SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

CONFERENCE ROOM A
CITY HALL, MUNICIPAL COMPLEX, 1 JUNKINS AVENUE

Members of the public also have the option to join the meeting over Zoom
*(See below for more details)**

2:00 PM **March 3, 2026**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of the February 3, 2026 Site Plan Review Technical Advisory Committee meeting minutes.

II. OLD BUSINESS

A. The request of **Brora LLC (Owner),** for property located at **150 Portsmouth Boulevard** requesting Site Plan Review Approval for the construction of three (3), six (6) story multifamily residential buildings with associated site work including parking, driveway access, utility, drainage, landscaping, and lighting improvements and reconstruction of Portsmouth Boulevard in front of the development. Said property is located on Assessor Map 213 Lot 12 and lies within the Office Research (OR) and Gateway Neighborhood Overlay (GNOD) Districts. (LU-25-114)

B. The request of **Sagamore Avenue CBC LLC (Owner),** for property located at **1151 Sagamore Avenue** requesting Site Plan Review approval for the demolition of the existing structure and construction of four (4) standalone condominium single family structures with associated site improvements. Said property is located on Assessor Map 224 Lot 19 and lies within the Mixed Residential Office (MRO) District. (LU-25-178)

C. The request of **Atlas Commons LLC (Owner)**, for property located at **581 Lafayette Road** requesting a second extension for Site Plan Approval. Said property is located on Assessor Map 229 Lot 8B and lies within the Gateway Corridor (G1) District. (LU-26-19)

III. NEW BUSINESS

A. The request of **304 Maplewood LLC (Owner)**, and **Planet Fitness (Applicant)**, for property located at **304 Maplewood Avenue** requesting amended Site Plan approval for a 1,011 square foot addition to the existing office building. Said property is located on Assessor Map 140 Lot 7 and lies within the Character District 4-L2 (CD4-L2) Historic Districts. (LU-26-5)

B. The request of **Jeannette MacDonald (Owner)**, for property located at **86 Farm Lane** requesting Preliminary and Final Subdivision approval and Site Plan Review approval to subdivide one lot into three lots with associated site improvements. Said property is located on Assessor Map 236 Lot 74 and lies within the Single Residence B (SRB) District. (LU-26-16)

C. The request of **Hope for Tomorrow Foundation (Owner)**, for property located at **315 Banfield Road** requesting amended Site Plan approval for the construction of a 2,115 s.f. Library addition to the existing 24,150 s.f. St. Patrick Academy School building with associated site improvements. Said property is located on Assessor Map 266 Lot 5 and lies within the Industrial (I) District. (LU-26-18)

D. The request of **Paul J. Griffin Family Trust (Owner)**, for property located at **0 South Street** and **Richards Avenue** requesting Preliminary and Final Subdivision approval to subdivide one lot into two conforming lots with associated improvements. Said property is located on Assessor Map 112 Lot 24A and lies within the General Residence A (GRA) District. (LU-26-19)

IV. ADJOURNMENT

**Members of the public also have the option to join this meeting over Zoom, a unique meeting ID and password will be provided once you register. To register, click on the link below or copy and paste this into your web browser:*

https://us06web.zoom.us/webinar/register/WN_pr-ZVJbJQIi0rkXRRxvLMA

SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

CONFERENCE ROOM A
CITY HALL, MUNICIPAL COMPLEX, 1 JUNKINS AVENUE

2:00 PM **February 3, 2026**

MEMBERS PRESENT:
Peter Stith, Chairperson, Planning Manager; David Desfosses, Construction Technician Supervisor; Chad Putney, Fire Prevention Officer; Peter Britz, Director of Planning & Sustainability; Shanti Wolph, Chief Building Inspector; Zachary Cronin, Assistant City Engineer, Eric Eby, Parking and Transportation Engineer; Mike Maloney; Deputy Police Chief; Vincent Hayes; Planner I

MEMBERS ABSENT:

ADDITIONAL STAFF PRESENT: Kate Homet, Environmental Planner and Sustainability Coordinator; Stefanie Casella, Senior Planner; Jennifer Crockett, Administrative Assistant I

MINUTES

I. APPROVAL OF MINUTES

A. Approval of the **January 6, 2026** meeting minutes.

P. Britz moved to approve the January 6, 2026 meeting minutes as presented, seconded by D. Desfosses.

II. OLD BUSINESS

A. REQUEST TO POSTPONE The request of **Brora LLC (Owner)**, for property located at **150 Portsmouth Boulevard** requesting Site Plan Review Approval for the construction of three (3), six (6) story multifamily residential buildings with associated site work including parking, driveway access, utility, drainage, landscaping, and lighting improvements and reconstruction of Portsmouth Boulevard in front of the development. Said property is located on Assessor Map 213 Lot 12 and lies within the Office Research (OR) and Gateway Neighborhood Overlay (GNOD) Districts. **REQUEST TO POSTPONE** (LU-25-114)

B. REQUEST TO POSTPONE The request of **Sagamore Avenue CBC LLC (Owner)**, for property located at **1151 Sagamore Avenue** requesting Site Plan Review approval for the demolition of the existing structure and construction of four (4) standalone condominium single family structures with associated site improvements. Said property is located on Assessor Map 224 Lot 19 and lies within the Mixed Residential Office (MRO) District. **REQUEST TO POSTPONE** (LU-25-178)

DISCUSSION AND DECISION OF THE BOARD

P. Britz made a motion to postpone Item II. A 150 Portsmouth Boulevard and Item II. B 1151 Sagamore Avenue to the March meeting. D. Desfosses seconded the motion. The motion passed unanimously.

C. The request of **Double MC LLC (Owner)**, for property located at **134 Pleasant Street** requesting Site Plan Review approval for redevelopment of the site to include reuse and expansion of the existing structure, and construction of a new structure, for residential and commercial uses with associated site improvements. Said property is located on Assessor Map 116 Lot 30 and lies within the Character District 4 (CD4). (LU-25-138)

SPEAKING TO THE APPLICATION

[Timestamp 5:39] John Chagnon from Haley Ward, Tracey Kozak from ARCove Architects, and Mark McNabb, property owner, came to present the application. Mr. Chagnon handed out a response to staff comments. He reviewed the responses, clarifying that the health club mentioned in the plans was a placeholder and has been updated to say professional office as they do not have a tenant in place. C. Putney asked about a turning template for firetrucks. Mr. Chagnon said they will add it to the existing truck-turning templates.

[Timestamp 10:07] Mr. Chagnon reviewed the parking calculations and the origin of the 40 foot right of way easement. Rebecca Brown arrived as an additional member of the project presentation. D. Desfosses recommended that a license be acquired for the construction of the proposed drain line and catch basin instead of an easement. The license will be for the pipe, and the construction will also require a stormwater permit. Mr. Chagnon stated that the new foundations will be waterproofed and that the basement will be engineered to resist groundwater. He reviewed the courthouse parking spaces that would be relocated. E. Eby said there were more than 7 spaces for the courthouse parking. Seven are within the easement, but there are additional spaces further up, resulting in a loss of spaces with the reconfiguration. Mr. Chagnon said they were creating three new spaces in the Parrott Avenue parking lot. This was further discussed between Mr. Chagnon and E. Eby.

[Timestamp 20:26] Mr. Chagnon reviewed and discussed the ramp to the garage with E. Eby. Mr. McNabb expressed that the ramp location helped reduce public confusion as the garage is a private use not a public one. Mr. Chagnon finished reviewing the staff comments. He mentioned that the design has been updated, and 4 additional apartments have been added. E. Eby asked about how they would manage public confusion around parking with the public Parrott Avenue parking lot being adjacent to the site and would this involve signage and paid after-hour parking as is currently

done. Mr. McNabb said they did not have a set plan in place and that they would have to see what the behavior is. This will also depend on what use is in the empty street level unit. C. Putney stated that they will need two separate towers for life safety purposes. For life safety purposes the site will be considered as having one building.

[Timestamp 28:57] P. Stith asked Ms. Kozak about the locations of the additional 4 apartments. She explained that two were added to each building. Mr. McNabb clarified that they did not add any square footage or height. S. Wolph asked for clarification about the total number of apartments and the number of Type A. Ms. Kozak stated there is one Type A accessible and that the rest are Type B. Mr. McNabb added that all the apartments would be serviced by elevators.

PUBLIC HEARING

[Timestamp 31:21] The public hearing was opened, no one spoke, the public hearing was then closed.

DISCUSSION AND DECISION OF THE BOARD

[Timestamp 31:37] TAC members reviewed typos in the submitted materials. P. Stith stated that he was not convinced that the roof below meets the intent of the penthouse. Ms. Kozak explained that the roof below was lower than the roof beside it making it a stepped roof and that there is no high roof in that location. That roof is a canopy over the entrance. They are measuring to that instead of the top floor. S. Wolph asked for clarification that the bedrooms were at least 7 square feet, as some of them are pretty small. Ms. Kozak explained that they are designed to fit a minimum of a queen bed with 2 feet all around – 9 feet minimum. E. Eby asked if there was a barrier between the parking spaces and the bicycle spaces in the underground parking. Mr. McNabb said there will be a standing half wall. The parking was further discussed.

[Timestamp 37:42] Mr. Chagnon stated that the change to office put them into the greater than 10,000 square feet, so the site now needs a loading zone. On the plan two spaces have been stripped for loading, taking out two parking spaces. The loading zone will be signed 6am – 6pm, it can be used at night for parking. P. Britz stated that the biggest thing is the alternate plan, he did not have a problem recommending it to the Planning Board. They will have to prove that the easements work. City Council approval will be needed, and it may be beneficial if received before going to Planning Board. This was further discussed. Z. Cronin stated third party oversight will be needed for work in the right-of-way and that a detailed foundation plan to make sure it is not overloading the city stormwater system. D. Desfosses stated that everything in the City's domain and the utility work on private property will need third party oversight and that the drainage system will require final approval from DPW before Planning Board submission.

D. Desfosses made a motion to recommend approval of this application to the Planning Board with the following conditions:

1) *City Council approval is needed for the proposed reconfiguration of traffic flow and parking spaces with easements.*

2) *Third party inspection required for utility work and work in the right-of-way and on City property.*

3) *Drainage system will require final approval from DPW before Planning Board submission.*

4) *Applicant must provide a license and easement plan.*

5) *Details of the foundation design will require DPW approval before a foundation permit can be issued.*

6) *Applicant must provide an updated truck turning template showing firetruck circulation layout and alternate circulation layout.*

7) *CMMP will be required.*

[Timestamp 42:32] S. Wolph asked if they had the intention to start construction before the Land Use process was finished. Mr. McNabb stated they did, for the existing building for work on the second floor and the stair tower outside. This was further discussed with TAC members. P. Britz suggested that a reference be made at the Planning Board.

P. Britz seconded the motion.

The motion passed unanimously.

III. ADJOURNMENT

The meeting adjourned at 2:42 PM.

K0076-065
February 18, 2026

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Request for Site Plan Review & Conditional Use Permits Review
Map 213 Lot 12 – Proposed Multi-Family Development

Dear Peter:

On behalf of Brora, LLC (Owner) and The Kane Company (Applicant) we are pleased to submit one (1) set of hard copies and one electronic file (.pdf) of the following information to support a request for a Site Review Permit and a Wetland Conditional Use Permit for the above referenced project.

Updated documents for the attention of the Technical Advisory Committee:

- One (1) 22x34 & one (1) 11x17 copy of the Site Plan Set, last revised February 18, 2026;
- TAC Comment Response Tracker, dated February 18, 2026;
- Schematic 8' Multi-Use Sidewalk Site Plan, dated January 16, 2026;
- Schematic Water Main Replacement Plan, dated January 16 ,2026;
- Drainage Outlet Exhibit, dated February 18, 2026;
- Atlantic Heights Emergency Access Plan Concept, dated October 7, 2016;
- Fire Truck Turning Exhibit, dated February 18, 2026;
- Community Space Exhibit, dated February 18, 2026;
- Wetland Buffer Exhibit, dated February 18, 2026;
- Grade Plane Exhibit, dated February 18, 2026;
- Drainage Analysis, dated February 18, 2026;
- Long-Term Operation & Maintenance Plan, dated February 18, 2026;

Documents that are unchanged from the previous TAC submission:

- Historical Site Overlay Exhibit, dated July 30, 2025;
- Green Building Statement, dated September 18, 2025;
- Eversource Will-Serve Letter, dated September 5, 2025
- Water & Wastewater Demand Analysis, dated September 22, 2025;
- Architectural Shadow Studies, dated November 2025;
- Landscape Operation & Maintenance Plan, dated November 17, 2025;
- Hillside Multifamily Development Project Resource Area Delineation Memo, dated September 17, 2025;
- Site Review Checklist, dated September 22, 2025;
- Wetland Conditional Use Permit Checklist, dated September 22, 2025;
- Lighting Cut Sheets;
- Traffic Impact Study, dated September 22, 2025;
- Third-Party Review Response – Traffic Impact Study, dated November 20, 2025;
- Application Fee Calculation Form;
- Authorization Form

177 Corporate Drive
Portsmouth, NH 03801

T 603.433.8818

TIGHEBOND.COM

PROJECT SUMMARY

Existing Conditions

The proposed project is located on a parcel of land along Portsmouth Boulevard that is identified as Map 213 Lot 12 on the City of Portsmouth Tax Maps. The property is bound to the north by Portsmouth Boulevard, to the west by the Hilton Homewood Suites, to the south by residences on Osprey Drive and to the east by residences on Dunlin Way. The site is currently undeveloped. This property is an 8.4-acre parcel of land located in the Office Research District and the Gateway Neighborhood Overly District (GNOD). The northern portion of the parcel along Portsmouth Boulevard, that contained multiple housing structures and parking areas prior to the mid-1990's, gently slopes up from north to south, and then approximately one-third of the way into the parcel the topography changes to a steep slope that plateaus in the south corner of the site after grade change of approximately 50- feet in elevation.

Proposed Redevelopment

The proposed project will be permitted under the recently adopted GNOD Overlay District regulations. As currently designed, the project will include three (3), six (6) story multifamily residential buildings consisting of approximately 274 dwelling units. With approval from the City Council, the Applicant will be proposing a Land Transfer to the City on separate property in order to achieve the Density Bonus offered by the Land Transfer Incentive Option (Section 10.686.30) and allow for six (6) story construction with up to 120 dwelling units per building.

The three (3) proposed buildings will be located along the frontage of Portsmouth Boulevard with associated parking located at the rear of buildings. Tenant amenity areas are anticipated to be provided on the first floor of the buildings with the primary amenities being centrally located in the middle building. The buildings will be connected by attractively landscaped and hardscaped outdoor amenity areas. The south portion of the site, where there is a significant change in grade, will remain undeveloped to provide a buffer between the proposed development and the existing residences along Osprey Drive. This south portion of the site is anticipated to be improved with walking paths and landscape features for outdoor recreation and will be the location of the required community space area. The section of Portsmouth Boulevard along the frontage of the subject property is proposed to be reconstructed with a new sidewalk and parking spaces to promote connection between the development and the surrounding neighborhood. Approximately 59% of the parcel is proposed to remain as open space post-construction.

Wetland Buffers

The proposed project results in work within the 100-foot wetland buffer. Therefore, a Wetland Conditional Use Permit is required for demolition and construction activities.

Wetlands are not located on the development parcel (Map 213 Lot 12), but rather on parcels located on the opposite side of Portsmouth Boulevard (Map 216, Lot 1-8A, Map 213 Lot 11). The 100-foot buffer in the vicinity of the project site extends across the right-of-way and into the development site. The buffer consists of the paved roadway of Portsmouth Boulevard and degraded, roadside habitat with disturbed areas of compacted gravel in addition to forested and open meadow areas with a moderate density of invasive vegetation. Stormwater flow from this section of the 100-foot buffer currently flows untreated into the wetlands as Portsmouth Boulevard lacks a stormwater treatment system.

Existing impervious areas within the buffer can be seen on the "Wetland Buffer Impervious Surface Exhibit" included under this submission. Under Section 10.1016(2) of the City of Portsmouth Zoning Ordinance, improvements to existing public rights-of-way and sidewalks are permitted in wetlands and wetland buffers. The reconstruction of Portsmouth Boulevard and its sidewalks within the wetland buffers are therefore considered permissible, and resulting impacts are not quantified.

Existing impervious areas within the development parcel include a compacted gravel drive. Impervious areas under the proposed condition within the buffer include a portion of Building A, a retaining wall, and a small portion of stairs connecting the site to the pedestrian sidewalk proposed along Portsmouth Boulevard. A comparison of the existing and proposed impervious areas within the buffer are numerically summarized in the following table (Table 1).

Table 1: 150 Portsmouth Boulevard, Wetland Buffer Impervious Surfaces

Buffer Segment	Existing Impervious (SF)	Final Impervious (SF)
0-25 feet	0	0
25-50 feet	0	0
50-100 feet	965	5,940
Total	965	5,940
Net Impervious Surface	**+4,975**	

The proposed site development includes a net increase in impervious areas within the 100-foot buffer (+4,975 sf). In order to offset this impact, the entirety of stormwater runoff within the right-of-way along the frontage of the development is proposed to be treated prior to discharge into the wetland using surface-level biofiltration systems. This amounts to almost 1 acre (42,250 sf) of treated impervious area within the right-of-way which does not contain stormwater treatment under the existing condition. The north edge of Portsmouth Boulevard is proposed to be planted with low-maintenance native grasses and trees in order to enhance the buffer and right-of-way.

LAND USE PERMIT APPLICATIONS

Local Permitting Timeline

The proposed project will require the following site-related approvals from the Planning Board:

- Site Plan Review Permit
- Wetland Conditional Use Permit

To date the applicant has attended the following meetings with the local land-use boards related to the Site Plan:

- March 20th, 2025 – Planning Board Conceptual Consultation
- June 18th, 2025 – Planning Board Design Review
- August 6th, 2025 – Conservation Commission Site Walk
- August 12th, 2025 – Technical Advisory Committee Work Session
- August 13th, 2025 – Conservation Commission Work Session
- October 7th, 2025 – Technical Advisory Committee Meeting
- October 8th, 2025 – Conservation Commission Meeting
    - Recommendation for Approval from the Conservation Commissions received
- January 6th, 2026 – Technical Advisory Committee Meeting

The project will also require the following approvals from the New Hampshire Department of Environmental Services (NHDES):

- Alteration of Terrain Permit
- Sewer Connection Permit

Site Plan Review Permit

The project will require a Site Plan Review Permit for the site improvements described above in the project summary. The project has previously met with the Planning Board for Conceptual Consultation, as well as the Technical Advisory Committee (TAC) and Conservation Commission (CC) for work sessions.

Zoning Compliance

The enclosed plans have been designed to comply with the City of Portsmouth Zoning Ordinance and specifically Section 10.680 – Gateway Neighborhood Overlay District within Article 6 – Overlay Districts.

CONDITIONAL USE PERMITS

Wetland Conditional Use Permit

Jurisdictional wetland areas are located on a separate property located north of the adjacent right-of-way (Map 216, Lot 1-8A, Map 213 Lot 11). The associated wetland buffer extends across the right-of-way and into the subject development parcel. A Conditional Use Permit for Wetland Buffer Impact will be required for the project for on-site work within the 100 ft wetland buffer.

Wetland Conditional Use Permit Criteria

Based on the above described and enclosed materials, the following addresses how the proposed project warrants the granting of a Wetland Conditional Use Permit by satisfying the following six (6) criteria for approval in Section 10.1017.50 of the Zoning Ordinance:

(1) The land is reasonably suited to the use, activity or alteration.

The proposed project design is an allowed use within the Gateway Neighborhood Overlay District. Prior to the mid-1990's, the land was home to multiple housing structures and parking areas within the proposed development area. Additionally, there were houses on the opposite side of the road within the areas now identified as wetlands which impose the wetland buffer on the subject property. Sometime between 1992 and 1998, these structures were removed from the site. The buffer area proposed to be impacted as part of the project is across a public Right-of-Way from the subject wetland area and consists of degraded, roadside habitat with compacted gravel soils. Stormwater runoff from the new impervious surfaces within the proposed buffer area will be collected and treated prior to discharge into the surrounding area.

(2) There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use, activity or alteration.

The location of the buildings in close proximity to lot frontage is driven by steep changes in topography into the southern portions of the parcel, consideration of building height and sight impacts with respect to abutters, and the restriction of location of parking facilities between principal buildings and the street (Section 10.1113.20). The placement of the proposed buildings and parking areas were sited in a way to reduce the areas of impervious surface within the wetland buffers while minimizing the impacts to the vegetated woodland area in the southern portion of the site which provides wildlife habitat and a natural screening buffer to the abutting residences.

Impacts inside of the public right-of-way within the wetland buffer are a permitted use under Section 10.1016(2) of the City of Portsmouth Zoning Ordinance.

(3) There will be no adverse impact on the wetland functional values of the site or surrounding properties;

The buffer consists of the paved roadway of Portsmouth Boulevard and degraded, roadside habitat with compacted gravel surfaces, in addition to forested and open meadow areas with a moderate density of invasive vegetation. The proposed site development is not anticipated to create an adverse impact to the wetland function values or surrounding properties, as stormwater from additional impervious areas will be collected, detained, and treated prior to discharge to wetlands. Additionally, the entirety of stormwater runoff within the public right-of-way along the frontage of the development, which currently discharges untreated surface runoff into the wetlands, is proposed to be collected and treated prior to discharge using surface-level biofiltration systems. Additional native vegetation and trees are also proposed within buffer areas.

(4) Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals; and

The natural vegetative state and managed woodland on the north side of the right-of-way will be impacted only temporarily to the extent necessary in order to construct right-of-way improvements. Minimal removal of trees and vegetation within the managed woodland will be required to construct a stormwater outlet at the east edge of the development. Any temporary disturbances of the wetland buffer will be restored following construction.

(5) The proposal is the alternative with the least adverse impact to areas and environments under the jurisdiction of this Section.

The proposed development is not anticipated to create an adverse impact on the existing buffer areas. The entirety of stormwater runoff within the right-of-way along the frontage of the development is proposed to be treated prior to discharge into the wetland using surface-level biofiltration systems, providing stormwater treatment within the right-of-way that it does not contain under the existing condition. All stormwater from the development parcel will be treated in accordance with City and State requirements. The northern edge of Portsmouth Boulevard is proposed to be planted with low-maintenance native grasses and trees in order to enhance the buffer and right-of-way, improving the existing condition which consists of a moderate density of invasive vegetation.

(6) Any area within the vegetated buffer strip will be returned to a natural state to the extent feasible.

The proposed work within the vegetated buffer strip is limited to the reconstruction of Portsmouth Boulevard within similar limits that it exists today. Areas temporarily disturbed for the removal and reconstruction of paved areas within the vegetated buffer strip will be restored following construction. These impacts are inside of the public right-of-way within the wetland buffer are a permitted use under Section 10.1016(2) of the City of Portsmouth Zoning Ordinance.

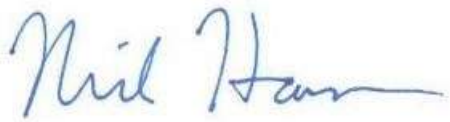
CONCLUSION

As shown in the enclosed information, the proposed project is expected to create distinctive, appealing, and high-quality housing connected to the community while respecting abutting properties, surrounding natural resources, and development goals within the City.

We respectfully request to be placed on the TAC meeting agenda for March 3rd, 2026. If you have any questions or need any additional information, please contact us by phone at (603) 294-9213 or by email at NAHansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.



Patrick M. Crimmins, PE
VICE PRESIDENT

Neil A. Hansen, PE
PROJECT MANAGER

Copy: Brora LLC

J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Reports\Applications\City of Portsmouth\20251117_TAC Submission\K0076-065 TAC Submission Letter.docx

150 PORTSMOUTH BOULEVARD - Site Plan Review - TAC & DPW COMMENTS (1/6/2025) RESPONSE

150 Portsmouth Boulevard
Portsmouth, New Hampshire
February 18, 2026

Prepared by: NAH/BKC
Project # K0076-065

-	TAC Comment	Response	Corresponding Plan Sheet #
1	Width of community space easement along pedestrian connection portion to be adjusted to be 15'-wide.	Comment no longer applicable. See response to Comment #5 below.	C-601, Community Space Exhibit
2	Please explain fire service/pump arrangement.	An 8" water main is proposed to loop around the site with connections to the existing 8" main on either side of Building B. A central fire pump room is proposed within Building B that is fed by an 8" service line off the 8" main. The central fire pump boosts flows up within Building B, and has a 6" outlet pipe that runs back through the site to provide fire services to Buildings A and C. Buildings A, B, and C are proposed to have their own resepective domestic booster pumps to serve more frequent and individual building demands.	C-501
3	Fire lane markings required in front of buildings on parking lot side.	Fire lane markings have been added to the drawings.	C-301
4	Proposed emergency access gate shall include Knox brand padlock.	The future design of the emergency road shall include a Knox-brand padlock on the gate when developed.	-
5	ADA-accessibility of pedestrian connection from Portsmouth Boulevard to southern hill (community space) to be studied.	The limits of the proposed community space have been revised under further coordination with City staff. A footpath is proposed on the southern edge of the site to direct users up the hill. This footpath is not proposed to be ADA-accesible due to the intended function like a hiking trail, and due to grading constraints of the space. A pocket park has been added to the south eastern corner of the site to function as an ADA-accessible community space connected to both the trail/wooded area and the right-of-way.	C-401
	DPW COMMENT	**Response**	**Corresponding Plan Sheet #**
6	There have been multiple public comments regarding the reinstallation of the temprorary gate currently at the end of Dunlin Way. We believe installing a gate at the end of Dunlin Way will impede overall safety in the area nd make it harder for the City to maintain the road and sidewalk network. We also largely believe that all entering and existing traffic from this new development will use Portsmouth Boulevard because it is the shortest route out of the neighborhood area. However, if a decision is made by the Planning Board that this gate is to be installed, the DPW will require the installation of a cul-de-sac before the gate likely in the area of the planned emergency access road from Atlantic Heights.	Ackowledged. In the TAC Work Session meeting on August 12, 2025, Deputy Fire Chief Pat Howe commented that the Fire Department does not want a gate at the end of Portsmouth Boulevard/Dunlin Way.	-
7	There should be a mechanical room in all buildings on the first floor adjacent to an exterior wall for purposes of water, fire, and electrical systems.	Floor plans have been updated to show mechanical rooms for all buildings.	Building Floor Plans
8	VGC curb is required in all public roads. SGC is not acceptable.	There is no sloped granite curb proposed within the right-of-way.	C-301
9	The existing conditions plan is showing slip lining the existing sewer; there are utility plans that show otherwise, please clarify. If new sewer is proposed, it must be extended to the hotel building. If slip lining is proposed, it must start at the first manhole uphill of the hotel building.	Installation of a new sewer main is proposed. The limits of removal and reconstruction are currently shown up to the sewer manhole adjacent to the hotel building (past the northern hotel driveway). The notes in reference to slip-lining sewer have been removed from the demolition plan.	C-201, C-501
10	Provide a road profile for Portsmouth Boulevard with all proposed and existing utilities shown so we can review the design properly.	A profile view has been added to the drawings (C-701)	C-701
11	We are not in favor of super-elevating the road, so provide drainage for both sides of the road.	The roadway has been revised to be crowned, and additional drainage along the southern edge of the road has been added.	C-401
12	Place the electrical and communications systems under the sidewalk as originally requested.	Electrical and communications systems are now located under the sidewalk.	C-501

13	Each building needs to have its own domestic service and its own shut-off valving outside of the structure. We recommend bringing one pipe in from the street and distributing the water behind the buildings similar to what is shown now, but there should be a fire and a domestic tap out in the street, and they should be separated by a distance. We will need leak detection and valve access easements on this site. Bypass metering will also be required.	Layout of water utility services has been revised to provide a loop between water mains entering the site and the main within the right-of-way, and shut-off valving has been added outside each structure. Easements and bypass metering will be provided.	C-501
14	The water main may also be looped through the site.	The water main is now proposed to loop within the site.	C-501
15	There is only one gas line shown on the plan (for the generator). What is the fuel source for these buildings?	Buildings will be utilizing heat pumps/electric energy-efficient HVAC systems.	Green Building Statement
16	Meet with Eversource/others to determine exactly where power and communications need to come from to determine total impact to City infrastructure.	The Applicant has reviewed the project further with Eversource and received direcion for necessary improvments. The plans have been updated to show required infrstructure improvements and tie-in locations within Portsmouth Boulevard and Dunlin way.	C-501
17	"City" lights shown will be lighting standards 20–24 feet high with LED heads. Size the lighting system to determine spacing, conduit needs, and power supply. The lighting will run off un-metered power from Eversource. Streelights shown to be relocated need to be assessed by the City to determine if they need replacing.	Lighting design within the right-of-way has been revised using standard light fixtures as provided by City staff. Lighting is proposed to be connected to existing lighting circuit within Portsmouth Boulevard as previously discussed with City staff. There are no streetlights within the limits of work proposed to be reused or relocated.	Photometrics Plan
18	Building mounted lighting is shown on the sidewalk side of the street. Please explain how the City will be able to guarantee lighting on the public sidewalk.	The lighting design has been revised to ensure suffucient lighting along the public sidewalk using the streetlights within the right-of-way only.	Photometrics Plan
19	All existing hydrant locations along the road should be maintained or relocated, as necessary.	The quantity and general locations of hydrants along the roadway have been revised to align with existing conditions.	C-201, C-501
20	40-foot spacing is too close for the street trees. Please spread them out a bit more. We are concerned that too much shade could create too much shade on the road and could then lead to more salting necessary.	Spacing of trees has been increased to 60 feet in order to ensure locations of trees do not impact door swing of adjacent parked cars.	L-101
21	Use City standard pavement mix designs and details. Many of the current details are unacceptable as shown.	Details have been updated accordingly - see comment and response to Comment #31 below.	C-802
22	What is the remaining street width in Portsmouth Boulevard in the hotel section proposed to be? Is it the same? Any trees requiring removal will need Trees and Greenery to agree. Reuse of existing ADA tiles may not be feasible. Use 24-inch square cast iron ADA panels as necessary to conform to ADA.	The street width in Porstmouth Boulevard is not currently proposed to be reduced as a result of the multi-use path construction (i.e. width to remain the same). The Applicant acknowledges that removal of trees will require Trees and Greenery approval (Note #2 added to schematic plan). New cast iron detectable warning panels are now proposed at tip-downs instead of reuse.	8' Multi-Use Sidewalk Site Plan
23	Provide a minimum of 10 feet of 12-inch DI water main beyond the new valve at Arthur Brady before bolting on the 12×6 reducer.	The schematic water main drawings have been revised accordingly. Final construction drawings will be coordinated with DPW for review and approval after receipt of Site Plan Review Approval by the Planning Board.	Water Main Replacement Plan
24	Show a hydrant in front of 1574 Woodbury; the City will work to secure permission for the hydrant. Also, the water service for this building needs to be tied to the new main.	The schematic water main drawings have been revised accordingly. Final construction drawings will be coordinated with DPW for review and approval after receipt of Site Plan Review Approval by the Planning Board.	Water Main Replacement Plan
25	We need a three-way water valve assembly at Commerce Way for the new main.	The schematic water main drawings have been revised accordingly. Final construction drawings will be coordinated with DPW for review and approval after receipt of Site Plan Review Approval by the Planning Board.	Water Main Replacement Plan
26	The drainage outfall needs to be reconfigured if the access road is not built. Discharge it 30 feet lower down the slope with a drop structure to dissipate energy.	The drainage outfall has been reconfigured to discharge farther down the slope as requested.	C-401

27	We feel that at the base of the re-graded hill, the engineer should have provided a 10-foot wide basin of at least 12-inch depth where water could accumulate, settle out, and then soak into the proposed underdrains or drain into beehive basins during frozen conditions instead of grading the slope right down to the parking stalls. Removing the trees and reshaping this hillside will remove most of the ability of the terrain to absorb and slow down this off-site runoff. Were there test pits conducted down below proposed grade levels in order to determine the actual remaining soil depth, suitability for infiltration, and runoff curve numbers? This area should be terraced at least once to increase the length and reduce the velocity of the flow paths and needs to be detailed more thoroughly. This flow should not be routed through the catch basin network but instead should be delivered for detention directly, as it likely will have very low pollutant levels compared to the sealed surfaces. An attempt should be made to infiltrate every possible amount of this hillside. With a 20-foot terrain cut, this needs to be detailed and multiple layers and or positions of under drains may be required to detail with spring groundwater conditions. The use of some retaining walls may be desirable to achieve the same vision with less impact. The drainage should be reviewed by a third-party engineer.	A detail has been included within the drawing set (C-805) demonstrating the design of the conveyance swale at the bottom of the slope. As reviewed with City staff in a work session meeting on 2/3/2026, test pits completed by Serverino concluded that ledge is expected to be encountered within one foot or so of existing grade within the slope. The intent of the project is to over excavate the southern hill and process surplus ledge fo reuse on-site as stuctural fill. The proposed vegetative and subgrade conditions of the slope are designed to emulate existing conditions, with a robust layer of loam over 4+ feet of granular fill material (reused from the lower portion of the site where buildings are to be located) to support long-term vegetative growth and percolation of stormwater runoff into the slope. Curve numbers are not proposed to be adjusted as slope conditions between the pre-development and post-development conditions will be similar. Flows from the slope are not proposed to be directed to detention directly because it would add redundant installation of drainage piping through the site that we do not believe is necessary. Under discussion with City staff in a work session meeting on 1/13/2026, it was determined that a third-party drainage review will not need not be completed as the project will be seeking review of the drainage system through an Alteration of Terrain permit.	C-401
	DPW EMAIL COMMENTS 1/15/2026	**Response**	**Corresponding Plan Sheet #**
28	As discussed, there will be little to no soil left on the hillside after re-grading, so please either 'design in' sufficient soil on the cut slope so that the HSG B Lawn Good Cn number used in the post condition portion of the report is plausible or change the runoff Cn to reflect what will be remaining after re-grading, whether that is ledge which would have a number in the 90's or a loam slope with minimal underlying soil that would likely have a curve number in the mid 80's as it would be a type C/D soil… This change will affect the amount of detention volume needed in the underground storage chamber. As discussed in person, I would prefer a better design in this area as an alternative..	See response to Comment #27 above.	
29	The flow path you are using to show the point of analysis being the box culvert should be shown on the plans so that the length and slopes associated with routing can be verified.	The flow path to the box culvert is shown for reference. The time of concentration for subcatchment POST-2.1 has been updated to include this additional flow path. There is no other means of adding that routing distance and length to other nodes in the model, and it does not have an effect on the model results.	C-702
30	On the emergency access plan, please show the existing power poles as they may be impacted by the proposed road.	Existing utilty poles have been added to the preliminary access road plan.	Emergency Access Road Grading Plan
31	On the City Right of Way pavement section, change the surface pavement to 3/8" and the binder should be ¾" fine binder. Both need to use the 'Portsmouth mix design standard' which has a max 10% rap specified, contractor to supply mix designs to DPW for approval before use. The gravel section should be 18" of NHDOT 304.4 fine stone for the base.	The City Right-of Way Pavement Section detail has been updated accordingly.	C-802
32	Catch basins to have type B grates.	The catch basin frame and grate detail has been updated to proposed NHDOT Type B grates.	C-804
33	If 30" drain pipe is indeed required, larger drain manholes than the 4' diam. Shown will be required.	5' and 6' diameter manholes are proposed for those accepting larger diameter pipe.	C-401
34	Add a note requiring the removal of the burlap and cages on all trees in the City ROW. City Arborist to be notified prior to planting so inspections can be scheduled.	A note has been addde to the Tree Planting Detail.	L-501

35	I saw the note that the sewer manholes need to be per City and State standards. Is there a note somewhere that the entire sewer system must be constructed to standards?	Note #1 on the Sewer Manhole detail has been revised to reference the entire sewer system. Note #10 on has been added under the Utility Notes on the General Notes and Legends sheet, as well.	C-807, C-101
36	Adjust detail a bit for conduits. Cable should not be over telephone, it should be adjacent to it and street lighting can be at 24” depth.	The Electrical and Communication Conduit Trench detail has been revised accordinly. A separate Lighting Conduit Trench detail has been added (on C-807) to convey shallower minimum installation depth.	C-805, C-807

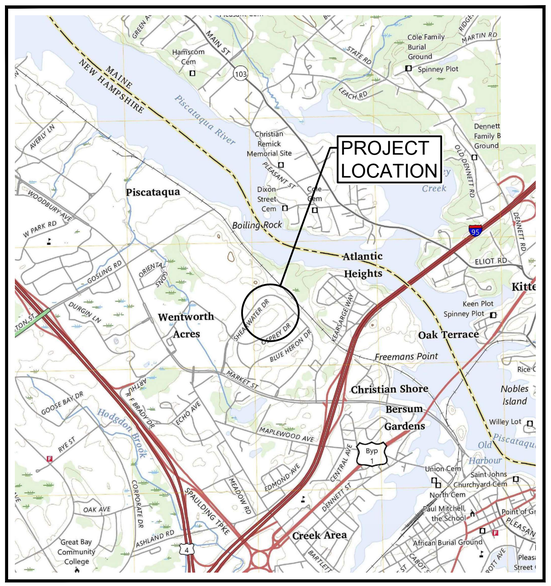
PROPOSED MULTI-FAMILY DEVELOPMENT

150 PORTSMOUTH BOULEVARD
PORTSMOUTH, NEW HAMPSHIRE

SEPTEMBER 22, 2025
LAST REVISED: FEBRUARY 18, 2026

SHEET NO.	SHEET TITLE	LAST REVISED
-	COVER SHEET	2/18/2026
1 OF 2	EXISTING CONDITIONS PLAN FOR DUNLIN WAY & PORTSMOUTH BOULEVARD	11/12/2025
2 OF 2	EXISTING CONDITIONS PLAN FOR DUNLIN WAY & PORTSMOUTH BOULEVARD	11/12/2025
C-101	GENERAL NOTES AND LEGEND	2/18/2026
C-201	DEMOLITION PLAN	2/18/2026
C-301	SITE PLAN	2/18/2026
C-401	GRADING. DRAINAGE, AND EROSION CONTROL PLAN	2/18/2026
C-501	UTILITIES PLAN	2/18/2026
C-601	EASEMENTS PLAN	2/18/2026
C-701	ROADWAY PLAN & PROFILE	2/18/2026
L-101	LANDSCAPE PLANTING PLAN	2/18/2026
C-801	EROSION CONTROL NOTES AND DETAILS SHEET	2/18/2026
C-802	DETAILS SHEET	2/18/2026
C-803	DETAILS SHEET	2/18/2026
C-804	DETAILS SHEET	2/18/2026
C-805	DETAILS SHEET	2/18/2026
C-806	DETAILS SHEET	2/18/2026
C-807	DETAILS SHEET	2/18/2026
C-808	DETAILS SHEET	2/18/2026
L-501	LANDSCAPE DETAILS	2/18/2026
L01	PHOTOMETRICS PLAN	2/18/2026
1 OF 5	BUILDING A OVERALL ELEVATIONS	2/18/2026
2 OF 5	BUILDING B OVERALL ELEVATIONS	2/18/2026
3 OF 5	BUILDING C OVERALL ELEVATIONS	2/18/2026
4 OF 5	OVERALL FLOOR PLANS - GROUND FLOOR PLAN	2/18/2026
5 OF 5	OVERALL FLOOR PLANS - LEVELS 2 - 6 PLAN	2/18/2026

LIST OF PERMITS		
LOCAL	STATUS	DATE
SITE PLAN REVIEW PERMIT	UNDER REVIEW	
CONDITIONAL USE PERMIT - WETLAND BUFFER	UNDER REVIEW	
STATE		
NHDES - SEWER CONNECTION PERMIT	NOT SUBMITTED	
NHDES - ALTERATION OF TERRAIN PERMIT	NOT SUBMITTED	
FEDERAL		
NPDES - CONSTRUCTION GENERAL PERMIT	NOT SUBMITTED	



LOCATION MAP
SCALE: 1" = 2000'

CONSTRUCTION NOTES:
1. THE CONTRACTOR SHALL NOT RELY ON SCALED DIMENSIONS AND SHALL CONTACT THE ENGINEER FOR CLARIFICATION IF A REQUIRED DIMENSION IS NOT PROVIDED ON THE PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND FOR SITE CONDITIONS THROUGHOUT CONSTRUCTION. NEITHER THE PLANS NOR THE SEAL OF THE ENGINEER AFFIXED HEREON EXTEND TO OR INCLUDE SYSTEMS REQUIRED FOR THE SAFETY OF THE CONTRACTOR, THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND IMPLEMENTING SAFETY PROCEDURES AND SYSTEMS AS REQUIRED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND ANY STATE OR LOCAL SAFETY REGULATIONS.
3. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION OF TIGHE & BOND.

PREPARED BY:
Tighe & Bond
177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
603-433-8818

PATRICK CRIMMINS No. 12378 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE - 2/18/26

NEIL A. HANSEN No. 15227 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE - 2/18/26

OWNER/APPLICANT:
BRORA LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801

ARCHITECT:
PROCON, INC.
PO BOX 4430
MANCHESTER, NH 03108

SURVEYOR:
DOUCET SURVEY, LLC.
102 KENT PLACE
NEWMARKET, NH 03857

TAC SUBMISSION SET
COMPLETE SET (26) SHEETS

Last Saved: 2/16/2026
Plotted: Feb 16, 2026 - 4:41pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-COVER.dwg

TBM 9009B
MAG NAIL SET UP 8"
IN POLE EVERSOURECE237/33
ELEV.=48.81'

TBM 9009A
'X' CUT IN BONNET
BOLT OF HYDRANT
ELEV.=54.83'

TBM 9009C
MAG NAIL SET UP 6"
IN POLE PSNH/237/35S
ELEV.=45.71'

TAX MAP 216, LOT 1-8A

TAX MAP 213, LOT 11

TAX MAP 213, LOT 12
364,581 Sq. Ft.
8.37 Acres

TAX MAP 213, LOT 2

TAX MAP 213, LOT 3

TAX MAP 213, LOT 4

TAX MAP 213, LOT 2-15

PORTSMOUTH BLVD. / DUNLIN WAY
(SEE NOTES 14&16)

OFFICE RESEARCH
GENERAL RESIDENCE B

NO SERVICE

2" METAL HYDRANT WITNESS

2" METAL HYDRANT WITNESS
OUT OF SERVICE

VGC IN DISREPAIR

CONC. BARRIERS

CONC. BLOCK BARRIERS (TYP.)

FILL PILE (TYP.)

~FILL PILE~

PAVEMENT BURIED UNDER GRAVEL

PAVEMENT BURIED

VGC BURIED

VGC GOES UNDERGROUND

APPROX. COVERED IN FILL DIRT/HAY

CURB BURIED

CURB BROKEN

BROKEN SECTION OF CURB

EP BURIED

ASPHALT SIDEWALK BROKEN/CRACKED

6' WOODEN STOCKADE FENCE

TRAIL

TP-X

5/8" REBAR FND. FLUSH W/CAP LLS 844

5/8" REBAR FND. FLUSH W/CAP LLS 989

5/8" REBAR FND. UP 1" W/CAP LLS 989

5/8" REBAR FND. UP 1" NO CAP

5/8" REBAR FND. UP 2" W/CAP LLS 844 (SEE NOTE 15)

5/8" REBAR FND. UP 4" W/CAP LLS 844 (SEE NOTE 15)

5/8" REBAR FND. UP 5" W/CAP LLS 844 (SEE NOTE 15)

5/8" REBAR FND. UP 6" W/CAP LLS 989

5/8" REBAR FND. UP 6" W/CAP LLS 844

5/8" REBAR FND. UP 18" NO CAP

1-1/2" I.P.F. FLUSH (S59°31'24"E, 1.86 TO CORNER)

1-1/4" I.P.F. UP 15"

SMH 2090
RIM ELEV.=62.0'
SHELF ELEV.=56.3'
(A) 6" VCP INV.=56.4'
(B) 8" PVC INV.=56.3'
(199.3) 8" VCP INV.=56.0'

SMH 1993
RIM ELEV.=52.9'
SHELF ELEV.=46.1'
(1967) 8" VCP INV.=45.7'
(2090) 8" VCP INV.=45.7'

SMH 1967
RIM ELEV.=48.6'
SHELF ELEV.=41.5'
(A) 4" UNK INV.=43.7'
(1013) 10" VCP INV.=41.0'
(199.3) 8" VCP INV.=41.0'

CB 2118
RIM ELEV.=46.1'
WATER ELEV.=43.5'
SUMP ELEV.=42.3'
(2120) 8" ACP INV.=43.4'
(A) 15" ACP INV.=43.4'

CBR 2119
RIM ELEV.=46.5'
WATER ELEV.=45.0'
DEBRIS ELEV.=43.3'
*NO PIPES VISIBLE
*FILLED WITH DEBRIS

DCB 2120
RIM ELEV.=44.7'
WATER ELEV.=42.9'
DEBRIS ELEV.=42.4'
(A) 8" VCP INV.=43.0'
(2118) 12" VCP INV.=42.6'
*COLLAPSED
*NO OTHER PIPES VISIBLE

SMH 1013
RIM ELEV.=45.8'
SHELF ELEV.=38.6'
(A) 6" VCP INV.=38.3'
(1267) 10" VCP INV.=38.2'
(1967) 10" VCP INV.=38.2'

CBR 1304
RIM ELEV.=44.0'
WATER ELEV.=39.9'
SUMP ELEV.=39.4'
(130.3) 8" VCP INV.=39.8'
(A) 8" VCP INV.=39.8'
*OFL NOT FOUND

CBR 1303
RIM ELEV.=43.9'
WATER ELEV.=40.1'
SUMP ELEV.=39.3'
(1304) 8" VCP INV.=39.1'

SMH 1267
RIM ELEV.=43.9'
SHELF ELEV.=38.5'
(1273) 8" PVC INV.=37.7'
(101.3) 10" VCP INV.=37.7'

DCB 1291
RIM ELEV.=42.6'
(1290) 12" CMP INV.=38.9'
(A) 12" UNK INV.=37.5'
(B) 12" CMP INV.=36.5'
(C) 12" UNK INV.=35.7'
(OFL) 12" UNK INV.=35.6'

SMH 1273
RIM ELEV.=42.8'
SHELF ELEV.=36.8'
(A) 12" PVC INV.=37.4'
(1267) 8" PVC INV.=35.9'
(2115) 8" PVC INV.=35.9'

CB 1290
RIM ELEV.=42.7'
DEBRIS ELEV.=39.9'
(1291) 10" PVC INV.=40.4'
(A) 8" HDPE INV.=40.0'

SMH 2115
RIM ELEV.=43.6'
SHELF ELEV.=36.4'
(1273) 8" PVC INV.=35.6'
(1398) 8" PVC INV.=35.5'

CB 2122
RIM ELEV.=44.8'
WATER ELEV.=40.0'
(A) 12" CMP INV.=41.0'
(B) 12" CMP INV.=40.1'
(C) 12" HDPE INV.=40.0'

SMH 1398
RIM ELEV.=45.5'
SHELF ELEV.=35.4'
(A) 4" PVC INV.=42.4'
(B) 4" PVC INV.=41.0'
(C) 4" PVC INV.=41.0'
(D) 4" PVC INV.=39.0'
(2115) 8" PVC INV.=34.7'
(E) 8" PVC INV.=34.5'

12" CLAY INV.=34.7'

PSNH237-34

PSNH237/32

PSNH27/37/10T

PSNH246/2/15E

100E/PSNH/246/1

L=762.51'
R=434.18'
Δ=100°35'00"
CB=S85°53'15"W
CL=668.27'

198.97'
N54°26'41"W

156.37'
S61°52'28"W

287.68'
S50°45'51"W

241.31'
S45°52'15"W

156.89'
S46°11'15"W

141.39'
S44°15'17"E

51.60'
S43°48'43"E

404.20'
N09°59'19"W

N35°35'16"E
134.16'

TO 2120

TO 2118

STATE OF NEW HAMPSHIRE
STEFANIE M. TETREAULT
No. 315
CERTIFIED WETLAND SCIENTIST
09/17/2025

STATE OF NEW HAMPSHIRE
JAMES P. GOVE
No. 0051
CERTIFIED WETLAND SCIENTIST
09-04-2025

NHSPC (NAD83 / 2011)

LEGEND

- EXISTING LOT LINE
- BUILDING SETBACK LINE
- 100 MAJOR CONTOUR LINE
- 98 MINOR CONTOUR LINE
- STONE WALL
- STOCKADE FENCE
- OHW OVERHEAD WIRE
- SD DRAIN LINE
- SS SEWER LINE
- XW WATER LINE (PER CLIENT)
- G GAS LINE
- TREE LINE
- SHRUB LINE
- EDGE OF DELINEATED WETLAND
- WETLAND AREA
- CONCRETE
- CRUSHED STONE
- PILE
- LEDGE OUTCROP
- × 100.0 SPOT GRADE
- UTILITY POLE
- UTILITY POLE & GUY WIRE
- UTILITY POLE W/LIGHT
- UTILITY POLE STUMP
- CATCH BASIN
- DOUBLE CATCH BASIN
- SEWER MANHOLE
- FIRE HYDRANT
- PIPE/ROD FOUND
- SIGN
- POST
- DECIDUOUS TREE 10" DIA. OR GREATER
- TEST PIT LOCATION
- A-1 WETLAND FLAG
- ACP ASBESTOS CONCRETE PIPE
- CONC. CONCRETE
- CMP CORRUGATED METAL PIPE
- EP EDGE OF PAVEMENT
- HDPE HIGH DENSITY POLYETHYLENE PIPE
- I.P.F. IRON PIPE FOUND
- PVC POLYVINYL CHLORIDE PIPE
- SGC SLOPED GRANITE CURB
- TYP. TYPICAL
- UNK UNKNOWN
- VCP VITREOUS CLAY PIPE
- VGC VERTICAL GRANITE CURB
- (X) INVERT I.D. CONNECTION UNKNOWN

40 0 40 80
SCALE: 1 INCH = 40 FT.

EXISTING CONDITIONS PLAN

FOR
THE KANE COMPANY
LAND OF
BRORA LLC
(TAX MAP 213, LOT 12)
DUNLIN WAY & PORTSMOUTH BOULEVARD
PORSTMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	11/12/25	ADD WATER LINE LOCATION	MWF
1	9/3/25	REVISE WETLAND NOTE	MWF

DRAWN BY:	G.A.N.	DATE:	MARCH 2025
CHECKED BY:	M.W.F.	DRAWING NO.	9009A
JOB NO.	9009	SHEET	1 OF 2

DOUCET SURVEY | A SAM Company
102 Kent Place, Newmarket, NH 03857 (603) 659-6560
Offices in Bedford & Keene, NH and Kennebunk, ME
Locations Nationwide | http://www.sam.biz

FILE NAME: C:\Users\MWF\AppData\Local\Temp\AcPublish_34484\9009A (748).dwg LAYOUT NAME: 22X34 TOPO PLAN (1) PLOTTED: Tuesday, November 11, 2025 - 7:45am

NOTES:

1. REFERENCE: TAX MAP 213, LOT 12
DUNLIN WAY & PORTSMOUTH BOULEVARD
PORTSMOUTH, NEW HAMPSHIRE 03801
D.S. PROJECT NO. 9009

2. TOTAL PARCEL AREA: 364,581 SQ. FT. OR 8.37 AC.

3. OWNER OF RECORD: BRORA LLC
210 COMMERCE WAY, SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 3465, PAGE 462

4. ZONE: OR – DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA	3 AC.
MIN. FRONTAGE	300 ft.
MIN. FRONT SETBACK	50 ft.
MIN. SIDE SETBACK	75 ft.
MIN. REAR SETBACK	50 ft.
MIN. BUILDING HEIGHT	60 ft.

ZONING INFORMATION LISTED HEREON IS BASED ON THE CITY OF PORTSMOUTH ZONING ORDINANCE AMENDED NOVEMBER 18, 2024 AS AVAILABLE ON THE CITY'S WEBSITE ON MARCH 25, 2025. ADDITIONAL REGULATIONS MAY APPLY, AND REFERENCE IS HEREBY MADE TO THE EFFECTIVE ZONING ORDINANCE. THE LAND OWNER IS RESPONSIBLE FOR VERIFYING AND COMPLYING WITH ALL APPLICABLE MUNICIPAL, STATE, AND FEDERAL REGULATIONS.

5. FIELD SURVEY PERFORMED BY J.P.E. & D.W.D. DURING FEBRUARY AND MARCH 2025 USING A TRIMBLE S6 TOTAL STATION AND A TRIMBLE R10 SURVEY GRADE GPS WITH A TRIMBLE TSC5 DATA COLLECTOR AND A TRIMBLE DINI DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.

6. HORIZONTAL DATUM BASED ON NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATE ZONE (2800) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

7. VERTICAL DATUM IS BASED ON APPROXIMATE NAVD88(GEOID18) (±.2') DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.

8. <u>WETLAND DELINEATION ON MAP 213, LOT 11 AND MAP 216, LOT 1-8A</u>

WETLANDS AND AREAS UNDER THE JURISDICTION OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, PURSUANT TO NH ADMINISTRATIVE RULES CHAPTER ENV-WT 100-900, WERE DELINEATED BY TIGHE & BOND ON MAP 213 LOT 11 AND MAP 216 LOT 1-8A ON MARCH 21, 2025 USING THE FOLLOWING METHODOLOGY AND STANDARDS:

a) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 20212, U.S. ARMY CORPS OF ENGINEERS.
b) NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC OILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
c) U.S. ARMY CORPS OF ENGINEERS. (2023). 2022 NATIONAL WETLAND PLANT LIST, VERSION 3.6. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, VICKSBURG, MS. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/
d) NEW HAMPSHIRE ADMINISTRATIVE RULE CHAPTER ENV-WT 602.23, DEFINITIONS: HIGHEST OBSERVABLE TIDE LINE (HOTL) AND ENV-WT 406, DELINEATION AND CLASSIFICATION OF JURISDICTIONAL AREAS, EFFECTIVE DECEMBER 15, 2019.

<u>WETLAND DELINEATION ON MAP 213, LOT 12</u>

WETLANDS ON MAP 213 LOT 12 WERE DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC.: JAMES P. GOVE, CWS 051, CSS 004, SENIOR SOIL SCIENTIST ON 06-06-2025. NO WETLANDS WERE OBSERVED. WETLANDS WERE DELINEATED USING THE FOLLOWING STANDARDS:

a) US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987).
b) REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012
c) FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.

9. FLOOD HAZARD ZONE: "X", PER FIRM MAP #33015C0259F, DATED 1/29/21.

10. PROPER FIELD PROCEDURES WERE FOLLOWED IN ORDER TO GENERATE CONTOURS AT 2' INTERVALS. ANY MODIFICATION OF THIS INTERVAL WILL DIMINISH THE INTEGRITY OF THE DATA, AND DOUCET SURVEY WILL NOT BE RESPONSIBLE FOR ANY SUCH ALTERATION PERFORMED BY THE USER.

11. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING: THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MANHOLE CONFIGURATION, ETC.

12. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.

13. ALL UNDERGROUND UTILITIES (ELECTRIC, GAS, TEL. WATER, SEWER DRAIN SERVICES) ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

14. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF DUNLIN WAY AS DEPICTED HEREON IS/ARE BASED ON RESEARCH CONDUCTED AT THE CITY OF PORTSMOUTH AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. PORTSMOUTH BOULEVARD IS A 50 FOOT WIDE RIGHT OF WAY PER REFERENCE PLAN 7.

15. MONUMENT OF BOUNDARY LINE ABANDONED BY R.C.R.D. PLAN D-38784 (REF. PLANS 1).

16. **AT TIME OF SURVEY PORTIONS OF PORTSMOUTH BOULEVARD ALONG THE SUBJECT PARCEL WAS OVERGROWN AND COVERED IN DEBRIS. THE LIMITS OF PAVEMENT AND SIDEWALK AS SHOWN IS BASED ON THE BEST AVAILABLE SURVEY LOCATIONS UNDER THE CURRENT STATE OF THE ROADWAY.**

REFERENCE PLANS:

1. "BOUNDARY LINE ADJUSTMENT PLAN, LAND OF DOAKS, LLC (TAX MAP 213, LOT 2) AND BRORA, LLC (TAX MAP 213, LOT 12), PORTSMOUTH, NEW HAMPSHIRE" BY DOUCET SURVEY, INC., DATED DECEMBER 31, 2014, R.C.R.D. PLAN D-38784.

2. "PRELIMINARY CONCEPT PLAN AT SCHILLER STATION, PORTSMOUTH, NEW HAMPSHIRE", BY PUBLIC SERVICE OF NEW HAMPSHIRE GENERAL ENGINEERING DIVISION, DATED 2/3/97.

3. "SUBDIVISION PLAN FOR BRORA, LLC", BY MILLETTE, SPRAGUE & COLWELL, INC., DATED AUGUST 27, 2003, R.C.R.D. PLAN #D-31583.

4. "SUBDIVISION/CONSOLIDATION PLAN MAP R-16/LOTS 1, 1-5 & 1-8B, MAP R-17/LOTS 2-1838 THRU 2-1844, MAP R-17/LOT 2-0300", BY CLD CONSULTING ENGINEERS, INC., DATED DEC. 1999 R.C.R.D. PLAN #D-28385.

5. "RESUBDIVISION PLAN OSPREY LANDING", BY CLD CONSULTING ENGINEERS, INC., DATED FEB. 1999, R.C.R.D. PLAN #D-27099.

6. "LOT LINE RELOCATION PLAN OSPREY LANDING", BY CLD CONSULTING ENGINEERS, INC., DATED FEB. 1999, R.C.R.D. PLAN #D-27029.

7. "SUBDIVISION PLAN OF MARINERS VILLAGE & SPINNAKER POINT CONDOMINIUM", BY ASSOCIATED ENGINEERING SERVICES, DATED OCTOBER 23, 1993, R.C.R.D. PLAN #D-23202.

<u>ABUTTERS INFORMATION:</u>

TAX MAP 213, LOT 2
NEP PORTSMOUTH OWNER LLC
& COLONY CAPITAL
545 E JOHN CARPENTER FREEWAY SUITE 1400
IRVING, TX 75062
R.C.R.D. BOOK 5627, PAGE 702

TAX MAP 213, LOT 2-15
INISHMAAN ASSOC. LTD. PARTNERSHIP
& JCM MANAGEMENT CO.
540 NORTH COMMERCIAL STREET
MANCHESTER, NH 03101
R.C.R.D. BOOK 3078, PAGE 1947

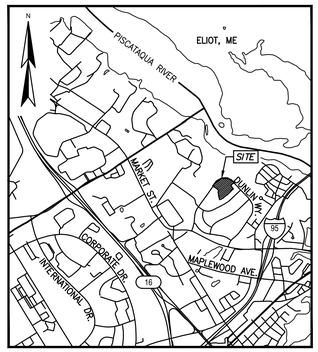
TAX MAP 213, LOT 3
THOM GRAEME
1518 SUMMER AVE
JUPITER, FL 33469
R.C.R.D. BOOK 3453, PAGE 2213

TAX MAP 213, LOT 4
DAVID S. ROGERS DECLARATION OF TRUST
15 DUNLIN WAY
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5539, PAGE 146

TAX MAP 213, LOT 10
MUKHLIS & ALABDULLA FAMILY TRUST
20 DUNLIN WAY
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 6579, PAGE 466

TAX MAP 213, LOT 11
GSP SCHILLER, LLC
431 RIVER RD.
BOW, NH 03304
R.C.R.D. BOOK 5887, PAGE 823

TAX MAP 216, LOT 1-8A
BEACON HARBOR TRUST, LLC
210 COMMERCE WAY SUITE 300
PORTSMOUTH, NH 03801
R.C.R.D. BOOK 5877, PAGE 2905



LOCATION MAP (n.t.s.)

EXISTING CONDITIONS PLAN
FOR
THE KANE COMPANY
LAND OF
BRORA LLC
(TAX MAP 213, LOT 12)
DUNLIN WAY & PORTSMOUTH BOULEVARD
PORSTMOUTH, NEW HAMPSHIRE

NO.	DATE	DESCRIPTION	BY
2	11/12/25	ADD WATER LINE LOCATION	MWF
1	9/3/25	REVISE WETLAND NOTE	MWF

DRAWN BY:	G.A.N.	DATE:	MARCH 2025
CHECKED BY:	M.W.F.	DRAWING NO.	9009A
JOB NO.	9009	SHEET	2 OF 2

DOUCET SURVEY LLC
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Offices in Bedford & Keene, NH and Kennebunk, ME
http://www.doucetsurvey.com

FILE NAME: C:\Users\MWF\Vaultin\Local\Temp\AcPublish_34684\9009A (TAB).dwg LAYOUT NAME: 22X34 TOPO PLAN (2) PLOTTED: Tuesday, November 11, 2025 - 7:45am

EXISTING CONDITIONS PLAN NOTES:

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY BY DOUCET SURVEY, LLC., DATED MARCH 2025.
2. WETLAND DELINEATION ON MAP 213, LOT 11 AND MAP 216, LOT 1-8A
   WETLANDS AND AREAS UNDER THE JURISDICTION OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, PURSUANT TO NH ADMINISTRATIVE RULES CHAPTER ENV-WT 100-900, WERE DELINEATED BY TIGHE & BOND ON MAP 213 LOT 11 AND MAP 216 LOT 1-8A ON MARCH 21, 2025 USING THE FOLLOWING METHODOLOGY AND STANDARDS:
   a. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, (VERSION 2.0) JANUARY 2012, U.S. ARMY CORPS OF ENGINEERS.
   b. NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019 VERSION 4, FIELD INDICATORS FOR IDENTIFYING HYDRIC OILS IN NEW ENGLAND. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MA.
   c. U.S. ARMY CORPS OF ENGINEERS. (2023). 2022 NATIONAL WETLAND PLANT LIST, VERSION 3.6. U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, VICKSBURG, MS. HTTP://WETLAND-PLANTS.USACE.ARMY.MIL/
   d. NEW HAMPSHIRE ADMINISTRATIVE RULE ENV-WT 406, DELINEATION AND CLASSIFICATION OF JURISDICTIONAL AREAS, EFFECTIVE DECEMBER 15, 2019.
3. WETLAND DELINEATION ON MAP 213, LOT 12
   WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC.: JAMES P. GOVE, CWS 051, CSS 004, SENIOR SOIL SCIENTIST ON 06-06-2025. NO WETLANDS WERE OBSERVED. WETLANDS WERE DELINEATED USING THE FOLLOWING STANDARDS:
   a. US ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JAN 1987).
   b. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012
   c. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE.
4. OFF-SITE EXISTING GRADES DERIVED FROM THE FOLLOWING SEPARATE PLANS:
   a. "ATLANTIC HEIGHTS EMERGENCY ACCESS" FOR THE CITY OF PORTSMOUTH, BY TIGHE & BOND, DATED 10/7/2016.

GENERAL NOTES:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
2. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES, AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
3. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
4. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION (E.G., EXISTING UTILITIES) SHOWN ON THESE DRAWINGS IS NOT GUARANTEED AND SOME SUBSURFACE INFORMATION MAY NOT BE SHOWN. DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL SUBSURFACE FEATURES WHICH MAY AFFECT CONSTRUCTION OPERATIONS BY TEST PIT OR OTHER METHODS, AS NECESSARY TO PREVENT DAMAGE TO UTILITIES AND OTHER SUBSURFACE FEATURES, AND/OR INTERRUPTIONS IN UTILITY SERVICE. PROVIDE DATA COLLECTED THROUGH THESE INVESTIGATIONS TO THE ENGINEER PRIOR TO CONSTRUCTING THE PROPOSED IMPROVEMENTS.
5. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY UTILITIES IDENTIFIED DURING CONSTRUCTION THAT ARE NOT SHOWN ON THE DRAWINGS OR THAT DIFFER IN SIZE OR MATERIAL
6. THE CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY; COORDINATION WITH THE OWNER, ALL SUBCONTRACTORS, AND WITH OTHER CONTRACTORS WORKING WITHIN THE LIMITS OF WORK, THE MEANS AND METHODS OF CONSTRUCTING THE PROPOSED WORK.
7. THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
9. THE CONTRACTOR SHALL COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAY WITH THE CITY OF PORTSMOUTH.
10. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
11. THE CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR.
12. BEFORE ANY DEWATERING IS PERFORMED A TEMPORARY DISCHARGE PERMIT FROM THE NHDES IS REQUIRED.
13. THE CONTRACTOR IS RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL/SAFETY DEVICES TO ENSURE SAFE VEHICULAR AND PEDESTRIAN ACCESS THROUGH THE WORK AREA, OR FOR SAFELY IMPLEMENTING DETOURS AROUND THE WORK AREA. PERFORM TRAFFIC CONTROL IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED TRAFFIC CONTROL PLAN.
14. WHEN WORKING IN THE RIGHT OF WAY, THE CONTRACTOR SHALL PROVIDE THE OWNER AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES A DETAILED PLAN OF APPROACH INDICATING METHODS OF PROPOSED TRAFFIC ROUTING ON A DAILY BASIS, AND COORDINATION TO ENSURE COMMUNICATION AND COORDINATION BETWEEN THE OWNER, THE CONTRACTOR AND LOCAL FIRE/POLICE/SCHOOL AUTHORITIES THROUGHOUT THE CONSTRUCTION PERIOD.
15. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL PROPERTIES WITHIN THE PROJECT AREA AT ALL TIMES DURING CONSTRUCTION.
16. NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITH THE PLANS OR BETWEEN THE PLANS AND ANY APPLICABLE LAW, REGULATION, CODE, STANDARD SPECIFICATION, OR MANUFACTURER'S INSTRUCTIONS.
17. TIGHE & BOND ASSUMES NO RESPONSIBILITY FOR ANY ISSUES, LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM TIGHE & BOND.
18. REMOVAL OR CUTTING OF VEGETATION WITHIN WETLAND BUFFER AREAS SHALL BE ONLY BE COMPLETED UNDER THE REQUIREMENTS AND RESTRICTIONS SET FORTH BY THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTION 10.1018.23.
19. THE USE OF FERTILIZERS, PESTICIDES, AND HERBICIDES WITHIN WETLAND BUFFER AREAS SHALL BE LIMITED BY THE RESTRICTIONS SET FORTH BY THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTIONS 10.1018.24 AND 10.1018.25.

DEMOLITION NOTES:

1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
2. THE CONTRACTOR IS RESPONSIBLE FOR SUPPORT OF EXISTING UTILITIES AND REPAIR OR REPLACEMENT COSTS OF UTILITIES DAMAGED DURING CONSTRUCTION, WHETHER ABOVE OR BELOW GRADE. REPLACE DAMAGED UTILITIES IMMEDIATELY AT NO ADDITIONAL COST TO THE OWNER AND AT NO COST TO THE PROPERTY OWNER.
3. ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY ARE ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
5. ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
6. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, TREES AND LANDSCAPING.
7. REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
9. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
10. UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK.
11. SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
12. PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
13. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
14. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.
15. THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
16. THE CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
17. THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
18. BOLD LINETYPES SHOWN WITHIN THE LIMITS OF WORK INDICATE SITE FEATURES TO BE REMOVED, UNLESS SPECIFICALLY IDENTIFIED TO REMAIN.
19. ASBESTOS CEMENT PIPE IS BELIEVED TO EXIST WITHIN THE PROJECT LIMITS. ASBESTOS CEMENT ENCOUNTERED THAT IS REQUIRED TO BE REMOVED SHALL BE SAFELY ABATED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS BY CERTIFIED ABATEMENT PROFESSIONALS.

SITE NOTES:

1. PAVEMENT MARKINGS, INCLUDING BUT NOT LIMITED TO; PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, CROSS WALKS, ARROWS, LEGENDS, AND CENTERLINES, SHALL BE CONSTRUCTED AS SHOWN ON THE DRAWINGS AND DETAILS, AND SHALL MEET THE FOLLOWING REQUIREMENTS:
   - ALL ON-SITE PAVEMENT MARKINGS EXCEPT CENTERLINES, MEDIAN ISLANDS, FOG/SHOULDER LINES, AND LANE LINES SHALL BE CONSTRUCTED USING WHITE TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248 TYPE "F".
   - ALL ON-SITE CENTERLINES AND MEDIAN ISLANDS SHALL BE CONSTRUCTED USING YELLOW THERMOPLASTIC STRIPING MATERIAL, MEETING THE REQUIREMENTS OF AASHTO M249.
   - ALL ON-SITE FOG/SHOULDER LINES AND LANE LINES SHALL BE CONSTRUCTED USING WHITE THERMOPLASTIC STRIPING MATERIAL, MEETING THE REQUIREMENTS OF AASHTO M249.
   - ALL PAVEMENT MARKINGS WITHIN PUBLIC RIGHT OF WAY SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, AND APPLICABLE DEPARTMENT OF TRANSPORTATION (DOT), STANDARD SPECIFICATIONS.
2. ALL PAVEMENT MARKINGS AND SIGNS SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" CURRENT EDITION, "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" CURRENT EDITION, AND THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA) AS APPLICABLE.
3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
4. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
5. THE CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED.
6. COORDINATE ALL WORK ADJACENT TO BUILDINGS WITH BUILDING DRAWINGS/CONTRACTOR.
7. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
8. ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
9. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING RETAINING WALL DESIGN FROM STRUCTURAL ENGINEER AND/OR WALL MANUFACTURER. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CONSTRUCT WALL IN ACCORDANCE WITH DESIGN APPROVED BY THE ENGINEER. RETAINING WALL SHALL BE SEGMENTAL BLOCK WALL SYSTEM AS OUTLINED IN THE DETAILS.
11. PROPERTY MANAGER WILL BE RESPONSIBLE FOR TIMELY SNOW REMOVAL FROM ALL PUBLIC WALKS, DRIVES, AND PARKING AREAS ON-SITE. SNOW SHALL BE HAULED OFF-SITE AND LEGALLY DISPOSED OF, WHEN NECESSARY, WHEN SNOW STORAGE AREAS HAVE REACHED CAPACITY.
12. ALL WINTER MAINTENANCE SHALL BE PERFORMED BY GREEN SNOWPRO CERTIFIED CONTRACTORS.

GRADING AND DRAINAGE NOTES:

1. GENERAL COMPACTION REQUIREMENTS:
   - BELOW PAVED OR CONCRETE AREAS: 95%
   - TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL: 95%
   - BELOW LOAM AND SEED AREAS: 90%
   - * ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
2. ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
3. SEE UTILITY PLAN FOR ALL SITE UTILITY INFORMATION.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
5. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
6. PROVIDE SITE GRADING AT ACCESSIBLE SIDEWALK RAMPS, SIDEWALKS, AND BUILDING ENTRANCES THAT IS CONSISTENT WITH THE RELEVANT ACCESS REQUIREMENTS OF THE ARCHITECTURAL BARRIERS ACT (ABA), THE AMERICANS WITH DISABILITIES ACT (ADA), AND MA ARCHITECTURAL ACCESS BOARD REQUIREMENTS (AAB). SMALL CHANGES IN GRADE OVER RELATIVELY SHORT DISTANCES (E.G. AT PARKING SPACES, ACCESSIBLE ROUTES, AND RAMPS) MIGHT NOT BE CLEARLY DEPICTED WITHIN THE CONTOUR INTERVAL SHOWN. COMPLY WITH THE CRITERIA IN THESE STANDARDS. SELECT MAXIMUM SLOPE CRITERIA ARE REPRODUCED BELOW:
   - ACCESSIBLE PARKING STALLS AND PASSENGER LOADING ZONES (IN ANY DIRECTION) SHALL BE < 2.0%
   - LONGITUDINAL SLOPE ALONG ACCESSIBLE ROUTES SHALL BE < 5.0%
   - CROSS SLOPE ALONG ACCESSIBLE ROUTES SHALL BE < 2.0%
7. THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES.
9. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
10. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.
11. THE CONTRACTOR SHALL VERIFY INVERTS OF EXISTING DRAIN LINES AND STRUCTURES AT PROPOSED DRAINAGE CONNECTION LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.

GENERAL EROSION CONTROL NOTES:

1. REFER TO SHEET C-601 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

UTILITY NOTES:

1. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
   - NATURAL GAS - UNITIL
   - WATER - CITY OF PORTSMOUTH
   - SEWER - CITY OF PORTSMOUTH
   - ELECTRIC - EVERSOURCE
   - COMMUNICATIONS - CONSOLIDATED COMM/FAIRPOINT/COMCAST
2. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
3. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
5. ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
6. ALL BELOW GRADE WATER VALVES AND FITTINGS SHALL HAVE MECHANICAL JOINT (MJ) ENDS. RESTRAIN ALL WATER VALVES AND FITTINGS JOINTS WITH RETAINER GLANDS, OR AS REQUIRED BY THE CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.
7. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO THE CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.
8. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH FIRE AND/OR WATER DEPARTMENT.
9. ALL SEWER MAIN INSTALLATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARDS AND APPLICABLE STATE STANDARDS (ENV-WQ 700).
10. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
11. THE CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
12. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
13. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, CURRENT EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
14. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
15. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
16. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
17. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO THE COMPLETION OF THIS PROJECT.
18. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
19. THE CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
20. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
21. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
22. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH SEWER DEPARTMENT.
23. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE INSULATED.
24. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
25. THE CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
26. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
27. THE CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
28. FINAL LOCATION OF ALL WATER METER AND VALVE SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT PRIOR TO CONSTRUCTION.
29. THE CONTRACTOR SHALL VERIFY INVERTS OF EXISTING SEWER LINES AND STRUCTURES AT PROPOSED SEWER CONNECTION LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.
30. THE CONTRACTOR SHALL VERIFY INVERTS OF EXISTING SEWER LINES AND STRUCTURES AT PROPOSED SEWER CONNECTION LOCATIONS PRIOR TO CONSTRUCTION AND IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.

ABBREVIATIONS

ABDN('D)	ABANDON(ED)	MIN	MINIMUM
AC	ASBESTOS CEMENT PIPE	MISC	MISCELLANEOUS
APPROX	APPROXIMATE	MON	MONUMENT
BC	BITUMINOUS CURB	MJ	MECHANICAL JOINT
BFP	BACK FLOW PREVENTOR	N	NORTH
BIT	BITUMINOUS	NITC	NOT IN THIS CONTRACT
BL	BASELINE	NTS	NOT TO SCALE
BLDG	BUILDING	N/A	NOT APPLICABLE
BND	BOUND	N/F	NOW OR FORMERLY
BOC	BOTTOM OF CURB	OC	ON CENTER
BOT	BOTTOM	OCS	OUTLET CONTROL STRUCTURE
BS	BOTTOM OF STEP	OH	OVERHEAD
BW	BOTTOM OF WALL	PB	PLANT BED
CATV	CABLE TELEVISION	PC	POINT OF CURVATURE
CB	CATCH BASIN	PCC	POINT OF COMPOUND CURVATURE
CCW	CEMENT CONCRETE WALK	PCPP	PERFORATED CORRUGATED POLYETHYLENE PIPE
CEM	CEMENT	PERF	PERFORATED
CI	CAST IRON PIPE	PI	POINT OF INTERSECTION
CL	CENTERLINE	PRC	POINT OF REVERSE CURVATURE
CLF	CHAIN LINK FENCE	PROT	PROTECT
CO	CLEAN OUT	PSF	POUNDS PER SQUARE FOOT
CONC	CONCRETE	PSI	POUNDS PER SQUARE INCH
CPP	CORRUGATED POLYETHYLENE PIPE	PT	POINT OF TANGENCY
CY	CUBIC YARD	PVC	POLYVINYLCHLORIDE
DH	DRILL HOLE	PVMT	PAVEMENT
DI	DUCTILE IRON PIPE	R	RADIUS
DIA	DIAMETER	RCP	REINFORCED CONCRETE PIPE
DMH	DRAIN MANHOLE	RD	ROOF DRAIN
E	EAST	REV	REVISION
EF	EACH FACE	ROW	RIGHT OF WAY
EG	EXISTING GRADE	RT	RIGHT
EL/ELEV	ELEVATION	R&D	REMOVE AND DISPOSE
ELEC	ELECTRIC	R&R	REMOVE AND RESET
EMH	ELECTRIC MANHOLE	R&S	REMOVE AND STACK
EOP	EDGE OF PAVEMENT	S	SOUTH
EW	EACH WAY	SAN	SANITARY
EXIST	EXISTING	SCH	SCHEDULE
FES	FLARED END SECTION	SF	SQUARE FOOT
FF	FINISH FLOOR	SMH	SEWER MANHOLE
FM	FORCE MAIN	SS	STAINLESS STEEL
G	GAS	STA	STATION
GG	GAS GATE	STL	STEEL
GRAN	GRANITE	STRM	STORM
HC	HANDICAP	T	TANGENT LENGTH
HDPE	HIGH DENSITY POLYETHYLENE	TC	TOP OF CURB
HMA	HOT MIX ASPHALT	TEL	TEL-DATA
HYD	HYDRANT	TP	TEST PIT
IN	INCHES	TS	TOP OF STEP
INV	INVERT	TW	TOP OF WALL
IP	IRON PIN	TYP	TYPICAL
L	LENGTH OF CURB	UP	UTILITY POLE
LP	LIGHT POLE	W	WATER
LT	LEFT	WG	WATER GATE
MAX	MAXIMUM	WV	WATER VALVE
MH	MANHOLE	XFMR	TRANSFORMER

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		PROPERTY LINE
		ADJACENT PROPERTY LINE
		RIGHT OF WAY (ROW) LINE
		EASEMENT LINE
		ZONING DISTRICT BOUNDARY LINE (APPROX)
		BUILDING SETBACK LINE
-8-	8	INTERMEDIATE CONTOURS
-10-	10	INDEX CONTOURS
x 44.45	x 44.45	SPOT SPOT GRADE
	2%	MAGNITUDE & DIRECTION OF SLOPE
		LIMIT OF WETLANDS WATER COURSE
		LIMIT OF LOCAL WETLAND BUFFER
B-XX		LOCATION OF BORING (APPROX)
TP-XX		LOCATION OF TEST PIT (APPROX)
		LIMIT OF WORK (APPROX)
		LIMIT OF SAWCUT (APPROX)
		LIMIT OF EROSION CONTROL (APPROX)
		INLET PROTECTION
		PAVEMENT / CONCRETE SECTION TO BE REMOVED (APPROX)
		LIMIT OF CLEARING & GRUBBING (APPROX)
		EDGE OF PAVEMENT
	VGC	VERTICAL GRANITE CURB
SGC	SGC	SLOPED GRANITE CURB
	15'R	CURB RADIUS
		PAVEMENT SECTION
		FENCE
		GUARDRAIL
		LIGHT POLE / BASE
		SIGN
		BOLLARD
		SNOW STORAG

EXISTING VGC TO BE REMOVED (TYP.)

EXISTING CONC. BARRIERS TO BE REMOVED (TYP.)

EXISTING HYDRANT TO REMAIN

EXISTING OVERHEAD UTILITIES WITHIN L.O.W. TO BE REMOVED (TYP.)

APPROXIMATE LIMITS OF MILL AND OVERLAY (SEE SITE PLAN)

SEWER MANHOLE TO BE REMOVED

BEGIN REMOVAL OF SEWER LINE

EXISTING WATER MAIN TO REMAIN; WATER MAIN SHOWN IS APPROXIMATE, BASED ON TEST PITS COMPLETED BY SEVERINO ON 11/4/2025

25' BUFFER WETLAND MARKERS TO BE INSTALLED PRIOR TO CONSTRUCTION (TYP. OF 2)

EXISTING 8" ACP DRAIN TO BE STUBBED & CAPPED

EXISTING PAVEMENT TO BE REMOVED (TYP.)

EXISTING HYDRANT TO BE REMOVED

SEWER MANHOLE TO BE REMOVED (TYP. OF ALL WITHIN LIMIT OF WORK)

EXISTING 8" VCP TO BE STUBBED & CAPPED

EXISTING CATCH BASINS & PIPE TO BE REMOVED

OVERHEAD SERVICES TO BE REMOVED (COORDINATE WITH EVERSOURCE)

PROPOSED SILT SOCK

SEWER LINES TO BE REMOVED (TYP.)

EXISTING FILL PILES TO BE REMOVED (TYP.)

EXISTING SHRUBS TO BE REMOVED (TYP.) 43,766 SF (1 ACRE)

EXISTING CATCH BASINS & PIPE TO BE REMOVED

EXISTING 12" CMP TO BE STUBBED & CAPPED

STONE WALLS TO BE REMOVED (TYP.)

EXISTING CATCH BASINS & PIPE TO BE REMOVED (TYP.)

EXISTING CONC. BARRIERS TO BE REMOVED (TYP.)

EXISTING HYDRANT TO BE REMOVED

PROPOSED SILT FENCE (TO BE INSTALLED AS FIRST ORDER TO WORK TO DELINEATE LIMIT OF CLEARING)

APPROXIMATE LIMITS OF CLEARING (TYP.)

EXISTING TREES TO BE REMOVED (TYP.) ±193,720 SF (4.45 ACRES)

EXISTING OVERHEAD UTILITIES WITHIN L.O.W. TO BE REMOVED (TYP.)

EXISTING UTILITY POLES TO REMAIN; OVERHEAD SERVICES TO EAST TO REMAIN (SEE UTILITY PLAN)

LIMIT OF OVERHEAD SERVICE REMOVAL

END REMOVAL OF SEWER LINE

STOCKADE FENCE TO REMAIN

EXISTING STONE WALL TO REMAIN

EXISTING TREES AND VEGETATION ALONG ABUTTING PROPERTY TO BE RETAINED TO MAXIMUM EXTENT POSSIBLE

PROPOSED SAWCUT LINE (TYP.)

PROPOSED INLET PROTECTION BARRIER

PROPOSED SILT FENCE (TO BE INSTALLED AS FIRST ORDER TO WORK TO DELINEATE LIMIT OF CLEARING)

50' WETLAND BUFFER

25' WETLAND BUFFER

100' WETLAND BUFFER

TAX MAP 213, LOT 10

TAX MAP 213, LOT 3

TAX MAP 213, LOT 4

TAX MAP 213, LOT 2-15

OFFICE RESEARCH
GENERAL RESIDENCE B

SEE SHEET C-101 FOR PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

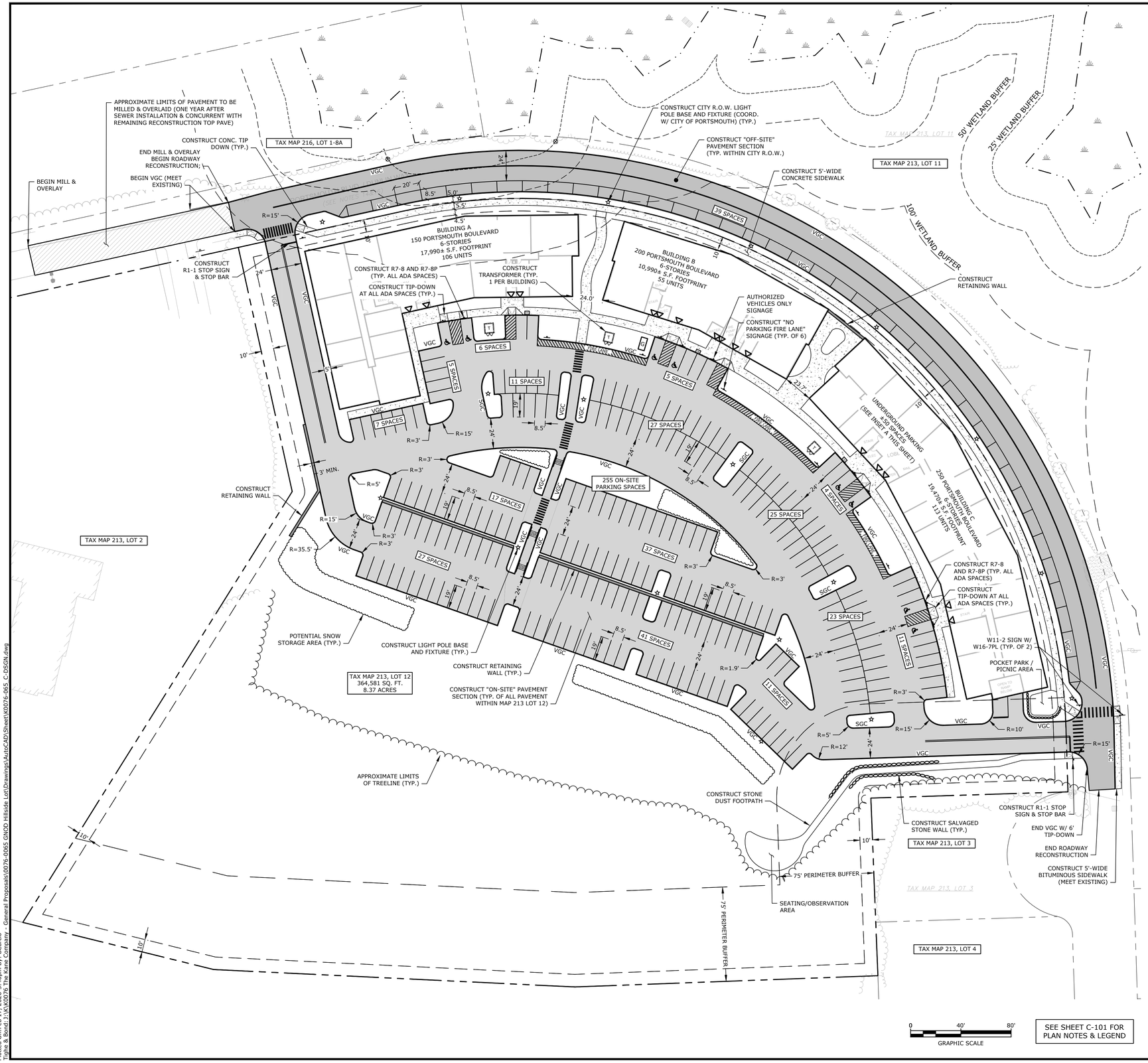
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DEMOLITION PLAN

SCALE: AS SHOWN

C-201

Last Saved: 2/16/2026
Plotted: Feb 18, 2026 - 5:14pm By: BCurcio
Tighe & Bond J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg



SEE SHEET C-101 FOR PLAN NOTES & LEGEND

SITE DATA:

LOCATION: TAX MAP 213 LOT 12

OWNER: BRORA LLC
210 COMMERCE WAY
SUITE 300
PORTSMOUTH, NH 03801

ZONING DISTRICT: OFFICE RESEARCH (OR)
GATEWAY NEIGHBORHOOD OVERLAY DISTRICT (GNOD)

PROPOSED USE: MULTI-FAMILY RESIDENTIAL

EXISTING LOT SIZE: 364,581 SQ. FT. (8.37 ACRES)

DEVELOPMENT STANDARDS

BUILDING PLACEMENT:	REQUIRED	PROPOSED
MINIMUM FRONT YARD:	10 FT	10 FT
MINIMUM SIDE YARD:	10 FT	10 FT
MINIMUM REAR YARD:	10 FT	450 FT±
MINIMUM PERIMETER BUFFER:	75 FT	75 FT
BUILDING AND LOT OCCUPATION:	**REQUIRED**	**PROPOSED**
MAXIMUM BUILDING COVERAGE:	75%	13%
MAXIMUM BUILDING FOOTPRINT:	NR	19,470 SQ FT
MAXIMUM BUILDING LENGTH:	400'	321 FT
MINIMUM SITE FRONTAGE:	300 FT	948 FT
MINIMUM SITE DEPTH:	100 FT	855 FT
MINIMUM OPEN SPACE:	10%	59%
BUILDING FORM (PRINCIPAL BUILDING):	**REQUIRED**	**PROPOSED**
MAXIMUM DWELLINGS PER BUILDING:	120 UNITS(1)	113(1)
MAXIMUM BUILDING HEIGHT:	6 STORIES(2) 80 FT	6 STORIES(2) <80 FT(2)

OFF-STREET PARKING REQUIREMENTS

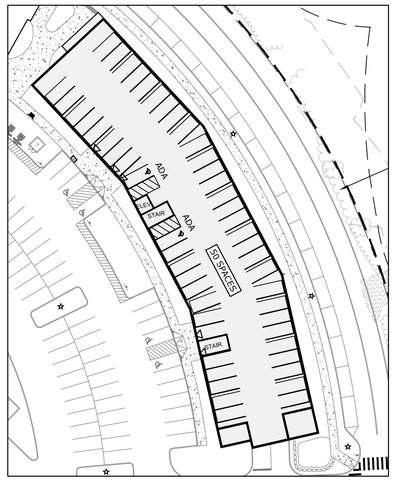
PARKING SPACES REQUIRED:		
DWELLING UNITS:		
RESIDENTIAL UNITS (LESS THAN 500 SQ FT)	45 UNITS X 0.5 SPACES	22.5 SPACES
RESIDENTIAL UNITS (>500 SQ FT)	229 UNITS X 1 SPACE	229 SPACES
VISITOR PARKING, 1.0 SPACE PER 5 UNITS	274 UNITS	54.8 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		306.3 SPACES
AFTER PUBLIC TRANSIT PROXIMITY REDUCTION (20%)		245 SPACES
PARKING SPACES	**REQUIRED**	**PROPOSED**
	245 SPACES	305 SPACES*

*INCLUDES 50 UNDERGROUND PARKING SPACES UNDER BUILDING C. DOES NOT INCLUDE 39 OFF-SITE SPACES.

ADA PARKING SPACES	REQUIRED	PROPOSED
	8 SPACES (2 VAN SPACE)	10 SPACES (10 VAN SPACES)
PARKING SPACE DIMENSIONAL REQUIREMENTS:		
STANDARD 90° STALL:		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
STANDARD 0° STALL:		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	20 FT MIN	20 FT
DRIVE AISLE WIDTH:		
90° (2-WAY TRAFFIC)	24 FT	24 FT
0° (2-WAY TRAFFIC)	24 FT	24 FT
COMMUNITY SPACE:	**REQUIRED**	**PROPOSED**
	10% 36,458 SF	27.4% 100,000 SF

NOTES:
(1) - UP TO 120 DWELLING UNITS PER BUILDING SHALL BE ALLOWED WITH CITY COUNCIL APPROVAL PER SECTION 10.686.30.
(2) - MAXIMUM BUILDING HEIGHT FOR ANY APARTMENT BUILDING OR MIXED USE BUILDING SHALL BE 6-STORIES OR 80 FT WITH CITY COUNCIL APPROVAL PER SECTION 10.686.30.

SITE RECORDING NOTES:
1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
4. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.



INSET A: UNDERGROUND PARKING LAYOUT
SCALE: 1:50

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

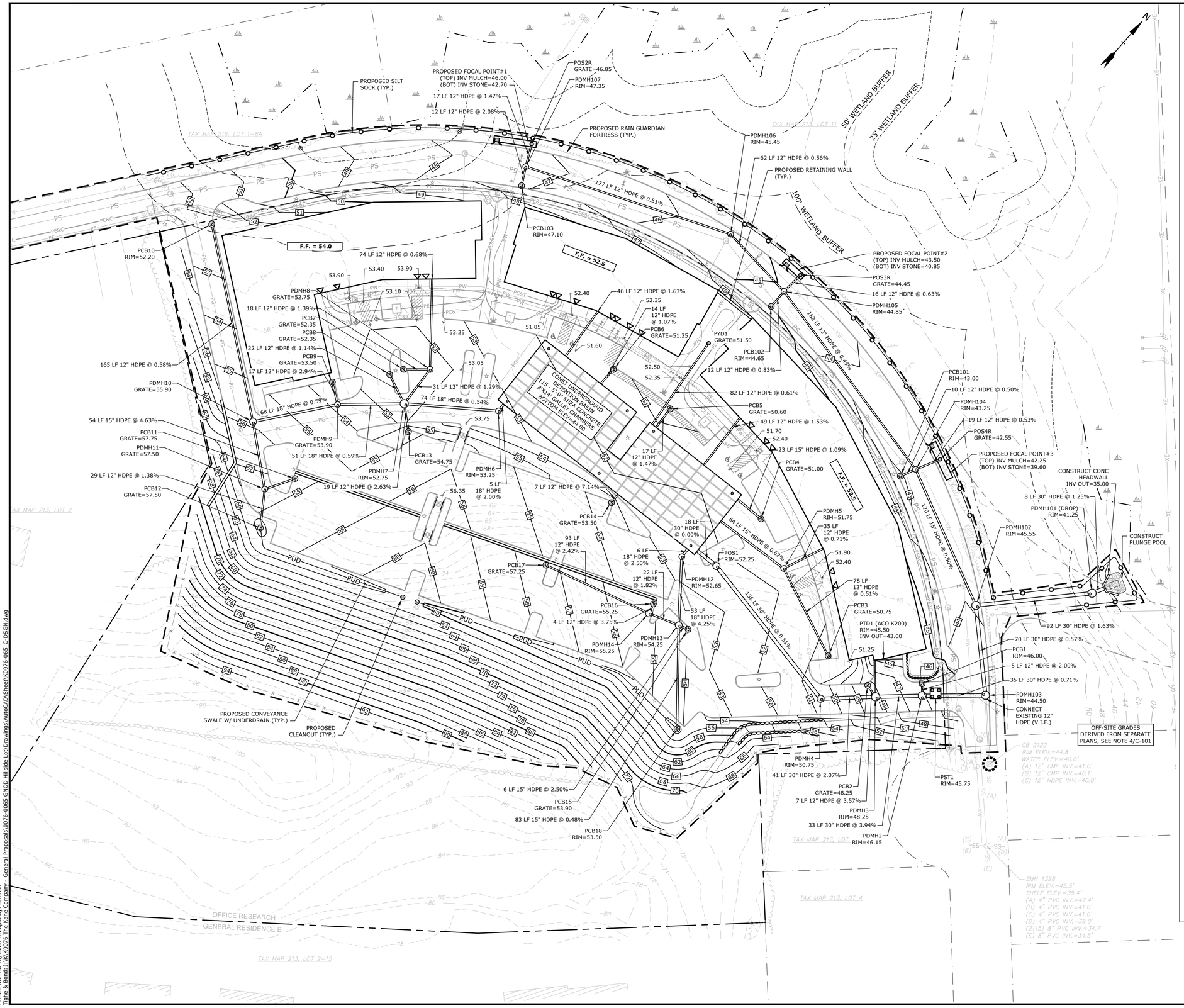
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-301

Last Saved: 2/17/2026
Plotted: Feb 17, 2026 - 3:40pm By: BCurcio
Tighe & Bond: J:\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg


PROPOSED SILT SOCK (TYP.)
PROPOSED FOCAL POINT#1 (TOP) INV MULCH=46.00 (BOT) INV STONE=42.70
17 LF 12" HDPE @ 1.47%
12 LF 12" HDPE @ 2.08%
POS2R GRATE=46.85
PDMH107 RIM=47.35
PROPOSED RAIN GUARDIAN FORTRESS (TYP.)
PDMH106 RIM=45.45
62 LF 12" HDPE @ 0.56%
PROPOSED RETAINING WALL (TYP.)
50' WETLAND BUFFER
25' WETLAND BUFFER
100' WETLAND BUFFER
177 LF 12" HDPE @ 0.51%
PCB103 RIM=47.10
F.F. = 54.0
F.F. = 52.5
PCB10 RIM=52.20
74 LF 12" HDPE @ 0.68%
PROPOSED FOCAL POINT#2 (TOP) INV MULCH=43.50 (BOT) INV STONE=40.85
POS3R GRATE=44.45
16 LF 12" HDPE @ 0.63%
PDMH105 RIM=44.85
PDMH8 GRATE=52.75
18 LF 12" HDPE @ 1.39%
PCB7 GRATE=52.35
PCB8 GRATE=52.35
22 LF 12" HDPE @ 1.14%
PCB9 GRATE=53.50
17 LF 12" HDPE @ 2.94%
165 LF 12" HDPE @ 0.58%
PDMH10 GRATE=55.90
46 LF 12" HDPE @ 1.63%
14 LF 12" HDPE @ 1.07%
PCB6 GRATE=51.25
PYD1 GRATE=51.50
PCB102 RIM=44.65
182 LF 12" HDPE @ 0.49%
12 LF 12" HDPE @ 0.83%
82 LF 12" HDPE @ 0.61%
PCB5 GRATE=50.60
49 LF 12" HDPE @ 1.53%
CONST UNDERGROUND DETENTION BASIN 115 - 5'0" DIA CONCRETE 8'X14' CULTEC CHAMBERS BOTTOM ELEV=44.00
31 LF 12" HDPE @ 1.29%
74 LF 18" HDPE @ 0.54%
68 LF 18" HDPE @ 0.59%
PDMH9 GRATE=53.90
51 LF 18" HDPE @ 0.59%
PDMH7 RIM=52.75
PCB13 GRATE=54.75
PDMH6 RIM=53.25
5 LF 18" HDPE @ 2.00%
54 LF 15" HDPE @ 4.63%
PCB11 GRATE=57.75
PDMH11 GRATE=57.50
29 LF 12" HDPE @ 1.38%
PCB12 GRATE=57.50
19 LF 12" HDPE @ 2.63%
7 LF 12" HDPE @ 7.14%
PCB14 GRATE=53.50
17 LF 12" HDPE @ 1.47%
23 LF 15" HDPE @ 1.09%
PCB4 GRATE=51.00
F.F. = 57.5
PDMH5 RIM=51.75
18 LF 30" HDPE @ 0.00%
35 LF 12" HDPE @ 0.71%
64 LF 15" HDPE @ 0.62%
93 LF 12" HDPE @ 2.42%
PCB17 GRATE=57.25
6 LF 18" HDPE @ 2.50%
POS1 RIM=52.25
22 LF 12" HDPE @ 1.82%
PDMH12 RIM=52.65
78 LF 12" HDPE @ 0.51%
PCB3 GRATE=50.75
PTD1 (ACO K200) RIM=45.50 INV OUT=43.00
135 LF 30" HDPE @ 0.51%
53 LF 18" HDPE @ 4.25%
PCB16 GRATE=55.25
4 LF 12" HDPE @ 3.75%
PDMH13 RIM=54.25
PDMH14 RIM=55.25
PCB101 RIM=43.00
10 LF 12" HDPE @ 0.50%
PDMH104 RIM=43.25
19 LF 12" HDPE @ 0.53%
POS4R GRATE=42.55
PROPOSED FOCAL POINT#3 (TOP) INV MULCH=42.25 (BOT) INV STONE=39.60
CONSTRUCT CONC HEADWALL INV OUT=35.00
8 LF 30" HDPE @ 1.25%
PDMH101 (DROP) RIM=41.25
PDMH102 RIM=45.55
CONSTRUCT PLUNGE POOL
130 LF 15" HDPE @ 0.50%
92 LF 30" HDPE @ 1.63%
70 LF 30" HDPE @ 0.57%
PCB1 RIM=46.00
5 LF 12" HDPE @ 2.00%
35 LF 30" HDPE @ 0.71%
PDMH103 RIM=44.50
CONNECT EXISTING 12" HDPE (V.I.F.)
OFF-SITE GRADES DERIVED FROM SEPARATE PLANS, SEE NOTE 4/C-101
PROPOSED CONVEYANCE SWALE W/ UNDERDRAIN (TYP.)
PROPOSED CLEANOUT (TYP.)
6 LF 15" HDPE @ 2.50%
PCB15 GRATE=53.90
83 LF 15" HDPE @ 0.48%
PCB18 RIM=53.50
PDMH4 RIM=50.75
41 LF 30" HDPE @ 2.07%
PCB2 GRATE=48.25
7 LF 12" HDPE @ 3.57%
PDMH3 RIM=48.25
33 LF 30" HDPE @ 3.94%
PDMH2 RIM=46.15
PST1 RIM=45.75
CB 2122 RIM ELEV.=44.8' WATER ELEV.=40.0' (A) 12" CMP INV.=41.0' (B) 12" CMP INV.=40.1' (C) 12" HDPE INV.=40.0'
SMH 1398 RIM ELEV.=45.5' SHELF ELEV.=35.4' (A) 4" PVC INV.=42.4' (B) 4" PVC INV.=41.0' (C) 4" PVC INV.=41.0' (D) 4" PVC INV.=39.0' (2115) 8" PVC INV.=34.7' (E) 8" PVC INV.=34.5'
TAX MAP 216, LOT 1-8A
TAX MAP 213, LOT 11
TAX MAP 213, LOT 2
TAX MAP 213, LOT
TAX MAP 213, LOT 4
TAX MAP 213, LOT 2-15
OFFICE RESEARCH
GENERAL RESIDENCE B
PUD
PUD
PUD

PSMH9
RIM=62.00
INV IN=56.40 SW (MEET EXISTING)
INV IN=56.30 SE (MEET EXISTING)
8" INV OUT=54.00 NE

CONST 32 LF
8" PVC SDR35
S= 2.03%

PSMH8
RIM=60.00 (V.I.F.)
8" INV IN=53.35 SW
8" INV OUT=53.25 NE

CONNECT TO EXISTING GAS MAIN
(VERIFY EXACT LIMITS IN FIELD)

PSMH7
RIM=52.35
8" INV IN=45.10 SW
8" INV OUT=45.00 NE

CONST 140 LF
8" PVC SDR35
S= 5.82%

CONSTRUCT 7'X13' ELECTRIC MANHOLE
(COORD. W/ EVERSOURCE)

SEE INSET BELOW FOR
ADDITIONAL WORK WITHIN
PORTSMOUTH BOULEVARD

CONNECT PROPOSED LIGHTING CIRCUIT
AND CONDUIT WITHIN RIGHT-OF-WAY
TO EXISTING PORTSMOUTH BOULEVARD
LIGHTING CIRCUIT

PROPOSED GAS MAIN
(COORD. W/ UNITIL)

CONSTRUCT CITY R.O.W. LIGHT
POLE BASE AND FIXTURE (COORD.
W/ CITY OF PORTSMOUTH) (TYP.)

CONST 245 LF
8" PVC SDR35
S= 2.04%

PSMH6
RIM=47.85
8" INV IN=40.00 SW
8" INV IN=40.00 SE
8" INV OUT=39.50 NE

CONST 37 LF
8" PVC SDR35
S= 2.70%

CONSTRUCT ELECTRIC MANHOLE
(COORD. W/ EVERSOURCE)

PROPOSED 10" TEE, THRUST BLOCK,
AND GATE VALVE (COORDINATE WITH
CITY OF PORTSMOUTH DPW)

CONST 227 LF
8" PVC SDR35
S= 0.44%

PROPOSED 10"X6"TEE, THRUST BLOCK,
AND 6" GATE VALVE TO FIRE HYDRANT
(COORDINATE WITH CITY OF
PORTSMOUTH DPW)

CONSTRUCT PRIMARY ELECTRICAL &
COMMUNICATIONS DUCT BANK (TYP.)

PSMH5
RIM=45.55
8" INV IN=38.50 SW
8" INV IN=38.50 S
8" INV OUT=38.40 E

CONST 38 LF
8" PVC SDR35
S= 2.63%

CONSTRUCT SEWER
SERVICE CONNECTION
INV=41.00

CONSTRUCT 6" FIRE &
4" DOMESTIC WATER
SERVICE CONNECTIONS

CONSTRUCT TRANSFORMER
PAD (COORDINATE WITH
EVERSOURCE) (TYP.)

CONSTRUCT POWER
DUCT TO EV-READY
LOCATIONS (TYP.)

CONSTRUCT ELECTRIC
SERVICE (TYP.)

CONSTRUCT 8" FIRE & 4"
DOMESTIC WATER
SERVICE CONNECTIONS

6" OVER 10"

10"x10" CROSS

APPROXIMATE
WATER ROOMS

CONSTRUCT 6" FIRE
SERVICE FEED
(BACK TO SITE)

CONSTRUCT
SEWER SERVICE
CONNECTION
INV=39.50

10"x4" REDUCER

10"x6" REDUCER

CONSTRUCT FIRE
HYDRANT (TYP.)

10"X4" TEE

10"X8" TEE

6"X6" TEE

10" CROSS

10"x6" REDUCER

6" OVER 10"

10"x4" REDUCER

CONSTRUCT
COMMUNICATIONS
SERVICE (TYP.)

CONSTRUCT ELECTRIC
SERVICE (TYP.)

CONSTRUCT FIRE
HYDRANT (TYP.)

CONSTRUCT TRANSFORMER
PAD (COORDINATE WITH
EVERSOURCE) (TYP.)

CONSTRUCT GENERATOR PAD
(COORDINATE WITH
ELECTRICAL DRAWINGS)

CONSTRUCT GENERATOR
ELECTRICAL SERVICE
(COORDINATE WITH
ELECTRICAL DRAWINGS)

CONSTRUCT 6" FIRE &
4" DOMESTIC WATER
SERVICE CONNECTIONS

CONSTRUCT SEWER
SERVICE CONNECTION
INV=37.00

CONST 26 LF
8" PVC SDR35
S= 1.92%

PROPOSED 10"X6"TEE, THRUST BLOCK,
AND 6" GATE VALVE (COORDINATE
WITH CITY OF PORTSMOUTH DPW)

CONSTRUCT FIRE
HYDRANT (TYP.)

CONSTRUCT LIGHT POLE BASE
AND FIXTURE (TYP.)

CONSTRUCT STREET LIGHTING
CONDUIT (MIN. 2-1.25" PVC, TYP.)

CONSTRUCT PRIMARY ELECTRICAL AND
COMMUNICATIONS DUCT BANK (TYP.)

PSMH4
RIM=43.10
8" INV IN=36.50 W
8" INV IN=36.50 S
8" INV OUT=36.40 SE

NOTE: EXISTING WATER MAIN ALIGNMENT
SHOWN IS APPROXIMATE BASED ON
VERIFICATION OF LOCATION THROUGH TEST
PITS COMPLETED BY SEVERINO ON
11/5/2025

CONST 124 LF
8" PVC SDR35
S= 0.48%

PSMH3
RIM=43.80
8" INV IN=35.80 NW
8" INV OUT=35.70 SE

OVERHEAD WIRES TO BE REROUTED
TO EXISTING UTILITY POLE (COORD.
W/ EVERSOURCE)

CONST 81 LF
8" PVC SDR35
S= 0.43%

CONSTRUCT CITY R.O.W. LIGHT
POLE BASE AND FIXTURE (COORD.
W/ CITY OF PORTSMOUTH) (TYP.)

CONST 28 LF
8" PVC SDR35
S= 0.54%

PSMH1
RIM=45.00
8" INV IN=35.10 W
INV OUT=35.00 SE (MEET EXISTING)

CONSTRUCT 2-5" CONDUIT RISERS UP
EXISTING POLE (USE 36" GALVANIZED RIGID
STEEL SWEEPS AND MIN. 10 LF GALVANIZED
STEEL RISER; COORD. W/ EVERSOURCE)

PSMH2
RIM=44.60
8" INV IN=35.35 NW
8" INV OUT=35.25 E

CONST 233 LF
8" PVC SDR35
S= 0.82%

PROPOSED 10"X10" TEE, THRUST BLOCK,
AND GATE VALVE (COORDINATE WITH
CITY OF PORTSMOUTH DPW) (TYP.)

50' WETLAND BUFFER

25' WETLAND BUFFER

100' WETLAND BUFFER

TAX MAP 216, LOT 1-8A

TAX MAP 213, LOT 11

TAX MAP 213, LOT 2

TAX MAP 213, LOT 3

TAX MAP 213, LOT 4

TAX MAP 213, LOT 10

PUD

SMH 1398
RIM ELEV.=45.5'
SHELF ELEV.=35.4'
(A) 4" PVC INV.=42.4'
(B) 4" PVC INV.=41.0'
(C) 4" PVC INV.=41.0'
(D) 4" PVC INV.=39.0'
(2115) 8" PVC INV.=34.7'
(E) 8" PVC INV.=34.5'

SEE SHEET C-101 FOR
PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

EXISTING SECTOR CABINET TO BE
REMOVED; EXISTING UNDERGROUND
CONDUIT TO BE CONNECTED TO NEW
ELECTRICAL MANHOLE WITHIN
PORTSMOUTH BOULEVARD

PORTSMOUTH BOULEVARD

CONSTRUCT PRIMARY ELECTRICAL &
COMMUNICATIONS DUCT BANK (TYP.)

CONSTRUCT 7'X13' ELECTRIC MANHOLE
(COORD. W/ EVERSOURCE)

CONSTRUCT COMMUNCATION MANHOLE
(COORD. W/ COMCAST)

INSET SCALE: 1" = 40'

Tighe&Bond

STATE OF NEW HAMPSHIRE
PATRICK CRIMMINS
No. 12378
LICENSED
PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE
NEIL A. HANSEN
No. 15227
LICENSED
PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

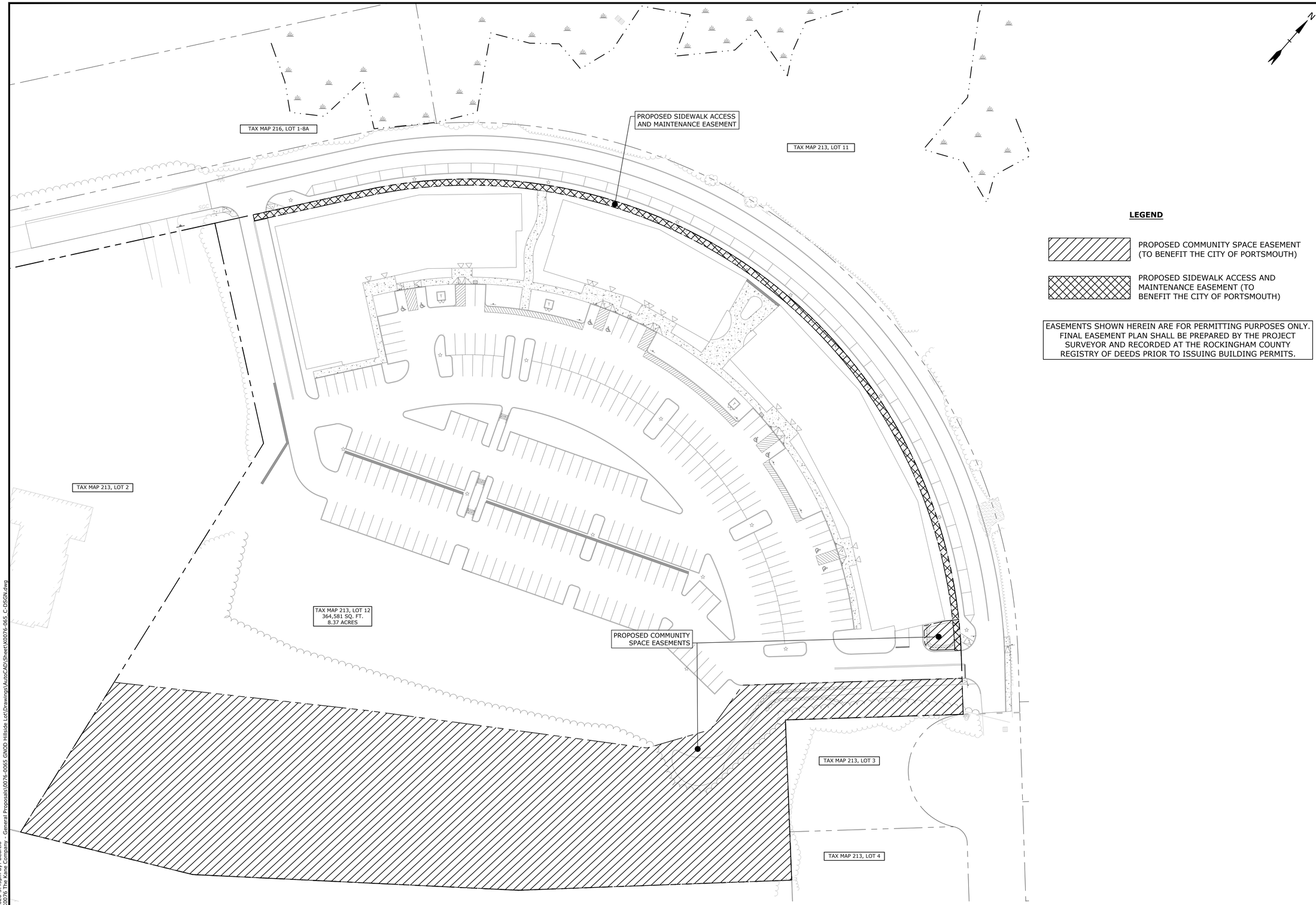
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-501

Last Saved: 2/17/2026
Plotted: Feb 18, 2026 - 2:43pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg



Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
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PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

EASEMENTS PLAN

SCALE: AS SHOWN

C-601

Last Saved: 2/17/2026
Plotted: Feb 17, 2026 - 3:45pm By: BCurcio
Tighe & Bond: J:\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg

STORM SEWER STRUCTURE TABLE

STRUCTURE	DIAM.	RIM	INV. IN	INV. OUT
PCB101	4'	43.00		39.70 NE
PCB102	4'	44.65		40.75 N
PCB103	4'	47.10		42.75 NW
PDMH101	6'	41.25	36.50 SW	35.10 NE
PDMH102	6'	43.95	38.10 SE 38.95 NW	38.00 NE
PDMH103	6'	44.50	39.25 SE 39.50 SW	38.50 NW
PDMH104	4'	43.25	39.65 NE 39.65 W 39.65 SW	39.55 SE
PDMH105	4'	44.85	40.65 N 40.65 W 40.65 S	40.55 E
PDMH106	4'	45.45	41.10 SW	41.00 E
PDMH107	4'	47.35	42.50 NW 42.50 SE	42.00 NE
POS2R	2'	46.85		42.75 SE
POS3R	2'	44.45		40.75 S
POS4R	2'	42.55		39.75 SW

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

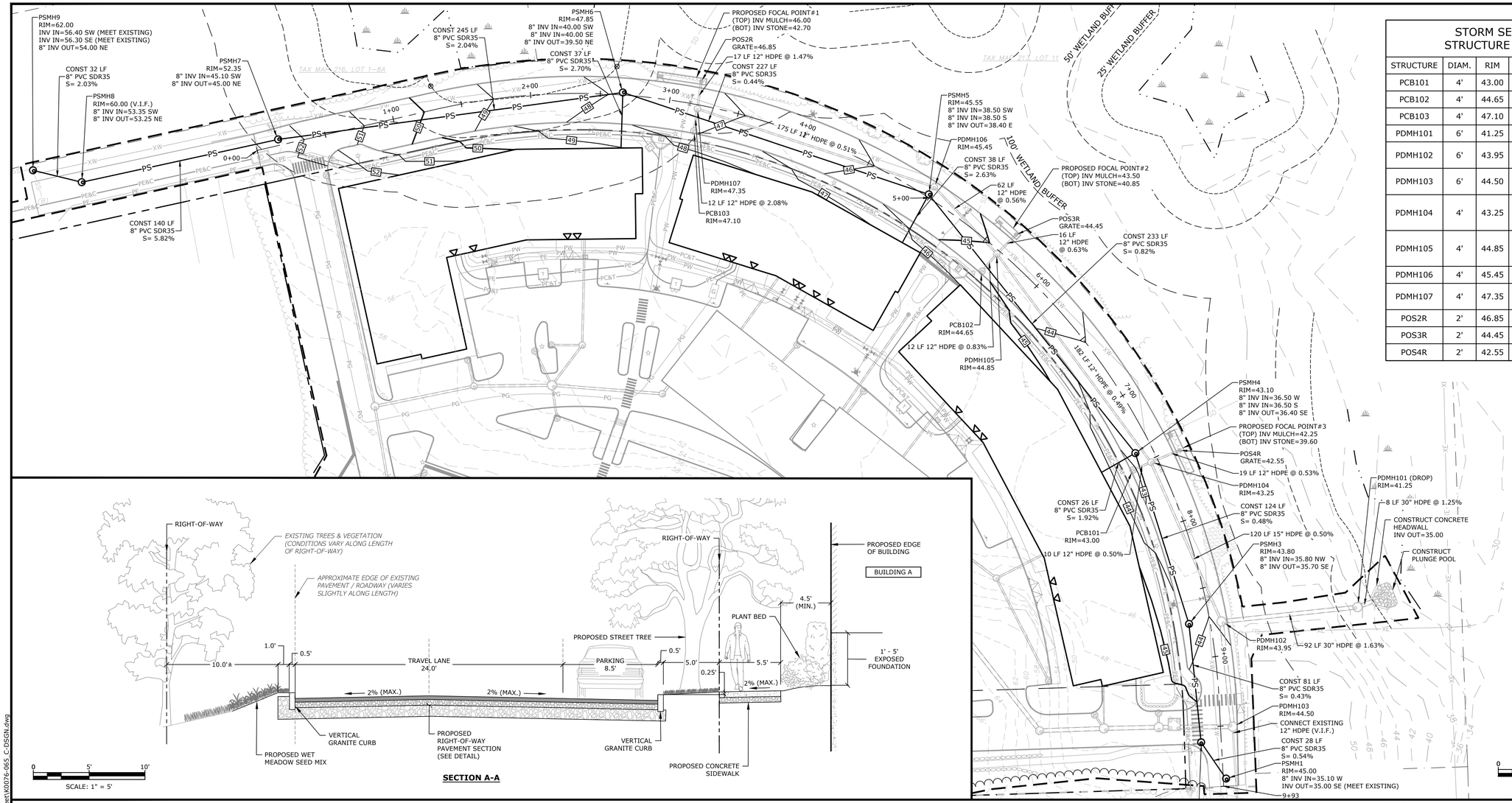
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

ROADWAY PLAN & PROFILE

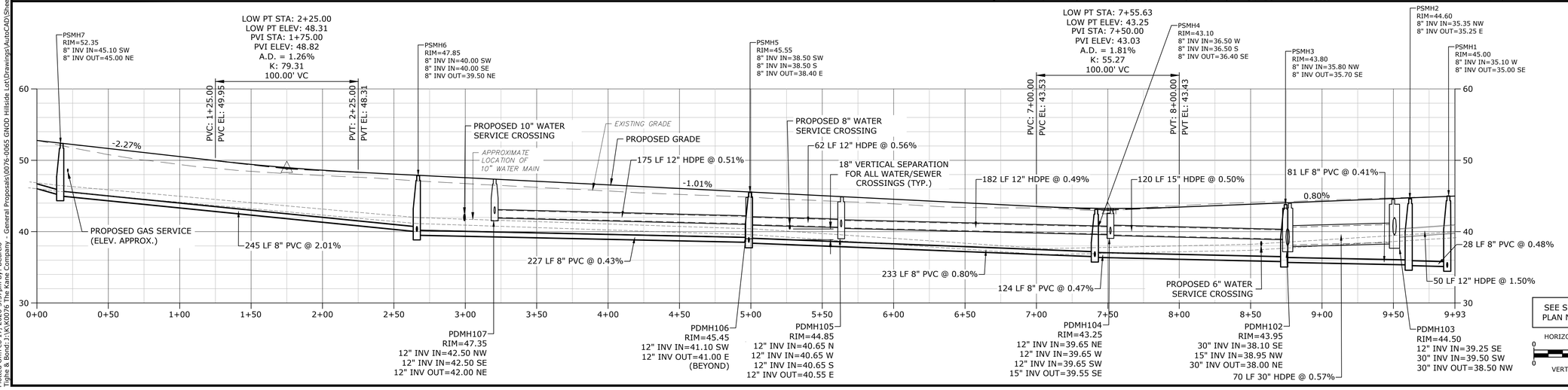
SCALE: AS SHOWN

C-701

Last Saved: 2/17/2026
Plotted: Feb 18, 2026 - 2:57pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg

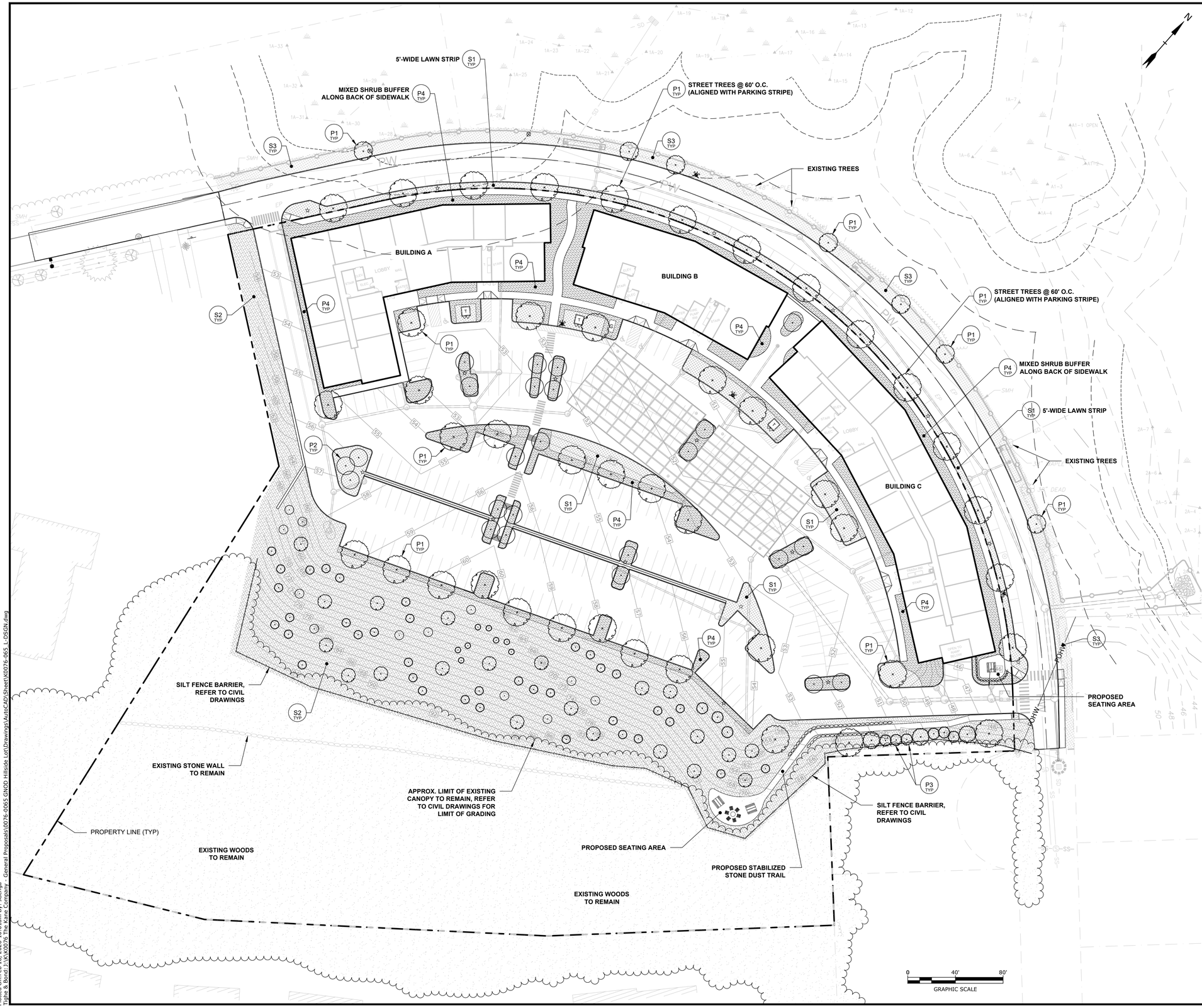


SECTION A-A



SEE SHEET C-101 FOR PLAN NOTES & LEGEND

HORIZONTAL SCALE 1" = 40'
0 40' 80'
VERTICAL SCALE 1" = 8'
0 8' 16'



PLANTING LEGEND

TAG	DESCRIPTION	SYMBOL(S)
TREES, SHRUBS & PERENNIALS		
P1	DECIDUOUS SHADE TREE	
P2	ORNAMENTAL TREE	
P3	EVERGREEN TREE	
P4	PLANT BED	
SEEDED AREAS		
S1	LAWN SEED MIX[1]	
S2	RESTORATION SEED MIX[2]	
S3	WET MEADOW SEED MIX[3]	

[1] 100% 5311 CONSERVATION MIX (ERNMX-114) BY ERNST CONSERVATION SEEDS

[2] 50% NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR DRY SITES BY NEW ENGLAND WETLAND PLANTS, INC.
50% NEW ENGLAND CONSERVATION/ WILDLIFE MIX BY NEW ENGLAND WETLAND PLANTS, INC.

[3] 100% NEW ENGLAND ROADSIDE MATRIX WET MEADOW SEED MIX BY NEW ENGLAND WETLAND PLANTS, INC.

REPRESENTATIVE TREE SPECIES

ABIES SPP.	FIR
ACER SPP.	MAPLE
AMELANCHIER SPP.	SERVICEBERRY
BETULA SPP.	BIRCH
CARPINUS SPP.	HORNBEAM
CERCIS SPP.	REDBUD
GLEDITSIA SPP.	HONEYLOCUST
JUNIPERUS SPP.	E. RED CEDAR
NYSSA SPP.	TUPELO
PICEA SPP.	SPRUCE
PINUS SPP.	PINE
QUERCUS SPP.	OAK
THUJA SPP.	ARBORVITAE/W. RED CEDAR

REPRESENTATIVE SHRUB SPECIES

BUXUS SPP.	BOXWOOD
CORNUS SPP.	DOGWOOD
HYDRANGEA SPP.	HYDRANGEA
ILEX SPP.	INKBERRY/WINTERBERRY
JUNIPERUS SPP.	JUNIPER
RHODODENDRON SPP.	RHODODENDRON
RHUS SPP.	SUMAC
VIBURNUM SPP.	VIBURNUM

PLANTING NOTES

1. ALL PLANT BEDS SHALL BE TOP DRESSED WITH 2" OF BARK MULCH. MULCH SHALL BE KEPT AWAY FROM TREE, SHRUB, AND PERENNIAL TRUNKS/BASES. REFER TO PLANTING DETAILS ON SHEET L-501.
2. SLOPE PLANTINGS AT THE REAR OF THE SITE SHALL BE WATERED AND MONITORED DURING ESTABLISHMENT TO ENSURE SEED AND PLANTING COVERAGE AND ESTABLISHMENT IS UNIFORM AND HEALTHY. AFTER ONE YEAR, APPLICANT SHALL PROVIDE A REPORT TO THE PLANNING AND SUSTAINABILITY DEPARTMENT ON SLOPE PLANTINGS. THIS REPORT MUST DEMONSTRATE AT LEAST AN 80% SURVIVAL RATE OF NEW PLANTINGS. IF PLANTINGS HAVE NOT ACHIEVED AN 80% SURVIVAL RATE AFTER ONE YEAR, APPLICANT SHALL REPLANT AREAS OF FAILURE UNTIL REQUIRED 80% COVERAGE IS ACHIEVED.
3. ALL FERTILIZERS USED WITHIN THE 100-FOOT WETLAND BUFFER SHALL CONFORM TO THE CITY OF PORTSMOUTH REQUIREMENTS AND THE NORTHEAST ORGANIC FARMING ASSOCIATION (NOFA) STANDARDS.
4. PROPOSED TREES WITHIN THE PROPOSED COMMUNITY SPACE AND STREET TREES ALONG THE CITY OF PORTSMOUTH RIGHT-OF-WAY SHALL BE REVIEWED AND APPROVED BY THE PORTSMOUTH TREES AND GREENERY COMMITTEE. INSTALLATION OF TREES SHALL BE OBSERVED BY THE CITY ARBORIST.

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_L-DSGN.DWG
DRAWN BY:	JDG
CHECKED:	RU/NAH
APPROVED:	PMC

PLANTING PLAN

SCALE: AS SHOWN

L-101

Last Saved: 2/17/2026
Plotted: Oct 18, 2025 - 10:01am By: JGonya
Xrefs: Civil 3D Data
Tighe & Bond J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_L-DSGN.dwg

GENERAL PROJECT INFORMATION
PROJECT APPLICANT: BRORA LLC

PROJECT NAME: PROPOSED MULTI-FAMILY DEVELOPMENT

PROJECT ADDRESS: DUNLIN WAY & PORTSMOUTH BOULEVARD
PORTSMOUTH, NH 03801

PROJECT LATITUDE: 43°-05'-29" N
PROJECT LONGITUDE: 70°-46'-48" W

PROJECT DESCRIPTION
THE PROPOSED PROJECT INCLUDES THREE 6-STORY MULTI-FAMILY BUILDINGS. THE PROJECT WILL ALSO CONSIST OF ASSOCIATED SITE IMPROVEMENTS SUCH AS PAVING, STORMWATER MANAGEMENT, UTILITIES AND LIGHTING.

DISTURBED AREA
THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 6.8 ACRES.

SOIL CHARACTERISTICS
BASED ON THE SITE SPECIFIC SOIL SURVEY, THE SOILS ON SITE PRIMARILY CONSIST OF CHATFIELD AND UDORTHENTS SOILS WITH A HYDROLOGIC SOIL GROUP RATINGS OF B AND C, RESPECTIVELY.

NAME OF RECEIVING WATERS
THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA A CLOSED DRAINAGE SYSTEM TO AN UNNAMED ON SITE WETLANDS WHICH ULTIMATELY FLOWS TO THE PISCATAQUA RIVER.

CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:
1. CONSTRUCT TEMPORARY AND PERMANENT SEDIMENT, EROSION AND DETENTION CONTROL FACILITIES. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EARTH MOVING OPERATIONS THAT WILL INFLUENCE STORMWATER RUNOFF SUCH AS:
   - NEW CONSTRUCTION
   - CONTROL OF DUST
   - CONSTRUCTION DURING LATE WINTER AND EARLY SPRING
3. ALL PERMANENT DITCHES, SWALES, DETENTION, RETENTION AND SEDIMENTATION BASINS TO BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
4. CLEAR AND DISPOSE OF DEBRIS.
5. CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED.
6. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
7. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
8. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
9. SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
10. FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
11. INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
12. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
13. REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

SPECIAL CONSTRUCTION NOTES:
1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE. THE AREA OF DISTURBANCE SHALL NOT EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED UNLESS FURTHER APPROVAL IS RECEIVED FROM THE NEW HAMPSHIRE LAND RESOURCES MANAGEMENT BUREAU.
2. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

EROSION CONTROL NOTES:
1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE "NEW HAMPSHIRE STORMWATER MANUAL VOLUME 3: EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION" PREPARED BY THE NHDES.
2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SACKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
4. SILT SACK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS WITHIN THE WORK LIMITS AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
5. TEMPORARY WATER DIVERSION AND PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
6. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY PROTECTION AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1.

STABILIZATION:
1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.;
   E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
2. WINTER STABILIZATION PRACTICES:
   A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
   C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
   A. TEMPORARY SEEDING;
   B. MULCHING.
4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

DUST CONTROL:
1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

STOCKPILES:
1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

OFF SITE VEHICLE TRACKING:
1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

VEGETATION:
1. TEMPORARY GRASS COVER:
   A. SEEDBED PREPARATION:
      a. APPLY FERTILIZER AT THE RATE OF 600 POUNDS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF THREE (3) TONS PER ACRE;
   B. SEEDING:
      a. UTILIZE ANNUAL RYE GRASS AT A RATE OF 40 LBS/ACRE;
      b. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF TWO (2) INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED;
      c. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). HYDROSEEDINGS, WHICH INCLUDE MULCH, MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING;
   C. MAINTENANCE:
      a. TEMPORARY SEEDING SHALL BE PERIODICALLY INSPECTED. AT A MINIMUM, 95% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHALL BE MADE AND OTHER TEMPORARY MEASURES USED IN THE INTERIM (MULCH, FILTER BARRIERS, CHECK DAMS, ETC.).
2. VEGETATIVE PRACTICE:
   A. FOR PERMANENT MEASURES AND PLANTINGS:
      a. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF THREE (3) TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5;
      b. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 800 POUNDS PER ACRE OF 10-20-20 FERTILIZER;
      c. SOIL CONDITIONERS AND FERTILIZER SHALL BE APPLIED AT THE RECOMMENDED RATES AND SHALL BE THOROUGHLY WORKED INTO THE LOAM. LOAM SHALL BE RAKED UNTIL THE SURFACE IS FINELY PULVERIZED, SMOOTH AND EVEN, AND THEN COMPACTED TO AN EVEN SURFACE CONFORMING TO THE REQUIRED LINES AND GRADES WITH APPROVED ROLLERS WEIGHING BETWEEN 4-1/2 POUNDS AND 5-1/2 POUNDS PER INCH OF WIDTH;
      d. SEED SHALL BE SOWN AT THE RATE SHOWN BELOW. SOWING SHALL BE DONE ON A CALM, DRY DAY, PREFERABLY BY MACHINE, BUT IF BY HAND, ONLY BY EXPERIENCED WORKMEN. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH;
      e. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE;
      f. THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED WITH GRASS SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED;
      g. THE CONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED;
      h. A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE APPLIED AT THE INDICATED RATE:

SEED MIX	APPLICATION RATE
CREEPING RED FESCUE	20 LBS/ACRE
TALL FESCUE	20 LBS/ACRE
REDTOP	2 LBS/ACRE

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE (1) PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. SEEDING SHALL BE DONE NO LATER THAN SEPTEMBER 15. IN NO CASE SHALL SEEDING TAKE PLACE OVER SNOW.

3. DORMANT SEEDING (SEPTEMBER 15 TO FIRST SNOWFALL):
   A. FOLLOW PERMANENT MEASURES SLOPE, LIME, FERTILIZER AND GRADING REQUIREMENTS. APPLY SEED MIXTURE AT TWICE THE INDICATED RATE. APPLY MULCH AS INDICATED FOR PERMANENT MEASURES.

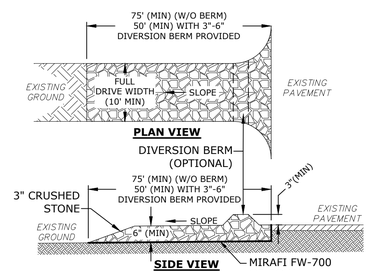
CONCRETE WASHOUT AREA:
   A. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FACILITY;
   B. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
   C. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
   D. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES:
1. THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
   1.1. FIRE-FIGHTING ACTIVITIES;
   1.2. FIRE HYDRANT FLUSHING;
   1.3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
   1.4. WATER USED TO CONTROL DUST;
   1.5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
   1.6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
   1.7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
   1.8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
   1.9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
   1.10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
   1.11. UNCONTAMINATED EXCAVATION DEWATERING;
   1.12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL:
4. WASTE MATERIAL:
   A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE:
   A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE:
   A. ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

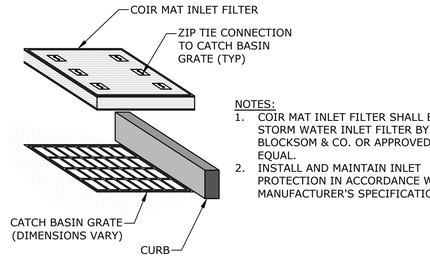
SPILL PREVENTION:
1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
   A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
      a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
      b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
      c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
      d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
      e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
      f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER.
      g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
   B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
      a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
      b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
      c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
   C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
      a. PETROLEUM PRODUCTS:
      i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
      ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
      iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
      iv. INSPECT FUEL STORAGE AREAS WEEKLY;
      v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
      vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
      vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
      viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
         (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
         (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
         (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
         (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
         (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
      ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES THESE REQUIREMENTS ARE SUMMARIZED IN WD-DWGB-22-6 BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT, OR ITS SUCCESSOR DOCUMENT.
      HTTPS://WWW.DES.NH.GOV/ORGANIZATION/COMMISSIONER/PIP/FACTSHEETS/DWGB/DOCUMENTS/DWGB-22-6.PDF
      b. FERTILIZERS:
      i. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS;
      ii. ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
      iii. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      c. PAINTS:
      i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
      ii. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
      iii. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
   D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
      a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
      b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
      c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
      d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
      e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
      f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
   E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
      a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
      b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
      c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
      d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
      e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
      f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES
   A. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP.



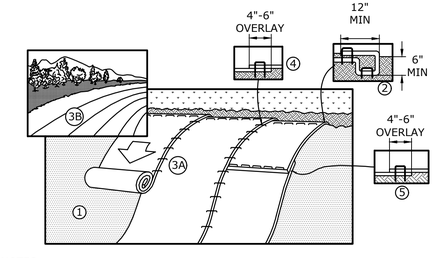
NOTE:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

STABILIZED CONSTRUCTION EXIT
NO SCALE



NOTES:
1. COIR MAT INLET FILTER SHALL BE STORM WATER INLET FILTER BY BLOCKSOM & CO. OR APPROVED EQUAL.
2. INSTALL AND MAINTAIN INLET PROTECTION IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

INLET PROTECTION BARRIER
NO SCALE



NOTES
1. EROSION CONTROL BLANKETS SHALL BE INSTALLED ON ALL STEEP SLOPE AREA (3:1 OR GREATER).
2. PRIOR TO INSTALLATION SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS. BLANKETS SHALL HAVE GOOD SOIL CONTACT.
3. PERMANENT SEEDING SHALL BE PLACED PRIOR TO INSTALLING BLANKETS.
4. BLANKETS SHALL BE LOOSELY LAID AND STAKED/STAPLED TO MAINTAIN DIRECT CONTACT WITH THE SOIL. BLANKETS SHALL NOT BE STRETCHED.
5. EROSION CONTROL BLANKET SHALL BE 'EAST COAST EROSION CONTROL ECC-2B™' OR EQUAL AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS.

EROSION CONTROL BLANKET
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

EROSION CONTROL NOTES AND DETAILS

SCALE: AS SHOWN

C-801

Last Saved: 2/16/2026 4:37pm By: BCurcio
Plotted On: 2/16/2026 4:37pm By: BCurcio
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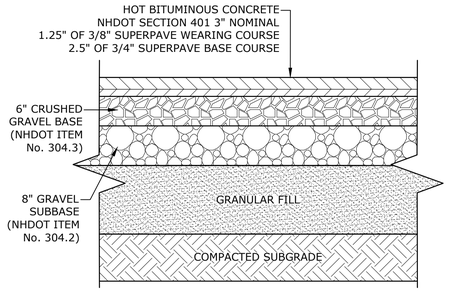
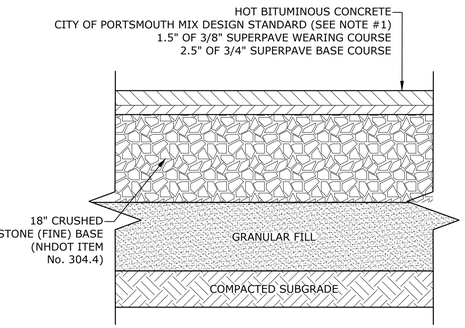


FINAL ON-SITE PAVEMENT SECTION TO BE COORDINATED WITH FINAL GEOTECHNICAL REPORT RECOMMENDATIONS.

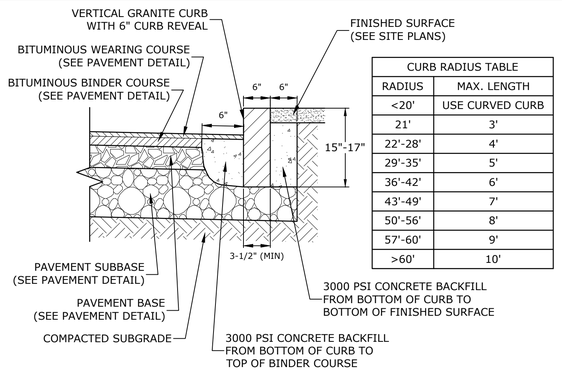
NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

ON-SITE PAVEMENT SECTION
NO SCALE



NOTES:
1. PAVEMENT MIX DESIGN WITHIN THE CITY RIGHT-OF-WAY SHALL COMPLY WITH THE CITY OF PORTSMOUTH MIX DESIGN STANDARD WITH A MAXIMUM OF 10% RAP. CONTRACTOR SHALL SUPPLY MIX DESIGNS TO DPW FOR APPROVAL PRIOR TO INSTALLATION.
2. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
3. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
4. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

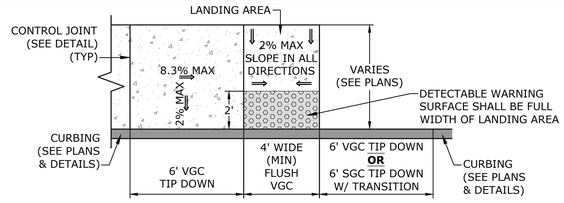
CITY RIGHT-OF-WAY PAVEMENT SECTION
NO SCALE



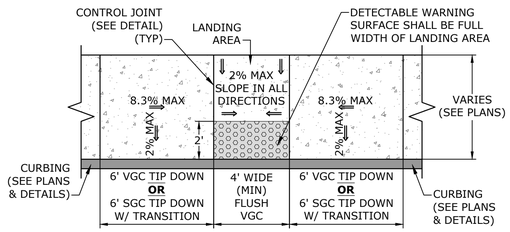
CURB RADIUS TABLE	
RADIUS	MAX. LENGTH
<20'	USE CURVED CURB
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
>60'	10'

NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

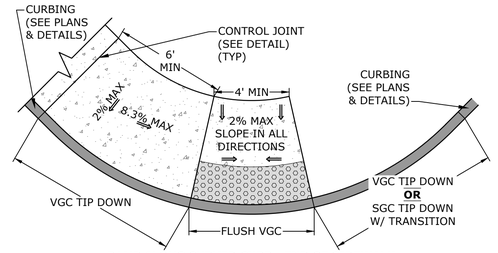
VERTICAL GRANITE CURB
NO SCALE



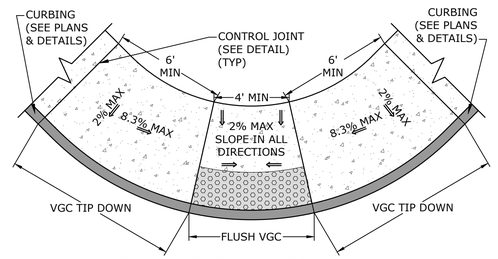
RAMP ALONG CURB - END OF SIDEWALK



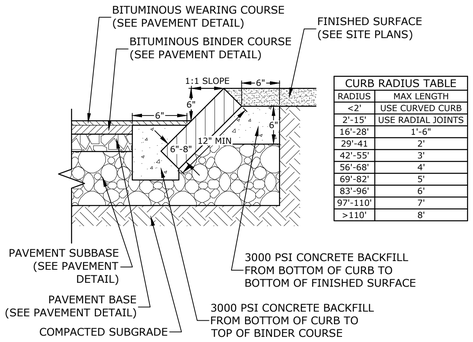
RAMP ALONG CURB - MIDDLE OF SIDEWALK



RAMP ALONG CURVED CURB - END OF SIDEWALK



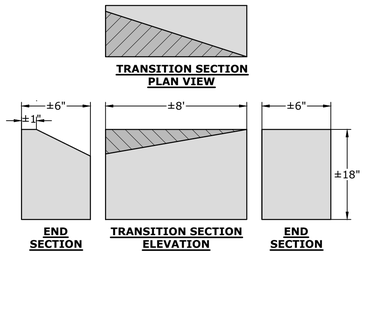
RAMP ALONG CURBED CURB - MIDDLE OF SIDEWALK



CURB RADIUS TABLE	
RADIUS	MAX LENGTH
<2'	USE CURVED CURB
2'-15'	USE RADIAL JOINTS
16'-28'	1'-6"
29'-41	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
>110'	8'

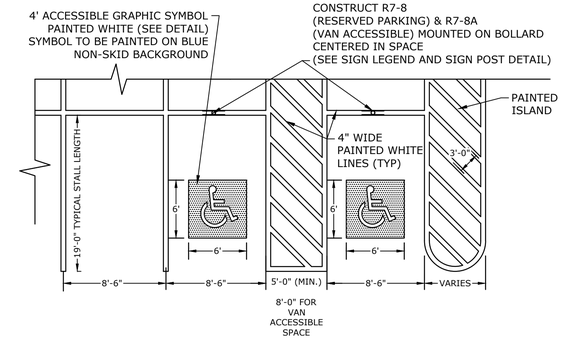
NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF SLOPED GRANITE CURB (SGC). SLOPED GRANITE CURB SHALL NOT BE INSTALLED WITHIN THE CITY RIGHT-OF-WAY.
2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

SLOPED GRANITE CURB
NO SCALE



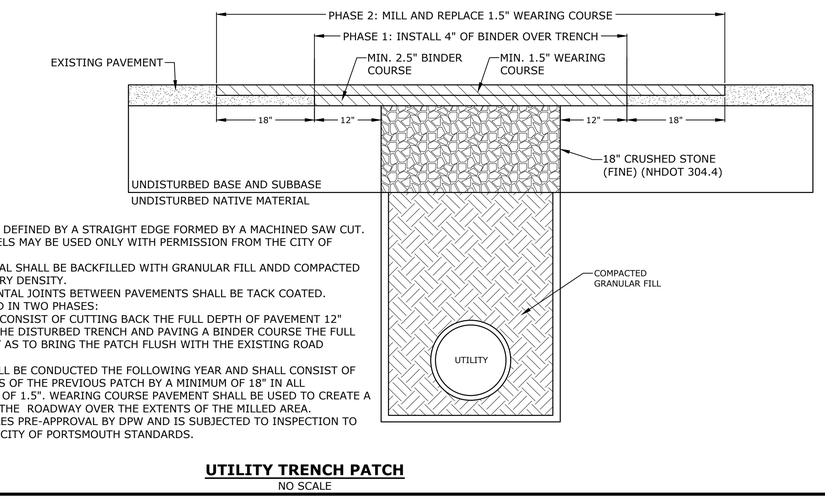
NOTES
1. THE INTENT OF THIS DETAIL IS TO PROVIDE A SMOOTH TRANSITION BETWEEN VERTICAL GRANITE CURB (VGC) AND SLOPE GRANITE CURB (SGC) WITHOUT REQUIRING FIELD CHIPPING DURING INSTALLATION.
2. THE SGC MAY REQUIRE ADJUSTMENTS TO MEET THE TRANSITION PIECE HEIGHT. TRANSITION SGC TO STANDARD REVEAL VGC AS QUICKLY AS POSSIBLE TO PROVIDE FOR THIS SMOOTH TRANSITION.

GRANITE CURB TRANSITION
NO SCALE



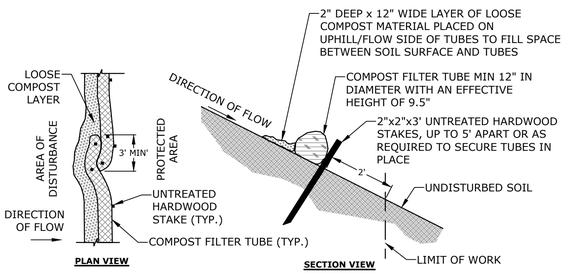
NOTES:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

PARKING STALL/PAINTED ISLAND STRIPING
NO SCALE



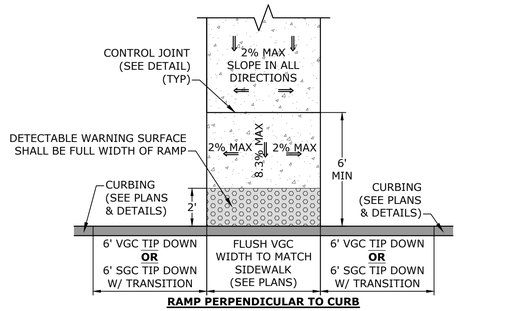
NOTES:
1. PAVEMENT EDGES SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT.
2. EXISTING SUBGRADE GRAVELS MAY BE USED ONLY WITH PERMISSION FROM THE CITY OF PORTSMOUTH DPW.
3. TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH GRANULAR FILL ANDD COMPACTED TO 95% OF ITS MAXIMUM DRY DENSITY.
4. ALL VERTICAL AND HORIZONTAL JOINTS BETWEEN PAVEMENTS SHALL BE TACK COATED.
5. PAVEMENT SHALL BE PLACED IN TWO PHASES:
   a. THE FIRST PHASE SHALL CONSIST OF CUTTING BACK THE FULL DEPTH OF PAVEMENT 12" BEYOND THE EDGES OF THE DISTURBED TRENCH AND PAVING A BINDER COURSE THE FULL DEPTH OF THE PAVEMENT AS TO BRING THE PATCH FLUSH WITH THE EXISTING ROAD SURFACE.
   b. THE SECOND PHASE SHALL BE CONDUCTED THE FOLLOWING YEAR AND SHALL CONSIST OF MILLING OVER THE EDGES OF THE PREVIOUS PATCH BY A MINIMUM OF 18" IN ALL DIRECTIONS TO A DEPTH OF 1.5". WEARING COURSE PAVEMENT SHALL BE USED TO CREATE A SMOOTH SURFACE WITH THE ROADWAY OVER THE EXTENTS OF THE MILLED AREA.
7. ANY TRENCH PATCH REQUIRES PRE-APPROVAL BY DPW AND IS SUBJECTED TO INSPECTION TO ENSURE COMPLIANCE WITH CITY OF PORTSMOUTH STANDARDS.

UTILITY TRENCH PATCH
NO SCALE



NOTES:
1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE. IT IS NOT NECESSARY TO TRENCH TUBES INTO EXISTING GRADE.
3. WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS CAN BE USED BEHIND TUBES AS REQUIRED (5' O.C. MAX) TO SECURE TUBES IN PLACE.
4. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM WITH 3' MINIMUM OVERLAP.
5. SECURE ENDS OF TUBES WITH STAKES SPACED 18" APART THROUGH TOPS OF TUBES.

SILT SOCK
NO SCALE



RAMP PERPENDICULAR TO CURB

NOTES:
1. DETECTABLE WARNING PANELS SHALL ONLY BE INSTALLED AT SPECIFIC LOCATIONS AS IDENTIFIED ON THE SITE PLANS, NOT ON ALL TIP-DOWNS. SEE SEPARATE DETAIL FOR WARNING PANEL REQUIREMENTS.
2. RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
3. A 6" CRUSHED GRAVEL BASE (NHDOT ITEM No. 304.3) SHALL BE PROVIDED BENEATH RAMPS.
4. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
5. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. THERE SHALL BE A 0" REVEAL BETWEEN PAVEMENT, CURB, AND CONCRETE TIP-DOWN SURFACES.
6. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2 FT. FROM THE ROADWAY CURBLINE.
7. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.

CONCRETE TIP DOWN RAMP WITH DETECTABLE WARNING SURFACE
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

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FILE:	K0076-065_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-802

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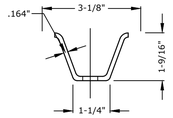
R1-1
30"X30"
WHITE ON RED

R7-8P
18" X 9"
GREEN ON WHITE

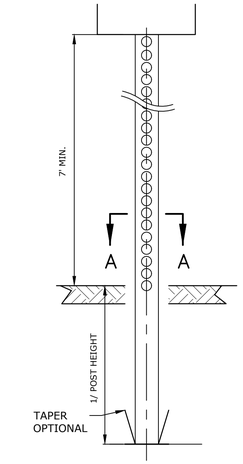
R7-8
12" X 18"
BLUE AND GREEN
ON WHITE

W11-2
30" X 30"
BLACK ON YELLOW

W16-7P
24"X12"
BLACK ON YELLOW



SECTION A-A



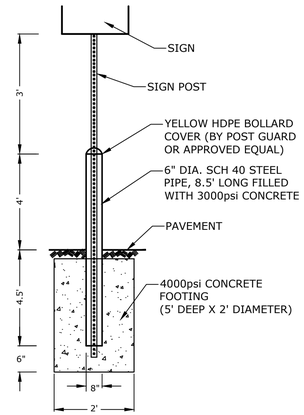
* IN LEDGE DRILL & GROUT TO A MIN OF 2'

LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASSTM A-576 (GRADE 1070 - 1080)

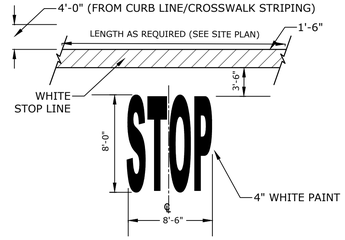
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED BLACK BAKED ON OR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:
ALL SIGNS TO BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.

SIGN LEGEND AND SIGN POST
NO SCALE



BOLLARD MOUNTED SIGN DETAIL
NO SCALE



NOTE:
1. PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.
2. STRIPING SHALL BE CONSTRUCTED USING USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.

STOP BAR AND LEGEND
NO SCALE

NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE CAST IRON PANEL SET IN CONCRETE.
2. CONCRETE THAT PLATES ARE SET IN SHALL BE NO LESS THAN 6" THICK, NHDOT TYPE AA (4000 PSI) WITH FIBER.
3. THE WARNING SURFACE SHALL EXTEND FULLY ACROSS AND WITHIN 2" OF THE EDGES OF THE SIDEWALK.
4. DETECTABLE WARNING SURFACES SHALL BE INSTALLED AT ALL MAJOR DRIVEWAYS AND STREET CROSSINGS.
5. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

CAST IRON DETECTABLE WARNING SURFACE
NO SCALE

NOTE:
1. COORDINATE WITH EVERSOURCE TO VERIFY THAT BOLLARD, FOOTING, AND BOLLARD COVER MEET EVERSOURCE REQUIREMENTS.

BOLLARD DETAIL
NO SCALE

NOTES:
1. SYMBOL SHALL BE CONSTRUCTED IN ALL ACCESSIBLE SPACES USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
2. SYMBOL SHALL BE CONSTRUCTED TO THE LATEST ADA, STATE AND LOCAL REQUIREMENTS.

ACCESSIBLE SYMBOL
NO SCALE

PLAN VIEW

CONTROL JOINT A

EXPANSION JOINT B

CONSTRUCTION JOINT

SECTION VIEW

NOTES:
1. SEE SITE PLAN FOR SIDEWALK WIDTH AND LOCATIONS.
2. SIDEWALKS WITHIN THE CITY RIGHT-OF-WAY SHALL BE CONSTRUCTED USING FIBER REINFORCEMENT.
3. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR WALK AND SIDE SLOPE GRADES.
4. SIDEWALK SURFACE SHALL GIVEN A BROOM FINISH.
5. ISOLATION JOINTS ADJACENT TO BUILDING SHALL BE COORDINATED WITH BUILDING DRAWINGS.
6. CONTRACTOR SHALL SUBMIT THE PROPOSED CONCRETE MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION.
7. ALL WORK SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.

CONCRETE SIDEWALK
NO SCALE

NOTE:
STRIPING SHALL BE CONSTRUCTED USING FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.

CROSSWALK STRIPING
NO SCALE

Tighe&Bond

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2/18/26

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C-803

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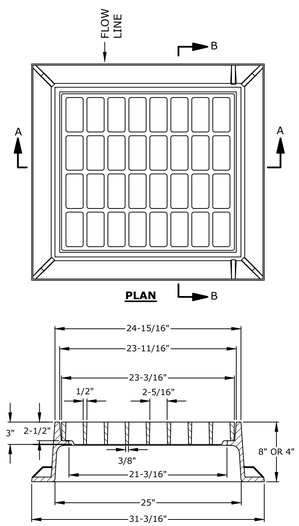
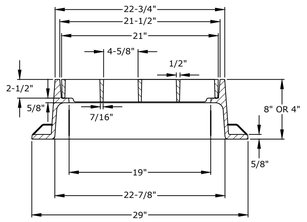
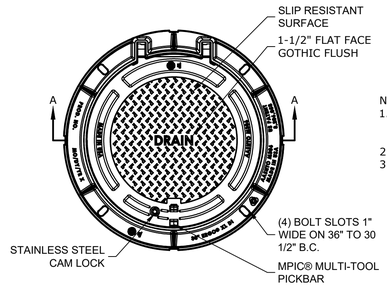




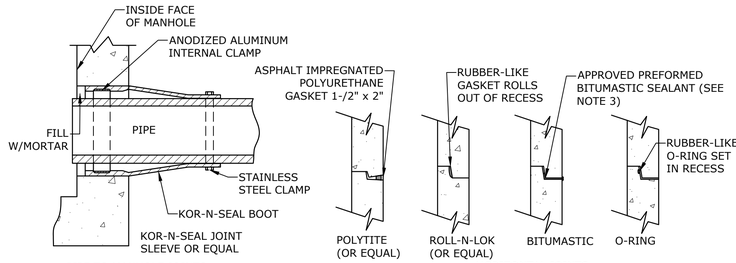
NOTES:
1. ALL DIMENSIONS ARE NOMINAL.
2. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   2.a. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   2.b. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   2.c. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
3. FRAME AVAILABLE IN 4" OR 8" HEIGHTS.
4. FREE OPEN AREA = 2.55 SQ. FT.
5. USE 3-FLANGE FRAME IF INSTALLED ADJACENT TO GRANITE CURB.

CATCH BASIN FRAME & GRATE (NHDOT - TYPE "B" GRATE)
NO SCALE



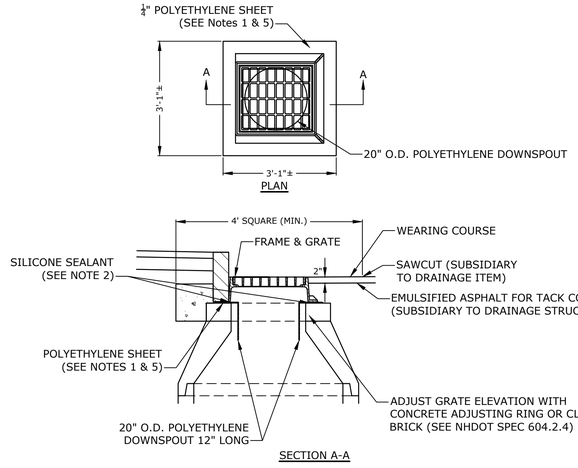
NOTES:
1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL BY EJ CO.
2. ALL DIMENSIONS ARE NOMINAL.
3. FRAMES USING NARROWER DIMENSIONS FOR THICKNESS ARE ALLOWED PROVIDED:
   A. THE FRAMES MEET OR EXCEED THE SPECIFIED LOAD RATING.
   B. THE INTERIOR PERIMETER (SEAT AREA) DIMENSIONS OF THE FRAMES REMAIN THE SAME TO ALLOW CONTINUED USE OF EXISTING GRATES/COVERS AS THE EXISTING FRAMES ALLOW, WITHOUT SHIMS OR OTHER MODIFICATIONS OR ACCOMMODATIONS.
   C. ALL OTHER PERTINENT REQUIREMENTS OF THE SPECIFICATIONS ARE MET.
4. LABEL TYPE OF MANHOLE WITH 3" HIGH LETTERS IN HE CENTER OF THE COVER.

DRAIN MANHOLE FRAME & COVER
NO SCALE



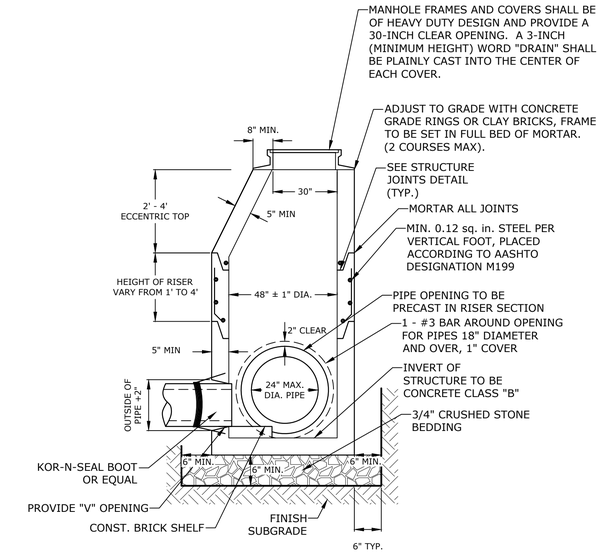
NOTES:
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

MANHOLE JOINTS
NO SCALE



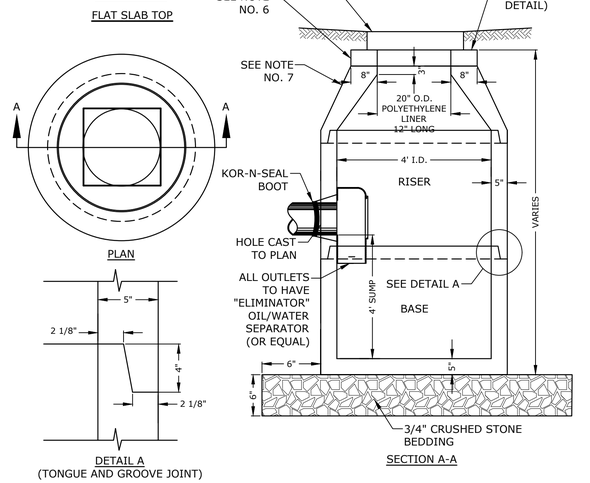
NOTES:
1. POLYETHYLENE LINERS SHALL ONLY BE REQUIRED FOR CATCH BASIN INLETS WITHIN THE CITY OF PORTSMOUTH RIGHT-OF-WAY.
2. POLYETHYLENE LINER SHALL BE FABRICATED AT THE SHOP. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
3. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT BETWEEN FRAME AND POLYETHYLENE SHEET.
4. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION (SUBSIDIARY TO DRAINAGE STRUCTURE).
5. USE ON DRAINAGE STRUCTURES 4' MIN. DIAMETER ONLY.
6. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
7. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
8. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT.

POLYETHYLENE LINER
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
6. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
7. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
8. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
9. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
10. ALL STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MINIMUM OF 12" OF INSIDE SURFACE BETWEEN HOLES, NO MORE THAN 75% OF A HORIZNTAL CROSS SECTION SHALL BE HOLES, AND THERE SHALL BE NO HOLES CLOSER THAN 3" TO JOINTS.

4' DIAMETER DRAIN MANHOLE
NO SCALE



NOTES:
1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASIN.

4' DIAMETER CATCHBASIN
NO SCALE

Tighe&Bond

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Plotted: Feb 18, 2026-4:37pm By: BCurcio
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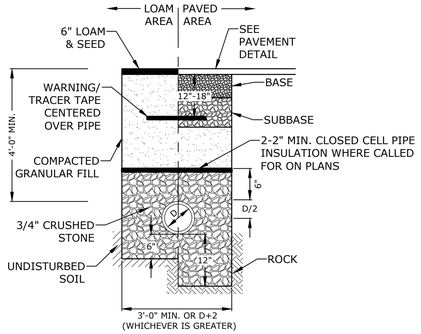
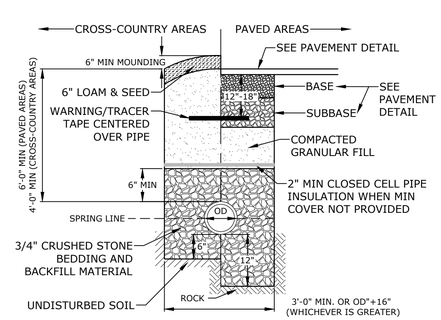


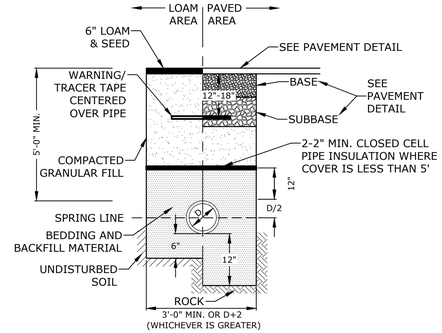
NOTES:
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

STORM DRAIN TRENCH
NO SCALE



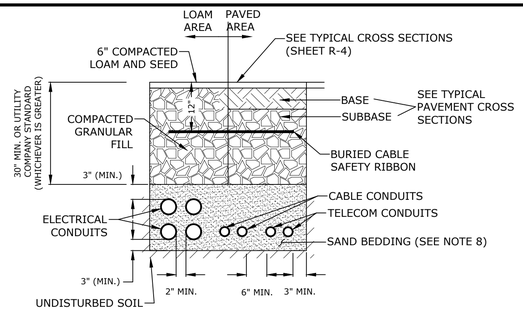
NOTES:
1. 3/4" CRUSHED STONE BEDDING AND BACKFILL MATERIAL FOR FULL WIDTH OF THE TRENCH FROM MINIMUM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO MINIMUM OF 6" OVER THE TOP OF THE PIPE.
2. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.
3. PIPE INSULATION SHALL BE PLACED ABOVE BLANKET MATERIAL AND SHALL EXTEND ACROSS THE FULL TRENCH WIDTH. PIPE INSULATION SHALL BE PROVIDED WHEN THE MINIMUM COVER REQUIREMENTS LISTED ARE NOT ABLE TO BE MET AND AS IDENTIFIED AS ON THE DRAWINGS.

SEWER SERVICE TRENCH
NO SCALE



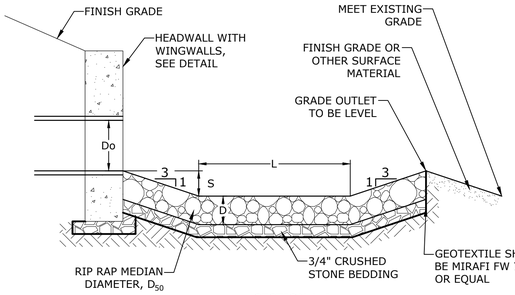
NOTES:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.

WATER TRENCH
NO SCALE

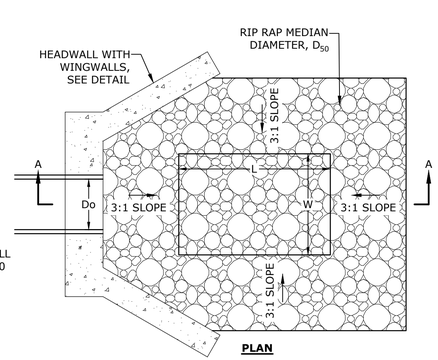


NOTES:
1. NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS.
2. CONDUIT ENCASEMENT FOR ELECTRICAL PRIMARIES AND SECONDARIES SHALL BE AS DIRECTED BY THE PROJECT ELECTRICAL DRAWINGS AND UTILITY COMPANY REQUIREMENTS.
3. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN.
3. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS.
4. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE UTILITY COMPANY IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
5. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND, WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
7. ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH RADIUS.

ELECTRICAL AND COMMUNICATION CONDUIT
NO SCALE



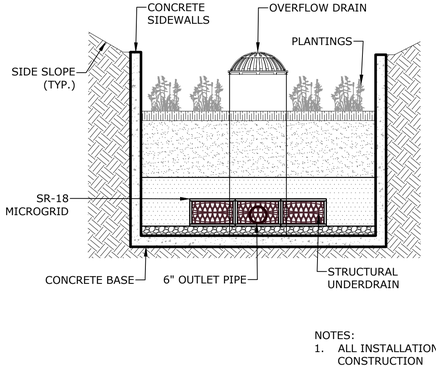
SECTION A-A



PLAN

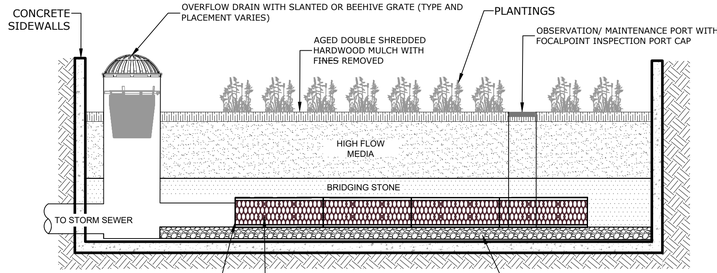
OUTLET PLUNGE POOL SIZING						
	Do	S	W	L	D_{50}	D
HW1	30"	2.0'	5.0'	8.0'	6"	1.13'

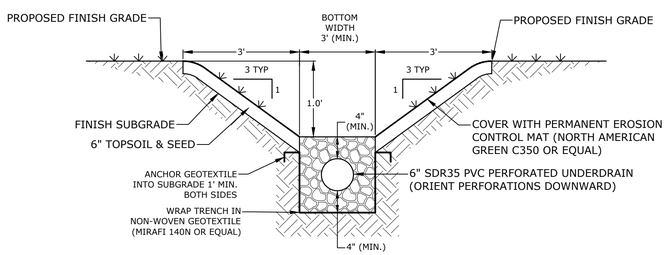
OUTLET PLUNGE POOL
NO SCALE



NOTES:
1. ALL INSTALLATIONS TO BE COORDINATED WITH FOCAL POINT PRIOR TO CONSTRUCTION

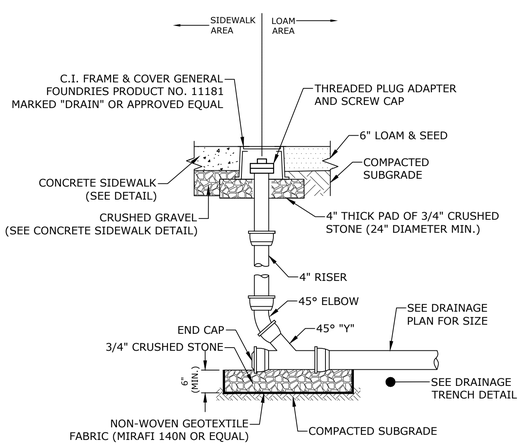
FOCAL POINT BIORETENTION CELL
NO SCALE



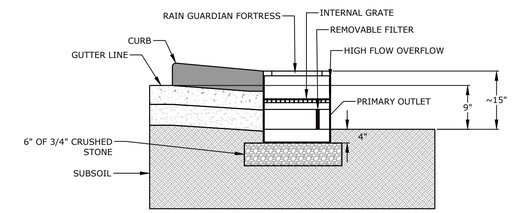


NOTES
1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS-SECTION AS REQUIRED TO MEET THE DESIGN INTENT. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHOULD BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHOULD NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

CONVEYANCE SWALE W/ UNDERDRAIN
NO SCALE



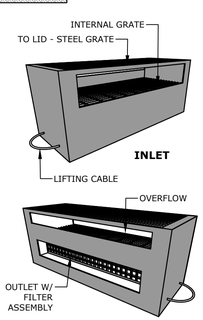
DRAINAGE CLEANOUT
NO SCALE



SECTION VIEW

SPECIFICATIONS
1. STEEL REINFORCED, COLD JOINT SECURED MONOLITHIC CONCRETE STRUCTURE (3.1202 CF CONCRETE, 478 LBS, 1.4205 CF STORAGE VOLUME), CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI AT 28 DAYS, CONCRETE AIR ENTRAINED (4% TO 8% BY VOLUME), MANUFACTURED AND DESIGNED TO ASTM C858
2. TWO-POINT PICK (EMBEDDED LIFTING CABLES)
3. INTERNAL GRATE - STEEL GRATE (25 LBS/PIECE, 1" THICK), 361 LB CONCENTRATED LOAD OR 206 LB/SQ-FT UNIFORM LOAD
4. TOP LID - STEEL GRATE (27 LBS/PIECE, 1" THICK), 361 LB CONCENTRATED LOAD OR 206 LB/SQ-FT UNIFORM LOAD
5. STEEL FACE PLATE (INLET AND OUTLET) - A36 1/4" THICKNESS
6. REMOVABLE FILTER ASSEMBLY (FIBERGLASS GRATE WITH FILTER AND ALUMINUM CHANNEL)

INSTALLATION NOTES
1. INSTALL THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR). THE DISTANCE FROM THE BACK OF THE CURB MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AN BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN FORTRESS. POSITION RAIN GUARDIAN FORTRESS SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE.
2. SET RAIN GUARDIAN FORTRESS ON THE PREPARED CRUSHED STONE BASE.
3. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.
4. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC ON THE INTERIOR SIDE OF THE RAIN GUARDIAN TURRET.



RAIN GUARDIAN FORTRESS
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

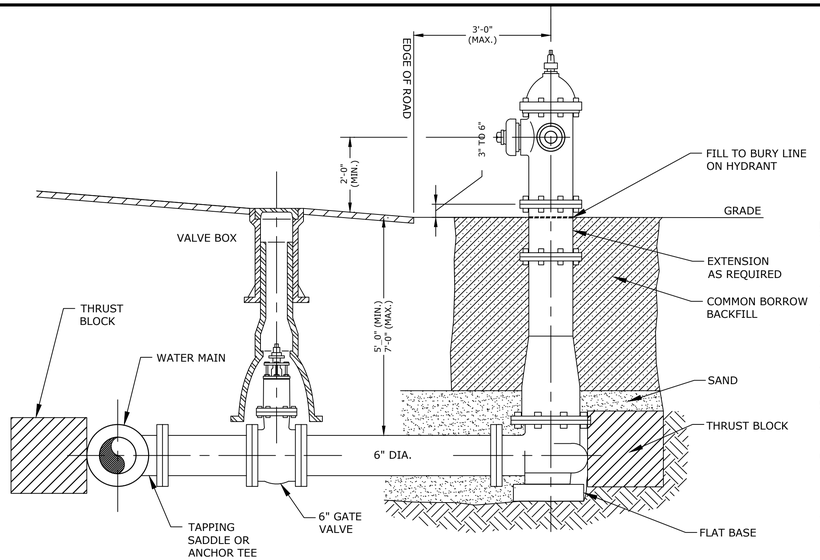
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

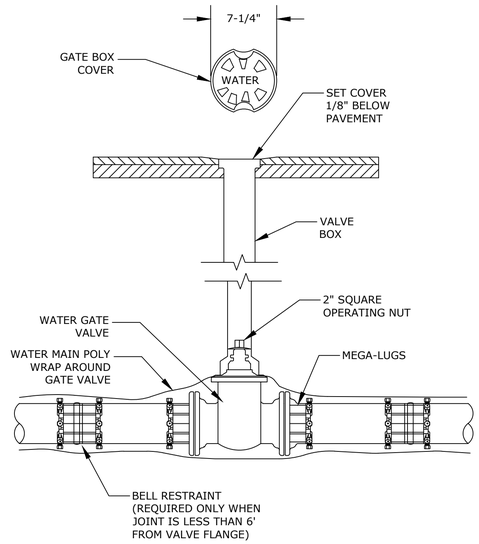
C-805

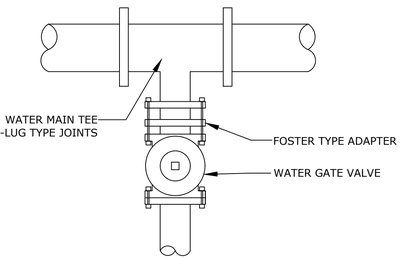
Last Saved: 2/16/2026
By: BCurcio
Plotted: 2/16/2026 4:38pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\k0076-065_C-DTLS.dwg



NOTES:
1. HYDRANT TO BE KENNEDY TYPE K-81A (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER AND FIRE DEPARTMENT.
2. HYDRANT SHALL OPEN RIGHT (CITY OF PORTSMOUTH) AND OPEN LEFT (PEASE TRADEPORT).
3. HYDRANT SHALL BE PAINTED IN ACCORDANCE WITH CITY OF PORTSMOUTH STANDARDS.
4. AREA AROUND HYDRANT SHALL BE GRADED TO ALLOW SURFACE WATER TO DRAIN AWAY.
5. CONTRACTOR SHALL INSTALL AN INDICATOR ATTACHED TO THE HYDRANT IN ACCORDANCE TO CITY OF PORTSMOUTH STANDARDS.
6. HYDRANT ASSEMBLY SHALL BE POLY WRAPPED FROM MAIN TO HYDRANT AT GROUND LEVEL, 6" (MIN.) OF SAND FOR BEDDING AND COVER, WARNING TAPE 18" ABOVE PIPE.
7. DRAIN HOLES ARE NOT PERMITTED.

FIRE HYDRANT
NO SCALE

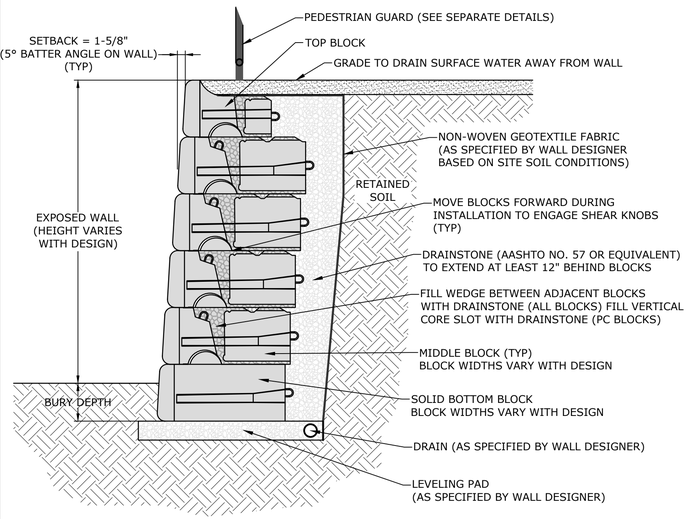




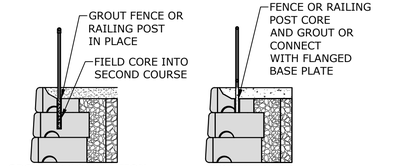
GATE VALVE AT TEE

NOTES:
1. WATER GATE VALVES SHALL OPEN RIGHT (CITY OF PORTSMOUTH) AND OPEN LEFT (PEASE TRADEPORT).
2. VALVE BOXES SHALL BE HEAVY PATTERN CAST IRON, TWO PIECE, SLIP TYPE, 5-INCH DIAMETER SHAFT WITH EXTENSIONS PIECES TO ALLOW FOR SUFFICIENT COVER.
3. THE UPPER SECTION OF THE BOX SHALL BE TOP-FLANGE TYPE TO PREVENT SETTLEMENT.
4. THE LOWER SECTION OF THE BOX SHALL BE BELLED-TYPE TO ENCLOSE THE OPERATING NUT OF THE VALVE.
5. THE COVER SHALL BE CAST IRON WITH THE WORD "WATER" PLAINLY CAST.
6. WHEN A PROJECT REQUIRES GATE BOX TOP TO TEMPORARILY BE SET TO BINDER DEPTH, THEN RAISED TO FINAL GRADE, RISER RINGS ARE NOT PERMITTED. CONTRACTOR SHALL RAISE THE ENTIRE TOP SECTION OF THE VALVE BOX TO FINAL GRADE. ASPHALT MATCHING THE THICKNESS OF THE BINDER SHALL BE PLACED AND COMPACTED BENEATH THE GATE BOX TOP FLANGE.
7. WHEN RISER RINGS ARE THE ONLY OPTION, ONLY FLANGED RISERS WILL BE PERMITTED.
8. WHEN FOSTER ADAPTOR CONNECTION IS NOT POSSIBLE, VALVES SHALL BE ANCHORED BACK TO MECHANICAL JOINTS WITH THREADED RODS.

WATER GATE VALVE
NO SCALE

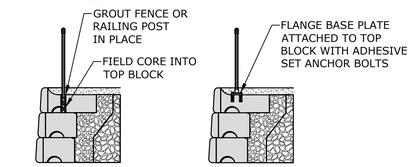


TYPICAL BLOCK RETAINING WALL SECTION
NO SCALE



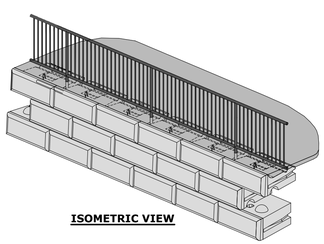
GROUTED CONNECTION (2 BLOCK)

MOMENT SLAB CONNECTION



GROUTED CONNECTION (1 BLOCK)

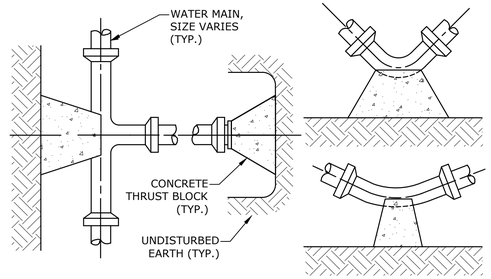
FLANGE BOLTED CONNECTION



ISOMETRIC VIEW

NOTE
1. THESE GENERIC PEDESTRIAN GUARD AND FENCE DETAILS SHOW POTENTIAL OPTIONS FOR INSTALLATION ON THE TOP OF RETAINING WALL. IT IS THE WALL DESIGN ENGINEER'S RESPONSIBILITY TO FULLY DESIGN AND DETAIL THE CONNECTION OF THE GUARD POSTS TO THE RETAINING WALL BLOCKS AND ASSURE ACCEPTABLE RESISTANCE TO THE APPLIED FORCES.

NOTES
1. RETAINING WALL SHALL BE REDI ROCK (BASIS OF DESIGN), VERSA-LOK, RECON WALL SYSTEMS, OR EQUAL.
2. THE CONTRACTOR SHALL SUBMIT DESIGN AND CALCULATIONS FOR THE RETAINING WALL THAT SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE. CALCULATIONS SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
3. MINIMUM DESIGN PARAMETERS:
   - GLOBAL STABILITY FACTOR OF SAFETY = 1.3
   - OVERTURNING FACTOR OF SAFETY UNDER STATIC LOADS = 1.5
   - SLIDING FACTOR OF SAFETY UNDER STATIC LOADS = 1.5
   - GEOGRID PULLOUT FACTOR OF SAFETY = 1.5
   - SEISMIC FACTOR OF SAFETY = 1.1
   - EQUIVALENT FLUID PRESSURE = 40 POUNDS PER CUBIC FOOT (PCF) FOR GRAVITY AND CANTILEVERED WALLS ABOVE GROUNDWATER AND WALLS WITH APPROPRIATE DRAINAGE BEHIND THE WALL.
   - HYDROSTATIC WATER PRESSURE ALONG THE HEIGHT OF THE WALL BELOW GROUNDWATER SHOULD BE INCLUDED IF DRAINAGE IS NOT PROVIDED.
   - WHERE THE CALCULATED EARTH PRESSURE BEHIND THE WALL IS LESS THAN 250 POUNDS PER SQUARE FOOT (PSF), IT SHOULD BE INCREASED TO 250 PSF TO ACCOUNT FOR STRESSES CREATED BY COMPACTION WITHIN 5 FEET OF THE WALL.
   - WALLS SHOULD BE DESIGNED FOR APPROPRIATE SLOPING BACKFILL.
   - WALLS SHOULD BE DESIGNED TO RESIST AN EARTHQUAKE FORCE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC), CURRENT EDITION.
4. WALL DESIGNS SHALL CONSIDER EFFECTS OF SLOPE, TRAFFIC LOADS, BUILDING LOADS, STRUCTURES, UTILITIES, GUARDRAIL AND/OR FENCING AS REQUIRED.
5. WALL DESIGN ENGINEER SHALL CONSIDER HEIGHT AND SPECIFY SAFETY RAIL WHERE REQUIRED.
6. ALL INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION MANUAL AND THE WALL DESIGN ENGINEER'S DESIGN PLANS AND SPECIFICATIONS.
7. THE WALL DESIGN ENGINEER SHALL COMPLETE SUFFICIENT INSPECTIONS DURING CONSTRUCTION TO CERTIFY WORK IS COMPLETED IN ACCORDANCE WITH DESIGN.
8. CONTRACTOR SHALL DIRECT SURFACE RUNOFF AWAY FROM THE WALL DURING CONSTRUCTION.
9. ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT OR OTHER SURFACE TREATMENT SHALL BE INSTALLED IN THE AREA OF THE WALL IMMEDIATELY AFTER THE WALL IS COMPLETE OR OTHER MEASURES SHALL BE TAKEN TO PROTECT THE WALL FROM RUNOFF.
10. CONTRACTOR SHALL SUPPLY PRODUCT INFORMATION FOR BLOCK TYPE / TEXTURE AND COLOR CHOICE TO THE OWNER FOR APPROVAL PRIOR TO ORDERING MATERIALS.
11. RETAINING WALL DESIGN PLANS AND CALCULATIONS SHALL BE FROM THE WALL MANUFACTURER AND SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
12. FINAL STRUCTURAL DESIGN TO BE SUBMITTED TO THE ENGINEER WITH ALL REQUIRED CALCULATIONS AND PLANS.
13. STRUCTURAL DESIGN TO BE COMPLETED AND STAMPED BY A NEW HAMPSHIRE LICENSED STRUCTURAL ENGINEER. DESIGN ENGINEER SHALL INSPECT WALL DURING CONSTRUCTION AND CERTIFY THAT IT HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATIONS SUBMITTED AS PART OF THE BUILDING PERMIT.
14. AN AS-BUILT PLAN SHOWING WALL LOCATION AND DIMENSIONS SHALL BE SUBMITTED TO THE OWNER AND ENGINEER UPON COMPLETION.
15. ANY UNSUITABLE SOIL SUCH AS FROZEN OR ORGANIC SOILS SHOULD BE REMOVED FROM BEHIND THE PROPOSED RETAINING WALLS AND REPLACED WITH FREE DRAINING BACKFILL SUCH AS GRAVEL BORROW.
16. EXISTING FILL SHOULD NOT BE USED WITHIN FIVE (5) FEET OF CANTILEVERED OR GRAVITY WALLS.
17. THESE DETAILS ARE FOR REFERENCE ONLY. DETERMINATION OF THE SUITABILITY AND/OR MANNER OF USE OF ANY DETAILS CONTAINED IN THIS DOCUMENT IS THE SOLE RESPONSIBILITY OF THE WALL DESIGN ENGINEER OF RECORD. FINAL PROJECT DESIGNS, INCLUDING ALL CONSTRUCTION DETAILS, SHALL BE PREPARED BY A NEW HAMPSHIRE LICENSED PROFESSIONAL ENGINEER USING THE ACTUAL CONDITIONS OF THE PROPOSED SITE.



TEST PRESSURE = 200psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES:
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

THRUST BLOCKING DETAIL
NO SCALE

TYPICAL FENCE OR PEDESTRIAN GUARD CONNECTION OPTIONS
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A. HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

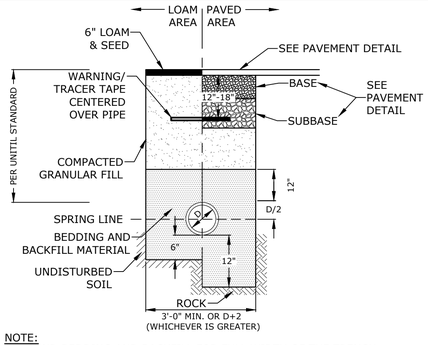
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

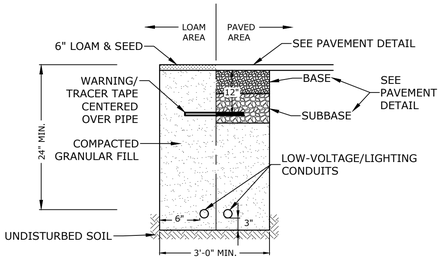
C-806

Last Saved: 2/16/2026
Plotted: Feb 16, 2026 - 4:38pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\0076-065_C-DTLS.dwg



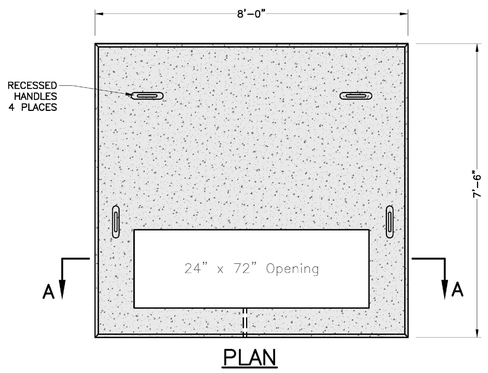
NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
2. GAS SHALL BE INSTALLED PER UNITIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNITIL AND THE CITY OF PORTSMOUTH.

GAS TRENCH
NO SCALE

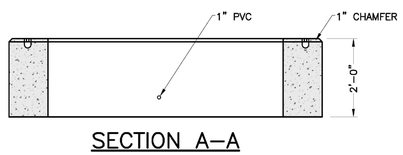


NOTES:
1. NO CONDUIT RUN SHALL EXCEED 360 DEGREES IN TOTAL BENDS. ALL ELBOWS TO BE LONG RADIUS; GRADUAL BENDS TO BE FORMED WITH CONDUIT BENDER ON SITE.
2. A SUITABLE PULLING STRING, CAPABLE OF 200 POUNDS OF PULL, SHALL BE INSTALLED IN THE CONDUIT PRIOR TO INSTALLING CONDUIT. THE STRING SHALL BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT.
3. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE.
4. ALL ELECTRICAL CONDUIT PENETRATING VAULTS AND FOUNDATION WALLS OR TRANSITIONING OUT OF A CONCRETE DUCT BANK SHALL BE RIGID GALVANIZED.
5. SEE UTILITY PLAN FOR LIMITS.

LIGHTING CONDUIT TRENCH
NO SCALE



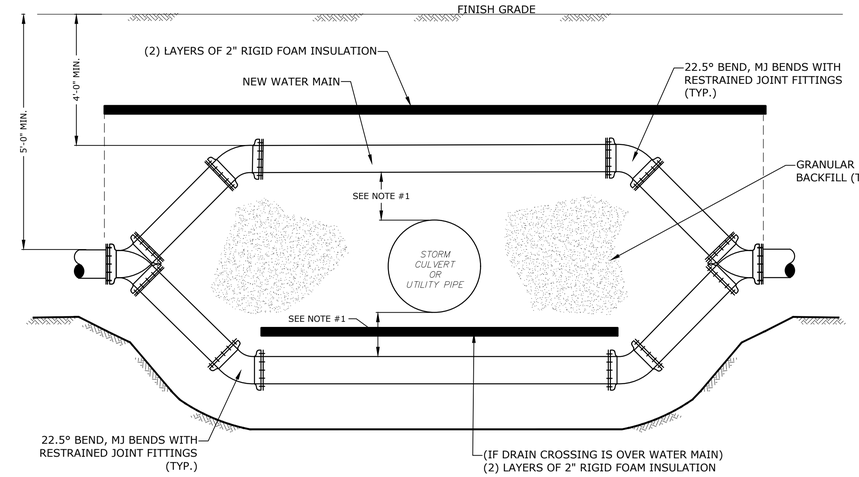
PLAN



SECTION A–A

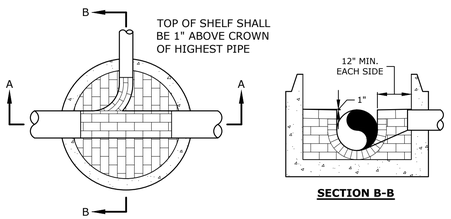
NOTES:
1. DIMENSIONS SHOWN REPRESENT TYPICAL REQUIREMENTS. MANHOLE LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED WITH EVERSOURCE PRIOR TO CONSTRUCTION
2. CONCRETE MINIMUM STRENGTH - 4,000 PSI @ 28 DAYS
3. STEEL REINFORCEMENT - ASTM A615, GRADE 60
4. PAD MEETS OR EXCEEDS EVERSOURCE SPECIFICATIONS

3-PHASE TRANSFORMER PAD
NO SCALE



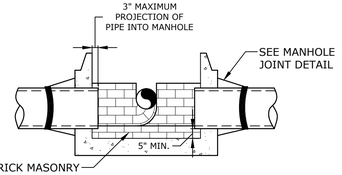
NOTES:
1. INSTALL WATER MAIN 12" VERTICALLY FROM DRAINAGE OR OTHER UTILITIES, AND 18" VERTICALLY FROM SEWER. WATER MUST BE INSTALLED ABOVE SEWER.
2. SUPPORT THE UTILITY PIPE WHILE INSTALLING WATER MAIN.
2. ALL BENDS SHALL BE 22.5° M.J. BENDS WITH RESTRAINED JOINT FITTINGS.
3. PIPE SHALL BE FULLY RESTRAINED MINIMUM 18" EACH SIDE OF ELBOWS.
4. REFER TO "WATER TRENCH" DETAIL FOR ADDITIONAL WATER MAIN INSTALLATION REQUIREMENTS.

WATER MAIN VERTICAL UTILITY CROSSING
NO SCALE

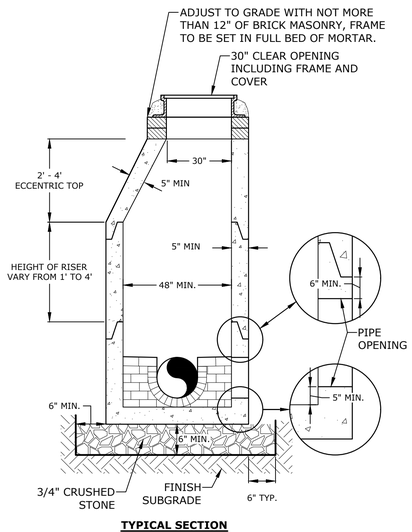


PLAN

SECTION B-B



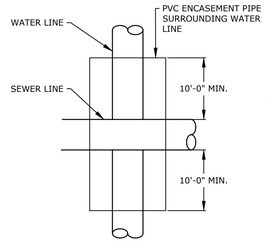
SECTION A-A



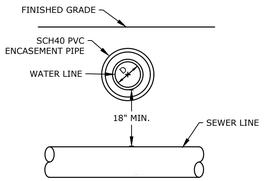
TYPICAL SECTION

NOTES:
1. ALL SEWER MANHOLES, AS WELL AS ASSOCIATED PIPES AND APPURTENANCES, SHALL BE CONSTRUCTED TO CITY AND STATE STANDARDS.
2. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
3. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
4. INVERT BRICKS SHALL BE LAID ON EDGE.
5. TWO (2) COATS OF BITUMINOUS WATERPROOF COATING SHALL BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
6. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY E). FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS. ALL OTHER MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A 3-INCH (MINIMUM HEIGHT) WORD "SEWER" SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER.
7. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
8. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

SEWER MANHOLE
NO SCALE



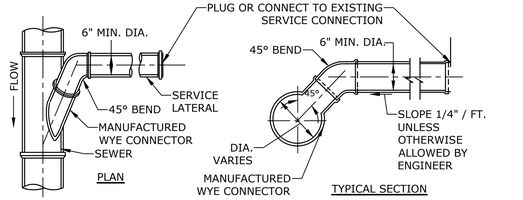
PLAN VIEW



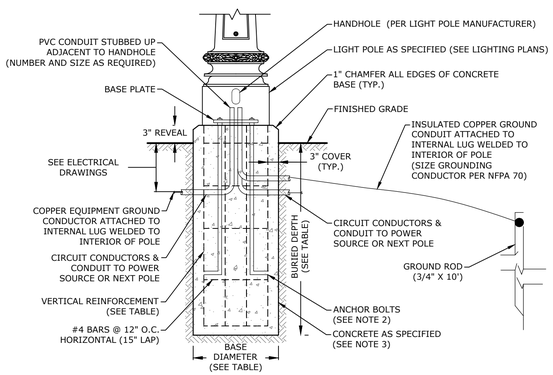
PROFILE VIEW

NOTES:
1. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED FROM ANY EXISTING OR PROPOSED WATER LINE.
2. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
3. AN 18" MINIMUM EDGE TO EDGE VERTICAL SEPARATION SHALL BE PROVIDED, WITH WATER ABOVE SEWER, AT ALL CROSSINGS.
4. WHERE AN 18" VERTICAL SEPARATION CANNOT BE PROVIDED, WATER LINE SHALL BE CONSTRUCTED WITH A PVC ENCASEMENT PIPE FOR A MINIMUM DISTANCE OF 10 FEET ON BOTH SIDES OF THE LINE BEING CROSSED, AS SHOWN ABOVE. A MINIMUM OF 6" VERTICAL SEPARATION BETWEEN WATER AND SEWER MUST BE PROVIDED.
4.1. ALTERNATIVELY, THE ENTIRE RUN OF SEWER PIPE BETWEEN MANHOLES MAY BE CONSTRUCTED WITH PRESSURE RATED PIPE (ASTM D2241).
5. CROSSINGS SHALL CONFORM TO THE CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS.

WATER & SEWER CROSSING
NO SCALE



STANDARD SERVICE LATERAL CONNECTION
NO SCALE



POLE HEIGHT	DEPTH (BURIED)	BASE DIAMETER	VERTICAL REINFORCEMENT
<16'	72" (MIN.)	18"	6 - #6
>16'	72" (MIN.)	24"	6 - #8

NOTES:
1. ALL LIGHT POLES, LUMINARIES AND WIRE TO BE FURNISHED BY THE CONTRACTOR UNLESS OTHERWISE DIRECTED.
2. CONTRACTOR SHALL VERIFY BOLT TEMPLATE AND ANCHOR BOLT SIZE WITH POLE MANUFACTURER PRIOR TO CONSTRUCTION.
3. CONCRETE SHALL BE 4,000 PSI CLASS A, PRE-CAST CONCRETE.
4. REINFORCEMENT SHALL BE ASTM A615, GRADE 60.
5. FOR LIGHT POLES GREATER THAN 20' IN HEIGHT, THE LIGHT POLE BASE SHALL BE DESIGNED AND STAMPED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.

TYPICAL LIGHT POLE BASE (ON-SITE)
NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
2/18/26

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

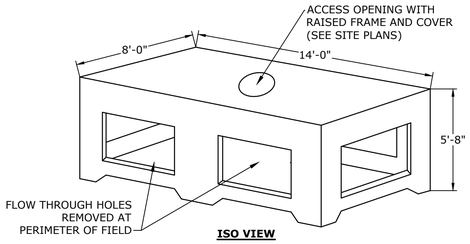
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-DTLS.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

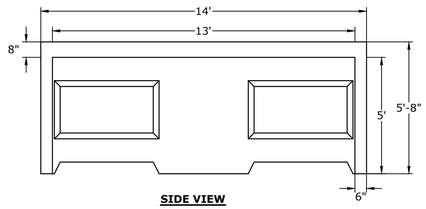
SCALE: AS SHOWN

C-807

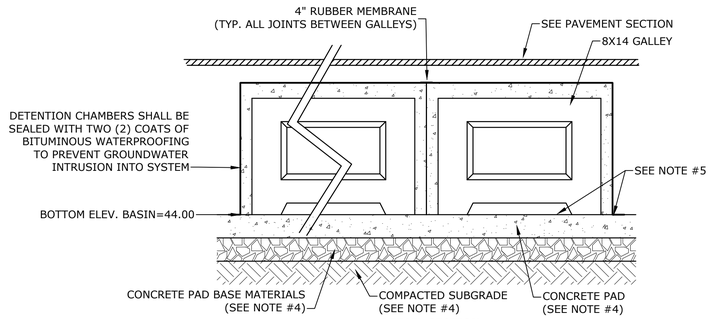
Last Saved: 2/16/2026 By: BCurcio
Plotted: 2/16/2026 8:56:4-38pm By: BCurcio
Tighe & Bond J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DTLS.dwg



ISO VIEW



SIDE VIEW

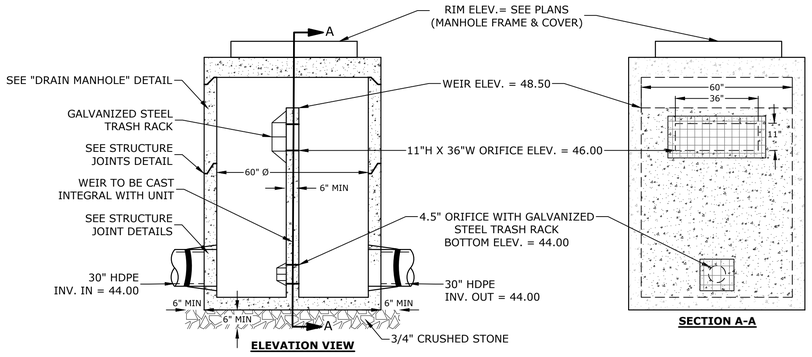


DETAIL SECTION

NOTES
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. END & SIDE UNITS DO NOT HAVE FLOW-THRU OPENINGS.
3. GALLEY SYSTEM CHAMBERS SHALL BE SHEA CONCRETE PRODUCTS OR EQUAL, AND SHALL BE INSTALL PER MANUFACTURERS RECOMMENDATIONS.
4. CONTRACTOR SHALL PROVIDE DESIGN LAYOUT PLANS AND DETAILS FOR EACH PROPOSED UNDERGROUND DETENTION GALLEY SYSTEM INCLUDING CONCRETE PAD DESIGN STAMPED BY A NEW HAMPSHIRE LICENSED STRUCTURAL ENGINEER.
5. THE PERIMETER HORIZONTAL JOINT BETWEEN THE GALLEY CHAMBERS AND THE CONCRETE FOUNDATION SHALL BE SEALED TO THE FOUNDATION WITH PRE-FORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891, 8.8 AND 8.12.
6. SEE GRADING, DRAINAGE, & EROSION CONTROL SHEETS FOR UNDERGROUND DETENTION SYSTEM LAYOUT.

TYPICAL UNDERGROUND DETENTION GALLEY SYSTEM

NO SCALE

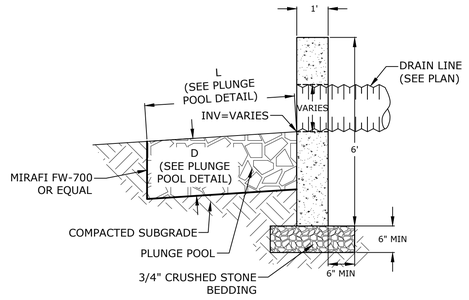


ELEVATION VIEW **SECTION A-A**

NOTES:
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRDE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.
4. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

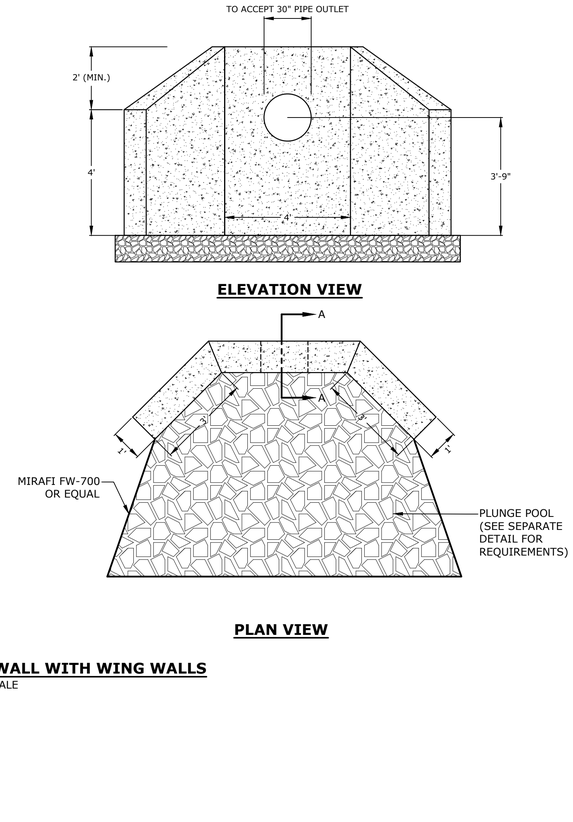
UDB OUTLET CONTROL STRUCTURE (POCS1)

NO SCALE



SECTION A-A

NOTES:
1. HEADWALL SHALL BE 5,000 PSI CONCRETE.
2. HEADWALL REINFORCEMENT SHALL BE 0.18 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. SEE PLUNGE POOL DETAIL FOR PLUNGE POOL DIMENSIONS AND REQUIREMENTS.

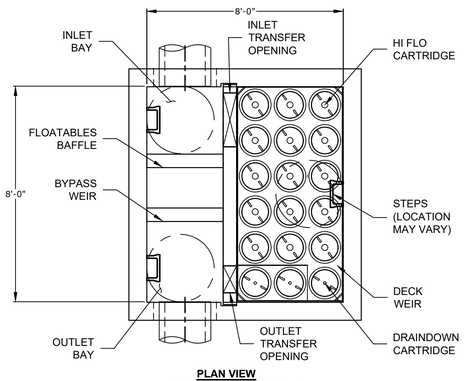


ELEVATION VIEW

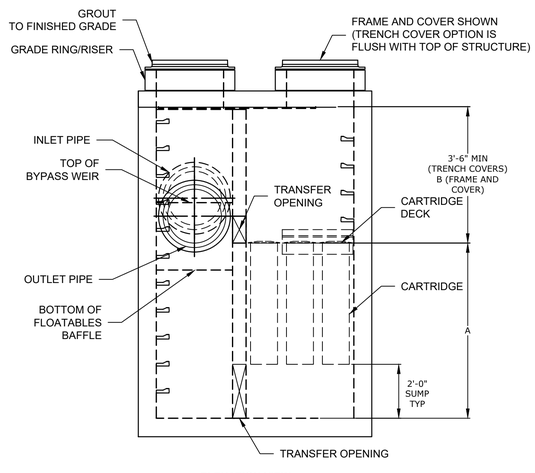
PLAN VIEW

PRECAST CONCRETE HEADWALL WITH WING WALLS

NO SCALE



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

GENERAL NOTES:
1. MANUFACTURER TO PROVIDE FINAL DIMENSIONS BASED ON APPROVED FLOWS AND ALL MATERIALS UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
3. STRUCTURE SHALL MEET AASHTO HS-20 LOADING REQUIREMENTS. CASTINGS SHALL MEET AASHTO M306 LOAD RATING.
4. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
5. CONTRACTOR SHALL PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.

B. CONTRACTOR SHALL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).

C. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

D. CARTRIDGE INSTALLATION, BY MANUFACTURER, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE TREATMENT UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT MANUFACTURER TO COORDINATE CARTRIDGE INSTALLATION.

TYPICAL FLOW-THROUGH TREATMENT UNIT

NO SCALE

Tighe&Bond

STATE OF NEW HAMPSHIRE – PATRICK CRIMMINS – No. 12378 – LICENSED PROFESSIONAL ENGINEER
2/18/26

STATE OF NEW HAMPSHIRE – NEIL A HANSEN – No. 15227 – LICENSED PROFESSIONAL ENGINEER
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PROPOSED MULTI-FAMILY DEVELOPMENT

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DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

DETAILS SHEET

SCALE: AS SHOWN

C-808

Last Saved: 2/16/2026
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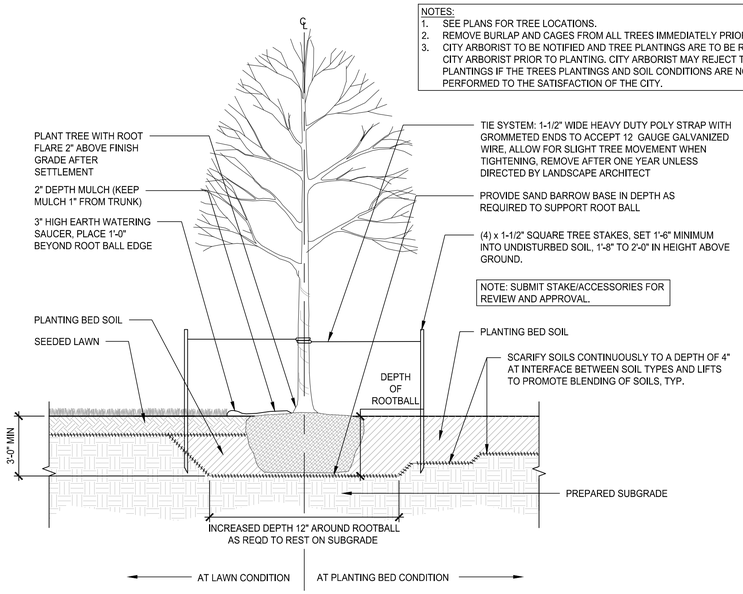
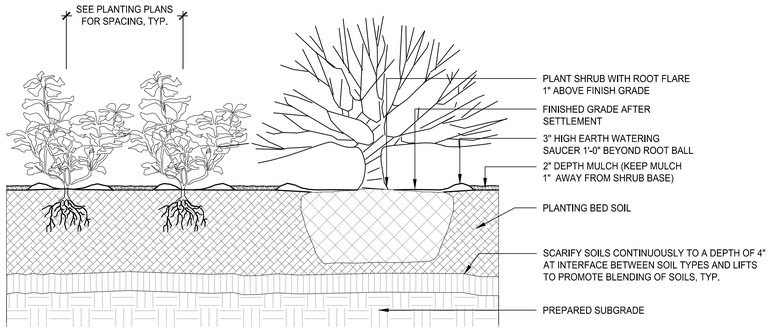
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DTLS.dwg

NOTES:
1. SEE PLANS FOR TREE LOCATIONS.
2. REMOVE BURLAP AND CAGES FROM ALL TREES IMMEDIATELY PRIOR TO PLANTING.
3. CITY ARBORIST TO BE NOTIFIED AND TREE PLANTINGS ARE TO BE REVIEWED WITH CITY ARBORIST PRIOR TO PLANTING. CITY ARBORIST MAY REJECT TREE PLANTINGS IF THE TREES PLANTINGS AND SOIL CONDITIONS ARE NOT PERFORMED TO THE SATISFACTION OF THE CITY.



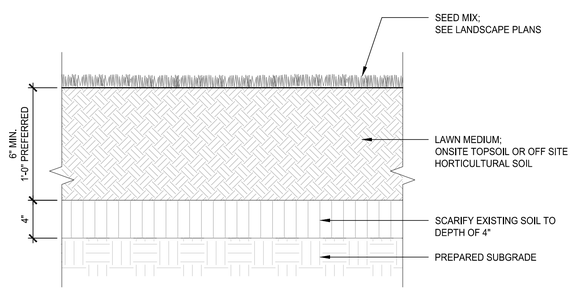
TREE PLANTING

DETAIL 1 / - — 1/4" = 1'-0"



PLANT BED

DETAIL 2 / - — 3/4" = 1'-0"



SEEDED LAWN

DETAIL 3 / - — 1" = 1'-0"

Last Saved:1/19/2026
Plotted On:Feb 17, 2026 - 1:09pm By: JGeraga
Tighe & Bond (A1K0072 The Gatekeeper Company - General Proposals\0076-0065 GNOO Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_L-DTLS.dwg

Tighe & Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

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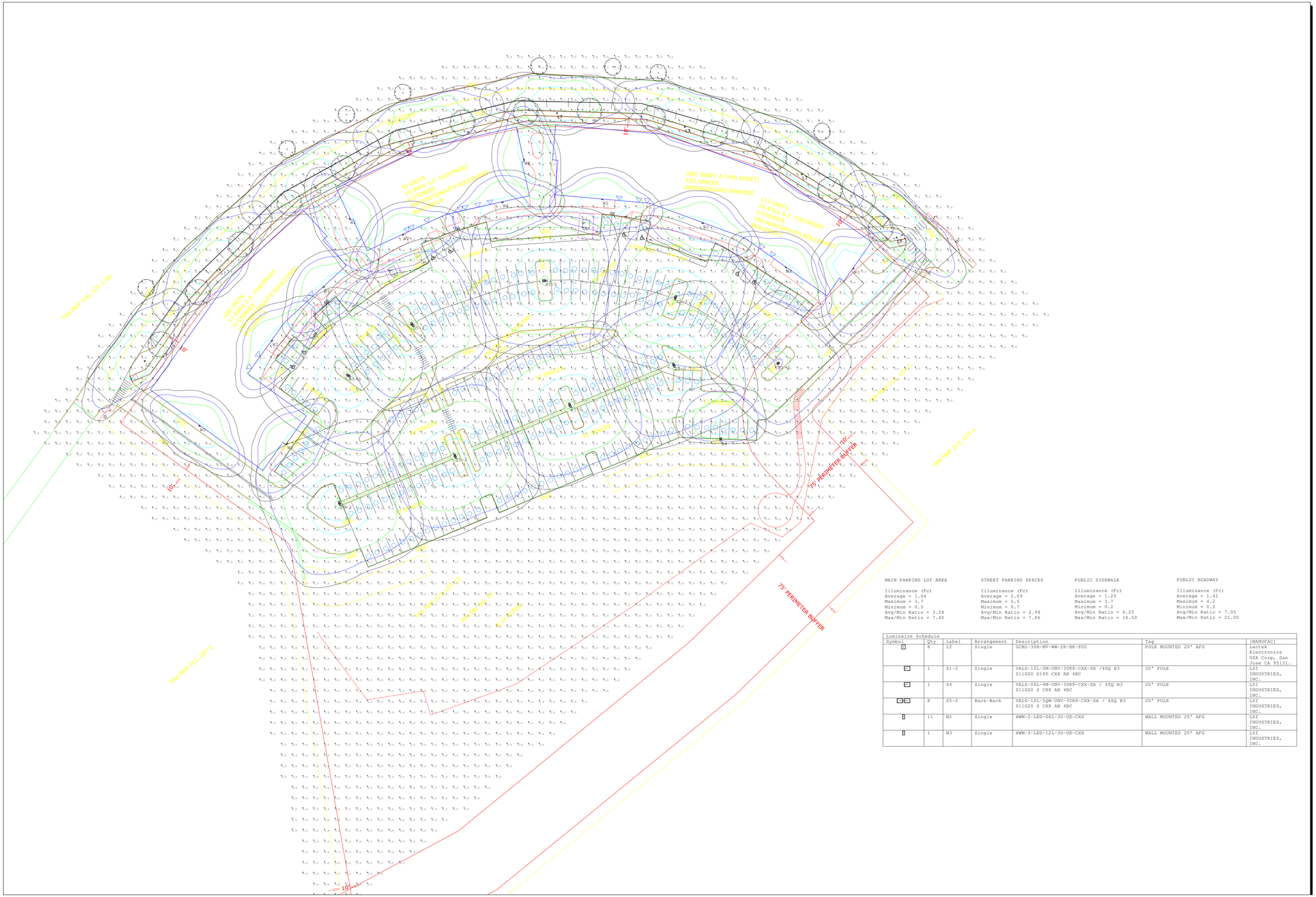
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_L-DTLS.DWG
DRAWN BY:	JDG
CHECKED:	RU/NAH
APPROVED:	PMC

LANDSCAPE DETAILS

SCALE: AS SHOWN

L-501



MAIN PARKING LOT AREA

Illuminance (Fc)
Average = 1.64
Maximum = 3.7
Minimum = 0.5
Avg/Min Ratio = 3.28
Max/Min Ratio = 7.40

STREET PARKING SPACES

Illuminance (Fc)
Average = 2.09
Maximum = 5.5
Minimum = 0.7
Avg/Min Ratio = 2.99
Max/Min Ratio = 7.86

PUBLIC SIDEWALK

Illuminance (Fc)
Average = 1.25
Maximum = 3.7
Minimum = 0.2
Avg/Min Ratio = 6.25
Max/Min Ratio = 18.50

PUBLIC ROADWAY

Illuminance (Fc)
Average = 1.41
Maximum = 4.2
Minimum = 0.2
Avg/Min Ratio = 7.05
Max/Min Ratio = 21.00

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
	8	LT	Single	GCM2-30H-MV-WW-2R-BK-850	POLE MOUNTED 20' AFG	Leotek Electronics USA Corp, San Jose CA 95131.
	1	S1-2	Single	VALS-12L-5M-UNV-30K8-CXX-SA /4SQ B3 S11G20 D180 CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.
	1	S4	Single	VALS-06L-4M-UNV-30K8-CXX-SA / 4SQ B3 S11G20 S CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.
	8	S5-2	Back-Back	VALS-12L-5QW-UNV-30K8-CXX-SA / 4SQ B3 S11G20 S CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.
	11	W2	Single	XWM-2-LED-06L-30-UE-CXX	WALL MOUNTED 20' AFG	LSI INDUSTRIES, INC.
	1	W3	Single	XWM-3-LED-12L-30-UE-CXX	WALL MOUNTED 20' AFG	LSI INDUSTRIES, INC.

EXPOSURE
LIGHTING — CONTROLS — ELECTRICAL

Exposure Lighting
501 ISLINGTON ST 1A
PORTSMOUTH NH 03801
603-601-8080

#	Date	Comments

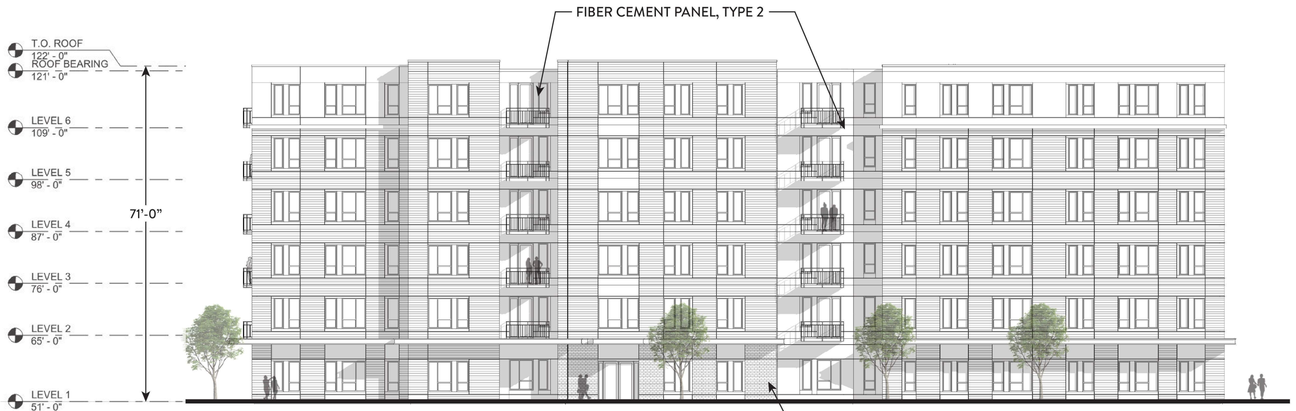
Revisions

Drawn By:
Checked By:
Date:2/17/2026
CALCULATIONS PERFORMED BY: KTS
Scale:NTS

PORTSMOUTH BLVD
MULTI-FAMILY HSG
PORTSMOUTH NH
REV 021726

L01

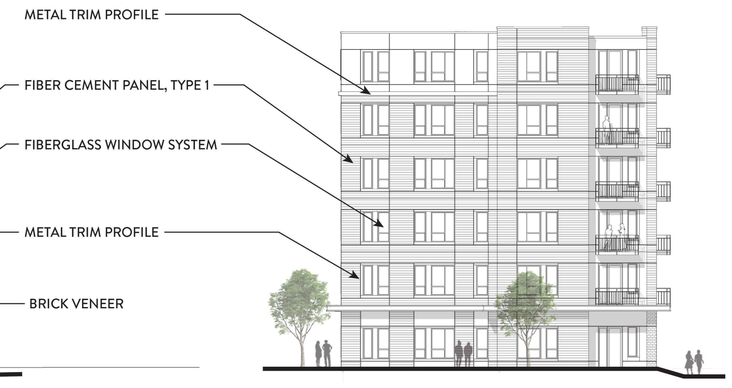
BUILDING A - Overall Elevations



BUILDING A - SOUTH ELEVATION

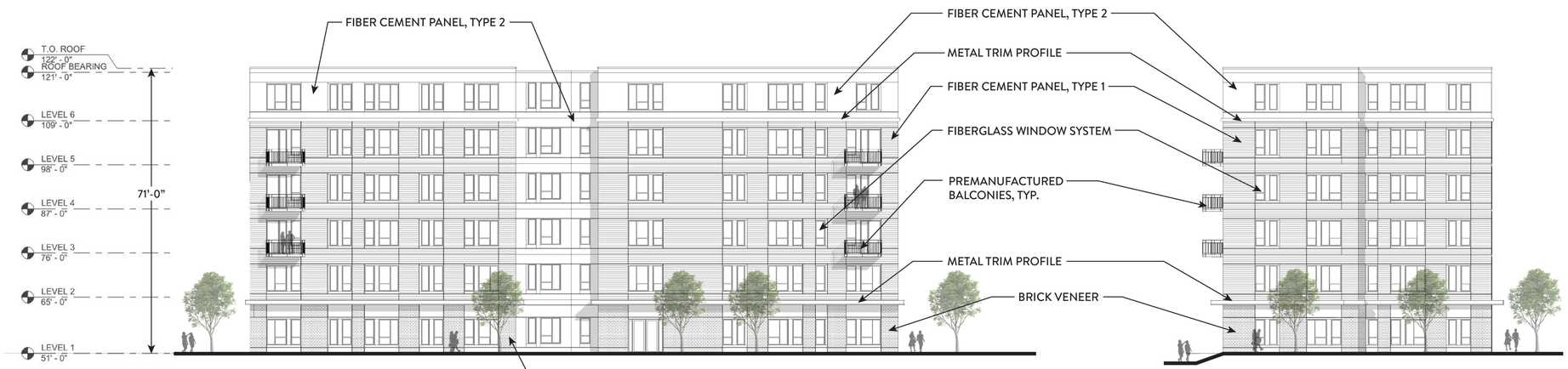
BUILDING A - WEST ELEVATION

BUILDING A - NORTH ELEVATION



BUILDING A - EAST ELEVATION

BUILDING B - Overall Elevations



BUILDING B - SOUTH ELEVATION

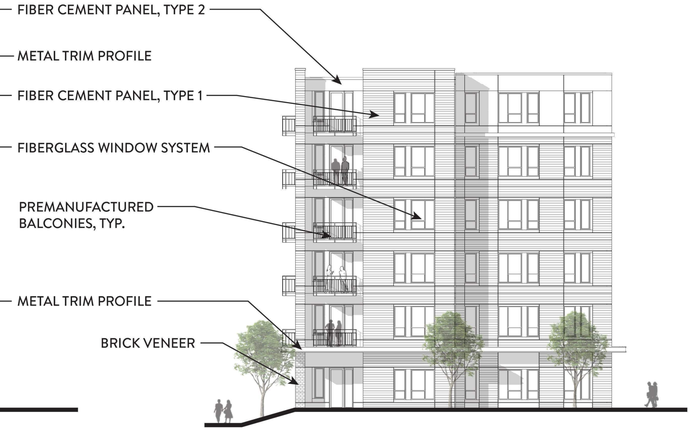
BUILDING B - WEST ELEVATION

BUILDING B - NORTH ELEVATION

BUILDING B - EAST ELEVATION

BUILDING C - Overall Elevations

BUILDING C - SOUTH ELEVATION



BUILDING C - WEST ELEVATION

BUILDING C - NORTH ELEVATION

BUILDING C - EAST ELEVATION

PROCON
CONNECT • CREATE • CONSTRUCT

ARCHITECTURAL EXHIBITS

MULTI-FAMILY DEVELOPMENT
PORTSMOUTH BOULEVARD
PORTSMOUTH, NH

Date
MAR
2026

OVERALL FLOOR PLANS

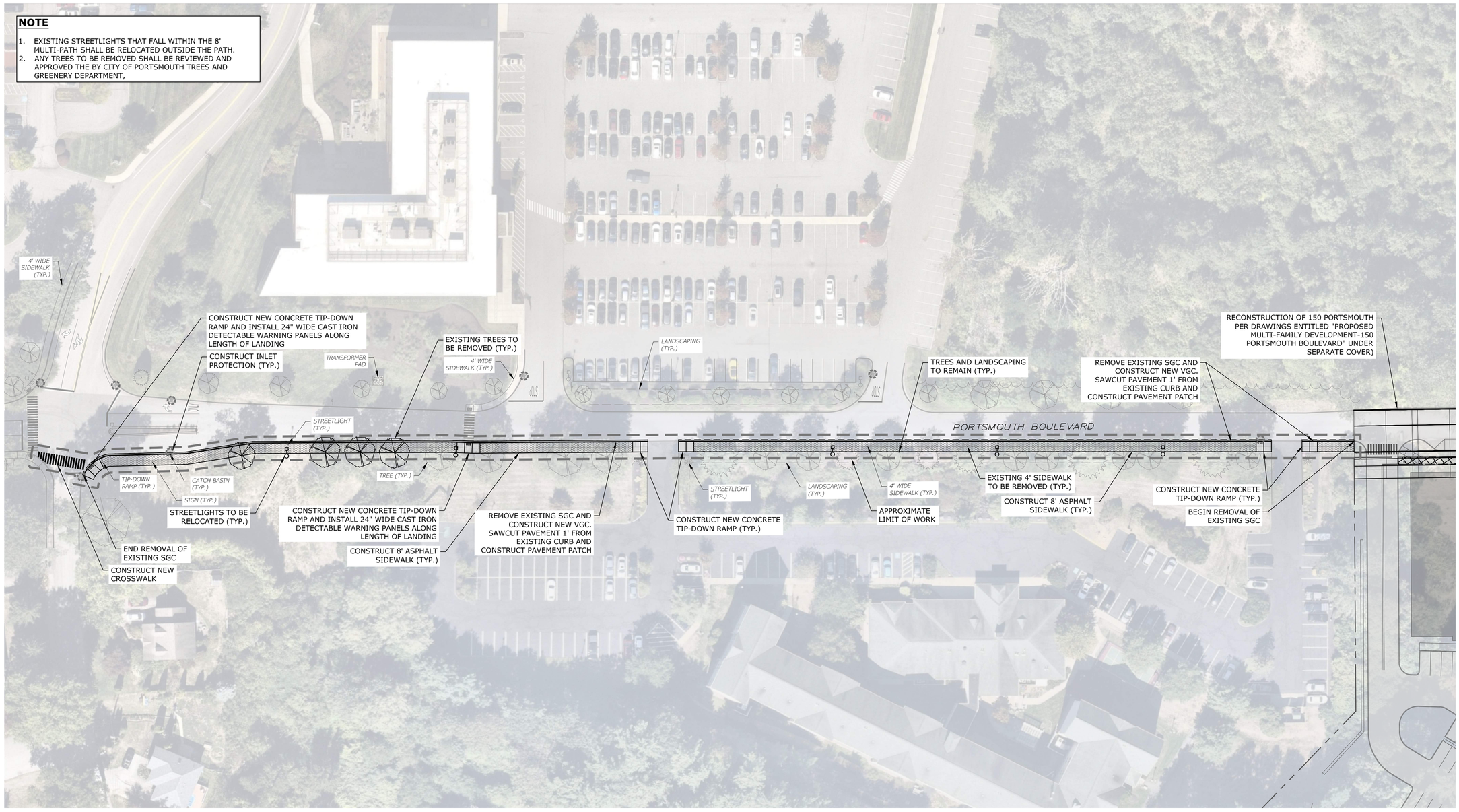
Ground Floor Plan

OVERALL FLOOR PLANS

Typical Floor Plan - Levels 2-6

NOTE

1. EXISTING STREETLIGHTS THAT FALL WITHIN THE 8' MULTI-PATH SHALL BE RELOCATED OUTSIDE THE PATH.
2. ANY TREES TO BE REMOVED SHALL BE REVIEWED AND APPROVED THE BY CITY OF PORTSMOUTH TREES AND GREENERY DEPARTMENT,



0 40' 80'

SCALE: 1" = 40'

Tighe&Bond
177 Corporate Drive
Portsmouth, NH 03801
(603) 433-8818

SCHEMATIC PLAN SET

THIS DOCUMENT IS RELEASED TEMPORARILY FOR PROGRESS REVIEW ONLY. IT IS NOT INTENDED FOR BIDDING OR CONSTRUCTION PURPOSES.

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
1	1/16/26	DPW COMMENTS

PROJECT NO:	K0076-0065
DATE:	10/16/2025
FILE:	K0076-065-OS_C-DSGN.dwg
DRAWN BY:	M.CURLEY
DESIGNED BY:	M.CURLEY
CHECKED BY:	B.CURCIO
APPROVED BY:	N.HANSEN

8' MULTI-USE SIDEWALK SITE PLAN

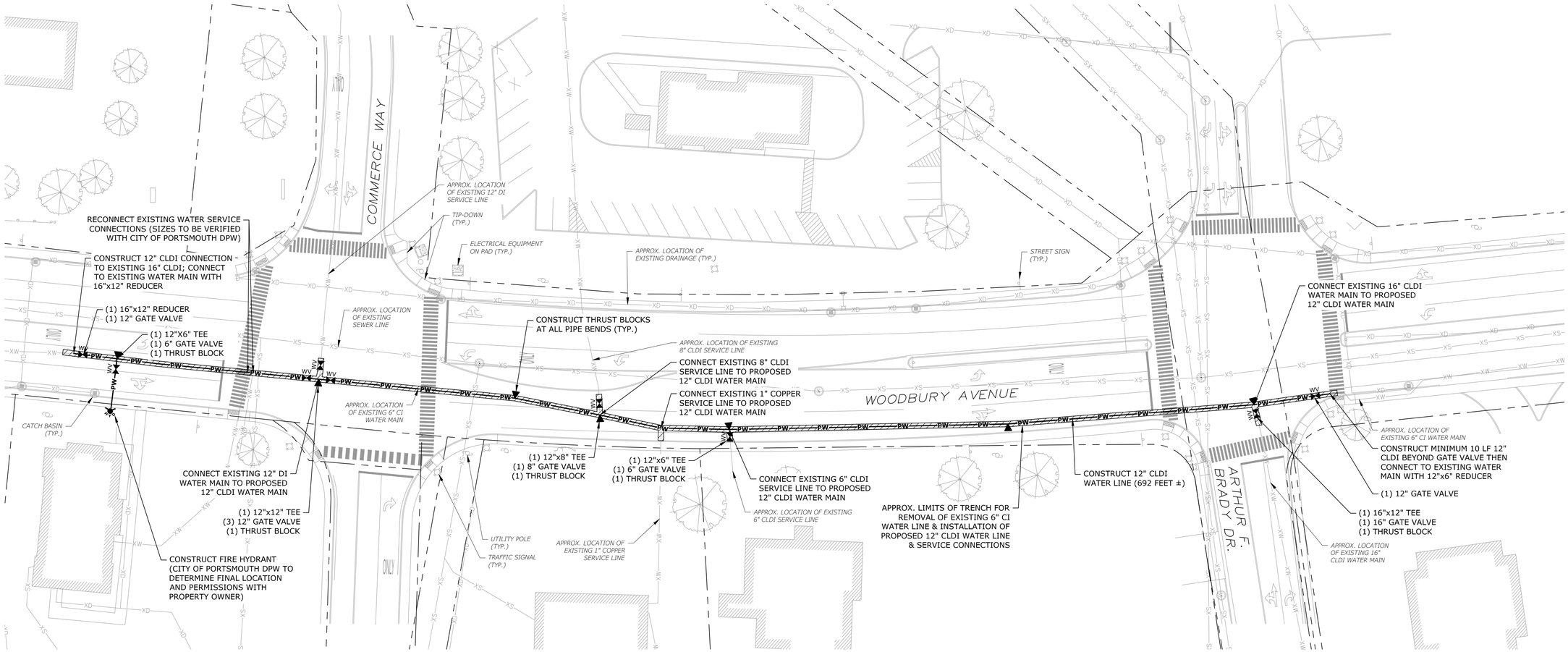
SCALE: AS SHOWN

SHEET 1 OF 1

Last Saved: 1/9/2026
Plotted: Jan 12, 2026-8:44am By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings (Off-Site)\Multi-Use Path\AutoCAD\Sheet\K0076-065-OS_C-DSGN.dwg

NOTES:

1. LOCATIONS, SIZES, AND MATERIAL OF WATER MAIN & SERVICE CONNECTIONS, SEWER LINES, AND DRAINAGE LINES ARE APPROXIMATE BASED ON GIS INFORMATION RECEIVED FROM THE CITY OF PORTSMOUTH.



0 30' 60'

SCALE: 1" = 30'

Tighe&Bond
177 Corporate Drive
Portsmouth, NH 03801
(603) 433-8818

SCHEMATIC PLAN SET

THIS DOCUMENT IS RELEASED TEMPORARILY FOR PROGRESS REVIEW ONLY. IT IS NOT INTENDED FOR BIDDING OR CONSTRUCTION PURPOSES.

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
1	1/16/26	DPW COMMENTS

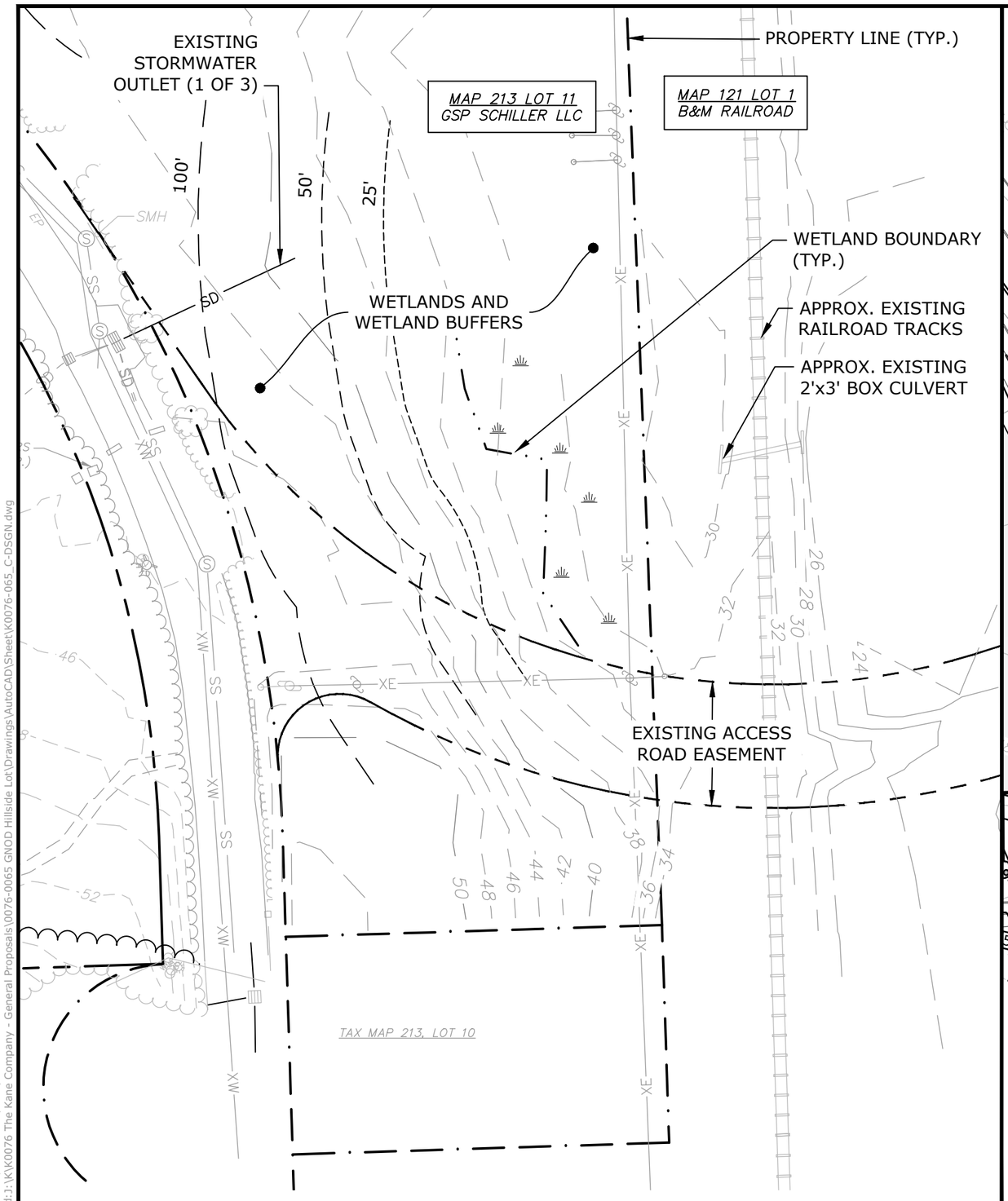
PROJECT NO:	K0076-0065
DATE:	10/16/2025
FILE:	K0076-065_C-DSGN.dwg
DRAWN BY:	M.CURLEY
DESIGNED BY:	M.CURLEY
CHECKED BY:	B.CURCIO
APPROVED BY:	N.HANSEN

WATER MAIN REPLACEMENT SITE PLAN

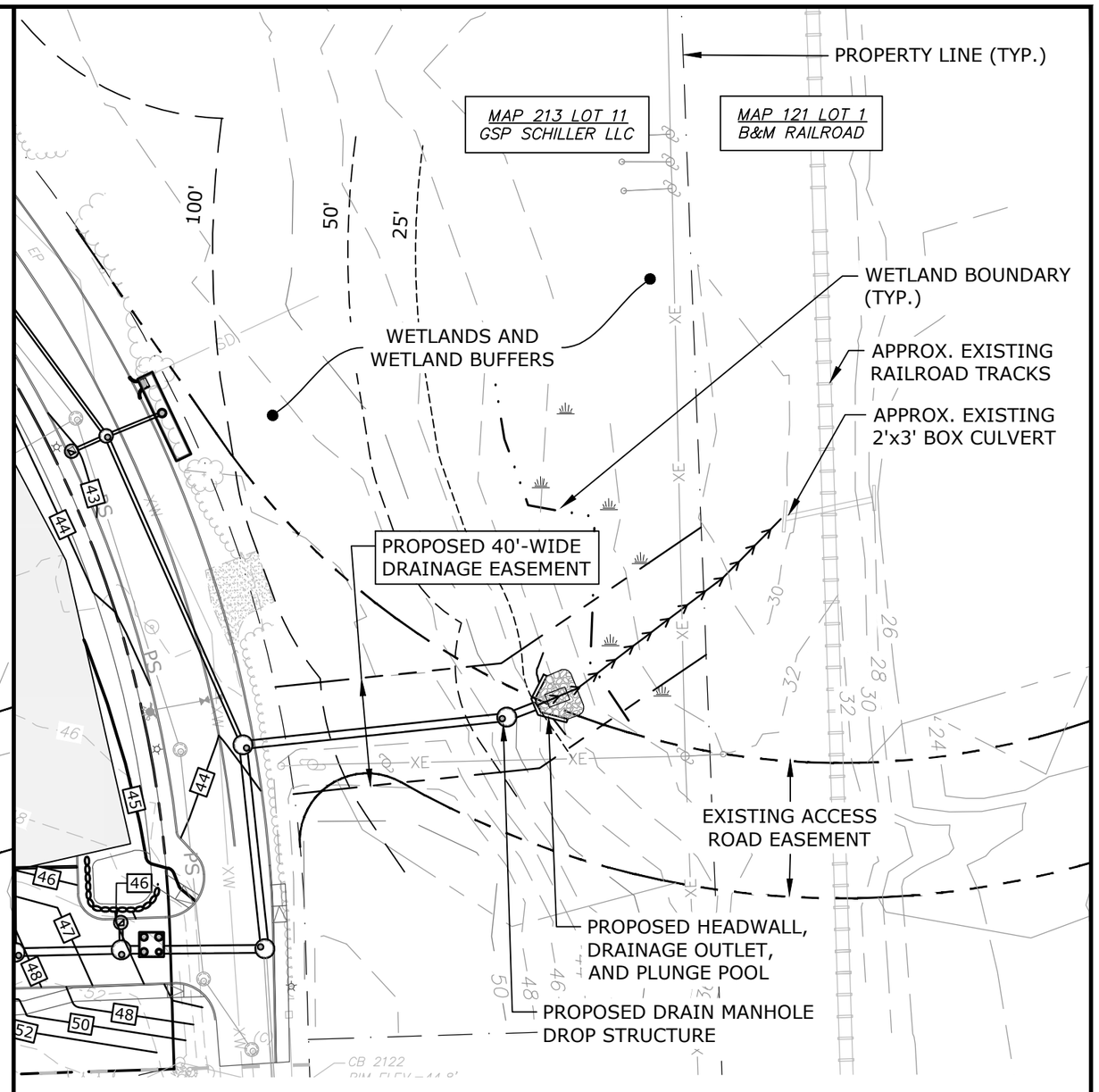
SCALE: AS SHOWN

SHEET 1 OF 1

Last Saved: 1/9/2026
Plotted: Oct 16, 2025 - 8:46am By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNDD Hillside Lot\Drawings (Off-Site)\Water Main Replacement\AutoCAD\Sheet\K0076-065_C-DSGN.dwg



EXISTING CONDITIONS



PROPOSED CONDITIONS

0 50' 100'

SCALE: 1" = 50'

NOTES:
1. EXISTING EASEMENTS LIMIT SHOWN DERIVED FROM SCHEMATIC DRAWINGS ENTITLED "ATLANTIC HEIGHTS EMERGENCY ACCESS" FOR THE CITY OF PORTSMOUTH, BY TIGHE & BOND, DATED 10/7/2016.

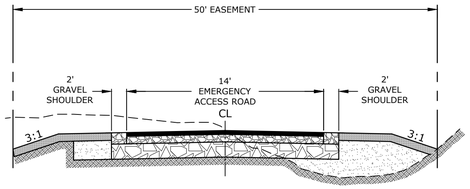
150 PORTSMOUTH BOULEVARD
PORTSMOUTH, NH

DRAINAGE OUTLET EXHIBIT

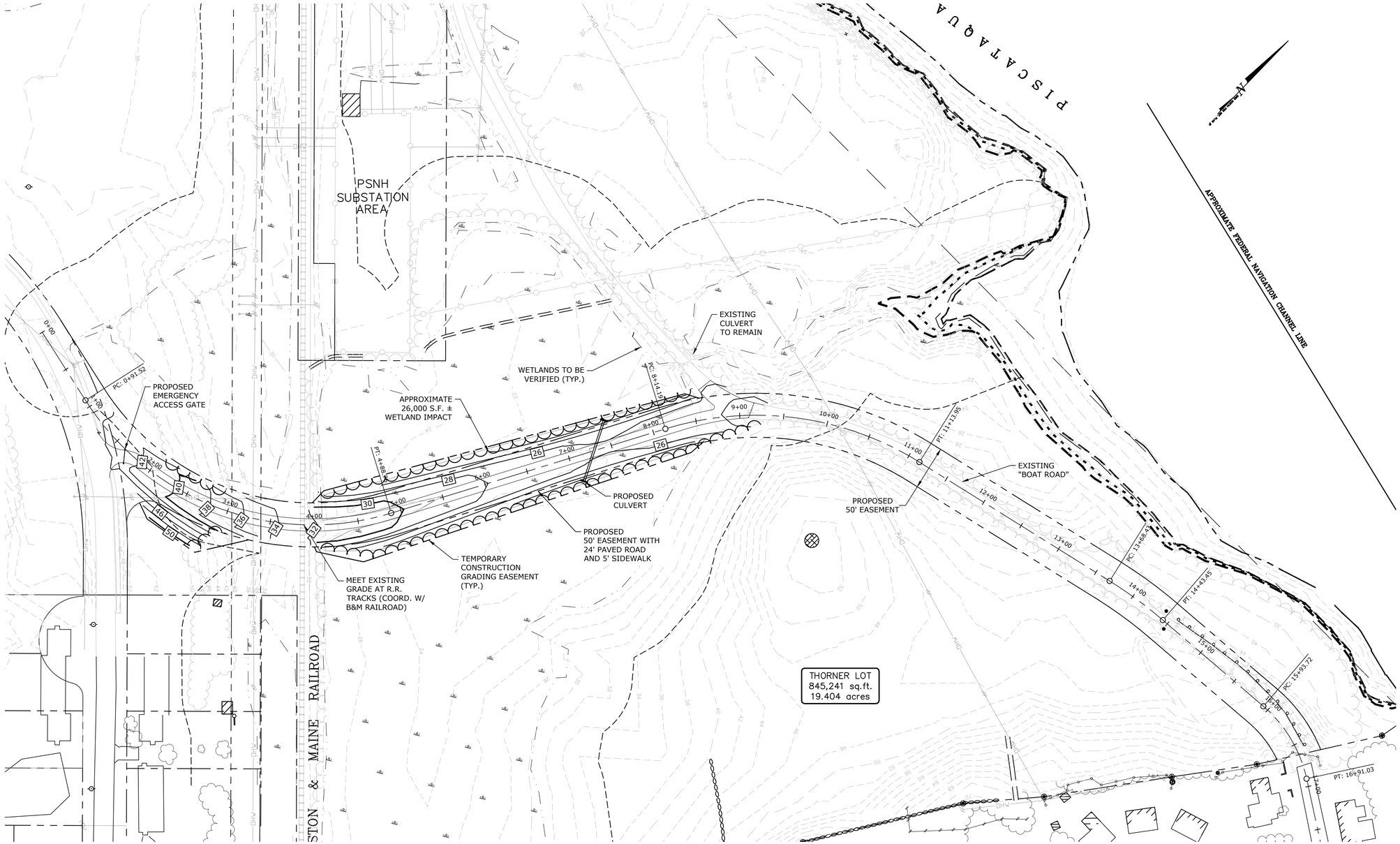
DATE: 2/18/2026
SCALE: AS SHOWN
FIGURE: 1 OF 2

Tighe & Bond

Plotted On:Feb 16, 2026-4:16pm By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg



EASEMENT & ROAD SECTION
NO SCALE



Tighe&Bond
www.tighebond.com

PRELIMINARY

SCALE IN FEET
0 60' 120'
GRAPHIC SCALE

Atlantic Heights Emergency Access

City of Portsmouth

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION

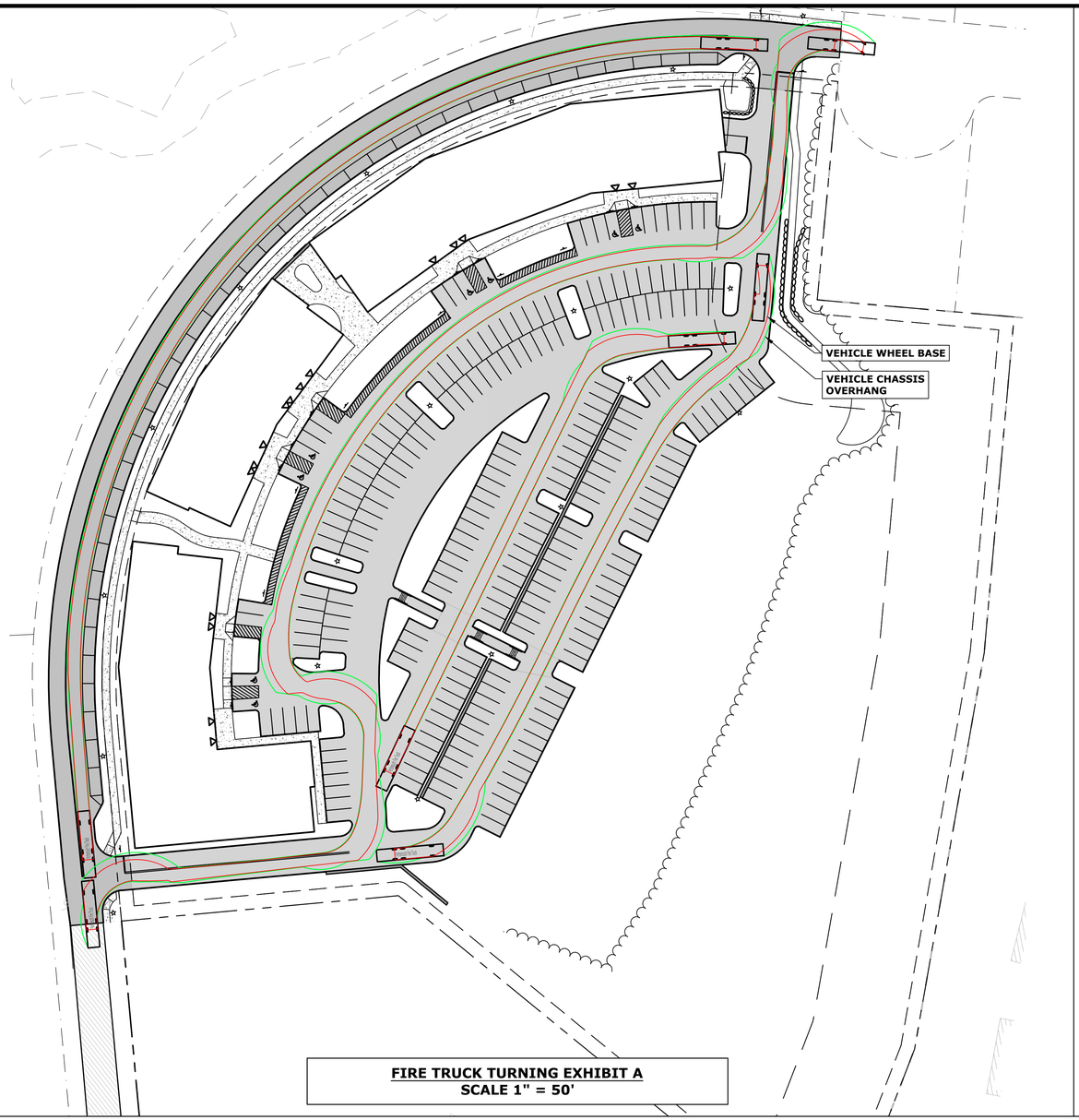
PROJECT NO:	P-0619-2
DATE:	OCTOBER 2016
FILE:	P-0619-2-CS-102 to C-10.dwg
DRAWN BY:	NAH
CHECKED:	PMC
APPROVED:	XX

EMERGENCY ACCESS ROAD GRADING PLAN

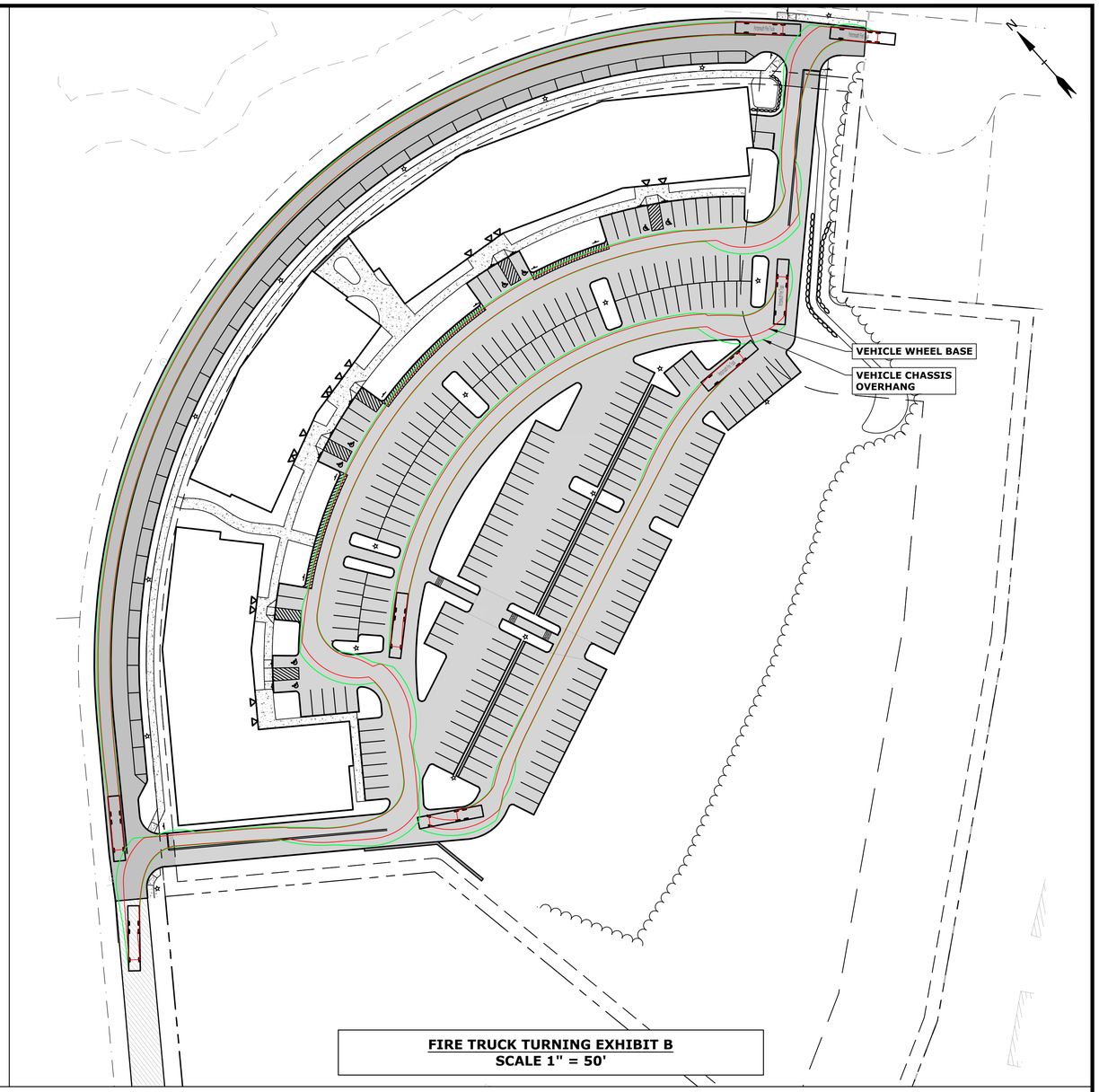
SCALE: AS SHOWN

C-101

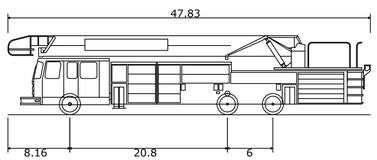
Last Saved: 10/18/2016
Plotted: 10/18/2016 10:03am By: BCurcio
Tighe & Bond: \\tighebond.com\data\Projects\P\P0619 Portsmouth Atlantic Heights Neighborhood Emergency\RtI\DWG-CAD\P-0619-2\SHEETS\P-0619-2-CS-102 to C-10.dwg



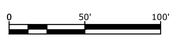
FIRE TRUCK TURNING EXHIBIT A
SCALE 1" = 50'



FIRE TRUCK TURNING EXHIBIT B
SCALE 1" = 50'



Portsmouth Fire Truck	
Overall Length	47.830ft
Overall Width	8.500ft
Overall Body Height	10.432ft
Min Body Ground Clearance	0.862ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	38.00°



LEGEND

VEHICLE WHEEL BASE

VEHICLE OVERHANG

PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

FIRE TRUCK TURNING EXHIBIT

DATE: 2/18/2026
SCALE: AS SHOWN
FIGURE: 1 OF 1

Tighe & Bond

Plotted On:Feb 16, 2026-3:40pm By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-FIG.dwg

An area of natural, semi-natural, or planted space set aside for human enjoyment and recreation or for the protection of wildlife or natural habitats. A **park** may consist of grassy areas, trees and other natural or planted landscape features, and may also contain walking **path**s and trails, monuments, fountains, playground equipment, benches, picnic tables and similar amenities.

Permitted Districts: All Districts

A **community space** available for informal activities in close proximity to neighborhood residences. A **pocket park** is spatially defined by buildings. Its landscape shall consist of **path**s, lawns and trees, formally disposed. The minimum size shall be 500 sq. ft.

Permitted Districts: All Districts

COMMUNITY SPACE:	REQUIRED	PROPOSED
	10%	27.3%
	36,458 SF	100,000 SF

0 30' 60'
GRAPHIC SCALE

N

PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

COMMUNITY SPACE EXHIBIT

DATE: 2/18/2026
SCALE: AS SHOWN
FIGURE: 1 OF 1

Tighe & Bond

Plotted On:Feb 17, 2026-1:08pm By: BCurcio
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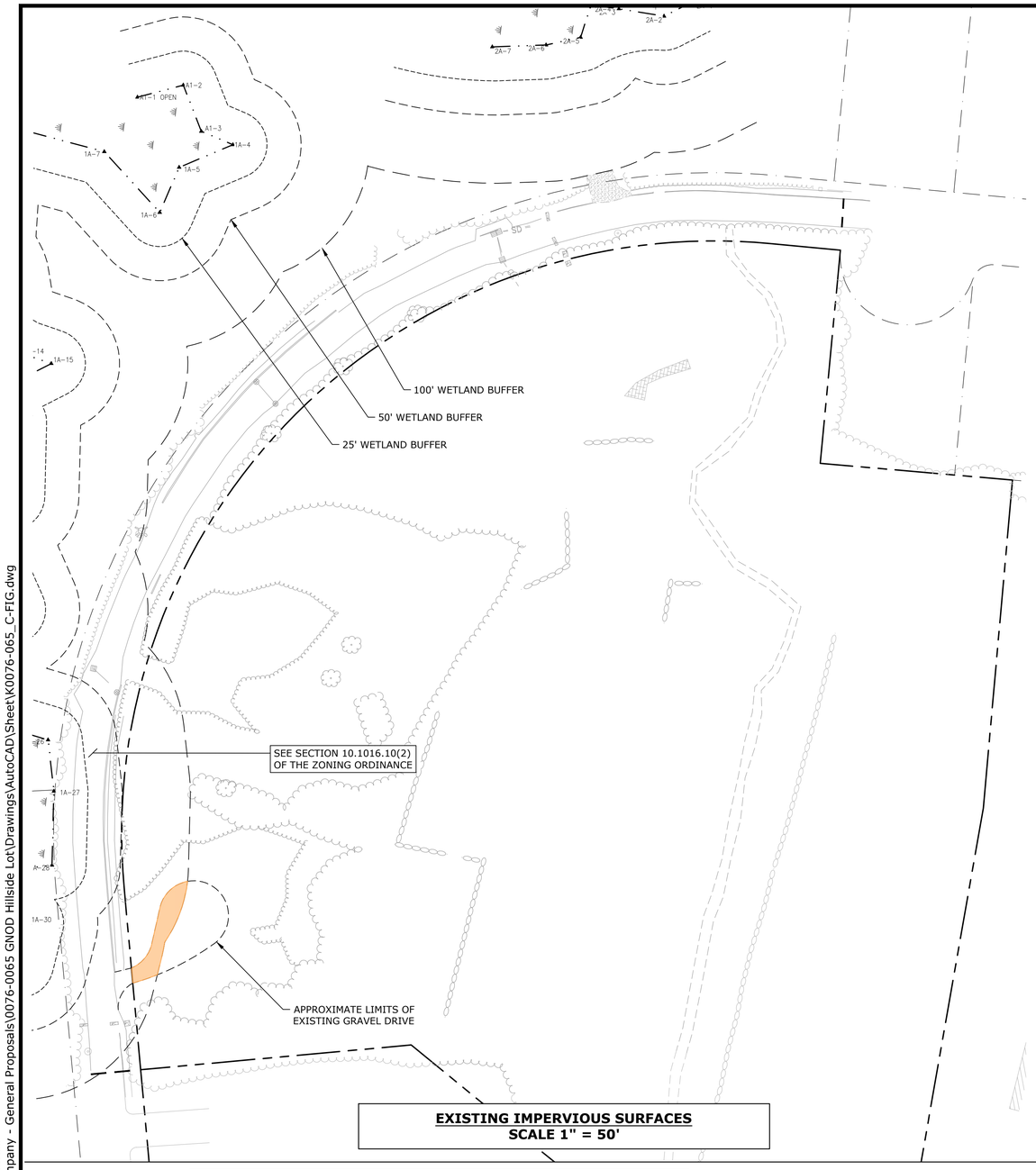
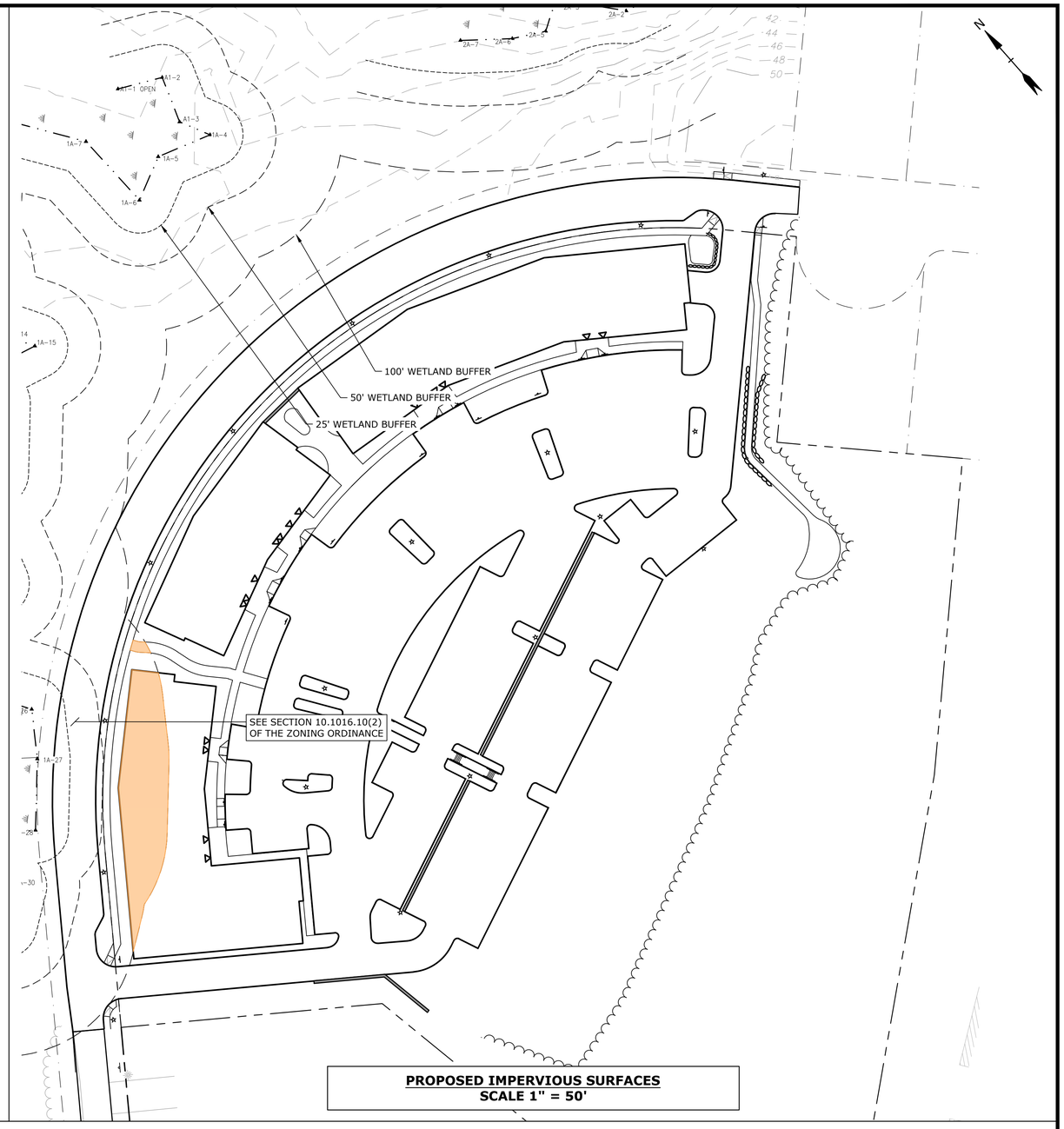


EXISTING IMPERVIOUS SURFACES
SCALE 1" = 50'



PROPOSED IMPERVIOUS SURFACES
SCALE 1" = 50'

10.1016 Permitted Uses

10.1016.10 The following **use**s, activities and **alteration**s are permitted in **wetland**s and **wetland buffer**s:

(1) Any **use** that does not involve the erection or construction of any **structure** or **impervious surface**, will not alter the natural surface configuration by the addition of fill or by dredging, will not result in site **alteration**s, and is otherwise permitted by the Zoning Ordinance. Examples of such **use**s include forestry and tree farming, wildlife refuges, parks and recreational **use**s, conservation and nature trails, and **open space**s as permitted or required by the Zoning Ordinance or Subdivision Regulations.

(2) Improvements to existing public rights-of-way and **sidewalk**s.

IMPERVIOUS SURFACES WITHIN WETLAND BUFFERS

LOCAL WETLAND BUFFER SETBACK	WITHIN DEVELOPMENT PARCEL	
	EXISTING (SF)	PROPOSED (SF)
0 - 25 FT	0	0
25 - 50 FT	0	0
50 - 100 FT	965	5,940
TOTAL IMPERVIOUS SURFACE	965	5,940
NET IMPERVIOUS SURFACE	+4,975	

0 50' 100'
GRAPHIC SCALE

PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

WETLAND BUFFER
IMPERVIOUS SURFACE EXHIBIT

DATE: 2/18/2026
SCALE: AS SHOWN
FIGURE: 1 OF 1

Tighe & Bond

Plotted On:Feb 16, 2026-3:30pm By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-FIG.dwg

BUILDING 1 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING HEIGHT		BUILDING ELEVATION	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
52.13	80'	69'	132.13'	123'

BUILDING 2 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING HEIGHT		BUILDING ELEVATION	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
47.55	80'	69'	127.55'	121.5'

BUILDING 3 ELEVATION AND HEIGHT				
GRADE PLANE ELEVATION	BUILDING HEIGHT		BUILDING ELEVATION	
	ALLOWED	PROPOSED	ALLOWED	PROPOSED
46.38	80'	69'	126.38'	121.5'

BUILDING A
FF = 54.00

BUILDING B
FF = 52.50

BUILDING 3
FF = 52.50

0 30' 60'
GRAPHIC SCALE

N

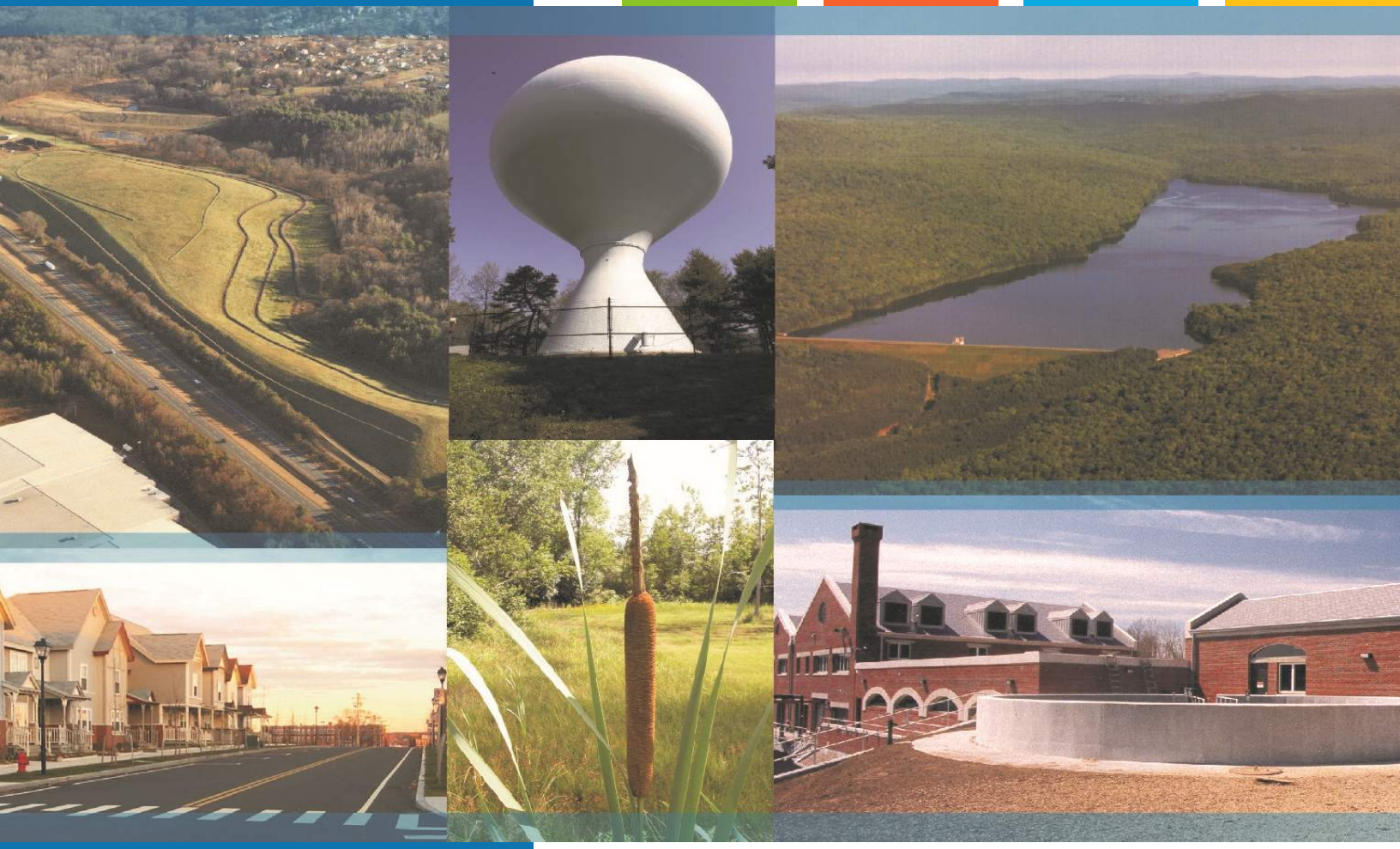
PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

GRADE PLANE EXHIBIT

DATE: 2/16/2026
SCALE: AS SHOWN
FIGURE: 1 OF 1

Tighe & Bond

Plotted On:Feb 16, 2026-3:49pm By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-FIG.dwg



Proposed Multi-Family Development
150 Portsmouth Boulevard
Portsmouth, NH

Drainage Analysis

Brora, LLC

February 18, 2026

Tighe&Bond

100% Recyclable

Section 1 Project Description

1.1 On-Site Soil Description 1-1
1.2 Pre- and Post-Development Comparison 1-2
1.3 Calculation Methods.....1-2

Section 2 Pre-Development Conditions

2.1 Pre-Development Watershed Plan 2-1
2.2 Pre-Development Calculations.....2-1

Section 3 Post-Development Conditions

3.1 Post-Development Watershed Plan 3-2
3.2 Post-Development Calculations 3-2

Section 4 Peak Rate Comparison

Section 5 Mitigation Description

5.1 Pre-Treatment Methods for Protecting Water Quality 5-3
5.2 Treatment Methods for Protecting Water Quality. 5-3

Section 6 BMP Worksheets

Section 7 Groundwater Recharge Volume Calculations

Appendices

A Web Soil Survey Report
B Site Specific Soil Survey Report & Test Pits
C Extreme Precipitation Tables
D Coastal Precipitation Increase

Section 1
Project Description

The proposed project is located on a parcel of land along Portsmouth Boulevard that is identified as Map 213 Lot 12 on the City of Portsmouth Tax Maps. The property is bound to the north by Portsmouth Boulevard, to the west by the Hilton Homewood Suites, to the south by residences on Osprey Drive and to the east by residences on Dunlin Way. The site is currently undeveloped. This property is an 8.4-acre parcel of land located in the Office Research District and the Gateway Neighborhood Overly District (GNOD). The northern portion of the parcel along Portsmouth Boulevard gently slopes up from north to south and then approximately one-third of the way into the parcel the topography changes to a steep slope that plateaus in the south corner of the site after grade change of approximately 50- feet in elevation.

The project will include three (3), six (6) story multifamily residential buildings consisting of approximately 274 dwelling units. The three (3) proposed buildings will be located along the frontage of Portsmouth Boulevard with associated parking located at the rear of buildings. The buildings will be connected by attractively landscaped and hardscaped outdoor amenity areas. The south portion of the site, where there is a significant change in grade, will remain undeveloped to provide a buffer between the proposed development and the existing residences along Osprey Drive. This south portion of the site is anticipated to be improved with walking paths and a natural landscape for outdoor recreation. The section of Portsmouth Boulevard along the frontage of the subject property is proposed to be reconstructed with a new sidewalk and parking spaces to promote connection between the development and the surrounding neighborhood.

1.1 On-Site Soil Description

Based on the site-specific soil survey completed by Gove Environmental Services, Inc (attached as Appendix B), the site is largely composed of Chatfield and Udorthents soils with Hydrologic Soil Group (HSG) ratings of HSG B and HSG C, respectively. The ground cover within the area of study consists mostly of wooded and grassed areas, with a section of dilapidated paved roadway along the northern extents. There is a wetland system on the other side of the road (under separate property ownership) which is presumed to ultimately flow to the Piscataqua River. The site contains a wooded high point in the southern half which generally slopes both north and south down steep wooded slopes.

1.2 Pre- and Post-Development Comparison

The pre-development and post-development watershed areas have been analyzed at two (2) distinct points of analysis (PA-1, PA-2). While the points of analysis have remained unchanged, the contributing sub-catchment areas vary between pre-development and post-development conditions. These adjustments were made to reflect the differences in drainage patterns between the existing and proposed conditions. The overall area analyzed as part of this drainage analysis was held constant.

Point of Analysis 2 (PA-1) is located to south of the site, and assesses flows to southerly neighboring abutters. **Point of Analysis 2 (PA-2)** is located to the north of site, and assesses flows discharging to an existing wetland on the other side of the right-of-way owned by the City of Portsmouth.

The peak discharge rates at these points of analysis were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, which can be found in Appendix B.

Furthermore, the site is located within a Coastal and Great Bay Community, therefore an added factor of safety of 15% was included as required by Env-Wq 1503.08(l).

1.3 Calculation Methods

The design storms analyzed in this study are the 1-year, 2-year, 10-year, 25-year and 50-year 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. The peak discharge rates were determined by analyzing Type III 24-hour storm events. The rainfall data for these storm events were obtained from the data published by the Northeast Regional Climate Center at Cornell University, with an additional 15% added factor of safety as required by Env-Wq 1503.08(l).

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

Section 2
Pre-Development Conditions

To analyze the pre-development condition, the site has been modeled utilizing the three (3) distinct points of analysis described in Section 1. These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet C-701.

The point of analysis and its contributing watershed areas under the *pre-development conditions* are described below:

Point of Analysis 1 (PA-1)

Point of Analysis 1 (PA-1) is comprised of a single subcatchment area (PRE-1.0) that consists of runoff from the southern portion of the site's high point. The area is entirely wooded. Runoff generally discharges across the southern edge of the property into the wooded boundaries of abutting properties.

Point of Analysis 2 (PA-2)

Point of Analysis 2 (PA-2) is comprised of two (2) subcatchment areas (PRE-2.0 and PRE-2.1).

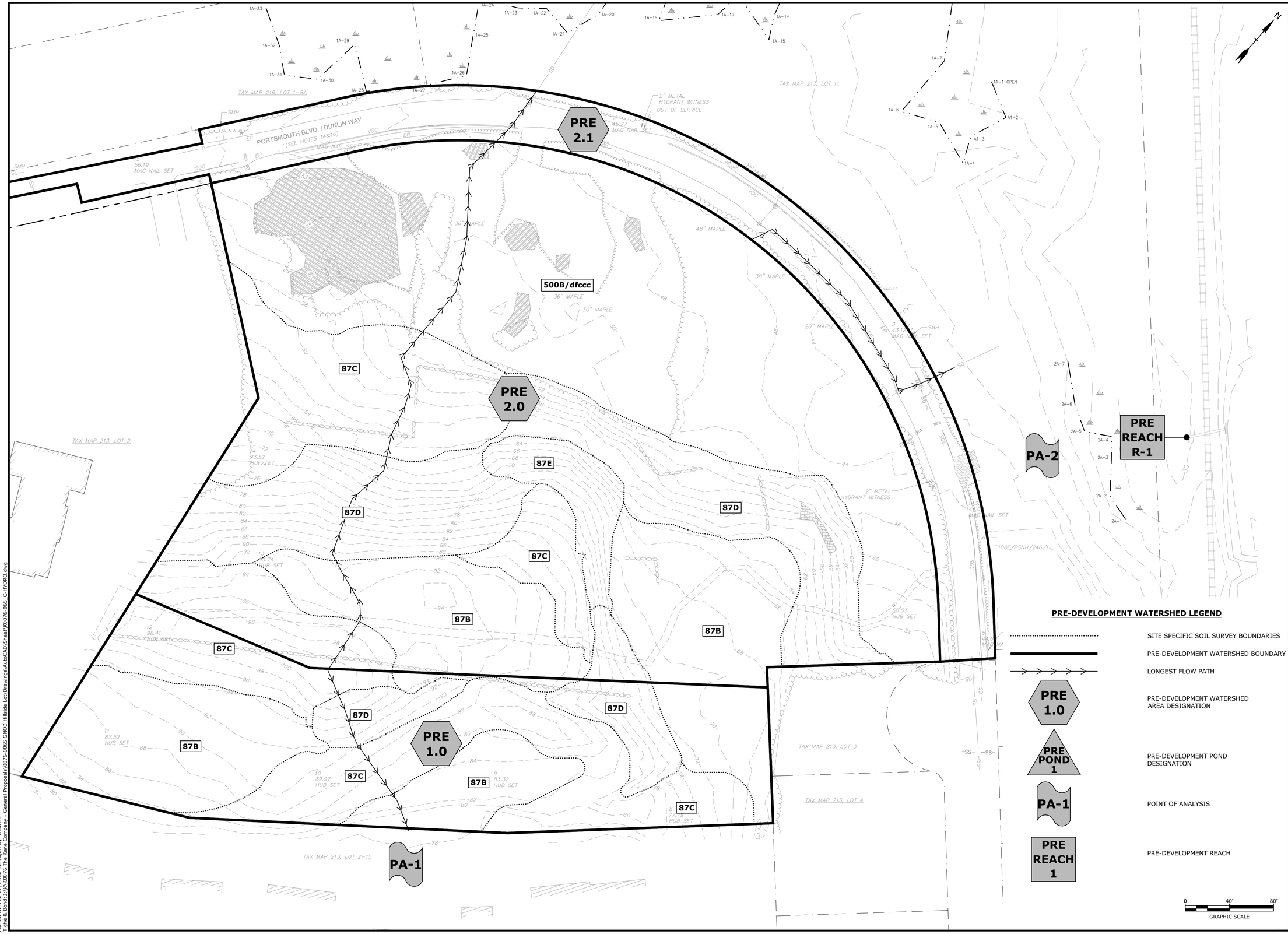
PRE-2.0 is characterized primarily of wooded and low-groundcover areas. Runoff from this subcatchment generally travels via overland flow from the wooded high point into the roadway, where runoff either flows into catch basins or directly sheets into the wetlands on the northern abutting properties.

PRE-2.1-is consists primarily of paved roadway, bituminous walkways and curb, with some contributing grassed and wooded areas. Runoff flows into catch basins with 8" and 12" pipe outlets, or directly sheets into the adjacent wetlands. There is no stormwater treatment for the site or right-of-way.

Two (2) intermediate points of analysis (PA-2.1 and PA-2.2) are included in the drainage model in order to demonstrate how channel protection requirements are met between the proposed development and the improvements within the City of Portsmouth right-of-way.

2.1 Pre-Development Watershed Plan

2.2 Pre-Development Calculations



PRE-DEVELOPMENT WATERSHED LEGEND

- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- PRE-DEVELOPMENT WATERSHED BOUNDARY
- LONGEST FLOW PATH
- PRE 1.0 — PRE-DEVELOPMENT WATERSHED AREA DESIGNATION
- PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS
- PRE REACH 1 — PRE-DEVELOPMENT REACH

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

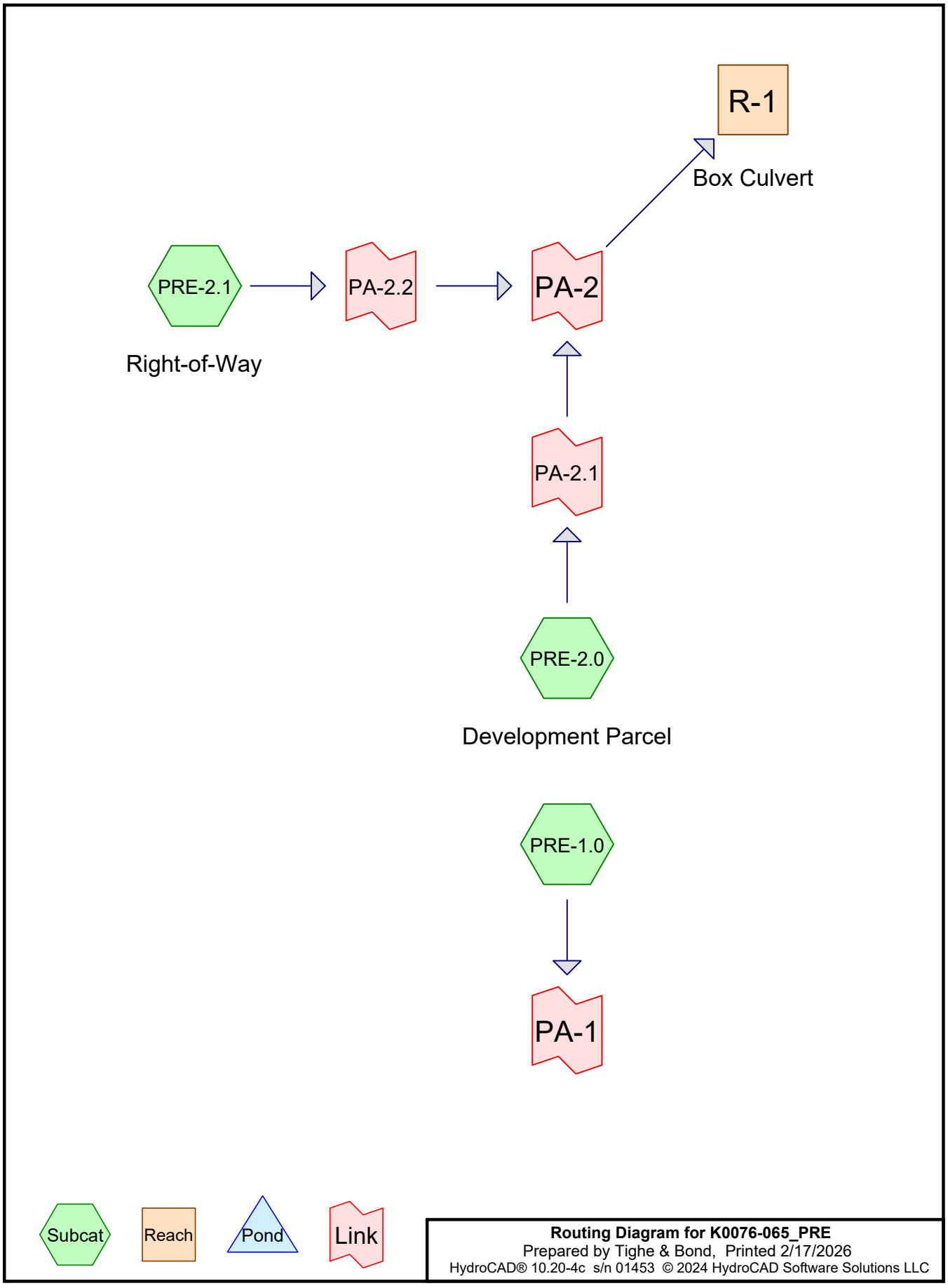
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-HYDRO.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C.701

Last Saved: 2/17/2026
Plotted: Feb 17, 2026 - 12:16pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-HYDRO.dwg



Routing Diagram for K0076-065_PRE
Prepared by Tighe & Bond, Printed 2/17/2026
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
28,030	74	>75% Grass cover, Good, HSG C (PRE-2.0, PRE-2.1)
790	48	Brush, Good, HSG B (PRE-2.0)
42,362	65	Brush, Good, HSG C (PRE-2.0, PRE-2.1)
13,671	91	Fallow, bare soil, HSG C (PRE-2.0)
700	96	Gravel surface, HSG C (PRE-2.0, PRE-2.1)
31,000	98	Paved parking, HSG C (PRE-2.1)
244,270	55	Woods, Good, HSG B (PRE-1.0, PRE-2.0)
59,402	70	Woods, Good, HSG C (PRE-2.0, PRE-2.1)
420,225	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
245,060	HSG B	PRE-1.0, PRE-2.0
175,165	HSG C	PRE-2.0, PRE-2.1
0	HSG D	
0	Other	
420,225		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PRE-1.0: Runoff Area=93,327 sf 0.00% Impervious Runoff Depth>0.21"
Flow Length=165' Tc=7.0 min CN=55 Runoff=0.16 cfs 1,615 cf

Subcatchment PRE-2.0: Development Runoff Area=271,248 sf 0.00% Impervious Runoff Depth>0.42"
Flow Length=601' Tc=12.3 min CN=62 Runoff=1.52 cfs 9,418 cf

Subcatchment PRE-2.1: Right-of-Way Runoff Area=55,650 sf 55.71% Impervious Runoff Depth>1.78"
Flow Length=231' Tc=6.0 min CN=87 Runoff=2.62 cfs 8,261 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.25' Max Vel=4.36 fps Inflow=3.39 cfs 17,679 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=3.33 cfs 17,676 cf

Link PA-1: Inflow=0.16 cfs 1,615 cf
Primary=0.16 cfs 1,615 cf

Link PA-2: Inflow=3.39 cfs 17,679 cf
Primary=3.39 cfs 17,679 cf

Link PA-2.1: Inflow=1.52 cfs 9,418 cf
Primary=1.52 cfs 9,418 cf

Link PA-2.2: Inflow=2.62 cfs 8,261 cf
Primary=2.62 cfs 8,261 cf

Total Runoff Area = 420,225 sf Runoff Volume = 19,294 cf Average Runoff Depth = 0.55"
92.62% Pervious = 389,225 sf 7.38% Impervious = 31,000 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE-1.0: Runoff Area=93,327 sf 0.00% Impervious Runoff Depth>0.41"
Flow Length=165' Tc=7.0 min CN=55 Runoff=0.48 cfs 3,169 cf

SubcatchmentPRE-2.0: Development Runoff Area=271,248 sf 0.00% Impervious Runoff Depth>0.70"
Flow Length=601' Tc=12.3 min CN=62 Runoff=3.23 cfs 15,804 cf

SubcatchmentPRE-2.1: Right-of-Way Runoff Area=55,650 sf 55.71% Impervious Runoff Depth>2.34"
Flow Length=231' Tc=6.0 min CN=87 Runoff=3.42 cfs 10,865 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.36' Max Vel=5.28 fps Inflow=5.66 cfs 26,669 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=5.66 cfs 26,667 cf

Link PA-1: Inflow=0.48 cfs 3,169 cf
Primary=0.48 cfs 3,169 cf

Link PA-2: Inflow=5.66 cfs 26,669 cf
Primary=5.66 cfs 26,669 cf

Link PA-2.1: Inflow=3.23 cfs 15,804 cf
Primary=3.23 cfs 15,804 cf

Link PA-2.2: Inflow=3.42 cfs 10,865 cf
Primary=3.42 cfs 10,865 cf

Total Runoff Area = 420,225 sf Runoff Volume = 29,838 cf Average Runoff Depth = 0.85"
92.62% Pervious = 389,225 sf 7.38% Impervious = 31,000 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE-1.0: Runoff Area=93,327 sf 0.00% Impervious Runoff Depth>1.28"
Flow Length=165' Tc=7.0 min CN=55 Runoff=2.63 cfs 9,958 cf

SubcatchmentPRE-2.0: Development Runoff Area=271,248 sf 0.00% Impervious Runoff Depth>1.80"
Flow Length=601' Tc=12.3 min CN=62 Runoff=10.00 cfs 40,761 cf

SubcatchmentPRE-2.1: Right-of-Way Runoff Area=55,650 sf 55.71% Impervious Runoff Depth>4.11"
Flow Length=231' Tc=6.0 min CN=87 Runoff=5.88 cfs 19,076 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.66' Max Vel=7.20 fps Inflow=14.34 cfs 59,837 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=14.34 cfs 59,833 cf

Link PA-1: Inflow=2.63 cfs 9,958 cf
Primary=2.63 cfs 9,958 cf

Link PA-2: Inflow=14.34 cfs 59,837 cf
Primary=14.34 cfs 59,837 cf

Link PA-2.1: Inflow=10.00 cfs 40,761 cf
Primary=10.00 cfs 40,761 cf

Link PA-2.2: Inflow=5.88 cfs 19,076 cf
Primary=5.88 cfs 19,076 cf

Total Runoff Area = 420,225 sf Runoff Volume = 69,795 cf Average Runoff Depth = 1.99"
92.62% Pervious = 389,225 sf 7.38% Impervious = 31,000 sf

Summary for Subcatchment PRE-1.0:

Runoff = 2.63 cfs @ 12.12 hrs, Volume= 9,958 cf, Depth> 1.28"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
93,327	55	Woods, Good, HSG B
93,327		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	115	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.0	165	Total			

Summary for Subcatchment PRE-2.0: Development Parcel

Runoff = 10.00 cfs @ 12.19 hrs, Volume= 40,761 cf, Depth> 1.80"
Routed to Link PA-2.1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
790	48	Brush, Good, HSG B
150,943	55	Woods, Good, HSG B
10,715	74	>75% Grass cover, Good, HSG C
56,407	70	Woods, Good, HSG C
38,372	65	Brush, Good, HSG C
0	98	Paved parking, HSG C
350	96	Gravel surface, HSG C
13,671	91	Fallow, bare soil, HSG C
271,248	62	Weighted Average
271,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	50	0.1400	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
3.7	347	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.6	172	0.0250	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	20	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	12	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
12.3	601	Total			

Summary for Subcatchment PRE-2.1: Right-of-Way

Runoff = 5.88 cfs @ 12.09 hrs, Volume= 19,076 cf, Depth> 4.11"
Routed to Link PA-2.2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
17,315	74	>75% Grass cover, Good, HSG C
2,995	70	Woods, Good, HSG C
3,990	65	Brush, Good, HSG C
31,000	98	Paved parking, HSG C
350	96	Gravel surface, HSG C
0	91	Fallow, bare soil, HSG C
55,650	87	Weighted Average
24,650		44.29% Pervious Area
31,000		55.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	20	0.0500	0.18		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
1.4	175	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.2	36	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
3.5	231	Total, Increased to minimum Tc = 6.0 min			

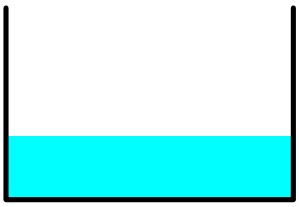
Summary for Reach R-1: Box Culvert

Inflow Area = 326,898 sf, 9.48% Impervious, Inflow Depth > 2.20" for 10-yr event
Inflow = 14.34 cfs @ 12.15 hrs, Volume= 59,837 cf
Outflow = 14.34 cfs @ 12.15 hrs, Volume= 59,833 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.20 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.12 fps, Avg. Travel Time= 0.2 min

Peak Storage= 50 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 3.00'
Bank-Full Depth= 2.00' Flow Area= 6.0 sf, Capacity= 65.42 cfs

3.00' x 2.00' deep channel, n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0080 '/'
Inlet Invert= 26.00', Outlet Invert= 25.80'



Summary for Link PA-1:

Inflow Area = 93,327 sf, 0.00% Impervious, Inflow Depth > 1.28" for 10-yr event
Inflow = 2.63 cfs @ 12.12 hrs, Volume= 9,958 cf
Primary = 2.63 cfs @ 12.12 hrs, Volume= 9,958 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2:

Inflow Area = 326,898 sf, 9.48% Impervious, Inflow Depth > 2.20" for 10-yr event
Inflow = 14.34 cfs @ 12.15 hrs, Volume= 59,837 cf
Primary = 14.34 cfs @ 12.15 hrs, Volume= 59,837 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach R-1 : Box Culvert

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2.1:

Inflow Area = 271,248 sf, 0.00% Impervious, Inflow Depth > 1.80" for 10-yr event
Inflow = 10.00 cfs @ 12.19 hrs, Volume= 40,761 cf
Primary = 10.00 cfs @ 12.19 hrs, Volume= 40,761 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2.2:

Inflow Area = 55,650 sf, 55.71% Impervious, Inflow Depth > 4.11" for 10-yr event
Inflow = 5.88 cfs @ 12.09 hrs, Volume= 19,076 cf
Primary = 5.88 cfs @ 12.09 hrs, Volume= 19,076 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE-1.0: Runoff Area=93,327 sf 0.00% Impervious Runoff Depth>2.17"
Flow Length=165' Tc=7.0 min CN=55 Runoff=4.86 cfs 16,840 cf

SubcatchmentPRE-2.0: Development Runoff Area=271,248 sf 0.00% Impervious Runoff Depth>2.85"
Flow Length=601' Tc=12.3 min CN=62 Runoff=16.36 cfs 64,312 cf

SubcatchmentPRE-2.1: Right-of-Way Runoff Area=55,650 sf 55.71% Impervious Runoff Depth>5.54"
Flow Length=231' Tc=6.0 min CN=87 Runoff=7.81 cfs 25,706 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.90' Max Vel=8.23 fps Inflow=22.19 cfs 90,018 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=22.19 cfs 90,013 cf

Link PA-1: Inflow=4.86 cfs 16,840 cf
Primary=4.86 cfs 16,840 cf

Link PA-2: Inflow=22.19 cfs 90,018 cf
Primary=22.19 cfs 90,018 cf

Link PA-2.1: Inflow=16.36 cfs 64,312 cf
Primary=16.36 cfs 64,312 cf

Link PA-2.2: Inflow=7.81 cfs 25,706 cf
Primary=7.81 cfs 25,706 cf

Total Runoff Area = 420,225 sf Runoff Volume = 106,857 cf Average Runoff Depth = 3.05"
92.62% Pervious = 389,225 sf 7.38% Impervious = 31,000 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE-1.0: Runoff Area=93,327 sf 0.00% Impervious Runoff Depth>3.10"
Flow Length=165' Tc=7.0 min CN=55 Runoff=7.20 cfs 24,100 cf

SubcatchmentPRE-2.0: Development Runoff Area=271,248 sf 0.00% Impervious Runoff Depth>3.91"
Flow Length=601' Tc=12.3 min CN=62 Runoff=22.78 cfs 88,308 cf

SubcatchmentPRE-2.1: Right-of-Way Runoff Area=55,650 sf 55.71% Impervious Runoff Depth>6.89"
Flow Length=231' Tc=6.0 min CN=87 Runoff=9.59 cfs 31,968 cf

Reach R-1: Box Culvert Avg. Flow Depth=1.11' Max Vel=8.97 fps Inflow=29.99 cfs 120,276 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=30.00 cfs 120,270 cf

Link PA-1: Inflow=7.20 cfs 24,100 cf
Primary=7.20 cfs 24,100 cf

Link PA-2: Inflow=29.99 cfs 120,276 cf
Primary=29.99 cfs 120,276 cf

Link PA-2.1: Inflow=22.78 cfs 88,308 cf
Primary=22.78 cfs 88,308 cf

Link PA-2.2: Inflow=9.59 cfs 31,968 cf
Primary=9.59 cfs 31,968 cf

Total Runoff Area = 420,225 sf Runoff Volume = 144,376 cf Average Runoff Depth = 4.12"
92.62% Pervious = 389,225 sf 7.38% Impervious = 31,000 sf

Section 3
Post-Development Conditions

To analyze the post-development condition, the site has been modeled utilizing the same three (3) distinct points of analysis as the Pre-Development condition with revised watershed areas to reflect the post-construction conditions.

The points of analysis and their sub-catchment areas are depicted on the plan entitled "Post-Development Watershed Plan," Sheet C-702.

Point of Analysis 1 (PA-1)

Point of Analysis 1 (PA-1) is comprised of a single subcatchment area (POST-1.0) that closely emulates the pre-development PRE-1.0 subcatchment area. Site clearing and development extend into this subcatchment area slightly, and development is proposed such that POST 1.0 will have a reduced watershed. Therefore, flows from this subcatchment and to this point of analysis are expected to be equivalent or less than the pre-development condition.

Point of Analysis 2 (PA-2)

Point of Analysis 2 (PA-2) is comprised of seven (7) subcatchment areas (POST-2.0, POST 2.1, POST-2.2, POST-2.3, POST-2.4, POST-2.5, and POST-2.6).

POST-2.0 comprises the majority of the development area on the subject parcel, collecting runoff from all parking areas, roofs, and sidewalks, as well as the vegetated southern hill. Runoff is collected by deep-sump catch basins and conveyed via closed drainage to an underground detention basin (UDB-1) with outlet control structure that detains and meters increased stormwater flows from added impervious areas. Stormwater is pre-treated prior to detention by utilizing off-line deep sump catch basins. Underground detention is achieved within a footprint of arrayed precast concrete chambers (UDB-1). Once discharged from the outlet control structure, stormwater is treated by a flow-through filtration treatment structure prior to discharging into a plunge pool on the eastern portion of the limits of work. The plunge pool is proposed to be located within an easement area granted to the City of Portsmouth by the abutting land owner.

POST-2.1 is a small subcatchment which is comprised of the eastern driveway access into the site, as well as some vegetated slopes. Runoff is collected by an off-line deep sump catch basin prior to discharge into the junction structure upstream of the flow-through filtration structure.

POST-2.2, POST-2.3, and POST-2.4 are comprised of paved roadways within the reconstructed limits of Portsmouth Boulevard. Flows from each of these three (3) subcatchment areas are directed to three (3) bioretention systems (FP-1, FP-2, and FP-3). Rain guardian turret inlets provide pre-treatment prior to conveying flows to the bioretention systems for treatment. Structural underdrains and overflow structures convey flows back into a closed drainage network within Portsmouth Boulevard for eventual discharge at the same plunge pool outlet described under Point of Analysis (PA-2).

POST-2.5 is comprised of a 10’ to 12’-wide grass strip between Portsmouth Boulevard and the northern right-of-way line. The grass strip, proposed to be planted with native grasses and trees, sheets north into the adjacent wetlands.

POST-2.6 is comprised of paved roadway, sidewalks, and improved landscaped areas within the reconstructed limits of Portsmouth Boulevard. Flows within this subcatchment are collected by offline deep-sump catch basins and conveyed into the closed drainage network within Portsmouth Boulevard for eventual discharge at the same plunge pool outlet described under Point of Analysis (PA-2).

Two (2) intermediate points of analysis (PA-2.1 and PA-2.2) are included in the drainage model in order to demonstrate how channel protection requirements are met between the proposed development and the improvements within the City of Portsmouth right-of-way.

3.1 Post-Development Watershed Plan

3.2 Post-Development Calculations

POST 2.5
POST 2.2
POST POND FP-1
POST 2.3
POST POND FP-2
POST 2.6
POST 2.4
POST POND FP-3
500B/dfccc
POST POND UDB-1
POST 2.0
POST 2.1
POST 1.0
POST REACH R-1
PA-2
PA-1
87B
87C
87D
87E
PUD
TAX MAP 216, LOT 1-8A
TAX MAP 213, LOT 11
TAX MAP 213, LOT 2
TAX MAP 213, LOT 3
TAX MAP 213, LOT 4
TAX MAP 213, LOT 2-16

POST-DEVELOPMENT WATERSHED LEGEND

- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- POST-DEVELOPMENT WATERSHED BOUNDARY
- POST-DEVELOPMENT LONGEST FLOW PATH
- POST 1.0 — POST-DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS
- POST REACH 1.0 — POST-DEVELOPMENT REACH

0 40' 80'
GRAPHIC SCALE

Tighe&Bond

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION
2	2/18/2026	TAC SUBMISSION #3
1	12/22/2025	TAC SUBMISSION #2

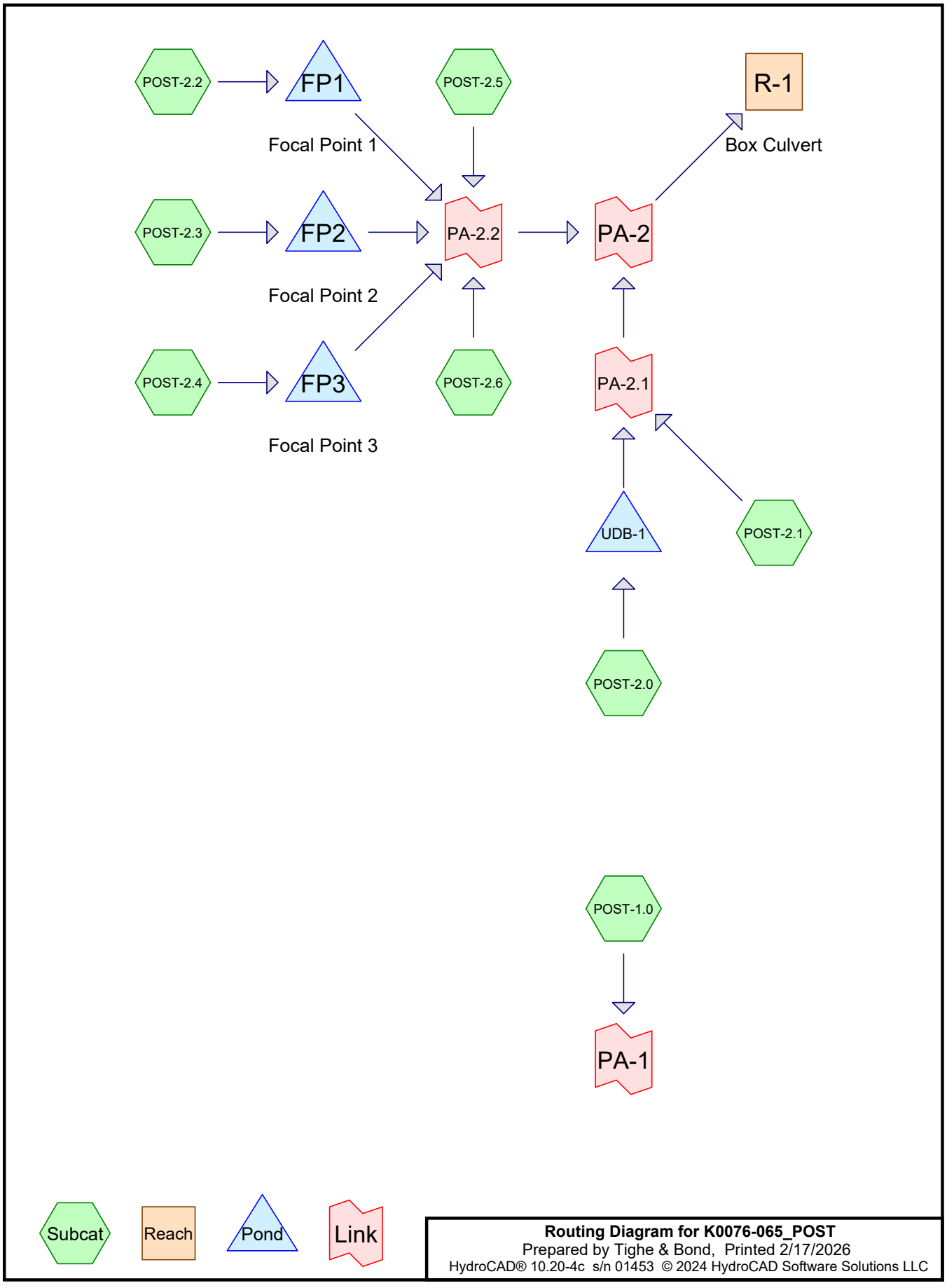
PROJECT NO:	K0076-065
DATE:	9/22/2025
FILE:	K0076-065_C-HYDRO.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C.702

Last Saved: 2/17/2026
Plotted: Feb 17, 2026 - 12:29pm By: BCurcio
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-HYDRO.dwg



Routing Diagram for K0076-065_POST
Prepared by Tighe & Bond, Printed 2/17/2026
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
69,731	61	>75% Grass cover, Good, HSG B (POST-2.0, POST-2.1)
39,922	74	>75% Grass cover, Good, HSG C (POST-2.0, POST-2.1, POST-2.5, POST-2.6)
66,423	98	Paved parking, HSG B (POST-2.0, POST-2.1)
87,794	98	Paved parking, HSG C (POST-2.0, POST-2.1, POST-2.2, POST-2.3, POST-2.4, POST-2.6)
1,004	98	Roofs, HSG B (POST-2.0)
47,449	98	Roofs, HSG C (POST-2.0)
107,902	55	Woods, Good, HSG B (POST-1.0, POST-2.0)
420,225	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
245,060	HSG B	POST-1.0, POST-2.0, POST-2.1
175,165	HSG C	POST-2.0, POST-2.1, POST-2.2, POST-2.3, POST-2.4, POST-2.5, POST-2.6
0	HSG D	
0	Other	
420,225		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPOST-1.0: Runoff Area=87,492 sf 0.00% Impervious Runoff Depth>0.21"
Flow Length=165' Tc=7.0 min CN=55 Runoff=0.15 cfs 1,514 cf

SubcatchmentPOST-2.0: Runoff Area=255,146 sf 60.64% Impervious Runoff Depth>1.56"
Flow Length=535' Tc=8.4 min CN=84 Runoff=9.69 cfs 33,068 cf

SubcatchmentPOST-2.1: Runoff Area=10,379 sf 37.54% Impervious Runoff Depth>1.22"
Flow Length=460' Tc=6.0 min CN=79 Runoff=0.33 cfs 1,059 cf

SubcatchmentPOST-2.2: Runoff Area=8,306 sf 100.00% Impervious Runoff Depth>2.82"
Flow Length=600' Tc=6.0 min CN=98 Runoff=0.55 cfs 1,949 cf

SubcatchmentPOST-2.3: Runoff Area=3,095 sf 100.00% Impervious Runoff Depth>2.82"
Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=0.21 cfs 726 cf

SubcatchmentPOST-2.4: Runoff Area=5,710 sf 100.00% Impervious Runoff Depth>2.82"
Flow Length=380' Tc=6.0 min CN=98 Runoff=0.38 cfs 1,340 cf

SubcatchmentPOST-2.5: Runoff Area=11,365 sf 0.00% Impervious Runoff Depth>0.94"
Flow Length=10' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=0.27 cfs 889 cf

SubcatchmentPOST-2.6: Runoff Area=38,732 sf 69.58% Impervious Runoff Depth>2.12"
Flow Length=1,125' Tc=6.0 min CN=91 Runoff=2.13 cfs 6,830 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.26' Max Vel=4.47 fps Inflow=3.55 cfs 37,186 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=3.55 cfs 37,180 cf

Pond FP1: Focal Point 1 Peak Elev=45.85' Storage=199 cf Inflow=0.55 cfs 1,949 cf
Outflow=0.42 cfs 1,954 cf

Pond FP2: Focal Point 2 Peak Elev=43.65' Storage=66 cf Inflow=0.21 cfs 726 cf
Outflow=0.09 cfs 728 cf

Pond FP3: Focal Point 3 Peak Elev=42.49' Storage=108 cf Inflow=0.38 cfs 1,340 cf
Outflow=0.18 cfs 1,342 cf

Pond UDB-1: Peak Elev=45.64' Storage=18,390 cf Inflow=9.69 cfs 33,068 cf
Outflow=0.64 cfs 24,383 cf

Link PA-1: Inflow=0.15 cfs 1,514 cf
Primary=0.15 cfs 1,514 cf

Link PA-2: Inflow=3.55 cfs 37,186 cf
Primary=3.55 cfs 37,186 cf

Link PA-2.1: Inflow=0.72 cfs 25,442 cf
Primary=0.72 cfs 25,442 cf

Link PA-2.2: Inflow=2.85 cfs 11,744 cf
Primary=2.85 cfs 11,744 cf

Total Runoff Area = 420,225 sf Runoff Volume = 47,376 cf Average Runoff Depth = 1.35"
51.77% Pervious = 217,555 sf 48.23% Impervious = 202,670 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPOST-1.0: Runoff Area=87,492 sf 0.00% Impervious Runoff Depth>0.41"
Flow Length=165' Tc=7.0 min CN=55 Runoff=0.45 cfs 2,971 cf

SubcatchmentPOST-2.0: Runoff Area=255,146 sf 60.64% Impervious Runoff Depth>2.09"
Flow Length=535' Tc=8.4 min CN=84 Runoff=13.04 cfs 44,409 cf

SubcatchmentPOST-2.1: Runoff Area=10,379 sf 37.54% Impervious Runoff Depth>1.71"
Flow Length=460' Tc=6.0 min CN=79 Runoff=0.47 cfs 1,475 cf

SubcatchmentPOST-2.2: Runoff Area=8,306 sf 100.00% Impervious Runoff Depth>3.44"
Flow Length=600' Tc=6.0 min CN=98 Runoff=0.67 cfs 2,384 cf

SubcatchmentPOST-2.3: Runoff Area=3,095 sf 100.00% Impervious Runoff Depth>3.44"
Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=0.25 cfs 888 cf

SubcatchmentPOST-2.4: Runoff Area=5,710 sf 100.00% Impervious Runoff Depth>3.44"
Flow Length=380' Tc=6.0 min CN=98 Runoff=0.46 cfs 1,639 cf

SubcatchmentPOST-2.5: Runoff Area=11,365 sf 0.00% Impervious Runoff Depth>1.36"
Flow Length=10' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=0.40 cfs 1,292 cf

SubcatchmentPOST-2.6: Runoff Area=38,732 sf 69.58% Impervious Runoff Depth>2.71"
Flow Length=1,125' Tc=6.0 min CN=91 Runoff=2.70 cfs 8,747 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.32' Max Vel=4.94 fps Inflow=4.72 cfs 48,556 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=4.72 cfs 48,550 cf

Pond FP1: Focal Point 1 Peak Elev=45.88' Storage=207 cf Inflow=0.67 cfs 2,384 cf
Outflow=0.68 cfs 2,384 cf

Pond FP2: Focal Point 2 Peak Elev=43.83' Storage=86 cf Inflow=0.25 cfs 888 cf
Outflow=0.21 cfs 890 cf

Pond FP3: Focal Point 3 Peak Elev=42.60' Storage=130 cf Inflow=0.46 cfs 1,639 cf
Outflow=0.35 cfs 1,639 cf

Pond UDB-1: Peak Elev=46.14' Storage=23,939 cf Inflow=13.04 cfs 44,409 cf
Outflow=1.23 cfs 32,130 cf

Link PA-1: Inflow=0.45 cfs 2,971 cf
Primary=0.45 cfs 2,971 cf

Link PA-2: Inflow=4.72 cfs 48,556 cf
Primary=4.72 cfs 48,556 cf

Link PA-2.1: Inflow=1.28 cfs 33,605 cf
Primary=1.28 cfs 33,605 cf

Link PA-2.2: Inflow=3.76 cfs 14,951 cf
Primary=3.76 cfs 14,951 cf

Total Runoff Area = 420,225 sf Runoff Volume = 63,804 cf Average Runoff Depth = 1.82"
51.77% Pervious = 217,555 sf 48.23% Impervious = 202,670 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPOST-1.0: Runoff Area=87,492 sf 0.00% Impervious Runoff Depth>1.28"
Flow Length=165' Tc=7.0 min CN=55 Runoff=2.47 cfs 9,336 cf

SubcatchmentPOST-2.0: Runoff Area=255,146 sf 60.64% Impervious Runoff Depth>3.80"
Flow Length=535' Tc=8.4 min CN=84 Runoff=23.48 cfs 80,804 cf

SubcatchmentPOST-2.1: Runoff Area=10,379 sf 37.54% Impervious Runoff Depth>3.30"
Flow Length=460' Tc=6.0 min CN=79 Runoff=0.90 cfs 2,858 cf

SubcatchmentPOST-2.2: Runoff Area=8,306 sf 100.00% Impervious Runoff Depth>5.34"
Flow Length=600' Tc=6.0 min CN=98 Runoff=1.02 cfs 3,696 cf

SubcatchmentPOST-2.3: Runoff Area=3,095 sf 100.00% Impervious Runoff Depth>5.34"
Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=0.38 cfs 1,377 cf

SubcatchmentPOST-2.4: Runoff Area=5,710 sf 100.00% Impervious Runoff Depth>5.34"
Flow Length=380' Tc=6.0 min CN=98 Runoff=0.70 cfs 2,541 cf

SubcatchmentPOST-2.5: Runoff Area=11,365 sf 0.00% Impervious Runoff Depth>2.83"
Flow Length=10' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=0.85 cfs 2,682 cf

SubcatchmentPOST-2.6: Runoff Area=38,732 sf 69.58% Impervious Runoff Depth>4.54"
Flow Length=1,125' Tc=6.0 min CN=91 Runoff=4.40 cfs 14,665 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.61' Max Vel=6.91 fps Inflow=12.67 cfs 92,616 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=12.67 cfs 92,609 cf

Pond FP1: Focal Point 1 Peak Elev=45.92' Storage=216 cf Inflow=1.02 cfs 3,696 cf
Outflow=1.07 cfs 3,695 cf

Pond FP2: Focal Point 2 Peak Elev=43.87' Storage=91 cf Inflow=0.38 cfs 1,377 cf
Outflow=0.48 cfs 1,378 cf

Pond FP3: Focal Point 3 Peak Elev=42.64' Storage=138 cf Inflow=0.70 cfs 2,541 cf
Outflow=0.76 cfs 2,540 cf

Pond UDB-1: Peak Elev=46.94' Storage=32,944 cf Inflow=23.48 cfs 80,804 cf
Outflow=9.64 cfs 64,797 cf

Link PA-1: Inflow=2.47 cfs 9,336 cf
Primary=2.47 cfs 9,336 cf

Link PA-2: Inflow=12.67 cfs 92,616 cf
Primary=12.67 cfs 92,616 cf

Link PA-2.1: Inflow=9.96 cfs 67,655 cf
Primary=9.96 cfs 67,655 cf

Link PA-2.2: Inflow=7.43 cfs 24,962 cf
Primary=7.43 cfs 24,962 cf

Total Runoff Area = 420,225 sf Runoff Volume = 117,958 cf Average Runoff Depth = 3.37"
51.77% Pervious = 217,555 sf 48.23% Impervious = 202,670 sf

Summary for Subcatchment POST-1.0:

Runoff = 2.47 cfs @ 12.12 hrs, Volume= 9,336 cf, Depth> 1.28"
Routed to Link PA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
87,492	55	Woods, Good, HSG B
87,492		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	115	0.1400	1.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.0	165	Total			

Summary for Subcatchment POST-2.0:

Runoff = 23.48 cfs @ 12.12 hrs, Volume= 80,804 cf, Depth> 3.80"
Routed to Pond UDB-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
0	48	Brush, Good, HSG B
20,410	55	Woods, Good, HSG B
65,083	98	Paved parking, HSG B
66,587	61	>75% Grass cover, Good, HSG B
1,004	98	Roofs, HSG B
13,436	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
41,177	98	Paved parking, HSG C
47,449	98	Roofs, HSG C
0	96	Gravel surface, HSG C
0	91	Fallow, bare soil, HSG C
255,146	84	Weighted Average
100,433		39.36% Pervious Area
154,713		60.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.1200	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
0.5	115	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	60	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.6	310	0.0050	3.21	2.52	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Corrugated PE, smooth interior
8.4	535	Total			

Summary for Subcatchment POST-2.1:

Runoff = 0.90 cfs @ 12.09 hrs, Volume= 2,858 cf, Depth> 3.30"
Routed to Link PA-2.1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
3,339	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
2,556	98	Paved parking, HSG C
0	98	Roofs, HSG C
3,144	61	>75% Grass cover, Good, HSG B
1,340	98	Paved parking, HSG B
10,379	79	Weighted Average
6,483		62.46% Pervious Area
3,896		37.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	30	0.5000	0.48		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
0.5	135	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	180	0.0050	5.91	29.00	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
1.7	115	0.0500	1.12		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.7	460	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST-2.2:

Runoff = 1.02 cfs @ 12.09 hrs, Volume= 3,696 cf, Depth> 5.34"
Routed to Pond FP1 : Focal Point 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
0	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
8,306	98	Paved parking, HSG C
0	98	Roofs, HSG C
8,306	98	Weighted Average
8,306		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	1.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
3.4	500	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.2	600	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST-2.3:

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,377 cf, Depth> 5.34"
Routed to Pond FP2 : Focal Point 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
0	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
3,095	98	Paved parking, HSG C
0	98	Roofs, HSG C
3,095	98	Weighted Average
3,095		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.23		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.9	135	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	235	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST-2.4:

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 2,541 cf, Depth> 5.34"
Routed to Pond FP3 : Focal Point 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
0	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
5,710	98	Paved parking, HSG C
0	98	Roofs, HSG C
5,710	98	Weighted Average
5,710		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	100	0.0150	1.23		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	180	0.0050	5.91	29.00	**Pipe Channel,** 30.0" Round Area= 4.9 sf Perim= 7.9' r= 0.63' n= 0.013 Corrugated PE, smooth interior
2.6	380	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST-2.5:

Runoff = 0.85 cfs @ 12.09 hrs, Volume= 2,682 cf, Depth> 2.83"
Routed to Link PA-2.2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
11,365	74	>75% Grass cover, Good, HSG C
11,365		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	10	0.3300	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
0.5	10	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment POST-2.6:

Runoff = 4.40 cfs @ 12.09 hrs, Volume= 14,665 cf, Depth> 4.54"
Routed to Link PA-2.2 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.58"

Area (sf)	CN	Description
11,782	74	>75% Grass cover, Good, HSG C
26,950	98	Paved parking, HSG C
38,732	91	Weighted Average
11,782		30.42% Pervious Area
26,950		69.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0500	1.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.20"
1.8	350	0.0250	3.21		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.8	675	0.0080	4.06	3.19	**Pipe Channel,** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
5.4	1,125	Total, Increased to minimum Tc = 6.0 min			

Summary for Reach R-1: Box Culvert

Inflow Area = 332,733 sf, 60.91% Impervious, Inflow Depth > 3.34" for 10-yr event
Inflow = 12.67 cfs @ 12.32 hrs, Volume= 92,616 cf
Outflow = 12.67 cfs @ 12.32 hrs, Volume= 92,609 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.32 fps, Avg. Travel Time= 0.2 min

Peak Storage= 46 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.61' , Surface Width= 3.00'
Bank-Full Depth= 2.00' Flow Area= 6.0 sf, Capacity= 65.42 cfs

3.00' x 2.00' deep channel, n= 0.011 Concrete pipe, straight & clean
Length= 25.0' Slope= 0.0080 '/'
Inlet Invert= 26.00', Outlet Invert= 25.80'

Summary for Pond FP1: Focal Point 1

Inflow Area = 8,306 sf,100.00% Impervious, Inflow Depth > 5.34" for 10-yr event
Inflow = 1.02 cfs @ 12.09 hrs, Volume= 3,696 cf
Outflow = 1.07 cfs @ 12.07 hrs, Volume= 3,695 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.07 cfs @ 12.07 hrs, Volume= 3,695 cf
Routed to Link PA-2.2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 45.92' @ 12.05 hrs Surf.Area= 81 sf Storage= 216 cf
Flood Elev= 46.50' Surf.Area= 81 sf Storage= 394 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.3 min (749.2 - 745.8)

Volume	Invert	Avail.Storage	Storage Description
#1	42.92'	34 cf	**3.00'W x 27.00'L x 2.08'H Focal Point 1** 168 cf Overall x 20.0% Voids
#2	45.00'	361 cf	**surface bowl (Prismatic)**Listed below (Recalc) -Impervious
		394 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.00	136	0	0
46.00	273	205	205
46.50	352	156	361

Device	Routing	Invert	Outlet Devices
#1	Primary	42.75'	**12.0" Round Culvert** L= 22.0' Ke= 0.500 Inlet / Outlet Invert= 42.75' / 42.50' S= 0.0114 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	42.92'	**100.000 in/hr Exfiltration FP over Surface area** Phase-In= 0.10'
#3	Device 1	45.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.99 cfs @ 12.07 hrs HW=45.91' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.99 cfs of 6.17 cfs potential flow)
  ├─**2=Exfiltration FP** (Exfiltration Controls 0.19 cfs)
  └─**3=Orifice/Grate** (Weir Controls 0.80 cfs @ 1.11 fps)

Summary for Pond FP2: Focal Point 2

Inflow Area = 3,095 sf,100.00% Impervious, Inflow Depth > 5.34" for 10-yr event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,377 cf
Outflow = 0.48 cfs @ 12.10 hrs, Volume= 1,378 cf, Atten= 0%, Lag= 0.9 min
Primary = 0.48 cfs @ 12.10 hrs, Volume= 1,378 cf
Routed to Link PA-2.2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 43.87' @ 12.10 hrs Surf.Area= 39 sf Storage= 91 cf
Flood Elev= 45.50' Surf.Area= 39 sf Storage= 188 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.2 min (749.0 - 745.8)

Volume	Invert	Avail.Storage	Storage Description
#1	40.92'	16 cf	**3.00'W x 13.00'L x 2.08'H Focal Point 1** 81 cf Overall x 20.0% Voids
#2	43.00'	172 cf	**surface bowl (Prismatic)**Listed below (Recalc) -Impervious
		188 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
43.00	50	0	0
44.00	133	92	92
44.50	187	80	172

Device	Routing	Invert	Outlet Devices
#1	Primary	40.75'	**12.0" Round Culvert** L= 24.0' Ke= 0.500 Inlet / Outlet Invert= 40.75' / 40.60' S= 0.0062 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	40.92'	**100.000 in/hr Exfiltration FP over Surface area** Phase-In= 0.10'
#3	Device 1	43.80'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.47 cfs @ 12.10 hrs HW=43.87' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.47 cfs of 6.12 cfs potential flow)
↑**2=Exfiltration FP** (Exfiltration Controls 0.09 cfs)
3=Orifice/Grate (Weir Controls 0.38 cfs @ 0.86 fps)

Summary for Pond FP3: Focal Point 3

Inflow Area = 5,710 sf,100.00% Impervious, Inflow Depth > 5.34" for 10-yr event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 2,541 cf
Outflow = 0.76 cfs @ 12.10 hrs, Volume= 2,540 cf, Atten= 0%, Lag= 0.9 min
Primary = 0.76 cfs @ 12.10 hrs, Volume= 2,540 cf
Routed to Link PA-2.2 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 42.64' @ 12.10 hrs Surf.Area= 77 sf Storage= 138 cf
Flood Elev= 43.50' Surf.Area= 77 sf Storage= 366 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.3 min (748.1 - 745.8)

Volume	Invert	Avail.Storage	Storage Description
#1	39.92'	32 cf	**3.00'W x 25.67'L x 2.08'H Focal Point 1** 160 cf Overall x 20.0% Voids
#2	42.00'	334 cf	**surface bowl (Prismatic)**Listed below (Recalc) -Impervious
		366 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
42.00	122	0	0
43.00	253	188	188
43.50	331	146	334

Device	Routing	Invert	Outlet Devices
#1	Primary	39.75'	**12.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 39.75' / 39.65' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	39.92'	**100.000 in/hr Exfiltration FP over Surface area** Phase-In= 0.10'
#3	Device 1	42.55'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.75 cfs @ 12.10 hrs HW=42.64' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.75 cfs of 5.85 cfs potential flow)
  └─**2=Exfiltration FP** (Exfiltration Controls 0.18 cfs)
  └─**3=Orifice/Grate** (Weir Controls 0.58 cfs @ 0.99 fps)

Summary for Pond UDB-1:

Inflow Area = 255,146 sf, 60.64% Impervious, Inflow Depth > 3.80" for 10-yr event
Inflow = 23.48 cfs @ 12.12 hrs, Volume= 80,804 cf
Outflow = 9.64 cfs @ 12.39 hrs, Volume= 64,797 cf, Atten= 59%, Lag= 16.3 min
Primary = 9.64 cfs @ 12.39 hrs, Volume= 64,797 cf
Routed to Link PA-2.1 :

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 46.94' @ 12.39 hrs Surf.Area= 12,544 sf Storage= 32,944 cf
Flood Elev= 49.00' Surf.Area= 12,544 sf Storage= 56,000 cf

Plug-Flow detention time= 180.3 min calculated for 64,797 cf (80% of inflow)
Center-of-Mass det. time= 105.2 min (912.9 - 807.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	44.00'	0 cf	**64.00'W x 196.00'L x 5.67'H Field A** 71,124 cf Overall - 71,124 cf Embedded = 0 cf x 40.0% Voids
#2A	44.00'	56,000 cf	**Shea Leaching Chamber 8x14x5.7**x 112 Inside #1 Inside= 84.0"W x 60.0"H => 38.46 sf x 13.00'L = 500.0 cf Outside= 96.0"W x 68.0"H => 45.36 sf x 14.00'L = 635.0 cf 112 Chambers in 8 Rows
		56,000 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	43.90'	**30.0" Round Culvert** L= 136.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 43.90' / 43.20' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf
#2	Device 1	44.00'	**4.5" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	46.00'	**36.0" W x 11.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	48.50'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=9.62 cfs @ 12.39 hrs HW=46.94' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 9.62 cfs of 24.96 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.88 cfs @ 7.99 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 8.74 cfs @ 3.18 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link PA-1:

Inflow Area = 87,492 sf, 0.00% Impervious, Inflow Depth > 1.28" for 10-yr event
Inflow = 2.47 cfs @ 12.12 hrs, Volume= 9,336 cf
Primary = 2.47 cfs @ 12.12 hrs, Volume= 9,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2:

Inflow Area = 332,733 sf, 60.91% Impervious, Inflow Depth > 3.34" for 10-yr event
Inflow = 12.67 cfs @ 12.32 hrs, Volume= 92,616 cf
Primary = 12.67 cfs @ 12.32 hrs, Volume= 92,616 cf, Atten= 0%, Lag= 0.0 min
Routed to Reach R-1 : Box Culvert

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2.1:

Inflow Area = 265,525 sf, 59.73% Impervious, Inflow Depth > 3.06" for 10-yr event
Inflow = 9.96 cfs @ 12.38 hrs, Volume= 67,655 cf
Primary = 9.96 cfs @ 12.38 hrs, Volume= 67,655 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Link PA-2.2:

Inflow Area = 67,208 sf, 65.56% Impervious, Inflow Depth > 4.46" for 10-yr event
Inflow = 7.43 cfs @ 12.09 hrs, Volume= 24,962 cf
Primary = 7.43 cfs @ 12.09 hrs, Volume= 24,962 cf, Atten= 0%, Lag= 0.0 min
Routed to Link PA-2 :

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPOST-1.0: Runoff Area=87,492 sf 0.00% Impervious Runoff Depth>2.17"
Flow Length=165' Tc=7.0 min CN=55 Runoff=4.56 cfs 15,787 cf

SubcatchmentPOST-2.0: Runoff Area=255,146 sf 60.64% Impervious Runoff Depth>5.20"
Flow Length=535' Tc=8.4 min CN=84 Runoff=31.76 cfs 110,572 cf

SubcatchmentPOST-2.1: Runoff Area=10,379 sf 37.54% Impervious Runoff Depth>4.64"
Flow Length=460' Tc=6.0 min CN=79 Runoff=1.26 cfs 4,017 cf

SubcatchmentPOST-2.2: Runoff Area=8,306 sf 100.00% Impervious Runoff Depth>6.83"
Flow Length=600' Tc=6.0 min CN=98 Runoff=1.29 cfs 4,725 cf

SubcatchmentPOST-2.3: Runoff Area=3,095 sf 100.00% Impervious Runoff Depth>6.83"
Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=0.48 cfs 1,761 cf

SubcatchmentPOST-2.4: Runoff Area=5,710 sf 100.00% Impervious Runoff Depth>6.83"
Flow Length=380' Tc=6.0 min CN=98 Runoff=0.89 cfs 3,248 cf

SubcatchmentPOST-2.5: Runoff Area=11,365 sf 0.00% Impervious Runoff Depth>4.10"
Flow Length=10' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=1.23 cfs 3,883 cf

SubcatchmentPOST-2.6: Runoff Area=38,732 sf 69.58% Impervious Runoff Depth>6.00"
Flow Length=1,125' Tc=6.0 min CN=91 Runoff=5.72 cfs 19,378 cf

Reach R-1: Box Culvert Avg. Flow Depth=0.87' Max Vel=8.10 fps Inflow=21.03 cfs 129,312 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=21.05 cfs 129,305 cf

Pond FP1: Focal Point 1 Peak Elev=45.94' Storage=223 cf Inflow=1.29 cfs 4,725 cf
Outflow=1.29 cfs 4,725 cf

Pond FP2: Focal Point 2 Peak Elev=43.87' Storage=91 cf Inflow=0.48 cfs 1,761 cf
Outflow=0.50 cfs 1,761 cf

Pond FP3: Focal Point 3 Peak Elev=42.66' Storage=141 cf Inflow=0.89 cfs 3,248 cf
Outflow=0.91 cfs 3,248 cf

Pond UDB-1: Peak Elev=47.62' Storage=40,547 cf Inflow=31.76 cfs 110,572 cf
Outflow=15.16 cfs 92,301 cf

Link PA-1: Inflow=4.56 cfs 15,787 cf
Primary=4.56 cfs 15,787 cf

Link PA-2: Inflow=21.03 cfs 129,312 cf
Primary=21.03 cfs 129,312 cf

Link PA-2.1: Inflow=15.69 cfs 96,318 cf
Primary=15.69 cfs 96,318 cf

Link PA-2.2: Inflow=9.60 cfs 32,994 cf
Primary=9.60 cfs 32,994 cf

Total Runoff Area = 420,225 sf Runoff Volume = 163,371 cf Average Runoff Depth = 4.67"
51.77% Pervious = 217,555 sf 48.23% Impervious = 202,670 sf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPOST-1.0: Runoff Area=87,492 sf 0.00% Impervious Runoff Depth>3.10"
Flow Length=165' Tc=7.0 min CN=55 Runoff=6.75 cfs 22,593 cf

SubcatchmentPOST-2.0: Runoff Area=255,146 sf 60.64% Impervious Runoff Depth>6.53"
Flow Length=535' Tc=8.4 min CN=84 Runoff=39.45 cfs 138,849 cf

SubcatchmentPOST-2.1: Runoff Area=10,379 sf 37.54% Impervious Runoff Depth>5.93"
Flow Length=460' Tc=6.0 min CN=79 Runoff=1.60 cfs 5,132 cf

SubcatchmentPOST-2.2: Runoff Area=8,306 sf 100.00% Impervious Runoff Depth>8.22"
Flow Length=600' Tc=6.0 min CN=98 Runoff=1.55 cfs 5,686 cf

SubcatchmentPOST-2.3: Runoff Area=3,095 sf 100.00% Impervious Runoff Depth>8.22"
Flow Length=235' Slope=0.0150 '/' Tc=6.0 min CN=98 Runoff=0.58 cfs 2,119 cf

SubcatchmentPOST-2.4: Runoff Area=5,710 sf 100.00% Impervious Runoff Depth>8.22"
Flow Length=380' Tc=6.0 min CN=98 Runoff=1.06 cfs 3,909 cf

SubcatchmentPOST-2.5: Runoff Area=11,365 sf 0.00% Impervious Runoff Depth>5.33"
Flow Length=10' Slope=0.3300 '/' Tc=6.0 min CN=74 Runoff=1.59 cfs 5,052 cf

SubcatchmentPOST-2.6: Runoff Area=38,732 sf 69.58% Impervious Runoff Depth>7.37"
Flow Length=1,125' Tc=6.0 min CN=91 Runoff=6.95 cfs 23,801 cf

Reach R-1: Box Culvert Avg. Flow Depth=1.05' Max Vel=8.74 fps Inflow=27.74 cfs 164,578 cf
n=0.011 L=25.0' S=0.0080 '/' Capacity=65.42 cfs Outflow=27.75 cfs 164,571 cf

Pond FP1: Focal Point 1 Peak Elev=45.96' Storage=229 cf Inflow=1.55 cfs 5,686 cf
Outflow=1.56 cfs 5,686 cf

Pond FP2: Focal Point 2 Peak Elev=43.88' Storage=93 cf Inflow=0.58 cfs 2,119 cf
Outflow=0.58 cfs 2,119 cf

Pond FP3: Focal Point 3 Peak Elev=42.67' Storage=143 cf Inflow=1.06 cfs 3,909 cf
Outflow=1.05 cfs 3,909 cf

Pond UDB-1: Peak Elev=48.29' Storage=48,068 cf Inflow=39.45 cfs 138,849 cf
Outflow=18.96 cfs 118,880 cf

Link PA-1: Inflow=6.75 cfs 22,593 cf
Primary=6.75 cfs 22,593 cf

Link PA-2: Inflow=27.74 cfs 164,578 cf
Primary=27.74 cfs 164,578 cf

Link PA-2.1: Inflow=19.61 cfs 124,011 cf
Primary=19.61 cfs 124,011 cf

Link PA-2.2: Inflow=11.72 cfs 40,567 cf
Primary=11.72 cfs 40,567 cf

Total Runoff Area = 420,225 sf Runoff Volume = 207,141 cf Average Runoff Depth = 5.92"
51.77% Pervious = 217,555 sf 48.23% Impervious = 202,670 sf

Section 4
Peak Rate Comparison

The following table summarizes and compares the pre- and post-development peak runoff rates from the 2-year, 10-year, 25-year and 50-year storm events at the points of analysis.

Note: PA-2.1 and PA-2.2 are not included within this table as they are intermediate points of analysis included exclusively to demonstrate compliance with channel protection requirements in accordance with Env-Wq 1507.05.

Table 4.1

Comparison of Pre- and Post-Development Flows (cfs)

	2-Year Storm	10-Year Storm	25-Year Storm	50-Year Storm
Pre-Development Watershed				
PA-1	0.48	2.63	4.86	7.20
PA-2	5.66	14.34	22.19	29.99
Post-Development Watershed				
PA-1	0.45	2.47	4.56	6.75
PA-2	4.72	12.67	21.03	27.74

Each of the points of analysis meets the channel protection requirements of Env-Wq 105.05 as follows:

PA-1: The 2-year, 24-hour post-development runoff volume (2,971 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (3,169 cf) by more than 0.1 ac-ft (or 4,356 cf).

PA-2: Although runoff within the development could be overdetained by the underground detention basin within the development parcel during the lower storm events, it cannot make up for increased impervious areas within the right-of-way that cannot be effectively detained due to lack of space and elevation constraints. Channel protection requirements are therefore proposed to be met under the following additional assessments of intermediate points-of-analysis PA-2.1 and PA-2.2.

PA-2.1 demonstrates how runoff from the development parcel during the 2-year storm event is insignificant (<2 cfs), and PA-2.2 demonstrates how the marginal changes to ground covers within the right-of-way does not amount to more than a 0.1 ac-ft increase in stormwater volume under the 2-year storm event:

> PA-2: The 2-year, 24-hour post-development peak flow rate generated from the proposed disturbance (4.72 cfs) is less than the 2-year, 24-hour pre-development peak flow rate (5.66 cfs), and;

PA-2.1: The 2-year, 24-hour post-development peak flow rate is less than 2 cfs (1.28 cfs).

PA-2.2: The 2-year, 24-hour post-development runoff volume (14,951 cf) has not increased over the 2-year, 24 hour pre-development runoff volume (10,865 cf) by more than 0.1 ac-ft (or 4,356 cf).

Section 5
Mitigation Description

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES AoT Regulations (Env-Wq 1500).

5.1 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the stormwater filtration systems consists of off-line deep sump catch basins.

5.2 Treatment Methods for Protecting Water Quality.

The runoff from proposed impervious areas will be treated by flow-through filtration systems and bioretention systems. Treatment systems are sized to treat the Water Quality Flow of their respective sub catchment areas. The BMP worksheets for the treatment practices have been included in Section 6 of this report.

The proposed stormwater management system is required to remove 80% of the annual Total Suspended Soils (TSS) loads and 50% of the annual Total Nitrogen (TN) loads per the City of Portsmouth's Site Plan regulations, Section 7.6.2.1.a.i. As shown in Table 5.1 the pollutant removal efficiencies for the proposed treatment systems exceed the City of Portsmouth's removal requirements.

Table 5.1 – Pollutant Removal Efficiencies

BMP	Total Suspended Solids	Total Nitrogen	Total Phosphorus
Flow-Through Filter w/Pretreatment[1]	85%	50%	55%
Bioretention w/ Pretreatment[2]	90%	65%	65%

1. Pollutant removal efficiencies from Contech Engineered Solutions, Jellyfish Filter Stormwater Treatment standard performance specifications. Pre-treatment upstream of the unit is assumed to be accounted for.
2. Pollutant removal efficiencies from NH Stormwater Manual Volume 2, Appendix E. Per the descriptions listed in the Appendix, pre-treatment is already accounted for in the efficiencies cited.

Section 6
BMP Worksheets

GENERAL CALCULATIONS - WQV and WQF
(optional worksheet)

This worksheet may be useful when designing a BMP that does not fit into one of the specific worksheets already provided (such as for a technology which is not a stormwater wetland, infiltration practice, etc.)

Water Quality Volume (WQV)

5.86	ac	A = Area draining to the practice
3.55	ac	A_I = Impervious area draining to the practice
0.61	decimal	I = Percent impervious area draining to the practice, in decimal form
0.60	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)
3.49	ac-in	WQV= 1" x Rv x A
12,661	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")

Water Quality Flow (WQF)

1	inches	P = Amount of rainfall. For WQF in NH, P = 1".
0.60	inches	Q = Water quality depth. Q = WQV/A
95	unitless	CN = Unit peak discharge curve number. CN =1000/(10+5P+10Q–10*[Q^2 + 1.25*Q*P] $^{0.5}$)
0.5	inches	S = Potential maximum retention. S = (1000/CN) - 10
0.094	inches	Ia = Initial abstraction. Ia = 0.2S
5.0	minutes	T_c = Time of Concentration
650.0	cfs/mi^2/in	q_u is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.
3.543	cfs	WQF = q_u x WQV. Conversion: to convert "cfs/mi^2/in * ac-in" to "cfs" multiply by 1mi^2/640ac.

Designer's Notes: Post-Detention Treatment #1

For treatment systems located downstream of detention facilities, the surrogate for the WQF is the discharge from a detention facility during a 2-year storm event (per NHDES).

UDB#1 2-year outflow = 1.23 CFS

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **FP-1 (Focal Point Bioretention System)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.20	ac	A = Area draining to the practice	
0.20	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.19	ac-in	WQV= 1" x Rv x A	
690	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
172	cf	25% x WQV (check calc for sediment forebay volume)	
517	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardian		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
43.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
42.75	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
43.25	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
43.25	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
46.14	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
46.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
See notes	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet C.605		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: Focal point system has been sized by manufacturer in accordance with WQF requirements.

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **FP-2 (Focal Point Bioretention System)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.07	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
241	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
60	cf	25% x WQV (check calc for sediment forebay volume)	
181	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardian		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
41.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
40.75	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
41.25	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
41.25	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
44.01	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
44.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
See notes	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet C.605		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: Focal point system has been sized by manufacturer in accordance with WQF requirements.

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **FP-3 (Focal Point Bioretention System)**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.13	ac	A = Area draining to the practice	
0.13	ac	A_I = Impervious area draining to the practice	
1.00	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.95	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
448	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
112	cf	25% x WQV (check calc for sediment forebay volume)	
336	cf	75% x WQV (check calc for surface sand filter volume)	
Rain Guardian		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
	sf	A_{SA} = Surface area of the practice	
	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
40.25	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
39.75	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
0.50	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
40.25	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
40.25	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
42.85	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
43.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
See Notes	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet C.605		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**> 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes: Focal point system has been sized by manufacturer in accordance with WQF requirements.

Section 7
Groundwater Recharge Volume Calculations

The proposed project is requesting a waiver from the Groundwater Recharge Requirements described in Env-Wq 1507.04. This request is being made due to the presence of shallow bedrock and shallow Estimated Seasonal High Water Table (SHWT), evidenced by geotechnical borings and the site-specific soil survey. Most notably, the Udorthents series soils within lower elevations of the site where infiltration areas may be feasible are noted to have a potential ESHWT 20" below existing grade. As such, groundwater recharge is not feasible.

APPENDIX A

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

August 27, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,130 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 27, Sep 3, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	4.2	42.5%
799	Urban land-Canton complex, 3 to 15 percent slopes	5.7	57.5%
Totals for Area of Interest		**9.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the

development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82s
Elevation: 0 to 980 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Freetown

Percent of map unit: 5 percent
Landform: Marshes, depressions, bogs, kettles, swamps
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro, very stony

Percent of map unit: 3 percent
Landform: Depressions, outwash terraces, drainageways, outwash deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Ridges, hills
Hydric soil rating: Unranked

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents
Percent of map unit: 5 percent
Hydric soil rating: No

Boxford and eldridge
Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott and scitico
Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scituate and newfields
Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield
Percent of map unit: 4 percent
Hydric soil rating: No

Walpole
Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

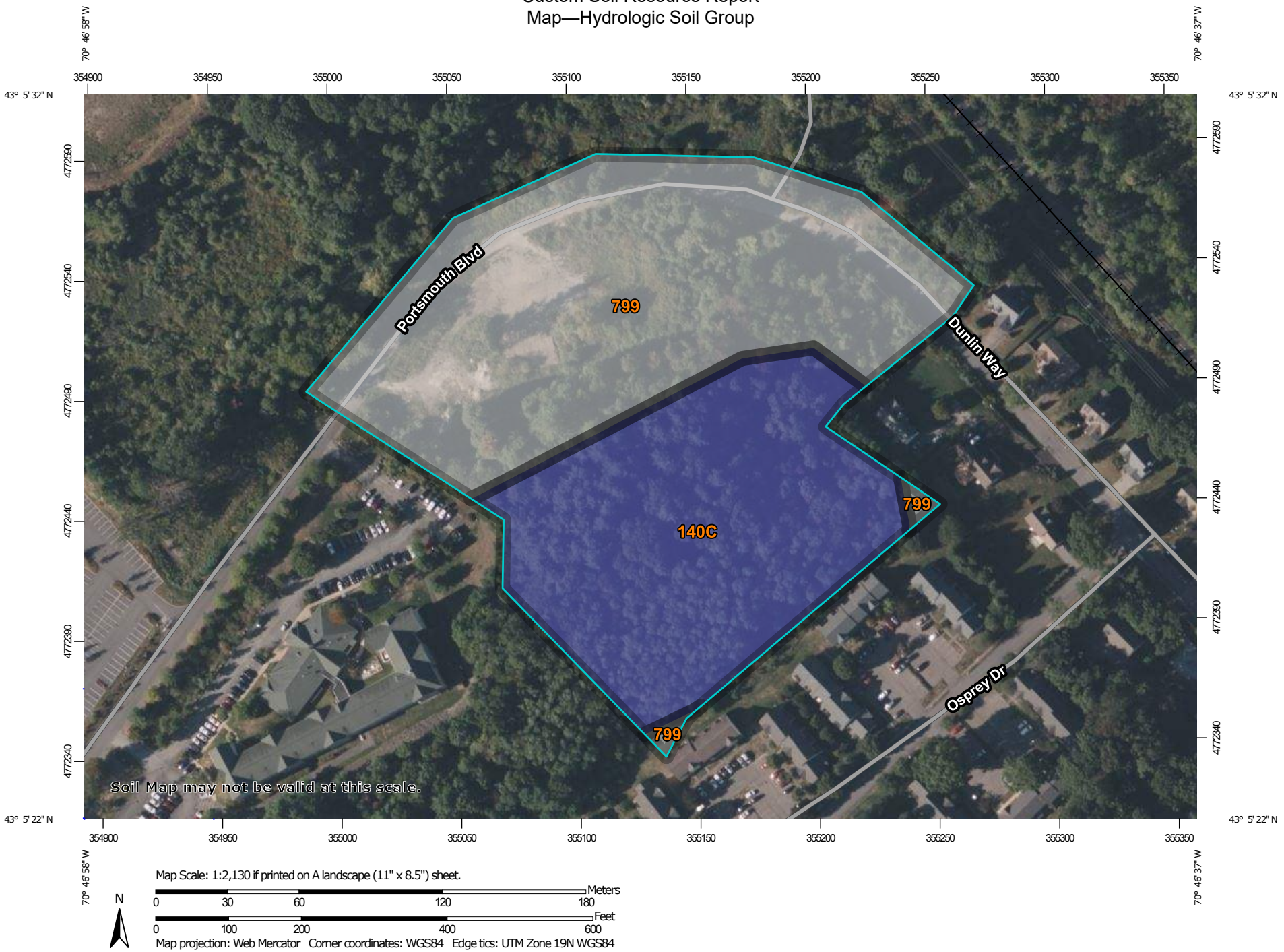
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Map—Hydrologic Soil Group



Map Scale: 1:2,130 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 27, Sep 3, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	4.2	42.5%
799	Urban land-Canton complex, 3 to 15 percent slopes		5.7	57.5%
Totals for Area of Interest			**9.8**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

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Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

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Tighe&Bond

APPENDIX B

GOVE ENVIRONMENTAL SERVICES, INC

SITE-SPECIFIC SOIL SURVEY REPORT
For
Dunlin Way, Portsmouth, NH
By
GES, Inc.
Project # 2025043
Date: 06-17-2025

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July, 2021.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for infiltration requirements by the NH DES Alteration of Terrain Bureau. The soil map was produced by a professional soil scientist and is not a product of the USDA Natural Resources Conservation Service. This report accompanies the soil map.

The site-specific soil map (SSSM) was produced 06-17-2025; prepared by JP Gove, CSS #004, GES, Inc.

Soils were identified with the New Hampshire State-wide Numerical Soils Legend, USDA NRCS, Durham, NH. Issue # 10, January 2011.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5, Ksat Values for New Hampshire Soils, September 2009.

High Intensity Soil Map symbols, based upon SSSNNE Special Publication 1, December 2017, were added to the Soil Legend.

Scale of soil map: Approximately 1” = 40”

Contours Interval: 2 feet

2. LANDFORMS & EXISTING CONDITIONS:

The site is located on two landforms. The northern portion of the site was originally housing, which has been demolished. This portion of the site was used for material storage and mixing of soil materials. The northern portion of the site is relatively flat and is underlain with marine silts and clays. The upper soil layers are a variable mix of loams, gravels, stone, etc. The upper layers of fill material range from 3 to 5 feet deep.

The southern portion of the site is a steep hill that is relatively undisturbed. It is primarily bedrock with a thin layer of soil over the rock. The rock appears to be slate or phyllite, maybe rippable in spots, but has hard outcrops. The depth to bedrock is somewhat variable, but most of the pits conducted had bedrock present between 20 and 40 inches deep.

3. DATE SOIL MAP PRODUCED

Date(s) of on-site field work: 06-06 and 06-17- 2025 (Wetlands (lack of) evaluated earlier by GES, Inc.).

Date(s) of test pits: 04-02-2025

Test pits recorded by: SW Cole

4. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Portsmouth

Location: Tax Map 213, Lot 12

Size of area: Approximately 8.4 acres

Was the map for the entire lot? Yes

If no, where was the mapping conducted on the parcel: N/A

5. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? Yes

If no, what was the purpose of the map? n/a

Who was the map prepared for? BRORA LLC

6. SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
87	Chatfield (well drained, very stony	227	B
500/dfccc	Udorthents, loamy	363	C

Supplemental Symbols: d = moderately well drained, f =marine silt and clay, c = mineral restrictive layer, c = low estimated Ksat, c = hydrologic group C.

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

7. NARRATIVE MAP UNIT DESCRIPTIONS

SITE-SPECIFIC MAP UNIT: 87

CORRELATED SOIL SERIES: Chatfield (well drained) very stony

LANDSCAPE SETTING: Hillside

CHARACTERISTIC SURFACE FEATURES: Forested, steeply sloping, outcrops

DRAINAGE CLASS: Well drained

PARENT MATERIAL: Bedrock controlled till

NATURE OF DISSIMILAR INCLUSIONS: Hollis, Outcrops, Canton

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 10%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture, Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

A 0 to 16" 10YR3/2 fsl, gr, fr
B 6 to 30" 10YR4/6, fsl, gr, fr
R=30"
ESHWT = N/A, no OBSWT, perched water table, lithic contact, numerous coarse fragments

SITE-SPECIFIC MAP UNIT: 500/dfccc

CORRELATED SOIL SERIES: Udorthents, loamy

LANDSCAPE SETTING: Excavated/graded area

CHARACTERISTIC SURFACE FEATURES: Smooth, fill hummocks

DRAINAGE CLASS: Moderately well drained

PARENT MATERIAL: Fill over marine

NATURE OF DISSIMILAR INCLUSIONS: Natural soil

ESTIMATED PERCENTAGE OF DISSIMILAR INCLUSIONS: 5%

SOIL PROFILE DESCRIPTIONS- horizon designation, depth, soil texture , Munsell color notation, Munsell color of redox features, soil structure, soil consistence, estimated coarse fragments, estimated seasonal high water table (ESHWT), observed water table (OBSWT), kind of water table (perched, apparent, or both), depth to lithic or paralithic contact:

Fill 0 to 40" 10YR4/2 to 4/4 Loam/silt/gravel massive friable

Possible redox features at 20".

C 40 to 52" 2,5Y5/3, silt loam, blocky, firm, 5YR5/6 redox

ESHWT = 20", OBSWT = 30", perched water table, no lithic contact, many coarse fragments in fill

8. RESPONSIBLE SOIL SCIENTIST

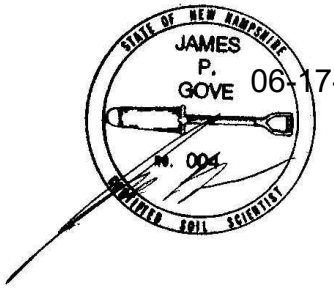
Name: James Gove

Certified Soil Scientist Number: 004

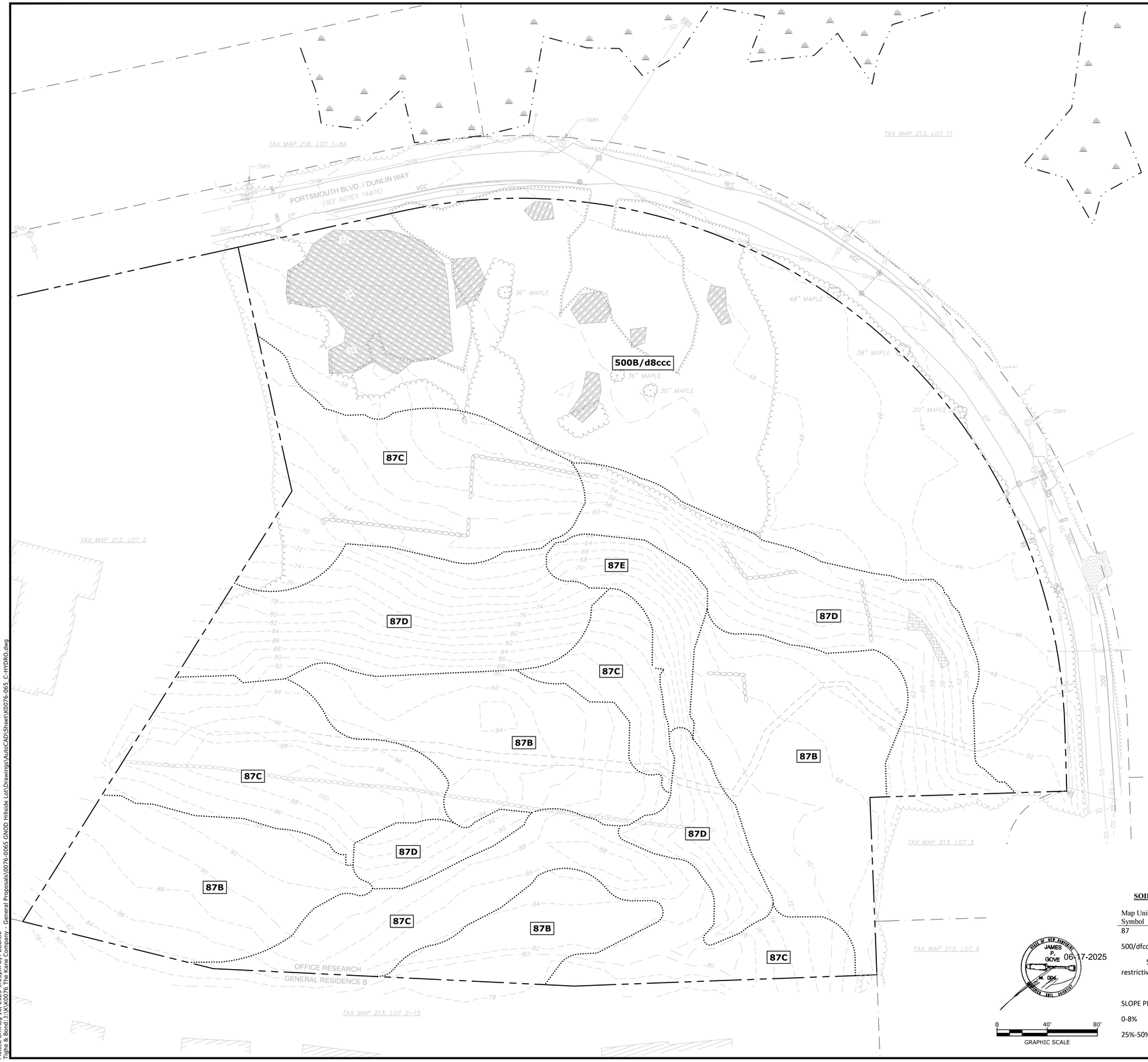
9. OTHER DISTINGUISHING FEATURES OF SITE

Northern portion of site was disturbed many years ago. Some of the site has been remained in active storage, but other areas have had volunteer shrubs take over. However, all of that portion, whether currently cleared or in shrubs, are disturbed soils – Udorthents, loamy.

10. CERTIFIED SOIL SCIENTIST STAMP


STATE OF NEW HAMPSHIRE
JAMES
P.
GOVE
06-17-2025
NO. 004
CERTIFIED SOIL SCIENTIST

8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz



LEGEND

SITE-SPECIFIC SOIL SURVEY BOUNDARIES

NOTE:
THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL MAP WAS PRODUCED 6-17-2025, AND WAS PREPARED BY JAMES P. GROVE, CSS #004, GOVE ENVIRONMENTAL SERVICES, INC.

SOIL IDENTIFICATION LEGEND

Map Unit Symbol	Map Unit Name	HISS Symbol	Hydrologic Soil Group
87	Chatfield (well drained, very stony	227	B
500/dfccc	Udorthents, loamy	363	C

Supplemental Symbols: d = moderately well drained, f =marine silt and clay, c = mineral restrictive layer, c = low estimated Ksat, c = hydrologic group C.

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%-50%	E	50%+	F		

STATE OF NEW HAMPSHIRE
JAMES P. GROVE
No. 004
CERTIFIED SOIL SCIENTIST
06-17-2025

Tighe&Bond
Engineers | Environmental Specialists

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION

PROJECT NO:	K0076-065
DATE:	7/30/2025
FILE:	K0076-065_C-HYDRO.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

SITE-SPECIFIC SOIL SURVEY PLAN

SCALE: AS SHOWN

1 OF 1

Last Saved: 7/22/2025
Plotted On: July 28, 2025 - 3:25pm By: BCurcio
Tighe & Bond :\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-HYDRO.dwg

APPENDIX C

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.090 degrees North
Longitude	70.776 degrees West
Elevation	10 feet
Date/Time	Mon Jul 14 2025 16:33:15 GMT-0400 (Eastern Daylight Time)

Note: 15% Great Bay Region coastal precipitation increase applied to values in drainage model.

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.80	3.21	3.93
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.56	**2yr**	2.83	3.42	3.92	4.66
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.39	5.02	5.91
10yr	0.41	0.65	0.82	1.11	1.44	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.85	5.51	**10yr**	4.29	5.30	6.06	7.08
25yr	0.48	0.76	0.96	1.33	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.72	6.15	7.07	**25yr**	5.44	6.80	7.76	8.98
50yr	0.53	0.85	1.09	1.53	2.06	2.74	**50yr**	1.77	2.51	3.27	4.30	5.63	7.36	8.55	**50yr**	6.51	8.22	9.37	10.76
100yr	0.60	0.97	1.25	1.76	2.40	3.22	**100yr**	2.07	2.96	3.86	5.11	6.72	8.82	10.34	**100yr**	7.80	9.94	11.31	12.89
200yr	0.67	1.09	1.41	2.03	2.80	3.80	**200yr**	2.41	3.49	4.58	6.09	8.04	10.56	12.50	**200yr**	9.35	12.02	13.66	15.46
500yr	0.79	1.30	1.69	2.46	3.44	4.72	**500yr**	2.97	4.34	5.71	7.64	10.16	13.42	16.08	**500yr**	11.88	15.46	17.53	19.66

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.87	0.92	1.32	1.67	2.21	2.48	**1yr**	1.96	2.39	2.85	3.16
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.78	4.17	**5yr**	3.34	4.01	4.70	5.51
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.36	4.84	**10yr**	3.86	4.66	5.41	6.38
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.77	3.55	4.67	5.87	**25yr**	4.13	5.64	6.61	7.75
50yr	0.48	0.73	0.91	1.31	1.76	2.16	**50yr**	1.52	2.12	2.35	3.09	3.95	5.27	6.77	**50yr**	4.66	6.51	7.67	8.99
100yr	0.53	0.81	1.01	1.46	2.00	2.47	**100yr**	1.73	2.41	2.62	3.44	4.38	5.91	7.82	**100yr**	5.23	7.52	8.91	10.43
200yr	0.59	0.89	1.12	1.63	2.27	2.81	**200yr**	1.96	2.75	2.93	3.81	4.83	6.61	9.02	**200yr**	5.85	8.67	10.34	12.13
500yr	0.68	1.02	1.31	1.90	2.70	3.36	**500yr**	2.33	3.29	3.40	4.36	5.51	7.66	10.89	**500yr**	6.78	10.47	12.58	14.82

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.25	1.74	2.21	2.98	3.15	**1yr**	2.64	3.03	3.57	4.37
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.69	**2yr**	3.03	3.55	4.07	4.82
5yr	0.40	0.61	0.76	1.05	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.32	4.94	**5yr**	3.83	4.75	5.36	6.35
10yr	0.47	0.72	0.89	1.24	1.60	1.97	**10yr**	1.38	1.92	2.27	3.10	3.94	5.32	6.18	**10yr**	4.71	5.94	6.79	7.81
25yr	0.57	0.87	1.08	1.55	2.03	2.55	**25yr**	1.75	2.50	2.94	4.06	5.13	7.79	8.31	**25yr**	6.89	7.99	9.10	10.29
50yr	0.67	1.01	1.26	1.81	2.44	3.10	**50yr**	2.11	3.04	3.58	4.98	6.28	9.76	10.41	**50yr**	8.64	10.01	11.37	12.67
100yr	0.78	1.18	1.48	2.14	2.93	3.78	**100yr**	2.53	3.69	4.35	6.13	7.70	12.22	13.05	**100yr**	10.81	12.55	14.22	15.62
200yr	0.91	1.37	1.74	2.52	3.52	4.61	**200yr**	3.03	4.50	5.31	7.54	9.45	15.34	16.37	**200yr**	13.57	15.74	17.80	19.26
500yr	1.13	1.68	2.16	3.15	4.47	5.97	**500yr**	3.86	5.84	6.89	9.95	12.41	20.74	22.11	**500yr**	18.36	21.26	23.96	25.39

Powered by ACIS
Northeast Regional Climate Center

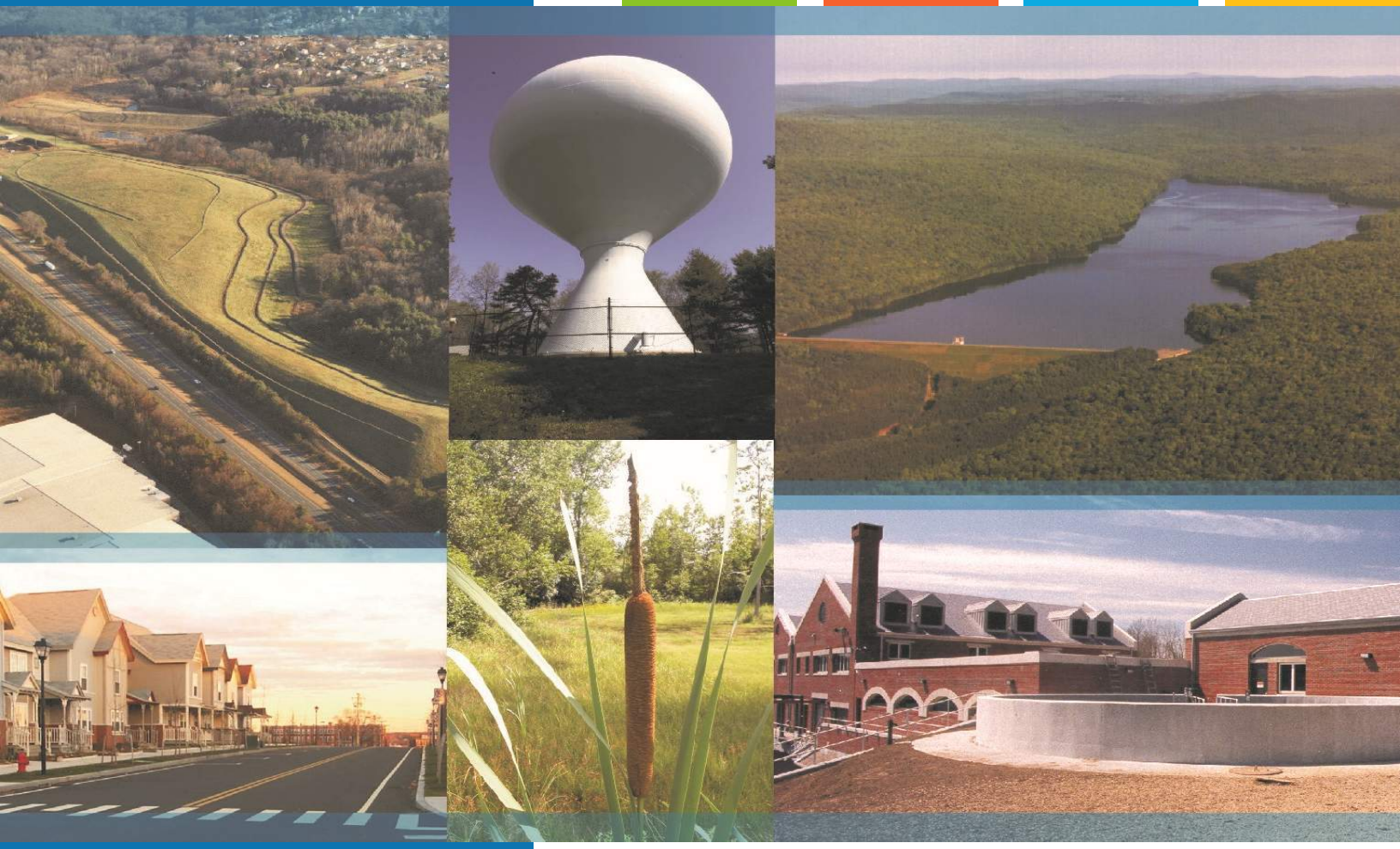
Tighe&Bond

APPENDIX D

Coastal and Great Bay Region Precipitation Increase		
	24-hr Storm Event (in.)	24-hr Storm Event + 15% (in.)
1 Year	2.65	3.05
2 Year	3.20	3.68
10 Year	4.85	5.58
25 Year	6.15	7.07
50 Year	7.36	8.46
100 Year	8.82	10.14

www.tighebond.com

100% Recyclable



Proposed Multi-Family Development
150 Portsmouth Boulevard
Portsmouth, NH

Long-Term Operation & Maipntenance Plan

Brora, LLC

February 18, 2026

Tighe&Bond

100% Recyclable

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Tighe&Bond

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1.3.1 Disposal Requirements 1-2
1.4 Snow & Ice Management for Standard Asphalt and Walkways 1-3

Section 2 Invasive Species

Section 3 Annual Updates and Log Requirements

Section 1
Long-Term Operation & Maintenance Plan

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

1.1 Contact/Responsible Party

Brora, LLC
210 Commerce Way, Suite 300
Portsmouth, NH 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

1.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Bioretention Systems
- Underground Detention Basin
- Flow-Through Treatment Units
- Rip Rap Outlets

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

1.3 Overall Site Operation & Maintenance Schedule

Maintenance Item	Frequency of Maintenance
Litter/Debris Removal	Weekly
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually
Bioretention Systems - Trash and debris to be removed. - Any required maintenance shall be addressed.	In accordance with Manufacturer's Recommendations Two (2) times annually After any rainfall event exceeding 2.5" in a 24-hr period
Flow-Through Treatment Units - Inspect vault for sediment build up, static water, plugged media and bypass condition - Replace Cartridges	In accordance with Manufacturer's Recommendations
Underground Detention Basin - Visually inspect sediment levels within system	Annually
Rip-Rap Outlets - Visually inspect for damage and deterioration	Annually

1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

1.4 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the attached for de-icing application rate guideline from the New Hampshire Stormwater Management Manual, Volume 2,).

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

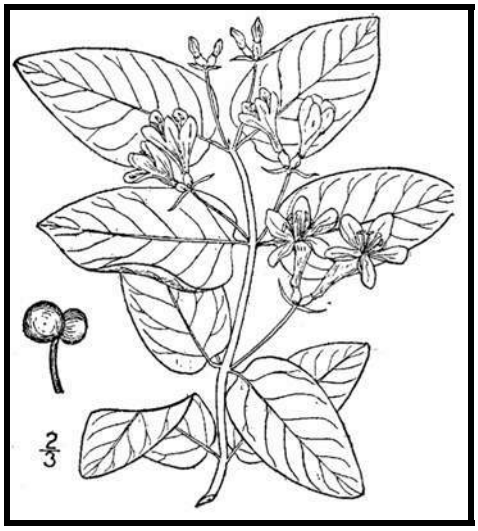
** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

UNIVERSITY of NEW HAMPSHIRE COOPERATIVE EXTENSION

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasives Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasives Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.



Tatarian honeysuckle
Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 3: 282.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non-native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non-viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

New Hampshire Regulations

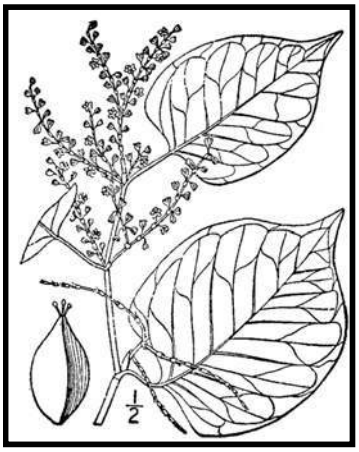
Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.



Japanese knotweed
Polygonum cuspidatum
USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 1: 676.

Bagging (solarization): Use this technique with softer-tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well-rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for *years* in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

<table>
<tr><th>Woody Plants</th><th>Method of Reproducing</th><th>Methods of Disposal</th></tr>
<tr><td rowspan="2">Norway maple
(Acer platanoides)
European barberry
(Berberis vulgaris)
Japanese barberry
(Berberis thunbergii)
autumn olive
(Elaeagnus umbellata)
burning bush
(Euonymus alatus)
Morrow's honeysuckle
(Lonicera morrowii)
Tatarian honeysuckle
(Lonicera tatarica)
showy bush honeysuckle
(Lonicera x bella)
common buckthorn
(Rhamnus cathartica)
glossy buckthorn
(Frangula alnus)</td><td rowspan="2">Fruit and Seeds
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Use as firewood.
▪ Make a brush pile.
▪ Chip.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip once all fruit has dropped from branches.
▪ Leave resulting chips on site and monitor.</td></tr>
<tr><td rowspan="2">oriental bittersweet
(Celastrus orbiculatus)
multiflora rose
(Rosa multiflora)</td><td rowspan="2">Fruits, Seeds, Plant Fragments
 </td><td>Prior to fruit/seed ripening
Seedlings and small plants
▪ Pull or cut and leave on site with roots exposed. No special care needed.
Larger plants
▪ Make a brush pile.
▪ Burn.</td></tr>
<tr><td>After fruit/seed is ripe
Don't remove from site.
▪ Burn.
▪ Make a covered brush pile.
▪ Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.</td></tr>
</table>

Non-Woody Plants	Method of Reproducing	Methods of Disposal
garlic mustard *(Alliaria petiolata)* spotted knapweed *(Centaurea maculosa)* ▪ Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort *(Cynanchum nigrum)* ▪ May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort *(Cynanchum rossicum)* giant hogweed *(Heracleum mantegazzianum)* ▪ Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket *(Hesperis matronalis)* perennial pepperweed *(Lepidium latifolium)* purple loosestrife *(Lythrum salicaria)* Japanese stilt grass *(Microstegium vimineum)* mile-a-minute weed *(Polygonum perfoliatum)*	**Fruits and Seeds** 	**Prior to flowering** Depends on scale of infestation Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material. **During and following flowering** Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation ▪ Pull or cut plant and leave on site with roots exposed. Large infestation ▪ Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). ▪ Monitor. Remove any re-sprouting material.
common reed (*Phragmites australis*) Japanese knotweed *(Polygonum cuspidatum)* Bohemian knotweed *(Polygonum x bohemicum)*	**Fruits, Seeds, Plant Fragments** Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	**Small infestation** ▪ Bag all plant material and let rot. ▪ Never pile and use resulting material as compost. ▪ Burn. **Large infestation** ▪ Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. ▪ Monitor and remove any sprouting material. ▪ Pile, let dry, and burn.

January 2010

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Managing Invasive Plants
Methods of Control

by Christopher Mattrick

They're out there. The problem of invasive plants is as close as your own backyard.

Maybe a favorite dogwood tree is struggling in the clutches of an Oriental bittersweet vine. Clawlike canes of multiflora rose are scratching at the side of your house. That handsome burning bush you planted few years ago has become a whole clump in practically no time … but what happened to the azalea that used to grow right next to it?

If you think controlling or managing invasive plants on your property is a daunting task, you're not alone. Though this topic is getting lots of attention from federal, state, and local government agencies, as well as the media, the basic question for most homeowners is simply, "How do I get rid of the invasive plants in my own landscape?" Fortunately, the best place to begin to tackle this complex issue is in our own backyards and on local conservation lands. We hope the information provided here will help you take back your yard. We won't kid you—there's some work involved, but the payoff in beauty, wildlife habitat, and peace of mind makes it all worthwhile.

PLAN OF ATTACK

Three broad categories cover most invasive plant control: mechanical, chemical, and biological. Mechanical control means physically removing plants from the environment through cutting or pulling. Chemical control uses herbicides to kill plants and inhibit regrowth. Techniques and chemicals used will vary depending on the species. Biological controls use plant diseases or insect predators, typically from the targeted species' home range. Several techniques may be effective in controlling a single species, but there is usually one preferred method—the one that is most resource efficient with minimal impact on non-target species and the environment.

Spraying chemicals to control invasive plants.

MECHANICAL CONTROL METHODS

Mechanical treatments are usually the first ones to look at when evaluating an invasive plant removal project. These procedures do not require special licensing or introduce chemicals into the environment. They do require permits in some situations, such as wetland zones. [See sidebar on page 23.] Mechanical removal is highly labor intensive and creates a significant amount of site disturbance, which can lead to rapid reinvasion if not handled properly.

Pulling and digging

Many herbaceous plants and some woody species (up to about one inch in diameter), if present in limited quantities, can be pulled out or dug up. It's important to remove as much of the root system as possible; even a small portion can restart the infestation. Pull plants by hand or use a digging fork, as shovels can shear off portions of the root system, allowing for regrowth. To remove larger woody stems (up to about three inches in diameter), use a Weed Wrench™, Root Jack, or Root Talon. These tools, available from several manufacturers, are designed to remove the aboveground portion of the plant as well as the entire root system. It's easiest to undertake this type of control in the spring or early summer when soils are moist and plants come out more easily.

Using tools to remove woody stems.

Volunteers hand pulling invasive plants.

Suffocation

Try suffocating small seedlings and herbaceous plants. Place double or triple layers of thick UV-stabilized plastic sheeting, either clear or black (personally I like clear), over the infestation and secure the plastic with stakes or weights. Make sure the plastic extends at least five feet past the edge of infestation on all sides. Leave the plastic in place for at least two years. This technique will kill everything beneath the plastic—invasive and non-invasive plants alike. Once the plastic is removed, sow a cover crop such as annual rye to prevent new invasions.

Cutting or mowing

This technique is best suited for locations you can visit and treat often. To be effective, you will need to mow or cut infested areas three or four times a year for up to five years. The goal is to interrupt the plant's ability to photosynthesize by removing as much leafy material as possible. Cut the plants at ground level and remove all resulting debris from the site. With this treatment, the infestation may actually appear to get worse at first, so you will need to be as persistent as the invasive plants themselves. Each time you cut the plants back, the root system gets slightly larger, but must also rely on its energy reserves to push up new growth. Eventually, you will exhaust these reserves and the plants will die. This may take many years, so you have to remain committed to this process once you start; otherwise the treatment can backfire, making the problem worse.

CHEMICAL CONTROL METHODS

Herbicides are among the most effective and resource-efficient tools to treat invasive species. Most of the commonly known invasive plants can be treated using only two herbicides—glyphosate (the active ingredient in Roundup™ and Rodeo™) and triclopyr (the active ingredient in Brush-B-Gone™ and Garlon™). Glyphosate is non-selective, meaning it kills everything it contacts. Triclopyr is selective and does not injure monocots (grasses, orchids, lilies, etc.). Please read labels and follow directions precisely for both environmental and personal safety. These are relatively benign herbicides, but improperly used they can still cause both short- and long-term health and environmental problems. Special aquatic formulations are required when working in wetland zones. You are required to have a state-issued pesticide applicator license when applying these chemicals on land you do not own. To learn more about the pesticide regulations in your state, visit or call your state's pesticide control division, usually part of the state's Department of Agriculture. In wetland areas, additional permits are usually required by the Wetlands Protection Act. [See sidebar on page 23.]

Foliar applications

When problems are on a small scale, this type of treatment is usually applied with a backpack sprayer or even a small handheld spray bottle. It is an excellent way to treat large monocultures of herbaceous plants, or to spot-treat individual plants that are difficult to remove mechanically, such as goutweed, swallowwort, or purple loosestrife. It is also an effective treatment for some woody species, such as Japanese barberry, multiflora rose, Japanese honeysuckle, and Oriental bittersweet that grow in dense masses or large numbers over many acres. The herbicide mixture should contain no more than five percent of the active ingredient, but it is important to follow the instructions on the product label. This treatment is most effective when the plants are actively growing, ideally when they are flowering or beginning to form fruit. It has been shown that plants are often more susceptible to this type of treatment if the existing stems are cut off and the regrowth is treated. This is especially true for Japanese knotweed. The target plants should be thoroughly wetted with the herbicide on a day when there is no rain in the forecast for the next 24 to 48 hours.

Cut stem treatments

There are several different types of cut stem treatments, but here we will review only the one most commonly used. All treatments of this type require a higher concentration of the active ingredient than is used in foliar applications. A 25 to 35 percent solution of the active ingredient should be used for cut stem treatments, but read and follow all label instructions. In most cases, the appropriate herbicide is glyphosate, except for Oriental bittersweet, on which triclopyr should be used. This treatment can be used on all woody stems, as well as phragmites and Japanese knotweed.

For woody stems, treatments are most effective when applied in the late summer and autumn—between late August and November. Stems should be cut close to the ground, but not so close that you will lose track of them. Apply herbicide directly to the cut surface as soon as possible after cutting. Delaying the application will reduce the effectiveness of the treatment. The herbicide can be applied with a sponge, paintbrush, or spray bottle.

Cut stem treatment tools.

For phragmites and Japanese knotweed, treatment is the same, but the timing and equipment are different. Plants should be treated anytime from mid-July through September, but the hottest, most humid days of the summer are best for this method. Cut the stems halfway between two leaf nodes at a comfortable height. Inject (or squirt) herbicide into the exposed hollow stem. All stems in an infestation should be treated. A wash bottle is the most effective application tool, but you can also use an eyedropper, spray bottle, or one of the recently developed high-tech injection systems.

It is helpful to mix a dye in with the herbicide solution. The dye will stain the treated surface and mark the areas that have been treated, preventing unnecessary reapplication. You can buy a specially formulated herbicide dye, or use food coloring or laundry dye.

There is not enough space in this article to describe all the possible ways to control invasive plants. You can find other treatments, along with more details on the above-described methods, and species-specific recommendations on The Nature Conservancy Web site (tncweeds.ucdavis.edu). An upcoming posting on the Invasive Plant Atlas of New England (www.ipane.org) and the New England Wild Flower Society (www.newfs.org) Web sites will also provide further details.

Hollow stem injection tools.

Biological controls—still on the horizon

Biological controls are moving into the forefront of control methodology, but currently the only widely available and applied biocontrol relates to purple loosestrife. More information on purple loosestrife and other biological control projects can be found at www.invasiveplants.net.

DISPOSAL OF INVASIVE PLANTS

Proper disposal of removed invasive plant material is critical to the control process. Leftover plant material can cause new infestations or reinfest the existing project area. There are many appropriate ways to dispose of invasive plant debris. I've listed them here in order of preference.

1. **Burn it**—Make a brush pile and burn the material following local safety regulations and restrictions, or haul it to your town's landfill and place it in their burn pile.

2. **Pile it**—Make a pile of the woody debris. This technique will provide shelter for wildlife as well.

3. **Compost it**—Place all your herbaceous invasive plant debris in a pile and process as compost. Watch the pile closely for resprouts and remove as necessary. Do not use the resulting compost in your garden. The pile is for invasive plants only.

Injecting herbicide into the hollow stem of phragmites.

4. **Dry it/cook it**—Place woody debris out on your driveway or any asphalt surface and let it dry out for a month. Place herbaceous material in a doubled-up black trash bag and let it cook in the sun for one month. At the end of the month, the material should be non-viable and you can dump it or dispose of it with the trash. The method assumes there is no viable seed mixed in with the removed material.

Care should be taken in the disposal of all invasive plants, but several species need extra attention. These are the ones that have the ability to sprout vigorously from plant fragments and should ideally be burned or dried prior to disposal: Oriental bittersweet, multiflora rose, Japanese honeysuckle, phragmites, and Japanese knotweed.

Christopher Mattrick is the former Senior Conservation Programs Manager for New England Wild Flower Society, where he managed conservation volunteer and invasive and rare plant management programs. Today, Chris and his family work and play in the White Mountains of New Hampshire, where he is the Forest Botanist and Invasive Species Coordinator for the White Mountain National Forest.

Controlling Invasive Plants in Wetlands

Special concerns; special precautions

Control of invasive plants in or around wetlands or bodies of water requires a unique set of considerations. Removal projects in wetland zones can be legal and effective if handled appropriately. In many cases, herbicides may be the least disruptive tools with which to remove invasive plants. You will need a state-issued pesticide license to apply herbicide on someone else's property, but all projects in wetland or aquatic systems fall under the jurisdiction of the Wetlands Protection Act and therefore require a permit. ***Yes, even hand-pulling that colony of glossy buckthorn plants from your own swampland requires a permit.*** Getting a permit for legal removal is fairly painless if you plan your project carefully.

1. Investigate and understand the required permits and learn how to obtain them. The entity charged with the enforcement of the Wetlands Protection Act varies from state to state. For more information in your state, contact:

   ME: Department of Environmental Protection
   www.state.me.us/dep/blwq/docstand/nrpapage.htm

   NH: Department of Environmental Services
   www.des.state.nh.us/wetlands/

   VT: Department of Environmental Conservation
   www.anr.state.vt.us/dec/waterq/permits/htm/pm_cud.htm

   MA: Consult your local town conservation commission

   RI: Department of Environmental Management
   www.dem.ri.gov/programs/benviron/water/permits/fresh/index.htm

   CT: Consult your local town Inland Wetland and Conservation Commission

2. Consult an individual or organization with experience in this area. Firsthand experience in conducting projects in wetland zones and navigating the permitting process is priceless. Most states have wetland scientist societies whose members are experienced in working in wetlands and navigating the regulations affecting them. A simple Web search will reveal the contact point for these societies. Additionally, most environmental consulting firms and some nonprofit organizations have skills in this area.

3. Develop a well-written and thorough project plan. You are more likely to be successful in obtaining a permit for your project if you submit a project plan along with your permit application. The plan should include the reasons for the project, your objectives in completing the project, how you plan to reach those objectives, and how you will monitor the outcome.

4. Ensure that the herbicides you plan to use are approved for aquatic use. Experts consider most herbicides harmful to water quality or aquatic organisms, but rate some formulations as safe for aquatic use. Do the research and select an approved herbicide, and then closely follow the instructions on the label.

5. If you are unsure—research, study, and most of all, ask for help. Follow the rules. The damage caused to aquatic systems by the use of an inappropriate herbicide or the misapplication of an appropriate herbicide not only damages the environment, but also may reduce public support for safe, well-planned projects.

Section 3
Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site including NHDES.

Copies of the Stormwater Maintenance report shall be submitted to the City of Portsmouth on an annual basis.

Stormwater Management Report						
Multifamily Development		**150 Portsmouth Boulevard**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
Deep Sump CB's			❑Yes ❑No			
Flow-Through Treatment Unit #1			❑Yes ❑No			
Bioretention System #1			❑Yes ❑No			
Bioretention System #2			❑Yes ❑No			
Bioretention System #3			❑Yes ❑No			
Underground Detention Basin			❑Yes ❑No			
Rip-Rap Outlet #1			❑Yes ❑No			

FocalPoint

BIOFILTRATION SYSTEMS

Operations & Maintenance

FERGUSON WATERWORKS

Ferguson.com/waterworks | 800.721.2590

GENERAL DESCRIPTION

The following general specifications describe the general operations and maintenance requirements for the FocalPoint® High Performance Modular Biofiltration System (HPMBS). The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, modular, constructed in place system designed to treat contaminated runoff.

Stormwater enters the HPMBS, is filtered by the High Performance Biofiltration Media and passes through to the underdrain/storage system where the treated water is detained, retained or infiltrated to sub-soils, prior to discharge to the storm sewer system of any remaining flow.

Higher flows bypass the FocalPoint® via a downstream inlet or other overflow conveyance. Maintenance is a simple, inexpensive and safe operation that does not require confined space entry, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain FocalPoint® Stormwater systems by following instructions in this manual.

BASIC OPERATIONS

FocalPoint® is a modular, high performance biofiltration system that often works in tandem with other integrated management practices (IMP). Contaminated stormwater runoff enters the biofiltration bed through a conveyance swale, planter box, or directly through a curb cut or false inlet. Energy is dissipated by a rock or vegetative dissipation device and is absorbed by a 3-inch layer of aged, double shreddded hardwood mulch, with fines removed, (when specified) on the surface of the biofiltration media.

As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the biofiltration media where the finer particles are removed and numerous chemical reactions take place to immobilize and capture pollutants in the soil media.

The cleansed water passes into the underdrain/storage system and remaining flows are directed to a storm sewer system or other appropriate discharge point. Once the pollutants are in the soil, bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a variety of very complex biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

DESIGN AND INSTALLATION

Each project presents different scopes for the use of FocalPoint® system. To ensure the safe and specified function of this stormwater BMP, Convergent Water Technologies and/or its Value Added Resellers (VAR) review each application before supply. Information and design assistance is available to the design engineer during the planning process. Correct FocalPoint® sizing is essential to optimum performance. The engineer shall submit calculations for approval by the local jurisdiction when required. The contractor and/or VAR is responsible for the correct installation of FocalPoint units as described in approved plans. A comprehensive installation manual is available at www.convergentwater.com.

MAINTENANCE

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons for maintenance include:

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the lifespan of your FocalPoint HPMBS.
- Avoid costly repairs.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the FocalPoint® is required to continue effective pollutant removal from stormwater runoff before any discharge into downstream waters. This procedure will also extend the longevity of the living biofiltration system. The unit will recycle and accumulate pollutants within the biomass, but may also subjected to other materials entering the surface of the system. This may include trash, silt and leaves etc. which will be contained above the mulch and/or biofiltration media layer. Too much silt may inhibit the FocalPoint's® flow rate, which is a primary reason for system maintenance. Removal of accumulated silt/sediment and/or replacement of the mulch layer (when specified), is an important activity that prevents overaccumulation of such silt/sediment.

When to Maintain?

The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as when the site is appropriately stabilized and the unit is installed and activated (i.e., when mulch and plantings are added).

Activation should be avoided until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after storm events of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the VAR/Maintenance contractor and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the VAR/Maintenance contractor of any damage to the plant(s), which constitute(s) an integral part of the biofiltration technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance of the HPMBS to the VAR/Maintenance contractor (i.e. no pruning or fertilizing).

EXCLUSION OF SERVICES

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant(s) in the FocalPoint® system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the VAR/Maintenance contractor maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the FocalPoint® (where the cleaned runoff drains to, such as drop-inlet) and block off the point where water enters of the FocalPoint®. The VAR/Maintenance contractor should be informed immediately.

MAINTENANCE VISIT SUMMARY

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of FocalPoint® and surrounding area
2. Removal of debris, trash and mulch
3. Mulch replacement
4. Plant health evaluation (including measurements) and pruning or replacement as necessary
5. Clean area around FocalPoint®
6. Complete paperwork, including date stamped photos of the tasks listed above.

MAINTENANCE TOOLS, SAFETY EQUIPMENT AND SUPPLIES

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes.

MAINTENANCE VISIT PROCEDURE

Inspection of FocalPoint® and surrounding area

Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

- Standing Water yes | no
- Is Bypass Inlet Clear? yes | no
- Damage to HPMBS System yes | no
- to Overflow conveyance yes | no

Removal of Silt / Sediment / Clay

Dig out silt (if any) and mulch and remove trash & foreign items.

- Silt / Clay Found? yes | no
- Cups / Bags Found? yes | no
- Leaves? yes | no
- Volume of material removed _____ (volume or weight)

Removal of debris, trash and mulch

After removal of mulch and debris, measure distance from the top of the FocalPoint® engineered media soil to the flow line elevation of the adjacent overflow conveyance. If this distance is greater than that specified on the plans (typ. 6" - 12"), add FocalPoint® media (not top soil or other) to recharge to the distance specified.

- Distance to media surface to flow line of overflow conveyance (inches) _____
- # of Buckets of Media Added _____

Mulch Replacement

Most maintenance visits require only replacement mulch (if utilized). Bags of clean, double shredded hardwood mulch are typically used for smaller biofiltration beds, however larger systems may require truck loads of mulch. For smaller projects, one cubic foot of mulch will cover four square feet of biofiltration bed, and for larger projects, one cubic yard of mulch will cover 108 square feet of biofiltration bed. Some visits may require additional FocalPoint® engineered soil media available from the VAR/Contractor.

- Add double shredded, aged hardwood mulch which has been screened to remove fines, evenly across the entire biofiltration media bed to a depth of 3".
- Clean accumulated sediment from energy dissipation system at the inlet to the FocalPoint® system to allow for entry of trash during a storm event.

Plant health evaluation and pruning or replacement as necessary

Examine the plant's health and replace if dead or dying.
Prune as necessary to encourage growth in the correct directions

- Height above Grade (feet) _____
- Width at Widest point (feet) _____
- Health alive | dead
- Damage to Plant yes | no

Clean area around FocalPoint®

- Clean area around unit and remove all refuse to be disposed of appropriately.

Complete paperwork

- Deliver Maintenance Report and photographs as appropriate.
- Some jurisdictions may require submission of maintenance reports in accordance with approvals.
- It is the responsibility of the Owner to comply with local regulations.

FocalPoint

BIOFILTRATION SYSTEM

FocalPoint Warranty

Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.

Maintenance Checklist

Element	Problem	What To Check	Should Exist	Action
Inlet	Excessiver sediment or trash accumulation	Accumulation of sediment or trash impair free flow of water into FocalPoint	Inlet free of obstructions allowing free flow into FocalPoint System	Sediments or trash should be removed
Mulch Cover	Trash and floatable debris accumulation	Excessive trash or debris accumulation.	Minimal trash or other debris on mulch cover	Trash and debris should be removed and mulch cover raked level. Ensure that bark nugget
Mulch Cover	Ponding of water on mulch cover	Ponding in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly over mulch cover.	Contact VAR for advice.
Plants	Plants not growing, or in poor condition	Soil/mulch too wet, evidence of spill. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact VAR for advice.
Plants	Plant growth excessive	Plants should be appropriate to the species and location of FocalPoint		Trim/prune plants in accordance with typical landscaping and

www.tighebond.com

100% Recyclable

NOTES:
1. IMAGE UNDERLAY DERIVED FROM GOOGLE EARTH IMAGERY DATED APRIL 1992.

0 50' 100'
GRAPHIC SCALE

N

PROPOSED MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

HISTORICAL SITE OVERLAY EXHIBIT

DATE: 07/30/25
SCALE: AS SHOWN
FIGURE: 1 OF 1

Tighe&Bond
Engineers | Environmental Specialists

1992 SITE IMAGERY

Plotted On:Jul 15, 2025-4:50pm By: BCurcio
Tighe & Bond:J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-FIG.dwg

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Manchester, NH 03108
info@proconinc.com

September 18, 2025

Portsmouth Planning Board

GREEN BUILDING STATEMENT
Portsmouth Boulevard Apartments – 150, 200, 250

The Core and Shell of these multi-family buildings at 150, 200, and 250 Portsmouth Boulevard are designed to meet or exceed current Energy Code requirements. A U.S. Department of Energy "COMcheck" will be submitted with the building permit application. Currently the State of New Hampshire has adopted the 2018 International Energy Code with amendments. These buildings will be built to current best practices and will exceed the 2018 IECC requirements when appropriate.

- Site: This site is a redevelopment on a site previously developed by the Air Force for residential uses. Parking is accommodated both on the surface and underneath one of the structures, reducing the total impervious footprint. This site provides good access to local businesses – by foot or bicycle. Landscaped open community space is provided on the perimeter. Bicycle storage (both outdoor and indoor) is provided for the residents. Parking lots are equipped with conduits for future installation of EV charging stations.
- Exterior Wall System: they will consist of continuous insulation outside the framing system at the podium levels and high R-value batt insulation at wood framed sections above. These insulation levels along with a continuous air barrier will provide high thermal performance. The exterior skin of is a combination of masonry, cementitious panel and lap siding. Some metal wall panel systems are provided as an accent. Interior vapor barriers are to be provided to allow for moisture management. These products are durable and have sustainable characteristics.
- Window Systems: windows have a thermally broken composite framing system with insulated, high-performance glazing to provide enhanced thermal performance and solar control. Large windows provide an abundance of daylight access for the residents.
- Roofing System: Includes a high reflectance light colored single-ply membrane system over continuous rigid insulation that exceeds the base energy code requirements. The roof structures are designed to handle the loads of adding solar panels in the future and the electrical systems are designed for adding solar components at a later date.
- HVAC System: all proposed systems are to be electric, reducing local fossil fuel emissions. High-efficiency, heat pump units with fresh air to residential units and common spaces. Bathroom exhaust is individually ducted to the exterior to avoid moisture collection points. Dryers in units are heat-pump types with condensate drains. Garage ventilation will feature variable speed fans with CO2 detectors to minimize energy usage when no vehicles are running.
- Plumbing System: fixtures are low flow. Individual water heaters are provided for each unit, allowing individual unit control.
- Lighting System: LED cutoff fixtures at exterior locations for energy efficiency and to minimize light pollution. Interior lighting is LED provided throughout – using less that 1 watt / sf. Perimeter daylight sensors to be used in common amenity spaces. Occupancy sensors to be utilized as required by code.
- Landscaping: local species that are drought tolerant and non-invasive species to be incorporated into the plantings list. Water Saving irrigation system provided.

EVERSOURCE ENERGY

9/5/2025

1700 Lafayette Road
Portsmouth, NH 03801

Trevor S Emmons
603-332-7515
Trevor.emmons@eversource.com

Joe Geoghegan
Tidemark
1359 Hooksett Road
Hooksett, NH 03106

Dear Mr. Geoghegan:

I am responding to your request to confirm the availability of electric service for the proposed Multi-Family Residential project at 150 Portsmouth Boulevard being constructed for/by the Kane Company.

The proposed project consists of three (3) 6-story buildings with 274 residential units and parking below grade of one (1) of the buildings. The proposed development will be constructed along Portsmouth Boulevard.

The developer will be responsible for the installation of all underground/overhead facilities and infrastructure required to service the new building. The service will be as shown on attached marked up Utility Plan C-501. The proposed building service will be fed from location to be determined by Eversource Engineering and as depicted on utility plan C-501. The developer will work with Eversource to obtain all necessary easements and licenses for the proposed underground/overhead facilities listed above.

This letter serves as confirmation that Eversource has sufficient capacity in the area to provide service to this proposed development. The cost of extending service to the aforementioned location and any associated infrastructure improvements necessary to provide service will be borne by the developer unless otherwise agreed upon.

The attached drawing titled "Proposed Multi-Family Development - Utility Plan" dated 9/5/2025, shows transformer locations to service your proposed project.

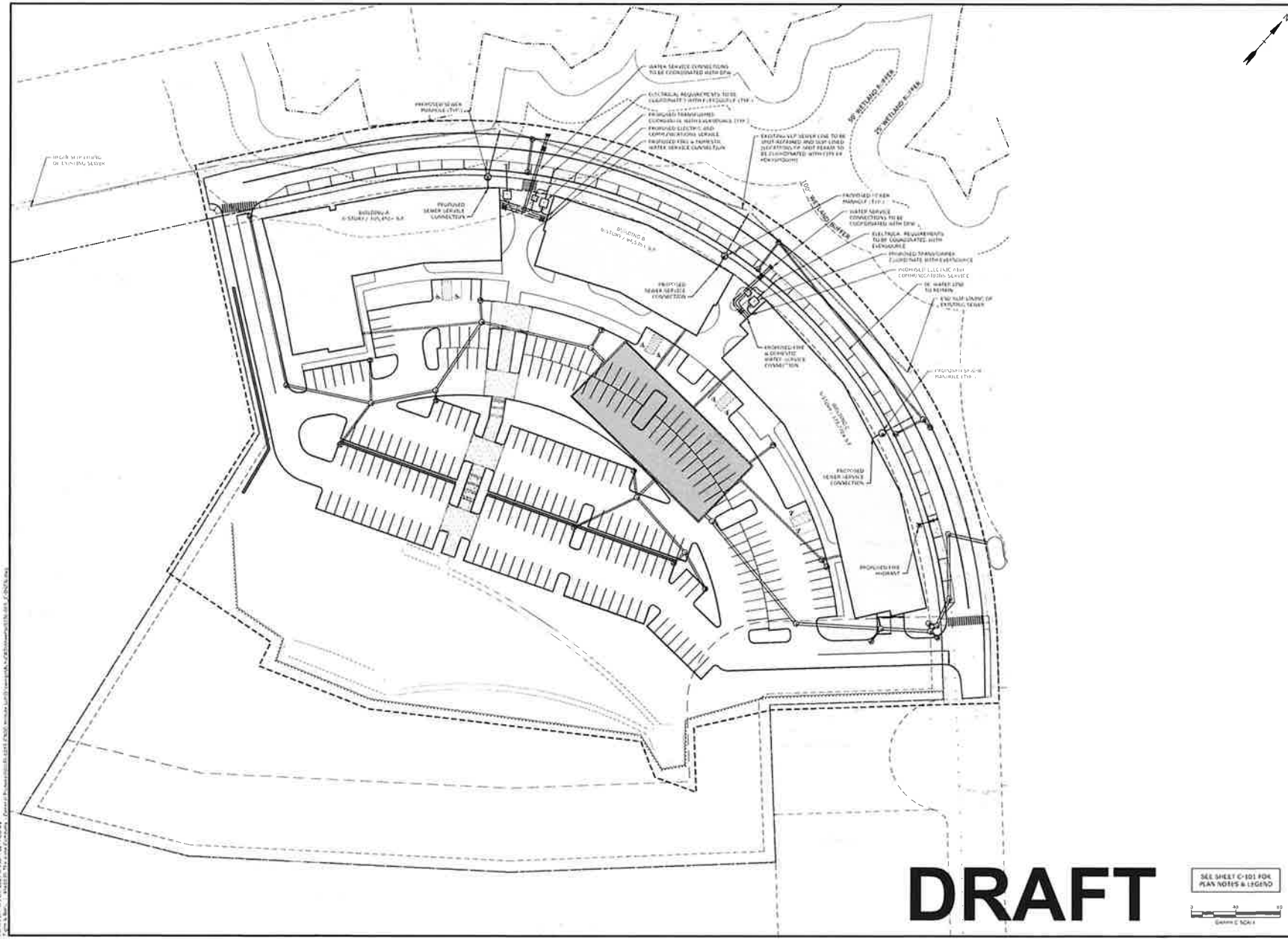
Eversource approves the locations shown; assuming the final installed locations meet all clearances, physical protection, and access requirements as outlined in Eversource's "Information & Requirements For Electric Supply" (https://www.eversource.com/content/docs/default-source/pdfs/requirements-for-electric-service-connections.pdf?sfvrsn=2).

If you require additional information or I can be of further assistance please do not hesitate to contact me at our Portsmouth Office, 603-332-7515

Respectfully.

Trevor Emmons
NH Eastern Regional Engineer, Eversource

cc: (via e-mail)
Thomas Boulter, Eastern Region Operations Manager, Eversource
Nickolai Kosko, Field Supervisor, Electric Design, Eversource



DRAFT

SEE SHEET C-101 FOR PLAN NOTES & LEGEND

0 40 80
GRAPHIC SCALE

Tighe&Bond
Engineers | Environmental Specialists

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION

PROJECT NO	40076.065
DATE	9/5/2025
FILE	40076.065_C-DSGN.DWG
DRAWN BY	MDC/MAC
CHECKED	NMT
APPROVED	PMC

UTILITIES PLAN

SCALE: AS SHOWN

C-501

Map 213 Lot 12 -Proposed Multi-Family Development Preliminary Water and Wastewater Demand Analysis

TO: City of Portsmouth, Technical Advisory Committee
FROM: Neil A. Hansen, PE
Patrick M. Crimmins, PE
COPY: Brora, LLC
DATE: September 22, 2025

The following memo is to provide an estimate of the average daily water and wastewater flows anticipated for the above-mentioned project for the purpose of allowing city staff to review capacity of the existing system. The flows have been calculated as a total development area.

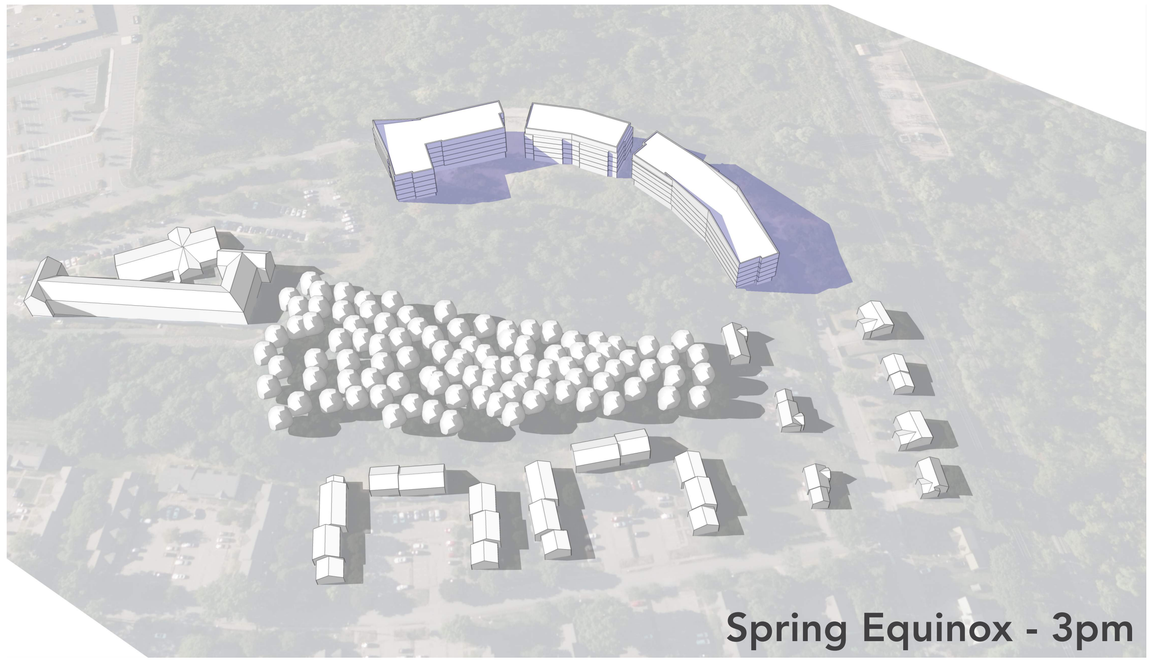
The proposed project is located on a parcel of land along Portsmouth Boulevard that is identified as Map 213 Lot 12 on the City of Portsmouth Tax Maps. The property is bound to the north by Portsmouth Boulevard, to the west by Hilton Homewood Suites, to the south by residences on Osprey Drive and to the east by residences on Dunlin Way. The site is currently undeveloped. This property is an 8.4-arce parcel of land located in the Office Research District and the Gateway Neighborhood Overly District (GNOD). The proposed will be permitted under the recently adopted GNOD Overly District regulations. As currently designed, the project will include three (3), six (6) story multifamily residential buildings consisting of approximately 274 dwelling units. The proposed sewer connection will be connected to the existing sewer system within Portsmouth Boulevard which has 8" PVC outlet pipes. There is no current development on the subject parcel, therefore a comparison to the existing condition is not provided.

As depicted in the table below, the average daily flow in gallons per day (GPD) has been calculated for the proposed project in accordance with Table 3-3: of Metcalf and Eddy, "Wastewater Engineering Treatment and Resource Reuse" as required under NHDES Env-Wq 700.

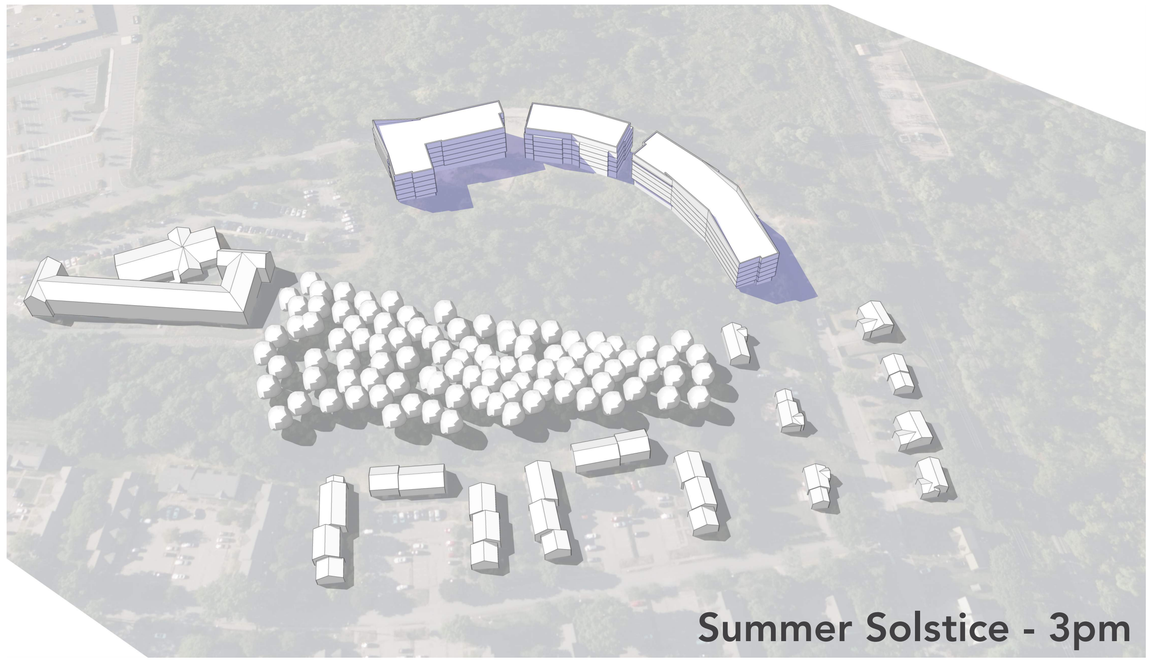
Overall Net Proposed Peak Gal/Day Design			
Use	Design Unit	Unit Design Flow (GPD)	Design Flow
Proposed:			
Studio Apartment	45 Units	120 GPD/Bdrm	5,400 GPD
1 Bdrm Apartment	126 Units	120 GPD/Bdrm	15,120 GPD
2 Bdrm Apartment	103 Units	120 GPD/Bdrm	24,720 GPD
		Total Design Flow:	**45,240 GPD**

SITE SHADOW STUDY (3PM) - *No Shadow Impact on Existing Buildings*

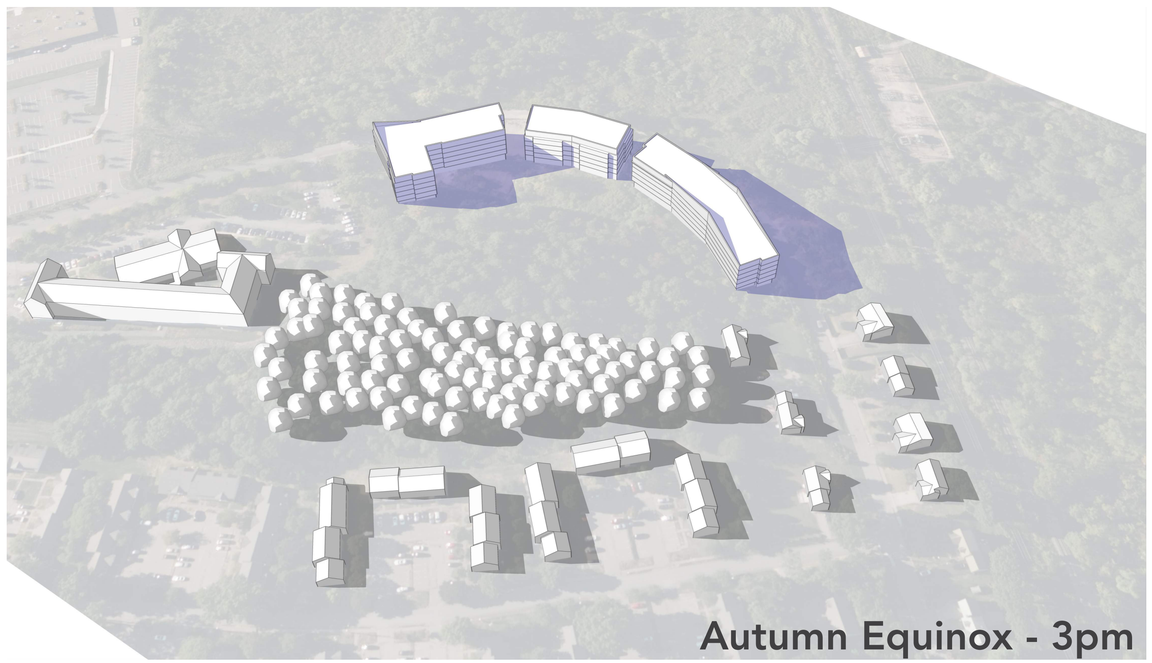
Indicates New Shadow



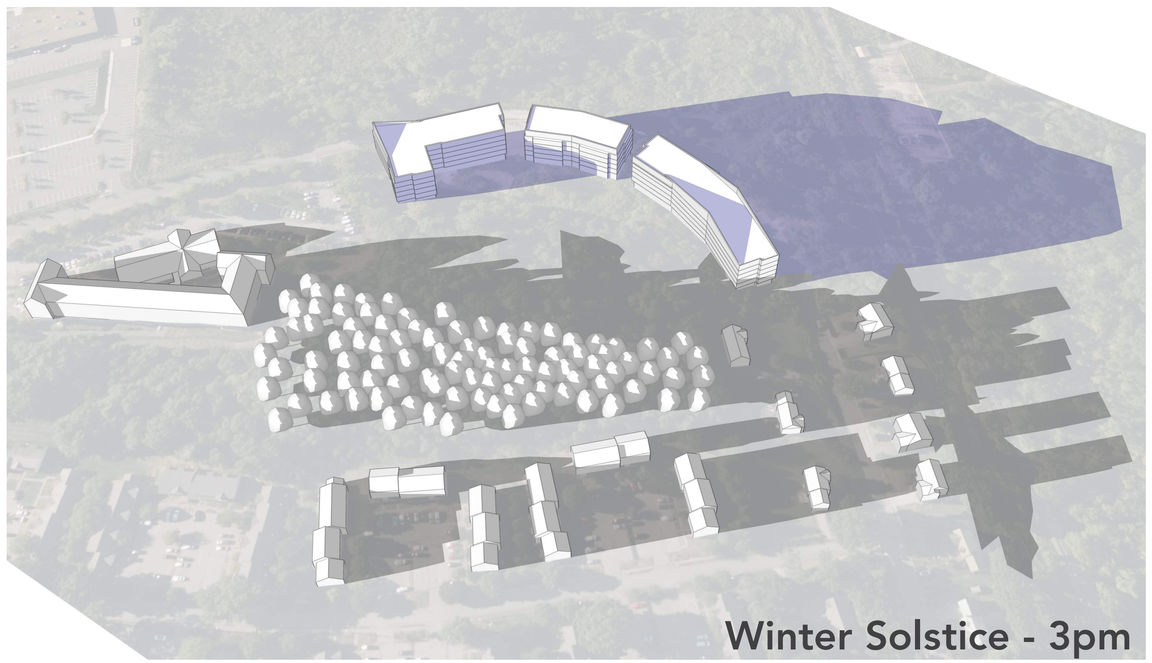
Spring Equinox - 3pm



Summer Solstice - 3pm



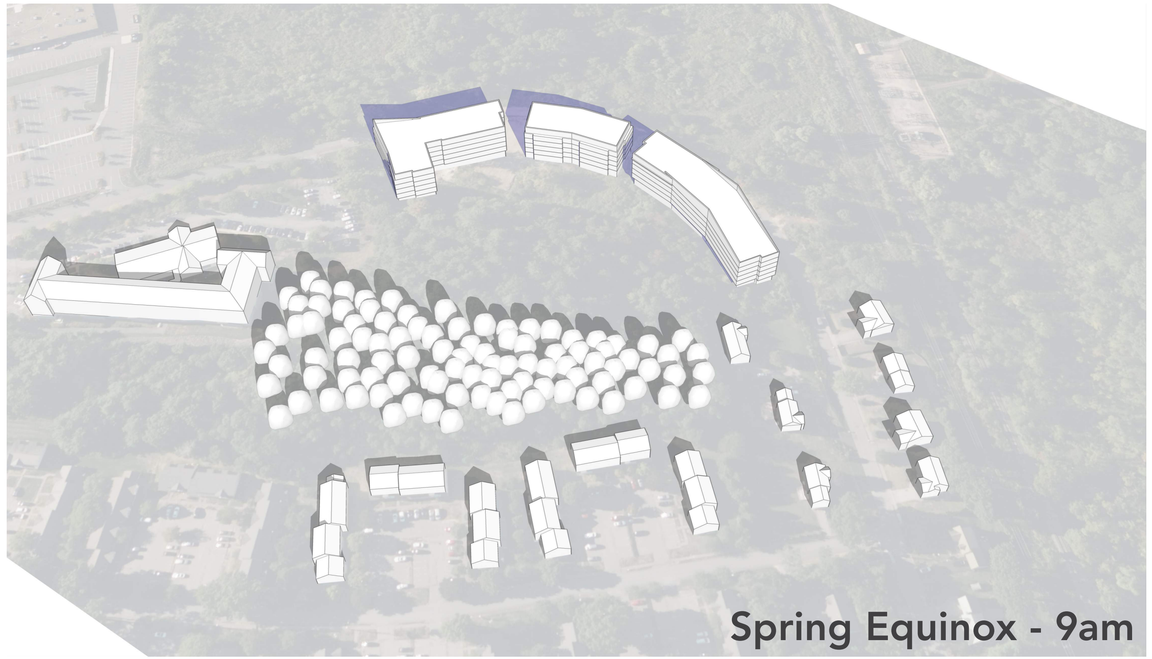
Autumn Equinox - 3pm



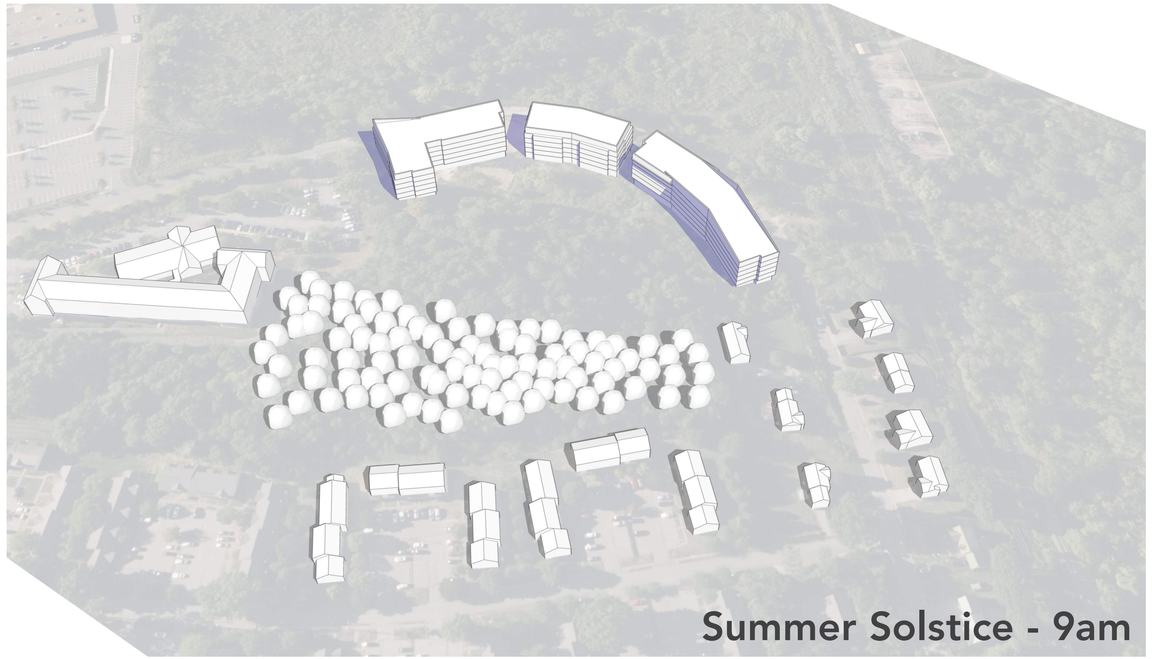
Winter Solstice - 3pm

SITE SHADOW STUDY (9AM) - *No Shadow Impact on Existing Buildings*

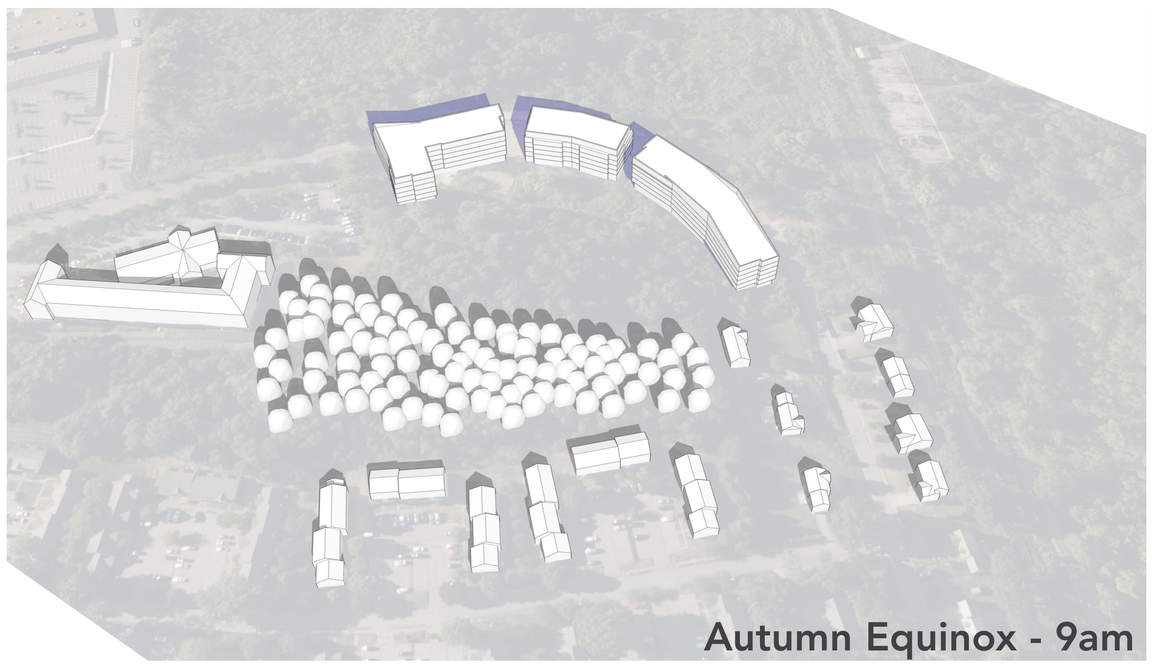
Indicates New Shadow



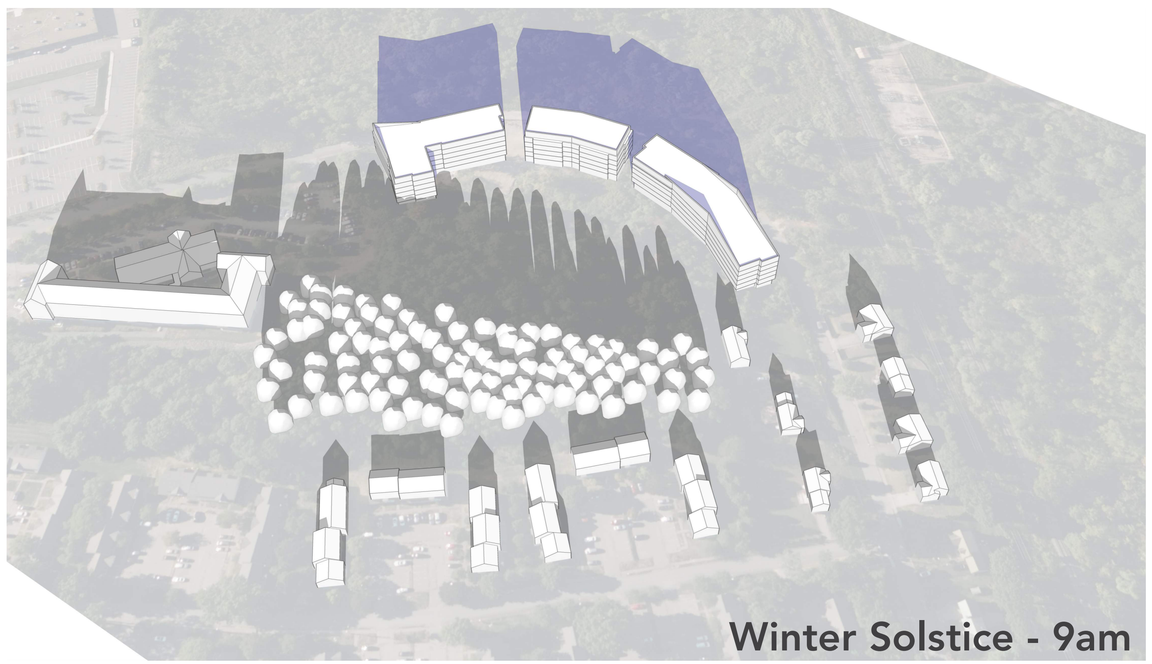
Spring Equinox - 9am



Summer Solstice - 9am



Autumn Equinox - 9am



Winter Solstice - 9am

LANDSCAPE MAINTENANCE SCHEDULE

150 Portsmouth Boulevard, Portsmouth, NH

Last Updated: November 14th, 2025

The intent of this plan is to help guide the management and maintenance of the proposed landscaping at the multi-family residential development at 150 Portsmouth Boulevard, in line with the design intent of the Landscape Architect. This document shall be used as a basis for post-construction maintenance activities, but should be used in conjunction with best landscaping practices, standards, and local regulations.

Area	Action Items	Frequency	Remarks	Spring			Growing Season			Fall			Winter		
LA	**Lawn Areas**			**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**
	Litter & Debris Removal	Weekly + as required	1. Remove and dispose of litter, debris, or other deleterious materials from lawn areas.												
	Mowing	Biweekly	1. Mowing height shall be 3 inches. Do not mow more than 1/3 of the leaf blade off. 2. Mow with sharp blades at a slow enough ground speed to cut the leaf blades rather than tear or rip them. Sharpen mower blades as soon as grass tips appear jagged or brown when cut.												
	Cleanup Clippings	After mowing	1. Sweep any grass clippings from adjacent paved surfaces back onto lawn or remove and dispose per local ordinances.												
	Watering	Daily	1. Water lawn by hand or automatic irrigation system, unless rainfall is sufficient.												
	Aerating	As required	1. Aerate lawn using manual or mechanical tools, preferably in early fall. 2. Cleanup displaced soil and clippings from adjacent paved surfaces.												
	Topdressing & Seeding	After aeration + as required	1. After aeration, or after identifying dead lawn areas, apply a thin layer of topdressing material (e.g., sand-compost mix). 2. Broadcast new lawn seed over topdressed areas. Cover with straw mulch as required.												
PB	**Plant Beds**			**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**
	Litter & Debris Removal	Weekly + as required	1. In spring, remove dead plant materials, road salt, litter, and other debris from winter plowing and maintenance activitites. 2. Throughout the year, remove additional dead plant materials and debris from mulch surface.												
	Watering	Daily	1. Water plants by hand or automatic irrigation system, unless rainfall is sufficient. 2. Check soil moisture levels during periods of drought and water by hand as required.												
	Tree Pruning	Annually	1. Prune shade trees as required to remove dead branches or branches obstructing pedestrian walkways, power lines, or other critical areas.												
	Shrub Pruning	Annually	1. Prune shrubs as required, depending on species. 2. Do not shear or form shrubs into hedged or rounded shapes unless otherwise directed.												
	Perennial Pruning	Annually	1. Prune perennials and groundcovers as required, depending on species.												
	Mulching	Annually	1. Replace or replenish bark mulch that is worn or displaced by erosion, plowing, animals, etc. 2. Spread and rake mulch evenly to a depth of not more than 3". Do not place mulch directly against tree, shrub, and perennial trunks or bases.												
	Weeding	Weekly	1. Remove weeds from plant beds and dispose of them per local ordinances.												
	Planting	As required	1. Replace dead plant material as required.												
RA	**Restoration Areas**			**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**
	Litter & Debris Removal	Weekly + as required	1. Remove and dispose of litter and debris from restoration and buffer areas.												
	Mowing	Annually	1. Mowing height shall be 4". 2. Mow once when soil surface is dry and firm and equipment can safely be brought on-site.												
	Tree Pruning	Annually	1. Only prune trees with branches obstructing pedestrian pathways, trails, or roadways. 2. In general, restoration areas shall be allowed to naturalize with minimal maintenance activities.												
	Seeding	Annually	1. Re-seed bare areas that have died, failed to establish, or eroded. 2. Rake and/or supplement soil as required to achieve seed-to-soil contact.												

Hillside Multifamily Development Project Resource Area Delineation

TO: Kimery Poldrack, SVP, Development & Construction

FROM: Stefanie Tetreault, CWS, PWS, Tighe & Bond
Lucas Acaba, Tighe & Bond

COPY: Patrick Crimmins, PE, Vice President
Neil Hansen, PE, Project Manager

DATE: September 17, 2025

The Kane Company has contracted with Tighe & Bond to provide wetland science services to support the design and permitting of the Hillside Multifamily Development Project on Portsmouth Boulevard and Dunlin Way in Portsmouth, New Hampshire. This memorandum describes Tighe & Bond's delineation and characterization of the existing wetland resource areas and condition of the 100-foot buffer to address the requirements of Section 10.1017.22(3) of the City of Porsmouth Zoning Ordinance (Chapter 10).

1 Site Location

The wetland delineation performed by Tighe & Bond was limited to the north side of Portsmouth Boulevard within 215 Commerce way (Map 216, Lot 1-8A) and off Dunlin Way (Map 213, Lot 11). The surrounding area consists of commercial properties to the west, moderate density residences to the east and south, and the Boston and Maine Railroad to the northeast. The Piscataqua River is located approximately 800 feet to the north. The development project is located on the south side of Portsmouth Boulevard (150 Portsmouth Boulevard; City of Portsmouth Tax Map 213 Lot 12; delineated by others). A Site Location Map is provided as Figure 1 in Attachment 1.

2 Wetland Resource Area Investigation

2.1 Methodology of Resource Area Investigation

On March 14, 2025, a Tighe & Bond New Hampshire Certified Wetland Scientist (CWS) visited the site to identify and delineate wetland resource areas and evaluate the jurisdictional status of each relative to local, state, and federal criteria. Jurisdictional wetland resource areas in the vicinity of the proposed work were delineated in accordance with the United States Army Corps of Engineers' (USACE) *Wetlands Delineation Manual and Regional Supplement* (2012), Field Indicators for Identifying Hydric Soils in New England (Version 4, 2017), and the New Hampshire Code of Administrative Rules: Delineation and Classification of Jurisdictional Areas (Chapter Env-Wt 400). The evaluation also included a review of publicly available resources such as LiDAR elevation data and historic aerial imagery.

Wetland resources were marked with survey flagging that was sequentially labeled alphanumerically. Flags were located using traditional survey methods. Local weather yielded

approximately 1.33-inches of rain in the week prior to the field delineation.[1] The site conditions were not considered atypical or problematic at the time of the delineation.

A Site Map showing the wetland delineation flag locations in provided as Figure 2 in Attachment 1. Representative photographs of the site are provided in Attachment 2.

2.2 Summary of Wetland Resource Areas

The following wetland resource areas were observed within the site: non-tidal wetlands and 100-foot buffer which are subject to jurisdiction under New Hampshire Statutes Title L – Water Management and Protection, Fill and Dredge in Wetlands (Chapter 482-A) and the City of Portsmouth Zoning Ordinance (Chapter 10), respectively.

The wetland resource areas observed in the field are described herein. A summary of wetland flag series is presented in Table 1-1.

TABLE 1-1
Summary of Wetland Delineation Series

Series	Points	Wetland Classification
1A	1A-1 through 1A-33	PSS1E[1]
2A	2A-1 through 2A-7	PEM1E[1]

[1] Classification of Wetlands and Deepwater Habitats of the United States by Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979.

2.2.1 Non-tidal Wetland

Wetlands are defined at RSA 482-A:2, X as "…an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

2.2.1.1 Series 1A

Series 1A defines the southeastern boundary of a non-tidal wetland to the northwest of Portsmouth Boulevard. The wetland is classified as palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated (PSS1E). Wetland vegetation observed included common winterberry (*Ilex verticilata*; FACW), speckled alder (*Alnus incana*; FACW), silky dogwood (*Swida amomum*; FACW), common reed (*Phragmites australis*; FACW), sensitive fern (*Onoclea sensibilis*; FACW), jewelweed (*Impatiens capensis*; FACW), and common wrinkle-leaved goldenrod (*Solidago rugosa*; FAC). Soil observed within the wetland consisted of 6 inches of sandy loam (10YR 2/1) underlain by 6 inches of sandy loam (10YR 2/1) with prominent redoximorphic concentrations (10YR 4/6).

The boundary between the wetland and adjacent uplands to the southeast was delineated by a transition to sandy loam (10YR 3/1) over compacted gravel soil and a transition to upland

[1] Weather Station ID: KMEELIOT27 (43.097° N, 70.768° W; Eliot, ME). Accessed via Weather Underground on 9/17/2025; https://www.wunderground.com/dashboard/pws/KMEELIOT27.

vegetation such as autumn olive (*Elaeagnus umbellata*; NC), staghorn sumac (*Rhus hirta*; NC), and Norway spruce (*Picea abies*; NC).

2.2.1.2 Series 2A

Series 2A defines the southwestern boundary of a non-tidal wetland to the northeast of Portsmouth Boulevard. The wetland is classified as palustrine, emergent, persistent, seasonally flooded/saturated (PEM1E). Wetland vegetation observed included red-osier dogwood (*Swida sericea*; FACW), smooth arrowwood (*Viburnum dentatum*; FAC), cattail (*Typha latifolia.*; OBL), sensitive fern (*O. sensibilis*; FACW), jewelweed (*I. capensis*; FACW), purple loosestrife (*Lythrum salicaria*; OBL), common grass-leaved goldenrod (*Euthamia gramnifolia*; FAC), and Devil's beggar-ticks (*Bidens frondosa*; FACW). Soil observed within the wetland consisted of 6 inches of sandy clay (10YR 5/1) underlain by 10 inches of sandy clay (10YR 6/1) with prominent redoximorphic concentrations (10YR 4/6).

The boundary between the wetland and adjacent uplands to the southwest was delineated by a transition to compacted sandy loam (10YR 4/4) and a transition to a forested plant community dominated by Norway maple (*Acer platanoides*; UPL), European privet (*Ligustrum vulgare*; FACU), European buckthorn (*Rhamnus cathartica*; FAC), and Japanese knotweed (*Fallopia japonica*; FACU).

2.2.2 100-foot Buffer

The 100-foot buffer from Wetlands 1A and 2A within the delineated area includes both forested areas and open meadows to the north and south of Portsmouth Boulevard as well as the paved roadway of Portsmouth Boulevard. Approximately 6% of the 100-foot buffer within the delineated area consists of the paved roadway of Portsmouth Boulevard.

Dominant vegetation observed within the forested areas included sugar maple (*Acer saccharum*; FACU), Norway maple (*A. platanoides*; UPL), staghorn sumac (*R. hirta*; NC), quaking aspen (*Populus tremuloides*; FACU), box elder (*Acer negundo*; FAC), crab apple (*Malus sp.*; NC), autumn olive (*E. umbellata*; NC), and European buckthorn (*R. cathartica*; FAC). Dominant vegetation observed within the open meadow areas included Canada goldenrod (*Solidago canadensis*; FACU), mugwort (*Artemisia vulgaris*; UPL), Queen Anne's Lace (*Daucus carota*; NC), common tansy (*Tancetum vulgare*; FACU), purple loosestrife (*L. salicaria*; OBL), common ragweed (*Ambrosia artemisiifolia*; FACU), and awl American-aster (*Symphyotrichum pilosum*; FACU). Overall, the observed vegetative community consisted of approximately 35% percent cover of invasive plant species.

2.2.2.1 100-foot Buffer Within Project Area

Approximately 29,000 square feet (sf) of the proposed project area is located within the 100-foot buffer of Wetland 1A. This includes approximately 20,000 sf (69%) within the Portsmouth Boulevard Right-of-Way which consists of the paved roadway and shoulders. Approximately 9,000 sf (31%) of the 100-foot buffer to Wetland 1A is located within 150 Portsmouth Boulevard (Map 213, Lot 12). This area is separated from Wetland 1A by Portsmouth Boulevard and consists of degraded, roadside habitat with compacted gravel soils and is dominated by Canada goldenrod (*S. canadensis*; FACU), Queen Anne's Lace (*D. carota*; NC), common ragweed (*A. artemisiifolia*; FACU), and awl American-aster (*S. pilosum*; FACU). Stormwater flow from this section of the 100-foot buffer currently sheet flows untreated into Wetland 1A as Portsmouth Boulevard lacks a stormwater management system.

3 Invasive Vegetation

Invasive species of vegetation present throughout the site at the time of the delineation included Norway maple (*A. platanoides*; UPL), Japanese knotweed (*F. japonica*; FACU), common reed (*P. australis*; FACW), European privet (*L. vulgare*, FACU), multiflora rose (Rosa multiflora; FACU), glossy buckthorn (*Frangula alnus*; FAC), common buckthorn (*R. cathartica*; FAC), autumn olive (*E. umbellata*; NC), Morrow's honeysuckle (*Lonicera morrowii*; FACU), Asiatic bittersweet (*Celastrus orbiculatus*; FACU), purple loosestrife (*L. salicaria*; OBL), and garlic-mustard (*Alliaria petiolata*; FACU). The primary populations of invasive species were located along the boundaries of wetlands 1A and 2A.

These species may provide refuge and food sources for small mammals and birds; however, their abundance in an area disturbed by human activity threatens the integrity of the native community. Invasive plant species generally prefer disturbed habitats and possess high dispersal abilities, enabling them to out-compete native vegetation.

Preventative measures should be taken during the project design and development to limit the potential for introduction or spread of invasive species during the project, such as:

- Limiting the areas of disturbance to avoid unnecessary disturbance of existing colonies of invasive species.
- Not importing materials such as fill, loam, mulch, haybales or gravel from sites where invasive species are known to occur.
- Immediately stabilizing exposed soils where work is complete or has temporarily ceased to prevent spread or further invasion of non-native species.
- Cleaning equipment of soil and plant material prior to mobilization and demobilization to and from the project site to limit spread of invasive species.

4 Summary

Two palustrine (non-tidal) wetlands were delineated north of Portsmouth Boulevard which are subject to jurisdiction under New Hampshire Statutes Title L – Water Management and Protection, Fill and Dredge in Wetlands (RSA 482-A). No direct impacts are proposed to Wetlands 1A or 2A as a result of the project. The project is located on the south side of Portsmouth Boulevard (City of Portsmouth Tax Map/Lot #213/12) and proposes permanent impacts within 100-feet of Wetland 1A.

The City of Portsmouth regulates the 100-foot buffer pursuant to the City of Portsmouth Zoning Ordinance (Chapter 10). The 100-foot buffer in the vicinity of the project site consists of disturbed forested and open meadow areas with a moderate density of invasive vegetation, as well as the paved roadway of Portsmouth Boulevard.

Attachments

A Site Figures
- Figure 1 – Site Location
- Figure 2 – Aerial Site Map

B Photographic Log

Tighe&Bond

ATTACHMENT A

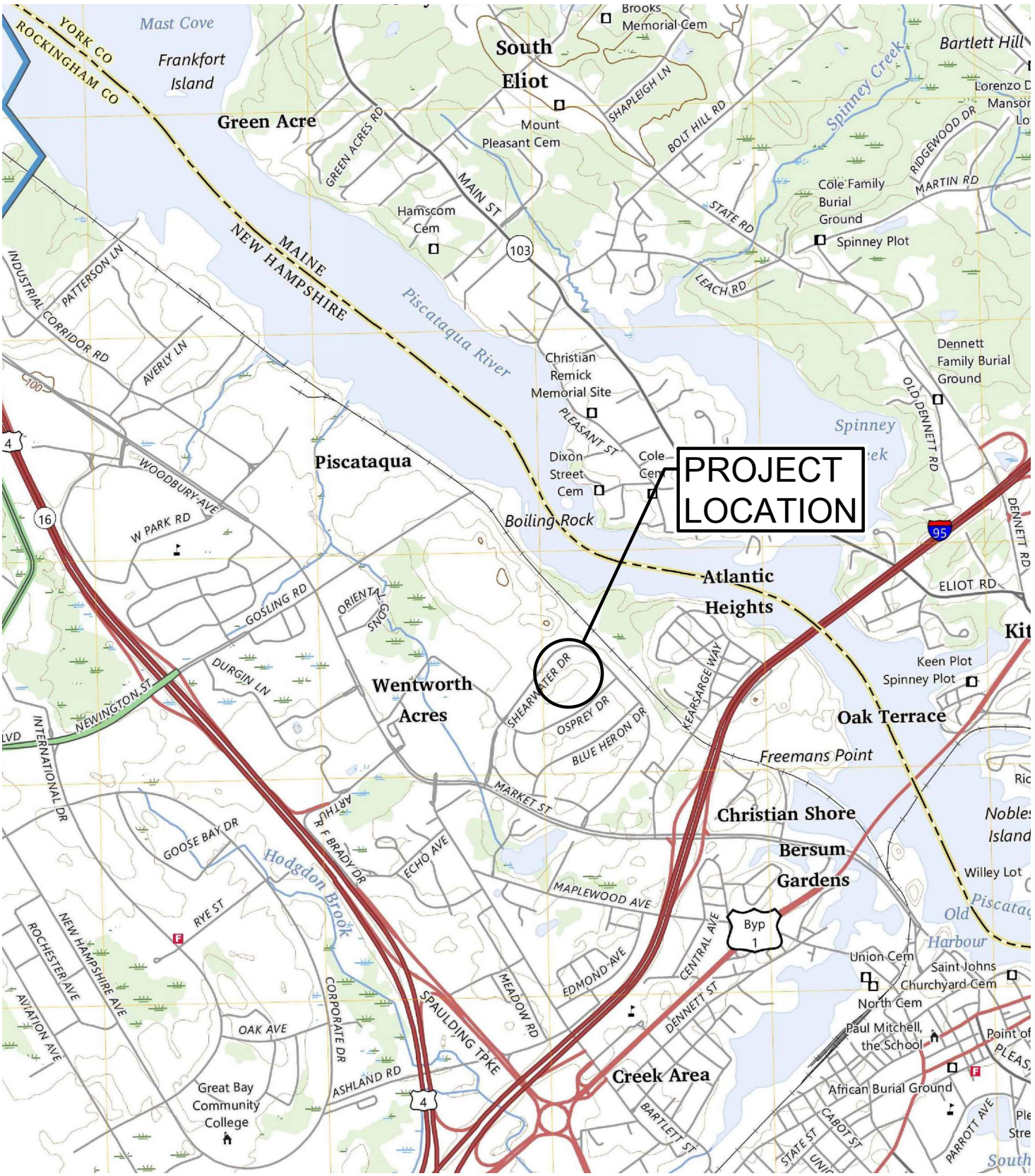


FIGURE 1
USGS AERIAL MAP

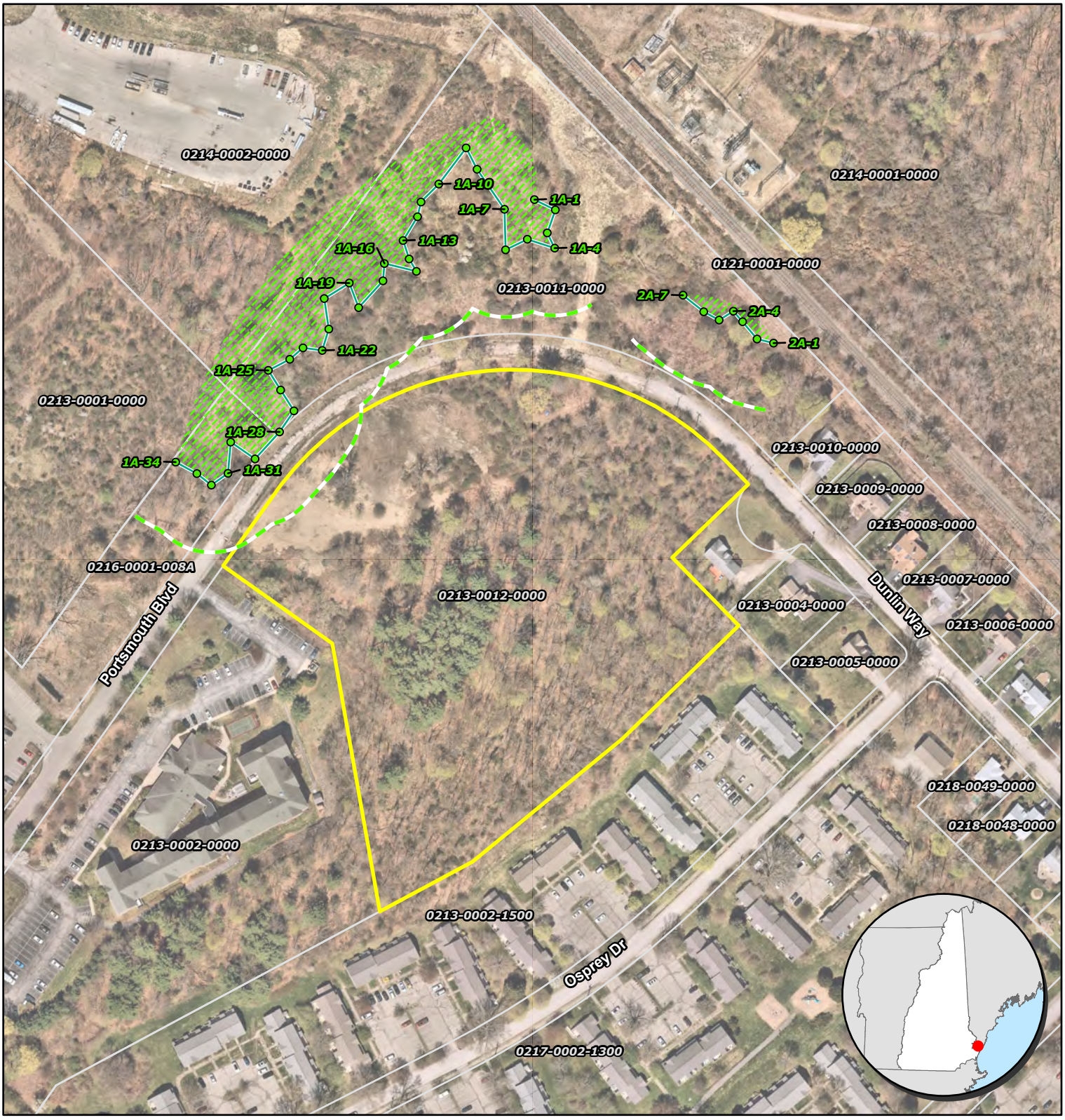
PROPOSED MULTI-FAMILY DEVELOPMENT
150 COMMERCE WAY
PORTSMOUTH, NH

DATE: 9/16/2025	Tighe&Bond
SCALE: 1" = 2000'	www.tighebond.com
FIGURE: 1	

Sep 16, 2025-4:44pm Plotted By: BCurcio
Tighe & Bond, Inc. J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-COVER.dwg

FIGURE 2
AERIAL
September 2025

Hillside Multi-Family Development
Dunlin Way and Portsmouth Boulevard,
Portsmouth, New Hampshire



- Wetland Flag
- Delineated Wetland Boundary
- 100-Foot Buffer Zone
- Wetland Area
- Approximate Subject Property
- Approximate Parcel Boundary

Tighe&Bond

Based on Nearmap Imagery (April 2025).
Wetland data was provided by Doucet Survey, surveyed in March 2025.
Parcel boundaries were provided by NH GRANIT and are approximate.

N

1:2,400
0 100 200
Feet

Tighe&Bond

ATTACHMENT B

Photographic Log

Client: Kane Company **Job Number:** K-0076-0065

Site: Hillside Multifamily Development Project
Portsmouth, New Hampshire

Photograph No.: 1	**Date:** 09/12/2025	**Direction Taken:** Northeast

Description: Typical view of Portsmouth Boulevard within the 100-foot buffer of Wetland 1A. Wetland 1A visible on the left side of the photo.

Photograph No.: 2	**Date:** 09/12/2025	**Direction Taken:** North

Description: Typical view of the boundary of Wetland 1A.

Photographic Log

Client: Kane Company **Job Number:** K-0076-0065

Site: Hillside Multifamily Development Project
Portsmouth, New Hampshire

Photograph No.: 3	**Date:** 09/12/2025	**Direction Taken:** North
Description: Representative view of the 100-foot buffer to Wetland 1A, north of Portsmouth Boulevard.		

Photograph No.: 4	**Date:** 09/12/2025	**Direction Taken:** East
Description: Representative view of the 100-foot buffer to Wetland 1A, south of Portsmouth Boulevard.		

Photographic Log

Client: Kane Company **Job Number:** K-0076-0065

Site: Hillside Multifamily Development Project
Portsmouth, New Hampshire

Photograph No.: 5	**Date:** 09/12/2025	**Direction Taken:** Northwest

Description: Representative view of Wetland 2A.

Photograph No.: 6	**Date:** 09/12/2025	**Direction Taken:** Northwest

Description: Representative view of the 100-foot buffer to Wetland 2A, north of Portsmouth Boulevard.

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: Brora, LLC Date Submitted: 9/22/2025

Application # (in City's online permitting): LU 25-114

Site Address: 150, 200, 250 Portsmouth Boulevard Map: 213 Lot: 12

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	Enclosed	N/A
☑	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Enclosed	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**	Enclosed	
☑	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	Building Floor Plans	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	Existing Conditions Plan, Site Plan C-300	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Enclosed	N/A
☑	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**	Existing Conditions Plan	N/A
☑	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Cover Sheet	N/A
☑	List of reference plans. **(2.5.3.1H)**	Existing Conditions Plans	N/A
☑	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	General Notes Sheet C-101	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☑	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☑	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Existing Conditions Plans	N/A
☑	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☑	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Existing Conditions Plan	N/A
☑	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	All plan sheets	N/A
☑	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	All plan sheets	N/A
☑	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☑	Source and date of data displayed on the plan. **(2.5.4.2D)**	General Notes Sheet C-101	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	Existing Conditions Plan Sheets	
☑	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	Site Plan C-301 Building Floor Plans & Elevations	
☑	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Site Plan C-301	
☑	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	Site Plan C-301 Landscape Plan L-101	
☑	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	Utility Plan C-501	
☑	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	Utility Plan C-501	

☑	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	Utility Plan C-501	
☑	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.	Building Floor Plans	
☑	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	Grading, Drainage, and Erosion Control Plans C-401	
☑	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	Photometrics Plans	
☑	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	Lighting Cut Sheets	
☑	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	Landscape Plan L-101	
☑	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Grading, Drainage, and Erosion Control Plans C-401	
☑	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	Site Plan C-301 Landscape Plan L-101	
☑	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	Existing Conditions Plan Sheets	
☑	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	
☑	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	Enclosed	
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Grading and Drainage Plan Sheet C-401	
☑	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☑	Stormwater Management and Erosion Control Plan. **(7.4)**	Enclosed	
☑	Inspection and Maintenance Plan **(7.6.5)**	Enclosed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	Cover Sheet	
☑	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	Enclosed	
☑	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Enclosed	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	Cover Sheet	
☑	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**	Site Plan Sheet C-301	N/A
☑	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☑	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	Site Plan Sheet C-301	N/A

Applicant's Signature: _____ **Date:** 9/22/2025

City of Portsmouth, New Hampshire

Wetland Conditional Use Permit Application Checklist

This wetland conditional use permit application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Conservation Commission and Planning Board review. The checklist is required to be uploaded as part of your wetland conditional use permit application to ensure a full and complete application is submitted to the Planning and Sustainability Department and to the online portal. A pre-application conference with a member of the Planning and Sustainability Department is encouraged as additional project information may be required depending on the size and scope of the project. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all wetland conditional use permit requirements. Please refer to Article 10 of the City of Portsmouth Zoning Ordinance for full details.

Applicant Responsibilities: Applicable fees are due upon application submittal to the Planning Board (no fees are required for Conservation Commission submission). The application will be reviewed by Planning and Sustainability Department staff to determine completeness. Incomplete applications which do not provide required information for the evaluation of the proposed site development shall not be provided review by the Conservation Commission or Planning Board.

Name of Applicant: Brora, LLC Date Submitted: 9/22/2025

Application # (in City's online permitting): LU 25-114

Site Address: 150, 200, 250 Portsmouth Boulevard Map: 213 Lot: 12

☑	Required Items for Submittal	Item Location (e.g. Page or Plan Sheet/Note #)
✔	Complete application form submitted via the City's web-based permitting program	Enclosed
✔	All application documents, plans, supporting documentation, this checklist and other materials uploaded to the application form in OpenGov in digital **Portable Document Format (PDF)**. One hard copy of all plans and materials shall be submitted to the Planning and Sustainability Department by the published deadline.	Enclosed

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)
✔	Basic property and wetland resource information. **(10.1017.21)**	Existing Conditions Plans
✔	Additional information required for projects proposing greater than 250 square feet of permanent or temporary impacts. **(10.1017.22)**	Cover Letter
✔	Demonstrate impacts as they relate to the criteria for approval set forth in Section 10.1017.50 (or Section 10.1017.60 in the case of utility installation in a right-of-way). **(10.1017.23)**	Cover Letter
✔	Balance impervious surface impacts with removal and/or wetland buffer enhancement plan. **(10.1017.24)**	Cover Letter, Wetland Buffer Impervious Surface Exhibit

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)
✔	Wetland buffer enhancement plan. **(10.1017.25)**	Landscape Plan L-101
☐	Living shoreline strategy provided for tidal wetland and/or tidal buffer impacts. **(10.1017.26)**	N/A
✔	Stormwater management must be in accordance with Best Management Practices including but not limited to: *1. New Hampshire Stormwater Manual, NHDES, current version.* *2. Best Management Practices to Control Non-point Source Pollution: A Guide for Citizens and City Officials, NHDES, January 2004.* **(10.1018.10)**	Drainage Report Grading, Drainage, and Erosion Control Plan C-401
☐	Vegetated Buffer Strip slope of greater than or equal to 10%. **(10.1018.22)**	N/A
✔	Removal or cutting of vegetation, use of fertilizers, pesticides and herbicides. **(10.1018.23/10.1018.24/10.1018.25)**	General Notes C-101 #18 and #19
☐	All new pavement within a wetland buffer shall be porous pavement. **(10.1018.31)**	N/A
☐	An application that proposes porous pavement in a wetland buffer shall include a pavement maintenance plan. **(10.1018.32)**	N/A
✔	Permanent wetland boundary markers shall be shown on the plan submitted with an application for a conditional use permit and shall be installed during project construction. **(10.1018.40)**	C-201
☑	**Requested Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**
✔	A narrative/letter addressed to the Conservation Commission Chair (if recommended to Planning Board then an additional narrative addressed to the Planning Board Chair at that time) describing the project and any proposed wetland and/or wetland buffer impacts. Please visit the WCUP instruction page for further application instructions.	Cover Letter
☐	If New Hampshire Department of Environmental Services (NHDES) Standard Dredge and Fill Permit is required for this work, please provide this permit application at the same time as your submission for a Wetland Conditional Use Permit.	N/A

Applicant's Signature: _____ **Date:** 9/22/2025

Catalog # : _____ Project : _____ Type : _____

Prepared By : _____ Date : _____

V-Locity Small (VALS)

Outdoor LED Area Light

OVERVIEW	
Lumen Package	6,000 - 27,000
Wattage Range	36 - 178
Efficacy Range (LPW)	142 - 171
Weight lbs(kg)	20 (9.1)
Control Options	IMSBT, ALB, ALS, 7-Pin, PCI

QUICK LINKS

Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction

- Rugged die-cast aluminum housing contains factory prewired driver and optical units. Cast aluminum wiring access door located underneath.
- Self-contained optic, board and heat sink assembly can be rotated or replaced in the field.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Shipping weight: TBD lbs in carton.

Optical System

- State-of-the-Art acrylic optics delivers industry leading optical control with an integrated gasket to provide IP66 rated seal.
- Proprietary refractor optics provide exceptional coverage and uniformity in distribution types 2, 3M, 3W, 4M, 4W, 4F, FTM, 5QN, 5QM, 5Q, 5QW, AM, WF and LC/RC.
- Available in 5000K, 4000K, 3500K, 3000K and 2700K color temperatures per ANSI C78.377 as well as phosphor converted amber.
- Minimum CRI of 80 (optional 70 CRI for 5000K and 4000K).
- Factory or field installable integral shielding available for enhanced spill light control.
- Zero Uplight (excludes adjustable arms).

Electrical

- High-performance driver features over-voltage, under voltage, short-circuit and over temperature protection.
- 0-10 volt dimming (10% - 100%) standard, must specify EXT option for dimming leads to be extended to fixture exterior.
- Standard Universal Voltage (120-277 VAC) Input 50/60 Hz or optional High Voltage (347-480 VAC).
- L70 Calculated Life: >60k Hours
- Total harmonic distortion: <20%
- Operating temperature: -40°C to +50°C (-40°F to +122°F).
- Power factor: >.90
- Input power stays constant over life.
- Field replaceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Driver is fully encased in potting material for moisture resistance and complies with FCC standards. Driver and key electronic components can easily be accessed.

Controls

- Optional integral passive infrared Bluetooth™ motion and photocell sensor. Fixtures operate independently and can be commissioned via iOS or Android configuration app.
- LSI's AirLink™ wireless control system options reduce energy and maintenance costs while optimizing light quality 24/7.

Installation

- REDiMount pole mount arm allows for a true one person installation.
- Side arm pole mount designed to mount to square or round poles.
- Pole mount arms can accommodate pole drill patterns from 2.4 to 5" on center and utilize LSI's reduced B3 or traditional B5 drill patterns.
- Additional mounting options are available including a mast arm or adjustable slip fitter that allow for luminaire attachment to a 2 3/8" tenon or mast arm.
- Adjustable arms allow for 65° of tilt (-5°below horizontal to +60° above horizontal) in 5° increments.

Warranty

- LSI luminaires carry a 5-year limited warranty. Refer to https://www.lsicorp.com/resources/terms-conditions-warranty/ for more information.

Listings

- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- DarkSky approved with 3000K or warmer color temperature selection (side arm pole and mast arm mounting only).
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet locations.
- IP66 rated Luminaire per IEC 60598-1.
- 3G rated for ANSI C136.31 high vibration applications are qualified.

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V-Locity Small (VALS) Outdoor LED Area Light

Type : _____

Have questions? Call us at (800) 436-7800

ORDERING GUIDE

Back to Quick Links

TYPICAL ORDER EXAMPLE: VALS 18L 4W UNV 40K8 BLK SA ALBMR2LR IS

Prefix	Lumen Package	Distribution	Orientation[2]	Voltage	Color Temp /Rendering	Finish
VALS - V-Locity Area Light Small	**6L** - 6,000 lms, 36W **9L** - 9,000 lms, 54W **12L** - 12,000 lms, 74W **15L** - 15,000 lms, 91W **18L** - 18,000 lms, 111W **21L** - 21,000 lms, 130W **24L** - 24,000 lms, 155W **27L** - 27,000 lms, 178W Custom Lumen Packages[1]	**2** - Type 2 **3M** - Type 3 Medium **3W** - Type 3 Wide **4M**- Type 4 Medium **4F** - Type 4 Forward **4W** - Type 4 Wide **FTM** - Forward Throw Medium **5QN** - Type 5 Square Narrow **5QM** - Type 5 Square Medium **5Q** - Type 5 Square **5QW** - Type 5 Square Wide **AM**- Automotive Merchandise **WF** - 6x6 Wide Flood **LC** - Left Corner **RC** - Right Corner	**(Blank)** - Standard **L**- Optics rotated left 90° **R** - Optics rotated right 90°	**UNV** - Universal Voltage (120-277V) **HV** - High Voltage (347-480V)	**50K7**- 5000 CCT - 70 CRI **50K8**- 5000 CCT - 80 CRI **40K7** - 4000 CCT - 70 CRI **40K8**- 4000 CCT - 80 CRI **35K8**- 3500 CCT - 80 CRI **30K8** - 3000 CCT - 80 CRI **27K8** - 2700 CCT - 80 CRI **AMB** - Phosphor Converted Amber	**BLK -** Black **BRZ -** Dark Bronze **GMG -** Gun Metal Gray **GPT -** Graphite **MSV -** Metallic Silver **PLP -** Platinum Plus **SVG -** Satin Verde Green **WHT -** White

Mounting	Controls (Choose One)		Options
SA - Universal Side Arm Pole Mount **SF** - Adjustable Slip Fitter **UA**- Universal Adjustable Pole Mount Arm **MA** - Mast Arm	**(Blank)** - None **Wireless Controls System** **ALSC** - AirLink Synapse Control System **ALSCS2** - AirLink Synapse Control System with 12-20' MH Motion Sensor **ALSCS4 -** AirLink Synapse Control System with 20-40' MH Motion Sensor **ALBMR1LR** - AirLink Blue Long Range Wireless Multi-Range Sensor Controller (8-15' MH)[4] **ALBMR2LR** - AirLink Blue Long Range Wireless Multi-Range Sensor Controller (16-40' MH)[4]	**Stand-Alone Controls** **EXT** - 0-10v Dimming leads extended to housing exterior **CR7P** - 7 Pin Control Receptacle ANSI C136.41[3] **IMSBTL1** - Integral Bluetooth™ Motion and Photocell Sensor (8-24' MH)[4] **IMSBTL2** - Integral Bluetooth™ Motion and Photocell Sensor (25-40' MH)[4] **PCIU** - 120-277 Button Photocell **PCI347** - 347V Button Photocell	**IS -** Integral Shield[2] **TE** - Tooless Entry (Mast Arm Only)

Need more information?
Click here for our glossary

Have additional questions?
Call us at (800) 436-7800

Accessory Ordering Information[5]

CONTROLS ACCESSORIES	
Description	**Order Number**
Twist Lock Photocell (120V) for use with CR7P	**122514**
Twist Lock Photocell (208-277) for use with CR7P	**122515**
Twist Lock Photocell (347V) for use with CR7P	**122516**
Twist Lock Photocell (480V) for use with CR7P	**1225180**
AirLink 5 Pin Twist Lock Controller	**661409**
AirLink 7 Pin Twist Lock Controller	**661410**
Shorting Cap for use with CR7P	**149328**

FUSING OPTIONS[7]	
Description	**Order Number**
Single Fusing (120V)	See Fusing Accessory Guide
Single Fusing (277V)	
Double Fusing (208V, 240V)	
Double Fusing (480V)	
Double Fusing (347V)	

EXTERNAL SHIELDING OPTIONS	
Description	**Order Number**
1.5" External Shield	See Shielding Guide
3" External Shield	

1. Custom lumen and wattage packages available, consult factory. Values are within industry standard tolerances but not DLC listed.
2. Not available on Type 5 or wide flood distributions.
3. Control device or shorting cap must be ordered separately. See Accessory Ordering Information.
4. Motion sensors are field configurable via the LSI app that can be downloaded from your smartphone's native app store.
5. Accessories are shipped separately and field installed.
6. "CLR" denotes finish. See Finish options.
7. Fusing must be located in hand hole of pole. See Fusing Accessory Guide for compatability.

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V-Locity Small (VALS) Outdoor LED Area Light

Type : _____

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ACCESSORIES

MOUNTING ACCESSORIES

Side Arm

Bullhorn Bracket
Mounts onto a 2" (51mm) IP, 2.375" (60mm) O.D. tenon and allows for mounting up to 4 adjustable slip fitter mount luminaires
Part Number: BKS PTB 2 CLR / BKS PTB 12 CLR (2 Luminaires)
Part Number: BKS PTB 3-30 CLR / BKS PTB 13-30 CLR (3 Luminaires)
Part Number: BKS PTB 4 CLR / BKS PTB 14 CLR (4 Luminaires)

Flood Wall Mount Bracket
Mounts onto vertical wall surface (hardware/anchors not included)
Part Number: BKS FMW 5 CLR (5" Straight Version)
Part Number: BKS FMW 18 CLR (18" Curved Version)

Bolt on Side Tenon Mount
Bolt on Side Tenon Mount
Part Number: BKSFBO 5 CLR (5" Straight Version)
Part Number: BKSFBO 18 CLR (18" Curved Version)
Part Number: BKSFBO 30 CLR (30" Dual Tenon Version)

Tenon / Slipfitter

Square Tenon Top
Allows to seamlessly integrate LSI luminaires to open top 4", 5" or 6" square poles with 11 ga. Or 7 ga. wall thickness
Part Number: BKA ISF10 _SQ CLR

Square Tenon Top
Mounts onto a 2" (51mm) IP, 2.375" (60mm) O.D. tenon and allows for mounting up to 4 luminaires
Part Number: BKA XNM *

Square Internal Slipfitter
Mounts inside 4" or 5" square pole and allows for mounting up to 4 lumianires
Part Number: BKA X_ISF * CLR

Wall Mount/ Wood Pole

Wall Mount Bracket
Mounts onto vertical wall surface (hardware/anchors not included)
Part Number: BKS XBO WM CLR

Wood Pole Bracket
Mounts onto wooden poles (6" minimum OD, hardware/anchors not inlcuded)
Part Number: BKS XBO WP CLR

SHIELDING, POLES & MISC. ACCESSORIES

Shielding

Integral Shield for Asymmetric Distributions
Field Install Integral shield provides maximum backlight control by shiedling each individual row of LEDS with minimal impact on Streett/front side distribution
Part Number: TBD

Integral Shield for Left and Right Corner Distributions
Field install integral shield provides cutoff from two sides for maximum spill light control when utilizing LC or RC corner distributions
Part Number: TBD

External Shield
External shield blocks view of light source from anyside of luminaire, additional shielding configurations available
Part Number: TBD (1.5") / TBD (3")

Poles

Square Poles
14 - 39' steel and aluminum poles in 4", 5" and 6" sizes for retrofit and new construction
Part Number: 4SQ/5SQ/6SQ

Round Poles
10 - 30' steel and aluminum poles in 4" and 5" sizes for retrofit and new construction
Part Number: 4RP/5RP

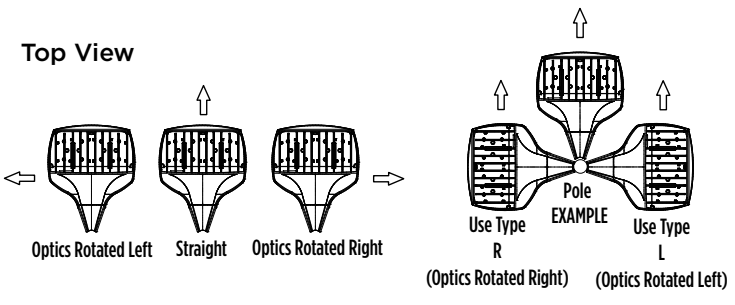
Tapered Poles
20' - 39' steel and aluminum poles for retrofit and new construction
Part Number: RTP

Misc.

Bird Spikes
10' linear bird spike (3' recommended per luminaire) silcone adhesive (covers approximately 25' linear fee of bird spike) and application tool
Spike Part Number: 751631
Adhesive Part Number: 751632
Caulk Gun Part Number: 751636

1 Replace CLR with paint finish description
2 Repleace XX with SQ for square pole or RD for round pole (≥3" OD)
3 Replace * with S (Single), D180 (Double @180°), D90 (Double @90°), T90 (Triple), Q90 (Quad)
4 Replace _ with 4 (4" square pole) or 5 (5" square pole)

OPTICS ROTATION

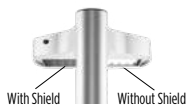


ACCESSORIES/OPTIONS

Integral Shield (IS)

Integral Shield (IS) available for improved backlight control without sacrificing Streett side performance. LSI's Integral Shield (IS) option delivers backlight control that significantly reduces spill light behind the pole for applications with pole locations close to adjacent properties. The design maximizes forward reflected light while reducing glare, maintaining the optical distribution selected, and most importantly eliminating light trespass. Shields rotate with the optical distribution.

Integral Shield (IS)



Luminaire Shown with AirLink Blue Sensor Option

7 Pin Photoelectric Control

7-pin ANSI C136.41-2013 control receptacle option available for twist lock photocontrols or wireless control modules. Control accessories sold separately. Dimming leads from the receptacle will be connected to the driver dimming leads (Consult factory for alternate wiring).

Luminaire Shown with CR7P

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V-Locity Small (VALS) Outdoor LED Area Light

Type : _____

Have questions? Call us at (800) 436-7800

PHOTOMETRICS

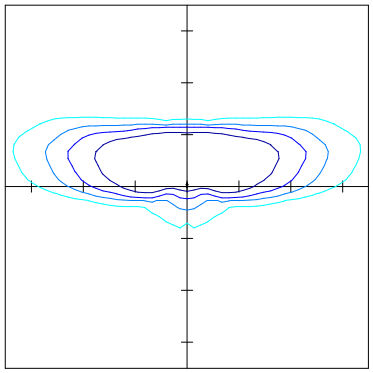
Back to Quick Links

Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

See the individual product page on https://www.lsicorp.com/ for detailed photometric data.

VALS 18L 2 40K8

V-LOCITY Area Small, 18,000lm, Type 2 Distribution



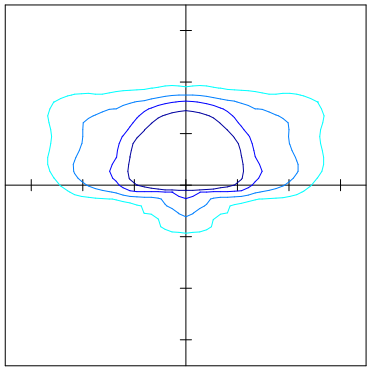
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	II Medium
BUG Rating	B2-U0-G4
Street Side Lumen %	88.9%
House Side Lumen %	11.1%
Uplight %	0.0%

VALS 18L 3M 40K8

V-LOCITY Area Small, 18,000lm, Type 3 Medium Distribution



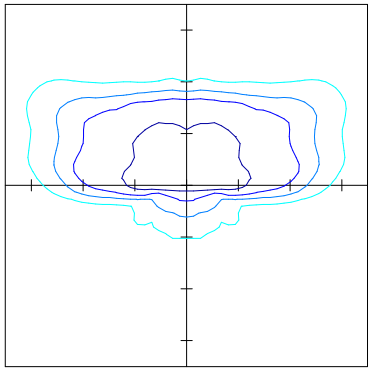
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	III Very Short
BUG Rating	B2-U0-G3
Street Side Lumen %	90.1%
House Side Lumen %	9.9%
Uplight %	0.0%

VALS 18L 3W 40K8

V-LOCITY Area Small, 18,000lm, Type 3 Wide Distribution



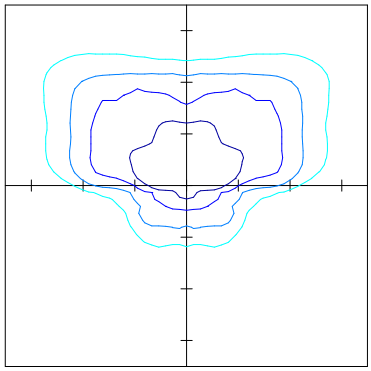
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	IV Medium
BUG Rating	B2-U0-G4
Street Side Lumen %	86.1%
House Side Lumen %	13.9%
Uplight %	0.0%

VALS 18L 4W 40K8

V-LOCITY Area Small, 18,000lm, Type 4 Wide Distribution



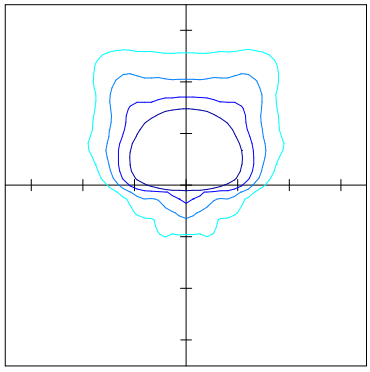
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	IV Medium
BUG Rating	B2-U0-G5
Street Side Lumen %	86.3%
House Side Lumen %	13.7%
Uplight %	0.0%

VALS 18L 4M 40K8

V-LOCITY Area Small, 18,000lm, Type 4 Medium Distribution



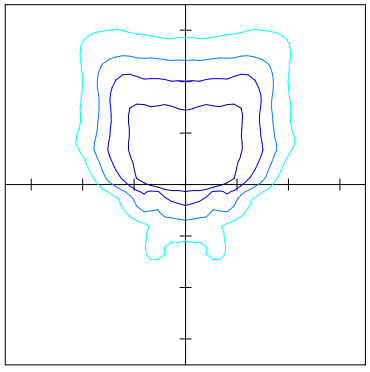
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	IV Very Short
BUG Rating	B1-U0-G3
Street Side Lumen %	91.0%
House Side Lumen %	9.0%
Uplight %	0.0%

VALS 18L 4F 40K8

V-LOCITY Area Small, 18,000lm, Type 4 Forward Distribution



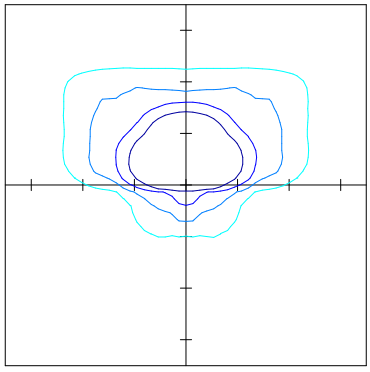
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	IV Short
BUG Rating	B2-U0-G4
Street Side Lumen %	87.9%
House Side Lumen %	12.1%
Uplight %	0.0%

VALS 18L FTM 40K8

V-LOCITY Area Small, 18,000lm, Forward Throw Medium Distribution



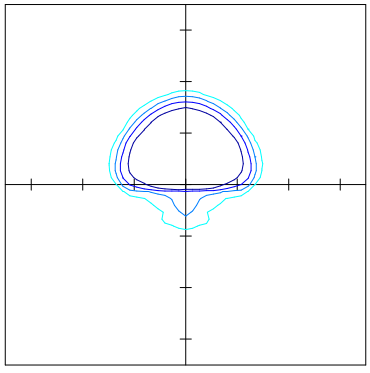
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	III Very Short
BUG Rating	B1-U0-G2
Street Side Lumen %	90.2%
House Side Lumen %	9.8%
Uplight %	0.0%

VALS 18L AM 40K8

V-LOCITY Area Small, 18,000lm, Automotive Merchandise Distribution



20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	III Very Short
BUG Rating	B1-U0-G2
Street Side Lumen %	94.1%
House Side Lumen %	5.9%
Uplight %	0.0%

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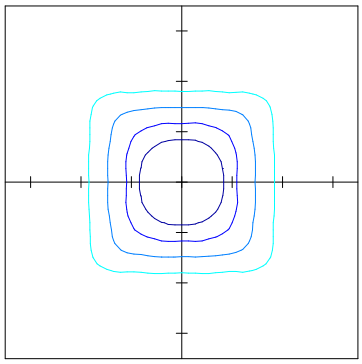
PHOTOMETRICS (CONTINUED)

Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

See the individual product page on https://www.lsicorp.com/ for detailed photometric data.

VALS 18L 5QN 40K8

V-LOCITY Area Small, 18,000lm, Type 5 Square Narrow Distribution



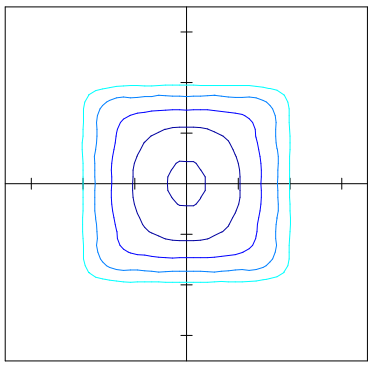
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	VS Very Short
BUG Rating	B3-U0-G2
0 - 60° Zonal Lumens	73.8%
60 - 90° Zonal Lumens	26.2%
Uplight %	0.0%

VALS 18L 5QM 40K8

V-LOCITY Area Small, 18,000lm, Type 5 Square Medium Distribution



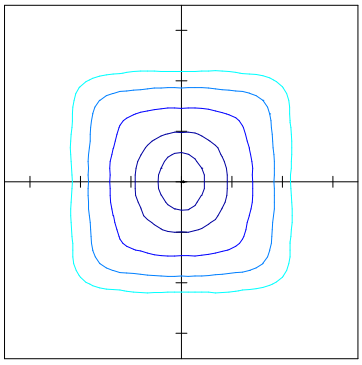
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	VS Short
BUG Rating	B4-U0-G2
0 - 60° Zonal Lumens	51.0%
60 - 90° Zonal Lumens	49.0%
Uplight %	0.0%

VALS 18L 5Q 40K8

V-LOCITY Area Small, 18,000lm, Type 5 Square Distribution



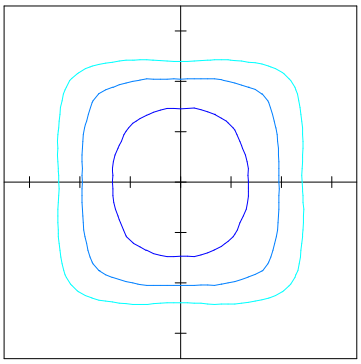
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	VS Medium
BUG Rating	B5-U0-G3
0 - 60° Zonal Lumens	41.8%
60 - 90° Zonal Lumens	58.2%
Uplight %	0.0%

VALS 18L 5QW 40K8

V-LOCITY Area Small, 18,000lm, Type 5 Square Wide Distribution



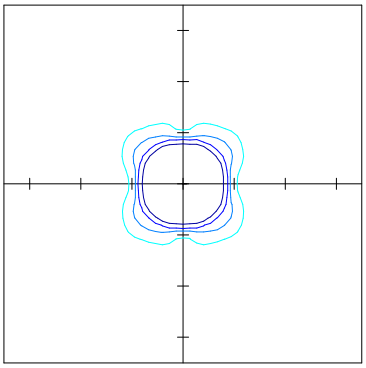
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	VS Medium
BUG Rating	B5-U0-G3
0 - 60° Zonal Lumens	33.7%
60 - 90° Zonal Lumens	66.3%
Uplight %	0.0%

VALS 18L WF 40K8

V-LOCITY Area Small, 18,000lm, Wide Flood Distribution



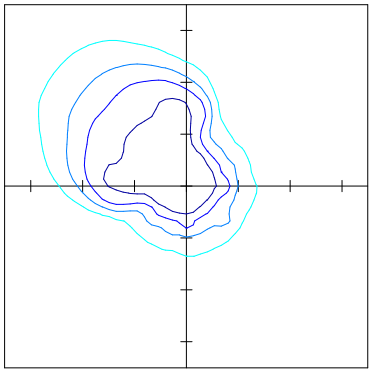
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

NEMA Type	6x6
Max Candela	9,352
Max Candela Angle	-19.5H x -29V
Beam Angle	80.7 x 90.0°
Field Angle	109.9 x 117.7°

VALS 18L LC 40K8

V-LOCITY Area Small, 18,000lm, Left Corner Distribution



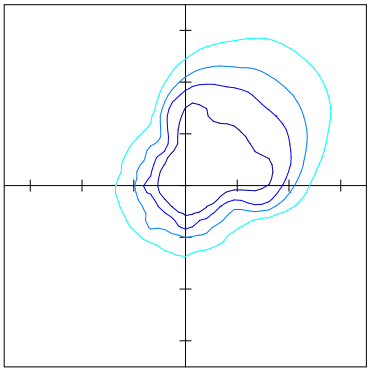
20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	N/A
BUG Rating	B3-U0-G4
Street Side Lumen %	74.3%
House Side Lumen %	25.7%
Uplight %	0.0%

VALS 18L RC 40K8

V-LOCITY Area Small, 18,000lm, Right Corner Distribution



20' Mounting Height / 30' Grid Spacing

2 FC 1 FC 0.5 FC 0.2 FC

IES Type	N/A
BUG Rating	B3-U0-G4
Street Side Lumen %	74.3%
House Side Lumen %	25.7%
Uplight %	0.0%

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PRODUCT DIMENSIONS

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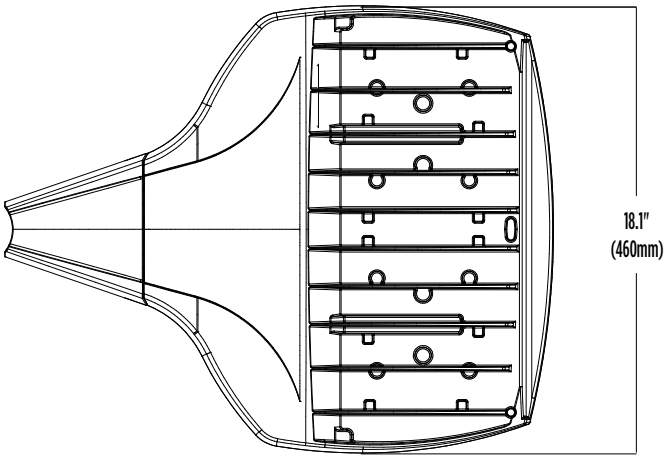


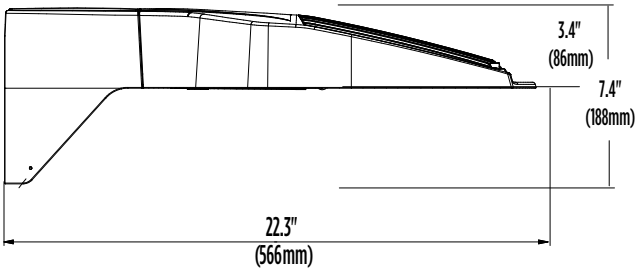
Luminaire EPA Chart - SA Side Arm		
Tilt Degree		0°
	Single	0.7
	D180°	1.3
	D90°	1.0
	T90°	1.4
	TN120°	1.5
	Q90°	1.4

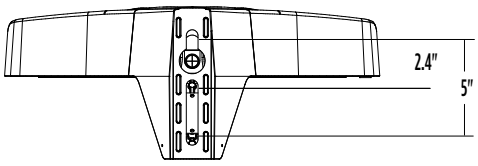
Luminaire EPA Chart - UA Universal Adjustable Arm						
Tilt Degree		0°	15°	30°	45°	60°
	Single	0.8	0.8	1.3	1.8	2.1
	D180°	1.5	1.9	2.5	3.2	3.8
	D90°	1.5	1.9	2.5	3.2	3.8
	T90°	1.8	2.1	2.7	3.2	3.8
	TN120°	1.8	2.3	3.4	4.3	5.0
	Q90°	1.8	2.1	2.7	3.2	3.8

Luminaire EPA Chart - MA Mast Arm		
Tilt Degree		0°
	Single	0.5

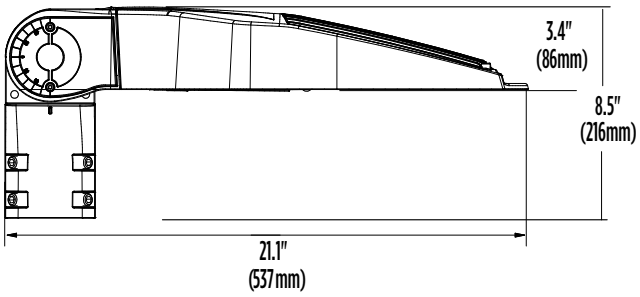
Luminaire EPA Chart - SF Adjustable Slip Fitter						
Tilt Degree		0°	15°	30°	45°	60°
	Single	0.7	1.3	1.4	1.8	2.2

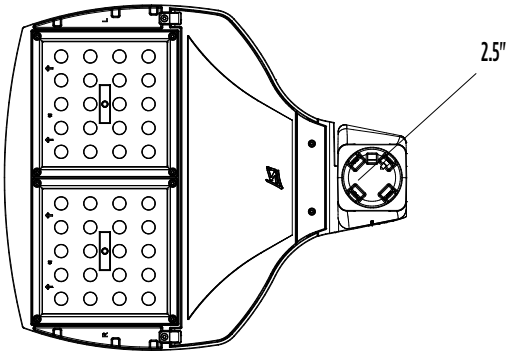
SA Universal Side Arm Mount



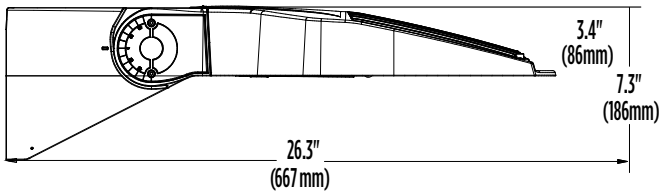


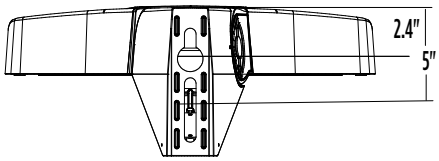
SF Adjustable Slipfitter



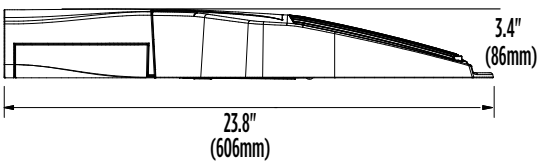


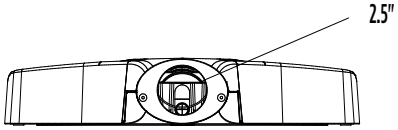
UA Universal Adjustable Arm





MA Mast Arm





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CONTROLS

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Integral Bluetooth™ Motion and Photocell Sensor (IMSBTxL)

Slim low profile sensor provides multi-level control based on motion and/or daylight. Sensor controls 0-10 VDC LED drivers and is IP66 rated for cold and wet locations (-40°F to 167°F). Two unique PIR lenses are available and used based on fixture mounting height. All control parameters are adjustable via an iOS or Android App capable of storing and transmitting sensor profiles.

Click here to learn more details about IMSBT

LEVITON App | Apple | Android

AirLink Blue (ALBMRxLR, ALBCSx)

Wireless Bluetooth Mesh Outdoor Lighting Control System that provides energy savings, code compliance and enhanced safety/security for parking lots and parking garages. Three key components; Bluetooth wireless radio/sensor controller, Time Keeper and an iOS App. Capable of grouping multiple fixtures and sensors as well as scheduling time-based events by zone. Radio/Sensor Controller is factory integrated into Area/Site, Wall Mounted, Parking Garage and Canopy luminaires.

Click here to learn more details about AirLink Blue

AirLink Blue App | Apple

Sensor Sequence of Operations

Standard Programming	On Event	Off Event	On Light Level	Dim Light Level	Daylight Harvesting	Delay To Off	Sensitivity
OMSBTxL/IMSBTxL	Motion	No Motion	100%	N/A	On; Auto Calibration	20 minutes	High
OMS	Motion	No Motion	N/A	N/A	N/A	30 seconds	Auto

Operation	Description
On Event	Trigger that activates lights to turn on; either automatic via motion detected or manually activated via push of button.
Off Event	Trigger that activates lights to turn off; either automatic via no motion detected or manually activated via push of button.
On Light Level	The light level that the fixtures will turn on to when ON EVENT occurs.
Dim Light Level	The light level that the fixtures will dim down to when no motion is detected.
Delay to Dim	The amount of time after which no motion is detected that the fixtures will be triggered to dim down. This sequence is optional, and sensor can be programmed to only trigger the fixture to turn off by entering 100% in this field.
Delay to Off	The amount of time after which no motion is detected that the fixtures will be triggered to turn off. If delay to dim is part of the programmed functionality, this is the amount of time after which no motion is detected after the fixture have already dimmed down.
Sensitivity	The sensitivity can be set to high, medium, low, or auto where applicable. High will detect smaller, simple motions. Low will only detect larger more complex motions. Auto temperature calibration adjusts the PIR sensitivity as ambient temperature rises to increase detection of heat movement through the field of view.

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Catalog # : _____ Project : _____

Prepared By : _____ Date : _____

Steel Poles

Square Straight

QUICK LINKS

Ordering Guide | Configurations | Dimensions | EPA

FEATURES & SPECIFICATIONS

Pole Shaft

- Straight poles are 4”, 5”, or 6” square.
- Pole shaft is electro-welded ASTM-A500 Grade C steel tubing with a minimum yield strength of 50,000 psi.
- On Tenon Mount steel poles, tenon is 2-3/8” O.D. high-strength pipe. Tenon is 4-3/4” in length.

Hand-Hole

- Standard hand-hole location is 12” above pole base.
- Poles 22’ and above have a 3” x 6” reinforced hand-hole. Shorter poles have a 2” x 4” non-reinforced hand-hole.

Base

- Pole base is ASTM-A36 hot-rolled steel plate with a minimum yield strength of 36,000 psi.
- Two-piece square base cover is optional.

Anchor Bolts

- Poles are furnished with anchor bolts featuring zinc-plated double nuts and washers. Galvanized anchor bolts are optional.
- Anchor Bolts conform to ASTM F 1554-07a Grade 55 with a minimum yield strength of 55,000 PSI.

Ground Lug

- Ground lug is standard.

Duplex Receptacle

- Weatherproof duplex receptacle is optional.

Ground Fault Circuit Interrupter

- Self-testing Ground fault circuit interrupter is optional.

Finishes

- Every pole is provided with the DuraGrip Protection System and a 5-year limited warranty:
- When the top-of-the line DuraGrip Plus Protection System is selected, in addition to the DuraGrip Protection System, a non-porous, automotive-grade corrosion coating is applied to the lower portion of the pole interior sealing and further protecting it from corrosion. This option extends the limited warranty to 7 years.

Determining The Luminaire/Pole Combination For Your Application:

- Select luminaire from luminaire ordering information.
- Select bracket configuration if required
- Determine EPA value from luminaire/ bracket EPA chart
- Select Pole Height
- Select MPH to match wind speed in the application area (See windspeed maps).
- Confirm pole EPA equal to or exceeding value of luminaire/bracket EPA
- Consult factory for special wind load requirements and banner brackets.

Pole Vibration Damper

- A pole vibration damper is recommended in open terrain areas of the country where low steady state winds are common.
- Non-tapered poles and lightly loaded poles are more susceptible to destructive vibration if a damper is not installed.

Listings

- UL Listed
- BAA/TAA Compliant

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Steel Poles - Square Straight

Type: _____

Have questions? Call us at (800) 436-7800

ORDERING GUIDE

Back to Quick Links

TYPICAL ORDER EXAMPLE: 4SQ B3 S11G 24 S PLP DGP

Pole Series	Mounting Method	Material	Height [2]	Mounting Configuration	Pole Finish	Options
4SQ - 4" x 4" Square Straight Pole (New Build) **5SQ** - 5" x 5" Square Straight Pole (New Build) **6SQ** - 6" x 6" Square Straight Pole (New Build) **4SQU** - 4" x 4" Square Straight Pole (Retrofit) **5SQU** - 5" x 5" Square Straight Pole (Retrofit) **6SQU** - 6" x 6" Square Straight Pole (Retrofit)	**Bolt-On Mount**[1] - See pole selection guide for patterns and fixture matches **B5** - 5" Traditional Drilling Pattern **B3** - 3" Reduced Drilling Pattern **B2** - 2" Reduced Drilling Pattern **T** - Tenon Mount - See pole selection guide for tenon and fixture/bracket matches **I** - No Mounting Holes[1] - Use with: BKA-IFM4 - Flush Mount Adapter[7] Greenlee Lifestyle CH Mounting Style Enterprise, Lexington, Constitution PT Single Mounting[2]	**S11G** – 11 Ga. Steel (4SQ/4SQU and 5SQ/5SQU Only) **S07G** – 07 Ga. Steel	**8'** **10'** **12'** **13'** **14'** **15'** **16'** **17'** **17'6"** **18'** **20'** **22'** **22'6"** **23'** **24'** **25'** **26'** **27'** **28'** **30'** **32'** **35'** **39'**	**S** – Single/Parallel **D180** – Double **D90** – Double **DN90** – Double **T90** – Triple **TN120** – Triple **Q90** – Quad **QN90** – Quad **N** – Tenon Mount (Standard Tenon size is 2-3/8" O.D.)[8]	**BRZ** – Bronze **BLK** – Black **PLP** – Platinum Plus **WHT** – White **SVG** – Satin Verde Green **GPT** – Graphite **MSV** – Metallic Silver **BZA** – Alternate Bronze	**GA** – Galvanized Anchor Bolts **SF** – Single Flood[3] **DF** – Double Flood [3] **DGP** – DuraGrip® Plus **LAB** – Less Anchor Bolts **CRXX** - Conduit Raceway[4]

Need more information?
Click here for our glossary

Have additional questions?
Call us at (800) 436-7800

Accessory Ordering Information

DESCRIPTION	PART NUMBER
4BC – 4" Square Base Cover	122559CLR
5BC – 5" Square Base Cover	122561CLR
6BC – 6" Square Base Cover	122563CLR
5BC - 5' Square Universal Base Cover	132488CLR
6BC - 6' Square Universal Base Cover	131252CLR
ER2 – Weatherproof Duplex Receptacle	122566CLR
GFI – Ground Fault Circuit Interrupter	122567CLR
MH5 - mounting Hole Plugs for use with 5" traditional drill pattern (3 set of 3 plugs)	132336
MH3 - mounting Hole Plugs for use with 3" reduced drill pattern (3 set of 3 plugs)	681126
MH2 - Mounting Hole Plugs for use with 2" reduced drill pattern (3 sets of 3 plugs)	725841
Vibration Damper - 4" Square Pole (bolt-on mount only)	172539
Vibration Damper - 5" Square Pole (bolt-on mount only)	172538
Vibration Damper - 6" Square Pole (bolt-on mount only)	178361

FOOTNOTES:
1 - See Area Light Brackets - 3" Reduced Drill Pattern and Area Light Brackets - 5" Traditional Drill Pattern Spec Sheets.
2 - Pole heights will have +/- 1/2" tolerance.
3 - See Flood Lighting Brackets section for choice of FBO brackets.
4 - CR selection must indicate required height and side of pole mounting location. Mounting template required at time of order.

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Steel Poles - Square Straight

Type: _____

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DRILLING LOCATIONS

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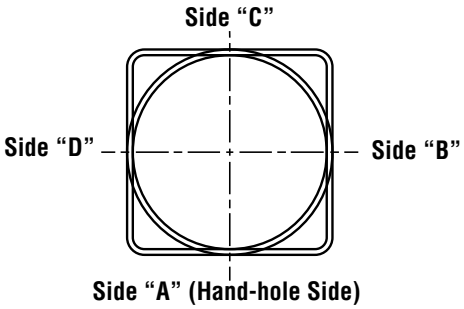
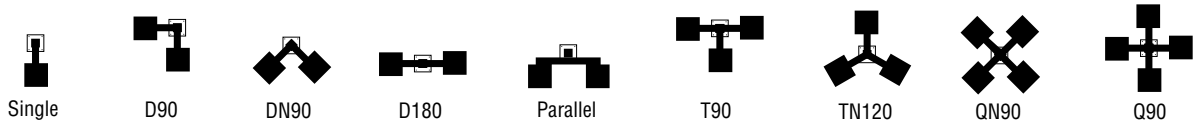
Sides	A	B	C	D
Hand-hole	X			
Single	X			
D180		X		X
D90	X			X
DN90[1]				
T90	X	X		X
TN120[2]				
Q90	X	X	X	X
QN90[3]				
Single FBO	X			
Double FBO		X		X



NOTES:
1 - Two locations will be 45° to the left and right of Side A.
2 - Other two locations will be 120° to the left and right of Side A.
3 - Two locations will be 45° to the left and right of Side A and two locations will be 135° to the left and right of Side A.

Consult factory for custom variations. Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20’ poles. Maximum height for SF and DF pole preparations on 20’ poles is 13’ from the base.

FIXTURE CONFIGURATIONS



Steel Poles - Square Straight

Type: _____

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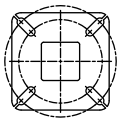
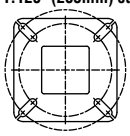
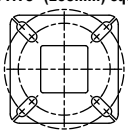
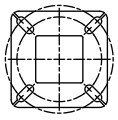
BOLT CIRCLE

STANDARD BASEPLATE

	4" (102mm) square 10-1/8" (257mm) sq.	**5" (127mm) square 10-1/8" (257mm) sq.**	**5" (127mm) square 10-1/8" (257mm) sq.**	**6" (152mm) square 12" (305mm) sq.**
	 11" (279mm) Dia. Bolt Circle	 **11" (279mm) Dia. Bolt Circle**	 **11" (279mm) Dia. Bolt Circle**	 **12" (305mm) Dia. Bolt Circle**
Bolt Circle Designator	B	C	D	J
Bolt Circle	Slotted 8"-11" (203mm-279mm)	Slotted 9"-11" (229mm-279mm)	Slotted 9"-11" (229mm-279mm)	Slotted 12" (305mm)
Anchor Bolt Size	3/4" x 30" (19mm x 762mm)	3/4" x 30" (19mm x 762mm)	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)
Anchor Bolt Projection	3-1/4" (83mm)	3-1/4" (83mm)	4" (102mm)	4" (102mm)
Base Plate Opening for Wireway Entry	3-5/8" (92mm)	4-3/4" (121mm)	4-5/8" (117mm)	5-5/8" (143mm)
Base Plate Dimensions	10-1/8" sq. x 3/4" thk. (257mm x 19mm)	10-1/8" sq. x 3/4" thk. (257mm x 19mm)	10-1/8" sq. x 1" thk. (257mm x 25mm)	12" sq. x 1-1/8" thk. (305mm x 29mm)
Pole Gauge	11	11	7	7

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the appropriate anchor bolt template.

UNIVERSAL BASEPLATE

	4" (102mm) square 10.5" (267mm) sq.	**5" (127mm) square 11.125" (283mm) sq.**	**5" (127mm) square 11.75" (298mm) sq.**	**6" (152mm) square 12-1/2" (318mm) sq.**
	 **4SQ**	 **5SQ**	 **5SQ**	 **14" (356mm) Dia. Bolt Circle**
Bolt Circle Designator	E	F	G	H
Bolt Circle	Slotted 9"-12"	Slotted 10-13"	Slotted 10-13"	Slotted 11"-14" (279mm-356mm)
Anchor Bolt Size	3/4" x 30" (19mm x 762 mm)	3/4x 30" (25mm x 914 mm)	1x 36" (25mm x 914 mm)	1" x 36" (25mm x 914mm)
Anchor Bolt Projection	3-1/4" (83 mm)	3-1/4" (83 mm)	4" (102 mm)	4" (102mm)
Base Plate Opening for Wireway Entry	3-5/8" (92mm)	4-3/4" (121mm)	5-1/8" (130 mm)	5-5/8" (143mm)
Base Plate Dimensions	10-1/2" sq. x 3/4" thk. (267 mm x 19 mm)	11-1/8 sq. x 3/4" thk. (283 mm x 19 mm)	11-3/4" sq. x 1" thk. (298 mm x 25 mm)	12 1/2" sq. x 1 1/8" thk. (318mm x 29mm)
Pole Gauge	11	11	7	7

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the appropriate anchor bolt template.

PRODUCT DIMENSIONS

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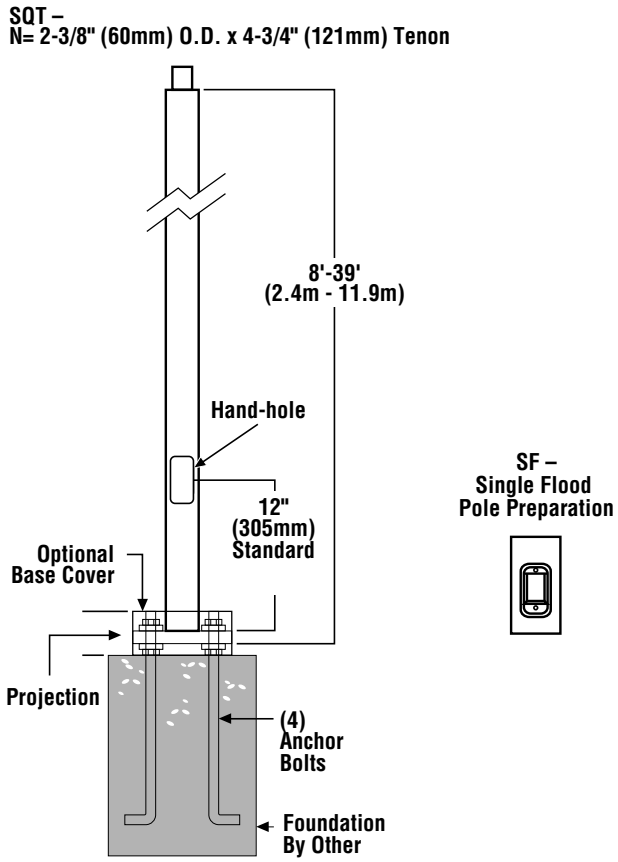
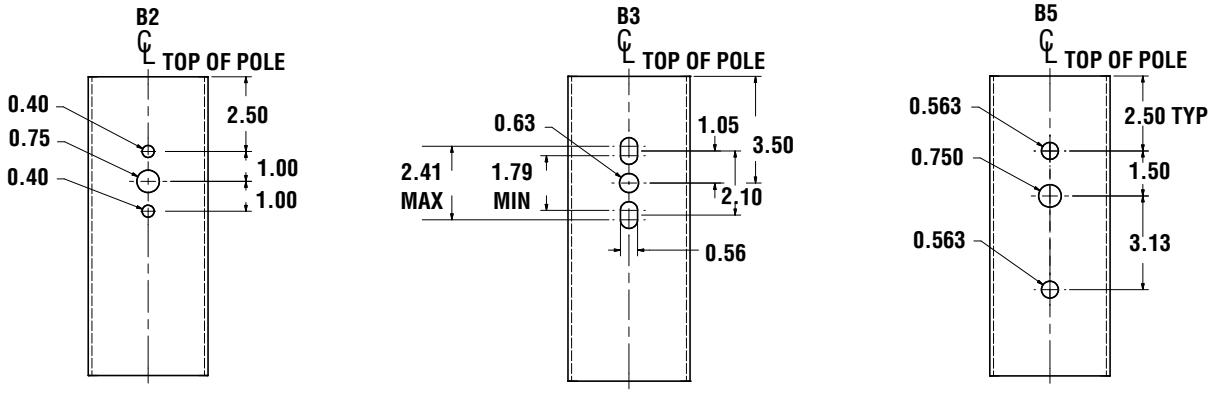


SHIPPING WEIGHTS	
4"(102mm) sq. 11 Ga. is approximately	7.50 lbs./ft.
4"(102mm) sq. 07 Ga. is approximately	10.00 lbs./ft.
5"(127mm) sq. 11 Ga. is approximately	9.00 lbs./ft.
5"(127mm) sq. 07 Ga. is approximately	12.50 lbs./ft.
6"(152mm) sq. 07 Ga. is approximately	15.40 lbs./ft.
Anchor Bolts (3/4" x 30")(19mm x 762mm)	15 lbs. (7kg)/set
Anchor Bolts (1" x 36")(25mm x 914mm)	30 lbs. (14kg)/set

Bolt-On Mount 2-Bolt Pattern



Steel Poles - Square Straight

Type: _____

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WIND SPEED

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EPA Information
All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

NOTE: Pole calculations include a 1.3 gust factor over steady wind velocity. Example: poles designed to withstand 80 MPH steady wind will withstand gusts to 104 MPH. EPAs are for locations 100 miles away from hurricane ocean lines. Consult LSI for other areas. Note: Hurricane ocean lines are the Atlantic and Gulf of Mexico coastal areas. For applications in Florida or Canada, consult factory.

Use ONLY with "Wind Speed Map for ASCE 7-10

POLE[1]	Mtg. Height Length (ft)	Wall Thick (ga)	BOLT CIRCLE			EPA								
			Designator	Dia. (in)	Anchor bolt Dia {in}	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH
4" x 11-ga x 12'	12	11	B	8" - 11"	0.75	13.9	12.5	11.3	9.2	7.6	6.3	5.2	4.3	3.6
4" x 11-ga x 14'	14	11	B	8" - 11"	0.75	10.7	9.5	8.5	6.8	5.4	4.4	3.5	2.7	2.1
4" x 11-ga x 16'	16	11	B	8" - 11"	0.75	8.2	7.2	6.4	4.9	3.8	2.9	2.1	1.5	1.0
4" x 11-ga x 18'	18	11	B	8" - 11"	0.75	6.3	5.4	4.7	3.4	2.4	1.6	1.0	0.4	n/a
4" x 11-ga x 20'	20	11	B	8" - 11"	0.75	4.6	3.9	3.2	2.1	1.2	0.6	n/a	n/a	n/a
4" x 11-ga x 22'	22	11	B	8" - 11"	0.75	7.6	6.6	5.7	4.2	3.0	2.0	1.2	0.5	n/a
4" x 11-ga x 24'	24	11	B	8" - 11"	0.75	6.0	5.1	4.3	2.9	1.8	0.9	n/a	n/a	n/a
4" x 11-ga x 26'	26	11	B	8" - 11"	0.75	4.6	3.7	3.0	1.7	0.7	n/a	n/a	n/a	n/a
4" x 7-ga x 14'	14	7	B	8" - 11"	0.75	18.3	16.4	14.9	12.2	10.2	8.5	7.1	5.9	5.0
4" x 7-ga x 16'	16	7	B	8" - 11"	0.75	14.7	13.2	11.8	9.6	7.8	6.3	5.2	4.2	3.4
4" x 7-ga x 18'	18	7	B	8" - 11"	0.75	11.9	10.5	9.3	7.4	5.9	4.6	3.6	2.8	2.1
4" x 7-ga x 20'	20	7	B	8" - 11"	0.75	9.6	8.4	7.4	5.7	4.3	3.2	2.3	1.6	0.9
4" x 7-ga x 22'	22	7	B	8" - 11"	0.75	7.7	6.6	5.7	4.2	3.0	2.0	1.2	0.5	n/a
4" x 7-ga x 24'	24	7	B	8" - 11"	0.75	6.0	5.1	4.3	2.9	1.8	0.9	n/a	n/a	n/a
4" x 7-ga x 26'	26	7	B	8" - 11"	0.75	4.6	3.7	3.0	1.7	0.7	n/a	n/a	n/a	n/a
4" x 7-ga x 28'[2]	28	7	B	8" - 11"	0.75	3.3	2.5	1.8	0.7	n/a	n/a	n/a	n/a	n/a
4" x 7-ga x 30'[2]	30	7	B	8" - 11"	0.75	2.2	1.4	0.8	n/a	n/a	n/a	n/a	n/a	n/a
5" x 11-ga x 14'	14	11	C	9" - 11"	0.75	17.4	15.7	14.1	11.5	9.3	7.7	6.3	5.2	4.2
5" x 11-ga x 16'	16	11	C	9" - 11"	0.75	13.8	12.3	10.9	8.7	6.9	5.5	4.3	3.3	2.5
5" x 11-ga x 18'	18	11	C	9" - 11"	0.75	10.8	9.6	8.4	6.5	4.9	3.7	2.6	1.8	1.1
5" x 11-ga x 20'	20	11	C	9" - 11"	0.75	8.5	7.3	6.3	4.6	3.2	2.1	1.2	0.5	n/a
5" x 11-ga x 22'	22	11	C	9" - 11"	0.75	10.9	9.5	8.3	6.2	4.5	3.2	2.1	1.2	0.5
5" x 11-ga x 24'	24	11	C	9" - 11"	0.75	8.8	7.5	6.4	4.5	3.0	1.8	0.8	n/a	n/a
5" x 11-ga x 26'	26	11	C	9" - 11"	0.75	6.8	5.7	4.6	3.0	1.6	0.6	n/a	n/a	n/a
5" x 11-ga x 28'	28	11	C	9" - 11"	0.75	5.2	4.1	3.2	1.6	0.4	n/a	n/a	n/a	n/a
5" x 11-ga x 30'	30	11	C	9" - 11"	0.75	3.6	2.7	1.8	0.4	n/a	n/a	n/a	n/a	n/a
5" x 7-ga x 20'	20	7	D	9" - 11"	1.00	21.6	19.3	17.3	14.0	11.3	9.2	7.4	6.0	4.8
5" x 7-ga x 22'	22	7	D	9" - 11"	1.00	20.7	18.6	16.6	13.3	10.7	8.5	6.8	5.4	4.2
5" x 7-ga x 24'	24	7	D	9" - 11"	1.00	17.7	15.6	13.8	10.8	8.5	6.6	5.0	3.7	2.6
5" x 7-ga x 26'	26	7	D	9" - 11"	1.00	14.9	13.1	11.4	8.8	6.6	4.9	3.5	2.3	1.3
5" x 7-ga x 28'	28	7	D	9" - 11"	1.00	12.5	10.9	9.4	6.9	4.9	3.4	2.1	1.0	n/a
5" x 7-ga x 30'	30	7	D	9" - 11"	1.00	10.3	8.9	7.5	5.2	3.4	2.0	0.8	n/a	n/a
5" x 7-ga x 35'	35	7	D	9" - 11"	1.00	6.0	4.8	3.6	1.8	n/a	n/a	n/a	n/a	n/a
6" x 7-ga x 24'	24	7	J	12"	1.00	18.6	16.4	14.3	11.2	8.6	6.5	4.8	3.4	2.2
6" x 7-ga x 26'	26	7	J	12"	1.00	15.6	13.4	11.7	8.8	6.5	4.6	3.0	1.8	0.7
6" x 7-ga x 28'	28	7	J	12"	1.00	12.9	10.9	9.3	6.7	4.6	2.8	1.5	n/a	n/a
6" x 7-ga x 30'	30	7	J	12"	1.00	10.4	8.8	7.3	4.8	2.9	1.3	n/a	n/a	n/a
6" x 7-ga x 32'	32	7	J	12"	1.00	8.3	6.8	5.5	3.1	1.3	n/a	n/a	n/a	n/a
6" x 7-ga x 34'	34	7	J	12"	1.00	6.5	5.0	3.7	1.6	n/a	n/a	n/a	n/a	n/a
6" x 7-ga x 35'	35	7	J	12"	1.00	5.5	4.2	2.9	0.9	n/a	n/a	n/a	n/a	n/a
6" x 7-ga x 39'	39	7	J	12"	1.00	2.3	1.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.
CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

Note:
1- Poles shorter than these listed here in for each gauge have EPA rating equal to or greater than what is provided in this table. To Confirm EPA ratings on shorter poles, contact LSI Industries.
2- LSI Industries recommends a vibration damper be ordered with this length.

Steel Poles - Square Straight

Type: _____

Have questions? Call us at (800) 436-7800

WIND SPEED

POLE[1]	Mtg. Height Length (ft)	Wall Thick (ga)	BOLT CIRCLE			EPA								
			Designator	Dia. (in)	Anchor bolt Dia (in)	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH
5" x 11-ga x 14'	14	11	F	11"	0.75	17.6	15.8	14.2	11.5	9.4	7.7	6.3	5.2	4.3
5" x 11-ga x 14'	14	11	F	13"	0.75	17.6	15.8	14.2	11.5	9.4	7.7	6.3	5.2	4.3
5" x 11-ga x 16'	16	11	F	11"	0.75	13.9	12.2	11.0	8.8	7.0	5.5	4.3	3.4	2.5
5" x 11-ga x 16'	16	11	F	13"	0.75	13.9	12.2	11.0	8.8	7.0	5.5	4.3	3.4	2.5
5" x 11-ga x 18'	18	11	F	11"	0.75	11.0	9.6	8.4	6.5	5.0	3.7	2.7	1.8	1.1
5" x 11-ga x 18'	18	11	F	13"	0.75	11.0	9.6	8.4	6.5	5.0	3.7	2.7	1.8	1.1
5" x 11-ga x 20'	20	11	F	11"	0.75	8.6	7.4	6.4	4.6	3.3	2.2	1.3	0.5	-
5" x 11-ga x 20'	20	11	F	13"	0.75	8.6	7.4	6.4	4.6	3.3	2.2	1.3	0.5	-
5" x 11-ga x 22'	22	11	F	11"	0.75	12.7	11.1	9.6	7.4	5.6	4.1	3.0	2.0	1.1
5" x 11-ga x 22'	22	11	F	12"	0.75	10.3	8.9	7.7	5.7	4.1	2.8	1.8	0.9	-
5" x 11-ga x 22'	22	11	F	13"	0.75	8.6	7.4	6.4	4.6	3.1	2.0	1.1	-	-
5" x 11-ga x 24'	24	11	F	11"	0.75	10.2	8.9	7.6	5.6	4.0	2.6	1.6	0.7	-
5" x 11-ga x 24'	24	11	F	12"	0.75	8.0	6.9	5.8	4.0	2.6	1.5	0.5	-	-
5" x 11-ga x 24'	24	11	F	13"	0.75	6.7	5.5	4.6	3.0	1.7	0.7	-	-	-
5" x 11-ga x 26'	26	11	F	11"	0.75	8.1	6.9	5.8	4.0	2.5	1.3	-	-	-
5" x 11-ga x 26'	26	11	F	12"	0.75	6.2	5.1	4.1	2.6	1.3	-	-	-	-
5" x 11-ga x 26'	26	11	F	13"	0.75	5.0	4.0	3.1	1.6	0.5	-	-	-	-
5" x 11-ga x 28'	28	11	F	11"	0.75	6.3	5.2	4.3	2.5	1.1	-	-	-	-
5" x 11-ga x 28'	28	11	F	12"	0.75	4.6	3.6	2.7	1.2	-	-	-	-	-
5" x 11-ga x 28'	28	11	F	13"	0.75	3.4	2.5	1.7	-	-	-	-	-	-
5" x 11-ga x 30'	30	11	F	11"	0.75	4.7	3.7	2.8	1.2	-	-	-	-	-
5" x 11-ga x 30'	30	11	F	12"	0.75	3.1	2.2	1.4	-	-	-	-	-	-
5" x 11-ga x 30'	30	11	F	13"	0.75	2.0	1.2	0.5	-	-	-	-	-	-
5" x 7-ga x 20'	20	7	G	11"	0.75	19.0	17.0	15.0	12.2	9.7	7.8	6.2	5.0	3.8
5" x 7-ga x 20'	20	7	G	12"	0.75	21.4	19.1	17.1	13.8	11.2	9.1	7.3	5.9	4.7
5" x 7-ga x 20'	20	7	G	13"	0.75	21.4	19.2	17.2	13.9	11.3	9.2	7.4	6.0	4.8
5" x 7-ga x 20'	20	7	G	11"	1	21.7	19.4	17.4	14.0	11.4	9.3	7.5	6.0	4.8
5" x 7-ga x 20'	20	7	G	13"	1	21.7	19.4	17.4	14.0	11.4	9.3	7.5	6.0	4.8
5" x 7-ga x 22'	22	7	G	11"	0.75	16.0	14.1	12.5	9.8	7.6	5.9	4.4	3.3	2.3
5" x 7-ga x 22'	22	7	G	12"	0.75	17.7	15.9	14.2	11.2	8.7	7.0	5.4	4.1	3.0
5" x 7-ga x 22'	22	7	G	13"	0.75	19.9	17.3	15.6	12.6	10.0	8.0	6.3	5.0	3.8
5" x 7-ga x 22'	22	7	G	11"	1	21.0	18.7	16.7	13.4	10.6	8.5	6.8	5.4	4.2
5" x 7-ga x 22'	22	7	G	12"	1	23.4	20.6	18.4	15.0	12.2	9.9	8.0	6.4	5.1
5" x 7-ga x 22'	22	7	G	13"	1	21.3	18.8	17.0	13.7	11.0	8.8	7.0	5.6	4.3
5" x 7-ga x 24'	24	7	G	11"	0.75	13.3	11.6	10.0	7.7	5.7	4.2	2.9	1.9	1.0
5" x 7-ga x 24'	24	7	G	12"	0.75	15.0	13.0	11.6	8.9	6.8	5.1	3.8	2.6	1.7
5" x 7-ga x 24'	24	7	G	13"	0.75	16.6	14.6	12.9	10.2	8.0	6.1	4.6	3.3	2.3
5" x 7-ga x 24'	24	7	G	11"	1	17.5	15.7	13.9	10.9	8.6	6.7	5.0	3.7	2.7
5" x 7-ga x 24'	24	7	G	12"	1	20.0	17.4	15.4	12.3	9.9	7.8	6.0	4.7	3.5
5" x 7-ga x 24'	24	7	G	13"	1	18.1	16.0	14.2	11.0	8.7	6.7	5.3	3.9	2.8
5" x 7-ga x 26'	26	7	G	11"	0.75	10.9	9.3	8.0	5.9	4.1	2.7	1.6	0.6	-
5" x 7-ga x 26'	26	7	G	12"	0.75	12.4	10.9	9.5	7.0	5.1	3.6	2.3	1.3	-
5" x 7-ga x 26'	26	7	G	13"	0.75	14.0	12.3	10.7	8.1	6.0	4.4	3.1	2.0	1.0
5" x 7-ga x 26'	26	7	G	11"	1	15.0	13.2	11.5	8.8	6.7	4.9	3.5	2.3	1.3

Steel Poles - Square Straight

Type: _____

Have questions? Call us at (800) 436-7800

WIND SPEED

POLE[1]	Mtg. Height Length (ft)	Wall Thick (ga)	BOLT CIRCLE			EPA								
			Designator	Dia. (in)	Anchor bolt Dia {in}	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH
5" x 7-ga x 26'	26	7	G	12"	1	17.0	14.8	13.0	10.2	7.9	6.0	4.4	3.1	2.1
5" x 7-ga x 26'	26	7	G	13"	1	15.3	13.5	11.8	9.0	6.8	5.0	3.6	2.5	1.4
5" x 7-ga x 28'	28	7	G	11"	0.75	8.9	7.4	6.3	4.3	2.7	1.4	-	-	-
5" x 7-ga x 28'	28	7	G	12"	0.75	10.2	8.8	7.5	5.3	3.5	2.1	1.0	-	-
5" x 7-ga x 28'	28	7	G	13"	0.75	11.8	10.2	8.8	6.4	4.5	3.0	1.7	0.7	-
5" x 7-ga x 28'	28	7	G	11"	1	12.5	10.9	9.5	7.0	5.0	3.3	2.1	1.0	-
5" x 7-ga x 28'	28	7	G	12"	1	14.2	12.4	11.0	8.2	6.0	4.3	3.0	1.7	0.8
5" x 7-ga x 28'	28	7	G	13"	1	12.9	11.0	9.7	7.2	5.2	3.6	2.2	1.1	-
5" x 7-ga x 30'	30	7	G	11"	0.75	7.0	5.8	4.7	2.8	1.3	-	-	-	-
5" x 7-ga x 30'	30	7	G	12"	0.75	8.4	7.0	5.8	3.8	2.2	0.9	-	-	-
5" x 7-ga x 30'	30	7	G	13"	0.75	9.7	8.2	7.0	4.8	3.0	1.6	0.5	-	-
5" x 7-ga x 30'	30	7	G	11"	1	10.4	8.8	7.6	5.3	3.4	2.0	0.8	-	-
5" x 7-ga x 30'	30	7	G	12"	1	12.0	10.3	9.0	6.4	4.4	2.9	1.6	0.5	-
5" x 7-ga x 30'	30	7	G	13"	1	10.6	9.1	7.7	5.5	3.6	2.1	1.0	-	-
5" x 7-ga x 35'	35	7	G	11"	0.75	3.2	2.2	1.2	-	-	-	-	-	-
5" x 7-ga x 35'	35	7	G	12"	0.75	4.4	3.2	2.2	0.5	-	-	-	-	-
5" x 7-ga x 35'	35	7	G	13"	0.75	5.5	4.2	3.1	1.3	-	-	-	-	-
5" x 7-ga x 35'	35	7	G	11"	1	6.0	4.8	3.6	1.8	-	-	-	-	-
5" x 7-ga x 35'	35	7	G	12"	1	7.3	6.0	4.8	2.7	1.1	-	-	-	-
5" x 7-ga x 35'	35	7	G	13"	1	6.3	5.0	3.8	1.9	-	-	-	-	-
6" x 7-ga x 24'	24	7	H	11"	1	16.5	14.4	12.6	9.6	7.2	5.3	3.8	2.5	1.4
6" x 7-ga x 24'	24	7	H	12-1/2"	1	19.8	17.5	15.4	12.0	9.2	7.0	5.3	3.8	2.7
6" x 7-ga x 24'	24	7	H	14"	1	23.0	20.5	18.0	14.3	11.2	8.9	6.9	5.3	3.8
6" x 7-ga x 26'	26	7	H	11"	1	13.7	11.8	10.2	7.5	5.3	3.6	2.1	1.0	-
6" x 7-ga x 26'	26	7	H	12-1/2"	1	16.5	14.6	12.6	9.6	7.0	5.2	3.6	2.2	1.1
6" x 7-ga x 26'	26	7	H	14"	1	19.6	17.3	15.2	11.7	8.9	6.7	5.0	3.5	2.2
6" x 7-ga x 28'	28	7	H	11"	1	11.0	9.3	7.8	5.5	3.5	1.9	0.6	-	-
6" x 7-ga x 28'	28	7	H	12-1/2"	1	13.8	12.0	10.2	7.5	5.2	3.4	1.9	0.7	-
6" x 7-ga x 28'	28	7	H	14"	1	16.4	14.5	12.5	9.4	6.9	4.7	3.2	1.8	0.7
6" x 7-ga x 30'	30	7	H	11"	1	9.0	7.3	6.0	3.6	1.9	0.5	-	-	-
6" x 7-ga x 30'	30	7	H	12-1/2"	1	11.4	9.6	8.0	5.5	3.4	1.7	-	-	-
6" x 7-ga x 30'	30	7	H	14"	1	14.0	12.0	10.0	7.2	5.0	3.2	1.6	-	-
6" x 7-ga x 32'	32	7	H	11"	1	7.0	5.5	4.2	2.0	-	-	-	-	-
6" x 7-ga x 32'	32	7	H	12-1/2"	1	9.2	7.6	6.0	3.8	1.8	-	-	-	-
6" x 7-ga x 32'	32	7	H	14"	1	11.4	9.7	8.0	5.4	3.2	1.6	-	-	-
6" x 7-ga x 34'	34	7	H	11"	1	5.1	3.7	2.5	0.6	-	-	-	-	-
6" x 7-ga x 34'	34	7	H	12-1/2"	1	7.2	5.6	4.4	2.2	-	-	-	-	-
6" x 7-ga x 34'	34	7	H	14"	1	9.3	7.6	6.2	3.6	1.7	-	-	-	-
6" x 7-ga x 35'	35	7	H	11"	1	4.2	3.0	1.8	-	-	-	-	-	-
6" x 7-ga x 35'	35	7	H	12-1/2"	1	6.2	4.8	3.6	1.4	-	-	-	-	-
6" x 7-ga x 35'	35	7	H	14"	1	8.2	6.6	5.2	2.9	1.0	-	-	-	-
6" x 7-ga x 39'	39	7	H	11"	1	1.0	-	-	-	-	-	-	-	-
6" x 7-ga x 39'	39	7	H	12-1/2"	1	3.0	1.6	0.5	-	-	-	-	-	-
6" x 7-ga x 39'	39	7	H	14"	1	4.6	3.3	2.0	-	-	-	-	-	-

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.

CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

Note:

1- Poles shorter than these listed here in for each gauge have EPA rating equal to or greater than what is provided in this table. To Confirm EPA ratings on shorter poles, contact LSI Industries.

2- LSI Industries recommends a vibration damper be ordered with this length.

Catalog # : _____ Project : _____ Type : _____

Prepared By : _____ Date : _____

Mirada Medium Wall Sconce (XWM)

Outdoor Wall Sconce

IP65 IK08

OVERVIEW	
Lumen Package	3,000 - 21,000
Wattage Range	23 - 175
Efficacy Range (LPW)	125 - 158
Weight lbs(kg)	27 (12.2)
Control Options	IMSBT, ALB, ALS, PCI

QUICK LINKS

Ordering Guide | Performance | Photometrics | Dimensions

FEATURES & SPECIFICATIONS

Construction

- Rugged die-cast aluminum housing contains factory prewired driver and optical unit. Hinged die-cast aluminum wiring access door located underneath.
- Galvanized-steel universal wall mount bracket comes standard with hinging mechanism to easily access the junction box wire connections without removing the luminaire.
- Optional pole-mounting bracket (XPMA) permits mounting to standard poles.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Max shipping weight: 30lbs in carton

Optical System

- State-of-the-Art one piece silicone optic provides industry leading optical control while also acting as an integrated gasket reducing system complexity and improving fixture reliability.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in Types 2, 3, 4, and FT distributions.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93-95%.
- Zero uplight.
- 5000K, 4000K, 3500K, 3000K, and 2700K color temperatures per ANSI C78.377. Also Available in Phosphor Converted Amber with Peak intensity at 610nm.
- 70 or 80CRI Minimum.

Electrical

- High-performance programmable driver features over-voltage, under-voltage, short-circuit and over temperature protection. Custom lumen and wattage packages available.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 Vac) Input 50/60 Hz or optional High Voltage (347-480 Vac).
- L80 Calculated Life: >100k Hours
- Total harmonic distortion (THD): <20%
- 3L to 12L operating temperature: -40°C to +50°C (-40°F to +122°F)
- 15L operating temperature: -40°C to +45°C (-40°F to +113°F).
- 18L operating temperature: -40°C to +40°C (-40°F to +104°F).
- 21L operating temperature: -40°C to +35°C (-40°F to + 95°F).
- Power factor (PF): >.90
- Input power stays constant over life.
- Optional 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Components are fully encased in potting material for moisture resistance. Driver complies with FCC standards. Driver and key electronic components can easily be accessed via hinged door.
- Optional integral emergency battery pack provides 90-minutes of constant power to the LED system, ensuring code compliance. A test switch/indicator button is installed on the housing for ease of maintenance. The fixture delivers 1500 lumens during emergency mode.

Controls

- Integral passive infrared Bluetooth™ motion sensor options. Fixtures operate independently and can be commissioned via an iOS or Android configuration app. Updates and modifications to the control strategy are easily implemented via an intuitive app.
- The ALBMRxLR utilizing an external antenna for long range communications allows for Bluetooth Mesh wireless up to 100' from node to node. Ensures reliable wireless communications for applications where only wall-mount fixture product is being utilized.

Installation

- Universal wall mounting plate easily mounts directly to 4" octagonal or square junction box.
- 2 fasteners secure the hinged door underneath the housing and provide quick & easy access to the electrical compartment for installing/servicing.
- Optional terminal block accepts up to 12 ga wire.

Warranty

- LSI luminaires carry a 5-year limited warranty. Refer to https://www.lsicorp.com/resources/terms-conditions-warranty/ for more information.
- 1 Year warranty on Battery Back-up option.

Listings

- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- IDA compliant; with 3000K or lower color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet Locations.
- IP65 rated luminaire per IEC 60598.
- 3G rated for ANSI C136.31 high vibration applications when pole mounted (using optional XPMA bracket) or wall mounted.
- IK08 rated luminiare per IEC 66262 mechanical impact code
- DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

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Mirada Medium Wall Sconce (XWM) Outdoor Wall Sconce

Type : _____

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ORDERING GUIDE

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TYPICAL ORDER EXAMPLE: XWM 2 LED 03L 30 UE BRZ ALSC

Family	Distribution	Light Source	Lumen Package	Color Temperature
XWM - Mirada Medium Wall Sconce	**2** - Type 2 **3** - Type 3 **4** - Type 4 **FT** - Type 4 Forward Throw	**LED**	**3L** - 3,000 **4L** - 4,000 **6L** - 6,000 **8L** - 8,000 **12L** - 12,000 **15L** - 15,000 **18L** - 18,000 **21L** - 21,000 **Custom Lumen Packages**[1]	**50** - 5000K (70CRI) **50K8** - 5000K (80CRI) **40** - 4000K (70CRI) **40K8** - 4000K (80CRI) **35K8** - 3500K (80CRI) **30** - 3000K (70 CRI) **30K8** - 3000K (80 CRI) **27K8** - 2700K (80 CRI) **AMB** - Phosphor Converted Amber[2]

Voltage	Finish	Controls	Options
UE - Universal Voltage (120-277V) **HV** - High Voltage (347-480V)	**BLK** - Black **BRZ** - Dark Bronze **GMG** - Gun Metal Gray **GPT** - Graphite **MSV** - Metallic Silver **PLP** - Platinum Plus **SVG** - Satin Verde Green **WHT** - White	**Blank** - None **Wireless Controls** **ALSC** - Airlink Synapse Control System **ALSCS01** - AirLink Synapse Control System with 8-12' Motion Sensor **ALSCS02** - AirLink Synapse Control System with 12-20' Motion Sensor **ALBMR1LR** - AirLink Blue Wireless Motion & Photo Sensor Controller (8 - 15') mounting height)[3] **ALBMR2LR** - AirLink Blue Wireless Motion & Photo Sensor Controller (16 - 40' mounting height)[3] **Standalone Controls** **DIM** - 0-10v Dimming leads extended to housing exterior **IMSBT1L** -Integral Bluetooth™ Motion and Photocell Sensor (8-24' MH)[3,4] **IMSBT2L** - Integral Bluetooth™ Motion and Photocell Sensor (25-40' MH)[3,4] **Button Type Photocells** **PCI120** - 120V **PCI208-277** - 208 -277V **PCI347** - 347V	**Blank** - None **BB** - Battery Back-up (0°C)[5] **CWBB** - Cold Weather Battery Backup (-20°C)[5] **XPMA** - Pole Mounting Bracket **SP1** - 10kV Surge Protection **TB** - Terminal Block

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FUSING ACCESSORY ORDERING INFORMATION[6]

Part Number	Description
FK120[7]	FK120 - Single Fusing
FK277[7]	FK277 - Single Fusing
FK347[7]	FK347 - Single Fusing
DFK208[7]	DFK - Double Fusing
DFK240[7]	DFK - Double Fusing (240V)
DFK480[7]	DFK - Double Fusing (480V)

MOUNTING ACCESSORY ORDERING INFORMATION[6]

Part Number[8]	Description
809374CLR	XWM Wet Location Surface Conduit/Wiring Box
751632	10' Linear Bird Spike Kit (2' Recommended per Luminaire)

1 Custom lumen and wattage packages available consult factory. Values are within industry standard tolerances but not DLC listed.
2 Only available in 6L Lumen Package. Consult factory for lead time and availability.
3 IMSBT and ALBMRxLR control options are not available in 3L or 4L lumen packages when high voltage (HV) is specified.
4 IMSBTxL is field configurable via the Leviton app that can be downloaded from your smartphone's app store.
5 Not available in HV.
6 Accessories are shipped separately and field installed.
7 Fusing must be located in a hand hole for pole or in the junction box.
8 "CLR" to be replaced by paint finish selection. See Finish options for paint color selections.

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PERFORMANCE

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Delivered Lumens[1]

Lumen Package	Distribution	CRI	3000K			4000K			5000K			Wattage
			Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	
3L	2	70	3,178	138	B1-U0-G1	3,368	146	B1-U0-G1	9,853	159	B1-U0-G1	23
	3		3,224	140	B1-U0-G1	3,416	148	B1-U0-G1	3,361	145	B1-U0-G1	
	4		3,210	140	B1-U0-G2	3,364	146	B1-U0-G2	3,294	143	B1-U0-G2	
	FT		3,160	137	B1-U0-G1	3,349	145	B1-U0-G1	3,294	143	B1-U0-G1	
4L	2	70	4,230	139	B1-U0-G1	4,483	147	B1-U0-G1	4,410	145	B1-U0-G1	30
	3		4,291	141	B1-U0-G1	4,547	150	B1-U0-G1	4,473	147	B1-U0-G1	
	4		4,234	141	B1-U0-G2	4,437	148	B1-U0-G2	4,344	145	B1-U0-G2	
	FT		4,206	138	B1-U0-G1	4,458	147	B1-U0-G1	4,385	144	B1-U0-G1	
6L	2	70	6,326	134	B2-U0-G1	6,704	142	B2-U0-G2	6,595	140	B2-U0-G2	47
	3		6,417	136	B1-U0-G2	6,800	144	B2-U0-G2	6,689	142	B2-U0-G2	
	4		6,336	135	B1-U0-G3	6,640	141	B1-U0-G3	6,500	138	B1-U0-G3	
	FT		6,290	134	B2-U0-G2	6,666	142	B2-U0-G2	6,557	139	B2-U0-G2	
8L	2	70	8,166	128	B2-U0-G2	8,654	135	B2-U0-G2	8,513	133	B2-U0-G2	64
	3		8,283	129	B2-U0-G2	8,778	137	B2-U0-G2	8,635	134	B2-U0-G2	
	4		8,362	131	B1-U0-G3	8,763	137	B2-U0-G3	8,579	134	B1-U0-G3	
	FT		8,120	126	B2-U0-G2	8,605	134	B2-U0-G2	8,465	132	B2-U0-G2	
12L	2	70	11,492	149	B2-U0-G2	12,033	156	B3-U0-G2	11,927	155	B3-U0-G2	77
	3		11,757	153	B2-U0-G2	12,311	160	B2-U0-G2	12,203	158	B2-U0-G2	
	4		11,486	149	B2-U0-G3	12,058	157	B2-U0-G3	11,716	152	B2-U0-G3	
	FT		11,721	152	B2-U0-G2	12,274	159	B2-U0-G3	12,166	158	B2-U0-G3	
15L	2	70	14,221	145	B3-U0-G2	14,891	152	B3-U0-G2	14,760	151	B3-U0-G2	98
	3		14,549	148	B2-U0-G2	15,235	155	B2-U0-G2	15,101	154	B2-U0-G2	
	4		14,099	144	B2-U0-G3	14,801	151	B2-U0-G3	14,382	147	B2-U0-G3	
	FT		14,505	148	B2-U0-G3	15,189	155	B2-U0-G3	15,055	154	B2-U0-G3	
18L	2	70	16,894	138	B3-U0-G3	17,690	145	B3-U0-G3	17,534	144	B3-U0-G3	122
	3		17,285	142	B3-U0-G3	18,099	148	B3-U0-G3	17,940	147	B3-U0-G3	
	4		16,951	139	B2-U0-G3	17,795	146	B3-U0-G3	17,291	142	B3-U0-G3	
	FT		17,231	141	B3-U0-G3	18,044	148	B3-U0-G3	17,885	147	B3-U0-G3	
21L	2	70	19,961	133	B3-U0-G3	20,902	139	B3-U0-G3	20,718	138	B3-U0-G3	150
	3		20,422	136	B3-U0-G3	21,385	143	B3-U0-G3	21,197	141	B3-U0-G3	
	4		19,768	132	B3-U0-G4	20,753	138	B3-U0-G5	20,165	134	B3-U0-G4	
	FT		20,360	136	B3-U0-G3	21,320	142	B3-U0-G3	21,132	141	B3-U0-G3	

LUMEN SCALING FACTOR

70CRI - 80CRI	3000K 70CRI - 3500K 80CRI	3000K 70CRI - 2700K 80CRI
0.93	1.00	0.86

Electrical Data (Amps) - 2700K/3000K/3500K/4000K/5000K[2]

Lumen Package	120V	208V	240V	277V	347V	480V
3L	0.19	0.11	0.10	0.08	0.07	0.05
4L	0.25	0.14	0.13	0.11	0.09	0.06
6L	0.39	0.23	0.20	0.17	0.14	0.10
9L	0.53	0.31	0.27	0.23	0.18	0.13
12L	0.64	0.37	0.32	0.28	0.22	0.16
15L	0.82	0.47	0.41	0.35	0.28	0.20
18L	1.02	0.59	0.51	0.44	0.35	0.25
21L	1.25	0.72	0.63	0.54	0.43	0.31

Recommended Lumen Maintenance - XWM[3]

Ambient Temperature C°	Initial[4]	25K hrs.[4]	50K hrs.[4]	75K hrs.[5]	100K hrs.[5]
35	99%	97%	95%	93%	91%
50	100%	98%	95%	93%	90%

Delivered Lumens (Phosphor Converted Amber)

Lumen Package	Distribution	Amber			Wattage
		Delivered Lumens	Efficacy	BUG Rating	
6L	2	3,325	76	B1-U0-G1	44
	3	3,385	78	B1-U0-G1	
	4	3,310	75	B1-U0-G1	
	FT	3,343	77	B1-U0-G1	

1 LEDs are frequently updated therefore values are nominal
2 Electrical data at 25C (77F). Actual wattage may differ by +/-10%.
3 Lumen maintenance values at 25°C are calculated per TM-21 based on LM-80 data and in-situ luminaire testing.
4 In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times (6X) the IESNA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip).
5 In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times NA LM-80-08 total test duration (in hours) for the device under testing ((DUT) i.e. the packaged LED chip).

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PHOTOMETRICS

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Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

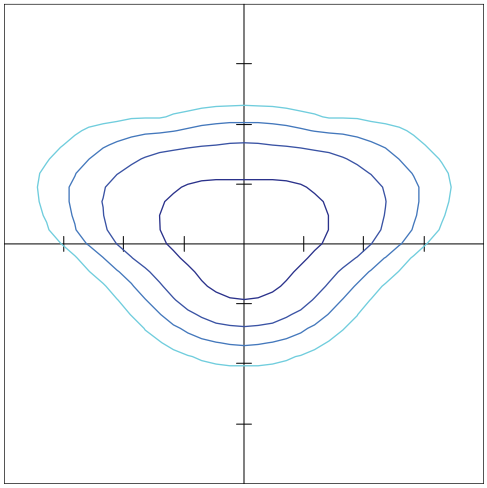
See the individual product page on https://www.lsicorp.com/ for detailed photometric data.

XWM-2-LED-12L-40

Luminaire Data	
Type 2 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	12,033
Watts	77
Efficacy	156
IES Type	Type II - Short
BUG Rating	B3-U0-G2

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	1,961	16%
Medium (30-60°)	6,874	57%
High (60-80°)	3,014	25%
Very High (80-90°)	184	2%
Uplight (90-180°)	0	0%
Total Flux	12,033	100%

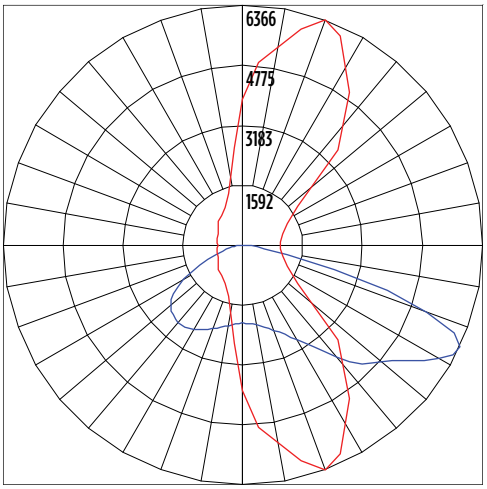
ISO Footcandle



15' Mounting Height / 15' Grid Spacing

5 FC 2 FC 1 FC 0.5 FC

Polar Curve



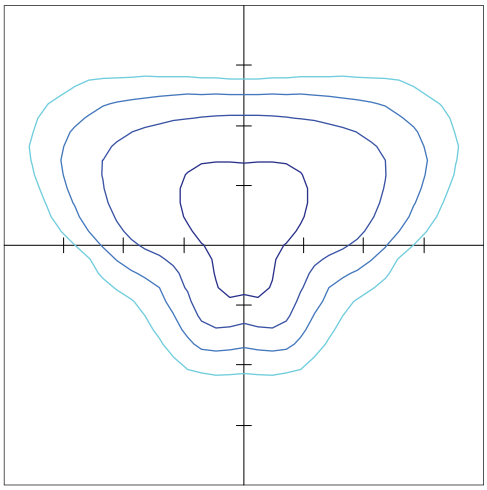
Vertical Plane Horizontal Cone

XWM-3-LED-12L-40

Luminaire Data	
Type 3 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	12,311
Watts	77
Efficacy	160
IES Type	Type III - Short
BUG Rating	B2-U0-G2

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	1,340	11%
Medium (30-60°)	6,164	50%
High (60-80°)	4,549	37%
Very High (80-90°)	258	2%
Uplight (90-180°)	0	0%
Total Flux	12,311	100%

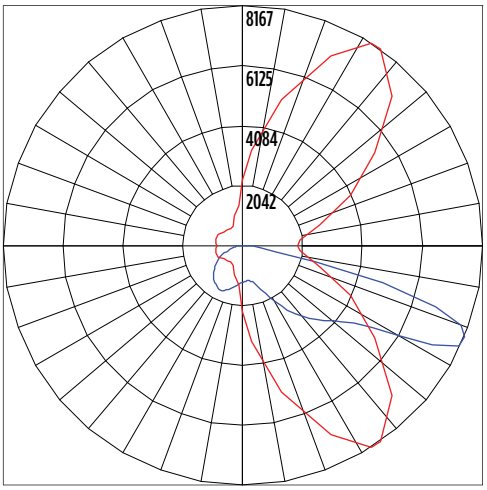
ISO Footcandle



15' Mounting Height / 15' Grid Spacing

10 FC 5 FC 2 FC 1 FC

Polar Curve



Vertical Plane Horizontal Cone

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Mirada Medium Wall Sconce (XWM) Outdoor Wall Sconce

Type : _____

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PHOTOMETRICS

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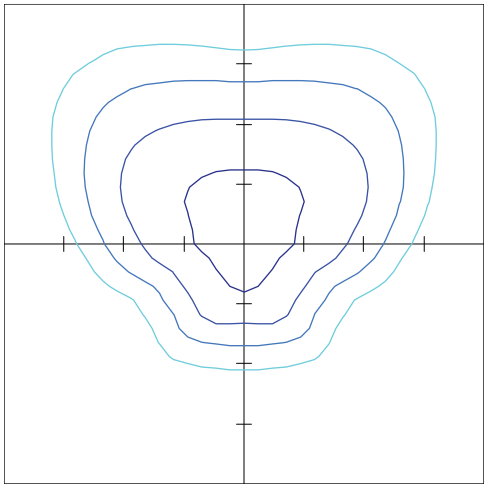
XWM-FT-LED-12L-40

Luminaire Data	
Type FT Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	12,274
Watts	77
Efficacy	159
IES Type	Type IV - Short
BUG Rating	B2-U0-G3

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	1,578	13%
Medium (30-60°)	5,798	47%
High (60-80°)	4,576	37%
Very High (80-90°)	322	3%
Uplight (90-180°)	0	0%
Total Flux	12,274	100%

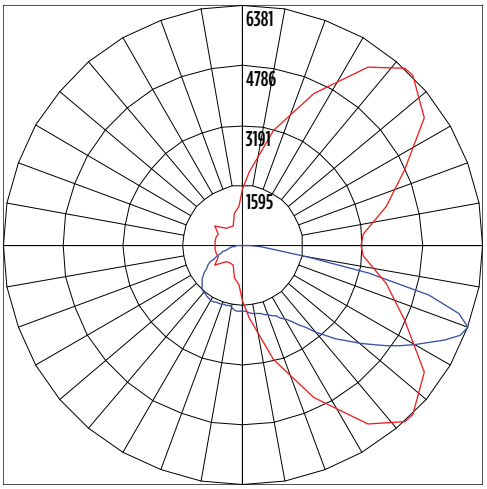
ISO Footcandle



15' Mounting Height / 15' Grid Spacing

5 FC 2 FC 1 FC 0.5 FC

Polar Curve



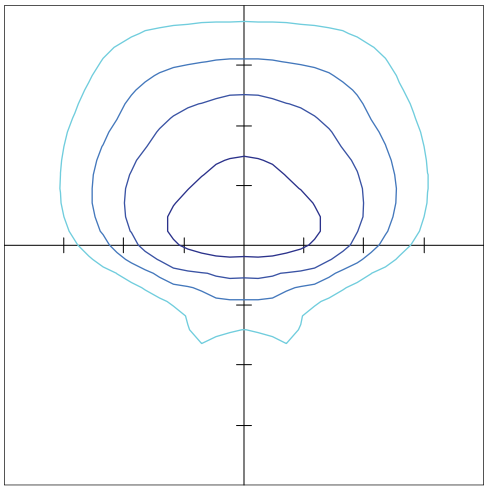
Vertical Plane Horizontal Cone

XWM-4-LED-12L-40

Luminaire Data	
Type 4 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	12,058
Watts	77
Efficacy	157
IES Type	Type IV - Very Short
BUG Rating	B2-U0-G3

Zonal Lumen Summary		
Zone	**Lumens**	**% Luminaire**
Low (0-30°)	1,345	11%
Medium (30-60°)	5,394	45%
High (60-80°)	4,855	40%
Very High (80-90°)	464	4%
Uplight (90-180°)	0	0%
Total Flux	12,058	100%

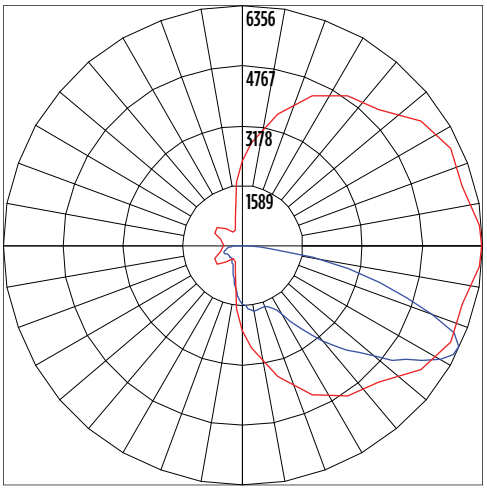
ISO Footcandle



15' Mounting Height / 15' Grid Spacing

5 FC 2 FC 1 FC 0.5 FC

Polar Curve



Vertical Plane Horizontal Cone

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Mirada Medium Wall Sconce (XWM) Outdoor Wall Sconce

Type : _____

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PRODUCT DIMENSIONS

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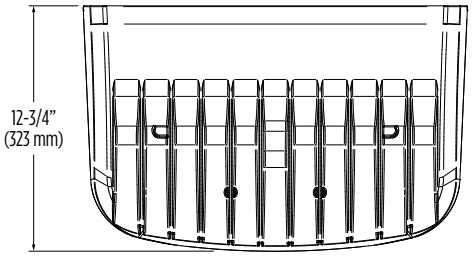
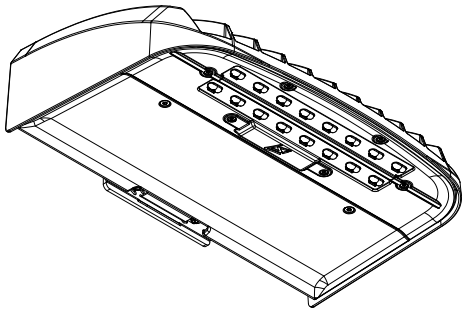
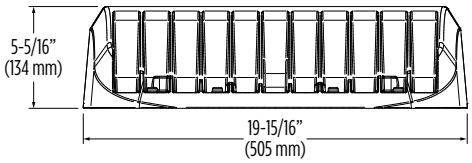
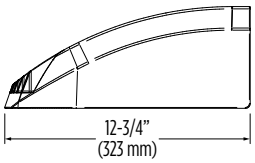


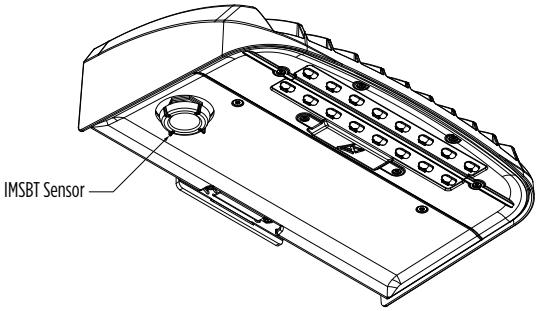






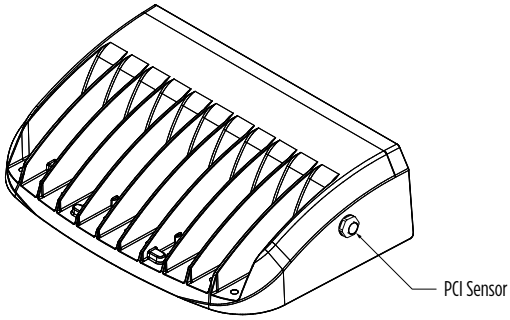
Mirada Medium Wall Sconce with Integral Bluetooth™ Motion and Photocell Sensor

(XWM IMSBTxL)



Mirada Medium Wall Sconce with Button Type Photocell

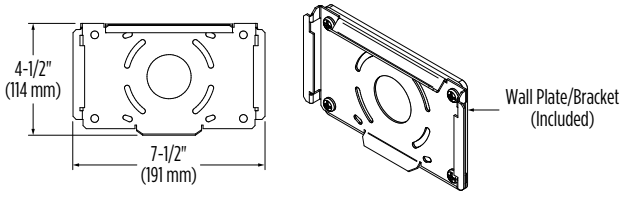
(XWM PCI)



Mounting Options

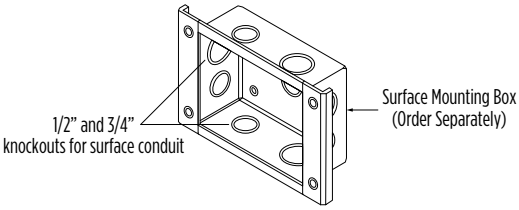
Mounting Over Junction Box

(Standard/Included)



XWM Wet Location Surface Conduit/Wiring Box

(809374CLR)



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CONTROLS

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Integral Bluetooth™ Motion and Photocell Sensor (IMSBTxL)

Slim low profile sensor provides multi-level control based on motion and/or daylight. Sensor controls 0-10 VDC LED drivers and is IP66 rated for cold and wet locations (-40°F to 167°F). Two unique PIR lenses are available and used based on fixture mounting height. All control parameters are adjustable via an iOS or Android App capable of storing and transmitting sensor profiles.

Click here to learn more details about IMSBT

LEVITON App Apple Android

AirLink Wireless Lighting Controller (ALSC, ALSCS)

The AirLink integrated controller is a California Title 24 compliant lighting controller that provides real-time light monitoring and control with utility-grade power monitoring. It includes a 24V sensor input and power supply to connect a sensor into the outdoor AirLink wireless lighting system. The wireless integrated controller is compatible with this fixture.

Click here to learn more details about AirLink

AirLink Blue (ALBMRxLR)

Wireless Bluetooth Mesh Outdoor Lighting Control System that provides energy savings, code compliance and enhanced safety/security for parking lots and parking garages. Three key components; Bluetooth wireless radio/sensor controller, Time Keeper and an iOS App. Capable of grouping multiple fixtures and sensors as well as scheduling time-based events by zone. Radio/Sensor Controller is factory integrated into Area/Site, Wall Mounted, Parking Garage and Canopy luminaires.

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AirLink Blue App Apple

Sensor Sequence of Operations

Standard Programming	On Event	Off Event	On Light Level	Dim Light Level	Daylight Harvesting	Delay To Off	Sensitivity
IMSBTxL	Motion	No Motion	100%	N/A	On; Auto Calibration	20 minutes	High

Operation	Description
On Event	Trigger that activates lights to turn on; either automatic via motion detected or manually activated via push of button.
Off Event	Trigger that activates lights to turn off; either automatic via no motion detected or manually activated via push of button.
On Light Level	The light level that the fixtures will turn on to when ON EVENT occurs.
Dim Light Level	The light level that the fixtures will dim down to when no motion is detected.
Delay to Dim	The amount of time after which no motion is detected that the fixtures will be triggered to dim down. This sequence is optional, and sensor can be programmed to only trigger the fixture to turn off by entering 100% in this field.
Delay to Off	The amount of time after which no motion is detected that the fixtures will be triggered to turn off. If delay to dim is part of the programmed functionality, this is the amount of time after which no motion is detected after the fixture have already dimmed down.
Sensitivity	The sensitivity can be set to high, medium, low, or auto where applicable. High will detect smaller, simple motions. Low will only detect larger more complex motions. Auto temperature calibration adjusts the PIR sensitivity as ambient temperature rises to increase detection of heat movement through the field of view.

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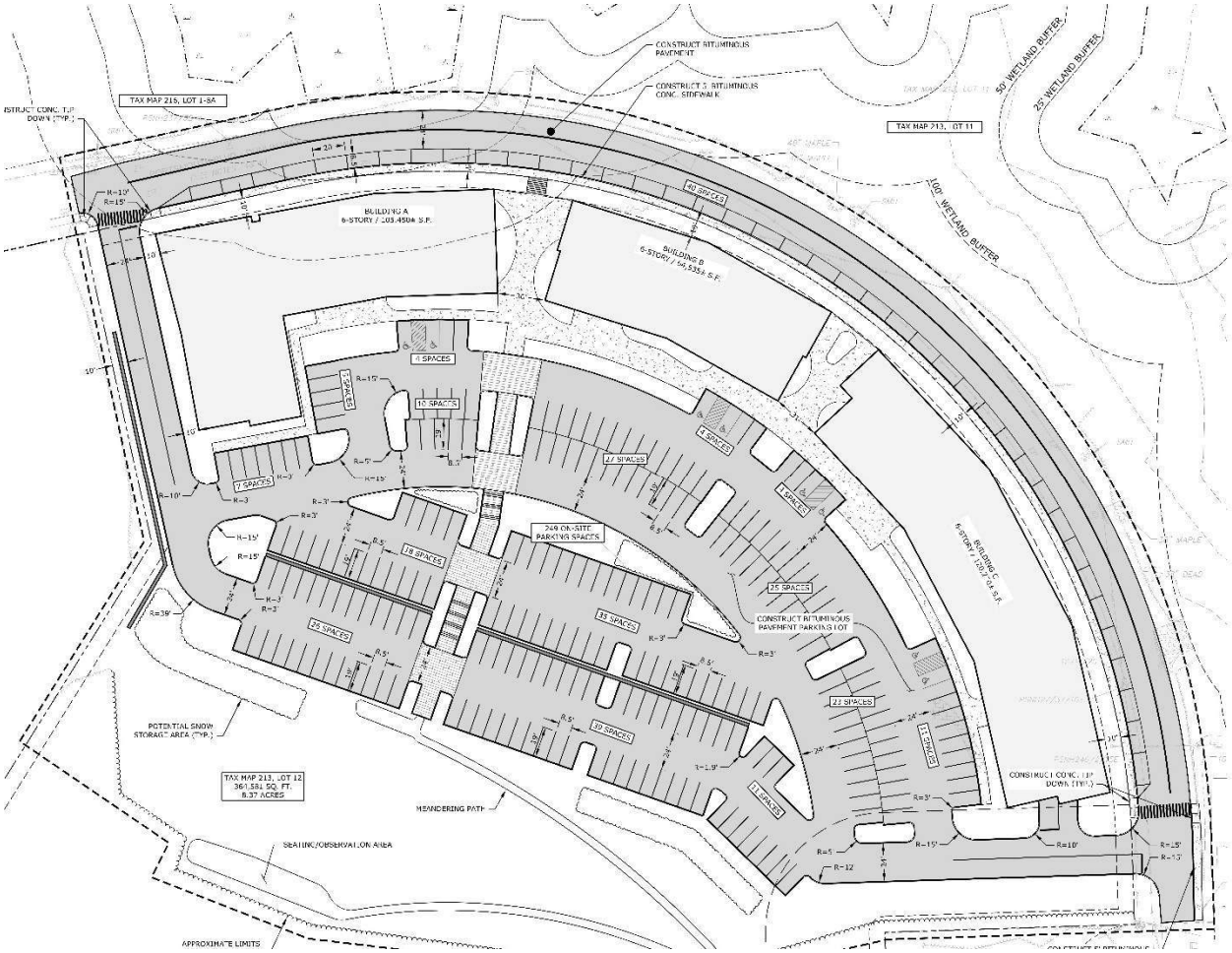

150 Portsmouth Boulevard Multi-Family Development
Portsmouth, NH

TRAFFIC IMPACT STUDY

September 22, 2025

Tighe&Bond

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Section 1
Study Overview

This Traffic Impact Study (TIS) evaluates the potential traffic impact of the proposed multi-family development located at 150 Portsmouth Boulevard in the City of Portsmouth, New Hampshire. The site is bounded by Portsmouth Boulevard to the north and west, Homewood Suites by Hilton to the south, and a residential neighborhood to the east. Figure 1 shows the Site location relative to the surrounding roadway network.

The project proposes to construct 274 residential units spread across three six-story buildings. On-site parking will be provided by surface parking lots and an underground parking structure. Site access will be provided via the two full-access driveways: the western driveway to Portsmouth Boulevard and the eastern driveway to Dunlin Way. The project is expected to be completed in 2027.

Based on the analyses conducted, it is the professional opinion of Tighe & Bond that the additional traffic expected to be generated by the proposed residential development is not expected to have a significant impact on traffic operations within the study area.

Section 2
Existing Conditions

The Project site is bounded by Portsmouth Boulevard to the north and west, Homewood Suites by Hilton to the south, and a residential neighborhood to the east. The property is proposed to be accessible via two full-access driveways with access to Portsmouth Boulevard to the west and Dunlin Way to the east. The following sections provide details on the adjacent roadways within the study area.

2.1 Roadways

2.1.1 Woodbury Avenue

Woodbury Avenue is classified as an urban minor arterial from Market Street to Commerce Way and is maintained by the City of Portsmouth. South of the Market Street intersection, Woodbury Road is classified as an urban major collector. The roadway is located southwest of the site location and primarily runs north-south in the study area. Woodbury Avenue runs from the Spaulding Turnpike interchange in Newington to the north and terminates at an intersection with Bartlett Street in the south.

Within the study area, northbound and southbound traffic are divided by an approximately ten-foot-wide raised concrete median. Woodbury Avenue typically provides two travel lanes in each direction with two- to four-foot-wide marked shoulders, widening at intersections to provide additional turning lanes. An approximately five- to seven-foot sidewalk is provided along both sides of Woodbury Avenue throughout the entire study area. Woodbury Avenue has a posted speed limit of 30 miles per hour (mph) in both directions.

2.1.2 Market Street

Market Street is classified as an urban minor arterial and is maintained by the City of Portsmouth. The roadway is located south of the site location and runs primarily in the east-west direction connecting Woodbury Avenue to the west and downtown Portsmouth to the east. Eastbound and westbound traffic on Market Street is divided by a six-foot wide raised concrete median between the I-95 Ramps and Woodbury Avenue.

The roadway generally provides two 11-foot travel lanes in each direction with two-foot-wide shoulders. A five-foot sidewalk is provided on the north side of the roadway within the study area. A pedestrian bridge is provided to cross Market Street at the intersection with Portsmouth Boulevard. Marked crosswalks are provided at Woodbury Avenue and the I-95 ramps. Market Street has a posted speed limit of 35 mph in both directions.

2.1.3 Portsmouth Boulevard

Portsmouth Boulevard is classified as local roadway and is maintained by the City of Portsmouth. The roadway runs north-south between Market Street to the south to extending north until it turns into Dunlin Way. A landscaped center median is provided between Market Street and Commerce Way. The roadway generally provides one 12-foot travel lane in each direction with turn lanes provided at the intersections with Market Street and Commerce Way. No shoulders are provided. Asphalt sidewalks are provided along the east side of the roadway between Market Street and the existing barricade located approximately 75 feet north of the existing northern hotel driveway. Existing

crosswalks are provided across Portsmouth Boulevard at the 75 Portsmouth Boulevard driveway and on the south leg of Portsmouth Boulevard at Commerce Way.

2.1.4 Commerce Way

Commerce Way is classified as a local roadway and is maintained by the City of Portsmouth. The roadway runs east-west, connecting Woodbury Avenue to Portsmouth Boulevard and providing access to office and other commercial uses along the roadway. The roadway provides one approximate 12-foot-wide travel lane with narrow shoulders in each direction, widening at the Woodbury Avenue and Portsmouth Boulevard intersections to provide additional turn lanes. A landscaped median is provided between the northern Portsmouth Plaza driveway and where the point at which the roadway turns southeast. An approximate five-foot wide sidewalk is provided along the south side of the roadway with mid-block crossing provided periodically at business driveways and bus stops.

2.2 Study Area Intersections

2.2.1 Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway

Commerce Way and the Durgin Square Plaza driveway intersect Woodbury Avenue at a signalized intersection, with Commerce Way approaching from the east, the Durgin Square Plaza driveway approaching from the west, and Woodbury Avenue running north-south. The Commerce Way westbound approach provides two lanes, with an exclusive right-turn lane and a shared through/left-turn lane. The Durgin Square Plaza driveway eastbound approach consists of two lanes, with an exclusive right-turn lane and a shared through/left-turn lane. The northbound and southbound Woodbury Avenue approaches provide three lanes, with one left-turn lane, one through lane, and one shared through/right-turn lane. Left-turn movements from Woodbury Avenue northbound and southbound are controlled with protected signal phases with right-turn side street overlaps provided during these phases. The eastbound and westbound approaches operate under split phasing. As previously described, a sidewalk is provided on both sides of Woodbury Avenue through the intersection, with a crosswalk across all four approaches and an exclusive pedestrian phase. Sidewalk is also provided on the south side of Commerce Way and the Durgin Square Plaza driveway. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.2 Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway

Arthur F Brady Drive and the Portsmouth Plaza driveway intersect Woodbury Avenue at a signalized intersection, with Arthur F Brady Drive approaching from the west, the Portsmouth Plaza Driveway approaching from the east, and Woodbury Avenue running north-south. The Arthur F Brady Drive eastbound approach provides two lanes, with an exclusive right-turn lane and a shared through/left-turn lane. The Portsmouth Plaza driveway westbound approach consists of two lanes, with an exclusive right-turn lane and a shared through/left-turn lane. The northbound and southbound Woodbury Avenue approaches provide three lanes, with one left-turn lane, one through lane, and one shared through/right-turn lane. Left-turn movements from Woodbury Avenue northbound and southbound are controlled with exclusive signal phases. The eastbound and westbound approaches operate under split phasing. As previously described, a sidewalk is provided on both sides of Woodbury Avenue through the intersection, with a

crosswalk across all four approaches and an exclusive pedestrian phase. Sidewalk is also provided on the north side of Arthur F Brady Drive. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.3 Woodbury Avenue at Market Street/Market Basket Driveway

Woodbury Avenue turns to the south at its intersection with Market Street and the Market Basket driveway, all meeting to form a four-way signalized intersection. Woodbury Avenue forms the south and west legs, Market Street forms the east leg, and the Market Basket driveway forms the north leg. The eastbound Woodbury Avenue approach provides a dedicated right-turn lane, two through lanes, and a dedicated left-turn lane. The northbound Woodbury Avenue approach provides a shared right-turn and through lane and two dedicated left-turn lanes. The westbound Market Street approach provides a shared through/ right-turn lane, a through lane, and a dedicated left-turn lane. The southbound Market Basket Driveway approach provides a shared right and through lane and a dedicated left-turn lane. The east, west, and south legs are divided by a raised concrete median while the north leg is divided by a raised median with landscaping. Protected only left-turn phasing is provided on the Woodbury Avenue eastbound and Market Street westbound approaches. The northbound and southbound approaches operate under split phasing. Sidewalks are provided along the north side of Market Street and both sides of Woodbury Avenue and the Market Basket driveway. Crosswalks are provided across all intersection legs, and an exclusive pedestrian phase is provided for the intersection. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.4 Market Street at Portsmouth Boulevard

Market Street runs east-west and is intersected by Portsmouth Boulevard to the north to form a three-way signalized intersection. The eastbound and westbound approaches provide dedicated left- and right-turn lanes, respectively, to Portsmouth Boulevard along with two through lanes in each direction. The Portsmouth Boulevard southbound approach provides one right-turn lane and dual left-turn lanes. The east and west legs are divided by a raised concrete median while the north leg is divided by a raised median with landscaping. Protected only left-turn phasing is provided on the Market Street eastbound approach with a southbound right-turn overlap. Sidewalks are provided along the north side of Market Street and the east side of Portsmouth Boulevard. A crosswalk is provided across Portsmouth Boulevard with a concurrent pedestrian phase. A pedestrian bridge is provided over the east leg. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.5 Market Street at I-95 Southbound Ramps

The I-95 southbound on- and off-ramps intersect Market Street to form a four-way signalized intersection. Market Street runs east-west, the I-95 southbound off-ramp approaches from the north, and the corresponding on-ramp exits the intersection to the south. The eastbound approach provides four lanes, with a channelized right-turn lane under yield control and three through lanes under signal control. The westbound approach provides a left-turn lane and two through lanes. The southbound approach provides one right-turn lane, one left-turn lane, and one shared right- and left-turn lane. The east leg is divided by a raised concrete median while the west leg is divided by a raised median with landscaping. Protected only left-turn phasing is provided on the Market Street westbound approach. A sidewalk is provided along the north side of Market Street. A crosswalk is provided across the I-95 southbound off-ramp with concurrent pedestrian phasing. A dedicated bicycle lane on the south side of Market

Street begins at the intersection and transitions to an off-road bicycle side path adjacent the roadway to the east of the intersection. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.6 Market Street at I-95 Northbound Ramps

The I-95 NB Ramps intersect Market Street to form a four-way signalized intersection. Market Street runs east-west, the I-95 NB Off-Ramp approaches from the south, and the corresponding On-Ramp exits the intersection to the north. The eastbound approach provides four lanes, with two left-turn lanes and two through lanes. The westbound approach provides a channelized right-turn lane under yield control and two through lanes controlled by the signal. The northbound approach provides one right-turn lane and one left-turn lane. The west leg is divided by a raised concrete median while the east leg is divided by a raised median with landscaping. Protected only left-turn phasing is provided on the Market Street eastbound approach. A sidewalk is provided along the north side of Market Street, west of the intersection, and along both sides of Market Street, east of the intersection. Crosswalks are provided across the I-95 northbound on-ramp and the east leg of Market Street with concurrent pedestrian phasing. The eastbound off-road bicycle side path transitions back to a bicycle lane within the roadway east of the intersection. Marked edge lines are provided on all approaches with a 1-to-2-foot offset from the curb.

2.2.7 Portsmouth Boulevard at Commerce Way/Osprey Drive

Commerce Way and Osprey Drive intersect Portsmouth Boulevard to form a four-way stop-controlled intersection. Portsmouth Boulevard runs north-south, Commerce Way approaches from the west, and Osprey Drive approaches from the east. The northbound approach provides two lanes, with one left-turn lane and one shared through and right-turn lane. The southbound approach provides one right-turn lane and one shared through/ left-turn lane. The eastbound approach provides one right-turn lane and one shared through/ left-turn lane. The westbound approach provides one all-purpose travel lane. The north leg is divided by a raised median with landscaping. All four approaches operate under stop-control. A sidewalk is provided along the east side of Portsmouth Boulevard and south side of Commerce Way and Osprey Drive. Crosswalks are provided across the south and east legs. Marked edge lines are provided on Commerce Way with a 1-to-2-foot offset from the curb.

2.3 Traffic Volumes

Turning movement counts (TMC) were collected at the study area intersections on Wednesday, July 9, 2025, during the weekday morning (7:00 AM to 9:00 AM) and weekday afternoon peak periods (3:00 PM to 6:00 PM) and on Saturday, July 12, 2025, during the Saturday midday peak period (11:00 AM to 1:00 PM). Automatic Traffic Recorder (ATR) counts were collected on Portsmouth Boulevard, south of Commerce Way, during a 48-hour period from Wednesday, July 9, 2025, through Thursday, July 10, 2025, concurrently with the TMC to record hourly traffic volumes and vehicular speeds. Pedestrian count data was also collected on the pedestrian bridge over Market Street at Portsmouth Boulevard on July 9, 2025, during the weekday morning and afternoon peak periods and on July 12, 2025, during the Saturday midday peak period.

The weekday morning, weekday afternoon, and Saturday midday TMCs were seasonally adjusted to a peak month per NHDOT guidelines based on 2024 Seasonal Adjustment Data available from NHDOT. A seasonal adjustment factor of 1.01 was applied to the traffic volumes based on Group 4 Averages: Urban Highways for the month of July. The

adjusted 2025 existing traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figure 2. The raw TMC data is provided in Appendix A. The NHDOT seasonal adjustment factors are enclosed in Appendix B.

The ATR data from Portsmouth Boulevard indicated average daily traffic (ADT) of approximately 1,500 vehicles per day in the northbound direction and 1,700 vehicles per day in the southbound direction. The measured 85th percentile speeds, also known as the operating speed of the roadway, were approximately 24 mph and 26 mph in the northbound and southbound directions, respectively.

Peak hour pedestrian count data collected on the pedestrian bridge over Market Street at Portsmouth Boulevard yielded 8 pedestrians (5 northbound, 3 southbound) during the weekday morning peak hour, 7 pedestrians (4 northbound, 3 southbound) during the weekday afternoon peak hour, and 4 pedestrians (1 northbound, 3 southbound) during the Saturday midday peak hour.

2.4 Capacity and Queue Analyses - Existing Condition

Capacity and queue analyses were performed for the study intersections for the 2025 Existing Conditions during the weekday morning, weekday afternoon, and Saturday midday peak hours. Analyses were conducted using Trafficware Synchro Studio 11 software, which conducts the analysis based on *Highway Capacity Manual (HCM)* methodology. Consistent with NHDOT guidelines, analyses for signalized intersections were conducted using methods of the 2000 HCM, while analysis for unsignalized intersections utilized the HCM 6th Edition methodology. The analysis results are categorized in terms of Level of Service (LOS), which describes the qualitative intersection operational conditions based on the calculated average delay per vehicle. A summary of the HCM capacity analysis methodology and a detailed definition of LOS is provided in Appendix C. The queue analysis results are summarized based upon the length of vehicle queueing on an intersection approach. For unsignalized intersections, queues are quantified for 95th percentile (design queues). For signalized intersections, queues are quantified by 95th percentile (design) and 50th percentile (average) queues. Tables 1 and 2 in Section 7 summarize the capacity and queue analyses results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix D.

As shown in Table 1, all of the overall intersections and a majority of the individual intersection approaches operate at acceptable at LOS D or better during the peak hours with the following exceptions:

- **Woodbury Avenue at Commerce Way/ Durgin Square Plaza Driveway**
    - The Durgin Square Plaza eastbound shared through and left-turn movement operates at LOS F during the weekday morning, weekday afternoon, and Saturday midday peak hours.
    - The Woodbury Avenue southbound left-turn movement operates at LOS E during the weekday afternoon peak hour.

- **Woodbury Avenue at Arthur F Brady Drive/ Portsmouth Plaza Driveway**
    - The Arthur F Brady drive eastbound shared through and left-turn movement operates at LOS E during the weekday afternoon peak hour and at LOS F during the Saturday midday peak hour.
- **Woodbury Avenue at Market Street/ Market Basket Driveway**
    - The Woodbury Avenue eastbound left-turn movement operates at LOS E during the weekday afternoon and Saturday midday peak hours.
- **Market Street at Portsmouth Boulevard**
    - The Market Street eastbound left-turn movement operates at LOS E during the Saturday midday peak hour.
- **Market Street at I-95 Southbound Ramps**
    - The Market Street westbound left-turn movement operates at LOS E during the Saturday midday peak hour.

A review of the queueing results in Table 2 shows design queues on all study intersection movements are accommodated within the available storage within turn bays and between intersections during each peak period with the following exceptions:

- **Woodbury Avenue at Commerce Way/ Durgin Square Plaza Driveway**
    - The Durgin Square Plaza eastbound shared through and left-turn movement exceeds the available storage by one vehicle length during the weekday afternoon peak hour and two vehicle lengths during the Saturday midday peak hour.
    - The Woodbury Avenue northbound left-turn movement exceeds the available storage by one vehicle length during the weekday afternoon peak hour and two vehicle lengths during the Saturday midday peak hour.
    - The Woodbury Avenue southbound left-turn movement exceeds the available storage by eight vehicle lengths during the weekday morning peak hour and three vehicle lengths during the weekday afternoon and Saturday midday peak hour.
- **Woodbury Avenue at Arthur F Brady Drive/ Portsmouth Plaza Driveway**
    - The Portsmouth Plaza westbound shared through and left-turn movement exceeds the available storage by four vehicle lengths during the weekday afternoon peak hour and six vehicle lengths during the Saturday midday peak hour.
    - The Woodbury Avenue southbound shared through and left-turn movement exceeds the available storage by two vehicle lengths during the weekday afternoon peak hour.
- **Woodbury Avenue at Market Street/ Market Basket Driveway**
    - The Market Basket southbound left-turn movement exceeds the available storage by one vehicle length during the weekday morning peak hour and six vehicle lengths during the weekday afternoon and Saturday midday peak hour.

- The Market Basket southbound shared through and left-turn movement exceeds the available storage by one vehicle length during the weekday morning peak hour and two vehicle lengths during the weekday afternoon and Saturday midday peak hour.

2.5 Collision History

Vehicle collision data for the study intersections was requested from the Portsmouth Police Department. However, as of this time, vehicle accident reports were not able to be provided due to reported staffing shortages.

2.6 Alternative Travel Modes

The study area is in a moderately densely developed setting in the City of Portsmouth where multimodal travel options are available. The following summarizes the details of various alternative travel modes supported within the study area.

Pedestrian facilities are generally present throughout the study area. Existing sidewalks are present on both sides of Woodbury Avenue and the north side of Market Street within the study area. There is a sidewalk on the east side of Portsmouth Boulevard from Market Street to the Site driveways. Marked crosswalks are provided across all legs of the Woodbury Avenue/Commerce Way, Woodbury Avenue/Arthur F Brady Drive, and Woodbury Avenue/Market Street intersections, each providing an exclusive pedestrian phase. Crosswalks are provided on the north side of Market Street between all intersections and on the south and east side of the Portsmouth Boulevard/Commerce Way/Osprey Drive intersection. A pedestrian bridge is provided to cross Market Street at the intersection with Portsmouth Boulevard.

The Cooperative Alliance for Seacoast Transportation (COAST) provides transit service within the study area. Bus Route 43 is the primary bus route in the study area with stops along Woodbury Avenue, Commerce Way, Portsmouth Boulevard, and Market Street. An existing bus stop is located at the intersection of Portsmouth Boulevard, at Commerce Way/ Osprey Drive, approximately 1,000 feet south of the proposed western Site driveway. The route operates from 6:30 AM to 8:57 PM Monday through Saturday. The Route 43 map and schedule are included in Appendix E.

Section 3
No-Build Conditions

The No-Build Condition represents the projection of traffic volumes and operating conditions without the anticipated additional site generated traffic. Consistent with NHDOT guidelines, the study area is analyzed for an Opening Year (2027) and Design Year (2037). This section describes the growth and development considerations included in the 2027 and 2037 No-Build traffic volumes.

3.1 Traffic Growth

To develop the traffic volumes for the 2027 and 2037 No-Build Conditions, the 2025 Existing traffic volumes were grown by one percent per year to represent the general growth of traffic on the study area roadways. This growth rate is consistent with the average growth rate in NHDOT Region E - Southeast, the region in which Portsmouth is located and previously approved developments in the area. Background NHDOT growth data is included in Appendix B.

NHDOT and the City of Portsmouth were contacted about other planned/approved developments in the area that may add new traffic to the study area prior to 2027. The following developments were identified:

- **100 Durgin Lane Multi-Family Development:** The project proposes to construct a 360-unit residential development. The project has been approved by the City and is anticipated to be occupied in 2027. Estimated site traffic volumes outlined in the project's Traffic Impact Study are included in the development of the 2027 and 2037 No-Build traffic volumes. Traffic volumes for this development are included in Appendix F.

- **1465 Woodbury Avenue Bank:** The project proposes to construct a 2,847+/- SF bank with a drive-through at the existing Portsmouth Plaza property. The project has been approved by the City and is anticipated to be occupied in 2027. Estimated site traffic volumes outlined in the project's Traffic Impact Study are included in the development of the 2027 and 2037 No-Build traffic volumes. Traffic volumes for this development are included in Appendix F.

It is assumed that other smaller developments or small vacancies in existing developments are also captured by the background traffic growth rate. The 2027 and 2037 No-Build traffic volumes for the weekday morning, weekday afternoon, and Saturday midday peak hours are shown in Figures 3 and 4, respectively.

3.2 Capacity and Queue Analyses – No-Build Conditions

Capacity and queue analyses were conducted for the 2027 and 2037 No-Build Conditions traffic volumes for all peak periods using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix D.

The increase in expected future traffic based on the one percent per year compounded growth rate and background development traffic volumes that were added to the

existing 2025 traffic volumes resulted in no degradation in LOS of operations when compared to existing conditions for the 2027 No-Build Condition.

The 2037 No-Build Condition resulted in degradation of level of service and increases in delay when compared to the 2027 No-Build Condition due to the addition of ten years of compounded annual growth. The following intersections showed additional degradation of operations from the 2027 to 2037 No-Build Condition:

- **Woodbury Avenue at Commerce Way/ Durgin Square Plaza Driveway**
    - The Woodbury Avenue southbound left-turn movement degrades from LOS D to E during the weekday morning and afternoon peak hours in 2037.
- **Woodbury Avenue at Arthur F Brady Drive/ Portsmouth Plaza Driveway**
    - The Woodbury Avenue southbound left-turn movement degrades from LOS D to E during the weekday morning and afternoon peak hours in 2037.
    - The Arthur F. Brady Drive eastbound shared through and left-turn movement degrades from LOS E to F during the weekday afternoon peak hour in 2037.
    - The Woodbury Avenue northbound left-turn movement degrades from LOS D to F during the weekday afternoon peak hour and from LOS D to E during the Saturday midday peak hour in 2037.
- **Woodbury Avenue at Market Street/ Market Basket Driveway**
    - The Market Street eastbound left-turn movement degrades from LOS E to F during the Saturday midday peak hour in 2037.

Design queues that were accommodated in the existing conditions continue to be accommodated within available storage in the 2027 No-Build condition or increased by less than two vehicle lengths.

While some intersections experience increases in design queue length of greater than two vehicle lengths in 2037 due to the compounded annual growth rate and approved developments in the area, design queues in 2037 are predicted to remain within available storage as shown in Table 2 with the following exceptions:

- **Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway**
    - The Woodbury Avenue southbound left left-turn movement design queue is predicted to increase by approximately three vehicle lengths in the weekday morning peak hour in 2037.
    - The Woodbury Avenue southbound shared through and right-turn movement design queue is predicted to increase by approximately five vehicle lengths in the weekday afternoon peak hour and three vehicle lengths in the Saturday midday peak hour in 2037.

- **Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway**
    - The Woodbury Avenue northbound shared through and right-turn movement design queue is predicted to increase by approximately four vehicle lengths in the Saturday midday peak hour in 2037.
    - The Woodbury Avenue southbound shared through and right-turn movement design queue is predicted to increase by approximately six vehicle lengths in the weekday afternoon peak hour and three vehicle lengths in the Saturday midday peak hour in 2037.
- **Woodbury Avenue at Market Street/Market Basket Driveway**
    - The Woodbury Avenue eastbound through movement design queue is predicted to increase by approximately three vehicle lengths in the weekday afternoon and Saturday midday peak hours in 2037.
    - The Woodbury Avenue westbound shared through and right-turn movement design queue is predicted to increase by approximately four vehicle lengths in the weekday afternoon and Saturday midday peak hours in 2037.
- **Market Street at I-95 Northbound Ramps**
    - The I-95 Northbound Off-Ramp right-turn movement design queue is predicted to increase by approximately three vehicle lengths in the weekday morning peak hour in 2037.

Section 4
Proposed Conditions

The project proposes to construct 274 residential units spread across three six-story buildings on a currently vacant site. Approximately 298 on-site parking spaces will be provided that are comprised of 249 surface parking spaces and 49 underground parking spaces on site with approximately 340 spaces; 40 additional off-site spaces will be provided. The proposed development is expected to be complete and occupied in 2027. The Site Plan is presented in Appendix G.

4.1 Site Access

Site access will be provided via the two full-access driveways located at the western and eastern corners of parcel. Both driveways will be placed under stop control. Each driveway is positioned to maximize sight lines.

4.2 Trip Generation

Trips expected to be generated by the proposed development were estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021. Multifamily Housing (Mid-Rise) (LUC-221) was used to estimate vehicle trips based on the current development program, which proposes 274 units in three six-story buildings.

Based on the ITE data, the proposed development is estimated to generate 109 trips (25 entering, 84 exiting) during the weekday morning peak hour, 107 trips (65 entering, 42 exiting) during the weekday afternoon peak hour, and 110 trips (56 entering, 54 exiting) during the Saturday midday peak hour. Table 3 provides a detailed summary of the trip generation.

4.3 Arrival and Departure Distribution

The distribution of the proposed site-generated traffic entering and exiting the Site was applied to the roadway network based on existing traffic patterns within the study area, discussions with the City, and a review of a previously approved study for a multi-family development. The following arrival/departure distributions are anticipated:

- 30% to/ from the South to Portsmouth Center via Market Street
- 25% to/ from the South via Route 1 Bypass
- 20% to/ from the North via Route 4 (Spaulding Turnpike)
- 20% to/ from the South via I-95
- 5% to/ from the North via I-95

Based on the regional distribution and surrounding roadway network, it is estimated that of the 25% of trips entering via Route 1 Bypass, 20% will enter via Woodbury Avenue and 5% will enter via Arthur F Brady Drive, while all departing trips to Route 1 Bypass are expected to utilize Woodbury Avenue. It is estimated that half (10%) of the 20% entering site traffic from the south via I-95 will utilize Woodbury Avenue, which has an off-ramp from I-95 northbound, while the remaining 10% will arrive via Market Street; all exiting traffic to the south via I-95 is expected to utilize Market Street, as there is no

direct on-ramp southbound from Woodbury Avenue. Finally, of the 20% of trips entering from the north via Spaulding Turnpike, it is assumed that 15% of entering trips will utilize Commerce Way, while the remaining 5% will continue along Market Street to Portsmouth Boulevard; all 20% of exiting trips are expected to utilize Arthur F Brady Drive to access the northbound on-ramp to Spaulding Turnpike.

Figure 5 presents the arrival and departure distributions of the traffic through the study area by intersection movement. Figure 6 shows the proposed site generated traffic distributed to the study area roadways for the weekday morning, weekday afternoon, and Saturday midday peak periods.

4.4 Multi-Modal Accommodations

As previously stated, pedestrian and transit facilities are provided in the vicinity of the site. Internal sidewalks are proposed adjacent to all parking areas and buildings on site. Sidewalks are present along the east side of Portsmouth Boulevard that will connect to the site. The existing and proposed sidewalk network will provide a continuous network to the existing bus stop located at the intersection of Portsmouth Boulevard, Commerce Way, and Osprey Drive. In addition, bicycle storage will be provided on site.

Section 5
Build Conditions

The anticipated site generated traffic volumes associated with the proposed development were added to the 2027 and 2037 No-Build Conditions traffic volumes to develop the 2027 and 2037 Build Conditions traffic volumes, which are presented in Figures 7 and 8, respectively.

5.1 Capacity and Queue Analyses - Build Condition

Capacity and queue analyses were conducted for the 2027 and 2037 Build Conditions for the peak hours using the methodology described in Section 2.4. Tables 1 and 2 in Section 7 summarize the capacity and queue results, respectively. Capacity analysis worksheets with full inputs, settings, and results are provided in Appendix D. Based on how HCM analysis results are calculated, some intersections show significant improvements in LOS and Queueing between the No Build and Build Conditions.

All the study area intersections and a majority of the individual intersection approaches continue to operate at acceptable LOS D or better during the peak hours in the 2027 and 2037 Build Conditions. All study area intersections that were identified in Section 2.4 and 3.2 to operate at LOS E or LOS F in the 2027 No-Build Conditions continue to operate at the same LOS under 2027 Build Conditions, with the exception of the following:

- **Woodbury Avenue at Arthur F Brady Drive/ Portsmouth Plaza Driveway**
    - The Woodbury Avenue northbound left-turn movement degrades from LOS D to E during the weekday afternoon and Saturday midday peak hour in 2027.
- **Woodbury Avenue at Market Street/ Market Basket Driveway**
    - The Woodbury Avenue eastbound left-turn movement degrades from LOS E to F during the Saturday midday peak hour in 2027.

The study area intersections identified to operate at LOS E or LOS F in the 2037 No-Build Conditions continue to operate at the same LOS under the 2037 Build Conditions, with the exception of the following:

- **Woodbury Avenue at Commerce Way/ Durgin Square Plaza Driveway**
    - The Woodbury Avenue southbound left-turn movement degrades from LOS E to F during the weekday afternoon and from LOS D to E during the Saturday midday peak hour in 2037.
- **Woodbury Avenue at Market Street/ Market Basket Driveway**
    - The Woodbury Avenue northbound shared through and right-turn movement degrades from LOS D to E during the weekday afternoon peak hour in 2037.

Design queues on all intersection approaches for the Build Conditions increased by less than two vehicle lengths or experience increases in design queues that are

accommodated within available storage when compared to 2027 and 2037 No-Build Conditions.

Section 6
Conclusions & Recommendations

1. The project proposes to construct 274 residential units spread over three six-story buildings. Approximately 298 parking spaces will be provided on site via surface and underground parking. The development is expected to be complete and occupied in 2027.

2. Access to the site will be provided via the two unsignalized driveways on Portsmouth Boulevard on the east and west corners of the parcel.

3. Based on ITE data, the proposed project is expected to generate 109 trips (25 entering, 84 exiting) during the weekday morning peak hour, 107 trips (65 entering, 42 exiting) during the weekday afternoon peak hour, and 110 trips (56 entering, 54 exiting) during the Saturday midday peak hour.

4. The project proposes internal sidewalk connections throughout the site which connect to the existing sidewalk on Portsmouth Boulevard to promote pedestrian safety and mobility, and provide connection to nearby transit facilities

5. Consistent with NHDOT guidelines, existing traffic volumes have been seasonally adjusted to the peak month condition.

6. The capacity analyses show that the study area intersections will generally continue to operate at the same LOS under Build Conditions as compared to the No-Build Conditions for both the 2027 opening year and 2037 design year, with minor increases in delay. A review of design queues indicates minor increases of two vehicles of less in the 2027 and 2037 Build Conditions compared to the corresponding No Build Conditions.

7. Based on the results of the foregoing analysis, it is the professional opinion of Tighe & Bond that the addition of site-generated traffic is expected to have a negligible effect on traffic operations within the study area as compared to the current vacant site condition.

Section 7
Tables

TABLE 1
Intersection Operation Summary - Capacity

	Lane Use	Weekday Morning Peak Hour														
		2025 Existing			2027 No Build			2027 Build			2037 No Build			2037 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway																
Overall		**C**	**24.3**	**0.50**	**C**	**21.4**	**0.51**	**C**	**21.9**	**0.51**	**C**	**26.6**	**0.56**	**C**	**27.2**	**0.56**
Durgin Square Plaza	EBLT	F	262.0	1.00	F	194.9	0.86	F	194.9	0.86	F	296.1	1.07	F	296.1	1.07
Driveway	EBR	C	26.9	0.01	C	27.7	0.01	C	27.6	0.01	C	27.9	0.01	C	27.9	0.01
Commerce Way	WBLT	D	45.9	0.44	D	42.3	0.35	D	42.2	0.35	D	49.5	0.47	D	49.5	0.47
	WBR	C	20.2	0.04	C	20.8	0.03	C	20.7	0.03	C	20.9	0.03	C	20.9	0.03
Woodbury Avenue	NBL	C	29.3	0.23	C	30.3	0.25	C	30.2	0.25	C	31.1	0.29	C	31.1	0.29
	NBTR	B	15.1	0.35	B	14.9	0.35	B	14.9	0.35	B	15.1	0.38	B	15.2	0.38
	SBL	D	52.7	0.90	D	49.6	0.87	D	51.9	0.89	E	69.3	0.96	E	72.1	0.97
	SBTR	B	10.2	0.32	B	10.2	0.36	B	10.2	0.36	B	10.3	0.38	B	10.3	0.38
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway																
Overall		**C**	**23.4**	**0.44**	**C**	**24.1**	**0.49**	**C**	**24.3**	**0.50**	**C**	**24.7**	**0.52**	**C**	**24.9**	**0.54**
Arthur F Brady Drive	EBLT	C	29.1	0.45	C	30.8	0.49	C	31.4	0.50	C	33.3	0.55	C	34.1	0.56
	EBR	B	17.7	0.07	B	18.7	0.07	B	18.6	0.07	B	19.3	0.08	B	19.2	0.08
Portsmouth Plaza	WBLT	C	31.6	0.30	C	32.9	0.31	C	33.3	0.32	C	34.2	0.35	C	34.4	0.35
Driveway	WBR	C	22.5	0.02	C	23.4	0.02	C	23.8	0.02	C	24.2	0.03	C	24.4	0.03
	NBL	C	26.3	0.44	C	27.5	0.45	C	27.6	0.49	C	28.4	0.48	C	28.9	0.53
Woodbury Avenue	NBTR	C	20.0	0.35	B	19.7	0.34	B	19.4	0.33	B	19.6	0.36	B	19.4	0.35
	SBL	C	27.1	0.21	C	28.2	0.22	C	28.6	0.22	C	29.3	0.25	C	29.5	0.25
	SBTR	C	24.4	0.59	C	25.2	0.65	C	25.7	0.65	C	25.7	0.67	C	26.1	0.67
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway																
Overall		**C**	**21.1**	**0.37**	**C**	**20.8**	**0.36**	**C**	**21.4**	**0.38**	**C**	**21.4**	**0.40**	**C**	**22.1**	**0.42**
	EBL	D	42.0	0.18	D	42.4	0.18	D	42.8	0.18	D	44.0	0.19	D	43.9	0.19
	EBT	C	20.8	0.34	C	20.8	0.36	C	21.0	0.36	C	21.1	0.38	C	21.8	0.40
Woodbury Avenue	EBR	B	10.6	0.13	B	10.6	0.16	B	10.7	0.16	B	10.7	0.17	B	11.0	0.17
	NBL	C	31.4	0.22	C	31.8	0.24	C	32.1	0.24	C	32.5	0.26	C	32.2	0.25
	NBTR	C	31.6	0.21	C	32.3	0.25	C	32.6	0.26	C	33.2	0.30	C	33.0	0.30
Market Street	WBL	D	35.1	0.50	D	35.3	0.48	D	38.5	0.59	D	37.4	0.54	D	40.4	0.62
	WBTR	B	16.9	0.37	B	16.7	0.36	B	16.7	0.37	B	17.0	0.39	B	17.2	0.41
Market Basket Driveway	SBL	C	34.3	0.41	C	34.5	0.39	D	35.1	0.40	D	35.5	0.42	D	35.6	0.43
	SBTR	C	32.9	0.26	C	33.4	0.25	C	33.9	0.26	C	34.2	0.27	C	34.2	0.27
Traffic Signal - Market Street at Portsmouth Boulevard																
Overall		**A**	**8.8**	**0.35**	**A**	**8.7**	**0.38**	**A**	**9.7**	**0.38**	**A**	**8.9**	**0.39**	**A**	**9.9**	**0.39**
	EBL	C	23.8	0.49	C	24.0	0.50	C	30.4	0.60	C	26.4	0.55	C	22.0	0.41
Market Street	EBT	A	4.9	0.21	A	5.0	0.23	A	5.4	0.24	A	5.1	0.26	A	5.3	0.25
	WBT	B	10.7	0.40	B	10.7	0.41	B	11.3	0.42	B	11.0	0.45	B	12.3	0.47
	WBR	A	5.3	0.13	A	5.2	0.13	A	5.2	0.14	A	5.3	0.15	A	5.8	0.15
Portsmouth Boulevard	SBL	B	15.4	0.11	B	15.4	0.10	B	15.3	0.18	B	15.4	0.11	B	16.5	0.19
	SBR	B	15.1	0.04	B	15.2	0.03	B	14.9	0.06	B	15.1	0.04	B	16.1	0.06
Traffic Signal - Market Street at I-95 SB Ramps																
Overall		**B**	**19.0**	**0.35**	**B**	**18.6**	**0.47**	**B**	**18.2**	**0.47**	**B**	**19.0**	**0.49**	**B**	**18.8**	**0.49**
	EBT	B	12.6	0.16	B	12.3	0.18	B	12.1	0.19	B	13.0	0.20	B	12.9	0.21
Market Street	EBR	A	0.1	0.06	A	0.1	0.06	A	0.1	0.07	A	0.1	0.07	A	0.1	0.08
	WBL	D	47.0	0.56	D	46.5	0.56	D	46.0	0.56	D	45.4	0.59	D	44.7	0.59
	WBT	A	5.9	0.20	A	6.1	0.21	A	6.3	0.21	A	7.4	0.23	A	8.1	0.23
	SBL	D	38.4	0.63	D	38.3	0.62	D	38.3	0.62	D	38.4	0.65	D	38.4	0.65
I-95 SB Off-Ramp	SBT	C	31.9	0.20	C	31.9	0.20	C	32.0	0.20	C	31.3	0.21	C	31.3	0.21
	SBR	C	31.2	0.12	C	31.3	0.12	C	31.3	0.12	C	30.5	0.13	C	30.6	0.13
Traffic Signal - Market Street at I-95 NB Ramps																
Overall		**B**	**18.7**	**0.33**	**B**	**18.6**	**0.47**	**B**	**18.6**	**0.47**	**B**	**19.4**	**0.49**	**B**	**19.5**	**0.49**
	EBL	C	28.9	0.43	C	28.5	0.44	C	28.2	0.44	C	28.1	0.46	C	27.8	0.47
Market Street	EBT	A	2.9	0.21	A	3.0	0.22	A	3.0	0.24	A	3.3	0.25	A	3.6	0.27
	WBT	B	12.6	0.20	B	12.9	0.21	B	13.0	0.21	B	14.3	0.24	B	14.7	0.25
	WBR	B	11.4	0.03	B	11.6	0.03	B	11.7	0.03	B	12.6	0.04	B	12.9	0.04
I-95 NB Off-Ramp	NBLT	D	36.2	0.59	D	36.3	0.60	D	36.5	0.60	D	35.2	0.60	C	34.6	0.60
	NBR	C	31.9	0.30	C	33.0	0.42	C	33.6	0.47	D	35.4	0.60	D	36.0	0.63
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive																
	NBL	B	11.1	0.35	B	10.4	0.29	B	10.7	0.30	B	10.9	0.33	B	11.2	0.34
Portsmouth Boulevard	NBTR	A	8.6	0.18	A	8.4	0.15	A	8.8	0.19	A	8.6	0.17	A	9.0	0.21
	SBLT	A	8.2	0.02	A	8.0	0.02	A	8.9	0.14	A	8.2	0.02	A	9.1	0.14
	SBR	A	7.4	0.01	A	7.3	0.01	A	7.4	0.01	A	7.4	0.01	A	7.5	0.01
	EBLT	A	9.2	0.06	A	8.9	0.05	A	9.3	0.06	A	9.1	0.05	A	9.5	0.06
Commerce Way	EBR	A	7.8	0.02	A	7.6	0.01	A	8.0	0.01	A	7.8	0.02	A	8.1	0.02
Osprey Drive	WB	A	10.0	0.18	A	9.7	0.17	B	10.3	0.20	A	10.0	0.20	B	10.6	0.22
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway																
Western Site Driveway	WB	--	--	--	--	--	--	A	8.9	0.08	--	--	--	A	8.9	0.08
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway																
Northern Site Driveway	NB	--	--	--	--	--	--	A	8.3	0.01	--	--	--	A	8.3	0.01

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

		Weekday Afternoon Peak Hour														
	Lane Use	2025 Existing			2027 No Build			2027 Build			2037 No Build			2037 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway																
Overall		**C**	**34.3**	**0.70**	**C**	**30.8**	**0.70**	**C**	**31.4**	**0.71**	**C**	**34.4**	**0.75**	**D**	**35.7**	**0.76**
Durgin Square Plaza	EBLT	F	177.6	1.10	F	122.9	0.94	F	122.9	0.94	F	174.9	1.09	F	174.9	1.09
Driveway	EBR	C	27.7	0.08	C	26.1	0.07	C	26.1	0.07	C	28.1	0.07	C	28.2	0.07
Commerce Way	WBLT	C	35.0	0.51	D	36.7	0.50	D	36.7	0.50	D	41.1	0.56	D	41.2	0.56
	WBR	C	24.8	0.18	C	25.7	0.12	C	25.7	0.12	C	27.4	0.14	C	27.5	0.14
	NBL	D	40.6	0.61	D	37.6	0.58	D	37.6	0.58	D	45.5	0.68	D	45.5	0.68
Woodbury Avenue	NBTR	C	24.4	0.59	C	22.8	0.60	C	22.8	0.60	C	22.6	0.62	C	22.6	0.61
	SBL	E	57.7	0.80	D	50.9	0.76	E	58.8	0.82	E	73.9	0.89	F	91.4	0.95
	SBTR	C	28.6	0.77	C	27.3	0.78	C	27.4	0.79	C	27.4	0.80	C	27.4	0.80
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway																
Overall		**C**	**33.1**	**0.70**	**C**	**33.7**	**0.72**	**C**	**34.2**	**0.72**	**D**	**39.2**	**0.77**	**D**	**40.3**	**0.78**
Arthur F Brady Drive	EBLT	E	72.2	0.84	E	76.1	0.85	E	76.1	0.85	F	126.3	1.02	F	126.5	1.02
	EBR	C	27.5	0.14	C	28.6	0.14	C	28.6	0.14	C	31.8	0.15	C	31.9	0.15
Portsmouth Plaza	WBLT	D	38.7	0.56	D	40.6	0.57	D	40.6	0.57	D	47.6	0.66	D	48.1	0.66
Driveway	WBR	C	25.0	0.08	C	25.8	0.08	C	25.9	0.08	C	28.0	0.09	C	28.2	0.09
	NBL	D	49.3	0.75	D	54.1	0.79	E	59.4	0.83	F	88.6	0.95	F	101.7	0.99
Woodbury Avenue	NBTR	C	23.9	0.51	C	24.1	0.53	C	24.0	0.53	C	23.9	0.53	C	23.8	0.53
	SBL	D	36.6	0.45	D	37.8	0.48	D	37.8	0.48	D	41.4	0.53	D	41.6	0.53
	SBTR	C	31.6	0.81	C	31.6	0.81	C	31.6	0.81	C	30.4	0.80	C	30.2	0.80
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway																
Overall		**C**	**27.7**	**0.60**	**C**	**28.5**	**0.63**	**C**	**29.5**	**0.65**	**C**	**30.7**	**0.67**	**C**	**32.1**	**0.69**
	EBL	E	60.2	0.45	E	60.8	0.45	E	61.7	0.45	E	71.1	0.53	E	67.3	0.50
	EBT	C	28.1	0.66	C	28.8	0.67	C	29.1	0.67	C	31.2	0.73	C	32.6	0.74
Woodbury Avenue	EBR	B	12.9	0.22	B	13.2	0.23	B	13.3	0.23	B	13.9	0.25	B	14.7	0.25
	NBL	D	39.3	0.48	D	40.3	0.52	D	40.7	0.51	D	42.7	0.57	D	44.5	0.58
	NBTR	D	41.1	0.52	D	43.2	0.57	D	47.0	0.63	D	48.5	0.65	E	57.3	0.73
Market Street	WBL	D	47.4	0.60	D	48.7	0.62	D	54.2	0.68	D	53.8	0.67	D	48.0	0.60
	WBTR	C	21.6	0.52	C	22.5	0.56	C	22.5	0.56	C	23.9	0.61	C	23.3	0.59
Market Basket Driveway	SBL	D	42.5	0.65	D	43.5	0.67	D	44.8	0.68	D	46.3	0.71	D	50.8	0.74
	SBTR	D	35.7	0.28	D	36.0	0.30	D	36.9	0.30	D	37.0	0.32	D	39.0	0.33
Traffic Signal - Market Street at Portsmouth Boulevard																
Overall		**B**	**11.5**	**0.54**	**B**	**10.5**	**0.45**	**B**	**11.5**	**0.46**	**B**	**11.2**	**0.48**	**B**	**12.5**	**0.48**
	EBL	C	29.5	0.53	C	29.6	0.53	C	25.7	0.49	C	25.2	0.38	C	24.6	0.39
Market Street	EBT	A	7.3	0.48	A	6.5	0.48	A	6.7	0.47	A	6.7	0.51	A	6.8	0.50
	WBT	B	13.0	0.55	B	11.9	0.54	B	13.8	0.58	B	13.5	0.61	B	15.8	0.64
	WBR	A	4.2	0.04	A	4.3	0.04	A	5.0	0.05	A	4.7	0.04	A	5.5	0.06
Portsmouth Boulevard	SBL	B	17.6	0.41	B	18.2	0.34	B	18.9	0.36	B	19.4	0.38	C	20.6	0.40
	SBR	B	16.0	0.08	B	17.0	0.06	B	17.6	0.07	B	18.0	0.06	B	19.0	0.08
Traffic Signal - Market Street at I-95 SB Ramps																
Overall		**B**	**17.7**	**0.56**	**B**	**17.6**	**0.54**	**B**	**17.4**	**0.55**	**B**	**18.2**	**0.58**	**B**	**18.1**	**0.59**
	EBT	B	17.6	0.44	B	17.3	0.45	B	17.3	0.46	B	19.2	0.53	B	18.9	0.53
Market Street	EBR	A	0.1	0.12	A	0.1	0.12	A	0.1	0.13	A	0.1	0.14	A	0.2	0.14
	WBL	C	30.0	0.75	C	30.7	0.76	C	30.9	0.76	C	30.9	0.79	C	32.0	0.80
	WBT	A	1.0	0.22	A	1.4	0.23	A	1.2	0.25	A	0.6	0.26	A	0.6	0.27
	SBL	D	39.1	0.66	D	39.4	0.66	D	39.4	0.66	D	40.1	0.69	D	40.8	0.70
I-95 SB Off-Ramp	SBT	C	32.4	0.30	C	32.5	0.31	C	32.5	0.31	C	32.3	0.36	C	32.5	0.37
	SBR	C	30.9	0.12	C	31.0	0.12	C	31.0	0.13	C	30.4	0.14	C	30.5	0.14
Traffic Signal - Market Street at I-95 NB Ramps																
Overall		**C**	**20.4**	**0.50**	**B**	**19.6**	**0.54**	**B**	**19.9**	**0.55**	**C**	**20.5**	**0.58**	**C**	**20.6**	**0.59**
	EBL	C	27.9	0.69	C	27.4	0.70	C	27.7	0.71	C	25.7	0.68	C	25.7	0.68
Market Street	EBT	A	9.7	0.25	A	9.6	0.26	A	10.0	0.27	B	10.3	0.29	B	10.3	0.30
	WBT	B	18.1	0.41	B	18.1	0.43	B	18.4	0.44	C	21.1	0.51	C	21.5	0.53
	WBR	B	15.4	0.13	B	15.2	0.13	B	15.3	0.13	B	17.1	0.15	B	17.2	0.15
I-95 NB Off-Ramp	NBLT	D	38.0	0.49	D	37.7	0.43	D	37.8	0.45	D	37.8	0.46	D	38.1	0.48
	NBR	C	34.6	0.15	C	34.9	0.12	C	34.7	0.12	C	34.7	0.13	C	34.6	0.13
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive																
	NBL	A	9.2	0.04	A	8.8	0.03	A	8.9	0.03	A	8.9	0.04	A	9.1	0.04
Portsmouth Boulevard	NBTR	A	8.7	0.13	A	8.1	0.10	A	9.1	0.19	A	8.3	0.11	A	9.4	0.21
	SBLT	A	9.4	0.16	A	8.8	0.12	A	9.4	0.19	A	9.0	0.14	A	9.7	0.21
	SBR	A	7.9	0.05	A	7.5	0.04	A	7.7	0.04	A	7.6	0.04	A	7.8	0.04
	EBLT	A	8.9	0.14	A	8.4	0.09	A	9.0	0.11	A	8.6	0.10	A	9.2	0.13
Commerce Way	EBR	A	9.3	0.31	A	8.2	0.20	A	8.7	0.22	A	8.5	0.23	A	9.0	0.24
Osprey Drive	WB	A	9.3	0.10	A	8.9	0.09	A	9.4	0.10	A	9.1	0.10	A	9.6	0.11
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway																
Western Site Driveway	WB	--	--	--	--	--	--	A	8.8	0.04	--	--	--	A	8.8	0.04
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway																
Northern Site Driveway	NB	--	--	--	--	--	--	A	8.3	0.00	--	--	--	A	8.3	0.00

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 1 (CONTINUED)
Intersection Operation Summary - Capacity

	Lane Use	Saturday Midday Peak Hour														
		2025 Existing			2027 No Build			2027 Build			2037 No Build			2037 Build		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway																
Overall		**C**	**31.1**	**0.70**	**C**	**29.9**	**0.70**	**C**	**30.2**	**0.71**	**C**	**33.1**	**0.75**	**C**	**33.6**	**0.76**
Durgin Square Plaza	EBLT	F	176.5	1.15	F	159.2	1.09	F	159.2	1.09	F	207.7	1.22	F	207.7	1.22
Driveway	EBR	C	21.9	0.08	C	22.4	0.08	C	22.5	0.08	C	24.2	0.09	C	24.2	0.09
Commerce Way	WBLT	D	37.5	0.40	D	37.8	0.38	D	37.8	0.38	D	41.0	0.47	D	41.1	0.47
	WBR	C	25.1	0.05	C	25.6	0.05	C	25.7	0.05	C	27.2	0.06	C	27.3	0.06
	NBL	C	33.2	0.59	C	34.1	0.59	C	34.4	0.60	D	42.2	0.70	D	42.3	0.70
Woodbury Avenue	NBTR	C	21.4	0.64	C	21.4	0.64	C	21.2	0.64	C	21.1	0.66	C	21.1	0.65
	SBL	D	37.2	0.67	D	37.9	0.67	D	41.7	0.72	D	50.2	0.78	E	56.3	0.83
	SBTR	C	23.4	0.73	C	23.8	0.75	C	23.7	0.75	C	23.8	0.76	C	23.8	0.76
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway																
Overall		**D**	**36.3**	**0.70**	**D**	**38.9**	**0.73**	**D**	**39.4**	**0.74**	**D**	**45.2**	**0.79**	**D**	**46.3**	**0.80**
Arthur F Brady Drive	EBLT	F	112.2	1.01	F	137.1	1.09	F	137.1	1.09	F	197.8	1.25	F	197.8	1.25
	EBR	C	26.0	0.14	C	27.0	0.15	C	27.0	0.15	C	28.9	0.18	C	28.9	0.19
Portsmouth Plaza	WBLT	D	37.8	0.59	D	39.4	0.60	D	39.4	0.60	D	45.2	0.68	D	45.2	0.68
Driveway	WBR	C	22.3	0.09	C	22.8	0.09	C	22.8	0.09	C	23.8	0.10	C	23.8	0.10
	NBL	D	44.9	0.73	D	49.4	0.76	E	55.1	0.81	E	67.1	0.87	E	79.9	0.93
Woodbury Avenue	NBTR	C	28.7	0.67	C	29.3	0.70	C	29.3	0.70	C	30.1	0.73	C	30.0	0.72
	SBL	D	35.2	0.54	D	36.4	0.56	D	36.4	0.56	D	39.3	0.61	D	39.3	0.61
	SBTR	C	30.9	0.77	C	31.4	0.79	C	31.6	0.79	C	31.8	0.81	C	31.8	0.81
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway																
Overall		**C**	**27.7**	**0.62**	**C**	**27.2**	**0.62**	**C**	**27.6**	**0.63**	**C**	**28.9**	**0.67**	**C**	**29.5**	**0.68**
	EBL	E	76.2	0.57	E	76.8	0.57	F	85.1	0.60	F	93.7	0.64	F	105.2	0.67
	EBT	C	26.4	0.54	C	25.9	0.54	C	26.1	0.54	C	26.9	0.58	C	27.3	0.59
Woodbury Avenue	EBR	B	13.3	0.20	B	12.9	0.22	B	13.0	0.22	B	13.4	0.24	B	13.6	0.24
	NBL	D	38.2	0.45	D	38.7	0.46	D	39.3	0.47	D	41.1	0.52	D	41.5	0.52
	NBTR	D	38.2	0.37	D	39.1	0.42	D	40.5	0.49	D	41.6	0.48	D	43.2	0.54
Market Street	WBL	D	41.6	0.46	D	42.2	0.46	D	44.1	0.54	D	45.4	0.52	D	48.4	0.59
	WBTR	C	25.0	0.67	C	24.2	0.66	C	24.1	0.66	C	26.1	0.72	C	26.1	0.72
Market Basket Driveway	SBL	D	40.4	0.66	D	41.8	0.65	D	42.7	0.66	D	45.0	0.69	D	45.5	0.70
	SBTR	C	33.9	0.33	D	35.4	0.34	D	36.0	0.34	D	36.7	0.37	D	37.0	0.37
Traffic Signal - Market Street at Portsmouth Boulevard																
Overall		**A**	**7.8**	**0.47**	**A**	**7.5**	**0.47**	**A**	**8.4**	**0.51**	**A**	**7.5**	**0.52**	**A**	**8.8**	**0.55**
	EBL	E	66.3	0.68	E	66.4	0.68	C	28.8	0.53	C	27.0	0.35	C	25.3	0.39
Market Street	EBT	A	4.1	0.35	A	4.0	0.37	A	4.2	0.37	A	4.0	0.40	A	4.1	0.40
	WBT	A	8.3	0.50	A	8.1	0.50	A	9.6	0.54	A	9.0	0.55	B	10.7	0.59
	WBR	A	3.7	0.02	A	3.7	0.02	A	4.3	0.03	A	4.0	0.02	A	4.7	0.04
Portsmouth Boulevard	SBL	C	20.1	0.14	C	20.3	0.12	C	20.5	0.20	C	21.7	0.13	C	22.1	0.22
	SBR	B	19.8	0.04	C	20.1	0.03	B	19.9	0.05	C	21.4	0.03	C	21.5	0.05
Traffic Signal - Market Street at I-95 SB Ramps																
Overall		**B**	**19.1**	**0.39**	**B**	**19.0**	**0.40**	**B**	**18.6**	**0.41**	**B**	**19.3**	**0.44**	**B**	**19.0**	**0.45**
	EBT	B	11.4	0.29	B	10.7	0.30	B	10.7	0.30	B	12.6	0.35	B	12.6	0.35
Market Street	EBR	A	0.1	0.08	A	0.1	0.09	A	0.1	0.09	A	0.1	0.09	A	0.1	0.10
	WBL	E	62.2	0.55	E	69.0	0.61	E	67.5	0.61	E	65.7	0.56	E	64.9	0.56
	WBT	A	2.8	0.19	A	2.7	0.19	A	3.0	0.20	A	2.8	0.22	A	3.1	0.23
	SBL	D	43.1	0.62	D	43.2	0.62	D	43.2	0.62	D	42.4	0.64	D	42.4	0.64
I-95 SB Off-Ramp	SBT	D	36.9	0.23	D	36.8	0.24	D	36.8	0.24	D	35.8	0.25	D	35.8	0.25
	SBR	D	36.2	0.15	D	36.0	0.15	D	36.0	0.15	D	35.0	0.17	D	35.0	0.17
Traffic Signal - Market Street at I-95 NB Ramps																
Overall		**C**	**23.1**	**0.39**	**C**	**22.3**	**0.38**	**C**	**22.3**	**0.39**	**C**	**22.7**	**0.42**	**C**	**22.7**	**0.43**
	EBL	D	52.4	0.71	D	50.4	0.71	D	51.0	0.71	D	50.2	0.72	D	50.5	0.72
Market Street	EBT	A	2.4	0.22	A	2.3	0.22	A	2.4	0.22	A	2.3	0.24	A	2.4	0.25
	WBT	B	14.4	0.29	B	13.7	0.28	B	14.0	0.29	B	15.0	0.32	B	15.3	0.33
	WBR	B	12.6	0.09	B	12.1	0.08	B	12.2	0.08	B	13.0	0.09	B	13.1	0.09
I-95 NB Off-Ramp	NBLT	D	41.6	0.28	D	41.8	0.30	D	41.8	0.32	D	41.8	0.32	D	41.9	0.34
	NBR	D	40.4	0.14	D	40.4	0.14	D	40.2	0.14	D	40.3	0.16	D	40.2	0.16
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive																
	NBL	A	8.2	0.02	A	8.1	0.02	A	8.2	0.02	A	8.2	0.02	A	8.3	0.02
Portsmouth Boulevard	NBTR	A	7.3	0.03	A	7.2	0.03	A	8.0	0.10	A	7.3	0.04	A	8.0	0.11
	SBLT	A	7.8	0.03	A	7.8	0.02	A	8.2	0.10	A	7.8	0.03	A	8.3	0.10
	SBR	A	6.9	0.01	A	6.9	0.01	A	7.0	0.01	A	6.9	0.01	A	7.0	0.01
Commerce Way	EBLT	A	7.8	0.05	A	7.7	0.04	A	8.2	0.06	A	7.8	0.05	A	8.3	0.06
	EBR	A	6.8	0.01	A	6.8	0.01	A	7.1	0.01	A	6.8	0.01	A	7.1	0.01
Osprey Drive	WB	A	8.3	0.10	A	8.2	0.08	A	8.6	0.09	A	8.3	0.09	A	8.7	0.10
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway																
Western Site Driveway	WB	--	--	--	--	--	--	A	8.9	0.05	--	--	--	A	8.9	0.05
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway																
Northern Site Driveway	NB	--	--	--	--	--	--	A	8.3	0.01	--	--	--	A	8.3	0.01

Legend
LOS - Level of Service
Delay - average delay per vehicle in seconds
V/C - volume to capacity ratio

TABLE 2
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Morning Peak Hour									
			2025 Existing		2027 No Build		2027 Build		2037 No Build		2037 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway												
Durgin Square Plaza	EBLT	150	2	26	2	28	2	28	2	33	2	33
Driveway	EBR	125	0	0	0	0	0	0	0	0	0	0
Commerce Way	WBLT	350	1	16	1	18	1	18	1	22	1	22
	WBR	150	0	0	0	2	0	2	0	4	0	4
	NBL	200	2	33	2	34	2	34	3	39	3	40
Woodbury Avenue	NBTR	375	22	166	24	174	24	174	26	192	26	192
	SBL	200	33	407	31	420	32	430	35	477	36	487
	SBTR	475	0	204	0	245	0	245	0	269	0	270
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway												
Arthur F Brady Drive	EBLT	975	31	149	35	170	35	170	39	190	39	191
	EBR	125	0	12	0	13	0	13	0	17	0	18
Portsmouth Plaza	WBLT	75	11	50	12	54	12	54	13	58	13	58
Driveway	WBR	75	0	0	0	0	0	0	0	0	0	0
	NBL	350	40	165	42	180	49	215	48	210	55	246
Woodbury Avenue	NBTR	650	47	138	51	147	51	147	57	163	57	163
	SBL	275	14	60	15	65	15	65	17	71	17	71
	SBTR	375	76	193	96	236	96	236	107	259	107	260
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
	EBL	225	1	12	1	12	1	12	1	12	1	12
	EBT	650	60	157	65	174	67	175	74	191	77	192
Woodbury Avenue	EBR	225	0	43	0	51	0	51	0	53	0	53
	NBL	275	13	49	14	53	15	53	17	58	17	59
	NBTR	300	10	66	13	75	14	78	17	87	18	90
Market Street	WBL	300	27	98	26	100	35	124	31	112	40	144
	WBTR	625	54	196	53	201	57	210	62	224	65	234
Market Basket Driveway	SBL	50	23	78	22	85	22	85	25	93	26	93
	SBTR	50	15	57	14	64	15	64	16	68	16	68
Traffic Signal - Market Street at Portsmouth Boulevard												
	EBL	225	6	47	6	48	8	57	7	51	15	61
Market Street	EBT	600	20	37	22	41	23	45	25	45	26	52
	WBT	>1000	26	94	26	96	27	103	29	108	63	118
	WBR	225	0	17	0	17	0	18	0	18	0	19
Portsmouth Boulevard	SBL	225	4	26	3	27	7	43	4	28	13	45
	SBR	225	0	26	0	28	0	38	0	30	0	39
Traffic Signal - Market Street at I-95 SB Ramps												
	EBT	250	50	86	55	94	58	99	63	106	67	112
Market Street	EBR	275	0	0	0	0	0	0	0	0	0	0
	WBL	225	55	98	55	98	55	96	61	101	0	96
	WBT	325	25	125	25	131	26	133	30	142	31	144
	SBL	400	104	156	103	157	103	157	113	169	113	169
I-95 SB Off-Ramp	SBT	975	14	65	14	67	14	67	14	70	14	70
	SBR	400	0	49	0	50	0	50	0	51	0	51
Traffic Signal - Market Street at I-95 NB Ramps												
	EBL	325	26	60	26	52	26	47	28	49	28	43
Market Street	EBT	325	3	107	3	118	3	7	4	10	5	15
	WBT	>1000	52	102	55	106	57	109	65	124	67	129
	WBR	325	0	5	0	5	0	5	0	9	0	9
I-95 NB Off-Ramp	NBLT	>1000	105	152	107	155	109	158	117	164	119	164
	NBR	150	12	79	33	107	44	121	73	157	85	166
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive												
	NBL	125	--	38	--	30	--	33	--	35	--	38
Portsmouth Boulevard	NBTR	600	--	18	--	13	--	18	--	15	--	20
	SBLT	300	--	3	--	0	--	13	--	0	--	13
	SBR	125	--	0	--	0	--	0	--	0	--	0
Commerce Way	EBLT	75	--	5	--	3	--	5	--	5	--	5
	EBR	125	--	3	--	0	--	0	--	0	--	0
Osprey Drive	WB	200	--	15	--	15	--	18	--	18	--	20
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway												
Western Site Driveway	WB	175	--	--	--	--	--	8	--	--	--	8
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway												
Northern Site Driveway	NB	50	--	--	--	--	--	0	--	--	--	0

Legend
50th & 95th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Weekday Afternoon Peak Hour									
			2025 Existing		2027 No Build		2027 Build		2037 No Build		2037 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway												
Durgin Square Plaza	EBLT	150	38	165	31	175	31	175	41	190	41	190
Driveway	EBR	125	0	19	0	27	0	27	0	28	0	28
Commerce Way	WBLT	350	41	95	28	103	29	103	34	114	34	114
	WBR	150	0	0	0	39	0	39	0	41	0	41
	NBL	200	48	210	49	215	49	215	58	240	59	240
Woodbury Avenue	NBTR	375	125	290	131	318	131	318	150	356	150	356
	SBL	200	62	275	63	280	69	304	76	310	82	332
	SBTR	475	173	392	183	434	184	436	211	520	212	523
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway												
Arthur F Brady Drive	EBLT	975	61	228	62	240	62	240	75	264	75	264
	EBR	125	0	28	0	34	0	35	0	36	0	36
Portsmouth Plaza	WBLT	75	55	184	57	189	57	189	70	215	70	215
Driveway	WBR	75	0	27	0	27	0	27	0	28	0	28
	NBL	350	82	297	87	303	93	321	108	341	113	356
Woodbury Avenue	NBTR	650	112	268	124	297	124	297	141	334	141	334
	SBL	275	43	122	48	128	48	128	57	138	58	138
	SBTR	375	195	413	213	475	214	478	244	559	245	561
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
	EBL	225	5	24	5	24	5	24	5	26	5	26
	EBT	650	183	406	187	426	192	432	220	491	224	496
Woodbury Avenue	EBR	225	0	54	0	62	0	62	1	66	2	69
	NBL	275	44	103	51	113	51	113	57	123	58	123
	NBTR	300	46	151	52	172	59	202	62	203	70	233
Market Street	WBL	300	44	118	46	120	52	133	52	130	58	152
	WBTR	625	117	332	128	373	132	382	152	442	154	450
Market Basket Driveway	SBL	50	89	204	95	221	96	221	107	262	108	262
	SBTR	50	36	101	41	110	41	110	46	120	46	120
Traffic Signal - Market Street at Portsmouth Boulevard												
	EBL	225	9	51	9	50	21	71	15	54	24	76
Market Street	EBT	600	72	139	71	126	73	132	84	148	87	162
	WBT	>1000	54	178	53	173	104	186	115	199	121	221
	WBR	225	0	9	0	9	0	12	0	10	0	13
Portsmouth Boulevard	SBL	225	27	70	19	75	35	86	34	82	40	93
	SBR	225	0	14	0	37	0	41	0	38	0	42
Traffic Signal - Market Street at I-95 SB Ramps												
	EBT	250	139	198	146	203	149	206	179	219	182	219
Market Street	EBR	275	0	0	0	0	0	0	0	0	0	0
	WBL	225	122	213	89	222	71	225	66	260	66	261
	WBT	325	5	3	1	1	1	1	1	1	1	1
	SBL	400	115	173	115	173	115	174	125	198	125	201
I-95 SB Off-Ramp	SBT	975	31	91	31	91	31	92	41	110	41	113
	SBR	400	0	52	0	52	0	52	0	56	0	57
Traffic Signal - Market Street at I-95 NB Ramps												
	EBL	325	151	201	152	209	153	211	171	237	171	246
Market Street	EBT	325	143	207	151	222	157	226	171	241	174	245
	WBT	>1000	128	203	136	210	142	215	163	226	170	231
	WBR	325	0	47	0	46	0	46	0	46	0	46
I-95 NB Off-Ramp	NBLT	>1000	64	88	53	95	57	100	58	103	62	108
	NBR	150	0	26	0	56	0	56	0	58	0	58
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive												
	NBL	125	--	3	--	3	--	3	--	3	--	3
Portsmouth Boulevard	NBTR	600	--	10	--	8	--	18	--	10	--	20
	SBLT	300	--	15	--	10	--	18	--	13	--	20
	SBR	125	--	3	--	3	--	3	--	3	--	3
Commerce Way	EBLT	75	--	13	--	8	--	10	--	8	--	10
	EBR	125	--	33	--	18	--	20	--	23	--	23
Osprey Drive	WB	200	--	8	--	8	--	8	--	8	--	10
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway												
Western Site Driveway	WB	175	--	--	--	--	--	3	--	--	--	3
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway												
Northern Site Driveway	NB	50	--	--	--	--	--	0	--	--	--	0

Legend
50th & 95th - 50th and 95th percentile queue lengths in feet

TABLE 2 (CONTINUED)
Intersection Operation Summary - Queues (In Feet)

	Lane Use	Available Storage	Saturday Midday Peak Hour									
			2025 Existing		2027 No Build		2027 Build		2037 No Build		2037 Build	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Traffic Signal - Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway												
Durgin Square Plaza	EBLT	150	30	210	29	217	29	217	38	232	38	232
Driveway	EBR	125	0	23	0	28	0	28	0	29	0	29
Commerce Way	WBLT	350	7	49	8	48	8	48	9	53	9	53
	WBR	150	0	20	0	19	0	19	0	25	0	25
	NBL	200	38	251	40	247	40	247	49	279	49	279
Woodbury Avenue	NBTR	375	86	323	91	338	91	338	103	382	103	382
	SBL	200	43	274	44	274	47	292	53	305	56	321
	SBTR	475	102	369	110	403	111	405	125	458	126	460
Traffic Signal - Woodbury Avenue at Arthur F Brady Drive/Portsmouth Plaza Driveway												
Arthur F Brady Drive	EBLT	975	72	307	80	327	80	327	109	358	109	358
	EBR	125	0	35	0	35	0	36	2	40	2	41
Portsmouth Plaza	WBLT	75	58	224	61	228	61	228	73	258	73	258
Driveway	WBR	75	0	28	0	29	0	29	0	30	0	30
	NBL	350	77	300	80	307	87	329	96	343	103	365
Woodbury Avenue	NBTR	650	135	318	147	347	147	347	170	420	170	420
	SBL	275	56	161	60	168	60	168	70	183	70	183
	SBTR	375	161	345	178	379	179	381	203	426	204	431
Traffic Signal - Woodbury Avenue at Market Street/Market Basket Driveway												
	EBL	225	6	29	6	29	6	29	7	32	7	32
	EBT	650	129	279	138	296	143	300	162	355	166	360
Woodbury Avenue	EBR	225	0	58	0	61	0	61	0	63	0	63
	NBL	275	38	94	40	101	40	101	48	110	49	110
	NBTR	300	29	99	35	114	39	136	42	126	47	153
Market Street	WBL	300	29	92	30	92	37	107	36	99	44	115
	WBTR	625	150	468	154	487	159	497	186	568	190	579
Market Basket Driveway	SBL	50	89	195	84	211	86	211	100	252	102	252
	SBTR	50	42	107	43	123	44	123	51	134	52	134
Traffic Signal - Market Street at Portsmouth Boulevard												
	EBL	225	3	28	4	28	9	47	4	31	15	50
Market Street	EBT	600	45	74	48	78	51	82	55	90	59	94
	WBT	>1000	52	165	53	168	55	183	60	194	131	211
	WBR	225	0	6	0	6	0	9	0	7	0	9
Portsmouth Boulevard	SBL	225	3	19	3	20	6	32	3	21	11	33
	SBR	225	0	19	0	27	0	34	0	28	0	34
Traffic Signal - Market Street at I-95 SB Ramps												
	EBT	250	112	169	113	173	116	178	131	201	134	206
Market Street	EBR	275	0	0	0	0	0	0	0	0	0	0
	WBL	225	75	124	71	126	71	127	79	136	78	136
	WBT	325	28	36	24	33	26	38	25	35	28	38
	SBL	400	107	166	110	169	110	169	121	180	121	180
I-95 SB Off-Ramp	SBT	975	13	81	14	83	14	83	14	84	14	84
	SBR	400	0	61	0	62	0	62	0	62	0	63
Traffic Signal - Market Street at I-95 NB Ramps												
	EBL	325	162	200	153	205	154	206	169	223	170	225
Market Street	EBT	325	20	61	19	64	20	65	22	65	22	67
	WBT	>1000	93	164	89	166	93	173	104	192	108	198
	WBR	325	0	34	0	38	0	38	0	41	0	41
I-95 NB Off-Ramp	NBLT	>1000	35	66	37	69	41	74	41	74	44	79
	NBR	150	0	61	0	61	0	61	0	64	0	64
Unsignalized AWSC - Portsmouth Boulevard at Commerce Way/Osprey Drive												
	NBL	125	--	3	--	3	--	3	--	3	--	3
Portsmouth Boulevard	NBTR	600	--	3	--	3	--	8	--	3	--	10
	SBLT	300	--	3	--	3	--	8	--	3	--	8
	SBR	125	--	0	--	0	--	0	--	0	--	0
Commerce Way	EBLT	75	--	3	--	3	--	5	--	3	--	5
	EBR	125	--	0	--	0	--	0	--	0	--	0
Osprey Drive	WB	200	--	8	--	8	--	8	--	8	--	8
Unsignalized TWSC - Portsmouth Boulevard at Western Site Driveway												
Western Site Driveway	WB	175	--	--	--	--	--	5	--	--	--	5
Unsignalized TWSC - Portsmouth Boulevard at Northern Site Driveway												
Northern Site Driveway	NB	50	--	--	--	--	--	0	--	--	--	0

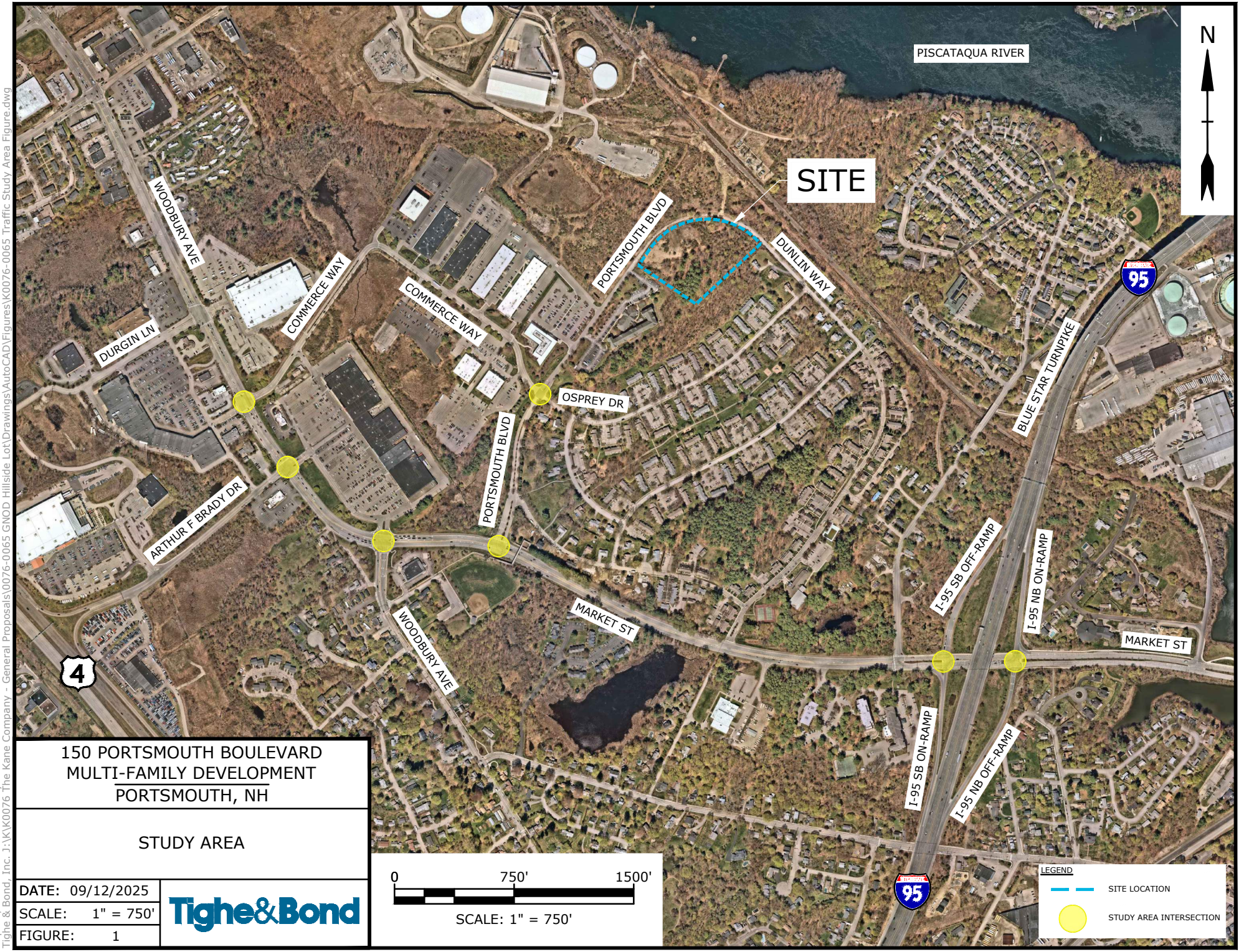
Legend
50th & 95th - 50th and 95th percentile queue lengths in feet

TABLE 3
Site-Generated Traffic Summary

Proposed - 274 Apartments **Peak Hour Period**	**Enter**	**Exit**	**Total**
Weekday Morning	25	84	109
Weekday Afternoon	65	42	107
Saturday Midday	56	54	110
Weekday	630	631	1,261
Saturday	616	616	1,232

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition, 2021
Land Use - 221 [Residential - Multifamily Housing (Mid-Rise)]

Section 8
Figures



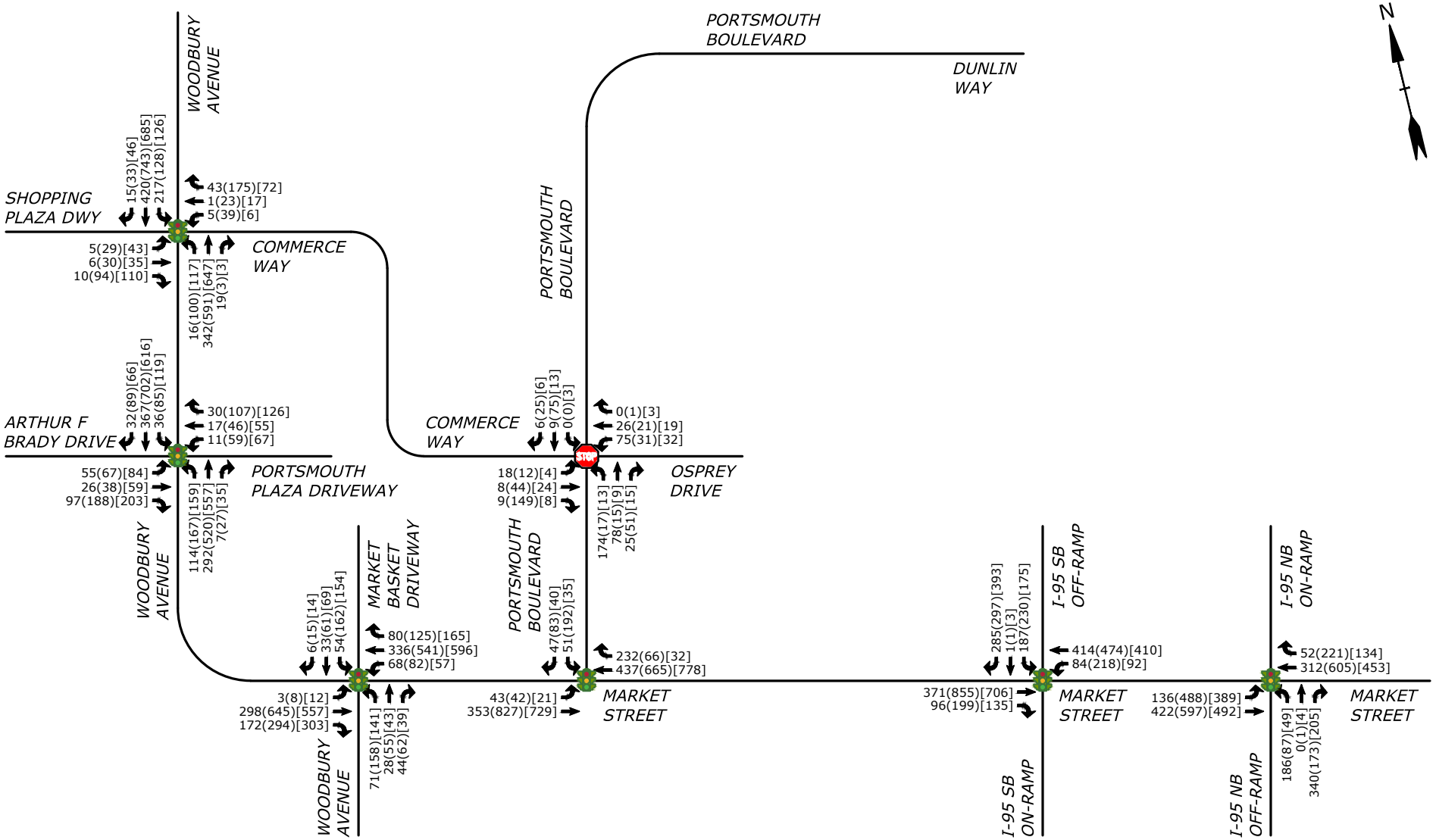
150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

STUDY AREA

DATE: 09/12/2025
SCALE: 1" = 750'
FIGURE: 1

Tighe&Bond

Sep 16, 2025-9:05am Plotted By: RCase
Tighe & Bond, Inc. J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Figures\K0076-0065 Traffic Study Area Figure.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

2025 EXISTING
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 2

Tighe&Bond

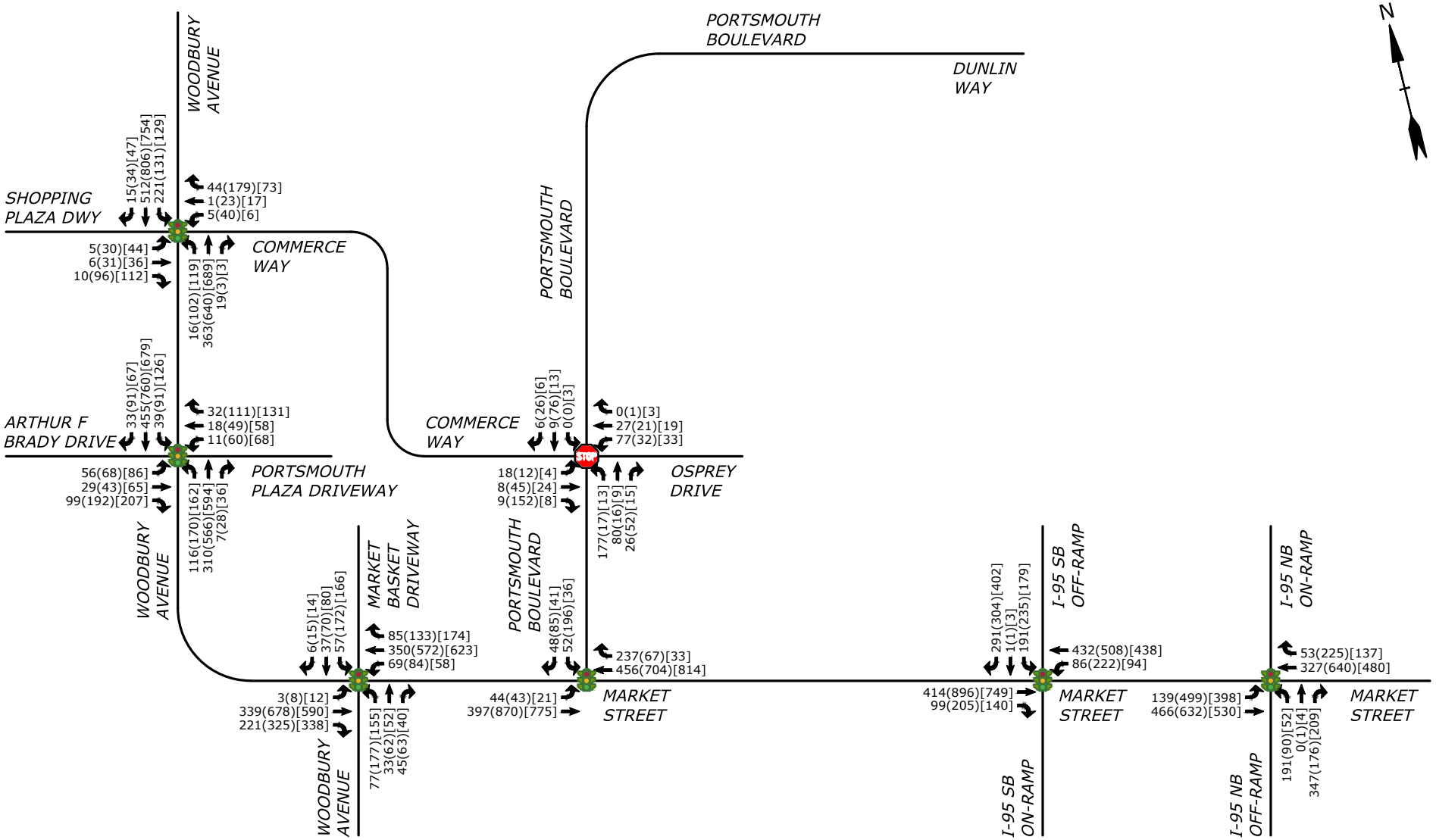
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

2027 NO BUILD
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 3

Tighe&Bond

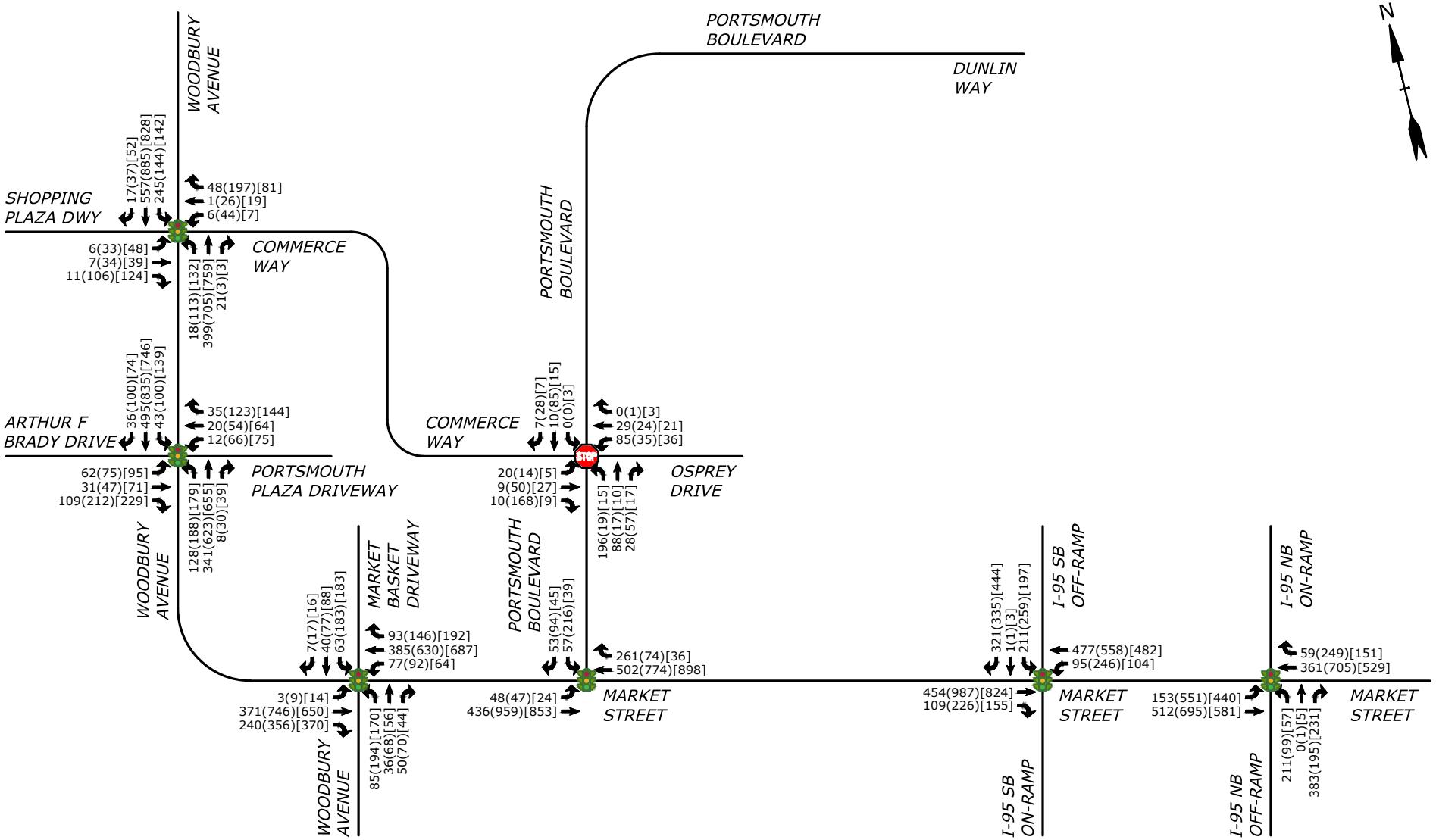
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

2037 NO BUILD
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 4

Tighe&Bond

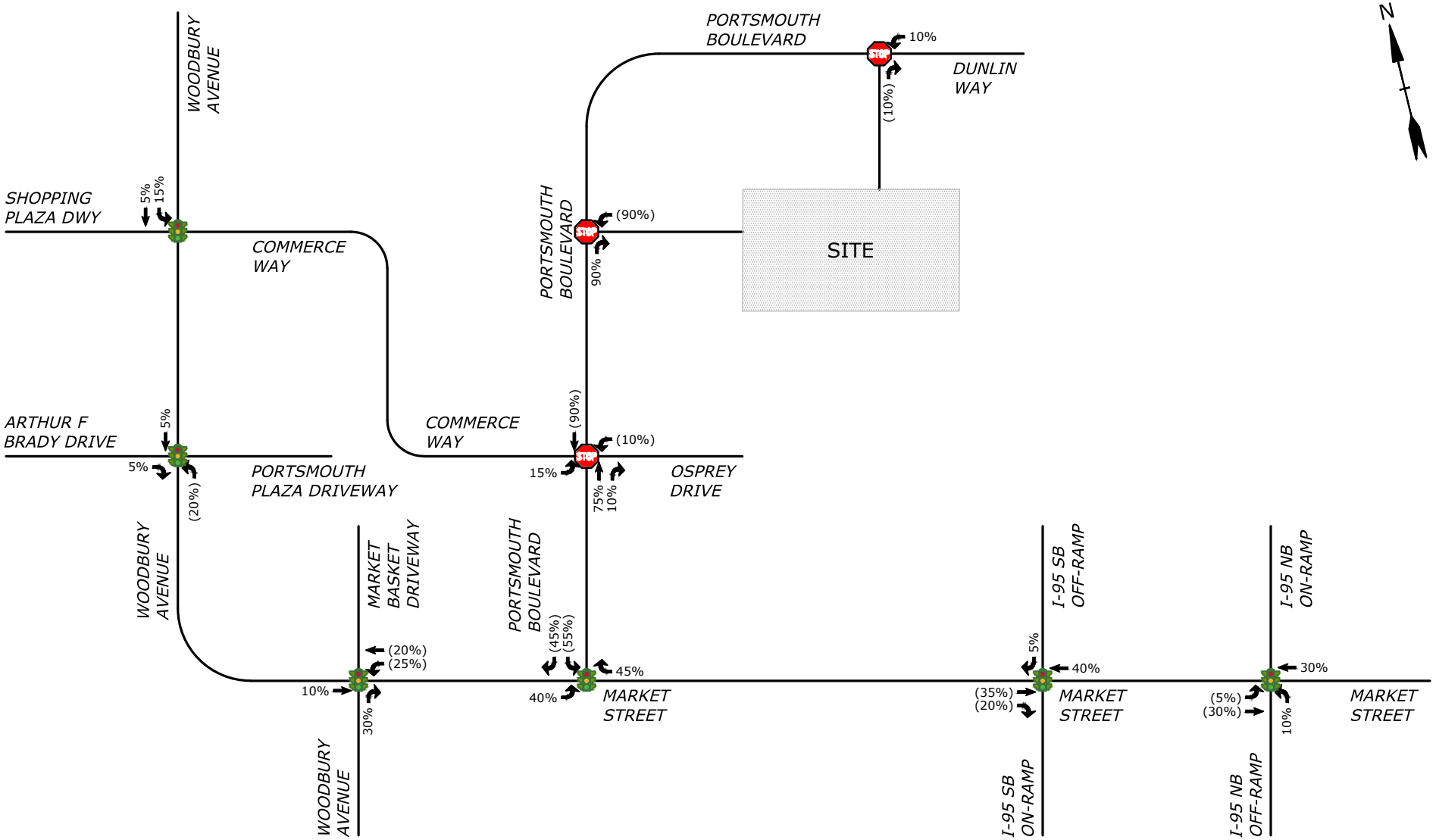
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

ARRIVAL & DEPARTURE
TRIP DISTRIBUTION

DATE: 09/12/2025
SCALE: NTS
FIGURE 5

Tighe&Bond

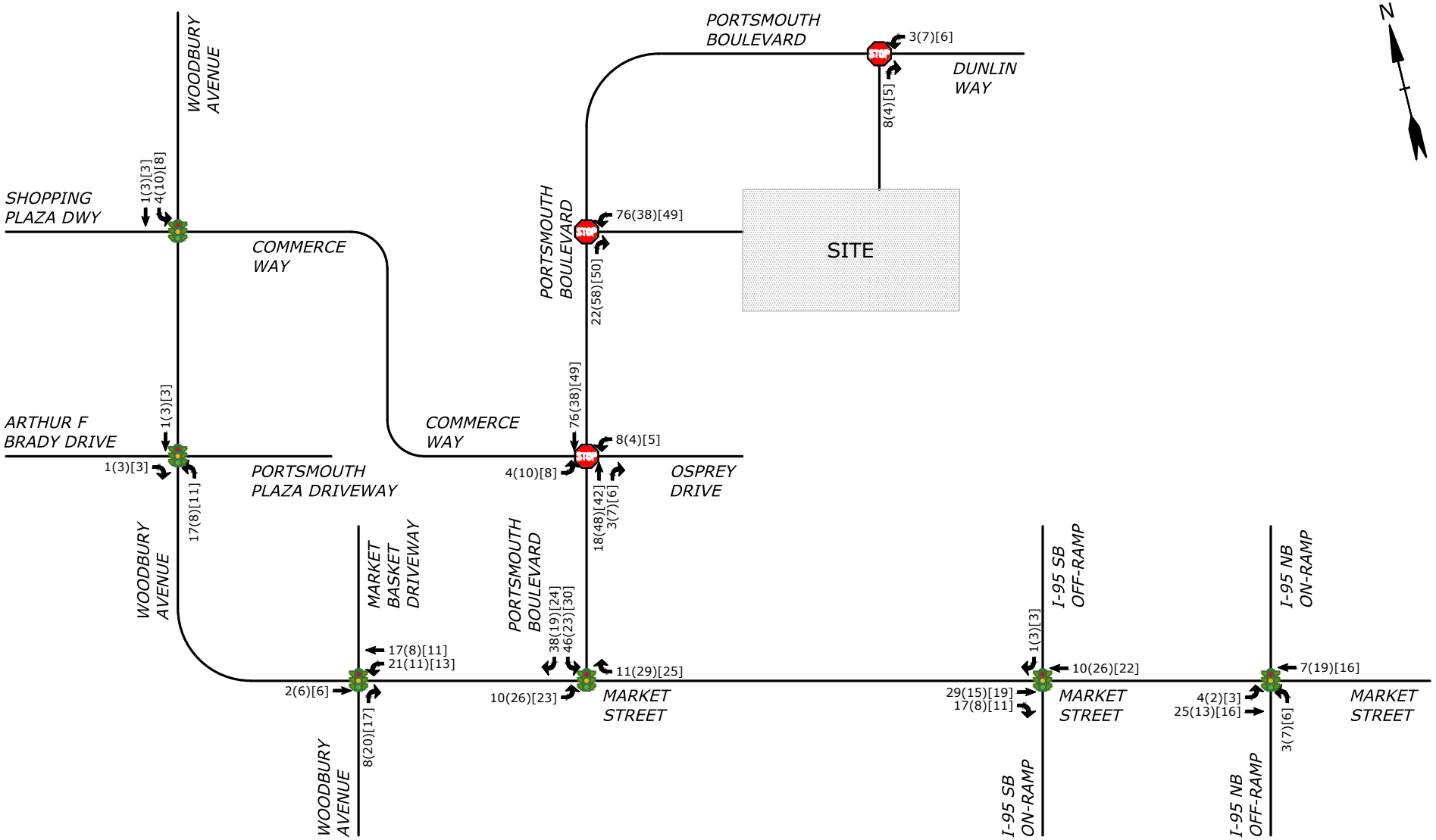
LEGEND

VOLUMES: ENTERING (EXITING)

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 6

Tighe&Bond

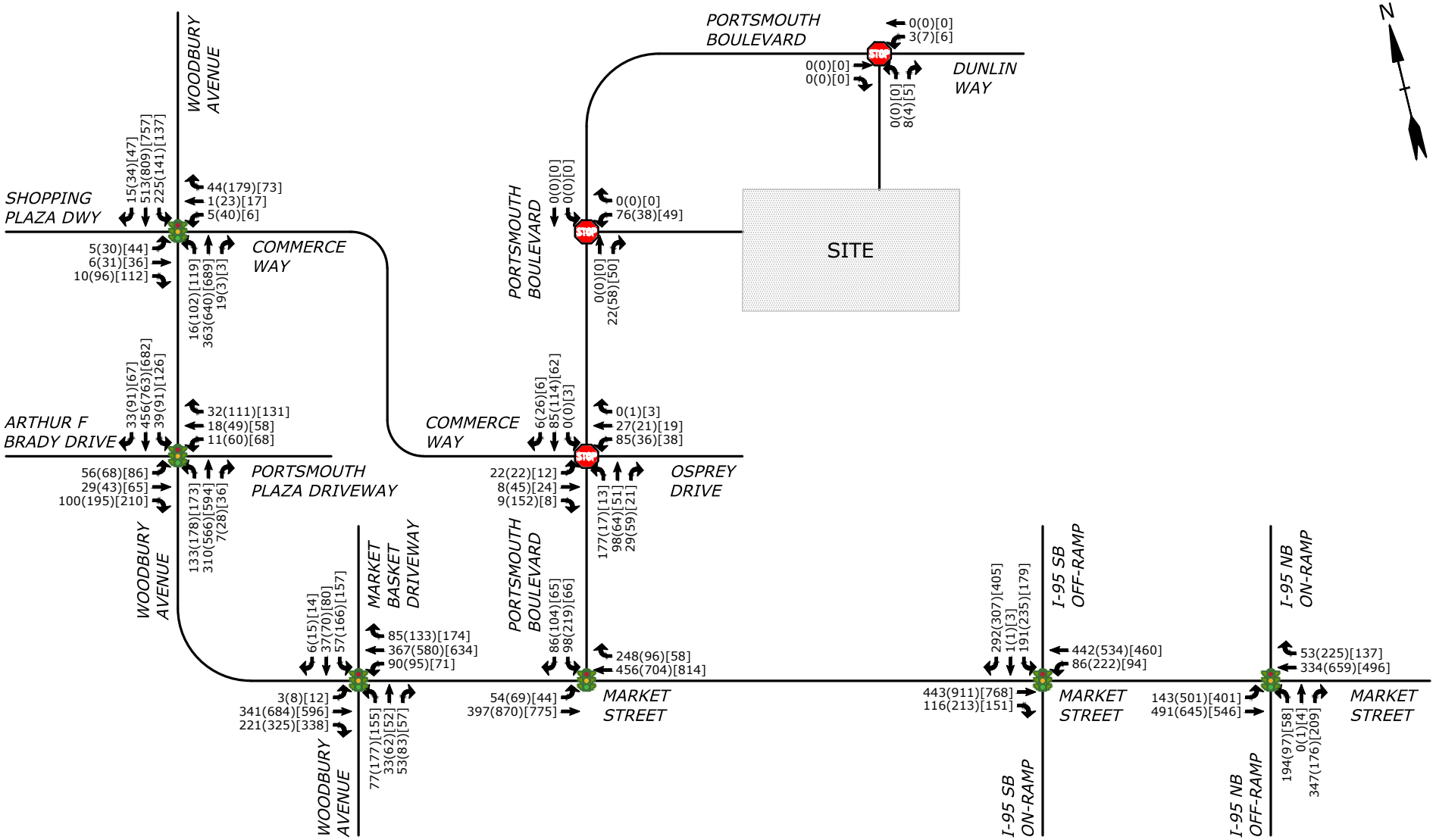
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

2027 BUILD
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 7

Tighe&Bond

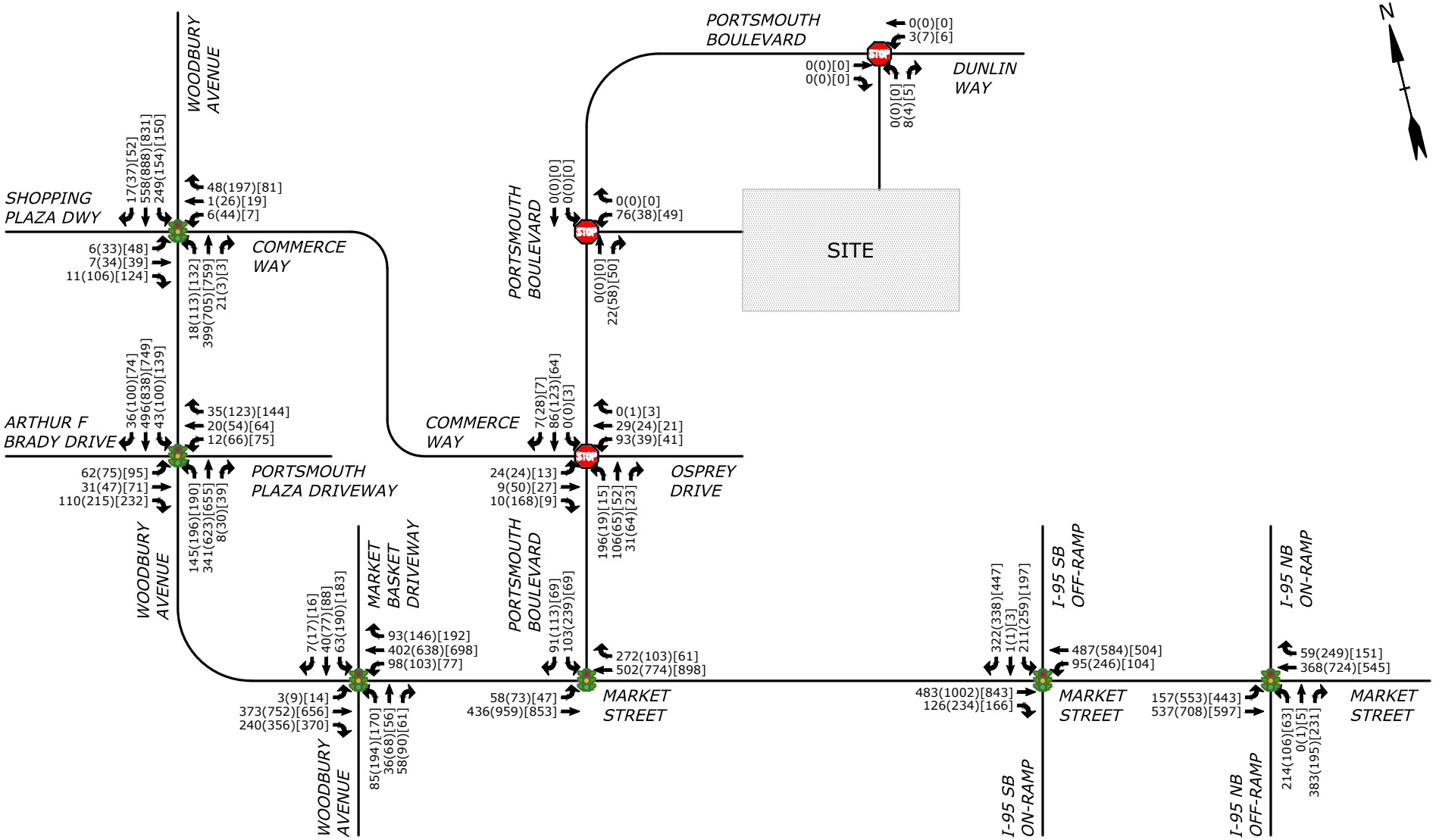
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg



150 PORTSMOUTH BOULEVARD
MULTI-FAMILY DEVELOPMENT
PORTSMOUTH, NH

2037 BUILD
TRAFFIC VOLUMES

DATE: 09/12/2025
SCALE: NTS
FIGURE 8

Tighe&Bond

LEGEND

VOLUMES: AM (PM) [SAT]

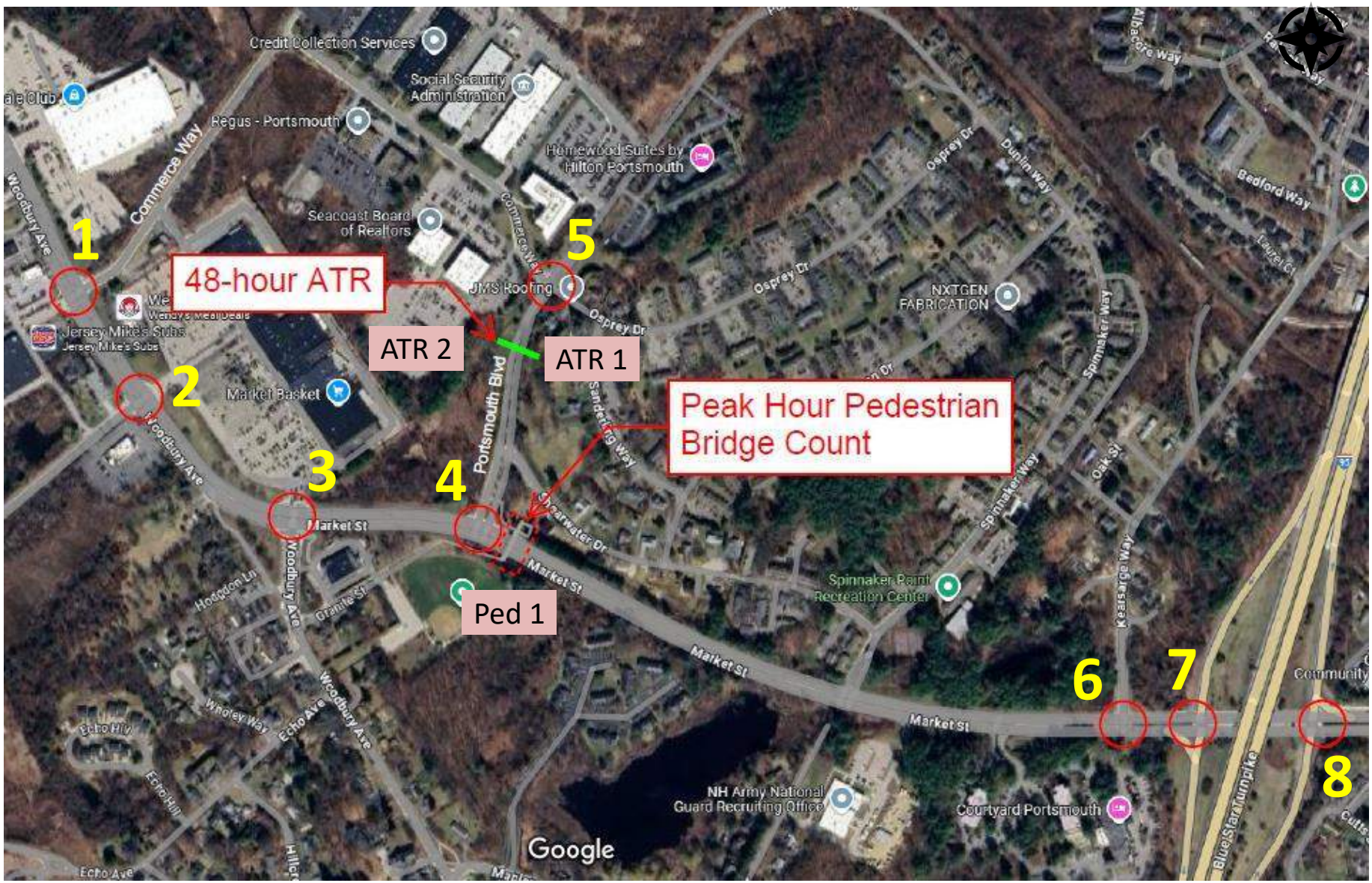
TRAFFIC SIGNAL

STOP SIGN

Sep 16, 2025-8:51am Plotted By: RCase
Tighe & Bond, Inc. C:\Users\LO70D2~1\Temp\AcPublish_61708\K0076-0065 Traffic Volume Figures.dwg

APPENDIX A

Traffic Count Data



BOSTON TRAFFIC DATA	BTD ID: 1712_1_TB	Portsmouth, NH	# of TMC's: 08	Client: Tighe & Bond
		Collected on July 9 to 12, 2025	# of ATR's: 02	Contact: Matthew Stoutz, PE, PTOE, RSP1

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

BOSTON TRAFFIC DATA
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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	2	0	6	0	20	68	1	0	2	43	1
7:15 AM	0	1	0	2	0	1	0	10	0	31	79	5	0	1	66	2
7:30 AM	0	1	2	3	0	1	0	8	0	28	83	2	0	6	65	2
7:45 AM	0	2	1	0	0	2	1	7	0	52	100	3	0	3	76	4
8:00 AM	0	1	4	2	0	2	0	9	1	50	98	3	0	5	82	10
8:15 AM	0	2	1	2	0	0	0	10	1	69	110	8	0	3	85	2
8:30 AM	0	0	0	6	0	1	0	17	0	42	108	1	0	4	80	2
8:45 AM	0	2	1	4	0	0	0	8	0	37	93	1	0	11	82	3
3:00 PM	0	10	10	26	0	3	3	25	0	38	170	7	0	21	136	1
3:15 PM	0	6	6	20	0	2	4	32	0	34	163	7	0	17	147	2
3:30 PM	0	11	2	18	0	18	7	24	0	40	181	7	0	25	159	2
3:45 PM	0	5	12	26	0	8	6	20	0	33	184	11	0	14	120	2
4:00 PM	0	8	2	24	0	8	7	31	0	31	202	8	0	22	159	1
4:15 PM	0	8	5	19	0	5	1	33	0	29	159	9	0	20	159	2
4:30 PM	0	8	8	32	0	5	6	31	0	21	175	10	0	25	145	0
4:45 PM	0	6	4	18	0	11	4	41	0	33	196	8	0	16	130	0
5:00 PM	0	8	10	20	0	19	7	68	0	42	191	8	0	21	126	1
5:15 PM	0	7	8	23	0	4	6	33	0	31	174	7	0	28	131	2
5:30 PM	0	5	3	21	0	6	7	32	0	32	160	11	0	16	127	0
5:45 PM	0	7	3	29	0	4	3	15	0	26	149	1	0	21	104	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**5**	**6**	**10**	**0**	**5**	**1**	**43**	**2**	**213**	**416**	**15**	**0**	**15**	**323**	**18**
PHF	**0.75**				**0.68**				**0.86**				**0.92**			
HV %	**0.0%**	**20.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.7%**	**0.0%**	**1.9%**	**3.6%**	**0.0%**	**0.0%**	**0.0%**	**3.1%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**29**	**30**	**93**	**0**	**39**	**23**	**173**	**0**	**127**	**736**	**33**	**0**	**90**	**532**	**3**
PHF	**0.79**				**0.63**				**0.93**				**0.92**			
HV %	**0.0%**	**3.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.9%**	**0.0%**	**1.6%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.2%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	1	3	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	2	2	0	0	0	2	0
7:30 AM	0	0	0	0	0	0	0	1	0	1	3	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	1	0
8:00 AM	0	1	0	0	0	0	0	1	0	1	3	0	0	0	3	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	4	0
8:30 AM	0	0	0	0	0	0	0	0	0	3	3	0	0	0	2	0
8:45 AM	0	0	0	0	0	0	0	0	0	2	5	0	0	0	1	0
3:00 PM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	3	0
3:15 PM	0	0	0	0	0	0	0	3	0	0	1	0	0	0	3	0
3:30 PM	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	0
3:45 PM	0	0	0	0	0	0	0	1	0	0	3	0	0	0	2	0
4:00 PM	0	2	0	1	0	0	0	1	0	1	1	0	0	0	1	0
4:15 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	1	0	1	4	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**6**	**14**	**0**	**0**	**0**	**10**	**0**
PHF	**0.25**				**0.50**				**0.71**				**0.63**			

PM PEAK HOUR 3:00 PM to 4:00 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**1**	**7**	**0**	**0**	**0**	**11**	**0**
PHF	**0.00**				**0.58**				**0.67**				**0.92**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
3:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

AM PEAK HOUR 7:45 AM to 8:45 AM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	1

PM PEAK HOUR 4:30 PM to 5:30 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	3	5	21	0	1	2	15	0	31	177	8	0	19	130	0
11:15 AM	0	6	7	22	0	1	5	13	0	30	174	9	0	17	141	2
11:30 AM	0	7	7	27	0	3	6	4	0	33	160	16	0	25	141	2
11:45 AM	0	7	9	21	0	0	5	18	0	26	164	16	0	18	158	2
12:00 PM	0	10	9	22	0	0	5	17	0	28	164	12	0	42	158	0
12:15 PM	0	9	9	27	0	3	6	16	0	26	170	8	0	26	181	0
12:30 PM	0	13	11	32	0	1	4	21	0	33	157	13	0	21	147	3
12:45 PM	0	11	6	28	0	2	2	17	0	38	187	13	0	24	140	0

MID PEAK HOUR 12:00 PM to 1:00 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**43**	**35**	**109**	**0**	**6**	**17**	**71**	**0**	**125**	**678**	**46**	**0**	**113**	**626**	**3**
PHF	**0.83**				**0.90**				**0.89**				**0.90**			
HV %	**0.0%**	**2.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.2%**	**0.0%**	**1.6%**	**0.1%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
11:30 AM	0	0	0	0	0	0	0	0	0	1	2	0	0	0	1	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
12:30 PM	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**7**	**0**	**0**	**0**	**3**	**0**
PHF	**0.00**				**0.25**				**0.67**				**0.38**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 1
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Commerce Way
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
11:15 AM	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
12:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0
12:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

MID PEAK HOUR 12:00 PM to 1:00 PM	Shopping Center Drive Northbound				Commerce Way Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	2	0	0	0	0	0	3	0	2

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	4	5	9	0	0	1	6	0	12	49	4	0	11	36	0
7:15 AM	0	9	8	8	0	2	7	9	0	11	67	8	0	18	52	0
7:30 AM	0	8	5	16	0	1	3	4	0	8	74	4	0	20	61	0
7:45 AM	0	12	7	24	0	1	5	8	0	5	84	13	0	22	66	2
8:00 AM	0	11	4	23	0	4	2	10	0	9	85	6	0	29	75	1
8:15 AM	0	12	10	26	0	1	3	7	0	8	97	7	0	30	73	2
8:30 AM	0	15	6	21	0	4	5	6	0	14	91	12	0	23	64	2
8:45 AM	0	16	6	26	0	2	7	7	0	5	86	7	0	29	73	2
3:00 PM	0	12	20	54	0	12	20	30	0	21	153	15	0	34	111	4
3:15 PM	0	19	12	35	0	8	17	22	0	20	163	20	1	33	135	6
3:30 PM	0	14	9	46	0	13	7	25	0	20	165	26	0	39	138	6
3:45 PM	0	14	9	39	0	16	11	22	0	26	172	24	1	42	112	11
4:00 PM	0	20	6	59	0	19	10	28	0	21	191	20	0	37	134	4
4:15 PM	0	18	14	42	0	10	18	31	0	15	152	16	0	46	131	6
4:30 PM	0	9	16	51	0	9	14	22	1	12	167	17	0	39	135	3
4:45 PM	0	13	13	34	0	11	9	16	0	15	199	19	0	46	114	7
5:00 PM	0	17	12	53	0	11	18	18	0	20	183	33	0	36	119	9
5:15 PM	0	17	16	38	0	14	12	14	0	24	162	12	0	43	130	10
5:30 PM	0	20	14	38	0	11	10	18	0	23	160	7	0	29	105	4
5:45 PM	0	5	13	29	0	10	9	22	0	7	159	14	0	23	95	6

AM PEAK HOUR 8:00 AM to 9:00 AM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**54**	**26**	**96**	**0**	**11**	**17**	**30**	**0**	**36**	**359**	**32**	**0**	**111**	**285**	**7**
PHF	**0.92**				**0.91**				**0.91**				**0.96**			
HV %	**0.0%**	**1.9%**	**11.5%**	**5.2%**	**0.0%**	**9.1%**	**5.9%**	**0.0%**	**0.0%**	**0.0%**	**4.2%**	**6.3%**	**0.0%**	**7.2%**	**3.2%**	**0.0%**

PM PEAK HOUR 3:30 PM to 4:30 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**66**	**38**	**186**	**0**	**58**	**46**	**106**	**0**	**82**	**680**	**86**	**1**	**164**	**515**	**27**
PHF	**0.85**				**0.89**				**0.91**				**0.97**			
HV %	**0.0%**	**0.0%**	**2.6%**	**2.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**2.3%**	**0.0%**	**0.6%**	**1.4%**	**3.7%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
7:15 AM	0	0	0	1	0	0	0	1	0	0	1	1	0	0	1	0
7:30 AM	0	0	0	1	0	0	0	0	0	0	3	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0
8:00 AM	0	0	1	1	0	1	0	0	0	0	4	0	0	0	3	0
8:15 AM	0	1	1	1	0	0	0	0	0	0	3	0	0	3	3	0
8:30 AM	0	0	1	1	0	0	0	0	0	0	1	2	0	1	2	0
8:45 AM	0	0	0	2	0	0	1	0	0	0	7	0	0	4	1	0
3:00 PM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	3	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
3:30 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	3	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	2	0
4:00 PM	0	0	0	1	0	0	0	0	0	0	2	0	0	1	1	0
4:15 PM	0	0	1	2	0	0	0	0	0	0	2	0	0	0	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	1	2	1	0	0	1	1
4:45 PM	0	0	0	1	0	1	0	0	0	0	2	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**3**	**5**	**0**	**1**	**1**	**0**	**0**	**0**	**15**	**2**	**0**	**8**	**9**	**0**
PHF	**0.75**				**0.50**				**0.61**				**0.71**			

PM PEAK HOUR 3:45 PM to 4:45 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**8**	**3**	**0**	**1**	**5**	**2**
PHF	**0.33**				**0.00**				**0.75**				**1.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0

PM PEAK HOUR 3:30 PM to 4:30 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	18	5	34	0	10	13	18	0	19	152	18	0	35	117	6
11:15 AM	0	20	14	43	0	7	14	20	0	29	159	19	0	39	120	8
11:30 AM	0	19	27	48	0	12	11	29	1	34	142	8	1	35	113	8
11:45 AM	0	21	19	53	0	10	18	24	0	27	148	14	0	38	141	5
12:00 PM	0	16	8	55	0	21	10	36	0	23	138	20	1	46	144	10
12:15 PM	0	22	12	48	0	16	12	30	0	32	163	14	0	36	153	10
12:30 PM	0	24	19	45	0	19	14	35	0	31	137	14	0	36	113	10
12:45 PM	0	19	13	50	0	15	8	25	0	30	166	19	0	35	119	15

MID PEAK HOUR 11:45 AM to 12:45 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**83**	**58**	**201**	**0**	**66**	**54**	**125**	**0**	**113**	**586**	**62**	**1**	**156**	**551**	**35**
PHF	**0.92**				**0.90**				**0.91**				**0.92**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	0
11:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
11:45 AM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**6**	**0**	**0**	**3**	**1**	**0**
PHF	**0.38**				**0.00**				**0.58**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 2
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Arthur Brady Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:30 AM	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0
11:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

MID PEAK HOUR 11:45 AM to 12:45 PM	Arthur Brady Drive Northbound				Shopping Center Drive Southbound				Woodbury Ave Eastbound				Woodbury Ave Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	1	0	0	0	0	0	0	0	0	0	5	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	6	12	4	0	8	7	0	0	0	43	16	0	11	39	14
7:15 AM	0	7	8	10	0	20	3	1	0	1	45	30	0	7	66	22
7:30 AM	0	10	7	13	0	17	4	1	0	3	56	34	0	10	71	15
7:45 AM	0	9	7	8	0	13	4	2	0	0	73	32	0	19	81	26
8:00 AM	0	12	6	13	0	14	12	1	0	0	59	44	0	12	93	19
8:15 AM	0	13	9	14	0	11	5	1	0	2	89	44	1	20	87	26
8:30 AM	0	21	10	7	0	18	7	4	0	1	73	35	0	16	70	14
8:45 AM	0	24	3	10	0	10	9	0	0	0	74	47	0	16	76	18
3:00 PM	0	34	9	19	0	52	25	3	1	0	148	76	0	22	107	31
3:15 PM	0	37	11	17	0	33	15	7	0	1	132	70	0	16	141	31
3:30 PM	0	50	12	19	0	42	11	5	0	2	134	80	1	24	128	26
3:45 PM	0	35	13	17	0	36	14	5	1	6	141	93	0	21	126	30
4:00 PM	0	30	15	17	0	39	15	3	0	1	176	88	0	18	142	33
4:15 PM	0	41	12	10	0	37	15	4	0	4	146	56	1	19	135	36
4:30 PM	0	43	15	13	0	42	19	2	0	2	151	72	0	21	131	28
4:45 PM	0	40	12	21	0	42	11	6	0	1	166	75	0	22	121	27
5:00 PM	0	33	7	16	0	40	12	6	1	6	140	85	1	31	122	32
5:15 PM	0	40	12	21	0	40	12	7	0	5	145	75	0	19	145	39
5:30 PM	0	36	14	12	0	55	28	3	0	4	133	72	1	20	92	33
5:45 PM	0	26	8	13	0	32	16	2	1	1	115	71	0	15	98	26

AM PEAK HOUR 8:00 AM to 9:00 AM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**70**	**28**	**44**	**0**	**53**	**33**	**6**	**0**	**3**	**295**	**170**	**1**	**64**	**326**	**77**
PHF	**0.93**				**0.79**				**0.87**				**0.87**			
HV %	**0.0%**	**1.4%**	**0.0%**	**2.3%**	**0.0%**	**7.5%**	**0.0%**	**16.7%**	**0.0%**	**0.0%**	**6.1%**	**1.2%**	**0.0%**	**4.7%**	**4.3%**	**0.0%**

PM PEAK HOUR 4:00 PM to 5:00 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**154**	**54**	**61**	**0**	**160**	**60**	**15**	**0**	**8**	**639**	**291**	**1**	**80**	**529**	**124**
PHF	**0.92**				**0.93**				**0.88**				**0.95**			
HV %	**0.0%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.7%**	**0.7%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	2	0	0	0	0	3	1	0	0	0	1
7:15 AM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	3	2	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	1	0	0	1	0
8:00 AM	0	0	0	0	0	2	0	0	0	0	4	1	0	0	3	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	5	0	0	2	5	0
8:30 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	0	2	0
8:45 AM	0	1	0	1	0	0	0	0	0	0	8	0	0	1	4	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0
3:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	3	0
3:30 PM	0	1	0	0	0	0	0	0	0	0	2	0	0	0	2	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1
4:00 PM	0	1	0	0	0	0	0	0	0	0	2	1	0	0	2	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	3	1	0	0	2	0
4:30 PM	0	2	0	0	0	1	0	0	0	0	2	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0
5:00 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**1**	**0**	**4**	**0**	**1**	**0**	**0**	**18**	**2**	**0**	**3**	**14**	**0**
PHF	**0.25**				**0.63**				**0.63**				**0.61**			

PM PEAK HOUR 3:45 PM to 4:45 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**9**	**2**	**0**	**0**	**7**	**1**
PHF	**0.38**				**0.25**				**0.69**				**0.67**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	2
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	1	0	0	1	1	0	0	1	0	0	0	0	0	0	1	2

PM PEAK HOUR 4:00 PM to 5:00 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	32	14	14	0	28	12	4	0	7	120	68	0	8	131	35
11:15 AM	0	34	15	12	0	35	20	2	0	0	137	58	0	13	119	38
11:30 AM	0	35	10	4	0	36	15	2	0	3	139	72	0	17	123	27
11:45 AM	0	31	12	9	0	51	20	4	0	1	136	77	0	13	155	47
12:00 PM	0	38	12	12	0	39	19	4	0	3	145	66	0	23	157	45
12:15 PM	0	43	11	9	0	27	14	4	0	4	129	85	0	9	145	31
12:30 PM	0	28	8	9	0	35	15	2	0	4	141	72	0	11	132	40
12:45 PM	0	36	6	14	0	52	21	5	0	7	132	91	0	13	130	28

MID PEAK HOUR 11:45 AM to 12:45 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**140**	**43**	**39**	**0**	**152**	**68**	**14**	**0**	**12**	**551**	**300**	**0**	**56**	**589**	**163**
PHF	**0.88**				**0.78**				**0.99**				**0.90**			
HV %	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**7.1%**	**0.0%**	**0.0%**	**0.4%**	**0.7%**	**0.0%**	**0.0%**	**0.2%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0
11:15 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0
12:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**2**	**0**	**0**	**1**	**0**
PHF	**0.38**				**0.00**				**0.50**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 3
Location:	Portsmouth, NH
Street 1:	Woodbury Ave
Street 2:	Market Street
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:15 AM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
12:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
12:30 PM	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:45 AM to 12:45 PM	Woodbury Ave Northbound				Shopping Center Drive Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	4	0	0	1	0	0	0	0	1	4	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	8	0	10	0	2	52	0	0	0	52	19
7:15 AM	0	0	0	0	0	7	0	3	0	6	72	0	0	0	94	22
7:30 AM	0	0	0	0	0	12	0	12	1	12	73	0	0	0	83	30
7:45 AM	0	0	0	0	0	14	0	11	0	9	83	0	0	0	112	62
8:00 AM	0	0	0	0	0	16	0	13	0	8	78	0	0	0	114	54
8:15 AM	0	0	0	0	0	11	0	14	0	16	92	0	0	0	115	72
8:30 AM	0	0	0	0	0	9	0	9	0	10	95	0	0	0	92	42
8:45 AM	0	0	0	0	0	11	0	15	0	10	85	0	0	0	93	35
3:00 PM	0	0	0	0	0	25	0	13	1	6	212	0	0	0	154	10
3:15 PM	0	0	0	0	0	24	0	15	0	11	172	0	0	0	175	15
3:30 PM	0	0	0	0	0	35	0	16	0	12	182	0	0	0	156	17
3:45 PM	0	0	0	0	0	17	0	11	0	7	191	0	0	0	170	15
4:00 PM	0	0	0	0	0	39	0	18	0	7	225	0	0	0	173	19
4:15 PM	0	0	0	0	0	26	0	25	0	13	183	0	0	0	165	23
4:30 PM	0	0	0	0	0	49	0	23	0	11	194	0	0	0	153	16
4:45 PM	0	0	0	0	0	21	0	15	0	9	218	0	0	0	164	12
5:00 PM	0	0	0	0	0	81	0	25	0	11	186	0	0	0	161	21
5:15 PM	0	0	0	0	0	39	0	19	0	10	193	0	0	0	178	16
5:30 PM	0	0	0	0	0	41	0	17	0	7	194	0	0	0	122	9
5:45 PM	0	0	0	0	0	18	0	10	0	9	151	0	2	0	121	11

AM PEAK HOUR 7:45 AM to 8:45 AM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**50**	**0**	**47**	**0**	**43**	**348**	**0**	**0**	**0**	**433**	**230**
PHF	**0.00**				**0.84**				**0.91**				**0.89**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.0%**	**0.0%**	**4.3%**	**0.0%**	**2.3%**	**3.7%**	**0.0%**	**0.0%**	**0.0%**	**2.5%**	**2.6%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**190**	**0**	**82**	**0**	**41**	**791**	**0**	**0**	**0**	**656**	**65**
PHF	**0.00**				**0.64**				**0.92**				**0.93**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.1%**	**0.0%**	**0.0%**	**0.0%**	**0.5%**	**4.6%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	0	5	0	0	0	1	2
7:15 AM	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	3	5
8:15 AM	0	0	0	0	0	1	0	2	0	1	3	0	0	0	5	0
8:30 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2	1
8:45 AM	0	0	0	0	0	0	0	2	0	3	5	0	0	0	4	3
3:00 PM	0	0	0	0	0	3	0	0	0	0	1	0	0	0	3	2
3:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	3	0
3:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	2	0
3:45 PM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	3	3
4:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	0	2	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	1
4:30 PM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	1	0
4:45 PM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	2	1
5:00 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
5:30 PM	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**2**	**0**	**4**	**0**	**4**	**14**	**0**	**0**	**0**	**14**	**9**
PHF	**0.00**				**0.50**				**0.56**				**0.72**			

PM PEAK HOUR 3:00 PM to 4:00 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**6**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**0**	**11**	**5**
PHF	**0.00**				**0.58**				**0.42**				**0.67**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

PM PEAK HOUR 4:30 PM to 5:30 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	1	8	0	7	1	3	146	0	0	0	162	9
11:15 AM	0	0	0	0	0	5	0	7	0	6	184	0	1	0	161	4
11:30 AM	0	0	0	0	0	7	0	6	0	0	172	0	0	0	165	9
11:45 AM	0	0	0	0	0	10	0	6	0	6	186	0	0	0	216	8
12:00 PM	0	0	0	0	0	5	0	12	1	5	193	0	0	0	208	10
12:15 PM	0	0	0	0	0	10	0	16	0	2	163	0	0	0	167	5
12:30 PM	0	0	0	0	0	10	0	6	0	7	178	0	0	0	178	9
12:45 PM	0	0	0	0	0	8	0	17	1	6	191	0	0	0	165	8

MID PEAK HOUR 11:45 AM to 12:45 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**35**	**0**	**40**	**1**	**20**	**720**	**0**	**0**	**0**	**769**	**32**
PHF	**0.00**				**0.72**				**0.93**				**0.89**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**11.4%**	**0.0%**	**2.5%**	**0.0%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.0%**	**0.1%**	**6.3%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:45 AM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12:15 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	0	1	0
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0

MID PEAK HOUR 11:00 AM to 12:00 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**1**	**3**
PHF	**0.00**				**0.25**				**0.31**				**1.00**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 4
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	Portsmouth Boulevard
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

MID PEAK HOUR 11:45 AM to 12:45 PM	Northbound				Portsmouth Boulevard Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	1	2	0	0	0	0	0	2	1	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	15	2	1	0	0	2	0	0	1	3	1	0	16	4	2
7:15 AM	0	14	7	7	0	0	1	2	0	7	1	1	0	6	6	0
7:30 AM	0	19	10	3	0	0	3	0	0	5	0	2	0	23	5	0
7:45 AM	0	45	24	7	0	0	1	2	0	5	0	1	0	19	8	0
8:00 AM	0	39	16	4	0	0	2	2	0	6	2	4	0	22	5	0
8:15 AM	0	55	25	9	0	0	2	0	0	4	2	2	0	21	7	0
8:30 AM	0	33	12	5	0	0	4	2	0	3	4	2	0	12	6	0
8:45 AM	0	26	13	4	0	0	2	1	0	6	2	4	0	20	2	0
3:00 PM	0	6	5	6	0	1	9	2	0	3	8	18	0	12	4	0
3:15 PM	0	4	8	11	0	0	10	2	0	4	5	22	0	9	8	0
3:30 PM	0	4	8	15	0	1	16	4	0	1	9	22	0	9	2	0
3:45 PM	0	4	8	9	0	0	8	1	0	2	3	14	0	12	1	1
4:00 PM	0	6	10	8	0	0	16	3	0	1	9	19	0	16	7	0
4:15 PM	0	2	8	15	0	0	11	2	0	1	11	21	0	12	3	0
4:30 PM	0	5	7	5	0	0	21	10	0	4	9	32	0	8	4	1
4:45 PM	0	1	5	12	0	0	10	5	0	4	6	20	0	6	6	0
5:00 PM	0	7	2	19	0	0	29	5	0	2	20	63	0	8	5	0
5:15 PM	0	4	1	14	0	0	14	5	0	2	9	33	0	9	6	0
5:30 PM	0	0	3	7	0	1	10	9	0	2	13	31	0	6	2	1
5:45 PM	0	3	4	7	0	0	6	1	0	1	11	7	0	9	5	0

AM PEAK HOUR 7:45 AM to 8:45 AM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**172**	**77**	**25**	**0**	**0**	**9**	**6**	**0**	**18**	**8**	**9**	**0**	**74**	**26**	**0**
PHF	**0.77**				**0.63**				**0.73**				**0.89**			
HV %	**0.0%**	**0.6%**	**0.0%**	**12.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**5.6%**	**0.0%**	**11.1%**	**0.0%**	**2.7%**	**3.8%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**17**	**15**	**50**	**0**	**0**	**74**	**25**	**0**	**12**	**44**	**148**	**0**	**31**	**21**	**1**
PHF	**0.73**				**0.73**				**0.60**				**0.88**			
HV %	**0.0%**	**17.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

BOSTON TRAFFIC DATA
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HEAVY VEHICLES

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0
8:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
8:45 AM	0	0	4	1	0	0	0	0	0	1	1	0	0	1	0	0
3:00 PM	0	1	0	1	0	0	0	0	0	0	0	3	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
3:45 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

AM PEAK HOUR 8:00 AM to 9:00 AM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**4**	**4**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**1**	**0**	**3**	**1**	**0**
PHF	**0.45**				**0.00**				**0.50**				**0.33**			

PM PEAK HOUR 3:00 PM to 4:00 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**2**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**1**
PHF	**0.38**				**0.25**				**0.50**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

BOSTON TRAFFIC DATA
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PEDESTRIANS & BICYCLES

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	11
3:15 PM	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	4
3:30 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	1	0	2
3:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	7
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2
4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
5:45 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1

AM PEAK HOUR 7:45 AM to 8:45 AM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	7

PM PEAK HOUR 4:30 PM to 5:30 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	5

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	1	1	6	0	1	2	0	0	0	7	1	0	8	8	1
11:15 AM	0	1	0	7	0	0	0	1	0	0	8	1	0	6	5	0
11:30 AM	0	2	2	3	0	0	2	0	0	0	6	1	0	5	4	0
11:45 AM	0	1	1	4	0	0	2	1	0	0	6	4	0	5	4	0
12:00 PM	0	3	3	4	0	0	3	1	0	0	5	1	0	7	6	0
12:15 PM	0	4	3	0	0	2	3	2	0	1	6	1	0	11	5	2
12:30 PM	0	4	2	4	0	1	1	2	0	2	6	3	0	5	3	0
12:45 PM	0	2	1	7	0	0	6	1	0	1	7	3	0	9	5	1

MID PEAK HOUR 12:00 PM to 1:00 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**13**	**9**	**15**	**0**	**3**	**13**	**6**	**0**	**4**	**24**	**8**	**0**	**32**	**19**	**3**
PHF	**0.93**				**0.79**				**0.82**				**0.75**			
HV %	**0.0%**	**7.7%**	**0.0%**	**0.0%**	**0.0%**	**33.3%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**12.5%**	**0.0%**	**0.0%**	**5.3%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:45 AM to 12:45 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**
PHF	**0.25**				**0.25**				**0.50**				**0.25**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 5
Location:	Portsmouth, NH
Street 1:	Portsmouth Boulevard
Street 2:	Commerce Way & Osprey Drive
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	Portsmouth Boulevard Northbound				Portsmouth Boulevard Southbound				Commerce Way Eastbound				Osprey Drive Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	12	0	40	0	0	50	23	0	10	42	0
7:15 AM	0	0	0	0	0	20	0	56	0	0	85	24	0	8	53	0
7:30 AM	0	0	0	0	0	32	0	58	0	0	73	21	1	14	55	0
7:45 AM	0	0	0	0	0	57	1	73	0	0	95	28	0	20	99	0
8:00 AM	0	0	0	0	0	37	0	75	0	0	78	20	0	19	104	0
8:15 AM	0	0	0	0	0	37	0	73	0	0	97	23	0	24	113	0
8:30 AM	0	0	0	0	0	54	0	61	0	0	97	24	0	20	93	0
8:45 AM	0	0	0	0	0	61	1	52	0	0	89	22	0	14	95	0
3:00 PM	0	0	0	0	0	30	1	71	0	0	180	56	0	55	105	0
3:15 PM	0	0	0	0	0	44	0	91	0	0	158	40	0	37	111	0
3:30 PM	0	0	0	0	0	36	0	87	0	0	181	42	0	51	99	0
3:45 PM	0	0	0	0	0	32	0	91	0	0	179	28	0	45	102	0
4:00 PM	0	0	0	0	0	27	0	81	0	0	227	52	0	53	129	0
4:15 PM	0	0	0	0	0	32	0	69	0	0	198	41	0	40	130	0
4:30 PM	0	0	0	0	0	47	0	74	0	0	199	48	0	54	112	0
4:45 PM	0	0	0	0	0	60	0	85	0	0	209	38	0	49	111	0
5:00 PM	0	0	0	0	0	60	1	60	0	0	213	65	0	67	122	0
5:15 PM	0	0	0	0	0	61	0	75	0	0	225	46	0	46	123	0
5:30 PM	0	0	0	0	0	34	0	67	0	0	199	37	0	51	100	0
5:45 PM	0	0	0	0	0	34	0	60	0	0	172	24	0	22	95	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**185**	**1**	**282**	**0**	**0**	**367**	**95**	**0**	**83**	**409**	**0**
PHF	**0.00**				**0.89**				**0.94**				**0.90**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**4.9%**	**0.0%**	**3.2%**	**0.0%**	**0.0%**	**3.5%**	**7.4%**	**0.0%**	**7.2%**	**4.9%**	**0.0%**

PM PEAK HOUR 4:30 PM to 5:30 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**228**	**1**	**294**	**0**	**0**	**846**	**197**	**0**	**216**	**468**	**0**
PHF	**0.00**				**0.90**				**0.94**				**0.90**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**	**0.7%**	**0.0%**	**0.0%**	**1.5%**	**1.5%**	**0.0%**	**1.4%**	**1.3%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	2	0	1	0	0	3	4	0	3	3	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	5	1	0	1	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	1	1	0
7:45 AM	0	0	0	0	0	1	0	1	0	0	4	1	0	1	5	0
8:00 AM	0	0	0	0	0	3	0	3	0	0	4	0	0	3	7	0
8:15 AM	0	0	0	0	0	3	0	4	0	0	3	3	0	0	4	0
8:30 AM	0	0	0	0	0	2	0	1	0	0	2	3	0	2	4	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	1	5	0
3:00 PM	0	0	0	0	0	0	0	2	0	0	1	7	0	3	3	0
3:15 PM	0	0	0	0	0	0	0	1	0	0	2	1	0	1	4	0
3:30 PM	0	0	0	0	0	2	0	1	0	0	3	1	0	4	2	0
3:45 PM	0	0	0	0	0	0	0	2	0	0	3	0	0	3	3	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	1	3	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	2	0	2	1	0
4:30 PM	0	0	0	0	0	1	0	1	0	0	3	0	0	1	1	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	3	1	0	1	2	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	3	2	0	1	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	4	1	0	0	4	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**9**	**0**	**9**	**0**	**0**	**13**	**7**	**0**	**6**	**20**	**0**
PHF	**0.00**				**0.64**				**0.83**				**0.65**			

PM PEAK HOUR 3:00 PM to 4:00 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**2**	**0**	**6**	**0**	**0**	**9**	**9**	**0**	**11**	**12**	**0**
PHF	**0.00**				**0.67**				**0.56**				**0.96**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
3:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	5	0	1	0	0	0	1	0	0

PM PEAK HOUR 4:30 PM to 5:30 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	8	0	3	0	0	0	1	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

BOSTON TRAFFIC DATA
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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	30	0	88	0	0	159	31	0	23	95	0
11:15 AM	0	0	0	0	0	36	1	87	0	0	156	28	0	26	79	0
11:30 AM	0	0	0	0	0	49	0	88	0	0	162	32	0	12	102	0
11:45 AM	0	0	0	0	0	41	1	108	0	0	192	38	0	31	114	0
12:00 PM	0	0	0	0	0	48	1	103	0	0	193	36	0	26	90	0
12:15 PM	0	0	0	0	0	35	1	86	0	0	152	28	0	22	96	0
12:30 PM	0	0	0	0	0	24	0	101	0	0	163	33	0	23	96	0
12:45 PM	0	0	0	0	0	44	0	87	0	0	193	27	0	36	98	0

MID PEAK HOUR 11:30 AM to 12:30 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**173**	**3**	**385**	**0**	**0**	**699**	**134**	**0**	**91**	**402**	**0**
PHF	**0.00**				**0.92**				**0.91**				**0.85**			
HV %	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.2%**	**0.0%**	**0.3%**	**0.0%**	**0.0%**	**0.6%**	**3.0%**	**0.0%**	**1.1%**	**0.5%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0
11:15 AM	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0	0
11:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0
12:15 PM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	1	0	0	1	1	0	2	0	0

MID PEAK HOUR 12:00 PM to 1:00 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**7**	**3**	**0**	**3**	**1**	**0**
PHF	**0.00**				**0.38**				**0.63**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 7
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 SB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0
11:45 AM	0	0	0	0	0	0	0	3	0	1	0	0	0	1	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:30 AM to 12:30 PM	I-95 SB On-Ramp Northbound				I-95 SB Off-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	7	0	1	0	0	0	5	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	23	0	36	0	0	0	0	0	13	42	0	0	0	27	8
7:15 AM	0	23	0	38	0	0	0	0	0	43	67	0	0	0	38	14
7:30 AM	0	27	0	49	0	0	0	0	0	28	78	0	0	0	43	9
7:45 AM	0	49	0	90	0	0	0	0	0	30	117	0	0	0	67	11
8:00 AM	0	45	0	77	0	0	0	0	0	32	87	0	0	0	86	10
8:15 AM	0	50	0	77	0	0	0	0	1	36	96	0	0	0	82	16
8:30 AM	0	39	0	93	0	0	0	0	0	36	116	0	0	0	71	14
8:45 AM	0	31	1	85	0	0	0	0	0	38	112	0	1	0	79	14
3:00 PM	0	21	2	45	0	0	0	0	0	98	107	0	0	0	143	48
3:15 PM	0	17	2	33	0	0	0	0	0	104	104	0	1	0	130	47
3:30 PM	0	21	1	17	0	0	0	0	0	104	111	0	0	0	136	64
3:45 PM	0	14	1	34	0	0	0	0	0	111	102	0	0	0	126	41
4:00 PM	0	13	1	28	0	0	0	0	0	131	123	0	0	0	169	44
4:15 PM	0	17	0	30	0	0	0	0	0	106	124	0	0	0	153	34
4:30 PM	0	14	0	25	0	0	0	0	0	121	121	0	1	0	152	57
4:45 PM	0	17	1	35	0	0	0	0	0	112	161	0	0	0	143	74
5:00 PM	0	31	0	57	0	0	0	0	0	119	153	0	0	0	154	42
5:15 PM	0	24	0	54	0	0	0	0	0	131	156	0	0	0	149	46
5:30 PM	0	23	0	55	0	0	0	0	0	99	134	0	0	0	123	38
5:45 PM	0	24	1	24	0	0	0	0	0	89	123	0	0	0	94	30

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**183**	**0**	**337**	**0**	**0**	**0**	**0**	**1**	**134**	**416**	**0**	**0**	**0**	**306**	**51**
PHF	**0.94**				**0.00**				**0.91**				**0.91**			
HV %	**0.0%**	**4.9%**	**0.0%**	**2.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**6.0%**	**3.4%**	**0.0%**	**0.0%**	**0.0%**	**5.2%**	**3.9%**

PM PEAK HOUR 4:30 PM to 5:30 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**86**	**1**	**171**	**0**	**0**	**0**	**0**	**0**	**483**	**591**	**0**	**1**	**0**	**598**	**219**
PHF	**0.73**				**0.00**				**0.94**				**0.94**			
HV %	**0.0%**	**3.5%**	**0.0%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**2.1%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**1.8%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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HEAVY VEHICLES

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	0	2	0	0	0	0	0	0	5	0	0	0	5	1
7:15 AM	0	0	0	2	0	0	0	0	0	4	1	0	0	0	1	1
7:30 AM	0	1	0	3	0	0	0	0	0	2	2	0	0	0	2	0
7:45 AM	0	1	0	3	0	0	0	0	0	2	3	0	0	0	4	0
8:00 AM	0	3	0	1	0	0	0	0	0	1	6	0	0	0	7	0
8:15 AM	0	3	0	1	0	0	0	0	0	3	3	0	0	0	1	2
8:30 AM	0	2	0	4	0	0	0	0	0	2	2	0	0	0	4	0
8:45 AM	0	4	0	3	0	0	0	0	0	1	2	0	1	0	1	1
3:00 PM	0	1	0	1	0	0	0	0	0	1	0	0	0	0	6	0
3:15 PM	0	1	0	2	0	0	0	0	0	2	0	0	0	0	3	1
3:30 PM	0	2	0	1	0	0	0	0	0	1	2	0	0	0	4	0
3:45 PM	0	0	0	0	0	0	0	0	0	3	2	0	0	0	6	0
4:00 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	4	1
4:15 PM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	2	1
4:30 PM	0	1	0	0	0	0	0	0	0	2	1	0	0	0	1	1
4:45 PM	0	1	0	0	0	0	0	0	0	1	3	0	0	0	2	1
5:00 PM	0	1	0	2	0	0	0	0	0	2	0	0	0	0	2	2
5:15 PM	0	0	0	0	0	0	0	0	0	5	1	0	0	0	1	0
5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
5:45 PM	0	0	0	2	0	0	0	0	0	0	2	0	0	0	2	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**9**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**8**	**14**	**0**	**0**	**0**	**16**	**2**
PHF	**0.75**				**0.00**				**0.79**				**0.64**			

PM PEAK HOUR 3:00 PM to 4:00 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**4**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**7**	**4**	**0**	**0**	**0**	**19**	**1**
PHF	**0.67**				**0.00**				**0.55**				**0.83**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS & BICYCLES

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

AM PEAK HOUR 7:45 AM to 8:45 AM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0

PM PEAK HOUR 4:30 PM to 5:30 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	0	0	0	0	2	0	1	0	0	0	1	0	0

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	12	1	50	0	0	0	0	0	86	97	0	0	0	101	27
11:15 AM	0	12	0	46	0	0	0	0	0	89	104	0	0	0	94	23
11:30 AM	0	18	1	51	0	0	0	0	0	90	120	0	0	0	95	39
11:45 AM	0	8	1	55	0	0	0	0	0	91	123	0	0	0	138	33
12:00 PM	0	14	2	51	0	0	0	0	0	120	138	0	0	0	102	32
12:15 PM	0	9	0	46	0	0	0	0	0	84	106	0	0	0	112	29
12:30 PM	0	14	1	50	0	0	0	0	0	73	108	0	0	0	108	49
12:45 PM	0	14	0	46	0	0	0	0	0	107	128	0	1	0	119	32

MID PEAK HOUR 11:30 AM to 12:30 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**49**	**4**	**203**	**0**	**0**	**0**	**0**	**0**	**385**	**487**	**0**	**0**	**0**	**447**	**133**
PHF	**0.91**				**0.00**				**0.84**				**0.85**			
HV %	**0.0%**	**2.0%**	**0.0%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**1.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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HEAVY VEHICLES

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
11:00 AM	0	0	0	0	0	0	0	0	0	2	2	0	0	0	2	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
11:30 AM	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:45 AM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
12:00 PM	0	0	0	1	0	0	0	0	0	2	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
12:45 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	0

MID PEAK HOUR 12:00 PM to 1:00 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	0	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**6**	**0**	**0**	**0**	**4**	**0**
PHF	**0.50**				**0.00**				**0.56**				**0.50**			

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Location 8
Location:	Portsmouth, NH
Street 1:	Market Street
Street 2:	I-95 NB Ramps
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS & BICYCLES

	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
11:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	2	0	0
11:45 AM	0	0	0	1	0	0	0	3	0	1	0	0	0	1	0	0
12:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
12:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

MID PEAK HOUR 11:30 AM to 12:30 PM	I-95 NB Off-Ramp Northbound				I-95 NB On-Ramp Southbound				Market Street Eastbound				Market Street Westbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
	0	0	0	1	0	0	0	7	0	1	0	0	0	5	0	1

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Ped 1
Location:	Portsmouth, NH Pedestrian Bridge
Street:	over Market Street
Count Date:	7/9/2025
Day of Week:	Wednesday
Weather:	Cloudy, 70°F

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PEDESTRIANS

Start Time	Northbound	Southbound
7:00 AM	0	0
7:15 AM	1	1
7:30 AM	0	0
7:45 AM	1	0
8:00 AM	0	0
8:15 AM	4	1
8:30 AM	0	2
8:45 AM	0	0
3:00 PM	2	1
3:15 PM	1	0
3:30 PM	0	1
3:45 PM	1	1
4:00 PM	0	1
4:15 PM	0	1
4:30 PM	0	0
4:45 PM	1	0
5:00 PM	0	1
5:15 PM	0	0
5:30 PM	0	0
5:45 PM	0	4
TOTAL	**11**	**14**

Client:	Matthew Stoutz, PE, PTOE, RSP1
Project #:	1712_1_TB
BTD #:	Ped 1
Location:	Portsmouth, NH Pedestrian Bridge
Street:	over Market Street
Count Date:	7/12/2025
Day of Week:	Saturday
Weather:	Cloudy, 80°F

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PEDESTRIANS

Start Time	Northbound	Southbound
11:00 AM	0	0
11:15 AM	0	0
11:30 AM	1	1
11:45 AM	0	2
12:00 PM	0	0
12:15 PM	0	0
12:30 PM	0	0
12:45 PM	2	0
TOTAL	**3**	**3**

Volume Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way

BOSTON TRAFFIC DATA
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Wednesday, July 9, 2025

Time	Total		NB				Time	Total		NB			
0000	0		0		0		1200	18		18		0	
0015	1		1		0		1215	20		20		0	
0030	1		1		0		1230	29		29		0	
0045	1	3	1	3	0	0	1245	35	102	35	102	0	0
0100	0		0		0		1300	23		23		0	
0115	1		1		0		1315	26		26		0	
0130	0		0		0		1330	19		19		0	
0145	0	1	0	1	0	0	1345	32	100	32	100	0	0
0200	0		0		0		1400	24		24		0	
0215	2		2		0		1415	26		26		0	
0230	0		0		0		1430	30		30		0	
0245	1	3	1	3	0	0	1445	21	101	21	101	0	0
0300	4		4		0		1500	17		17		0	
0315	1		1		0		1515	26		26		0	
0330	0		0		0		1530	28		28		0	
0345	2	7	2	7	0	0	1545	20	91	20	91	0	0
0400	0		0		0		1600	25		25		0	
0415	2		2		0		1615	24		24		0	
0430	2		2		0		1630	17		17		0	
0445	2	6	2	6	0	0	1645	18	84	18	84	0	0
0500	0		0		0		1700	30		30		0	
0515	2		2		0		1715	17		17		0	
0530	3		3		0		1730	10		10		0	
0545	8	13	8	13	0	0	1745	15	72	15	72	0	0
0600	8		8		0		1800	15		15		0	
0615	6		6		0		1815	8		8		0	
0630	14		14		0		1830	11		11		0	
0645	18	46	18	46	0	0	1845	10	44	10	44	0	0
0700	18		18		0		1900	8		8		0	
0715	28		28		0		1915	9		9		0	
0730	36		36		0		1930	13		13		0	
0745	71	153	71	153	0	0	1945	9	39	9	39	0	0
0800	60		60		0		2000	10		10		0	
0815	87		87		0		2015	11		11		0	
0830	53		53		0		2030	6		6		0	
0845	44	244	44	244	0	0	2045	5	32	5	32	0	0
0900	46		46		0		2100	5		5		0	
0915	29		29		0		2115	5		5		0	
0930	27		27		0		2130	6		6		0	
0945	28	130	28	130	0	0	2145	6	22	6	22	0	0
1000	22		22		0		2200	13		13		0	
1015	30		30		0		2215	4		4		0	
1030	16		16		0		2230	4		4		0	
1045	17	85	17	85	0	0	2245	4	25	4	25	0	0
1100	31		31		0		2300	5		5		0	
1115	18		18		0		2315	2		2		0	
1130	19		19		0		2330	3		3		0	
1145	20	88	20	88	0	0	2345	1	11	1	11	0	0
							Total	**1502**		**1502**		**0**	

Volume Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way

BOSTON TRAFFIC DATA
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Thursday, July 10, 2025

Time	Total		NB				Time	Total		NB			
0000	4		4		0		1200	20		20		0	
0015	5		5		0		1215	24		24		0	
0030	1		1		0		1230	24		24		0	
0045	1	11	1	11	0	0	1245	37	105	37	105	0	0
0100	1		1		0		1300	29		29		0	
0115	2		2		0		1315	28		28		0	
0130	1		1		0		1330	22		22		0	
0145	1	5	1	5	0	0	1345	23	102	23	102	0	0
0200	1		1		0		1400	18		18		0	
0215	0		0		0		1415	29		29		0	
0230	0		0		0		1430	25		25		0	
0245	1	2	1	2	0	0	1445	23	95	23	95	0	0
0300	4		4		0		1500	25		25		0	
0315	1		1		0		1515	19		19		0	
0330	0		0		0		1530	14		14		0	
0345	3	8	3	8	0	0	1545	17	75	17	75	0	0
0400	1		1		0		1600	14		14		0	
0415	0		0		0		1615	16		16		0	
0430	2		2		0		1630	16		16		0	
0445	2	5	2	5	0	0	1645	18	64	18	64	0	0
0500	3		3		0		1700	17		17		0	
0515	0		0		0		1715	17		17		0	
0530	3		3		0		1730	26		26		0	
0545	5	11	5	11	0	0	1745	18	78	18	78	0	0
0600	13		13		0		1800	18		18		0	
0615	5		5		0		1815	9		9		0	
0630	7		7		0		1830	14		14		0	
0645	16	41	16	41	0	0	1845	13	54	13	54	0	0
0700	16		16		0		1900	14		14		0	
0715	25		25		0		1915	7		7		0	
0730	39		39		0		1930	13		13		0	
0745	63	143	63	143	0	0	1945	13	47	13	47	0	0
0800	86		86		0		2000	6		6		0	
0815	101		101		0		2015	5		5		0	
0830	57		57		0		2030	2		2		0	
0845	40	284	40	284	0	0	2045	10	23	10	23	0	0
0900	46		46		0		2100	5		5		0	
0915	31		31		0		2115	13		13		0	
0930	29		29		0		2130	6		6		0	
0945	31	137	31	137	0	0	2145	3	27	3	27	0	0
1000	13		13		0		2200	10		10		0	
1015	17		17		0		2215	2		2		0	
1030	21		21		0		2230	7		7		0	
1045	22	73	22	73	0	0	2245	4	23	4	23	0	0
1100	25		25		0		2300	6		6		0	
1115	17		17		0		2315	2		2		0	
1130	23		23		0		2330	1		1		0	
1145	19	84	19	84	0	0	2345	2	11	2	11	0	0
							Total	**1508**		**1508**		**0**	

Volume Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way

BOSTON TRAFFIC DATA
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Wednesday, July 9, 2025

Time	Total		SB				Time	Total		SB			
0000	0		0		0		1200	45		45		0	
0015	2		2		0		1215	31		31		0	
0030	2		2		0		1230	30		30		0	
0045	2	6	2	6	0	0	1245	24	130	24	130	0	0
0100	1		1		0		1300	23		23		0	
0115	0		0		0		1315	27		27		0	
0130	0		0		0		1330	33		33		0	
0145	0	1	0	1	0	0	1345	32	115	32	115	0	0
0200	0		0		0		1400	28		28		0	
0215	3		3		0		1415	21		21		0	
0230	0		0		0		1430	43		43		0	
0245	2	5	2	5	0	0	1445	31	123	31	123	0	0
0300	2		2		0		1500	39		39		0	
0315	1		1		0		1515	41		41		0	
0330	0		0		0		1530	47		47		0	
0345	7	10	7	10	0	0	1545	34	161	34	161	0	0
0400	2		2		0		1600	51		51		0	
0415	9		9		0		1615	44		44		0	
0430	8		8		0		1630	61		61		0	
0445	4	23	4	23	0	0	1645	36	192	36	192	0	0
0500	8		8		0		1700	100		100		0	
0515	8		8		0		1715	56		56		0	
0530	10		10		0		1730	47		47		0	
0545	6	32	6	32	0	0	1745	22	225	22	225	0	0
0600	3		3		0		1800	17		17		0	
0615	3		3		0		1815	24		24		0	
0630	14		14		0		1830	9		9		0	
0645	16	36	16	36	0	0	1845	17	67	17	67	0	0
0700	19		19		0		1900	15		15		0	
0715	8		8		0		1915	8		8		0	
0730	28		28		0		1930	12		12		0	
0745	21	76	21	76	0	0	1945	6	41	6	41	0	0
0800	27		27		0		2000	10		10		0	
0815	24		24		0		2015	11		11		0	
0830	18		18		0		2030	3		3		0	
0845	26	95	26	95	0	0	2045	5	29	5	29	0	0
0900	27		27		0		2100	3		3		0	
0915	21		21		0		2115	6		6		0	
0930	31		31		0		2130	2		2		0	
0945	20	99	20	99	0	0	2145	2	13	2	13	0	0
1000	20		20		0		2200	4		4		0	
1015	23		23		0		2215	5		5		0	
1030	27		27		0		2230	1		1		0	
1045	14	84	14	84	0	0	2245	1	11	1	11	0	0
1100	18		18		0		2300	3		3		0	
1115	23		23		0		2315	0		0		0	
1130	32		32		0		2330	2		2		0	
1145	44	117	44	117	0	0	2345	3	8	3	8	0	0
							Total	**1699**		**1699**		**0**	

Volume Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way

BOSTON TRAFFIC DATA
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Thursday, July 10, 2025

Time	Total		SB				Time	Total		SB			
0000	4		4		0		1200	44		44		0	
0015	1		1		0		1215	30		30		0	
0030	1		1		0		1230	27		27		0	
0045	1	7	1	7	0	0	1245	31	132	31	132	0	0
0100	0		0		0		1300	28		28		0	
0115	0		0		0		1315	20		20		0	
0130	0		0		0		1330	23		23		0	
0145	0	0	0	0	0	0	1345	22	93	22	93	0	0
0200	1		1		0		1400	19		19		0	
0215	0		0		0		1415	23		23		0	
0230	1		1		0		1430	37		37		0	
0245	4	6	4	6	0	0	1445	21	100	21	100	0	0
0300	3		3		0		1500	42		42		0	
0315	0		0		0		1515	42		42		0	
0330	1		1		0		1530	51		51		0	
0345	5	9	5	9	0	0	1545	43	178	43	178	0	0
0400	3		3		0		1600	60		60		0	
0415	7		7		0		1615	34		34		0	
0430	8		8		0		1630	46		46		0	
0445	4	22	4	22	0	0	1645	37	177	37	177	0	0
0500	10		10		0		1700	83		83		0	
0515	3		3		0		1715	34		34		0	
0530	13		13		0		1730	43		43		0	
0545	11	37	11	37	0	0	1745	39	199	39	199	0	0
0600	1		1		0		1800	23		23		0	
0615	5		5		0		1815	16		16		0	
0630	5		5		0		1830	21		21		0	
0645	15	26	15	26	0	0	1845	11	71	11	71	0	0
0700	16		16		0		1900	9		9		0	
0715	19		19		0		1915	14		14		0	
0730	26		26		0		1930	9		9		0	
0745	17	78	17	78	0	0	1945	6	38	6	38	0	0
0800	28		28		0		2000	8		8		0	
0815	26		26		0		2015	6		6		0	
0830	25		25		0		2030	5		5		0	
0845	20	99	20	99	0	0	2045	8	27	8	27	0	0
0900	53		53		0		2100	6		6		0	
0915	20		20		0		2115	4		4		0	
0930	16		16		0		2130	4		4		0	
0945	25	114	25	114	0	0	2145	5	19	5	19	0	0
1000	11		11		0		2200	7		7		0	
1015	16		16		0		2215	3		3		0	
1030	39		39		0		2230	2		2		0	
1045	24	90	24	90	0	0	2245	1	13	1	13	0	0
1100	38		38		0		2300	4		4		0	
1115	28		28		0		2315	1		1		0	
1130	32		32		0		2330	0		0		0	
1145	39	137	39	137	0	0	2345	3	8	3	8	0	0
							Total	**1680**		**1680**		**0**	

Classification Report

Job # 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way
Direction Northbound
Wednesday, July 9, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	3	0	3	0	0	0	0	0	0	0	0	0	0	0
0100	1	0	0	1	0	0	0	0	0	0	0	0	0	0
0200	3	0	3	0	0	0	0	0	0	0	0	0	0	0
0300	7	0	6	1	0	0	0	0	0	0	0	0	0	0
0400	6	0	6	0	0	0	0	0	0	0	0	0	0	0
0500	13	0	12	0	1	0	0	0	0	0	0	0	0	0
0600	46	0	42	4	0	0	0	0	0	0	0	0	0	0
0700	153	0	138	14	0	1	0	0	0	0	0	0	0	0
0800	244	0	207	33	2	2	0	0	0	0	0	0	0	0
0900	130	1	103	22	2	2	0	0	0	0	0	0	0	0
1000	85	3	69	10	2	1	0	0	0	0	0	0	0	0
1100	88	0	80	4	0	4	0	0	0	0	0	0	0	0
1200	102	0	90	9	0	3	0	0	0	0	0	0	0	0
1300	100	0	85	12	1	2	0	0	0	0	0	0	0	0
1400	101	0	80	19	0	2	0	0	0	0	0	0	0	0
1500	91	0	80	8	1	2	0	0	0	0	0	0	0	0
1600	84	0	73	9	0	2	0	0	0	0	0	0	0	0
1700	72	1	63	5	1	2	0	0	0	0	0	0	0	0
1800	44	1	38	4	0	1	0	0	0	0	0	0	0	0
1900	39	0	33	5	0	1	0	0	0	0	0	0	0	0
2000	32	0	28	3	0	1	0	0	0	0	0	0	0	0
2100	22	0	21	1	0	0	0	0	0	0	0	0	0	0
2200	25	1	21	3	0	0	0	0	0	0	0	0	0	0
2300	11	0	9	2	0	0	0	0	0	0	0	0	0	0
Total	**1502**	**7**	**1290**	**169**	**10**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.47%**	**85.89%**	**11.25%**	**0.67%**	**1.73%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way
Direction Northbound
Thursday, July 10, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	11	0	10	0	1	0	0	0	0	0	0	0	0	0
0100	5	0	3	2	0	0	0	0	0	0	0	0	0	0
0200	2	0	1	1	0	0	0	0	0	0	0	0	0	0
0300	8	0	5	3	0	0	0	0	0	0	0	0	0	0
0400	5	0	4	1	0	0	0	0	0	0	0	0	0	0
0500	11	0	9	1	0	0	1	0	0	0	0	0	0	0
0600	41	1	36	3	0	0	1	0	0	0	0	0	0	0
0700	143	0	124	16	0	2	1	0	0	0	0	0	0	0
0800	284	0	251	30	2	1	0	0	0	0	0	0	0	0
0900	137	0	123	13	0	1	0	0	0	0	0	0	0	0
1000	73	0	57	13	1	2	0	0	0	0	0	0	0	0
1100	84	1	69	13	0	1	0	0	0	0	0	0	0	0
1200	105	0	85	15	0	4	1	0	0	0	0	0	0	0
1300	102	0	88	11	1	1	1	0	0	0	0	0	0	0
1400	95	0	76	17	0	2	0	0	0	0	0	0	0	0
1500	75	0	61	12	1	1	0	0	0	0	0	0	0	0
1600	64	0	54	7	0	3	0	0	0	0	0	0	0	0
1700	78	0	70	5	1	2	0	0	0	0	0	0	0	0
1800	54	1	46	6	0	1	0	0	0	0	0	0	0	0
1900	47	0	39	7	0	1	0	0	0	0	0	0	0	0
2000	23	0	21	1	0	1	0	0	0	0	0	0	0	0
2100	27	0	25	2	0	0	0	0	0	0	0	0	0	0
2200	23	0	21	2	0	0	0	0	0	0	0	0	0	0
2300	11	0	10	1	0	0	0	0	0	0	0	0	0	0
Total	**1508**	**3**	**1288**	**182**	**7**	**23**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.00%	**0.20%**	**85.41%**	**12.07%**	**0.46%**	**1.53%**	**0.33%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way
Direction Southbound
Wednesday, July 9, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	6	0	6	0	0	0	0	0	0	0	0	0	0	0
0100	1	0	1	0	0	0	0	0	0	0	0	0	0	0
0200	5	0	4	1	0	0	0	0	0	0	0	0	0	0
0300	10	0	8	2	0	0	0	0	0	0	0	0	0	0
0400	23	0	23	0	0	0	0	0	0	0	0	0	0	0
0500	32	0	26	5	1	0	0	0	0	0	0	0	0	0
0600	36	0	30	4	0	1	1	0	0	0	0	0	0	0
0700	76	0	65	8	1	2	0	0	0	0	0	0	0	0
0800	95	0	78	14	1	1	1	0	0	0	0	0	0	0
0900	99	1	75	19	2	1	0	0	0	1	0	0	0	0
1000	84	0	73	8	1	2	0	0	0	0	0	0	0	0
1100	117	0	97	14	1	4	0	0	0	1	0	0	0	0
1200	130	2	109	16	0	2	1	0	0	0	0	0	0	0
1300	115	1	101	11	0	2	0	0	0	0	0	0	0	0
1400	123	1	100	19	0	3	0	0	0	0	0	0	0	0
1500	161	0	147	13	0	1	0	0	0	0	0	0	0	0
1600	192	0	166	24	0	2	0	0	0	0	0	0	0	0
1700	225	0	201	23	0	1	0	0	0	0	0	0	0	0
1800	67	1	58	6	1	1	0	0	0	0	0	0	0	0
1900	41	0	39	1	0	1	0	0	0	0	0	0	0	0
2000	29	1	24	1	0	3	0	0	0	0	0	0	0	0
2100	13	0	12	1	0	0	0	0	0	0	0	0	0	0
2200	11	0	10	1	0	0	0	0	0	0	0	0	0	0
2300	8	0	7	1	0	0	0	0	0	0	0	0	0	0
Total	**1699**	**7**	**1460**	**192**	**8**	**27**	**3**	**0**	**0**	**2**	**0**	**0**	**0**	**0**
	100.00%	**0.41%**	**85.93%**	**11.30%**	**0.47%**	**1.59%**	**0.18%**	**0.00%**	**0.00%**	**0.12%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Classification Report

Job # 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way
Direction Southbound
Thursday, July 10, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Class 1 Motorcycle	Class 2 Passenger Car	Class 3 Vans, Pick up Trucks	Class 4 Bus	Class 5 2 Axle 6 Tires	Class 6 3 Axle Unit	Class 7 4 Axles or more Unit	Class 8 3 or 4 Axle Trailer	Class 9 5 Axle Trailer	Class 10 6 Axle or more Trailer	Class 11 5 Axle or less Multi-Trailer	Class 12 6 Axle Multi-Trailer	Class 13 7 Axle or more Multi-Trailer
0000	7	0	7	0	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	6	0	4	2	0	0	0	0	0	0	0	0	0	0
0300	9	0	7	2	0	0	0	0	0	0	0	0	0	0
0400	22	0	22	0	0	0	0	0	0	0	0	0	0	0
0500	37	0	28	9	0	0	0	0	0	0	0	0	0	0
0600	26	0	20	5	0	1	0	0	0	0	0	0	0	0
0700	78	0	66	6	1	3	1	0	0	1	0	0	0	0
0800	99	0	86	11	1	1	0	0	0	0	0	0	0	0
0900	114	0	97	15	1	1	0	0	0	0	0	0	0	0
1000	90	0	80	9	0	1	0	0	0	0	0	0	0	0
1100	137	0	120	14	0	3	0	0	0	0	0	0	0	0
1200	132	0	113	18	0	1	0	0	0	0	0	0	0	0
1300	93	0	78	12	0	2	1	0	0	0	0	0	0	0
1400	100	0	78	18	0	3	1	0	0	0	0	0	0	0
1500	178	0	150	27	0	1	0	0	0	0	0	0	0	0
1600	177	1	154	19	0	3	0	0	0	0	0	0	0	0
1700	199	2	177	19	0	1	0	0	0	0	0	0	0	0
1800	71	0	61	6	1	3	0	0	0	0	0	0	0	0
1900	38	0	34	3	0	1	0	0	0	0	0	0	0	0
2000	27	0	22	3	0	2	0	0	0	0	0	0	0	0
2100	19	0	18	1	0	0	0	0	0	0	0	0	0	0
2200	13	0	13	0	0	0	0	0	0	0	0	0	0	0
2300	8	0	7	1	0	0	0	0	0	0	0	0	0	0
Total	**1680**	**3**	**1442**	**200**	**4**	**27**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
	100.00%	**0.18%**	**85.83%**	**11.90%**	**0.24%**	**1.61%**	**0.18%**	**0.00%**	**0.00%**	**0.06%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Speed Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way
Dir Northbound
Wednesday, July 9, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	3	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0
0100	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0200	3	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
0300	7	0	0	1	1	3	1	1	0	0	0	0	0	0	0	0	0
0400	6	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0
0500	13	0	0	0	3	8	2	0	0	0	0	0	0	0	0	0	0
0600	46	0	0	0	11	23	11	1	0	0	0	0	0	0	0	0	0
0700	153	0	0	4	53	83	13	0	0	0	0	0	0	0	0	0	0
0800	244	0	3	20	90	120	9	2	0	0	0	0	0	0	0	0	0
0900	130	0	0	3	40	75	11	1	0	0	0	0	0	0	0	0	0
1000	85	0	1	2	30	40	12	0	0	0	0	0	0	0	0	0	0
1100	88	0	0	0	39	35	13	1	0	0	0	0	0	0	0	0	0
1200	102	0	0	3	31	62	6	0	0	0	0	0	0	0	0	0	0
1300	100	0	0	0	27	55	18	0	0	0	0	0	0	0	0	0	0
1400	101	0	0	6	36	52	5	2	0	0	0	0	0	0	0	0	0
1500	91	0	0	0	36	43	12	0	0	0	0	0	0	0	0	0	0
1600	84	0	0	2	21	46	11	4	0	0	0	0	0	0	0	0	0
1700	72	0	0	1	18	42	10	1	0	0	0	0	0	0	0	0	0
1800	44	0	0	0	10	26	8	0	0	0	0	0	0	0	0	0	0
1900	39	0	0	0	6	26	7	0	0	0	0	0	0	0	0	0	0
2000	32	0	0	3	9	12	8	0	0	0	0	0	0	0	0	0	0
2100	22	0	0	2	9	7	3	1	0	0	0	0	0	0	0	0	0
2200	25	0	0	0	8	14	3	0	0	0	0	0	0	0	0	0	0
2300	11	0	1	0	5	3	1	1	0	0	0	0	0	0	0	0	0
Total	**1502**	**0**	**5**	**47**	**487**	**780**	**168**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.0%	**0.0%**	**0.3%**	**3.1%**	**32.4%**	**51.9%**	**11.2%**	**1.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Maximum = 32.2 mph, Minimum = 8.1 mph, Mean = 21.2 mph
85% Speed = 24.55 mph, 95% Speed = 27.07 mph, Median = 21.14 mph
10 mph Pace = 16 - 26, Number in Pace = 1286 (85.62%)
Variance = 12.17, Standard Deviation = 3.49 mph

Speed Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 1
Location Portsmouth Blvd NB, south of Commerce Way
Dir Northbound
Thursday, July 10, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	11	0	0	0	2	6	3	0	0	0	0	0	0	0	0	0	0
0100	5	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0
0200	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
0300	8	0	0	0	3	2	3	0	0	0	0	0	0	0	0	0	0
0400	5	0	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
0500	11	0	0	0	2	5	4	0	0	0	0	0	0	0	0	0	0
0600	41	0	2	1	8	24	6	0	0	0	0	0	0	0	0	0	0
0700	143	0	0	2	49	80	11	1	0	0	0	0	0	0	0	0	0
0800	284	0	1	18	124	122	19	0	0	0	0	0	0	0	0	0	0
0900	137	0	0	9	49	68	10	1	0	0	0	0	0	0	0	0	0
1000	73	0	0	1	32	35	5	0	0	0	0	0	0	0	0	0	0
1100	84	0	0	5	31	42	6	0	0	0	0	0	0	0	0	0	0
1200	105	0	0	4	50	47	3	1	0	0	0	0	0	0	0	0	0
1300	102	0	3	5	39	47	7	1	0	0	0	0	0	0	0	0	0
1400	95	0	0	6	31	48	10	0	0	0	0	0	0	0	0	0	0
1500	75	0	0	1	26	39	9	0	0	0	0	0	0	0	0	0	0
1600	64	0	0	2	18	39	5	0	0	0	0	0	0	0	0	0	0
1700	78	0	0	0	19	45	13	1	0	0	0	0	0	0	0	0	0
1800	54	0	0	2	15	33	4	0	0	0	0	0	0	0	0	0	0
1900	47	0	0	0	10	30	7	0	0	0	0	0	0	0	0	0	0
2000	23	0	0	3	8	10	2	0	0	0	0	0	0	0	0	0	0
2100	27	0	0	0	9	13	5	0	0	0	0	0	0	0	0	0	0
2200	23	0	0	1	8	10	3	1	0	0	0	0	0	0	0	0	0
2300	11	0	0	0	2	7	2	0	0	0	0	0	0	0	0	0	0
Total	**1508**	**0**	**6**	**61**	**535**	**759**	**141**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.0%	**0.0%**	**0.4%**	**4.0%**	**35.5%**	**50.3%**	**9.4%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Maximum = 32.6 mph, Minimum = 6.1 mph, Mean = 20.8 mph
85% Speed = 24.25 mph, 95% Speed = 26.28 mph, Median = 20.86 mph
10 mph Pace = 16 - 26, Number in Pace = 1324 (87.80%)
Variance = 11.34, Standard Deviation = 3.37 mph

Speed Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way
Dir Southbound
Wednesday, July 9, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	6	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0
0100	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0200	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0
0300	10	0	0	0	1	7	2	0	0	0	0	0	0	0	0	0	0
0400	23	0	0	0	1	7	10	4	1	0	0	0	0	0	0	0	0
0500	32	0	0	1	4	11	12	3	1	0	0	0	0	0	0	0	0
0600	36	0	0	0	9	20	7	0	0	0	0	0	0	0	0	0	0
0700	76	0	0	0	9	54	12	1	0	0	0	0	0	0	0	0	0
0800	95	0	0	0	16	58	19	2	0	0	0	0	0	0	0	0	0
0900	99	0	0	1	27	56	15	0	0	0	0	0	0	0	0	0	0
1000	84	0	0	0	17	51	12	4	0	0	0	0	0	0	0	0	0
1100	117	0	0	3	10	61	37	6	0	0	0	0	0	0	0	0	0
1200	130	0	0	1	20	76	27	6	0	0	0	0	0	0	0	0	0
1300	115	0	0	1	20	71	17	5	1	0	0	0	0	0	0	0	0
1400	123	0	0	3	24	61	31	4	0	0	0	0	0	0	0	0	0
1500	161	0	0	1	19	102	34	5	0	0	0	0	0	0	0	0	0
1600	192	0	0	0	15	116	54	7	0	0	0	0	0	0	0	0	0
1700	225	0	0	0	9	128	82	6	0	0	0	0	0	0	0	0	0
1800	67	0	0	0	13	35	18	1	0	0	0	0	0	0	0	0	0
1900	41	0	0	1	3	24	13	0	0	0	0	0	0	0	0	0	0
2000	29	0	0	2	5	17	3	2	0	0	0	0	0	0	0	0	0
2100	13	0	0	0	5	6	0	2	0	0	0	0	0	0	0	0	0
2200	11	0	0	0	0	9	2	0	0	0	0	0	0	0	0	0	0
2300	8	0	0	0	0	3	4	1	0	0	0	0	0	0	0	0	0
Total	**1699**	**0**	**0**	**14**	**228**	**984**	**411**	**59**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.0%	**0.0%**	**0.0%**	**0.8%**	**13.4%**	**57.9%**	**24.2%**	**3.5%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Maximum = 37.4 mph, Minimum = 11.8 mph, Mean = 23.3 mph
85% Speed = 26.56 mph, 95% Speed = 29.14 mph, Median = 23.15 mph
10 mph Pace = 18 - 28, Number in Pace = 1489 (87.64%)
Variance = 11.36, Standard Deviation = 3.37 mph

Speed Report

Job 1712_1_TB
Area 1712_Portsmouth NH_ATR 2
Location Portsmouth Blvd SB, south of Commerce Way
Dir Southbound
Thursday, July 10, 2025

BOSTON TRAFFIC DATA
PO BOX 1723, Framingham, MA 01701
Office: 978-746-1259
DataRequest@BostonTrafficData.com
www.BostonTrafficData.com

Time	Total	Speed Bins (mph)															
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80
0000	7	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0
0100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0200	6	0	0	0	2	3	1	0	0	0	0	0	0	0	0	0	0
0300	9	0	0	0	1	7	1	0	0	0	0	0	0	0	0	0	0
0400	22	0	0	0	1	7	13	0	1	0	0	0	0	0	0	0	0
0500	37	0	0	1	4	19	7	5	1	0	0	0	0	0	0	0	0
0600	26	0	0	0	7	15	4	0	0	0	0	0	0	0	0	0	0
0700	78	0	0	1	11	44	20	2	0	0	0	0	0	0	0	0	0
0800	99	0	0	0	9	70	18	2	0	0	0	0	0	0	0	0	0
0900	114	0	1	1	29	64	16	3	0	0	0	0	0	0	0	0	0
1000	90	0	0	1	14	55	19	1	0	0	0	0	0	0	0	0	0
1100	137	0	0	0	17	93	24	2	1	0	0	0	0	0	0	0	0
1200	132	0	0	0	15	86	30	1	0	0	0	0	0	0	0	0	0
1300	93	0	0	1	23	48	20	0	1	0	0	0	0	0	0	0	0
1400	100	0	0	3	25	51	18	3	0	0	0	0	0	0	0	0	0
1500	178	0	0	1	29	105	40	3	0	0	0	0	0	0	0	0	0
1600	177	0	0	1	21	116	37	2	0	0	0	0	0	0	0	0	0
1700	199	0	0	0	22	115	59	3	0	0	0	0	0	0	0	0	0
1800	71	0	0	0	13	37	19	2	0	0	0	0	0	0	0	0	0
1900	38	0	0	1	4	20	13	0	0	0	0	0	0	0	0	0	0
2000	27	0	0	0	7	17	1	2	0	0	0	0	0	0	0	0	0
2100	19	0	0	0	3	12	3	1	0	0	0	0	0	0	0	0	0
2200	13	0	0	0	2	8	3	0	0	0	0	0	0	0	0	0	0
2300	8	0	0	0	0	5	3	0	0	0	0	0	0	0	0	0	0
Total	**1680**	**0**	**1**	**11**	**259**	**1001**	**372**	**32**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	100.0%	**0.0%**	**0.1%**	**0.7%**	**15.4%**	**59.6%**	**22.1%**	**1.9%**	**0.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**

Maximum = 36.8 mph, Minimum = 9.7 mph, Mean = 23.0 mph
85% Speed = 26.17 mph, 95% Speed = 28.46 mph, Median = 22.93 mph
10 mph Pace = 18 - 28, Number in Pace = 1489 (88.63%)
Variance = 10.57, Standard Deviation = 3.25 mph

APPENDIX B

NHDOT Traffic Data

Group 4 Averages: Urban Highways

Month	MADT	Adjustment to Average	Adjustment to Peak
January	14,556	1.04	1.09
February	15,385	0.98	1.03
March	14,276	1.06	1.11
April	14,515	1.04	1.10
May	15,571	0.97	1.02
June	15,918	0.95	1.00
July	15,765	0.96	1.01
August	15,856	0.95	1.00
September	15,571	0.97	1.02
October	15,698	0.96	1.01
November	14,429	1.05	1.10
December	13,960	1.08	1.14

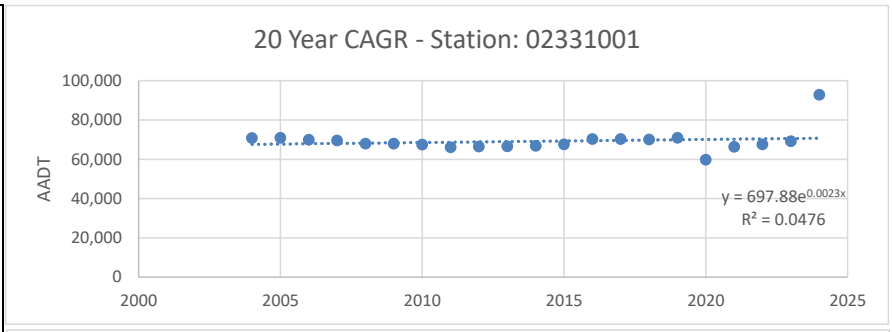
Average ADT: 15,125
Peak ADT: 15,918

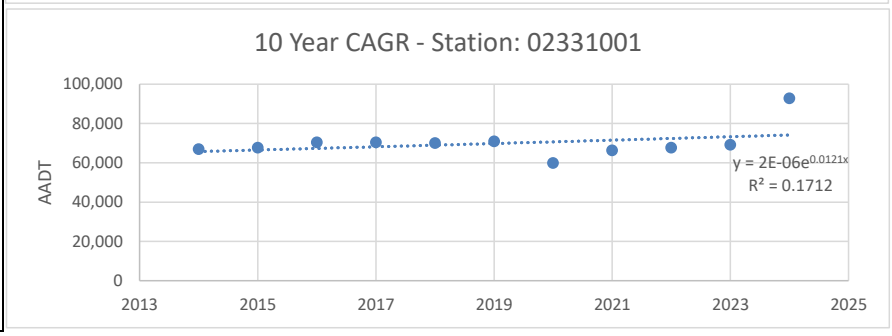
GROUP	Station	TOWN	LOCATION
04	02051003	Bow	NH 3A south of Robinson Rd
04	02089001	Chichester	NH 28 (Suncook Valley Rd) north of Bear Hill Rd
04	02091001	Claremont	NH 12/103 east of Vermont SL
04	02125001	Dover	Dover Point Rd south of Thornwood Ln
04	02133021	Durham	US 4 east of NH 108
04	02229022	Hudson	Circumferential Hwy east of Nashua TL
04	02253025	Lebanon	NH 120 1 mile south of Hanover TL (south of Lahaye Dr)
04	02255001	Barrington	NH 125 (Calef Hwy) north of Pinkham Rd
04	02287001	Marlborough	NH 12 at Swanzey TL
04	02297001	Merrimack	US 3 (Daniel Webster Hwy) north of Hilton Dr
04	*02303001*	*Amherst*	*NH 101A at Amherst TL (west of Overlook Dr)*
04	*02315051*	*Hudson*	*NH 111 (Bridge / Ferry St) at Hudson TL*
04	02339001	Newport	NH 10 1 mile south of Croydon TL (north of Corbin Rd)
04	02345001	North Hampton	US 1 (Lafayette Rd) north of North Rd
04	02445001	Wilton	NH 101 at Wilton TL (west of Old County Farm Rd)
04	*02489001*	*Windham*	*NH 28 at Derry TL (north of Northland Rd)*
04	*62099056*	*Concord*	*NH 106 (Sheep Davis Rd) at Loudon TL (north of Ashby Rd)*
04	*62099059*	*Concord*	*Clinton St Rte: NH 13*
04	*62387052*	*Rindge*	*US 202 at Jaffrey TL (north of County Rd)*
04	62389040	Rochester	Spaulding Tpke N
04	72099278	Concord	US 3 (Fisherville Rd) north of Sewalls Falls Rd
04	82037087	Bedford	New Boston Rd
04	*82101031*	*Conway*	*White Mountain Hwy at Washington St*
04	*82101032*	*Conway*	*Pleasent St*
04	*82101033*	*Conway*	*White Mountain Hwy at Pleasant St*
04	*82169060*	*Gilford*	*Weirs Rd Rte: NH 11B*
04	82197076	Hampton Falls	US 1 (Lafayette Rd) south of Ramp to NH 101
04	*82213067*	*Henniker*	*Rush Rd*
04	*82237075*	*Keene*	*Keene By-Pass Rte: NH 101*
04	82243052	Kingston	NH Route 125 Rte: NH 107
04	82253117	Lebanon	Meriden Rd Rte: NH 120
04	*82253119*	*Lebanon*	*Etna Rd*
04	*82303020*	*Milford*	*NH 101 (Milford Bypass) North of Phelan Rd*
04	*82303066*	*Milford*	*NH 101 (Milford Bypass) East of NH 13*

** denotes Station that is not included in calculation*

10 and 20 Year Growth Rates			Station Finder	Select The Year, Town, and Location
Town:	Newington		1) Town:	Newington
Location:	US 4/NH 16 (Spaulding TPK) east/south of General Sullivan Bridge (Exit 4-5)		2) Location:	US 4/NH 16 (Spaulding TPK) east/south of General Sullivan Bridge (Exit 4-5)
Station:	02331001	FC: 2	Station:	02331001
Group:	3	Region: E	Manual Station:	

Year	AADT	Annual Change
2004	70,866	
2005	71,000	0.19%
2006	69,945	-1.49%
2007	69,614	-0.47%
2008	68,000	-2.32%
2009	68,000	0.00%
2010	67,491	-0.75%
2011	66,177	-1.95%
2012	66,537	0.54%
2013	66,679	0.21%
2014	66,891	0.32%
2015	67,673	1.17%
2016	70,393	4.02%
2017	70,335	-0.08%
2018	70,054	-0.40%
2019	70,895	1.20%
2020	59,835	-15.60%
2021	66,357	10.90%
2022	67,618	1.90%
2023	69,173	2.30%
2024	92,809	34.17%





20 Year CAGR:	1.36%	10 Year CAGR:	3.33%
20 Year EXP:	0.23%	10 Year EXP:	1.21%
20-Average:	0.79%	10-Average:	2.27%

Data Notes: Limited data collected in 2024, estimate only

APPENDIX C

Capacity Analysis Methodology

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).[1] The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- *LOS A* describes conditions with little to no delay to motorists.
- *LOS B* represents a desirable level with relatively low delay to motorists.
- *LOS C* describes conditions with average delays to motorists.
- *LOS D* describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- *LOS E* represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- *LOS F* is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay is used to establish the operating characteristics for an intersection or an approach to an intersection. Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a lane group's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the traffic signal cycle capacity is fully utilized and indicates a capacity failure. The level-of-service criteria for signalized intersections are shown in Table A-1.

[1] *Highway Capacity Manual, 6TH Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay at an unsignalized intersection is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

Volume-to-capacity (v/c) ratios are also used to help signify the utilization of a movement's capacity at an intersection. A v/c ratio of ≥1.00 represents conditions when the movement is fully utilized and indicates a capacity failure. The capacity of the movements is based on the distribution of gaps in the major street traffic stream, the selection of gaps to complete the desired movement, and the follow-up headways for each driver in the queue. When an unsignalized intersection is located within 0.25 miles of a signalized intersection, traffic flows may not be random and some platoon structure may exist, thereby affecting the minor street operations. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	**Signalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**Unsignalized Intersection Criteria** Average Control Delay (Seconds per Vehicle)	**V/C Ratio >1.00[a]**
A	≤10	≤10	F
B	>10 and ≤20	>10 and ≤15	F
C	>20 and ≤35	>15 and ≤25	F
D	>35 and ≤55	>25 and ≤35	F
E	>55 and ≤80	>35 and ≤50	F
F	>80	>50	F

Note: [a]For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Source: *Highway Capacity Manual, 6th Edition: A Guide for Multimodal Mobility Analysis.* Washington, D.C.: Transportation Research Board, 2016. Exhibit 19-8, Pg. 19-16.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups on the minor street approaches or to the left turns from the major street approaches.

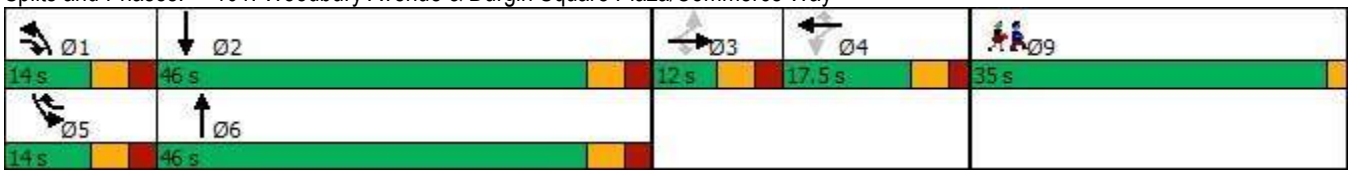
APPENDIX D

Capacity Analysis Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	5	6	10	5	1	43	16	342	217	420	
Future Volume (vph)	5	6	10	5	1	43	16	342	217	420	
Lane Group Flow (vph)	0	15	13	0	8	63	17	393	252	505	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.05	0.04		0.03	0.14	0.06	0.36	0.68	0.21	
Control Delay		28.5	0.2		28.2	2.5	27.4	16.4	34.0	12.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		28.5	0.2		28.2	2.5	27.4	16.4	34.0	12.3	
Queue Length 50th (ft)		2	0		1	0	2	22	33	0	
Queue Length 95th (ft)		26	0		16	0	33	166	#407	204	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		308	436		621	445	384	2938	371	2947	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.05	0.03		0.01	0.14	0.04	0.13	0.68	0.17	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 45.5
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	6	10	5	1	43	16	342	19	217	420	15
Future Volume (vph)	5	6	10	5	1	43	16	342	19	217	420	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1538		1750	1553	1694	3357		1636	3368	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1538		1827	1553	1694	3357		1636	3368	
Peak-hour factor, PHF	0.75	0.75	0.75	0.68	0.68	0.68	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	7	8	13	7	1	63	17	372	21	252	488	17
RTOR Reduction (vph)	0	0	12	0	0	52	0	3	0	0	2	0
Lane Group Flow (vph)	0	15	1	0	8	11	17	390	0	252	503	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		0.5	3.1		0.6	10.9	2.6	20.1		10.3	27.8	
Effective Green, g (s)		0.5	3.1		0.6	10.9	2.6	20.1		10.3	27.8	
Actuated g/C Ratio		0.01	0.05		0.01	0.18	0.04	0.34		0.17	0.46	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		15	79		18	283	73	1128		281	1565	
v/s Ratio Prot			0.00			0.01	0.01	0.12		c0.15	c0.15	
v/s Ratio Perm		c0.01	0.00		c0.00	0.00						
v/c Ratio		1.00	0.01		0.44	0.04	0.23	0.35		0.90	0.32	
Uniform Delay, d1		29.6	26.9		29.4	20.1	27.6	14.9		24.2	10.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		232.4	0.0		16.5	0.1	1.6	0.2		28.4	0.1	
Delay (s)		262.0	26.9		45.9	20.2	29.3	15.1		52.7	10.2	
Level of Service		F	C		D	C	C	B		D	B	
Approach Delay (s)		152.9			23.1			15.7			24.3	
Approach LOS		F			C			B			C	

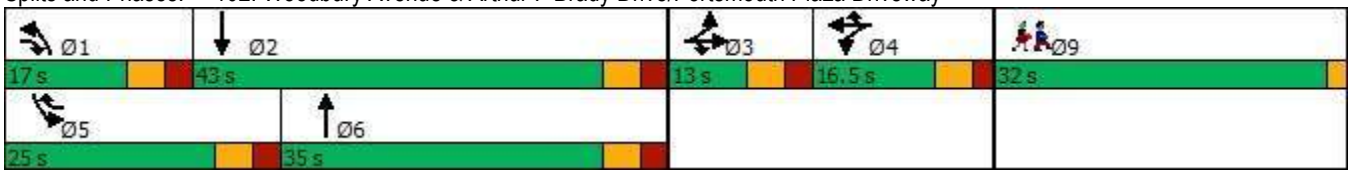
Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	59.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	26	97	17	30	114	292	36	367	
Future Volume (vph)	26	97	17	30	114	292	36	367	
Lane Group Flow (vph)	88	105	31	33	119	311	40	438	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.43	0.17	0.16	0.08	0.42	0.34	0.20	0.57	
Control Delay	42.2	1.9	36.1	0.4	36.4	23.2	35.7	27.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.2	1.9	36.1	0.4	36.4	23.2	35.7	27.5	
Queue Length 50th (ft)	31	0	11	0	40	47	14	76	
Queue Length 95th (ft)	#149	12	50	0	#165	138	60	193	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	203	635	320	681	318	1671	530	2111	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.43	0.17	0.10	0.05	0.37	0.19	0.08	0.21	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 64.4
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	26	97	11	17	30	114	292	7	36	367	32
Future Volume (vph)	55	26	97	11	17	30	114	292	7	36	367	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1692	1487		1689	1463	1678	3342		1620	3309	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1692	1487		1689	1463	1678	3342		1620	3309	
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.96	0.96	0.96	0.91	0.91	0.91
Adj. Flow (vph)	60	28	105	12	19	33	119	304	7	40	403	35
RTOR Reduction (vph)	0	0	76	0	0	27	0	1	0	0	6	0
Lane Group Flow (vph)	0	88	29	0	31	6	119	310	0	40	432	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.8	18.7		4.1	12.1	10.9	17.8		8.0	14.9	
Effective Green, g (s)		7.8	18.7		4.1	12.1	10.9	17.8		8.0	14.9	
Actuated g/C Ratio		0.12	0.28		0.06	0.18	0.16	0.27		0.12	0.22	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		197	416		103	265	273	890		194	738	
v/s Ratio Prot		c0.05	0.02		c0.02	0.00	c0.07	c0.09		0.02	c0.13	
v/s Ratio Perm												
v/c Ratio		0.45	0.07		0.30	0.02	0.44	0.35		0.21	0.59	
Uniform Delay, d1		27.5	17.7		30.0	22.5	25.2	19.8		26.5	23.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.1		1.6	0.0	1.1	0.2		0.5	1.2	
Delay (s)		29.1	17.7		31.6	22.5	26.3	20.0		27.1	24.4	
Level of Service		C	B		C	C	C	C		C	C	
Approach Delay (s)		22.9			26.9			21.8			24.6	
Approach LOS		C			C			C			C	

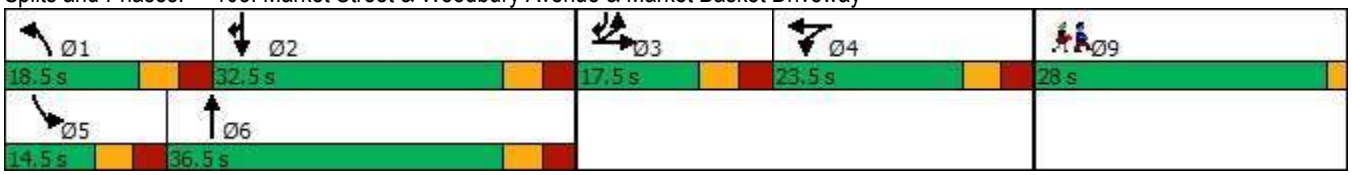
Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	66.8	Sum of lost time (s)	25.5
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	71	28	54	33	68	336	3	298	172	
Future Volume (vph)	71	28	54	33	68	336	3	298	172	
Lane Group Flow (vph)	76	77	68	50	78	478	3	343	198	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.20	0.33	0.29	0.20	0.35	0.34	0.02	0.38	0.23	
Control Delay	34.8	22.7	36.5	31.8	38.0	18.2	39.7	27.9	4.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	34.8	22.7	36.5	31.8	38.0	18.2	39.7	27.9	4.1	
Queue Length 50th (ft)	13	10	23	15	27	54	1	60	0	
Queue Length 95th (ft)	49	66	78	57	98	196	12	157	43	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	592	327	501	520	323	1586	215	1402	880	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.13	0.24	0.14	0.10	0.24	0.30	0.01	0.24	0.23	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 68.1
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	28	44	54	33	6	68	336	80	3	298	172
Future Volume (vph)	71	28	44	54	33	6	68	336	80	3	298	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1634		1834	1884		1678	3245		1647	3355	1501
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1634		1834	1884		1678	3245		1647	3355	1501
Peak-hour factor, PHF	0.93	0.93	0.93	0.79	0.79	0.79	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	76	30	47	68	42	8	78	386	92	3	343	198
RTOR Reduction (vph)	0	42	0	0	6	0	0	14	0	0	0	101
Lane Group Flow (vph)	76	35	0	68	44	0	78	464	0	3	343	97
Confl. Peds. (#/hr)			2	2			1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	7.9	7.9		6.8	6.8		7.1	29.1		0.8	22.8	37.2
Effective Green, g (s)	7.9	7.9		6.8	6.8		7.1	29.1		0.8	22.8	37.2
Actuated g/C Ratio	0.10	0.10		0.09	0.09		0.09	0.38		0.01	0.30	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	349	170		164	169		157	1247		17	1010	737
v/s Ratio Prot	c0.02	0.02		c0.04	0.02		c0.05	c0.14		0.00	0.10	0.06
v/s Ratio Perm												
v/c Ratio	0.22	0.21		0.41	0.26		0.50	0.37		0.18	0.34	0.13
Uniform Delay, d1	31.1	31.0		32.6	32.1		32.6	16.7		37.1	20.6	10.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.6		1.7	0.8		2.5	0.2		4.9	0.2	0.1
Delay (s)	31.4	31.6		34.3	32.9		35.1	16.9		42.0	20.8	10.6
Level of Service	C	C		C	C		D	B		D	C	B
Approach Delay (s)		31.5			33.7			19.5			17.2	
Approach LOS		C			C			B			B	

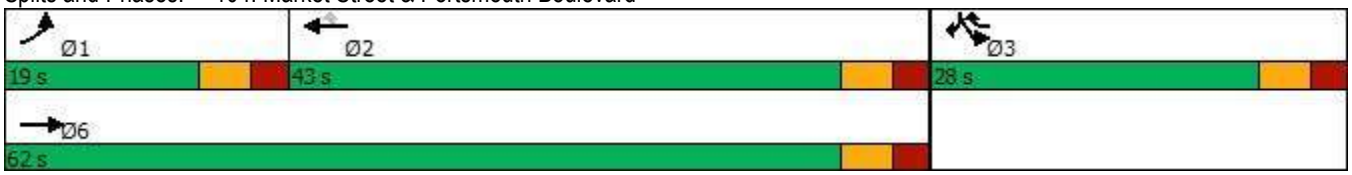
Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	75.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	353	437	232	51	47
Future Volume (vph)	43	353	437	232	51	47
Lane Group Flow (vph)	47	388	491	261	61	56
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.15	0.24	0.38	0.26	0.10	0.17
Control Delay	20.9	5.4	10.8	1.4	19.8	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	5.4	10.8	1.4	19.8	9.7
Queue Length 50th (ft)	6	20	26	0	4	0
Queue Length 95th (ft)	47	37	94	17	26	26
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	604	3213	2939	1343	2122	1032
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.12	0.17	0.19	0.03	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 40.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	353	437	232	51	47
Future Volume (vph)	43	353	437	232	51	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1678	3355	3388	1546	3255	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1678	3355	3388	1546	3255	1553
Peak-hour factor, PHF	0.91	0.91	0.89	0.89	0.84	0.84
Adj. Flow (vph)	47	388	491	261	61	56
RTOR Reduction (vph)	0	0	0	123	0	46
Lane Group Flow (vph)	47	388	491	138	61	10
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.5	24.1	15.6	23.0	7.4	7.4
Effective Green, g (s)	2.5	24.1	15.6	23.0	7.4	7.4
Actuated g/C Ratio	0.06	0.55	0.36	0.53	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	96	1858	1215	1030	553	264
v/s Ratio Prot	0.03	c0.12	c0.14	c0.02	0.02	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.49	0.21	0.40	0.13	0.11	0.04
Uniform Delay, d1	19.9	4.9	10.5	5.2	15.3	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.1	0.2	0.1	0.1	0.1
Delay (s)	23.8	4.9	10.7	5.3	15.4	15.1
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.0	8.8		15.2	
Approach LOS		A	A		B	

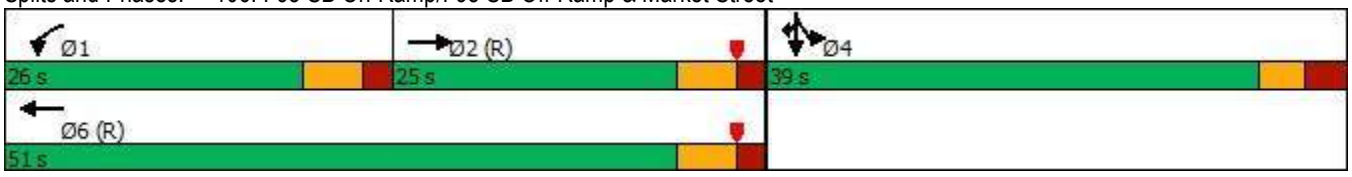
Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	371	96	84	414	187	1	285
Future Volume (vph)	371	96	84	414	187	1	285
Lane Group Flow (vph)	395	102	93	460	185	173	173
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	25.0		26.0	51.0	39.0	39.0	39.0
Total Split (%)	27.8%		28.9%	56.7%	43.3%	43.3%	43.3%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.15	0.06	0.49	0.20	0.63	0.46	0.43
Control Delay	14.7	0.1	49.6	6.7	42.9	11.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	0.1	49.6	6.7	42.9	11.6	8.1
Queue Length 50th (ft)	50	0	55	25	104	14	0
Queue Length 95th (ft)	86	0	98	125	156	65	49
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2558	1724	356	2286	604	621	650
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	103	0	4	5
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.06	0.26	0.21	0.31	0.28	0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 81 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	371	96	84	414	0	0	0	0	187	1	285
Future Volume (vph)	0	371	96	84	414	0	0	0	0	187	1	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4821	1724	1604	3323					1649	1440	1475
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4821	1724	1604	3323					1649	1440	1475
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	0.89	0.89	0.89
Adj. Flow (vph)	0	395	102	93	460	0	0	0	0	210	1	320
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	121	142
Lane Group Flow (vph)	0	395	102	93	460	0	0	0	0	185	52	31
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		46.5	90.0	9.4	61.9					16.1	16.1	16.1
Effective Green, g (s)		46.5	90.0	9.4	61.9					16.1	16.1	16.1
Actuated g/C Ratio		0.52	1.00	0.10	0.69					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2490	1724	167	2285					294	257	263
v/s Ratio Prot		0.08		c0.06	c0.14					c0.11	0.04	0.02
v/s Ratio Perm			0.06									
v/c Ratio		0.16	0.06	0.56	0.20					0.63	0.20	0.12
Uniform Delay, d1		11.5	0.0	38.3	5.1					34.2	31.5	31.0
Progression Factor		1.09	1.00	1.12	1.12					1.00	1.00	1.00
Incremental Delay, d2		0.1	0.1	3.9	0.2					4.2	0.4	0.2
Delay (s)		12.6	0.1	47.0	5.9					38.4	31.9	31.2
Level of Service		B	A	D	A					D	C	C
Approach Delay (s)		10.1			12.8			0.0			33.9	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

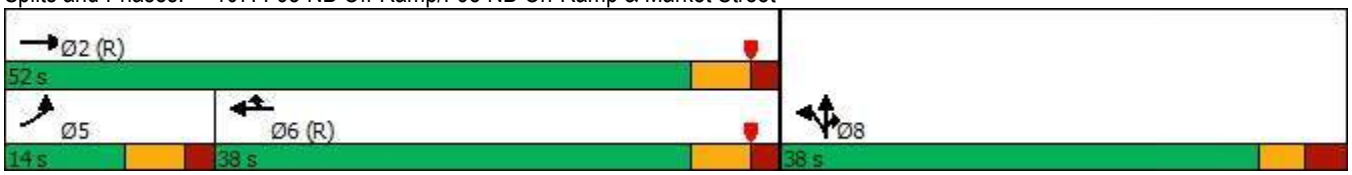
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	136	422	312	52	0	340
Future Volume (vph)	136	422	312	52	0	340
Lane Group Flow (vph)	149	464	343	57	198	362
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	32.0	32.0
Total Split (s)	14.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	15.6%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.43	0.21	0.20	0.06	0.59	0.63
Control Delay	31.7	3.3	14.4	0.7	39.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.7	3.3	14.4	0.7	39.2	9.8
Queue Length 50th (ft)	26	3	52	0	105	12
Queue Length 95th (ft)	60	107	102	5	152	79
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	351	2261	1724	928	622	774
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.21	0.20	0.06	0.32	0.47

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	422	0	0	312	52	186	0	340	0	0	0
Future Volume (vph)	136	422	0	0	312	52	186	0	340	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3255	3355			3438	1743		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3255	3355			3438	1743		1752	1568			
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	149	464	0	0	343	57	198	0	362	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	28	0	0	271	0	0	0
Lane Group Flow (vph)	149	464	0	0	343	29	0	198	91	0	0	0
Confl. Peds. (#/hr)	4					4						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.5	60.7			45.2	45.2		17.3	17.3			
Effective Green, g (s)	9.5	60.7			45.2	45.2		17.3	17.3			
Actuated g/C Ratio	0.11	0.67			0.50	0.50		0.19	0.19			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	343	2262			1726	875		336	301			
v/s Ratio Prot	c0.05	c0.14			0.10	0.02		c0.11	0.06			
v/s Ratio Perm												
v/c Ratio	0.43	0.21			0.20	0.03		0.59	0.30			
Uniform Delay, d1	37.7	5.5			12.4	11.3		33.1	31.2			
Progression Factor	0.74	0.49			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.2			0.3	0.1		3.1	0.8			
Delay (s)	28.9	2.9			12.6	11.4		36.2	31.9			
Level of Service	C	A			B	B		D	C			
Approach Delay (s)		9.2			12.5			33.5			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	8	9	75	26	0	174	78	25	0	9	6
Future Vol, veh/h	18	8	9	75	26	0	174	78	25	0	9	6
Peak Hour Factor	0.73	0.73	0.73	0.89	0.89	0.89	0.77	0.77	0.77	0.63	0.63	0.63
Heavy Vehicles, %	6	6	6	3	3	3	1	1	1	0	0	0
Mvmt Flow	25	11	12	84	29	0	226	101	32	0	14	10
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.8	10	10.2	7.9
HCM LOS	A	A	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	69%	0%	74%	0%	0%
Vol Thru, %	0%	76%	31%	0%	26%	100%	0%
Vol Right, %	0%	24%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	103	26	9	101	9	6
LT Vol	174	0	18	0	75	0	0
Through Vol	0	78	8	0	26	9	0
RT Vol	0	25	0	9	0	0	6
Lane Flow Rate	226	134	36	12	113	14	10
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.345	0.18	0.06	0.017	0.179	0.021	0.012
Departure Headway (Hd)	5.504	4.831	6.051	4.998	5.691	5.335	4.63
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	653	742	591	714	630	669	770
Service Time	3.234	2.561	3.798	2.744	3.729	3.084	2.378
HCM Lane V/C Ratio	0.346	0.181	0.061	0.017	0.179	0.021	0.013
HCM Control Delay	11.1	8.6	9.2	7.8	10	8.2	7.4
HCM Lane LOS	B	A	A	A	A	A	A
HCM 95th-tile Q	1.5	0.7	0.2	0.1	0.6	0.1	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	29	30	94	39	23	175	100	591	128	743	
Future Volume (vph)	29	30	94	39	23	175	100	591	128	743	
Lane Group Flow (vph)	0	75	119	0	99	278	109	645	138	834	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.10	0.31		0.51	0.41	0.61	0.59	0.79	0.77	
Control Delay		180.0	6.5		47.9	4.8	55.1	26.8	71.1	31.3	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		180.0	6.5		47.9	4.8	55.1	26.8	71.1	31.3	
Queue Length 50th (ft)		~38	0		41	0	48	125	62	173	
Queue Length 95th (ft)		#165	19		95	0	#210	290	#275	392	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		68	388		222	674	180	1804	174	1795	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.10	0.31		0.45	0.41	0.61	0.36	0.79	0.46	

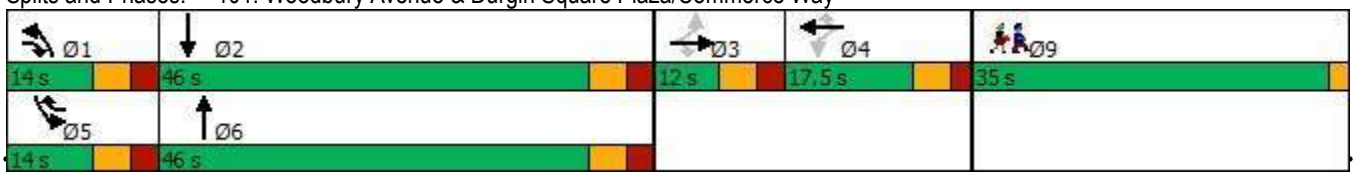
Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 81.1
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	30	94	39	23	175	100	591	3	128	743	33
Future Volume (vph)	29	30	94	39	23	175	100	591	3	128	743	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1590		1804	1583	1728	3453		1668	3430	
Flt Permitted		0.47	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		878	1590		1424	1583	1728	3453		1668	3430	
Peak-hour factor, PHF	0.79	0.79	0.79	0.63	0.63	0.63	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	37	38	119	62	37	278	109	642	3	138	799	35
RTOR Reduction (vph)	0	0	97	0	0	211	0	0	0	0	3	0
Lane Group Flow (vph)	0	75	22	0	99	67	109	645	0	138	831	0
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.4	14.9		11.1	19.6	8.5	25.7		8.5	25.7	
Effective Green, g (s)		6.4	14.9		11.1	19.6	8.5	25.7		8.5	25.7	
Actuated g/C Ratio		0.08	0.18		0.14	0.24	0.10	0.32		0.10	0.32	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		68	290		193	380	180	1088		173	1081	
v/s Ratio Prot			0.01			0.02	0.06	0.19		c0.08	c0.24	
v/s Ratio Perm		c0.09	0.01		c0.07	0.02						
v/c Ratio		1.10	0.08		0.51	0.18	0.61	0.59		0.80	0.77	
Uniform Delay, d1		37.5	27.6		32.7	24.5	34.9	23.5		35.7	25.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		140.1	0.1		2.3	0.2	5.7	0.9		22.0	3.4	
Delay (s)		177.6	27.7		35.0	24.8	40.6	24.4		57.7	28.6	
Level of Service		F	C		C	C	D	C		E	C	
Approach Delay (s)		85.7			27.5			26.7			32.7	
Approach LOS		F			C			C			C	

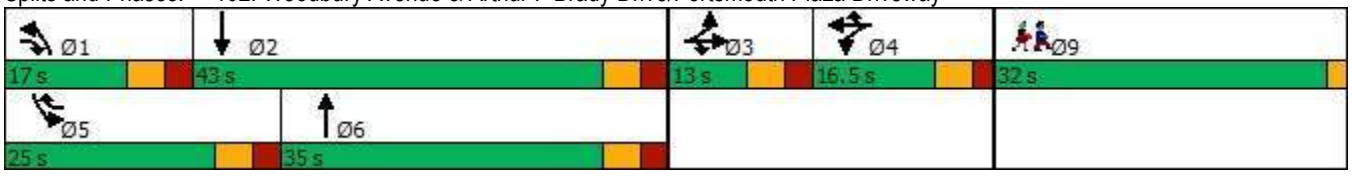
Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	81.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	38	188	46	107	167	520	85	702	
Future Volume (vph)	38	188	46	107	167	520	85	702	
Lane Group Flow (vph)	124	221	118	120	172	564	93	869	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.84	0.44	0.55	0.22	0.74	0.50	0.45	0.80	
Control Delay	83.9	5.7	50.1	4.7	59.6	27.1	45.1	33.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	83.9	5.7	50.1	4.7	59.6	27.1	45.1	33.8	
Queue Length 50th (ft)	61	0	55	0	82	112	43	195	
Queue Length 95th (ft)	#228	28	#184	27	#297	268	122	413	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	148	507	231	672	231	1225	385	1532	
Starvation Cap Reductn	0	0	0	0	0	0	0	19	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.44	0.51	0.18	0.74	0.46	0.24	0.57	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 85.4
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	38	188	59	46	107	167	520	27	85	702	89
Future Volume (vph)	67	38	188	59	46	107	167	520	27	85	702	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1745	1531		1725	1507	1728	3429		1668	3389	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1745	1531		1725	1507	1728	3429		1668	3389	
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.97	0.97	0.97	0.91	0.91	0.91
Adj. Flow (vph)	79	45	221	66	52	120	172	536	28	93	771	98
RTOR Reduction (vph)	0	0	173	0	0	90	0	3	0	0	8	0
Lane Group Flow (vph)	0	124	48	0	118	30	172	561	0	93	861	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.3	18.7		10.6	21.3	11.4	27.9		10.7	27.2	
Effective Green, g (s)		7.3	18.7		10.6	21.3	11.4	27.9		10.7	27.2	
Actuated g/C Ratio		0.08	0.22		0.12	0.25	0.13	0.32		0.12	0.32	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		147	332		212	372	228	1109		207	1069	
v/s Ratio Prot		c0.07	0.03		c0.07	0.02	c0.10	0.16		0.06	c0.25	
v/s Ratio Perm												
v/c Ratio		0.84	0.14		0.56	0.08	0.75	0.51		0.45	0.81	
Uniform Delay, d1		38.9	27.3		35.6	24.9	36.1	23.6		35.0	27.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		33.3	0.2		3.1	0.1	13.2	0.4		1.6	4.5	
Delay (s)		72.2	27.5		38.7	25.0	49.3	23.9		36.6	31.6	
Level of Service		E	C		D	C	D	C		D	C	
Approach Delay (s)		43.6			31.8			29.9			32.1	
Approach LOS		D			C			C			C	

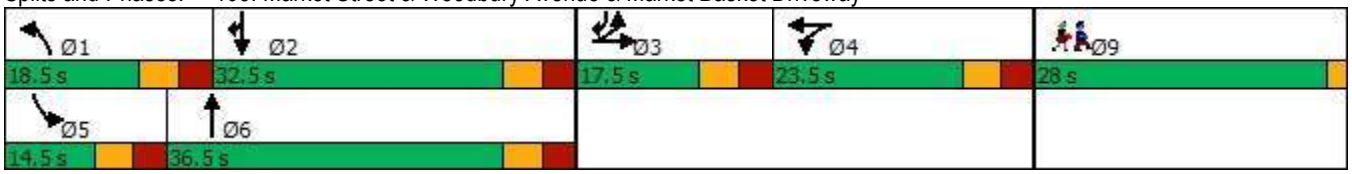
Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	158	55	162	61	82	541	8	645	294	
Future Volume (vph)	158	55	162	61	82	541	8	645	294	
Lane Group Flow (vph)	172	127	174	82	86	701	9	733	334	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.44	0.56	0.61	0.27	0.45	0.49	0.07	0.71	0.36	
Control Delay	43.9	41.2	48.0	36.9	49.3	22.2	47.0	34.6	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.9	41.2	48.0	36.9	49.3	22.2	47.0	34.6	3.7	
Queue Length 50th (ft)	44	46	89	36	44	117	5	183	0	
Queue Length 95th (ft)	103	#151	204	101	118	332	24	#406	54	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	459	261	404	418	258	1554	172	1120	961	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.49	0.43	0.20	0.33	0.45	0.05	0.65	0.35	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 85.6
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



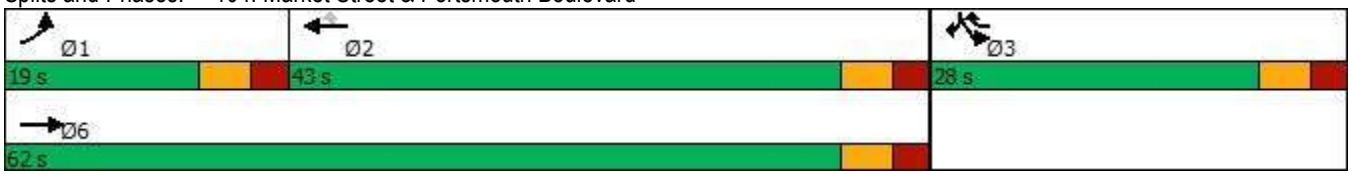
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	55	62	162	61	15	82	541	125	8	645	294
Future Volume (vph)	158	55	62	162	61	15	82	541	125	8	645	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1675		1906	1943		1728	3344		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1675		1906	1943		1728	3344		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.88	0.88	0.88
Adj. Flow (vph)	172	60	67	174	66	16	86	569	132	9	733	334
RTOR Reduction (vph)	0	33	0	0	7	0	0	13	0	0	0	166
Lane Group Flow (vph)	172	94	0	174	75	0	86	688	0	9	733	168
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.9	9.9		12.9	12.9		7.6	36.0		1.1	29.5	45.9
Effective Green, g (s)	9.9	9.9		12.9	12.9		7.6	36.0		1.1	29.5	45.9
Actuated g/C Ratio	0.11	0.11		0.14	0.14		0.08	0.39		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	362	181		268	273		143	1315		20	1113	775
v/s Ratio Prot	0.05	c0.06		c0.09	0.04		c0.05	c0.21		0.01	c0.21	0.11
v/s Ratio Perm												
v/c Ratio	0.48	0.52		0.65	0.28		0.60	0.52		0.45	0.66	0.22
Uniform Delay, d1	38.4	38.6		37.2	35.1		40.5	21.2		44.9	26.7	12.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	2.5		5.3	0.5		6.9	0.4		15.3	1.4	0.1
Delay (s)	39.3	41.1		42.5	35.7		47.4	21.6		60.2	28.1	12.9
Level of Service	D	D		D	D		D	C		E	C	B
Approach Delay (s)		40.1			40.3			24.4			23.6	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	827	665	66	192	83
Future Volume (vph)	42	827	665	66	192	83
Lane Group Flow (vph)	46	899	715	71	300	130
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.16	0.53	0.52	0.07	0.39	0.28
Control Delay	26.0	9.0	13.9	1.2	20.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	9.0	13.9	1.2	20.2	7.1
Queue Length 50th (ft)	9	72	54	0	27	0
Queue Length 95th (ft)	51	139	178	9	70	14
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	521	3216	2783	1252	1712	880
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.28	0.26	0.06	0.18	0.15

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 48.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	827	665	66	192	83
Future Volume (vph)	42	827	665	66	192	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1577	3351	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1577	3351	1599
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.64	0.64
Adj. Flow (vph)	46	899	715	71	300	130
RTOR Reduction (vph)	0	0	0	28	0	101
Lane Group Flow (vph)	46	899	715	43	300	29
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.6	28.1	19.5	30.8	11.3	11.3
Effective Green, g (s)	2.6	28.1	19.5	30.8	11.3	11.3
Actuated g/C Ratio	0.05	0.55	0.38	0.60	0.22	0.22
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	87	1888	1310	1129	736	351
v/s Ratio Prot	0.03	c0.26	c0.21	0.01	c0.09	0.02
v/s Ratio Perm				0.02		
v/c Ratio	0.53	0.48	0.55	0.04	0.41	0.08
Uniform Delay, d1	23.8	7.1	12.5	4.2	17.2	15.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.2	0.5	0.0	0.4	0.1
Delay (s)	29.5	7.3	13.0	4.2	17.6	16.0
Level of Service	C	A	B	A	B	B
Approach Delay (s)		8.4	12.2		17.1	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

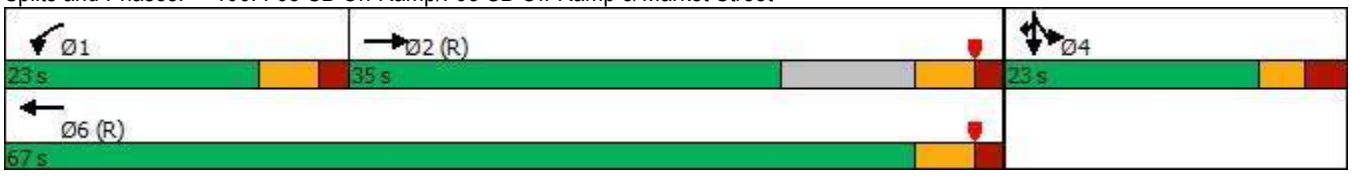
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	855	199	218	474	230	1	297
Future Volume (vph)	855	199	218	474	230	1	297
Lane Group Flow (vph)	910	212	242	527	205	194	188
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	35.0		23.0	67.0	23.0	23.0	23.0
Total Split (%)	38.9%		25.6%	74.4%	25.6%	25.6%	25.6%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.44	0.12	0.75	0.22	0.66	0.50	0.44
Control Delay	19.1	0.1	36.2	1.1	43.6	15.2	7.7
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	0.1	36.2	1.1	43.6	15.2	7.7
Queue Length 50th (ft)	139	0	74	0	115	31	0
Queue Length 95th (ft)	198	0	#213	0	173	91	52
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2248	1757	342	2427	353	420	465
Starvation Cap Reductn	506	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	34	0	1	1
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.12	0.71	0.22	0.58	0.46	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 55
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	855	199	218	474	0	0	0	0	230	1	297
Future Volume (vph)	0	855	199	218	474	0	0	0	0	230	1	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4916	1757	1668	3455					1698	1504	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4916	1757	1668	3455					1698	1504	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	910	212	242	527	0	0	0	0	256	1	330
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	110	154
Lane Group Flow (vph)	0	910	212	242	527	0	0	0	0	205	84	34
Confl. Peds. (#/hr)	8					8						
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		38.1	90.0	17.4	61.5					16.5	16.5	16.5
Effective Green, g (s)		38.1	90.0	17.4	61.5					16.5	16.5	16.5
Actuated g/C Ratio		0.42	1.00	0.19	0.68					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2081	1757	322	2360					311	275	278
v/s Ratio Prot		c0.19		c0.15	0.15					c0.12	0.06	0.02
v/s Ratio Perm			0.12									
v/c Ratio		0.44	0.12	0.75	0.22					0.66	0.30	0.12
Uniform Delay, d1		18.4	0.0	34.3	5.3					34.1	31.8	30.7
Progression Factor		0.92	1.00	0.61	0.15					1.00	1.00	1.00
Incremental Delay, d2		0.6	0.1	9.0	0.2					5.0	0.6	0.2
Delay (s)		17.6	0.1	30.0	1.0					39.1	32.4	30.9
Level of Service		B	A	C	A					D	C	C
Approach Delay (s)		14.3			10.1			0.0			34.3	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

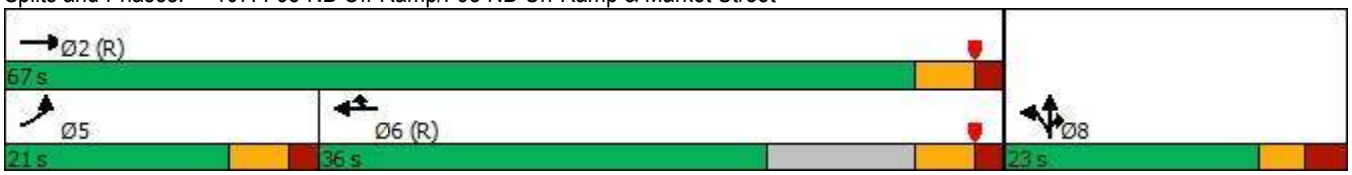
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	488	597	605	221	1	173
Future Volume (vph)	488	597	605	221	1	173
Lane Group Flow (vph)	519	635	644	235	120	237
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	23.0	23.0
Total Split (s)	21.0	67.0	36.0	36.0	23.0	23.0
Total Split (%)	23.3%	74.4%	40.0%	40.0%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.69	0.25	0.41	0.25	0.49	0.56
Control Delay	29.9	10.6	19.5	3.6	42.1	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	10.6	19.5	3.6	42.1	10.2
Queue Length 50th (ft)	151	143	128	0	64	0
Queue Length 95th (ft)	201	207	203	47	88	26
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	749	2519	1671	972	335	491
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.25	0.39	0.24	0.36	0.48

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	488	597	0	0	605	221	87	1	173	0	0	0
Future Volume (vph)	488	597	0	0	605	221	87	1	173	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1775	1583			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.73	0.73	0.73	0.92	0.92	0.92
Adj. Flow (vph)	519	635	0	0	644	235	119	1	237	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	132	0	0	204	0	0	0
Lane Group Flow (vph)	519	635	0	0	644	103	0	120	33	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	20.1	65.6			39.5	39.5		12.4	12.4			
Effective Green, g (s)	20.1	65.6			39.5	39.5		12.4	12.4			
Actuated g/C Ratio	0.22	0.73			0.44	0.44		0.14	0.14			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	748	2518			1568	795		244	218			
v/s Ratio Prot	c0.15	0.18			c0.18	0.06		c0.07	0.02			
v/s Ratio Perm												
v/c Ratio	0.69	0.25			0.41	0.13		0.49	0.15			
Uniform Delay, d1	32.1	4.1			17.3	15.0		35.9	34.2			
Progression Factor	0.79	2.34			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.6	0.2			0.8	0.3		2.1	0.4			
Delay (s)	27.9	9.7			18.1	15.4		38.0	34.6			
Level of Service	C	A			B	B		D	C			
Approach Delay (s)		17.9			17.4			35.7			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	44	149	31	21	1	17	15	51	0	75	25
Future Vol, veh/h	12	44	149	31	21	1	17	15	51	0	75	25
Peak Hour Factor	0.60	0.60	0.60	0.88	0.88	0.88	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	20	73	248	35	24	1	23	21	70	0	103	34
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

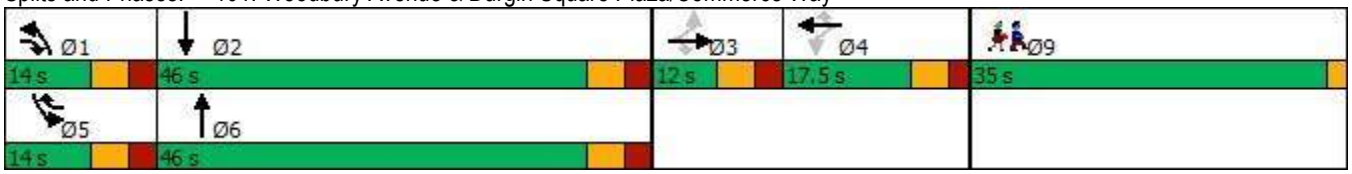
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	9.2	9.3	8.8	9
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	21%	0%	58%	0%	0%
Vol Thru, %	0%	23%	79%	0%	40%	100%	0%
Vol Right, %	0%	77%	0%	100%	2%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	66	56	149	53	75	25
LT Vol	17	0	12	0	31	0	0
Through Vol	0	15	44	0	21	75	0
RT Vol	0	51	0	149	1	0	25
Lane Flow Rate	23	90	93	248	60	103	34
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.04	0.129	0.138	0.312	0.094	0.16	0.046
Departure Headway (Hd)	6.178	5.127	5.336	4.525	5.636	5.591	4.884
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	577	694	670	792	632	638	728
Service Time	3.943	2.892	3.084	2.273	3.702	3.354	2.647
HCM Lane V/C Ratio	0.04	0.13	0.139	0.313	0.095	0.161	0.047
HCM Control Delay	9.2	8.7	8.9	9.3	9.3	9.4	7.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.5	1.3	0.3	0.6	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	43	35	110	6	17	72	117	647	126	685	
Future Volume (vph)	43	35	110	6	17	72	117	647	126	685	
Lane Group Flow (vph)	0	94	133	0	26	80	130	722	142	822	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.09	0.28		0.13	0.22	0.56	0.61	0.64	0.69	
Control Delay		164.3	5.7		39.3	5.2	46.0	22.9	49.5	24.6	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		164.3	5.7		39.3	5.2	46.0	22.9	49.5	24.6	
Queue Length 50th (ft)		30	0		7	0	38	86	43	102	
Queue Length 95th (ft)		#210	23		49	20	#251	323	#274	369	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		86	473		361	370	231	2310	223	2294	
Starvation Cap Reductn		0	0		0	0	0	45	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.09	0.28		0.07	0.22	0.56	0.32	0.64	0.36	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 68
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	35	110	6	17	72	117	647	3	126	685	46
Future Volume (vph)	43	35	110	6	17	72	117	647	3	126	685	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1589		1813	1568	1728	3453		1668	3422	
Flt Permitted		0.46	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		859	1589		1794	1568	1728	3453		1668	3422	
Peak-hour factor, PHF	0.83	0.83	0.83	0.90	0.90	0.90	0.90	0.90	0.90	0.89	0.89	0.89
Adj. Flow (vph)	52	42	133	7	19	80	130	719	3	142	770	52
RTOR Reduction (vph)	0	0	103	0	0	67	0	0	0	0	4	0
Lane Group Flow (vph)	0	94	30	0	26	13	130	722	0	142	818	0
Confl. Peds. (#/hr)			2	2					2	2		
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.8	15.9		2.6	11.7	9.1	23.4		9.1	23.4	
Effective Green, g (s)		6.8	15.9		2.6	11.7	9.1	23.4		9.1	23.4	
Actuated g/C Ratio		0.10	0.22		0.04	0.16	0.13	0.33		0.13	0.33	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		82	355		65	258	221	1136		213	1126	
v/s Ratio Prot			0.01			0.01	0.08	0.21		c0.09	c0.24	
v/s Ratio Perm		c0.11	0.01		c0.01	0.00						
v/c Ratio		1.15	0.08		0.40	0.05	0.59	0.64		0.67	0.73	
Uniform Delay, d1		32.1	21.8		33.5	25.0	29.2	20.2		29.6	21.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		144.3	0.1		4.0	0.1	4.0	1.2		7.7	2.4	
Delay (s)		176.5	21.9		37.5	25.1	33.2	21.4		37.2	23.4	
Level of Service		F	C		D	C	C	C		D	C	
Approach Delay (s)		85.9			28.1			23.2			25.4	
Approach LOS		F			C			C			C	

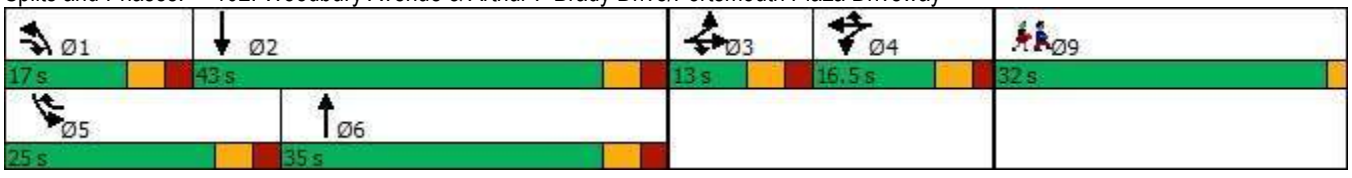
Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	59	203	55	126	159	557	119	616	
Future Volume (vph)	59	203	55	126	159	557	119	616	
Lane Group Flow (vph)	155	221	135	140	173	643	131	750	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.99	0.42	0.58	0.23	0.72	0.67	0.53	0.76	
Control Delay	113.7	5.5	48.9	4.1	55.8	32.4	43.7	33.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	113.7	5.5	48.9	4.1	55.8	32.4	43.7	33.0	
Queue Length 50th (ft)	72	0	58	0	77	135	56	161	
Queue Length 95th (ft)	#307	35	#224	28	#300	318	161	345	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	156	522	240	727	240	1257	400	1594	
Starvation Cap Reductn	0	0	0	0	0	0	0	21	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.99	0.42	0.56	0.19	0.72	0.51	0.33	0.48	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 82.6
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	59	203	67	55	126	159	557	35	119	616	66
Future Volume (vph)	84	59	203	67	55	126	159	557	35	119	616	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767	1546		1726	1507	1728	3419		1668	3397	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1767	1546		1726	1507	1728	3419		1668	3397	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92	0.91	0.91	0.91
Adj. Flow (vph)	91	64	221	74	61	140	173	605	38	131	677	73
RTOR Reduction (vph)	0	0	171	0	0	101	0	4	0	0	7	0
Lane Group Flow (vph)	0	155	50	0	135	39	173	639	0	131	743	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.3	18.8		11.1	23.3	11.5	23.1		12.2	23.8	
Effective Green, g (s)		7.3	18.8		11.1	23.3	11.5	23.1		12.2	23.8	
Actuated g/C Ratio		0.09	0.23		0.13	0.28	0.14	0.28		0.15	0.29	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		154	348		229	421	238	948		244	970	
v/s Ratio Prot		c0.09	0.03		c0.08	0.03	c0.10	0.19		0.08	c0.22	
v/s Ratio Perm												
v/c Ratio		1.01	0.14		0.59	0.09	0.73	0.67		0.54	0.77	
Uniform Delay, d1		38.0	25.8		34.0	22.2	34.4	26.8		32.9	27.2	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		74.2	0.2		3.8	0.1	10.5	1.9		2.3	3.7	
Delay (s)		112.2	26.0		37.8	22.3	44.9	28.7		35.2	30.9	
Level of Service		F	C		D	C	D	C		D	C	
Approach Delay (s)		61.5			29.9			32.1			31.5	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

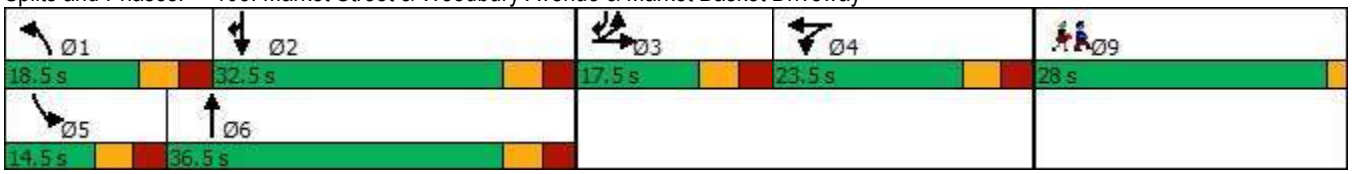
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	141	43	154	69	57	596	12	557	303	
Future Volume (vph)	141	43	154	69	57	596	12	557	303	
Lane Group Flow (vph)	160	93	197	106	63	845	12	563	306	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.42	0.42	0.61	0.31	0.35	0.63	0.09	0.59	0.34	
Control Delay	42.0	35.8	44.5	35.7	45.6	25.2	45.8	32.6	3.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.0	35.8	44.5	35.7	45.6	25.2	45.8	32.6	3.8	
Queue Length 50th (ft)	38	29	89	42	29	150	6	129	0	
Queue Length 95th (ft)	94	99	195	107	92	#468	29	279	58	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	469	262	413	429	264	1407	176	1145	895	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.34	0.35	0.48	0.25	0.24	0.60	0.07	0.49	0.34	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 82.8
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	43	39	154	69	14	57	596	165	12	557	303
Future Volume (vph)	141	43	39	154	69	14	57	596	165	12	557	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1689		1906	1955		1728	3325		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1689		1906	1955		1728	3325		1728	3455	1546
Peak-hour factor, PHF	0.88	0.88	0.88	0.78	0.78	0.78	0.90	0.90	0.90	0.99	0.99	0.99
Adj. Flow (vph)	160	49	44	197	88	18	63	662	183	12	563	306
RTOR Reduction (vph)	0	27	0	0	6	0	0	18	0	0	0	159
Lane Group Flow (vph)	160	66	0	197	100	0	63	827	0	12	563	147
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.5	9.5		14.0	14.0		7.1	32.9		1.1	26.9	42.9
Effective Green, g (s)	9.5	9.5		14.0	14.0		7.1	32.9		1.1	26.9	42.9
Actuated g/C Ratio	0.11	0.11		0.16	0.16		0.08	0.37		0.01	0.30	0.48
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	357	180		299	307		137	1229		21	1044	745
v/s Ratio Prot	c0.05	0.04		c0.10	0.05		c0.04	c0.25		0.01	0.16	0.10
v/s Ratio Perm												
v/c Ratio	0.45	0.37		0.66	0.33		0.46	0.67		0.57	0.54	0.20
Uniform Delay, d1	37.3	37.0		35.3	33.3		39.1	23.5		43.7	25.9	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	1.3		5.2	0.6		2.4	1.5		32.5	0.5	0.1
Delay (s)	38.2	38.2		40.4	33.9		41.6	25.0		76.2	26.4	13.3
Level of Service	D	D		D	C		D	C		E	C	B
Approach Delay (s)		38.2			38.2			26.2			22.6	
Approach LOS		D			D			C			C	

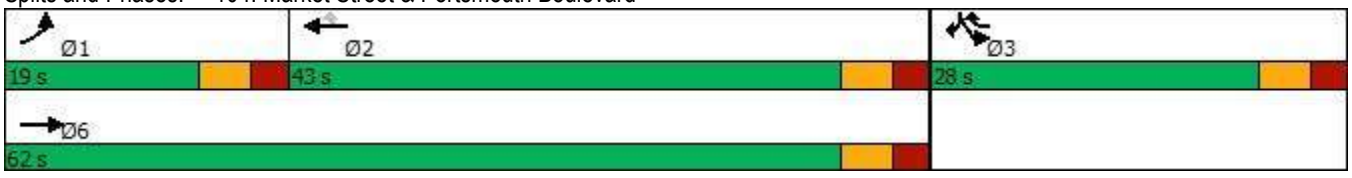
Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	729	778	32	35	40
Future Volume (vph)	21	729	778	32	35	40
Lane Group Flow (vph)	23	784	874	36	49	56
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.08	0.35	0.41	0.03	0.10	0.19
Control Delay	21.0	5.1	7.7	1.1	19.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	5.1	7.7	1.1	19.8	9.8
Queue Length 50th (ft)	3	45	52	0	3	0
Queue Length 95th (ft)	28	74	165	6	19	19
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	559	3330	2963	1325	1733	852
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.24	0.29	0.03	0.03	0.07

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 43.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	729	778	32	35	40
Future Volume (vph)	21	729	778	32	35	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1569	3164	1509
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1569	3164	1509
Peak-hour factor, PHF	0.93	0.93	0.89	0.89	0.72	0.72
Adj. Flow (vph)	23	784	874	36	49	56
RTOR Reduction (vph)	0	0	0	14	0	50
Lane Group Flow (vph)	23	784	874	22	49	6
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	1%	1%	1%	1%	7%	7%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	1.0	32.0	25.0	30.4	5.4	5.4
Effective Green, g (s)	1.0	32.0	25.0	30.4	5.4	5.4
Actuated g/C Ratio	0.02	0.65	0.51	0.62	0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	34	2238	1748	1156	345	164
v/s Ratio Prot	0.01	c0.23	c0.25	0.00	c0.02	0.00
v/s Ratio Perm				0.01		
v/c Ratio	0.68	0.35	0.50	0.02	0.14	0.04
Uniform Delay, d1	24.0	4.0	8.1	3.7	19.9	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.2	0.1	0.2	0.0	0.2	0.1
Delay (s)	66.3	4.1	8.3	3.7	20.1	19.8
Level of Service	E	A	A	A	C	B
Approach Delay (s)		5.8	8.1		19.9	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	49.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

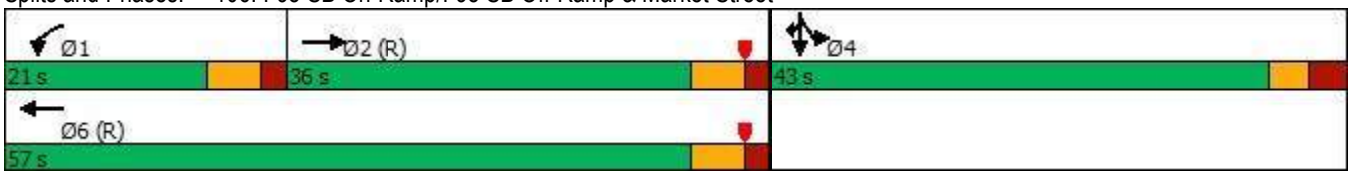
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	706	135	92	410	175	3	393
Future Volume (vph)	706	135	92	410	175	3	393
Lane Group Flow (vph)	776	148	108	482	171	227	222
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	36.0		21.0	57.0	43.0	43.0	43.0
Total Split (%)	36.0%		21.0%	57.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.29	0.08	0.55	0.19	0.62	0.55	0.51
Control Delay	12.7	0.1	68.0	3.2	47.9	12.1	9.1
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	0.1	68.0	3.2	47.9	12.1	9.1
Queue Length 50th (ft)	112	0	76	26	107	13	0
Queue Length 95th (ft)	169	0	124	35	166	81	61
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2675	1775	255	2477	628	674	701
Starvation Cap Reductn	1020	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.08	0.42	0.19	0.27	0.34	0.32

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	706	135	92	410	0	0	0	0	175	3	393
Future Volume (vph)	0	706	135	92	410	0	0	0	0	175	3	393
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4964	1775	1668	3455					1698	1474	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4964	1775	1668	3455					1698	1474	1519
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	776	148	108	482	0	0	0	0	190	3	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	172	186
Lane Group Flow (vph)	0	776	148	108	482	0	0	0	0	171	55	36
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		53.9	100.0	11.8	71.7					16.3	16.3	16.3
Effective Green, g (s)		53.9	100.0	11.8	71.7					16.3	16.3	16.3
Actuated g/C Ratio		0.54	1.00	0.12	0.72					0.16	0.16	0.16
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2675	1775	196	2477					276	240	247
v/s Ratio Prot		c0.16		c0.06	0.14					c0.10	0.04	0.02
v/s Ratio Perm			0.08									
v/c Ratio		0.29	0.08	0.55	0.19					0.62	0.23	0.15
Uniform Delay, d1		12.6	0.0	41.6	4.7					39.0	36.4	35.9
Progression Factor		0.88	1.00	1.42	0.57					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	3.2	0.2					4.1	0.5	0.3
Delay (s)		11.4	0.1	62.2	2.8					43.1	36.9	36.2
Level of Service		B	A	E	A					D	D	D
Approach Delay (s)		9.6			13.7			0.0			38.3	
Approach LOS		A			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	51.2%	ICU Level of Service	A	
Analysis Period (min)	15			

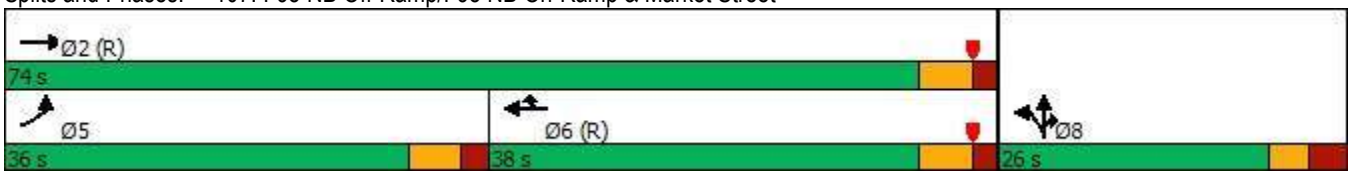
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	389	492	453	134	4	205
Future Volume (vph)	389	492	453	134	4	205
Lane Group Flow (vph)	463	586	533	158	58	225
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	26.0	26.0
Total Split (s)	36.0	74.0	38.0	38.0	26.0	26.0
Total Split (%)	36.0%	74.0%	38.0%	38.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.71	0.22	0.29	0.16	0.28	0.59
Control Delay	54.7	2.7	16.1	3.6	42.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	2.7	16.1	3.6	42.4	11.9
Queue Length 50th (ft)	162	20	93	0	35	0
Queue Length 95th (ft)	200	61	164	34	66	61
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	1005	2647	1832	1006	359	499
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.22	0.29	0.16	0.16	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	389	492	0	0	453	134	49	4	205	0	0	0
Future Volume (vph)	389	492	0	0	453	134	49	4	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1798	1599			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1798	1599			
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	463	586	0	0	533	158	54	4	225	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	199	0	0	0
Lane Group Flow (vph)	463	586	0	0	533	81	0	58	26	0	0	0
Confl. Peds. (#/hr)	7		1	1		7			1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	19.4	76.6			51.2	51.2		11.4	11.4			
Effective Green, g (s)	19.4	76.6			51.2	51.2		11.4	11.4			
Actuated g/C Ratio	0.19	0.77			0.51	0.51		0.11	0.11			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	650	2646			1829	927		204	182			
v/s Ratio Prot	c0.14	0.17			c0.15	0.04		c0.03	0.02			
v/s Ratio Perm												
v/c Ratio	0.71	0.22			0.29	0.09		0.28	0.14			
Uniform Delay, d1	37.7	3.3			14.0	12.5		40.6	39.9			
Progression Factor	1.29	0.66			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.6	0.2			0.4	0.2		1.0	0.5			
Delay (s)	52.4	2.4			14.4	12.6		41.6	40.4			
Level of Service	D	A			B	B		D	D			
Approach Delay (s)		24.5			14.0			40.6			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	24	8	32	19	3	13	9	15	3	13	6
Future Vol, veh/h	4	24	8	32	19	3	13	9	15	3	13	6
Peak Hour Factor	0.82	0.82	0.82	0.75	0.75	0.75	0.93	0.93	0.93	0.79	0.79	0.79
Heavy Vehicles, %	3	3	3	2	2	2	3	3	3	5	5	5
Mvmt Flow	5	29	10	43	25	4	14	10	16	4	16	8
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

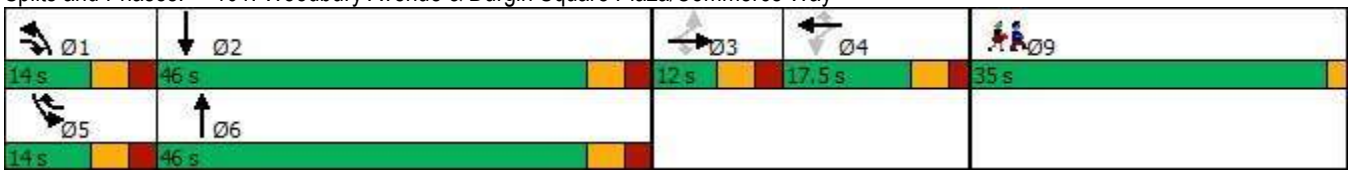
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	7.6	8.3	7.6	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	14%	0%	59%	19%	0%
Vol Thru, %	0%	38%	86%	0%	35%	81%	0%
Vol Right, %	0%	62%	0%	100%	6%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	24	28	8	54	16	6
LT Vol	13	0	4	0	32	3	0
Through Vol	0	9	24	0	19	13	0
RT Vol	0	15	0	8	3	0	6
Lane Flow Rate	14	26	34	10	72	20	8
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.021	0.032	0.045	0.011	0.095	0.028	0.009
Departure Headway (Hd)	5.368	4.428	4.774	4.001	4.767	5.003	4.207
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	671	813	743	883	745	720	855
Service Time	3.068	2.128	2.55	1.777	2.838	2.705	1.909
HCM Lane V/C Ratio	0.021	0.032	0.046	0.011	0.097	0.028	0.009
HCM Control Delay	8.2	7.3	7.8	6.8	8.3	7.8	6.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0	0.3	0.1	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	5	6	10	5	1	44	16	363	221	512	
Future Volume (vph)	5	6	10	5	1	44	16	363	221	512	
Lane Group Flow (vph)	0	12	11	0	6	48	17	416	240	573	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.04	0.03		0.02	0.11	0.06	0.36	0.67	0.23	
Control Delay		29.5	0.2		29.7	0.8	28.2	15.9	34.3	12.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		29.5	0.2		29.7	0.8	28.2	15.9	34.3	12.0	
Queue Length 50th (ft)		2	0		1	0	2	24	31	0	
Queue Length 95th (ft)		28	0		18	2	34	174	#420	245	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		299	426		603	435	373	2932	360	2945	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.04	0.03		0.01	0.11	0.05	0.14	0.67	0.19	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 46.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	6	10	5	1	44	16	363	19	221	512	15
Future Volume (vph)	5	6	10	5	1	44	16	363	19	221	512	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1773	1538		1754	1553	1694	3359		1636	3372	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1538		1827	1553	1694	3359		1636	3372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	7	11	5	1	48	17	395	21	240	557	16
RTOR Reduction (vph)	0	0	10	0	0	39	0	3	0	0	1	0
Lane Group Flow (vph)	0	12	1	0	6	9	17	413	0	240	572	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		0.5	3.0		0.6	10.9	2.5	21.4		10.3	29.2	
Effective Green, g (s)		0.5	3.0		0.6	10.9	2.5	21.4		10.3	29.2	
Actuated g/C Ratio		0.01	0.05		0.01	0.18	0.04	0.35		0.17	0.48	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		14	75		17	277	69	1176		275	1611	
v/s Ratio Prot			0.00			0.01	0.01	0.12		c0.15	c0.17	
v/s Ratio Perm		c0.01	0.00		c0.00	0.00						
v/c Ratio		0.86	0.01		0.35	0.03	0.25	0.35		0.87	0.36	
Uniform Delay, d1		30.3	27.6		30.1	20.7	28.4	14.7		24.8	10.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		164.6	0.0		12.2	0.0	1.9	0.2		24.8	0.1	
Delay (s)		194.9	27.7		42.3	20.8	30.3	14.9		49.6	10.2	
Level of Service		F	C		D	C	C	B		D	B	
Approach Delay (s)		114.9			23.2			15.5			21.8	
Approach LOS		F			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		

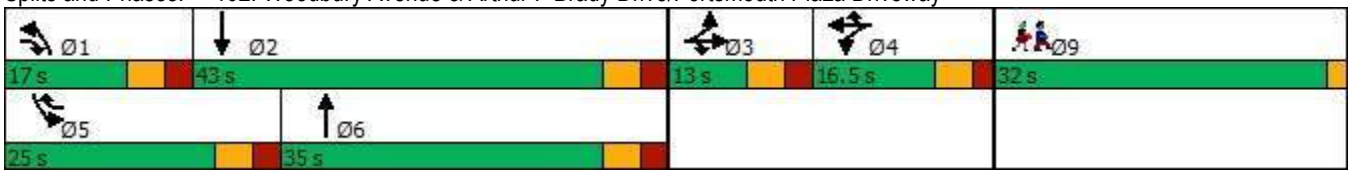
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	29	99	18	32	116	310	39	455	
Future Volume (vph)	29	99	18	32	116	310	39	455	
Lane Group Flow (vph)	93	108	32	35	121	330	42	531	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.47	0.18	0.16	0.09	0.44	0.33	0.21	0.63	
Control Delay	45.0	2.1	37.8	0.4	38.5	22.6	37.3	27.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.0	2.1	37.8	0.4	38.5	22.6	37.3	27.9	
Queue Length 50th (ft)	35	0	12	0	42	51	15	96	
Queue Length 95th (ft)	#170	13	54	0	#180	147	65	236	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	197	620	310	662	308	1618	513	2049	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.47	0.17	0.10	0.05	0.39	0.20	0.08	0.26	

Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 66.9
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	29	99	11	18	32	116	310	7	39	455	33
Future Volume (vph)	56	29	99	11	18	32	116	310	7	39	455	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694	1487		1690	1463	1678	3343		1620	3316	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1694	1487		1690	1463	1678	3343		1620	3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	61	32	108	12	20	35	121	323	7	42	495	36
RTOR Reduction (vph)	0	0	79	0	0	29	0	1	0	0	5	0
Lane Group Flow (vph)	0	93	29	0	32	6	121	329	0	42	526	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.8	18.9		4.2	12.4	11.1	19.9		8.2	17.0	
Effective Green, g (s)		7.8	18.9		4.2	12.4	11.1	19.9		8.2	17.0	
Actuated g/C Ratio		0.11	0.27		0.06	0.18	0.16	0.29		0.12	0.25	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		190	406		102	262	269	961		191	814	
v/s Ratio Prot		c0.05	0.02		c0.02	0.00	c0.07	c0.10		0.03	c0.16	
v/s Ratio Perm												
v/c Ratio		0.49	0.07		0.31	0.02	0.45	0.34		0.22	0.65	
Uniform Delay, d1		28.8	18.7		31.1	23.4	26.3	19.5		27.6	23.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0	0.1		1.8	0.0	1.2	0.2		0.6	1.8	
Delay (s)		30.8	18.7		32.9	23.4	27.5	19.7		28.2	25.2	
Level of Service		C	B		C	C	C	B		C	C	
Approach Delay (s)		24.3			28.0			21.8			25.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

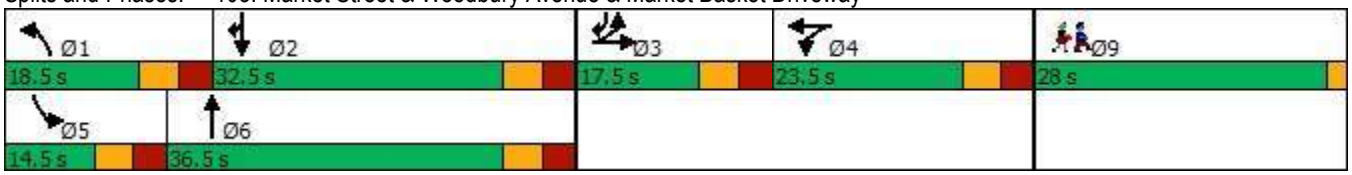
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	77	33	57	37	69	350	3	339	221	
Future Volume (vph)	77	33	57	37	69	350	3	339	221	
Lane Group Flow (vph)	83	83	62	47	75	472	3	368	240	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.21	0.36	0.27	0.20	0.34	0.33	0.02	0.39	0.26	
Control Delay	35.3	24.7	37.2	32.9	38.5	17.7	40.3	27.5	3.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.3	24.7	37.2	32.9	38.5	17.7	40.3	27.5	3.8	
Queue Length 50th (ft)	14	13	22	14	26	53	1	65	0	
Queue Length 95th (ft)	53	75	85	64	100	201	12	174	51	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	587	324	496	515	320	1578	213	1389	904	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.26	0.13	0.09	0.23	0.30	0.01	0.26	0.27	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 68.9
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	33	45	57	37	6	69	350	85	3	339	221
Future Volume (vph)	77	33	45	57	37	6	69	350	85	3	339	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1644		1834	1887		1678	3244		1646	3355	1501
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1644		1834	1887		1678	3244		1646	3355	1501
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	35	48	62	40	7	75	380	92	3	368	240
RTOR Reduction (vph)	0	40	0	0	5	0	0	15	0	0	0	120
Lane Group Flow (vph)	83	43	0	62	42	0	75	457	0	3	368	120
Confl. Peds. (#/hr)			2	2			1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.0	8.0		6.7	6.7		7.1	29.9		0.8	23.6	38.1
Effective Green, g (s)	8.0	8.0		6.7	6.7		7.1	29.9		0.8	23.6	38.1
Actuated g/C Ratio	0.10	0.10		0.09	0.09		0.09	0.39		0.01	0.31	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	350	171		160	165		155	1267		17	1035	747
v/s Ratio Prot	0.02	c0.03		c0.03	0.02		c0.04	c0.14		0.00	0.11	0.08
v/s Ratio Perm												
v/c Ratio	0.24	0.25		0.39	0.25		0.48	0.36		0.18	0.36	0.16
Uniform Delay, d1	31.4	31.5		33.0	32.6		33.0	16.5		37.5	20.5	10.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.8		1.6	0.8		2.4	0.2		4.9	0.2	0.1
Delay (s)	31.8	32.3		34.5	33.4		35.3	16.7		42.4	20.8	10.6
Level of Service	C	C		C	C		D	B		D	C	B
Approach Delay (s)		32.0			34.0			19.3			16.9	
Approach LOS		C			C			B			B	

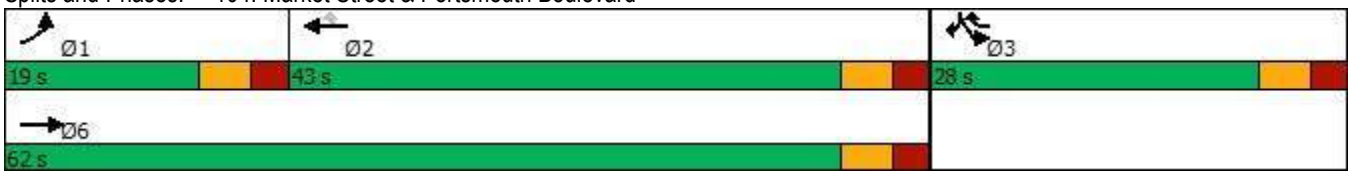
Intersection Summary			
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	28.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	397	456	237	52	48
Future Volume (vph)	44	397	456	237	52	48
Lane Group Flow (vph)	48	432	496	258	57	52
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.15	0.26	0.38	0.26	0.10	0.16
Control Delay	20.9	5.5	10.8	1.4	20.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	5.5	10.8	1.4	20.0	10.0
Queue Length 50th (ft)	6	22	26	0	3	0
Queue Length 95th (ft)	48	41	96	17	27	28
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	602	3213	2940	1343	2118	1028
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.13	0.17	0.19	0.03	0.05

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 40.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	397	456	237	52	48
Future Volume (vph)	44	397	456	237	52	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1678	3355	3388	1546	3255	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1678	3355	3388	1546	3255	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	432	496	258	57	52
RTOR Reduction (vph)	0	0	0	121	0	43
Lane Group Flow (vph)	48	432	496	137	57	9
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.5	24.2	15.7	23.1	7.4	7.4
Effective Green, g (s)	2.5	24.2	15.7	23.1	7.4	7.4
Actuated g/C Ratio	0.06	0.56	0.36	0.53	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	96	1862	1219	1031	552	263
v/s Ratio Prot	0.03	c0.13	c0.15	c0.02	0.02	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.50	0.23	0.41	0.13	0.10	0.03
Uniform Delay, d1	19.9	5.0	10.5	5.2	15.3	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.1	0.2	0.1	0.1	0.1
Delay (s)	24.0	5.0	10.7	5.2	15.4	15.2
Level of Service	C	A	B	A	B	B
Approach Delay (s)		6.9	8.8		15.3	
Approach LOS		A	A		B	

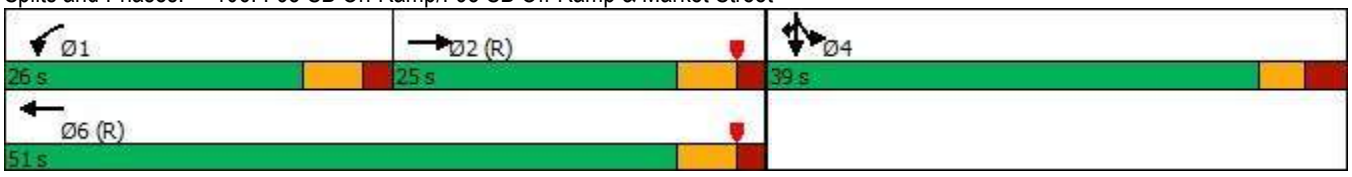
Intersection Summary			
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	43.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	414	99	86	432	191	1	291
Future Volume (vph)	414	99	86	432	191	1	291
Lane Group Flow (vph)	440	105	93	470	183	171	171
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	25.0		26.0	51.0	39.0	39.0	39.0
Total Split (%)	27.8%		28.9%	56.7%	43.3%	43.3%	43.3%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.17	0.06	0.49	0.21	0.63	0.46	0.43
Control Delay	14.2	0.1	49.1	7.0	42.9	11.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	0.1	49.1	7.0	42.9	11.6	8.1
Queue Length 50th (ft)	55	0	55	25	103	14	0
Queue Length 95th (ft)	94	0	98	131	157	67	50
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2563	1724	356	2289	604	620	649
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	93	0	4	4
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.06	0.26	0.21	0.30	0.28	0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 81 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	414	99	86	432	0	0	0	0	191	1	291
Future Volume (vph)	0	414	99	86	432	0	0	0	0	191	1	291
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4821	1724	1604	3323					1649	1441	1475
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4821	1724	1604	3323					1649	1441	1475
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	440	105	93	470	0	0	0	0	208	1	316
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	119	141
Lane Group Flow (vph)	0	440	105	93	470	0	0	0	0	183	52	30
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		46.6	90.0	9.4	62.0					16.0	16.0	16.0
Effective Green, g (s)		46.6	90.0	9.4	62.0					16.0	16.0	16.0
Actuated g/C Ratio		0.52	1.00	0.10	0.69					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2496	1724	167	2289					293	256	262
v/s Ratio Prot		0.09		c0.06	c0.14					c0.11	0.04	0.02
v/s Ratio Perm			0.06									
v/c Ratio		0.18	0.06	0.56	0.21					0.62	0.20	0.12
Uniform Delay, d1		11.5	0.0	38.3	5.1					34.2	31.6	31.1
Progression Factor		1.05	1.00	1.11	1.17					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	3.9	0.2					4.1	0.4	0.2
Delay (s)		12.3	0.1	46.5	6.1					38.3	31.9	31.3
Level of Service		B	A	D	A					D	C	C
Approach Delay (s)		9.9			12.8			0.0			34.0	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

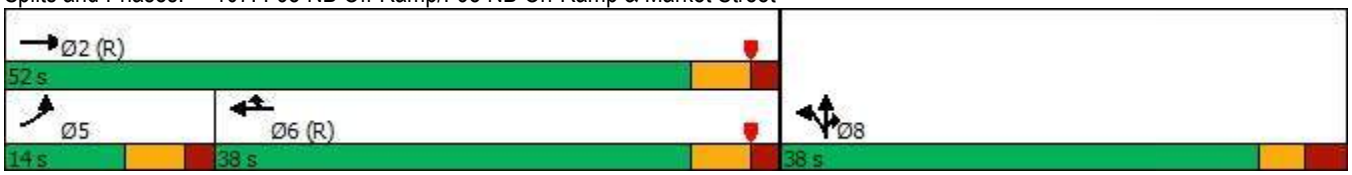
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	139	466	327	53	0	347
Future Volume (vph)	139	466	327	53	0	347
Lane Group Flow (vph)	151	507	355	58	203	369
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	32.0	32.0
Total Split (s)	14.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	15.6%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.44	0.23	0.21	0.06	0.60	0.67
Control Delay	31.3	3.4	14.6	0.8	39.3	13.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	3.4	14.6	0.8	39.3	13.3
Queue Length 50th (ft)	26	3	55	0	107	33
Queue Length 95th (ft)	52	118	106	5	155	107
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	354	2253	1714	923	622	751
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.23	0.21	0.06	0.33	0.49

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	466	0	0	327	53	191	0	347	0	0	0
Future Volume (vph)	139	466	0	0	327	53	191	0	347	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3255	3355			3438	1743		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3255	3355			3438	1743		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	151	507	0	0	355	58	203	0	369	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	242	0	0	0
Lane Group Flow (vph)	151	507	0	0	355	29	0	203	127	0	0	0
Confl. Peds. (#/hr)	4					4						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.6	60.5			44.9	44.9		17.5	17.5			
Effective Green, g (s)	9.6	60.5			44.9	44.9		17.5	17.5			
Actuated g/C Ratio	0.11	0.67			0.50	0.50		0.19	0.19			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	347	2255			1715	869		340	304			
v/s Ratio Prot	c0.05	c0.15			0.10	0.02		c0.12	0.08			
v/s Ratio Perm												
v/c Ratio	0.44	0.22			0.21	0.03		0.60	0.42			
Uniform Delay, d1	37.7	5.7			12.6	11.5		33.0	31.8			
Progression Factor	0.73	0.49			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.2			0.3	0.1		3.3	1.3			
Delay (s)	28.5	3.0			12.9	11.6		36.3	33.0			
Level of Service	C	A			B	B		D	C			
Approach Delay (s)		8.9			12.7			34.2			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	8	9	77	27	0	177	80	26	0	9	6
Future Vol, veh/h	18	8	9	77	27	0	177	80	26	0	9	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	6	6	3	3	3	1	1	1	0	0	0
Mvmt Flow	20	9	10	84	29	0	192	87	28	0	10	7
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.6	9.7	9.7	7.7
HCM LOS	A	A	A	A

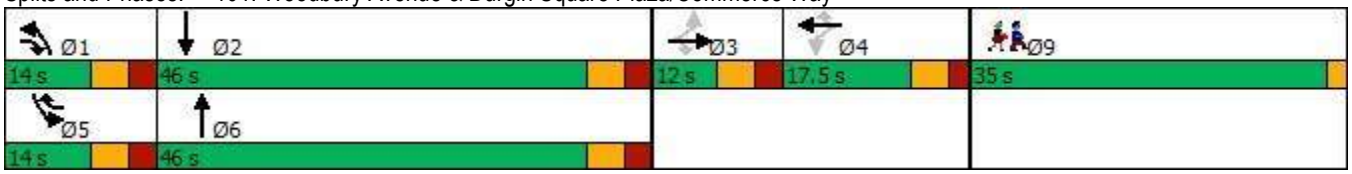
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	69%	0%	74%	0%	0%
Vol Thru, %	0%	75%	31%	0%	26%	100%	0%
Vol Right, %	0%	25%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	106	26	9	104	9	6
LT Vol	177	0	18	0	77	0	0
Through Vol	0	80	8	0	27	9	0
RT Vol	0	26	0	9	0	0	6
Lane Flow Rate	192	115	28	10	113	10	7
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.292	0.153	0.046	0.013	0.174	0.014	0.008
Departure Headway (Hd)	5.459	4.785	5.9	4.848	5.543	5.237	4.532
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	660	750	607	738	648	683	788
Service Time	3.183	2.509	3.635	2.582	3.57	2.973	2.268
HCM Lane V/C Ratio	0.291	0.153	0.046	0.014	0.174	0.015	0.009
HCM Control Delay	10.4	8.4	8.9	7.6	9.7	8	7.3
HCM Lane LOS	B	A	A	A	A	A	A
HCM 95th-tile Q	1.2	0.5	0.1	0	0.6	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	30	31	96	40	23	179	102	640	131	806	
Future Volume (vph)	30	31	96	40	23	179	102	640	131	806	
Lane Group Flow (vph)	0	67	104	0	68	195	111	699	141	904	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.94	0.26		0.39	0.36	0.57	0.60	0.75	0.77	
Control Delay		136.1	6.4		45.7	5.4	52.8	25.6	65.1	30.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		136.1	6.4		45.7	5.4	52.8	25.6	65.1	30.1	
Queue Length 50th (ft)		31	0		28	0	49	131	63	183	
Queue Length 95th (ft)		#175	27		103	39	#215	318	#280	434	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		71	397		242	549	195	1950	188	1940	
Starvation Cap Reductn		0	0		0	0	0	45	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.94	0.26		0.28	0.36	0.57	0.37	0.75	0.47	

Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 77.9
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	31	96	40	23	179	102	640	3	131	806	34
Future Volume (vph)	30	31	96	40	23	179	102	640	3	131	806	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1590		1802	1583	1728	3453		1668	3431	
Flt Permitted		0.45	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		851	1590		1428	1583	1728	3453		1668	3431	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	33	34	104	43	25	195	111	696	3	141	867	37
RTOR Reduction (vph)	0	0	84	0	0	155	0	0	0	0	3	0
Lane Group Flow (vph)	0	67	20	0	68	40	111	699	0	141	901	0
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.6	15.4		7.6	16.4	8.8	26.5		8.8	26.5	
Effective Green, g (s)		6.6	15.4		7.6	16.4	8.8	26.5		8.8	26.5	
Actuated g/C Ratio		0.08	0.19		0.10	0.21	0.11	0.34		0.11	0.34	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		71	309		137	328	192	1156		185	1149	
v/s Ratio Prot			0.01			0.01	0.06	0.20		c0.08	c0.26	
v/s Ratio Perm		c0.08	0.01		c0.05	0.01						
v/c Ratio		0.94	0.07		0.50	0.12	0.58	0.60		0.76	0.78	
Uniform Delay, d1		36.1	26.0		33.9	25.5	33.4	21.9		34.1	23.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		86.8	0.1		2.8	0.2	4.2	0.9		16.8	3.6	
Delay (s)		122.9	26.1		36.7	25.7	37.6	22.8		50.9	27.3	
Level of Service		F	C		D	C	D	C		D	C	
Approach Delay (s)		64.0			28.5			24.9			30.5	
Approach LOS		E			C			C			C	

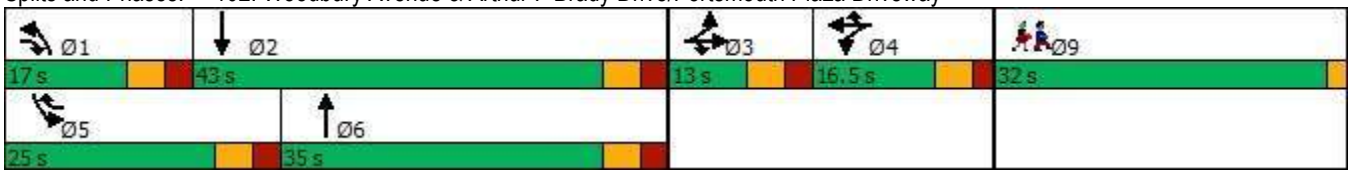
Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	43	192	49	111	170	566	91	760	
Future Volume (vph)	43	192	49	111	170	566	91	760	
Lane Group Flow (vph)	121	209	118	121	175	613	99	925	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.84	0.43	0.57	0.22	0.78	0.52	0.47	0.81	
Control Delay	86.5	5.8	51.7	4.7	64.3	27.5	46.2	33.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	86.5	5.8	51.7	4.7	64.3	27.5	46.2	33.8	
Queue Length 50th (ft)	62	0	57	0	87	124	48	213	
Queue Length 95th (ft)	#240	34	#189	27	#303	297	128	#475	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	144	489	224	657	224	1206	374	1489	
Starvation Cap Reductn	0	0	0	0	0	0	0	18	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.43	0.53	0.18	0.78	0.51	0.26	0.63	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 87.5
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	43	192	60	49	111	170	566	28	91	760	91
Future Volume (vph)	68	43	192	60	49	111	170	566	28	91	760	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747	1531		1726	1507	1728	3431		1668	3392	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1747	1531		1726	1507	1728	3431		1668	3392	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	74	47	209	65	53	121	175	584	29	99	826	99
RTOR Reduction (vph)	0	0	165	0	0	91	0	3	0	0	7	0
Lane Group Flow (vph)	0	121	44	0	118	30	175	610	0	99	918	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.2	18.6		10.6	21.6	11.4	29.8		11.0	29.4	
Effective Green, g (s)		7.2	18.6		10.6	21.6	11.4	29.8		11.0	29.4	
Actuated g/C Ratio		0.08	0.21		0.12	0.24	0.13	0.34		0.12	0.33	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	322		206	368	222	1156		207	1128	
v/s Ratio Prot		c0.07	0.03		c0.07	0.02	c0.10	0.18		0.06	c0.27	
v/s Ratio Perm												
v/c Ratio		0.85	0.14		0.57	0.08	0.79	0.53		0.48	0.81	
Uniform Delay, d1		40.1	28.4		36.8	25.7	37.3	23.6		36.0	27.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		36.0	0.2		3.8	0.1	16.7	0.4		1.7	4.6	
Delay (s)		76.1	28.6		40.6	25.8	54.1	24.1		37.8	31.6	
Level of Service		E	C		D	C	D	C		D	C	
Approach Delay (s)		46.0			33.1			30.7			32.2	
Approach LOS		D			C			C			C	

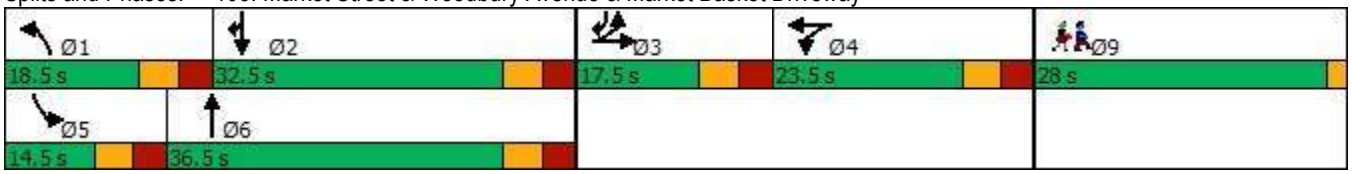
Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	25.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	177	62	172	70	84	572	8	678	325	
Future Volume (vph)	177	62	172	70	84	572	8	678	325	
Lane Group Flow (vph)	192	135	185	91	88	742	9	737	353	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.49	0.59	0.62	0.29	0.46	0.52	0.07	0.72	0.37	
Control Delay	44.9	44.0	48.3	37.7	50.0	23.0	47.2	35.2	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.9	44.0	48.3	37.7	50.0	23.0	47.2	35.2	3.7	
Queue Length 50th (ft)	51	52	95	41	46	128	5	187	0	
Queue Length 95th (ft)	113	#172	#221	110	120	#373	24	#426	62	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	451	255	397	411	254	1531	169	1100	960	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.43	0.53	0.47	0.22	0.35	0.48	0.05	0.67	0.37	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 86.7
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



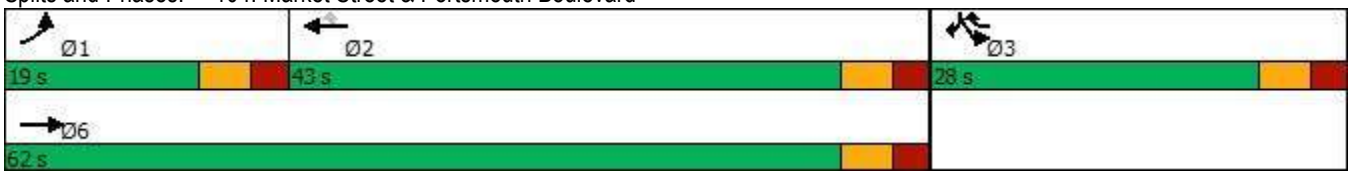
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	62	63	172	70	15	84	572	133	8	678	325
Future Volume (vph)	177	62	63	172	70	15	84	572	133	8	678	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1681		1906	1949		1728	3344		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1681		1906	1949		1728	3344		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	192	67	68	185	75	16	88	602	140	9	737	353
RTOR Reduction (vph)	0	30	0	0	6	0	0	13	0	0	0	176
Lane Group Flow (vph)	192	105	0	185	85	0	88	729	0	9	737	177
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.2	10.2		13.5	13.5		7.7	36.3		1.1	29.7	46.4
Effective Green, g (s)	10.2	10.2		13.5	13.5		7.7	36.3		1.1	29.7	46.4
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.08	0.39		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	368	184		277	283		143	1309		20	1106	773
v/s Ratio Prot	0.06	c0.06		c0.10	0.04		c0.05	c0.22		0.01	c0.21	0.11
v/s Ratio Perm												
v/c Ratio	0.52	0.57		0.67	0.30		0.62	0.56		0.45	0.67	0.23
Uniform Delay, d1	38.9	39.2		37.5	35.4		41.1	21.9		45.5	27.2	13.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	4.0		6.0	0.6		7.6	0.5		15.3	1.5	0.2
Delay (s)	40.3	43.2		43.5	36.0		48.7	22.5		60.8	28.8	13.2
Level of Service	D	D		D	D		D	C		E	C	B
Approach Delay (s)		41.5			41.0			25.2			24.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	870	704	67	196	85
Future Volume (vph)	43	870	704	67	196	85
Lane Group Flow (vph)	47	946	757	72	213	92
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.17	0.52	0.51	0.07	0.32	0.23
Control Delay	24.6	7.9	12.6	1.3	20.9	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	7.9	12.6	1.3	20.9	8.3
Queue Length 50th (ft)	9	71	53	0	19	0
Queue Length 95th (ft)	50	126	173	9	75	37
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	517	3276	2843	1279	1698	855
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.29	0.27	0.06	0.13	0.11

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 47.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	870	704	67	196	85
Future Volume (vph)	43	870	704	67	196	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1576	3351	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1576	3351	1599
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.92	0.92
Adj. Flow (vph)	47	946	757	72	213	92
RTOR Reduction (vph)	0	0	0	29	0	75
Lane Group Flow (vph)	47	946	757	43	213	17
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.6	29.2	20.6	30.2	9.6	9.6
Effective Green, g (s)	2.6	29.2	20.6	30.2	9.6	9.6
Actuated g/C Ratio	0.05	0.57	0.41	0.59	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	88	1985	1401	1123	633	302
v/s Ratio Prot	0.03	c0.27	c0.22	0.01	c0.06	0.01
v/s Ratio Perm				0.02		
v/c Ratio	0.53	0.48	0.54	0.04	0.34	0.06
Uniform Delay, d1	23.5	6.3	11.5	4.3	17.8	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.2	0.4	0.0	0.3	0.1
Delay (s)	29.6	6.5	11.9	4.3	18.2	17.0
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.6	11.3		17.8	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		

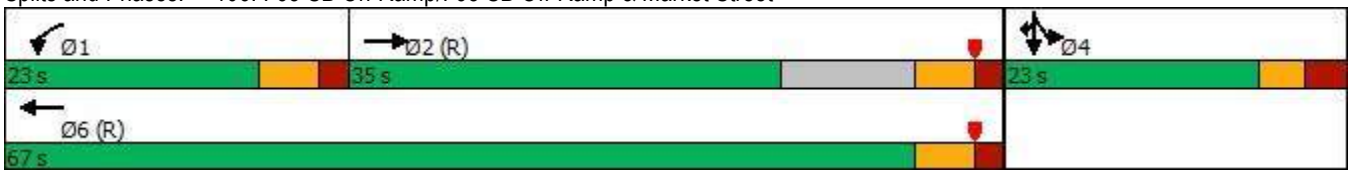
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	896	205	222	508	235	1	304
Future Volume (vph)	896	205	222	508	235	1	304
Lane Group Flow (vph)	953	218	241	552	204	194	188
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	35.0		23.0	67.0	23.0	23.0	23.0
Total Split (%)	38.9%		25.6%	74.4%	25.6%	25.6%	25.6%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.45	0.12	0.76	0.23	0.66	0.51	0.44
Control Delay	18.7	0.1	37.2	1.5	43.8	15.3	7.8
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	0.1	37.2	1.5	43.8	15.3	7.8
Queue Length 50th (ft)	146	0	86	1	115	31	0
Queue Length 95th (ft)	203	0	#222	1	173	91	52
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2249	1757	337	2428	352	419	464
Starvation Cap Reductn	498	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	49	0	1	2
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.12	0.72	0.23	0.58	0.46	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	896	205	222	508	0	0	0	0	235	1	304
Future Volume (vph)	0	896	205	222	508	0	0	0	0	235	1	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4916	1757	1668	3455					1698	1504	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4916	1757	1668	3455					1698	1504	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	953	218	241	552	0	0	0	0	255	1	330
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	110	154
Lane Group Flow (vph)	0	953	218	241	552	0	0	0	0	204	84	34
Confl. Peds. (#/hr)	8					8						
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		38.5	90.0	17.1	61.6					16.4	16.4	16.4
Effective Green, g (s)		38.5	90.0	17.1	61.6					16.4	16.4	16.4
Actuated g/C Ratio		0.43	1.00	0.19	0.68					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2102	1757	316	2364					309	274	276
v/s Ratio Prot		c0.19		c0.14	0.16					c0.12	0.06	0.02
v/s Ratio Perm			0.12									
v/c Ratio		0.45	0.12	0.76	0.23					0.66	0.31	0.12
Uniform Delay, d1		18.3	0.0	34.5	5.3					34.2	31.9	30.8
Progression Factor		0.91	1.00	0.60	0.23					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1	9.8	0.2					5.2	0.6	0.2
Delay (s)		17.3	0.1	30.7	1.4					39.4	32.5	31.0
Level of Service		B	A	C	A					D	C	C
Approach Delay (s)		14.1			10.3			0.0			34.4	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			

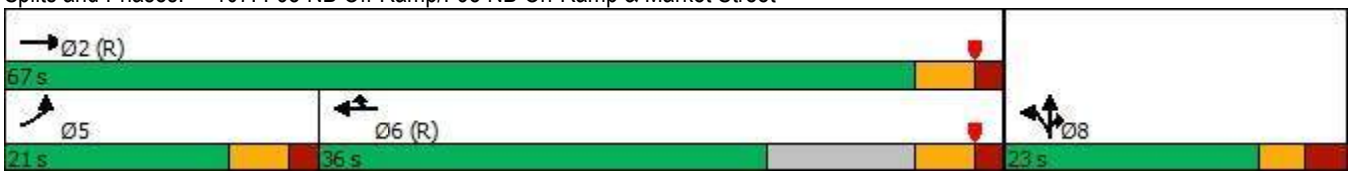
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	499	632	640	225	1	176
Future Volume (vph)	499	632	640	225	1	176
Lane Group Flow (vph)	531	672	681	239	99	191
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	23.0	23.0
Total Split (s)	21.0	67.0	36.0	36.0	23.0	23.0
Total Split (%)	23.3%	74.4%	40.0%	40.0%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.70	0.26	0.43	0.26	0.43	0.51
Control Delay	29.6	10.5	19.3	3.4	40.8	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.6	10.5	19.3	3.4	40.8	10.4
Queue Length 50th (ft)	152	151	136	0	53	0
Queue Length 95th (ft)	209	222	210	46	95	56
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	757	2542	1665	972	335	453
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.26	0.41	0.25	0.30	0.42

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	499	632	0	0	640	225	90	1	176	0	0	0
Future Volume (vph)	499	632	0	0	640	225	90	1	176	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1775	1583			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	531	672	0	0	681	239	98	1	191	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	133	0	0	166	0	0	0
Lane Group Flow (vph)	531	672	0	0	681	106	0	99	25	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	20.3	66.2			39.9	39.9		11.8	11.8			
Effective Green, g (s)	20.3	66.2			39.9	39.9		11.8	11.8			
Actuated g/C Ratio	0.23	0.74			0.44	0.44		0.13	0.13			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	755	2541			1584	803		232	207			
v/s Ratio Prot	c0.16	0.19			c0.19	0.06		c0.06	0.02			
v/s Ratio Perm												
v/c Ratio	0.70	0.26			0.43	0.13		0.43	0.12			
Uniform Delay, d1	32.1	3.9			17.2	14.8		36.0	34.5			
Progression Factor	0.77	2.41			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.7	0.2			0.9	0.3		1.7	0.4			
Delay (s)	27.4	9.6			18.1	15.2		37.7	34.9			
Level of Service	C	A			B	B		D	C			
Approach Delay (s)		17.5			17.3			35.8			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	45	152	32	21	1	17	16	52	0	76	26
Future Vol, veh/h	12	45	152	32	21	1	17	16	52	0	76	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	13	49	165	35	23	1	18	17	57	0	83	28
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

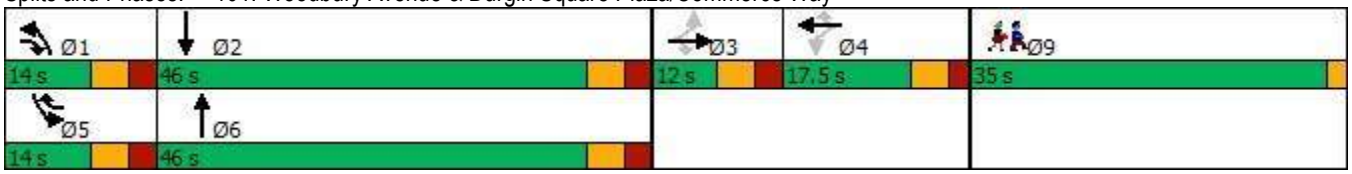
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.3	8.9	8.2	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	21%	0%	59%	0%	0%
Vol Thru, %	0%	24%	79%	0%	39%	100%	0%
Vol Right, %	0%	76%	0%	100%	2%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	68	57	152	54	76	26
LT Vol	17	0	12	0	32	0	0
Through Vol	0	16	45	0	21	76	0
RT Vol	0	52	0	152	1	0	26
Lane Flow Rate	18	74	62	165	59	83	28
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.03	0.099	0.089	0.201	0.087	0.121	0.036
Departure Headway (Hd)	5.864	4.821	5.189	4.381	5.363	5.288	4.583
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	611	743	691	819	668	678	781
Service Time	3.597	2.555	2.915	2.107	3.398	3.02	2.315
HCM Lane V/C Ratio	0.029	0.1	0.09	0.201	0.088	0.122	0.036
HCM Control Delay	8.8	8.1	8.4	8.2	8.9	8.8	7.5
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.3	0.7	0.3	0.4	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	44	36	112	6	17	73	119	689	129	754	
Future Volume (vph)	44	36	112	6	17	73	119	689	129	754	
Lane Group Flow (vph)	0	87	122	0	25	79	129	752	140	871	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.04	0.27		0.12	0.22	0.57	0.61	0.64	0.71	
Control Delay		149.0	5.9		40.0	5.1	47.0	22.9	50.3	25.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		149.0	5.9		40.0	5.1	47.0	22.9	50.3	25.0	
Queue Length 50th (ft)		29	0		8	0	40	91	44	110	
Queue Length 95th (ft)		#217	28		48	19	#247	338	#274	403	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		84	458		357	365	227	2266	219	2250	
Starvation Cap Reductn		0	0		0	0	0	45	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.04	0.27		0.07	0.22	0.57	0.34	0.64	0.39	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 68.9
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	36	112	6	17	73	119	689	3	129	754	47
Future Volume (vph)	44	36	112	6	17	73	119	689	3	129	754	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1589		1812	1568	1728	3453		1668	3425	
Flt Permitted		0.46	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		859	1589		1809	1568	1728	3453		1668	3425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	39	122	7	18	79	129	749	3	140	820	51
RTOR Reduction (vph)	0	0	95	0	0	66	0	0	0	0	3	0
Lane Group Flow (vph)	0	87	27	0	25	13	129	752	0	140	868	0
Confl. Peds. (#/hr)			2	2					2	2		
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.8	15.9		2.6	11.7	9.1	24.5		9.1	24.5	
Effective Green, g (s)		6.8	15.9		2.6	11.7	9.1	24.5		9.1	24.5	
Actuated g/C Ratio		0.09	0.22		0.04	0.16	0.13	0.34		0.13	0.34	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		80	349		65	254	217	1171		210	1162	
v/s Ratio Prot			0.01			0.01	0.07	0.22		c0.08	c0.25	
v/s Ratio Perm		c0.10	0.01		c0.01	0.00						
v/c Ratio		1.09	0.08		0.38	0.05	0.59	0.64		0.67	0.75	
Uniform Delay, d1		32.7	22.3		34.0	25.6	29.8	20.1		30.1	21.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		126.5	0.1		3.8	0.1	4.3	1.2		7.8	2.7	
Delay (s)		159.2	22.4		37.8	25.6	34.1	21.4		37.9	23.8	
Level of Service		F	C		D	C	C	C		D	C	
Approach Delay (s)		79.3			28.6			23.2			25.7	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	65	207	58	131	162	594	126	679	
Future Volume (vph)	65	207	58	131	162	594	126	679	
Lane Group Flow (vph)	164	225	137	142	176	685	137	811	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	1.08	0.43	0.60	0.23	0.75	0.69	0.55	0.78	
Control Delay	135.9	5.6	50.5	4.1	59.2	32.8	44.9	33.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	135.9	5.6	50.5	4.1	59.2	32.8	44.9	33.7	
Queue Length 50th (ft)	~80	0	61	0	80	147	60	178	
Queue Length 95th (ft)	#327	35	#228	29	#307	#347	168	379	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	152	518	234	714	234	1226	391	1557	
Starvation Cap Reductn	0	0	0	0	0	0	0	20	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.08	0.43	0.59	0.20	0.75	0.56	0.35	0.53	

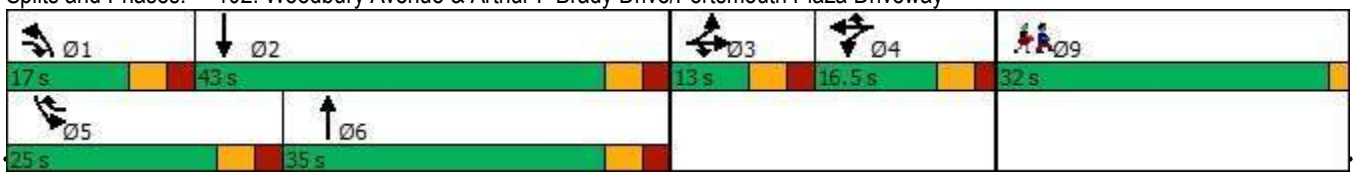
Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 84.3
Natural Cycle: 115
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	65	207	68	58	131	162	594	36	126	679	67
Future Volume (vph)	86	65	207	68	58	131	162	594	36	126	679	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1546		1727	1507	1728	3420		1668	3402	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1768	1546		1727	1507	1728	3420		1668	3402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	71	225	74	63	142	176	646	39	137	738	73
RTOR Reduction (vph)	0	0	176	0	0	102	0	4	0	0	6	0
Lane Group Flow (vph)	0	164	49	0	137	40	176	681	0	137	805	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.3	18.7		11.2	23.8	11.4	24.4		12.6	25.6	
Effective Green, g (s)		7.3	18.7		11.2	23.8	11.4	24.4		12.6	25.6	
Actuated g/C Ratio		0.09	0.22		0.13	0.28	0.13	0.29		0.15	0.30	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		151	339		227	420	231	979		246	1022	
v/s Ratio Prot		c0.09	0.03		c0.08	0.03	c0.10	0.20		0.08	c0.24	
v/s Ratio Perm												
v/c Ratio		1.09	0.15		0.60	0.09	0.76	0.70		0.56	0.79	
Uniform Delay, d1		39.0	26.8		34.9	22.7	35.6	27.1		33.7	27.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		98.1	0.2		4.5	0.1	13.8	2.2		2.7	4.1	
Delay (s)		137.1	27.0		39.4	22.8	49.4	29.3		36.4	31.4	
Level of Service		F	C		D	C	D	C		D	C	
Approach Delay (s)		73.4			31.0			33.4			32.1	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

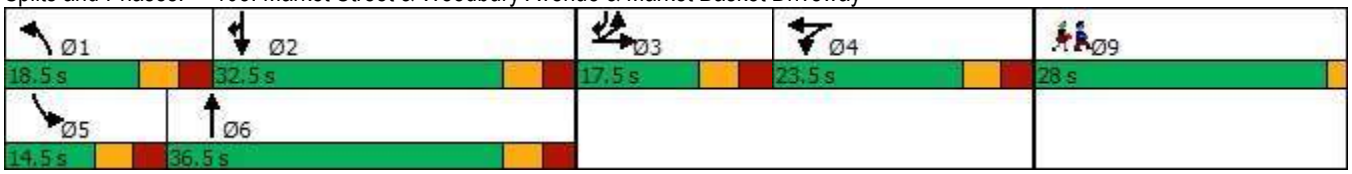
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	155	52	166	80	58	623	12	590	338	
Future Volume (vph)	155	52	166	80	58	623	12	590	338	
Lane Group Flow (vph)	168	100	180	102	63	866	12	596	341	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.43	0.45	0.61	0.33	0.35	0.62	0.09	0.59	0.37	
Control Delay	42.2	38.8	45.8	37.0	46.1	24.6	46.0	32.0	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.2	38.8	45.8	37.0	46.1	24.6	46.0	32.0	3.7	
Queue Length 50th (ft)	40	35	84	43	30	154	6	138	0	
Queue Length 95th (ft)	101	114	211	123	92	#487	29	296	61	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	460	255	405	421	259	1411	172	1145	937	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.39	0.44	0.24	0.24	0.61	0.07	0.52	0.36	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 83.9
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	52	40	166	80	14	58	623	174	12	590	338
Future Volume (vph)	155	52	40	166	80	14	58	623	174	12	590	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1701		1906	1962		1728	3324		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1701		1906	1962		1728	3324		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	168	57	43	180	87	15	63	677	189	12	596	341
RTOR Reduction (vph)	0	22	0	0	5	0	0	17	0	0	0	171
Lane Group Flow (vph)	168	78	0	180	97	0	63	849	0	12	596	170
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.8	9.8		13.1	13.1		7.1	34.7		1.1	28.7	45.0
Effective Green, g (s)	9.8	9.8		13.1	13.1		7.1	34.7		1.1	28.7	45.0
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.08	0.38		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	364	184		276	284		136	1278		21	1099	771
v/s Ratio Prot	c0.05	0.05		c0.09	0.05		c0.04	c0.26		0.01	0.17	0.11
v/s Ratio Perm												
v/c Ratio	0.46	0.42		0.65	0.34		0.46	0.66		0.57	0.54	0.22
Uniform Delay, d1	37.7	37.6		36.4	34.7		39.7	22.9		44.3	25.3	12.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	1.6		5.4	0.7		2.5	1.3		32.5	0.5	0.1
Delay (s)	38.7	39.1		41.8	35.4		42.2	24.2		76.8	25.9	12.9
Level of Service	D	D		D	D		D	C		E	C	B
Approach Delay (s)		38.8			39.5			25.5			21.9	
Approach LOS		D			D			C			C	

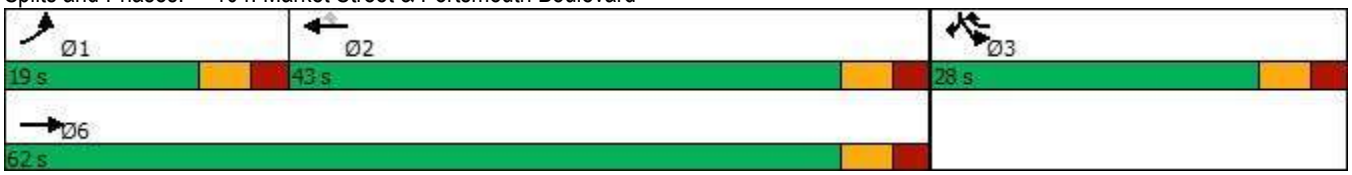
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	28.0
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	775	814	33	36	41
Future Volume (vph)	21	775	814	33	36	41
Lane Group Flow (vph)	23	833	885	36	39	45
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.08	0.36	0.41	0.03	0.08	0.16
Control Delay	20.9	5.1	7.6	1.1	20.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	5.1	7.6	1.1	20.0	10.3
Queue Length 50th (ft)	4	48	53	0	3	0
Queue Length 95th (ft)	28	78	168	6	20	27
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	553	3334	2956	1329	1716	839
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.30	0.03	0.02	0.05

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 43.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	21	775	814	33	36	41
Future Volume (vph)	21	775	814	33	36	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1569	3164	1509
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1569	3164	1509
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	833	885	36	39	45
RTOR Reduction (vph)	0	0	0	14	0	40
Lane Group Flow (vph)	23	833	885	22	39	5
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	1%	1%	1%	1%	7%	7%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	1.0	32.5	25.5	30.7	5.2	5.2
Effective Green, g (s)	1.0	32.5	25.5	30.7	5.2	5.2
Actuated g/C Ratio	0.02	0.65	0.51	0.62	0.10	0.10
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	34	2259	1772	1158	331	157
v/s Ratio Prot	0.01	c0.24	c0.26	0.00	c0.01	0.00
v/s Ratio Perm				0.01		
v/c Ratio	0.68	0.37	0.50	0.02	0.12	0.03
Uniform Delay, d1	24.2	3.9	7.9	3.7	20.2	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.2	0.1	0.2	0.0	0.2	0.1
Delay (s)	66.4	4.0	8.1	3.7	20.3	20.1
Level of Service	E	A	A	A	C	C
Approach Delay (s)		5.7	8.0		20.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

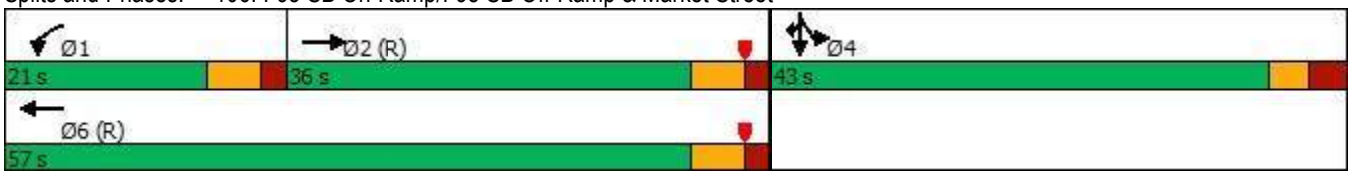
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	749	140	94	438	179	3	402
Future Volume (vph)	749	140	94	438	179	3	402
Lane Group Flow (vph)	814	152	102	476	175	233	227
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	36.0		21.0	57.0	43.0	43.0	43.0
Total Split (%)	36.0%		21.0%	57.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.29	0.09	0.53	0.19	0.62	0.56	0.52
Control Delay	12.1	0.1	69.9	3.1	47.9	12.0	9.0
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	0.1	69.9	3.1	47.9	12.0	9.0
Queue Length 50th (ft)	113	0	71	24	110	14	0
Queue Length 95th (ft)	173	0	126	33	169	83	62
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2808	1775	253	2469	628	678	705
Starvation Cap Reductn	985	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.09	0.40	0.19	0.28	0.34	0.32

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	749	140	94	438	0	0	0	0	179	3	402
Future Volume (vph)	0	749	140	94	438	0	0	0	0	179	3	402
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4964	1775	1668	3455					1698	1474	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4964	1775	1668	3455					1698	1474	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	814	152	102	476	0	0	0	0	195	3	437
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	175	190
Lane Group Flow (vph)	0	814	152	102	476	0	0	0	0	175	58	37
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		55.4	100.0	10.1	71.5					16.5	16.5	16.5
Effective Green, g (s)		55.4	100.0	10.1	71.5					16.5	16.5	16.5
Actuated g/C Ratio		0.55	1.00	0.10	0.72					0.16	0.16	0.16
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2750	1775	168	2470					280	243	250
v/s Ratio Prot		c0.16		c0.06	0.14					c0.10	0.04	0.02
v/s Ratio Perm			0.09									
v/c Ratio		0.30	0.09	0.61	0.19					0.62	0.24	0.15
Uniform Delay, d1		11.9	0.0	43.0	4.7					38.9	36.3	35.7
Progression Factor		0.88	1.00	1.47	0.54					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	5.9	0.2					4.3	0.5	0.3
Delay (s)		10.7	0.1	69.0	2.7					43.2	36.8	36.0
Level of Service		B	A	E	A					D	D	D
Approach Delay (s)		9.1			14.4			0.0			38.3	
Approach LOS		A			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			

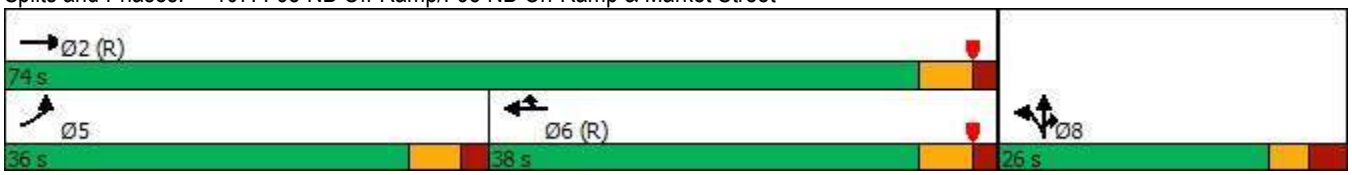
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	398	530	480	137	4	209
Future Volume (vph)	398	530	480	137	4	209
Lane Group Flow (vph)	433	576	522	149	61	227
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	26.0	26.0
Total Split (s)	36.0	74.0	38.0	38.0	26.0	26.0
Total Split (%)	36.0%	74.0%	38.0%	38.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.71	0.22	0.28	0.15	0.30	0.59
Control Delay	52.7	2.6	15.3	3.4	42.6	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	2.6	15.3	3.4	42.6	11.8
Queue Length 50th (ft)	153	19	89	0	37	0
Queue Length 95th (ft)	205	64	166	38	69	61
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	1005	2645	1866	1017	359	501
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.22	0.28	0.15	0.17	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	530	0	0	480	137	52	4	209	0	0	0
Future Volume (vph)	398	530	0	0	480	137	52	4	209	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1797	1599			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1797	1599			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	433	576	0	0	522	149	57	4	227	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	71	0	0	201	0	0	0
Lane Group Flow (vph)	433	576	0	0	522	78	0	61	26	0	0	0
Confl. Peds. (#/hr)	7		1	1		7			1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	18.3	76.6			52.3	52.3		11.4	11.4			
Effective Green, g (s)	18.3	76.6			52.3	52.3		11.4	11.4			
Actuated g/C Ratio	0.18	0.77			0.52	0.52		0.11	0.11			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	613	2646			1869	947		204	182			
v/s Ratio Prot	c0.13	0.17			c0.15	0.04		c0.03	0.02			
v/s Ratio Perm												
v/c Ratio	0.71	0.22			0.28	0.08		0.30	0.14			
Uniform Delay, d1	38.3	3.3			13.3	11.9		40.6	39.9			
Progression Factor	1.22	0.64			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.6	0.2			0.4	0.2		1.1	0.5			
Delay (s)	50.4	2.3			13.7	12.1		41.8	40.4			
Level of Service	D	A			B	B		D	D			
Approach Delay (s)		22.9			13.3			40.7			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	24	8	33	19	3	13	9	15	3	13	6
Future Vol, veh/h	4	24	8	33	19	3	13	9	15	3	13	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	2	2	2	3	3	3	5	5	5
Mvmt Flow	4	26	9	36	21	3	14	10	16	3	14	7
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

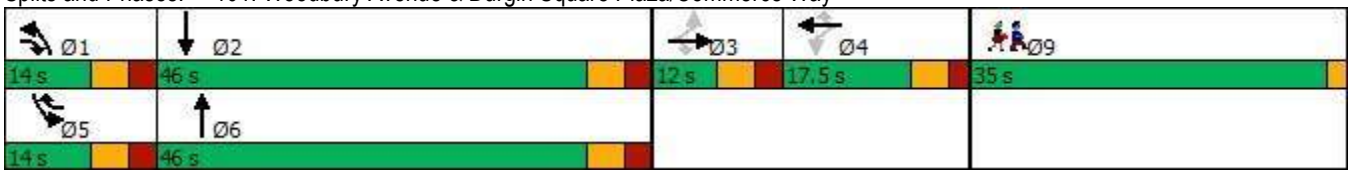
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	7.5	8.2	7.5	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	14%	0%	60%	19%	0%
Vol Thru, %	0%	38%	86%	0%	35%	81%	0%
Vol Right, %	0%	62%	0%	100%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	24	28	8	55	16	6
LT Vol	13	0	4	0	33	3	0
Through Vol	0	9	24	0	19	13	0
RT Vol	0	15	0	8	3	0	6
Lane Flow Rate	14	26	30	9	60	17	7
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.02	0.031	0.04	0.01	0.079	0.024	0.007
Departure Headway (Hd)	5.235	4.296	4.76	3.987	4.758	4.871	4.075
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	677	822	747	889	748	726	864
Service Time	3.021	2.081	2.525	1.752	2.82	2.66	1.865
HCM Lane V/C Ratio	0.021	0.032	0.04	0.01	0.08	0.023	0.008
HCM Control Delay	8.1	7.2	7.7	6.8	8.2	7.8	6.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0	0.3	0.1	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	5	6	10	5	1	44	16	363	225	513	
Future Volume (vph)	5	6	10	5	1	44	16	363	225	513	
Lane Group Flow (vph)	0	12	11	0	6	48	17	416	245	574	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.04	0.03		0.02	0.11	0.06	0.37	0.68	0.23	
Control Delay		29.5	0.2		29.7	0.8	28.2	15.9	34.7	12.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		29.5	0.2		29.7	0.8	28.2	15.9	34.7	12.0	
Queue Length 50th (ft)		2	0		1	0	2	24	32	0	
Queue Length 95th (ft)		28	0		18	2	34	174	#430	245	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		300	427		606	436	374	2932	361	2945	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.04	0.03		0.01	0.11	0.05	0.14	0.68	0.19	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 46.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	6	10	5	1	44	16	363	19	225	513	15
Future Volume (vph)	5	6	10	5	1	44	16	363	19	225	513	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1773	1538		1754	1553	1694	3359		1636	3372	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1538		1827	1553	1694	3359		1636	3372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	7	11	5	1	48	17	395	21	245	558	16
RTOR Reduction (vph)	0	0	10	0	0	39	0	3	0	0	1	0
Lane Group Flow (vph)	0	12	1	0	6	9	17	413	0	245	573	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		0.5	3.0		0.6	10.9	2.5	21.3		10.3	29.1	
Effective Green, g (s)		0.5	3.0		0.6	10.9	2.5	21.3		10.3	29.1	
Actuated g/C Ratio		0.01	0.05		0.01	0.18	0.04	0.35		0.17	0.48	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		14	75		17	277	69	1172		276	1608	
v/s Ratio Prot			0.00			0.01	0.01	0.12		c0.15	c0.17	
v/s Ratio Perm		c0.01	0.00		c0.00	0.00						
v/c Ratio		0.86	0.01		0.35	0.03	0.25	0.35		0.89	0.36	
Uniform Delay, d1		30.2	27.6		30.0	20.7	28.3	14.7		24.8	10.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		164.6	0.0		12.2	0.0	1.9	0.2		27.1	0.1	
Delay (s)		194.9	27.6		42.2	20.7	30.2	14.9		51.9	10.2	
Level of Service		F	C		D	C	C	B		D	B	
Approach Delay (s)		114.9			23.1			15.5			22.7	
Approach LOS		F			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	43.1%	ICU Level of Service	A
Analysis Period (min)	15		

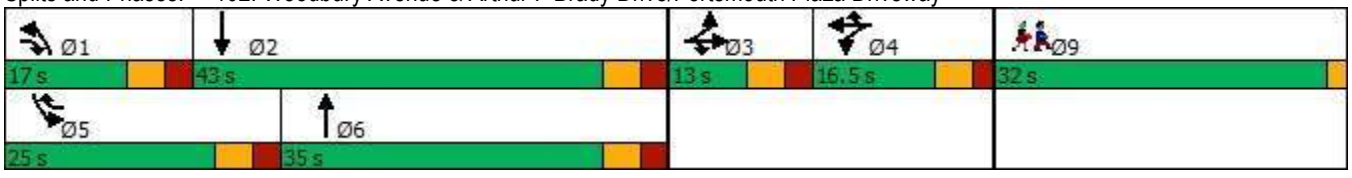
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	29	100	18	32	133	310	39	456	
Future Volume (vph)	29	100	18	32	133	310	39	456	
Lane Group Flow (vph)	93	109	32	35	139	330	42	532	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.48	0.18	0.17	0.09	0.47	0.32	0.22	0.63	
Control Delay	45.4	2.2	37.8	0.4	38.9	22.4	37.5	28.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.4	2.2	37.8	0.4	38.9	22.4	37.5	28.2	
Queue Length 50th (ft)	35	0	12	0	49	51	15	96	
Queue Length 95th (ft)	#170	13	54	0	#215	147	65	236	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	194	610	304	653	302	1588	503	2011	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.48	0.18	0.11	0.05	0.46	0.21	0.08	0.26	

Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 67.6
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	29	100	11	18	32	133	310	7	39	456	33
Future Volume (vph)	56	29	100	11	18	32	133	310	7	39	456	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1694	1487		1690	1463	1678	3343		1620	3316	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1694	1487		1690	1463	1678	3343		1620	3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	61	32	109	12	20	35	139	323	7	42	496	36
RTOR Reduction (vph)	0	0	78	0	0	29	0	1	0	0	5	0
Lane Group Flow (vph)	0	93	31	0	32	6	139	329	0	42	527	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.7	19.6		4.2	12.4	11.9	20.8		8.2	17.1	
Effective Green, g (s)		7.7	19.6		4.2	12.4	11.9	20.8		8.2	17.1	
Actuated g/C Ratio		0.11	0.28		0.06	0.18	0.17	0.30		0.12	0.24	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		186	416		101	259	285	993		189	810	
v/s Ratio Prot		c0.05	0.02		c0.02	0.00	c0.08	c0.10		0.03	c0.16	
v/s Ratio Perm												
v/c Ratio		0.50	0.07		0.32	0.02	0.49	0.33		0.22	0.65	
Uniform Delay, d1		29.3	18.5		31.5	23.8	26.3	19.2		28.0	23.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1	0.1		1.8	0.0	1.3	0.2		0.6	1.9	
Delay (s)		31.4	18.6		33.3	23.8	27.6	19.4		28.6	25.7	
Level of Service		C	B		C	C	C	B		C	C	
Approach Delay (s)		24.5			28.4			21.8			25.9	
Approach LOS		C			C			C			C	

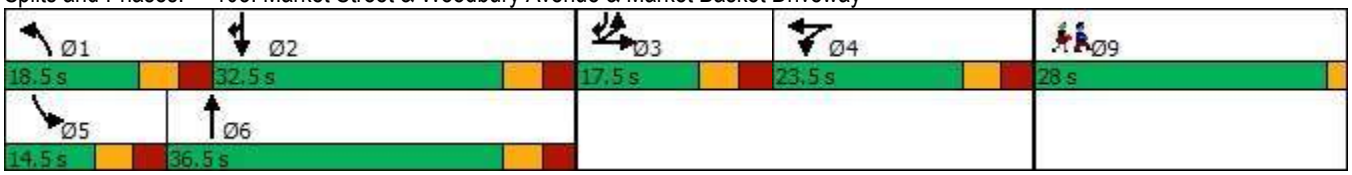
Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	77	33	57	37	90	367	3	341	221	
Future Volume (vph)	77	33	57	37	90	367	3	341	221	
Lane Group Flow (vph)	83	92	62	47	98	491	3	371	240	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.21	0.39	0.28	0.20	0.42	0.34	0.02	0.39	0.26	
Control Delay	35.7	24.0	37.6	33.3	39.8	17.9	41.0	27.9	3.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.7	24.0	37.6	33.3	39.8	17.9	41.0	27.9	3.8	
Queue Length 50th (ft)	15	14	22	15	35	57	1	67	0	
Queue Length 95th (ft)	53	78	85	64	124	210	12	175	51	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	579	326	490	509	316	1572	211	1372	899	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.28	0.13	0.09	0.31	0.31	0.01	0.27	0.27	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 69.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



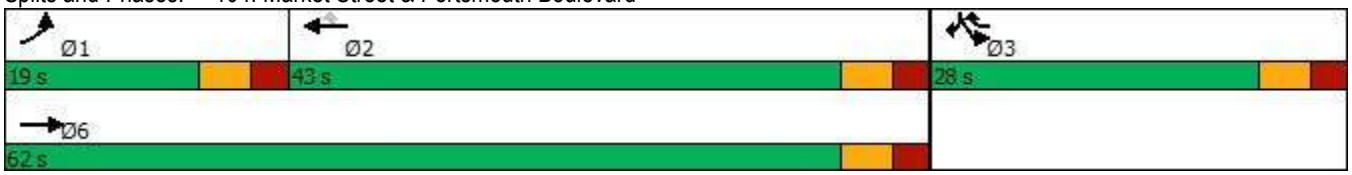
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	33	53	57	37	6	90	367	85	3	341	221
Future Volume (vph)	77	33	53	57	37	6	90	367	85	3	341	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1631		1834	1887		1678	3248		1647	3355	1501
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1631		1834	1887		1678	3248		1647	3355	1501
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	35	57	62	40	7	98	399	92	3	371	240
RTOR Reduction (vph)	0	48	0	0	5	0	0	13	0	0	0	121
Lane Group Flow (vph)	83	44	0	62	42	0	98	478	0	3	371	119
Confl. Peds. (#/hr)			2	2			1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.1	8.1		6.6	6.6		7.7	30.7		0.8	23.8	38.4
Effective Green, g (s)	8.1	8.1		6.6	6.6		7.7	30.7		0.8	23.8	38.4
Actuated g/C Ratio	0.10	0.10		0.09	0.09		0.10	0.40		0.01	0.31	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	351	170		156	161		167	1289		17	1032	745
v/s Ratio Prot	0.02	c0.03		c0.03	0.02		c0.06	c0.15		0.00	0.11	0.08
v/s Ratio Perm												
v/c Ratio	0.24	0.26		0.40	0.26		0.59	0.37		0.18	0.36	0.16
Uniform Delay, d1	31.8	31.8		33.5	33.1		33.3	16.5		37.9	20.8	10.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.8		1.7	0.9		5.2	0.2		4.9	0.2	0.1
Delay (s)	32.1	32.6		35.1	33.9		38.5	16.7		42.8	21.0	10.7
Level of Service	C	C		D	C		D	B		D	C	B
Approach Delay (s)		32.4			34.6			20.3			17.1	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	28.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	54	397	456	248	98	86
Future Volume (vph)	54	397	456	248	98	86
Lane Group Flow (vph)	59	432	496	270	107	93
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.18	0.27	0.40	0.27	0.17	0.24
Control Delay	21.5	6.0	11.6	1.4	19.6	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	6.0	11.6	1.4	19.6	8.6
Queue Length 50th (ft)	8	23	27	0	7	0
Queue Length 95th (ft)	57	45	103	18	43	38
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	597	3197	2893	1328	2099	1034
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.14	0.17	0.20	0.05	0.09

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 41.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	54	397	456	248	98	86
Future Volume (vph)	54	397	456	248	98	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1678	3355	3388	1547	3255	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1678	3355	3388	1547	3255	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	432	496	270	107	93
RTOR Reduction (vph)	0	0	0	125	0	76
Lane Group Flow (vph)	59	432	496	145	107	17
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.6	24.1	15.5	23.8	8.3	8.3
Effective Green, g (s)	2.6	24.1	15.5	23.8	8.3	8.3
Actuated g/C Ratio	0.06	0.54	0.35	0.54	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	98	1821	1182	1038	608	290
v/s Ratio Prot	c0.04	0.13	c0.15	c0.03	0.03	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.60	0.24	0.42	0.14	0.18	0.06
Uniform Delay, d1	20.4	5.3	11.0	5.2	15.2	14.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.0	0.1	0.2	0.1	0.1	0.1
Delay (s)	30.4	5.4	11.3	5.2	15.3	14.9
Level of Service	C	A	B	A	B	B
Approach Delay (s)		8.4	9.1		15.1	
Approach LOS		A	A		B	

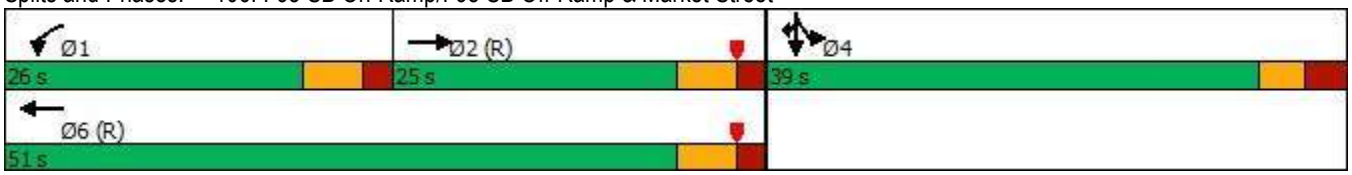
Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	44.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	443	116	86	442	191	1	292
Future Volume (vph)	443	116	86	442	191	1	292
Lane Group Flow (vph)	471	123	93	480	183	172	171
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	25.0		26.0	51.0	39.0	39.0	39.0
Total Split (%)	27.8%		28.9%	56.7%	43.3%	43.3%	43.3%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.18	0.07	0.49	0.21	0.63	0.46	0.43
Control Delay	13.9	0.1	48.6	7.2	42.9	11.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	0.1	48.6	7.2	42.9	11.6	8.1
Queue Length 50th (ft)	58	0	55	26	103	14	0
Queue Length 95th (ft)	99	0	96	133	157	67	50
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2563	1724	356	2289	604	620	649
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	91	0	4	4
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.07	0.26	0.22	0.30	0.28	0.27

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 81 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	443	116	86	442	0	0	0	0	191	1	292
Future Volume (vph)	0	443	116	86	442	0	0	0	0	191	1	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4821	1724	1604	3323					1649	1440	1475
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4821	1724	1604	3323					1649	1440	1475
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	471	123	93	480	0	0	0	0	208	1	317
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	120	141
Lane Group Flow (vph)	0	471	123	93	480	0	0	0	0	183	52	30
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		46.6	90.0	9.4	62.0					16.0	16.0	16.0
Effective Green, g (s)		46.6	90.0	9.4	62.0					16.0	16.0	16.0
Actuated g/C Ratio		0.52	1.00	0.10	0.69					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2496	1724	167	2289					293	256	262
v/s Ratio Prot		0.10		c0.06	c0.14					c0.11	0.04	0.02
v/s Ratio Perm			0.07									
v/c Ratio		0.19	0.07	0.56	0.21					0.62	0.20	0.12
Uniform Delay, d1		11.6	0.0	38.3	5.1					34.2	31.6	31.1
Progression Factor		1.03	1.00	1.10	1.21					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	3.9	0.2					4.1	0.4	0.2
Delay (s)		12.1	0.1	46.0	6.3					38.3	32.0	31.3
Level of Service		B	A	D	A					D	C	C
Approach Delay (s)		9.6			12.8			0.0			33.9	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

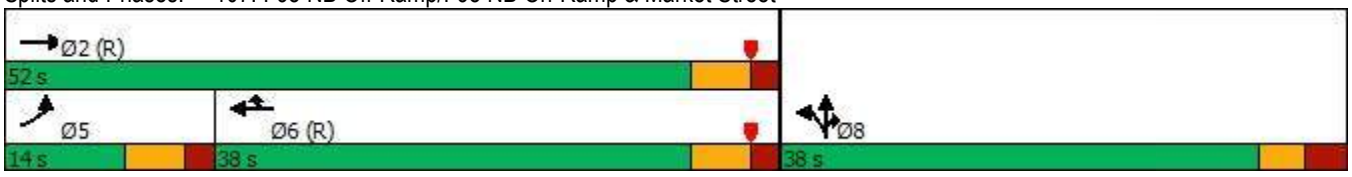
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	143	491	334	53	0	347
Future Volume (vph)	143	491	334	53	0	347
Lane Group Flow (vph)	155	534	363	58	206	369
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	32.0	32.0
Total Split (s)	14.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	15.6%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.44	0.24	0.21	0.06	0.60	0.69
Control Delay	31.0	3.4	14.8	0.8	39.4	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	3.4	14.8	0.8	39.4	15.5
Queue Length 50th (ft)	26	3	57	0	109	44
Queue Length 95th (ft)	47	7	109	5	158	121
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	358	2250	1706	920	622	737
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.24	0.21	0.06	0.33	0.50

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	491	0	0	334	53	194	0	347	0	0	0
Future Volume (vph)	143	491	0	0	334	53	194	0	347	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3255	3355			3438	1743		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3255	3355			3438	1743		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	155	534	0	0	363	58	206	0	369	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	225	0	0	0
Lane Group Flow (vph)	155	534	0	0	363	29	0	206	144	0	0	0
Confl. Peds. (#/hr)	4					4						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.7	60.4			44.7	44.7		17.6	17.6			
Effective Green, g (s)	9.7	60.4			44.7	44.7		17.6	17.6			
Actuated g/C Ratio	0.11	0.67			0.50	0.50		0.20	0.20			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	350	2251			1707	865		342	306			
v/s Ratio Prot	c0.05	c0.16			0.11	0.02		c0.12	0.09			
v/s Ratio Perm												
v/c Ratio	0.44	0.24			0.21	0.03		0.60	0.47			
Uniform Delay, d1	37.6	5.8			12.7	11.6		33.0	32.1			
Progression Factor	0.73	0.48			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.2			0.3	0.1		3.4	1.6			
Delay (s)	28.2	3.0			13.0	11.7		36.5	33.6			
Level of Service	C	A			B	B		D	C			
Approach Delay (s)		8.7			12.8			34.6			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	8	9	85	27	0	177	98	29	0	85	6
Future Vol, veh/h	22	8	9	85	27	0	177	98	29	0	85	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	6	6	3	3	3	1	1	1	0	0	0
Mvmt Flow	24	9	10	92	29	0	192	107	32	0	92	7
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	9	10.3	9.9	8.8
HCM LOS	A	B	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	73%	0%	76%	0%	0%
Vol Thru, %	0%	77%	27%	0%	24%	100%	0%
Vol Right, %	0%	23%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	127	30	9	112	85	6
LT Vol	177	0	22	0	85	0	0
Through Vol	0	98	8	0	27	85	0
RT Vol	0	29	0	9	0	0	6
Lane Flow Rate	192	138	33	10	122	92	7
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.299	0.189	0.056	0.014	0.196	0.137	0.008
Departure Headway (Hd)	5.594	4.93	6.2	5.125	5.802	5.322	4.617
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	643	726	575	694	617	671	770
Service Time	3.336	2.673	3.966	2.889	3.855	3.078	2.373
HCM Lane V/C Ratio	0.299	0.19	0.057	0.014	0.198	0.137	0.009
HCM Control Delay	10.7	8.8	9.3	8	10.3	8.9	7.4
HCM Lane LOS	B	A	A	A	B	A	A
HCM 95th-tile Q	1.3	0.7	0.2	0	0.7	0.5	0

Intersection	
Int Delay, s/veh	6.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	0	0	22	0	0
Future Vol, veh/h	76	0	0	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	24	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	13	12	0	0	24	0
Stage 1	12	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1006	1069	-	-	1591	-
Stage 1	1011	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1006	1069	-	-	1591	-
Mov Cap-2 Maneuver	1006	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1006	1591	-
HCM Lane V/C Ratio	-	-	0.082	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	3	0	0	8
Future Vol, veh/h	0	0	3	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	3	0	0	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	7	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	6	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1014	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1017	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1012	1084
Mov Cap-2 Maneuver	-	-	-	-	1012	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1015	-

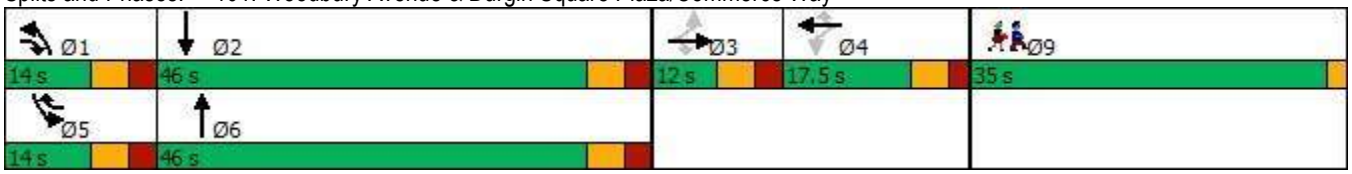
Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.008	-	-	0.002	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	30	31	96	40	23	179	102	640	141	809	
Future Volume (vph)	30	31	96	40	23	179	102	640	141	809	
Lane Group Flow (vph)	0	67	104	0	68	195	111	699	152	907	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.94	0.26		0.39	0.36	0.57	0.60	0.81	0.78	
Control Delay		136.1	6.4		45.8	5.4	52.9	25.6	71.9	30.2	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		136.1	6.4		45.8	5.4	52.9	25.6	71.9	30.2	
Queue Length 50th (ft)		31	0		29	0	49	131	69	184	
Queue Length 95th (ft)		#175	27		103	39	#215	318	#304	436	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		71	397		241	549	195	1949	188	1938	
Starvation Cap Reductn		0	0		0	0	0	45	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.94	0.26		0.28	0.36	0.57	0.37	0.81	0.47	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 77.9
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	31	96	40	23	179	102	640	3	141	809	34
Future Volume (vph)	30	31	96	40	23	179	102	640	3	141	809	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1590		1802	1583	1728	3453		1668	3431	
Flt Permitted		0.45	1.00		0.77	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		851	1590		1428	1583	1728	3453		1668	3431	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	33	34	104	43	25	195	111	696	3	152	870	37
RTOR Reduction (vph)	0	0	84	0	0	155	0	0	0	0	3	0
Lane Group Flow (vph)	0	67	20	0	68	40	111	699	0	152	904	0
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.6	15.4		7.6	16.4	8.8	26.5		8.8	26.5	
Effective Green, g (s)		6.6	15.4		7.6	16.4	8.8	26.5		8.8	26.5	
Actuated g/C Ratio		0.08	0.19		0.10	0.21	0.11	0.34		0.11	0.34	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		71	309		137	328	192	1156		185	1149	
v/s Ratio Prot			0.01			0.01	0.06	0.20		c0.09	c0.26	
v/s Ratio Perm		c0.08	0.01		c0.05	0.01						
v/c Ratio		0.94	0.07		0.50	0.12	0.58	0.60		0.82	0.79	
Uniform Delay, d1		36.1	26.0		33.9	25.5	33.4	21.9		34.4	23.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		86.8	0.1		2.8	0.2	4.2	0.9		24.5	3.6	
Delay (s)		122.9	26.1		36.7	25.7	37.6	22.8		58.8	27.4	
Level of Service		F	C		D	C	D	C		E	C	
Approach Delay (s)		64.0			28.5			24.9			31.9	
Approach LOS		E			C			C			C	

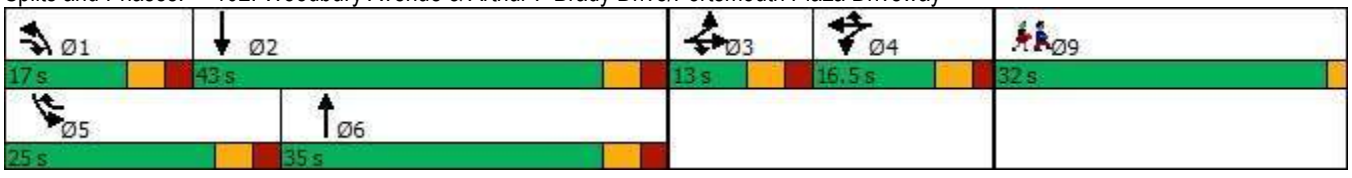
Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	25.5
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	43	195	49	111	178	566	91	763	
Future Volume (vph)	43	195	49	111	178	566	91	763	
Lane Group Flow (vph)	121	212	118	121	184	613	99	928	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.84	0.43	0.57	0.22	0.82	0.52	0.47	0.81	
Control Delay	86.5	5.9	51.8	4.7	69.0	27.5	46.3	33.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	86.5	5.9	51.8	4.7	69.0	27.5	46.3	33.8	
Queue Length 50th (ft)	62	0	57	0	93	124	48	214	
Queue Length 95th (ft)	#240	35	#189	27	#321	297	128	#478	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	144	492	223	656	224	1207	373	1486	
Starvation Cap Reductn	0	0	0	0	0	0	0	18	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.84	0.43	0.53	0.18	0.82	0.51	0.27	0.63	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 87.6
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	43	195	60	49	111	178	566	28	91	763	91
Future Volume (vph)	68	43	195	60	49	111	178	566	28	91	763	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747	1531		1726	1507	1728	3431		1668	3392	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1747	1531		1726	1507	1728	3431		1668	3392	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	74	47	212	65	53	121	184	584	29	99	829	99
RTOR Reduction (vph)	0	0	167	0	0	91	0	3	0	0	7	0
Lane Group Flow (vph)	0	121	45	0	118	30	184	610	0	99	921	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.2	18.6		10.6	21.6	11.4	29.9		11.0	29.5	
Effective Green, g (s)		7.2	18.6		10.6	21.6	11.4	29.9		11.0	29.5	
Actuated g/C Ratio		0.08	0.21		0.12	0.24	0.13	0.34		0.12	0.33	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		142	321		206	367	222	1159		207	1130	
v/s Ratio Prot		c0.07	0.03		c0.07	0.02	c0.11	0.18		0.06	c0.27	
v/s Ratio Perm												
v/c Ratio		0.85	0.14		0.57	0.08	0.83	0.53		0.48	0.81	
Uniform Delay, d1		40.1	28.4		36.8	25.8	37.6	23.6		36.1	27.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		36.0	0.2		3.8	0.1	21.8	0.4		1.7	4.6	
Delay (s)		76.1	28.6		40.6	25.9	59.4	24.0		37.8	31.6	
Level of Service		E	C		D	C	E	C		D	C	
Approach Delay (s)		45.9			33.2			32.2			32.2	
Approach LOS		D			C			C			C	

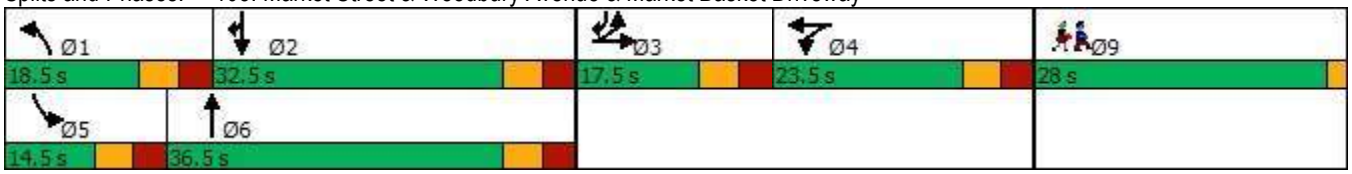
Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	177	62	172	70	95	580	8	684	325	
Future Volume (vph)	177	62	172	70	95	580	8	684	325	
Lane Group Flow (vph)	192	157	185	91	100	751	9	743	353	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.48	0.66	0.63	0.30	0.51	0.52	0.07	0.71	0.37	
Control Delay	44.7	45.0	48.9	38.0	51.5	23.0	47.5	35.5	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.7	45.0	48.9	38.0	51.5	23.0	47.5	35.5	3.7	
Queue Length 50th (ft)	51	59	96	41	52	132	5	192	0	
Queue Length 95th (ft)	113	#202	#221	110	133	#382	24	#432	62	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	436	254	384	398	245	1501	163	1064	942	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.44	0.62	0.48	0.23	0.41	0.50	0.06	0.70	0.37	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 88.4
Natural Cycle: 95
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



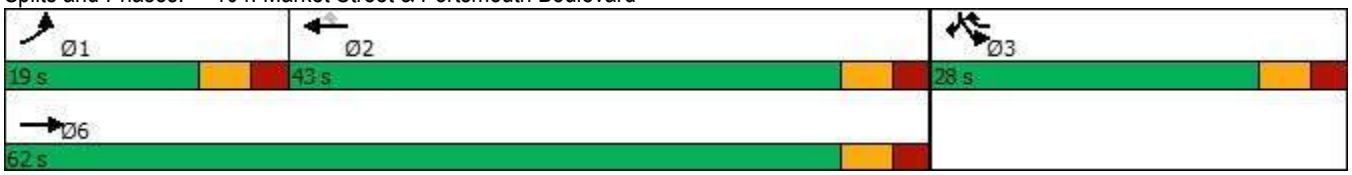
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	62	83	172	70	15	95	580	133	8	684	325
Future Volume (vph)	177	62	83	172	70	15	95	580	133	8	684	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1662		1906	1949		1728	3345		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1662		1906	1949		1728	3345		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	192	67	90	185	75	16	100	611	140	9	743	353
RTOR Reduction (vph)	0	39	0	0	6	0	0	13	0	0	0	175
Lane Group Flow (vph)	192	118	0	185	85	0	100	738	0	9	743	178
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.6	10.6		13.6	13.6		8.1	37.6		1.1	30.6	47.7
Effective Green, g (s)	10.6	10.6		13.6	13.6		8.1	37.6		1.1	30.6	47.7
Actuated g/C Ratio	0.11	0.11		0.14	0.14		0.09	0.40		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	375	186		274	280		147	1329		20	1117	779
v/s Ratio Prot	0.06	c0.07		c0.10	0.04		c0.06	c0.22		0.01	c0.22	0.12
v/s Ratio Perm												
v/c Ratio	0.51	0.63		0.68	0.30		0.68	0.56		0.45	0.67	0.23
Uniform Delay, d1	39.6	40.1		38.4	36.3		42.0	22.0		46.4	27.6	13.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	6.9		6.4	0.6		12.2	0.5		15.3	1.5	0.2
Delay (s)	40.7	47.0		44.8	36.9		54.2	22.5		61.7	29.1	13.3
Level of Service	D	D		D	D		D	C		E	C	B
Approach Delay (s)		43.6			42.2			26.3			24.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	94.6	Sum of lost time (s)	28.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	69	870	704	96	219	104
Future Volume (vph)	69	870	704	96	219	104
Lane Group Flow (vph)	75	946	757	103	238	113
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.26	0.51	0.56	0.11	0.35	0.27
Control Delay	26.8	7.8	15.6	1.3	23.0	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.8	7.8	15.6	1.3	23.0	8.0
Queue Length 50th (ft)	21	73	104	0	35	0
Queue Length 95th (ft)	71	132	186	12	86	41
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	486	3209	2611	1234	1597	821
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.29	0.29	0.08	0.15	0.14

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 51.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	69	870	704	96	219	104
Future Volume (vph)	69	870	704	96	219	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1576	3351	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1576	3351	1599
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.92	0.92
Adj. Flow (vph)	75	946	757	103	238	113
RTOR Reduction (vph)	0	0	0	44	0	91
Lane Group Flow (vph)	75	946	757	59	238	22
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	4.7	30.9	20.2	30.6	10.4	10.4
Effective Green, g (s)	4.7	30.9	20.2	30.6	10.4	10.4
Actuated g/C Ratio	0.09	0.58	0.38	0.57	0.20	0.20
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	152	2002	1309	1082	653	312
v/s Ratio Prot	0.04	c0.27	c0.22	0.01	c0.07	0.01
v/s Ratio Perm				0.03		
v/c Ratio	0.49	0.47	0.58	0.05	0.36	0.07
Uniform Delay, d1	23.2	6.5	13.2	5.0	18.6	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.2	0.6	0.0	0.3	0.1
Delay (s)	25.7	6.7	13.8	5.0	18.9	17.6
Level of Service	C	A	B	A	B	B
Approach Delay (s)		8.1	12.7		18.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

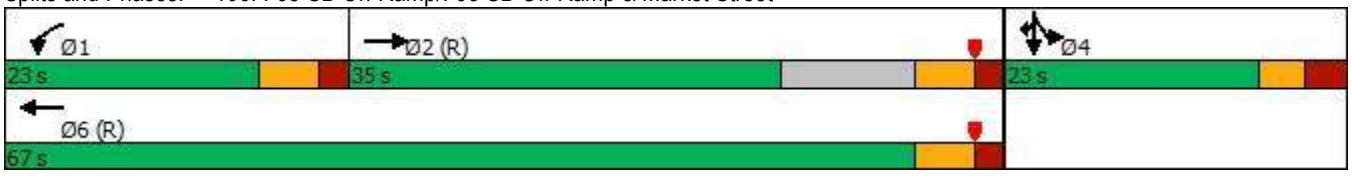
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	911	213	222	534	235	1	307
Future Volume (vph)	911	213	222	534	235	1	307
Lane Group Flow (vph)	969	227	241	580	204	196	190
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	35.0		23.0	67.0	23.0	23.0	23.0
Total Split (%)	38.9%		25.6%	74.4%	25.6%	25.6%	25.6%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.46	0.13	0.76	0.25	0.66	0.51	0.44
Control Delay	18.6	0.1	37.4	1.3	44.0	15.3	7.8
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	0.1	37.4	1.3	44.0	15.4	7.9
Queue Length 50th (ft)	149	0	71	1	115	31	0
Queue Length 95th (ft)	206	0	#224	1	174	92	52
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2249	1757	337	2428	351	420	465
Starvation Cap Reductn	491	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	75	0	2	4
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.13	0.72	0.25	0.58	0.47	0.41

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	911	213	222	534	0	0	0	0	235	1	307
Future Volume (vph)	0	911	213	222	534	0	0	0	0	235	1	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4916	1757	1668	3455					1698	1504	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4916	1757	1668	3455					1698	1504	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	969	227	241	580	0	0	0	0	255	1	334
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	112	155
Lane Group Flow (vph)	0	969	227	241	580	0	0	0	0	204	84	35
Confl. Peds. (#/hr)	8					8						
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		38.5	90.0	17.1	61.6					16.4	16.4	16.4
Effective Green, g (s)		38.5	90.0	17.1	61.6					16.4	16.4	16.4
Actuated g/C Ratio		0.43	1.00	0.19	0.68					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2102	1757	316	2364					309	274	276
v/s Ratio Prot		c0.20		c0.14	0.17					c0.12	0.06	0.02
v/s Ratio Perm			0.13									
v/c Ratio		0.46	0.13	0.76	0.25					0.66	0.31	0.13
Uniform Delay, d1		18.4	0.0	34.5	5.4					34.2	31.9	30.8
Progression Factor		0.91	1.00	0.61	0.18					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.1	9.8	0.2					5.2	0.6	0.2
Delay (s)		17.3	0.1	30.9	1.2					39.4	32.5	31.0
Level of Service		B	A	C	A					D	C	C
Approach Delay (s)		14.1			9.9			0.0			34.4	
Approach LOS		B			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			

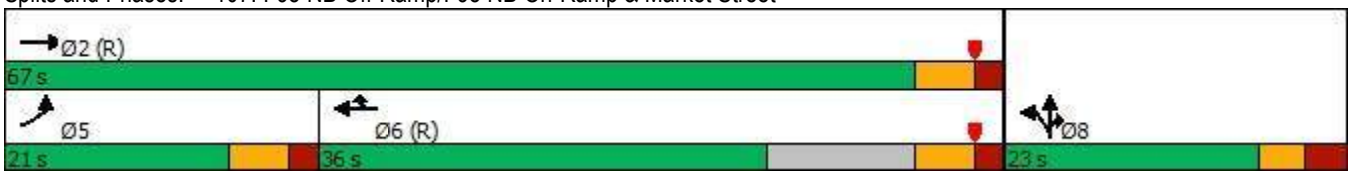
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	501	645	659	225	1	176
Future Volume (vph)	501	645	659	225	1	176
Lane Group Flow (vph)	533	686	701	239	106	191
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	23.0	23.0
Total Split (s)	21.0	67.0	36.0	36.0	23.0	23.0
Total Split (%)	23.3%	74.4%	40.0%	40.0%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.70	0.27	0.45	0.26	0.45	0.51
Control Delay	29.8	11.0	19.6	3.4	41.2	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	11.0	19.6	3.4	41.2	10.2
Queue Length 50th (ft)	153	157	142	0	57	0
Queue Length 95th (ft)	211	226	215	46	100	56
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	757	2534	1661	970	335	453
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.27	0.42	0.25	0.32	0.42

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	501	645	0	0	659	225	97	1	176	0	0	0
Future Volume (vph)	501	645	0	0	659	225	97	1	176	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1775	1583			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	533	686	0	0	701	239	105	1	191	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	134	0	0	166	0	0	0
Lane Group Flow (vph)	533	686	0	0	701	105	0	106	25	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	20.3	66.0			39.7	39.7		12.0	12.0			
Effective Green, g (s)	20.3	66.0			39.7	39.7		12.0	12.0			
Actuated g/C Ratio	0.23	0.73			0.44	0.44		0.13	0.13			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	755	2533			1576	799		236	211			
v/s Ratio Prot	c0.16	0.20			c0.20	0.06		c0.06	0.02			
v/s Ratio Perm												
v/c Ratio	0.71	0.27			0.44	0.13		0.45	0.12			
Uniform Delay, d1	32.1	4.0			17.5	14.9		36.0	34.4			
Progression Factor	0.78	2.46			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.7	0.2			0.9	0.3		1.9	0.4			
Delay (s)	27.7	10.0			18.4	15.3		37.8	34.7			
Level of Service	C	B			B	B		D	C			
Approach Delay (s)		17.8			17.6			35.8			0.0	
Approach LOS		B			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	45	152	36	21	1	17	64	59	0	114	26
Future Vol, veh/h	22	45	152	36	21	1	17	64	59	0	114	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	24	49	165	39	23	1	18	70	64	0	124	28
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.8	9.4	9.1	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	33%	0%	62%	0%	0%
Vol Thru, %	0%	52%	67%	0%	36%	100%	0%
Vol Right, %	0%	48%	0%	100%	2%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	123	67	152	58	114	26
LT Vol	17	0	22	0	36	0	0
Through Vol	0	64	45	0	21	114	0
RT Vol	0	59	0	152	1	0	26
Lane Flow Rate	18	134	73	165	63	124	28
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.031	0.191	0.112	0.214	0.099	0.187	0.037
Departure Headway (Hd)	5.981	5.138	5.526	4.657	5.677	5.423	4.718
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	695	647	767	627	658	754
Service Time	3.74	2.897	3.278	2.408	3.745	3.183	2.477
HCM Lane V/C Ratio	0.03	0.193	0.113	0.215	0.1	0.188	0.037
HCM Control Delay	8.9	9.1	9	8.7	9.4	9.4	7.7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.7	0.4	0.8	0.3	0.7	0.1

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	0	0	58	0	0
Future Vol, veh/h	38	0	0	58	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	0	0	63	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	33	32	0	0	63	0
Stage 1	32	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	980	1042	-	-	1540	-
Stage 1	991	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	1042	-	-	1540	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1540	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	0	0	4
Future Vol, veh/h	0	0	7	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	8	0	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	17	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1001	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	996	1084
Mov Cap-2 Maneuver	-	-	-	-	996	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1002	-

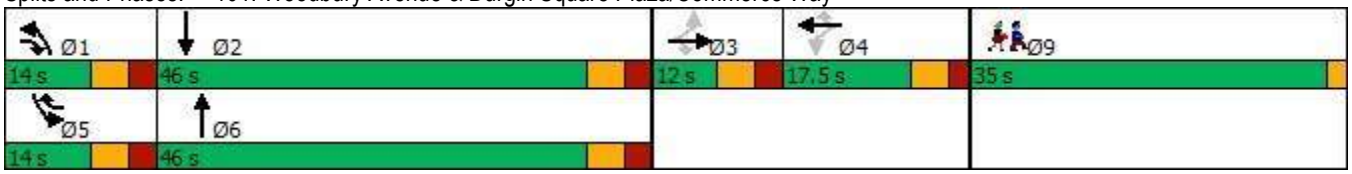
Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.004	-	-	0.005	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	44	36	112	6	17	73	119	689	137	757	
Future Volume (vph)	44	36	112	6	17	73	119	689	137	757	
Lane Group Flow (vph)	0	87	122	0	25	79	129	752	149	874	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.04	0.27		0.12	0.22	0.57	0.61	0.68	0.71	
Control Delay		149.7	5.9		40.0	5.1	47.0	22.8	53.0	25.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		149.7	5.9		40.0	5.1	47.0	22.8	53.0	25.0	
Queue Length 50th (ft)		29	0		8	0	40	91	47	111	
Queue Length 95th (ft)		#217	28		48	19	#247	338	#292	405	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		84	458		356	365	226	2263	218	2247	
Starvation Cap Reductn		0	0		0	0	0	45	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.04	0.27		0.07	0.22	0.57	0.34	0.68	0.39	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 69
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	36	112	6	17	73	119	689	3	137	757	47
Future Volume (vph)	44	36	112	6	17	73	119	689	3	137	757	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1589		1812	1568	1728	3453		1668	3425	
Flt Permitted		0.46	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		859	1589		1809	1568	1728	3453		1668	3425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	39	122	7	18	79	129	749	3	149	823	51
RTOR Reduction (vph)	0	0	95	0	0	66	0	0	0	0	3	0
Lane Group Flow (vph)	0	87	27	0	25	13	129	752	0	149	871	0
Confl. Peds. (#/hr)			2	2					2	2		
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.8	15.8		2.6	11.6	9.0	24.6		9.0	24.6	
Effective Green, g (s)		6.8	15.8		2.6	11.6	9.0	24.6		9.0	24.6	
Actuated g/C Ratio		0.09	0.22		0.04	0.16	0.12	0.34		0.12	0.34	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		80	347		65	251	215	1176		207	1166	
v/s Ratio Prot			0.01			0.01	0.07	0.22		c0.09	c0.25	
v/s Ratio Perm		c0.10	0.01		c0.01	0.00						
v/c Ratio		1.09	0.08		0.38	0.05	0.60	0.64		0.72	0.75	
Uniform Delay, d1		32.7	22.4		34.0	25.6	29.9	20.1		30.4	21.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		126.5	0.1		3.8	0.1	4.5	1.2		11.4	2.7	
Delay (s)		159.2	22.5		37.8	25.7	34.4	21.2		41.7	23.7	
Level of Service		F	C		D	C	C	C		D	C	
Approach Delay (s)		79.4			28.6			23.1			26.3	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

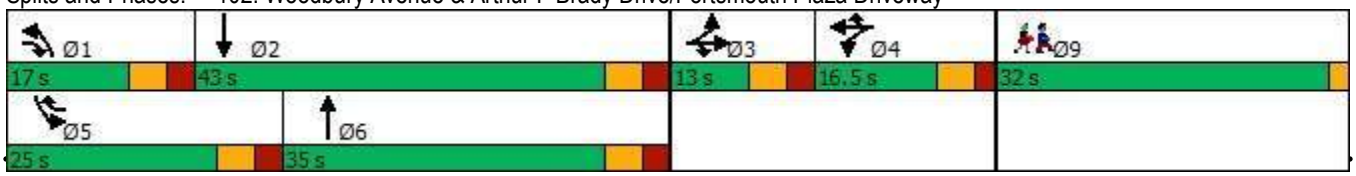
c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	65	210	58	131	173	594	126	682	
Future Volume (vph)	65	210	58	131	173	594	126	682	
Lane Group Flow (vph)	164	228	137	142	188	685	137	814	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	1.08	0.44	0.60	0.23	0.80	0.69	0.55	0.79	
Control Delay	135.9	5.6	50.5	4.1	64.1	32.8	44.9	33.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	135.9	5.6	50.5	4.1	64.1	32.8	44.9	33.7	
Queue Length 50th (ft)	~80	0	61	0	87	147	60	179	
Queue Length 95th (ft)	#327	36	#228	29	#329	#347	168	381	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	152	520	234	714	234	1226	390	1558	
Starvation Cap Reductn	0	0	0	0	0	0	0	21	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.08	0.44	0.59	0.20	0.80	0.56	0.35	0.53	

Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 84.3
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	65	210	68	58	131	173	594	36	126	682	67
Future Volume (vph)	86	65	210	68	58	131	173	594	36	126	682	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1546		1727	1507	1728	3420		1668	3402	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1768	1546		1727	1507	1728	3420		1668	3402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	71	228	74	63	142	188	646	39	137	741	73
RTOR Reduction (vph)	0	0	178	0	0	102	0	4	0	0	6	0
Lane Group Flow (vph)	0	164	50	0	137	40	188	681	0	137	808	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.3	18.7		11.2	23.8	11.4	24.4		12.6	25.6	
Effective Green, g (s)		7.3	18.7		11.2	23.8	11.4	24.4		12.6	25.6	
Actuated g/C Ratio		0.09	0.22		0.13	0.28	0.13	0.29		0.15	0.30	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		151	339		227	420	231	979		246	1022	
v/s Ratio Prot		c0.09	0.03		c0.08	0.03	c0.11	0.20		0.08	c0.24	
v/s Ratio Perm												
v/c Ratio		1.09	0.15		0.60	0.09	0.81	0.70		0.56	0.79	
Uniform Delay, d1		39.0	26.8		34.9	22.7	35.9	27.1		33.7	27.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		98.1	0.2		4.5	0.1	19.3	2.2		2.7	4.2	
Delay (s)		137.1	27.0		39.4	22.8	55.1	29.3		36.4	31.6	
Level of Service		F	C		D	C	E	C		D	C	
Approach Delay (s)		73.1			31.0			34.8			32.3	
Approach LOS		E			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	60.4%	ICU Level of Service	B
Analysis Period (min)	15		

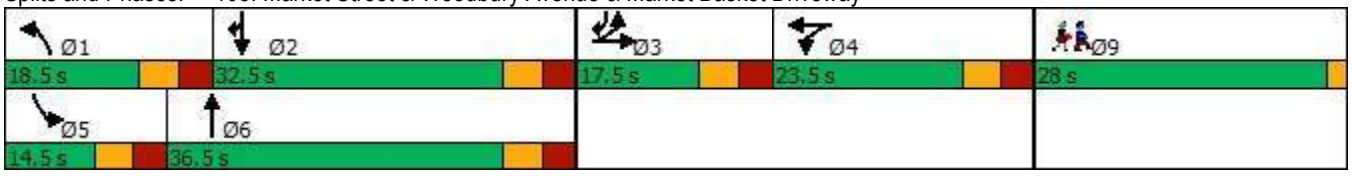
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	155	52	166	80	71	634	12	596	338	
Future Volume (vph)	155	52	166	80	71	634	12	596	338	
Lane Group Flow (vph)	168	119	180	102	77	878	12	602	341	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.44	0.53	0.61	0.33	0.42	0.62	0.09	0.59	0.37	
Control Delay	42.7	38.7	46.6	37.3	47.7	24.5	46.4	32.2	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.7	38.7	46.6	37.3	47.7	24.5	46.4	32.2	3.7	
Queue Length 50th (ft)	40	39	86	44	37	159	6	143	0	
Queue Length 95th (ft)	101	#136	211	123	107	#497	29	300	61	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	452	257	398	414	254	1416	169	1145	935	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.37	0.46	0.45	0.25	0.30	0.62	0.07	0.53	0.36	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 85
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	52	57	166	80	14	71	634	174	12	596	338
Future Volume (vph)	155	52	57	166	80	14	71	634	174	12	596	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1676		1906	1962		1728	3326		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1676		1906	1962		1728	3326		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	168	57	62	180	87	15	77	689	189	12	602	341
RTOR Reduction (vph)	0	32	0	0	5	0	0	17	0	0	0	171
Lane Group Flow (vph)	168	87	0	180	97	0	77	861	0	12	602	170
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	9.8	9.8		13.1	13.1		7.6	35.8		1.1	29.3	45.6
Effective Green, g (s)	9.8	9.8		13.1	13.1		7.6	35.8		1.1	29.3	45.6
Actuated g/C Ratio	0.11	0.11		0.14	0.14		0.08	0.39		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	359	179		273	281		143	1302		20	1107	771
v/s Ratio Prot	0.05	c0.05		c0.09	0.05		c0.04	c0.26		0.01	0.17	0.11
v/s Ratio Perm												
v/c Ratio	0.47	0.49		0.66	0.34		0.54	0.66		0.60	0.54	0.22
Uniform Delay, d1	38.3	38.4		37.0	35.3		40.2	22.8		44.9	25.6	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	2.1		5.7	0.7		3.9	1.3		40.2	0.5	0.1
Delay (s)	39.3	40.5		42.7	36.0		44.1	24.1		85.1	26.1	13.0
Level of Service	D	D		D	D		D	C		F	C	B
Approach Delay (s)		39.8			40.3			25.7			22.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	28.0
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

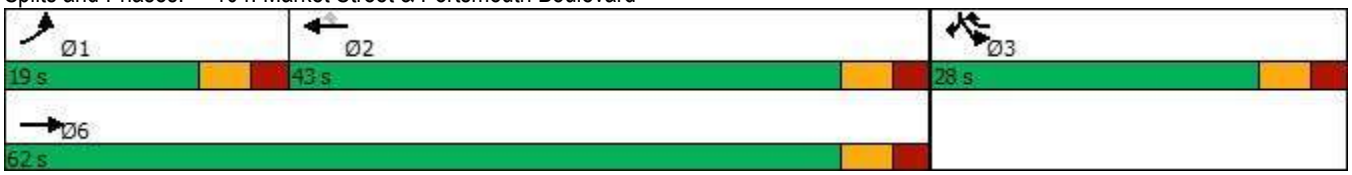
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	775	814	58	66	65
Future Volume (vph)	44	775	814	58	66	65
Lane Group Flow (vph)	47	833	885	63	72	71
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.16	0.37	0.45	0.06	0.14	0.23
Control Delay	23.4	5.1	10.3	1.4	22.4	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.4	5.1	10.3	1.4	22.4	10.1
Queue Length 50th (ft)	9	51	55	0	6	0
Queue Length 95th (ft)	47	82	183	9	32	34
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	548	3312	2863	1296	1699	843
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.25	0.31	0.05	0.04	0.08

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 45.5
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	44	775	814	58	66	65
Future Volume (vph)	44	775	814	58	66	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1570	3164	1509
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1570	3164	1509
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	833	885	63	72	71
RTOR Reduction (vph)	0	0	0	26	0	63
Lane Group Flow (vph)	47	833	885	37	72	8
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	1%	1%	1%	1%	7%	7%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.6	32.5	23.9	29.6	5.7	5.7
Effective Green, g (s)	2.6	32.5	23.9	29.6	5.7	5.7
Actuated g/C Ratio	0.05	0.65	0.48	0.59	0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	89	2236	1644	1113	359	171
v/s Ratio Prot	0.03	c0.24	c0.26	0.00	c0.02	0.01
v/s Ratio Perm				0.02		
v/c Ratio	0.53	0.37	0.54	0.03	0.20	0.05
Uniform Delay, d1	23.2	4.1	9.3	4.3	20.2	19.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	0.1	0.3	0.0	0.3	0.1
Delay (s)	28.8	4.2	9.6	4.3	20.5	19.9
Level of Service	C	A	A	A	C	B
Approach Delay (s)		5.5	9.3		20.2	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

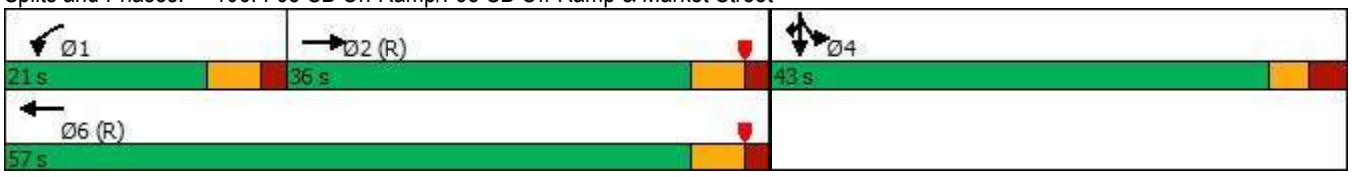
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	768	151	94	460	179	3	405
Future Volume (vph)	768	151	94	460	179	3	405
Lane Group Flow (vph)	835	164	102	500	175	234	229
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	36.0		21.0	57.0	43.0	43.0	43.0
Total Split (%)	36.0%		21.0%	57.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.30	0.09	0.53	0.20	0.62	0.56	0.52
Control Delay	12.0	0.1	68.6	3.3	47.9	12.0	9.0
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	0.1	68.6	3.3	47.9	12.0	9.0
Queue Length 50th (ft)	116	0	71	26	110	14	0
Queue Length 95th (ft)	178	0	126	38	169	83	62
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2808	1775	253	2469	628	678	706
Starvation Cap Reductn	966	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.09	0.40	0.20	0.28	0.35	0.32

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	768	151	94	460	0	0	0	0	179	3	405
Future Volume (vph)	0	768	151	94	460	0	0	0	0	179	3	405
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4964	1775	1668	3455					1698	1474	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4964	1775	1668	3455					1698	1474	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	835	164	102	500	0	0	0	0	195	3	440
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	176	191
Lane Group Flow (vph)	0	835	164	102	500	0	0	0	0	175	58	38
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		55.4	100.0	10.1	71.5					16.5	16.5	16.5
Effective Green, g (s)		55.4	100.0	10.1	71.5					16.5	16.5	16.5
Actuated g/C Ratio		0.55	1.00	0.10	0.72					0.16	0.16	0.16
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2750	1775	168	2470					280	243	250
v/s Ratio Prot		c0.17		c0.06	0.14					c0.10	0.04	0.02
v/s Ratio Perm			0.09									
v/c Ratio		0.30	0.09	0.61	0.20					0.62	0.24	0.15
Uniform Delay, d1		12.0	0.0	43.0	4.7					38.9	36.3	35.8
Progression Factor		0.87	1.00	1.43	0.60					1.00	1.00	1.00
Incremental Delay, d2		0.3	0.1	5.9	0.2					4.3	0.5	0.3
Delay (s)		10.7	0.1	67.5	3.0					43.2	36.8	36.0
Level of Service		B	A	E	A					D	D	D
Approach Delay (s)		8.9			14.0			0.0			38.3	
Approach LOS		A			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

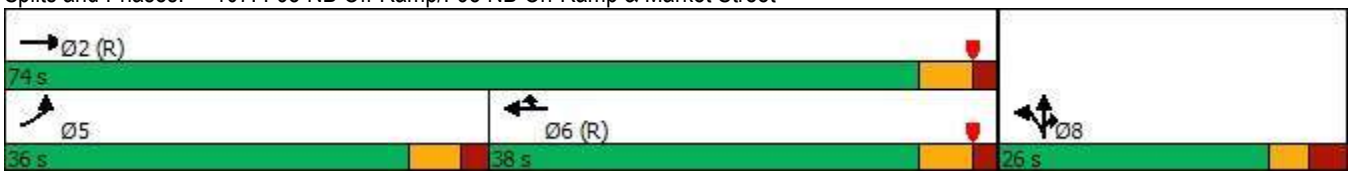
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	401	546	496	137	4	209
Future Volume (vph)	401	546	496	137	4	209
Lane Group Flow (vph)	436	593	539	149	67	227
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	26.0	26.0
Total Split (s)	36.0	74.0	38.0	38.0	26.0	26.0
Total Split (%)	36.0%	74.0%	38.0%	38.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.71	0.22	0.29	0.15	0.32	0.59
Control Delay	53.4	2.7	15.6	3.5	43.1	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	2.7	15.6	3.5	43.1	11.7
Queue Length 50th (ft)	154	20	93	0	41	0
Queue Length 95th (ft)	206	65	173	38	74	61
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	1005	2639	1857	1013	359	501
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.22	0.29	0.15	0.19	0.45

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	546	0	0	496	137	58	4	209	0	0	0
Future Volume (vph)	401	546	0	0	496	137	58	4	209	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1797	1599			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1797	1599			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	436	593	0	0	539	149	63	4	227	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	72	0	0	201	0	0	0
Lane Group Flow (vph)	436	593	0	0	539	77	0	67	26	0	0	0
Confl. Peds. (#/hr)	7		1	1		7			1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	18.4	76.4			52.0	52.0		11.6	11.6			
Effective Green, g (s)	18.4	76.4			52.0	52.0		11.6	11.6			
Actuated g/C Ratio	0.18	0.76			0.52	0.52		0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	616	2639			1858	942		208	185			
v/s Ratio Prot	c0.13	0.17			c0.15	0.04		c0.04	0.02			
v/s Ratio Perm												
v/c Ratio	0.71	0.22			0.29	0.08		0.32	0.14			
Uniform Delay, d1	38.3	3.4			13.6	12.0		40.6	39.7			
Progression Factor	1.24	0.64			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.6	0.2			0.4	0.2		1.2	0.5			
Delay (s)	51.0	2.4			14.0	12.2		41.8	40.2			
Level of Service	D	A			B	B		D	D			
Approach Delay (s)		23.0			13.6			40.6			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	24	8	38	19	3	13	51	21	3	62	6
Future Vol, veh/h	12	24	8	38	19	3	13	51	21	3	62	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	2	2	2	3	3	3	5	5	5
Mvmt Flow	13	26	9	41	21	3	14	55	23	3	67	7
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8	8.6	8	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	33%	0%	63%	5%	0%
Vol Thru, %	0%	71%	67%	0%	32%	95%	0%
Vol Right, %	0%	29%	0%	100%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	72	36	8	60	65	6
LT Vol	13	0	12	0	38	3	0
Through Vol	0	51	24	0	19	62	0
RT Vol	0	21	0	8	3	0	6
Lane Flow Rate	14	77	39	9	65	71	7
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.021	0.101	0.056	0.01	0.093	0.098	0.008
Departure Headway (Hd)	5.417	4.711	5.196	4.327	5.107	4.985	4.26
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	663	763	691	830	704	722	843
Service Time	3.128	2.421	2.91	2.04	3.119	2.694	1.969
HCM Lane V/C Ratio	0.021	0.101	0.056	0.011	0.092	0.098	0.008
HCM Control Delay	8.2	8	8.2	7.1	8.6	8.2	7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.3	0.2	0	0.3	0.3	0

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	0	0	50	0	0
Future Vol, veh/h	49	0	0	50	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	0	0	54	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	28	27	0	0	54	0
Stage 1	27	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	987	1048	-	-	1551	-
Stage 1	996	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	987	1048	-	-	1551	-
Mov Cap-2 Maneuver	987	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	987	1551	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	6	0	0	5
Future Vol, veh/h	0	0	6	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	7	0	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	15	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	14	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1004	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1000	1084
Mov Cap-2 Maneuver	-	-	-	-	1000	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1005	-

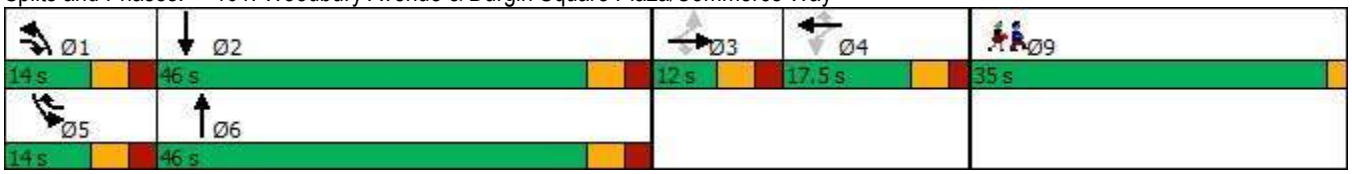
Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.005	-	-	0.004	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	6	7	11	6	1	48	18	399	245	557	
Future Volume (vph)	6	7	11	6	1	48	18	399	245	557	
Lane Group Flow (vph)	0	15	12	0	8	52	20	457	266	623	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.05	0.03		0.03	0.12	0.07	0.40	0.74	0.25	
Control Delay		30.3	0.2		30.0	1.2	29.0	16.0	37.6	11.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		30.3	0.2		30.0	1.2	29.0	16.0	37.6	11.9	
Queue Length 50th (ft)		2	0		1	0	3	26	35	0	
Queue Length 95th (ft)		33	0		22	4	39	192	#477	269	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		300	427		605	436	374	2926	361	2938	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.05	0.03		0.01	0.12	0.05	0.16	0.74	0.21	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 47.2
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	7	11	6	1	48	18	399	21	245	557	17
Future Volume (vph)	6	7	11	6	1	48	18	399	21	245	557	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1538		1750	1553	1694	3359		1636	3371	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1538		1827	1553	1694	3359		1636	3371	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	8	12	7	1	52	20	434	23	266	605	18
RTOR Reduction (vph)	0	0	11	0	0	43	0	3	0	0	1	0
Lane Group Flow (vph)	0	15	1	0	8	9	20	454	0	266	622	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		0.5	3.0		0.6	11.0	2.5	21.7		10.4	29.6	
Effective Green, g (s)		0.5	3.0		0.6	11.0	2.5	21.7		10.4	29.6	
Actuated g/C Ratio		0.01	0.05		0.01	0.18	0.04	0.35		0.17	0.48	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		14	75		17	277	68	1185		276	1622	
v/s Ratio Prot			0.00			0.01	0.01	0.14		c0.16	c0.18	
v/s Ratio Perm		c0.01	0.00		c0.00	0.00						
v/c Ratio		1.07	0.01		0.47	0.03	0.29	0.38		0.96	0.38	
Uniform Delay, d1		30.5	27.8		30.3	20.9	28.6	14.9		25.4	10.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		265.6	0.0		19.2	0.0	2.4	0.2		43.9	0.2	
Delay (s)		296.1	27.9		49.5	20.9	31.1	15.1		69.3	10.3	
Level of Service		F	C		D	C	C	B		E	B	
Approach Delay (s)		176.9			24.7			15.8			28.0	
Approach LOS		F			C			B			C	

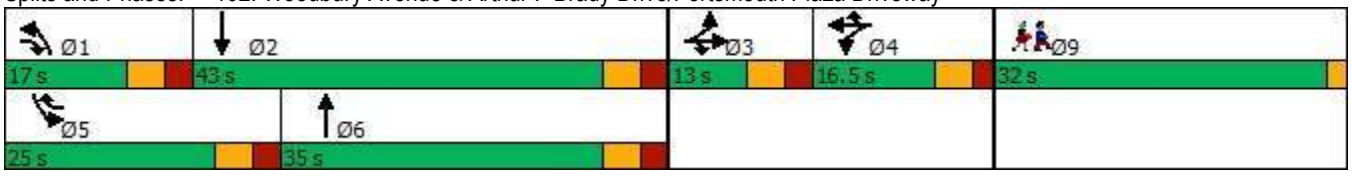
Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	61.5	Sum of lost time (s)	25.5
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	31	109	20	35	128	341	43	495	
Future Volume (vph)	31	109	20	35	128	341	43	495	
Lane Group Flow (vph)	101	118	35	38	133	363	47	577	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.53	0.20	0.18	0.09	0.47	0.34	0.24	0.65	
Control Delay	48.2	2.9	38.8	0.5	40.1	22.5	38.4	28.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.2	2.9	38.8	0.5	40.1	22.5	38.4	28.1	
Queue Length 50th (ft)	39	0	13	0	48	57	17	107	
Queue Length 95th (ft)	#190	17	58	0	#210	163	71	259	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	190	603	299	643	297	1571	496	1980	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.20	0.12	0.06	0.45	0.23	0.09	0.29	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 69
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	31	109	12	20	35	128	341	8	43	495	36
Future Volume (vph)	62	31	109	12	20	35	128	341	8	43	495	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1693	1487		1690	1463	1678	3343		1620	3316	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1693	1487		1690	1463	1678	3343		1620	3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	67	34	118	13	22	38	133	355	8	47	538	39
RTOR Reduction (vph)	0	0	86	0	0	31	0	1	0	0	4	0
Lane Group Flow (vph)	0	101	32	0	35	7	133	362	0	47	573	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.8	19.5		4.3	12.7	11.7	21.7		8.4	18.4	
Effective Green, g (s)		7.8	19.5		4.3	12.7	11.7	21.7		8.4	18.4	
Actuated g/C Ratio		0.11	0.27		0.06	0.18	0.16	0.30		0.12	0.26	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		185	406		101	260	275	1017		190	855	
v/s Ratio Prot		c0.06	0.02		c0.02	0.00	c0.08	c0.11		0.03	c0.17	
v/s Ratio Perm												
v/c Ratio		0.55	0.08		0.35	0.03	0.48	0.36		0.25	0.67	
Uniform Delay, d1		30.1	19.2		32.2	24.2	27.1	19.3		28.6	23.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3	0.1		2.1	0.0	1.3	0.2		0.7	2.0	
Delay (s)		33.3	19.3		34.2	24.2	28.4	19.6		29.3	25.7	
Level of Service		C	B		C	C	C	B		C	C	
Approach Delay (s)		25.8			29.0			21.9			26.0	
Approach LOS		C			C			C			C	

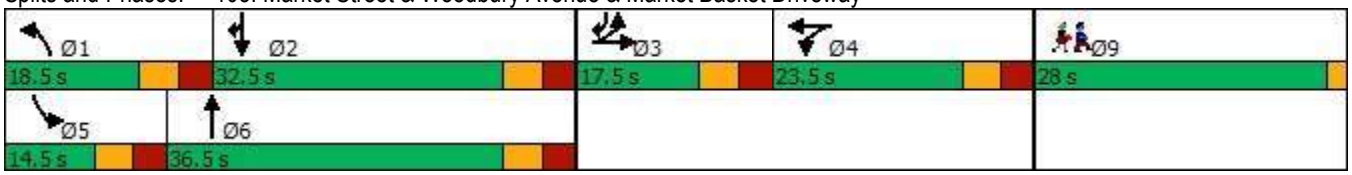
Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	71.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	85	36	63	40	77	385	3	371	240	
Future Volume (vph)	85	36	63	40	77	385	3	371	240	
Lane Group Flow (vph)	91	93	68	51	84	519	3	403	261	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.23	0.40	0.30	0.21	0.38	0.36	0.02	0.42	0.28	
Control Delay	36.3	27.0	38.3	33.3	40.2	18.2	41.7	27.9	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	36.3	27.0	38.3	33.3	40.2	18.2	41.7	27.9	3.7	
Queue Length 50th (ft)	17	17	25	16	31	62	1	74	0	
Queue Length 95th (ft)	58	87	93	68	112	224	12	191	53	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	573	319	485	503	313	1562	209	1358	912	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.29	0.14	0.10	0.27	0.33	0.01	0.30	0.29	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 70.7
Natural Cycle: 85
Control Type: Actuated-Uncoordinated

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



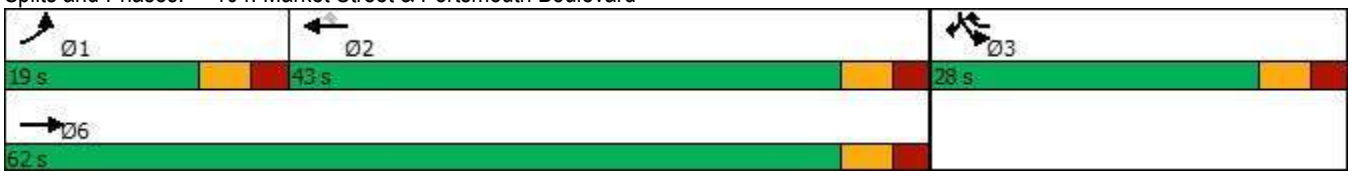
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	36	50	63	40	7	77	385	93	3	371	240
Future Volume (vph)	85	36	50	63	40	7	77	385	93	3	371	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1643		1834	1885		1678	3244		1647	3355	1501
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1643		1834	1885		1678	3244		1647	3355	1501
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	39	54	68	43	8	84	418	101	3	403	261
RTOR Reduction (vph)	0	41	0	0	6	0	0	14	0	0	0	129
Lane Group Flow (vph)	91	52	0	68	45	0	84	505	0	3	403	132
Confl. Peds. (#/hr)			2	2			1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.3	8.3		6.9	6.9		7.3	31.1		0.8	24.6	39.4
Effective Green, g (s)	8.3	8.3		6.9	6.9		7.3	31.1		0.8	24.6	39.4
Actuated g/C Ratio	0.11	0.11		0.09	0.09		0.09	0.40		0.01	0.31	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	355	174		161	166		156	1290		16	1055	756
v/s Ratio Prot	0.03	c0.03		c0.04	0.02		c0.05	c0.16		0.00	0.12	0.09
v/s Ratio Perm												
v/c Ratio	0.26	0.30		0.42	0.27		0.54	0.39		0.19	0.38	0.17
Uniform Delay, d1	32.1	32.3		33.8	33.3		33.8	16.8		38.4	20.9	10.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.0		1.8	0.9		3.5	0.2		5.6	0.2	0.1
Delay (s)	32.5	33.2		35.5	34.2		37.4	17.0		44.0	21.1	10.7
Level of Service	C	C		D	C		D	B		D	C	B
Approach Delay (s)		32.9			35.0			19.8			17.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	28.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	48	436	502	261	57	53
Future Volume (vph)	48	436	502	261	57	53
Lane Group Flow (vph)	52	474	546	284	62	58
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.16	0.29	0.42	0.29	0.10	0.18
Control Delay	21.3	5.7	11.1	1.5	20.3	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	5.7	11.1	1.5	20.3	9.8
Queue Length 50th (ft)	7	25	29	0	4	0
Queue Length 95th (ft)	51	45	108	18	28	30
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	606	3210	2909	1399	2268	1099
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.15	0.19	0.20	0.03	0.05

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 41.2
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	48	436	502	261	57	53
Future Volume (vph)	48	436	502	261	57	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1678	3355	3388	1546	3255	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1678	3355	3388	1546	3255	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	474	546	284	62	58
RTOR Reduction (vph)	0	0	0	133	0	48
Lane Group Flow (vph)	52	474	546	151	62	10
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.5	24.2	15.7	23.2	7.5	7.5
Effective Green, g (s)	2.5	24.2	15.7	23.2	7.5	7.5
Actuated g/C Ratio	0.06	0.55	0.36	0.53	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	95	1857	1217	1033	558	266
v/s Ratio Prot	0.03	c0.14	c0.16	c0.03	0.02	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.55	0.26	0.45	0.15	0.11	0.04
Uniform Delay, d1	20.0	5.1	10.7	5.2	15.3	15.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1	0.3	0.1	0.1	0.1
Delay (s)	26.4	5.1	11.0	5.3	15.4	15.1
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.2	9.0		15.3	
Approach LOS		A	A		B	

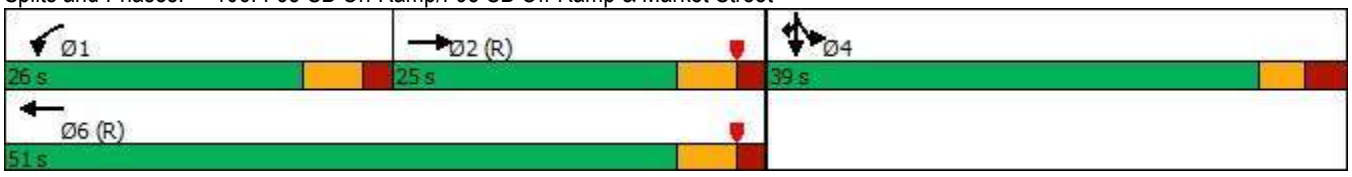
Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	43.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	454	109	95	477	211	1	321
Future Volume (vph)	454	109	95	477	211	1	321
Lane Group Flow (vph)	483	116	103	518	202	189	188
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	25.0		26.0	51.0	39.0	39.0	39.0
Total Split (%)	27.8%		28.9%	56.7%	43.3%	43.3%	43.3%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.19	0.07	0.52	0.23	0.65	0.47	0.44
Control Delay	15.0	0.1	47.1	8.5	42.8	11.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	0.1	47.1	8.5	42.8	11.0	7.7
Queue Length 50th (ft)	63	0	61	30	113	14	0
Queue Length 95th (ft)	106	0	101	142	169	70	51
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2483	1724	356	2252	604	629	659
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	123	0	5	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.07	0.29	0.24	0.33	0.30	0.29

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 81 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	454	109	95	477	0	0	0	0	211	1	321
Future Volume (vph)	0	454	109	95	477	0	0	0	0	211	1	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4821	1724	1604	3323					1649	1440	1475
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4821	1724	1604	3323					1649	1440	1475
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	483	116	103	518	0	0	0	0	229	1	349
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	131	152
Lane Group Flow (vph)	0	483	116	103	518	0	0	0	0	202	58	36
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		45.2	90.0	9.8	61.0					17.0	17.0	17.0
Effective Green, g (s)		45.2	90.0	9.8	61.0					17.0	17.0	17.0
Actuated g/C Ratio		0.50	1.00	0.11	0.68					0.19	0.19	0.19
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2421	1724	174	2252					311	272	278
v/s Ratio Prot		0.10		c0.06	c0.16					c0.12	0.04	0.02
v/s Ratio Perm			0.07									
v/c Ratio		0.20	0.07	0.59	0.23					0.65	0.21	0.13
Uniform Delay, d1		12.4	0.0	38.2	5.5					33.7	30.9	30.3
Progression Factor		1.03	1.00	1.05	1.30					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	5.2	0.2					4.6	0.4	0.2
Delay (s)		13.0	0.1	45.4	7.4					38.4	31.3	30.5
Level of Service		B	A	D	A					D	C	C
Approach Delay (s)		10.5			13.7			0.0			33.5	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	48.6%	ICU Level of Service	A	
Analysis Period (min)	15			

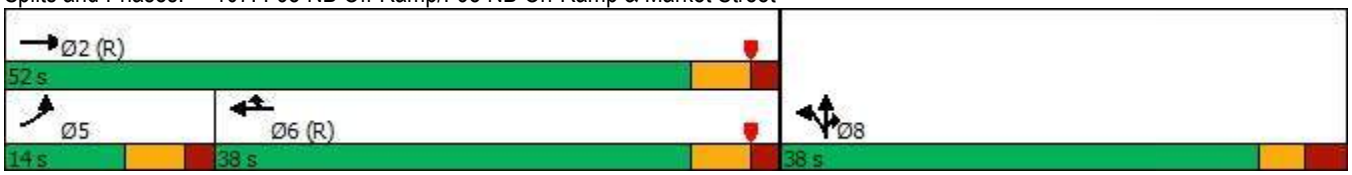
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	153	512	361	59	0	383
Future Volume (vph)	153	512	361	59	0	383
Lane Group Flow (vph)	166	557	392	64	224	407
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	32.0	32.0
Total Split (s)	14.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	15.6%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.46	0.25	0.24	0.07	0.60	0.75
Control Delay	31.1	3.8	16.2	1.4	37.9	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	3.8	16.2	1.4	37.9	20.2
Queue Length 50th (ft)	28	4	65	0	117	73
Queue Length 95th (ft)	49	10	124	9	164	157
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	366	2195	1650	893	622	727
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.25	0.24	0.07	0.36	0.56

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	512	0	0	361	59	211	0	383	0	0	0
Future Volume (vph)	153	512	0	0	361	59	211	0	383	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3255	3355			3438	1743		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3255	3355			3438	1743		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	166	557	0	0	392	64	224	0	407	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	33	0	0	208	0	0	0
Lane Group Flow (vph)	166	557	0	0	392	31	0	224	199	0	0	0
Confl. Peds. (#/hr)	4					4						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.0	58.9			42.9	42.9		19.1	19.1			
Effective Green, g (s)	10.0	58.9			42.9	42.9		19.1	19.1			
Actuated g/C Ratio	0.11	0.65			0.48	0.48		0.21	0.21			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	361	2195			1638	830		371	332			
v/s Ratio Prot	c0.05	c0.17			0.11	0.02		c0.13	0.13			
v/s Ratio Perm												
v/c Ratio	0.46	0.25			0.24	0.04		0.60	0.60			
Uniform Delay, d1	37.5	6.4			13.9	12.5		32.0	32.0			
Progression Factor	0.73	0.47			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.3			0.3	0.1		3.2	3.4			
Delay (s)	28.1	3.3			14.3	12.6		35.2	35.4			
Level of Service	C	A			B	B		D	D			
Approach Delay (s)		9.0			14.0			35.3			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	9	10	85	29	0	196	88	28	0	10	7
Future Vol, veh/h	20	9	10	85	29	0	196	88	28	0	10	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	6	6	3	3	3	1	1	1	0	0	0
Mvmt Flow	22	10	11	92	32	0	213	96	30	0	11	8
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.8	10	10	7.9
HCM LOS	A	A	A	A

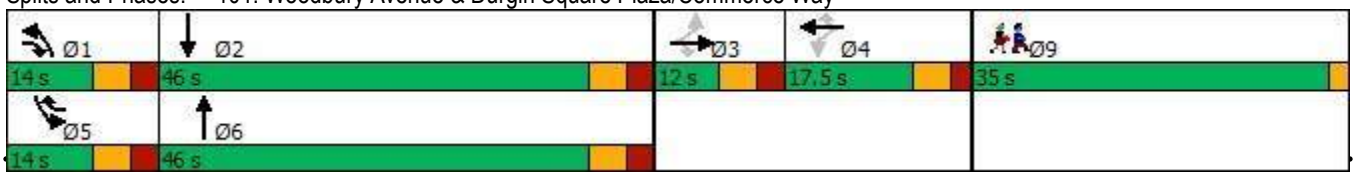
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	69%	0%	75%	0%	0%
Vol Thru, %	0%	76%	31%	0%	25%	100%	0%
Vol Right, %	0%	24%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	196	116	29	10	114	10	7
LT Vol	196	0	20	0	85	0	0
Through Vol	0	88	9	0	29	10	0
RT Vol	0	28	0	10	0	0	7
Lane Flow Rate	213	126	32	11	124	11	8
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.326	0.169	0.053	0.015	0.194	0.016	0.01
Departure Headway (Hd)	5.509	4.837	6.003	4.951	5.63	5.327	4.621
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	652	741	596	721	637	670	771
Service Time	3.241	2.569	3.746	2.693	3.664	3.075	2.369
HCM Lane V/C Ratio	0.327	0.17	0.054	0.015	0.195	0.016	0.01
HCM Control Delay	10.9	8.6	9.1	7.8	10	8.2	7.4
HCM Lane LOS	B	A	A	A	A	A	A
HCM 95th-tile Q	1.4	0.6	0.2	0	0.7	0	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	33	34	106	44	26	197	113	705	144	885	
Future Volume (vph)	33	34	106	44	26	197	113	705	144	885	
Lane Group Flow (vph)	0	73	115	0	76	214	123	769	155	992	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.06	0.29		0.44	0.39	0.67	0.61	0.87	0.78	
Control Delay		172.8	6.7		48.7	5.6	60.5	25.5	84.4	30.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		172.8	6.7		48.7	5.6	60.5	25.5	84.4	30.1	
Queue Length 50th (ft)		~41	0		34	0	58	150	76	211	
Queue Length 95th (ft)		#190	28		#114	41	#240	356	#310	#520	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		69	390		228	550	184	1845	178	1836	
Starvation Cap Reductn		0	0		0	0	0	44	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.06	0.29		0.33	0.39	0.67	0.43	0.87	0.54	

Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 81.5
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	34	106	44	26	197	113	705	3	144	885	37
Future Volume (vph)	33	34	106	44	26	197	113	705	3	144	885	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1590		1802	1583	1728	3453		1668	3431	
Flt Permitted		0.46	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		864	1590		1422	1583	1728	3453		1668	3431	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	36	37	115	48	28	214	123	766	3	155	952	40
RTOR Reduction (vph)	0	0	94	0	0	171	0	0	0	0	3	0
Lane Group Flow (vph)	0	73	21	0	76	43	123	769	0	155	989	0
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.5	15.2		7.9	16.6	8.7	30.0		8.7	30.0	
Effective Green, g (s)		6.5	15.2		7.9	16.6	8.7	30.0		8.7	30.0	
Actuated g/C Ratio		0.08	0.18		0.10	0.20	0.10	0.36		0.10	0.36	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		67	291		135	316	181	1249		175	1241	
v/s Ratio Prot			0.01			0.01	0.07	0.22		c0.09	c0.29	
v/s Ratio Perm		c0.08	0.01		c0.05	0.01						
v/c Ratio		1.09	0.07		0.56	0.14	0.68	0.62		0.89	0.80	
Uniform Delay, d1		38.2	28.0		35.8	27.3	35.8	21.7		36.6	23.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		136.7	0.1		5.3	0.2	9.7	0.9		37.3	3.7	
Delay (s)		174.9	28.1		41.1	27.4	45.5	22.6		73.9	27.4	
Level of Service		F	C		D	C	D	C		E	C	
Approach Delay (s)		85.1			31.0			25.8			33.7	
Approach LOS		F			C			C			C	

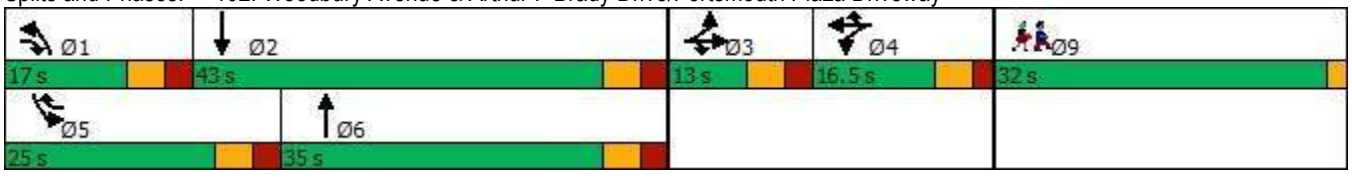
Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	47	212	54	123	188	623	100	835	
Future Volume (vph)	47	212	54	123	188	623	100	835	
Lane Group Flow (vph)	133	230	131	134	194	673	109	1017	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.99	0.47	0.65	0.25	0.93	0.53	0.53	0.79	
Control Delay	123.7	6.3	58.3	4.7	91.0	27.4	49.7	32.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
Total Delay	123.7	6.3	58.3	4.7	91.0	27.4	49.7	32.8	
Queue Length 50th (ft)	75	0	70	0	108	141	57	244	
Queue Length 95th (ft)	#264	36	#215	28	#341	334	138	#559	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	134	486	208	644	208	1278	347	1382	
Starvation Cap Reductn	0	0	0	0	0	0	0	43	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.99	0.47	0.63	0.21	0.93	0.53	0.31	0.76	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 93.1
Natural Cycle: 125
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	47	212	66	54	123	188	623	30	100	835	100
Future Volume (vph)	75	47	212	66	54	123	188	623	30	100	835	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747	1531		1726	1507	1728	3431		1668	3392	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1747	1531		1726	1507	1728	3431		1668	3392	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	82	51	230	72	59	134	194	642	31	109	908	109
RTOR Reduction (vph)	0	0	185	0	0	102	0	3	0	0	7	0
Lane Group Flow (vph)	0	133	45	0	131	32	194	670	0	109	1010	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.1	18.3		10.9	22.5	11.2	34.6		11.6	35.0	
Effective Green, g (s)		7.1	18.3		10.9	22.5	11.2	34.6		11.6	35.0	
Actuated g/C Ratio		0.08	0.19		0.12	0.24	0.12	0.37		0.12	0.37	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		131	297		199	359	205	1258		205	1258	
v/s Ratio Prot		c0.08	0.03		c0.08	0.02	c0.11	0.20		0.07	c0.30	
v/s Ratio Perm												
v/c Ratio		1.02	0.15		0.66	0.09	0.95	0.53		0.53	0.80	
Uniform Delay, d1		43.6	31.5		39.9	27.9	41.3	23.5		38.8	26.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		82.7	0.2		7.6	0.1	47.3	0.4		2.6	3.8	
Delay (s)		126.3	31.8		47.6	28.0	88.6	23.9		41.4	30.4	
Level of Service		F	C		D	C	F	C		D	C	
Approach Delay (s)		66.4			37.7			38.4			31.4	
Approach LOS		E			D			D			C	

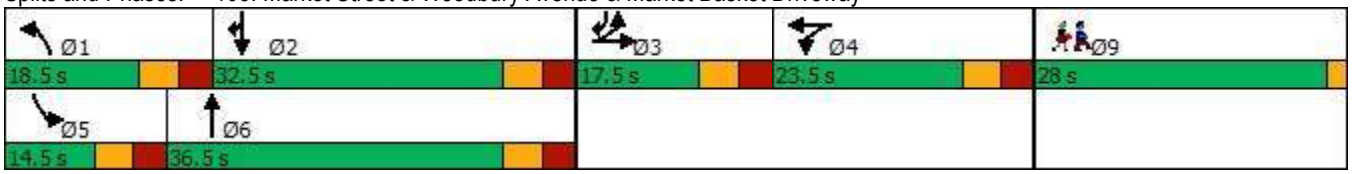
Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	194	68	190	77	92	630	9	746	356	
Future Volume (vph)	194	68	190	77	92	630	9	746	356	
Lane Group Flow (vph)	211	150	204	101	97	817	10	811	387	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.53	0.66	0.66	0.31	0.51	0.57	0.08	0.78	0.40	
Control Delay	46.2	47.3	49.5	37.6	51.9	24.2	47.9	38.0	3.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	46.2	47.3	49.5	37.6	51.9	24.2	47.9	38.0	3.8	
Queue Length 50th (ft)	57	62	107	46	52	152	5	220	1	
Queue Length 95th (ft)	123	#203	#262	120	130	#442	26	#491	66	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	427	244	376	390	240	1470	160	1042	970	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.49	0.61	0.54	0.26	0.40	0.56	0.06	0.78	0.40	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 89.6
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



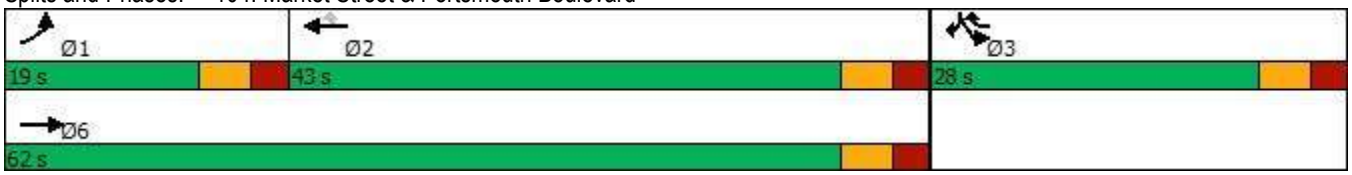
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	68	70	190	77	17	92	630	146	9	746	356
Future Volume (vph)	194	68	70	190	77	17	92	630	146	9	746	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1680		1906	1948		1728	3344		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1680		1906	1948		1728	3344		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	211	74	76	204	83	18	97	663	154	10	811	387
RTOR Reduction (vph)	0	30	0	0	7	0	0	13	0	0	0	192
Lane Group Flow (vph)	211	120	0	204	94	0	97	804	0	10	811	195
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.6	10.6		14.6	14.6		8.1	38.0		1.1	31.0	48.1
Effective Green, g (s)	10.6	10.6		14.6	14.6		8.1	38.0		1.1	31.0	48.1
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.08	0.40		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	369	185		289	295		145	1322		19	1114	773
v/s Ratio Prot	0.06	c0.07		c0.11	0.05		c0.06	c0.24		0.01	c0.23	0.13
v/s Ratio Perm												
v/c Ratio	0.57	0.65		0.71	0.32		0.67	0.61		0.53	0.73	0.25
Uniform Delay, d1	40.6	41.0		38.7	36.3		42.7	23.1		47.2	28.8	13.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	7.6		7.6	0.6		11.1	0.8		23.9	2.4	0.2
Delay (s)	42.7	48.5		46.3	37.0		53.8	23.9		71.1	31.2	13.9
Level of Service	D	D		D	D		D	C		E	C	B
Approach Delay (s)		45.1			43.2			27.1			26.0	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	959	774	74	216	94
Future Volume (vph)	47	959	774	74	216	94
Lane Group Flow (vph)	51	1042	832	80	235	102
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.19	0.55	0.58	0.08	0.36	0.26
Control Delay	27.1	7.9	15.1	1.2	23.2	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	7.9	15.1	1.2	23.2	8.3
Queue Length 50th (ft)	15	84	115	0	34	0
Queue Length 95th (ft)	54	148	199	10	82	38
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	479	3222	2617	1251	1574	805
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.32	0.32	0.06	0.15	0.13

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 51.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	959	774	74	216	94
Future Volume (vph)	47	959	774	74	216	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1576	3351	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1576	3351	1599
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.92	0.92
Adj. Flow (vph)	51	1042	832	80	235	102
RTOR Reduction (vph)	0	0	0	33	0	83
Lane Group Flow (vph)	51	1042	832	47	235	19
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	4.2	31.5	21.3	31.3	10.0	10.0
Effective Green, g (s)	4.2	31.5	21.3	31.3	10.0	10.0
Actuated g/C Ratio	0.08	0.59	0.40	0.59	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	135	2034	1375	1098	626	298
v/s Ratio Prot	0.03	c0.30	c0.24	0.01	c0.07	0.01
v/s Ratio Perm				0.02		
v/c Ratio	0.38	0.51	0.61	0.04	0.38	0.06
Uniform Delay, d1	23.4	6.5	12.8	4.7	19.0	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.2	0.8	0.0	0.4	0.1
Delay (s)	25.2	6.7	13.5	4.7	19.4	18.0
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.6	12.8		19.0	
Approach LOS		A	B		B	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	53.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

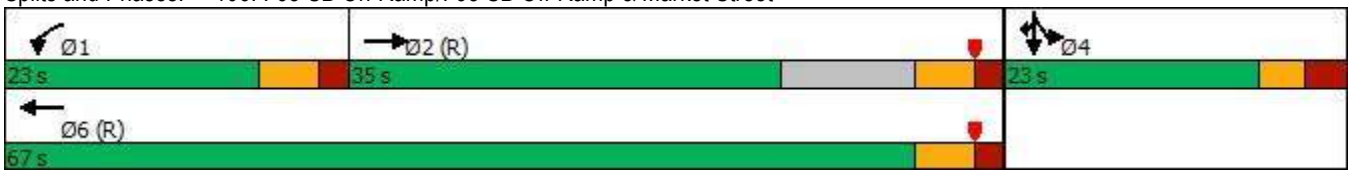
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	987	226	246	558	259	1	335
Future Volume (vph)	987	226	246	558	259	1	335
Lane Group Flow (vph)	1050	240	267	607	226	214	207
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	35.0		23.0	67.0	23.0	23.0	23.0
Total Split (%)	38.9%		25.6%	74.4%	25.6%	25.6%	25.6%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.53	0.14	0.79	0.26	0.69	0.54	0.45
Control Delay	20.3	0.2	38.0	0.6	44.8	17.3	7.7
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	0.2	38.0	0.6	44.8	17.4	7.8
Queue Length 50th (ft)	179	0	63	1	125	41	0
Queue Length 95th (ft)	219	0	#260	1	198	110	56
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2177	1757	347	2400	355	422	481
Starvation Cap Reductn	387	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	115	0	4	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.14	0.77	0.27	0.64	0.51	0.44

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 55
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	987	226	246	558	0	0	0	0	259	1	335
Future Volume (vph)	0	987	226	246	558	0	0	0	0	259	1	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4916	1757	1668	3455					1698	1504	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4916	1757	1668	3455					1698	1504	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1050	240	267	607	0	0	0	0	282	1	364
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	110	167
Lane Group Flow (vph)	0	1050	240	267	607	0	0	0	0	226	104	40
Confl. Peds. (#/hr)	8					8						
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		36.5	90.0	18.2	60.7					17.3	17.3	17.3
Effective Green, g (s)		36.5	90.0	18.2	60.7					17.3	17.3	17.3
Actuated g/C Ratio		0.41	1.00	0.20	0.67					0.19	0.19	0.19
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		1993	1757	337	2330					326	289	291
v/s Ratio Prot		c0.21		c0.16	0.18					c0.13	0.07	0.03
v/s Ratio Perm			0.14									
v/c Ratio		0.53	0.14	0.79	0.26					0.69	0.36	0.14
Uniform Delay, d1		20.2	0.0	34.1	5.8					33.9	31.5	30.2
Progression Factor		0.91	1.00	0.58	0.06					1.00	1.00	1.00
Incremental Delay, d2		0.9	0.1	11.1	0.2					6.3	0.8	0.2
Delay (s)		19.2	0.1	30.9	0.6					40.1	32.3	30.4
Level of Service		B	A	C	A					D	C	C
Approach Delay (s)		15.7			9.8			0.0			34.4	
Approach LOS		B			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	58.3%	ICU Level of Service	B	
Analysis Period (min)	15			

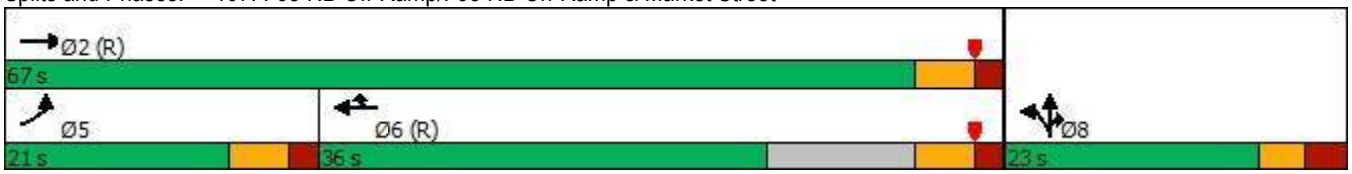
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	551	695	705	249	1	195
Future Volume (vph)	551	695	705	249	1	195
Lane Group Flow (vph)	586	739	750	265	109	212
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	23.0	23.0
Total Split (s)	21.0	67.0	36.0	36.0	23.0	23.0
Total Split (%)	23.3%	74.4%	40.0%	40.0%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.68	0.29	0.51	0.29	0.46	0.54
Control Delay	28.3	11.3	21.8	3.4	41.3	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	11.3	21.8	3.4	41.3	10.3
Queue Length 50th (ft)	171	171	163	0	58	0
Queue Length 95th (ft)	#237	241	226	46	103	58
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	856	2530	1590	953	335	470
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.29	0.47	0.28	0.33	0.45

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	551	695	0	0	705	249	99	1	195	0	0	0
Future Volume (vph)	551	695	0	0	705	249	99	1	195	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1775	1583			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	586	739	0	0	750	265	108	1	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	156	0	0	183	0	0	0
Lane Group Flow (vph)	586	739	0	0	750	109	0	109	29	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	23.0	65.9			36.9	36.9		12.1	12.1			
Effective Green, g (s)	23.0	65.9			36.9	36.9		12.1	12.1			
Actuated g/C Ratio	0.26	0.73			0.41	0.41		0.13	0.13			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	856	2529			1465	742		238	212			
v/s Ratio Prot	c0.17	0.21			c0.21	0.06		c0.06	0.02			
v/s Ratio Perm												
v/c Ratio	0.68	0.29			0.51	0.15		0.46	0.13			
Uniform Delay, d1	30.2	4.1			19.8	16.7		35.9	34.3			
Progression Factor	0.78	2.46			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.0	0.3			1.3	0.4		1.9	0.4			
Delay (s)	25.7	10.3			21.1	17.1		37.8	34.7			
Level of Service	C	B			C	B		D	C			
Approach Delay (s)		17.1			20.1			35.8			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	50	168	35	24	1	19	17	57	0	85	28
Future Vol, veh/h	14	50	168	35	24	1	19	17	57	0	85	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	15	54	183	38	26	1	21	18	62	0	92	30
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.5	9.1	8.4	8.7
HCM LOS	A	A	A	A

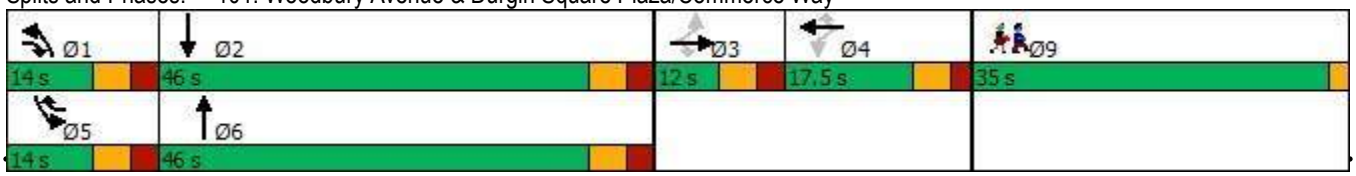
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	22%	0%	58%	0%	0%
Vol Thru, %	0%	23%	78%	0%	40%	100%	0%
Vol Right, %	0%	77%	0%	100%	2%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	74	64	168	60	85	28
LT Vol	19	0	14	0	35	0	0
Through Vol	0	17	50	0	24	85	0
RT Vol	0	57	0	168	1	0	28
Lane Flow Rate	21	80	70	183	65	92	30
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.034	0.11	0.102	0.226	0.099	0.138	0.039
Departure Headway (Hd)	5.958	4.911	5.259	4.447	5.452	5.378	4.672
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	600	727	681	807	656	665	764
Service Time	3.707	2.659	2.992	2.18	3.497	3.124	2.418
HCM Lane V/C Ratio	0.035	0.11	0.103	0.227	0.099	0.138	0.039
HCM Control Delay	8.9	8.3	8.6	8.5	9.1	9	7.6
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.3	0.9	0.3	0.5	0.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	48	39	124	7	19	81	132	759	142	828	
Future Volume (vph)	48	39	124	7	19	81	132	759	142	828	
Lane Group Flow (vph)	0	94	135	0	29	88	143	828	154	957	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.16	0.30		0.15	0.25	0.67	0.63	0.74	0.73	
Control Delay		186.0	6.0		41.0	6.3	53.2	22.9	59.8	25.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		186.0	6.0		41.0	6.3	53.2	22.9	59.8	25.1	
Queue Length 50th (ft)		~38	0		9	0	49	103	53	125	
Queue Length 95th (ft)		#232	29		53	25	#279	382	#305	458	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		81	452		326	354	215	2153	208	2138	
Starvation Cap Reductn		0	0		0	0	0	43	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.16	0.30		0.09	0.25	0.67	0.39	0.74	0.45	

Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 71.7
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	39	124	7	19	81	132	759	3	142	828	52
Future Volume (vph)	48	39	124	7	19	81	132	759	3	142	828	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1589		1812	1568	1728	3453		1668	3424	
Flt Permitted		0.46	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		872	1589		1736	1568	1728	3453		1668	3424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	42	135	8	21	88	143	825	3	154	900	57
RTOR Reduction (vph)	0	0	107	0	0	74	0	0	0	0	3	0
Lane Group Flow (vph)	0	94	28	0	29	14	143	828	0	154	954	0
Confl. Peds. (#/hr)			2	2					2	2		
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.7	15.6		2.7	11.6	8.9	27.5		8.9	27.5	
Effective Green, g (s)		6.7	15.6		2.7	11.6	8.9	27.5		8.9	27.5	
Actuated g/C Ratio		0.09	0.21		0.04	0.15	0.12	0.37		0.12	0.37	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		77	329		62	241	204	1262		197	1252	
v/s Ratio Prot			0.01			0.01	0.08	0.24		c0.09	c0.28	
v/s Ratio Perm		c0.11	0.01		c0.02	0.00						
v/c Ratio		1.22	0.09		0.47	0.06	0.70	0.66		0.78	0.76	
Uniform Delay, d1		34.2	24.0		35.5	27.1	31.9	19.9		32.2	21.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		173.4	0.1		5.5	0.1	10.4	1.2		18.0	2.8	
Delay (s)		207.7	24.2		41.0	27.2	42.2	21.1		50.2	23.8	
Level of Service		F	C		D	C	D	C		D	C	
Approach Delay (s)		99.5			30.6			24.3			27.4	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	75.2	Sum of lost time (s)	25.5
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	71	229	64	144	179	655	139	746	
Future Volume (vph)	71	229	64	144	179	655	139	746	
Lane Group Flow (vph)	180	249	152	157	195	754	151	891	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	1.23	0.48	0.68	0.25	0.87	0.72	0.60	0.80	
Control Delay	188.4	6.4	56.0	4.1	75.1	33.5	47.7	33.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	188.4	6.4	56.0	4.1	75.1	33.5	47.7	33.8	
Queue Length 50th (ft)	~109	2	73	0	96	170	70	203	
Queue Length 95th (ft)	#358	40	#258	30	#343	#420	183	426	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	146	518	224	719	225	1177	374	1494	
Starvation Cap Reductn	0	0	0	0	0	0	0	20	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.23	0.48	0.68	0.22	0.87	0.64	0.40	0.60	

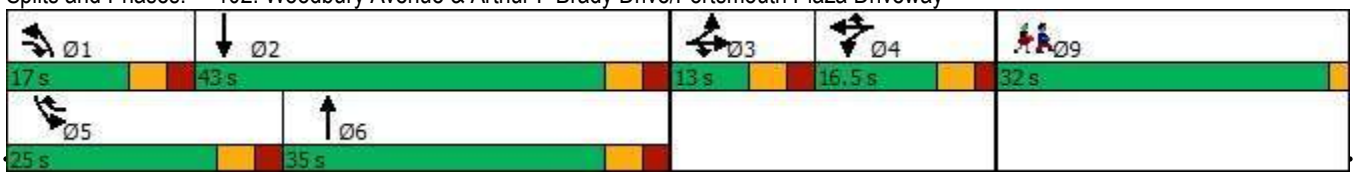
Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 87.3
Natural Cycle: 125
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	71	229	75	64	144	179	655	39	139	746	74
Future Volume (vph)	95	71	229	75	64	144	179	655	39	139	746	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1546		1727	1507	1728	3421		1668	3402	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1768	1546		1727	1507	1728	3421		1668	3402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	77	249	82	70	157	195	712	42	151	811	80
RTOR Reduction (vph)	0	0	190	0	0	113	0	3	0	0	6	0
Lane Group Flow (vph)	0	180	59	0	152	44	195	751	0	151	885	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.2	18.6		11.4	24.6	11.4	26.7		13.2	28.5	
Effective Green, g (s)		7.2	18.6		11.4	24.6	11.4	26.7		13.2	28.5	
Actuated g/C Ratio		0.08	0.21		0.13	0.28	0.13	0.30		0.15	0.32	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		144	325		222	419	223	1034		249	1098	
v/s Ratio Prot		c0.10	0.04		c0.09	0.03	c0.11	0.22		0.09	c0.26	
v/s Ratio Perm												
v/c Ratio		1.25	0.18		0.68	0.10	0.87	0.73		0.61	0.81	
Uniform Delay, d1		40.5	28.6		36.7	23.7	37.7	27.5		35.1	27.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		157.2	0.3		8.4	0.1	29.3	2.6		4.1	4.4	
Delay (s)		197.8	28.9		45.2	23.8	67.1	30.1		39.3	31.8	
Level of Service		F	C		D	C	E	C		D	C	
Approach Delay (s)		99.7			34.3			37.7			32.9	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

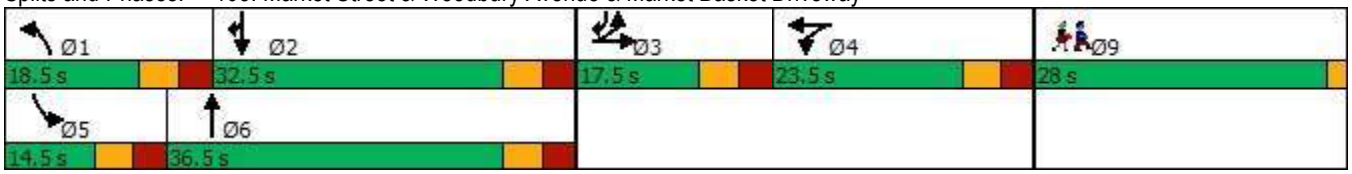
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	170	56	183	88	64	687	14	650	370	
Future Volume (vph)	170	56	183	88	64	687	14	650	370	
Lane Group Flow (vph)	185	109	199	113	70	956	14	657	374	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.49	0.50	0.65	0.35	0.40	0.67	0.11	0.62	0.39	
Control Delay	44.6	41.3	47.9	37.9	48.7	25.9	47.2	33.0	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.6	41.3	47.9	37.9	48.7	25.9	47.2	33.0	3.7	
Queue Length 50th (ft)	48	42	100	51	36	186	7	162	0	
Queue Length 95th (ft)	110	#126	#252	134	99	#568	32	#355	63	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	437	244	384	400	246	1420	164	1108	955	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.42	0.45	0.52	0.28	0.28	0.67	0.09	0.59	0.39	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 87.5
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	56	44	183	88	16	64	687	192	14	650	370
Future Volume (vph)	170	56	44	183	88	16	64	687	192	14	650	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1698		1906	1961		1728	3324		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1698		1906	1961		1728	3324		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	185	61	48	199	96	17	70	747	209	14	657	374
RTOR Reduction (vph)	0	23	0	0	5	0	0	17	0	0	0	186
Lane Group Flow (vph)	185	86	0	199	108	0	70	939	0	14	657	188
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.0	10.0		14.2	14.2		7.3	37.0		1.2	30.9	47.4
Effective Green, g (s)	10.0	10.0		14.2	14.2		7.3	37.0		1.2	30.9	47.4
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.08	0.39		0.01	0.33	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	356	180		287	295		134	1306		22	1134	778
v/s Ratio Prot	c0.06	0.05		c0.10	0.06		c0.04	c0.28		0.01	0.19	0.12
v/s Ratio Perm												
v/c Ratio	0.52	0.48		0.69	0.37		0.52	0.72		0.64	0.58	0.24
Uniform Delay, d1	39.8	39.6		37.9	35.9		41.7	24.2		46.2	26.2	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	2.0		7.1	0.8		3.6	1.9		47.5	0.7	0.2
Delay (s)	41.1	41.6		45.0	36.7		45.4	26.1		93.7	26.9	13.4
Level of Service	D	D		D	D		D	C		F	C	B
Approach Delay (s)		41.3			42.0			27.4			23.0	
Approach LOS		D			D			C			C	

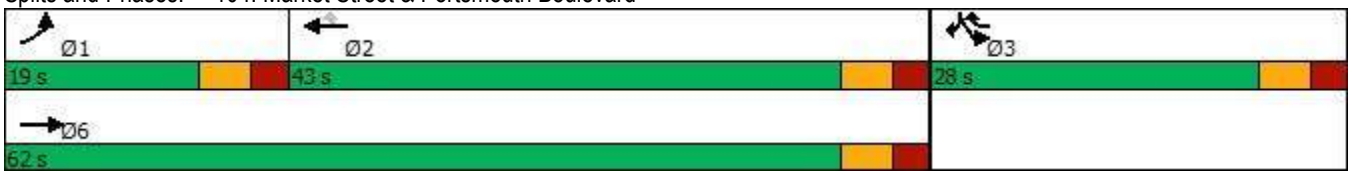
Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	94.1	Sum of lost time (s)	28.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	853	898	36	39	45
Future Volume (vph)	24	853	898	36	39	45
Lane Group Flow (vph)	26	917	976	39	42	49
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.10	0.38	0.47	0.04	0.09	0.18
Control Delay	23.7	4.8	9.6	1.4	22.7	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	4.8	9.6	1.4	22.7	11.0
Queue Length 50th (ft)	4	55	60	0	3	0
Queue Length 95th (ft)	31	90	194	7	21	28
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	517	3325	2747	1320	1603	788
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.28	0.36	0.03	0.03	0.06

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 47.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	24	853	898	36	39	45
Future Volume (vph)	24	853	898	36	39	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1569	3164	1509
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1569	3164	1509
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	917	976	39	42	49
RTOR Reduction (vph)	0	0	0	15	0	44
Lane Group Flow (vph)	26	917	976	24	42	5
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	1%	1%	1%	1%	7%	7%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	2.3	35.1	26.8	32.0	5.2	5.2
Effective Green, g (s)	2.3	35.1	26.8	32.0	5.2	5.2
Actuated g/C Ratio	0.04	0.67	0.51	0.61	0.10	0.10
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	75	2318	1770	1140	314	150
v/s Ratio Prot	0.02	c0.27	c0.28	0.00	c0.01	0.00
v/s Ratio Perm				0.01		
v/c Ratio	0.35	0.40	0.55	0.02	0.13	0.03
Uniform Delay, d1	24.3	3.9	8.7	4.0	21.5	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.8	0.1	0.4	0.0	0.2	0.1
Delay (s)	27.0	4.0	9.0	4.0	21.7	21.4
Level of Service	C	A	A	A	C	C
Approach Delay (s)		4.6	8.8		21.5	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

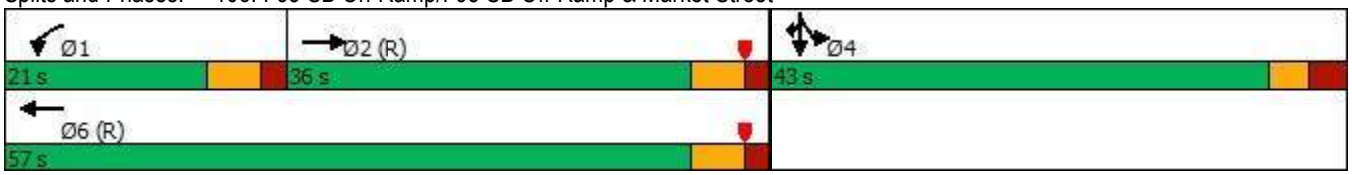
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	824	155	104	482	197	3	444
Future Volume (vph)	824	155	104	482	197	3	444
Lane Group Flow (vph)	896	168	113	524	193	256	251
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	36.0		21.0	57.0	43.0	43.0	43.0
Total Split (%)	36.0%		21.0%	57.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.35	0.09	0.56	0.22	0.64	0.56	0.53
Control Delay	14.0	0.1	71.1	3.3	46.6	11.2	8.4
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	0.1	71.1	3.3	46.6	11.2	8.4
Queue Length 50th (ft)	131	0	78	25	121	14	0
Queue Length 95th (ft)	201	0	136	35	180	84	62
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2580	1775	256	2421	628	691	720
Starvation Cap Reductn	856	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.09	0.44	0.22	0.31	0.37	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	824	155	104	482	0	0	0	0	197	3	444
Future Volume (vph)	0	824	155	104	482	0	0	0	0	197	3	444
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4964	1775	1668	3455					1698	1473	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4964	1775	1668	3455					1698	1473	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	896	168	113	524	0	0	0	0	214	3	483
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	190	206
Lane Group Flow (vph)	0	896	168	113	524	0	0	0	0	193	66	45
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		52.0	100.0	12.1	70.1					17.9	17.9	17.9
Effective Green, g (s)		52.0	100.0	12.1	70.1					17.9	17.9	17.9
Actuated g/C Ratio		0.52	1.00	0.12	0.70					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2581	1775	201	2421					303	263	271
v/s Ratio Prot		c0.18		c0.07	0.15					c0.11	0.04	0.03
v/s Ratio Perm			0.09									
v/c Ratio		0.35	0.09	0.56	0.22					0.64	0.25	0.17
Uniform Delay, d1		14.1	0.0	41.5	5.3					38.0	35.3	34.7
Progression Factor		0.87	1.00	1.50	0.50					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	3.5	0.2					4.3	0.5	0.3
Delay (s)		12.6	0.1	65.7	2.8					42.4	35.8	35.0
Level of Service		B	A	E	A					D	D	D
Approach Delay (s)		10.6			14.0			0.0			37.3	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

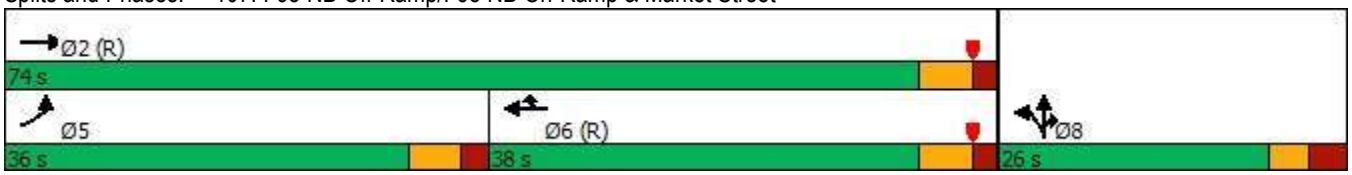
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	440	581	529	151	5	231
Future Volume (vph)	440	581	529	151	5	231
Lane Group Flow (vph)	478	632	575	164	67	251
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	26.0	26.0
Total Split (s)	36.0	74.0	38.0	38.0	26.0	26.0
Total Split (%)	36.0%	74.0%	38.0%	38.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.72	0.24	0.32	0.16	0.32	0.62
Control Delay	52.3	2.6	16.7	3.6	43.1	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	2.6	16.7	3.6	43.1	11.9
Queue Length 50th (ft)	169	22	104	0	41	0
Queue Length 95th (ft)	223	65	192	41	74	64
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	1005	2639	1808	997	359	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.24	0.32	0.16	0.19	0.48

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	440	581	0	0	529	151	57	5	231	0	0	0
Future Volume (vph)	440	581	0	0	529	151	57	5	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1798	1599			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1798	1599			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	478	632	0	0	575	164	62	5	251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	81	0	0	222	0	0	0
Lane Group Flow (vph)	478	632	0	0	575	83	0	67	29	0	0	0
Confl. Peds. (#/hr)	7		1	1		7			1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	19.8	76.4			50.6	50.6		11.6	11.6			
Effective Green, g (s)	19.8	76.4			50.6	50.6		11.6	11.6			
Actuated g/C Ratio	0.20	0.76			0.51	0.51		0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	663	2639			1808	916		208	185			
v/s Ratio Prot	c0.14	0.18			c0.16	0.05		c0.04	0.02			
v/s Ratio Perm												
v/c Ratio	0.72	0.24			0.32	0.09		0.32	0.16			
Uniform Delay, d1	37.5	3.4			14.5	12.8		40.6	39.8			
Progression Factor	1.24	0.62			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.7	0.2			0.5	0.2		1.2	0.5			
Delay (s)	50.2	2.3			15.0	13.0		41.8	40.3			
Level of Service	D	A			B	B		D	D			
Approach Delay (s)		22.9			14.6			40.7			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	27	9	36	21	3	15	10	17	3	15	7
Future Vol, veh/h	5	27	9	36	21	3	15	10	17	3	15	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	2	2	2	3	3	3	5	5	5
Mvmt Flow	5	29	10	39	23	3	16	11	18	3	16	8
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

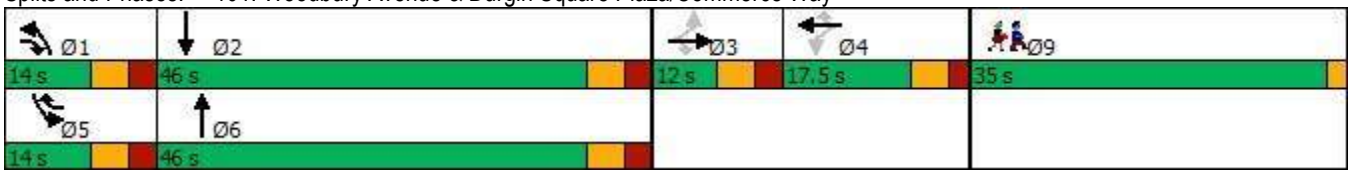
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	7.6	8.3	7.6	7.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	16%	0%	60%	17%	0%
Vol Thru, %	0%	37%	84%	0%	35%	83%	0%
Vol Right, %	0%	63%	0%	100%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	27	32	9	60	18	7
LT Vol	15	0	5	0	36	3	0
Through Vol	0	10	27	0	21	15	0
RT Vol	0	17	0	9	3	0	7
Lane Flow Rate	16	29	35	10	65	20	8
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.024	0.035	0.046	0.011	0.087	0.027	0.009
Departure Headway (Hd)	5.256	4.314	4.785	4.006	4.78	4.984	4.199
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	673	817	741	882	743	723	857
Service Time	3.053	2.11	2.562	1.782	2.853	2.684	1.899
HCM Lane V/C Ratio	0.024	0.035	0.047	0.011	0.087	0.028	0.009
HCM Control Delay	8.2	7.3	7.8	6.8	8.3	7.8	6.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0	0.3	0.1	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	6	7	11	6	1	48	18	399	249	558	
Future Volume (vph)	6	7	11	6	1	48	18	399	249	558	
Lane Group Flow (vph)	0	15	12	0	8	52	20	457	271	625	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		0.05	0.03		0.03	0.12	0.07	0.40	0.75	0.25	
Control Delay		30.3	0.2		30.1	1.2	29.1	16.0	38.5	11.9	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		30.3	0.2		30.1	1.2	29.1	16.0	38.5	11.9	
Queue Length 50th (ft)		2	0		1	0	3	26	36	0	
Queue Length 95th (ft)		33	0		22	4	40	192	#487	270	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		300	427		605	436	374	2925	361	2938	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.05	0.03		0.01	0.12	0.05	0.16	0.75	0.21	

Intersection Summary
Cycle Length: 124.5
Actuated Cycle Length: 47.3
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	7	11	6	1	48	18	399	21	249	558	17
Future Volume (vph)	6	7	11	6	1	48	18	399	21	249	558	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1538		1750	1553	1694	3359		1636	3371	
Flt Permitted		1.00	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1538		1827	1553	1694	3359		1636	3371	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	8	12	7	1	52	20	434	23	271	607	18
RTOR Reduction (vph)	0	0	11	0	0	43	0	3	0	0	1	0
Lane Group Flow (vph)	0	15	1	0	8	9	20	454	0	271	624	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		0.5	3.0		0.6	11.1	2.5	21.7		10.5	29.7	
Effective Green, g (s)		0.5	3.0		0.6	11.1	2.5	21.7		10.5	29.7	
Actuated g/C Ratio		0.01	0.05		0.01	0.18	0.04	0.35		0.17	0.48	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		14	74		17	279	68	1183		278	1625	
v/s Ratio Prot			0.00			0.01	0.01	0.14		c0.17	c0.19	
v/s Ratio Perm		c0.01	0.00		c0.00	0.00						
v/c Ratio		1.07	0.01		0.47	0.03	0.29	0.38		0.97	0.38	
Uniform Delay, d1		30.6	27.9		30.3	20.8	28.7	14.9		25.4	10.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		265.6	0.0		19.2	0.0	2.4	0.2		46.6	0.2	
Delay (s)		296.1	27.9		49.5	20.9	31.1	15.2		72.1	10.3	
Level of Service		F	C		D	C	C	B		E	B	
Approach Delay (s)		176.9			24.7			15.8			29.0	
Approach LOS		F			C			B			C	

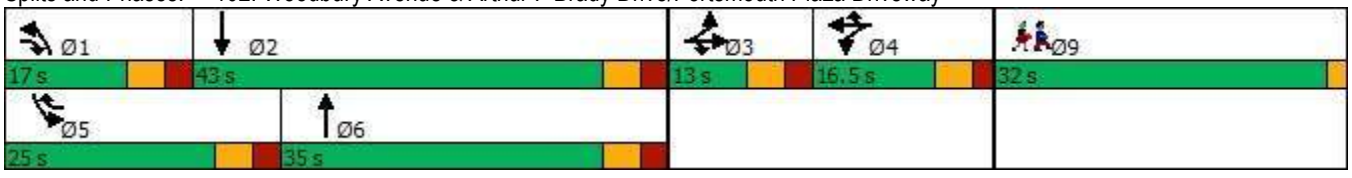
Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	61.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	31	110	20	35	145	341	43	496	
Future Volume (vph)	31	110	20	35	145	341	43	496	
Lane Group Flow (vph)	101	120	35	38	151	363	47	578	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	0.54	0.20	0.18	0.09	0.51	0.34	0.24	0.65	
Control Delay	48.6	3.0	38.8	0.5	40.7	22.4	38.4	28.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.6	3.0	38.8	0.5	40.7	22.4	38.4	28.2	
Queue Length 50th (ft)	39	0	13	0	55	57	17	107	
Queue Length 95th (ft)	#191	18	58	0	#246	163	71	260	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	188	598	296	639	294	1555	490	1959	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.54	0.20	0.12	0.06	0.51	0.23	0.10	0.30	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 69.3
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	31	110	12	20	35	145	341	8	43	496	36
Future Volume (vph)	62	31	110	12	20	35	145	341	8	43	496	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1693	1487		1690	1463	1678	3343		1620	3316	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1693	1487		1690	1463	1678	3343		1620	3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.96	0.96	0.96	0.92	0.92	0.92
Adj. Flow (vph)	67	34	120	13	22	38	151	355	8	47	539	39
RTOR Reduction (vph)	0	0	87	0	0	31	0	1	0	0	4	0
Lane Group Flow (vph)	0	101	33	0	35	7	151	362	0	47	574	0
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	5%	5%	5%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.7	19.9		4.3	12.7	12.2	22.2		8.4	18.4	
Effective Green, g (s)		7.7	19.9		4.3	12.7	12.2	22.2		8.4	18.4	
Actuated g/C Ratio		0.11	0.28		0.06	0.18	0.17	0.31		0.12	0.26	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		181	412		101	259	285	1035		189	850	
v/s Ratio Prot		c0.06	0.02		c0.02	0.00	c0.09	c0.11		0.03	c0.17	
v/s Ratio Perm												
v/c Ratio		0.56	0.08		0.35	0.03	0.53	0.35		0.25	0.67	
Uniform Delay, d1		30.4	19.1		32.4	24.4	27.1	19.2		28.8	24.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.7	0.1		2.1	0.0	1.8	0.2		0.7	2.1	
Delay (s)		34.1	19.2		34.4	24.4	28.9	19.4		29.5	26.1	
Level of Service		C	B		C	C	C	B		C	C	
Approach Delay (s)		26.0			29.2			22.2			26.3	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	71.7	Sum of lost time (s)	25.5
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

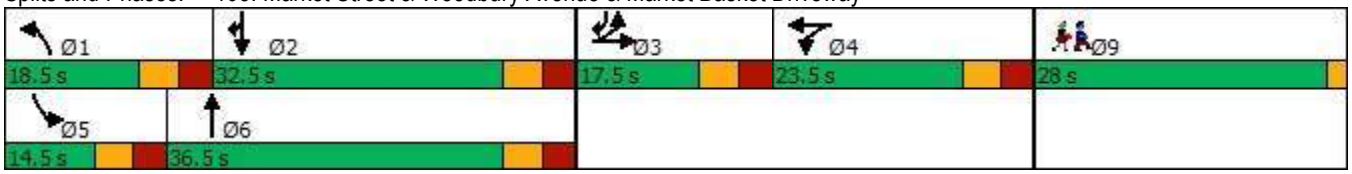
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	85	36	63	40	98	402	3	373	240	
Future Volume (vph)	85	36	63	40	98	402	3	373	240	
Lane Group Flow (vph)	91	101	68	51	107	538	3	405	261	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.23	0.42	0.29	0.21	0.43	0.38	0.02	0.44	0.28	
Control Delay	36.7	26.5	38.7	33.7	40.8	18.3	42.0	28.7	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	36.7	26.5	38.7	33.7	40.8	18.3	42.0	28.7	3.7	
Queue Length 50th (ft)	17	18	26	16	40	65	1	77	0	
Queue Length 95th (ft)	59	90	93	68	#144	234	12	192	53	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	587	329	496	515	320	1623	213	1389	931	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.16	0.31	0.14	0.10	0.33	0.33	0.01	0.29	0.28	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 70.6
Natural Cycle: 85
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



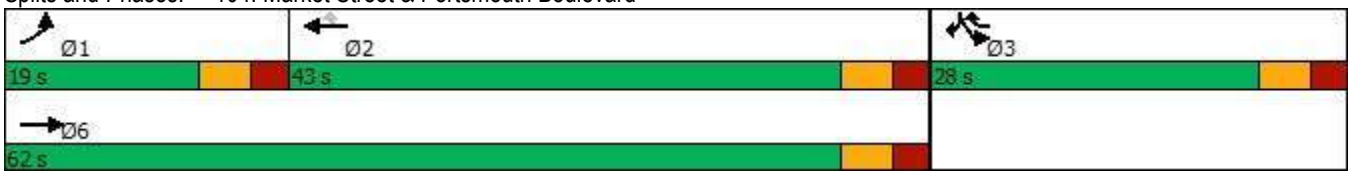
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	36	58	63	40	7	98	402	93	3	373	240
Future Volume (vph)	85	36	58	63	40	7	98	402	93	3	373	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		0.98	1.00	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1633		1834	1885		1678	3248		1648	3355	1501
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1633		1834	1885		1678	3248		1648	3355	1501
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	39	62	68	43	8	107	437	101	3	405	261
RTOR Reduction (vph)	0	47	0	0	6	0	0	13	0	0	0	132
Lane Group Flow (vph)	91	54	0	68	45	0	107	525	0	3	405	129
Confl. Peds. (#/hr)			2	2			1		1	1		1
Heavy Vehicles (%)	1%	1%	1%	5%	5%	5%	4%	4%	4%	4%	4%	4%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	8.5	8.5		6.8	6.8		8.0	30.8		0.8	23.6	38.6
Effective Green, g (s)	8.5	8.5		6.8	6.8		8.0	30.8		0.8	23.6	38.6
Actuated g/C Ratio	0.11	0.11		0.09	0.09		0.10	0.39		0.01	0.30	0.49
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	365	177		159	164		172	1282		16	1015	742
v/s Ratio Prot	0.03	c0.03		c0.04	0.02		c0.06	c0.16		0.00	0.12	0.09
v/s Ratio Perm												
v/c Ratio	0.25	0.30		0.43	0.27		0.62	0.41		0.19	0.40	0.17
Uniform Delay, d1	31.8	32.0		33.8	33.3		33.6	17.0		38.3	21.6	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.0		1.8	0.9		6.8	0.2		5.6	0.3	0.1
Delay (s)	32.2	33.0		35.6	34.2		40.4	17.2		43.9	21.8	11.0
Level of Service	C	C		D	C		D	B		D	C	B
Approach Delay (s)		32.6			35.0			21.1			17.7	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	436	502	272	103	91
Future Volume (vph)	58	436	502	272	103	91
Lane Group Flow (vph)	63	474	546	296	112	99
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.21	0.27	0.45	0.30	0.19	0.27
Control Delay	23.8	5.6	13.6	1.5	21.4	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	5.6	13.6	1.5	21.4	8.6
Queue Length 50th (ft)	15	26	63	0	13	0
Queue Length 95th (ft)	61	52	118	19	45	39
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	542	3186	2737	1320	1921	957
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.15	0.20	0.22	0.06	0.10

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 45.8
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	436	502	272	103	91
Future Volume (vph)	58	436	502	272	103	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1678	3355	3388	1547	3255	1553
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1678	3355	3388	1547	3255	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	474	546	296	112	99
RTOR Reduction (vph)	0	0	0	140	0	81
Lane Group Flow (vph)	63	474	546	156	112	18
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	4%	4%	3%	3%	4%	4%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	4.3	26.6	16.3	24.8	8.5	8.5
Effective Green, g (s)	4.3	26.6	16.3	24.8	8.5	8.5
Actuated g/C Ratio	0.09	0.56	0.35	0.53	0.18	0.18
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	153	1894	1172	1011	587	280
v/s Ratio Prot	0.04	c0.14	c0.16	c0.03	0.03	0.01
v/s Ratio Perm				0.07		
v/c Ratio	0.41	0.25	0.47	0.15	0.19	0.06
Uniform Delay, d1	20.2	5.2	12.0	5.7	16.4	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	0.1	0.3	0.1	0.2	0.1
Delay (s)	22.0	5.3	12.3	5.8	16.5	16.1
Level of Service	C	A	B	A	B	B
Approach Delay (s)		7.2	10.0		16.3	
Approach LOS		A	B		B	

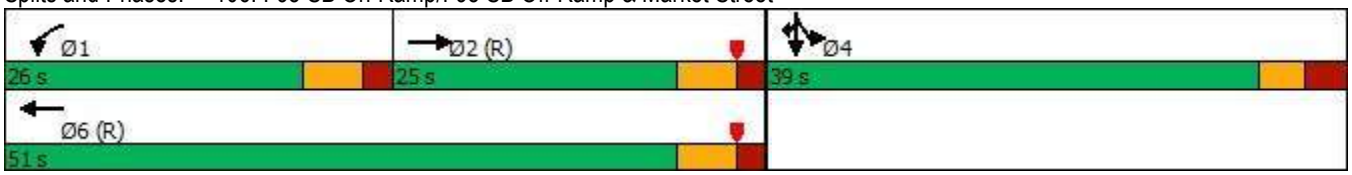
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	483	126	95	487	211	1	322
Future Volume (vph)	483	126	95	487	211	1	322
Lane Group Flow (vph)	514	134	103	529	202	189	189
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	25.0		26.0	51.0	39.0	39.0	39.0
Total Split (%)	27.8%		28.9%	56.7%	43.3%	43.3%	43.3%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.21	0.08	0.52	0.23	0.65	0.47	0.44
Control Delay	14.9	0.1	46.4	9.2	42.8	11.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	0.1	46.4	9.2	42.8	11.0	7.7
Queue Length 50th (ft)	67	0	0	31	113	14	0
Queue Length 95th (ft)	112	0	96	144	169	70	51
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2483	1724	356	2252	604	629	660
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	109	0	5	6
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.08	0.29	0.25	0.33	0.30	0.29

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 81 (90%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	483	126	95	487	0	0	0	0	211	1	322
Future Volume (vph)	0	483	126	95	487	0	0	0	0	211	1	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.87	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4821	1724	1604	3323					1649	1440	1475
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4821	1724	1604	3323					1649	1440	1475
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	514	134	103	529	0	0	0	0	229	1	350
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	131	153
Lane Group Flow (vph)	0	514	134	103	529	0	0	0	0	202	58	36
Confl. Peds. (#/hr)	5					5						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	2%	2%	2%	4%	4%	4%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		45.2	90.0	9.8	61.0					17.0	17.0	17.0
Effective Green, g (s)		45.2	90.0	9.8	61.0					17.0	17.0	17.0
Actuated g/C Ratio		0.50	1.00	0.11	0.68					0.19	0.19	0.19
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2421	1724	174	2252					311	272	278
v/s Ratio Prot		0.11		c0.06	c0.16					c0.12	0.04	0.02
v/s Ratio Perm			0.08									
v/c Ratio		0.21	0.08	0.59	0.23					0.65	0.21	0.13
Uniform Delay, d1		12.5	0.0	38.2	5.6					33.7	30.9	30.3
Progression Factor		1.01	1.00	1.04	1.41					1.00	1.00	1.00
Incremental Delay, d2		0.2	0.1	5.2	0.2					4.6	0.4	0.2
Delay (s)		12.9	0.1	44.7	8.1					38.4	31.3	30.6
Level of Service		B	A	D	A					D	C	C
Approach Delay (s)		10.2			14.1			0.0			33.5	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	48.8%	ICU Level of Service	A	
Analysis Period (min)	15			

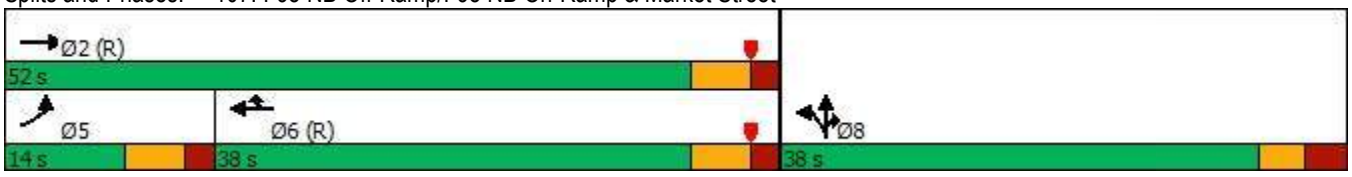
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	157	537	368	59	0	383
Future Volume (vph)	157	537	368	59	0	383
Lane Group Flow (vph)	171	584	400	64	228	407
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	32.0	32.0
Total Split (s)	14.0	52.0	38.0	38.0	38.0	38.0
Total Split (%)	15.6%	57.8%	42.2%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.47	0.27	0.25	0.07	0.60	0.76
Control Delay	30.8	4.1	16.7	1.4	37.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.8	4.1	16.7	1.4	37.2	21.8
Queue Length 50th (ft)	28	5	67	0	119	85
Queue Length 95th (ft)	43	15	129	9	164	166
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	371	2178	1634	885	622	716
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.27	0.24	0.07	0.37	0.57

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 30 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	537	0	0	368	59	214	0	383	0	0	0
Future Volume (vph)	157	537	0	0	368	59	214	0	383	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3255	3355			3438	1743		1752	1568			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3255	3355			3438	1743		1752	1568			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	171	584	0	0	400	64	228	0	407	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	192	0	0	0
Lane Group Flow (vph)	171	584	0	0	400	30	0	228	215	0	0	0
Confl. Peds. (#/hr)	4					4						
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	4%	4%	4%	5%	5%	5%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.1	58.4			42.3	42.3		19.6	19.6			
Effective Green, g (s)	10.1	58.4			42.3	42.3		19.6	19.6			
Actuated g/C Ratio	0.11	0.65			0.47	0.47		0.22	0.22			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	365	2177			1615	819		381	341			
v/s Ratio Prot	c0.05	c0.17			0.12	0.02		0.13	c0.14			
v/s Ratio Perm												
v/c Ratio	0.47	0.27			0.25	0.04		0.60	0.63			
Uniform Delay, d1	37.4	6.7			14.3	12.9		31.7	31.9			
Progression Factor	0.72	0.49			1.00	1.00		1.00	1.00			
Incremental Delay, d2	0.9	0.3			0.4	0.1		3.0	4.1			
Delay (s)	27.8	3.6			14.7	12.9		34.6	36.0			
Level of Service	C	A			B	B		C	D			
Approach Delay (s)		9.1			14.4			35.5			0.0	
Approach LOS		A			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	9	10	93	29	0	196	106	31	0	86	7
Future Vol, veh/h	24	9	10	93	29	0	196	106	31	0	86	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	6	6	3	3	3	1	1	1	0	0	0
Mvmt Flow	26	10	11	101	32	0	213	115	34	0	93	8
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	9.2	10.6	10.3	9
HCM LOS	A	B	B	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	73%	0%	76%	0%	0%
Vol Thru, %	0%	77%	27%	0%	24%	100%	0%
Vol Right, %	0%	23%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	196	137	33	10	122	86	7
LT Vol	196	0	24	0	93	0	0
Through Vol	0	106	9	0	29	86	0
RT Vol	0	31	0	10	0	0	7
Lane Flow Rate	213	149	36	11	133	93	8
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.334	0.206	0.063	0.016	0.217	0.141	0.01
Departure Headway (Hd)	5.649	4.987	6.303	5.23	5.888	5.416	4.71
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	716	565	679	607	658	754
Service Time	3.401	2.738	4.08	3.006	3.951	3.184	2.478
HCM Lane V/C Ratio	0.335	0.208	0.064	0.016	0.219	0.141	0.011
HCM Control Delay	11.2	9	9.5	8.1	10.6	9.1	7.5
HCM Lane LOS	B	A	A	A	B	A	A
HCM 95th-tile Q	1.5	0.8	0.2	0	0.8	0.5	0

Intersection	
Int Delay, s/veh	6.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	76	0	0	22	0	0
Future Vol, veh/h	76	0	0	22	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	83	0	0	24	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	13	12	0	0	24	0
Stage 1	12	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	1006	1069	-	-	1591	-
Stage 1	1011	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	1006	1069	-	-	1591	-
Mov Cap-2 Maneuver	1006	-	-	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1006	1591	-
HCM Lane V/C Ratio	-	-	0.082	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	7.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	3	0	0	8
Future Vol, veh/h	0	0	3	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	3	0	0	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	7	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	6	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1014	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1017	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1012	1084
Mov Cap-2 Maneuver	-	-	-	-	1012	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1015	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

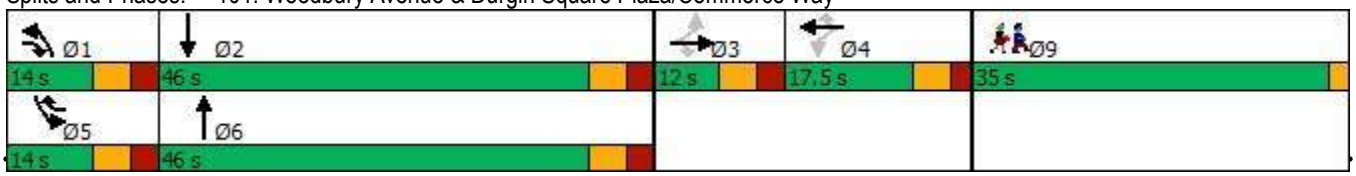
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.008	-	-	0.002	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	33	34	106	44	26	197	113	705	154	888	
Future Volume (vph)	33	34	106	44	26	197	113	705	154	888	
Lane Group Flow (vph)	0	73	115	0	76	214	123	769	166	995	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.06	0.29		0.44	0.39	0.67	0.60	0.94	0.78	
Control Delay		172.8	6.7		48.8	5.6	60.8	25.4	96.4	30.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		172.8	6.7		48.8	5.6	60.8	25.4	96.4	30.1	
Queue Length 50th (ft)		~41	0		34	0	59	150	82	212	
Queue Length 95th (ft)		#190	28		#114	41	#240	356	#332	#523	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		69	390		227	549	184	1840	177	1831	
Starvation Cap Reductn		0	0		0	0	0	44	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.06	0.29		0.33	0.39	0.67	0.43	0.94	0.54	

Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 81.6
Natural Cycle: 120
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	34	106	44	26	197	113	705	3	154	888	37
Future Volume (vph)	33	34	106	44	26	197	113	705	3	154	888	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.98	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1836	1590		1802	1583	1728	3453		1668	3431	
Flt Permitted		0.46	1.00		0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		864	1590		1422	1583	1728	3453		1668	3431	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93
Adj. Flow (vph)	36	37	115	48	28	214	123	766	3	166	955	40
RTOR Reduction (vph)	0	0	94	0	0	171	0	0	0	0	3	0
Lane Group Flow (vph)	0	73	21	0	76	43	123	769	0	166	992	0
Confl. Peds. (#/hr)			1	1			1					1
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.5	15.2		7.9	16.6	8.7	30.1		8.7	30.1	
Effective Green, g (s)		6.5	15.2		7.9	16.6	8.7	30.1		8.7	30.1	
Actuated g/C Ratio		0.08	0.18		0.10	0.20	0.10	0.36		0.10	0.36	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		67	291		135	316	181	1252		174	1244	
v/s Ratio Prot			0.01			0.01	0.07	0.22		c0.10	c0.29	
v/s Ratio Perm		c0.08	0.01		c0.05	0.01						
v/c Ratio		1.09	0.07		0.56	0.14	0.68	0.61		0.95	0.80	
Uniform Delay, d1		38.2	28.1		35.9	27.3	35.8	21.7		37.0	23.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		136.7	0.1		5.3	0.2	9.7	0.9		54.4	3.7	
Delay (s)		174.9	28.2		41.2	27.5	45.5	22.6		91.4	27.4	
Level of Service		F	C		D	C	D	C		F	C	
Approach Delay (s)		85.2			31.1			25.8			36.5	
Approach LOS		F			C			C			D	

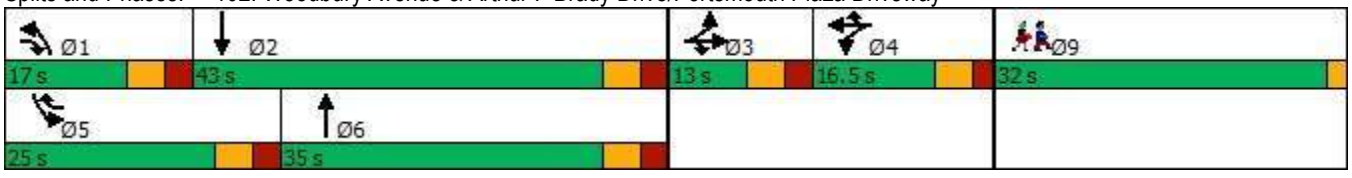
Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	83.0	Sum of lost time (s)	25.5
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	47	215	54	123	196	623	100	838	
Future Volume (vph)	47	215	54	123	196	623	100	838	
Lane Group Flow (vph)	133	234	131	134	202	673	109	1020	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	1.00	0.48	0.65	0.25	0.98	0.52	0.53	0.79	
Control Delay	125.1	6.3	58.5	4.7	100.6	27.4	49.8	32.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	
Total Delay	125.1	6.3	58.5	4.7	100.6	27.4	49.8	32.7	
Queue Length 50th (ft)	75	0	70	0	113	141	58	245	
Queue Length 95th (ft)	#264	36	#215	28	#356	334	138	#561	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	133	488	207	643	207	1283	346	1378	
Starvation Cap Reductn	0	0	0	0	0	0	0	46	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.00	0.48	0.63	0.21	0.98	0.52	0.32	0.77	

Intersection Summary
Cycle Length: 121.5
Actuated Cycle Length: 93.3
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	47	215	66	54	123	196	623	30	100	838	100
Future Volume (vph)	75	47	215	66	54	123	196	623	30	100	838	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747	1531		1726	1507	1728	3431		1668	3392	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1747	1531		1726	1507	1728	3431		1668	3392	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	82	51	234	72	59	134	202	642	31	109	911	109
RTOR Reduction (vph)	0	0	189	0	0	102	0	3	0	0	7	0
Lane Group Flow (vph)	0	133	45	0	131	32	202	670	0	109	1013	0
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.1	18.3		10.9	22.5	11.2	34.9		11.6	35.3	
Effective Green, g (s)		7.1	18.3		10.9	22.5	11.2	34.9		11.6	35.3	
Actuated g/C Ratio		0.08	0.19		0.12	0.24	0.12	0.37		0.12	0.37	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		131	296		198	358	204	1265		204	1265	
v/s Ratio Prot		c0.08	0.03		c0.08	0.02	c0.12	0.20		0.07	c0.30	
v/s Ratio Perm												
v/c Ratio		1.02	0.15		0.66	0.09	0.99	0.53		0.53	0.80	
Uniform Delay, d1		43.8	31.7		40.1	28.1	41.6	23.4		39.0	26.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		82.7	0.2		8.0	0.1	60.0	0.4		2.7	3.7	
Delay (s)		126.5	31.9		48.1	28.2	101.7	23.8		41.6	30.2	
Level of Service		F	C		D	C	F	C		D	C	
Approach Delay (s)		66.2			38.0			41.8			31.3	
Approach LOS		E			D			D			C	

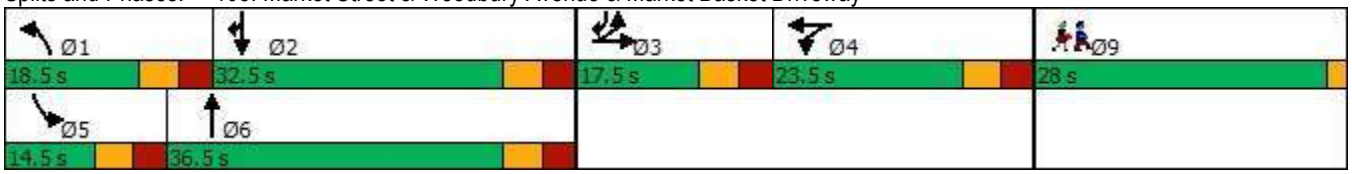
Intersection Summary			
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	94.6	Sum of lost time (s)	25.5
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	194	68	190	77	103	638	9	752	356	
Future Volume (vph)	194	68	190	77	103	638	9	752	356	
Lane Group Flow (vph)	211	172	204	101	108	826	10	817	387	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.54	0.74	0.68	0.32	0.56	0.55	0.08	0.83	0.42	
Control Delay	46.8	51.1	51.7	37.6	53.9	23.8	48.1	41.7	4.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	46.8	51.1	51.7	37.6	53.9	23.8	48.1	41.7	4.0	
Queue Length 50th (ft)	58	70	108	46	58	154	5	224	2	
Queue Length 95th (ft)	123	#233	#262	120	#152	#450	26	#496	69	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	403	239	355	369	226	1496	151	983	935	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.52	0.72	0.57	0.27	0.48	0.55	0.07	0.83	0.41	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 93.1
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



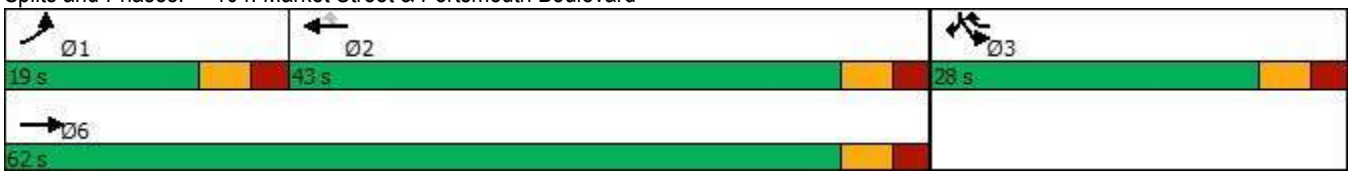
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	68	90	190	77	17	103	638	146	9	752	356
Future Volume (vph)	194	68	90	190	77	17	103	638	146	9	752	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1663		1906	1948		1728	3345		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1663		1906	1948		1728	3345		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	211	74	98	204	83	18	108	672	154	10	817	387
RTOR Reduction (vph)	0	39	0	0	7	0	0	13	0	0	0	192
Lane Group Flow (vph)	211	133	0	204	94	0	108	813	0	10	817	195
Confl. Bikes (#/hr)						1			1			2
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.9	10.9		14.5	14.5		10.4	41.3		1.2	32.1	49.5
Effective Green, g (s)	10.9	10.9		14.5	14.5		10.4	41.3		1.2	32.1	49.5
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.10	0.41		0.01	0.32	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	365	181		276	283		180	1384		20	1111	766
v/s Ratio Prot	0.06	c0.08		c0.11	0.05		c0.06	c0.24		0.01	c0.24	0.13
v/s Ratio Perm												
v/c Ratio	0.58	0.73		0.74	0.33		0.60	0.59		0.50	0.74	0.25
Uniform Delay, d1	42.3	43.0		40.8	38.3		42.7	22.7		49.0	30.1	14.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	14.3		9.9	0.7		5.3	0.6		18.3	2.6	0.2
Delay (s)	44.5	57.3		50.8	39.0		48.0	23.3		67.3	32.6	14.7
Level of Service	D	E		D	D		D	C		E	C	B
Approach Delay (s)		50.2			46.9			26.2			27.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	28.0
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	959	774	103	239	113
Future Volume (vph)	73	959	774	103	239	113
Lane Group Flow (vph)	79	1042	832	111	260	123
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.29	0.52	0.64	0.12	0.40	0.30
Control Delay	29.2	7.9	18.1	1.3	24.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	7.9	18.1	1.3	24.9	8.0
Queue Length 50th (ft)	24	87	121	0	40	0
Queue Length 95th (ft)	76	162	221	13	93	42
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	434	3151	2362	1209	1424	750
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.33	0.35	0.09	0.18	0.16

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 56.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	959	774	103	239	113
Future Volume (vph)	73	959	774	103	239	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1576	3351	1599
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1576	3351	1599
Peak-hour factor, PHF	0.92	0.92	0.93	0.93	0.92	0.92
Adj. Flow (vph)	79	1042	832	111	260	123
RTOR Reduction (vph)	0	0	0	48	0	99
Lane Group Flow (vph)	79	1042	832	63	260	24
Confl. Peds. (#/hr)	1			1		
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	6.7	34.2	21.5	32.5	11.0	11.0
Effective Green, g (s)	6.7	34.2	21.5	32.5	11.0	11.0
Actuated g/C Ratio	0.12	0.60	0.38	0.57	0.19	0.19
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	202	2065	1298	1060	644	307
v/s Ratio Prot	0.05	c0.30	c0.24	0.01	c0.08	0.01
v/s Ratio Perm				0.03		
v/c Ratio	0.39	0.50	0.64	0.06	0.40	0.08
Uniform Delay, d1	23.4	6.6	14.7	5.5	20.2	18.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	1.1	0.0	0.4	0.1
Delay (s)	24.6	6.8	15.8	5.5	20.6	19.0
Level of Service	C	A	B	A	C	B
Approach Delay (s)		8.1	14.6		20.1	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	57.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

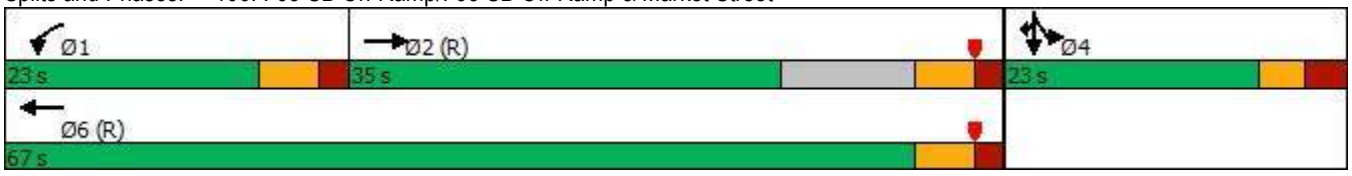
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	1002	234	246	584	259	1	338
Future Volume (vph)	1002	234	246	584	259	1	338
Lane Group Flow (vph)	1066	249	267	635	226	215	209
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	35.0		23.0	67.0	23.0	23.0	23.0
Total Split (%)	38.9%		25.6%	74.4%	25.6%	25.6%	25.6%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.53	0.14	0.80	0.27	0.70	0.54	0.46
Control Delay	19.9	0.2	39.0	0.6	45.6	17.6	7.9
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.1	0.1
Total Delay	20.1	0.2	39.0	0.6	45.6	17.6	7.9
Queue Length 50th (ft)	182	0	66	1	125	41	0
Queue Length 95th (ft)	219	0	#261	1	201	113	57
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2177	1757	344	2400	352	420	480
Starvation Cap Reductn	387	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	176	0	6	10
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.14	0.78	0.29	0.64	0.52	0.44

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 60
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1002	234	246	584	0	0	0	0	259	1	338
Future Volume (vph)	0	1002	234	246	584	0	0	0	0	259	1	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.89	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (prot)		4916	1757	1668	3455					1698	1504	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.99	1.00
Satd. Flow (perm)		4916	1757	1668	3455					1698	1504	1519
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1066	249	267	635	0	0	0	0	282	1	367
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	111	169
Lane Group Flow (vph)	0	1066	249	267	635	0	0	0	0	226	104	40
Confl. Peds. (#/hr)	8					8						
Confl. Bikes (#/hr)			3			1						
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		36.9	90.0	18.0	60.9					17.1	17.1	17.1
Effective Green, g (s)		36.9	90.0	18.0	60.9					17.1	17.1	17.1
Actuated g/C Ratio		0.41	1.00	0.20	0.68					0.19	0.19	0.19
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2015	1757	333	2337					322	285	288
v/s Ratio Prot		c0.22		c0.16	0.18					c0.13	0.07	0.03
v/s Ratio Perm			0.14									
v/c Ratio		0.53	0.14	0.80	0.27					0.70	0.37	0.14
Uniform Delay, d1		20.0	0.0	34.3	5.8					34.1	31.7	30.3
Progression Factor		0.90	1.00	0.59	0.06					1.00	1.00	1.00
Incremental Delay, d2		0.9	0.2	11.9	0.3					6.8	0.8	0.2
Delay (s)		18.9	0.2	32.0	0.6					40.8	32.5	30.5
Level of Service		B	A	C	A					D	C	C
Approach Delay (s)		15.4			9.9			0.0			34.8	
Approach LOS		B			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			

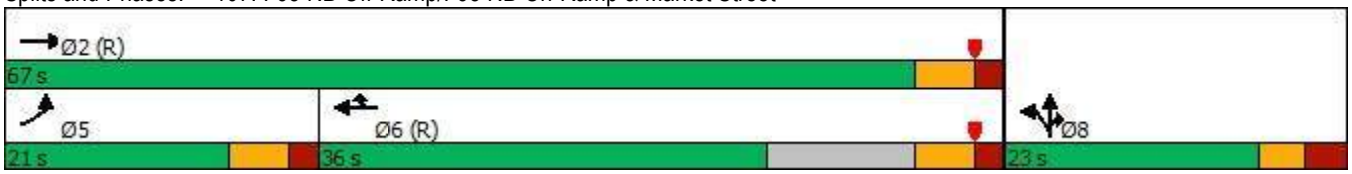
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	553	708	724	249	1	195
Future Volume (vph)	553	708	724	249	1	195
Lane Group Flow (vph)	588	753	770	265	116	212
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	23.0	23.0
Total Split (s)	21.0	67.0	36.0	36.0	23.0	23.0
Total Split (%)	23.3%	74.4%	40.0%	40.0%	25.6%	25.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.68	0.30	0.53	0.30	0.48	0.53
Control Delay	28.5	11.3	22.2	3.4	41.9	10.2
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	28.5	11.8	22.2	3.4	41.9	10.2
Queue Length 50th (ft)	171	174	170	0	62	0
Queue Length 95th (ft)	#246	245	231	46	108	58
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	860	2524	1588	952	335	470
Starvation Cap Reductn	0	1239	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.59	0.48	0.28	0.35	0.45

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 65
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	708	0	0	724	249	106	1	195	0	0	0
Future Volume (vph)	553	708	0	0	724	249	106	1	195	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1775	1583			
Flt Permitted	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1775	1583			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	588	753	0	0	770	265	115	1	212	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	157	0	0	183	0	0	0
Lane Group Flow (vph)	588	753	0	0	770	108	0	116	29	0	0	0
Confl. Peds. (#/hr)	2					2						
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	23.1	65.8			36.7	36.7		12.2	12.2			
Effective Green, g (s)	23.1	65.8			36.7	36.7		12.2	12.2			
Actuated g/C Ratio	0.26	0.73			0.41	0.41		0.14	0.14			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	860	2525			1457	738		240	214			
v/s Ratio Prot	c0.18	0.22			c0.22	0.06		c0.07	0.02			
v/s Ratio Perm												
v/c Ratio	0.68	0.30			0.53	0.15		0.48	0.13			
Uniform Delay, d1	30.2	4.2			20.1	16.8		36.0	34.3			
Progression Factor	0.79	2.41			1.00	1.00		1.00	1.00			
Incremental Delay, d2	2.0	0.3			1.4	0.4		2.1	0.4			
Delay (s)	25.7	10.3			21.5	17.2		38.1	34.6			
Level of Service	C	B			C	B		D	C			
Approach Delay (s)		17.1			20.4			35.9			0.0	
Approach LOS		B			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	50	168	39	24	1	19	65	64	0	123	28
Future Vol, veh/h	24	50	168	39	24	1	19	65	64	0	123	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	0	0	0	4	4	4	1	1	1
Mvmt Flow	26	54	183	42	26	1	21	71	70	0	134	30
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	9.1	9.6	9.4	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	32%	0%	61%	0%	0%
Vol Thru, %	0%	50%	68%	0%	38%	100%	0%
Vol Right, %	0%	50%	0%	100%	2%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	19	129	74	168	64	123	28
LT Vol	19	0	24	0	39	0	0
Through Vol	0	65	50	0	24	123	0
RT Vol	0	64	0	168	1	0	28
Lane Flow Rate	21	140	80	183	70	134	30
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.035	0.204	0.125	0.24	0.111	0.205	0.041
Departure Headway (Hd)	6.082	5.227	5.592	4.725	5.769	5.521	4.814
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	585	681	638	754	616	646	737
Service Time	3.854	2.998	3.355	2.488	3.852	3.291	2.585
HCM Lane V/C Ratio	0.036	0.206	0.125	0.243	0.114	0.207	0.041
HCM Control Delay	9.1	9.4	9.2	9	9.6	9.7	7.8
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.8	0.4	0.9	0.4	0.8	0.1

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	0	0	58	0	0
Future Vol, veh/h	38	0	0	58	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	0	0	63	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	33	32	0	0	63	0
Stage 1	32	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	980	1042	-	-	1540	-
Stage 1	991	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	1042	-	-	1540	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	980	1540	-
HCM Lane V/C Ratio	-	-	0.042	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	7	0	0	4
Future Vol, veh/h	0	0	7	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	8	0	0	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	17	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	16	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1001	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	996	1084
Mov Cap-2 Maneuver	-	-	-	-	996	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1002	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.004	-	-	0.005	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations											
Traffic Volume (vph)	48	39	124	7	19	81	132	759	150	831	
Future Volume (vph)	48	39	124	7	19	81	132	759	150	831	
Lane Group Flow (vph)	0	94	135	0	29	88	143	828	163	960	
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA	Prot	NA	
Protected Phases		3	1		4	5	1	6	5	2	9
Permitted Phases	3		3	4		4					
Detector Phase	3	3	1	4	4	5	1	6	5	2	
Switch Phase											
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0	12.0	12.0	11.5	11.5	12.0	12.0	16.0	12.0	16.0	35.0
Total Split (s)	12.0	12.0	14.0	17.5	17.5	14.0	14.0	46.0	14.0	46.0	35.0
Total Split (%)	9.6%	9.6%	11.2%	14.1%	14.1%	11.2%	11.2%	36.9%	11.2%	36.9%	28%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5	2.5	2.5	2.0	2.0	2.5	2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0		5.5	6.0	6.0	6.0	6.0	6.0	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	None	Min	None	Min	None
v/c Ratio		1.16	0.30		0.15	0.25	0.67	0.62	0.79	0.73	
Control Delay		188.2	6.0		40.9	6.3	53.4	22.8	64.2	25.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		188.2	6.0		40.9	6.3	53.4	22.8	64.2	25.1	
Queue Length 50th (ft)		~38	0		9	0	49	103	56	126	
Queue Length 95th (ft)		#232	29		53	25	#279	382	#321	460	
Internal Link Dist (ft)		286			401			403		253	
Turn Bay Length (ft)			100			125	100		150		
Base Capacity (vph)		81	451		325	353	215	2150	207	2135	
Starvation Cap Reductn		0	0		0	0	0	43	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		1.16	0.30		0.09	0.25	0.67	0.39	0.79	0.45	

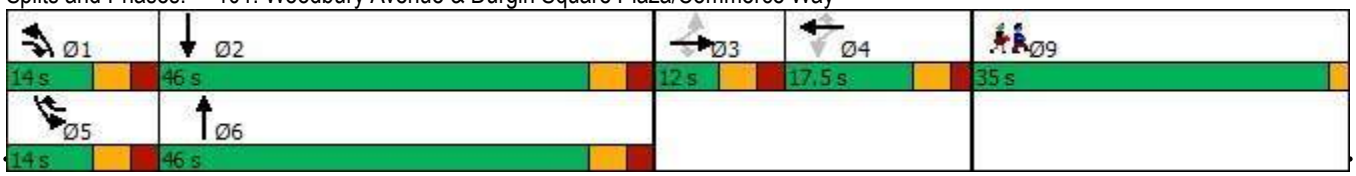
Intersection Summary

Cycle Length: 124.5
Actuated Cycle Length: 71.8
Natural Cycle: 110
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 101: Woodbury Avenue & Durgin Square Plaza/Commerce Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	39	124	7	19	81	132	759	3	150	831	52
Future Volume (vph)	48	39	124	7	19	81	132	759	3	150	831	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	11	11	12	10	11	12
Total Lost time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1831	1589		1812	1568	1728	3453		1668	3424	
Flt Permitted		0.46	1.00		0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		872	1589		1736	1568	1728	3453		1668	3424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	42	135	8	21	88	143	825	3	163	903	57
RTOR Reduction (vph)	0	0	107	0	0	74	0	0	0	0	3	0
Lane Group Flow (vph)	0	94	28	0	29	14	143	828	0	163	957	0
Confl. Peds. (#/hr)			2	2					2	2		
Confl. Bikes (#/hr)									3			
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Turn Type	Perm	NA	pm+ov	Perm	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		3	1		4	5	1	6		5	2	
Permitted Phases	3		3	4		4						
Actuated Green, G (s)		6.7	15.6		2.7	11.6	8.9	27.6		8.9	27.6	
Effective Green, g (s)		6.7	15.6		2.7	11.6	8.9	27.6		8.9	27.6	
Actuated g/C Ratio		0.09	0.21		0.04	0.15	0.12	0.37		0.12	0.37	
Clearance Time (s)		6.0	6.0		5.5	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		77	329		62	241	204	1265		197	1255	
v/s Ratio Prot			0.01			0.01	0.08	0.24		c0.10	c0.28	
v/s Ratio Perm		c0.11	0.01		c0.02	0.00						
v/c Ratio		1.22	0.09		0.47	0.06	0.70	0.65		0.83	0.76	
Uniform Delay, d1		34.3	24.1		35.6	27.2	31.9	19.9		32.4	21.0	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		173.4	0.1		5.5	0.1	10.4	1.2		23.9	2.8	
Delay (s)		207.7	24.2		41.1	27.3	42.3	21.1		56.3	23.8	
Level of Service		F	C		D	C	D	C		E	C	
Approach Delay (s)		99.5			30.7			24.2			28.5	
Approach LOS		F			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	25.5
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT	Ø9
Lane Configurations									
Traffic Volume (vph)	71	232	64	144	190	655	139	749	
Future Volume (vph)	71	232	64	144	190	655	139	749	
Lane Group Flow (vph)	180	252	152	157	207	754	151	894	
Turn Type	NA	pt+ov	NA	pt+ov	Prot	NA	Prot	NA	
Protected Phases	3	1 3	4	4 5	1	6	5	2	9
Permitted Phases									
Detector Phase	3	1 3	4	4 5	1	6	5	2	
Switch Phase									
Minimum Initial (s)	6.0		6.0		6.0	10.0	6.0	10.0	7.0
Minimum Split (s)	12.0		11.5		12.0	16.0	12.0	16.0	32.0
Total Split (s)	13.0		16.5		17.0	35.0	25.0	43.0	32.0
Total Split (%)	10.7%		13.6%		14.0%	28.8%	20.6%	35.4%	26%
Yellow Time (s)	3.5		3.5		3.5	3.5	3.5	3.5	2.0
All-Red Time (s)	2.5		2.0		2.5	2.5	2.5	2.5	0.0
Lost Time Adjust (s)	0.0		0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0		5.5		6.0	6.0	6.0	6.0	
Lead/Lag	Lead		Lag		Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes		Yes		Yes	Yes	Yes	Yes	
Recall Mode	None		None		None	Min	Min	Min	None
v/c Ratio	1.23	0.48	0.68	0.25	0.92	0.72	0.60	0.80	
Control Delay	188.4	6.5	56.2	4.1	84.8	33.4	47.7	33.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	188.4	6.5	56.2	4.1	84.8	33.4	47.7	33.9	
Queue Length 50th (ft)	~109	2	73	0	103	170	70	204	
Queue Length 95th (ft)	#358	41	#258	30	#365	#420	183	#431	
Internal Link Dist (ft)	352		79			702		403	
Turn Bay Length (ft)		100			300		250		
Base Capacity (vph)	146	520	224	719	224	1176	374	1493	
Starvation Cap Reductn	0	0	0	0	0	0	0	20	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	1.23	0.48	0.68	0.22	0.92	0.64	0.40	0.61	

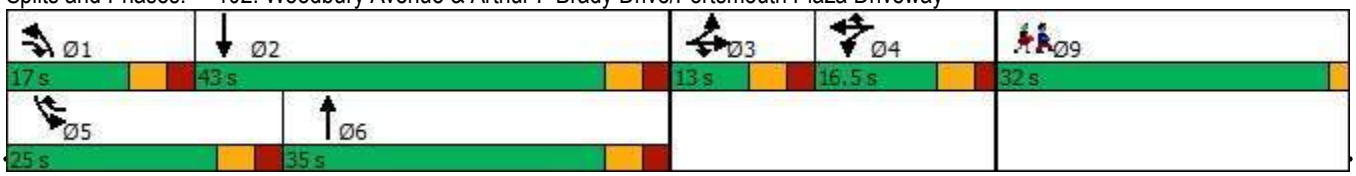
Intersection Summary

Cycle Length: 121.5
Actuated Cycle Length: 87.4
Natural Cycle: 125
Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 102: Woodbury Avenue & Arthur F Brady Drive/Portsmouth Plaza Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	71	232	75	64	144	190	655	39	139	749	74
Future Volume (vph)	95	71	232	75	64	144	190	655	39	139	749	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	10	10	10	11	11	11	10	11	11
Total Lost time (s)		6.0	6.0		5.5	5.5	6.0	6.0		6.0	6.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1768	1546		1727	1507	1728	3421		1668	3402	
Flt Permitted		0.97	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1768	1546		1727	1507	1728	3421		1668	3402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	77	252	82	70	157	207	712	42	151	814	80
RTOR Reduction (vph)	0	0	192	0	0	113	0	3	0	0	6	0
Lane Group Flow (vph)	0	180	60	0	152	44	207	751	0	151	888	0
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)									5			
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA	pt+ov	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	3	3	1 3	4	4	4 5	1	6		5	2	
Permitted Phases												
Actuated Green, G (s)		7.2	18.6		11.4	24.6	11.4	26.8		13.2	28.6	
Effective Green, g (s)		7.2	18.6		11.4	24.6	11.4	26.8		13.2	28.6	
Actuated g/C Ratio		0.08	0.21		0.13	0.28	0.13	0.30		0.15	0.32	
Clearance Time (s)		6.0			5.5		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		144	325		222	419	222	1037		249	1100	
v/s Ratio Prot		c0.10	0.04		c0.09	0.03	c0.12	0.22		0.09	c0.26	
v/s Ratio Perm												
v/c Ratio		1.25	0.19		0.68	0.10	0.93	0.72		0.61	0.81	
Uniform Delay, d1		40.6	28.7		36.8	23.7	38.1	27.5		35.2	27.4	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		157.2	0.3		8.4	0.1	41.8	2.5		4.1	4.4	
Delay (s)		197.8	28.9		45.2	23.8	79.9	30.0		39.3	31.8	
Level of Service		F	C		D	C	E	C		D	C	
Approach Delay (s)		99.3			34.3			40.8			32.9	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	25.5
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

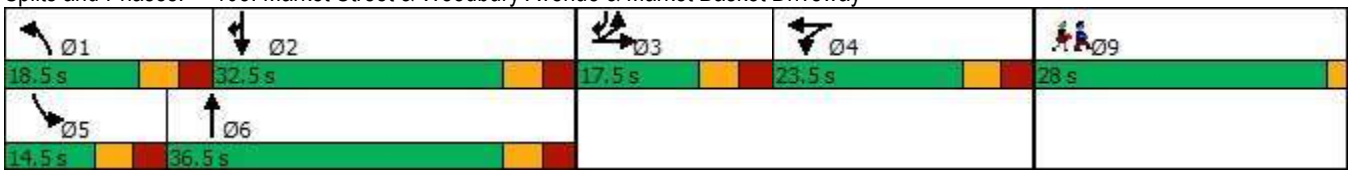
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	Ø9
Lane Configurations										
Traffic Volume (vph)	170	56	183	88	77	698	14	656	370	
Future Volume (vph)	170	56	183	88	77	698	14	656	370	
Lane Group Flow (vph)	185	127	199	113	84	968	14	663	374	
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA	pt+ov	
Protected Phases	3	3	4	4	1	6	5	2	2 3	9
Permitted Phases										
Detector Phase	3	3	4	4	1	6	5	2	2 3	
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	6.0	10.0	6.0	10.0		1.0
Minimum Split (s)	12.5	12.5	12.5	12.5	12.5	16.5	12.5	16.5		28.0
Total Split (s)	17.5	17.5	23.5	23.5	18.5	36.5	14.5	32.5		28.0
Total Split (%)	14.6%	14.6%	19.6%	19.6%	15.4%	30.4%	12.1%	27.1%		23%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5		2.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		0.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5		
Lead/Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Min	None	Min		None
v/c Ratio	0.49	0.57	0.65	0.35	0.46	0.68	0.11	0.63	0.39	
Control Delay	45.0	41.8	48.6	38.2	50.2	25.9	47.5	33.3	3.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.0	41.8	48.6	38.2	50.2	25.9	47.5	33.3	3.7	
Queue Length 50th (ft)	49	47	102	52	44	190	7	166	0	
Queue Length 95th (ft)	110	#153	#252	134	115	#579	32	#360	63	
Internal Link Dist (ft)		627		118		637		702		
Turn Bay Length (ft)	275				300		275		200	
Base Capacity (vph)	434	248	381	397	244	1434	162	1099	951	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.43	0.51	0.52	0.28	0.34	0.68	0.09	0.60	0.39	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 88.2
Natural Cycle: 105
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 103: Market Street & Woodbury Avenue & Market Basket Driveway



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	170	56	61	183	88	16	77	698	192	14	656	370
Future Volume (vph)	170	56	61	183	88	16	77	698	192	14	656	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	14	14	14	11	11	11	11	11	11
Total Lost time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	6.5
Lane Util. Factor	0.97	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3351	1677		1906	1961		1728	3325		1728	3455	1546
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3351	1677		1906	1961		1728	3325		1728	3455	1546
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99	0.99
Adj. Flow (vph)	185	61	66	199	96	17	84	759	209	14	663	374
RTOR Reduction (vph)	0	32	0	0	5	0	0	17	0	0	0	186
Lane Group Flow (vph)	185	95	0	199	108	0	84	951	0	14	663	188
Confl. Peds. (#/hr)									1	1		
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	3	3		4	4		1	6		5	2	2 3
Permitted Phases												
Actuated Green, G (s)	10.0	10.0		14.2	14.2		7.8	37.6		1.2	31.0	47.5
Effective Green, g (s)	10.0	10.0		14.2	14.2		7.8	37.6		1.2	31.0	47.5
Actuated g/C Ratio	0.11	0.11		0.15	0.15		0.08	0.40		0.01	0.33	0.50
Clearance Time (s)	6.5	6.5		6.5	6.5		6.5	6.5		6.5	6.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	353	177		285	294		142	1320		21	1130	775
v/s Ratio Prot	0.06	c0.06		c0.10	0.06		c0.05	c0.29		0.01	0.19	0.12
v/s Ratio Perm												
v/c Ratio	0.52	0.54		0.70	0.37		0.59	0.72		0.67	0.59	0.24
Uniform Delay, d1	40.1	40.1		38.2	36.2		41.9	24.1		46.6	26.5	13.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	3.1		7.3	0.8		6.5	2.0		58.7	0.8	0.2
Delay (s)	41.5	43.2		45.5	37.0		48.4	26.1		105.2	27.3	13.6
Level of Service	D	D		D	D		D	C		F	C	B
Approach Delay (s)		42.2			42.4			27.9			23.4	
Approach LOS		D			D			C			C	

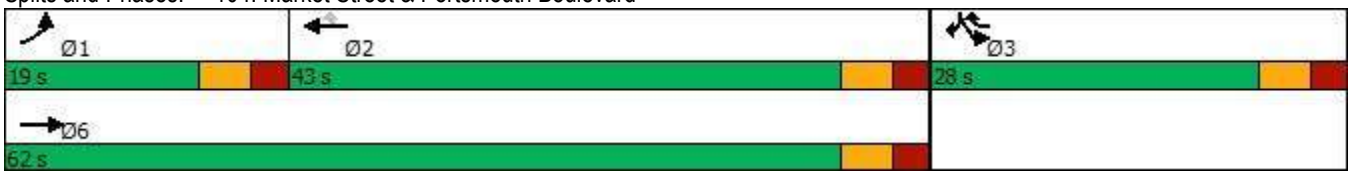
Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	94.7	Sum of lost time (s)	28.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	853	898	61	69	69
Future Volume (vph)	47	853	898	61	69	69
Lane Group Flow (vph)	51	917	976	66	75	75
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Detector Phase	1	6	2	3	3	3
Switch Phase						
Minimum Initial (s)	6.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	12.0	16.0	40.0	12.0	12.0	12.0
Total Split (s)	19.0	62.0	43.0	28.0	28.0	28.0
Total Split (%)	21.1%	68.9%	47.8%	31.1%	31.1%	31.1%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None	Min	Min	None	None	None
v/c Ratio	0.18	0.38	0.51	0.07	0.15	0.25
Control Delay	25.6	4.9	12.2	1.4	24.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	4.9	12.2	1.4	24.6	10.3
Queue Length 50th (ft)	15	59	131	0	11	0
Queue Length 95th (ft)	50	94	211	9	33	34
Internal Link Dist (ft)		637	2574		923	
Turn Bay Length (ft)	200			200	175	
Base Capacity (vph)	503	3265	2644	1285	1559	781
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.28	0.37	0.05	0.05	0.10

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 49.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated

Splits and Phases: 104: Market Street & Portsmouth Boulevard



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	853	898	61	69	69
Future Volume (vph)	47	853	898	61	69	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	12	11	12
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1728	3455	3455	1569	3164	1509
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1728	3455	3455	1569	3164	1509
Peak-hour factor, PHF	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	917	976	66	75	75
RTOR Reduction (vph)	0	0	0	27	0	67
Lane Group Flow (vph)	51	917	976	39	75	8
Confl. Peds. (#/hr)	2			2		
Confl. Bikes (#/hr)				2		
Heavy Vehicles (%)	1%	1%	1%	1%	7%	7%
Turn Type	Prot	NA	NA	pm+ov	Prot	Prot
Protected Phases	1	6	2	3	3	3
Permitted Phases				2		
Actuated Green, G (s)	4.1	35.6	25.5	31.2	5.7	5.7
Effective Green, g (s)	4.1	35.6	25.5	31.2	5.7	5.7
Actuated g/C Ratio	0.08	0.67	0.48	0.59	0.11	0.11
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	132	2307	1652	1095	338	161
v/s Ratio Prot	0.03	c0.27	c0.28	0.00	c0.02	0.01
v/s Ratio Perm				0.02		
v/c Ratio	0.39	0.40	0.59	0.04	0.22	0.05
Uniform Delay, d1	23.4	4.0	10.1	4.7	21.8	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.1	0.6	0.0	0.3	0.1
Delay (s)	25.3	4.1	10.7	4.7	22.1	21.5
Level of Service	C	A	B	A	C	C
Approach Delay (s)		5.2	10.3		21.8	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	53.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

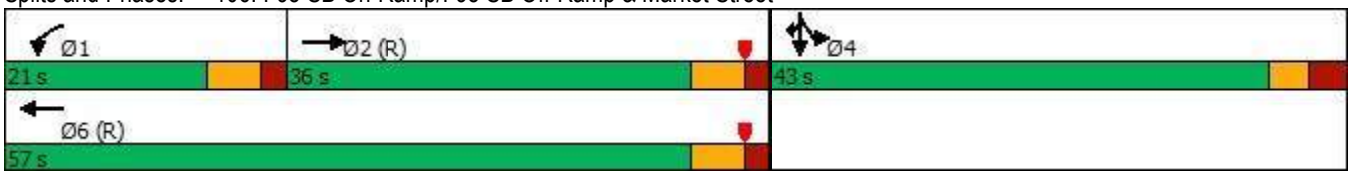
c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	843	166	104	504	197	3	447
Future Volume (vph)	843	166	104	504	197	3	447
Lane Group Flow (vph)	916	180	113	548	193	257	253
Turn Type	NA	Free	Prot	NA	Split	NA	Prot
Protected Phases	2		1	6	4	4	4
Permitted Phases		Free					
Detector Phase	2		1	6	4	4	4
Switch Phase							
Minimum Initial (s)	8.0		4.0	8.0	4.0	4.0	4.0
Minimum Split (s)	14.0		10.0	36.0	10.0	10.0	10.0
Total Split (s)	36.0		21.0	57.0	43.0	43.0	43.0
Total Split (%)	36.0%		21.0%	57.0%	43.0%	43.0%	43.0%
Yellow Time (s)	4.0		4.0	4.0	3.0	3.0	3.0
All-Red Time (s)	2.0		2.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Recall Mode	C-Min		None	C-Min	None	None	None
v/c Ratio	0.36	0.10	0.56	0.23	0.64	0.57	0.53
Control Delay	14.0	0.1	70.5	3.4	46.6	11.2	8.3
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	0.1	70.5	3.4	46.6	11.2	8.3
Queue Length 50th (ft)	134	0	79	28	121	14	0
Queue Length 95th (ft)	206	0	136	38	180	84	63
Internal Link Dist (ft)	222			349		806	
Turn Bay Length (ft)			200		250		250
Base Capacity (vph)	2580	1775	256	2421	628	691	721
Starvation Cap Reductn	839	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.10	0.44	0.23	0.31	0.37	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 50
Control Type: Actuated-Coordinated

Splits and Phases: 106: I-95 SB On-Ramp/I-95 SB Off-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	843	166	104	504	0	0	0	0	197	3	447
Future Volume (vph)	0	843	166	104	504	0	0	0	0	197	3	447
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	16	10	11	12	12	12	12	12	12	12
Total Lost time (s)		6.0	4.0	6.0	6.0					6.0	6.0	6.0
Lane Util. Factor		0.91	1.00	1.00	0.95					0.95	0.91	0.95
Frpb, ped/bikes		1.00	0.98	1.00	1.00					1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	0.86	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (prot)		4964	1775	1668	3455					1698	1473	1519
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	1.00
Satd. Flow (perm)		4964	1775	1668	3455					1698	1473	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	916	180	113	548	0	0	0	0	214	3	486
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	191	208
Lane Group Flow (vph)	0	916	180	113	548	0	0	0	0	193	66	45
Confl. Peds. (#/hr)	7					7						
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	1%	1%	1%
Turn Type		NA	Free	Prot	NA					Split	NA	Prot
Protected Phases		2		1	6					4	4	4
Permitted Phases			Free									
Actuated Green, G (s)		52.0	100.0	12.1	70.1					17.9	17.9	17.9
Effective Green, g (s)		52.0	100.0	12.1	70.1					17.9	17.9	17.9
Actuated g/C Ratio		0.52	1.00	0.12	0.70					0.18	0.18	0.18
Clearance Time (s)		6.0		6.0	6.0					6.0	6.0	6.0
Vehicle Extension (s)		4.0		3.0	4.0					3.0	3.0	3.0
Lane Grp Cap (vph)		2581	1775	201	2421					303	263	271
v/s Ratio Prot		c0.18		c0.07	0.16					c0.11	0.04	0.03
v/s Ratio Perm			0.10									
v/c Ratio		0.35	0.10	0.56	0.23					0.64	0.25	0.17
Uniform Delay, d1		14.1	0.0	41.5	5.3					38.0	35.3	34.7
Progression Factor		0.86	1.00	1.48	0.54					1.00	1.00	1.00
Incremental Delay, d2		0.4	0.1	3.4	0.2					4.3	0.5	0.3
Delay (s)		12.6	0.1	64.9	3.1					42.4	35.8	35.0
Level of Service		B	A	E	A					D	D	D
Approach Delay (s)		10.5			13.6			0.0			37.3	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

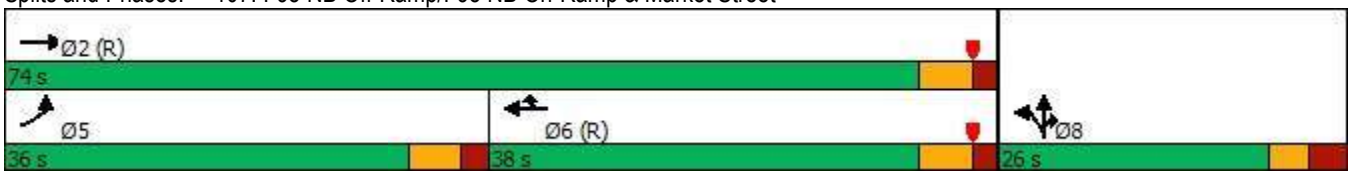
c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Configurations						
Traffic Volume (vph)	443	597	545	151	5	231
Future Volume (vph)	443	597	545	151	5	231
Lane Group Flow (vph)	482	649	592	164	73	251
Turn Type	Prot	NA	NA	Prot	NA	Prot
Protected Phases	5	2	6	6	8	8
Permitted Phases						
Detector Phase	5	2	6	6	8	8
Switch Phase						
Minimum Initial (s)	4.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	10.0	14.0	27.0	27.0	26.0	26.0
Total Split (s)	36.0	74.0	38.0	38.0	26.0	26.0
Total Split (%)	36.0%	74.0%	38.0%	38.0%	26.0%	26.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.72	0.25	0.33	0.17	0.34	0.61
Control Delay	52.5	2.7	17.1	3.6	43.4	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	2.7	17.1	3.6	43.4	11.7
Queue Length 50th (ft)	170	22	109	0	44	0
Queue Length 95th (ft)	225	67	198	41	79	64
Internal Link Dist (ft)		349	924		883	
Turn Bay Length (ft)				200		150
Base Capacity (vph)	1005	2632	1795	991	359	520
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.25	0.33	0.17	0.20	0.48

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 82 (82%), Referenced to phase 2:EBT and 6:WBT, Start of Red
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 107: I-95 NB Off-Ramp/I-95 NB On-Ramp & Market Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	443	597	0	0	545	151	63	5	231	0	0	0
Future Volume (vph)	443	597	0	0	545	151	63	5	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	12	12	12	16	12	12	12	12	12	12
Total Lost time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Lane Util. Factor	0.97	0.95			0.95	1.00		1.00	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	3351	3455			3574	1812		1797	1599			
Flt Permitted	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	3351	3455			3574	1812		1797	1599			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	482	649	0	0	592	164	68	5	251	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	82	0	0	221	0	0	0
Lane Group Flow (vph)	482	649	0	0	592	82	0	73	30	0	0	0
Confl. Peds. (#/hr)	7		1	1		7			1	1		
Confl. Bikes (#/hr)			1			5						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Prot	NA			NA	Prot	Split	NA	Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	19.9	76.2			50.3	50.3		11.8	11.8			
Effective Green, g (s)	19.9	76.2			50.3	50.3		11.8	11.8			
Actuated g/C Ratio	0.20	0.76			0.50	0.50		0.12	0.12			
Clearance Time (s)	6.0	6.0			6.0	6.0		6.0	6.0			
Vehicle Extension (s)	3.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	666	2632			1797	911		212	188			
v/s Ratio Prot	c0.14	0.19			c0.17	0.05		c0.04	0.02			
v/s Ratio Perm												
v/c Ratio	0.72	0.25			0.33	0.09		0.34	0.16			
Uniform Delay, d1	37.5	3.5			14.8	12.9		40.5	39.6			
Progression Factor	1.25	0.62			1.00	1.00		1.00	1.00			
Incremental Delay, d2	3.7	0.2			0.5	0.2		1.3	0.5			
Delay (s)	50.5	2.4			15.3	13.1		41.9	40.2			
Level of Service	D	A			B	B		D	D			
Approach Delay (s)		22.9			14.8			40.6			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	22.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	27	9	41	21	3	15	52	23	3	64	7
Future Vol, veh/h	13	27	9	41	21	3	15	52	23	3	64	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	2	2	2	3	3	3	5	5	5
Mvmt Flow	14	29	10	45	23	3	16	56	25	3	70	8
Number of Lanes	0	1	1	0	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	2
HCM Control Delay	8.1	8.7	8.1	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	33%	0%	63%	4%	0%
Vol Thru, %	0%	69%	68%	0%	32%	96%	0%
Vol Right, %	0%	31%	0%	100%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	75	40	9	65	67	7
LT Vol	15	0	13	0	41	3	0
Through Vol	0	52	27	0	21	64	0
RT Vol	0	23	0	9	3	0	7
Lane Flow Rate	16	81	43	10	71	73	8
Geometry Grp	5	5	5	5	4b	5	5
Degree of Util (X)	0.024	0.106	0.063	0.012	0.101	0.102	0.009
Departure Headway (Hd)	5.451	4.734	5.222	4.357	5.139	5.019	4.294
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	659	760	688	824	699	717	836
Service Time	3.165	2.448	2.936	2.07	3.153	2.733	2.008
HCM Lane V/C Ratio	0.024	0.107	0.063	0.012	0.102	0.102	0.01
HCM Control Delay	8.3	8	8.3	7.1	8.7	8.3	7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.4	0.2	0	0.3	0.3	0

Intersection	
Int Delay, s/veh	4.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	0	0	50	0	0
Future Vol, veh/h	49	0	0	50	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	0	0	54	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	28	27	0	0	54	0
Stage 1	27	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	987	1048	-	-	1551	-
Stage 1	996	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	987	1048	-	-	1551	-
Mov Cap-2 Maneuver	987	-	-	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	987	1551	-
HCM Lane V/C Ratio	-	-	0.054	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	0	0	6	0	0	5
Future Vol, veh/h	0	0	6	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	7	0	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1	0	15	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	14	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1622	-	1004	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1622	-	1000	1084
Mov Cap-2 Maneuver	-	-	-	-	1000	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	1005	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.2	8.3
HCM LOS			A

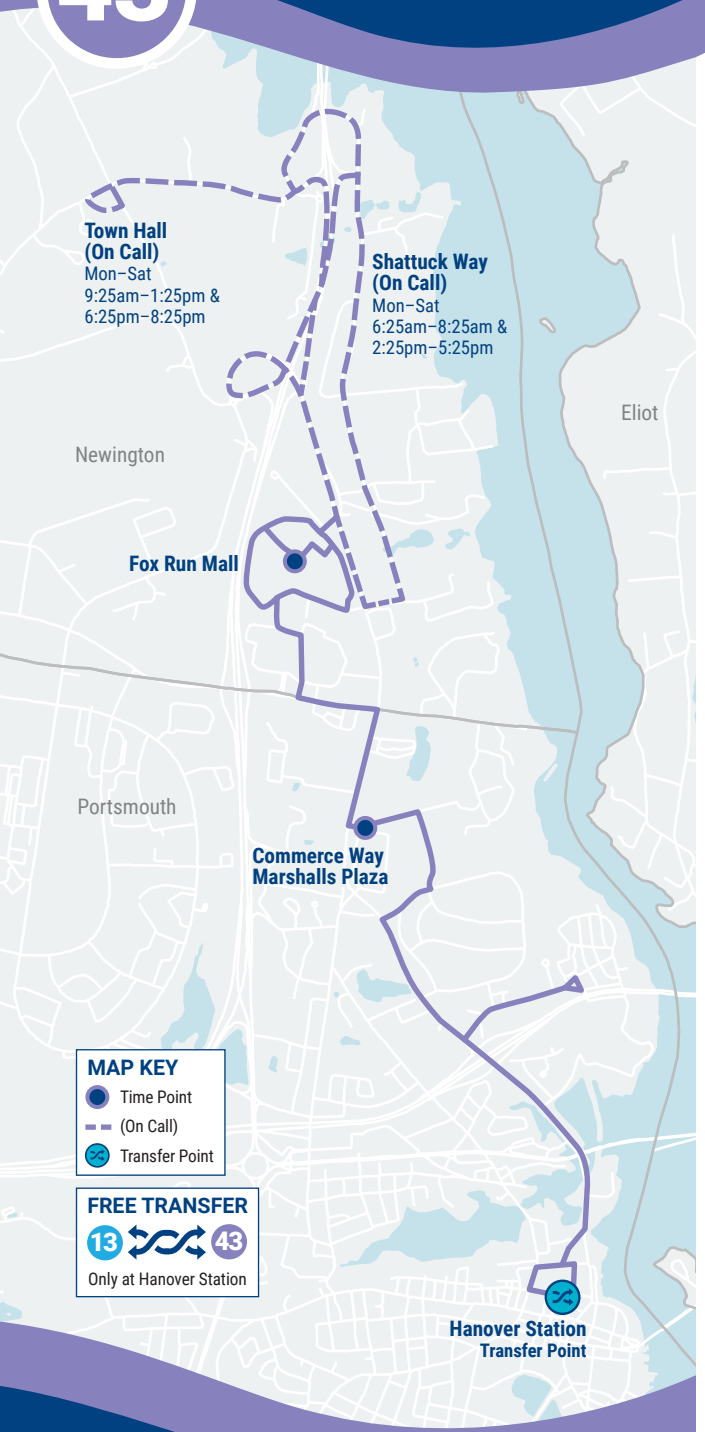
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1084	-	-	1622	-
HCM Lane V/C Ratio	0.005	-	-	0.004	-
HCM Control Delay (s)	8.3	-	-	7.2	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

APPENDIX E

COAST Bus Schedule & Map

Route 43 Map

Portsmouth • Newington



Ride Information

COAST BUS FARES

Base Cash Fare **$1.50**

All passengers ages 5 and up are required to pay this fare each time they board a COAST bus.

Half-Fare **$ 0.75**

Passengers 65 and older, or passengers with a disability are entitled to pay half the cash fare. Proof of eligibility is required by showing a Medicare card, photo ID with birth date, COAST ADA Paratransit Card, or COAST Half-Fare Card. Please contact COAST to apply for a Half-Fare Card.

Multi-Ride Tickets and Passes

*Available at **www.coastbus.org** or call 603-743-5777, TTY 711.*

Unlimited Monthly Pass **$ 52**

Unlimited rides on COAST Routes for the month.

YOUR RIGHTS

COAST adheres to all Federal regulations regarding Civil Rights. If you need to request an ADA Reasonable Modification/ Accommodation, or if you believe you have been discriminated against or would like to file a complaint under the ADA or Title VI, please contact COAST's Civil Rights Officer at 603-516-0788, TTY 711 or email CivilRights@coastbus.org.

NO SERVICE DAYS

COAST does not operate on the following holidays:

- New Year's Day
- Martin Luther King Jr./ Civil Rights Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Eve Day
- Christmas Day

42 Sumner Drive • Dover, NH 03820

603-743-5777 • TTY 711 • **www.coastbus.org**

This brochure is available in alternative formats upon request.

Bus Schedule & Map 43

COAST

Effective 09.17.22

ROUTE 43

Portsmouth • Newington

Find all of the full COAST schedules online at **coastbus.org**

MAP OUT YOUR GAME PLAN

Planning your trip has never been easier!

www.coastbus.org

COAST SYSTEM MAP

EXPRESS • INBOUND • OUTBOUND

Route 43 Portsmouth • Newington

How to Read the Schedule

Printed bus schedules only show the timepoints ● (major bus stops where the bus will hold until the scheduled departure time). In between those timepoints are many other stops that you can use. For a full listing of bus stops, visit **www.coastbus.org**, or use the Passio GO! App.

The times shown represent the number of minutes after the hour that the bus will depart from that stop. Last stop times are arrivals. Any exceptions will be noted.

EXPRESS (M-Sat)	Single Run Only		
DOVER - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Dover Transportation Center	6:30am	--	--
● Fox Run Mall	6:45am	--	--

INBOUND (M-Sat)	Service On Every Hour		
NEWINGTON - PORTSMOUTH	First Bus	Minutes Past Hour	Last Bus
● Fox Run Mall	6:30am	:30	8:30pm
● Commerce Way (Marshalls Plaza)	6:36am	:36	8:36pm
● Hanover Station	6:57am	:57	8:57pm

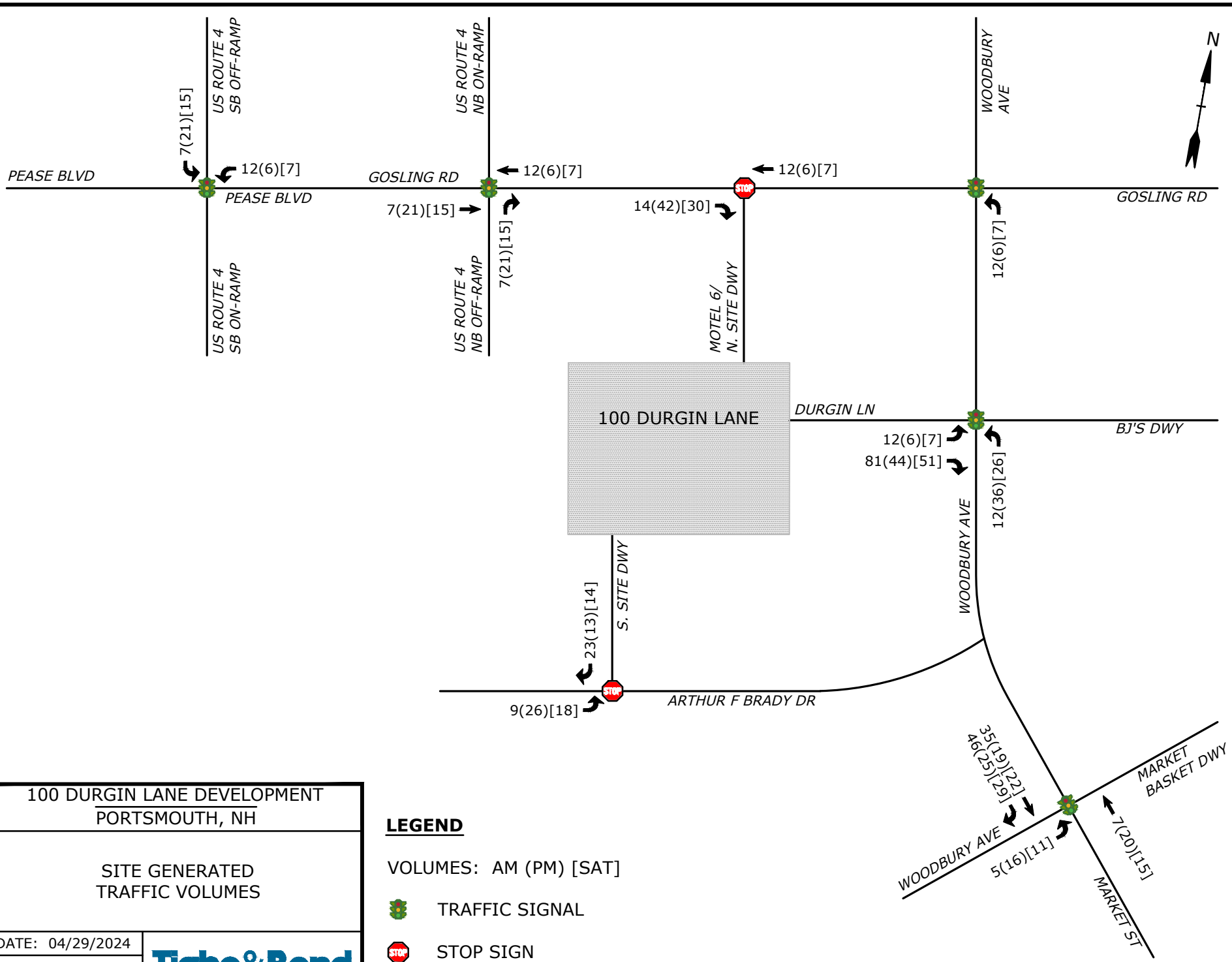
OUTBOUND (M-Sat)	Service On Every Hour		
PORTSMOUTH - NEWINGTON	First Bus	Minutes Past Hour	Last Bus
● Hanover Station	7:00am	:00	8:00pm
● Commerce Way (Marshalls Plaza)	7:09am	:09	8:09pm
● Fox Run Mall	7:22am	:22	8:22pm

MAP IT!

For a full listing of bus stops, visit
www.coastbus.org
or use the Passio GO! App.

APPENDIX F

Background Development Traffic Volumes



100 DURGIN LANE DEVELOPMENT
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES

DATE: 04/29/2024
SCALE: NTS
FIGURE 6

Tighe&Bond

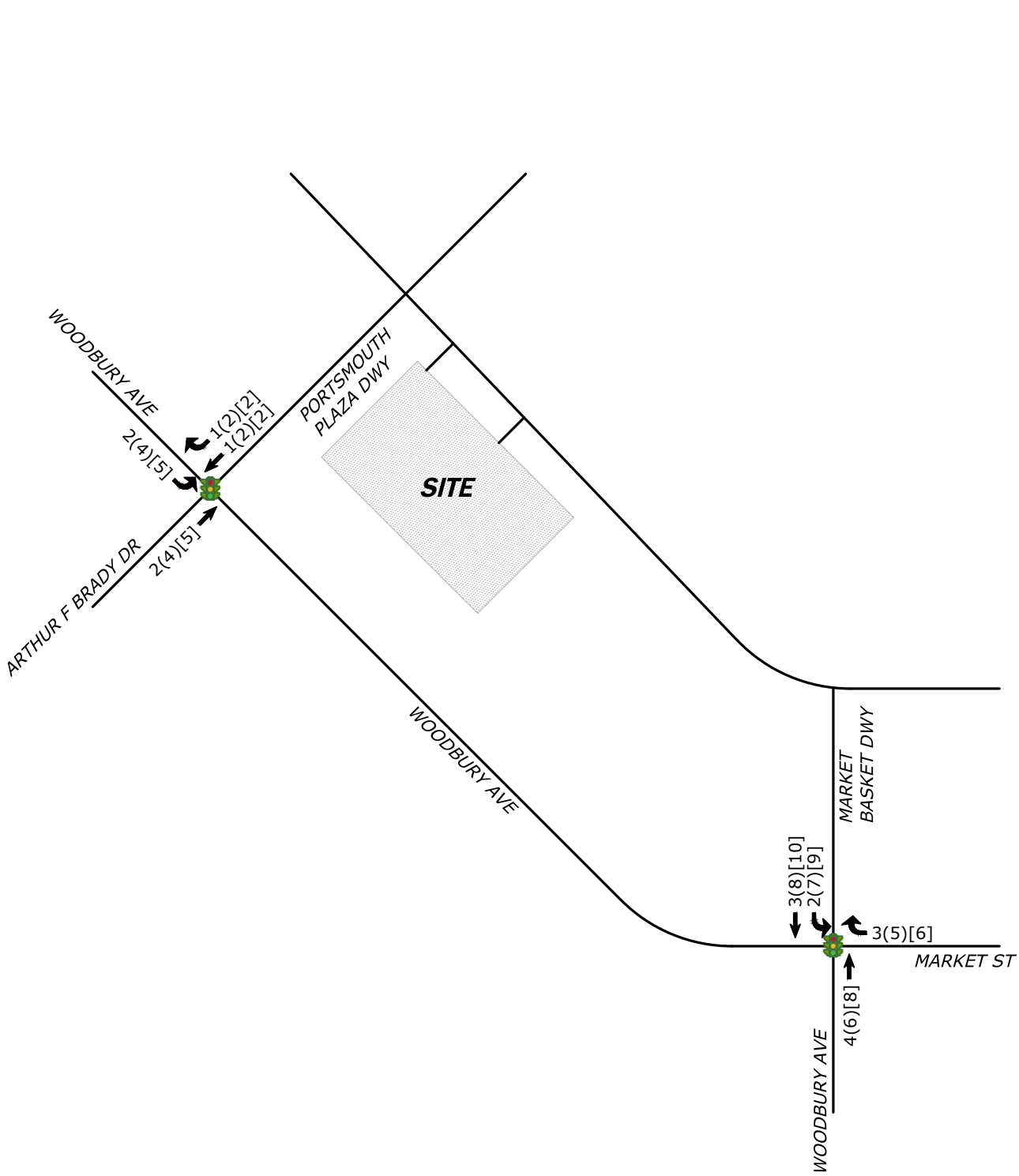
LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

STOP SIGN

Apr 29, 2024-10:18am Plotted By: MBlair
Tighe & Bond, Inc. J:\E\E5071 Eastern Real Estate\001 Portsmouth, NH 100 Durgin Lane\Drawings\AutoCAD\Figures\E5071-001 Traffic Volume Figures.dwg



LEGEND

VOLUMES: AM (PM) [SAT]

TRAFFIC SIGNAL

1465 WOODBURY AVENUE
PORTSMOUTH, NH

SITE GENERATED
TRAFFIC VOLUMES (NEW TRIPS)

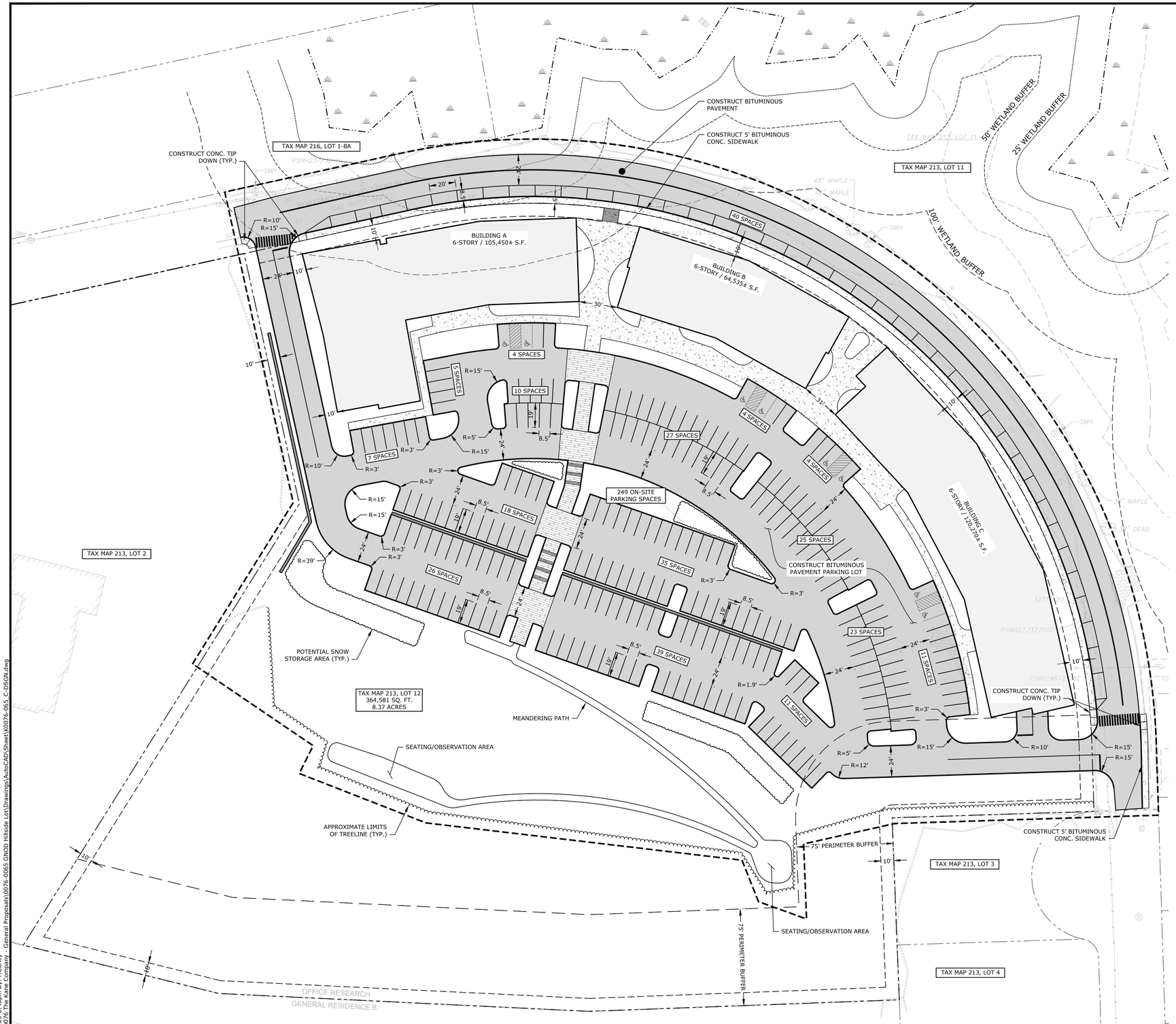
DATE:	6/24/2025
SCALE:	NO SCALE
FIGURE:	6

Tighe&Bond

Jun 24, 2025-4:24pm Plotted By: RCase
Tighe & Bond, Inc. J:\Q\Q5004 Quincy & Company, Inc\0001_1465 Woodbury Avenue\Drawings\AutoCAD\Figures\Q5004-001 Traffic Volume Figures.dwg

APPENDIX G

Site Development Plan



SITE DATA:

LOCATION: TAX MAP 118 LOT 28

OWNER: BRORA LLC
210 COMMERCE WAY
SUITE 300
PORTSMOUTH, NH 03801

ZONING DISTRICT: OFFICE RESEARCH (OR)
GATEWAY NEIGHBORHOOD OVERLAY DISTRICT (GNOD)

PROPOSED USE: MULTI-FAMILY RESIDENTIAL

EXISTING LOT SIZE: 364,581 SQ. FT. (8.37 ACRES)

DEVELOPMENT STANDARDS

BUILDING PLACEMENT:	REQUIRED	PROPOSED
MINIMUM FRONT YARD:	10 FT	10 FT
MINIMUM SIDE YARD:	10 FT	10 FT
MINIMUM REAR YARD:	10 FT	450 FT±
MINIMUM PERIMETER BUFFER:	75 FT	75 FT±

BUILDING AND LOT OCCUPATION:	REQUIRED	PROPOSED
MAXIMUM BUILDING COVERAGE:	75%	13%
MAXIMUM BUILDING FOOTPRINT:	NR	19,220 SQ FT
MAXIMUM BUILDING LENGTH:	400'	321 FT
MINIMUM SITE FRONTAGE:	300 FT	948 FT
MINIMUM SITE DEPTH:	100 FT	855 FT
MINIMUM OPEN SPACE:	10%	>10%

BUILDING FORM (PRINCIPAL BUILDING):	REQUIRED	PROPOSED
MAXIMUM DWELLINGS PER UNIT:	120 UNITS[1]	113[1]
MAXIMUM BUILDING HEIGHT:	6 STORIES[2] 80 FT	6 STORIES[2] <80 FT[2]

OFF-STREET PARKING REQUIREMENTS

PARKING SPACES REQUIRED:

DWELLING UNITS:		
RESIDENTIAL UNITS (LESS THAN 500 SQ FT)	45 UNITS X 0.5 SPACES	22.5 SPACES
RESIDENTIAL UNITS (500 - 750 SQ FT)	124 UNITS X 1 SPACE	124 SPACES
RESIDENTIAL UNITS (>750 SQ FT)	105 X UNITS X 1.3 SPACES	136.5 SPACES
VISITOR PARKING, 1.0 SPACE PER 5 UNITS	274 UNITS	54.8 SPACES
TOTAL MINIMUM PARKING SPACES REQUIRED =		337.8 SPACES
AFTER PUBLIC TRANSIT PROXIMITY REDUCTION (20%)		271 SPACES

PARKING SPACES	REQUIRED	PROPOSED
	271 SPACES	298 SPACES*

*INCLUDES 49 UNDERGROUND PARKING SPACES UNDER BUILDING C. DOES NOT INCLUDE 40 OFF-SITE SPACES.

ADA PARKING SPACES	REQUIRED	PROPOSED
	8 SPACES (2 VAN SPACE)	8 SPACES (8 VAN SPACES)

PARKING SPACE DIMENSIONAL REQUIREMENTS:		
STANDARD 90° STALL:		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	19 FT MIN	19 FT
STANDARD 0° STALL:		
WIDTH	8.5 FT MIN	8.5 FT
LENGTH	20 FT MIN	20 FT
DRIVE AISLE WIDTH:		
90° (2-WAY TRAFFIC)	24 FT	24 FT
0° (2-WAY TRAFFIC)	24 FT	24 FT

BICYCLE SPACES	REQUIRED	PROPOSED
1 BICYCLE SPACE / 5 DWELLING UNITS:	30 SPACES (MAX)	TBD

NOTES:
(1) - UP TO 120 DWELLING UNITS PER BUILDING SHALL BE ALLOWED WITH CITY COUNCIL APPROVAL PER SECTION 10.686.30.
(2) - MAXIMUM BUILDING HEIGHT FOR ANY APARTMENT BUILDING OR MIXED USE BUILDING SHALL BE 6-STORIES OR 80 FT WITH CITY COUNCIL APPROVAL PER SECTION 10.686.30.

SITE RECORDING NOTES:
1. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
2. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
3. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
4. THIS IS NOT A BOUNDARY SURVEY AND SHALL NOT BE USED AS SUCH.

SEE SHEET C-101 FOR PLAN NOTES & LEGEND

0 40' 80'
GRAPHIC SCALE

Tighe&Bond
Engineers | Environmental Specialists

PROPOSED MULTI-FAMILY DEVELOPMENT

Brora LLC

Portsmouth, NH

MARK	DATE	DESCRIPTION

PROJECT NO:	K0076-065
DATE:	7/30/2025
FILE:	K0076-065_C-DSGN.DWG
DRAWN BY:	MDC/BKC
CHECKED:	NAH
APPROVED:	PMC

SITE PLAN

SCALE: AS SHOWN

C-301

Last Saved: 9/4/2025
Plotted: 9/5/2025 6:48pm By: MCurley
Tighe & Bond: J:\K\K0076 The Kane Company - General Proposals\0076-0065 GNOD Hillside Lot\Drawings\AutoCAD\Sheet\K0076-065_C-DSGN.dwg

www.tighebond.com

100% Recyclable

K0076-0065
November 20, 2025

Mr. Peter Stith, Planning Manager
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: **Response to Comments – Traffic Peer Review 1**
150 Portsmouth Boulevard Multi-Family Development

Dear Peter:

Tighe & Bond has prepared this letter in response to peer review comments on the subject project received from McClure Engineering Co. (McClure) in a letter dated November 5, 2025. The 150 Portsmouth Boulevard Multi-Family Development Traffic Impact Study, dated September 22, 2025, was submitted to the City in September 2025. For ease of review, McClure comments are repeated herein in *italics*, followed by our response for each.

1. **Study Area**

   The TIS defines a study area that appropriately captures the roadway network expected to be affected by the proposed residential development. The intersections evaluated provided a reasonable extent for analyzing project-related traffic conditions. McClure concurs that the scope of the study is consistent with NHDOT guidelines and adequately represents the area of influence for the project.

   Response: No response required.

2. **Traffic Counts**

   The traffic counts used within the TIS were collected in July 2025. The traffic counts collected during the weekday morning, weekday afternoon, and Saturday midday were seasonally adjusted in accordance with NHDOT guidelines, using the 2024 Seasonal Adjustment Data. The seasonally adjusted factor applied to the traffic volumes was 1.01, which aligns with the peak adjustment factor for Group 4 Averages: Urban Highways for the month of July. McClure agrees that the methodology and final values are reasonable and in accordance with NHDOT guidelines. Additionally, McClure concurs that studying the weekday morning, weekday evening, and the Saturday midday peak periods are appropriate for this residential development.

   Response: No response required.

3. **Background Growth**

   The TIS utilized an annual traffic growth factor of 1.0 percent per year. McClure concurs that this is reasonable and in accordance with NHDOT guidelines, as this is the percentage provided for NHDOT Region E – Southeast from the NHDOT.

   Two (2) substantial projects that could add more traffic to the study area were identified by T&B as the 100 Durgin Lane Multi-Family Development and the 1465 Woodbury Avenue Bank. The 100 Durgin Lane Multi-Family Development proposes the construction of a 360-unit residential development and has been approved by the city. This development is anticipated to be occupied by 2027. The other project, the 1465 Woodbury Avenue Bank, is a project proposing the development of a 2,847 +/- SF

bank with a drive-through. The bank would be located on the current Portsmouth Plaza property. The project has been approved by the city and is expected to be occupied in 2027. Each of these projects' estimated site volumes from their respective TISs were included in the future year No-build traffic volumes for this TIS. The TIS also acknowledged that other smaller developments and vacancies would likely occur, which were assumed to be included in the 1.0 percent annual background growth. McClure concurs that these assumptions are reasonable and appropriate.

Response: No response required.

4. Crash Data

No discussion of crash data was included as part of the TIS due to lack of availability from the Police Department. It is recommended that T&B attempt another request from the Police Department for the most recent 5 years of available crash data for all study area intersections. Crash trends, if any, should be identified and a discussion should be provided to consider if any safety concerns could be further exasperated by the development and the associated site trips.

Response: We have previously made multiple attempts to request crash data from the Portsmouth Police Department. Each time, the Department has indicated they are unable to fulfill the request due to staffing limitations.

5. Site Access

The TIS did not include a discussion of the anticipated sight distances at the two proposed site driveways. American Association of State Highway and Transportation Officials (AASHTO) requirements should be included relative to both Intersection Sight Distance (ISD) and Stopping Sight Distance (SSD) to ensure safe operation.

Response: Intersection sight distance (ISD) and stopping sight distance (SSD) were reviewed at the proposed site driveways based on AASHTO guidance. A design speed of 30 mph was utilized based on the posted speed on Portsmouth Boulevard of 25 mph and collected speed data which indicates operating speeds on Portsmouth Boulevard, south of Commerce Way of 24 mph and 26 mph in the northbound and southbound directions, respectively. The desirable intersection sight distance based on AASHTO guidance and a 30 mph design speed is 335 feet. Based on the development plan and measurement of available sight distance using available aerial mapping, intersection sight distance exceeds the desirable sight distance at the proposed west driveway looking left (south) and right (north). At the proposed east driveway, ISD is met looking right (east), but is not met looking left (west) due to the existing curvature of the roadway, providing approximately 260 feet of the desirable 335 feet intersection sight distance.

The required stopping sight distance for a 30 mph design speed is 200 feet per AASHTO guidelines, which is satisfied in both directions at each proposed site driveway.

As noted in the TIS, the majority of site-generated traffic is expected to utilize the proposed west driveway, with only a minor proportion using the east driveway. While desirable ISD is not met at the anticipated lower volume east driveway, required SSD is met at both driveways. Proposed landscaping along the site frontage will be designed to maximize sight lines to the greatest extent practicable.

6. Site Trip Generation

Site trip generation was estimated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition, 2021 and the Multifamily Housing (Mid-Rise) (LUC-221) was used to predict the number of trips based on the current project proposal.

The 12th Edition of the Trip Generation Manual was recently released. McClure requests that a sensitivity analysis be prepared that compares the relevant trip generation using the 11th versus the 12th editions. Provided that the 12th edition does not yield a net increase in trips, McClure concurs with the methodology for trip generation as documented in the TIS.

Response: Based on a review of trip generation for LUC 221 based on trip generation methodology published in the new ITE Trip Generation Manual, 12th Edition (2025), the proposed 274-unit residential development is estimated to generate 107 trips (25 entering, 82 exiting) during the weekday morning peak hour, 104 trips (67 entering, 37 exiting) during the weekday afternoon peak hour, and 99 trips (50 entering, 49 exiting) during the Saturday midday peak hour. As shown in the summary below, the comparison indicates fewer total estimated trips during each peak period when utilizing the 12th Edition trip generation methodology. Therefore, the analysis presented in the TIS based on the 11th edition methodology can be considered conservative.

Trip Generation Comparison (LUC 221)

Proposed - 274 Apartments							
	11th Edition			**12th Edition**			
Peak Hour	**Enter**	**Exit**	**Total**	**Enter**	**Exit**	**Total**	**Change (Total)**
Weekday AM	25	84	**109**	25	82	**107**	**-2**
Weekday PM	65	42	**107**	67	37	**104**	**-3**
Saturday Midday	56	54	**110**	50	49	**99**	**-11**

7. Trip Distribution

The traffic generated by the proposed project was distributed based on existing traffic patterns within the study area along with discussions with the city and a review of a prior multi-family facility traffic study. While no origin-destination data source was explicitly cited, McClure agrees that the resulting assignment is balanced and reasonable for the project's location.

Response: No response required. We do note that the project trips for the previously approved residential projects in the vicinity of the project site utilized US Census Journey-to-Work data.

8. Capacity and Queue Analysis

The TIS evaluated operations using Synchro 11 following the Highway Capacity Manual 2000 (HCM 2000) for signalized intersections and the Highway Capacity Manual 6th Edition (HCM) for unsignalized intersections. This methodology is appropriate and consistent with NHDOT guidelines.

Please confirm the source of the signal timing and phasing information that was utilized for the Synchro analyses. Was information taken from the cabinets in the field or were

record plans utilized? The system has been taken out of coordination and splits may have been fine-tuned since the original design. Please confirm.

Overall, McClure concurs that the project's incremental impact on queue, level of service (LOS) and control delay across the seven (7) study intersections is nominal under 2037 Build conditions. The TIS demonstrates that all intersections operate at a LOS D or better, with only localized queue increases at certain approaches. Additionally, under the Build condition, none of the intersections have more than two additional vehicle lengths added to the queues relative to the No Build condition.

The Woodbury Avenue at Commerce Way/Durgin Square Plaza Driveway intersection experiences congestion and long queues under No Build conditions. The TIS documented several movements where the 95th percentile queues exceed available storage, including southbound left-turn and southbound shared through and right-turn movements. These exceedances were present in the No Build scenario and did not significantly worsen in the Build scenario, which adds only marginal increases in approach delay. With long cycle times and oversaturated movements already present, McClure concurs that the issue reflects existing corridor conditions rather than projected-related impacts but recommends continued coordination with the City regarding queue management and that a mitigation measure be considered (to be discussed at the end of this section).

The Woodbury Avenue at Arthur F. Brady Drive/ Portsmouth Plaza Driveway intersection also shows constrained operations in the No Build condition, with several movements already over capacity. The westbound shared through and right-turn, southbound left-turn, northbound left-turn, eastbound through and left-turn, and the southbound shared through and right-turn movements all exhibit 95th percentile queues exceeding storage. These exceedances persist in the Build condition but are not significantly worsened by site traffic. McClure concurs with the TIS that these conditions reflect broader corridor congestion, and finds the modeling assumptions appropriate and consistent with NHDOT practices.

The Woodbury Avenue at Market Street/Market Basket Driveway intersection is heavily trafficked and signalized, serving multiple regional retail destinations. Under the No Build conditions, the southbound left-turn, the southbound shared through and right-turn, the eastbound through, and the westbound shared through and right-turn movements already experience a 95th percentile queue exceeding the current storage availability. This remains similar under Build conditions, with no additional significant delay on other movements. Overall intersection operations remain at LOS D. McClure agrees with the TIS that this localized storage deficiency is an existing issue and not materially impacted by site traffic.

The Market Street at Portsmouth Boulevard signalized intersection provides a key connection between Market Street and the site corridor. The TIS found that both No Build and Build conditions operate acceptably, with all approaches maintaining efficient performance and only minor increases in delay. The eastbound left-turn movement remains at LOS C, and 95th percentile queues are contained within storage limits under all scenarios.

The Market Street at I-95 Southbound Ramps intersection is a signalized freeway terminal. The analysis shows overall LOS B-C across the studied periods, with Build traffic adding less than one (1) percent to total entering volume. Queues on the southbound ramp and Market Street approaches remain within existing pocket storage under both No Build and Build conditions. McClure agrees that the methodology and

results are sound and that project traffic does not materially affect interchange operations.

The Market Street at I-95 Northbound Ramps intersection is signalized and operates acceptably through the Build condition. Under the No Build condition, the northbound right-turn movement already slightly exceeds the current storage available. The Build scenario adds negligible delay or queueing beyond those levels.

The Portsmouth Boulevard at Commerce Way/Osprey Drive intersection is all-way stop-controlled near the project site. The TIS shows LOS A-B under all scenarios, with 95th percentile queues well within the available storage lengths.

Although increases in delay and queueing are expected to be minimal as a result of the proposed development, it is requested that a mitigated condition be considered for the 2027 Build scenario that includes optimized signal timing and phasing. It is unclear if there will be much benefit that results from optimization, but if so, this would be a relatively low-cost improvement for the corridor to mitigate the increases in volume.

Response: Signal timing and phasing for all locations were originally obtained from record plans. The Portsmouth City Engineer confirmed that record plans provided current information for City-owned locations. Signal timing and phasing from record plans were confirmed in the field in November 2025 at the I-95 ramp locations under NHDOT jurisdiction.

Testing of potential signal timing modifications at the Woodbury Avenue study intersections indicates timing split adjustments would result in only nominal improvements in operations. Poor operations on side street approaches may be due in part to the existing split phasing operations. It is also understood that the Woodbury Avenue signals currently run uncoordinated, which the City has identified as an ongoing issue. Restoring coordination along this corridor, as originally intended during the prior signal upgrade, may offer operational benefits beyond the scope of this project.

A review of signal timing at the Market Street at I-95 southbound ramp intersection indicates only nominal improvements in delay could be achieved on the Market Street westbound left movement during the Saturday midday peak period under the 2027 Build condition. Because the three intersections along Market Street operate under a coordinated system, generally experience acceptable levels of service on all other movements, and fall under NHDOT jurisdiction, no changes to the signal timings are recommended at this time.

9. Recommendations and Conclusions

The TIS prepared by T&B concludes that the proposed 274-unit residential development with 298 on-site parking spaces will be accessed by two unsignalized driveways on Portsmouth Boulevard on the east and west corners of the parcel. Analyses indicate that the Build scenario does not vary significantly from the No Build scenario and that most of the differences between the two conditions are negligible. No off-site mitigation measures or geometric improvements were recommended by the applicant. Existing congestion reflects pre-existing conditions and is not significantly degraded by site-generated traffic.

McClure has reviewed the analysis, conclusions, and recommendations for completeness and reasonableness. The methodologies are consistent with accepted NHDOT practices, and the findings are reasonable. However, McClure would

recommend the following additional information be provided via a supplemental submittal by T&B:

1. *If available, a discussion of crash data and what, if any, impact this project may have on existing crash trends.*
2. *A discussion of the anticipated sight distances for the two site driveways along Portsmouth Boulevard/Dunlin Way.*
3. *A sensitivity analysis in tabular format comparing the development's trip generation using ITE 11th Edition versus the 12th Edition.*
4. *A clarification of the source of existing signal timing and phasing used for the signalized study intersections with the TIS analyses.*
5. *A tabular summary of a mitigated condition that includes the 2027 Build scenario that explores optimized signal timing and phasing.*

Response:

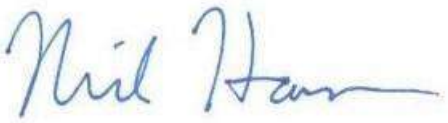
1. Refer to response to Comment 4.
2. Refer to response to Comment 5.
3. Refer to response to Comment 6.
4. Refer to response to Comment 8.
5. Refer to response to Comment 8 above. Review of potential timing split modifications reveals that timing modifications may only have a nominal impact on traffic operations, particularly at the Woodbury Avenue study intersections. Therefore, a tabular summary of results under a mitigated 2027 Build condition has not been provided as part of the response.

If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at nahansen@tighebond.com.

Sincerely,

TIGHE & BOND, INC.

Patrick M. Crimmins, PE
Vice President



Neil A. Hansen, PE
Project Manager

Copy: Brora, LLC

City of Portsmouth Planning Department

Site Plan Review Application Fee

Project: 150 Portsmouth Boulevard **Map/Lot:** Map 213 Lot 12

Applicant: Brora, LLC

All development

Base fee $600 $600.00

Plus $5.00 per $1,000 of site costs

Site costs $3,300,000 +*** + $16,500.00

***Actual site costs are not known at this time, but anticipated to exceed $3.3M.**

Plus $10.00 per 1,000 S.F. of site development area

Site development area 323,800 S.F. + $3,238.00

Fee **$20,000.00**

Maximum fee: $20,000.00

Conditonal Use Permit Application Fee

Wetlands Conditonal Use Permit Greater than 1,000 SF **Fee** **$1,300.00**

Fee received by: _____ Date: _____

Note: Initial application fee may be based on the applicant's estimates of site costs and site development area. Following site plan approval, the application fee will be recalculated based on the approved site plan and site engineer's corresponding site cost estimate as approved by the Department of Public Works, and any additional fee shall be paid prior to the issuance of a building permit.

Letter of Authorization
Dunlin Way & Portsmouth Boulevard, Portsmouth
Map 213 Lot 12

The undersigned owner and applicant of the above-referenced property hereby authorize representatives of Tighe & Bond, Inc. to represent their interests, and to submit any and all materials related thereto on their behalf for any local and state permitting applications solely in connection with the multifamily development thereof.

Brora, LLC

Date: 4/21/2025

By: _____

Name: Jennifer Stebbins Thomas

Title: Manager

The Kane Company

Date: 4/21/2025

By: _____

Name: Kimery Poldrack

Title: SVP Development & Construction

February 17, 2026

Peter Stith, TAC Committee Chair
City of Portsmouth
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Request for Site Plan Review at 1151 Sagamore Avenue, Tax Map 224, Lot 19

Dear Mr. Stith and Technical Advisory Committee (TAC) Members:

On behalf of 1151 Sagamore CBC LLC we are pleased to submit the attached plan set for **Site Plan Review and Approval** for the above-mentioned project and request that we be placed on the agenda for your **March 3, 2026,** meeting. The project is the demolition of the existing building and proposed new construction of four (4) standalone residential condominium units with the associated and required site improvements.

This will be the TAC's third review of this application. This application was previously reviewed in Summer 2025 as a Sketch Plan, followed by its first formal review at the January 6, 2026 TAC meeting. At this meeting, comments were provided by the Department of Public Works (DPW). A revised application that addressed these comments was placed on the February 3, 2026 agenda, but was withdrawn due to unaddressed DPW comments. With this resubmission, we have included application items that have been revised from the February 3, 2026 submission; these items include:

1. Cover Letter
2. Pump Design Report
3. Drainage Report
4. Drawing Set

Please see below for the DPW's comments provided after the January 6, 2026 TAC meeting, in bold, followed by updated responses of how they have been addressed, in plain text.

TAC Comments

1. **Increase domestic water service sizes to 1" for to each building.**
   HW Response: The drawings have been updated per this comment.

2. **Fire services should have a curb stop for each building.**
   HW Response: The drawings have been updated per this comment.

3. **Paint domestic and fire service curb boxes blue and red, respectively.**
   HW Response: The drawings have been updated per this comment.

4. **South side of the driveway does not need radius. Remove radius and continue straight line of driveway until it intersects with Sagamore Ave.**
   HW Response: The driveway entrance has been updated per this comment.

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5. **Consider redirecting driveway to Wentworth Road.**
   HW Response: The NHDOT expressed no concerns with the site's current access location and it is the preference of the Owner to keep it as is.

6. **Add flushing hydrant to the end of the fire service main.**
   HW Response: The drawings have been updated per this comment.

7. **NHDES may push back on individual sewer pumps to common force main. DES has required individual services connecting to the sewer main in Sagamore Ave in the past.**
   HW Response: The Applicant will coordinate with NHDES as needed. It would be preferred to utilize the site's existing force main stub versus disturbing Sagamore Ave to add additional connections.

8. **Stub for sewer force main is 1.5". Stated size of sewer force main on property is 2". Confirm that 1.5" service size is sufficient for the four proposed properties. If it is sufficient then decrease force main size on property to 1.5".**
   HW Response: Per continued discussions with DPW, the force main has been revised to 1.25-inch. A revised copy of the pump design report has been provided.

9. **City to provide sewer tie card for sewer stub location. Existing sewer alignment in Sagamore Ave is incorrect.**
   HW Response: The drawings have been updated per the sewer information provided by the City.

10. **Sagamore Avenue is a state highway and will require a driveway permit from NHDOT.**
    HW Response: An application was submitted with NHDOT in November 2025 and their comments were addressed in this Site Plan application. Additional information they requested, such as a Drainage Report, will be provided to the NHDOT after they have been reviewed by the TAC.

11. **The topography provided in the existing features plan does not match up with the drainage pattern provided in the drain study. It appears there is a large depression in the center of the lot that would naturally detain stormwater. This is not represented in the study. Also, as offsite flow onto the site needs to be accounted for in design, it is not relevant to the pre and post condition Summary and the offsite areas should have been shown a routing separately. In short, we believe that developing this site to the degree shown will dramatically influence the downstream drainage and that needs to be addressed.**
    HW Response: We have worked with DPW to revise the hydrology model to accurately depict existing drainage patterns. To comply with local stormwater regulations, the site design has been revised to include robust stormwater infiltration BMPs.

12. **The engineer is showing detaining of drainage in direct proximity of what I believe is a proposed basement. This approach is not approvable as it will create hydraulic loading on the foundation and additional need to dewater the basement area.**
    HW Response: We have worked with DPW to address concerns with stormwater detention adjacent to basements. Revisions to the design include raising the basement slab grade by several feet, and provision of numerous water-proofing details.

13. **Was more than one test pit conducted on site to determine soil type, depth to SHGW and ledge? Based on the one test pit shown, the soil is very shallow and rocky making infiltration almost impossible. A stormwater flowage easement may be necessary to create this level of development.**
    HW Response: One test pit was performed on the site in the location of the proposed rain garden, the test pit log is included within the Drainage Report. This test pit was performed at approximately elevation 29' and identified the seasonal high-water table approximately 2 feet deep, and ledge approximately 41 inches deep. The bottoms of both infiltration systems have been set at elevation 28' to allow for 1' of separation from the SHWT.

14. **The proposed transformer should be further from the driveway.**
    HW Response: The drawings have been updated per this comment.

We look forward to TAC review of this submission and the Committees feedback on the proposed design.

Sincerely,
Haley Ward, Inc.

Drew Olehowski, PE
Project Manager

DJO-cba

CITY OF PORTSMOUTH
Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801
(603) 610-7216

TECHNICAL ADVISORY COMMITTEE

February 5, 2026

Sagamore Avenue CBC, LLC
76 State Street
Newburyport, Massachusetts 01950

RE: Site Plan Review approval for property located at 1151 Sagamore Avenue, Portsmouth, NH 03801 (LU-24-178)

Dear Property Owner:

The Technical Advisory Committee, at its regularly scheduled meeting of Tuesday, February 3, 2026, considered your application for Site Plan Review approval for the demolition of the existing structure and construction of four (4) standalone condominium single family structures with associated site improvements. Said property is shown on Assessor Map 224 Lot 19 and lies within the Mixed Residential Office (MRO) District. As a result of said consideration, the Committee voted to **postpone** the application to the March meeting.

This matter will be placed on the agenda for the Technical Advisory Committee meeting scheduled for **Tuesday, March 3, 2026**. One (1) hard copy of any revised plans and supporting reports and exhibits as well as an updated electronic file (in a PDF format) must be filed in the Planning Department by **Wednesday, February 18, 2026**.

The minutes and audio recording of this meeting are available by contacting the Planning & Sustainability Department.

Very truly yours,

Peter Britz,
Planning and Sustainability Director

cc:

Environment One Corporation

Pressure Sewer Preliminary

Cost and Design Analysis

For

1151 Sagamore Ave

Portsmouth, NH

Prepared For:
Drew Olehowski Haley Ward
120 Main St Suite 132
Saco ME 04072
Tel: 207-576-6488
Fax:
Prepared By: D.Coppola

February 11, 2026

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
D.Coppola

1151 Sagamore Ave
Portsmouth, NH

February 11, 2026

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE										Friction loss calculations were based on a Constant for inside roughness "C" of:							150
1.00	1.00	4	4	200	11.00	3	33.00	1.25	7.31	274.00	14.40	39.46	39.46	32.00	28.00	4.00	43.46

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

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PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

Prepared By:
D.Coppola

1151 Sagamore Ave
Portsmouth, NH

February 11, 2026

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for			SDR11HDPE					Gals per Day per Dwelling		200
1.00	1.00	4	1.25	7.52	274.00	20.61	800	38.81	0.62	0.62

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

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HALEY WARD

STORMWATER MANAGEMENT AND EROSION CONTROL PLAN

TO THE CITY OF PORTSMOUTH
FOR 1151 SAGAMORE AVENUE
Map 224, Lot 19 | Portsmouth, NH

APPLICANT:
1151 Sagamore Avenue CBC LLC
76 State Street, Newburyport, ME 01950

February 17, 2026
JN: 5010314.002

REPORT PREPARED BY:
Haley Ward, Inc.
200 Griffin Road, Unit 14 | Portsmouth, NH 03801

EXECUTIVE SUMMARY

This drainage analysis examines the pre-development (existing) and post-development (proposed) stormwater drainage patterns for the proposed residential redevelopment project at 1151 Sagamore Avenue in Portsmouth, NH. The site is shown on the City of Portsmouth Assessor's Tax Map 224 as Lot 19. The project proposes to replace an existing building with four (4) single family condominiums. The total size of the lot is 30,191 square-feet (0.69 acres). The size of the total drainage area is 67,213 square-feet (1.53 acres).

The development will provide for the construction of four (4) standalone condominium units, with associated landscaping, utilities, and driveways. The new buildings will be serviced by public water and sewer. The development has the potential to increase stormwater runoff to adjacent properties and therefore must be designed in a manner to prevent that occurrence. This will be done primarily by capturing stormwater runoff and routing it through appropriate stormwater facilities, designed to ensure that there will be no significant increase in peak runoff from the site as a result of this project.

The hydrologic modeling utilized for this analysis uses the "Extreme Precipitation" values for rainfall from The Northeast Regional Climate Center (Cornell University), with a 15% increase to comply with local ordinance.

INTRODUCTION / PROJECT DESCRIPTION

This drainage report is designed to assist the owner, planning board, contractor, regulatory reviewer, and others in understanding the impact of the proposed development project on local surface water runoff and quality. The project site is shown on the City of Portsmouth, NH Assessor's Tax Map 224 as Lot 19. Bounding the site to north is Wentworth Road. Bounding the site to east is Sagamore Avenue. Bounding the site to south is a condominium complex. Bounding the site to the west is a City owned conservation land.

The property is situated in the Mixed Residential Office Zone. A vicinity map is included in the Appendix to this report. The proposed building replacement will demolish an existing building and associated driveway.

This report includes information about the existing site necessary to analyze stormwater runoff and to design any required mitigation. The report includes maps of pre- development and post-development watersheds, subcatchment areas and calculations of runoff. The report will provide a narrative of the stormwater runoff and describe numerically and graphically the surface water runoff patterns

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for this site. Proposed stormwater management and treatment structures and methods will also be described, as well as erosion and sediment control practices. To fully understand the proposed site development the reader should also review a complete site plan set in addition to this report.

METHODOLOGY

"Extreme Precipitation" values from The Northeast Regional Climate Center (Cornell University) have been used for modeling purposes. These values have been used in this analysis, with a 15% addition to comply with local ordinances.

This report uses the US Soil Conservation Service (SCS) Method for estimating stormwater runoff. The SCS method is published in The National Engineering Handbook (NEH), Section 4 "Hydrology" and includes the Technical Release No. 20, (TR-20) "Computer Program for Project Formulation Hydrology", and Technical Release No. 55 (TR-55) "Urban Hydrology for Small Watersheds" methods. This report uses the HydroCAD version 10.20 program, written by HydroCAD Software Solutions LLC, Chocorua, N.H., to apply these methods for the calculation of runoff and for pond modeling. Rainfall data and runoff curve numbers are taken from "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire."

Time of Concentration (Tc) is calculated by entering measured flow path data such as flow path type, length, slope and surface characteristics into the HydroCAD program. For the purposes of this report, a minimum time of concentration of 5 minutes is used.

The storm events used for the calculations in this report are the 2-year, 10-year, 25-year, and 50-year (24-hour) storms. Watershed basin boundaries have been delineated using topographic maps prepared by Haley Ward and field observations to confirm.

SITE SPECIFIC INFORMATION

Based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Soil Survey of Rockingham County, New Hampshire the site is made up of one soil type:

Soil Symbol	Soil Name and Slopes
140B	Chatfield-Hollis-Canton complex (0-8% slopes), rocky

Chatfield-Hollis-Canton complex is well drained with a stated depth to restrictive feature of 20-41 inches.

One test pit was dug on the site in the location of the proposed Rain Garden. A restrictive ledge layer was identified at 41-inches. The seasonal high-water table was identified at approximately 18" depth, or elevation 27-feet. The soil is described as fine, sandy loam, granular, friable, fill.

The physical characteristics of the site consist of flat (0-8%) grades that generally slope downward from the south to the north of the lot. Elevations on the site range from 30 to 35 feet above sea level. The existing site is developed and includes an existing building located in the front of the lot, with an asphalt driveway. Vegetation around the developed portion of the lot consists of established grasses, shrubs, and trees.

There are no protected natural resources on or directly adjacent to the subject property.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) number 33015C0286F (effective date January 29, 2021), the project site is located in Zone X and is determined to be outside of the 0.2% annual chance floodplain. A copy of the FIRM map is included in the Appendix.

CONSTRUCTION TIMING

Development of the site has been ongoing throughout 2025; completed activities include blasting/excavation to bring the site to foundation grade, and the exiting home has already been demolished. Construction of the proposed development is anticipated to begin in Spring 2026, pending receipt of required land use permits. Prior to further earth moving activities, the site will be stabilized via the proposed erosion control devices as shown on the Site Plan. These devices will not be removed until the site has been stabilized via permanent vegetation, which is expected to occur in Fall/Winter 2026.

LOW-IMPACT DEVELOPMENT STATEMENT

The proposed developed utilized Low-Impact Develeopment to the greatest extent practical. Primarily, runoff generated from the proposed driveway and building roofs is directed to a Rain Garden which has been designed per the New Hampshire Stormwater Manual. Impervious areas have been minimized by including garages within the proposed buildings, eliminating the need for additional outdoor parking spaces.

BUFFERS, SETBACKS, EXISTING FEATURES

The site will adhere to the applicable setbacks found within the City zoning ordinance. There are no setbacks related to protected natural resources. The site is not within a mapped floodplain. There are mature trees between the subject parcel and the abutting property to the south which will be protected as deemed practical. There are no known water quality concerns associated with this site.

WASTE

The majority of the site preparation, including demolition of the existing building, has already been completed at the time of this application's submission. Additional construction debris will be collected in a dumpster and will be disposed of off-site by a licensed hauler. Solid waste and wastewater generated by the proposed residential units will be handled via public systems.

PRE-DEVELOPMENT DRAINAGE

In the pre-development condition, the site has been analyzed as three (3) subcatchment watershed basins based on localized topography and discharge location. A Pre-Development Hydrology map and HydroCAD model results have been provided.

Subcatchment 1 (1S) represents the majority of the subject property area, as well as offsite area to the north, which drains towards the center of the site where runoff is detained in a local low point. Runoff in this detention area has been observed to infiltrate; no pooling of water has been documented. While the majority of runoff entering this area is discarded via infiltration, any overflow is directed to the southwest corner of the site (Summation Point 1.)

Subcatchment 2 (2S) represents the front of the subject property, as well as a portion of the abutting 1151 Sagamore Avenue property to the south. This area drains to the northeast corner of the site where it is discharged to the Sagamore Avenue Public ROW (Summation Point 2, SP2)

POST-DEVELOPMENT DRAINAGE

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. In the post-development condition, the site has been analyzed as eight (8) subcatchment basins. A Post-Development Hydrology map and HydroCAD model results have been provided.

Subcatchment 1 (1S) continues to represent the area to the north of the site. This drainage area will be intercepted by an infiltration trench to be located on the

north side of the proposed buildings. This trench has been designed to detain and infiltrate runoff from the 50-year storm event. This trench is equipped with underdrain pipe and several manholes for maintenance access. In the event that this trench were to fail, runoff will be directed to the rain garden.

Subctachment 2 (2S) continues to represent the front of the lot and the adjacent 1155 Sagamore Avenue property. Runoff in this area will continue to be directed to the northeast corner of the lot, Summation Point 2.

Subcatchment 3 (3S) represents the proposed driveway and landscaped areas. Runoff within this subcatchment will be directed as overland flow to a proposed rain garden at the rear of the site. This rain garden will release controlled follow to a subsurface detention system located beneath the proposed driveway.

Subcatchments 4,5,6, and 7 (4S, 5S, 6S, 7S) represent the roof areas of the four proposed buildings. These units will be equipped with gutters and downspouts which will direct their runoff to the proposed rain garden.

Subcatchment 8 (8S) represents a portion of the 1155 Sagamore Avenue property, as well as offsite area to the west. Runoff from this offsite area cannot be feasibly captured by the proposed onsite stormwater infrastructure and is therefore the source of the minor post-development peak runoff rate increase, as identified below.

RUNOFF COMPARISON

Table 1: Pre-Development to Post-Development Comparison

	Q2 (CFS)		Q10 (CFS)		Q25(CFS)		Q50 (CFS)		
Design Point	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Description**
SP1	0.00	0.05	0.00	0.16	0.00	0.27	0.00	0.38	Southwest corner of property
SP2	0.38	0.38	0.87	0.78	1.30	1.13	1.71	1.46	Sagamore Ave ROW

As shown in Table 1, post-development runoff rates are similar to those observed under pre-development conditions. The minor increases observed at Summation Point 1 are due to runoff from the offsite areas (Subcatchment 8) that cannot be feasibly detained by the proposed onsite detention features. These increases of less than one half CFS are not expected to have a significant impact on downstream properties.

OFFSITE INFRASTRUCTURE CAPACITY

There is no Town infrastructure utilized in this project in regard to storm drainage. All retention and routing to the final destination of the stormwater is done on-site, therefore no impact to city infrastructure is anticipated.

EROSION AND SEDIMENT CONTROL PRACTICES

The erosion potential for this site as it exists is moderate due to the presence of soils that are highly erodible. During construction, the major potential for erosion is wind and stormwater runoff. The contractor will be required to inspect and maintain all necessary erosion control measures, as well as installing any additional measures as required. All erosion control practices shall conform to "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire." Some examples of erosion and sediment control measures to be utilized for this project during construction may include:

- Silt Soxx (or approved alternative) located at the toe of disturbed slopes
- Stabilized construction entrance at access point to the site
- Temporary mulching and seeding for disturbed areas
- Spraying water over disturbed areas to minimize wind erosion

After construction, permanent stabilization will be accomplished by permanent seeding, landscaping, and surfacing the access drives and parking areas with asphalt paving and other areas with impervious walkways.

CONCLUSION

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. With the design of the rain garden, the post- development runoff rates are effectively equivalent to the pre-development runoff rates. Erosion and sediment control practices will be implemented for both the temporary condition during construction and for final stabilization after construction. Therefore, there are no negative impacts to downstream receptors or adjacent properties anticipated as a result of this project.

REFERENCES

1. Comprehensive Environmental Inc. and New Hampshire Department of Environmental Services. *New Hampshire Stormwater Manual (Volumes 1, 2 and 3)*, December 2008 (Revision 1.0).
2. Minnick, E.L. and H.T. Marshall. *Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire*, prepared by Rockingham County Conservation District, prepared for New Hampshire Department of Environmental Services, in cooperation with USDA Soil Conservation Service, August 1992.
3. HydroCAD Software Solution, LLC. *HydroCAD Stormwater Modeling System Version*

   10.20 copyright 2013.

Property Information

Property ID	0224-0019-0000
Location	1151 SAGAMORE AVE
Owner	1151 SAGAMORE AVENUE CBC LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Portsmouth, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 10/23/2025

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.052 degrees North
Longitude	70.748 degrees West
Elevation	10 feet
Date/Time	Fri Aug 25 2023 11:03:42 GMT-0400 (Eastern Daylight Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.67	2.94	**1yr**	2.36	2.82	3.24	3.96	4.57	**1yr**
2yr	0.32	0.50	0.62	0.82	1.03	1.30	**2yr**	0.89	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.45	3.95	4.70	5.35	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.08	4.60	**5yr**	3.61	4.42	5.07	5.96	6.73	**5yr**
10yr	0.41	0.65	0.82	1.12	1.46	1.90	**10yr**	1.26	1.73	2.24	2.91	3.76	4.88	5.55	**10yr**	4.32	5.34	6.12	7.14	8.01	**10yr**
25yr	0.48	0.77	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.76	6.19	7.13	**25yr**	5.48	6.85	7.85	9.07	10.09	**25yr**
50yr	0.54	0.87	1.11	1.55	2.09	2.78	**50yr**	1.80	2.54	3.31	4.35	5.69	7.42	8.62	**50yr**	6.56	8.29	9.48	10.87	12.02	**50yr**
100yr	0.60	0.98	1.26	1.79	2.44	3.28	**100yr**	2.10	3.00	3.93	5.19	6.80	8.88	10.42	**100yr**	7.86	10.02	11.46	13.03	14.33	**100yr**
200yr	0.68	1.11	1.44	2.07	2.85	3.87	**200yr**	2.46	3.54	4.66	6.17	8.12	10.65	12.60	**200yr**	9.42	12.11	13.85	15.63	17.08	**200yr**
500yr	0.81	1.33	1.73	2.51	3.52	4.81	**500yr**	3.03	4.42	5.82	7.76	10.28	13.53	16.20	**500yr**	11.97	15.58	17.81	19.89	21.57	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.62	0.86	0.93	1.34	1.69	2.26	2.50	**1yr**	2.00	2.41	2.88	3.21	3.94	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.81	2.33	3.07	3.47	**2yr**	2.72	3.33	3.84	4.56	5.11	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.11	2.72	3.80	4.20	**5yr**	3.36	4.04	4.74	5.56	6.26	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.80	2.38	3.05	4.38	4.88	**10yr**	3.88	4.69	5.47	6.44	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.74	3.52	4.78	5.91	**25yr**	4.23	5.68	6.69	7.83	8.72	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.05	3.91	5.41	6.82	**50yr**	4.79	6.56	7.77	9.10	10.06	**50yr**
100yr	0.54	0.81	1.02	1.47	2.02	2.47	**100yr**	1.74	2.41	2.63	3.39	4.31	6.10	7.87	**100yr**	5.40	7.57	9.04	10.58	11.63	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.81	**200yr**	1.97	2.75	2.94	3.74	4.74	6.86	9.09	**200yr**	6.07	8.74	10.50	12.32	13.45	**200yr**
500yr	0.69	1.02	1.31	1.91	2.72	3.36	**500yr**	2.34	3.29	3.42	4.26	5.39	8.01	10.98	**500yr**	7.09	10.56	12.80	15.09	16.30	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	**1yr**	0.77	1.06	1.26	1.74	2.20	2.98	3.18	**1yr**	2.64	3.06	3.59	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.52	3.43	3.72	**2yr**	3.03	3.58	4.11	4.86	5.64	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.63	**5yr**	1.16	1.59	1.89	2.54	3.26	4.36	4.98	**5yr**	3.85	4.79	5.40	6.40	7.18	**5yr**
10yr	0.47	0.72	0.89	1.25	1.62	1.99	**10yr**	1.39	1.94	2.29	3.11	3.97	5.36	6.23	**10yr**	4.74	5.99	6.85	7.87	8.79	**10yr**
25yr	0.58	0.88	1.10	1.57	2.06	2.59	**25yr**	1.78	2.53	2.97	4.08	5.18	7.75	8.38	**25yr**	6.86	8.05	9.20	10.38	11.45	**25yr**
50yr	0.68	1.03	1.28	1.84	2.48	3.15	**50yr**	2.14	3.08	3.61	5.02	6.36	9.69	10.50	**50yr**	8.57	10.10	11.51	12.78	14.01	**50yr**
100yr	0.80	1.20	1.51	2.18	2.99	3.84	**100yr**	2.58	3.76	4.40	6.19	7.83	12.11	13.16	**100yr**	10.71	12.65	14.40	15.76	17.15	**100yr**
200yr	0.93	1.41	1.78	2.58	3.60	4.70	**200yr**	3.10	4.59	5.37	7.63	9.63	15.17	16.51	**200yr**	13.43	15.87	18.04	19.43	20.98	**200yr**
500yr	1.16	1.73	2.22	3.23	4.59	6.11	**500yr**	3.96	5.97	6.97	10.10	12.71	20.46	22.28	**500yr**	18.11	21.43	24.31	25.62	27.41	**500yr**

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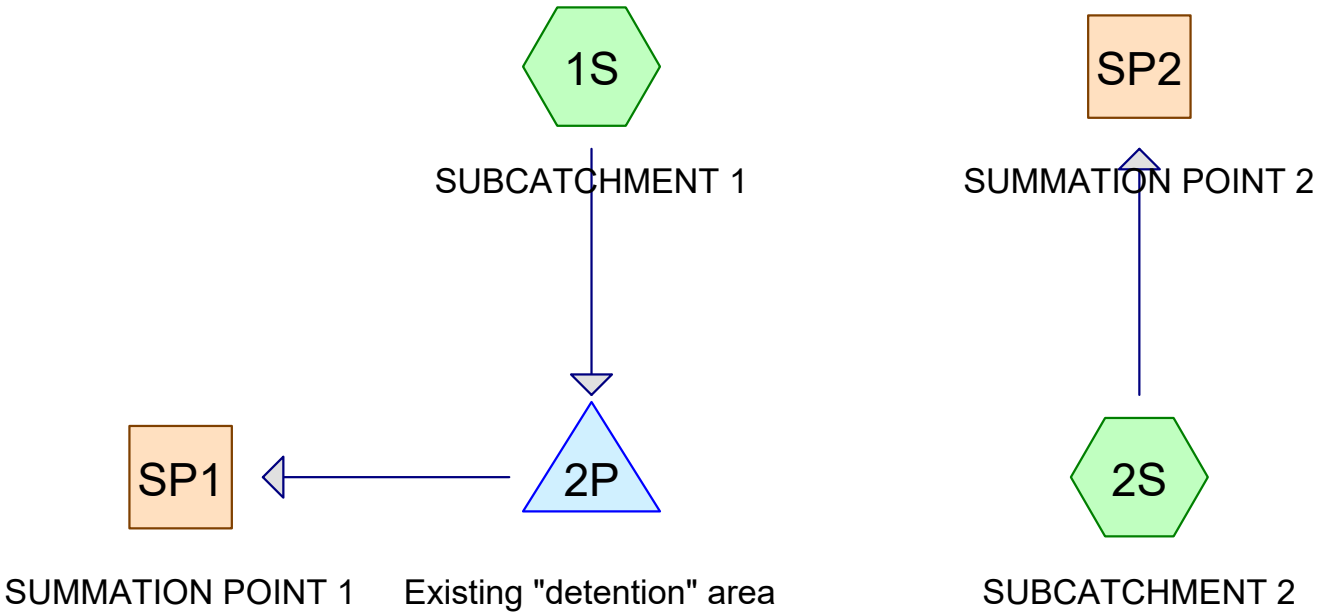


Subcat Reach Pond Link

Routing Diagram for Pre Development
Prepared by Haley Ward, Printed 2/13/2026
HydroCAD® 10.20-7a s/n 00641 © 2025 HydroCAD Software Solutions LLC

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=47,354 sf 10.22% Impervious Runoff Depth>0.66"
Flow Length=100' Slope=0.0800 '/' Tc=13.4 min CN=61 Runoff=0.50 cfs 0.060 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=12,579 sf 27.43% Impervious Runoff Depth>1.19"
Tc=5.0 min CN=71 Runoff=0.38 cfs 0.029 af

Reach SP1: SUMMATION POINT 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: SUMMATION POINT 2 Inflow=0.38 cfs 0.029 af
Outflow=0.38 cfs 0.029 af

Pond 2P: Existing "detention" area Peak Elev=27.60' Storage=704 cf Inflow=0.50 cfs 0.060 af
Discarded=0.12 cfs 0.060 af Primary=0.00 cfs 0.000 af Outflow=0.12 cfs 0.060 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.089 af Average Runoff Depth = 0.77"
86.16% Pervious = 1.186 ac 13.84% Impervious = 0.190 ac

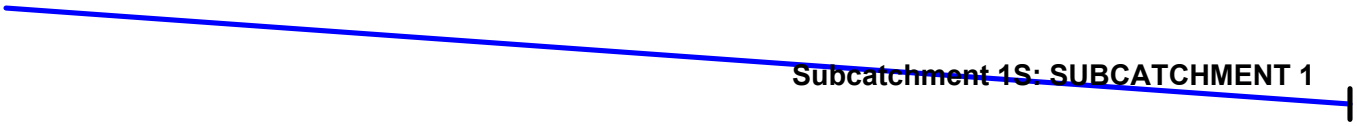
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 0.50 cfs @ 12.23 hrs, Volume= 0.060 af, Depth> 0.66"
Routed to Pond 2P : Existing "detention" area

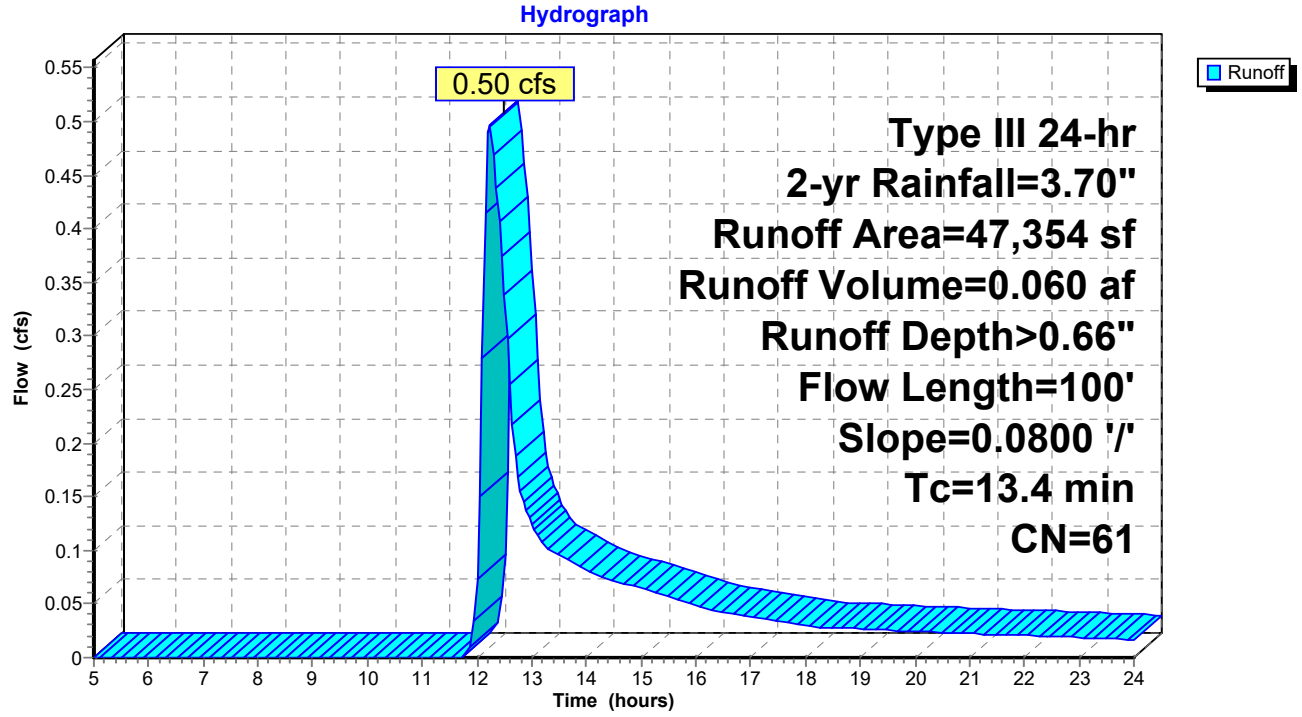
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	28,956	55	Woods, Good, HSG B
	13,557	61	>75% Grass cover, Good, HSG B
*	4,841	98	IMPERVIOUS
	47,354	61	Weighted Average
	42,513		89.78% Pervious Area
	4,841		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

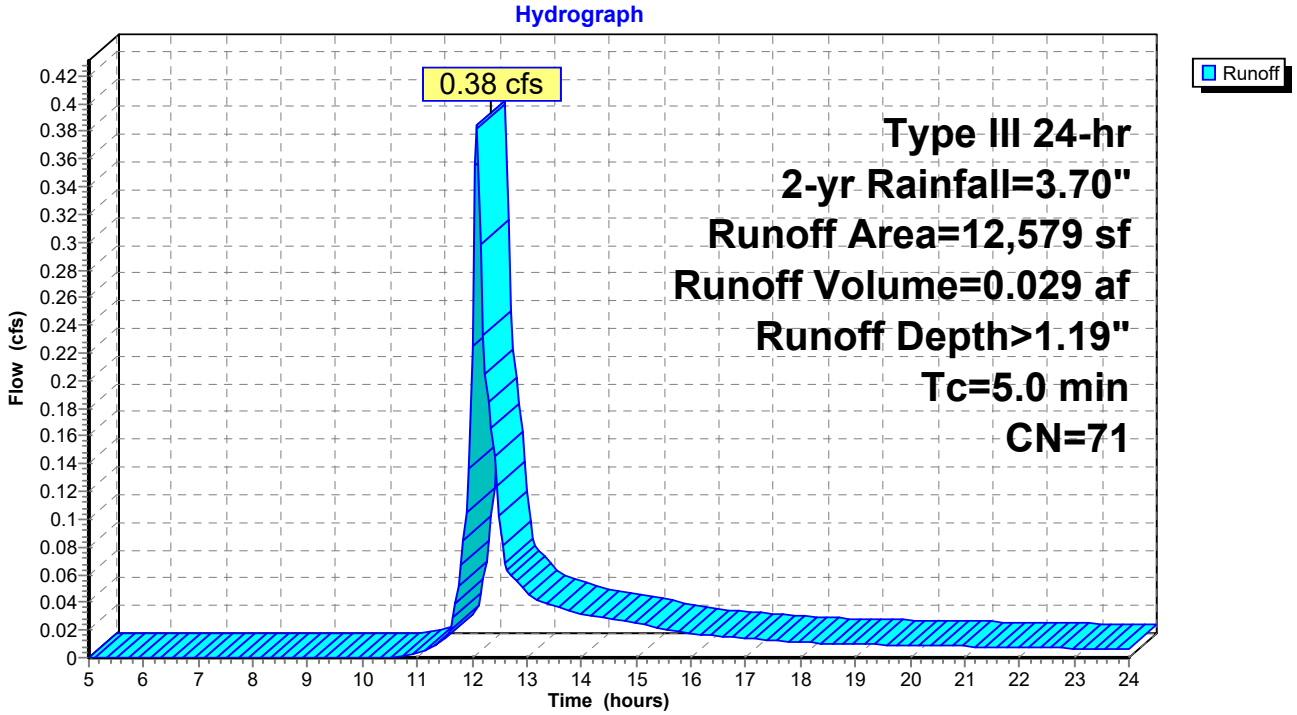
Runoff = 0.38 cfs @ 12.09 hrs, Volume= 0.029 af, Depth> 1.19"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	9,128	61	>75% Grass cover, Good, HSG B
*	3,451	98	IMPERVIOUS
	12,579	71	Weighted Average
	9,128		72.57% Pervious Area
	3,451		27.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2

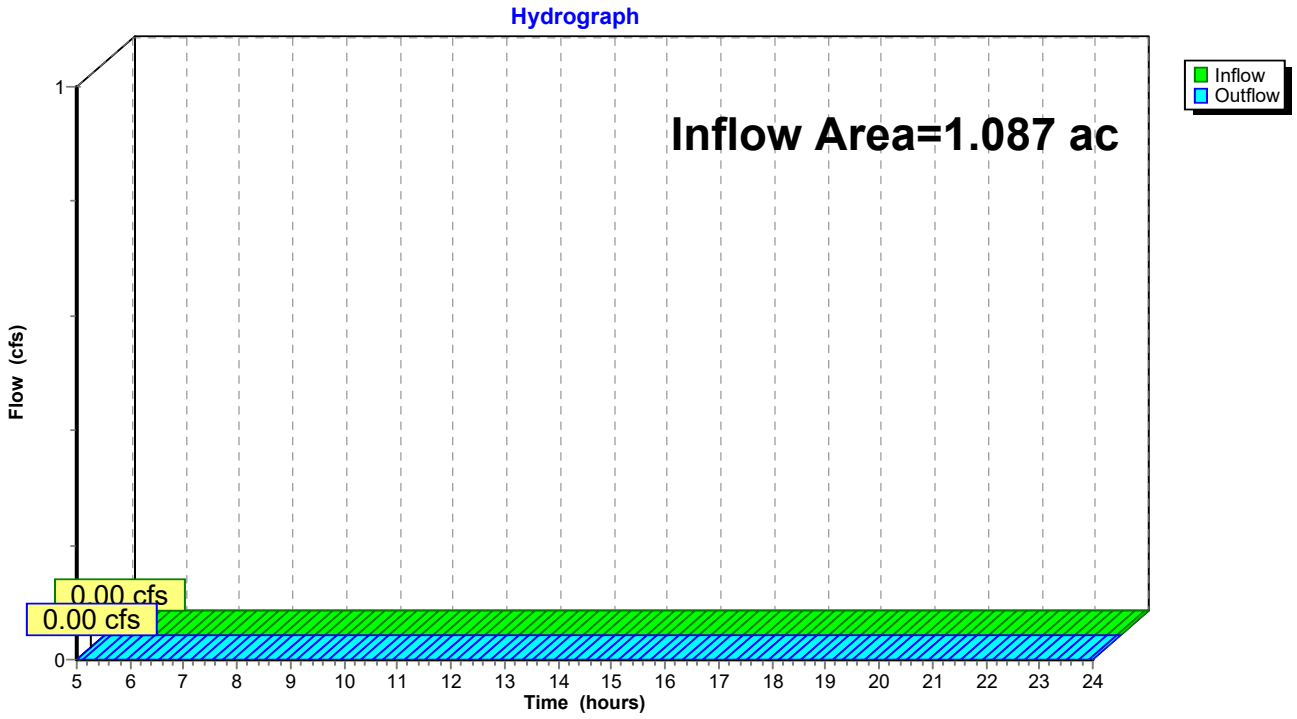


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

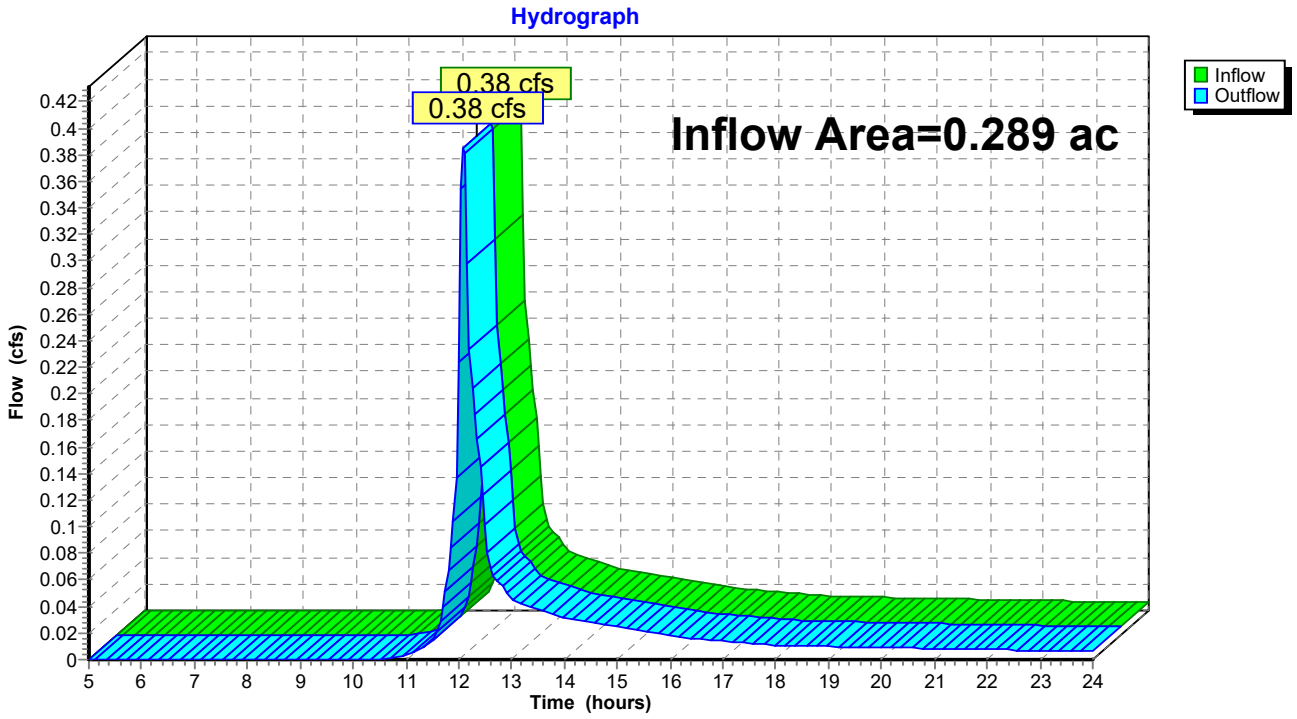


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.289 ac, 27.43% Impervious, Inflow Depth > 1.19" for 2-yr event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 0.029 af
Outflow = 0.38 cfs @ 12.09 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 2P: Existing "detention" area

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth > 0.66" for 2-yr event
Inflow = 0.50 cfs @ 12.23 hrs, Volume= 0.060 af
Outflow = 0.12 cfs @ 13.07 hrs, Volume= 0.060 af, Atten= 76%, Lag= 50.3 min
Discarded = 0.12 cfs @ 13.07 hrs, Volume= 0.060 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 27.60' @ 13.07 hrs Surf.Area= 2,104 sf Storage= 704 cf

Plug-Flow detention time= 67.4 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 65.8 min (968.5 - 902.6)

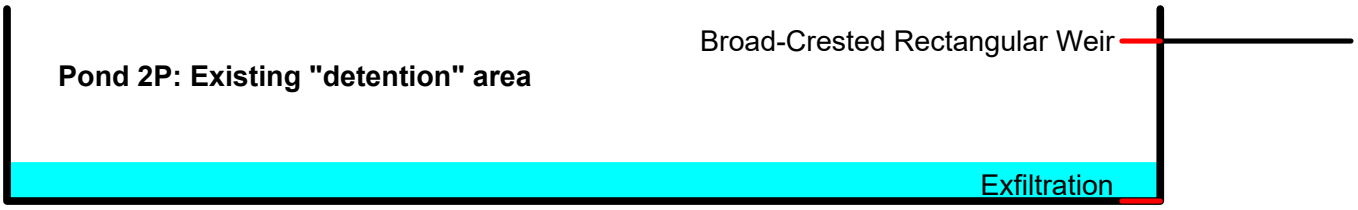
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	17,225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	250	0	0
28.00	3,350	1,800	1,800
29.00	8,000	5,675	7,475
30.00	11,500	9,750	17,225

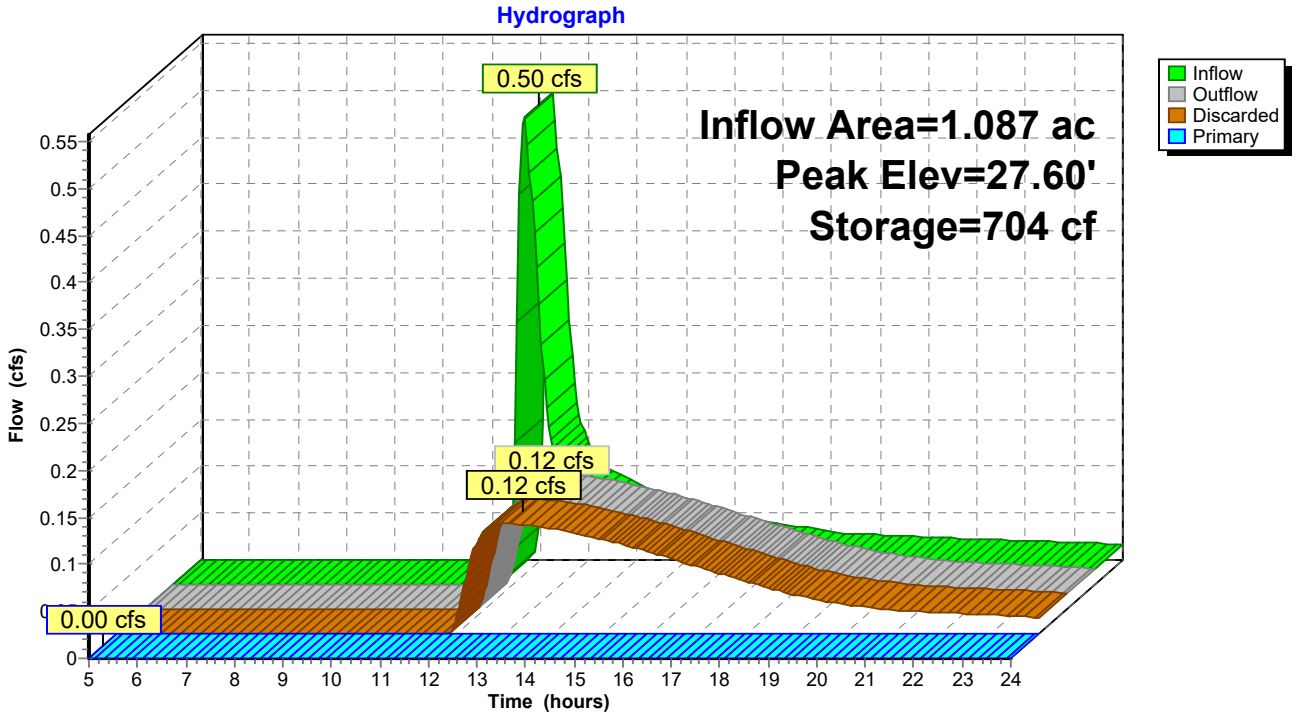
Device	Routing	Invert	Outlet Devices
#1	Discarded	27.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	29.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.12 cfs @ 13.07 hrs HW=27.60' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=27.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Pond 2P: Existing "detention" area



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=47,354 sf 10.22% Impervious Runoff Depth>1.74"
Flow Length=100' Slope=0.0800 '/' Tc=13.4 min CN=61 Runoff=1.63 cfs 0.158 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=12,579 sf 27.43% Impervious Runoff Depth>2.59"
Tc=5.0 min CN=71 Runoff=0.87 cfs 0.062 af

Reach SP1: SUMMATION POINT 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: SUMMATION POINT 2 Inflow=0.87 cfs 0.062 af
Outflow=0.87 cfs 0.062 af

Pond 2P: Existing "detention" area Peak Elev=28.22' Storage=2,652 cf Inflow=1.63 cfs 0.158 af
Discarded=0.24 cfs 0.155 af Primary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.155 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.220 af Average Runoff Depth = 1.92"
86.16% Pervious = 1.186 ac 13.84% Impervious = 0.190 ac

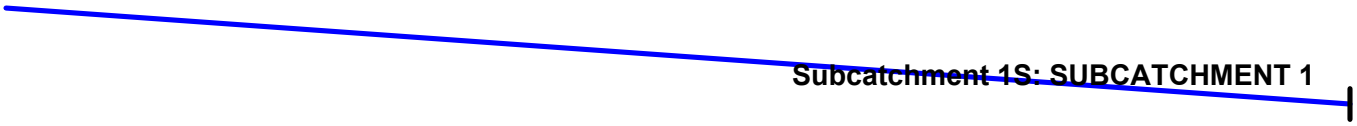
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 1.63 cfs @ 12.20 hrs, Volume= 0.158 af, Depth> 1.74"
Routed to Pond 2P : Existing "detention" area

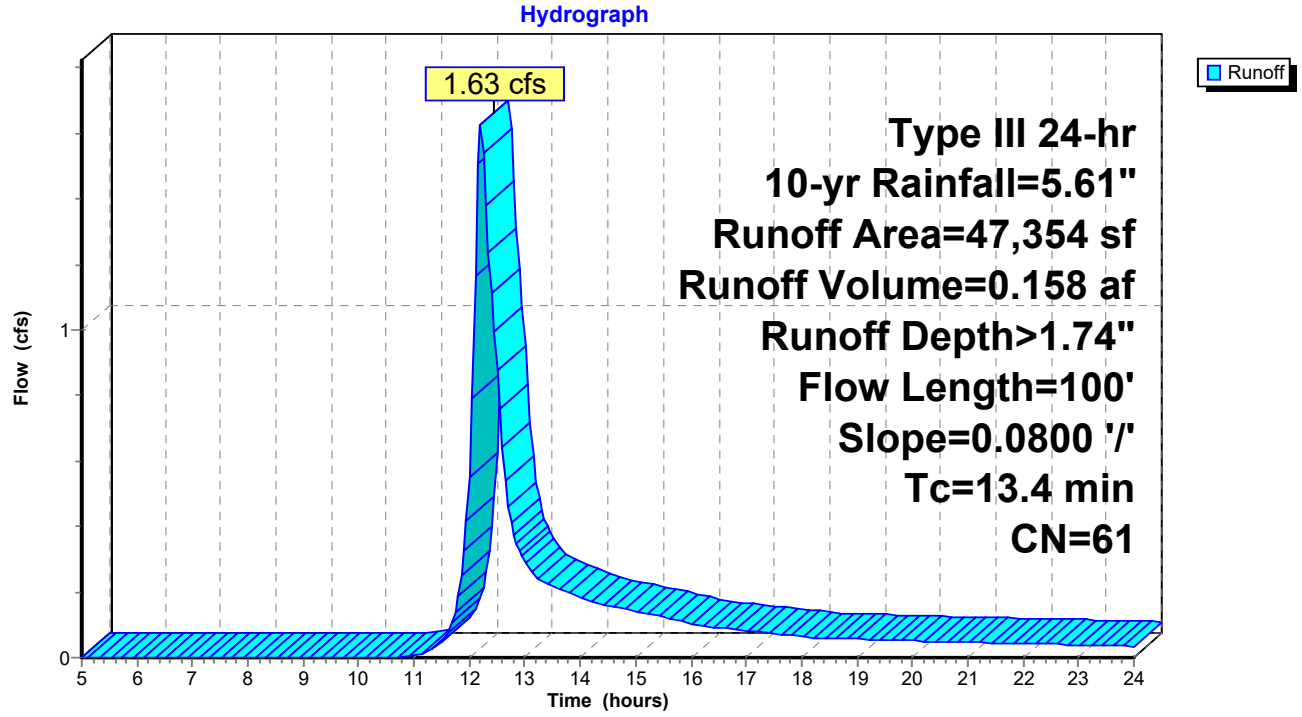
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
	28,956	55	Woods, Good, HSG B
	13,557	61	>75% Grass cover, Good, HSG B
*	4,841	98	IMPERVIOUS
	47,354	61	Weighted Average
	42,513		89.78% Pervious Area
	4,841		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

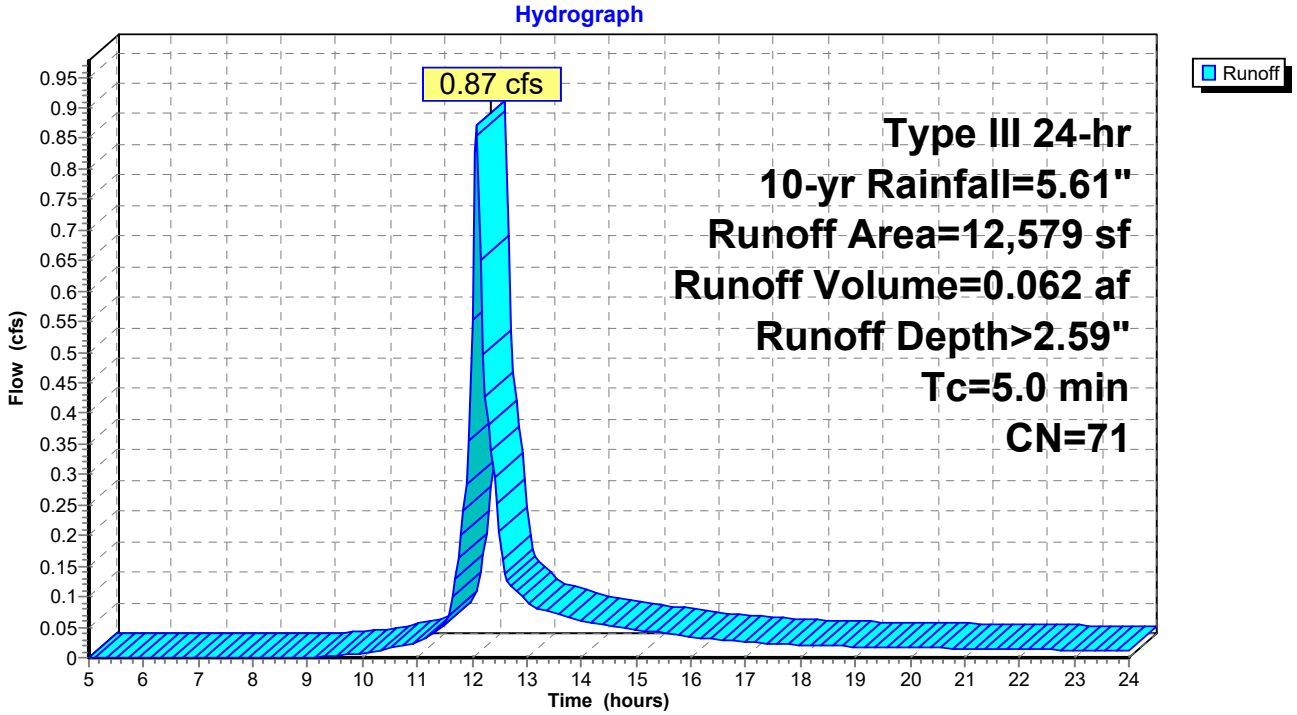
Runoff = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af, Depth> 2.59"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
	9,128	61	>75% Grass cover, Good, HSG B
*	3,451	98	IMPERVIOUS
	12,579	71	Weighted Average
	9,128		72.57% Pervious Area
	3,451		27.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2

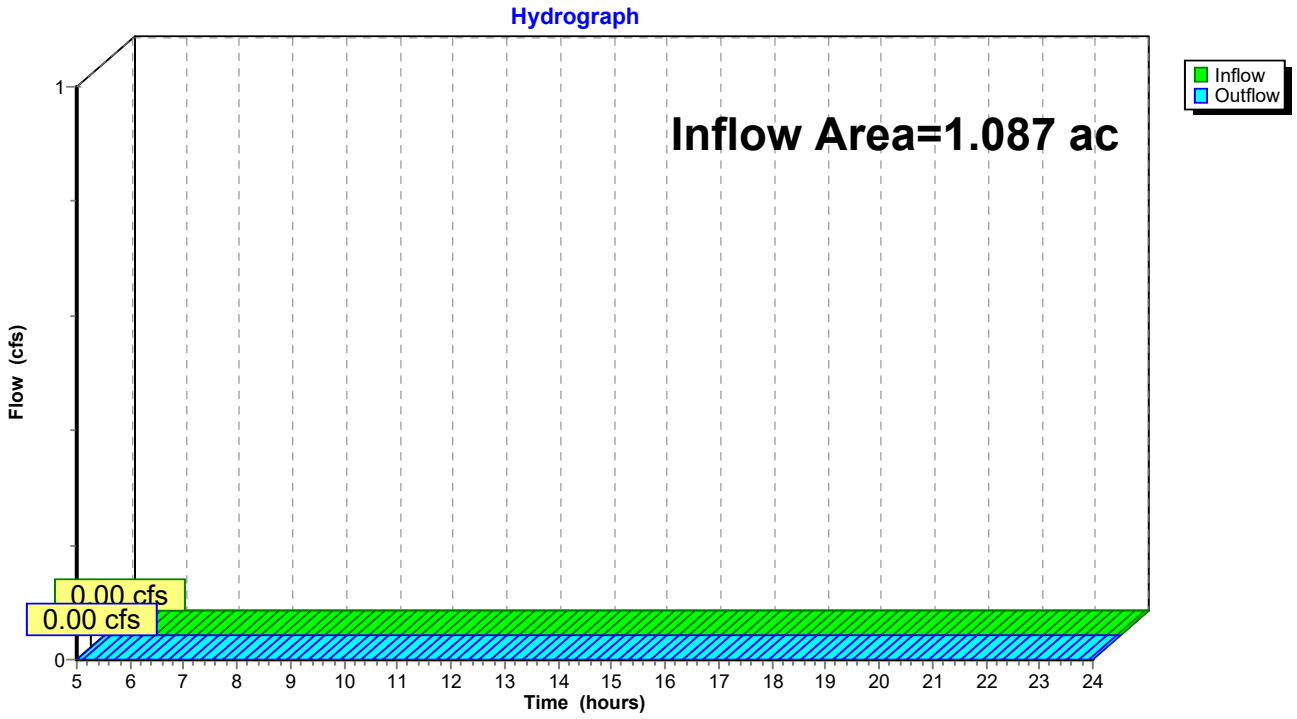


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth = 0.00" for 10-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

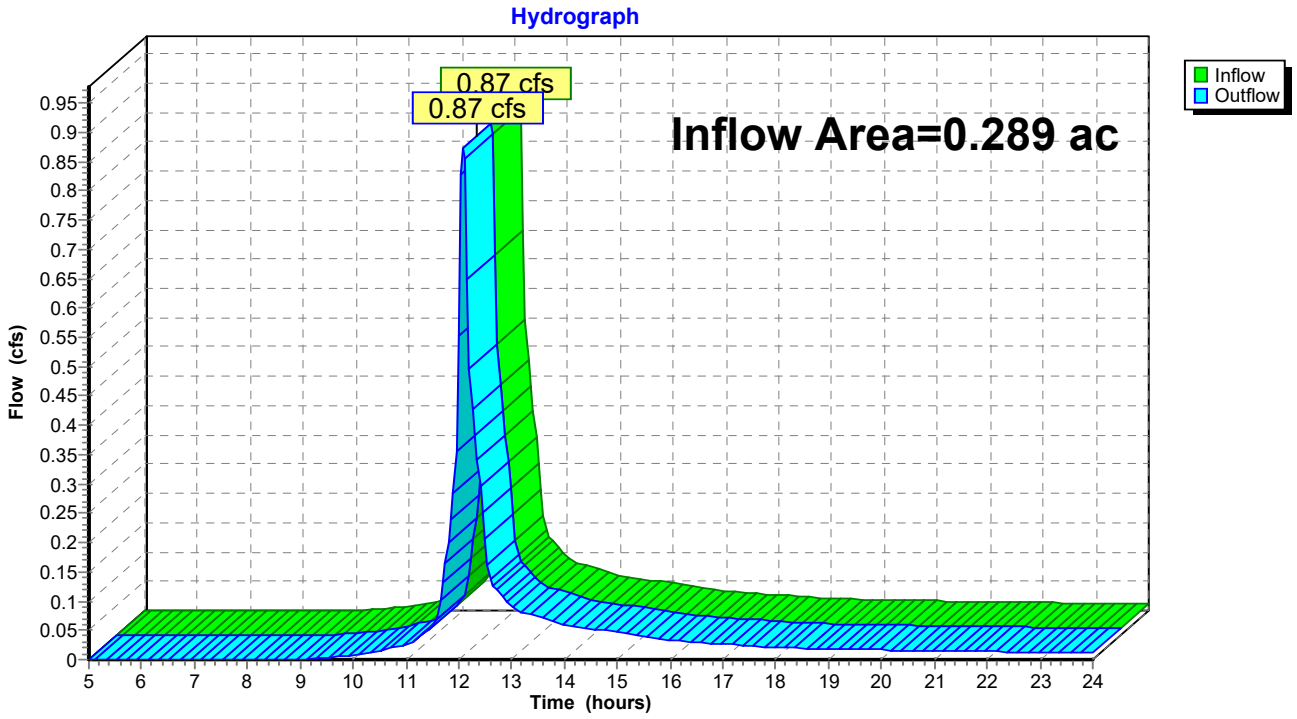


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.289 ac, 27.43% Impervious, Inflow Depth > 2.59" for 10-yr event
Inflow = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af
Outflow = 0.87 cfs @ 12.08 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 2P: Existing "detention" area

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth > 1.74" for 10-yr event
Inflow = 1.63 cfs @ 12.20 hrs, Volume= 0.158 af
Outflow = 0.24 cfs @ 13.23 hrs, Volume= 0.155 af, Atten= 85%, Lag= 61.5 min
Discarded = 0.24 cfs @ 13.23 hrs, Volume= 0.155 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.22' @ 13.23 hrs Surf.Area= 4,376 sf Storage= 2,652 cf

Plug-Flow detention time= 141.3 min calculated for 0.155 af (98% of inflow)
Center-of-Mass det. time= 130.3 min (999.7 - 869.4)

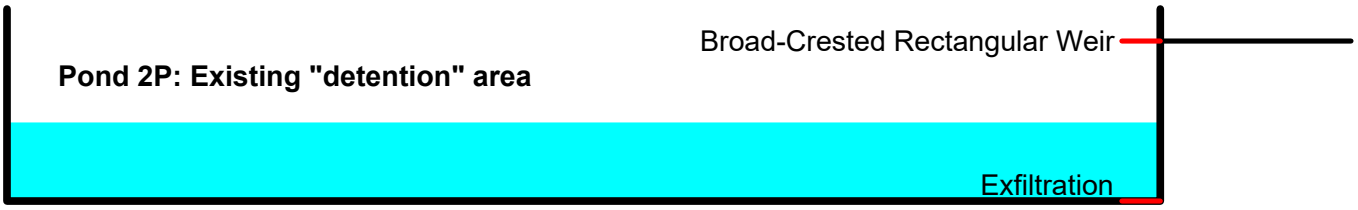
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	17,225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	250	0	0
28.00	3,350	1,800	1,800
29.00	8,000	5,675	7,475
30.00	11,500	9,750	17,225

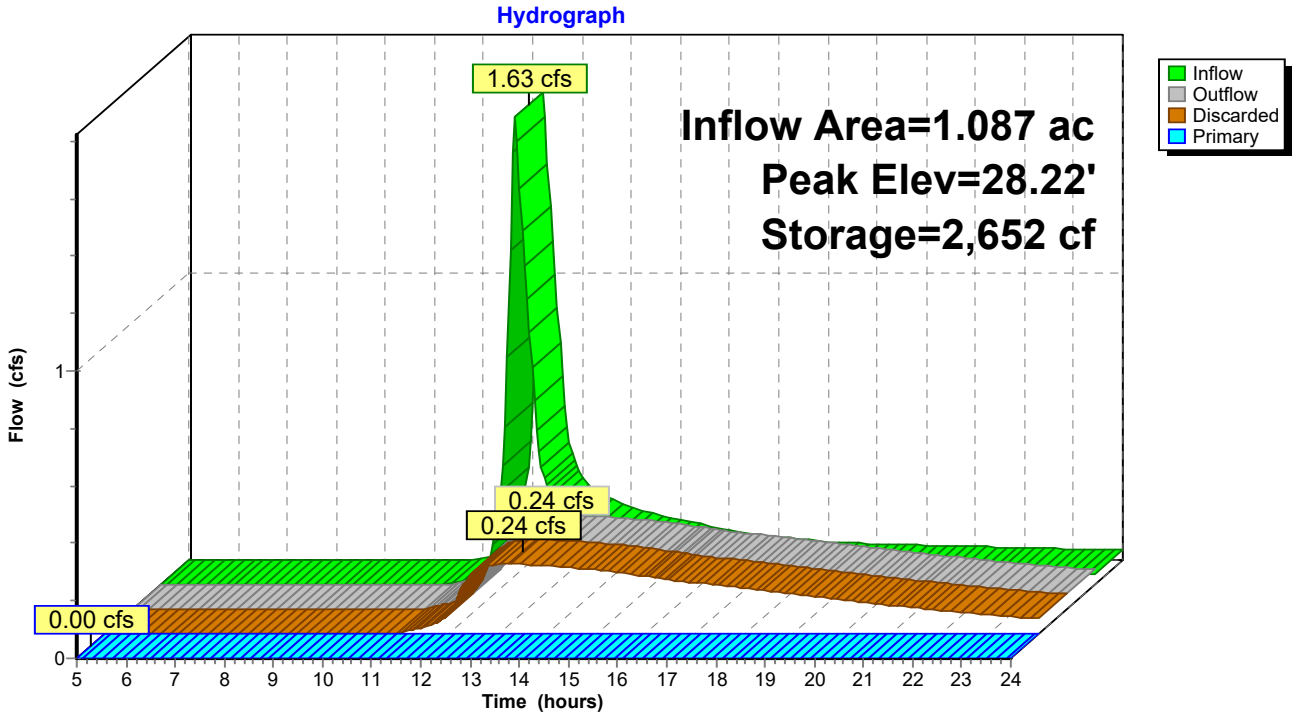
Device	Routing	Invert	Outlet Devices
#1	Discarded	27.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	29.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.24 cfs @ 13.23 hrs HW=28.22' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=27.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Pond 2P: Existing "detention" area



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=47,354 sf 10.22% Impervious Runoff Depth>2.78"
Flow Length=100' Slope=0.0800 '/' Tc=13.4 min CN=61 Runoff=2.71 cfs 0.252 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=12,579 sf 27.43% Impervious Runoff Depth>3.82"
Tc=5.0 min CN=71 Runoff=1.30 cfs 0.092 af

Reach SP1: SUMMATION POINT 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: SUMMATION POINT 2 Inflow=1.30 cfs 0.092 af
Outflow=1.30 cfs 0.092 af

Pond 2P: Existing "detention" area Peak Elev=28.61' Storage=4,705 cf Inflow=2.71 cfs 0.252 af
Discarded=0.34 cfs 0.239 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.239 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.344 af Average Runoff Depth = 3.00"
86.16% Pervious = 1.186 ac 13.84% Impervious = 0.190 ac

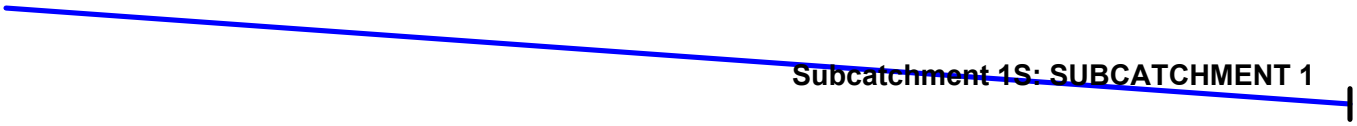
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 2.71 cfs @ 12.20 hrs, Volume= 0.252 af, Depth> 2.78"
Routed to Pond 2P : Existing "detention" area

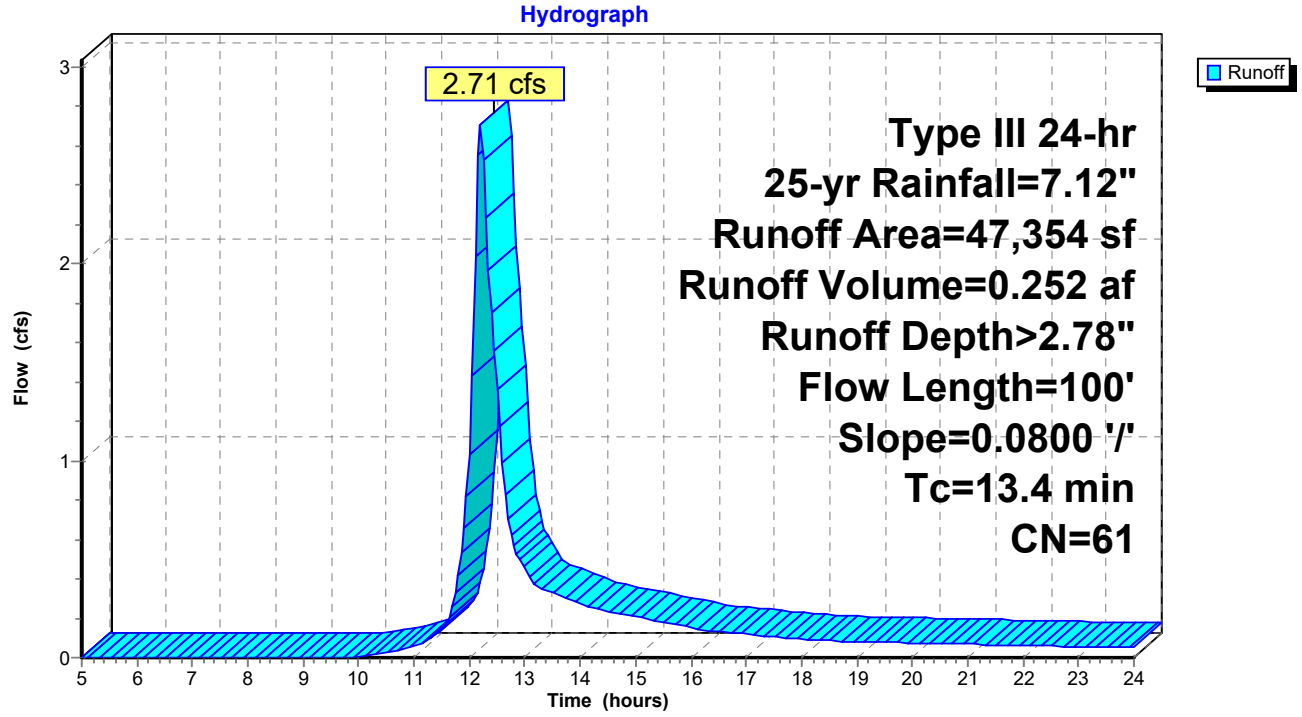
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
	28,956	55	Woods, Good, HSG B
	13,557	61	>75% Grass cover, Good, HSG B
*	4,841	98	IMPERVIOUS
	47,354	61	Weighted Average
	42,513		89.78% Pervious Area
	4,841		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

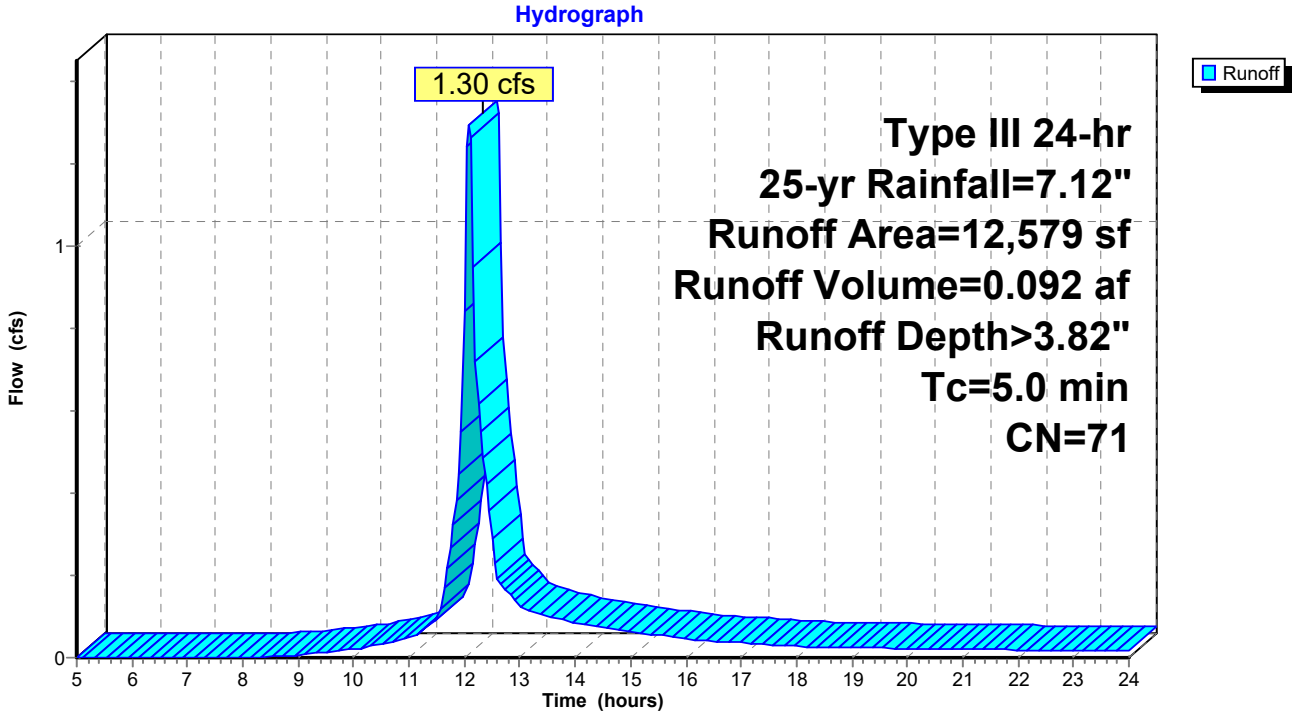
Runoff = 1.30 cfs @ 12.08 hrs, Volume= 0.092 af, Depth> 3.82"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
	9,128	61	>75% Grass cover, Good, HSG B
*	3,451	98	IMPERVIOUS
	12,579	71	Weighted Average
	9,128		72.57% Pervious Area
	3,451		27.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2

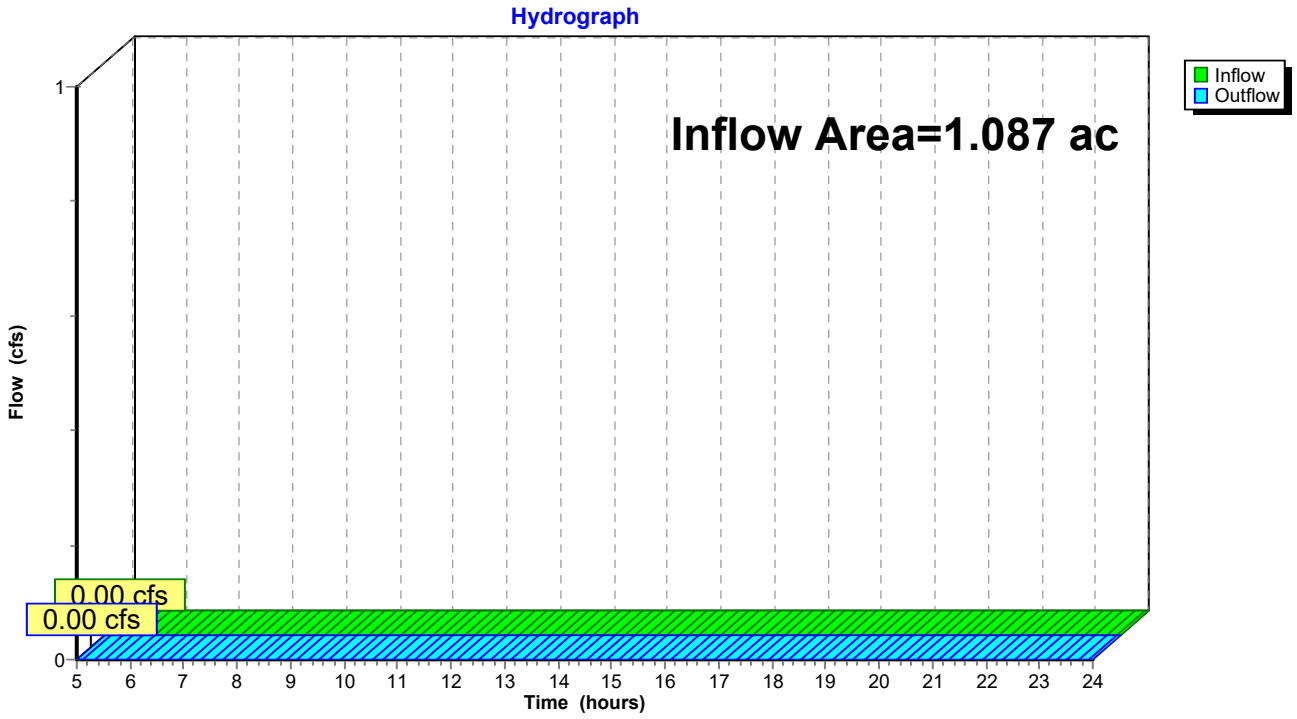


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth = 0.00" for 25-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

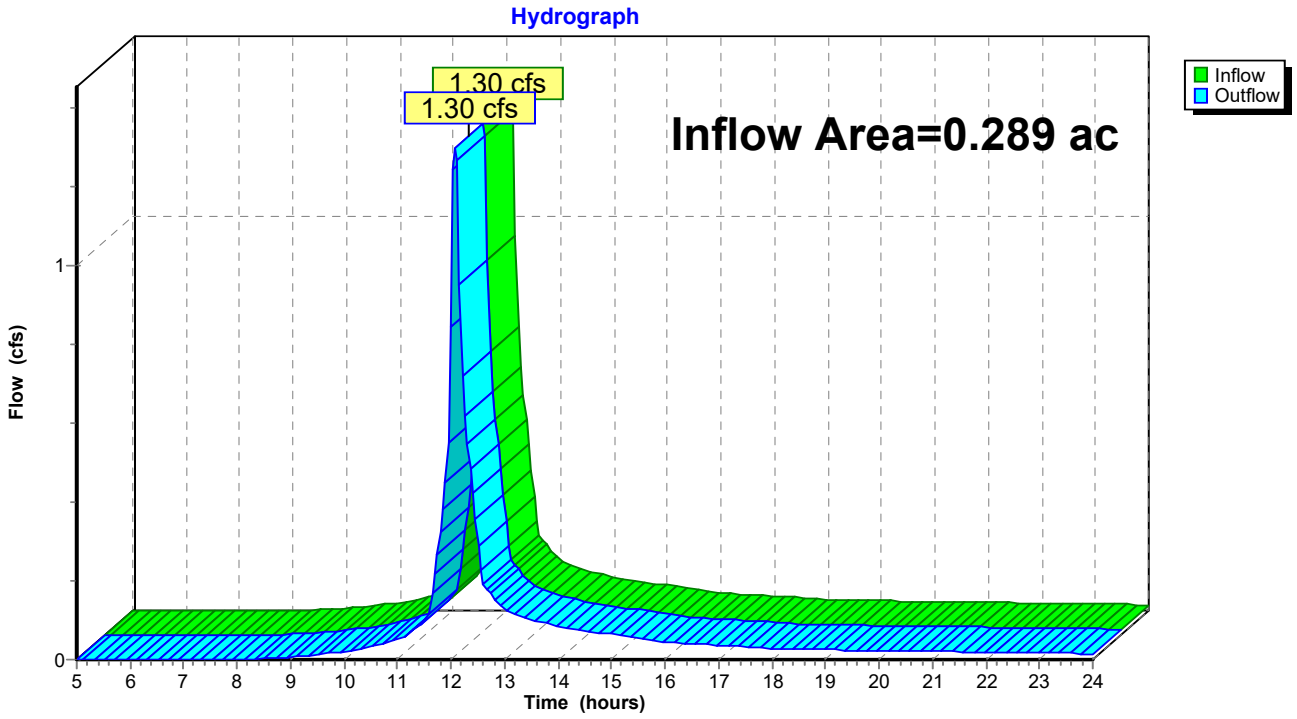


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.289 ac, 27.43% Impervious, Inflow Depth > 3.82" for 25-yr event
Inflow = 1.30 cfs @ 12.08 hrs, Volume= 0.092 af
Outflow = 1.30 cfs @ 12.08 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 2P: Existing "detention" area

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth > 2.78" for 25-yr event
Inflow = 2.71 cfs @ 12.20 hrs, Volume= 0.252 af
Outflow = 0.34 cfs @ 13.36 hrs, Volume= 0.239 af, Atten= 87%, Lag= 69.9 min
Discarded = 0.34 cfs @ 13.36 hrs, Volume= 0.239 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.61' @ 13.36 hrs Surf.Area= 6,183 sf Storage= 4,705 cf

Plug-Flow detention time= 179.9 min calculated for 0.238 af (95% of inflow)
Center-of-Mass det. time= 152.9 min (1,008.3 - 855.3)

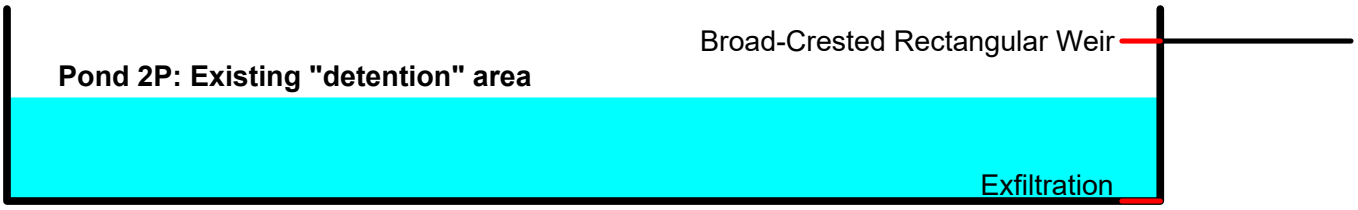
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	17,225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	250	0	0
28.00	3,350	1,800	1,800
29.00	8,000	5,675	7,475
30.00	11,500	9,750	17,225

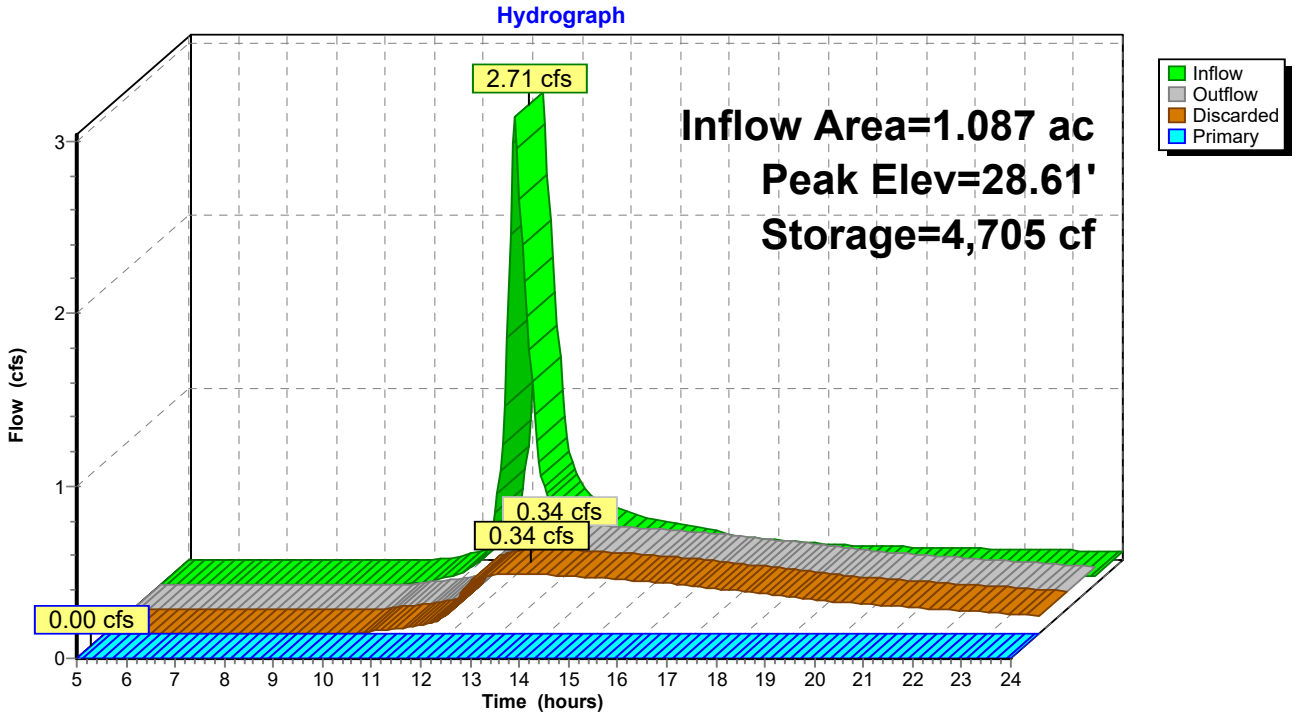
Device	Routing	Invert	Outlet Devices
#1	Discarded	27.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	29.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.34 cfs @ 13.36 hrs HW=28.61' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=27.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Pond 2P: Existing "detention" area



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=47,354 sf 10.22% Impervious Runoff Depth>3.84"
Flow Length=100' Slope=0.0800 '/' Tc=13.4 min CN=61 Runoff=3.81 cfs 0.348 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=12,579 sf 27.43% Impervious Runoff Depth>5.04"
Tc=5.0 min CN=71 Runoff=1.71 cfs 0.121 af

Reach SP1: SUMMATION POINT 1 Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach SP2: SUMMATION POINT 2 Inflow=1.71 cfs 0.121 af
Outflow=1.71 cfs 0.121 af

Pond 2P: Existing "detention" area Peak Elev=28.93' Storage=6,956 cf Inflow=3.81 cfs 0.348 af
Discarded=0.43 cfs 0.320 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.320 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.469 af Average Runoff Depth = 4.09"
86.16% Pervious = 1.186 ac 13.84% Impervious = 0.190 ac

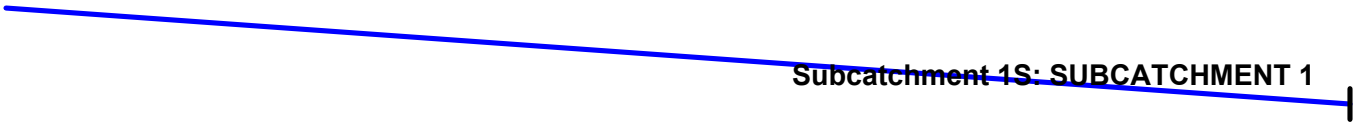
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 3.81 cfs @ 12.19 hrs, Volume= 0.348 af, Depth> 3.84"
Routed to Pond 2P : Existing "detention" area

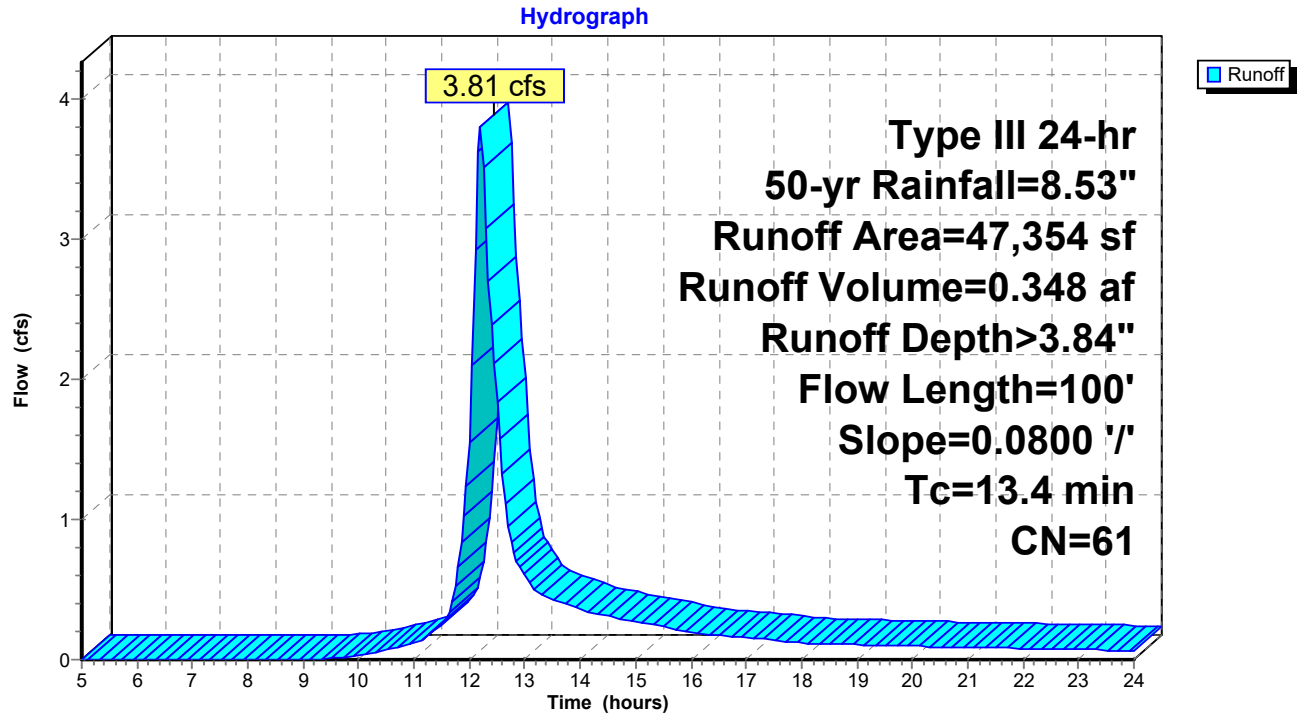
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
	28,956	55	Woods, Good, HSG B
	13,557	61	>75% Grass cover, Good, HSG B
*	4,841	98	IMPERVIOUS
	47,354	61	Weighted Average
	42,513		89.78% Pervious Area
	4,841		10.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0800	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

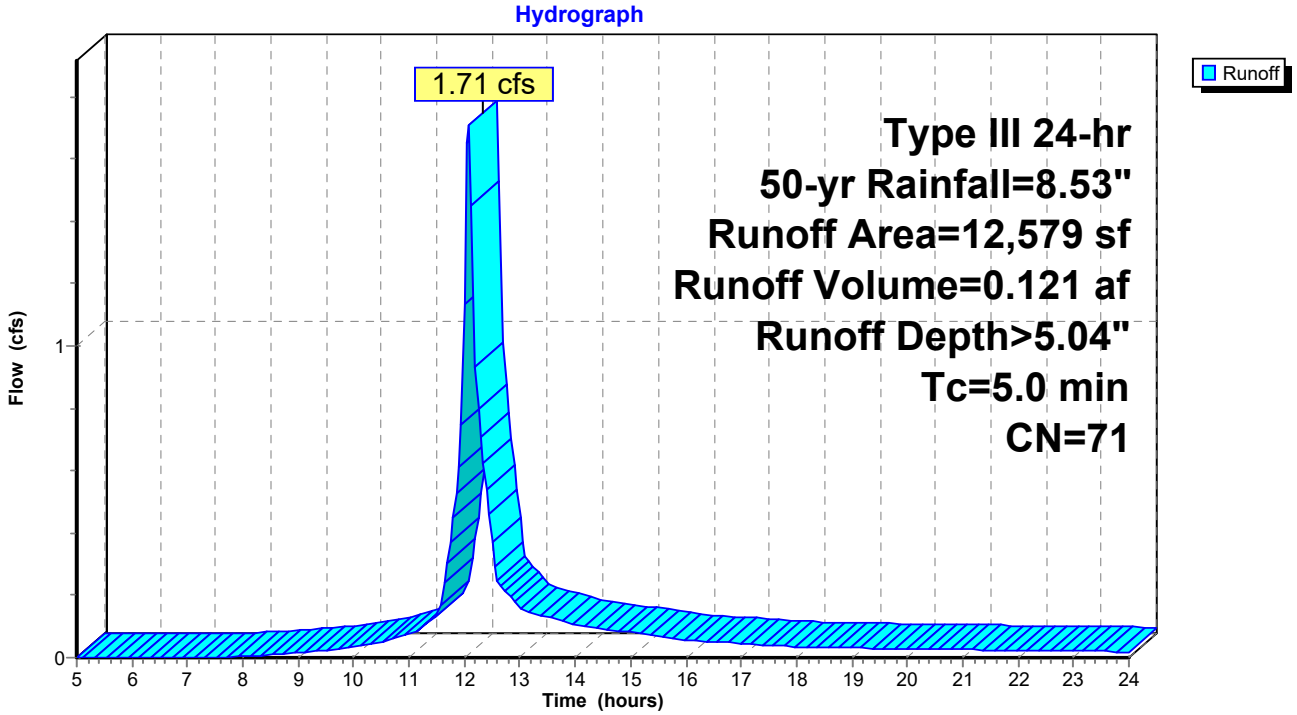
Runoff = 1.71 cfs @ 12.08 hrs, Volume= 0.121 af, Depth> 5.04"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
	9,128	61	>75% Grass cover, Good, HSG B
*	3,451	98	IMPERVIOUS
	12,579	71	Weighted Average
	9,128		72.57% Pervious Area
	3,451		27.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2

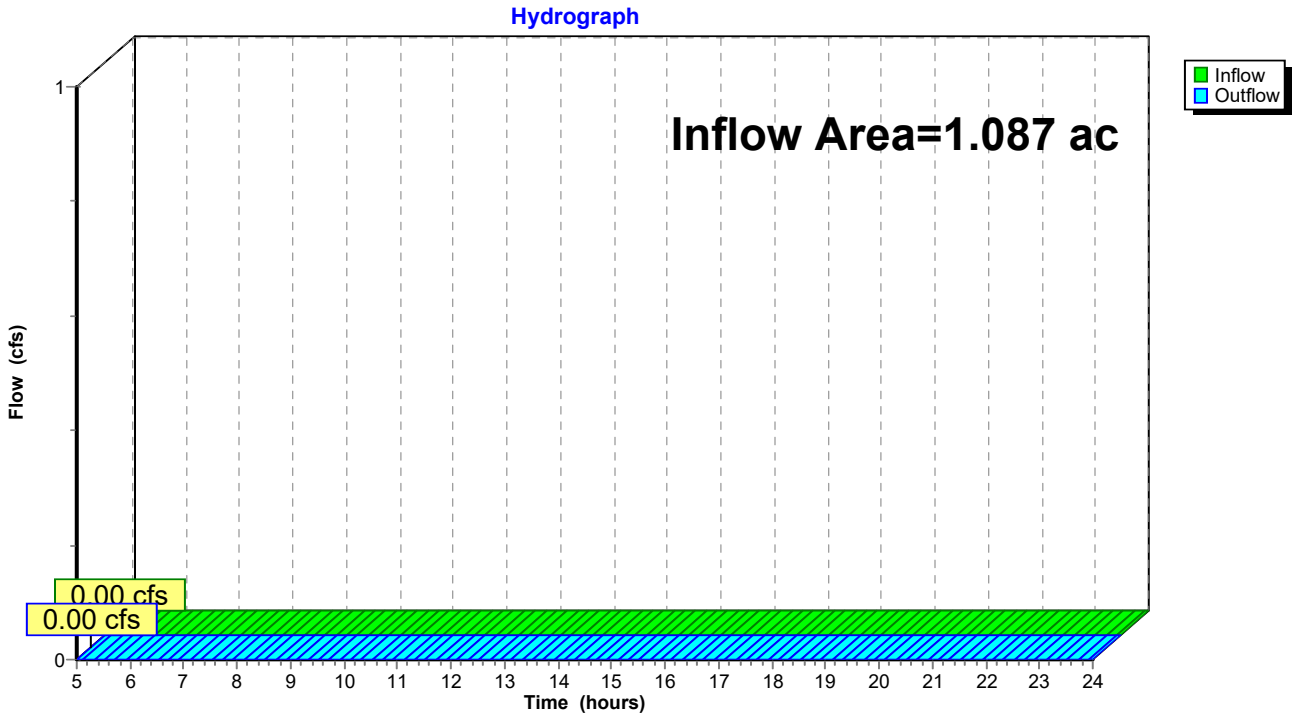


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth = 0.00" for 50-yr event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

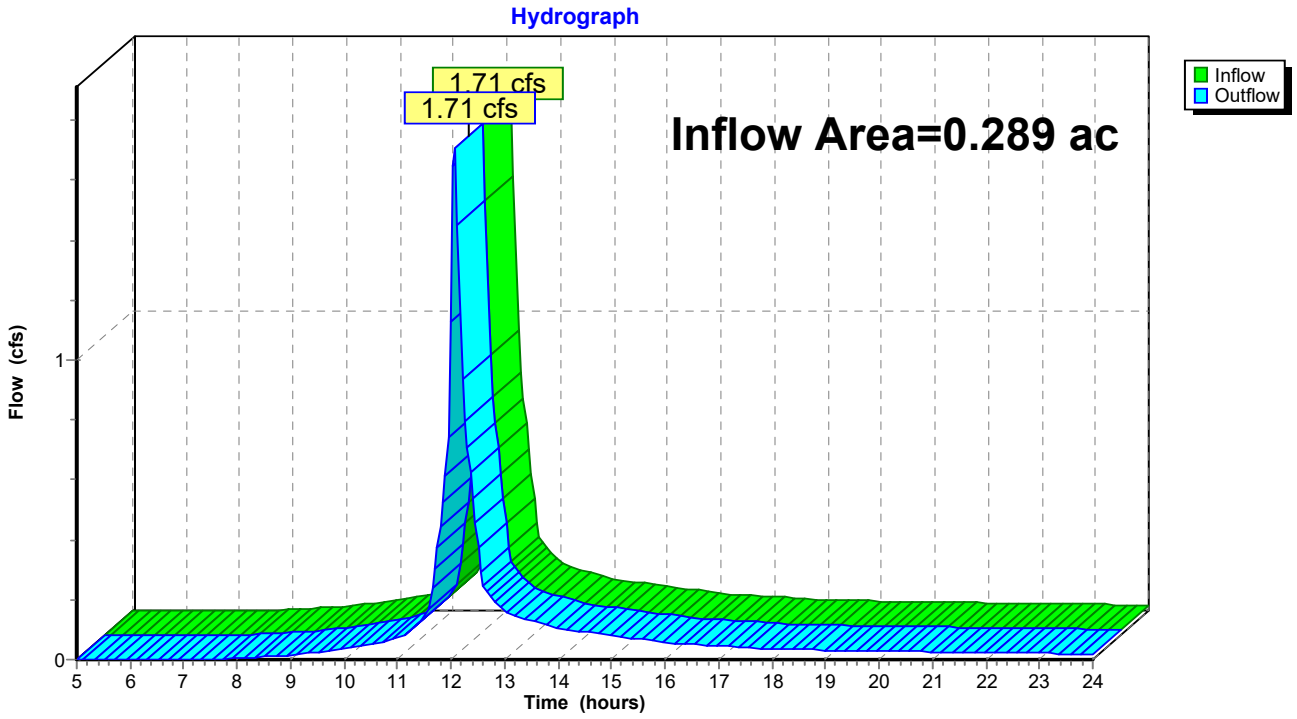


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.289 ac, 27.43% Impervious, Inflow Depth > 5.04" for 50-yr event
Inflow = 1.71 cfs @ 12.08 hrs, Volume= 0.121 af
Outflow = 1.71 cfs @ 12.08 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 2P: Existing "detention" area

Inflow Area = 1.087 ac, 10.22% Impervious, Inflow Depth > 3.84" for 50-yr event
Inflow = 3.81 cfs @ 12.19 hrs, Volume= 0.348 af
Outflow = 0.43 cfs @ 13.54 hrs, Volume= 0.320 af, Atten= 89%, Lag= 80.5 min
Discarded = 0.43 cfs @ 13.54 hrs, Volume= 0.320 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.93' @ 13.54 hrs Surf.Area= 7,692 sf Storage= 6,956 cf

Plug-Flow detention time= 209.3 min calculated for 0.320 af (92% of inflow)
Center-of-Mass det. time= 168.7 min (1,014.6 - 845.9)

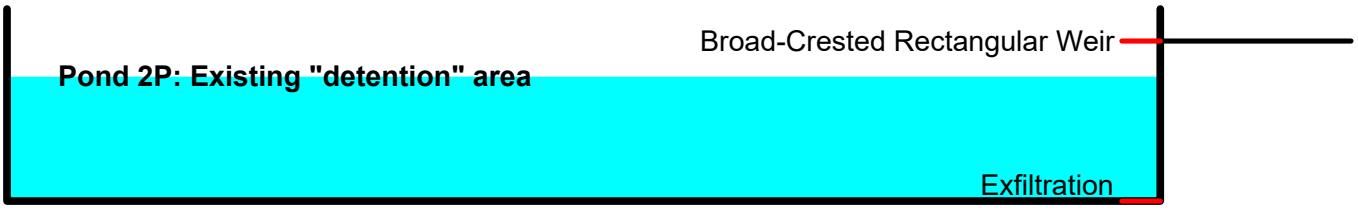
Volume	Invert	Avail.Storage	Storage Description
#1	27.00'	17,225 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.00	250	0	0
28.00	3,350	1,800	1,800
29.00	8,000	5,675	7,475
30.00	11,500	9,750	17,225

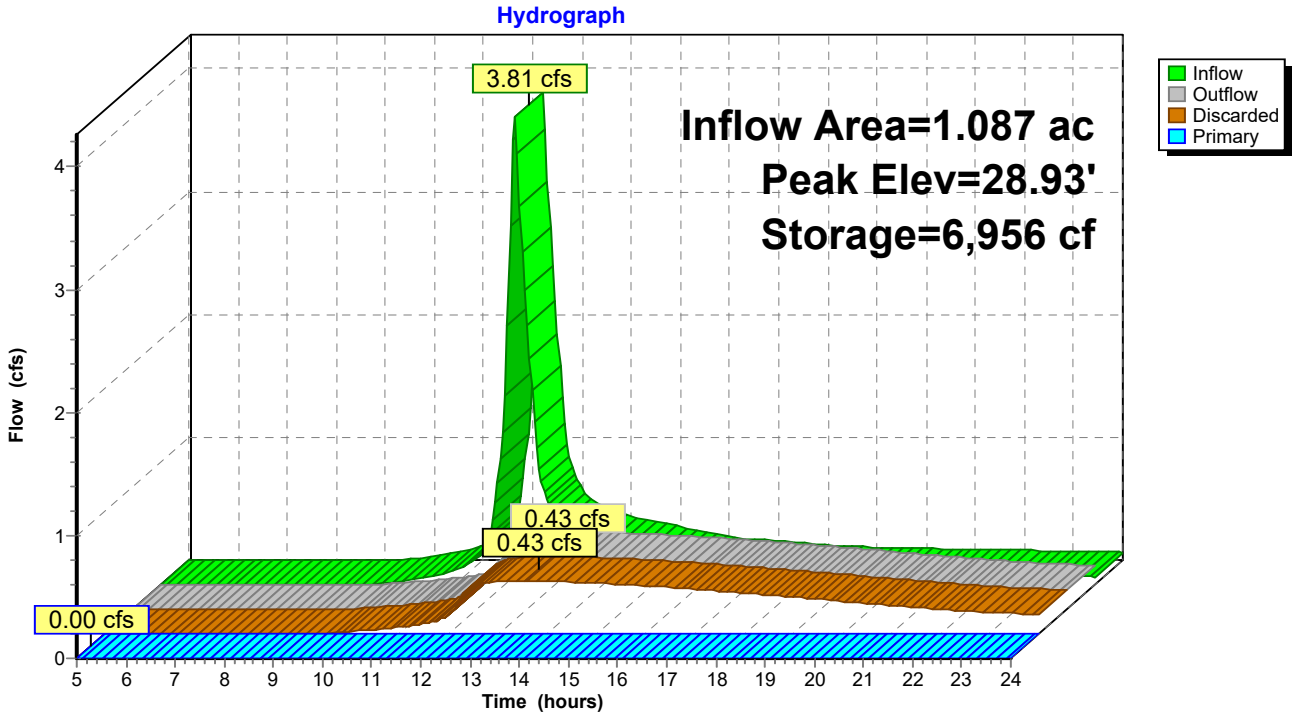
Device	Routing	Invert	Outlet Devices
#1	Discarded	27.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	29.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

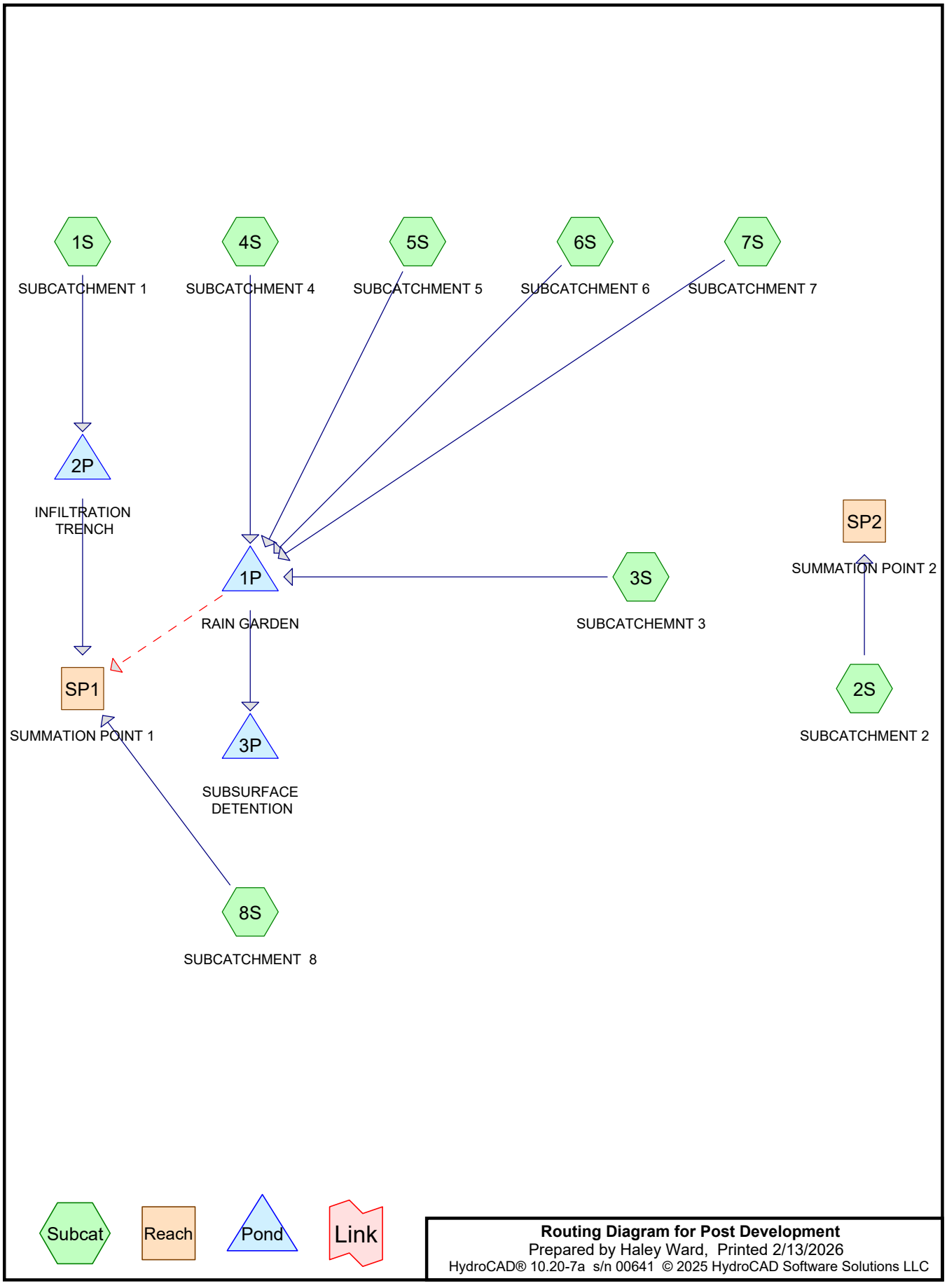
Discarded OutFlow Max=0.43 cfs @ 13.54 hrs HW=28.93' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=27.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Pond 2P: Existing "detention" area





Routing Diagram for Post Development
Prepared by Haley Ward, Printed 2/13/2026
HydroCAD® 10.20-7a s/n 00641 © 2025 HydroCAD Software Solutions LLC

Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=26,883 sf 8.11% Impervious Runoff Depth>0.61"
Flow Length=490' Tc=34.4 min CN=60 Runoff=0.18 cfs 0.032 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=9,849 sf 37.64% Impervious Runoff Depth>1.44"
Tc=5.0 min CN=75 Runoff=0.38 cfs 0.027 af

Subcatchment3S: SUBCATCHEMNT3 Runoff Area=10,559 sf 56.44% Impervious Runoff Depth>1.95"
Tc=0.0 min CN=82 Runoff=0.64 cfs 0.039 af

Subcatchment4S: SUBCATCHMENT4 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment5S: SUBCATCHMENT5 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment6S: SUBCATCHMENT6 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment7S: SUBCATCHMENT7 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>3.39"
Tc=5.0 min CN=98 Runoff=0.17 cfs 0.013 af

Subcatchment8S: SUBCATCHMENT 8 Runoff Area=4,442 sf 0.00% Impervious Runoff Depth>0.62"
Tc=10.0 min CN=60 Runoff=0.05 cfs 0.005 af

Reach SP1: SUMMATION POINT 1 Inflow=0.05 cfs 0.005 af
Outflow=0.05 cfs 0.005 af

Reach SP2: SUMMATION POINT 2 Inflow=0.38 cfs 0.027 af
Outflow=0.38 cfs 0.027 af

Pond 1P: RAIN GARDEN Peak Elev=30.96' Storage=1,298 cf Inflow=1.18 cfs 0.093 af
Discarded=0.02 cfs 0.011 af Primary=0.82 cfs 0.065 af Secondary=0.00 cfs 0.000 af Outflow=0.83 cfs 0.076 af

Pond 2P: INFILTRATIONTRENCH Peak Elev=28.09' Storage=87 cf Inflow=0.18 cfs 0.032 af
Discarded=0.13 cfs 0.031 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.031 af

Pond 3P: SUBSURFACEDETENTION Peak Elev=28.64' Storage=920 cf Inflow=0.82 cfs 0.065 af
Outflow=0.19 cfs 0.065 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.157 af Average Runoff Depth = 1.37"
66.55% Pervious = 0.916 ac 33.45% Impervious = 0.460 ac

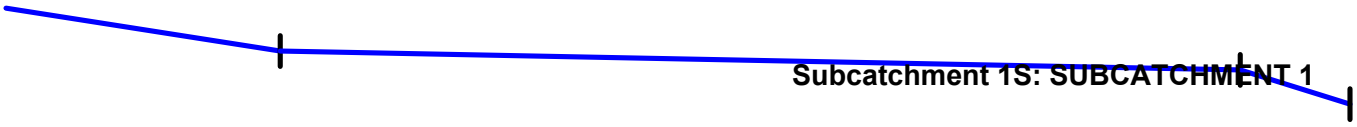
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 0.18 cfs @ 12.60 hrs, Volume= 0.032 af, Depth> 0.61"
Routed to Pond 2P : INFILTRATION TRENCH

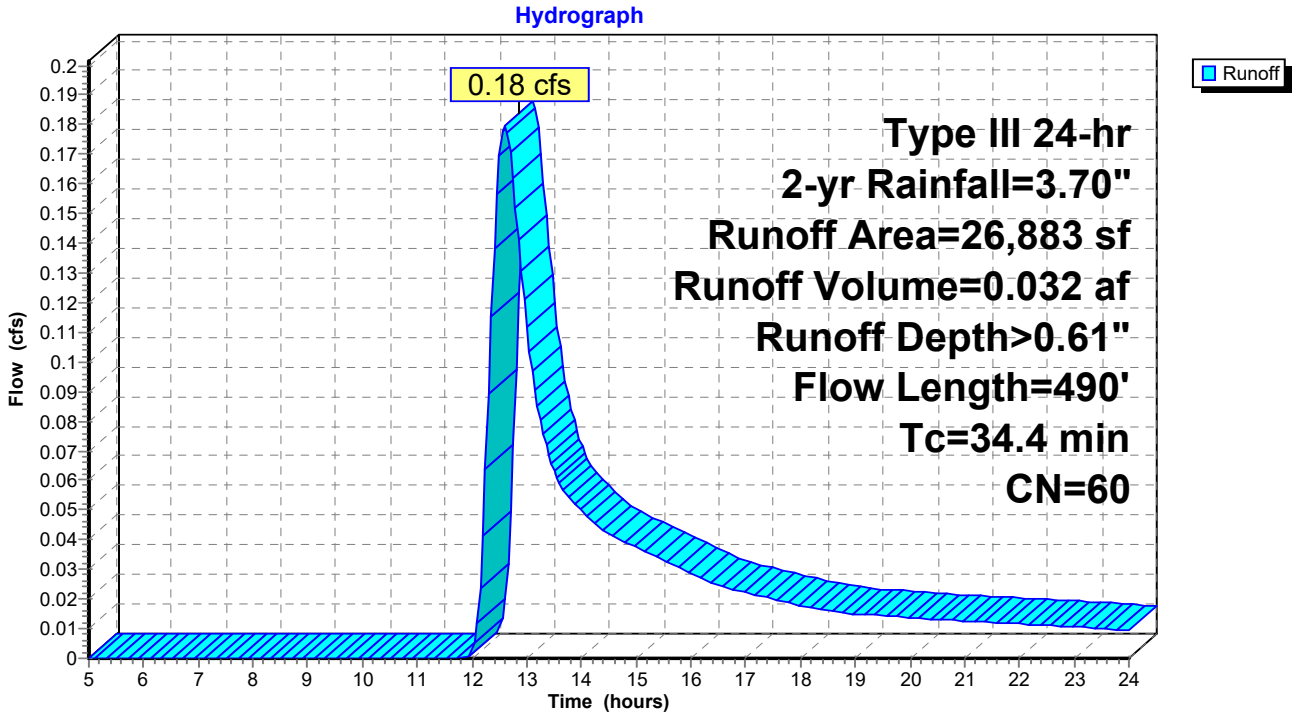
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	16,143	55	Woods, Good, HSG B
	8,559	61	>75% Grass cover, Good, HSG B
*	2,181	98	IMPERVIOUS
	26,883	60	Weighted Average
	24,702		91.89% Pervious Area
	2,181		8.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	100	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"
16.5	350	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
34.4	490	Total			



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

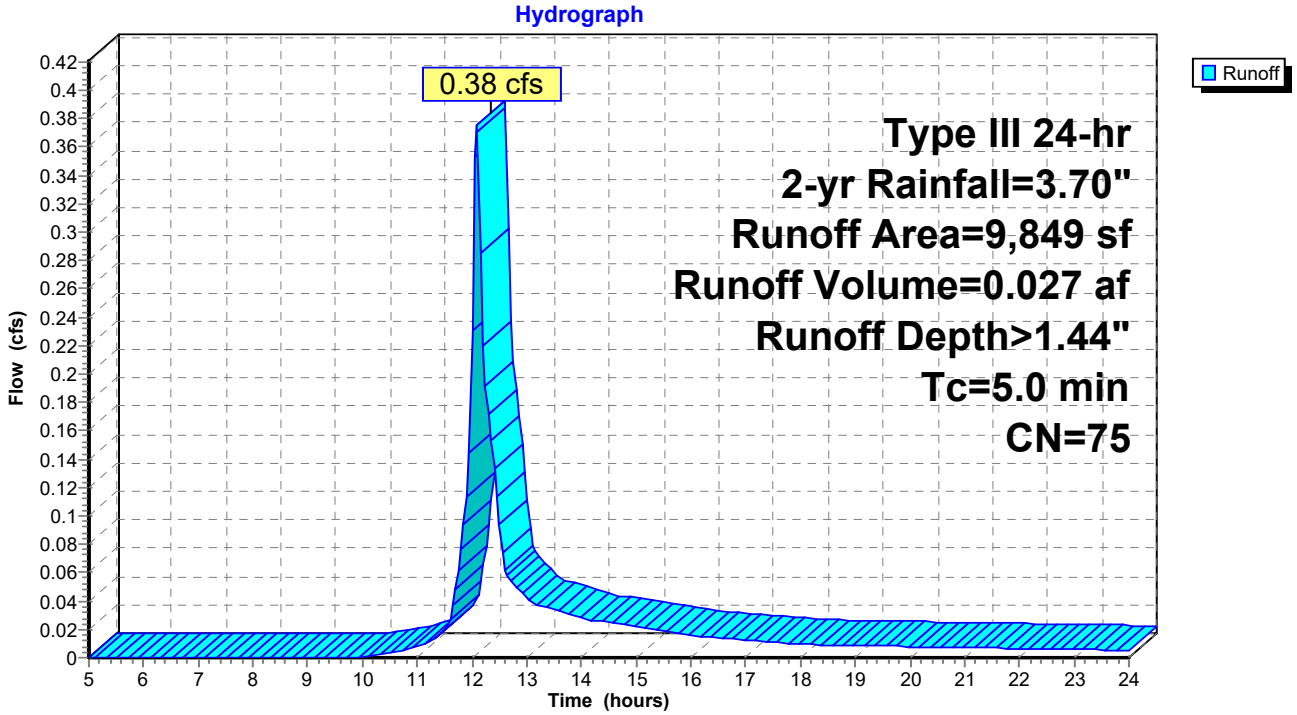
Runoff = 0.38 cfs @ 12.08 hrs, Volume= 0.027 af, Depth> 1.44"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	6,142	61	>75% Grass cover, Good, HSG B
*	3,707	98	IMPERVIOUS
	9,849	75	Weighted Average
	6,142		62.36% Pervious Area
	3,707		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2



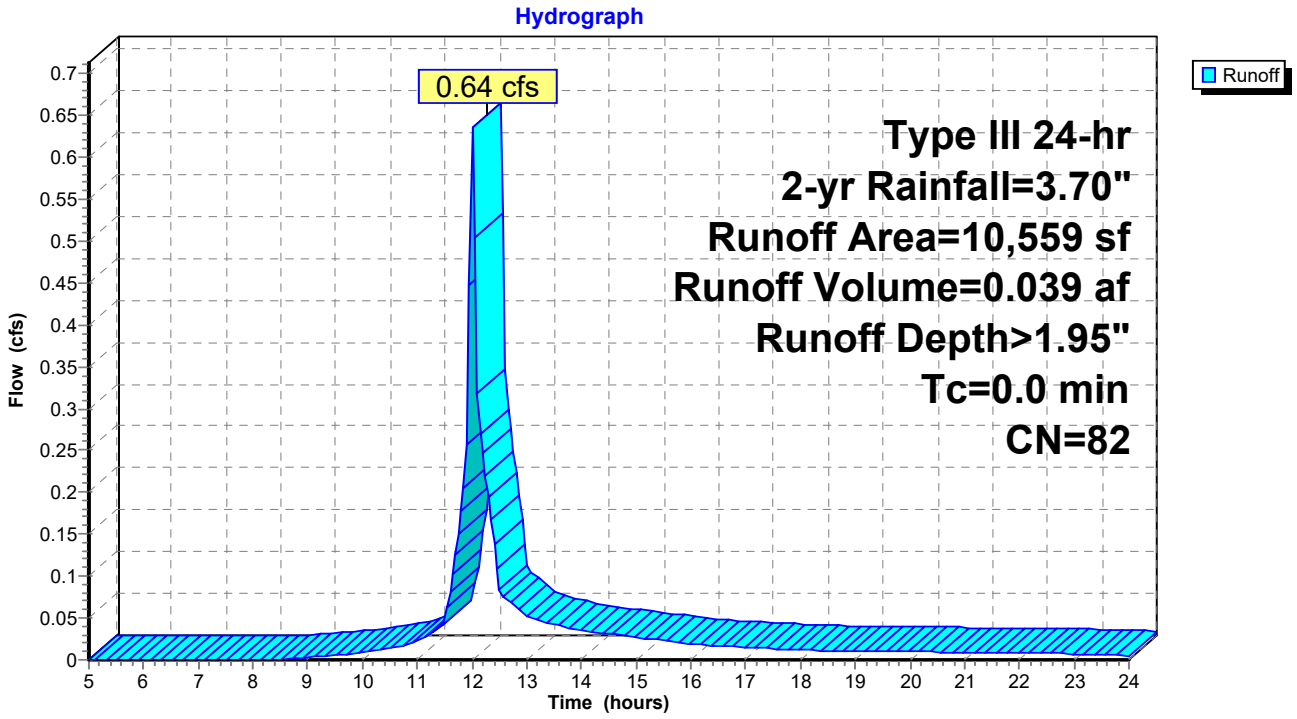
Summary for Subcatchment 3S: SUBCATCHEMNT 3

Runoff = 0.64 cfs @ 12.00 hrs, Volume= 0.039 af, Depth> 1.95"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
	18	55	Woods, Good, HSG B
	4,582	61	>75% Grass cover, Good, HSG B
*	5,959	98	IMPERVIOUS
	10,559	82	Weighted Average
	4,600		43.56% Pervious Area
	5,959		56.44% Impervious Area

Subcatchment 3S: SUBCATCHEMNT 3



Summary for Subcatchment 4S: SUBCATCHMENT 4

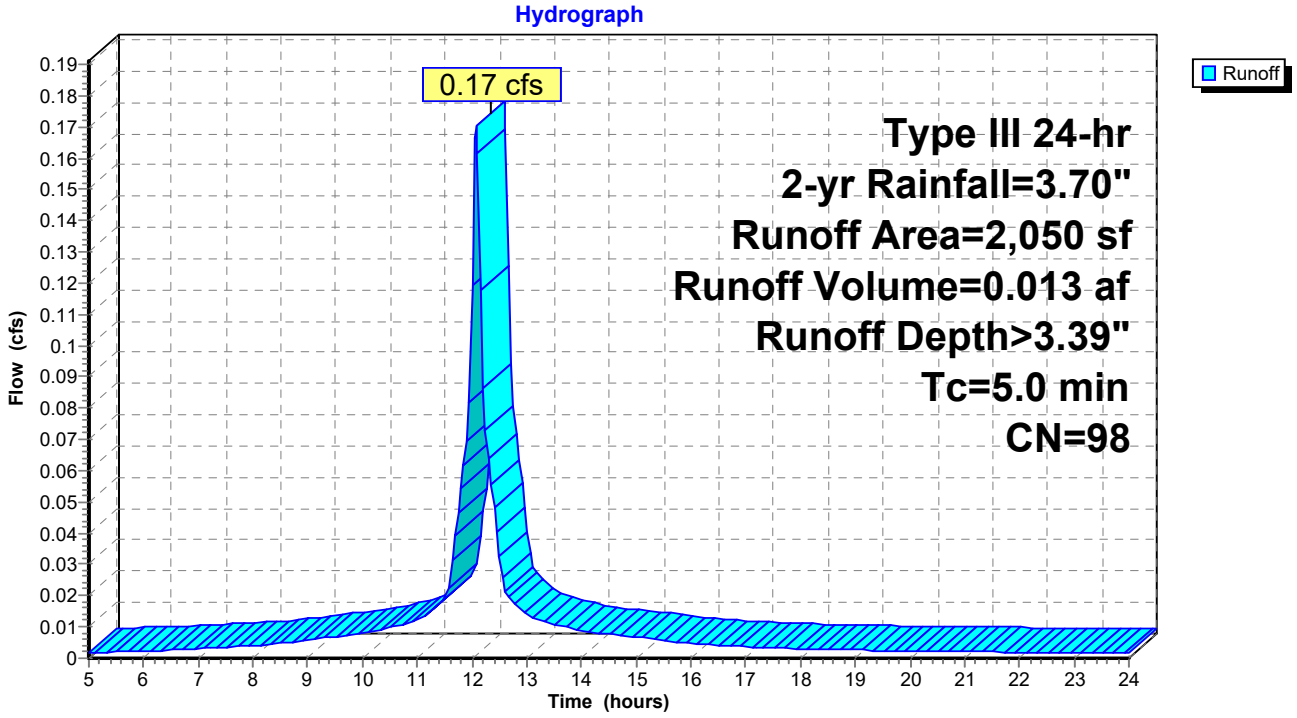
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 3.39"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: SUBCATCHMENT 4



Summary for Subcatchment 5S: SUBCATCHMENT 5

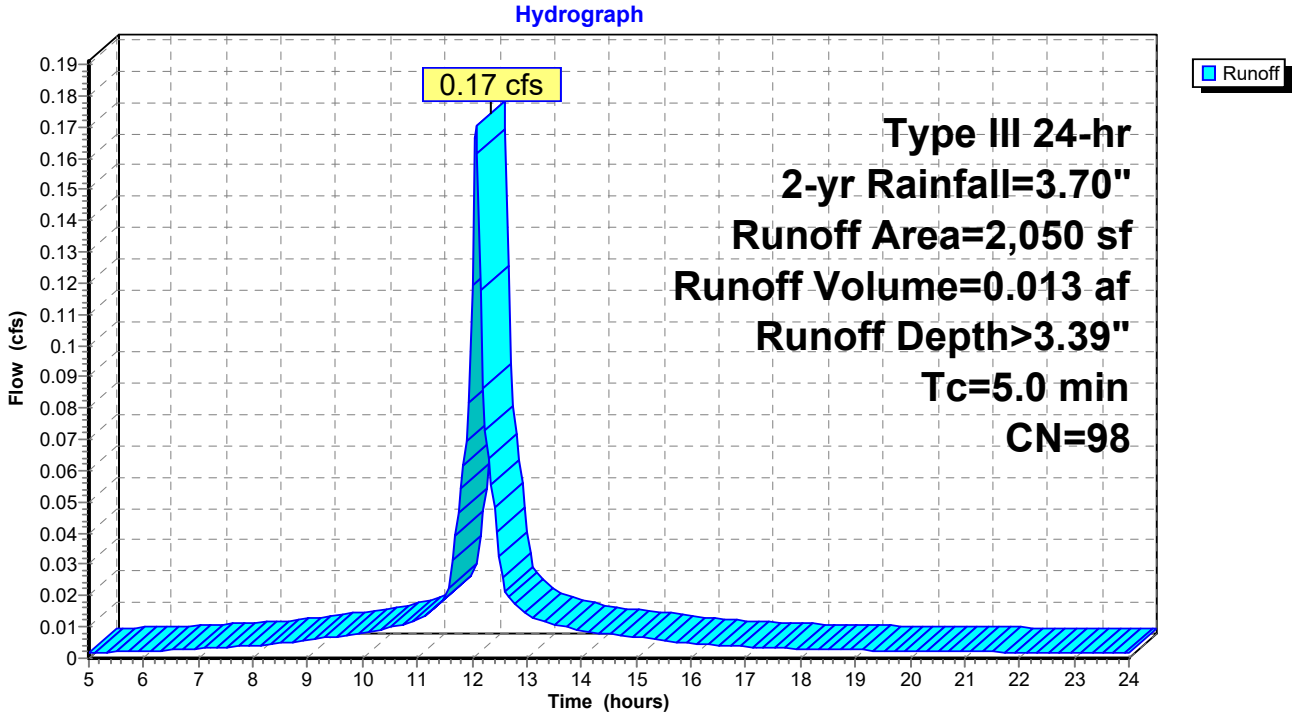
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 3.39"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: SUBCATCHMENT 5



Summary for Subcatchment 6S: SUBCATCHMENT 6

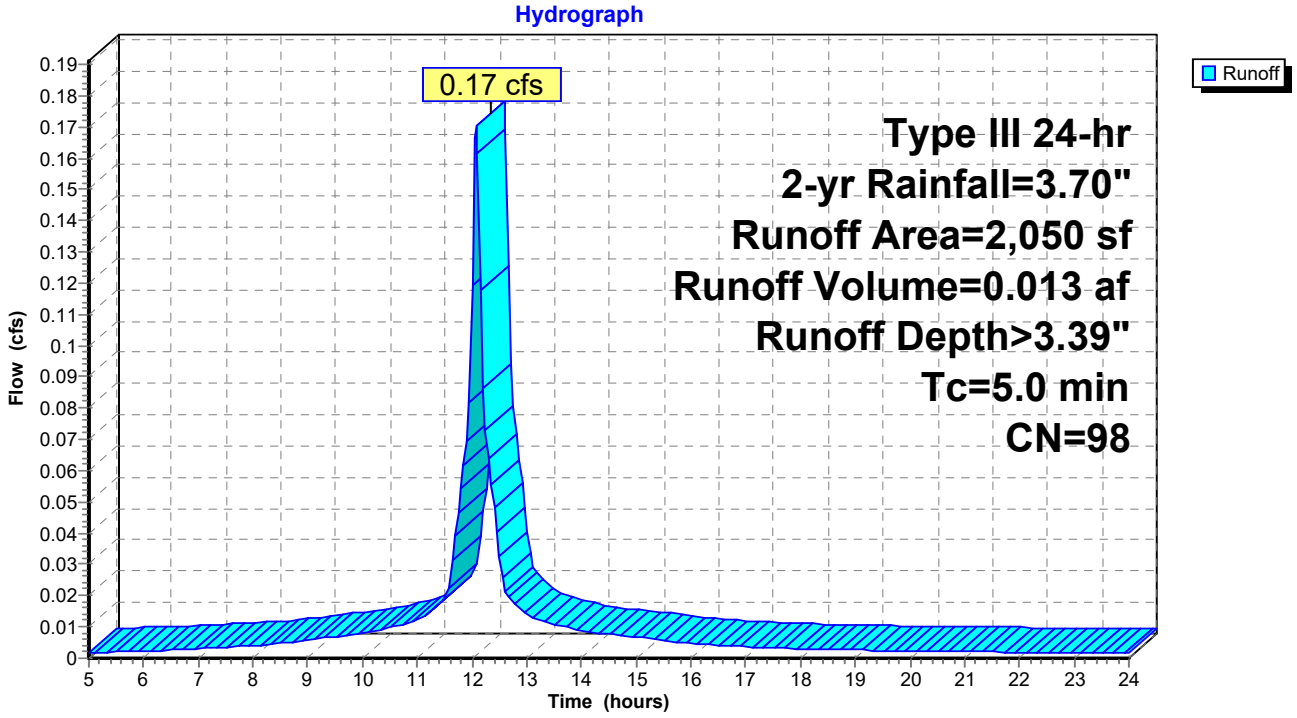
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 3.39"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: SUBCATCHMENT 6



Summary for Subcatchment 7S: SUBCATCHMENT 7

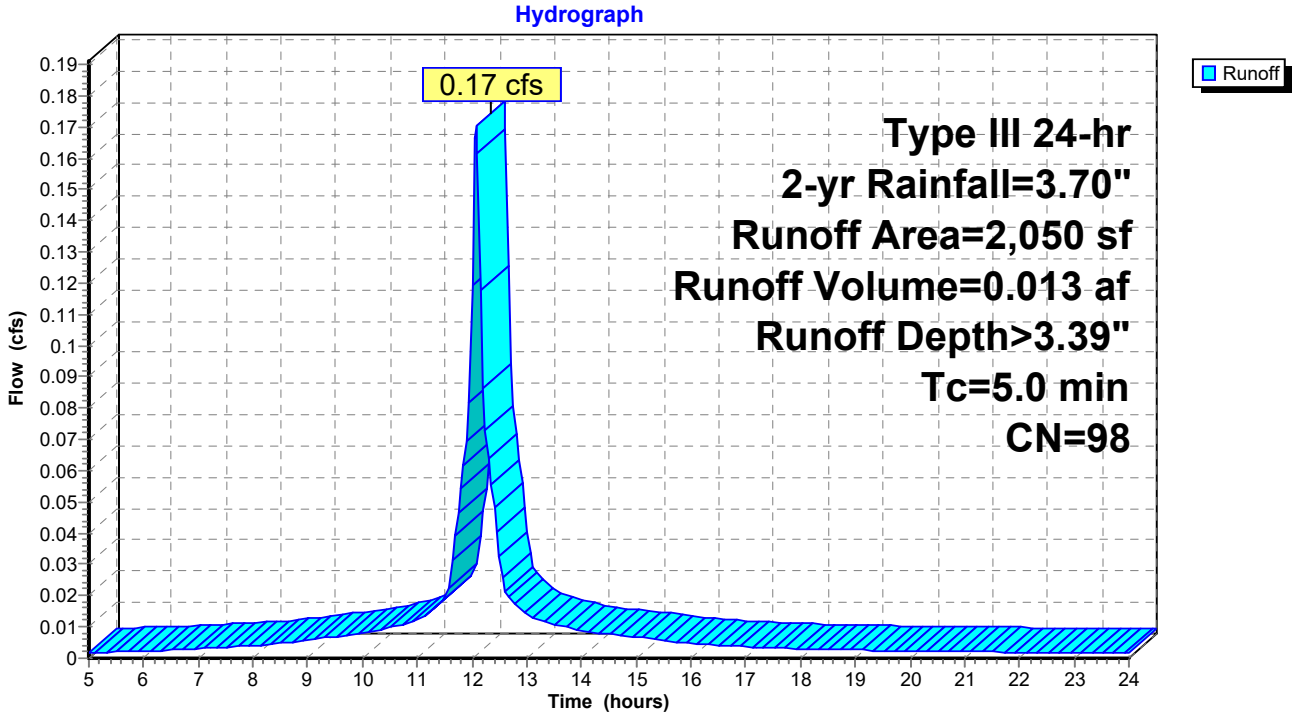
Runoff = 0.17 cfs @ 12.07 hrs, Volume= 0.013 af, Depth> 3.39"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: SUBCATCHMENT 7



Summary for Subcatchment 8S: SUBCATCHMENT 8

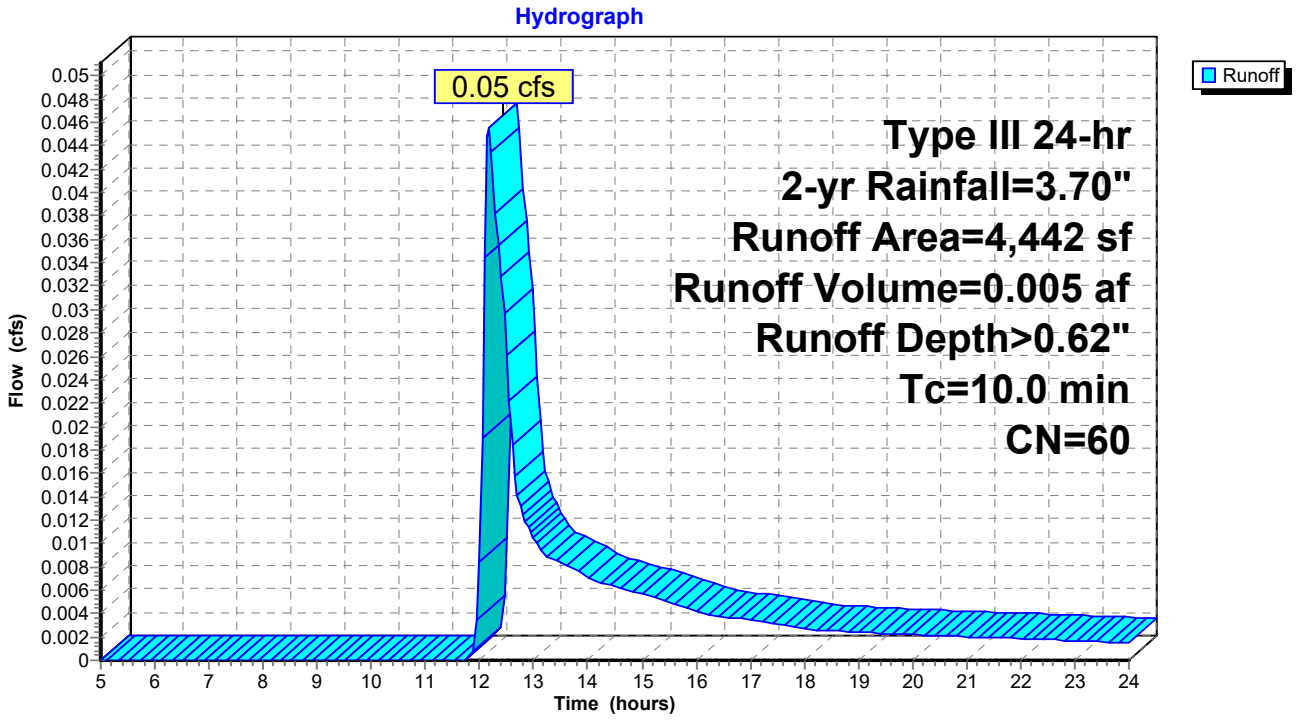
Runoff = 0.05 cfs @ 12.18 hrs, Volume= 0.005 af, Depth> 0.62"
Routed to Reach SP1 : SUMMATION POINT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.70"

Area (sf)	CN	Description
679	55	Woods, Good, HSG B
3,763	61	>75% Grass cover, Good, HSG B
4,442	60	Weighted Average
4,442		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 8S: SUBCATCHMENT 8

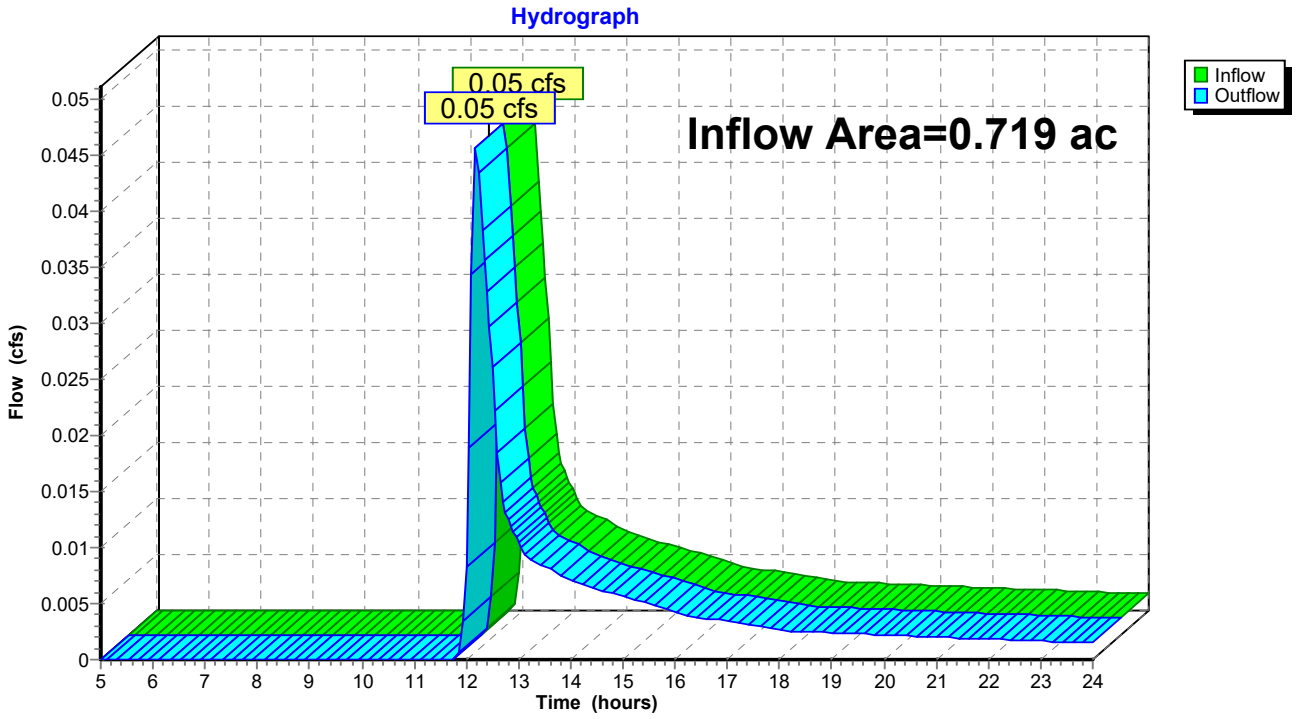


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 0.719 ac, 6.96% Impervious, Inflow Depth > 0.09" for 2-yr event
Inflow = 0.05 cfs @ 12.18 hrs, Volume= 0.005 af
Outflow = 0.05 cfs @ 12.18 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

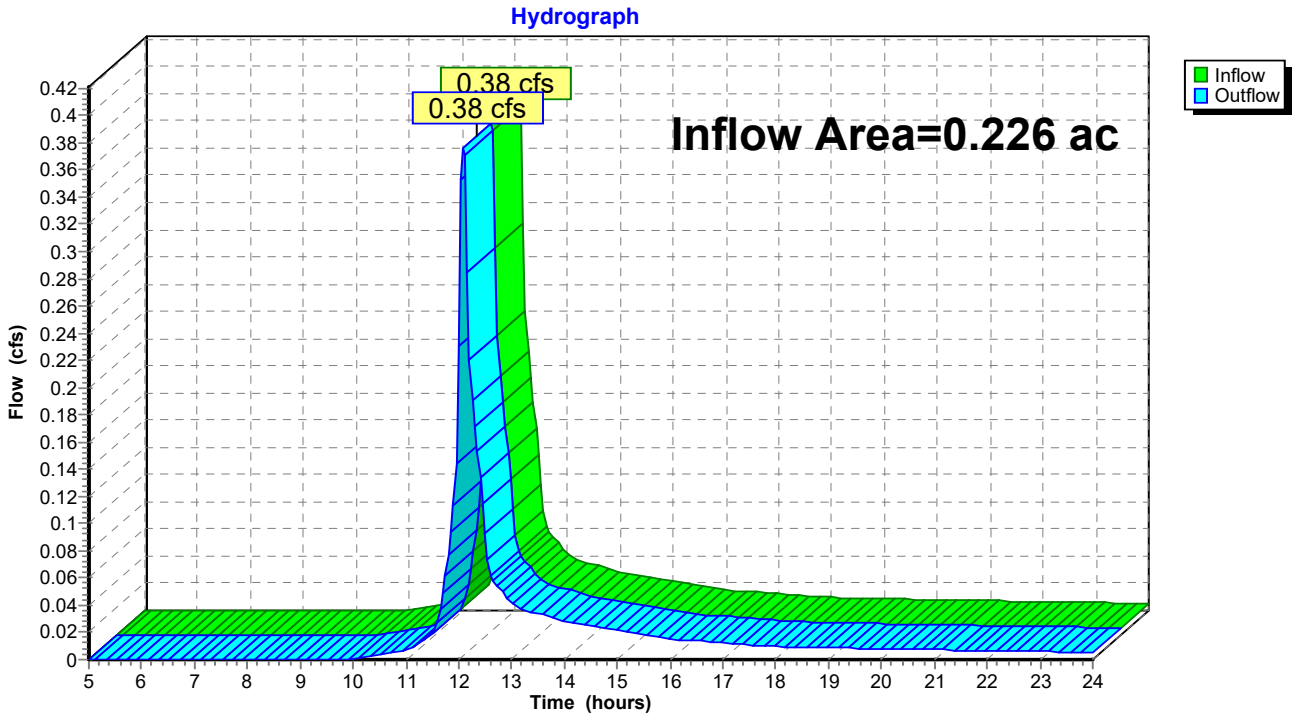


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.226 ac, 37.64% Impervious, Inflow Depth > 1.44" for 2-yr event
Inflow = 0.38 cfs @ 12.08 hrs, Volume= 0.027 af
Outflow = 0.38 cfs @ 12.08 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 2.58" for 2-yr event
Inflow = 1.18 cfs @ 12.04 hrs, Volume= 0.093 af
Outflow = 0.83 cfs @ 12.13 hrs, Volume= 0.076 af, Atten= 29%, Lag= 5.8 min
Discarded = 0.02 cfs @ 12.13 hrs, Volume= 0.011 af
Primary = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af
Routed to Pond 3P : SUBSURFACE DETENTION
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 30.96' @ 12.13 hrs Surf.Area= 1,488 sf Storage= 1,298 cf

Plug-Flow detention time= 131.7 min calculated for 0.076 af (82% of inflow)
Center-of-Mass det. time= 60.8 min (850.0 - 789.2)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	5,850 cf	**Custom Stage Data (Prismatic)** Listed below

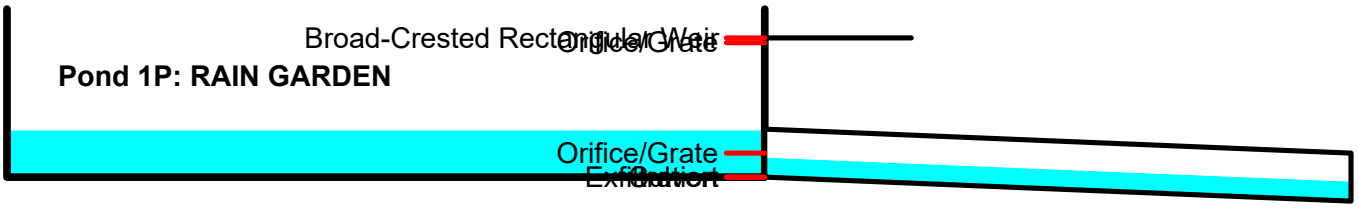
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	1,200	0	0
31.00	1,500	1,350	1,350
33.50	2,100	4,500	5,850

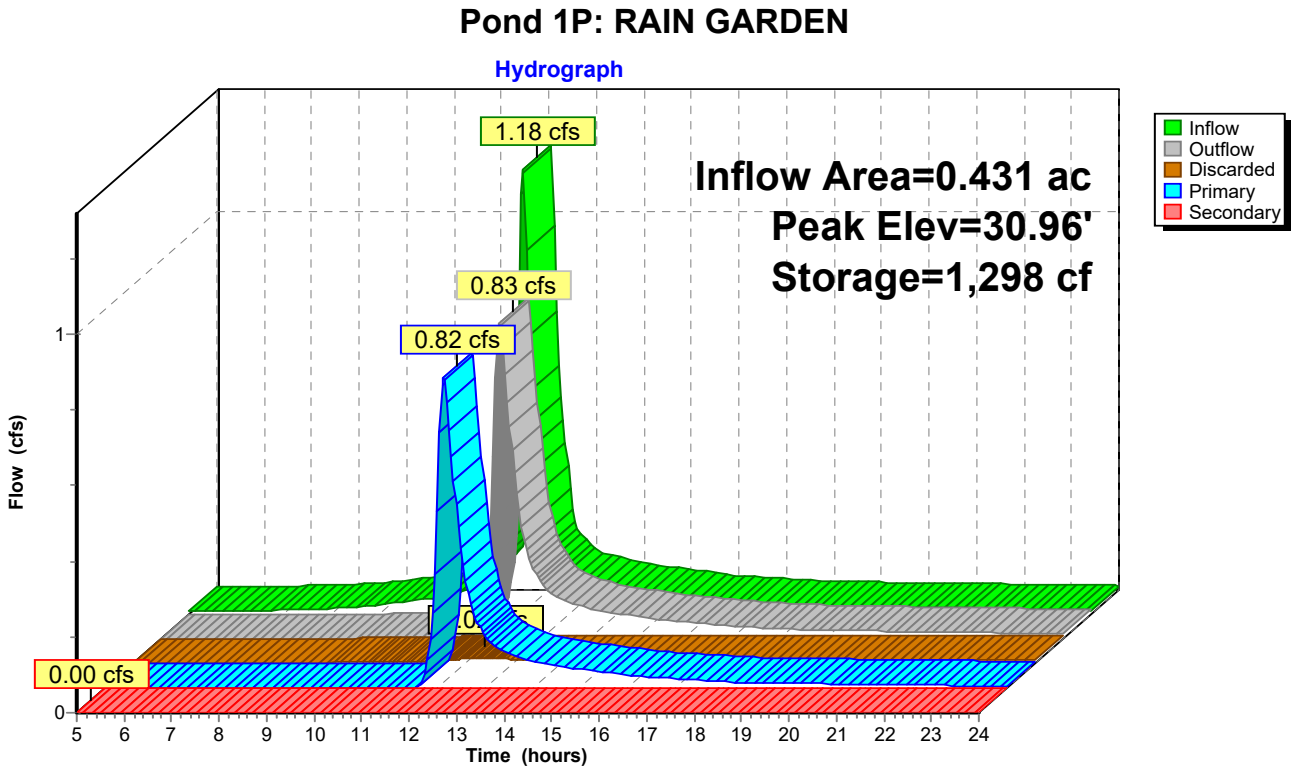
Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	**2.400 in/hr Exfiltration over Surface area above 30.00'** Excluded Surface area = 1,200 sf
#2	Primary	30.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.00' / 29.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	30.50'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	32.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	32.90'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 12.13 hrs HW=30.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.81 cfs @ 12.13 hrs HW=30.96' (Free Discharge)
└**2=Culvert** (Passes 0.81 cfs of 2.04 cfs potential flow)
└**3=Orifice/Grate** (Orifice Controls 0.81 cfs @ 2.31 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=30.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)





Summary for Pond 2P: INFILTRATION TRENCH

Inflow Area = 0.617 ac, 8.11% Impervious, Inflow Depth > 0.61" for 2-yr event
Inflow = 0.18 cfs @ 12.60 hrs, Volume= 0.032 af
Outflow = 0.13 cfs @ 12.45 hrs, Volume= 0.031 af, Atten= 29%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.45 hrs, Volume= 0.031 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.09' @ 12.92 hrs Surf.Area= 2,300 sf Storage= 87 cf

Plug-Flow detention time= 5.1 min calculated for 0.031 af (100% of inflow)
Center-of-Mass det. time= 4.3 min (926.6 - 922.3)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	2,157 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 6,900 cf Overall - 1,508 cf Embedded = 5,392 cf x 40.0% Voids
#2	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
#3	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
		3,665 cf	Total Available Storage

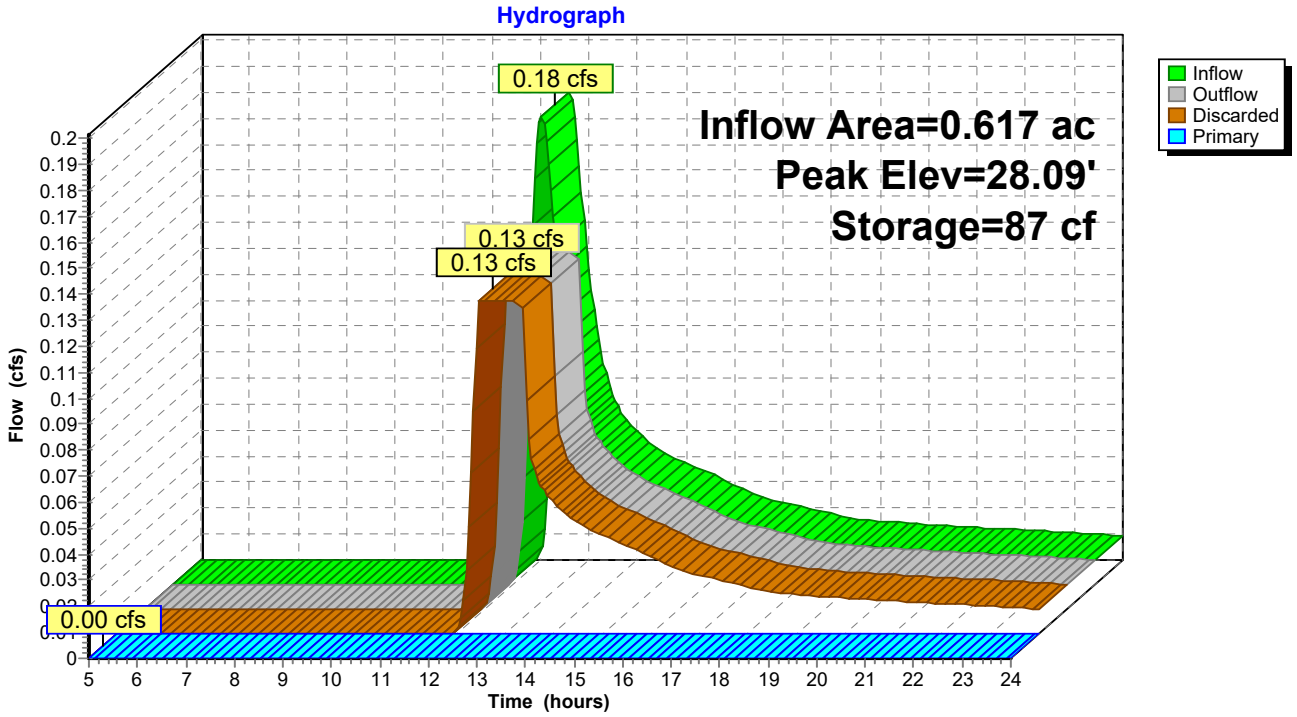
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	2,300	0	0
31.00	2,300	6,900	6,900

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	31.00'	**320.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.13 cfs @ 12.45 hrs HW=28.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: INFILTRATION TRENCH



Summary for Pond 3P: SUBSURFACE DETENTION

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 1.80" for 2-yr event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 0.065 af
Outflow = 0.19 cfs @ 11.95 hrs, Volume= 0.065 af, Atten= 76%, Lag= 0.0 min
Discarded = 0.19 cfs @ 11.95 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 28.64' @ 12.78 hrs Surf.Area= 3,500 sf Storage= 920 cf

Plug-Flow detention time= 38.2 min calculated for 0.065 af (100% of inflow)
Center-of-Mass det. time= 38.0 min (861.9 - 824.0)

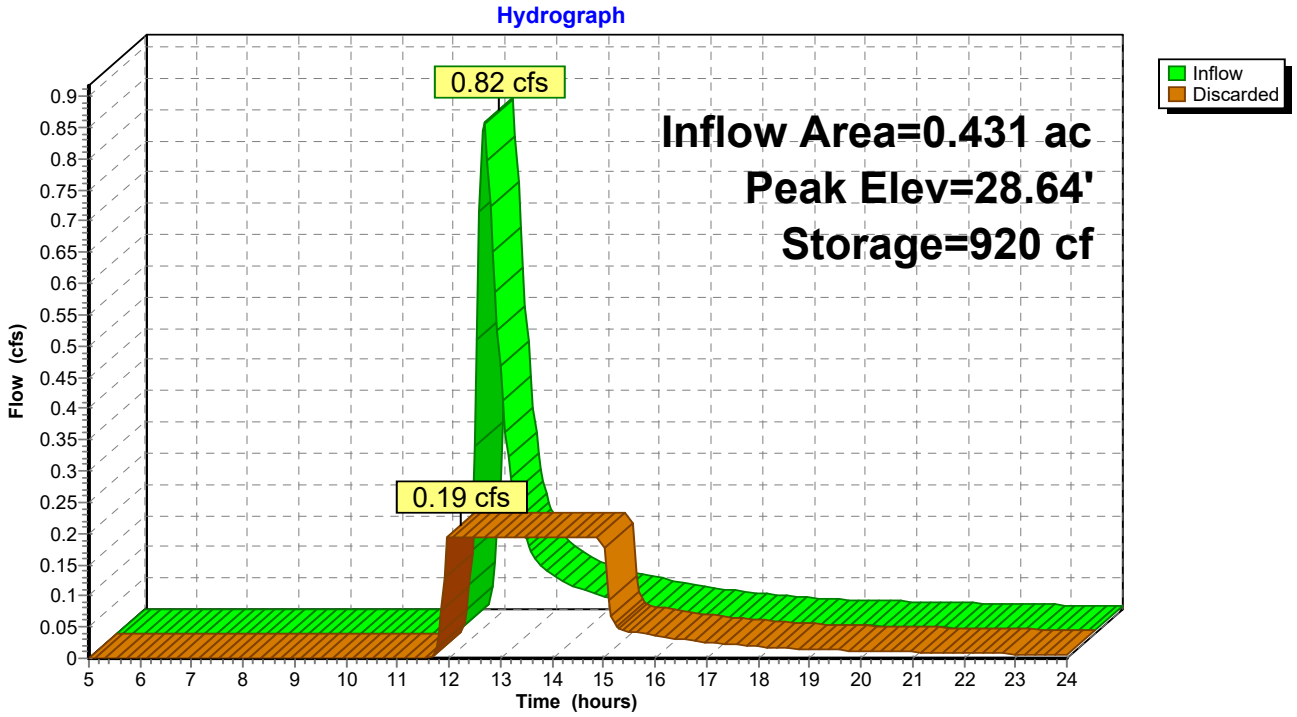
Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	3,748 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 10,500 cf Overall - 1,131 cf Embedded = 9,369 cf x 40.0% Voids
#2	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#3	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#4	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
		4,879 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	3,500	0	0
31.00	3,500	10,500	10,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 11.95 hrs HW=28.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Pond 3P: SUBSURFACE DETENTION



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=26,883 sf 8.11% Impervious Runoff Depth>1.66"
Flow Length=490' Tc=34.4 min CN=60 Runoff=0.59 cfs 0.085 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=9,849 sf 37.64% Impervious Runoff Depth>2.95"
Tc=5.0 min CN=75 Runoff=0.78 cfs 0.056 af

Subcatchment3S: SUBCATCHEMNT3 Runoff Area=10,559 sf 56.44% Impervious Runoff Depth>3.63"
Tc=0.0 min CN=82 Runoff=1.18 cfs 0.073 af

Subcatchment4S: SUBCATCHMENT4 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>5.22"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.020 af

Subcatchment5S: SUBCATCHMENT5 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>5.22"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.020 af

Subcatchment6S: SUBCATCHMENT6 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>5.22"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.020 af

Subcatchment7S: SUBCATCHMENT7 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>5.22"
Tc=5.0 min CN=98 Runoff=0.26 cfs 0.020 af

Subcatchment8S: SUBCATCHMENT 8 Runoff Area=4,442 sf 0.00% Impervious Runoff Depth>1.67"
Tc=10.0 min CN=60 Runoff=0.16 cfs 0.014 af

Reach SP1: SUMMATION POINT 1 Inflow=0.16 cfs 0.014 af
Outflow=0.16 cfs 0.014 af

Reach SP2: SUMMATION POINT 2 Inflow=0.78 cfs 0.056 af
Outflow=0.78 cfs 0.056 af

Pond 1P: RAIN GARDEN Peak Elev=31.14' Storage=1,603 cf Inflow=1.97 cfs 0.155 af
Discarded=0.02 cfs 0.013 af Primary=1.45 cfs 0.125 af Secondary=0.00 cfs 0.000 af Outflow=1.47 cfs 0.138 af

Pond 2P: INFILTRATIONTRENCH Peak Elev=29.07' Storage=1,200 cf Inflow=0.59 cfs 0.085 af
Discarded=0.13 cfs 0.085 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.085 af

Pond 3P: SUBSURFACEDETENTION Peak Elev=29.43' Storage=2,312 cf Inflow=1.45 cfs 0.125 af
Outflow=0.19 cfs 0.125 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.310 af Average Runoff Depth = 2.70"
66.55% Pervious = 0.916 ac 33.45% Impervious = 0.460 ac

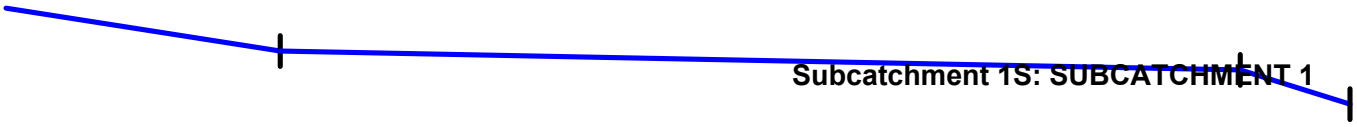
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 0.59 cfs @ 12.53 hrs, Volume= 0.085 af, Depth> 1.66"
Routed to Pond 2P : INFILTRATION TRENCH

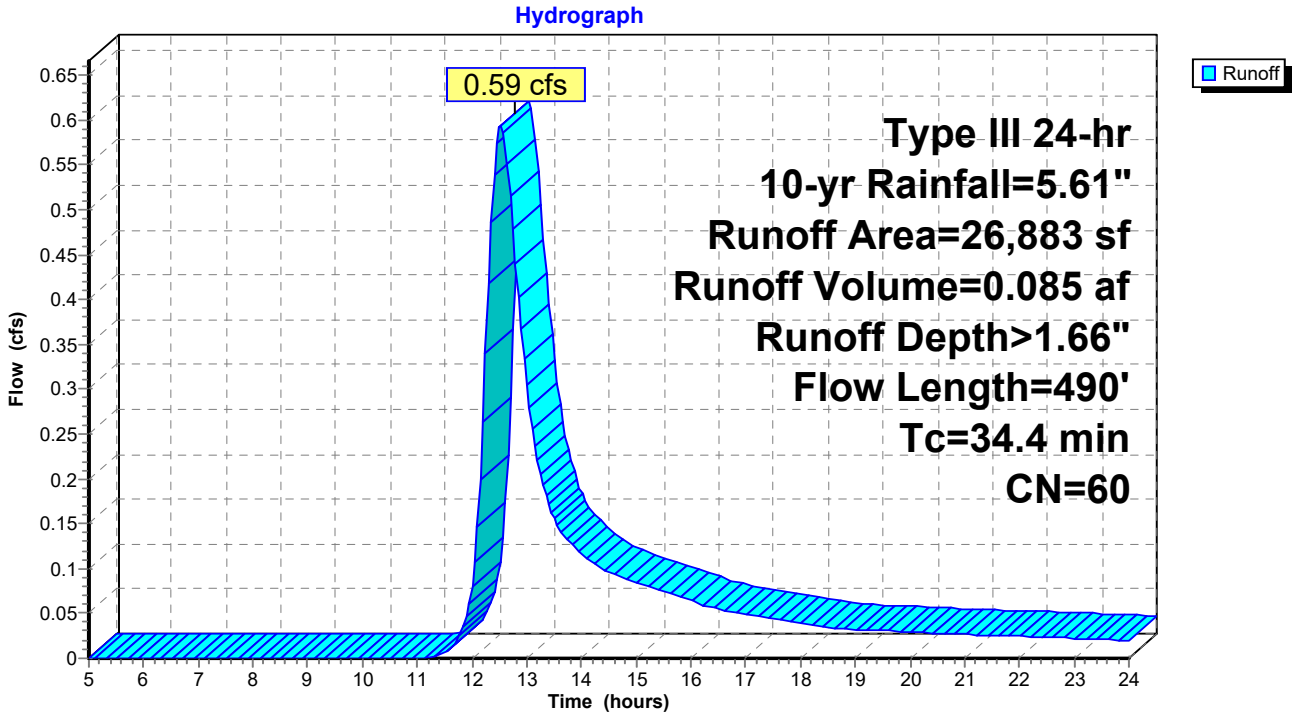
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
	16,143	55	Woods, Good, HSG B
	8,559	61	>75% Grass cover, Good, HSG B
*	2,181	98	IMPERVIOUS
	26,883	60	Weighted Average
	24,702		91.89% Pervious Area
	2,181		8.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	100	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"
16.5	350	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
34.4	490	Total			



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

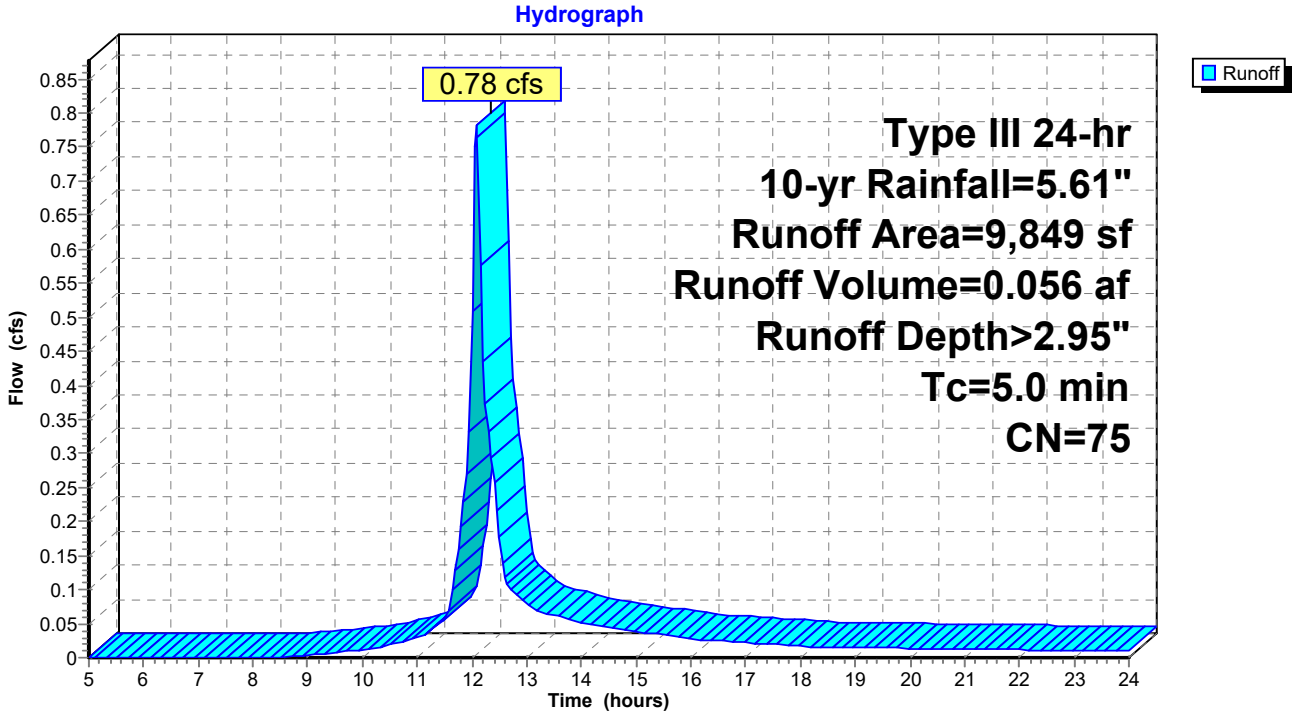
Runoff = 0.78 cfs @ 12.08 hrs, Volume= 0.056 af, Depth> 2.95"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
	6,142	61	>75% Grass cover, Good, HSG B
*	3,707	98	IMPERVIOUS
	9,849	75	Weighted Average
	6,142		62.36% Pervious Area
	3,707		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2



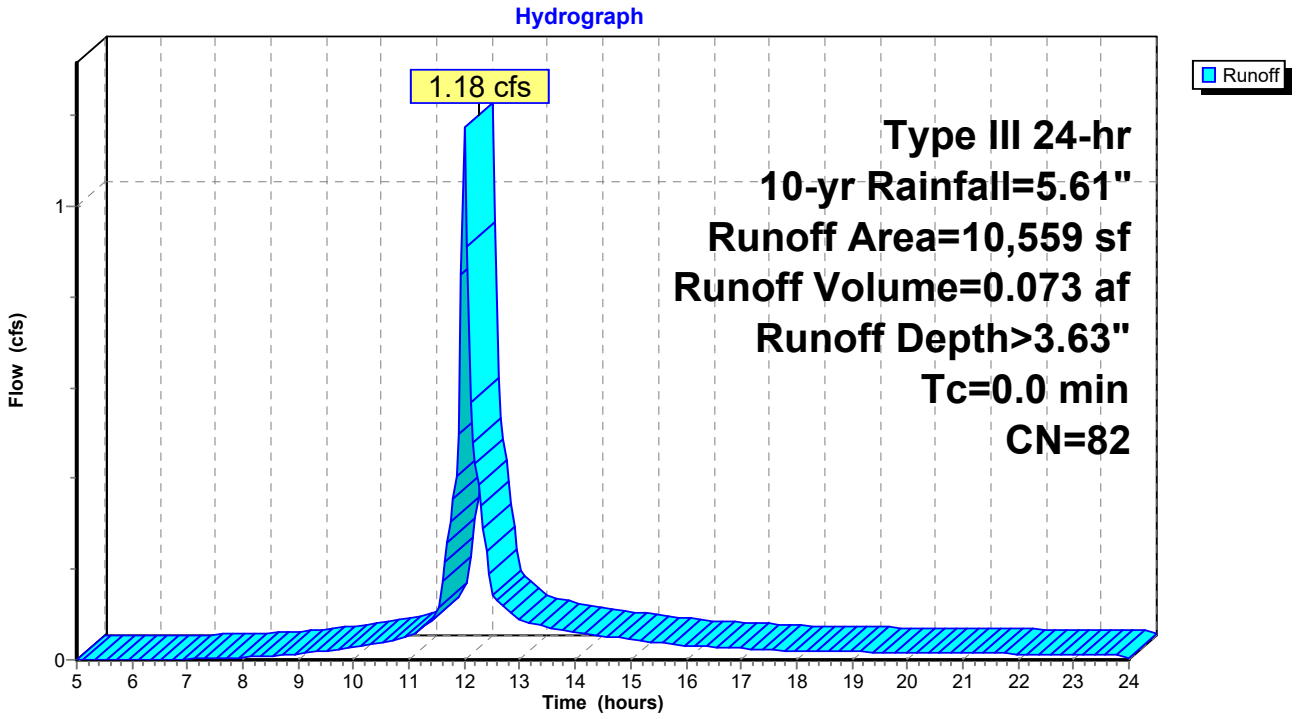
Summary for Subcatchment 3S: SUBCATCHEMNT 3

Runoff = 1.18 cfs @ 12.00 hrs, Volume= 0.073 af, Depth> 3.63"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
	18	55	Woods, Good, HSG B
	4,582	61	>75% Grass cover, Good, HSG B
*	5,959	98	IMPERVIOUS
	10,559	82	Weighted Average
	4,600		43.56% Pervious Area
	5,959		56.44% Impervious Area

Subcatchment 3S: SUBCATCHEMNT 3



Summary for Subcatchment 4S: SUBCATCHMENT 4

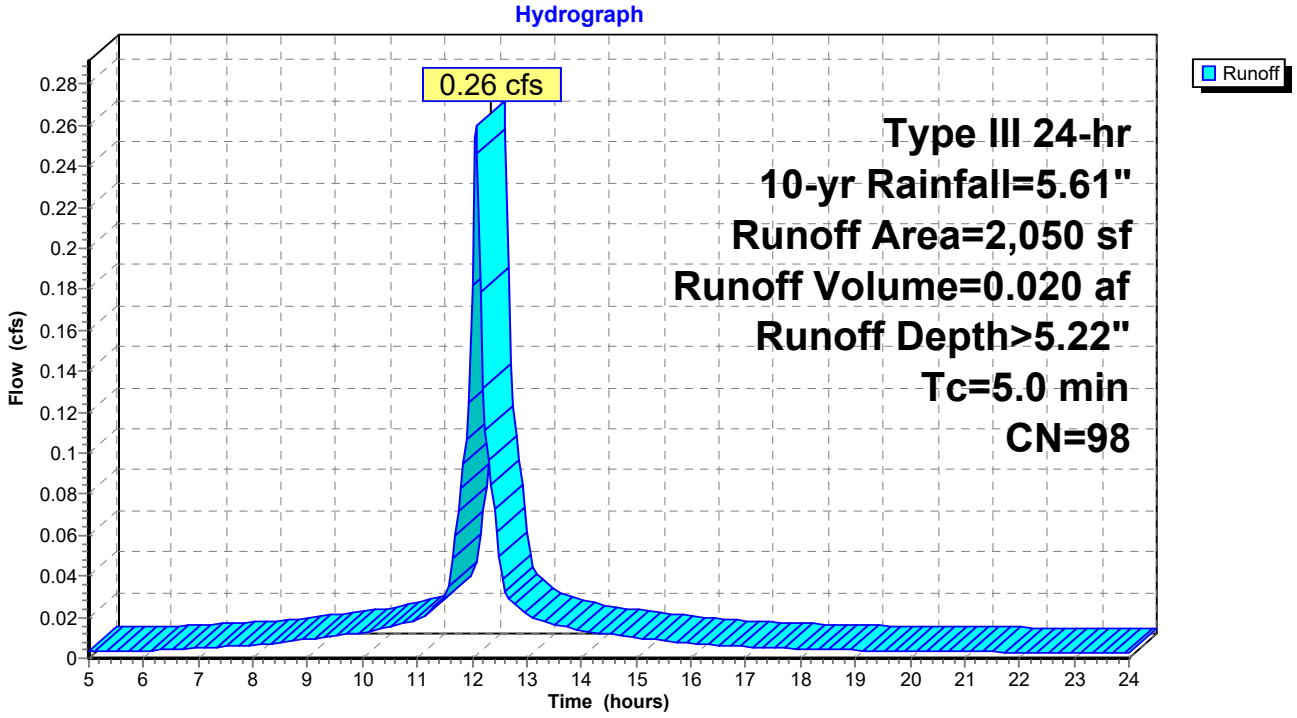
Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.020 af, Depth> 5.22"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: SUBCATCHMENT 4



Summary for Subcatchment 5S: SUBCATCHMENT 5

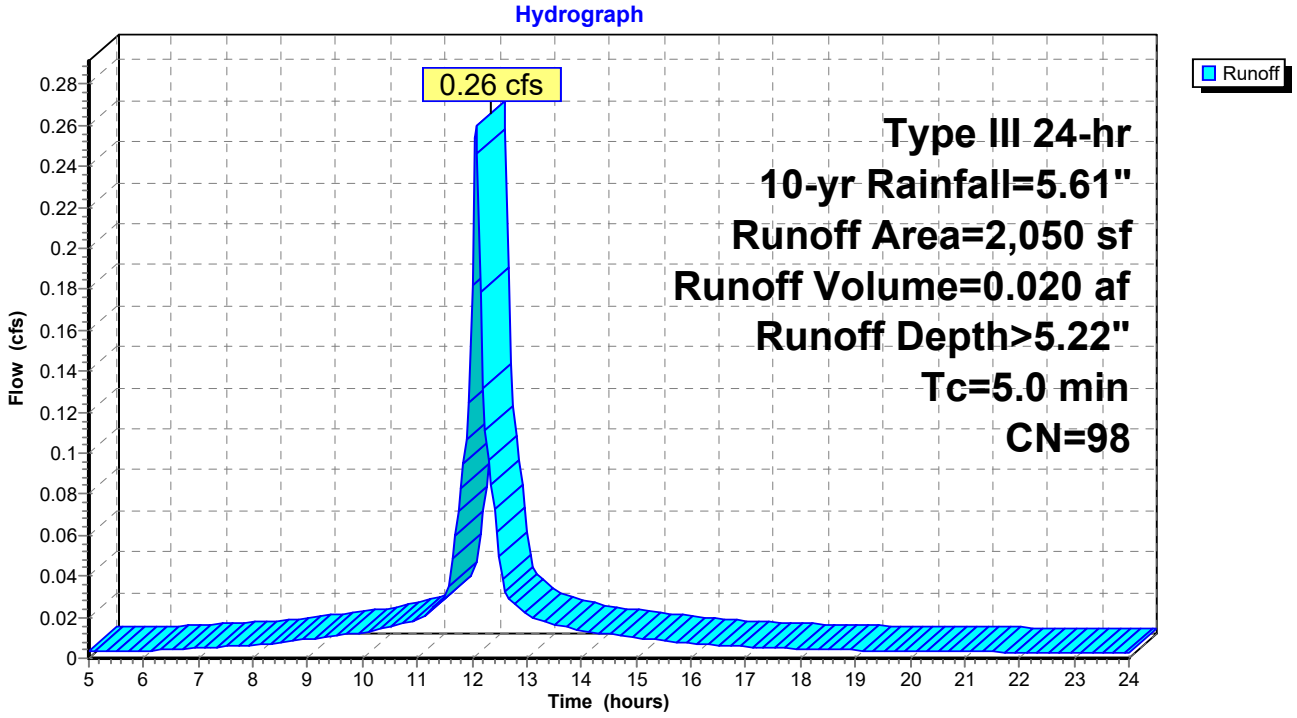
Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.020 af, Depth> 5.22"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: SUBCATCHMENT 5



Summary for Subcatchment 6S: SUBCATCHMENT 6

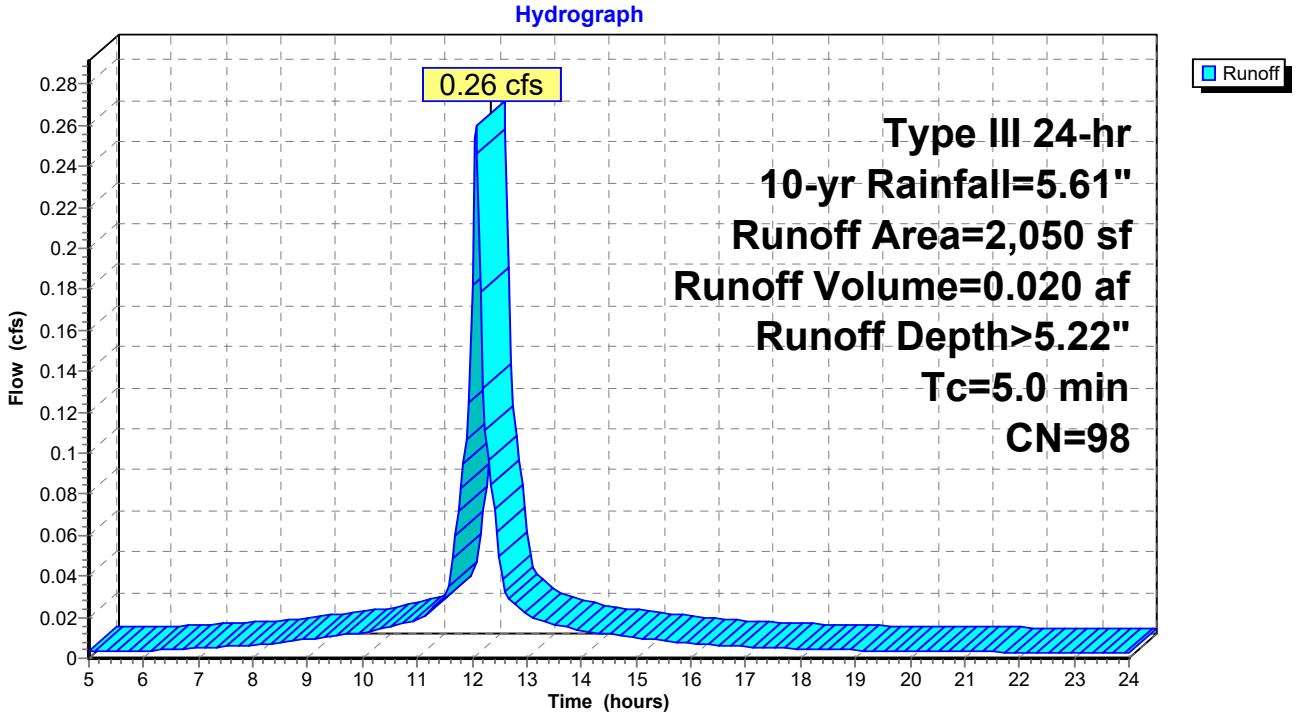
Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.020 af, Depth> 5.22"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: SUBCATCHMENT 6



Summary for Subcatchment 7S: SUBCATCHMENT 7

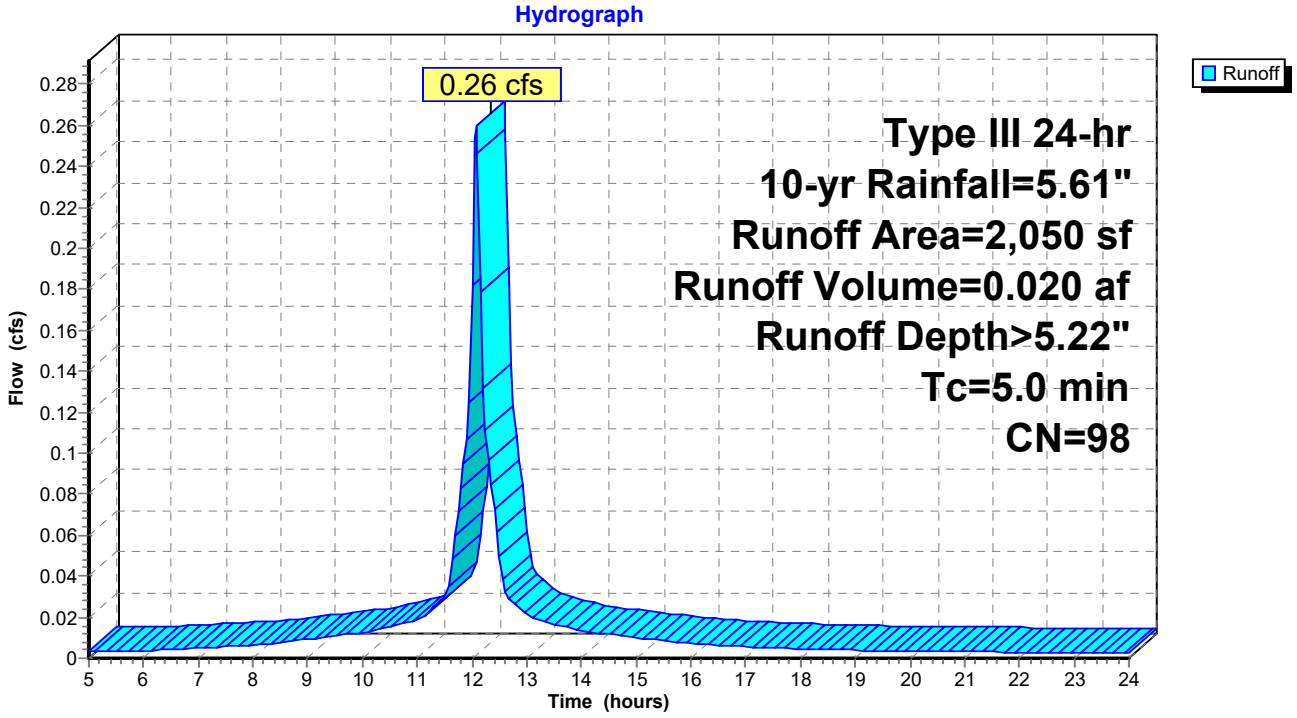
Runoff = 0.26 cfs @ 12.07 hrs, Volume= 0.020 af, Depth> 5.22"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: SUBCATCHMENT 7



Summary for Subcatchment 8S: SUBCATCHMENT 8

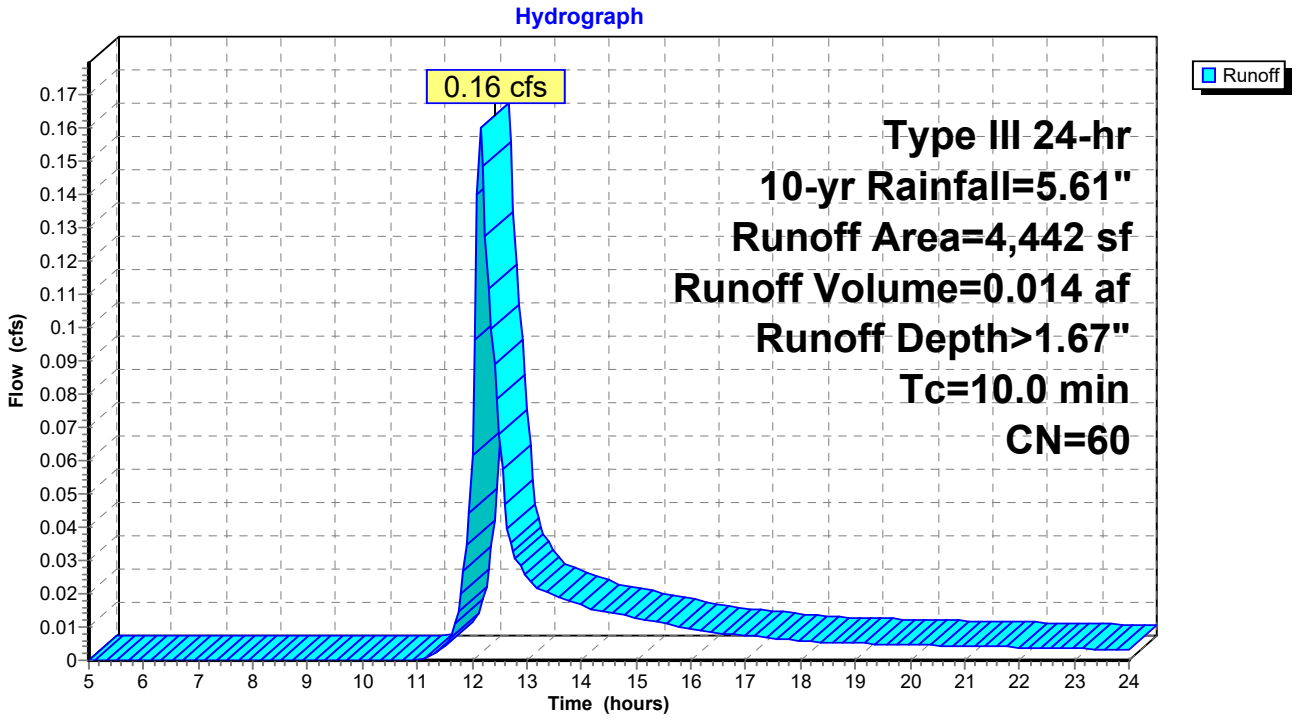
Runoff = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af, Depth> 1.67"
Routed to Reach SP1 : SUMMATION POINT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=5.61"

Area (sf)	CN	Description
679	55	Woods, Good, HSG B
3,763	61	>75% Grass cover, Good, HSG B
4,442	60	Weighted Average
4,442		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 8S: SUBCATCHMENT 8

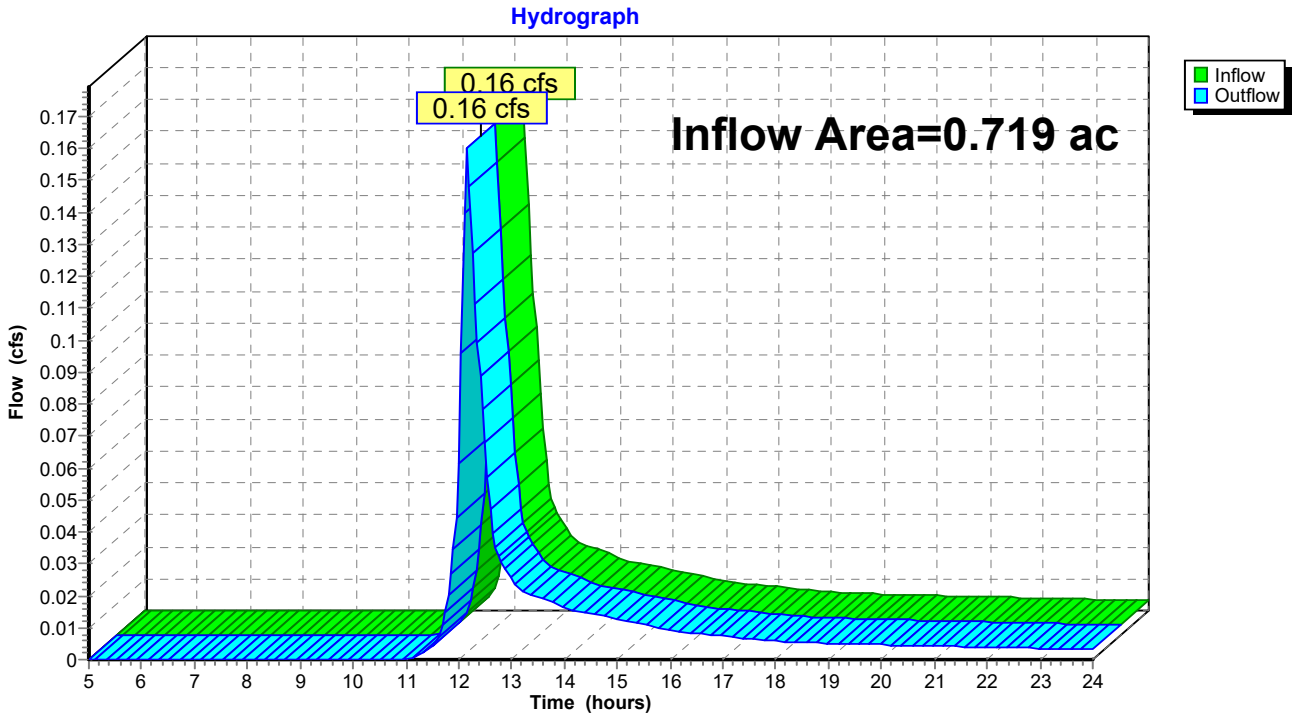


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 0.719 ac, 6.96% Impervious, Inflow Depth > 0.24" for 10-yr event
Inflow = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af
Outflow = 0.16 cfs @ 12.16 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

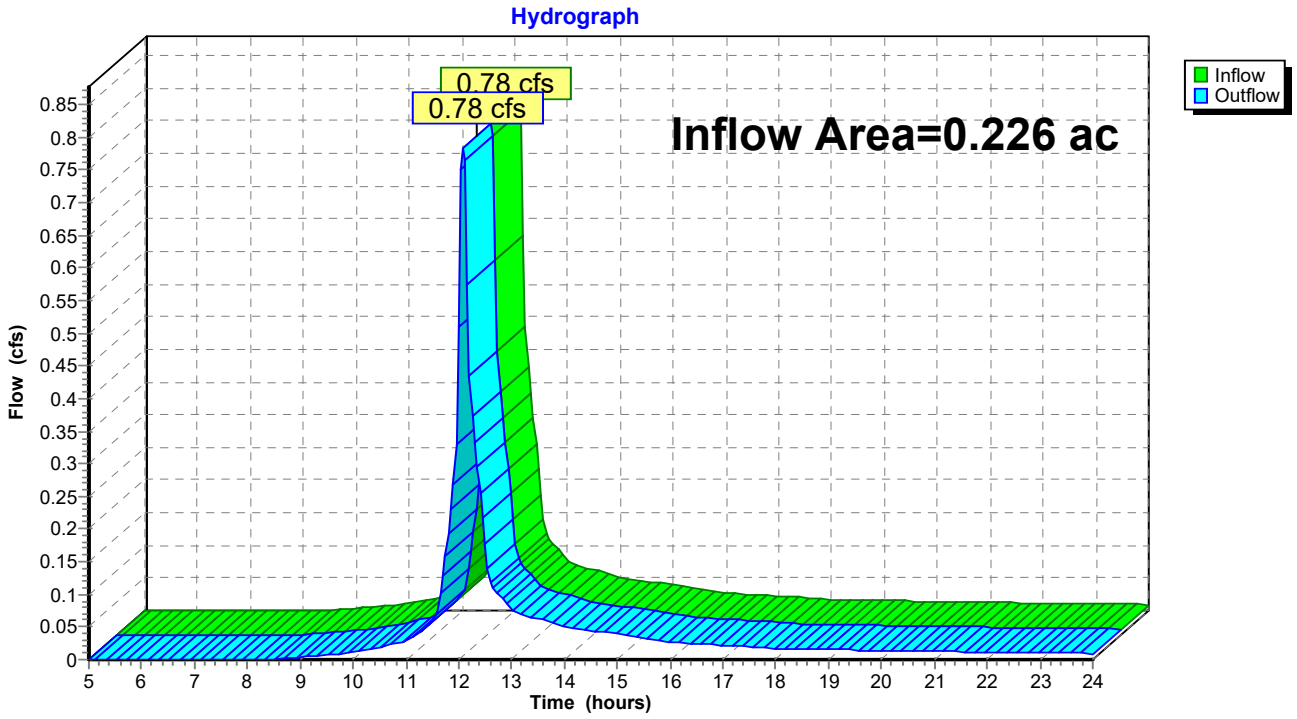


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.226 ac, 37.64% Impervious, Inflow Depth > 2.95" for 10-yr event
Inflow = 0.78 cfs @ 12.08 hrs, Volume= 0.056 af
Outflow = 0.78 cfs @ 12.08 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 4.32" for 10-yr event
Inflow = 1.97 cfs @ 12.03 hrs, Volume= 0.155 af
Outflow = 1.47 cfs @ 12.12 hrs, Volume= 0.138 af, Atten= 26%, Lag= 5.3 min
Discarded = 0.02 cfs @ 12.12 hrs, Volume= 0.013 af
Primary = 1.45 cfs @ 12.12 hrs, Volume= 0.125 af
Routed to Pond 3P : SUBSURFACE DETENTION
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 31.14' @ 12.12 hrs Surf.Area= 1,534 sf Storage= 1,603 cf

Plug-Flow detention time= 97.0 min calculated for 0.138 af (89% of inflow)
Center-of-Mass det. time= 45.4 min (827.5 - 782.1)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	5,850 cf	**Custom Stage Data (Prismatic)** Listed below

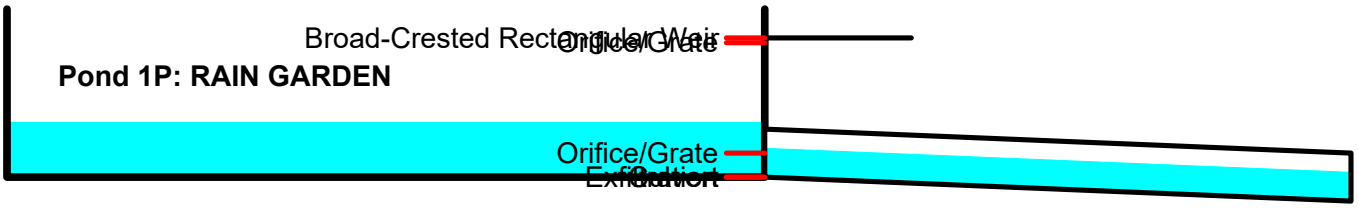
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	1,200	0	0
31.00	1,500	1,350	1,350
33.50	2,100	4,500	5,850

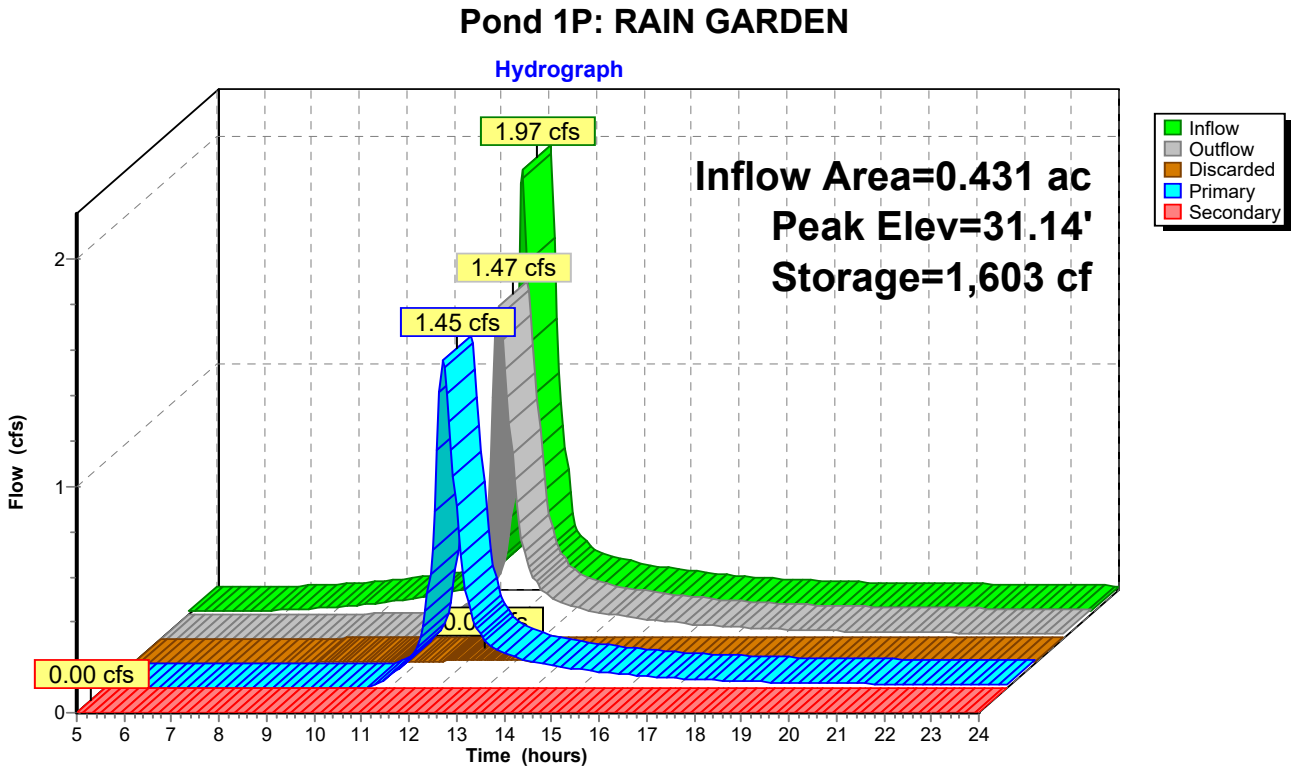
Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	**2.400 in/hr Exfiltration over Surface area above 30.00'** Excluded Surface area = 1,200 sf
#2	Primary	30.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.00' / 29.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	30.50'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	32.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	32.90'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 12.12 hrs HW=31.14' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.43 cfs @ 12.12 hrs HW=31.14' (Free Discharge)
└**2=Culvert** (Passes 1.43 cfs of 2.38 cfs potential flow)
└**3=Orifice/Grate** (Orifice Controls 1.43 cfs @ 2.71 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=30.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)





Summary for Pond 2P: INFILTRATION TRENCH

Inflow Area = 0.617 ac, 8.11% Impervious, Inflow Depth > 1.66" for 10-yr event
Inflow = 0.59 cfs @ 12.53 hrs, Volume= 0.085 af
Outflow = 0.13 cfs @ 12.15 hrs, Volume= 0.085 af, Atten= 79%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.15 hrs, Volume= 0.085 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 29.07' @ 13.80 hrs Surf.Area= 2,300 sf Storage= 1,200 cf

Plug-Flow detention time= 84.8 min calculated for 0.085 af (100% of inflow)
Center-of-Mass det. time= 84.0 min (972.1 - 888.2)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	2,157 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 6,900 cf Overall - 1,508 cf Embedded = 5,392 cf x 40.0% Voids
#2	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
#3	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
		3,665 cf	Total Available Storage

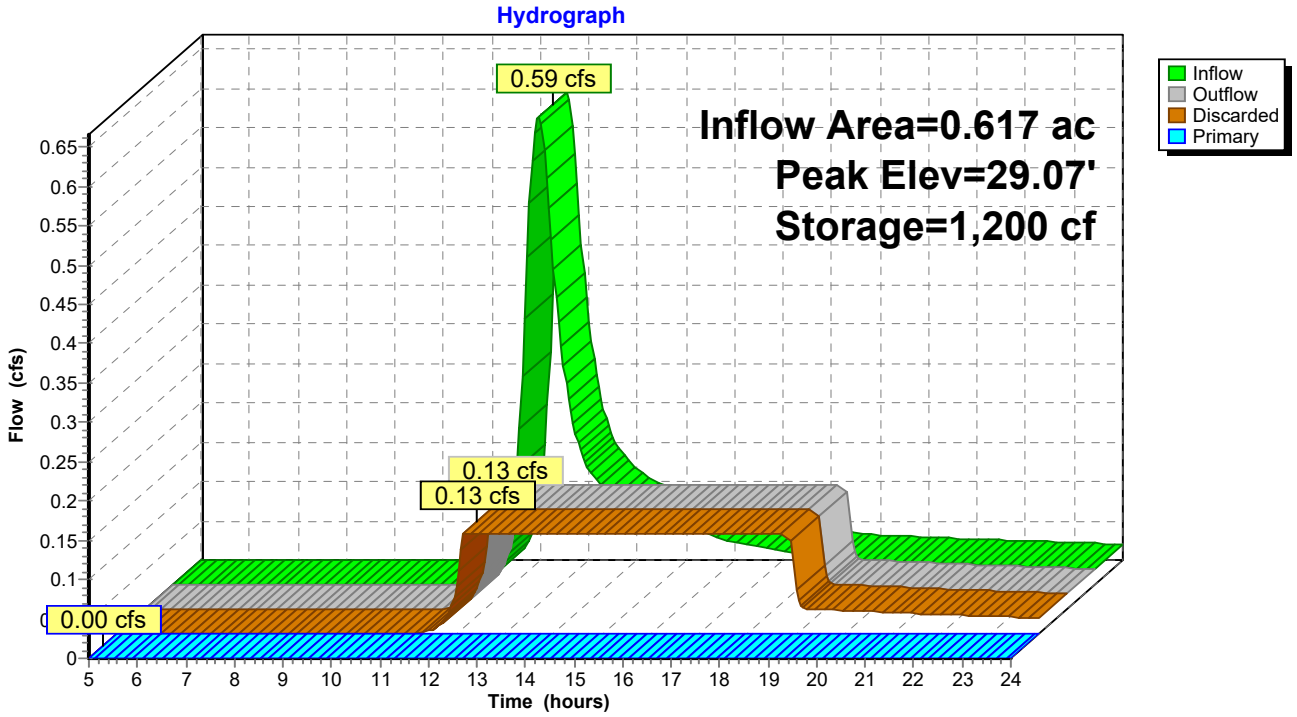
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	2,300	0	0
31.00	2,300	6,900	6,900

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	31.00'	**320.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.13 cfs @ 12.15 hrs HW=28.04' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: INFILTRATION TRENCH



Summary for Pond 3P: SUBSURFACE DETENTION

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 3.49" for 10-yr event
Inflow = 1.45 cfs @ 12.12 hrs, Volume= 0.125 af
Outflow = 0.19 cfs @ 11.70 hrs, Volume= 0.125 af, Atten= 87%, Lag= 0.0 min
Discarded = 0.19 cfs @ 11.70 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 29.43' @ 13.09 hrs Surf.Area= 3,500 sf Storage= 2,312 cf

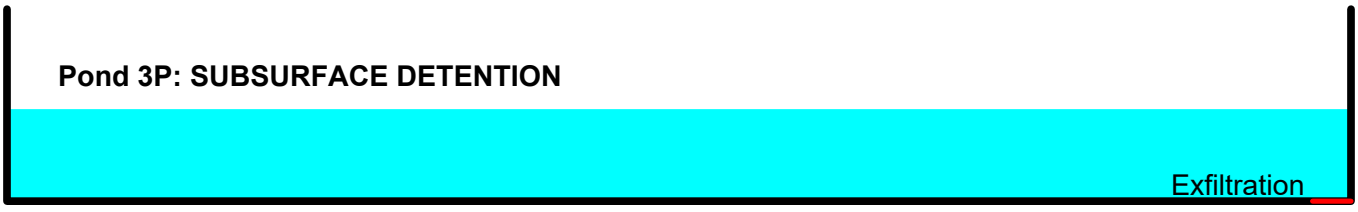
Plug-Flow detention time= 104.7 min calculated for 0.125 af (100% of inflow)
Center-of-Mass det. time= 104.1 min (917.4 - 813.3)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	3,748 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 10,500 cf Overall - 1,131 cf Embedded = 9,369 cf x 40.0% Voids
#2	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#3	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#4	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
		4,879 cf	Total Available Storage

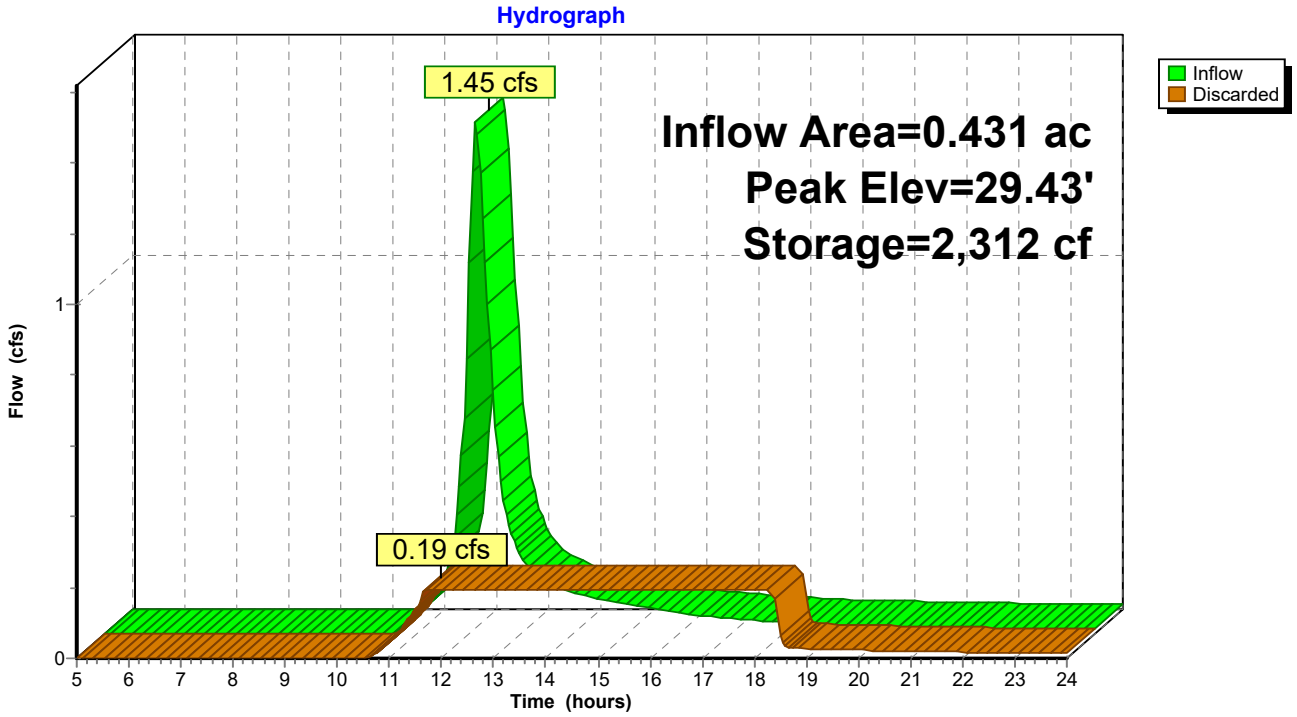
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	3,500	0	0
31.00	3,500	10,500	10,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 11.70 hrs HW=28.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.19 cfs)



Pond 3P: SUBSURFACE DETENTION



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=26,883 sf 8.11% Impervious Runoff Depth>2.67"
Flow Length=490' Tc=34.4 min CN=60 Runoff=1.00 cfs 0.137 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=9,849 sf 37.64% Impervious Runoff Depth>4.25"
Tc=5.0 min CN=75 Runoff=1.13 cfs 0.080 af

Subcatchment3S: SUBCATCHEMNT3 Runoff Area=10,559 sf 56.44% Impervious Runoff Depth>5.03"
Tc=0.0 min CN=82 Runoff=1.61 cfs 0.102 af

Subcatchment4S: SUBCATCHMENT4 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>6.65"
Tc=5.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment5S: SUBCATCHMENT5 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>6.65"
Tc=5.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment6S: SUBCATCHMENT6 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>6.65"
Tc=5.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment7S: SUBCATCHMENT7 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>6.65"
Tc=5.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment8S: SUBCATCHMENT 8 Runoff Area=4,442 sf 0.00% Impervious Runoff Depth>2.68"
Tc=10.0 min CN=60 Runoff=0.27 cfs 0.023 af

Reach SP1: SUMMATION POINT 1 Inflow=0.27 cfs 0.023 af
Outflow=0.27 cfs 0.023 af

Reach SP2: SUMMATION POINT 2 Inflow=1.13 cfs 0.080 af
Outflow=1.13 cfs 0.080 af

Pond 1P: RAIN GARDEN Peak Elev=31.27' Storage=1,829 cf Inflow=2.63 cfs 0.206 af
Discarded=0.02 cfs 0.014 af Primary=1.92 cfs 0.175 af Secondary=0.00 cfs 0.000 af Outflow=1.94 cfs 0.189 af

Pond 2P: INFILTRATIONTRENCH Peak Elev=30.04' Storage=2,629 cf Inflow=1.00 cfs 0.137 af
Discarded=0.13 cfs 0.131 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.131 af

Pond 3P: SUBSURFACEDETENTION Peak Elev=30.07' Storage=3,474 cf Inflow=1.92 cfs 0.175 af
Outflow=0.19 cfs 0.175 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.446 af Average Runoff Depth = 3.89"
66.55% Pervious = 0.916 ac 33.45% Impervious = 0.460 ac

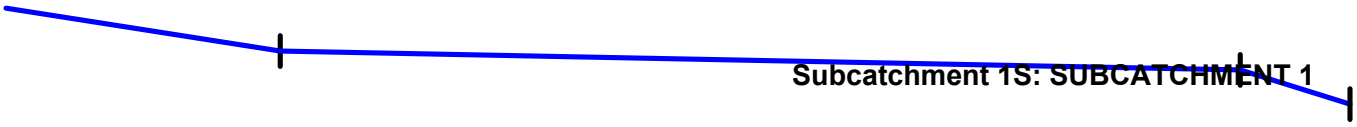
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 1.00 cfs @ 12.51 hrs, Volume= 0.137 af, Depth> 2.67"
Routed to Pond 2P : INFILTRATION TRENCH

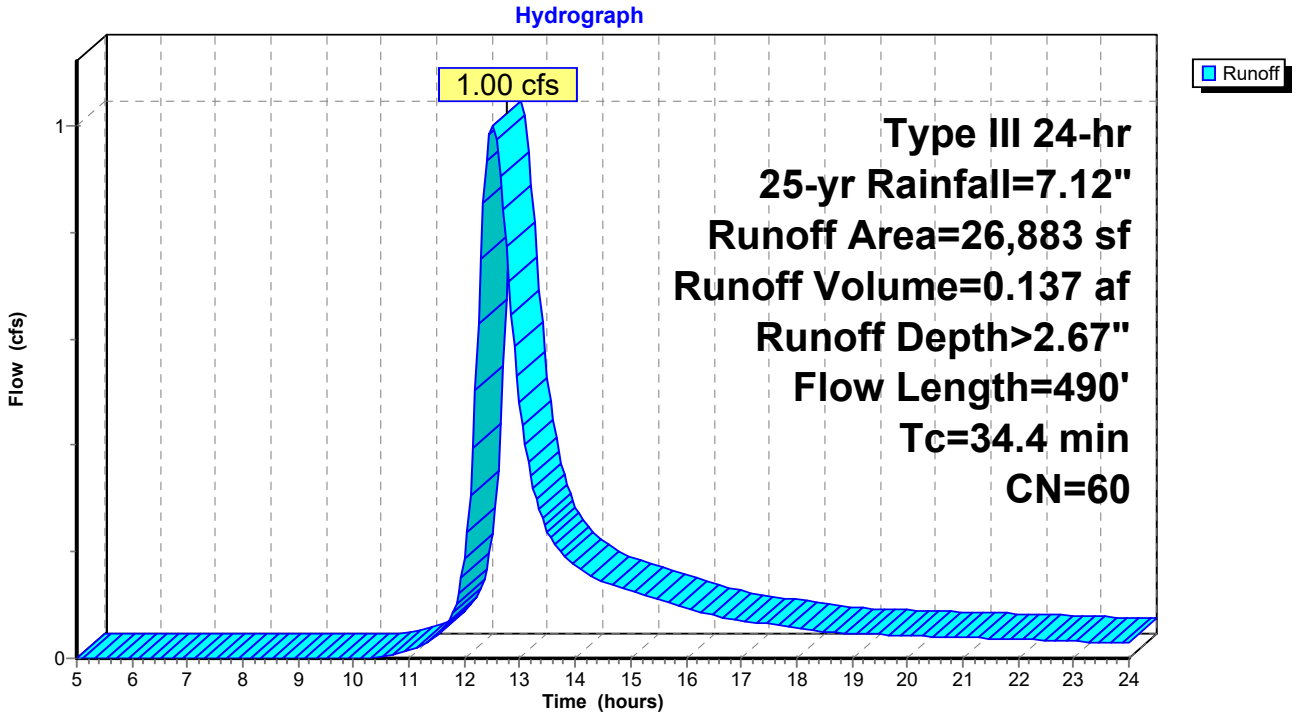
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
	16,143	55	Woods, Good, HSG B
	8,559	61	>75% Grass cover, Good, HSG B
*	2,181	98	IMPERVIOUS
	26,883	60	Weighted Average
	24,702		91.89% Pervious Area
	2,181		8.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	100	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"
16.5	350	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
34.4	490	Total			



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

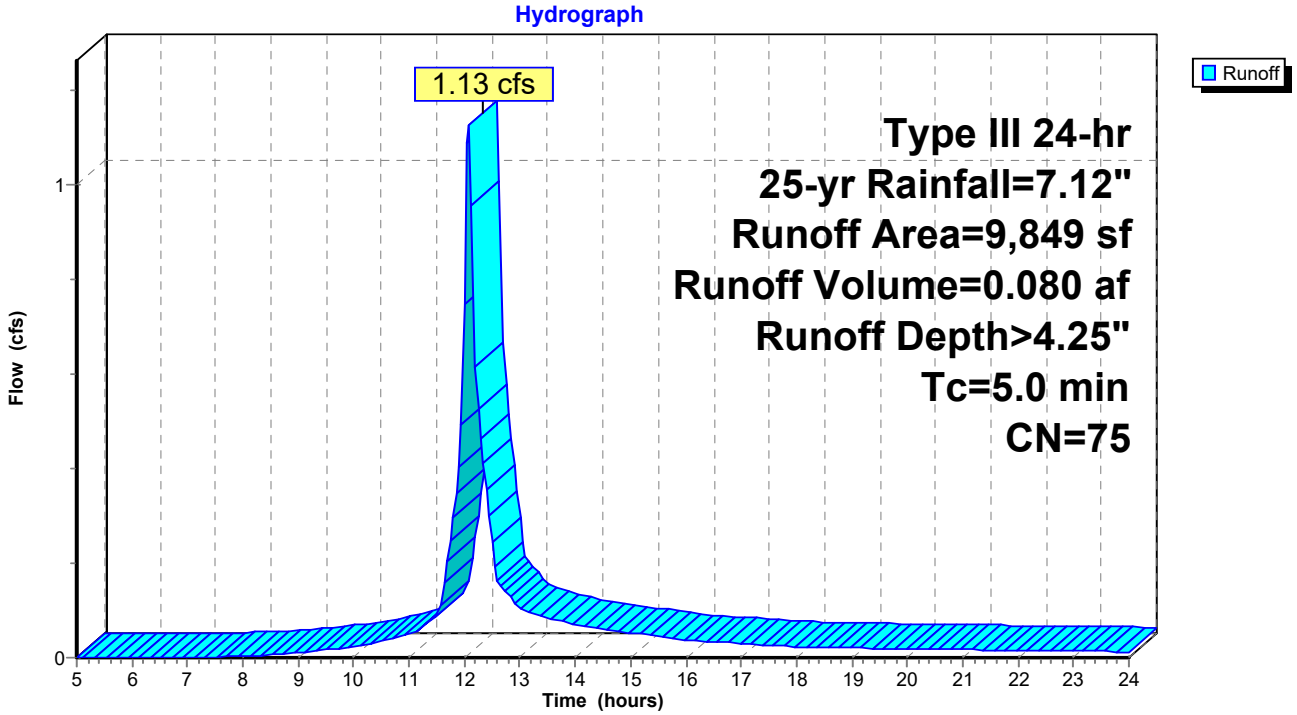
Runoff = 1.13 cfs @ 12.08 hrs, Volume= 0.080 af, Depth> 4.25"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
	6,142	61	>75% Grass cover, Good, HSG B
*	3,707	98	IMPERVIOUS
	9,849	75	Weighted Average
	6,142		62.36% Pervious Area
	3,707		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2



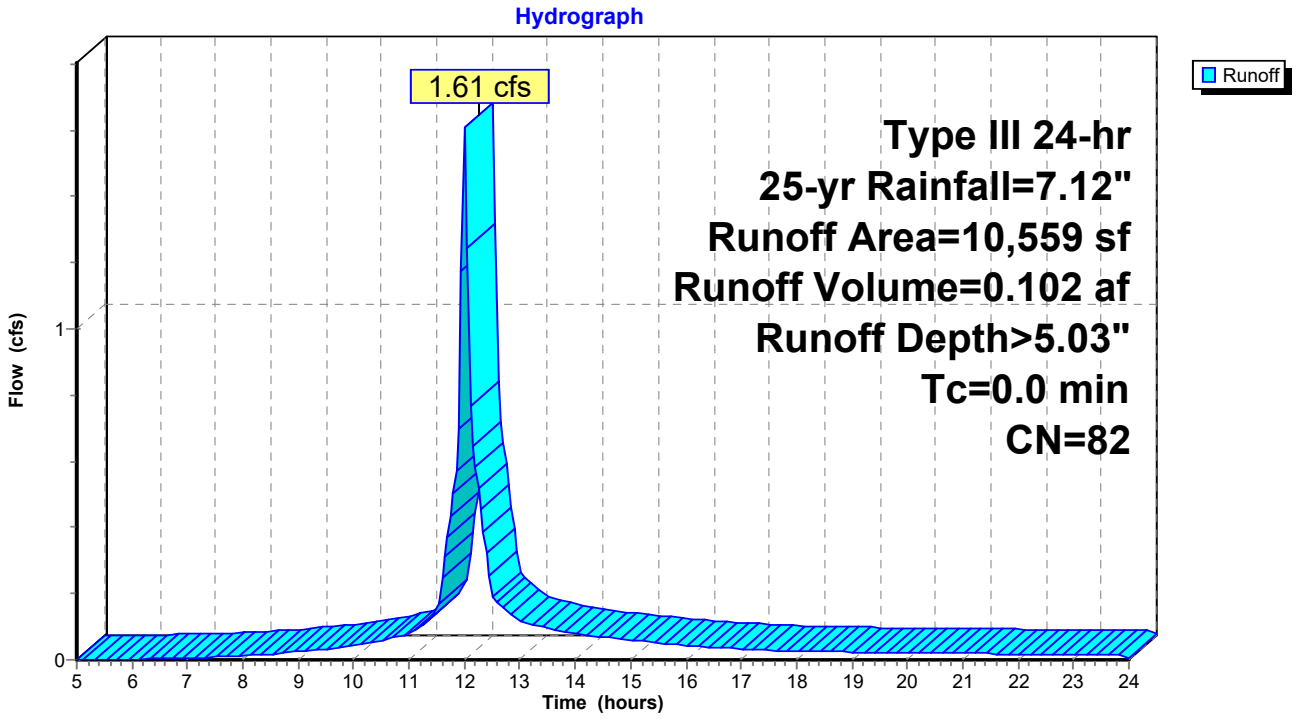
Summary for Subcatchment 3S: SUBCATCHEMNT 3

Runoff = 1.61 cfs @ 12.00 hrs, Volume= 0.102 af, Depth> 5.03"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
	18	55	Woods, Good, HSG B
	4,582	61	>75% Grass cover, Good, HSG B
*	5,959	98	IMPERVIOUS
	10,559	82	Weighted Average
	4,600		43.56% Pervious Area
	5,959		56.44% Impervious Area

Subcatchment 3S: SUBCATCHEMNT 3



Summary for Subcatchment 4S: SUBCATCHMENT 4

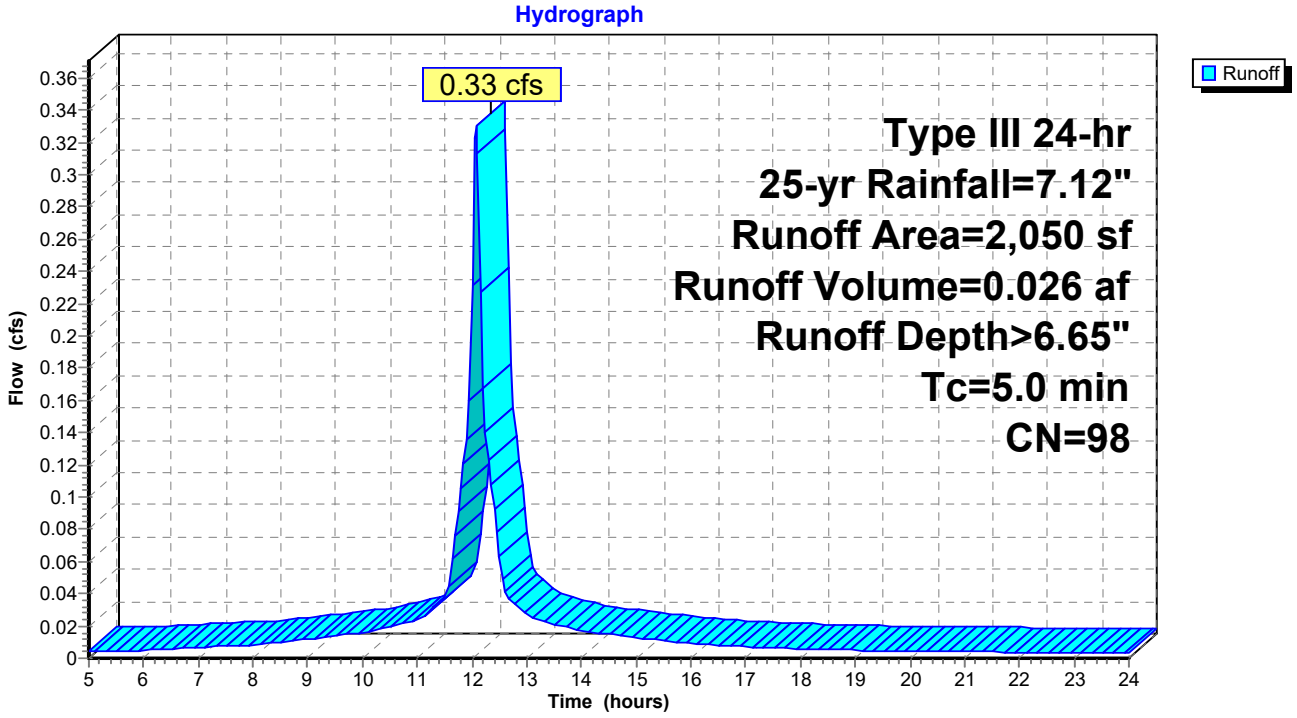
Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.026 af, Depth> 6.65"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: SUBCATCHMENT 4



Summary for Subcatchment 5S: SUBCATCHMENT 5

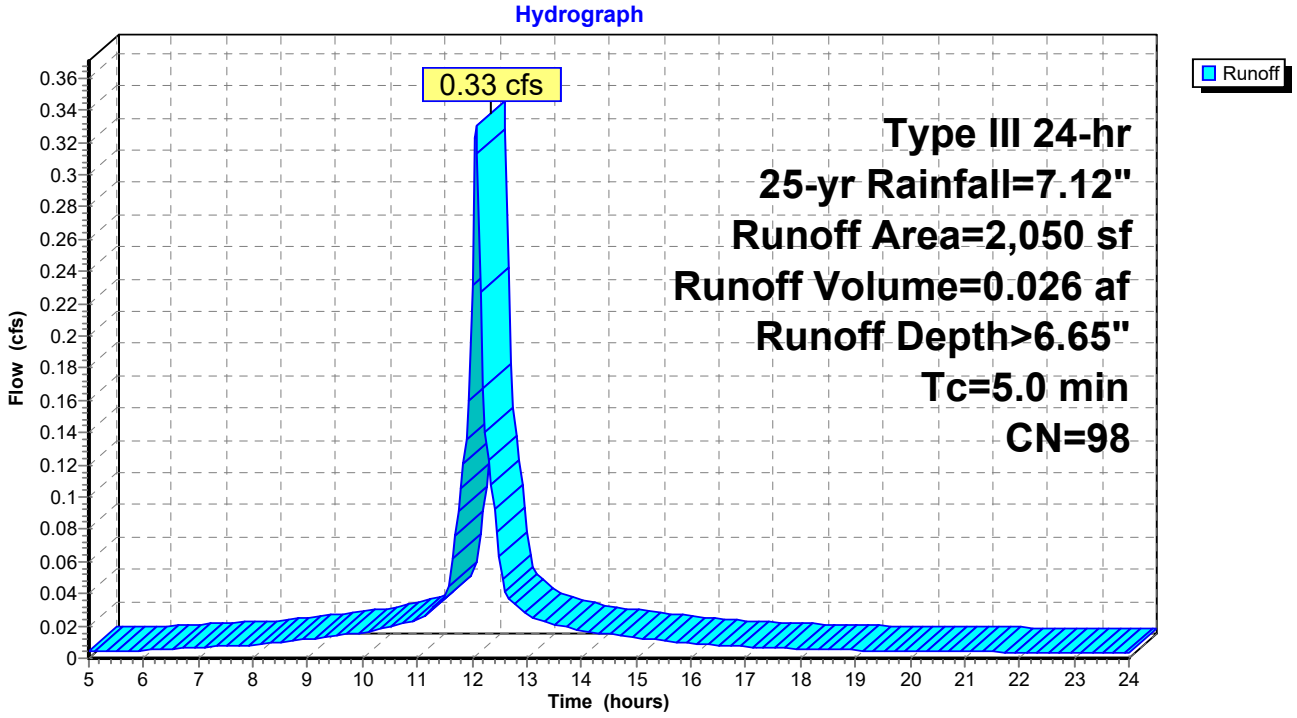
Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.026 af, Depth> 6.65"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: SUBCATCHMENT 5



Summary for Subcatchment 6S: SUBCATCHMENT 6

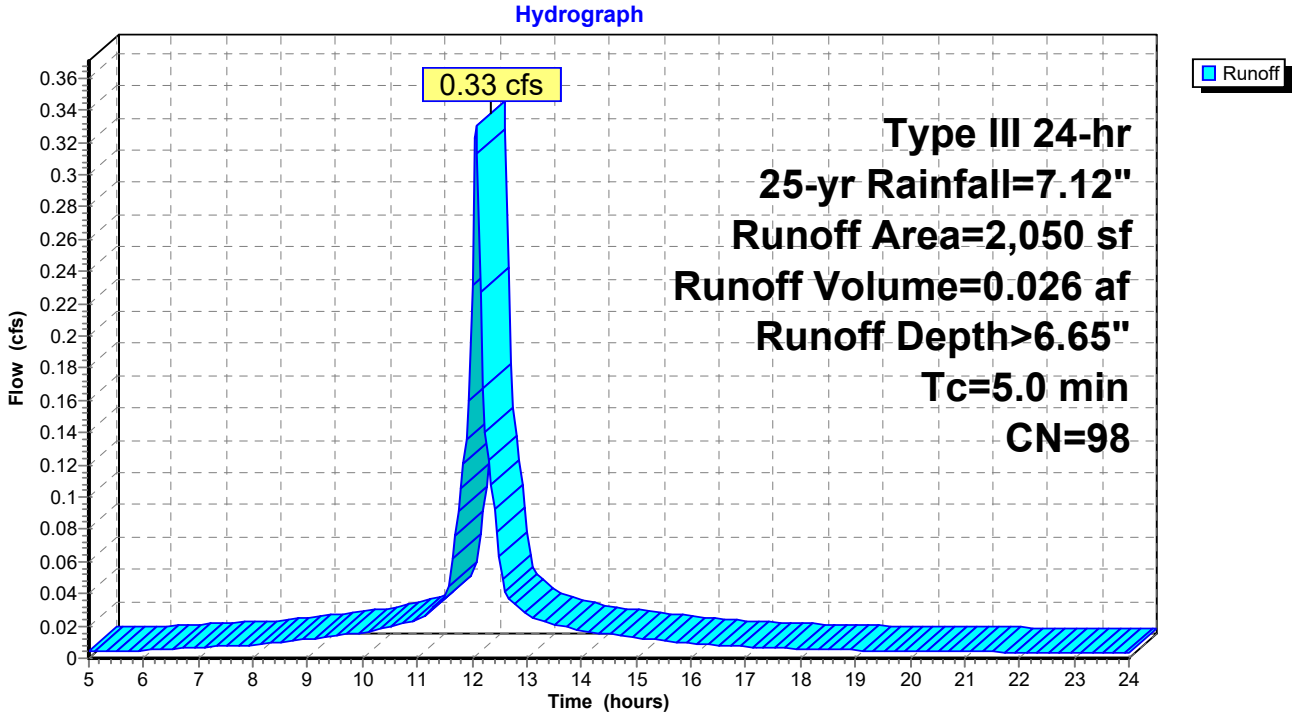
Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.026 af, Depth> 6.65"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: SUBCATCHMENT 6



Summary for Subcatchment 7S: SUBCATCHMENT 7

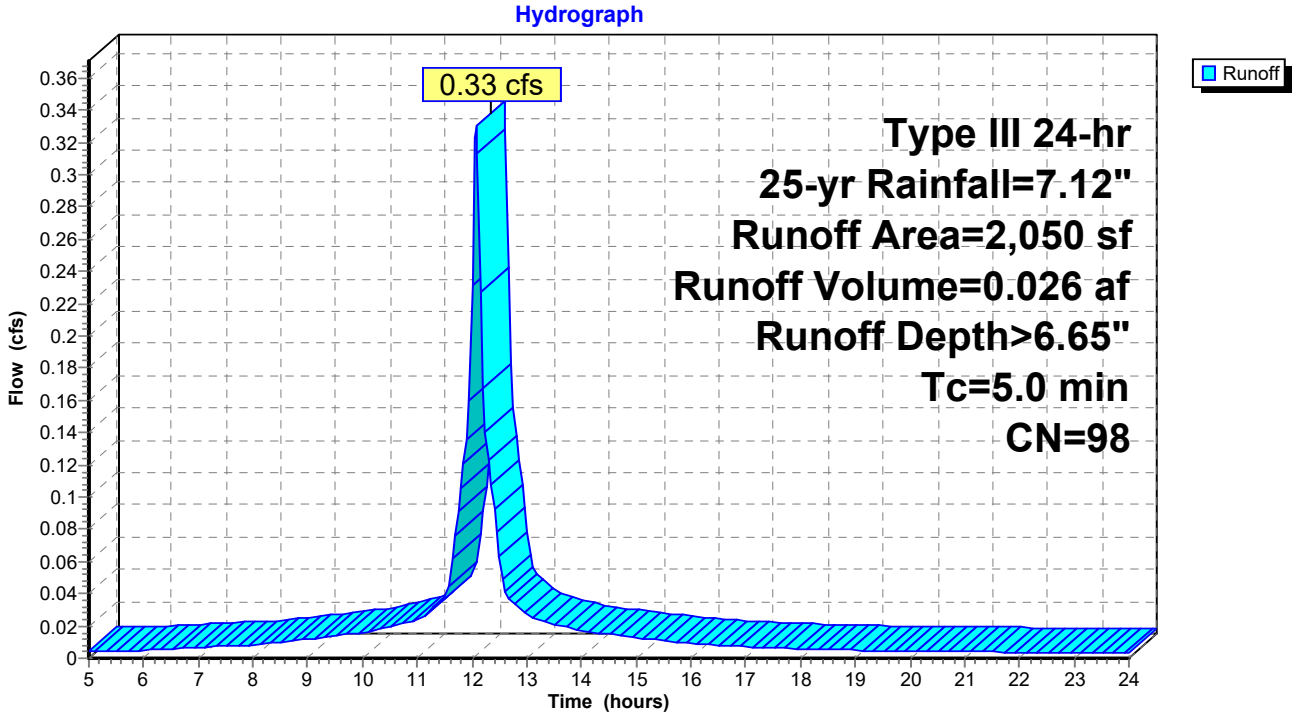
Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.026 af, Depth> 6.65"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: SUBCATCHMENT 7



Summary for Subcatchment 8S: SUBCATCHMENT 8

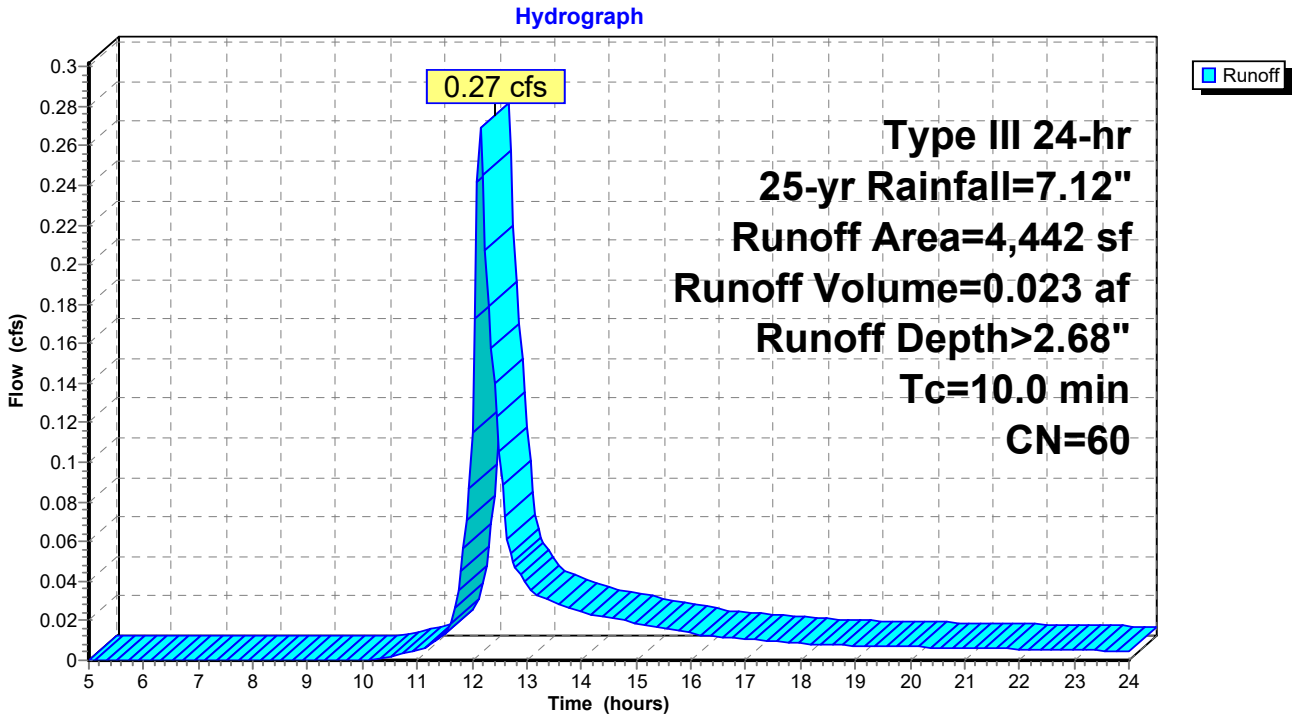
Runoff = 0.27 cfs @ 12.15 hrs, Volume= 0.023 af, Depth> 2.68"
Routed to Reach SP1 : SUMMATION POINT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=7.12"

Area (sf)	CN	Description
679	55	Woods, Good, HSG B
3,763	61	>75% Grass cover, Good, HSG B
4,442	60	Weighted Average
4,442		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 8S: SUBCATCHMENT 8

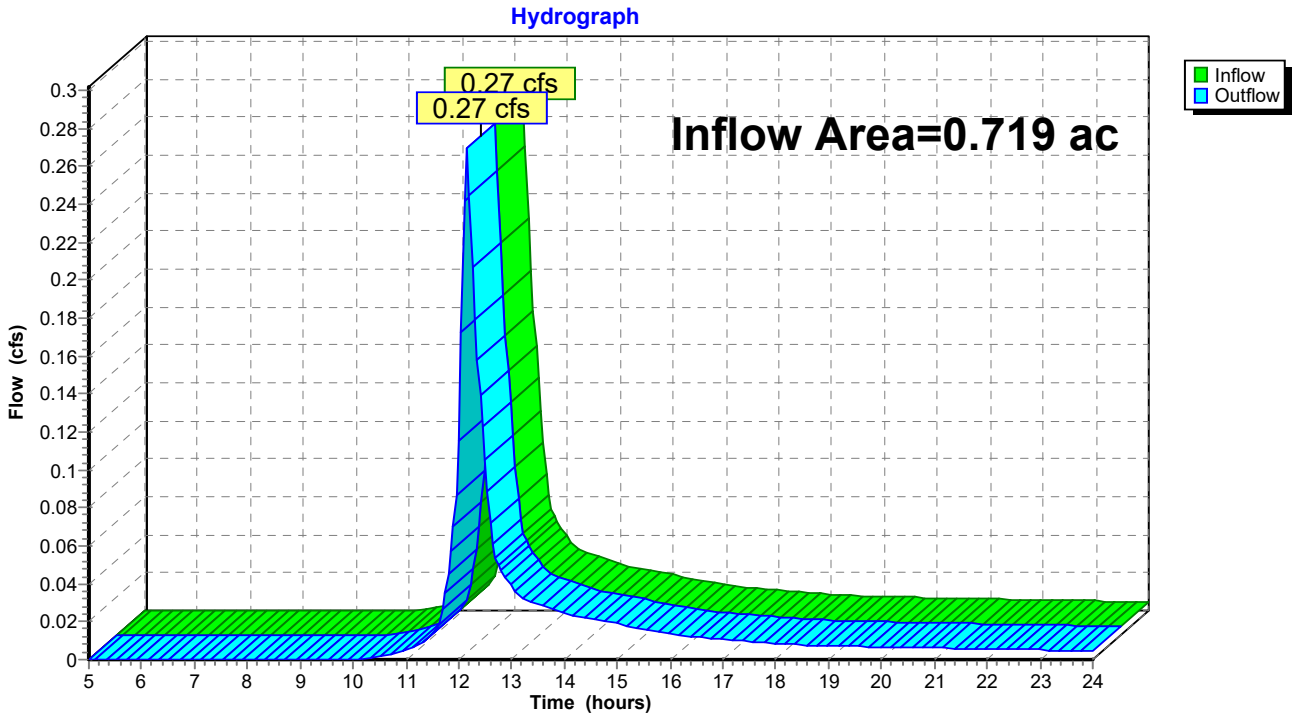


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 0.719 ac, 6.96% Impervious, Inflow Depth > 0.38" for 25-yr event
Inflow = 0.27 cfs @ 12.15 hrs, Volume= 0.023 af
Outflow = 0.27 cfs @ 12.15 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

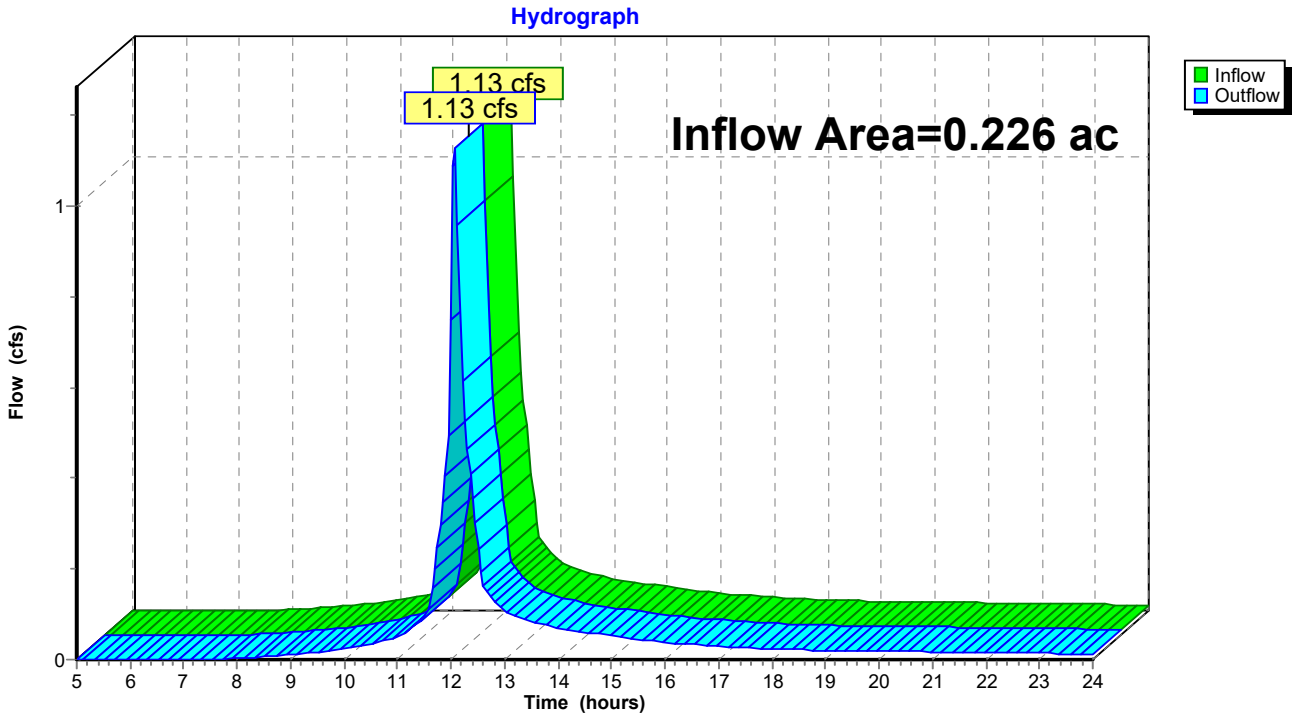


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.226 ac, 37.64% Impervious, Inflow Depth > 4.25" for 25-yr event
Inflow = 1.13 cfs @ 12.08 hrs, Volume= 0.080 af
Outflow = 1.13 cfs @ 12.08 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 5.74" for 25-yr event
Inflow = 2.63 cfs @ 12.02 hrs, Volume= 0.206 af
Outflow = 1.94 cfs @ 12.11 hrs, Volume= 0.189 af, Atten= 26%, Lag= 5.3 min
Discarded = 0.02 cfs @ 12.11 hrs, Volume= 0.014 af
Primary = 1.92 cfs @ 12.11 hrs, Volume= 0.175 af
Routed to Pond 3P : SUBSURFACE DETENTION
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 31.27' @ 12.11 hrs Surf.Area= 1,564 sf Storage= 1,829 cf

Plug-Flow detention time= 81.7 min calculated for 0.188 af (91% of inflow)
Center-of-Mass det. time= 39.1 min (817.0 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	5,850 cf	**Custom Stage Data (Prismatic)** Listed below

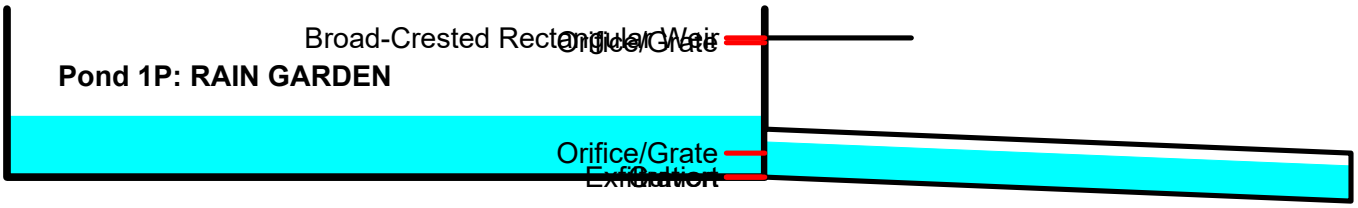
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	1,200	0	0
31.00	1,500	1,350	1,350
33.50	2,100	4,500	5,850

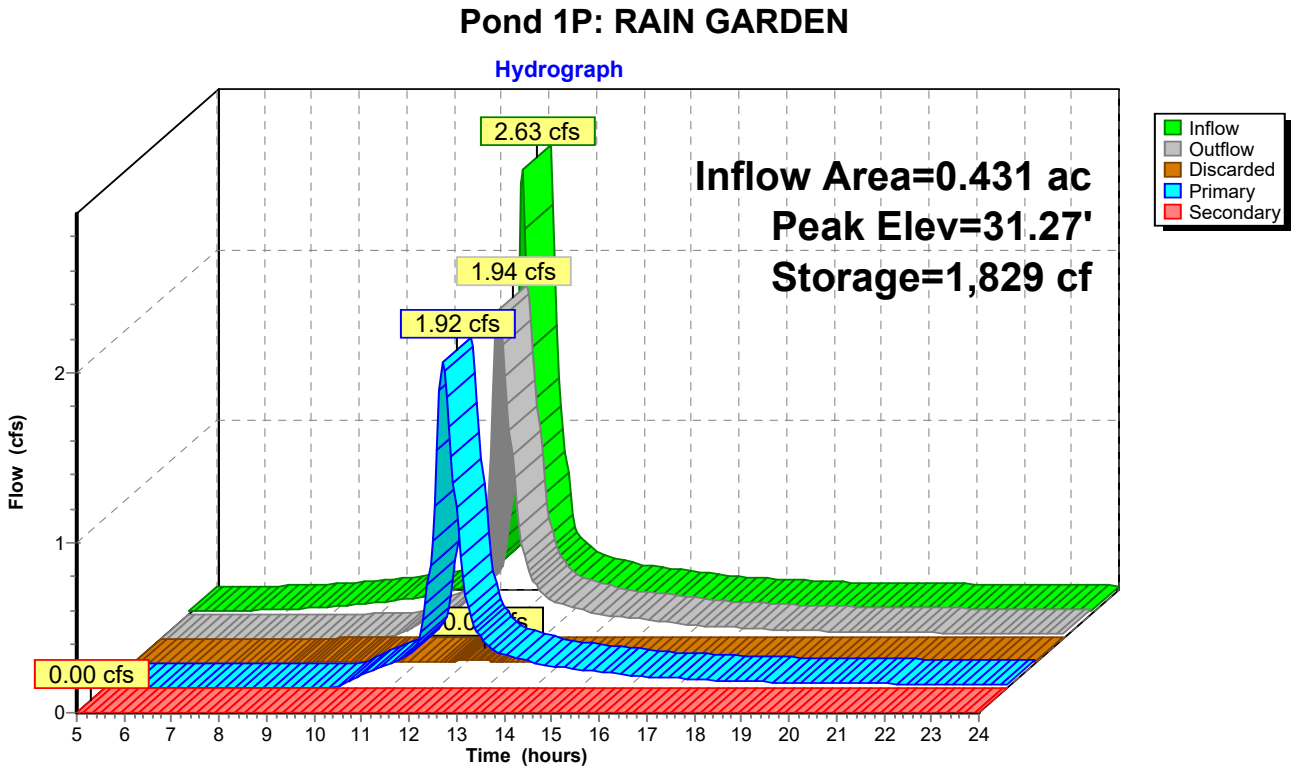
Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	**2.400 in/hr Exfiltration over Surface area above 30.00'** Excluded Surface area = 1,200 sf
#2	Primary	30.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.00' / 29.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	30.50'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	32.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	32.90'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 12.11 hrs HW=31.26' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.90 cfs @ 12.11 hrs HW=31.26' (Free Discharge)
└**2=Culvert** (Passes 1.90 cfs of 2.60 cfs potential flow)
└**3=Orifice/Grate** (Orifice Controls 1.90 cfs @ 2.97 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=30.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)





Summary for Pond 2P: INFILTRATION TRENCH

Inflow Area = 0.617 ac, 8.11% Impervious, Inflow Depth > 2.67" for 25-yr event
Inflow = 1.00 cfs @ 12.51 hrs, Volume= 0.137 af
Outflow = 0.13 cfs @ 12.00 hrs, Volume= 0.131 af, Atten= 87%, Lag= 0.0 min
Discarded = 0.13 cfs @ 12.00 hrs, Volume= 0.131 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 30.04' @ 14.94 hrs Surf.Area= 2,300 sf Storage= 2,629 cf

Plug-Flow detention time= 216.4 min calculated for 0.131 af (96% of inflow)
Center-of-Mass det. time= 194.2 min (1,068.1 - 873.9)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	2,157 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 6,900 cf Overall - 1,508 cf Embedded = 5,392 cf x 40.0% Voids
#2	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
#3	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
		3,665 cf	Total Available Storage

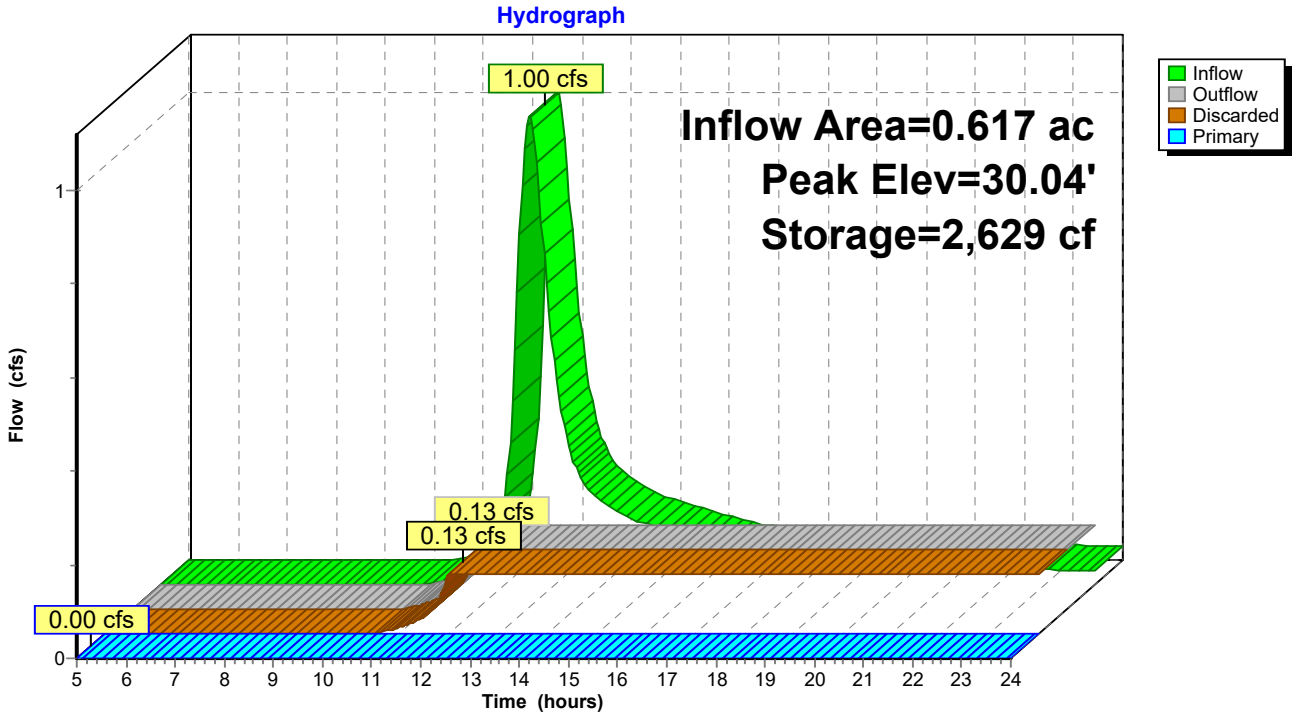
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	2,300	0	0
31.00	2,300	6,900	6,900

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	31.00'	**320.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.13 cfs @ 12.00 hrs HW=28.04' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=28.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: INFILTRATION TRENCH



Summary for Pond 3P: SUBSURFACE DETENTION

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 4.87" for 25-yr event
Inflow = 1.92 cfs @ 12.11 hrs, Volume= 0.175 af
Outflow = 0.19 cfs @ 11.45 hrs, Volume= 0.175 af, Atten= 90%, Lag= 0.0 min
Discarded = 0.19 cfs @ 11.45 hrs, Volume= 0.175 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 30.07' @ 13.44 hrs Surf.Area= 3,500 sf Storage= 3,474 cf

Plug-Flow detention time= 160.8 min calculated for 0.175 af (100% of inflow)
Center-of-Mass det. time= 160.5 min (967.2 - 806.7)

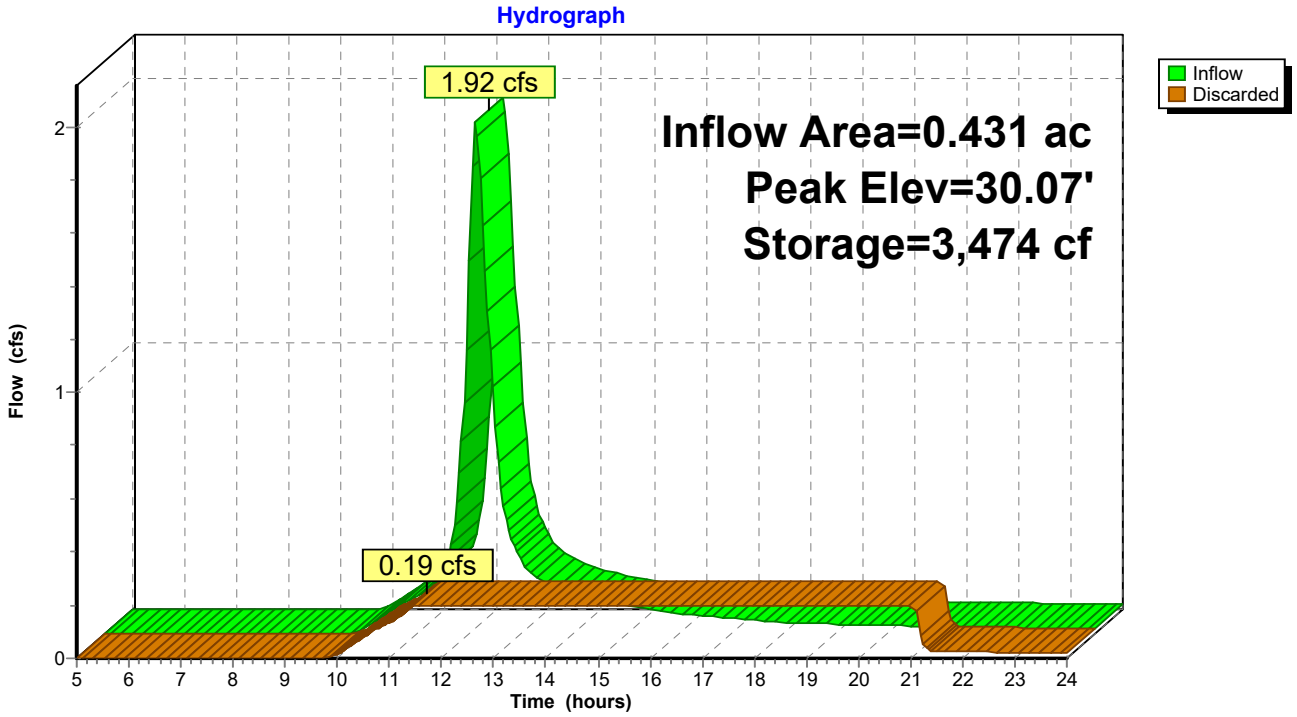
Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	3,748 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 10,500 cf Overall - 1,131 cf Embedded = 9,369 cf x 40.0% Voids
#2	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#3	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#4	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
		4,879 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	3,500	0	0
31.00	3,500	10,500	10,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 11.45 hrs HW=28.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Pond 3P: SUBSURFACE DETENTION



Time span=5.00-24.00 hrs, dt=0.05 hrs, 381 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: SUBCATCHMENT1 Runoff Area=26,883 sf 8.11% Impervious Runoff Depth>3.71"
Flow Length=490' Tc=34.4 min CN=60 Runoff=1.41 cfs 0.191 af

Subcatchment2S: SUBCATCHMENT2 Runoff Area=9,849 sf 37.64% Impervious Runoff Depth>5.52"
Tc=5.0 min CN=75 Runoff=1.46 cfs 0.104 af

Subcatchment3S: SUBCATCHEMNT3 Runoff Area=10,559 sf 56.44% Impervious Runoff Depth>6.36"
Tc=0.0 min CN=82 Runoff=2.02 cfs 0.129 af

Subcatchment4S: SUBCATCHMENT4 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>7.99"
Tc=5.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment5S: SUBCATCHMENT5 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>7.99"
Tc=5.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment6S: SUBCATCHMENT6 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>7.99"
Tc=5.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment7S: SUBCATCHMENT7 Runoff Area=2,050 sf 100.00% Impervious Runoff Depth>7.99"
Tc=5.0 min CN=98 Runoff=0.40 cfs 0.031 af

Subcatchment8S: SUBCATCHMENT 8 Runoff Area=4,442 sf 0.00% Impervious Runoff Depth>3.73"
Tc=10.0 min CN=60 Runoff=0.38 cfs 0.032 af

Reach SP1: SUMMATION POINT 1 Inflow=0.38 cfs 0.046 af
Outflow=0.38 cfs 0.046 af

Reach SP2: SUMMATION POINT 2 Inflow=1.46 cfs 0.104 af
Outflow=1.46 cfs 0.104 af

Pond 1P: RAIN GARDEN Peak Elev=31.38' Storage=2,042 cf Inflow=3.23 cfs 0.254 af
Discarded=0.02 cfs 0.015 af Primary=2.35 cfs 0.222 af Secondary=0.00 cfs 0.000 af Outflow=2.37 cfs 0.236 af

Pond 2P: INFILTRATIONTRENCH Peak Elev=31.00' Storage=3,665 cf Inflow=1.41 cfs 0.191 af
Discarded=0.13 cfs 0.136 af Primary=0.31 cfs 0.015 af Outflow=0.44 cfs 0.150 af

Pond 3P: SUBSURFACEDETENTION Peak Elev=30.85' Storage=4,672 cf Inflow=2.35 cfs 0.222 af
Outflow=0.19 cfs 0.221 af

Total Runoff Area = 1.376 ac Runoff Volume = 0.580 af Average Runoff Depth = 5.06"
66.55% Pervious = 0.916 ac 33.45% Impervious = 0.460 ac

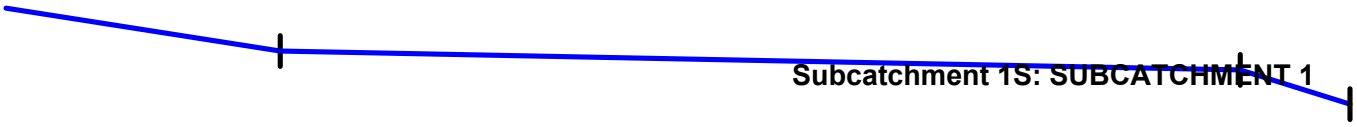
Summary for Subcatchment 1S: SUBCATCHMENT 1

Runoff = 1.41 cfs @ 12.50 hrs, Volume= 0.191 af, Depth> 3.71"
Routed to Pond 2P : INFILTRATION TRENCH

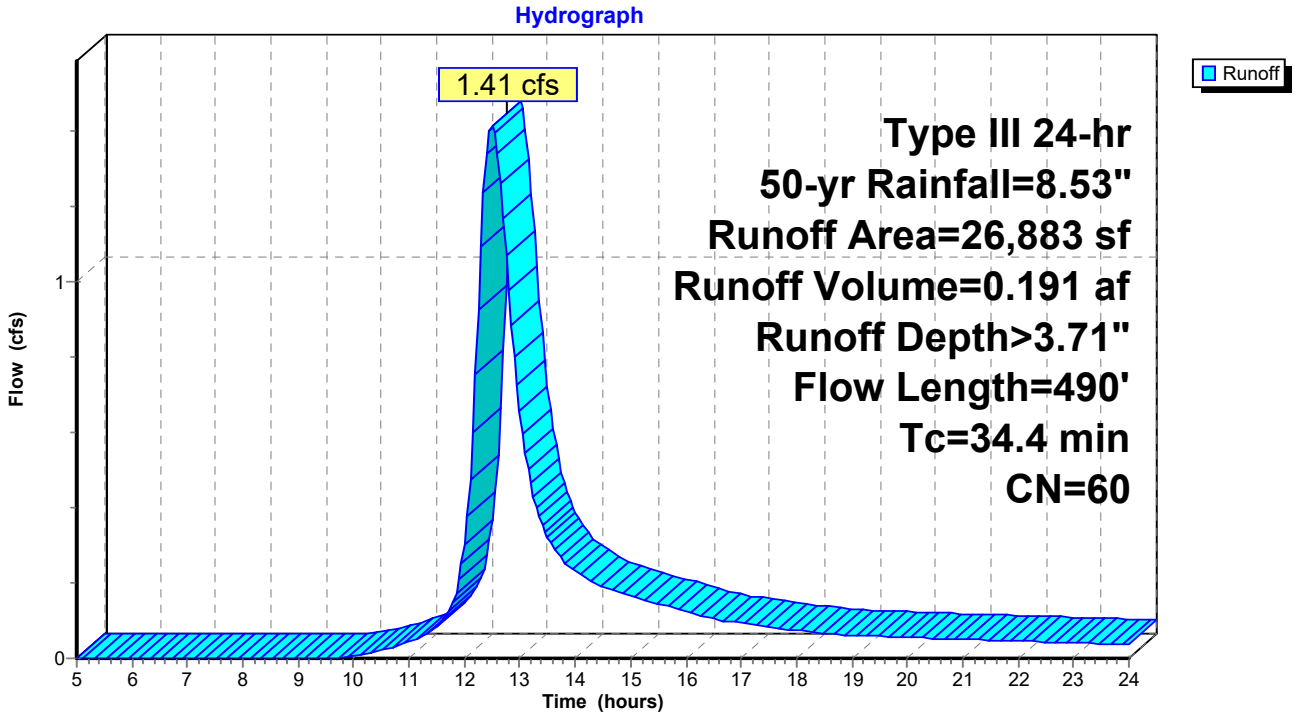
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
	16,143	55	Woods, Good, HSG B
	8,559	61	>75% Grass cover, Good, HSG B
*	2,181	98	IMPERVIOUS
	26,883	60	Weighted Average
	24,702		91.89% Pervious Area
	2,181		8.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.7	100	0.0400	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.70"
16.5	350	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	40	0.0800	4.24		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
34.4	490	Total			



Subcatchment 1S: SUBCATCHMENT 1



Summary for Subcatchment 2S: SUBCATCHMENT 2

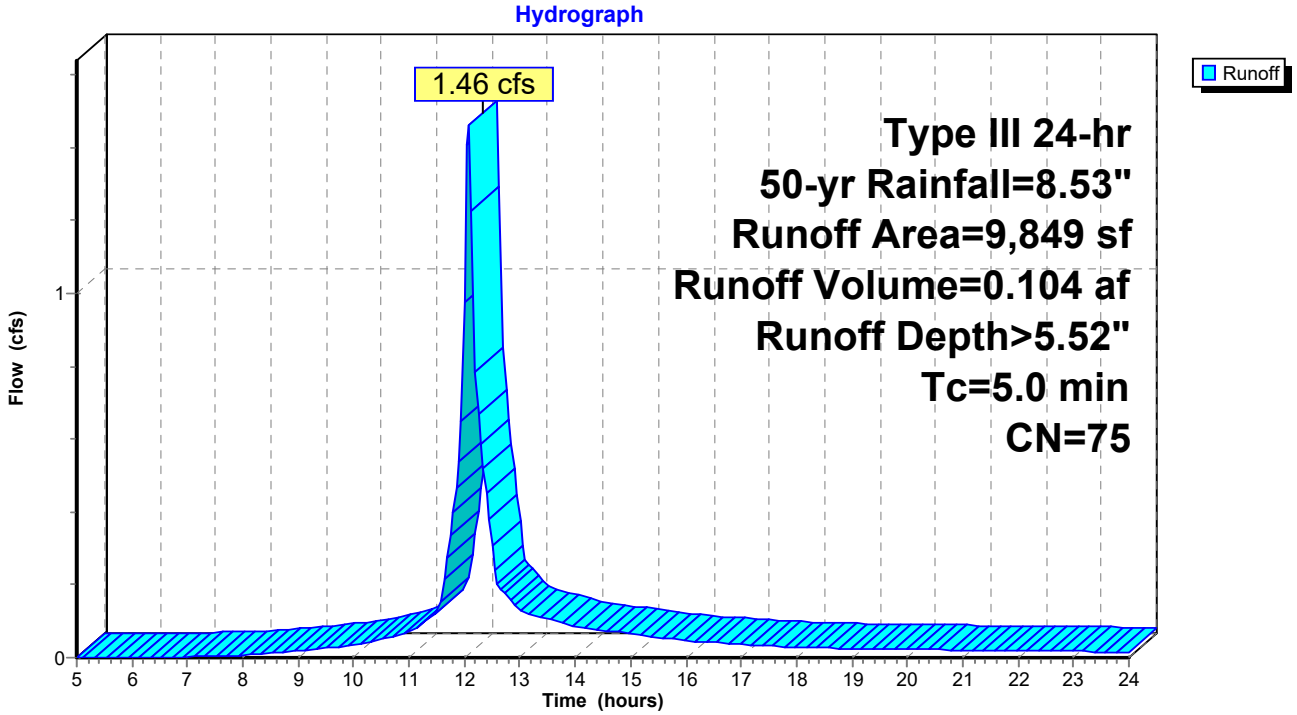
Runoff = 1.46 cfs @ 12.07 hrs, Volume= 0.104 af, Depth> 5.52"
Routed to Reach SP2 : SUMMATION POINT 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
	6,142	61	>75% Grass cover, Good, HSG B
*	3,707	98	IMPERVIOUS
	9,849	75	Weighted Average
	6,142		62.36% Pervious Area
	3,707		37.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 2S: SUBCATCHMENT 2



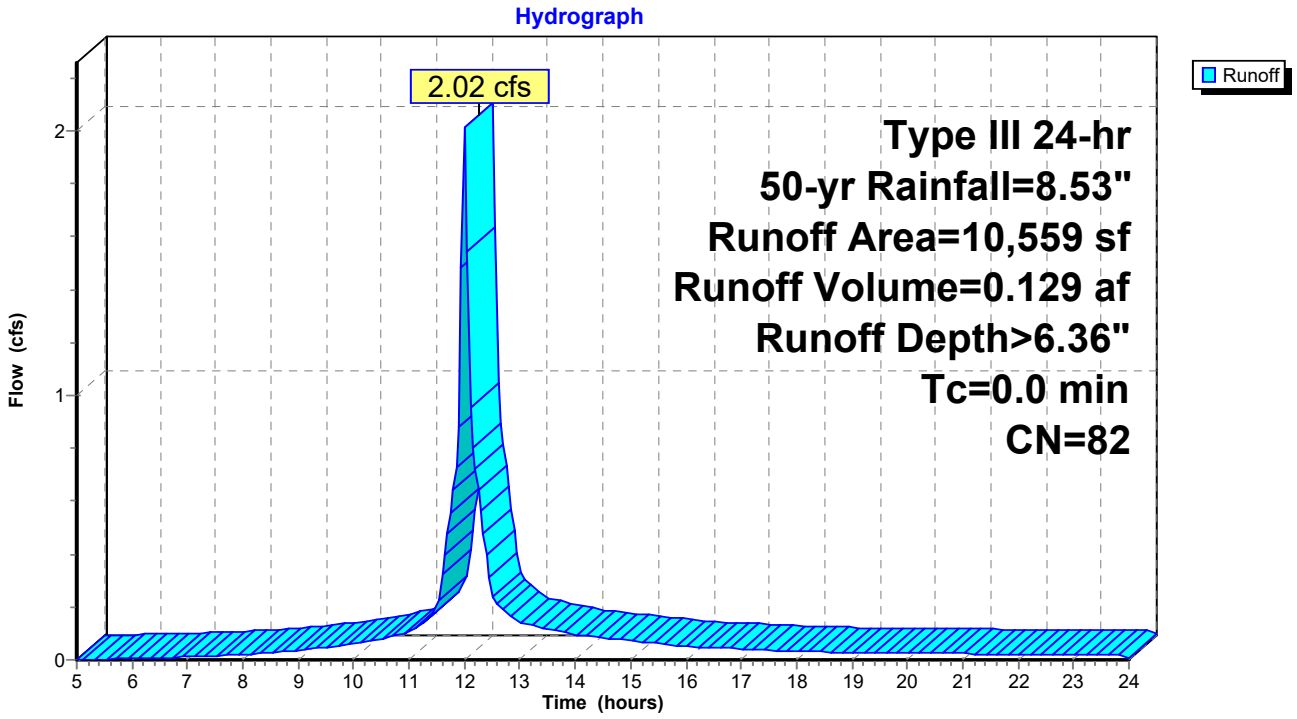
Summary for Subcatchment 3S: SUBCATCHEMNT 3

Runoff = 2.02 cfs @ 12.00 hrs, Volume= 0.129 af, Depth> 6.36"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
	18	55	Woods, Good, HSG B
	4,582	61	>75% Grass cover, Good, HSG B
*	5,959	98	IMPERVIOUS
	10,559	82	Weighted Average
	4,600		43.56% Pervious Area
	5,959		56.44% Impervious Area

Subcatchment 3S: SUBCATCHEMNT 3



Summary for Subcatchment 4S: SUBCATCHMENT 4

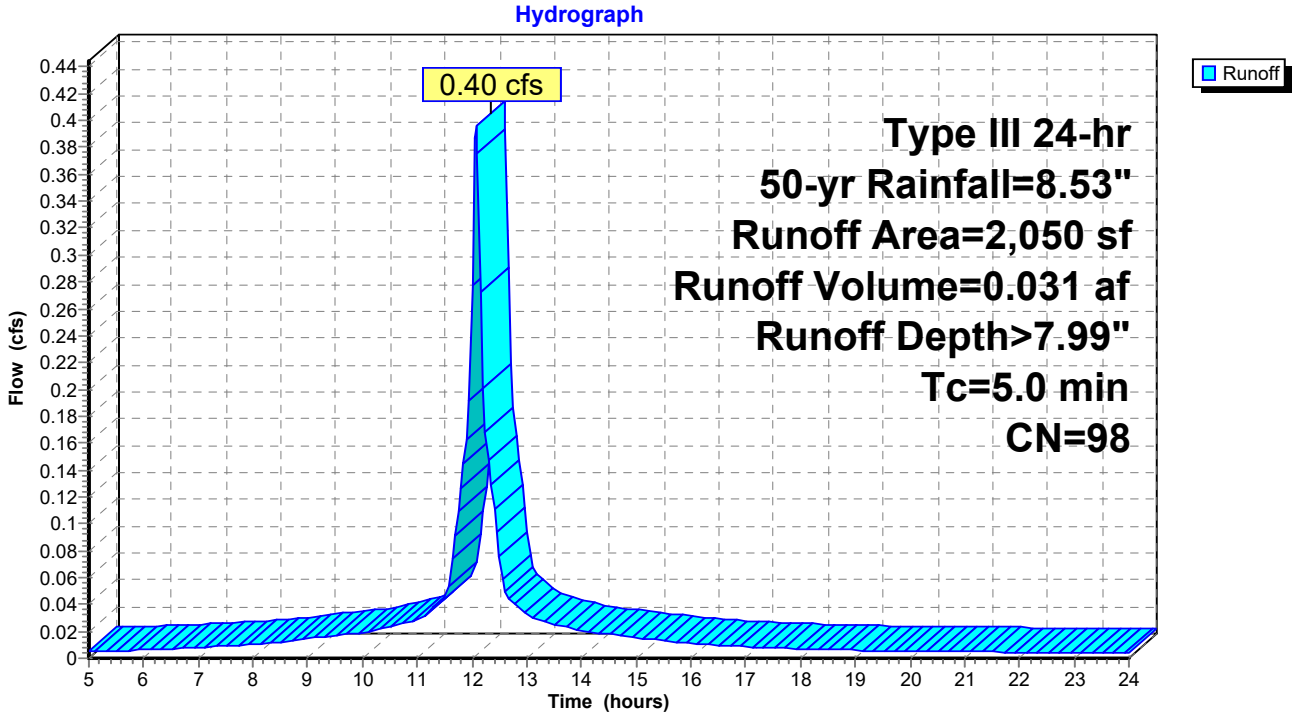
Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth> 7.99"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 4S: SUBCATCHMENT 4



Summary for Subcatchment 5S: SUBCATCHMENT 5

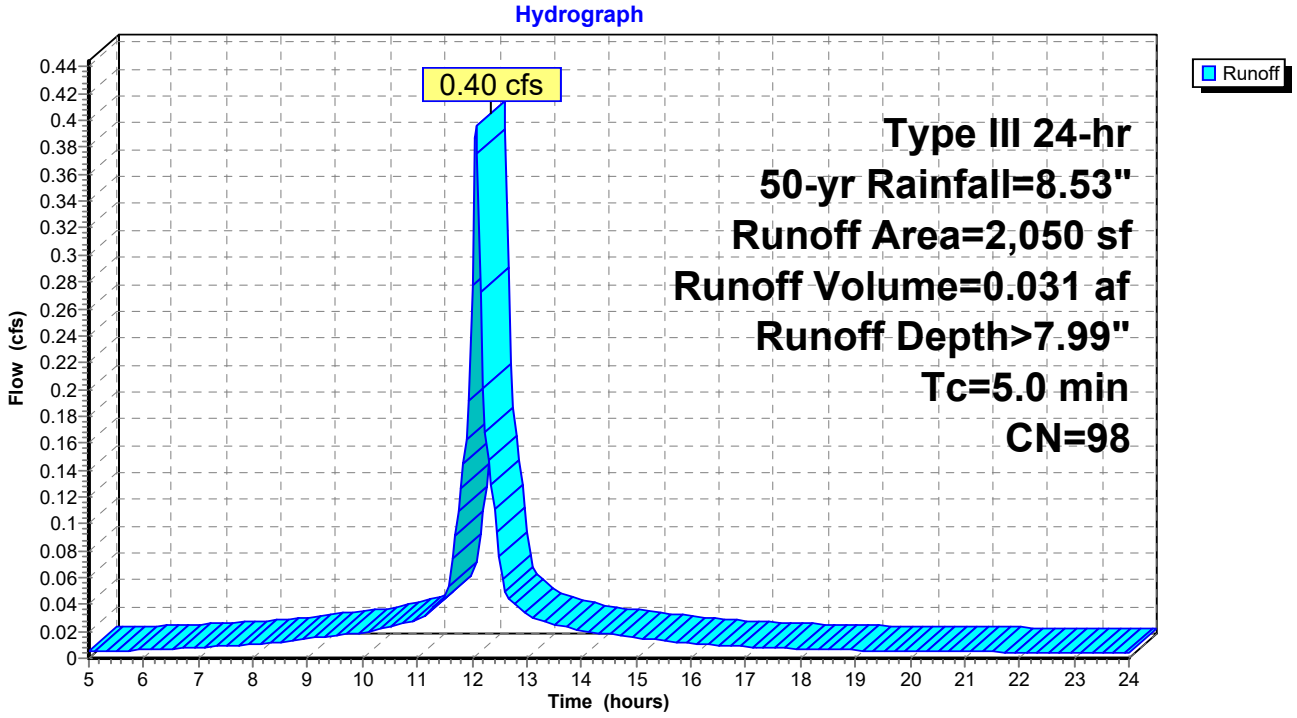
Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth> 7.99"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 5S: SUBCATCHMENT 5



Summary for Subcatchment 6S: SUBCATCHMENT 6

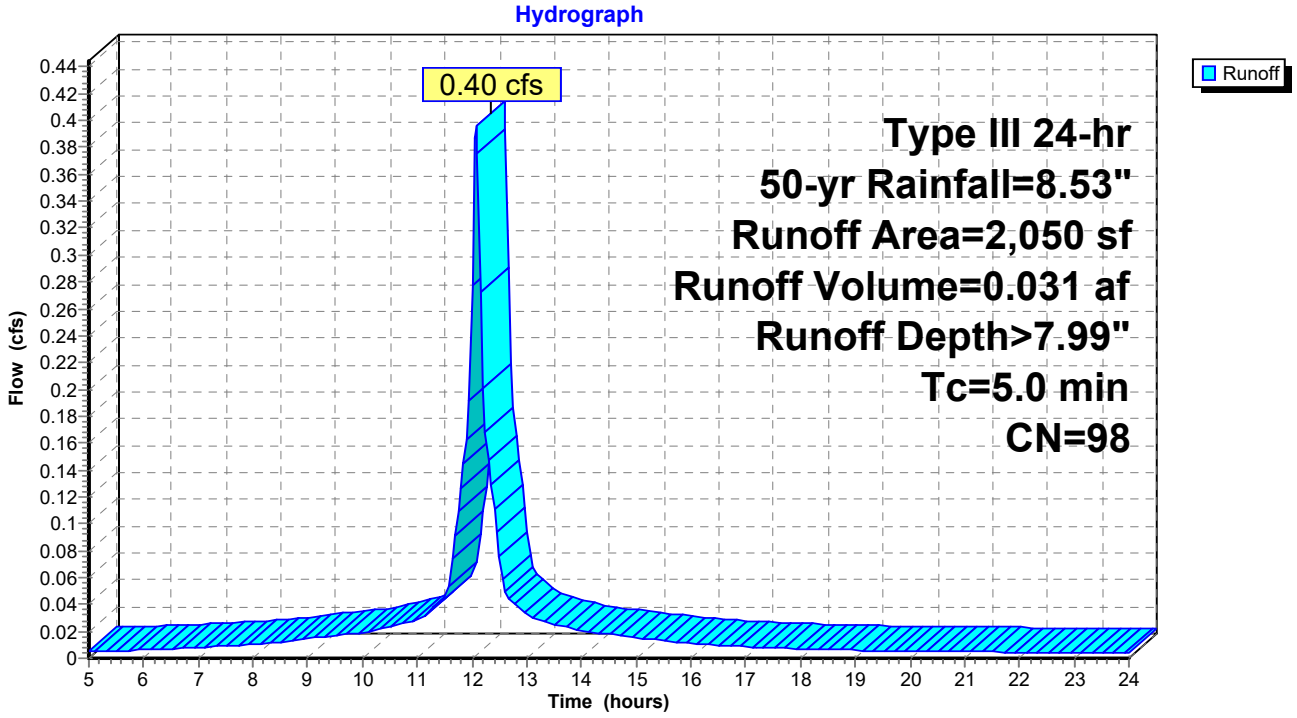
Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth> 7.99"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: SUBCATCHMENT 6



Summary for Subcatchment 7S: SUBCATCHMENT 7

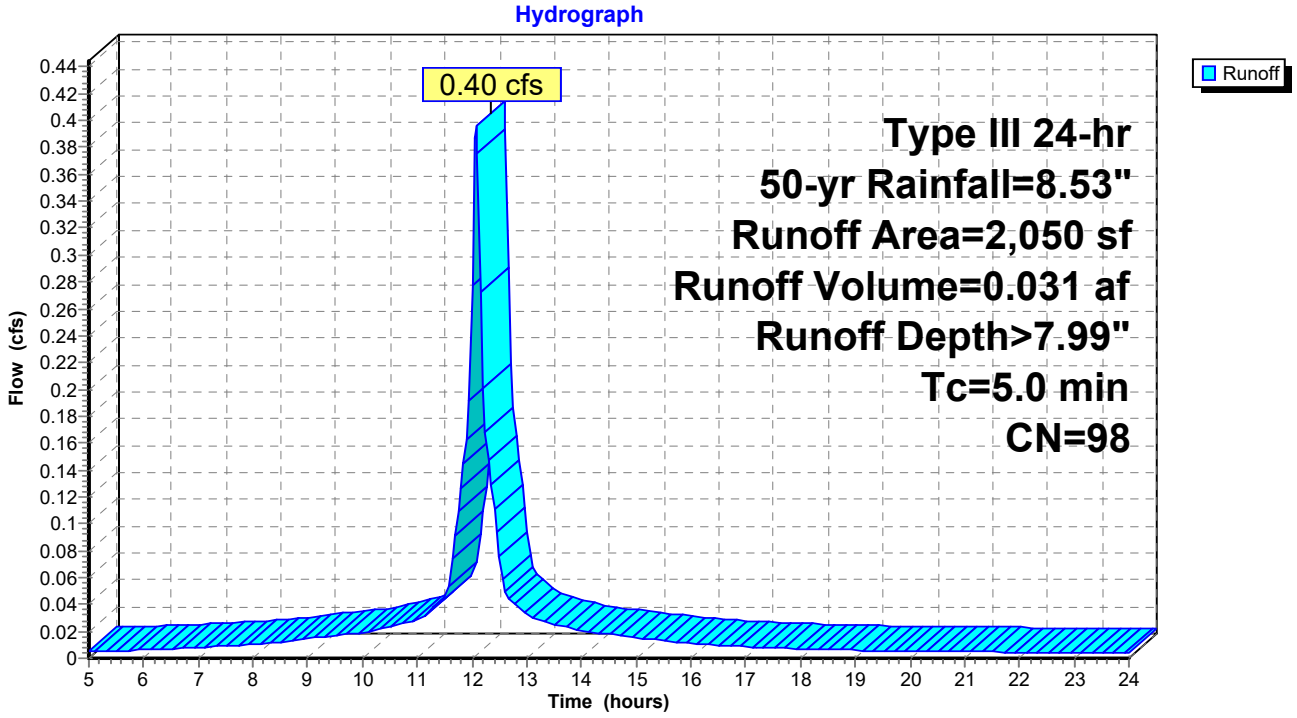
Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.031 af, Depth> 7.99"
Routed to Pond 1P : RAIN GARDEN

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

	Area (sf)	CN	Description
*	2,050	98	IMPERVIOUS
	2,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 7S: SUBCATCHMENT 7



Summary for Subcatchment 8S: SUBCATCHMENT 8

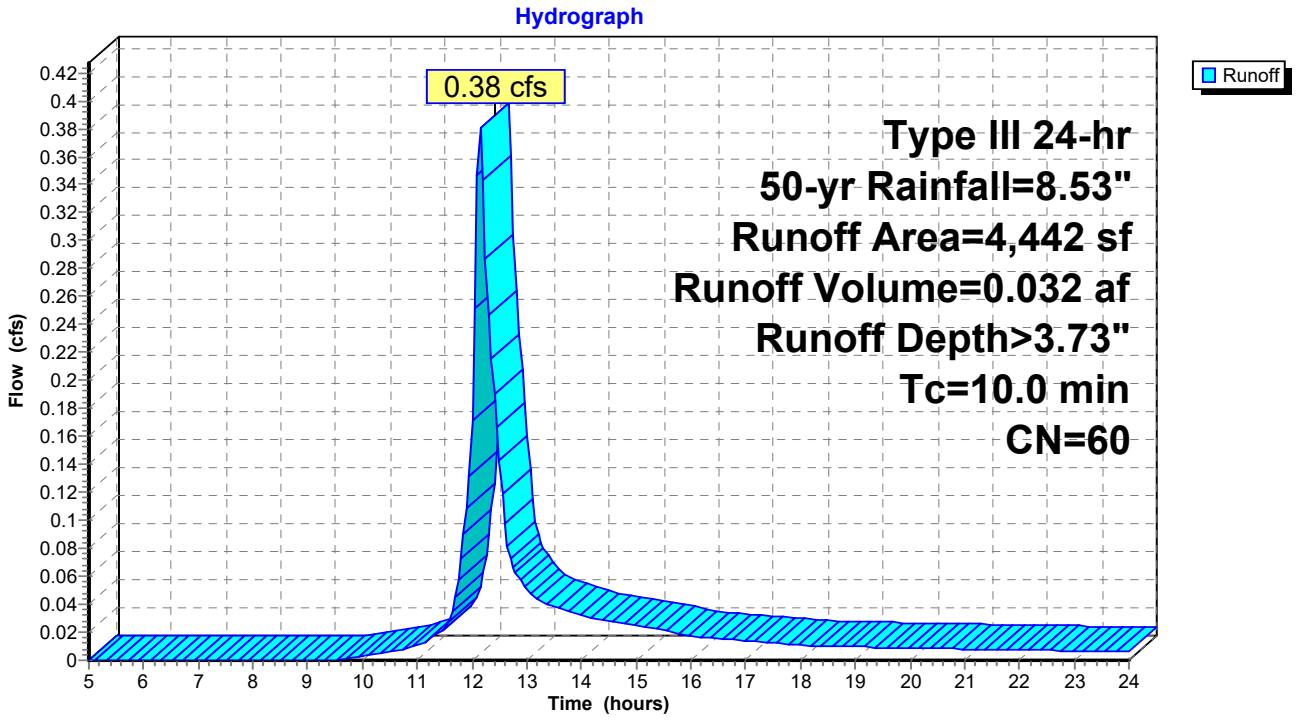
Runoff = 0.38 cfs @ 12.15 hrs, Volume= 0.032 af, Depth> 3.73"
Routed to Reach SP1 : SUMMATION POINT 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr Rainfall=8.53"

Area (sf)	CN	Description
679	55	Woods, Good, HSG B
3,763	61	>75% Grass cover, Good, HSG B
4,442	60	Weighted Average
4,442		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment 8S: SUBCATCHMENT 8

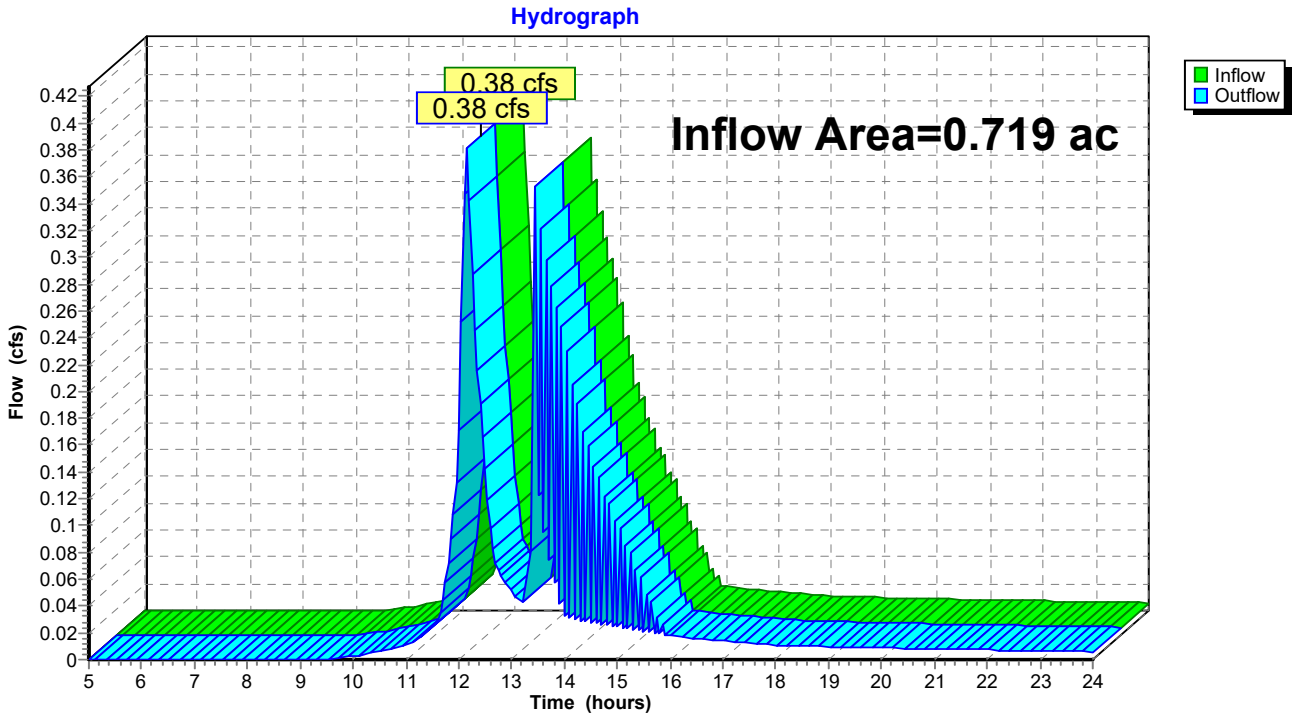


Summary for Reach SP1: SUMMATION POINT 1

Inflow Area = 0.719 ac, 6.96% Impervious, Inflow Depth > 0.77" for 50-yr event
Inflow = 0.38 cfs @ 12.15 hrs, Volume= 0.046 af
Outflow = 0.38 cfs @ 12.15 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP1: SUMMATION POINT 1

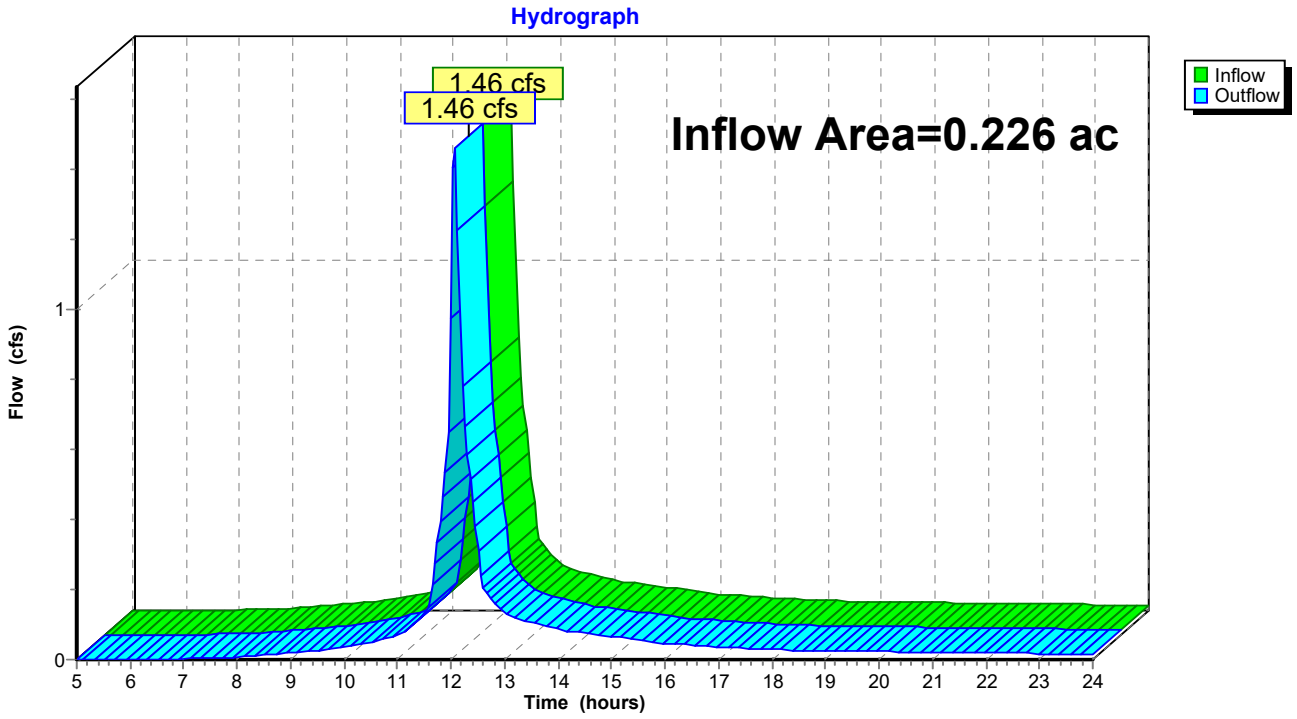


Summary for Reach SP2: SUMMATION POINT 2

Inflow Area = 0.226 ac, 37.64% Impervious, Inflow Depth > 5.52" for 50-yr event
Inflow = 1.46 cfs @ 12.07 hrs, Volume= 0.104 af
Outflow = 1.46 cfs @ 12.07 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs

Reach SP2: SUMMATION POINT 2



Summary for Pond 1P: RAIN GARDEN

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 7.08" for 50-yr event
Inflow = 3.23 cfs @ 12.02 hrs, Volume= 0.254 af
Outflow = 2.37 cfs @ 12.11 hrs, Volume= 0.236 af, Atten= 26%, Lag= 5.4 min
Discarded = 0.02 cfs @ 12.11 hrs, Volume= 0.015 af
Primary = 2.35 cfs @ 12.11 hrs, Volume= 0.222 af
Routed to Pond 3P : SUBSURFACE DETENTION
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 31.38' @ 12.11 hrs Surf.Area= 1,592 sf Storage= 2,042 cf

Plug-Flow detention time= 71.7 min calculated for 0.236 af (93% of inflow)
Center-of-Mass det. time= 35.1 min (809.9 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	30.00'	5,850 cf	**Custom Stage Data (Prismatic)** Listed below

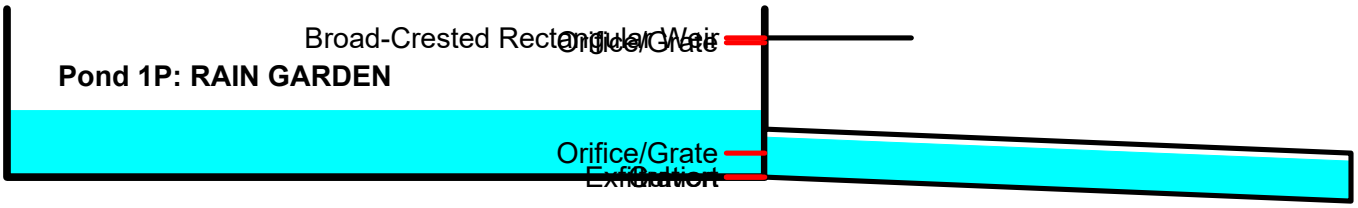
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.00	1,200	0	0
31.00	1,500	1,350	1,350
33.50	2,100	4,500	5,850

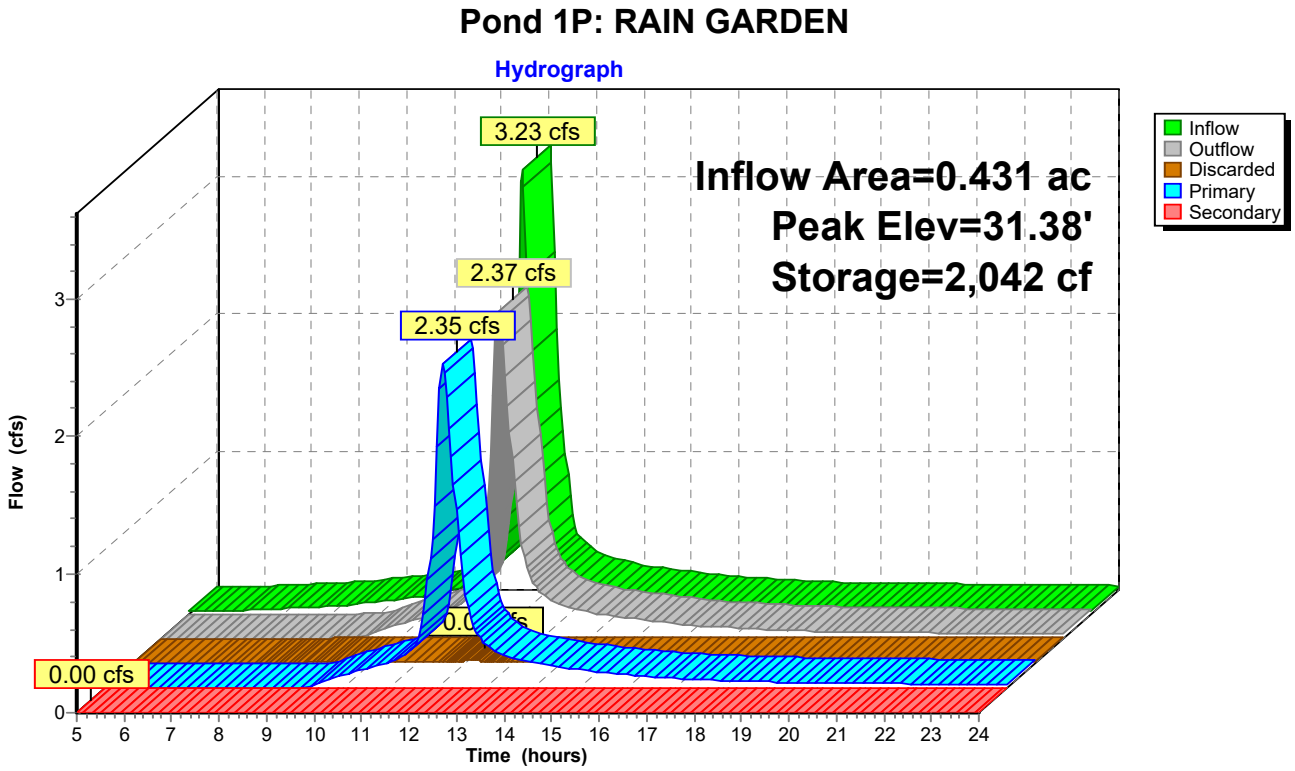
Device	Routing	Invert	Outlet Devices
#1	Discarded	30.00'	**2.400 in/hr Exfiltration over Surface area above 30.00'** Excluded Surface area = 1,200 sf
#2	Primary	30.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 30.00' / 29.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Device 2	30.50'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	32.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	32.90'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.02 cfs @ 12.11 hrs HW=31.38' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.33 cfs @ 12.11 hrs HW=31.38' (Free Discharge)
└**2=Culvert** (Passes 2.33 cfs of 2.80 cfs potential flow)
└**3=Orifice/Grate** (Orifice Controls 2.33 cfs @ 3.19 fps)
└**4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=30.00' (Free Discharge)
└**5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)





Summary for Pond 2P: INFILTRATION TRENCH

Inflow Area = 0.617 ac, 8.11% Impervious, Inflow Depth > 3.71" for 50-yr event
Inflow = 1.41 cfs @ 12.50 hrs, Volume= 0.191 af
Outflow = 0.44 cfs @ 13.45 hrs, Volume= 0.150 af, Atten= 69%, Lag= 57.0 min
Discarded = 0.13 cfs @ 11.80 hrs, Volume= 0.136 af
Primary = 0.31 cfs @ 13.45 hrs, Volume= 0.015 af
Routed to Reach SP1 : SUMMATION POINT 1

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 31.00' @ 13.45 hrs Surf.Area= 2,300 sf Storage= 3,665 cf

Plug-Flow detention time= 249.6 min calculated for 0.150 af (79% of inflow)
Center-of-Mass det. time= 170.8 min (1,035.2 - 864.4)

Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	2,157 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 6,900 cf Overall - 1,508 cf Embedded = 5,392 cf x 40.0% Voids
#2	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
#3	28.50'	754 cf	**24.0" Round Pipe Storage** Inside #1 L= 240.0'
		3,665 cf	Total Available Storage

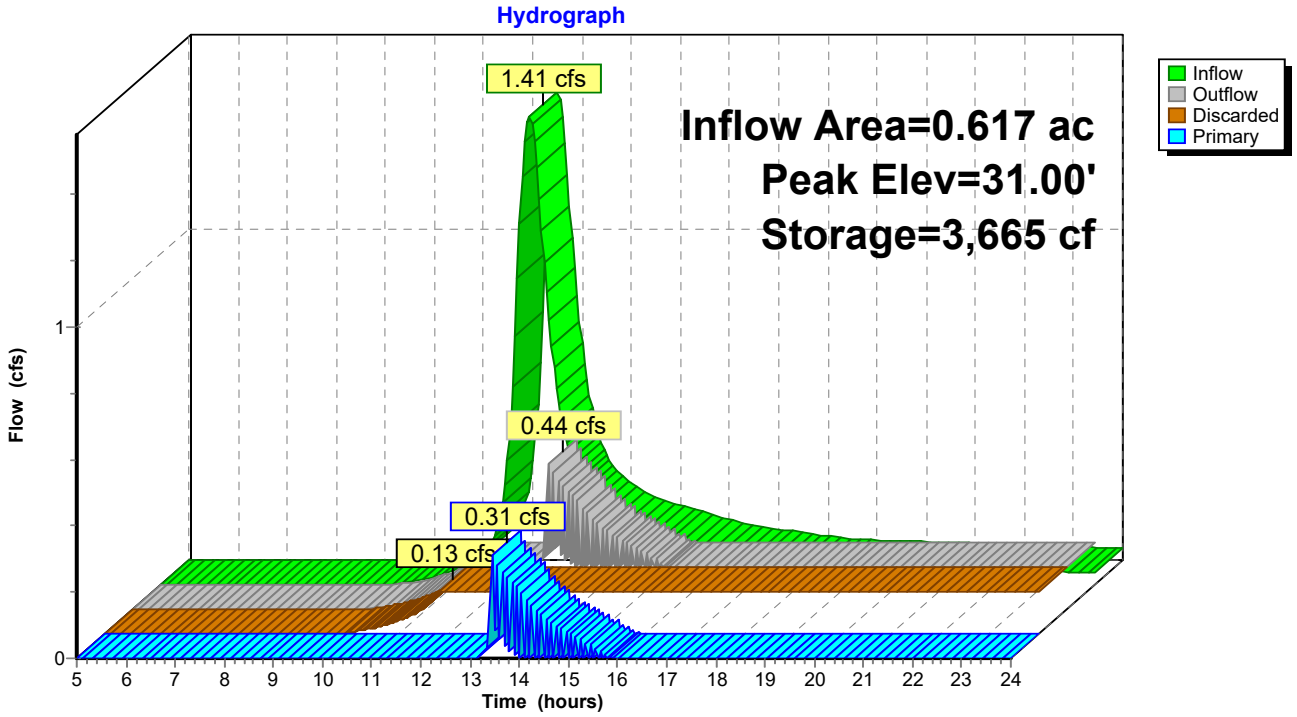
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	2,300	0	0
31.00	2,300	6,900	6,900

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**
#2	Primary	31.00'	**320.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.13 cfs @ 11.80 hrs HW=28.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=0.09 cfs @ 13.45 hrs HW=31.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.09 cfs @ 0.11 fps)

Pond 2P: INFILTRATION TRENCH



Summary for Pond 3P: SUBSURFACE DETENTION

Inflow Area = 0.431 ac, 75.48% Impervious, Inflow Depth > 6.17" for 50-yr event
Inflow = 2.35 cfs @ 12.11 hrs, Volume= 0.222 af
Outflow = 0.19 cfs @ 11.15 hrs, Volume= 0.221 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.19 cfs @ 11.15 hrs, Volume= 0.221 af

Routing by Stor-Ind method, Time Span= 5.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 30.85' @ 13.88 hrs Surf.Area= 3,500 sf Storage= 4,672 cf

Plug-Flow detention time= 219.9 min calculated for 0.221 af (100% of inflow)
Center-of-Mass det. time= 219.5 min (1,021.2 - 801.7)

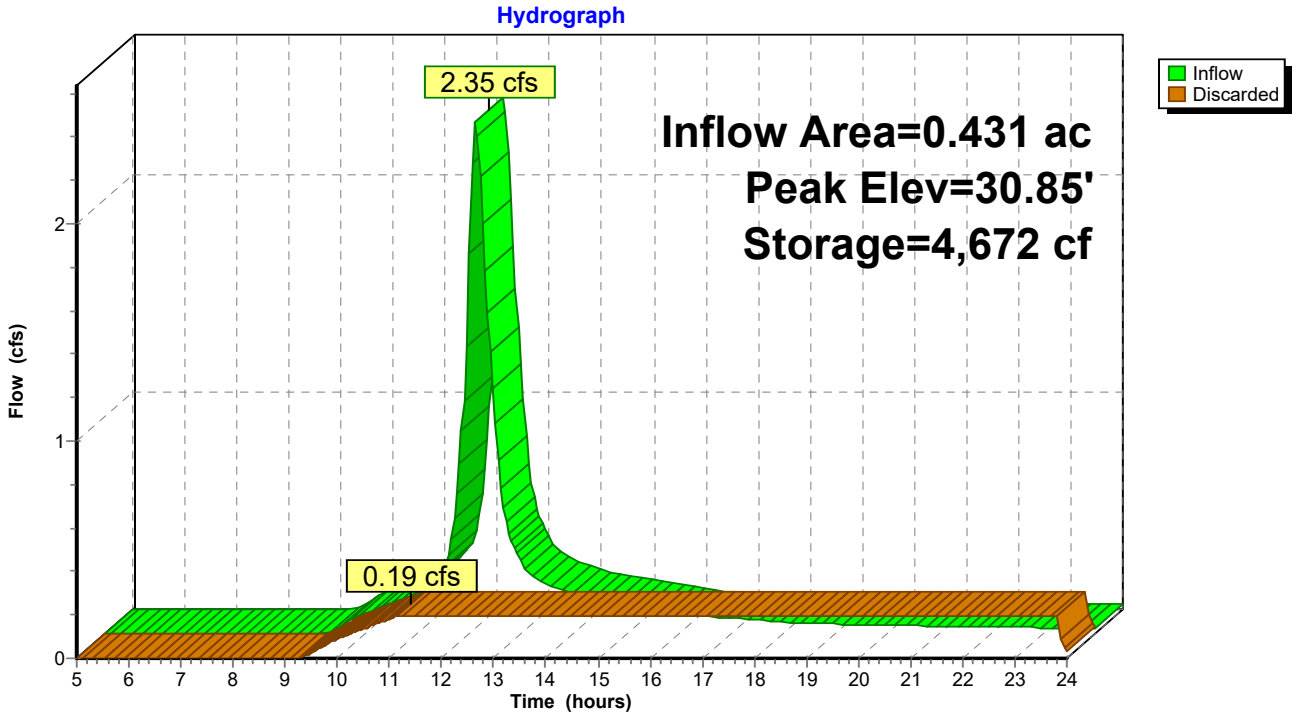
Volume	Invert	Avail.Storage	Storage Description
#1	28.00'	3,748 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 10,500 cf Overall - 1,131 cf Embedded = 9,369 cf x 40.0% Voids
#2	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#3	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
#4	28.50'	377 cf	**24.0" Round Pipe Storage** Inside #1 L= 120.0'
		4,879 cf	Total Available Storage

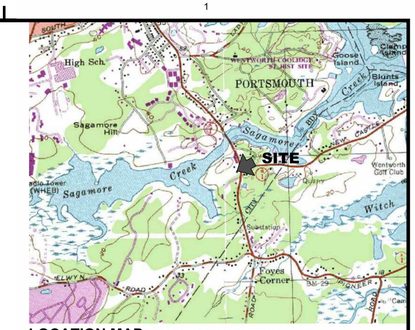
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
28.00	3,500	0	0
31.00	3,500	10,500	10,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	28.00'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.19 cfs @ 11.15 hrs HW=28.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Pond 3P: SUBSURFACE DETENTION





LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
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PRE LEGEND:

	PROPERTY LINE
	WATERSHED BOUNDARY LINE
1	WATERSHED DESIGNATION
	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
PF	PIPE FLOW

GRAPHIC SCALE

30 0 15 30 60 90

(IN FEET)
1 inch = 30 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

PRE-DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE
DREW JOHN OLEHOWSKI
No. 18515
LICENSED
PROFESSIONAL ENGINEER
01/16/2026

DATE	SCALE
2025.12.22	1"=30'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C701** REV. **1**

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LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
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POST LEGEND:

	PROPERTY LINE
	WATERSHED BOUNDARY LINE
1	WATERSHED DESIGNATION
	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
PF	PIPE FLOW

GRAPHIC SCALE
40 0 20 40 80 120
(IN FEET)
1 inch = 40 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS
ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT
1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE
POST DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE · DREW JOHN OLEHOWSKI · No. 18515 · LICENSED PROFESSIONAL ENGINEER · 01.16.2026

DATE	SCALE
2025.12.22	1"=30'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C702** REV. **1**

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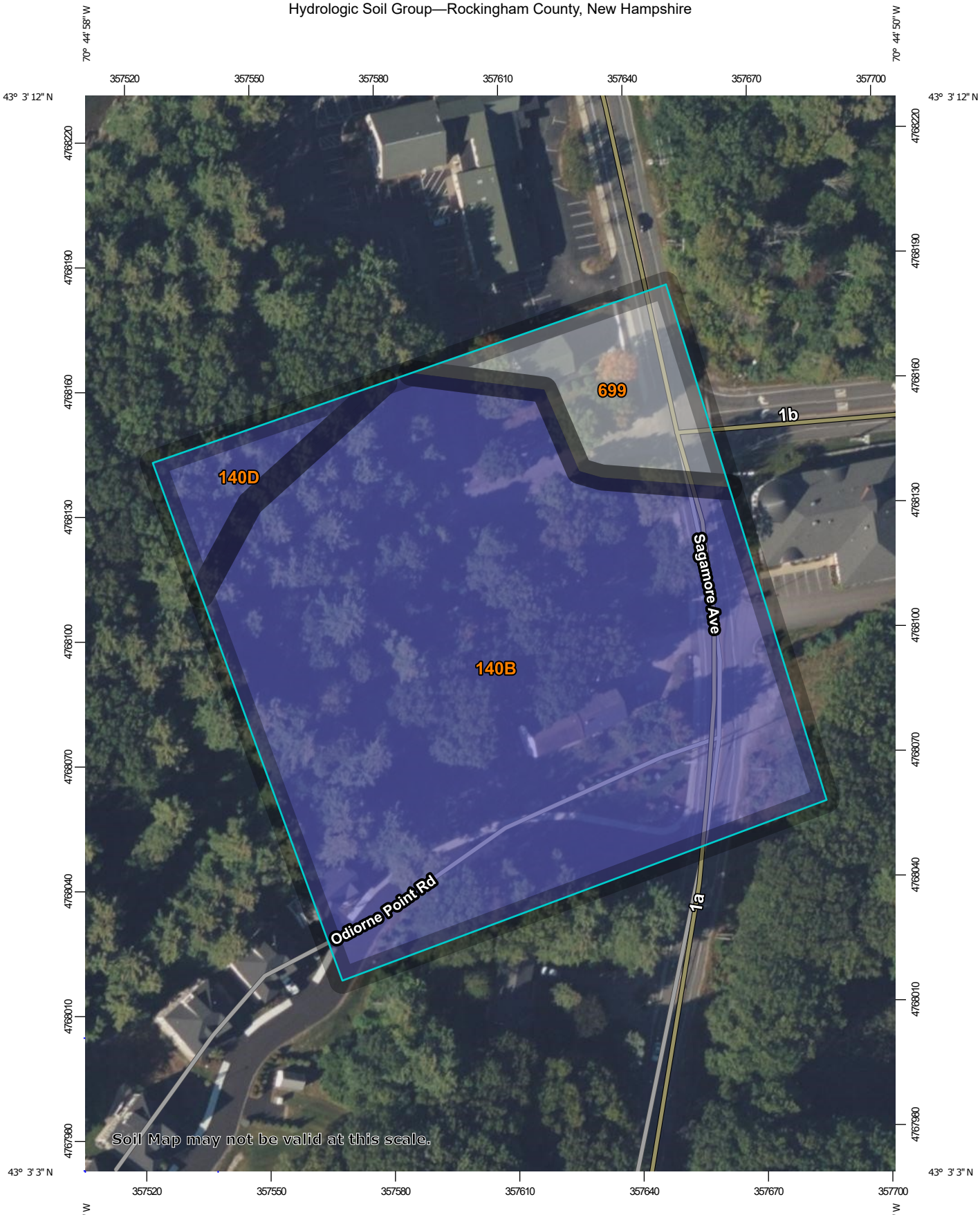


Map Scale: 1:1,260 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 28, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	3.5	84.8%
140D	Chatfield-Hollis-Canton complex, 15 to 35 percent slopes, rocky	B	0.2	4.9%
699	Urban land		0.4	10.3%
Totals for Area of Interest			**4.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

From the test pit observations taken 7/16/2025 and the Test Pit log created from this reading it is determined that the Soil Permeability Class for the Receiving Layer (0-16") to be Moderate to Moderately Rapid. This permeability Class equates to a permeability rate of 6 cm/hr. This is converted to 26 MPI.

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE & US FOREST SERVICE

NRCS-Soils-232-2A
JWH / 04-22

SOIL DESCRIPTION

Soil type:		Map Unit Symbol:	File No:
Area:	Date:	Described by:	
Location			Photo Number:
Native Veg.			Climate:
Parent material			
Relief		% Slope	Aspect:
Elevation	Drainage	Gr. water	
Additional notes:			

Soil Profile / Landscape Sketch

Hori-zon	Depth Inches	Color Moist	Color Redox Features	% Redox	Texture	Structure	Consistence Moist	Boun-dary	Roots	% Frags
B	0-16"	10yr 4/4	N/A		Silty Loam	Friable	Loose		Yes	
	16"-18"	10yr 4/6	N/A		Sandy Loam	Friable	Firming		No	
	18"-41"	10yr 4/6	18 = ESHWT		Sandy Loam	Angular Blocky	Firm		↓	
Ledge	41"	Restrictive Ledge	10yr 5/6 2.5-4 6/2			Platy				

TABLE 17A

Visual indicators of permeability: structural characteristics of soil

Permeability class (Table 15)	*Structure, type and class (Sec. 73) (1)*	*Structure, grade and consistency (Secs 72 + 80) (2)*	*Relationship of horizontal and vertical axes, overlap, cleavage, and its direction (3)*	*Porosity channels and cracks (4)*
Very slow permeability	Massive	Very strong		Without visible pores.
	Irregular blocky; often assuming a columnar structure	Clods are very strong and cannot be broken by hand. More force is required to break the blocks vertically than horizontally. Horizontal breakage is usually along the block faces and in some instances the small irregular angular blocks can be flaked off horizontally.	Where the irregular blocky structure dominates, the irregular fragments are very firmly developed with a longer horizontal than vertical axis and with sharp angles. These are meshed shingle-fashion with about 50 percent horizontal overlap. Under proper moisture conditions, the medium to coarse irregular angular blocks break along definite cleavage to fine irregular, angular blocky structure, the arrangement remaining the same regardless of size.	The individual blocks have no visible pores, but some tortuous vertical channels that seem to follow block faces are discernible, usually at 2- to 5-cm intervals which seldom extend more than 5-8 cm without a horizontal jog.
	Structureless	It is usually difficult to break into the mass, but once broken in, the small indurated lumps pulverize easily.		
Slow permeability	Fine to medium irregular blocky	More force is required to break the blocks along the vertical than the horizontal axis. The broken faces tend to assume a saw-toothed appearance.	The irregular angular blocks have sharp angles and the horizontal axes are longer than the vertical. The blocks are generally meshed shingle-fashion with about 40 percent horizontal overlap.	There are very few small pores discernible. The apparent vertical cracks which follow the block surfaces seldom extend more than a few cm before jogs of 2-5 cm appear.
	Usually platy, sometimes structureless	Plates broken horizontally fracture along straight smooth lines, the laminated layers seeming to be made of small flattish "chips" that can be easily removed by tweezers.	Horizontal bedding can be easily detected in "chip" form, generally lying in shingle-fashion with horizontal overlap of 40-50 percent or more. Sometimes the thin, laminated layers are continuous.	Only a few very fine vertical pores are visible. Flow of water follows apparently tortuous lines around the main chips.
Moderately slow permeability	Medium to fine irregular blocky, fragmental	The blocks (clods) and fragments are less firm and stable than those of the slower permeability classes. They can be more easily broken along the vertical axes.	The angle of the blocks and fragments is not sharp and often very slightly rounded. The horizontal axis is only slightly longer than the vertical. The structural fragments overlap 20-25 percent. If the overlap is oblique, the size of fragments may be larger and the overlap more than 25 percent.	Pores are fine but moderately numerous. The oblique overlap is indicative of freer air and water movement. Root penetration is noticeable.
Moderate permeability	Fine to medium subangular blocky (nut-like), partially rounded, some obtuse angles	Cohesion of soil materials is moderate and clods are easily broken by hand, but seldom fractured unless broken individually.	The clods or blocks overlap only slightly and many vertical fractures are almost straight. Cleavage generally occurs along the faces of the nuciform aggregates.	Pores are medium to fine and numerous.
Moderately rapid permeability	Medium subangular blocky (nuciform) coarse granular or crumb structure	The structural aggregates are not firmly developed and the cohesion of soil material is moderately weak.	Vertical cleavage is nearly always along aggregate faces and follows approximately straight vertical or oblique lines, with only occasional slight overlap of structural aggregates.	Pores in the aggregate are large and numerous.
Rapid permeability	Crumb structure (sometimes ranging toward a single-grain condition)	Consistency ranges from slightly plastic when wet to friable or crumbly when dry.		Pore space is large.
Very rapid permeability	Single-grain structure	Consistency ranges from non-plastic when wet to incoherent when moist or dry.		

TABLE 17 B
Visual Indicators of permeability: texture, physical behaviour and colour of soil

Permeability class (Table 15)	*Texture and profile*	*Physical behaviour*	*Colour and mottling*
Very slow permeability	Claypans, heavy clay, or in presence of very slowly permeable substratum	Soil cracks severely on drying with exception of hardpan or indurated layers which do not crack or fracture.	Generally mottled.
	Hardpan as distinguished from claypan	The hardpan layers associated with this class often consist of highly indurated layers of sand or sand and gravel. These usually give out a ringing sound when struck with a spade.	High degree of mottling.
Slow permeability	Clay or silty clay, claypans, moderately indurated layers	Shrinkage and cracking are less pronounced than in the very slowly permeable class.	Mottling is moderately strong.
	Silt, "siltpan"		Moderately strong mottling and greyish colour are indications of this type of structure.
Moderately slow permeability	Moderately fine-textured horizons, showing a small amount of granulation or a slight dispersion of particles	Shrinkage is usually not very pronounced and cracks are neither large nor numerous.	Mottling is moderate, but the colour is brighter than for the slow permeability class.
Moderate permeability	Moderately fine textures, slightly plastic when wet and moderately hard when dry		Mottling is generally slight.
Moderately rapid permeability	Moderately fine to medium-textured soils		Occasional mottling. Colour is generally moderately bright yellow.
Rapid permeability	Medium or moderately coarse-textured soils		There are no mottlings unless water-table is high. Colour is generally very bright. Organic matter content is usually moderate or low.
Very rapid permeability	Coarse-textured or gravelly soils		Colour is bright unless the water-table is high.

TABLE 15
Soil permeability classes for agriculture and conservation

Soil permeability classes	Permeability rates[1]	
	cm/hour	cm/day
Very slow	Less than 0.13	Less than 3
Slow	0.13 - 0.3	3 - 12
Moderately slow	0.5 - 2.0	12 - 48
Moderate	2.0 - 6.3	48 - 151
Moderately rapid	6.3 - 12.7	151 - 305
Rapid	12.7 - 25	305 - 600
Very rapid	More than 25	More than 600

Conversion Table: cm/h to min/inch

	cm/hr	min/inch		cm/hr	min/inch
60 MPI Slowest	1	152.40		41	3.72
Allowable Design	2	76.20		42	3.63
	3	50.80		43	3.54
	4	38.10		44	3.46
	5	30.48		45	3.39
	6	25.40		46	3.31
	7	21.77		47	3.24
	8	19.05		48	3.18
	9	16.93		49	3.11
	10	15.24		50	3.05
	11	13.85		51	2.99
	12	12.70		52	2.93
	13	11.72		53	2.88
	14	10.89		54	2.82
	15	10.16		55	2.77
	16	9.53		56	2.72
	17	8.96		57	2.67
	18	8.47		58	2.63
	19	8.02		59	2.58
	20	7.62		60	2.54
	21	7.26		61	2.50
	22	6.93		62	2.46
	23	6.63		63	2.42
	24	6.35		64	2.38
	25	6.10		65	2.34

National Flood Hazard Layer FIRMette

FEMA

70°45'12"W 43°3'21"N

70°44'35"W 43°2'54"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/27/2023 at 1:41 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

INSPECTION & LONG-TERM MAINTENANCE PLAN FOR PROPOSED RESIDENTIAL DEVELOPMENT

1151 SAGAMORE AVENUE
PORTSMOUTH, NH

Introduction

The intent of this plan is to provide 1151 Sagamore Avenue CBC, LLC (herein referred to as "owner") with a list of procedures that document the inspection and maintenance requirements of the stormwater management system for this development. Specifically, the Rain Garden and associated structures on the project site (collectively referred to as the "Stormwater Management System"). The contact information for the owner shall be kept current, and if there is a change of ownership of the property this plan must be transferred to the new owner.

The following inspection and maintenance program is necessary to keep the stormwater management system functioning properly and will help in maintaining a high quality of stormwater runoff to minimize potential environmental impacts. By following the enclosed procedures, the owner will be able to maintain the functional design of the stormwater management system and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Annual Report

The owner shall prepare an annual Inspection & Maintenance Report. The report shall include a summary of the system's maintenance and repair by transmission of the Inspection & Maintenance Log and other information as required. A copy of the report shall be delivered annually to the City of Portsmouth Public Works Department, as required.

Inspection & Maintenance Checklist/Log

The following pages contain the Stormwater Management System Inspection & Maintenance Requirements and a blank copy of the Stormwater Management System Inspection & Maintenance Log. These forms are provided to the owner as a guideline for performing the inspection and maintenance of the Stormwater Management System. This is a guideline and should be periodically reviewed for conformance with current practice and standards.

200 GRIFFIN RD. UNIT 14, PORTSMOUTH, NH 03802 603.430.9282 | HALEYWARD.COM

Stormwater Management System Components

The Stormwater Management System is designed to mitigate both the quantity and quality of site- generated stormwater runoff. As a result, the design includes the following elements:

Non-Structural BMPs

Non-Structural best management practices (BMP's) include temporary and permanent measures that typically require less labor and capital inputs and are intended to provide protection against erosion of soils. Examples of non-structural BMP's on this project include but are not limited to:

- Temporary and Permanent mulching
- Temporary and Permanent grass cover
- Trees
- Shrubs and ground covers
- Miscellaneous landscape plantings
- Dust control
- Tree protection
- Topsoiling
- Sediment barriers
- Stabilized construction entrance
- Vegetated buffer area

Structural BMPs

Structural BMPs are more labor and capital-intensive structures or installations that require more specialized personnel to install. Examples on this project include but are not limited to:

- Rain Garden
- Outlet Control Structures and Storm Drains

Inspection and Maintenance Requirements

The following summarizes the inspection and maintenance requirements for the various BMPs that may be found on this project.

1. **Grassed areas (until established):** After each rain event of 0.5" or more during a 24-hour period, inspect grassed areas for signs of disturbance, such as erosion. If damaged areas are discovered, immediately repair the damage. Repairs may include adding new topsoil, lime, seed, fertilizer and mulch.

2. **Plantings**: Planting and landscaping (trees, shrubs) shall be monitored bi-monthly during the first year to insure viability and vigorous growth. Replace dead or dying vegetation with new stock and make adjustments to the conditions that caused the dead or dying vegetation. During dryer times of the year, provide weekly watering or irrigation during the establishment period of the first year.

   Make the necessary adjustments to ensure long-term health of the vegetated covers, i.e. provide more permanent mulch or compost or other means of protection.

3. **Vegetated buffer area:** Check for scour or sediment buildup in buffer area, at least annually. Replace any vegetation removed by scour or sediment buildup with similar vegetation.

4. **Rain Garden:** After installation of the rain garden, perform the following inspections on a monthly basis:

   a. Monitor for excessive or concentrated accumulations of debris, or excessive erosion below the various pipe inlets. Remove debris as required and replace or add inlet fabric strips or rip rap stones.
   b. Monitor the outflow for problems with erosion. Repair as required.
   c. After significant rainfalls, monitor rain garden surfaces for ponding of water. If water remains flooded over the surface 24 hours after a 1" rainfall, then investigate the cause, if not related to overflow blockage, then excavate and replace filter media.
   d. Monitor vegetation on rain garden and replace dead or dying vegetation as required.
   e. Monitor rain garden for rodent borrows and repair as required; remove persistent occupiers.
   f. Monitor side slopes of rain garden for damage or erosion—repair, as necessary.

5. **Outlet Control Structures and Storm Drains:** Monitor accumulation of debris in outlet control structures monthly or after significant rain events. Remove sediments when they accumulate within the yard drains and outlet pipe. During construction, maintain inlet protection until the site has been stabilized. Prior to the end of construction, inspect the drains and basins for accumulations and remove and clean by jet-vacuuming.

Pollution Prevention

The following pollution prevention activities shall be undertaken to minimize potential impacts on stormwater runoff quality. The Contractor is responsible for all activities during construction. The Owner is responsible thereafter.

Spill Procedures: Any discharge of waste oil or other pollutant shall be reported immediately to the New Hampshire Department of Environmental Services (NHDES). The Contractor/Owner will be responsible for any incident of groundwater contamination resulting from the improper discharge of pollutants to the stormwater system, and may be required by NHDES to remediate incidents that may impact groundwater quality. If the property ownership is transferred, the new owner will be informed of the legal responsibilities associated with operation of the stormwater system, as indicated above.

Sanitary Facilities: Sanitary facilities shall be provided during all phases of construction.

Material Storage: No on site trash facility is provided until homes are constructed. The contractors are required to remove trash from the site. Hazardous material storage is prohibited.

Material Disposal: All waste material, trash, sediment, and debris shall be removed from the site and disposed of in accordance with applicable local, state, and federal guidelines and regulations. Removed sediments shall be if necessary dewatered prior to disposal.

Invasive Species

Monitor the Stormwater Management System for signs of invasive species growth. If caught early, their eradication is much easier. The most likely places where invasions start is in wetter, disturbed soils or detention ponds. Species such as phragmites and purple loose-strife are common invaders in these wetter areas. If they are found, the owner shall refer to the fact-sheet created by the University of New Hampshire Cooperative Extension (or other source) or contact a wetlands scientist with experience in invasive species control to implement a plan of action for eradication. Measures that do not require the application of chemical herbicides should be the first line of defense.

Figure 1: Lythrum salicaria, Purple Loosestrife. Photo by Liz West.

Figure 2: Phragmites australis. Photo by Le Loup Gris

RAIN GARDEN MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	**FREQUENCY**	**MAINTENANCE REQUIREMENTS**
-Inspect pond surface for the occurrence of sediment, trash, debris, or structural damage.	Bi-Yearly and following major storm events	*-Remove sediments, trash, and debris, as necessary.* *-Repair outlet structures and appurtenances, as necessary.*
-Check to see if pond drains within 72 hours of rainfall. *-Check vegetation health.*	Annually	*-If system does not drain within 72 hours of a rainfall event, consult a qualified professional about restoration of function of the dry well.* *-Vegetation should be maintained and pruned.* *-Dead or diseased vegetation should be removed, as well as any invasive species.*

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	**INSPECTOR CONTACT INFO**
DATE OF INSPECTION	**REASON FOR INSPECTION** ☐LARGE STORM EVENT ☐PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? ☐YES ☐NO	**DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE**
DATE OF MAINTENANCE	**PERFORMED BY**
NOTES	

CLOSED DRAINAGE STRUCTURE LONG-TERM MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	**FREQUENCY**	**MAINTENANCE REQUIREMENTS**
-Outlet Control Structures *-Drain Manholes* *-Catch Basins*	Monthly for 1 year following construction, Every other Month thereafter	*Check for erosion or short-circuiting* *Check for sediment accumulation* *Check for floatable contaminants*
-Drainage Pipes	Monthly for 1 year following construction, 1 time per 2 years thereafter	*Check for sediment accumulation/clogging, or soiled runoff.* *Check for erosion at outlets.*

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	**INSPECTOR CONTACT INFO**
DATE OF INSPECTION	**REASON FOR INSPECTION** ☐LARGE STORM EVENT ☐PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? ☐YES ☐NO	**DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE**
DATE OF MAINTENANCE	**PERFORMED BY**
NOTES	

STABILIZED CONSTRUCTION ENTRANCE CONSTRUCTION MAINTENANCE SHEET

INSPECTION REQUIREMENTS		
ACTION TAKEN	**FREQUENCY**	**MAINTENANCE REQUIREMENTS**
ENTRANCE SURFACE *-Check for sediment accumulation/clogging of stone*	After heavy rains, as necessary	*-Top dress pad with new stone.* *-Replace stone completely if completely clogged.*
WASHING FACILITIES (if applicable) *-Monitor Sediment Accumulation*	As often as necessary	*-Remove Sediments from traps.*

MAINTENANCE LOG	
PROJECT NAME	
INSPECTOR NAME	**INSPECTOR CONTACT INFO**
DATE OF INSPECTION	**REASON FOR INSPECTION** ☐LARGE STORM EVENT ☐PERIODIC CHECK-IN
IS CORRECTIVE ACTION NEEDED? ☐YES ☐NO	**DESCRIBE ANY PROBLEMS, NEEDED MAINTENANCE**
DATE OF MAINTENANCE	**PERFORMED BY**
NOTES	

1151 SAGAMORE AVENUE CBC, LLC
SITE PLAN REVIEW

1151 SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE

PROJECT INFORMATION

CIVIL ENGINEER
HALEY WARD, INC.
ATTN: DREW OLEHOWSKI, PE.
200 GRIFFIN ROAD, UNIT 14
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.430.9282

OWNER / APPLICANT
1151 SAGAMORE AVENUE CBC, LLC
76 STATE STREET
NEWBURYPORT, MASSACHUSETTS 01950

SURVEYOR
HALEY WARD, INC.
ATTN: CHARLES ADAMS, LLS, PLS
200 GRIFFIN ROAD, UNIT 14
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.430.9282

LANDSCAPE ARCHITECT
TERRA FIRMA LANDSCAPE ARCHITECTURE
ATTN: TERRENCE PARKER
163.A COURT STREET
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.531.9109

UTILITY PROVIDERS

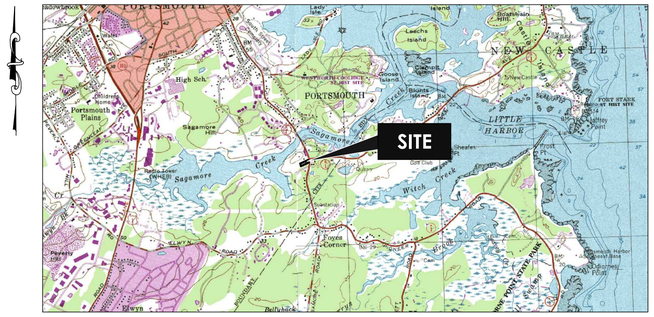
WATER & SEWER
CITY OF PORTSMOUTH DEPT. OF PUBLIC WORKS
ATTN: DOUG SPARKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.427.1530

ELECTRIC
EVERSOURCE
ATTN: NICHOLAS KOSKO
1700 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.436.7708, EXT. 3327565

CABLE
XFINITY BY COMCAST
ATTN: MIKE COLLINS
180 GREENLEAF AVENUE
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.266.2278

COMMUNICATIONS
CONSOLIDATED COMMINICATIONS
ATTN: BENJAMIN WILLS
1575 GREENLAND ROAD
GREENLAND, NEW HAMPSHIRE 03840
T: 603.427.5525

NATURAL GAS
UNITIL
ATTN: DAVE BEAULIEU
325 WEST ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.294.5144



LOCATION MAP

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C201	PROPOSED DRIVEWAY PLAN & PROFILE
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C501	SITE DETAILS
C502	SITE DETAILS
C503	SITE DETAILS
C701	PRE-DEVELOPMENT HYDROLOGY PLAN
C702	POST-DEVELOPMENT HYDROLOGY PLAN
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TR-2	TURNING DIAGRAM
TR-3	TURNING DIAGRAM
TR-4	TURNING DIAGRAM
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PLANS BY TERRA FIRMA LANDSCAPE ARCHITECTURE:

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L-2	LANDSCAPE DETAILS

PERMITS & APPROVALS
CITY OF PORTSMOUTH - SITE PLAN REVIEW: IN PROGRESS

PLAN REFERENCE
1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD, INC.

2. AS-BUILT SITE PLAN FOR BUILD AMERICA, PREPARED NOVEMBER 2025 BY AMBIT ENGINEERING, INC., A DIVISION OF HALEY WARD, INC.

3. SUPPLEMENTAL LIDAR TOPOGRAPHY OBTAINED FROM THE NOAA DIGITAL COAST DATA ACCESS VIEWER.

ISSUED FOR PERMITTING
FEBRUARY 13, 2026

HALEY WARD
www.haleyward.com

CONSTRUCTION SEQUENCE

DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

INSTALL SILT SOXX TO CONTROL EROSION AND SEDIMENTATION PRIOR TO ANY EARTH MOVING ACTIVITIES.

REMOVE EXISTING BUILDINGS AND OTHER SITE FEATURES TO BE REMOVED.

CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.

CUT AND REMOVE ALL TREES, SHRUBS, SAPLINGS, BRUSH, VINES AND OTHER DEBRIS AND RUBBISH AS REQUIRED.

STRIP AND STOCKPILE LOAM FROM SITE. STOCKPILES SHALL BE SURROUNDED WITH SILT SOXX TO CONTROL SEDIMENT RUN OFF.

ROUGH GRADE SITE AND CONSTRUCT DRAINAGE STRUCTURES, RAIN GARDEN AND SWALES. INSTALL AND MAINTAIN EROSION CONTROL DEVICES AS SHOWN ON THE PLANS. ALL PERMANENT DITCHES, AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM. CONSTRUCT BUILDING FOUNDATIONS.

LOAM AND SEED DISTURBED AREAS IN ACCORDANCE WITH VEGETATIVE PRACTICE AND GENERAL CONSTRUCTION NOTES. CUT AND FILL SLOPES SHALL BE SEEDED IMMEDIATELY AFTER THEIR CONSTRUCTION.

CONSTRUCT UTILITIES, BUILDINGS AND PAVEMENT BASE COURSE.

PLANT LANDSCAPING.

CONSTRUCT PAVEMENT WEARING COURSE.

REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF FOUR HOUSING UNITS WITH ASSOCIATED PARKING AND UTILITIES.

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 0.695 ACRES.

BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE CONSIST OF CHATFIELD-HOLLIS-CANTON COMPLEX WHICH IS WELL DRAINED SOILS WITH A HYDROLOGIC SOIL GROUP RATING OF B.

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA OVERLAND DRAINAGE PATHWAYS WHICH ULTIMATELY FLOW TO THE SAGAMORE CREEK.

GENERAL CONSTRUCTION NOTES

THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.

ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.

THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DUST CONTROL: DUST CONTROL MEASURES SHALL INCLUDE BUT ARE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.
IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.

SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.

ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.

ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.

FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.

FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.

DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.

THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.

ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
- EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
- IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA.

STABILIZATION MEASURES TO BE USED INCLUDE:
- TEMPORARY SEEDING;
- MULCHING.

1. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
2. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN THESE AREAS, SILTSOXX, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
3. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILTSOXX, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

MAINTENANCE AND PROTECTION

THE SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.

SILTSOXX SHALL BE REMOVED ONCE SITE IS STABILIZED, AND DISTURBED AREAS RESULTING FROM SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.

THE CATCH BASIN INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

WINTER NOTES

ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATED GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;

AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;

STOCKPILES

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

CONCRETE WASHOUT AREA

THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
1. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FAILITY;
2. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
3. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
4. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL

1. WASTE MATERIAL
   - ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   - NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   - ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
   - ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   - SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
   - ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

BLASTING NOTES

1. CONTRACTOR SHALL CONTACT THE NHDES AND/OR LOCAL JURISDICTION PRIOR TO COMMENCING ANY BLASTING ACTIVITIES.
2. FOR ANY PROJECT FOR WHICH BLASTING OF BEDROCK IS ANTICIPATED, THE APPLICANT SHALL SUBMIT A BLASTING PLAN THAT IDENTIFIES:
   - WHERE THE BLASTING ACTIVITIES ARE ANTICIPATED TO OCCUR;
   - THE ESTIMATED QUANTITY OF BLAST ROCK IN CUBIC YARDS; AND
   - SITE-SPECIFIC BLASTING BEST MANAGEMENT PRACTICES.

ABBREVIATIONS

@	AT	MAX.	MAXIMUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MDOT	MAINE DEPT. OF TRANSPORTATION
APPROX.±	APPROXIMATELY	MH	MANHOLE
		MIN	MINIMUM
BLDG	BUILDING		
		N	NORTHING
CL	CENTERLINE	NE	NORTHEAST
CB	CATCH BASIN	N.T.S.	NOT TO SCALE
		NWT	NON WOVEN GEOTEXTILE
CLR	CLEAR	OD	OUTSIDE DIAMETER
CMP	CORRUGATED METAL PIPE	O.C.	ON CENTER
CO	CLEANOUT	OH	OVERHEAD
CPE	CORRUGATED POLYETHYLENE	OZ	OUNCES
		PERF	PERFORATED
DI	DUCTILE IRON		
DIA.	DIAMETER	PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
E	EASTING	PVC	POLYVINYL CHLORIDE
EL	ELEVATION	PL	PROPERTY LINE
EFM	EXISTING FORCE MAIN	POH	PROPOSED OVERHEAD ELECTRIC
EPS	EXTRUDED POLYSTYRENE	PUGE	PROPOSED UNDERGROUND ELECTRIC
FM	FORCEMAIN	R	RADIUS
GAL	GALLON	S	SLOPE
GALV	GALVANIZED	SCL	STORMWATER COLLECTION LINE
		SCS	STORMWATER COLLECTION SYSTEM
GPH	GALLONS PER HOUR	SDR	STANDARD DIMENSION RATIO
GPM	GALLONS PER MINUTE	SE	SOUTHEAST
		SHT	SHEET
HDPE	HIGH DENSITY POLYETHYLENE	SQ	SQUARE
HP	HORSEPOWER	SS	STAINLESS STEEL
		SY	SQUARE YARD
ID	INSIDE DIAMETER		
IN.	INCHES	TBM	TEMPORARY BENCH MARK
INT.	INTERSECTION	TOC	TOP OF CONCRETE
INV.	INVERT	TYP	TYPICAL

LEGEND:

ITEMS SHOWN MAY NOT APPEAR ON PLANS

DESCRIPTION	*EXISTING*	*PROPOSED*
PROPERTY LINE		
BENCHMARK		
SURVEY STATION		
IRON PIN		
DRILL HOLE		
BOUND		
TEST PIT	TP	
SEWER MANHOLE	S	S DV
GAS VALVE		
UTILITY POLE		
GUY ANCHOR		
ELECTRICAL MANHOLE	E	E
TRANSFORMER		TR
PULLBOX	P	P
WELL	W	W
WATER VALVE	WV	
WATER SHUTOFF		
HYDRANT		
AIR RELIEF VALVE		
DRAINAGE MANHOLE	D	D
CATCH BASIN		
CURB INLET		
PARKING LIGHT		
FLOOD LIGHT		
SITE LIGHT		
SIGN		
TRASH CAN		
FLAGPOLE		
MONITORING WELL	MW	MW
EDGE OF GRAVEL		
EDGE OF PAVEMENT		
CURBING		
MAJOR FOOT CONTOUR	100	100
MINOR FOOT CONTOUR	98	98
WATERLINE	W	W
STORM DRAIN	SD	SD
UNDER DRAIN		UD
SANITARY SEWER	SS	SS
FORCE MAIN		FM
OVERHEAD UTILITIES	OHU	OHU
UNDERGROUND UTILITIES	UGE	UGU
GAS LINE	GAS	GAS
CHAIN LINK FENCE	X	X
GUARDRAIL		
SILT FENCE		SF
TREE LINE		
GRAVEL SURFACE		
PAVED SURFACE		
CONCRETE SURFACE		
BUILDING FOOTPRINT		
WETLANDS	WET	
RIPRAP		
FILTER SURFACE		

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

GENREAL NOTES, LEGEND & ABBREVIATIONS

STATE OF NEW HAMPSHIRE · PROFESSIONAL ENGINEER · DREW JOHN OLEHOWSKI No. 18515 LICENSED
02/13/2026

DATE: 2025.12.22	SCALE: NTS
DRAWN BY: BLQ/PJM	DESIGNED BY: BLQ/PJM
CHECKED BY: DJO	
PROJECT No.: 5010314.002	
DRAWING No.: C001	REV.: 2

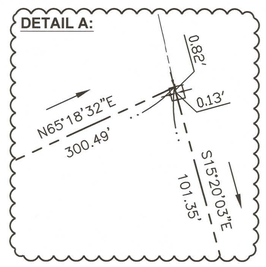
FILE LOCATION: P:\#45\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE - PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314-002-CIVR.DWG, 2026.02.13, 1:13 PM

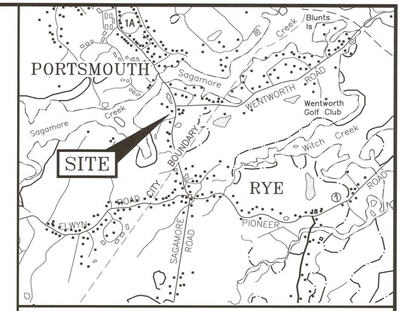
LEGEND:

DESCRIPTION	EXISTING
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
1234/123	DEED BOOK/PAGE
N/F	NOW OR FORMALLY
TYP.	TYPICAL
TBS	TO BE SET
INV.	INVERT
ELV.	ELEVATION
FF	FINISHED FLOOR
SWL	SINGLE WHITE LINE
DYL	DOUBLE YELLOW LINE
VGC	VERTICAL GRANITE CURB
MAP 21 LOT 8	21
BENCHMARK	
RAILROAD SPIKE	
BOUND	
IRON ROD/PIPE FOUND	
SET 5/8" REBAR WITH SURVEYOR'S CAP	
CATCH BASIN	
SEWER MANHOLE	S
DRAIN MANHOLE	D
UTILITY POLE	
GUY WIRE	
HYDRANT	
GATE VALVE	GGV WGV SGV
GAS/WATER SHUTOFF	
TREES	
GAS/ELECTRIC METER	E G
MAIL BOX	
SIGN	
SPOT GRADE	12x1
PROPERTY LINE	
APPROXIMATE EXTERIOR PROPERTY LINE	
EDGE OF PAVEMENT	
EDGE OF GRAVEL	
MINOR FOOT CONTOUR	98
MAJOR FOOT CONTOUR	100
WETLAND FLAG/WETLAND	A1
FRESH WATER WETLAND LINE	
WETLAND BUFFER LINE	WB
TREELINE	
STORM DRAIN LINE	SD
OVERHEAD UTILITY LINE	OHU

PLAN REFERENCES:

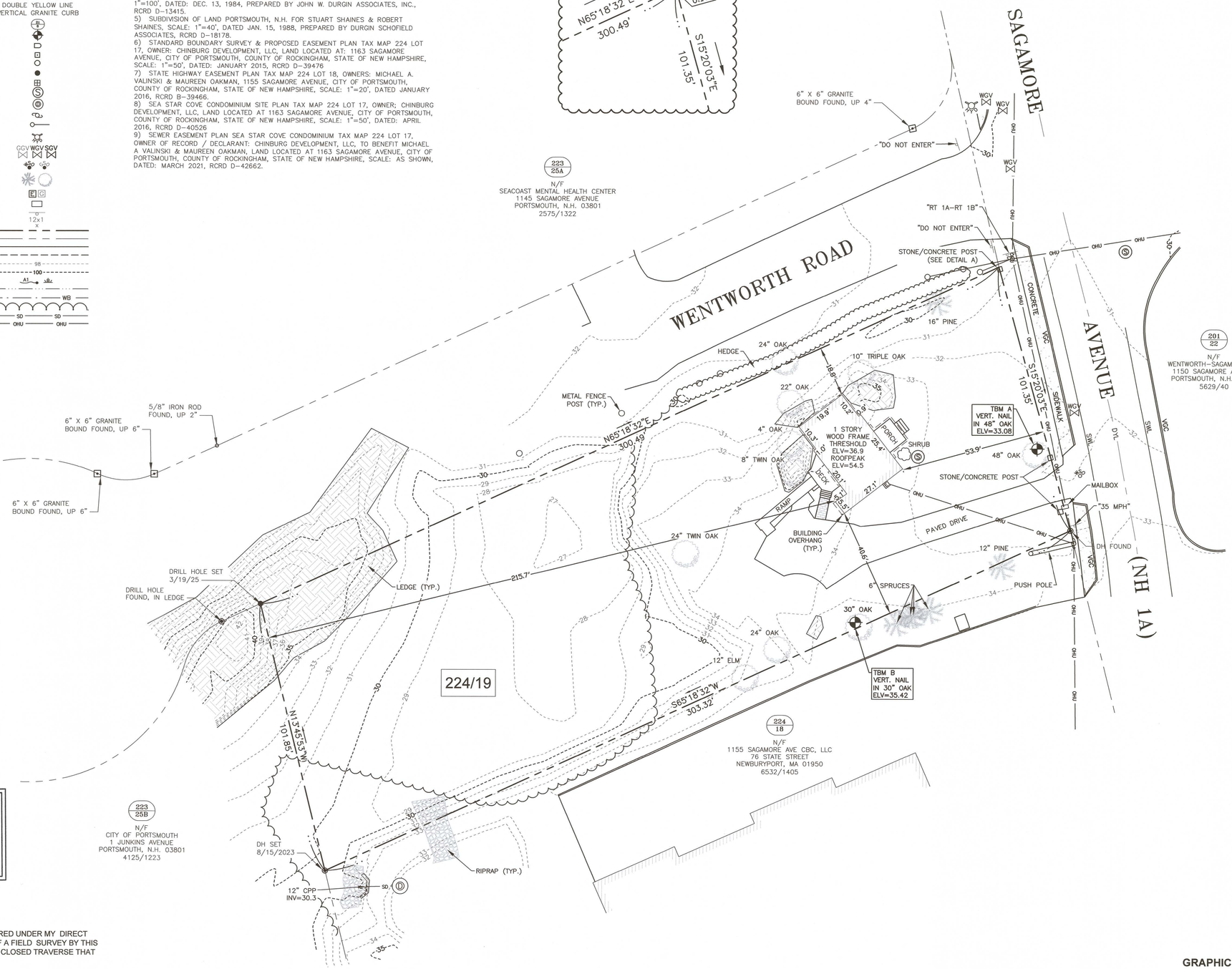
1) PLAN OF LAND ON SAGAMORE CREEK, PORTSMOUTH, N.H. OWNED BY JOSIAH F. ADAMS, SURVEYED BY E.M.HUNT, JUN. ENGR., SCALE: 1"=1000', DATED: MARCH 1908, RCRD PLAN# 00254.
2) PLAN OF LAND PORTSMOUTH, N.H. FOR NORMAN J. & JANET S. SMITH, SCALE: 1IN.=100FT., DATED: NOV. 1964, PREPARE BY JOHN W. DURGIN CIVIL ENGINEERS, RCRD PLAN# 1549.
3) BOUNDARY LINE CHANGE LODGE 444 LOYAL ORDER OF MOOSE AND ROBERT & STUART SHAINES, SAGAMORE AVENUE, PORTSMOUTH, NEW HAMPSHIRE, SCALE: 1"=50', DATED MAY 1984, PREPARED BY K.E.MOORE & B.G.STAPLES LAND SURVEYORS, RCRD D-13349.
4) SUBDIVISION OF LAND PORTSMOUTH & RYE, N.H. FOR R & S TRUST, SCALE: 1"=100', DATED: DEC. 13, 1984, PREPARED BY JOHN W. DURGIN ASSOCIATES, INC., RCRD D-13415.
5) SUBDIVISION OF LAND PORTSMOUTH, N.H. FOR STUART SHAINES & ROBERT SHAINES, SCALE: 1"=40', DATED JAN. 15, 1988, PREPARED BY DURGIN SCHOFIELD ASSOCIATES, RCRD D-18178.
6) STANDARD BOUNDARY SURVEY & PROPOSED EASEMENT PLAN TAX MAP 224 LOT 17, OWNER: CHINBURG DEVELOPMENT, LLC, LAND LOCATED AT: 1163 SAGAMORE AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, SCALE: 1"=50', DATED: JANUARY 2015, RCRD D-39476
7) STATE HIGHWAY EASEMENT PLAN TAX MAP 224 LOT 18, OWNERS: MICHAEL A. VALINSKI & MAUREEN OAKMAN, 1155 SAGAMORE AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, SCALE: 1"=20', DATED JANUARY 2016, RCRD B-39466.
8) SEA STAR COVE CONDOMINIUM SITE PLAN TAX MAP 224 LOT 17, OWNER; CHINBURG DEVELOPMENT, LLC, LAND LOCATED AT 1163 SAGAMORE AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, SCALE: 1"=50', DATED: APRIL 2016, RCRD D-40526
9) SEWER EASEMENT PLAN SEA STAR COVE CONDOMINIUM TAX MAP 224 LOT 17, OWNER OF RECORD / DECLARANT: CHINBURG DEVELOPMENT, LLC, TO BENEFIT MICHAEL A VALINSKI & MAUREEN OAKMAN, LAND LOCATED AT 1163 SAGAMORE AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE, SCALE: AS SHOWN, DATED: MARCH 2021, RCRD D-42662.





LOCATION MAP SCALE: 1" = 1,000'

NORTH (2011)
GRID NAD83



GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 224 AS LOT 19.

2) OWNER OF RECORD:
1151 SAGAMORE AVENUE CBC, LLC
76 STATE STREET
NEWBURYPORT, MA 01950
RCRD 6633/1720

3) PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0286F. EFFECTIVE JANUARY 29, 2021.

4) EXISTING LOT AREA:
30,191 S.F.
0.69 ACRES

5) PARCEL IS LOCATED IN MIXED RESIDENTIAL OFFICE (MRO) ZONING DISTRICT.

6) DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:		7,500 S.F.
FRONTAGE:		100 FEET
SETBACKS:	FRONT	5 FEET
	SIDE	10 FEET
	REAR	15 FEET
MAXIMUM STRUCTURE HEIGHT:		40 FEET SLOPED ROOF 30 FEET FLAT ROOF
MAXIMUM BUILDING COVERAGE:		40%
MINIMUM OPEN SPACE:		25%

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITION ON ASSESSOR'S MAP 224 LOT 19 IN THE CITY OF PORTSMOUTH.

8) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.

9) ABUTTER INFORMATION TAKEN FROM THE CITY OF PORTSMOUTH GIS WEBSITE.

REV.	DATE	DESCRIPTION	BY	CHK.
1	10/22/2025	OWNERSHIP NAME	PAY	PAY
0	3/26/25	ISSUED FOR COMMENT	RJB	PAY

DRAWING ISSUE STATUS

SITE SURVEY

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Road, Unit 14
Portsmouth, NH 03801
603-430-9282
WWW.HALEYWARD.COM

PROJECT

BUILD AMERICA
1151 SAGAMORE AVENUE PORTSMOUTH, N.H.

TITLE

EXISTING CONDITIONS PLAN

DATE	FEBRUARY 2025
SCALE	1"=20'
DRAWN BY	RJB
DESIGNED BY	---
CHECKED BY	PAY
PROJECT No.	5010314.002
FIELD BOOK / PAGE	FB 450 PG 15
DRAWING No.	V101
REV.	1

STATE OF NEW HAMPSHIRE — No. 1122 — PHILLIP A. YETMAN — LICENSED LAND SURVEYOR — LLS

``I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

PHILIP A. YETMAN, LLS 1122 DATE 10/23/2025

FILE LOCATION: NCSS LOCAL\FILES\PROJECTS\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\5010314.002-V-EC.DWG, 2025.10.23, 11:21 AM

PARCEL INFORMATION

MAP - LOT:	224 - 19
LOT AREA (ACRES):	.69 ACRES
ZONE OR DISTRICT:	MRO - MIXED RESIDENTIAL OFFICE
EXISTING USE:	SINGLE FAMILY RESIDENTIAL
FLOOD ZONE (PNL 33015C0286F):	N/A
WATER:	PUBLIC
SEWER:	PUBLIC
RECORD OWNER:	1151 SAGAMORE AVENUE CBC, LLC
	76 STATE STREET
	NEWBURYPORT, MASSACHUSETTS 01950

SITE DEVELOPMENT DATA

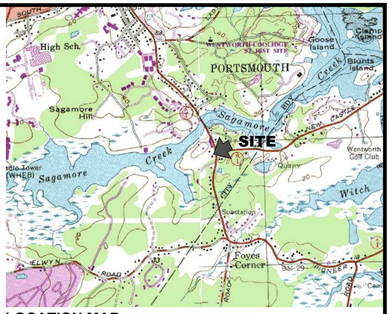
	PRE-CONSTRUCTION IMPERVIOUS (SF)	POST-CONSTRUCTION IMPERVIOUS (SF
MAIN STRUCTURE	789	7124
DECKS, STAIRS, & RAMPS	287	770
WALKWAYS	36	288
PAVEMENT	1575	6649
TOTAL IMPERVIOUS:	2687	14831
LOT COVERAGE:	8.90%	49.12%

DESIGN STANDARDS - PORTSMOUTH MRO

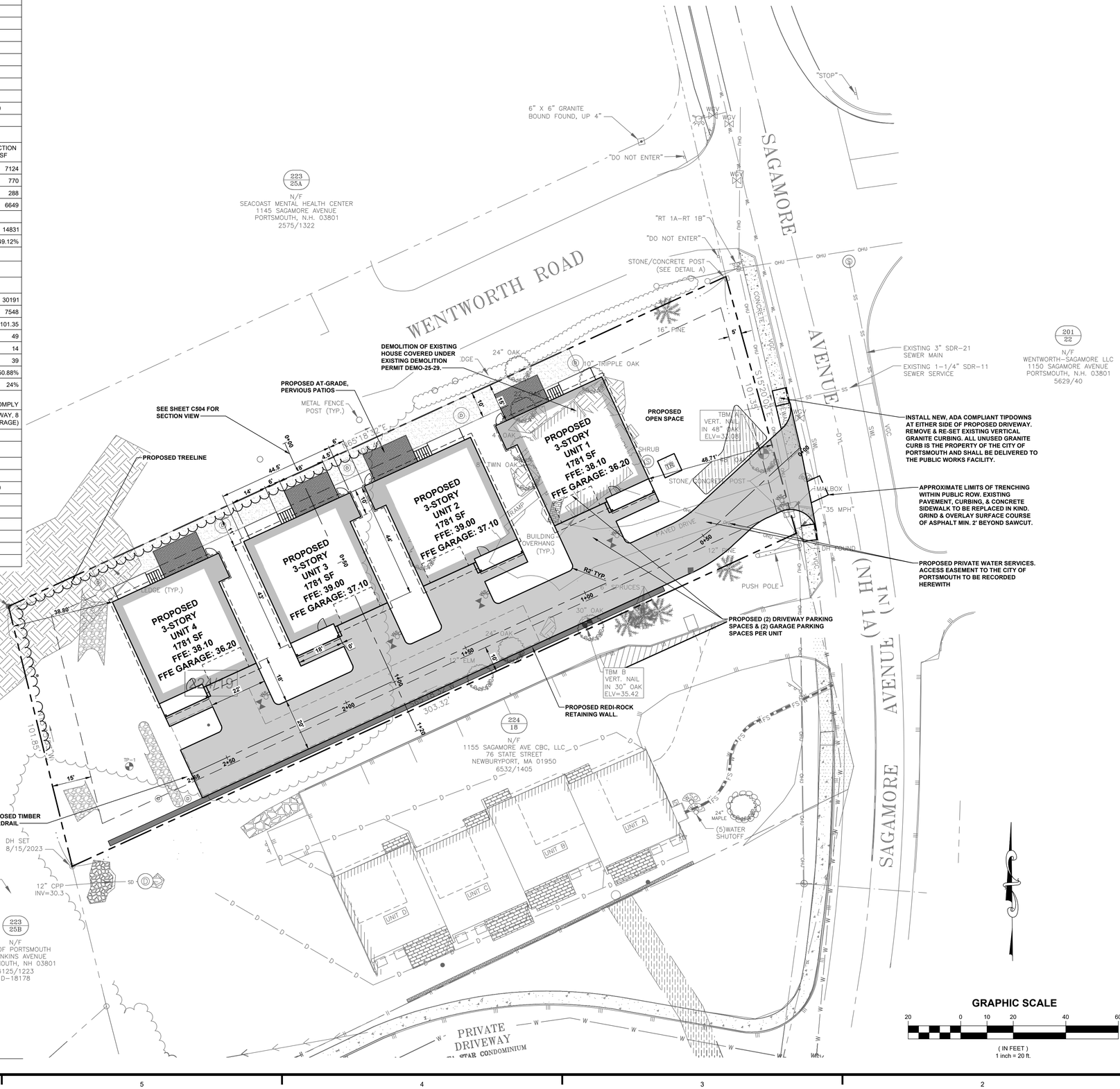
	REQ'D	PROVIDED
MIN. LOT AREA (SF)	7500	30191
LOT AREA PER DWELLING UNIT (SF)	7500	7548
MINIMUM ROAD FRONTAGE (FT)	100	101.35
MINIMUM SETBACK, FRONT YARD (FT)	5	49
MINIMUM SETBACK, SIDE YARDS (FT)	10	14
MINIMUM SETBACK, REAR YARDS (FT)	15	39
MINIMUM OPEN SPACE	25%	50.88%
MAXIMUM STRUCTURE COVERAGE	40%	24%
MAXIMUM BUILDING HEIGHT (FT)	30 (FLAT ROOF), 40 (SLOPED ROOF)	TO COMPLY
PARKING:	1.3 PER UNIT x 4 = 6	16 (8 DRIVEWAY, 8 GARAGE)

PROJECT INFORMATION

APPLICANT:	1151 SAGAMORE AVENUE CBC, LLC
	76 STATE STREET
	NEWBURYPORT, MASSACHUSETTS 01950
ENGINEER:	HALEY WARD, INC.
	ATTN: DREW OLEHOWKI, PE
	200 GRIFFIN ROAD
	UNIT 4
	PORTSMOUTH, NEW HAMPSHIRE 03801



LOCATION MAP: USGS QUADRANGLE: KITTERY
MAPTECH® USGS TOPOGRAPHIC SERIES™,
©MAPTECH®, INC. 978-933-3000
WWW.MAPTECH.COM/TOPO
SCALE: 1"=2000'



CONDITIONS OF APPROVAL:

1. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS:

2. THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

3. ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ **DATE** _____

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

NOTES:

1. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
2. TRASH PICKUP TO BE CURBSIDE.

PLAN REFERENCE:

1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD.
2. OFF-SITE TOPOGRAPHIC CONTOURS WERE PROVIDED BY THE CITY OF PORTSMOUTH GIS DEPARTMENT.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

PROPOSED SITE PLAN

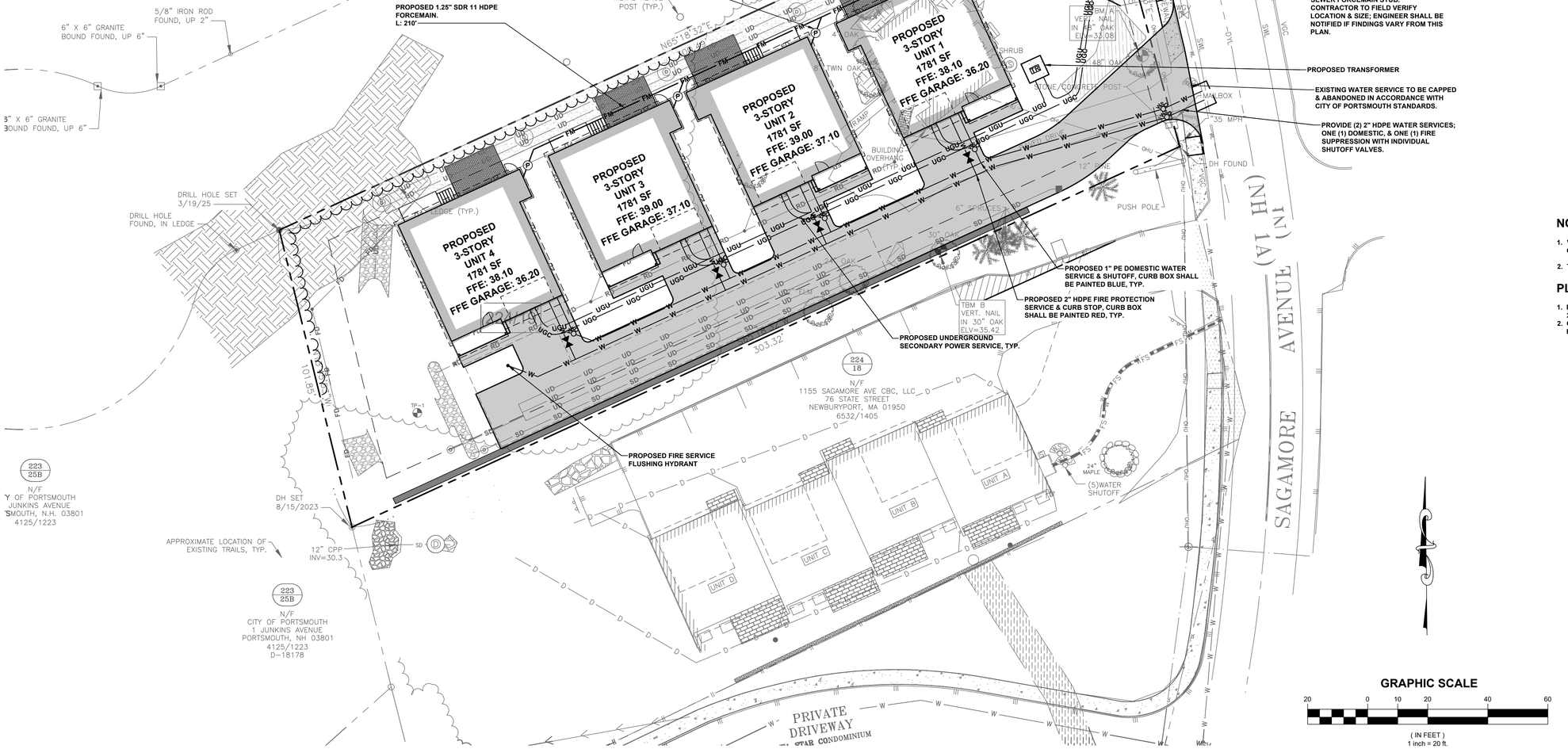
STATE OF NEW HAMPSHIRE – DREW JOHN OLEHOWSKI No. 18515 LICENSED PROFESSIONAL ENGINEER – 02/13/2026

DATE	SCALE
2025.12.22	1"=20'
DRAWN BY: BLQ/PJM	DESIGNED BY: BLQ/PJM
CHECKED BY: DJO	
PROJECT No.: 5010314.002	
DRAWING No.: C101	REV.: 2

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\000-1151 SAGAMORE AVE, PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002C-SP.DWG, 2026.02.13, 1:14 PM

UTILITY NOTES:

1. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY.
3. SEE GRADING AND DRAINAGE PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. ALL WORK WITHIN CITY R.O.W. SHALL BE COORDINATED WITH CITY OF PORTSMOUTH
6. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
7. ANY CONNECTION TO EXISTING WATERMAIN SHALL BE CONSTRUCTED BY THE CITY OF PORTSMOUTH.
8. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
9. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
10. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH BUILDING DRAWINGS AND UTILITY COMPANIES.
11. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
12. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
13. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATED TO THE OWNER PRIOR TO THE COMPLETION OF PROJECT.
14. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED IN THESE DRAWING TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
15. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
16. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS WATER ABOVE SEWER.
17. SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVED AREAS.
18. GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
19. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
20. ALL SEWER PIPES WITH LESS THAN 6' COVER SHALL BE INSULATED.
21. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
22. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER IN COORDINATION WITH THE SITE CIVIL ENGINEER.
23. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
24. FINAL REVIEW OF ALL UTILITIES SHALL BE MADE DURING THE REQUIRED SEWER CONNECTION PERMIT PROCESS IN COORDINATION WITH DEPARTMENT OF PUBLIC WORKS.
25. ALL WORK PERFORMED IN THE PUBLIC RIGHT-OF-WAY SHALL BE BUILT TO DEPARTMENT OF PUBLIC WATER WORKS STANDARDS.
26. THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.
27. UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.
28. PROVIDE STANDARD LEAK, VALVE AND METER EASEMENT DEED FOR THE PRIVATE WATER SYSTEM TO BE REVIEWED AND APPROVED BY THE CITY OF PORTSMOUTH. PAINT DOMESTIC WATER SHUTOFF BLUE AND FIRE SERVICE SHUTOFF RED.



LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
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WWW.MAPTECH.COM/TOPO

NOTES:

1. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
2. TRASH PICKUP TO BE CURBSIDE.

PLAN REFERENCE:

1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD.
2. OFF-SITE TOPOGRAPHIC CONTOURS WERE PROVIDED BY THE CITY OF PORTSMOUTH GIS DEPARTMENT.

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

UTILITY PLAN

STATE OF NEW HAMPSHIRE · DREW JOHN OLEHOWSKI · No. 18516 · LICENSED PROFESSIONAL ENGINEER · 02.13.2026

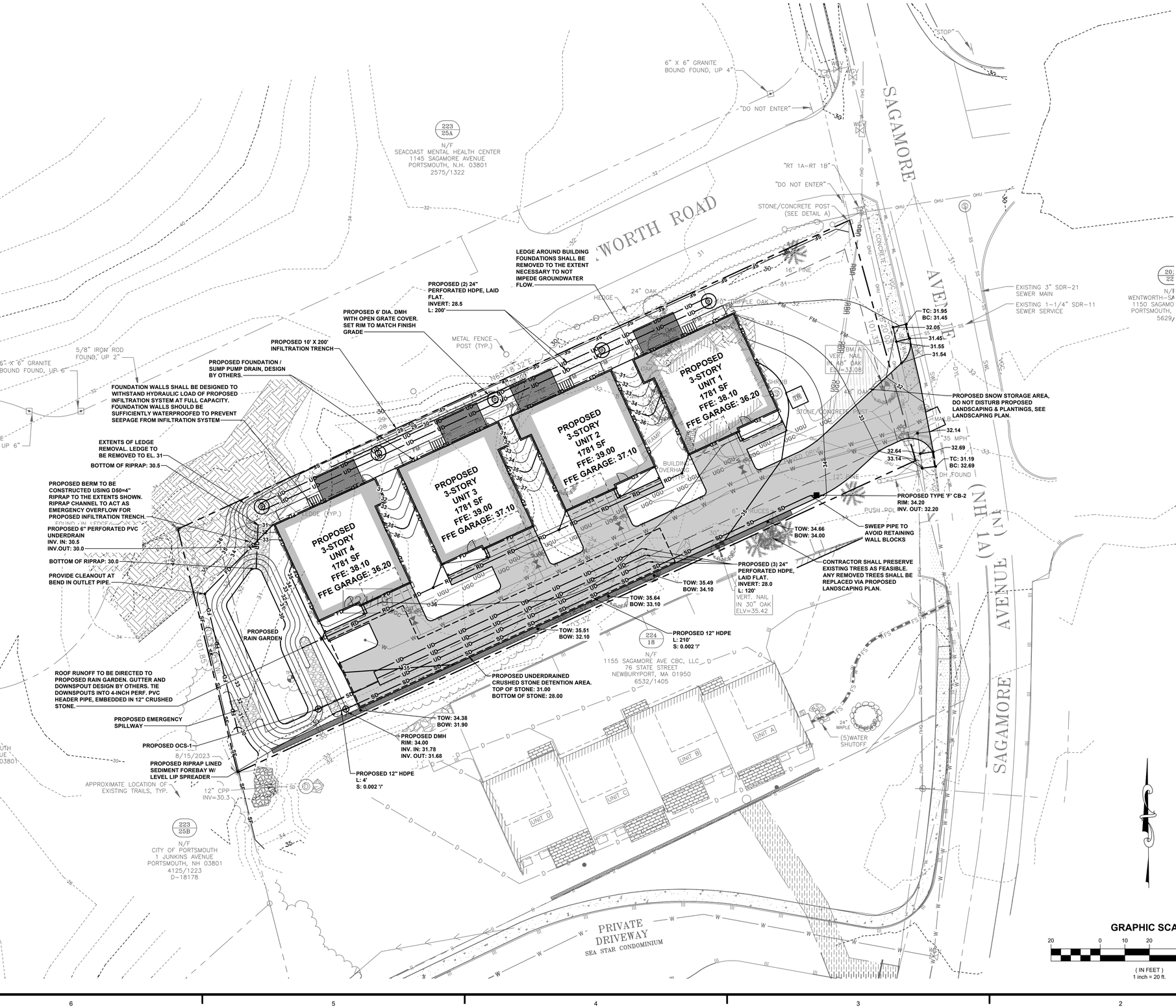
DATE	SCALE
2025.12.22	1"=20'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C102** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE, PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314-002-C-SP.DWG, 2026.02.13, 1:13 PM



LOCATION MAP: USGS QUADRANGLE: KITTERY
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SCALE: 1"=2000'

NOTES:

1. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
2. TRASH PICKUP TO BE CURBSIDE.

PLAN REFERENCE:

1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD.
2. OFF-SITE TOPOGRAPHIC CONTOURS WERE PROVIDED BY THE CITY OF PORTSMOUTH GIS DEPARTMENT.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

GRADING PLAN

STATE OF NEW HAMPSHIRE – DREW JOHN OLEHOWSKI No. 18515 LICENSED PROFESSIONAL ENGINEER – 02/13/2026

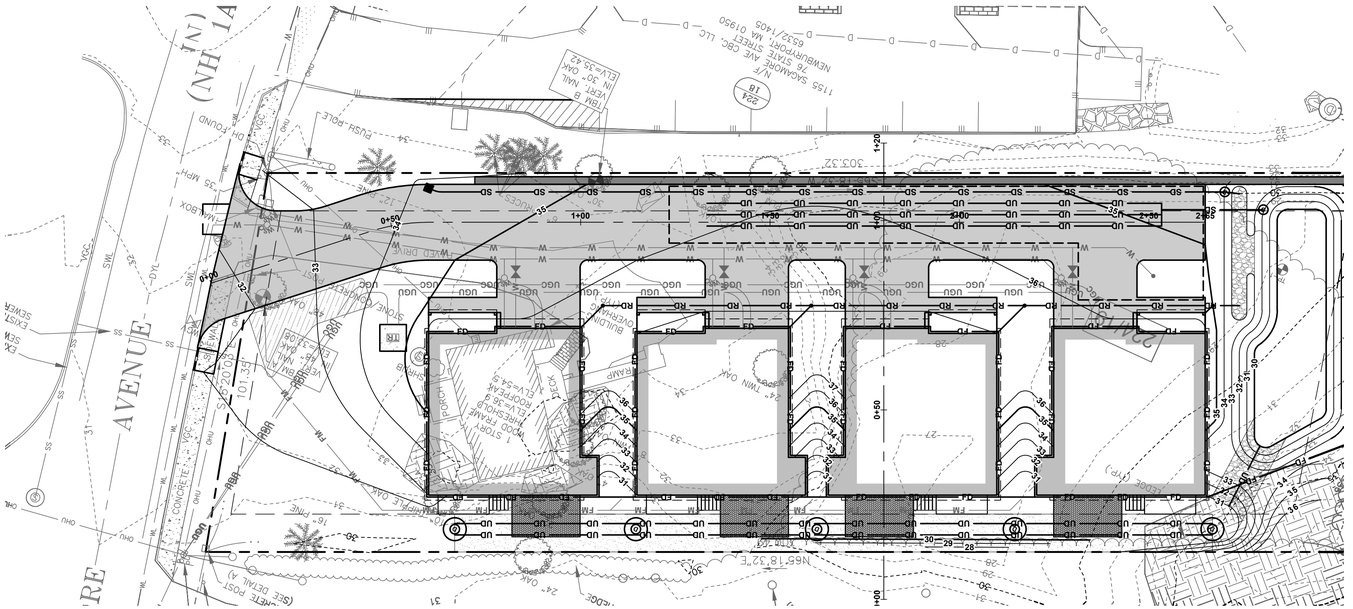
DATE	SCALE
2025.12.22	1"=20'

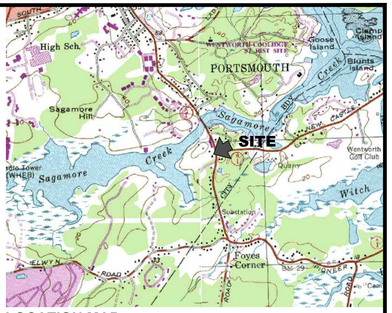
DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C103** REV. **2**

FILE LOCATION: P:\MHS\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE - PORTSMOUTH - PAYA\2-CAD_FILES\CIVIL\5010314.002-C-SP.DWG, 2026.02.13, 1:13 PM





LOCATION MAP: USGS QUADRANGLE: KITTERY
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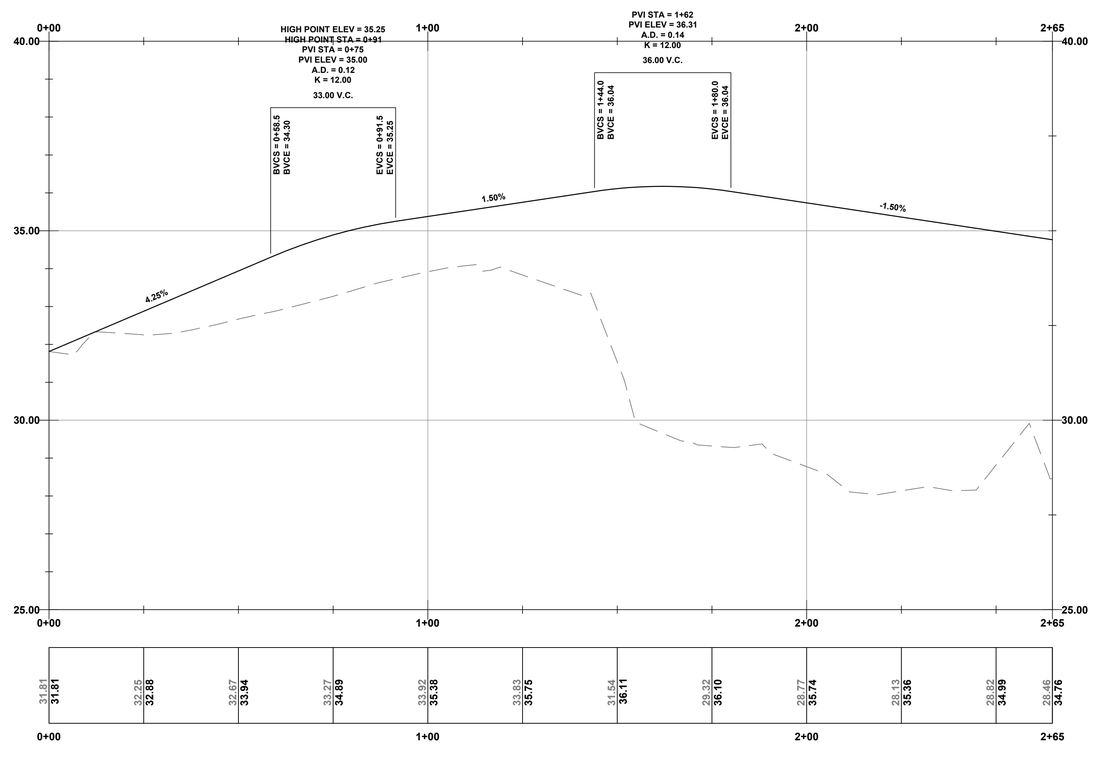
SCALE: 1"=2000'



PROFILE VIEW OF PROPOSED DRIVEWAY - STA 0+00 TO 2+65
SCALE: H: 1"=40' / V: 1"=4'

NOTES:

1. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
2. TRASH PICKUP TO BE CURBSIDE.

PLAN REFERENCE:

1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD.
2. OFF-SITE TOPOGRAPHIC CONTOURS WERE PROVIDED BY THE CITY OF PORTSMOUTH GIS DEPARTMENT.

GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS
ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

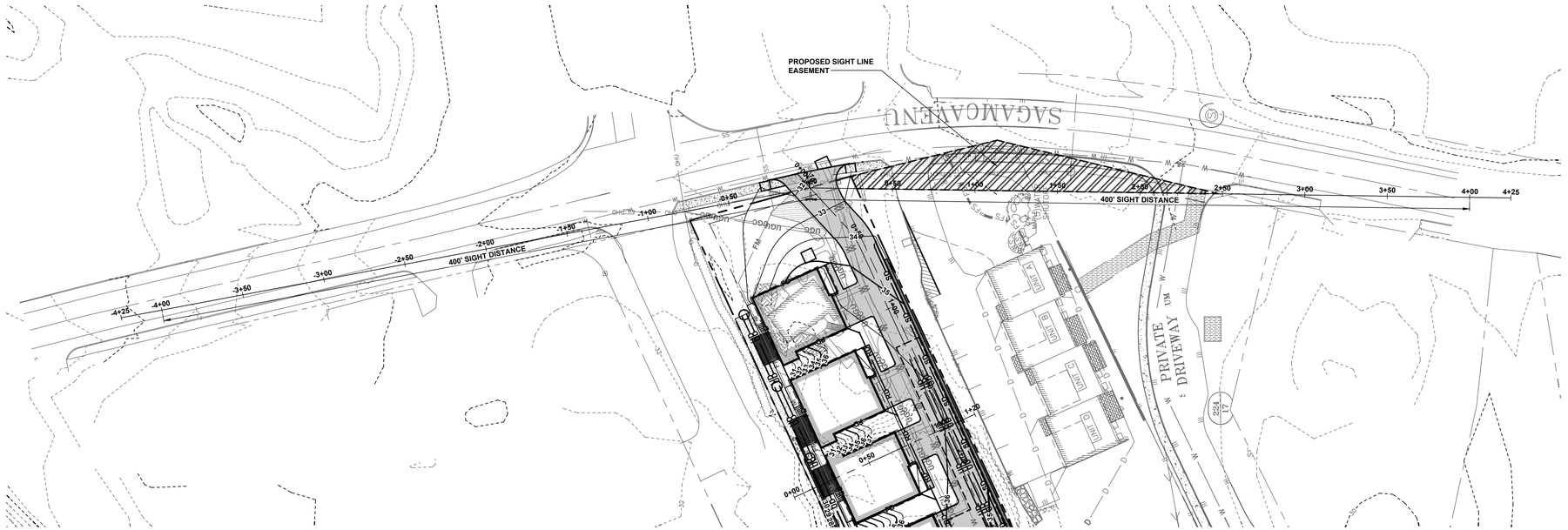
PROJECT
1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE
PROPOSED DRIVEWAY PLAN & PROFILE

STATE OF NEW HAMPSHIRE · DREW JOHN OLEHOWSKI · No. 18516 · LICENSED · PROFESSIONAL ENGINEER ·
02/13/2026

DATE	SCALE
2025.12.22	1"=20'
DRAWN BY: BLQ/PJM	DESIGNED BY: BLQ/PJM
CHECKED BY: DJO	
PROJECT No.: 5010314.002	
DRAWING No.: **C201**	REV.: **2**

FILE LOCATION: P:\NH\5010314_BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAYG\2-CAD_FILES\CIVIL\5010314-002-C-SP.DWG, 2026.02.13, 1:13 PM



LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
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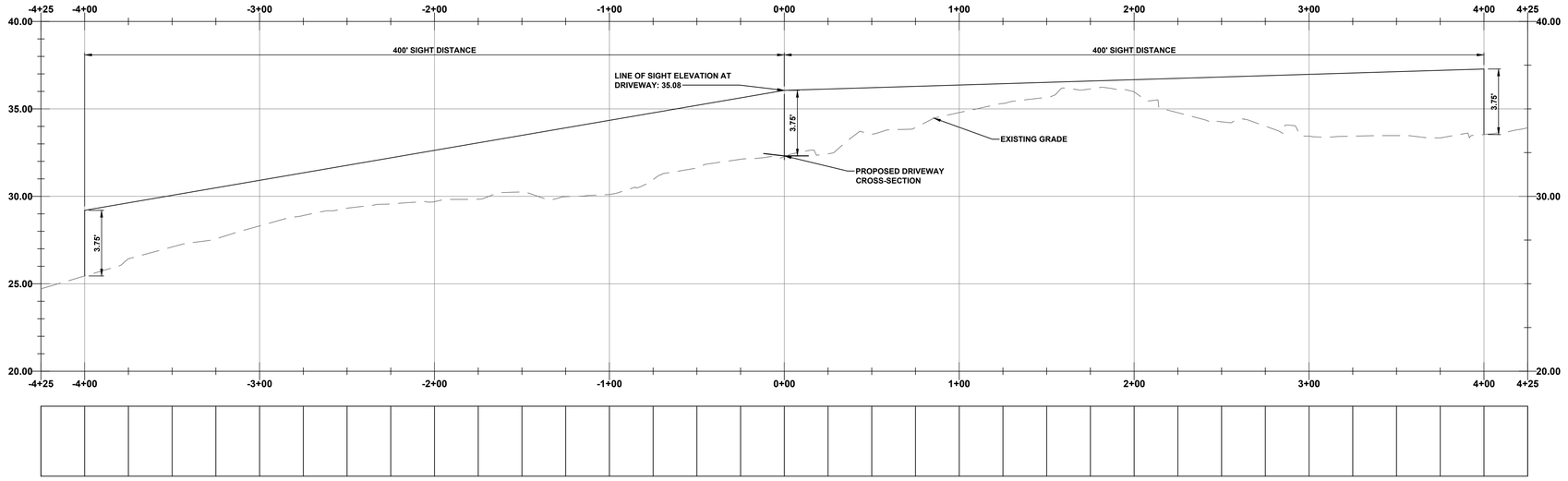


PROFILE VIEW OF SITE DISTANCE - STA -4+25 TO 4+25
SCALE: H: 1"=40' / V: 1"=4'

NOTES:

1. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
2. TRASH PICKUP TO BE CURBSIDE.

PLAN REFERENCE:

1. EXISTING CONDITIONS PLAN FOR BUILD AMERICA, PREPARED FEBRUARY 2025 BY HALEY WARD.
2. OFF-SITE TOPOGRAPHIC CONTOURS WERE PROVIDED BY THE CITY OF PORTSMOUTH GIS DEPARTMENT.

GRAPHIC SCALE
40 0 20 40 80 120
(IN FEET)
1 inch = 40 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS
ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT
1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE
SITE DISTANCE PLAN & PROFILE

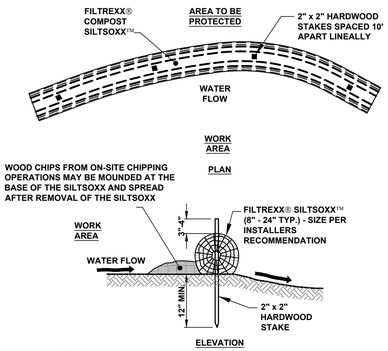
STATE OF NEW HAMPSHIRE - DREW JOHN OLEHOWSKI No. 18515 LICENSED PROFESSIONAL ENGINEER
02/13/2026

DATE	SCALE
2025.12.22	1"=40'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002
DRAWING No. **C202** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE, PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002-C-SP.DWG, 2026.02.13, 1:13 PM

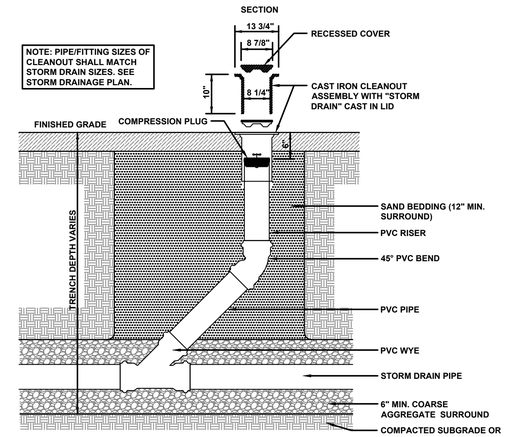


NOTES:

1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

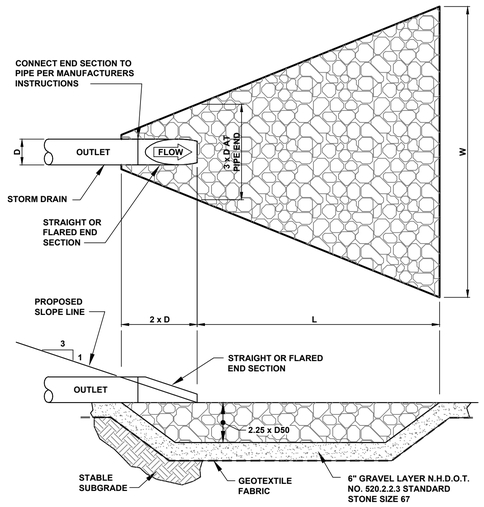
FILTREXX SILTSOXX DETAIL

NTS



STORM DRAIN CLEANOUT DETAIL

NTS



LENGTH TABLE			
D	L	W	D50
12"	14'	17'	3"
15"	16'	20'	4"
18"	20'	25'	6"
24"	30'	36'	8"

(REFER TO NOTE 1)

NOTES
1) USE d50 AS NOTED IN TABLE UNLESS SPECIFIED OTHERWISE ON PLANS.

2) UNDERLAY RIP-RAP WITH 6" OF SIZE 67 STONE FILL (N.H.D.O.T. NO. 520.2.2.3) & MIRAFI 700X OR APPROVED EQUAL GEOTEXTILE FABRIC.

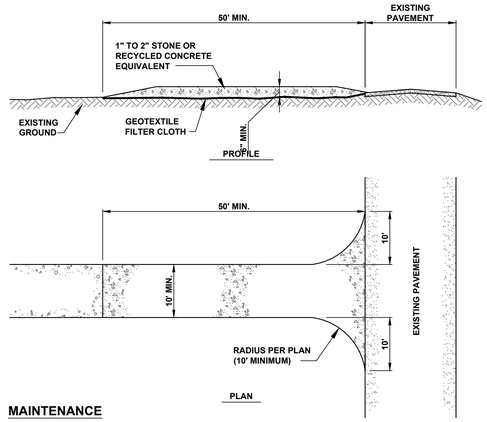
3) USE WIDTHS NOTED IN TABLE OR CONFORM TO NATURAL OR PROPOSED SWALE TOPOGRAPHY.

NHDOT NO. 520.2.2.3 STANDARD STONE SIZE 67

SIEVE SIZE	PERCENTAGE BY WEIGHT PASSING
1" (25.0mm)	100
3/4" (19.0mm)	90 - 100
3/8" (9.5mm)	20 - 25
No. 4 (4.75mm)	0 - 10
No. 8 (2.36mm)	0 - 5

CULVERT OUTLET PROTECTION

N.T.S.



MAINTENANCE

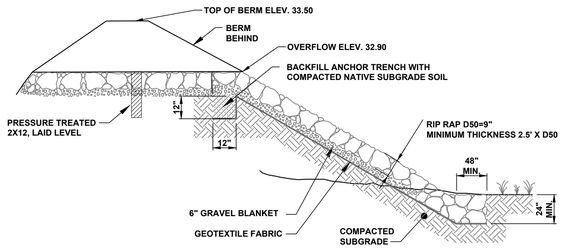
1) MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE GRAVEL AND THE EFFECTIVENESS OF THE GRAVEL PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOP DRESSED WITH NEW STONE. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
2) IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS

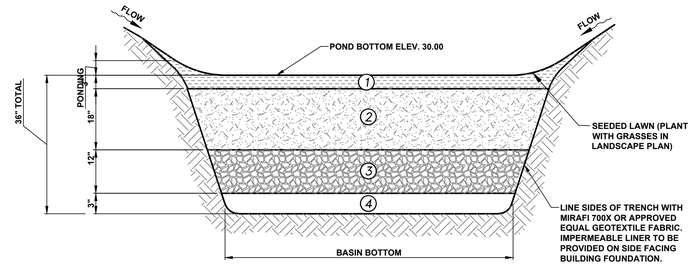
1) STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2) THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3) THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4) THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5) GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6) ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8) WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY, WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION ENTRANCE DETAIL

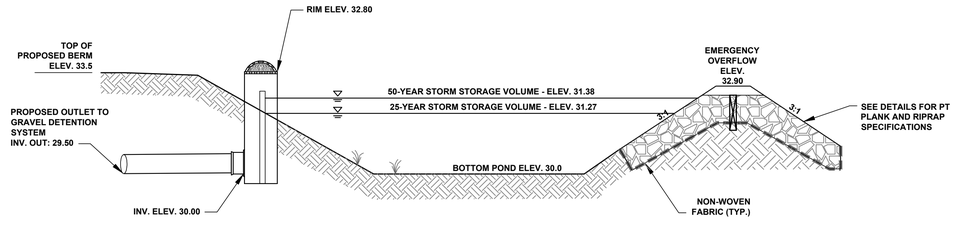
NTS



EMERGENCY SPILLWAY SECTION



RAIN GARDEN SECTION



RAIN GARDEN PROFILE

TYPICAL RAIN GARDEN DETAILS

N.T.S.

RAIN GARDEN MEDIA	
①	MULCH/GROWING MEDIUM: GRASS SEED MIX A WITH LOAM
②	SOIL FILTER LAYER: USE UNHSC BIORETENTION SOIL SPECIFICATIONS DATED FEBRUARY, 2017.20% – 30% MULCH BY VOLUME, MIXED THOROUGHLY WITH LOAMY, COARSE SAND (70% – 80% BY VOLUME) MEETING THE FOLLOWING GRADATION;

SIEVE NO.	% BY WEIGHT, PASSING
4	100
10	95
40	10 – 25
200	0 – 5

③	0.75"ø – 1.5"ø CRUSHED STONE, WASHED.
④	⅜" PEA GRAVEL

BIORETENTION MAINTENANCE

SOILS:
VISUALLY INSPECT AND REPAIR EROSION MONTHLY. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. CHECK THE pH ONCE OR TWICE A YEAR. APPLY AN ALKALINE PRODUCT, SUCH AS LIMESTONE, IF NEEDED.

MULCH:
REMULCH ANY VOID AREAS BY HAND AS NEEDED. EVERY 6 MONTHS, IN THE SPRING AND FALL, ADD A FRESH MULCH LAYER. ONCE EVERY 2 TO 3 YEARS, IN THE SPRING, REMOVE OLD MULCH LATER BEFORE APPLYING NEW ONE.

PLANTS:
IMMEDIATELY AFTER THE COMPLETION OF CELL CONSTRUCTION, WATER GRASS COVERING FOR 14 CONSECUTIVE DAYS UNLESS THERE IS SUFFICIENT NATURAL RAINFALL. ONCE A MONTH (MORE FREQUENTLY IN SUMMER), VISUALLY INSPECT VEGETATION FOR DISEASE OR PEST PROBLEMS. IF TREATMENT IS WARRANTED, USE THE LEAST TOXIC APPROACH. TWICE A YEAR, FROM MARCH 15TH TO APRIL 30TH AND OCTOBER 1ST TO NOVEMBER 30TH, REMOVE AND REPLACE ALL DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. DURING TIMES OF EXTENDED DROUGHT, LOOK FOR PHYSICAL FEATURES OF STRESS (UNREVIVED WILTING, YELLOW, SPOTTED OR BROWN PATCHES ETC.). WATER IN THE EARLY MORNING AS NEEDED. WEED REGULARLY, IF NEEDED.

DETENTION POND OUTLET STRUCTURE DETAIL

NTS

TYPICAL TYPE 'F' CATCH BASIN DETAIL

NTS

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

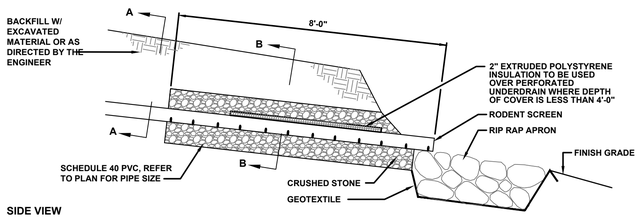
TITLE

SITE DETAILS

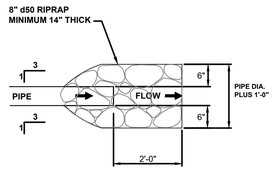
STATE OF NEW HAMPSHIRE - DREW JOHN OLEHOWSKI - No. 18515 - LICENSED PROFESSIONAL ENGINEER
02/13/2026

DATE	SCALE
2025.12.22	NTS
DRAWN BY: BLQ/PJM	DESIGNED BY: BLQ/PJM	CHECKED BY: DJO
PROJECT No.: 5010314.002	
DRAWING No.: C501	REV.: 2

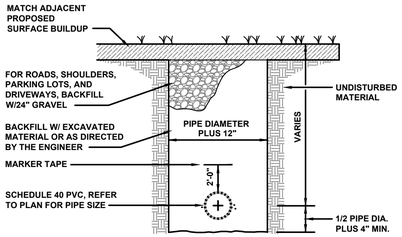
FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\003-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002C-SP.DWG, 2026.02.13, 1:14 PM



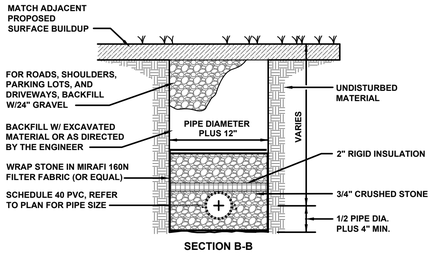
SIDE VIEW



RIP RAP APRON PLAN VIEW



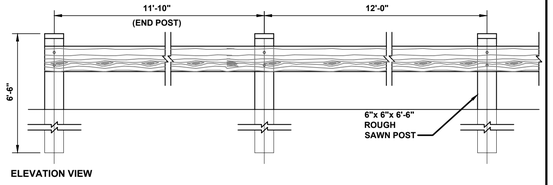
SECTION A-A



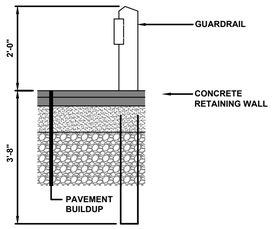
SECTION B-B

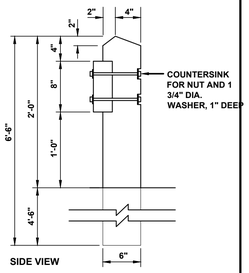
ROOF OR FOUNDATION DRAIN OUTLET DETAIL

NTS



ELEVATION VIEW





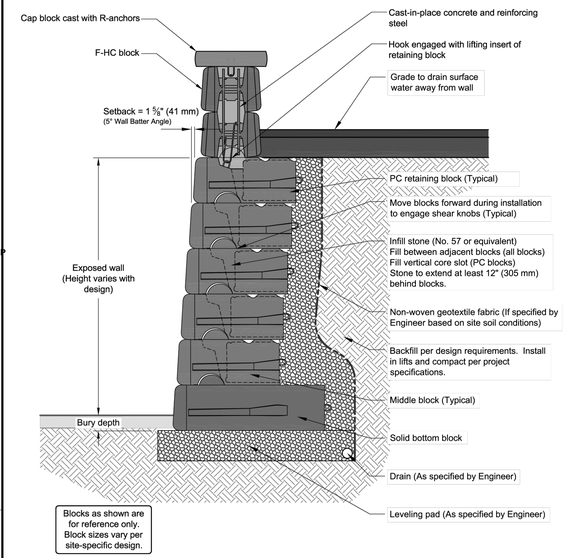
SIDE VIEW

NOTES:
1. LUMBER SHALL BE ROUGH SAWN HEMLOCK.
2. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED.

TYPICAL TIMBER GUARDRAIL DETAIL

NTS

Typical Gravity Wall Section with Freestanding Hollow Core Coping



This drawing is for reference only. Determination of the suitability and/or manner of use of any details contained in this document is the sole responsibility of the design engineer of record. Final project designs, including all construction details, shall be prepared by a licensed professional engineer using the actual conditions of the proposed site.

DRAWN BY:	NWL
APPROVED BY:	JRJ
DATE:	31MAY2018
SHEET:	1 of 1

TITLE: Typical Gravity Wall Detail

FILE: Typical-Gravity-Wall-with-F-HC-Section.dwg

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05481 US 31 SOUTH, CHARLEVOIX, MI 49720
(866) 222-8400 ext 3010 • engineering@redi-rock.com
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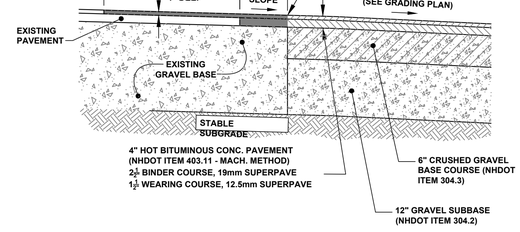
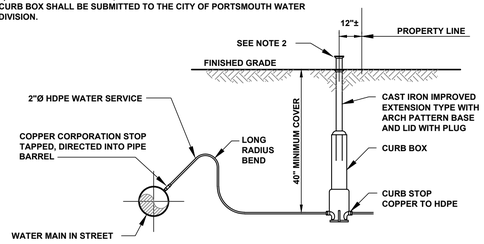


NOTES:
1) PAVEMENT SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS - SECTION 401.
2) CRUSHED GRAVEL AND GRAVEL SUBBASE SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS - SECTION 304, TABLE 1E, AND SHALL BE COMPACTED AS INDICATED IN SECTION 304, 3.6 COMPACTION, AND 3.7 DENSITY TESTING, AND CITY OF PORTSMOUTH CONSTRUCTION STANDARDS.

TYPICAL ASPHALT PAVEMENT GRINDING DETAIL

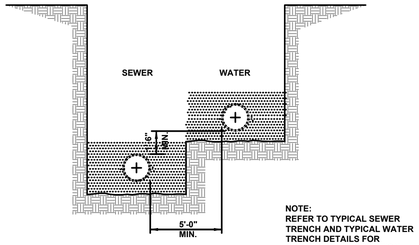
NTS

NOTE:
1) INSTALLATION OF WATER MAIN TAP & CURB STOP & BOX SHALL ONLY BE PERFORMED BY THOSE AUTHORIZED BY THE PUBLIC WORKS DEPARTMENT.
2) IN AREAS OF HEAVY GROWTH THE CURB BOX COVER SHALL BE SET 6" ABOVE FINISH GRADE AND A WITNESS STAKE SET.
3) CURB BOX SHALL BE SET APPROXIMATELY 12" OUTSIDE PROPERTY LINE AS SHOWN.
4) PRIOR TO ACCEPTANCE, A PLAN INDICATING THE LOCATION OF THE CURB BOX SHALL BE SUBMITTED TO THE CITY OF PORTSMOUTH WATER DIVISION.



TYPICAL WATER SERVICE DETAIL

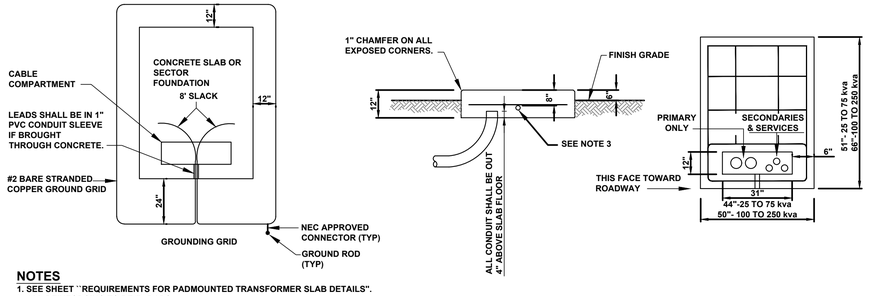
NTS



NOTE:
REFER TO TYPICAL SEWER TRENCH AND TYPICAL WATER TRENCH DETAILS FOR ADDITIONAL INFORMATION.

TYPICAL SEWER / WATER SEPARATION DETAIL

NTS

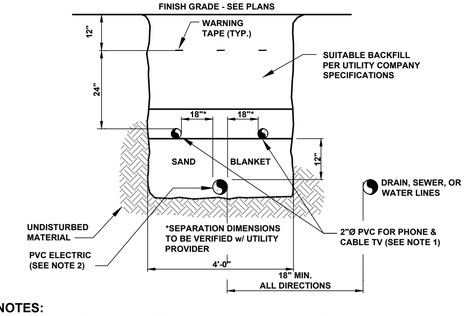


NOTES

1. SEE SHEET ``REQUIREMENTS FOR PADMOUNTED TRANSFORMER SLAB DETAILS''.
2. ALL REINFORCING TO BE #6 BARS.
3. 1" PVC CONDUIT SLEEVE FOR GROUND GRID LEADS.
4. THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CUSTOMER AND IS TO BE BURIED AT LEAST 12" BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTON TO THE TRANSFOMER. THE TWO 8' GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.

3 PHASE TRANSFORMER PAD DETAIL

NTS



NOTES:
1) ALL CONDUIT TO BE U.L. LISTED, SCH. 80 UNDER ALL TRAVEL WAYS, & SCH. 40 FOR THE REMAINDER.
2) NORMAL CONDUIT SIZES FOR CMP ARE 3 INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4 INCH FOR THREE PHASE SECONDARY, AND 5 INCH FOR THREE PHASE PRIMARY.
3) ALL WORK TO CONFORM TO THE NATIONAL ELECTRICAL CODE (LATEST REVISION)
4) INSTALL A 200# PULL ROPE FOR EACH CONDUIT
5) VERIFY ALL CONDUIT SPECIFICATIONS WITH UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION.

TYPICAL UNDERGROUND UTILITY TRENCH DETAIL

NTS

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

SITE DETAILS

STATE OF NEW HAMPSHIRE - PROFESSIONAL ENGINEER - DREW JOHN OLEHOWSKI No. 18518 LICENSED
02/13/2026

DATE	SCALE
2025.12.22	NTS

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

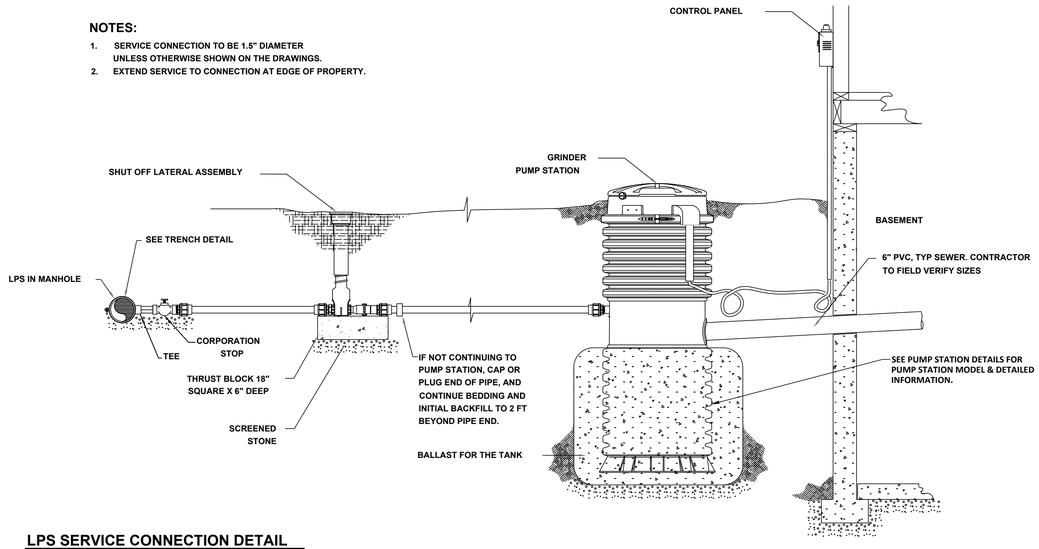
PROJECT No. 5010314.002

DRAWING No. **C502** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002-C-SP.DWG, 2026.02.13, 1:13 PM

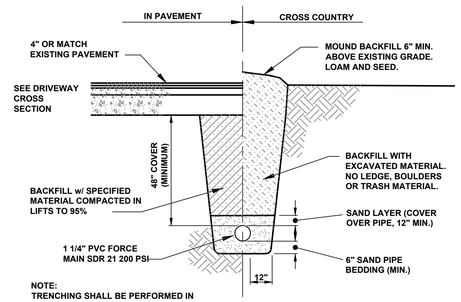
NOTES:

1. SERVICE CONNECTION TO BE 1.5" DIAMETER UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
2. EXTEND SERVICE TO CONNECTION AT EDGE OF PROPERTY.



LPS SERVICE CONNECTION DETAIL

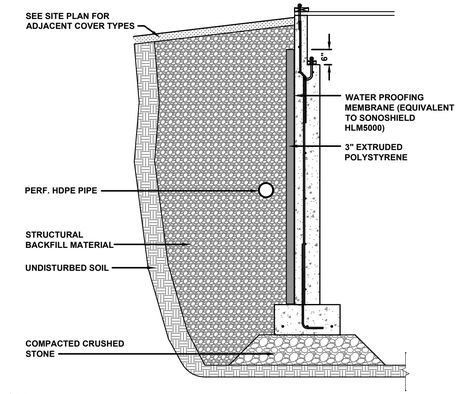
NTS



NOTE:
TRENCHING SHALL BE PERFORMED IN ACCORDANCE WITH STATE OF N.H. STANDARDS FOR SEWER CONSTRUCTION.

FORCE MAIN TRENCH DETAIL

NTS



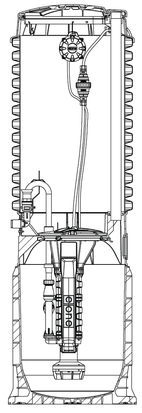
NOTE:
FINAL FOUNDATION WATERPROOFING SCHEME TO BE DETERMINED BY CONTRACTOR.

TYPICAL BASEMENT WALL BACKFILL & DRAINAGE DETAIL

NTS

E/ONE EXTREME SERIES

DH071



General Features

The model DH071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 is a popular choice for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 has a cable that connects the motor controls to the level controls through watertight penetrations.

Operational Information

Motor
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections
4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections
Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

E/One requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

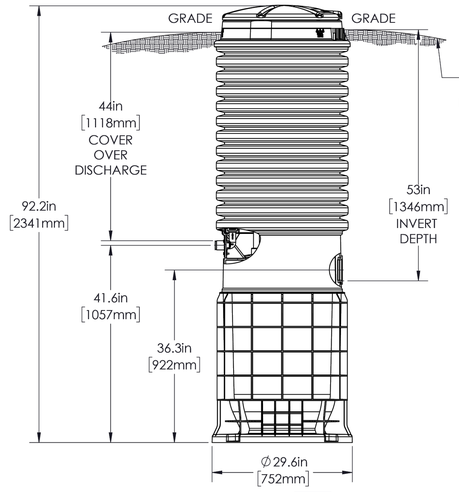
Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

NA0050P01 Rev E

NA0050P06

DH071-93



NOTE: DIMENSIONS ARE FOR REF ONLY

CONCRETE BALLAST NOT REQUIRED

DISCHARGE: 1-1/4in FEMALE PIPE THREAD

INLET: EPDM GROMMET FOR 4in DWV PIPE (STANDARD)

BK	JG	10/13/2023	D	1:16
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

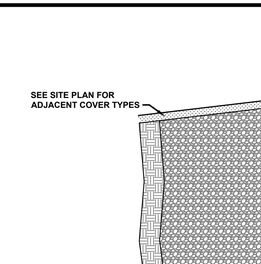
MODEL DH071-93
CUT SHEET

NA0050P06

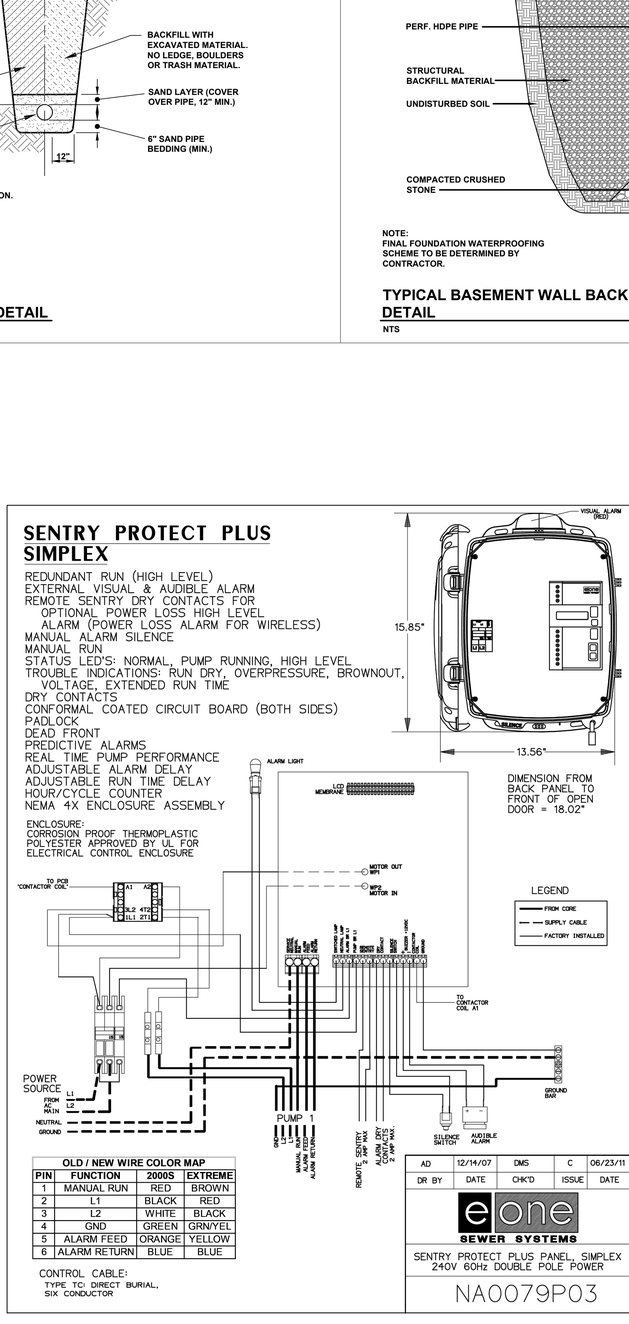
SENTRY PROTECT PLUS SIMPLEX

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
REMOTE SENTRY DRY CONTACTS FOR
OPTIONAL POWER LOSS HIGH LEVEL
ALARM (POWER LOSS ALARM FOR WIRELESS)
MANUAL ALARM SILENCE
MANUAL RUN
STATUS LED'S: NORMAL, PUMP RUNNING, HIGH LEVEL
TROUBLE INDICATIONS: RUN DRY, OVERPRESSURE, BROWNOUT, VOLTAGE, EXTENDED RUN TIME
DRY CONTACTS
CONFORMAL COATED CIRCUIT BOARD (BOTH SIDES)
PADLOCK
DEAD FRONT
PREDICTIVE ALARMS
REAL TIME PUMP PERFORMANCE
ADJUSTABLE ALARM DELAY
ADJUSTABLE RUN TIME DELAY
HOUR/CYCLE COUNTER
NEMA 4X ENCLOSURE ASSEMBLY

ENCLOSURE:
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE



DIMENSION FROM BACK PANEL TO FRONT OF OPEN DOOR = 18.02"



OLD / NEW WIRE COLOR MAP			
PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL, SIX CONDUCTOR

AD	12/14/07	DMS	C	06/23/11
DR BY	DATE	CHK'D	ISSUE	DATE

e/one SEWER SYSTEMS

SENTRY PROTECT PLUS PANEL, SIMPLEX
240V 60Hz DOUBLE POLE POWER

NA0079P03

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

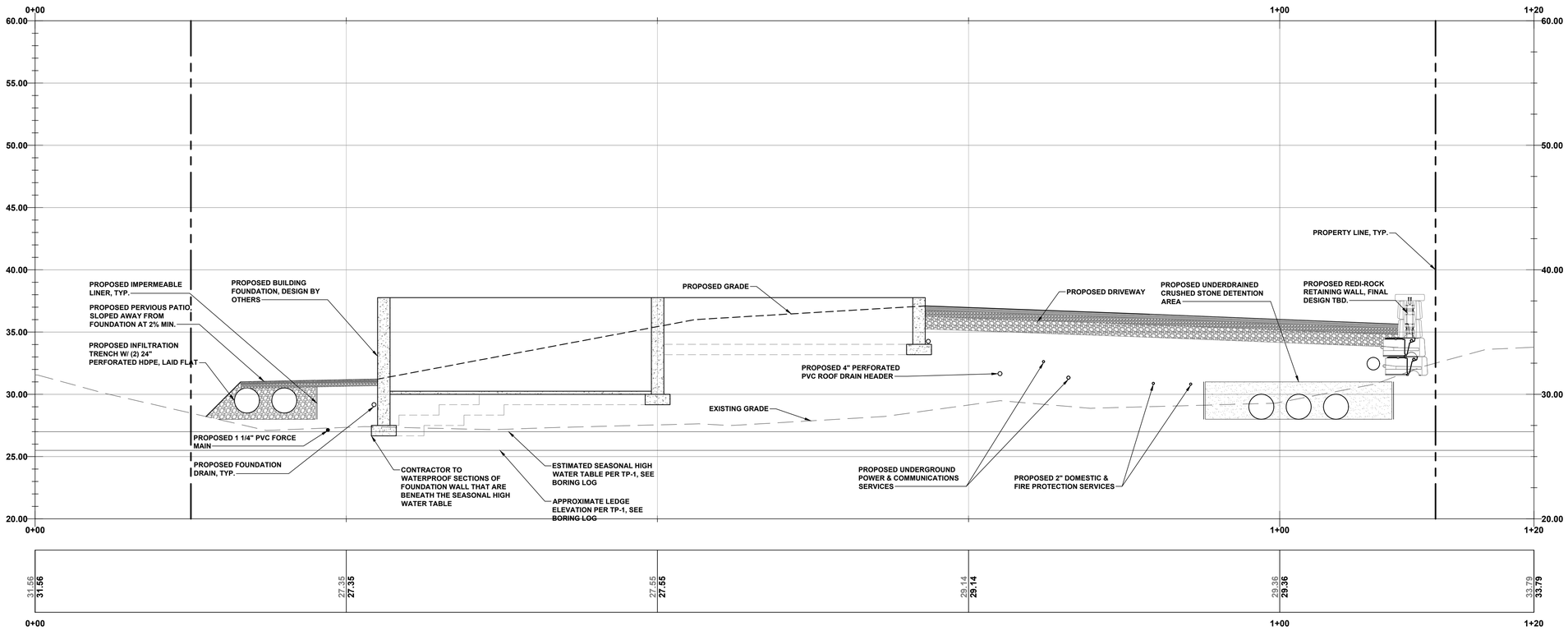
TITLE

SITE DETAILS

STATE OF NEW HAMPSHIRE · DREW JOHN OLEHOWSKI · No. 18516 · LICENSED PROFESSIONAL ENGINEER · 02/13/2026

DATE	SCALE
2025.12.22	NTS
DRAWN BY: BLQ/PJM	DESIGNED BY: BLQ/PJM	CHECKED BY: DJO
PROJECT No.	5010314.002	
DRAWING No.	C503	REV. 2

FILE LOCATION P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002-C-SP.DWG, 2026.02.13, 1:14 PM



PROFILE VIEW OF CROSS SECTION A - STA 0+00 TO 1+20

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

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HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

SITE DETAILS

STATE OF NEW HAMPSHIRE - DREW JOHN OLEHOWSKI No. 18516 LICENSED PROFESSIONAL ENGINEER
02/13/2026

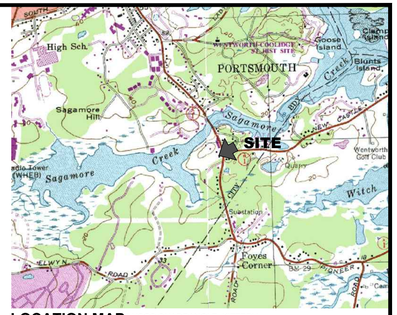
DATE	SCALE
2025.12.22	NTS

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C504** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002-C-SP.DWG, 2026.02.13, 1:14 PM



LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
MAPTECH® USGS TOPOGRAPHIC SERIES™, ©MAPTECH®, INC. 978-933-3000
WWW.MAPTECH.COM/TOPO

PRE LEGEND:

	PROPERTY LINE
	WATERSHED BOUNDARY LINE
1	WATERSHED DESIGNATION
	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
PF	PIPE FLOW

GRAPHIC SCALE
30 0 15 30 60 90
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS
ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT
1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE
PRE-DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE
DREW JOHN OLEHOWSKI
No. 18516
LICENSED PROFESSIONAL ENGINEER
02/13/2026

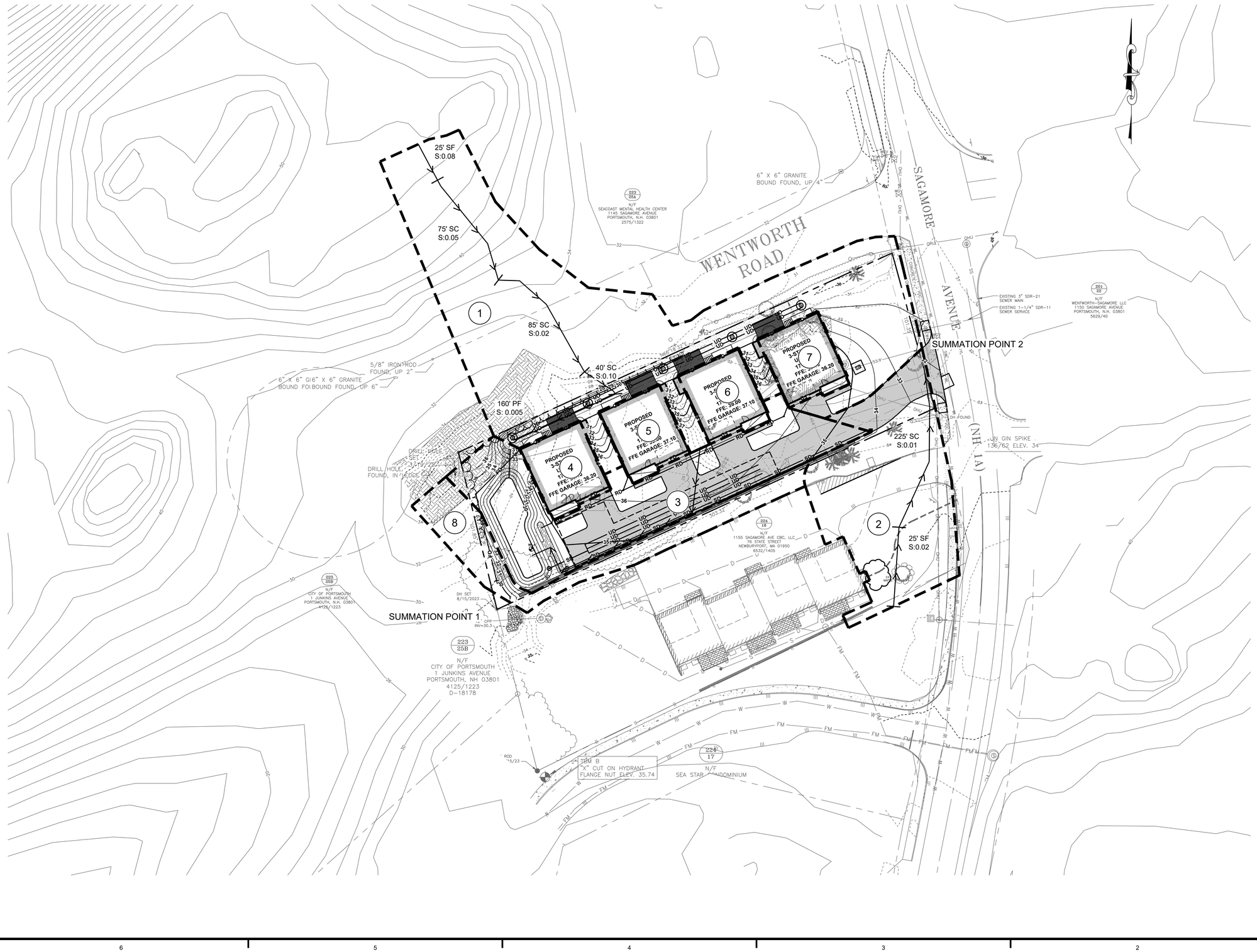
DATE	SCALE
2025.12.22	1"=30'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C701** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314-002-C-HY.DWG, 2026.02.13, 1:14 PM



LOCATION MAP: USGS QUADRANGLE: KITTERY
SCALE: 1"=2000'
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WWW.MAPTECH.COM/TOPO

POST LEGEND:

	PROPERTY LINE
	WATERSHED BOUNDARY LINE
1	WATERSHED DESIGNATION
	TIME OF CONCENTRATION FLOW PATH
50' SF	FLOW PATH DESCRIPTION
SF	SHEET FLOW
SC	SHALLOW CONCENTRATED FLOW
CF	CHANNEL FLOW
PF	PIPE FLOW

GRAPHIC SCALE

40 0 20 40 80 120

(IN FEET)
1 inch = 40 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
2	2026.02.13	REVISED PER TAC REVIEW COMMENTS	PJM	DJO
1	2026.01.16	REVISED PER TAC REVIEW COMMENTS	PJM	DJO

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE

POST DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE
DREW JOHN OLEHOWSKI
No. 18518
LICENSED
PROFESSIONAL ENGINEER
02/13/2026

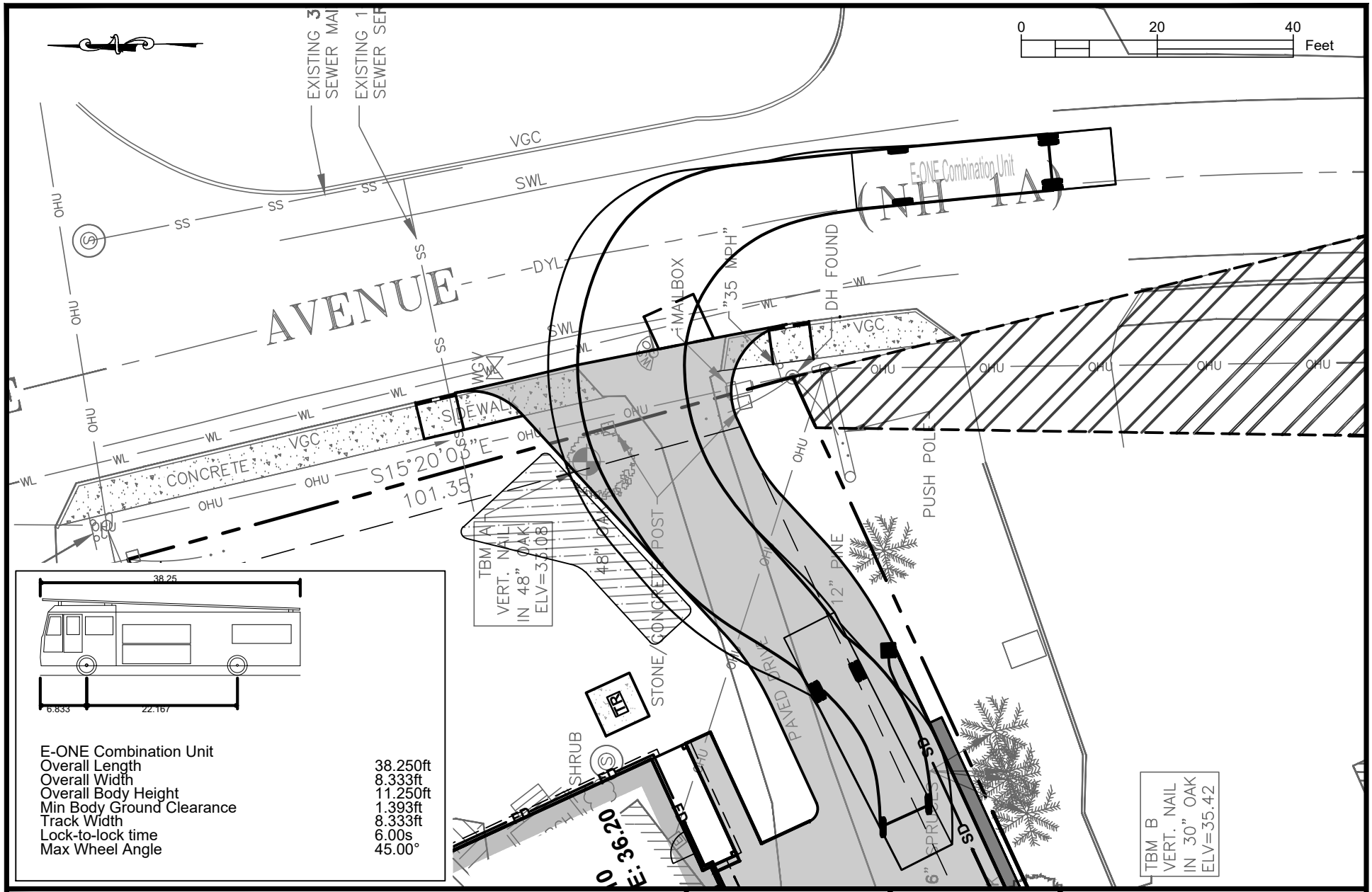
DATE	SCALE
2025.12.22	1"=30'

DRAWN BY	DESIGNED BY	CHECKED BY
BLQ/PJM	BLQ/PJM	DJO

PROJECT No. 5010314.002

DRAWING No. **C702** REV. **2**

FILE LOCATION: P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314-002-C-HYDWG, 2026.02.13, 1:14 PM

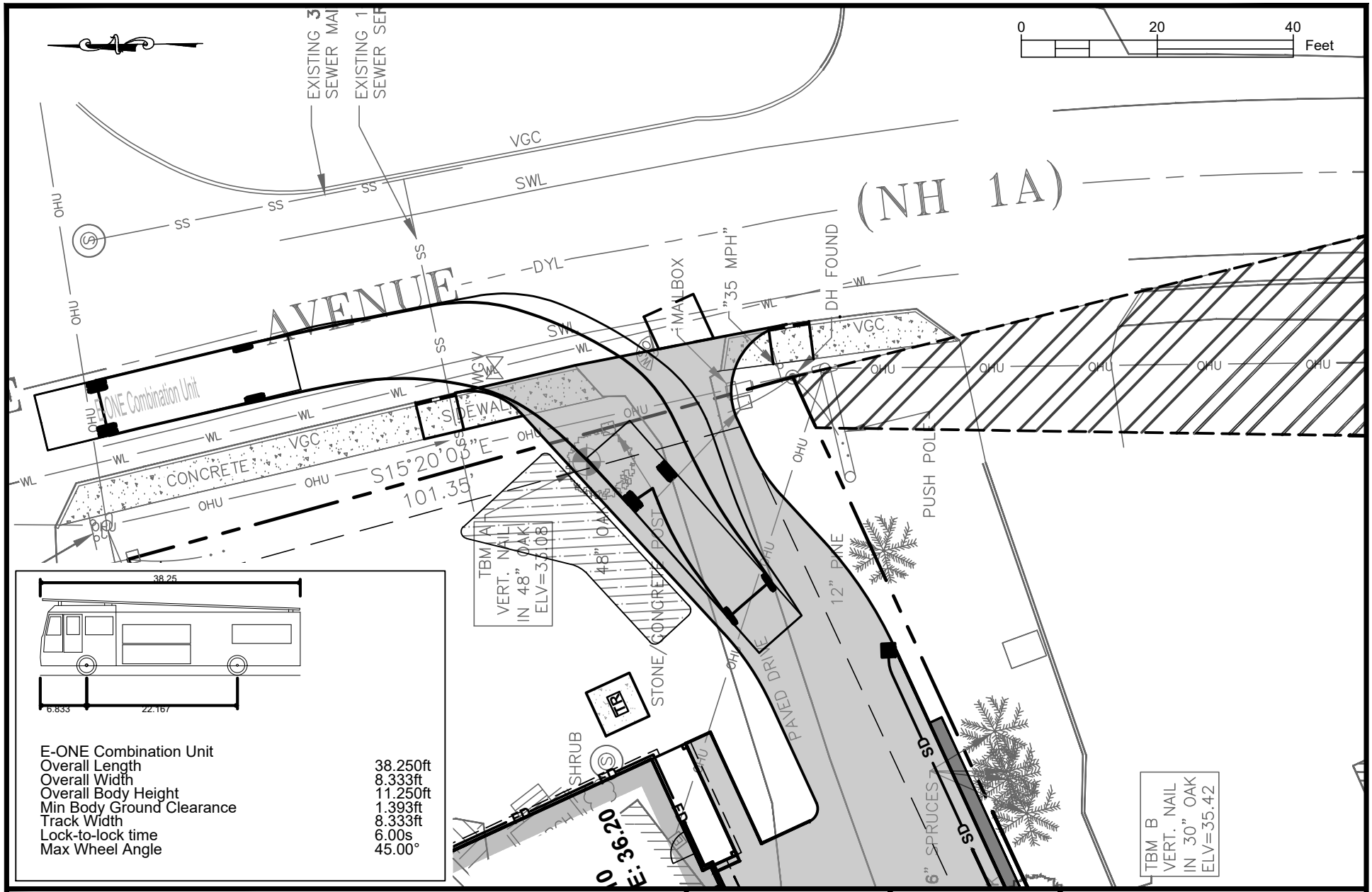


E-ONE Combination Unit	
Overall Length	38.250ft
Overall Width	8.333ft
Overall Body Height	11.250ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

PROJECT	**1151 SAGAMORE AVENUE CBC, LLC** **1151 SAGAMORE AVE., PORTSMOUTH NH**	DWG No.	**TR-1**
TITLE	**TURNING EXHIBIT** **LEFT TURN ENTERING COMPLEX**	JN	5010314.002
		SCALE	1"=20'

BY	PJM
DATE	2025.12.22
REV.	
REV. DATE	

HALEY WARD



E-ONE Combination Unit	
Overall Length	38.250ft
Overall Width	8.333ft
Overall Body Height	11.250ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

PROJECT

1151 SAGAMORE AVENUE CBC, LLC

1151 SAGAMORE AVE., PORTSMOUTH NH

TITLE

TURNING EXHIBIT

RIGHT TURN ENTERING COMPLEX

DWG No. **TR-2**

JN 5010314.002

SCALE 1"=20'

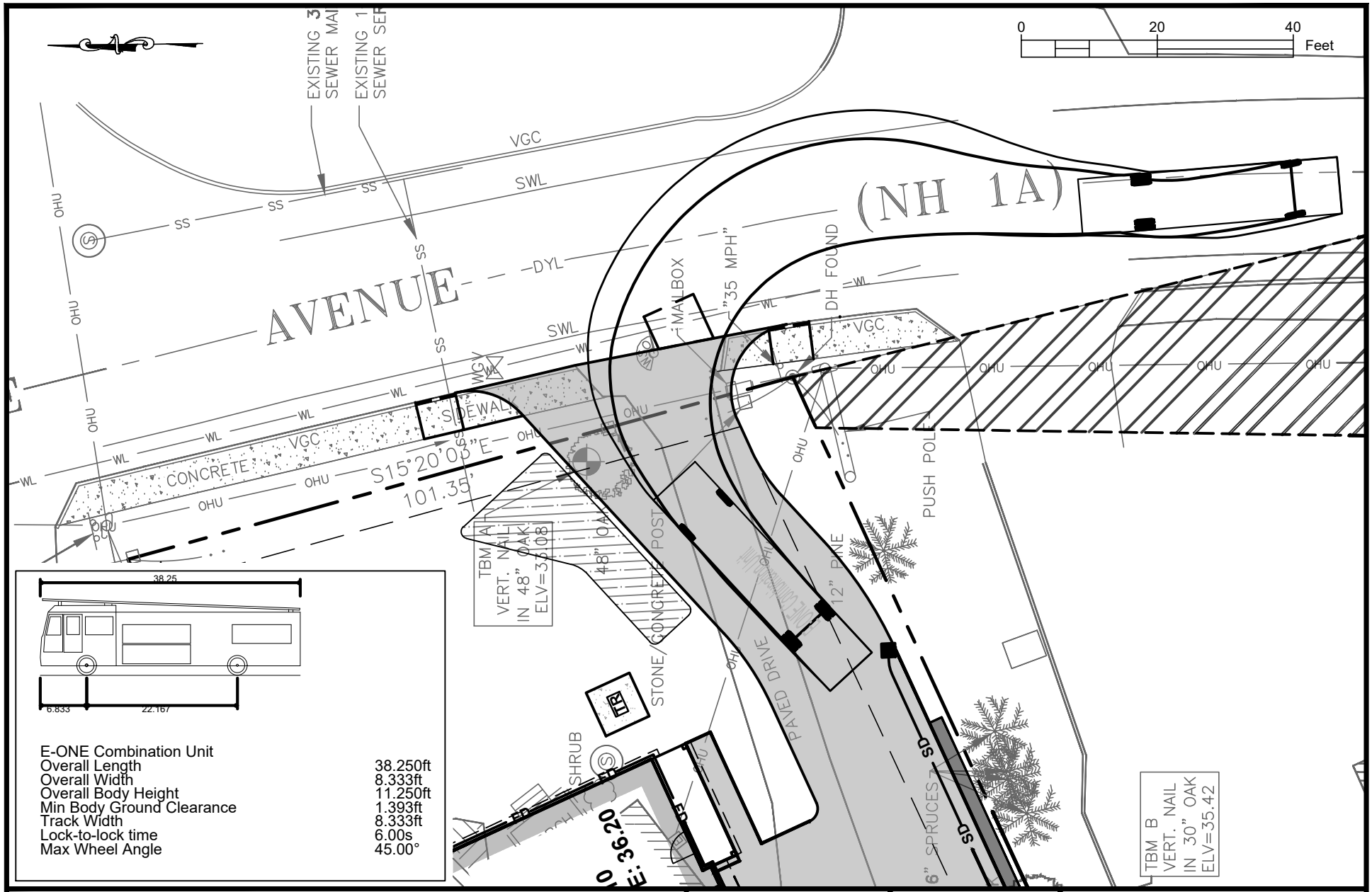
BY PJM

DATE 2025.12.22

REV.

REV. DATE

HALEY WARD



E-ONE Combination Unit	
Overall Length	38.250ft
Overall Width	8.333ft
Overall Body Height	11.250ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

PROJECT

1151 SAGAMORE AVENUE CBC, LLC

1151 SAGAMORE AVE., PORTSMOUTH NH

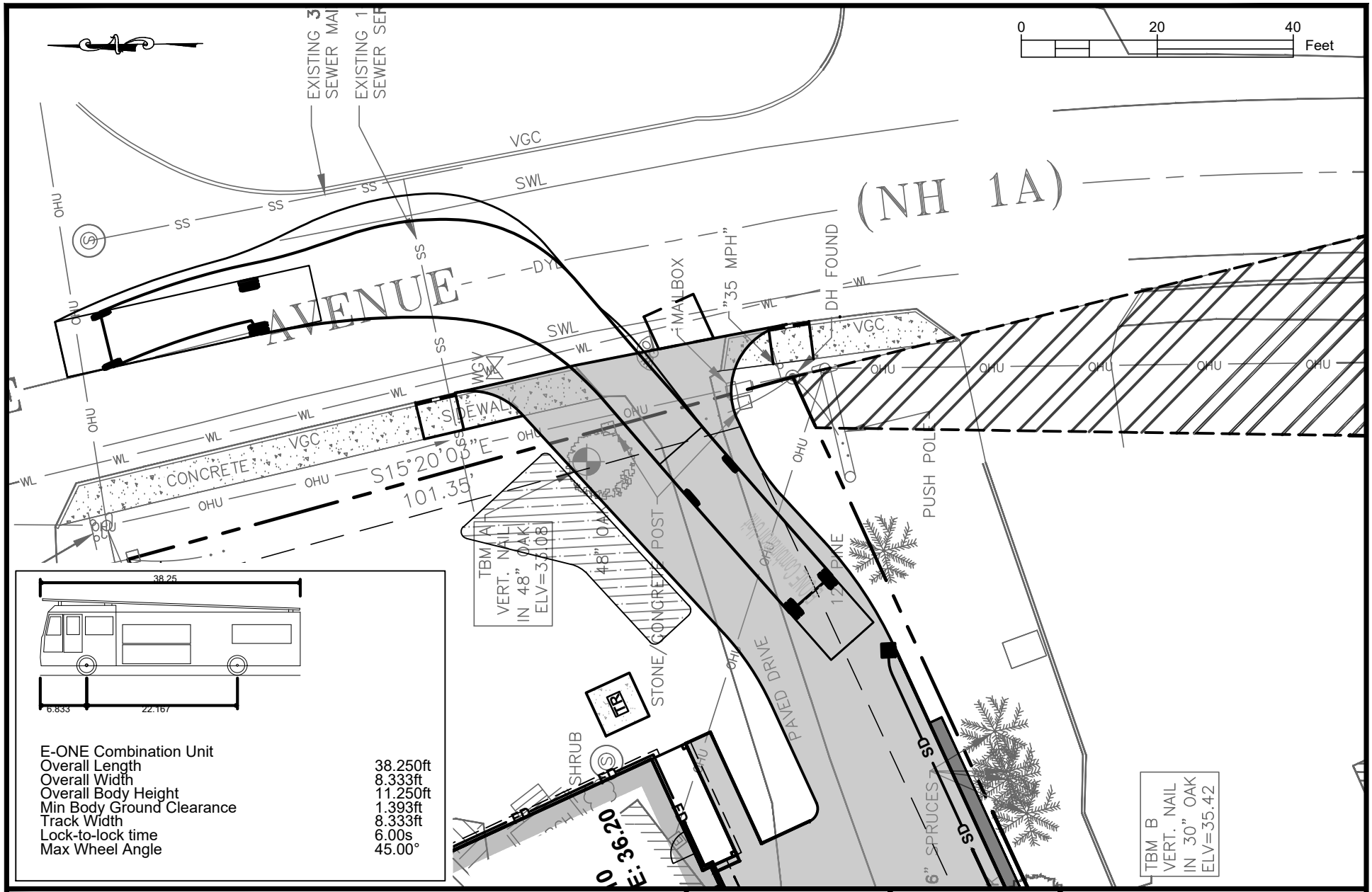
TITLE

TURNING EXHIBIT

RIGHT TURN EXITING COMPLEX

DWG No.	TR-3
JN	5010314.002
SCALE	1"=20'
BY	PJM
DATE	2025.12.22
REV.	
REV. DATE	

HALEY WARD



E-ONE Combination Unit	
Overall Length	38.250ft
Overall Width	8.333ft
Overall Body Height	11.250ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

PROJECT

1151 SAGAMORE AVENUE CBC, LLC

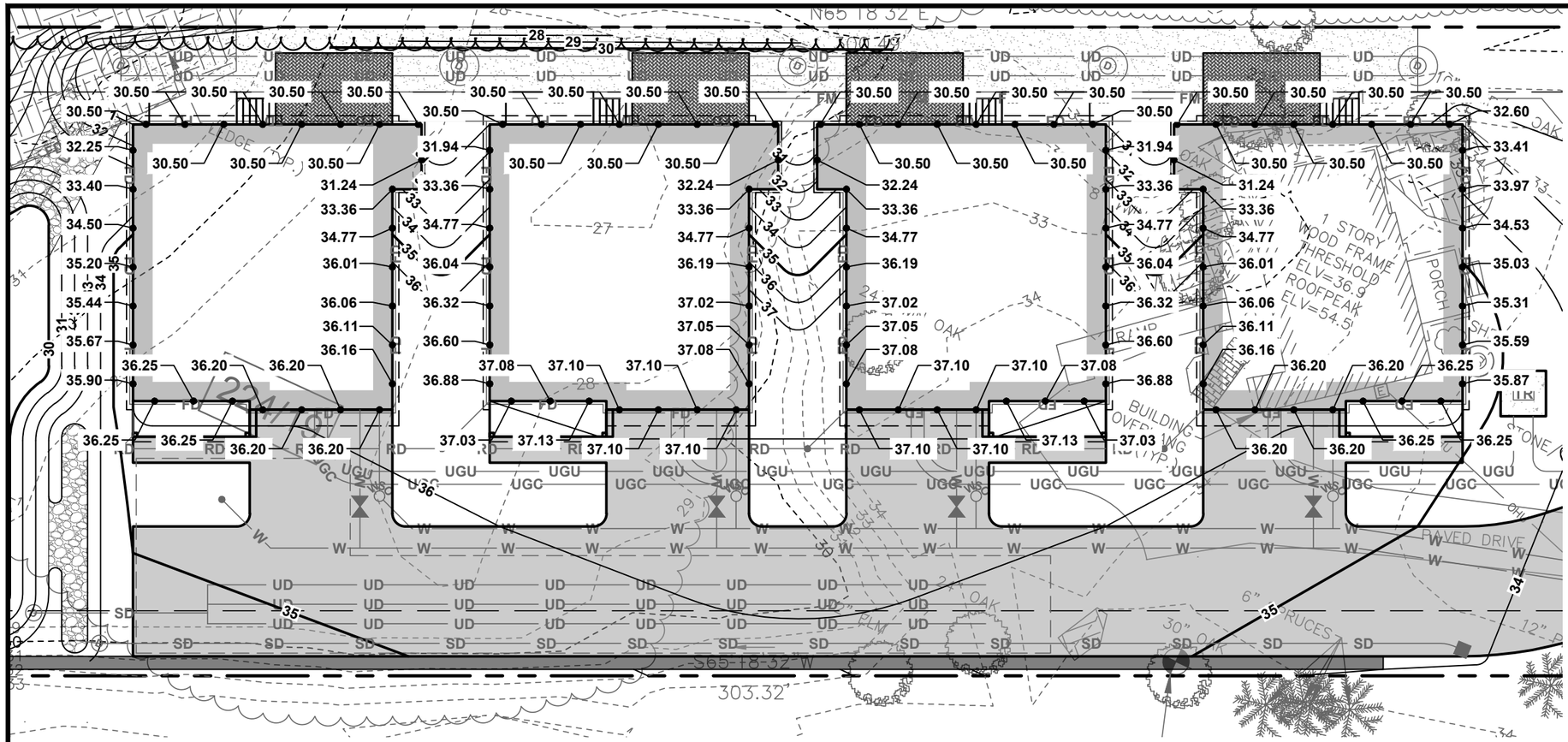
1151 SAGAMORE AVE., PORTSMOUTH NH

TITLE

TURNING EXHIBIT
LEFT TURN EXITING COMPLEX

DWG No.	TR-4
JN	5010314.002
SCALE	1"=20'
BY	PJM
DATE	2025.12.22
REV.	
REV. DATE	

HALEY WARD



AVERAGE GRADE PLANE CALCULATIONS

	NORTH				EAST				SOUTH				WEST				TOTAL AVERAGE GRADE			
	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 1	UNIT 2	UNIT 3	UNIT 4
	30.5	30.5	30.5	30.5	33.41	31.94	32.24	31.24	36.2	37.1	37.1	36.2	31.24	32.24	31.94	32.25	34.16	34.53	34.53	34.04
	30.5	30.5	30.5	30.5	33.97	33.36	33.36	33.36	36.2	37.1	37.1	36.2	33.36	33.36	33.36	33.4				
	30.5	30.5	30.5	30.5	34.53	34.77	34.77	34.77	36.2	37.1	37.1	36.2	34.77	34.77	34.77	34.5				
	30.5	30.5	30.5	30.5	35.03	36.04	36.19	36.01	36.2	37.1	37.1	36.2	36.01	36.19	36.04	35.2				
	30.5	30.5	30.5	30.5	35.31	36.32	37.02	36.06	36.25	37.13	37.13	36.25	36.06	37.02	36.32	35.44				
	30.5	30.5	30.5	30.5	35.59	36.6	37.05	36.11	36.25	37.08	37.08	36.25	36.11	37.05	36.6	35.67				
	32.6	30.5	30.5	30.5	35.87	36.88	37.08	36.16	36.25	37.03	37.03	36.25	36.16	37.08	36.88	35.9				
TOTAL	215.6	213.5	213.5	213.5	243.71	245.91	247.71	243.71	253.55	259.64	259.64	253.55	243.71	247.71	245.91	242.36				
# OF POINTS	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7				
AVERAGE GRADE	30.8	30.5	30.5	30.5	34.82	35.13	35.39	34.82	36.22	37.09	37.09	36.22	34.82	35.39	35.13	34.62				

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

PROJECT
1151 SAGAMORE AVENUE CBC, LLC
1151 SAGAMORE AVE., PORTSMOUTH, NH

TITLE
AVERAGE GRADE PLAN EXHIBIT

DWG No. **EXHIBIT 1**
JN 5010314.002
SCALE 1"=20'

BY \PJM
DATE 2026.02.13
REV.
REV. DATE

DRAWING STATUS
NOT FOR CONSTRUCTION

HALEY WARD

P:\NH\5010314-BUILD_AMERICA\002-1151 SAGAMORE AVE., PORTSMOUTH - PAY\02-CAD_FILES\CIVIL\5010314.002-C-SP.DWG

Plant List - Trees and Shrubs

ID	Qty	Botanical Name	Common Name	Scheduled Size	Mature Height	Mature Width	Growth Habit	Tolerances	Requirements
ARB	5	Acer rubrum 'Bowhall'	Bowhall Maple	3" Cal.	40-60'	10-15'	Upright, Broadly Columnar	Urban, Wet Soil	Full, partial sun. Moist, well drained soils.
GTH	1	Gleditsia triacanthos inermis 'Halka'	Halka Honeylocust	2" Cal.	30-40'	30-40'	Rounded	Urban, Salt, Drought, Wind, Heat	Full sun. Moist, well drained soils.
JBD	121	Juniperus communis depressa 'Blueberry Delight'	Blueberry Delight Juniper	2 Gal.	18-24"	4-5'	Spreading	Drought, Deer, Urban, Salt	Full, partial sun. Average, well drained soil.
PGD	3	Picea glauca 'Densata'	Black Hills Spruce	7-8' Ht.	20-30'	15-20'	Pyramidal	Drought, Deer, Wind	Full sun. Moist, well drained soils.
QB	1	Quercus bicolor	Swamp White Oak	3" Cal.	40-60'	40-60'	Broad	Drought, Moist Soil, Urban	Full sun, large space. Medium to wet, acidic soil.
RGL	47	Rhus aromatica 'Grow Low'	Grow Low Sumac	18-24"	18-24"	6-8'	Spreading	Drought, Urban, Salt	Full, partial sun. Dry to average, well drained soil.
TOS	5	Thuja occidentalis 'Smaragd'	American Arborvitae	7-8' Ht.	15-20'	5-6'	Upright, Pyramidal	Urban, Moist Soil	Full, partial sun. Average, well drained soil.
VBM	5	Viburnum dentatum 'Blue Muffin®'	Blue Muffin® Viburnum	3-4' Ht.	6-8'	4-5'	Compact	Deer, Moist Soil, Drought, Salt., Urban	Full, partial sun. Average, well drained soil.

Plant List - Perennials

ID	Qty	Botanical Name	Common Name	Scheduled Size	Mature Height	Mature Width	Growth Habit	Tolerances	Requirements
BAP	14	Baptisia australis	False Indigo	1 Gal.	36"	36"	Bushy	Salt, Drought, Urban	Sun, partial shade. Average soil.
PVS	19	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.	36"	30-48"	Clump	Drought, Wet soil, Urban, Salt	Sun, partial shade. Average to moist soil.

ERNST SEEDS

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Date: November 06, 2025

Rain Garden Grass Mix - ERNMX-180-1

	Botanical Name	Common Name
40.30 %	*Schizachyrium scoparium, Fort Indiantown Gap-PA Ecotype*	Little Bluestem, Fort Indiantown Gap-PA Ecotype
20.00 %	*Elymus virginicus, Madison-NY Ecotype*	Virginia Wildrye, Madison-NY Ecotype
17.80 %	*Carex vulpinoidea, PA Ecotype*	Fox Sedge, PA Ecotype
9.00 %	*Panicum clandestinum, Tioga*	Deertongue, Tioga
6.00 %	*Chasmanthium latifolium, WV Ecotype*	River Oats, WV Ecotype
5.50 %	*Panicum rigidulum, PA Ecotype*	Redtop Panicgrass, PA F
0.70 %	*Juncus effusus*	Soft Rush
0.70 %	*Juncus tenuis, PA Ecotype*	Path Rush, PA Ecoty;

100.00 % **Mix Price/Lb Bulk: $28.84**

Seeding Rate: 15 lb per acre with a cover crop. For sites that drain within 24 hours of a rain event use one of the following cover crops:Oats (1 Jan to 31 Jul; 30 lbs/acre), Japanese Millet (1 May to 31 Aug; 10 lbs/acre), or grain rye (1 Aug to 31 Dec; 30 lbs/acre).

Grasses & Grass-like Species - Herbaceous Perennial; Stormwater Management

Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

ERNST SEEDS

Ernst Conservation Seeds
8884 Mercer Pike
Meadville, PA 16335
(800) 873-3321 Fax (814) 336-5191
www.ernstseed.com

Date: November 07, 2025

Conservation Shade Mix - ERNMX-129

	Botanical Name	Common Name
30.00 %	*Festuca rubra*	Creeping Red Fescue
30.00 %	*Festuca rubra ssp. commutata*	Chewings Fescue
20.00 %	*Lolium multiflorum*	Annual Ryegrass
10.00 %	*Poa pratensis, 'Baron'*	Kentucky Bluegrass, 'Baron'
10.00 %	*Poa trivialis*	Rough Bluegrass

100.00 %

Seeding Rate: 100-200 lb per acre, or 3-5 lb per 1,000 sq ft

Grasses & Grass-like Species - Herbaceous Perennial; Lawn & Turfgrass Sites

While designed for deep-shaded areas, this mix requires at least 2 hours of sunlight daily. The fescues and bluegrasses are shade tolerant and blend very well together. Mix formulations are subject to change without notice depending on the availability of existing and new products. While the formula may change, the guiding philosophy and function of the mix will not.

terra *firma*
landscape architecture
163.a Court Street Portsmouth, NH 03801
603.531.9109 | terrence@terrafirmalandarch.com

Build America
1151 Sagamore Ave.
Portsmouth, NH

Project Title

TERRENCE PARKER
NEW HAMPSHIRE
00254
LICENSED LANDSCAPE ARCHITECT

Landscape Architect
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

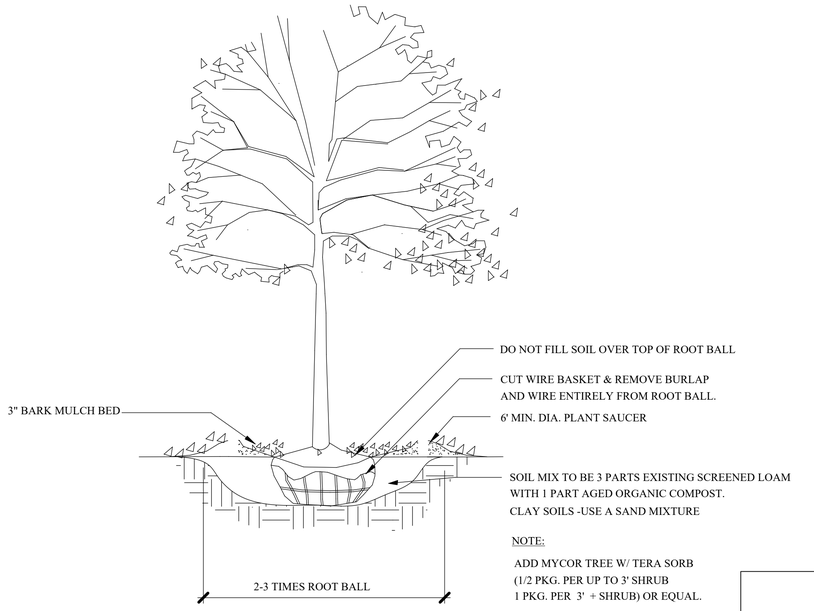
Consultant

REV.	DATE	DESCRIPTION
C	2/11/2026	CIVIL PLAN UPDATES
B	12/19/2025	
A	12/5/2025	Patio, Walkway, and Window Well Adjustments
NO.	DATE	ISSUE NOTE

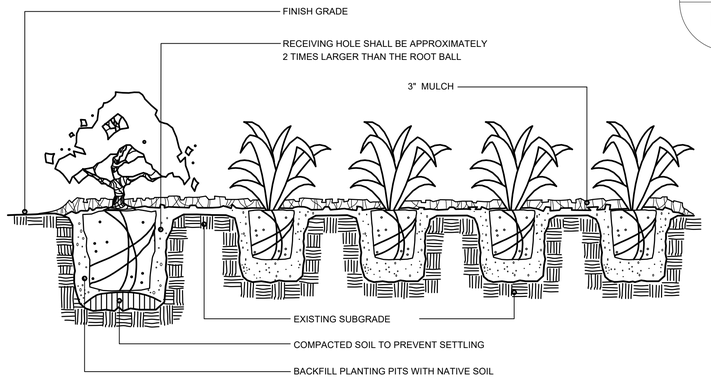
Project Manager
Drawn By: TC
Date: November 2025
Reviewed By: TP
Project ID: 1151 Sagamore

Sheet Title: Landscape Plan

Sheet No.: L-1

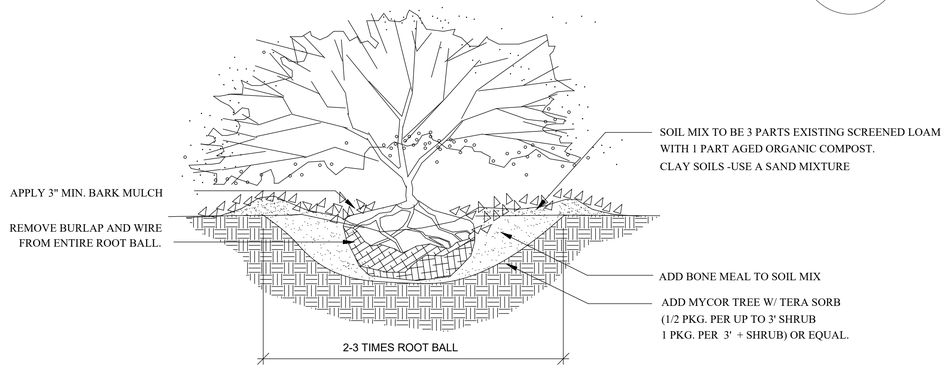


1 / L-5 TREE PLANTING - 2"+ CAL.
SCALE: NTS

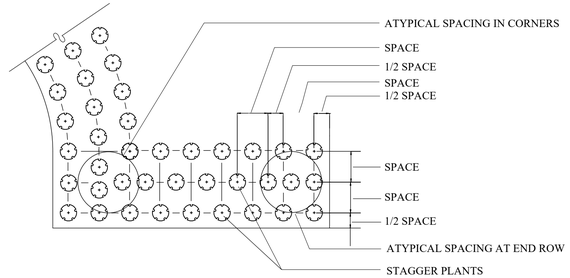


NOTE: SHRUBS SHALL BE PLANTED A MINIMUM OF 1" & NO MORE THAN 2" ABOVE FINISH GRADE, DEPENDING UPON SITE CONDITIONS.

3 / L-5 SHRUB/GROUND COVER PLANTING DETAIL
SCALE: NTS



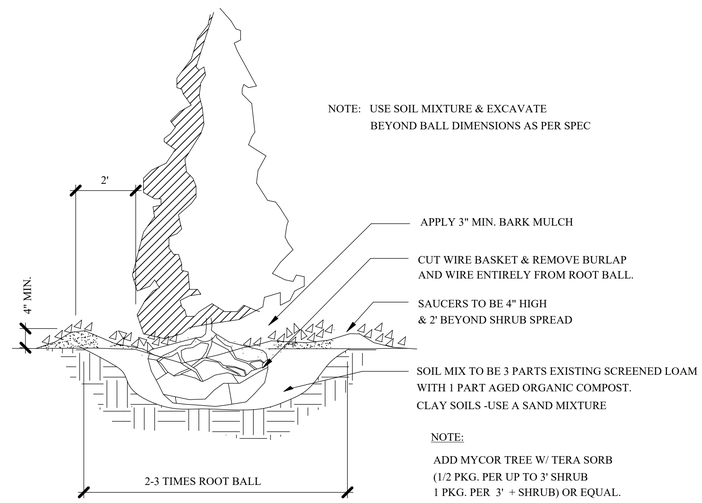
4 / L-5 B&B SHRUB PLANTING
SCALE: NTS



NOTES:

1. PLACE PLANTS IN BED AS SHOWN, SPACING AS SPECIFIED IN PLANT SCHEDULE.
2. GROUNDCOVER SHALL BE TRIANGULAR SPACED IN ROWS PARALLEL TO STRAIGHT EDGES AND SHALL BE EVENLY SPACED IN ROWS PARALLEL TO CURVE EDGES.

5 / L-5 GROUND COVER SPACING DETAIL
SCALE: NTS



2 / L-5 PYRAMIDAL EVERGREEN TREE PLANTING
SCALE: NTS

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 2" LAYER OF SHREDDED PINE BARK MULCH.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.

terra firma
landscape architecture
163.a Court Street Portsmouth, NH 03801
603.531.9109 | terrence@terrafirmalandarch.com

Build America

1151 Sagamore Ave.
Portsmouth, NH

Project Title

Landscape Architect
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

REV.	DATE	DESCRIPTION
C	2/11/2026	CIVIL PLAN UPDATES

NO.	DATE	ISSUE NOTE

Project Manager
Drawn By: TC
Date: November 2025
Reviewed By: TP
Project ID: 1151 Sagamore

Sheet Title
Landscape Details

Sheet No.
L-2

HALEY WARD

200 Griffin Road, Unit 14, Portsmouth, NH 03801
Phone (603) 430-9282

13 February, 2026

Peter Stith, TAC Committee Chair
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

RE: Request for Approval Extension, Conditional Use Permit and Site Plan Approval at 581 Lafayette Road; Mixed Use Development; Tax Map 229 Lot 8B

Dear Mr. Stith and TAC Members:

On behalf of Atlas Common, LLC (Owner) we submit a request for a second one-year extension of the May 16, 2024 approval under Section 2.14 of the Site Plan Review Regulations. The project consists of additional residential units at 581 Lafayette Road with two new building additions, with the associated and required site improvements. This request is to extend the approval to May 16, 2027. Atlas Commons, LLC, received Site Plan & CUP approval from the Planning Board on May 16, 2024 and received a one-year extension on March 20, 2025, to construct an addition of two new buildings that includes 72 apartments (including 20% of the units as Workforce Housing) located at 581 Lafayette Road and in accordance with the Land Use Record LU-23-189.

Due to the complexity of this project and the extensive design of community improvements to build a pedestrian connection to the High School and the difficulty with obtaining financing for a project that has a 20% Workforce Housing component, we need additional time and respectfully request another one-year extension of the Site Plan & CUP Approval.

Site Plan Submission

The attached plans represent the progress since the Planning Board approval. The design team has been working on final Architectural Plans and coordination with the approved site plans. The following represents the changes to the plans since the approval.

The following sheets were amended for the "Documents Permit Set 6/30/2025" to remove the encroachment onto the New Hampshire Department of Transportation Right of Way.

1. Community Space and Easement Plan
2. C1 Existing Conditions Plan
3. C2 Demolition Plan, C3 Site Plan
4. LT1 Lighting Plan
5. C5 Uility Plan
6. C6 Grading a Drainage Erosion Control Plan
7. C7 Open Space Plan

8. C8 On-Site Community Space Plan
9. C8.1 Off-Site Landscape Maintenance Area
10. T1 Fire Truck Turning Plan
11. T2 Delivery Truck Turning Plan

The Plan set has had the following edits, based on each Sheet with the change listed:

1. **Cover Sheet:** Removed "Site Permit Plans" Title and replaced with "Documents Permit Set"
2. **Community Space & Easement Plan:** No Change
3. **C1 Existing Conditions Plan:** No Change
4. **C2 Demolition Plan:** No Change
5. **C3 Site Plan:** No Change
6. **Removed:** Community Space Landscape Architecture Plans L-1A, L-1B, L-2, L-3
7. **Removed:** Basement and Level One Parking Plans C4
8. **LT1 Lighting Plan:**
9. **C5 Utility Plan:** Relocated Fire Hydrant and Electrical Transformer. This was necessary as the NHDOT ROW altered parking configuration and available space for utilities.
10. **C6 Grading Drainage Erosion Control Plan:** Grading around perimeter of both proposed buildings were raised. This was necessary as the Structural Engineer required taller structural members for the first level parking garage. No change to Drainage Structures.
11. **C7 Open Space Plan:** Open Space Calculation Table Square Feet pavement 31,409 to 30,757; Total 77,824 to 77,172. Lot Coverage 79.3% to 78.6%; Open Space 20.6% to 21.4%
12. **C8 On-Site Community Space Plan:** No Change
13. **C8.1 Off-Site Landscape Maintenance Area:** Off-Site Landscape Maintenance Area table updated square footage. Lafayette Park 7,749 to 8,935; Ledgewood park unchanged
14. **T1 Fire Truck Turning Plan:** No Change
15. **T2 Delivery Truck Turning Plan:** No Change

There were no significant changes to the Ordinance that would impact this development, other than the revision to the maximum required parking of 1 space per unit. The previous approval had 23 units requiring 1.3 spaces; therefore, a reduction of 6 parking spaces could be expected.

Public Realm Improvements

The design team worked with the Trees and Greenery Committee, as well as the School and Recreation Departments to finalize the location of the path, and worked to obtain a NHDES Wetland permit for the minor wetland impact. The DES approval, and the Final Plans, are attached to this submission.

Approval Requested

We hereby request that the Technical Advisory Committee grant the second one-year extension request, without the Public Hearing requirement.

Sincerely,

John Chagnon, PE; Ambit Engineering – Haley Ward

P:\NH\5010156-McNabb_Properties\1397.03-Lafayette Rd., Portsmouth-JRC\2023 Site Plan 1397.03\Applications\Portsmouth Site Plan\581 Lafayette TAC Request for Extension 2-12-26.doc

CITY OF PORTSMOUTH
Planning & Sustainability
Department
1 Junkins Avenue
Portsmouth, New
Hampshire 03801
(603) 610-7216

PLANNING BOARD

May 23, 2024

Atlas Commons, LLC
3 Pleasant Street, Suite 400
Portsmouth, New Hampshire 03801

RE: Site Plan Review & CUP Approval for property located at 581 Lafayette Road (LU-23-189)

Dear Property Owner:

The Planning Board, at its regularly scheduled meeting of **Thursday, May 16, 2024** , considered your application for Site Plan review approval for two 4-story additions to the existing building that will total 72 residential units with associated site improvements including lighting, utilities, landscaping, and stormwater treatment/management and a Conditional Use Permit from Section 10.5B72 for increased density, building height and footprint Said property is shown on Assessor Map 229 Lot 8B and lies within the Gateway Corridor (G1) District. As a result of said consideration, the Board voted 1) to find that the Conditional Use Permit application meets the criteria set forth in Section 10.5B11 and 10.5B73 and to adopt the findings of fact as presented; *and* 2) to grant modifications of standards from Section 10.5B22.40 Special Setback Requirements on Lafayette Road, Section 10.5B73.20 to allow the public realm improvements to be located in a different zoning district, Section 10.5B34.80 to allow a building with 72 units, Section 10.5B41.80 to allow 7.6% community space where 10% is required, and to allow a building footprint of 42,434 square feet where 24,000 is allowed; *and* 3) to **grant** the Conditional Use Permit with the following **condition**:

3.1) Prior to the issuance of a Certificate of Occupancy, the applicant will revise the design of the public realm improvements to a form satisfactory to the Superintendent and City Manager.

Site Plan Approval

1) The Board voted to find that the Site Plan Application meets the requirements set forth in the Site Plan Regulations Section 2.9 Evaluation Criteria and adopt the findings of fact as presented; *and* 2) to **grant** Site Plan approval with the following **conditions**:

Conditions to be satisfied subsequent to final approval of site plan but prior to the issuance of a building permit or the commencement of any site work or construction activity:

2.1) The site plan and any easement plans and deeds shall be recorded at the Registry of Deeds by the City or as deemed appropriate by the Planning Department.

2.2) The applicant shall agree to pay for the services of an oversight engineer, to be selected by the City, to monitor the construction of improvements within the public rights-of-way and on site.

2.3) Any site development (new or redevelopment) resulting in 15,000 square feet or greater ground disturbance will require the submittal of a Land Use Development Tracking Form through the Pollutant Tracking and Accounting Program (PTAP) online portal. For more information visit: https://www.cityofportsmouth.com/publicworks/stormwater/ptap

2.4) A recordable landscape license revocable by the City. The Applicant with provide and maintain adequate evidence of insurance for the maintenance of City property, including the City as additional insured. The amount and form of such insurance shall be set by the Public Works Director and the City Attorney.

2.5) Final site plan set shall be updated to show revised parking layout.

2.6) The public realm improvements shall include appropriate lighting if approved by the Superintendent and City Manager.

Conditions to be satisfied subsequent to final approval of site plan but prior to the issuance of a certificate of occupancy and release of the surety:

2.7) The Engineer of Record shall submit a written report (with photographs and engineer stamp) certifying that the stormwater infrastructure was constructed to the approved plans and specifications and will meet the design performance.

2.8) A stormwater inspection and maintenance report shall be completed annually and copies shall be submitted for review to the City's Stormwater Division/ Public Works Department.

The Board's decision may be appealed up to thirty (30) days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning Department for more details about the appeals process.

This site plan approval shall not be effective until a site plan review agreement has been signed satisfying the requirements of Section 2.12 of the City's Site Review Approval Regulations.

Unless otherwise indicated above, applicant is responsible for applying for and securing a building permit from the Inspection Department prior to starting any project work.

The Planning & Sustainability Director must certify that all outstanding conditions of approval have been completed prior to issuance of a building permit unless otherwise indicated above.

This site plan approval shall expire unless a building permit is issued within a period of one (1) year from the date granted by the Planning Board unless an extension is granted by the Planning Board in accordance with Section 2.14 of the Site Review Regulations.

The Findings of Fact associated with this decision are available: attached here or as an attachment in the Viewpoint project record associated with this application and on the Planning Board Meeting website:

https://www.cityofportsmouth.com/planportsmouth/planning-board/planning-board-archived-meetings-and-material

The minutes and audio recording of this meeting are available by contacting the Planning & Sustainability Department.

Very truly yours,

Rick Chellman, Chairman of the Planning Board

cc: Shanti Wolph, Chief Building Inspector
Rosann Maurice-Lentz, City Assessor

Peter H. Rice, Director of Public Works
Francis X. Bruton, Esq; Bruton & Berube, PLLC
John Chagnon; Ambit Engineering, INC.

CITY OF PORTSMOUTH
Planning & Sustainability
Department
1 Junkins Avenue
Portsmouth, New Hampshire
03801
(603) 610-7216

PLANNING BOARD

April 4, 2025

Atlas Commons, LLC
3 Pleasant Street, Suite 400
Portsmouth, New Hampshire 03801

RE: Site Plan & CUP extension requests for property located at 581 Lafayette Road (LU-23-189)

Dear Property Owner:

The Planning Board, at its meeting of Thursday, March 20, 2025, considered your request for a 1-Year extension to the May 16, 2024 Conditional Use Permit and Site Plan approvals.

As a result of said consideration, the Board voted **grant** a one-year extension to the Planning Board Approval of the Site Plan and Conditional Use Permit to **May 16, 2026.**

The Board's decision may be appealed up to thirty (30) days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning & Sustainability Department for more details about the appeals process.

The minutes and audio recording of this meeting are available by contacting the Planning & Sustainability Department.

Very truly yours,

Rick Chellman, Chairman of the Planning Board

cc: Shanti Wolph, Chief Building Inspector
Rosann Maurice-Lentz, City Assessor
Francis X. Bruton, Esq; Bruton & Berube, PLLC
John Chagnon; Ambit Engineering, INC.

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

May 27, 2025

ATLAS COMMONS LLC
10 PLEASANT STREET SUITE 300
PORTSMOUTH NH 03801

Re: Approved Expedited Minimum Wetlands Permit Application (RSA 482-A)
NHDES File Number: 2025-00630
Subject Property: 581 Lafayette Road, Portsmouth, Tax Map/Block/Lot(s): 229/no block/3

Dear Applicant:

On May 23, 2025, the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau approved the above-referenced Expedited Minimum Wetlands Permit Application. Enclosed please find Wetlands Permit # 2025-00630 to Impact 690 square feet of forested wetland to construct an ADA compliant improved walking/ bike trail for pedestrian traffic. The permittee shall notify the department in writing at least one week prior to commencing any work under this permit and shall file a notice of completion of work and certificate of compliance with the department within 10 working days of completion of the work authorized by this permit.

This permit is not valid unless signed by the permittee and the principal contractor, if any, who will build or install the project. Prior to start of construction, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project**.** It shall remain posted until the project is completed. Transfer of this permit to a new owner shall require notification to, and approval of, the NHDES. **This permit does not convey any property right, nor does it preclude the need to meet any other applicable state, federal, or municipal legal requirements.**

In accordance with RSA 482-A:10, RSA 21-O:14, and Rules Ec-Wet 100-200, **any person aggrieved by this decision may file a Notice of Appeal directly with the NH Wetlands Council (Council) within 30 days of the decision date, May 23, 2025.** Every ground claiming the decision is unlawful or unreasonable must be fully set forth in the Notice of Appeal. Only the grounds set forth in the Notice of Appeal are considered by the Council. Information about the Council, including Council Rules, is available at https://www.nhec.nh.gov/wetlands-council/about. For appeal related issues, contact the Council Appeals Clerk at (603) 271-3650.

This approval is based on the following findings:
1. This project is classified as a minimum impact project in accordance with Env-Wt 517.06(a) as the project proposes impacts less than 3,000 square feet and will have no adverse impacts to a priority resource area.
2. On April 10, 2025, NHDES received comments from the Portsmouth Conservation Commission with concerns regarding "Concern over fill, fill material (porosity), stormwater retention, impacts to surrounding vegetation and proposed trail materials and long-term maintenance within a sensitive area."
3. NHDES finds that the applicants agent, Haley Ward, response to NHDES' request for more information letter received on April 24, 2025 addressed these concerns raised by the Portsmouth Conservation Commission.

If you have any questions, please contact me at Alexander.D.Feuti@des.nh.gov or (603) 271-2917.

Sincerely,

Alexander Feuti
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

Enclosure

Copied: Sam Hayden, Haley Ward
Municipal Clerk/Conservation Commission

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS PERMIT 2025-00630
NOTE CONDITIONS

PERMITTEE:	**ATLAS COMMONS LLC** **10 PLEASANT STREET SUITE 300** **PORTSMOUTH NH 03801**
PROJECT LOCATION:	**581 LAFAYETTE ROAD, PORTSMOUTH** **Tax Map/Block/Lot(s): 229/no block/3**
WATERBODY:	
APPROVAL DATE:	**MAY 23, 2025** **EXPIRATION DATE: MAY 23, 2030**

The New Hampshire Department of Environmental Services' (NHDES) review of permit application 2025-00630 has found that it is consistent with RSA 482-A. NHDES hereby issues this Wetlands Permit authorizing the impacts described provided the Conditions imposed are met. To validate this Permit, the Permittee and the Principal Contractor are required to sign below.

PERMIT DESCRIPTION:
Impact 690 square feet of forested wetland to construct an ADA compliant improved walking/ bike trail for pedestrian traffic.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:

1. In accordance with Env-Wt 307.16 and Env-Wt 324.05(b), all work shall be done in accordance with the approved revised plans dated January 3, 2025 by Ambit Engineering, INC., as received by the NH Department of Environmental Services (NHDES) on March 17, 2025.
2. In accordance with Env-Wt 307.11(b), limits of fill shall be clearly identified prior to commencement of work and controlled in accordance with Env-Wt 307.03 to ensure that fill does not spill over or erode into any area where filling is not authorized.
3. In accordance with Env-Wt 307.05(e), to prevent the use of soil or seed stock containing nuisance or invasive species, the contractor responsible for work shall follow Best Management Practices for the Control of Invasive and Noxious Plant Species (Invasive Plant BMPs).
4. In accordance with Env-Wt 307.11(e), fill shall be not placed so as to direct flows onto adjacent or down-current property.
5. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
6. In accordance with Env-Wt 307.03(e), all exposed soils and other fills shall be permanently stabilized within 3 days following final grading.
7. In accordance with Env-Wt 307.03(c)(3), water quality control measures shall be installed prior to start of work and in accordance with the manufacturer's recommended specifications or, if none, the applicable requirements of Env-Wq 1506 or Env-Wq 1508.
8. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained so as to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.

9. In accordance with Env-Wt 307.03(c)(7), temporary water quality control methods shall be removed upon completion of work when compliance with Env-Wt 307.03(c)(6) is achieved.
10. In accordance with Env-Wt 307.03(g)(1), the person in charge of construction equipment shall inspect such equipment for leaking fuel, oil, and hydraulic fluid each day prior to entering surface waters or wetlands or operating in an area where such fluids could reach groundwater, surface waters, or wetlands.
11. In accordance with Env-Wt 307.03(g)(3) and (4), the person in charge of construction equipment shall maintain oil spill kits and diesel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site so as to be readily accessible at all times during construction; and train each equipment operator in the use of spill kits.

ANY INDIVIDUAL CONDUCTING WORK UNDER THIS PERMIT IS ADVISED OF THE FOLLOWING:

1. This permit does not preclude the need to meet any other applicable state, federal, or municipal legal requirements.
2. The permit holder is responsible for reading, and ensuring compliance with, the applicable general conditions established in Env-Wt 307.
3. This permit does not in any way authorize the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.
4. This approval does not convey any property right. The permittee is responsible for ensuring that they have the legal authority to access the subject lands and conduct the impacts described.

APPROVED:

Alexander Feuti
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____ _____

PERMITTEE SIGNATURE (required) PRINCIPAL CONTRACTOR SIGNATURE (required)

MIXED USE DEVELOPMENT

581 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
CONSTRUCTION PLANS
DOCUMENTS PERMIT SET

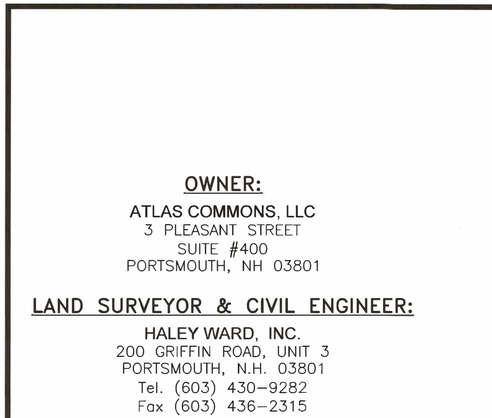
OWNER:
ATLAS COMMONS, LLC
3 PLEASANT STREET
SUITE #400
PORTSMOUTH, NH 03801

LAND SURVEYOR & CIVIL ENGINEER:
HALEY WARD, INC.
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, N.H. 03801
Tel. (603) 430-9282
Fax (603) 436-2315

ARCHITECT:
ARCOVE ARCHITECTS
3 CONGRESS STREET, SUITE 1
PORTSMOUTH, NH 03801
TEL. (603) 988-0042

LANDSCAPE ARCHITECT:
TERRA FIRMA LANDSCAPE ARCHITECTURE
163A COURT STREET
PORTSMOUTH, NH 03801
TEL. (603) 430-8388

PERMIT LIST:
NHDES SEWER DISCHARGE PERMIT: TO BE SUMBITTED
PORTSMOUTH SITE PLAN APPROVAL: PENDING
CITY COUNCIL APPROVAL: PENDING



Residential Districts
- R Rural
- SRA Single Residence A
- SRB Single Residence B
- GRA General Residence A
- GRB General Residence B
- GRC General Residence C
- GA/MH Garden Apartment/Mobile Hom

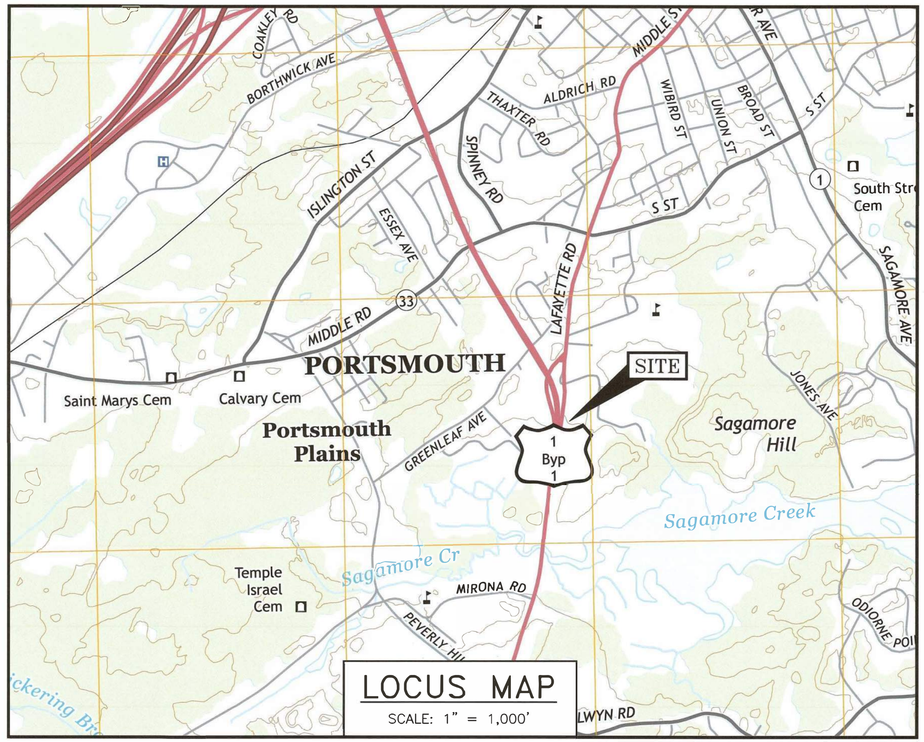
Mixed Residential Districts
- MRO Mixed Residential Office
- MRB Mixed Residential Business
- G1 Gateway Cooridor
- G2 Gateway Center

Business Districts
- GB General Business
- B Business
- WB Waterfront Business

Industrial Districts
- OR Office Research
- I Industrial
- WI Waterfront Industrial

Airport Districts
- AIR Airport
- AI Airport Industrial
- PI Pease Industrial
- ABC Airport Business Commercial

Other Districts
- M Municipal
- NRP Natural Resource Protection
- TC Transportation Corridor



LOCUS MAP
SCALE: 1" = 1,000'

LEGEND:

EXISTING	PROPOSED	
		PROPERTY LINE
		SETBACK
S	S	SEWER PIPE
SL	SL	SEWER LATERAL
G	G	GAS LINE
D	D	STORM DRAIN
W	W	WATER LINE
WS	WS	WATER SERVICE
UGE	UGE	UNDERGROUND ELECTRIC
OHW	OHW	OVERHEAD ELECTRIC/WIRES
	UD	FOUNDATION DRAIN
		EDGE OF PAVEMENT (EP)
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		UTILITY POLE
		WALL MOUNTED EXTERIOR LIGHTS
		TRANSFORMER ON CONCRETE PAD
		ELECTRIC HANDHOLD
		SHUT OFFS (WATER/GAS)
	GV	GATE VALVE
	HYD	HYDRANT
CB	CB	CATCH BASIN
S	SMH	SEWER MANHOLE
D	DMH	DRAIN MANHOLE
T	TMH	TELEPHONE MANHOLE
14	14	PARKING SPACE COUNT
PM		PARKING METER
LSA		LANDSCAPED AREA
TBD	TBD	TO BE DETERMINED
CI	CI	CAST IRON PIPE
COP	COP	COPPER PIPE
DI	DI	DUCTILE IRON PIPE
PVC	PVC	POLYVINYL CHLORIDE PIPE
RCP	RCP	REINFORCED CONCRETE PIPE
AC	–	ASBESTOS CEMENT PIPE
VC	VC	VITRIFIED CLAY PIPE
EP	EP	EDGE OF PAVEMENT
EL.	EL.	ELEVATION
FF	FF	FINISHED FLOOR
INV	INV	INVERT
S =	S =	SLOPE FT/FT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL

DIG SAFE – ME – NH – RI – VT 1-888-344-7233 CALL TOLL FREE

INDEX OF SHEETS

DWG No.	
–	COMMUNITY SPACE & EASEMENT PLAN
C1	EXISTING CONDITIONS PLAN
C2	DEMOLITION PLAN
C3	SITE PLAN
L1–L3	LANDSCAPE PLANS – ON SITE & OFF SITE
LT1	LIGHTING PLAN
~~C4~~	~~PARKING PLAN~~
C5	UTILITY PLAN
C6	GRADING, DRAINAGE, EROSION CONTROL PLAN
C7	OPEN SPACE PLAN
C8	ON-SITE COMMUNITY SPACE PLAN
C8.1	OFF-SITE LANDSCAPE MAINTENANCE AREA
~~C9~~	~~PUBLIC REALM PLAN~~
~~C10~~	~~PUBLIC REALM PLAN~~
T1 & T2	TURNING PLANS
D1 – D6	EROSION CONTROL NOTES AND DETAILS

PORTSMOUTH APPROVAL CONDITIONS NOTE:
ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

UTILITY CONTACTS

ELECTRIC:
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 436-7708, Ext. 555.5678
~~ATTN: MICHAEL DUGDV, P.E. (MANAGER)~~
ATTN: Nicholas Kosko

NATURAL GAS:
UNITIL
325 WEST ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 294-5144
ATTN: DAVE BEAULIEU

CABLE:
COMCAST
155 COMMERCE WAY
PORTSMOUTH, N.H. 03801
Tel. (603) 679-5695 (X1037)
ATTN: MIKE COLLINS

SEWER & WATER:
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 427-1530
~~ATTN: JIM TOW~~
ATTN: Doug Sparks

COMMUNICATIONS:
FAIRPOINT COMMUNICATIONS
JOE CONSIDINE
1575 GREENLAND ROAD
GREENLAND, N.H. 03840
Tel. (603) 427-5525

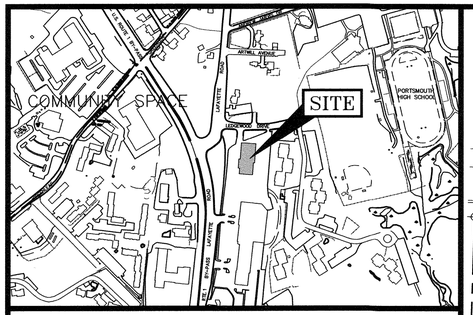
SITE PLANS
MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

PLAN SET SUBMITTAL DATE Addendum 1: 6/30/2025

5010156 1397.04

P:\2013\5010156 - McNabb_Properties\1397.03 - Lafayette Rd., Portsmouth - NH\2023 Site Plan 1397.03\Plans & Sheets\Site\Final Set revised 7-25-24\1397.04 Cover 2024.dwg, 7/18/2024 11:58:29 AM, Kevin Ks Walker, Ortelo



LOCATION MAP SCALE: 1" = 400'±

LAFAYETTE ROAD
U.S. ROUTE 1

NEW HAMPSHIRE STATE PLANE NAD 83

PSNH 146/27 w/CONDUIT

241.20' N05°54'49"E

PSNH 146/28

TEMP. POLE

N05°32'11"W 96.20'

BUS STOP

PSNH 146/28

PROPOSED BIKE RACK

LSA

STOP SIGNS

OUTSIDE DINING

4'Ht. FENCE W/GATES

FF 24.86

BUILDING OVERHANG (TYP.)

OUTDOOR DINING CAFE 1,294 S.F.

BUILDING OVERHANG (TYP)

PATIO

229/8B

EXISTING BUILDING FF=24.93

POCKET PARK 6,351 S.F.

N81°42'43"E 281.77'

PROPOSED 5 STORY RESIDENTIAL BUILDING

BUILDING LINE ABOVE

PROPOSED SIDEWALK

330.45' N84°06'58"W

BOLLARD (TYP.)

CONCRETE PAD

STAIR

PROPOSED 5 STORY RESIDENTIAL BUILDING

PROPOSED CONCRETE BLOCK RETAINING WALL

DUMPSTER ENCLOSURE

72.02' S07°08'19"W

L1

L2

PROPOSED LSA

246.26' S05°56'03"W

229/7

N/F
RPL PROPERTIES LLC
62 MIDDLE DUBSTABLE ROAD
NASHUA, NH 03062
3828/1944

75.04' S39°14'18"E

GRAPHIC SCALE

10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

LEDGEWOOD DRIVE

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	S15°17'27"W	14.20'
L2	S48°43'16"E	33.26'

COMMUNITY SPACE

6,351 S.F. OF POCKET PARK

1,294 S.F. OF OUTDOOR DINING CAFE

PROPOSED COMMUNITY SPACE 7,645 S.F.
LOT AREA 98,124 S.F.

COMMUNITY SPACE REQUIRED: 10%
(PER SECTION 10.5B41.80.2)
COMMUNITY SPACE PROVIDED: 7.8%

COMMUNITY SPACE USES
(PER SECTION 10.5B102)

PROPOSED USES: OUTDOOR DINING CAFE
POCKET PARK

MAINTENANCE AREA

10,473 S.F. OF AREA WHERE THE LANDSCAPING WILL BE MAINTAINED BY THE OWNER OF TAX MAP 229 LOT 8B.

ABUTTERS

229/8
N/F
599 LAFAYETTE LLC
C/O BAKER PROPERTIES
953 ISLINGTON STREET #230
PORTSMOUTH, NH 03801
5592/0456

229/3
CITY OF PORTSMOUTH SCHOOL
PO BOX 628
PORTSMOUTH, NH 03801
1985/0379

231/8
STATE OF NEW HAMPSHIRE
STATE HOUSE
CONCORD, NH 03301
2303/0042

243/1
N/F
155 GREENLEAF LLC
549 US HIGHWAY 1 BYPASS
PORTSMOUTH, NH 03801
6127/1245

243/2
N/F
OPERATION BLESSING MASTER CARD
600 LAFAYETTE ROAD
PORTSMOUTH, NH 03801

229/6
N/F
DOMER REALTY LLC
545 LAFAYETTE ROAD
PORTSMOUTH, NH 03801
4231/1881

229/6A
N/F
ST. NICHOLAS GREEK ORTHODOX CHURCH
40 ANDREW JARVIS DRIVE
PORTSMOUTH, NH 03801
2410/0505

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR
NO. 738
JOHN R. CHAGNON
SIGNATURE

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

JOHN R. CHAGNON, LLS 738

7.20.24
DATE

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.436.2315

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.

2) OWNERS OF RECORD:
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538

3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270F, EFFECTIVE JANUARY 29, 2021

4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY NEIGHBORHOOD CORRIDOR (G1) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE COMMUNITY SPACE EASEMENT ON TAX MAP 229 LOT 8B AND THE ADDITIONAL OFF-SITE AREA WHERE CITY LANDSCAPE MAINTENANCE WILL BE THE RESPONSIBILITY OF THE TAX MAP 229 LOT 8B PROPERTY OWNER.

NO.	DESCRIPTION	DATE
4	Addendum 1	6/30/25
3	PARKING ENCROACHMENT, COMMUNITY SPACE	7/20/24
2	TITLE, ABUTTERS	3/24/24
1	EASEMENT LOCATIONS	2/21/24
0	ISSUED FOR COMMENT	1/24/24

REVISIONS

581 LAFAYETTE ROAD COMMUNITY SPACE & EASEMENT PLAN TAX MAP 229 – LOT 8B

TO

THE CITY OF PORTSMOUTH

OWNER

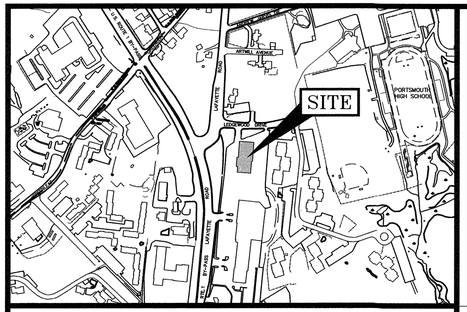
ATLAS COMMONS, LLC

PROPERTY LOCATED AT
581 LAFAYETTE ROAD
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1" = 20' JANUARY 2024

FB 259, PG 10 5010156

P:\NH\2021\156-Atlantic_Properties\139123-Lafayette Rd, Portsmouth (RC)\023 Site Plan 139123.dgn Plan & Specs\Site\Final Set revised 7-20-24\COMMUNITY SPACE EASEMENT.dwg, 7/24/2024 8:57:23 AM, Canon TX-3000 - Direct



LOCATION MAP SCALE: 1" = 400'±

LEGEND

EXISTING	DESCRIPTION
124/21	MAP 124 / LOT 21
N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
	BOUNDARY LINE
	SETBACK LINE
RR SPK FND	RAILROAD SPIKE FOUND
IR FND	IRON ROD FOUND
IP FND	IRON PIPE FOUND
DH FND	DRILL HOLE FOUND
BND w/ DH	BOUND w/ DRILL HOLE
FM	FORCE MAIN
S	SEWER LINE
G	GAS LINE
D	STORM DRAIN
W	POTABLE WATER LINE
	UNDERGROUND ELECTRIC
	OVERHEAD WIRES
100	CONTOUR LINE
97x3	SPOT ELEVATION
	EDGE OF PAVEMENT
	WOODS / TREE LINE
	UTILITY POLE (w/ GUY) (w/ LIGHT)
	LIGHT POLE
GV	SHUTOFF/CURB STOP (WATER, GAS, SEWER)
	GATE VALVE
HYD.	HYDRANT
CB	CATCH BASIN
T	TELEPHONE MANHOLE
S	SEWER MANHOLE
D	DRAIN MANHOLE
FF	FINISHED FLOOR
INV.	INVERT
TBM	TEMPORARY BENCHMARK
TYP.	TYPICAL

PROJECT ABUTTERS:

TM/LOT	NAME
229/3	CITY OF PORTSMOUTH
229/7	RPL PROPERTIES, LLC
229/8	599 LAFAYETTE, LLC
231/8	STATE OF NEW HAMPSHIRE
243/1	155 GREENLEAF, LLC
243/2	OPERATION BLESSING
229/6	DOMER REALTY, LLC
229/6A	ST. NICHOLAS GREEK ORTHODOX CHURCH

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	S15°17'27"W	14.20'
L2	S48°43'16"E	33.26'

NEW HAMPSHIRE STATE PLANE NAD 83

LAFAYETTE ROAD
U.S. ROUTE 1

229/8B
EXISTING BUILDING FF=24.93

241.20'
N05°54'49"E

N05°32'11"W
96.20'

N81°42'43"E
281.77'

330.45'
N84°06'58"W

72.02'
S07°08'19"W

246.26'
S05°56'03"W

L E D G E W O O D D R I V E

IRRIGATION PITS
ADA SIGNS
PSNH 146/26
TEMP. POLE
PSNH 146/25
BUS STOP
IRRIGATION PIT
IR SET
6"X6" NHBND
BIKE RACK
SEE NOTE 10
NAIL SET
STOP SIGNS
PSNH 146/27 w/CONDUIT
30.0' FRONT SETBACK
TREE BOX FILTER OVERFLOW
FF 24.86
BUILDING OVERHANG (TYP)
4' ORNAMENTAL BLACK FENCE ENCLOSURE
PATIO
1" PVC WATER LINE (TYP 3)
FREEZER CONTROLLER
IRRIGATION PITS
ROOF DRAINS (TYP)
STANDPIPE CONNECTION
LAWN
FHB
15' SIDE SETBACK
SMH 1
GREASE TRAP 1
10' FRONT SETBACK
DUMPSTER ENCLOSURE
IR/CAP FND
TBM X CUT ON HYDRANT FLANGE BOLT ELEV. 26.54
LSA

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

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NOTES:

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3 PLEASANT STREET, SUITE 400
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6474/1538

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4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY (GW) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS ON TAX MAP 229 LOT 8B.

8) EASEMENTS & RESTRICTIONS:
A) ROAD/UTILITY EASEMENT AREA: SEE C-3316 AND RCRD 2110/428 AND 2184/184. THIS EASEMENT WAS PARTIALLY TERMINATED ON 11/9/15: SEE RCRD 5669/0645.

B) 30' RIGHT OF WAY: SEE D-8806 AND 5446/2589.

C) MUTUAL PARKING AND ACCESS RIGHTS FOR LOTS 1-3 ON PLAN D-8806 ARE OF RECORD. RCRD 2343/128 AND 5446/2588.

9) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

10) THE 2011 NHDOT LAFAYETTE ROAD PROJECT IDENTIFIED THIS ENCROACHMENT.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
4	Addendum 1	6/30/25
3	ABUTTERS	3/24/24
2	CONTOURS, NOTE 6	1/24/24
1	ISSUED FOR APPROVAL	9/5/23
0	ISSUED FOR COMMENT	7/5/23

REVISIONS

STATE OF NEW HAMPSHIRE No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR SIGNATURE

SCALE: 1"=20' JULY 2023

EXISTING CONDITIONS PLAN

C1

FB 259 PG 10

1397.04

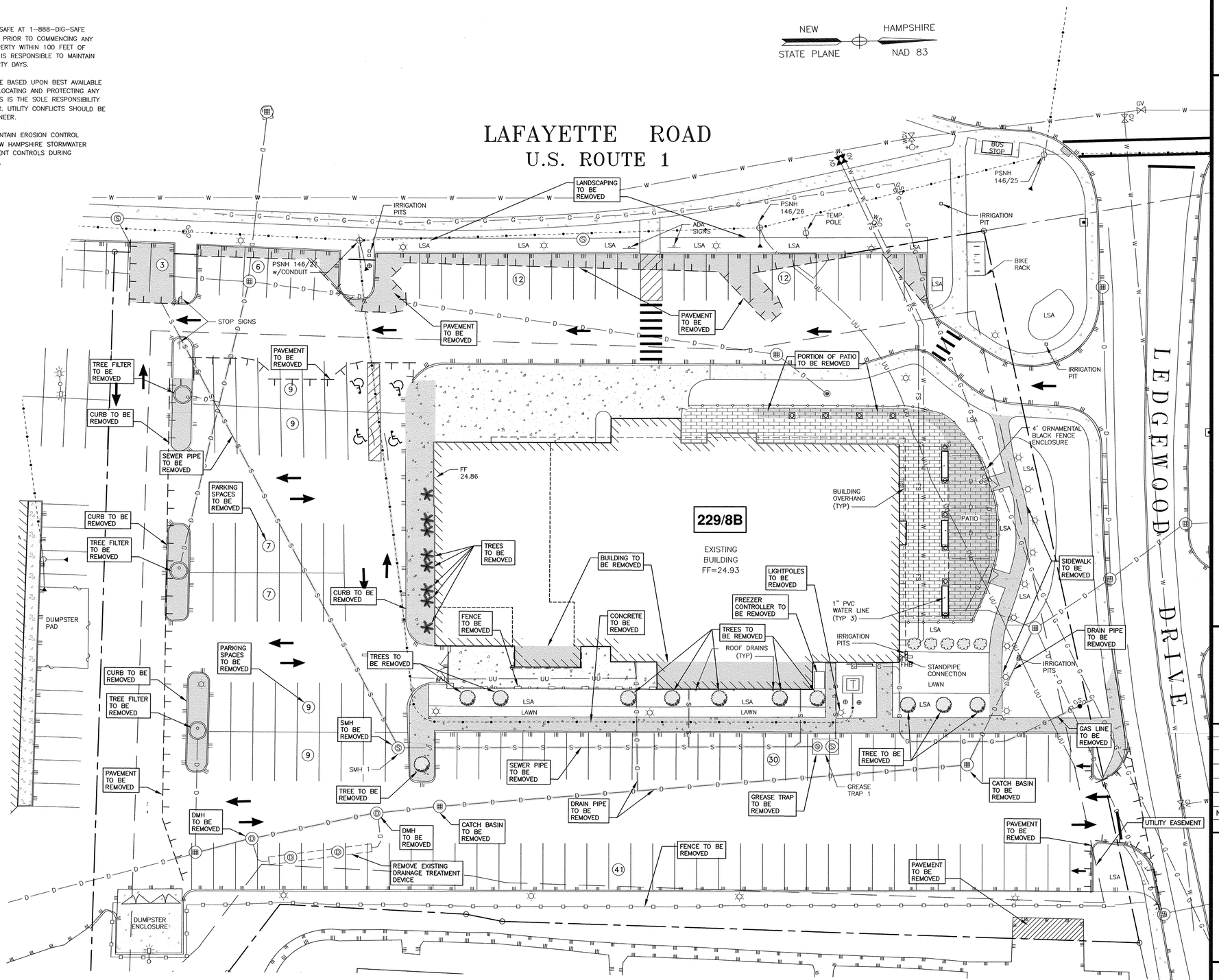
P:\NH\5015166-Nichols_Properties\1397.03-Lafayette Rd., Portsmouth-JRC\2023 Site Plan 1397.03\Plans & Specs\Site\Final Set\1397.04 EXISTING 2023.dwg, 3/27/2024 8:37:46 AM, Canon TX 9000 Driver

GENERAL NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).



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200 Griffin Road, Unit 3
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603.430.9282
WWW.HALEYWARD.COM

DEMOLITION NOTES

A) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE DESIGNER. IT IS THE CONTRACTORS' RESPONSIBILITY TO LOCATE UTILITIES AND ANTICIPATE CONFLICTS. CONTRACTOR SHALL REPAIR EXISTING UTILITIES DAMAGED BY THEIR WORK AND RELOCATE EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED PRIOR TO COMMENCING ANY WORK IN THE IMPACTED AREA OF THE PROJECT.

B) ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTORS UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.

C) ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO THE ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

D) THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.

E) SAWCUT AND REMOVE PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT TRENCH IN AREAS WHERE PAVEMENT IS TO BE REMOVED.

F) IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL THE PERMIT APPROVALS.

G) THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL CONSTRUCTION PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR ANY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK.

H) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE, UTILITIES, VEGETATION, PAVEMENT, AND CONTAMINATED SOIL WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ANY EXISTING DOMESTIC / IRRIGATION SERVICE WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR PROPER CAPPING / RE-USE.

I) PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS WITHIN CONSTRUCTION LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE HIGH FLOW SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF WARRANTED OR FABRIC BECOMES CLOGGED. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.

J) THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFELY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.

K) ANY CONTAMINATED MATERIAL REMOVED DURING THE COURSE OF THE WORK WILL REQUIRE HANDLING IN ACCORDANCE WITH NHDES REGULATIONS. CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN IN PLACE, AND COMPLY WITH ALL APPLICABLE PERMITS, APPROVALS, AUTHORIZATIONS, AND REGULATIONS

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
4	Addendum 1	6/30/25
3	PAVEMENT ENCROACHMENT REMOVAL	5/1/24
2	BUILDING & SIDEWALK DEMO	2/21/24
1	ISSUED FOR APPROVAL	9/5/23
0	ISSUED FOR COMMENT	7/5/23

REVISIONS

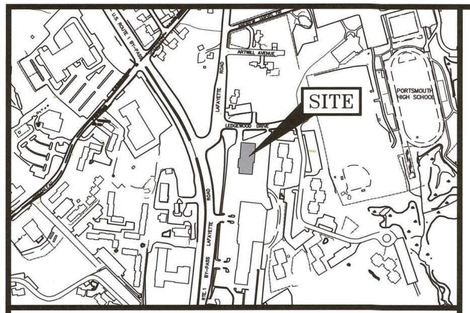
STATE OF NEW HAMPSHIRE
JOHN R. CHAGNON No. 7651
LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=20' JULY 2023

DEMOLITION PLAN C2

FB 259 PG 10 1397.04

P:\NH\1397.04_Multifolk_Properties\1397.03-Lafayette Rd, Portsmouth\RC\2023 Site Plan 1397.03\Plans & Specs\Draft\set 1\set Revised 2-22-2024\C2-2024Comp_1.04.2024 at 7:30 PM, Carson TX-3000 Direct



LOCATION MAP SCALE: 1" = 400'±

IMPERVIOUS SURFACE AREAS
(TO PROPERTY LINE)

STRUCTURE	POST-CONSTRUCTION IMPERVIOUS (S.F.)
MAIN STRUCTURE	42434
SIDEWALK	4,604
PAVEMENT	30,890
CURB	266
RETAINING WALL	737
COBBLE BAND	551
TOTAL	79482
LOT SIZE	98,124
% IMPERVIOUS SURFACE	81.0%

WAIVER REQUESTS:
SECTION 10.5B22.40 – SPECIAL SETBACK FROM LAFAYETTE ROAD
SECTION 10.5B34.80 MIXED USE BUILDING: MAXIMUM DWELLING UNITS PER BUILDING
SECTION – 10.5B41.80 – COMMUNITY SPACE COVERAGE
SECTION 10.5B34.80 MIXED USE BUILDING: MAXIMUM BUILDING FOOTPRINT

NEW HAMPSHIRE STATE PLANE NAD 83

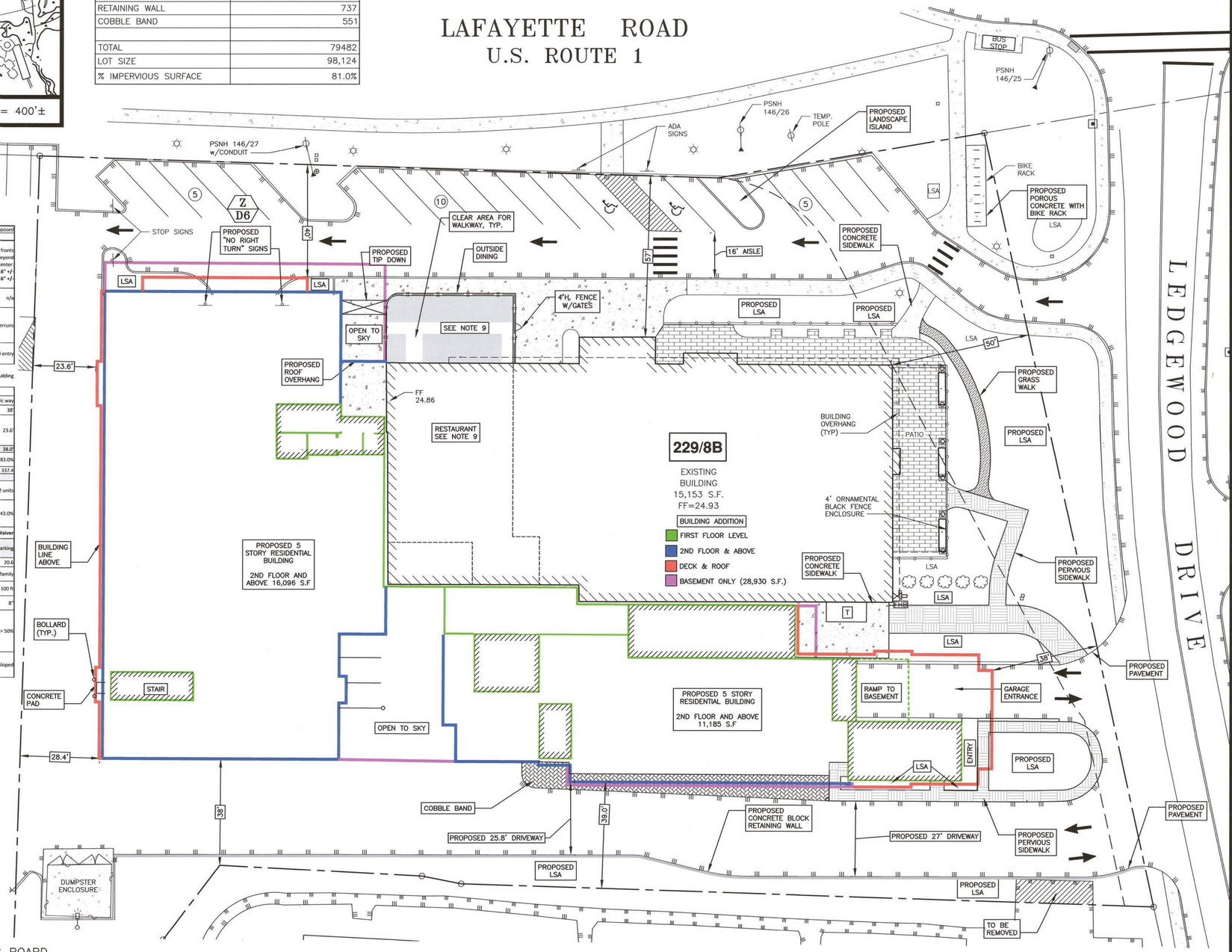
ZONING TABLE

	allowed	proposed
Zone	G1	
Height	5 stories or 60 ft per Density Bonus 10.5B72.30: 4 stories or 50 ft (+ density bonus 1 story or 10') 10.5B.22.20, at streets <60' row: 35' max <25' setback 45' max <50' setback. 60' max >50' setback.	<35'/3 stories at street fronts <45'/4 stories beyond <60'/5 stories at center **Building A: 56'-9 13/16" +/-** **Building B: 57'-8 1/16" +/-**
Penthouses	10' above allowed building height	n/a
Roof appurtenance	<10' above allowed height. Roof decks, roof gardens, and related structures and appurtenances shall not be counted in the building height limits.	<10' elevator & stair overruns
Façade Types	forecourt, recessed entry, dooryard, step, porch	recessed entry
Building Types	A Mixed-Use Building	A Mixed-Use Building
Setbacks (ft) *		
Front (principle)	70'-90' from cl of Lafayette Rd	Waiver for setback within public way
Front (secondary)	min 0' & max 50' from Lot Line at Ledgewood	38'
Side	Minimum side setback: 15 ft.	23.6'
Rear	20 ft min,	38.0'
Front lot line buildout commercial/mixed-use	75%	83.0%
Frontage, Lafayette	100 ft min	337.4
Lot area (sf)	NR	
lot area per dwelling unit	Workforce Housing incentive, 36 per acre = 81 units	72 units
Building Coverage, maximum	60%	43.0%
Footprint, max	24,000 sf	**Waiver**
ground floor area per use, max	NR	parking
Open space, minimum	20%	20.6
permitted uses (G1)	multifamily, restaurant	multifamily
façade modulation length, max (ft)	100'	modulations < 100 ft
floor height above sidewalk, max	24"	8"
glazing, shopfront, min	50% ground floor	glazed and open > 50%
roof types(pitch)	ALL (flat roofs must have "parapet wall that acts as a structural expression of the building façade and its materials)	Flat & Sloped

PORTSMOUTH APPROVAL CONDITIONS
NOTES:
1) ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.
2) THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
3) ALL IMPROVEMENTS SHOWN ON THIS SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____



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NOTES:
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6474/1538
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2.2526 AC
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6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10
7) THE PURPOSE OF THIS PLAN IS TO SHOW A PROPOSED BUILDING ADDITION ON TAX MAP 229 LOT 8B.
8) DESIGN BASED ON ARCHITECTURAL PLAN BY ARCOVE ARCHITECTS DATED 5/1/24.
9) CONVERSION OF TUSCAN MARKETPLACE TO RESTAURANT (NORTHEASTERN THAI, LLC) APPROVED UNDER PERMIT: LU-22-254

9 Addendum 1 6/30/25

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
8	REMOVE PARKING ENCROACHMENT	7/20/24
7	DRIVE RAMP	3/5/24
6	BUILDING REVISION, PARKING LAYOUT	2/21/24
5	SIGNAGE	2/6/24
4	TABLES & PARKING	1/24/24
3	LANDSCAPE AREA, IMPERVIOUS TABLE	1/2/24
2	IMPERVIOUS SURFACE TABLE	12/19/23
1	ISSUED FOR APPROVAL	11/20/23
0	ISSUED FOR COMMENT	8/31/23

REVISIONS

STATE OF NEW HAMPSHIRE – LICENSED LAND SURVEYOR – No. 738 JOHN R. CHAGNON – SIGNATURE

JOHN R. CHAGNON No. 7851 – STATE OF NEW HAMPSHIRE – LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=20' JULY 2023

SITE PLAN C3

FB 259 PG 10 1397.04

P:\NH\2023\1397.04\Mark_Properties\1397.04 Lafayette Rd, Portsmouth_NH\2023 Site Plan 1397.04 Lafayette Rd, Portsmouth_NH.dwg, 7/24/2024 10:18:16 AM, Canon TX-3000 - Direct

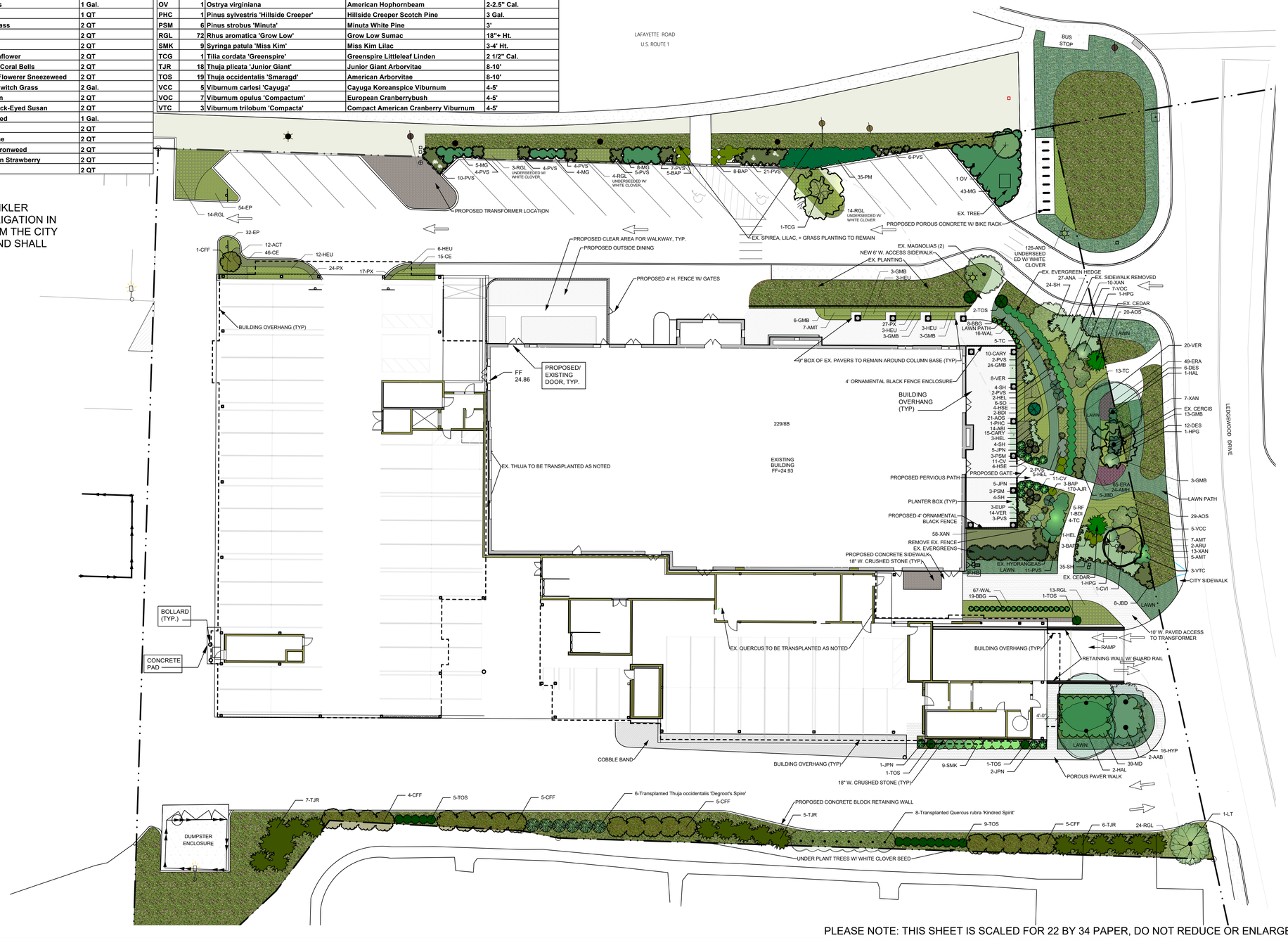
Plant List - Perennials

ID	Qty	Botanical Name	Common Name	Scheduled Size
ABI	14	Amsonia 'Blue Ice'	Blue Star Flower	2 QT
ACT	12	Actaea racemosa	Bugbane	1 Gal.
AJR	170	Ajuga reptans 'Mahogany'	Bugleweed	2 QT
AMH	24	Amsonia hubrichtii	Arkansas Blue Star	1 Gal.
AMT	19	Amsonia tabernaemontana	Eastern Blue Star	1 Gal.
ANA	27	Aster novae-angliae	New England Aster	2 QT
AND	126	Andropogon ger. 'Blackhawks'	Big Bluestem	Plugs
AOS	70	Aster oblongifolius 'October Skies'	Aromatic Aster	2 QT
ARU	2	Aruncus dioicus	Goat's Beard	2 QT
BAP	19	Baptisia australis 'Screaming Yellow'	False Indigo	2 QT
CARY	25	Caryopteris clandonensis 'First Choice'	First Choice Bluebeard	2 QT
CE	61	Carex eburnea	Seersucker Sedge	2 QT
CV	22	Coreopsis verticillata 'Moonbeam'	Threadleaf Coreopsis	2 QT
DES	18	Deschampsia cespitosa	Tussock Grass	1 Gal.
EP	86	Epimedium x rubrum 'Sweetheart'	Barrenwort	1 QT
ERA	114	Eragrostis spectabilis	Purple Lovegrass	2 QT
EUP	3	Eupatorium maculatum 'Gateway'	Joe Pye Weed	2 QT
GMB	55	Geranium macrorrhizum 'Bevan's'	Cranesbill	2 QT
HEL	11	Helianthus salicifolius	Willowleaf Sunflower	2 QT
HEU	27	Heuchera villosa 'Autumn Bride'	Autumn Bride Coral Bells	2 QT
HSE	8	Helenium 'Sahin's Early Flowerer'	Sahin's Early Flowerer Sneezeweed	2 QT
PVS	81	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.
PX	68	Polystichum acrostichoides	Christmas Fern	2 QT
RF	5	Rudbeckia fulgida 'Goldstrum'	Goldstrum Black-Eyed Susan	2 QT
SH	71	Sporobolus heterolepsis	Prairie Dropseed	1 Gal.
SO	6	Stachys officinalis	Bishop's Wort	2 QT
TC	22	Thermopsis caroliniana	Carolina Lupine	2 QT
VER	42	Vernonia lettermannii 'Iron Butterfly'	Iron Butterfly Ironweed	2 QT
WAL	83	Waldsteinia ternata	Siberian Barren Strawberry	2 QT
XAN	88	Xanthorhiza simplicissima	Yellowroot	2 QT

NOTE: IRRIGATION IN THE FORM OF SPRINKLER HEADS IN THE LAWN AREAS AND DRIP IRRIGATION IN PLANTING BEDS SHALL BE SOURCED FROM THE CITY OF PORTSMOUTH'S MUNICIPAL WATER, AND SHALL INCLUDE A BACK FLOW PREVENTION.

Plant List - Trees and Shrubs

ID	Qty	Botanical Name	Common Name	Scheduled Size
AAB	2	Amelanchier grandiflora 'Autumn Brilliance'	Autumn Brilliance Serviceberry	2 1/1" Cal.
BBG	27	Buxus microphylla 'Baby Gem'	Baby Gem Boxwood	4-4 1/2'
BDI	3	Buddlea 'Davidii'	Butterfly Bush	4-5'
CFF	20	Carpinus betulus 'Frans Fontaine'	Frans Fontaine Hornbeam	1 1/2-2" Cal.
CVI	1	Chionanthus virginicus	Fringe Tree	7-8'
HAL	3	Halesia carolina 'Jersey Belle'	Jersey Belle Carolina Silverbelle	1 1/2" Cal.
HPG	3	Hydrangea paniculata 'Grandiflora'	PeeGee Panicle Hydrangea	5 Gal.
HYP	16	Hypercum 'Hidcote'	St. Johnswort	5 Gal.
JBD	13	Juniperus communis depressa 'AmiDak'	Blueberry Delight Juniper	2 Gal.
JPN	13	Juniperus procumbens 'Nana'	Dwarf Japanese Garden Juniper	3 Gal.
LT	1	Liriodendron tulipifera	Tulip Tree	2 1/2" Cal.
MD	39	Microbiota decussata	Russian Arborvitae	2 G
MG	60	Myrica gale	Sweetgale	2 Gal.
OV	1	Ostrya virginiana	American Hophornbeam	2-2.5" Cal.
PHC	1	Pinus sylvestris 'Hillside Creeper'	Hillside Creeper Scotch Pine	3 Gal.
PSM	6	Pinus strobus 'Minuta'	Minuta White Pine	3'
RGL	72	Rhus aromatica 'Grow Low'	Grow Low Sumac	18"+ Ht.
SMK	9	Syringa patula 'Miss Kim'	Miss Kim Lilac	3-4' Ht.
TCG	1	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	2 1/2" Cal.
TJR	18	Thuja plicata 'Junior Giant'	Junior Giant Arborvitae	8-10'
TOS	19	Thuja occidentalis 'Smaragd'	American Arborvitae	8-10'
VCC	5	Viburnum carlesi 'Cayuga'	Cayuga Koreanspice Viburnum	4-5'
VOC	7	Viburnum opulus 'Compactum'	European Cranberrybush	4-5'
VTC	3	Viburnum trilobum 'Compacta'	Compact American Cranberry Viburnum	4-5'



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NEW HAMPSHIRE LICENSED LANDSCAPE ARCHITECT
TERRENCE P. PARKER
041

No.	Date	By	Revision Notes
H	5/14/2024		PLANNING SUBMISSION
G	3/27/2024		PLANNING SUBMISSION
F	3/4/2024		TAC SUBMISSION
E	2/21/2024		PLANNING SUBMISSION
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C	2/12/2024		COMMUNITY SPACE DESIGN
B	1/10/2024		TREES + GREENERY COMMENTS
A	1/2/2024		TAC COMMENTS

No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
581 LAFAYETTE

Sheet Title
On-Site Community Space Landscape Plan

Project Manager	Project ID: 581 LAFAYETTE
Drawn By: TC	Scale: 1:240
Reviewed By: TP	Sheet No.: L-1A of 2
Date: 11/20/2023	
CAD File Name: 581LAFAYETTE51324.vwx	

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE.

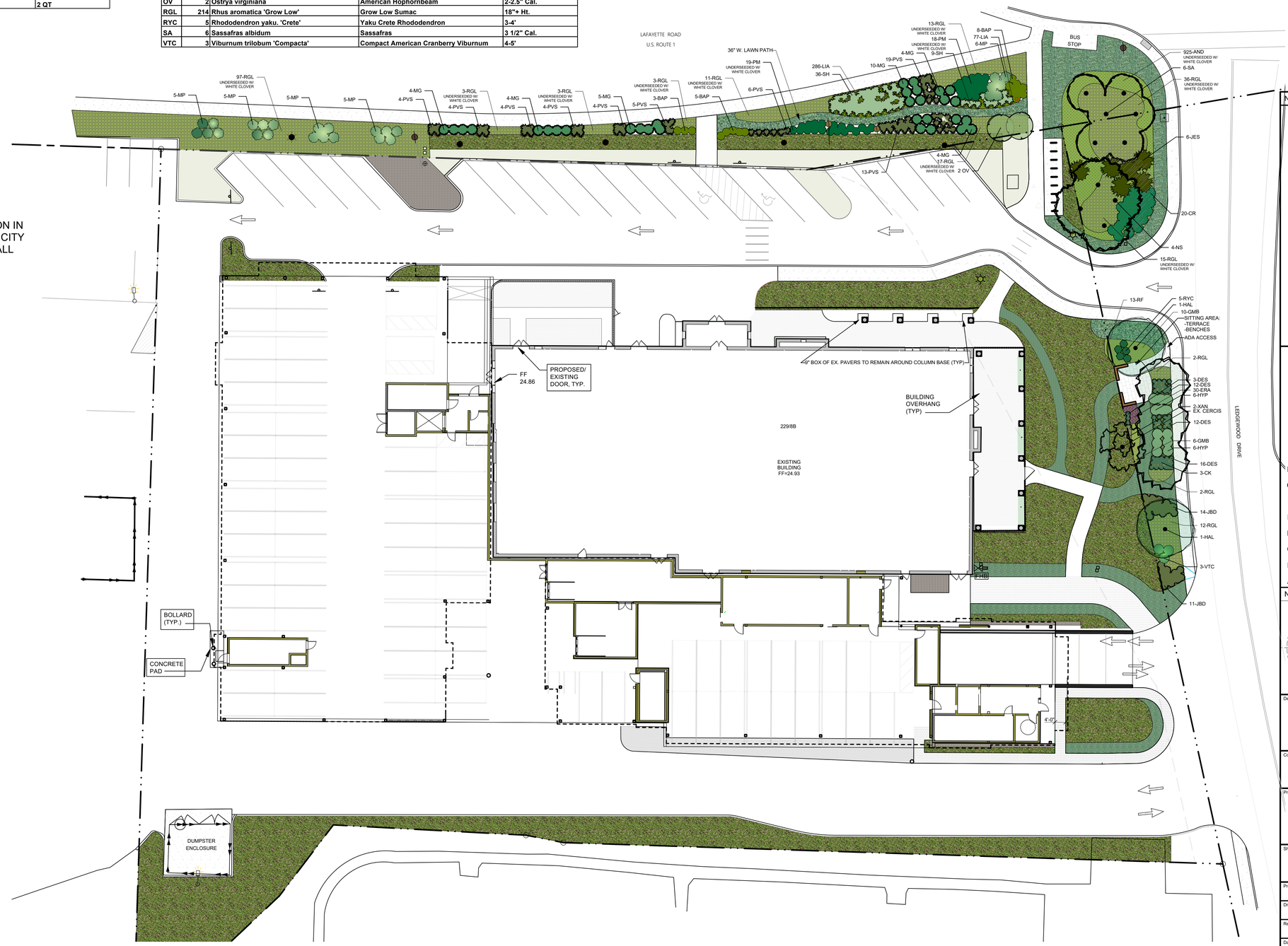
Plant List - Off-Site Perennials

ID	Qty	Botanical Name	Common Name	Scheduled Size
AND	925	Andropogon ger. 'Blackhawks'	Big Bluestem	Plugs
BAP	16	Baptisia australis 'Screaming Yellow'	False Indigo	2 QT
DES	43	Deschampsia cespitosa	Tussock Grass	1 Gal.
ERA	30	Eragrostis spectabilis	Purple Lovegrass	2 QT
GMB	16	Geranium macrorrhizum 'Bevan's'	Cranesbill	2 QT
LIA	363	Liatris spicata	Gayfeather	2 QT
PVS	63	Panicum virgatum 'Shenandoah'	Shenandoah Switch Grass	2 Gal.
RF	13	Rudbeckia fulgida 'Goldstrum'	Goldstrum Black-Eyed Susan	2 QT
SH	45	Sporobolus heterolepsis	Prairie Dropseed	1 Gal.
XAN	2	Xanthorhiza simplicissima	Yellowroot	2 QT

Plant List - Off-Site Trees + Shrubs

ID	Qty	Botanical Name	Common Name	Scheduled Size
CK	3	Cladrastis kentukea	Yellowwood	2 1/2" Cal.
CR	20	Cornus racemosa	Grey Dogwood	5 Gal.
HAL	2	Halesia carolina 'Jersey Belle'	Jersey Belle Carolina Silverbelle	1 1/2" Cal.
HYP	12	Hypercum 'Hidcote'	St. Johnswort	5 Gal.
JBD	25	Juniperus communis depressa 'AmiDak'	Blueberry Delight Juniper	2 Gal.
JES	6	Juniperus virginiana 'Emerald Sentinel'	Emerald Sentinel Red Cedar	3" Cal.
MG	31	Myrica gale	Sweetgale	2 Gal.
MP	26	Myrica pensylvanica	Northern Bayberry	2 Gal.
NS	4	Nyssa sylvetica	Black Tupelo	3" Cal.
OV	2	Ostrya virginiana	American Hophornbeam	2-2.5" Cal.
RGL	214	Rhus aromatica 'Grow Low'	Grow Low Sumac	18"+ Ht.
RYC	5	Rhododendron yaku. 'Crete'	Yaku Crete Rhododendron	3-4'
SA	6	Sassafras albidum	Sassafras	3 1/2" Cal.
VTC	3	Viburnum trilobum 'Compacta'	Compact American Cranberry Viburnum	4-5'

NOTE: IRRIGATION IN THE FORM OF SPRINKLER HEADS IN THE LAWN AREAS AND DRIP IRRIGATION IN PLANTING BEDS SHALL BE SOURCED FROM THE CITY OF PORTSMOUTH'S MUNICIPAL WATER, AND SHALL INCLUDE A BACK FLOW PREVENTION.



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NEW HAMPSHIRE LICENSED LANDSCAPE ARCHITECT
TERRENCE P. PARKER
041

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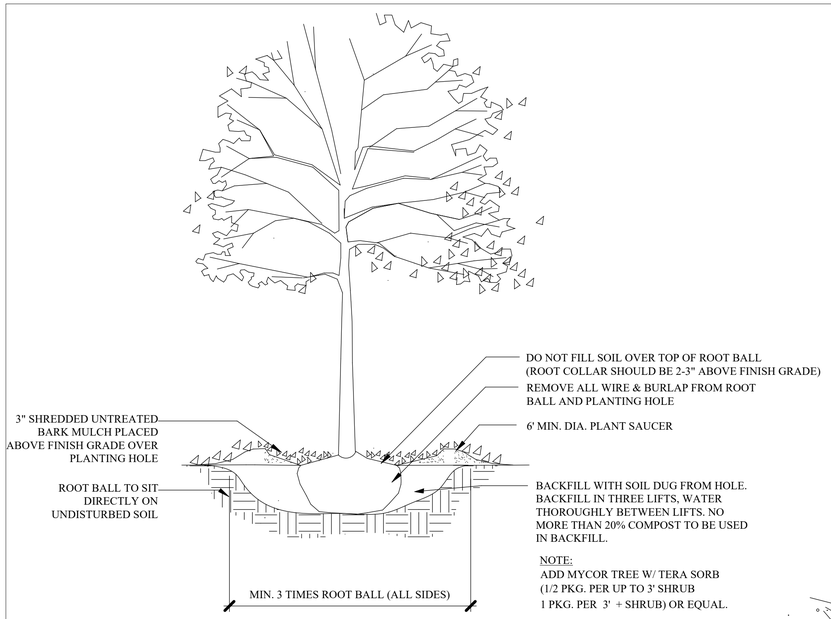
Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
581 LAFAYETTE

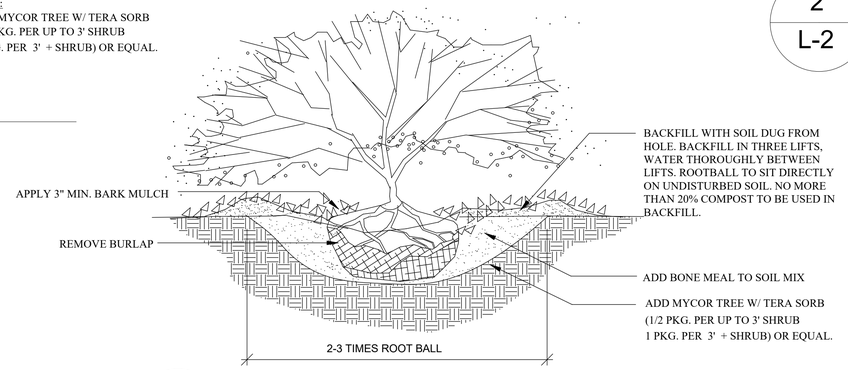
Sheet Title
Off-Site Community Space Landscape Plan

Project Manager	Project ID: 581 LAFAYETTE
Drawn By: TC	Scale: 1:240
Reviewed By: TP	Sheet No.: L-1B of 2
Date: 11/20/2023	
CAD File Name: 581LAFAYETTE51324.vwx	



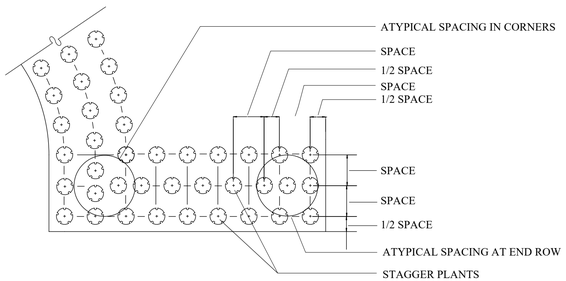
1 L-2

TREE PLANTING - 2"+ CAL.
SCALE: NTS



3 L-2

B&B SHRUB PLANTING
SCALE: NTS

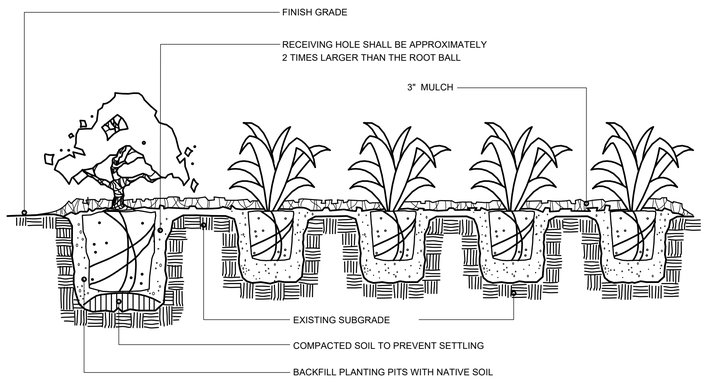


NOTES:

1. PLACE PLANTS IN BED AS SHOWN, SPACING AS SPECIFIED IN PLANT SCHEDULE.
2. GROUNDCOVER SHALL BE TRIANGULAR SPACED IN ROWS PARALLEL TO STRAIGHT EDGES AND SHALL BE EVENLY SPACED IN ROWS PARALLEL TO CURVE EDGES.

4 L-2

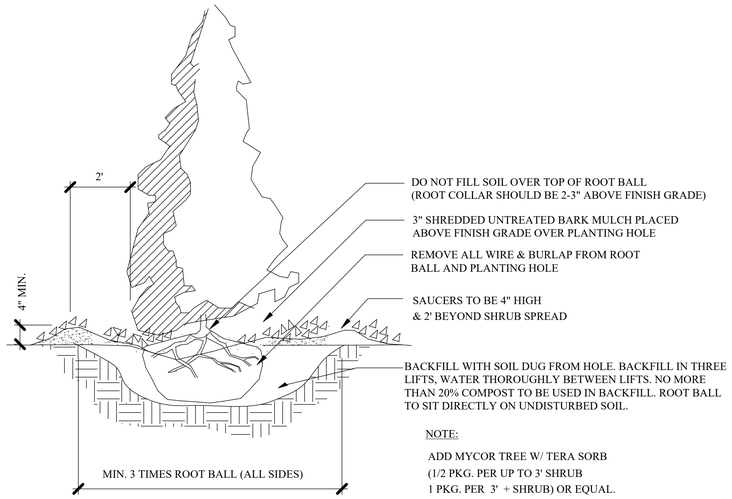
GROUND COVER SPACING DETAIL
SCALE: NTS



NOTE: SHRUBS SHALL BE PLANTED A MINIMUM OF 1" & NO MORE THAN 2" ABOVE FINISH GRADE, DEPENDING UPON SITE CONDITIONS.

5 L-2

SHRUB/GROUND COVER PLANTING DETAIL
SCALE: NTS



2 L-2

PYRAMIDAL EVERGREEN TREE PLANTING
SCALE: NTS

LANDSCAPE NOTES:

1. THE CONTRACTOR SHALL LOCATE AND VERIFY THE EXISTENCE OF ALL UTILITIES PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTINGS SHOWN ON THE DRAWINGS.
3. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED BY THE CURRENT AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. ALL PLANT SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT.
5. ALL PLANT MATERIALS SHALL BE EXACTLY AS SPECIFIED BY THE LANDSCAPE ARCHITECT. IF PLANT SPECIES CULTIVARS ARE FOUND TO VARY FROM THAT SPECIFIED AT ANY TIME DURING THE GUARANTEE PERIOD, THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO HAVE THE CONTRACTOR REPLACE THAT PLANT MATERIAL. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT DELIVERED TO THE SITE FOR AESTHETIC REASONS BEFORE PLANTING. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR THE QUALITY FOR ALL THE PLANTS.
6. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, UPON DELIVERY OR AT THE JOB SITE WHILE WORK IS ON-GOING TO CONFORMITY TO SPECIFIED QUALITY, SIZE AND VARIETY.
7. PLANTS FURNISHED IN CONTAINERS SHALL HAVE THE ROOTS WELL ESTABLISHED IN THE SOIL MASS AND SHALL HAVE AT LEAST ONE (1) GROWING SEASON. ROOT-BOUND PLANTS OR INADEQUATELY SIZED CONTAINERS TO SUPPORT THE PLANT MAY BE DEEMED UNACCEPTABLE.
8. NO PLANT SHALL BE PUT IN THE GROUND BEFORE GRADING HAS BEEN FINISHED AND APPROVED BY THE LANDSCAPE ARCHITECT.
9. ALL PLANTS SHALL BE INSTALLED AND DETAILED PER PROJECT SPECIFICATIONS.
10. ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24-HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN IF NECESSARY, DURING THE FIRST GROWING SEASON.
11. ALL PLANTS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE FULL YEAR FROM THE TIME OF PROVISIONAL ACCEPTANCE. DURING THIS TIME, THE OWNER SHALL MAINTAIN ALL PLANT MATERIALS IN THE ABOVE MANNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE PLANTS TO ENSURE PROPER CARE. IF THE CONTRACTOR IS DISSATISFIED WITH THE CARE GIVEN, HE SHALL IMMEDIATELY, AND IN SUFFICIENT TIME TO PERMIT THE CONDITION TO BE RECTIFIED, NOTIFY THE LANDSCAPE ARCHITECT IN WRITING OR OTHERWISE FORFEIT HIS CLAIM. LANDSCAPE CONTRACTOR SHALL PRUNE PLANTINGS OF DEAD LIMBS OR TWIGS DURING THE FIRST YEAR OF GROWTH.
12. FINAL ACCEPTANCE BY THE LANDSCAPE ARCHITECT WILL BE MADE UPON THE CONTRACTOR'S REQUEST AFTER ALL CORRECTIVE WORK HAS BEEN COMPLETED.
13. LANDSCAPE CONTRACTOR SHOULD REPLACE DEAD PLANTINGS IMMEDIATELY UPON OWNER DIRECTION WITHIN THE WARRANTY PERIOD AND AGAIN AT THE END OF THE GUARANTEE PERIOD, THE CONTRACTOR SHALL HAVE REPLACED ANY PLANT MATERIAL THAT IS MISSING, NOT TRUE TO SIZE AS SPECIFIED, THAT HAVE DIED, THAT HAVE LOST THEIR NATURAL SHAPE DUE TO DEAD BRANCHES, EXCESSIVE PRUNING OR INADEQUATE OR IMPROPER CARE, OR THAT ARE, IN THE OPINION OF THE LANDSCAPE ARCHITECT, IN UNHEALTHY OR UNSIGHTLY CONDITION.
14. ALL LANDSCAPE AREAS TO BE GRASS COMMON TO REGION EXCEPT FOR INTERIOR LANDSCAPED ISLANDS OR WHERE OTHER PLANT MATERIAL IS CALLED FOR.
15. ALL TREES AND SHRUBS TO BE PLANTED IN MULCH BEDS WITH DEFINED AND CUT EDGES TO SEPARATE TURF GRASS AREAS.
16. FOR ANY LANDSCAPE AREA SO DESIGNATED TO REMAIN, WHETHER ON OR OFF-SITE, REMOVE WEEDS, ROCKS, CONSTRUCTION ITEMS, ETC., THEN APPLY GRASS SEED OR PINE BARK MULCH AS DEPICTED ON PLANS.
17. LANDSCAPE CONTRACTOR SHALL FEED AND PRUNE EX. TREES, ON OR JUST OFF SITE, THAT HAVE EXPERIENCED ROOT BASE INTRUSION OR DAMAGE DURING CONSTRUCTION IMMEDIATELY AND FOR THE DURATION OF THE WARRANTY PERIOD AT THE DIRECTION OF THE LANDSCAPE ARCHITECT.
18. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCING AT THE EDGE OF THE EX. TREE CANOPY THE CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPED AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS OR LAWN SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
19. ALL MULCH AREAS SHALL RECEIVE A 2-3" LAYER OF SHREDDED PINE BARK MULCH.
20. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
21. ALL PLANTING HOLES TO BE HAND-DUG, EXCEPT IN NEW CONSTRUCTION WITH NEW PLANTING PITS, PLANTING NEAR CURBS, OR AREAS WHERE SILVA CELLS WILL BE USED. IF HOLES ARE MACHINE-DUG, BOTTOM OF HOLES NEED TO BE THE APPROPRIATE HEIGHT, AND FIRMED BY THE MACHINE TO CREATE STABILITY FOR THE PLANT MATERIAL.

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No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

Project Title
581 LAFAYETTE

Sheet Title
Landscape Details

Project Manager	Project ID: 581 LAFAYETTE
Drawn By: TC	Scale: AS NOTED
Reviewed By: TP	Sheet No.: L-2
Date: 11/20/2023	of 2
CAD File Name: 581LAFAYETTE51324.vwx	

INCLUDED

1 x Steadyrack
2 x End Caps
1 x Rear Tyre Rest
4 x Hex Bolts – for rack
4 x Masonry* Wall Plugs – for rack
2 x Screws – for Rear Tyre Rest
2 x Masonry* Wall Plugs – for Rear Tyre Rest
2 x Spare Rubber Tips
*Masonry use only

Fixings are for either Masonry (brick/concrete) or timber. If you're installing into a different type of wall structure, speak to your local hardware store for the correct fixings. Racks can be mounted to any vertical surface capable of supporting the rack + bike weight.

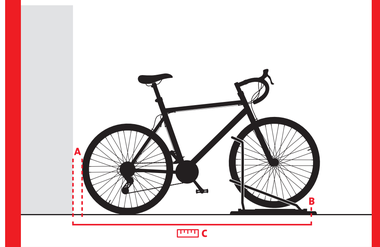
WARNING
We do not recommend installing your Steadyrack into gyprock, plasterboard or drywall. Doing so will void your Steadyrack warranty. The provided wall plugs are for masonry use only.

NEEDED

TAPE MEASURE
HAMMER
POWER DRILL
8MM + 10MM BIT
10MM SOCKET
ADJUSTABLE WRENCH
SPIRIT LEVEL
PENCIL

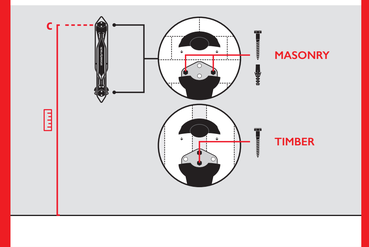
1. MEASURE MOUNTING HEIGHT

- Place the rack on the floor.
- Make sure your bike fits in the rack before drilling. If you have any concerns, get in touch with our Customer Support team.
- Place the bike in the rack, leaving a gap (around 50 – 75mm) between the back tyre and wall (A).
- The gap is the distance from the ground when the bike is in the rack.
- Pencil a mark on the floor in the top mounting hole (B).
  - 2 x vertical holes for timber install.
  - 2 x horizontal for masonry install.
- Measure the distance from the wall to the mark on floor (C).



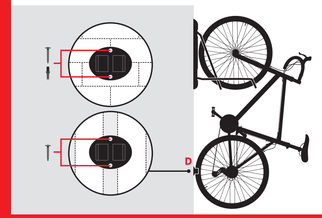
2. MOUNT RACK (WALL OR FRAME)

- Transfer the measurement to the wall (C). Drill the hole using the 10mm bit.
- Line up the rack and loosely install the single bolt.
- Place the spirit level against the plastic body – ensure it's level.
- Hold the rack in place and pencil mark the remaining holes.
- Remove the rack. Drill the remaining holes.
- If it's masonry, insert the supplied masonry wall plugs.
- Line the rack up over the holes. Insert 4 x hex bolts and firmly affix the rack. Click the End Caps in place.



3. INSTALL REAR TYRE REST

- Hang the bike in the rack.
- Line the Rear Tyre Rest up with the rear axle (D).
- Pencil mark the top mounting hole.
- Remove the rest and bike.
- Place the spirit level in centre - ensure the rack and rest are aligned.
- Drill a hole using the 8mm bit on the pencil mark.
- Line up the rest – mark the second hole.
- Drill the second hole and, if installing in masonry, insert the wall plugs.
- Place the rest and affix with the screws.



4. ROLL BIKE ON. DONE. EASY.

steadyrack
STORE EASY

LET'S KEEP THIS EASY...

INSTRUCTIONS

HI अतिरिक्त जानकारी के लिए, "Steadyrack इंस्टॉलेशन वीडियो" खोजें
KO 반덕된 설명은, "스테디랙 설치 안내"를 검색하세요.
JA 手順の翻訳版は、「ステディラック取り付け手順」を検索してください。
ES Si desea consultar las instrucciones traducidas, busque «Instrucciones de instalación de Steadyracks.
PT Para consultar as instruções traduzidas, pesquise "Instruções de Instalação Steadyrack".
DA Til oversatte instruktioner, søg "Steadyrack installationsvejledning".
NO For oversatte instruksjoner, søk på "Steadyrack installeringsinstruksjoner".
RU Перевод инструкции находится в разделе «Инструкции по установке стеллажей».
DE Für eine Übersetzung der Anleitung suchen Sie bitte nach "Steadyrack Installationsanleitung".
FR Pour consulter la traduction de ces instructions, recherchez « Instructions d'installation du Steadyrack ».
NL Zoek op 'Steadyrack Installatiehandleiding' voor vertaalde instructies.
IT Per consultare la traduzione delle istruzioni, cerca "Istruzioni Installazione Steadyrack".

MAINTAINING YOUR STEADYRACK

To ensure your Steadyrack Bike Rack operates perfectly we recommend you perform the following basic maintenance and checks:

Check and adjust tension on the nuts on Central Pivot Bar
The nuts that attach the central pivot bar to the top and bottom mounting brackets are pre-tensioned in the factory to a torque setting of 5Nm. This is to ensure there is enough resistance when you push your bike into the rack to stop the arms swinging out of the way.

Remove the two clip-in End Caps which cover the mounting brackets using a 13mm socket wrench or a suitable spanner. Adjust the nuts connecting the central spine to the top and bottom mounting brackets to the desired tension. Be sure to not overtighten or the rack won't pivot. Replace your End Caps and you are good to go.

Check the nuts attaching the top and bottom arms to the Central Pivot Bar
The 2 arms are connected to the central pivot bar by tamper-proof bolts with dome nuts and black tips either side. Tamper-proof bolts have been used to provide added security against potential theft of your bike. These can work loose over time. Check them periodically and tighten using a Pin Torx 6 Lobe bit, which can be purchased from your local hardware store.

Check your mounting bolts from time to time to make sure they have not worked loose and tighten if necessary.

Cleaning
Wipe the rack down with lukewarm soapy water using a soft sponge or microfibre cloth. Then wipe down with a clean, soft cloth to remove the cleaning solution and dry thoroughly. For more stubborn marks, mix one part vinegar with one part water and follow the above processes.

Materials
Mild Steel Zinc or Chrome plated and ABS, PP, TPE and Nylon plastics.

WARRANTY

The boring but necessary legal stuff.

Steadyrack warrants that the Steadyrack Bike Rack is free from defects in workmanship and materials for a period of 12 months from the date of retail purchase. Any claim for breach of this warranty must be made on the following conditions:

a. the defects have arisen solely from faulty materials or workmanship;
b. the Steadyrack Bike Rack must not have been changed nor tampered with in any way;
c. failure of the Steadyrack Bike Rack must not be due to misuse, improper installation or other maltreatment, interference or abuse including, but not limited to, use in a manner contrary to our specifications or instructions;
d. the Steadyrack Bike Rack must be returned to the supplier;
e. Steadyrack will not be responsible for damage or loss caused during or as a result of shipping;
f. Steadyrack warranty is voided if racks are used to transport bicycles.

Subject to the above conditions of warranty, if the Steadyrack Bike Rack fails for any reason within the warranty period and the Steadyrack Bike Rack is returned to us, Steadyrack will at its discretion repair or replace, or cause to be repaired or replaced, the Steadyrack free of charge at its expense.

Except as expressly provided herein all express and implied warranties, guarantees and conditions under statute or general law as to merchantability, description, quality, suitability or fitness of the Steadyrack Bike Rack for any purpose or as to design, assembly, installation, materials or workmanship or otherwise are, to the extent permitted by law, hereby expressly excluded and Steadyrack shall not be liable for physical or financial injury loss or damage or for consequential loss or damage of any kind arising out of the supply, assembly, installation or use of the Steadyrack Bike Rack or arising in any other way whatsoever. Still awake? Right, now that's out of the way, let's install that Steadyrack!

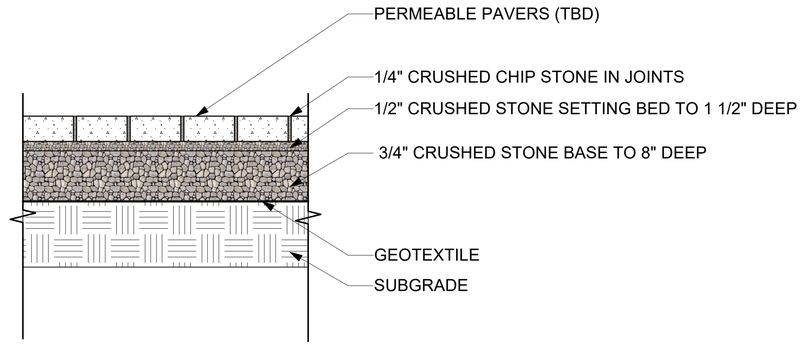
TURN OVER FOR FULL INSTRUCTIONS

SCAN THE QR CODE TO WATCH THE INSTALLATION VIDEO ONLINE

FOR MORE INSTALLATION ADVICE VISIT STEADYRACK.COM/INSTALLATION

1
L-3

BIKE RACK DETAIL
SCALE: NTS



2
L-3

POROUS SIDEWALK DETAIL
SCALE: 1" = 1'-0"

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REGISTERED LANDSCAPE ARCHITECT
TERRENCE P. PARKER
041
STATE OF NEW HAMPSHIRE

No.	Date	By	Revision Notes
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F	3/4/2024		TAC SUBMISSION
E	2/21/2024		PLANNING SUBMISSION
D	2/14/2024		T+G COMMENTS (GATE REMOVAL)
C	2/12/2024		COMMUNITY SPACE DESIGN
B	1/10/2024		TREES + GREENERY COMMENTS
A	1/2/2024		TAC COMMENTS

No.	Date	Issue Notes

Design Firm
terra firma landscape architecture
163.a Court Street
Portsmouth, NH

Consultant

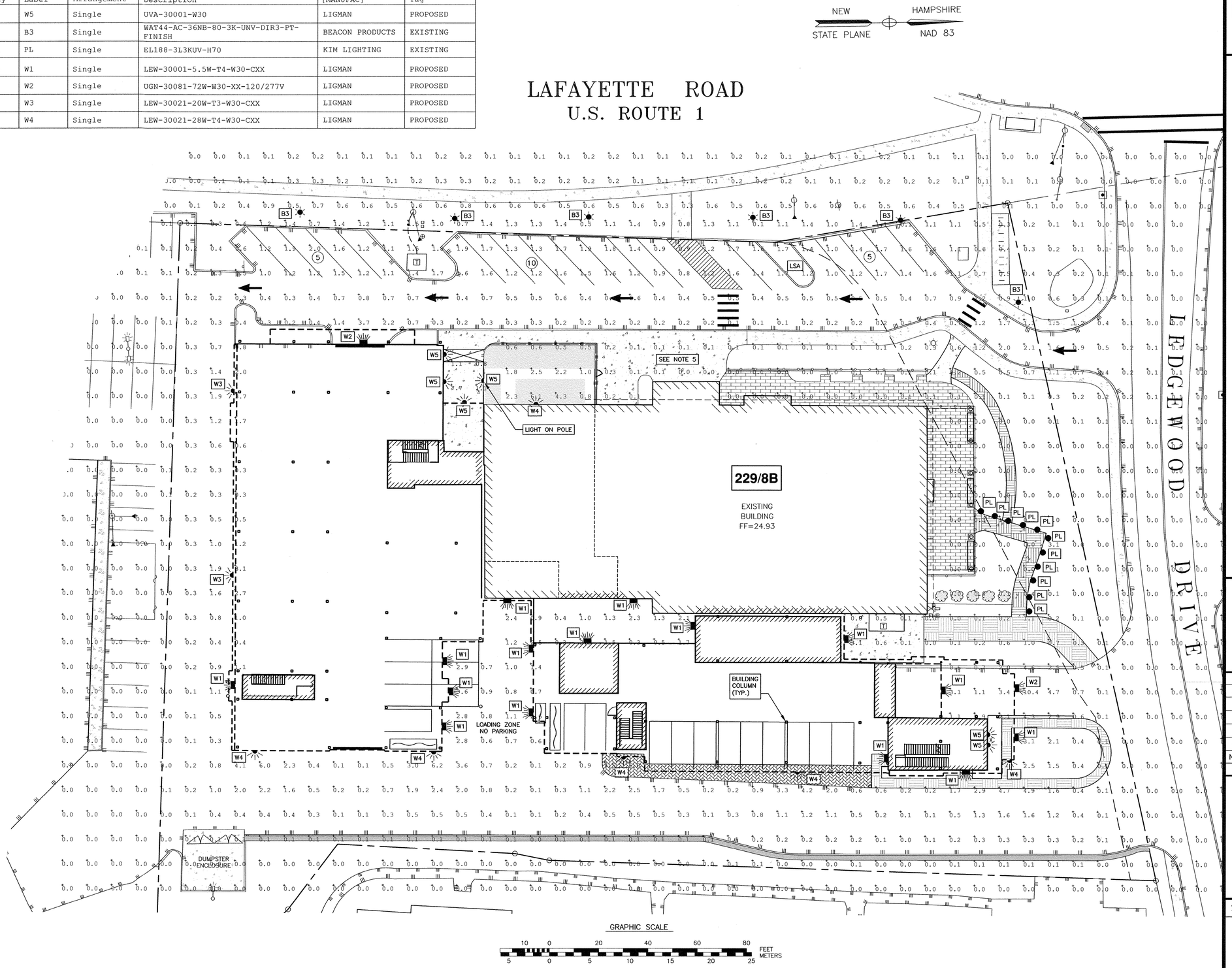
Project Title
581 LAFAYETTE

Sheet Title
Landscape Details

Project Manager	Project ID: 581 LAFAYETTE
Drawn By: TC	Scale: AS NOTED
Reviewed By: TP	Sheet No.: L-3 of 2
Date: 11/20/2023	
CAD File Name: 581LAFAYETTE51324.vwx	

PLEASE NOTE: THIS SHEET IS SCALED FOR 22 BY 34 PAPER, DO NOT REDUCE OR ENLARGE. .

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	[MANUFAC]	Tag
	6	W5	Single	UVA-30001-W30	LIGMAN	PROPOSED
	6	B3	Single	WAT44-AC-36NB-80-3K-UNV-DIR3-PT-FINISH	BEACON PRODUCTS	EXISTING
	11	PL	Single	EL188-3L3KUV-H70	KIM LIGHTING	EXISTING
	15	W1	Single	LEW-30001-5.5W-T4-W30-CXX	LIGMAN	PROPOSED
	2	W2	Single	UGN-30081-72W-W30-XX-120/277V	LIGMAN	PROPOSED
	2	W3	Single	LEW-30021-20W-T3-W30-CXX	LIGMAN	PROPOSED
	6	W4	Single	LEW-30021-28W-T4-W30-CXX	LIGMAN	PROPOSED



AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.

WWW.HALEYWARD.COM

200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.

2) OWNERS OF RECORD:
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538

3) THE PURPOSE OF THIS PLAN IS TO SHOW PROPOSED LIGHTING ON TAX MAP 229 LOT 8B.

4) LIGHTING DESIGN BY EXPOSURE ESS. CONTACT: KEN SWEENEY 603-759-1043.

5) NO CHANGE PROPOSED TO THE EXISTING BUILDING FRONT AND SIDE LIGHTING.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
4	Addendum 1	6/30/25
3	PARKING ENCROACHMENT	7/20/24
2	ADDED FIXTURES	3/27/24
1	BUILDING	2/21/24
0	ISSUED FOR APPROVAL	1/24/24

REVISIONS

SCALE: 1"=20' JULY 2023

LIGHTING PLAN

LT1

FB 259 PG 10

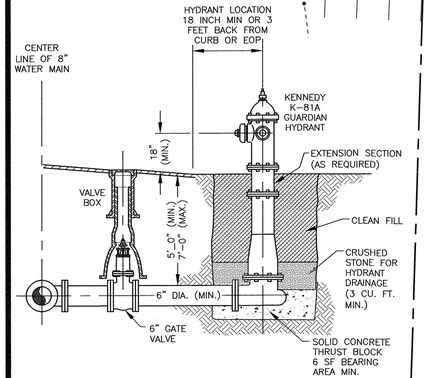
1397.04

EXISITNG SEWER STRUCTURE SCHEDULE					
STRUCTURE	PROP/EX	RIM	PIPE SIZE	INVERT	DIRECTION
SMH 1	EX	22.56	8" CI	13.26	IN
			8" CI	13.21	OUT
GREASE TRAP 1	EX	23.63		17.58	OUT
GREASE TRAP 1	EX	23.63		17.23	OUT

NEW HAMPSHIRE STATE PLANE NAD 83

LAFAYETTE ROAD
U.S. ROUTE 1

PROPOSED INV. 13.77
SMH 1
IRRIGATION PITS
PROPOSED GATE VALVE
CONNECT TO TRANSFORMER
PROPOSED FIRE HYDRANT
PSNH 146/27 w/CONDUIT
45' X 0.004FT/FT 8" PVC SDR35
PROPOSED TRANSFORMER
STOP SIGNS
100' X 0.004FT/FT 8" PVC SDR35
PROPOSED SEWER MANHOLE (A) INV. IN=14.05 INV. IN=13.95
PROPOSED SEWER MANHOLE (B) RIM (MATCH GRADE) INV. IN=14.55 INV. OUT=14.45
PROPOSED UNDERGROUND ELECTRICAL SERVICE SPLICE INTO BUILDING CONDUIT
FF 24.86
229/8B
EXISTING BUILDING FF=24.93
BUILDING OVERHANG (TYP)
INTERNAL NEW BUILDING SEWER CONNECTION
PROPOSED 8" SCHEDULE 40 SEWER S=0.004 FT/FT
BASEMENT WALL
CONNECT TO EXISTING
PROPOSED ELECTRICAL SERVICE IN CONDUIT
PROVIDE SHOP DRAWINGS FOR PIPE SUPPORTS & CORNER SWEEP
INTERNAL NEW BUILDING SEWER CONNECTION
CONNECT GREASE TRAP FORCE MAIN TO GRAVITY SEWER
PROPOSED 120'X2" FORCE MAIN CLASS 150
PROPOSED GREASE TRAP INV. OUT 17.50±
DOMESTIC WATER SERVICE –EXTEND INTERNALLY
PROPOSED SPRINKLER CONNECTION –EXTEND INTERNALLY
Signage: Kill Switch for Photo Voltaic Cells
1" PVC WATER LINE (TYP 3)
CONNECT TO EXISTING
IRRIGATION PITS
STANDPIPE CONNECTION
PROPOSED GAS SERVICE
PROPOSED PUMP STATION
DUMPSTER ENCLOSURE
BUS STOP
PSNH 146/25
PSNH 146/26
TEMP. POLE
IRRIGATION PIT
PROPOSED UTILITY POLE W/ GUY
BIKE RACK
PROPOSED UNDERGROUND ELECTRICAL SERVICE
IRRIGATION PIT
4' ORNAMENTAL BLACK FENCE ENCLOSURE
CB 4
CB 5
LSA
LEDGEWOOD DRIVE



NOTES:
1) THE PUMPER OUTLET NOZZLE SHALL FACE THE STREET.
2) CENTERLINE OF NOZZLES SHALL BE A MINIMUM OF 2 FEET ABOVE FINISHED GRADE OF STREET.
3) AREA AROUND HYDRANT SHALL BE GRADED TO ALLOW ANY SURFACE WATER TO DRAIN AWAY FROM HYDRANT.
4) HYDRANT SHALL BE FIRMLY SUPPORTED ALL AROUND THE STANDPIPE.
5) EARTH FILL SHALL BE TAMPED TO GIVE FIRM SUPPORT TO THE HYDRANT BARREL.
6) A GATE VALVE SHALL BE INSTALLED BETWEEN THE HYDRANT AND THE MAIN ON THE LATERAL.
7) HYDRANT LATERALS SHALL BE 6" INSIDE DIAMETER (MINIMUM).
8) HYDRANT LATERALS SHALL BE CONNECTED TO WATER MAINS 8 INCHES IN DIAMETER OR LARGER.
9) INSTALLATION OF HYDRANTS IN AREAS OF HEAVY VEGETATIVE GROWTH SHALL HAVE A 10 FOOT RADIUS CLEAR AREA ALL AROUND THE OPERATING NUT OF THE HYDRANT AND THERE SHALL ALSO BE AN INDICATOR POST FABRICATED FROM 2 INCH INSIDE DIAMETER GALVANIZED STEEL PIPE, 7 FEET ABOVE FINISHED GRADE, AND SET 2 FEET BELOW GRADE IN CLASS "A" CONCRETE CONCRETE 6 INCHES ALL AROUND POST. THIS POST SHALL BE COATED WITH ZINC CHROMATE PRIMER AND PAINTED WITH HIGH VISIBILITY RED. THE INDICATOR POST SHALL BE NO CLOSER THAN 3 FEET FROM THE OPERATING NUT, AND SET ON THE SIDE OF THE HYDRANT FACING ONCOMING TRAFFIC. TOP OF POST SHALL BE THREADED AND CAPPED.
10) INSTALLATION OF HYDRANTS IN HEAVY GROWTH AREAS SHALL HAVE GATE BOXES RAISED 6 INCHES ABOVE GRADE AND SHALL BE PAINTED ORANGE FOR HIGH VISIBILITY.

1 / C5 FIRE HYDRANT DETAIL
NTS

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:
1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1–888–DIG–SAFE (1–888–344–7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) SEWER FLOW CALCULATION
EXISTING RESTAURANTS(S)
225 SEATS X 10 GPD/SEAT = 2,250 GPD

PROPOSED RESIDENCES
106 BEDROOMS X 80 GPD/BEDROOM = 8,480 GPD

TOTAL FLOW = 10,730 GPD

5) FINAL SEWER PIPE DESIGN (BUILDING PERMIT PHASE) SHALL BE REVIEWED AND APPROVED BY PORTSMOUTH DPW.

6) FIRE HYDRANT WILL BE PRIVATE AND SUBJECT TO CITY OF PORTSMOUTH DPW REGULATIONS AND MAINTENANCE.

NO.	DESCRIPTION	DATE
9	Addendum 1	6/30/25

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
8	PARKING ENCROACHMENT	7/20/24
7	PARKING, TRANSFORMER, HYDRANT	5/1/24
6	NOTE 5, HYDRANT	3/27/24
5	BUILDING & SEWER	3/5/24
4	TRANSFORMER, NOTE 4	2/6/24
3	FORCE MAIN	1/24/24
2	GREASE TRAP	12/19/23
1	ISSUED FOR APPROVAL	11/20/23

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=20' FEBRUARY 2023

UTILITY PLAN

C5

FB 259 PG 10

1397.04

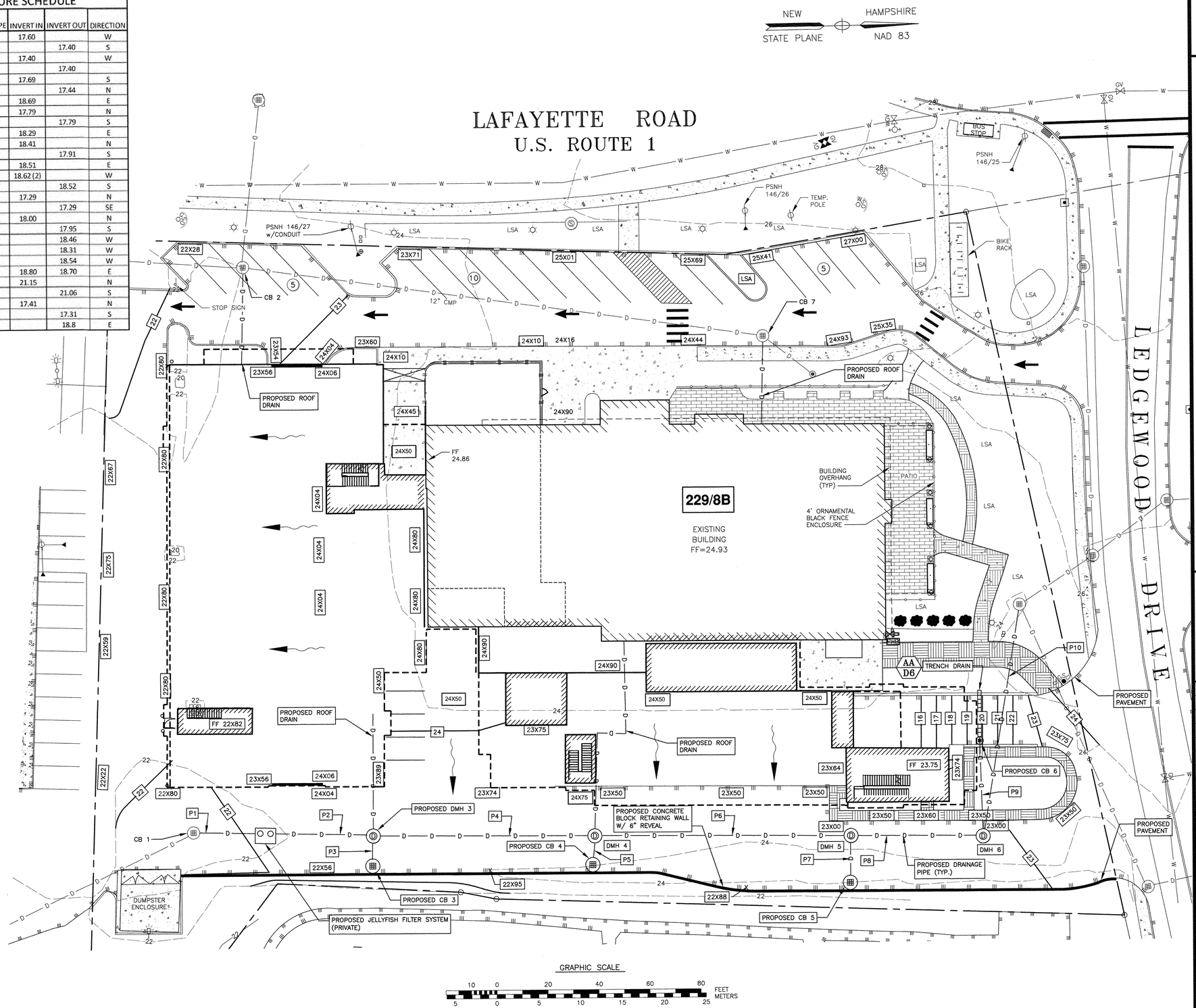
P:\97\1397.04 Hotfoods_Properties\1397.04 Lafayette Rd, Portsmouth, NH\2023 Site Plan 1397.04\Plans & Specs\SitePlan Set revised 4-29-24\C3 UTILITY.dwg, 7/24/2024 12:01:13 PM, Canon TX 3000 - Direct

DRAINAGE STRUCTURE SCHEDULE

STRUCTURE	PROP/EX	RIM	PIPE SIZE/TYPE	INVERT IN	INVERT OUT	DIRECTION
DMH 1	EX	22.3	15"	17.60		W
			10"		17.40	S
DMH 2	EX	22.3	15"	17.40		W
					17.40	
DMH 3	PROP	22.4	24"	17.69		S
			18"		17.44	N
			12"	18.69		E
DMH 4	PROP	23.2	18"	17.79		N
			18"		17.79	S
			12"	18.29		E
DMH 5	PROP	23.0	12"	18.41		N
			18"		17.91	S
			12"	18.51		E
DMH 6	PROP	23.0	12"	18.62 (2)		W
			12"		18.52	S
CB 1	EX	21.46	24"	17.29		N
					17.29	SE
CB 2	EX	22.00	12"	18.00		N
			15"		17.95	S
CB 3	PROP	22.16	12"		18.46	W
CB 4	PROP	22.45	12"		18.31	W
CB 5	PROP	22.60	12"		18.54	W
CB 6	PROP	20.05	12"	18.80	18.70	E
CB 7	EX	24.16	12"	21.15		N
			10"		21.06	S
JELLYFISH FILTER	PROP	23.05	24"	17.41		N
			24"		17.31	S
TRENCH DRAIN	PROP	20.05			18.8	E

DRAINAGE PIPE SCHEDULE

PIPE #	PIPE SIZE	LENGTH	SLOPE
P1	24"	22'	0.0008
P2	24"	36'	0.0008
P3	12"	7'	0.0022
P4	18"	82'	0.0012
P5	12"	6'	0.0022
P6	18"	95'	0.0012
P7	12"	13'	0.0022
P8	12"	47'	0.0022
P9	12"	33'	0.0022
P10	12"	88'	0.0022



HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

8 Addendum 1 6/30/25

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
7	GRADING	4/28/25
6	PARKING ENCROACHMENT	7/20/24
5	PIPE SCHEDULE	3/27/24
4	PIPE/DMH LAYOUT	3/5/24
3	BUILDING GRADES	2/21/24
2	GRADES	1/24/24
1	ISSUED FOR APPROVAL	11/20/23

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=20' JULY 2023

GRADING DRAINAGE EROSION CONTROL PLAN

C6

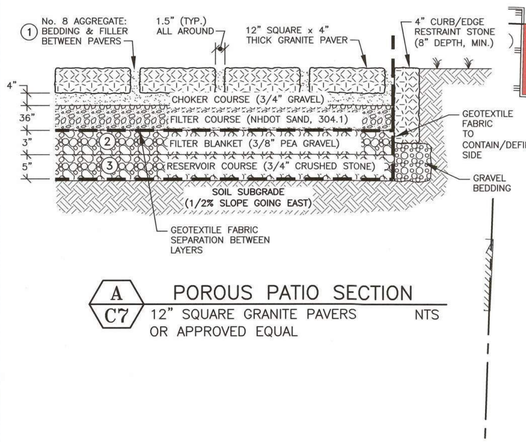
FB 259 PG 10

1397.04

ASTM D 448 GRADATION TABLE

①		②		③	
ASTM No. 8 BEDDING & JOINT FILLER		ASTM No. 57 STONE OPEN GRADED BASE		ASTM No. 2 STONE SUBBASE	
SIEVE SIZE	PASSING BY WEIGHT (%)	SIEVE SIZE	PASSING BY WEIGHT (%)	SIEVE SIZE	PASSING BY WEIGHT (%)
1/2" (12.5mm)	100	1.5" (37.5mm)	100	3" (75mm)	100
3/8" (9.5mm)	85–100	1" (25mm)	95–100	2.5" (63mm)	90–100
No. 4 (4.75mm)	10–30	1/2" (12.5mm)	25–60	2" (50mm)	35–70
No. 8 (2.36mm)	0–10	No. 4 (4.75mm)	0–10	1.5" 37.5mm)	0–15
No. 16 (1.16mm)	0–5	No. 8 (2.36mm)	0–5	3/4" (19mm)	0–5

NOTES:
1) PAVING SYSTEM BASE DESIGN IS SIMILAR TO BASE REQUIRED FOR THE UNI ECO-STONE PAVER. INSTALLATION SHALL FOLLOW MANUFACTURER'S INSTRUCTIONS FOR PLACEMENT OF BASE MATERIALS.
2) ALL STONE SHALL BE ANGULAR, WITH 90% FRACTURED FACES. STONE SHALL BE WASHED WITH LESS THAN 1% PASSING THE 200 SIEVE.
3) CONTRACTOR SHALL SUBMIT SIEVE ANALYSIS FOR EACH COURSE MATERIAL TO PROJECT ENGINEER FOR APPROVAL PRIOR TO PLACEMENT.
4) ALL FABRIC TO BE TENCATE MIRAFI 140N NONWOVEN GEOTEXTILE.



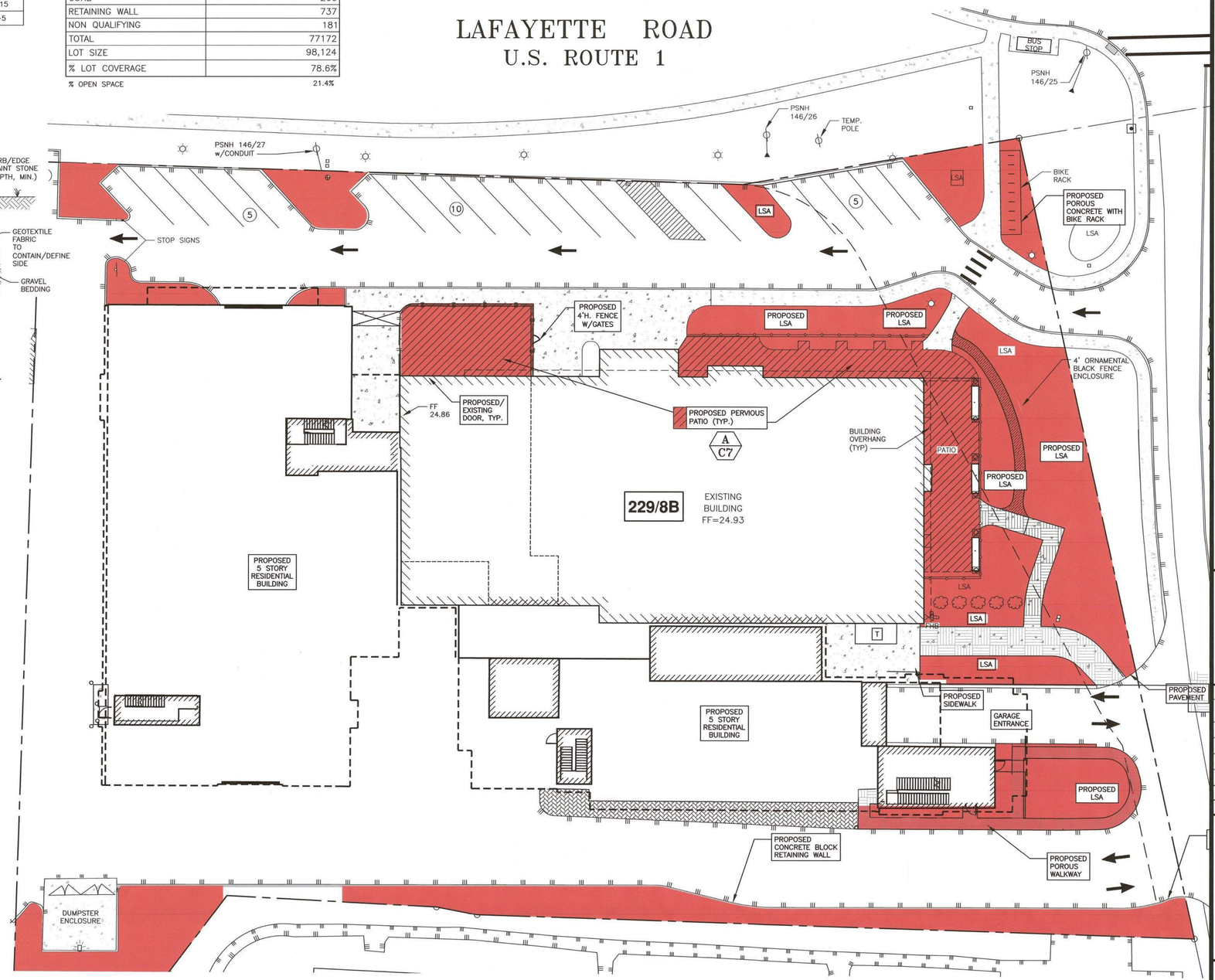
A C7 POROUS PATIO SECTION
12" SQUARE GRANITE PAVERS OR APPROVED EQUAL NTS

OPEN SPACE CALCULATION
(TO PROPERTY LINE)

STRUCTURE	POST-CONSTRUCTION IMPERVIOUS (S.F.)
MAIN STRUCTURE	42343
SIDEWALK	2,888
PAVEMENT	30,757
CURB	266
RETAINING WALL	737
NON QUALIFYING	181
TOTAL	77172
LOT SIZE	98,124
% LOT COVERAGE	78.6%
% OPEN SPACE	21.4%

SIDEWALK NOTES:
IMPERVIOUS WALKWAY= 4,604 S.F.
POROUS WALKWAY= 1,716 S.F.
REMAINING IMPERVIOUS= 4,604–1,716= 2,888 S.F.

NEW HAMPSHIRE STATE PLANE NAD 83



OPEN SPACE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:
1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.
2) OWNERS OF RECORD:
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538
3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270E, EFFECTIVE MAY 17, 2005
4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC
5) PARCEL IS LOCATED IN THE GATEWAY NEIGHBORHOOD CORRIDOR (G1) DISTRICT.
6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10
7) THE PURPOSE OF THIS PLAN IS TO SHOW THE OPEN SPACE ON TAX MAP 229 LOT 8B.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
5	Addendum 1	6/30/25
4	PARKING ENCROACHMENT, OPEN SPACE TABLE	7/20/24
3	UPDATE	3/27/24
2	UPDATE	2/21/24
1	OPEN SPACE	1/2/24
0	ISSUED FOR COMMENT	12/19/23

REVISIONS

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON

SCALE: 1"=20' JULY 2023

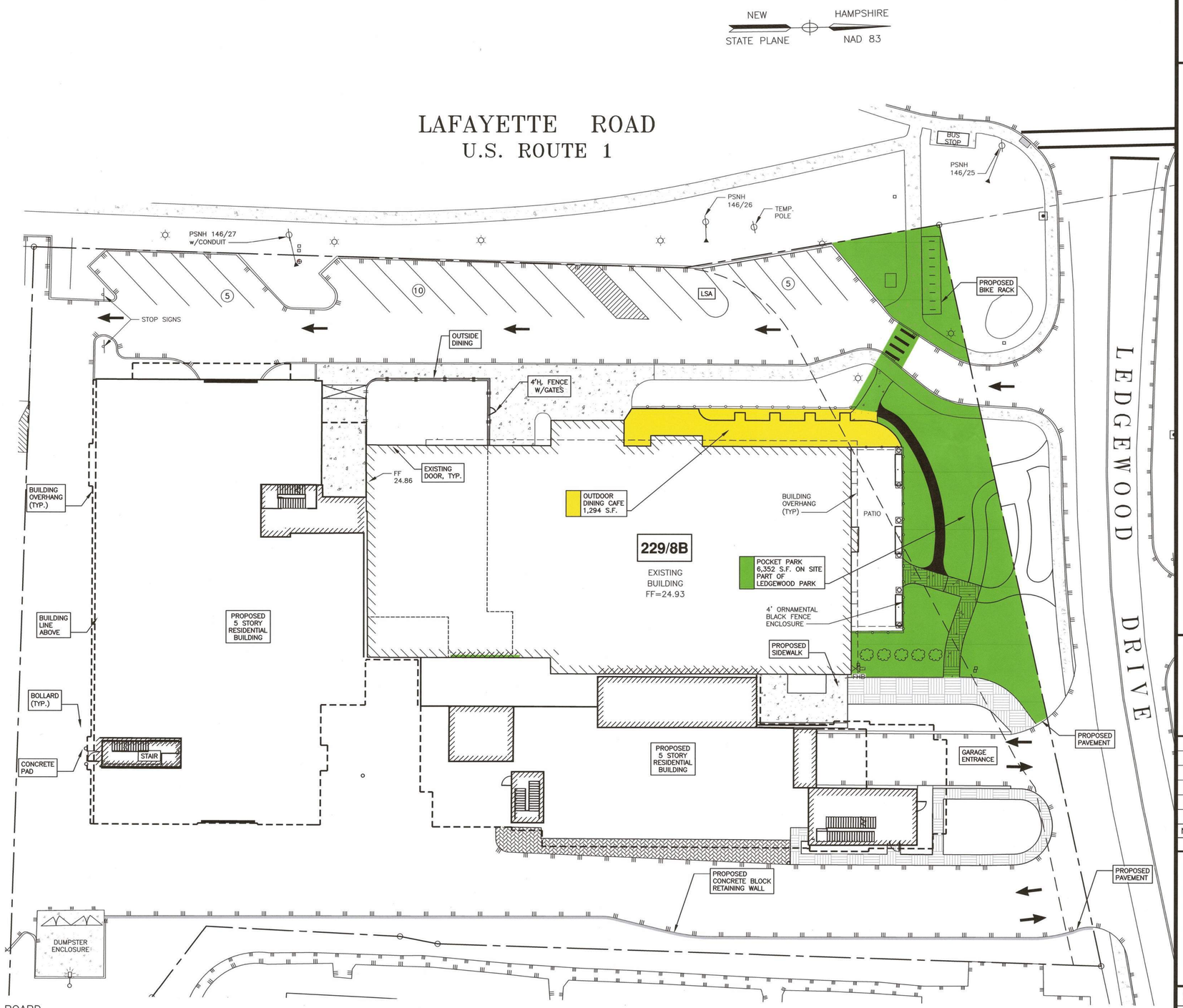
OPEN SPACE PLAN

C7

FB 259 PG 10

1397.04

P:\Active\2021\1158 - Michaels_Properties\1397.03 - Lafayette Rd, Portsmouth_WC\2023 Site Plan 1397.03\Plans & Specs\Site\Final Set\ALTA\1397.04 OPEN SPACE 2024.dwg, 7/19/2024 3:05:07 PM, Canon TX-3000 - Direct



COMMUNITY SPACE ON-SITE

POCKET PARK = 6,352 S.F.
OUTDOOR DINING CAFE = 1,294 S.F.

PROPOSED ON-SITE COMMUNITY SPACE 7,646 S.F.
LOT AREA 98,124 S.F.

COMMUNITY SPACE REQUIRED: 10%
(PER SECTION 10.5B41.80.2)
ON-SITE COMMUNITY SPACE PROVIDED: 7.8%

COMMUNITY SPACE USES
(PER SECTION 10.5B102)

PROPOSED USES: OUTDOOR DINING CAFE
POCKET PARK

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.

2) OWNERS OF RECORD:
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538

3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270F, EFFECTIVE JANUARY 29, 2021

4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY NEIGHBORHOOD CORRIDOR (G1) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE ON-SITE COMMUNITY SPACE ON TAX MAP 229 LOT 8B.

6 Addendum 1 6/30/25

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
5	PARKING ENCROACHMENT & POCKET PARK	7/20/24
4	BUILDING LAYOUT	3/27/24
3	AREAS/TYPES	2/21/24
2	COMMUNITY SPACE TYPES	2/6/24
1	AREAS/TYPES	1/24/24
0	ISSUED FOR COMMENT	12/19/23

REVISIONS

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON SIGNATURE

SCALE: 1"=20' JULY 2023

ON-SITE COMMUNITY SPACE PLAN

C8

FB 259 PG 10

5010156

NEW HAMPSHIRE
STATE PLANE NAD 83

LAFAYETTE ROAD
U.S. ROUTE 1

LAFAYETTE PARK
8,935 S.F.

LEDGEWOOD PARK
1,602 S.F.

LSA

BUS STOP

PSNH 146/25

PSNH 146/26

TEMP. POLE

PSNH 146/27 w/CONDUIT

STOP SIGNS

PROPOSED BIKE RACK

PROPOSED OUTSIDE DINING

PROPOSED 4'H. FENCE W/GATES

FF 24.86

PROPOSED/ EXISTING DOOR, TYP.

BUILDING OVERHANG (TYP.)

BUILDING OVERHANG (TYP)

PATIO

229/8B

EXISTING BUILDING FF=24.93

4' ORNAMENTAL BLACK FENCE ENCLOSURE

PROPOSED SIDEWALK

FHB

BUILDING LINE ABOVE

PROPOSED 5 STORY RESIDENTIAL BUILDING

BOLLARD (TYP.)

CONCRETE PAD

STAIR

PROPOSED 5 STORY RESIDENTIAL BUILDING

PROPOSED PAVEMENT

PROPOSED CONCRETE BLOCK RETAINING WALL

PROPOSED PAVEMENT

DUMPSTER ENCLOSURE

LEDGEWOOD DRIVE

OFF-SITE LANDSCAPE MAINTENANCE AREA

LAFAYETTE PARK = 8,935 S.F.
LEDGEWOOD PARK = 1,602 S.F.

PROPOSED OFF-SITE MAINTENANCE AREA 10,537 S.F.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

GRAPHIC SCALE

10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.

200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

WWW.HALEYWARD.COM

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.

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3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538

3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270F, EFFECTIVE JANUARY 29, 2021

4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY NEIGHBORHOOD CORRIDOR (G1) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE OFF-SITE COMMUNITY SPACE TO BE MAINTAINED BY THE OWNER OF TAX MAP 229 LOT 8B.

8) SIGNAGE IDENTIFYING THE POCKET PARK AS PUBLIC SPACE TO BE PROVIDED.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
3	Addendum 1	6/30/25
2	BUILDING LAYOUT	3/27/24
1	TITLE	2/21/24
0	ISSUED FOR COMMENT	2/21/24

REVISIONS

STATE OF NEW HAMPSHIRE — No. 738 JOHN R. CHAGNON — LICENSED LAND SURVEYOR

SCALE: 1"=20' JULY 2023

OFF-SITE LANDSCAPE MAINTENANCE AREA

C8.1

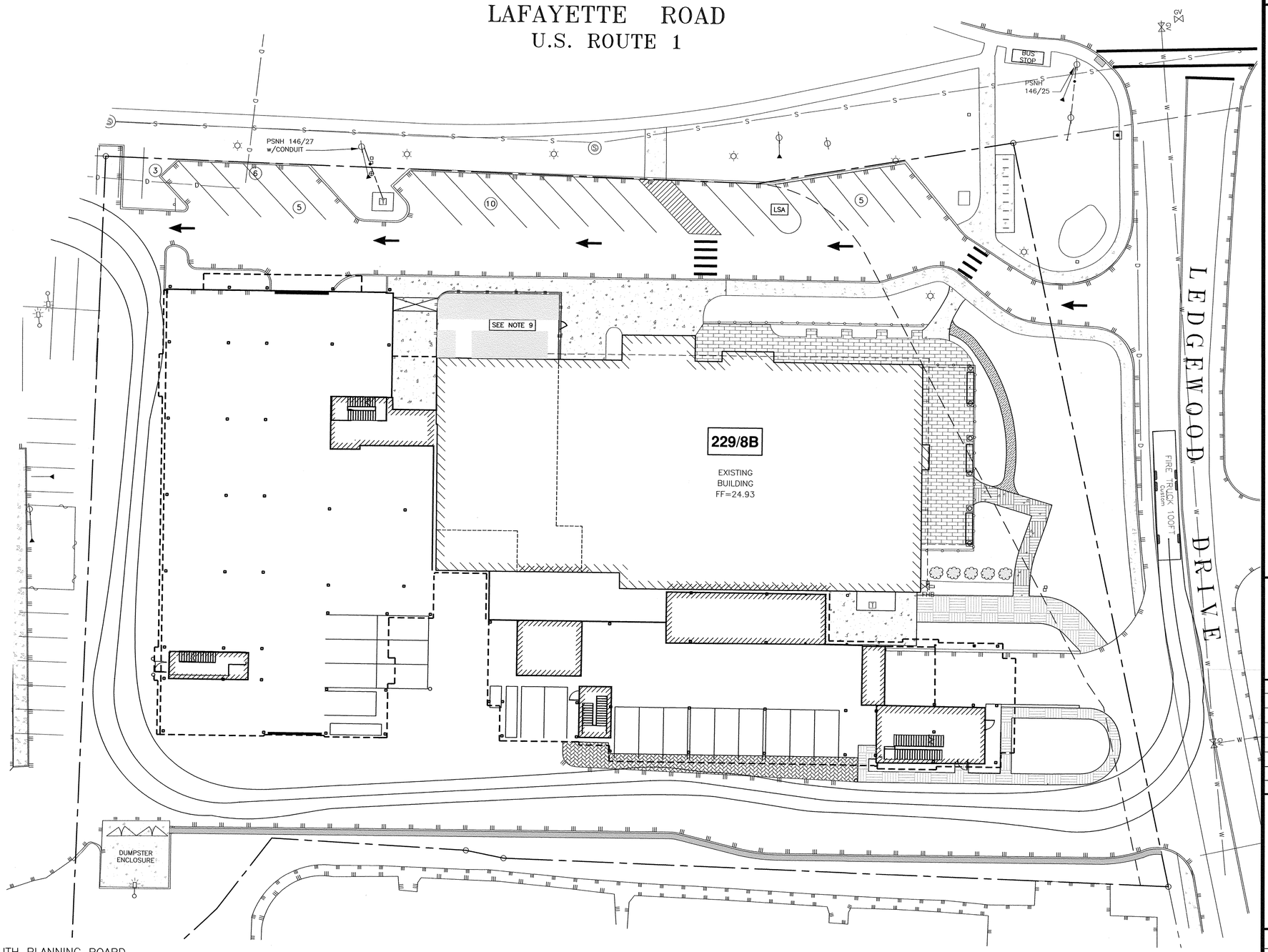
FB 259 PG 10

5010156

P:\NH\2021\156-McHaffie_Properties\197-181-Lafayette Rd, Portsmouth--IBC\2023 Site Plan 197-181\Plans & Specs\Site\Final Set Revised 2-22-2024\C3 - COMMUNITY SPACE OFF SITE.dwg,Reg, 7/16/2024 3:39:47 PM, Canon TX-3000 - Direct

NEW HAMPSHIRE
STATE PLANE NAD 83

LAFAYETTE ROAD
U.S. ROUTE 1



APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

GRAPHIC SCALE

10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 8B.

2) OWNERS OF RECORD:
ATLAS COMMONS, LLC
3 PLEASANT STREET, SUITE 400
PORTSMOUTH, NH 03801
6474/1538

3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270E, EFFECTIVE MAY 17, 2005

4) EXISTING LOT AREA:
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY CORRIDOR (G1) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

7) THE PURPOSE OF THIS PLAN IS TO SHOW GENERAL TURNING MOVEMENTS ON TAX MAP 229 LOT 8B.

8) DESIGN BASED ON ARCHITECTURAL PLAN BY ARCOVE ARCHITECTS DATED 8/22/23.

9) CONVERSION OF TUSCAN MARKETPLACE TO RESTAURANT (NORTHEASTERN THAI, LLC) APPROVED UNDER PERMIT: LU-22-254

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
5	Addendum 1	6/30/25
4	PARKING ENCROACHMENT	7/20/24
3	BUILDING COLUMNS & BOLLARD	3/27/24
2	BUILDING	3/5/24
1	ISSUED FOR APPROVAL	9/29/23
0	ISSUED FOR COMMENT	8/31/23

REVISIONS

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON

SCALE: 1"=20' JULY 2023

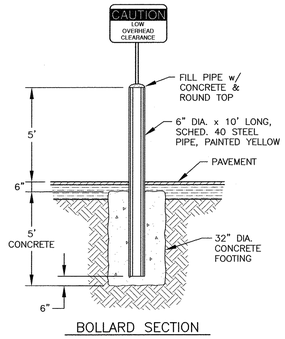
FIRE TRUCK TURNING PLAN

T1

FB 259 PG 10

1397.04

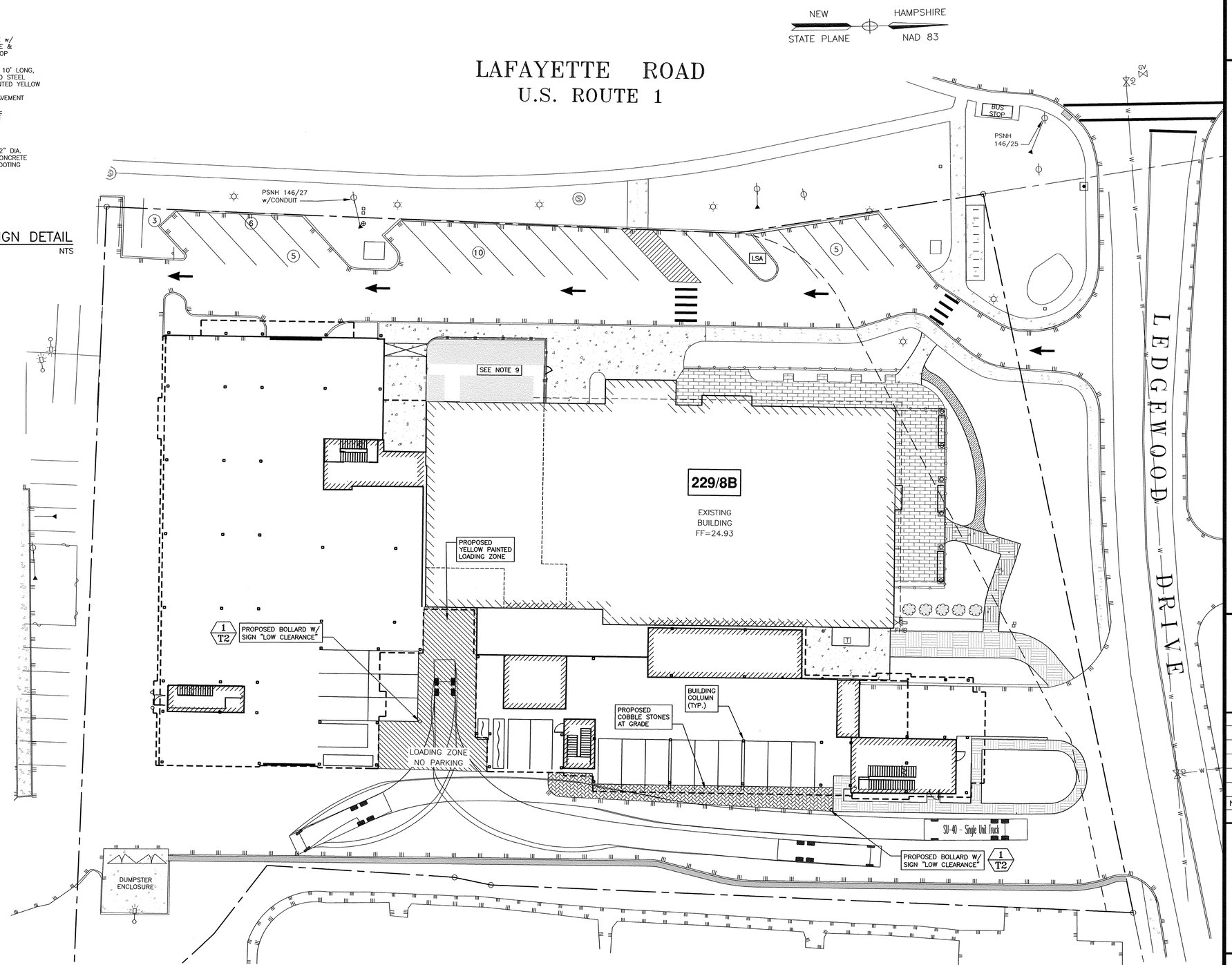
P:\NH\SITES\1397.04\Work_Properties\1397.01-Lafayette Rd, Portsmouth, NH\2023 Site Plan 1397.01\Plans & Specs\Site\Final Set Revised 3-5-2024\T2 TRUCK TURNING 3-5-24.dwg, 7/5/2024 3:51:29 PM, Canon TX-3000 - Direct



BOLLARD SECTION

1 T2 BOLLARD W/ SIGN DETAIL

NTS



APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.

WWW.HALEYWARD.COM

200 Griffin Road, Unit 3
Portsmouth, NH 03801
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COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
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0	ISSUED FOR COMMENT	8/31/23

REVISIONS

STATE OF NEW HAMPSHIRE
JOHN R. CHAGNON
No. 7851
LICENSED
PROFESSIONAL ENGINEER

SCALE: 1"=20'

JULY 2023

DELIVERY TRUCK TURNING PLAN

T2

FB 259 PG 10

1397.04

EROSION CONTROL NOTES

CONSTRUCTION SEQUENCE

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. THE CONTRACTOR SHALL OBTAIN AN **NPDES** PHASE II STORMWATER PERMIT BEFORE BEGINNING CONSTRUCTION AND SHALL HAVE ON SITE A STORMWATER POLLUTION PREVENTION PLAN (**S.W.P.P.P.**) AVAILABLE FOR INSPECTION BY THE PERMITTING AUTHORITY DURING THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THE **S.W.P.P.P.** AND INSPECTING AND MAINTAINING ALL BMP'S CALLED FOR BY THE PLAN. THE CONTRACTOR SHALL SUBMIT A NOTICE OF TERMINATION (**N.O.T.**) FORM TO THE REGIONAL EPA OFFICE WITHIN 30 DAYS OF FINAL STABILIZATION OF THE ENTIRE SITE OR TURNING OVER CONTROL OF THE SITE TO ANOTHER OPERATOR.
3. INSTALL PERIMETER CONTROLS, i.e., SILTSOXX AROUND THE LIMITS OF DISTURBANCE AND CATCH BASIN BASKETS AS NEEDED BEFORE ANY EARTH MOVING OPERATIONS.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.
5. CUT AND GRUB ALL TREES, SHRUBS, SAPLINGS, BRUSH, VINES AND REMOVE OTHER DEBRIS AND RUBBISH AS REQUIRED.
6. DEMOLISH EXISTING WALKWAYS, PAVEMENT, AND UTILITIES AS INDICATED ON THE PLANS.
7. REPLANT TREES OR MOVE TO STABLE LOCATION.
8. BEGIN CONSTRUCTION OF ADDITIONS.
9. LAYOUT AND INSTALL ALL BURIED UTILITIES AND SERVICES UP TO 10' OF THE PROPOSED BUILDING FOUNDATIONS. CAP AND MARK TERMINATIONS OR LOG SWING TIES.
10. FINISH GRADE SITE, BACKFILL ROAD SUBBASE GRAVEL IN TWO, COMPACTED LIFTS. PROVIDE TEMPORARY EROSION PROTECTION IN THE FORM OF MULCHING, JUTE MESH OR DITCH DAMS.
11. INSTALL RETAINING WALL.
12. INSTALL DRAINAGE SYSTEM.
13. PLACE BINDER LAYER OF PAVEMENT, THEN RAISE CATCH BASIN FRAMES TO FINAL GRADE. REINSTALL BASIN INLET PROTECTION.
14. PLANT LANDSCAPING IN AREAS OUT OF WAY OF BUILDING CONSTRUCTION. PREPARE AND STABILIZE FINAL SITE GRADING BY ADDING TOPSOIL, SEED, MULCH AND FERTILIZER.
15. AFTER BUILDINGS ARE COMPLETED, FINISH ALL REMAINING LANDSCAPED WORK.
16. CONSTRUCT ASPHALT WEARING COURSE.
17. REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES UPON COMPLETION OF FINAL STABILIZATION OF THE SITE.

GENERAL CONSTRUCTION NOTES

1. THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
2. DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.
3. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.
4. DUST CONTROL: IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.
5. SILT FENCES AND SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILT FENCES AND SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.
6. AVOID THE USE OF FUTURE OPEN SPACES (LOAM AND SEED AREAS) WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL USE THE ROADBEDS OF FUTURE ACCESS DRIVES AND PARKING AREAS.
7. ADDITIONAL TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNTS NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS--CONSTRUCT SILT FENCE OR SILTSOXX AROUND TOPSOIL STOCKPILE.
8. AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL. STUMPS SHALL BE DISPOSED OF IN AN APPROVED FACILITY.
9. ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.
10. ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.
11. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.
12. FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.
13. DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.
14. THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.
15. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
16. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    - BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
    - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
    - EROSION CONTROL BLANKETS HAVE BEEN INSTALLED

VEGETATIVE PRACTICE

FOR PERMANENT MEASURES AND PLANTINGS:

LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE.

FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10-20-20 FERTILIZER.

SEED SHALL BE SOWN AT THE RATES SHOWN IN THE TABLE BELOW. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE, AND SHALL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.

THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED.

A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE:

GENERAL COVER	PROPORTION	SEEDING RATE
CREEPING RED FESCUE	50%	100 LBS/ACRE
KENTUCKY BLUEGRASS	50%	

SLOPE SEED (USED ON ALL SLOPES GREATER THAN OR EQUAL TO 3:1)

CREEPING RED FESCUE	42%	
TALL FESCUE	42%	48 LBS/ACRE
BIRDSFOOT TREFOIL	16%	

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH APPLICABLE STATE AND FEDERAL SEED LAWS.

FOR TEMPORARY PROTECTION OF DISTURBED AREAS:
MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:
PERENNIAL RYE: 0.7 LBS/1,000 S.F.
MULCH: 1.5 TONS/ACRE

MAINTENANCE AND PROTECTION

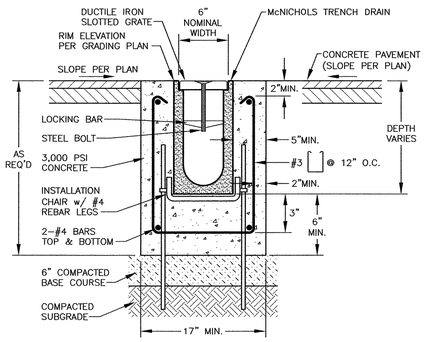
1. THE CONTRACTOR SHALL MAINTAIN ALL LOAM & SEED AREAS UNTIL FINAL ACCEPTANCE AT THE COMPLETION OF THE CONTRACT. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, REMOVAL OF STONES AND OTHER FOREIGN OBJECTS OVER 1/2 INCHES IN DIAMETER WHICH MAY APPEAR AND THE FIRST TWO (2) CUTTINGS OF GRASS NO CLOSER THEN TEN (10) DAYS APART. THE FIRST CUTTING SHALL BE ACCOMPLISHED WHEN THE GRASS IS FROM 2 1/2 TO 3 INCHES HIGH. ALL BARE AND DEAD SPOTS WHICH BECOME APPARENT SHALL BE PROPERLY PREPARED, LIMED AND FERTILIZED, AND RESEEDED BY THE CONTRACTOR AT HIS EXPENSE AS MANY TIMES AS NECESSARY TO SECURE GOOD GROWTH. THE ENTIRE AREA SHALL BE MAINTAINED, WATERED AND CUT UNTIL ACCEPTANCE OF THE LAWN BY THE OWNER'S REPRESENTATIVE.
2. THE CONTRACTOR SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO PROTECT THE GRASS WHILE IT IS DEVELOPING.
3. TO BE ACCEPTABLE, SEEDED AREAS SHALL CONSIST OF A UNIFORM STAND OF AT LEAST 90 PERCENT ESTABLISHED PERMANENT GRASS SPECIES, WITH UNIFORM COUNT OF AT LEAST 100 PLANTS PER SQUARE FOOT.
4. SEEDED AREAS WILL BE FERTILIZED AND RESEEDED AS NECESSARY TO INSURE VEGETATIVE ESTABLISHMENT.
5. THE SWALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY UNTIL ADEQUATE VEGETATION IS ESTABLISHED.
6. THE SILT FENCE OR SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
7. SILT FENCING AND SILTSOXX SHALL BE REMOVED ONCE VEGETATION IS ESTABLISHED, AND DISTURBED AREAS RESULTING FROM SILT FENCE AND SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.

WINTER NOTES

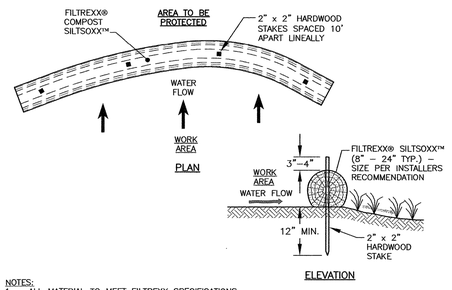
1. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

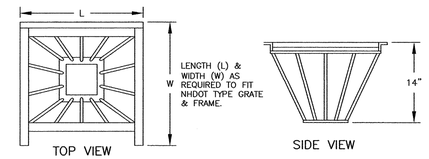


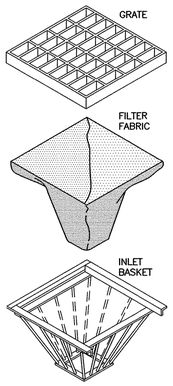
D / C4 EVAPORATIVE TRENCH DRAIN DETAIL IN GARAGE — NTS



NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

A / C6 FILTREXX® SILTSOXX™ FILTRATION SYSTEM — NTS





1) INLET BASKETS SHALL BE INSTALLED IMMEDIATELY AFTER CATCH BASIN CONSTRUCTION IS COMPLETE AND SHALL REMAIN IN PLACE AND BE MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

2) FILTER FABRIC SHALL BE PUSHED DOWN AND FORMED TO THE SHAPE OF THE BASKET. THE SHEET OF FABRIC SHALL BE LARGE ENOUGH TO BE SUPPORTED BY THE BASKET FRAME WHEN HOLDING SEDIMENT AND, SHALL EXTEND AT LEAST 6" PAST THE FRAME. THE INLET GRATE SHALL BE PLACED OVER THE BASKET/FRAME AND WILL SERVE AS THE FABRIC ANCHOR.

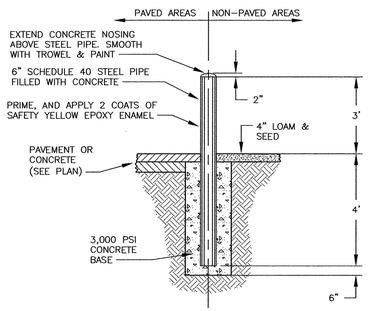
3) THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE, OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:
–RAB STRENGTH: 45 LB. MIN. IN ANY PRINCIPAL DIRECTION (ASTM D1682)
–MULLEN BURST STRENGTH: MIN. 60 psi (ASTM D774)

4) THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 gpm/s.f. (MULTIPLY THE PERMITTIVITY IN SEC.–1 FROM ASTM 54491–85 CONSTANT HEAD TEST USING THE CONVERSION FACTOR OF 74.)

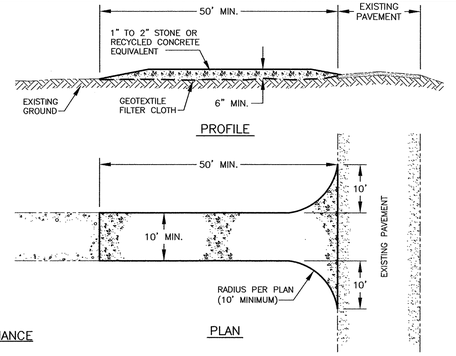
5) THE INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

6) SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

B / C6 CATCH BASIN INLET BASKET — NTS



E / C3 PIPE BOLLARD DETAIL — NTS



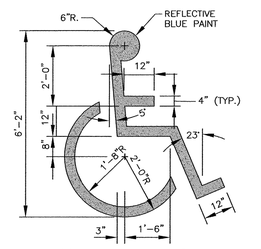
MAINTENANCE

1) MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE GRAVEL AND THE EFFECTIVENESS OF THE GRAVEL PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOP DRESSED WITH NEW STONE. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
2) IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS

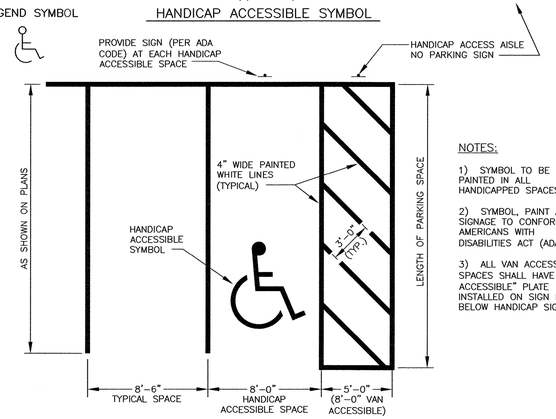
1) STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2) THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3) THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4) THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5) GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6) ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT–OF–WAY MUST BE REMOVED PROMPTLY.
8) WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY, WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

C / C6 STABILIZED CONSTRUCTION ENTRANCE — NTS



HANDICAP ACCESSIBLE SYMBOL

LEGEND SYMBOL



NOTES:

1) SYMBOL TO BE PAINTED IN ALL HANDICAPPED SPACES.

2) SYMBOL, PAINT AND SIGNAGE TO CONFORM TO AMERICANS WITH DISABILITIES ACT (ADA).

3) ALL VAN ACCESSIBLE SPACES SHALL HAVE "VAN ACCESSIBLE" PLATE INSTALLED ON SIGN POST BELOW HANDICAP SIGN.

EE / C3 HANDICAP PARKING DETAIL — NTS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

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MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
2	Addendum 1	6/30/25
1	DETAIL EE	2/21/24
0	ISSUED FOR COMMENT	11/20/23

REVISIONS

SCALE: AS NOTED NOVEMBER 2023

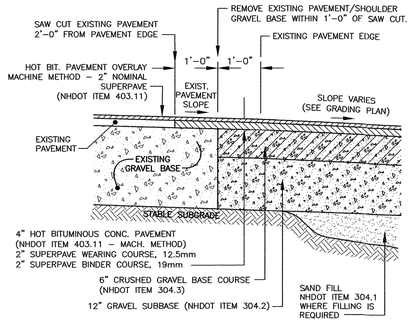
EROSION CONTROL NOTES & DETAILS

D1

FB 259 PG 10

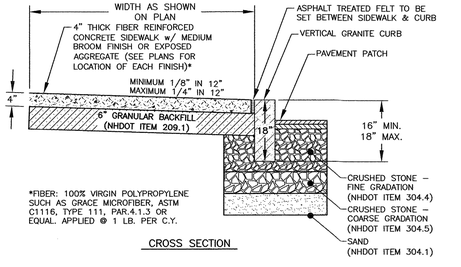
5010156 1397.04

P:\NHS\5010156-McNabb_Properties\1397.04-Lafayette Rd, Portsmouth-JRC\2023 Site Plan 1397.04\Plans & Specs\Site\Final Set Revised 2-14-2024\1397.04 SITE DETAILS 2024.dwg 2/14/2024 4:29:43 PM, USHRSH-FS01\Portsmouth Plotter Canon TX3000

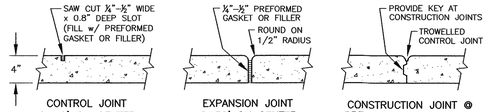


F / C3 FULL DEPTH PAVEMENT SECTION AND PAVEMENT JOINT DETAIL

NTS

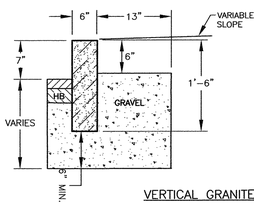


CROSS SECTION



G / C3 PORTLAND CEMENT CONCRETE SIDEWALK

NTS



VERTICAL GRANITE CURB

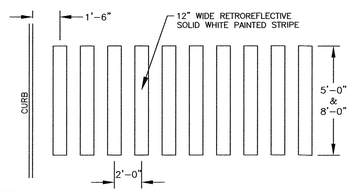
MIN. LENGTH OF CURB STONES: 3FT.
MAX. LENGTH OF CURB STONES: 10FT.
MAX. LENGTH OF STRAIGHT CURB STONES LAID ON CURVE: SEE CHART

NOTE: ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATE LENGTH.

Radius	Max. length
21'	3'
22' – 28'	4'
29' – 35'	5'
36' – 42'	6'
43' – 49'	7'
50' – 56'	8'
57' – 60'	9'
over 60'	10'

H / C3 GRANITE CURBING DETAILS (CITY OF PORTSMOUTH)

NTS

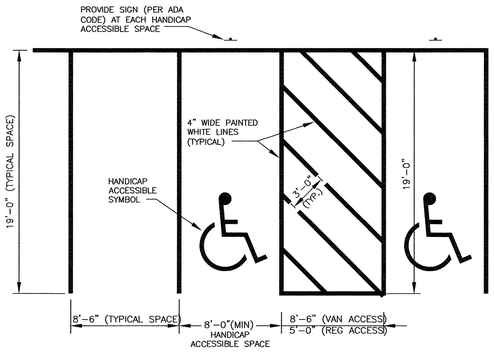


I / C3 PAINTED CROSSWALK DETAIL

NTS

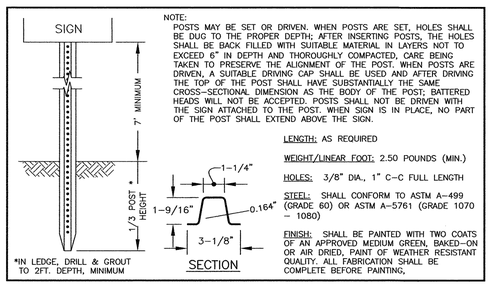
APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____



J / C3 PARKING STALL DETAIL

NTS



NOTE:
POSTS MAY BE SET OR DRIVEN. WHEN POSTS ARE SET, HOLES SHALL BE DUG TO THE PROPER DEPTH; AFTER INSERTING POSTS, THE HOLES SHALL BE BACK FILLED WITH SUITABLE MATERIAL IN LAYERS NOT TO EXCEED 6" IN DEPTH AND THOROUGHLY COMPACTED, CARE BEING TAKEN TO PRESERVE THE ALIGNMENT OF THE POST. WHEN POSTS ARE DRIVEN, A SUITABLE DRIVING CAP SHALL BE USED AND AFTER DRIVING THE TOP OF THE POST SHALL HAVE SUBSTANTIALLY THE SAME CROSS–SECTIONAL DIMENSION AS THE BODY OF THE POST; BATTERED HEADS WILL NOT BE ACCEPTED. POSTS SHALL NOT BE DRIVEN WITH THE SIGN ATTACHED TO THE POST. WHEN SIGN IS IN PLACE, NO PART OF THE POST SHALL EXTEND ABOVE THE SIGN.

LENGTH: AS REQUIRED

WEIGHT/LINEAR FOOT: 2.50 POUNDS (MIN.)

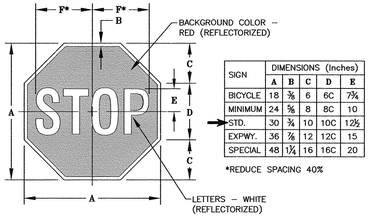
HOLES: 3/8" DIA., 1" C–C FULL LENGTH

STEEL: SHALL CONFORM TO ASTM A–499 (GRADE 60) OR ASTM A–5761 (GRADE 1070 – 1080)

FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN, BAKED–ON OR AIR DRIED, PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

K / C3 SIGN POST DETAIL

NTS



SIGN	DIMENSIONS (Inches)				
	A	B	C	D	E
BICYCLE	18	3/8	6	6C	7¾
MINIMUM	24	5/8	8	8C	10
STD.	30	¾	10	10C	12½
EXPWY.	36	⅞	12	12C	15
SPECIAL	48	1¼	16	16C	20

*REDUCE SPACING 40%

R1–1
A" x A"

R7–8a
12" x 18"
SIGN ON POST

EACH SPACE SHALL HAVE THIS SIGN DISPLAYED PER ADA CODE

"VAN ACCESSIBLE" SHALL ALSO BE DISPLAYED WHERE INDICATED

12"x18"

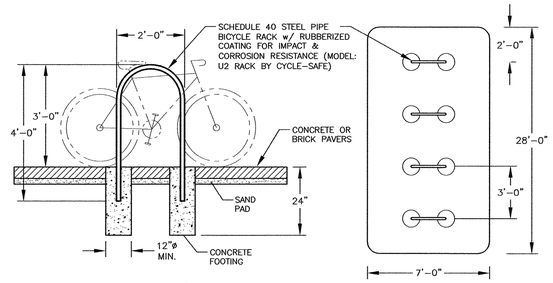
R10–7
24" x 30"
SIGN ON POST

SEE DETAIL NN/D7 FOR SIGN LOCATION AT INTERSECTION OF LEDGEWOOD DRIVE AND LAFAYETTE ROAD

R5–1
30" x 30"

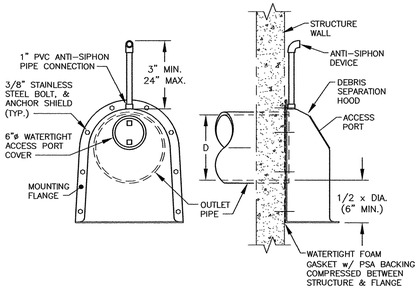
M / C3 SIGN DETAILS

NTS



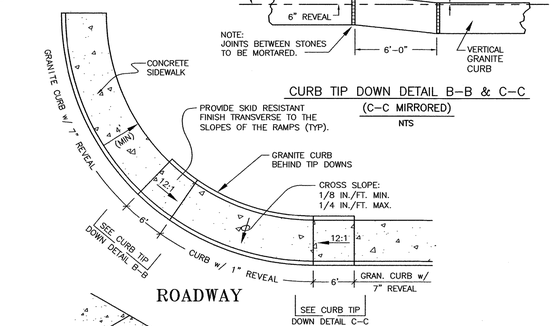
N / C3 UPTURNED "U" BICYCLE RACK

NTS



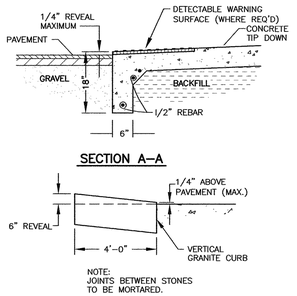
O / C6 CATCH BASIN OUTLET HOOD DETAIL

NTS



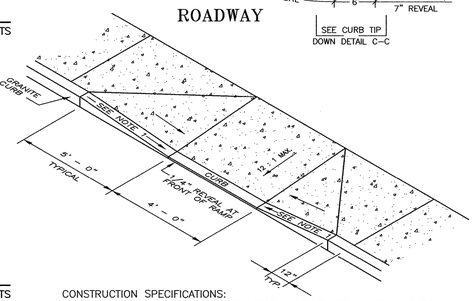
CURB TIP DOWN DETAIL B–B & C–C (C–C MIRRORED)

NTS



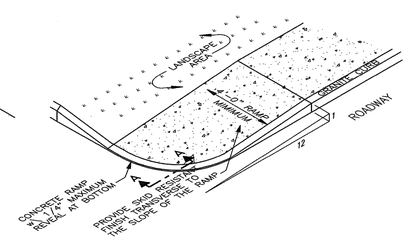
NOTE:
JOINTS BETWEEN STONES TO BE MORTARED.

GRANITE CURB END FOR VERTICAL GRANITE CURB



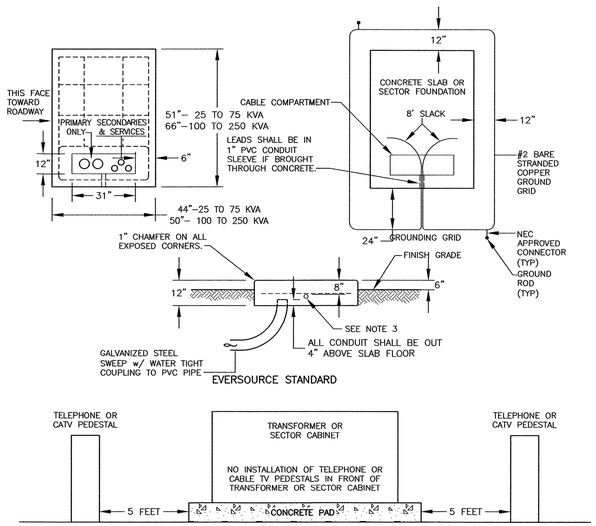
CONSTRUCTION SPECIFICATIONS:
1) SLOPE OF RAMP VARIES WITH SIDEWALK WIDTH & HEIGHT, WITH A MAXIMUM SLOPE OF 12 : 1 AND A MINIMUM SLOPE OF 16 : 1.

2) A SKID RESISTANT FINISH TRANSVERSE TO THE SLOPE OF THE RAMP AND WARPED SIDEWALK, SHALL BE USED ON PORTLAND CEMENT CONCRETE RAMPS.



L / C3 TIP DOWNS FOR CONCRETE SIDEWALK

NTS



NOTES
1. ALL REINFORCING TO BE #6 BARS.
2. 1" PVC CONDUIT SLEEVE FOR GROUND GRID LEADS.
3. THE GROUND GRID SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AND IS TO BE BURIED AT LEAST 12" BELOW GRADE. EIGHT FEET OF EXTRA WIRE FOR EACH GROUND GRID LEG SHALL BE LEFT EXPOSED IN THE CABLE COMPARTMENT TO ALLOW FOR THE CONNECTION TO THE TRANSFOMER. THE TWO 8' GROUND RODS MAY BE EITHER GALVANIZED STEEL OR COPPERWELD AND THEY SHALL BE CONNECTED TO THE GRID WITH NEC APPROVED CONNECTORS.
4. NO SHRUBS, FENCES, OR PERMANENT STRUCTURES CAN BE PLACED WITHIN 10 FEET OF THE FRONT AND 5 FEET OF THE SIDES AND BACK OF PAD–MOUNTED EQUIPMENT. THE COMPANY HAS THE RIGHT TO REMOVE THESE OBJECTS WITHOUT NOTICE TO THE OWNER.

P / C5 TRANSFORMER PAD

COORDINATE WITH EVERSOURCE

NTS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
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MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
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NO.	DESCRIPTION	DATE
1	Addendum 1	6/30/25
0	ISSUED FOR COMMENT	11/20/23

REVISIONS

SCALE: AS NOTED NOVEMBER 2023

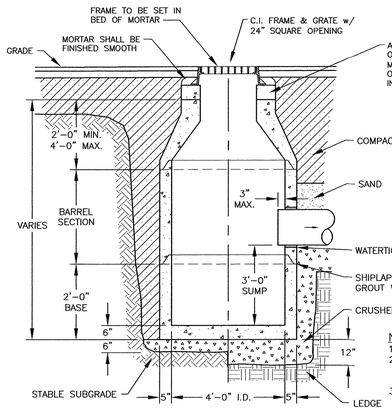
DETAILS

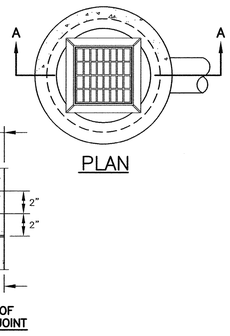
D2

FB 259 PG 10

5010156 1397.04

P:\5010\5010156 McNabb, Properties\1397.03 Lafayette Rd, Portsmouth - NC\2023 Site Plan 1397.03\Plans & Specs\Site\Final Site\1397.03 Details 2023.dwg, 11/20/2023 3:52:23 PM, Portsmouth Plotter Canon TS9000 (temporary).tp3





PLAN

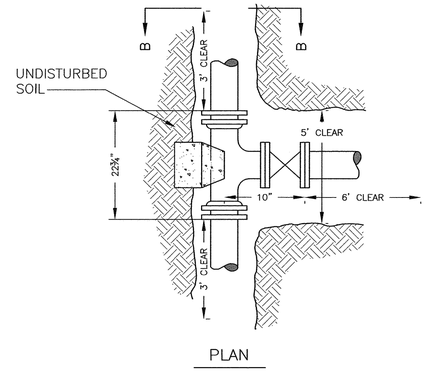
DETAIL OF SHIPLAP JOINT

SECTION A – A

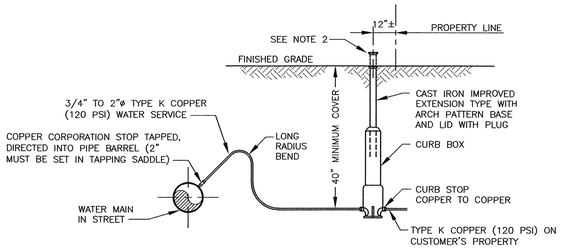
NOTES:
1. CONCRETE SHALL BE 4,000 P.S.I. AFTER 28 DAYS.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FT. IN ALL SECTIONS & SHALL BE PLACED IN THE CENTER THIRD OF WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. EACH CASTING TO HAVE LIFTING HOLES CAST IN.

Q / C5 CATCH BASIN DETAIL

NTS



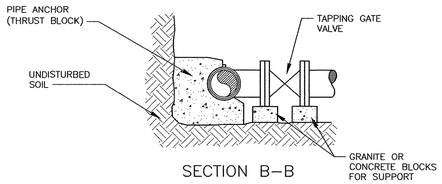
PLAN



NOTE:
1) INSTALLATION OF WATER MAIN TAP & CURB STOP & BOX SHALL ONLY BE PERFORMED BY THOSE AUTHORIZED BY THE PUBLIC WORKS DEPARTMENT.
2) IN AREAS OF HEAVY GROWTH THE CURB BOX COVER SHALL BE SET 6" ABOVE FINISH GRADE AND A WITNESS STAKE SET.
3) CURB BOX SHALL BE SET APPROXIMATELY 12" OUTSIDE PROPERTY LINE AS SHOWN.
4) PRIOR TO ACCEPTANCE, A PLAN INDICATING THE LOCATION OF THE CURB BOX SHALL BE SUBMITTED TO THE CITY OF PORTSMOUTH WATER DIVISION.

V / C4 WATER SERVICE CONNECTION

INSTALL PER PORTSMOUTH REQUIREMENTS NTS

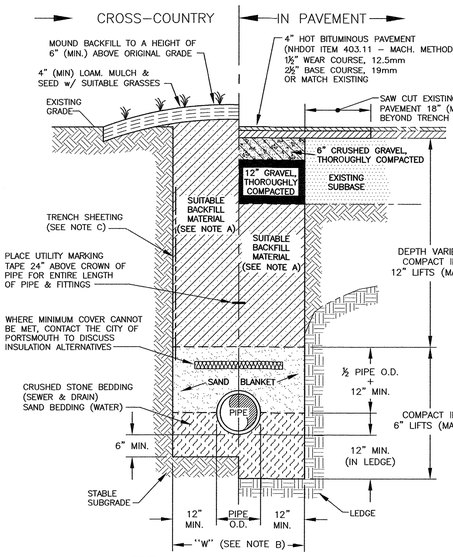


SECTION B–B

NOTES:
1) ALL MATERIALS SHALL BE APPROVED BY THE PORTSMOUTH WATER DEPARTMENT PRIOR TO INSTALLATION AND USE.
2) ALL JOINTS SHALL BE MECHANICAL.
3) "CLEAR" DIMENSIONS SHOWN ATE REQUIRED FOR WORKSPACE. NO JOINTS ON PIPE BEING TAPPED WITHIN "CLEAR" AREA.
4) FORD TYPE STAINLESS STEEL TAPPING SADDLES OR APPROVED EQUAL ARE ALSO ACCEPTABLE.

T / C4 TAPPING SLEEVE AND GATE

INSTALL PER PORTSMOUTH REQUIREMENTS NTS



TRENCH NOTES:
A) TRENCH BACKFILL:
– IN PAVED AREAS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIALS DEEMED TO BE UNACCEPTABLE BY THE ENGINEER.

– IN CROSS–COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE.

B) "W" = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D..

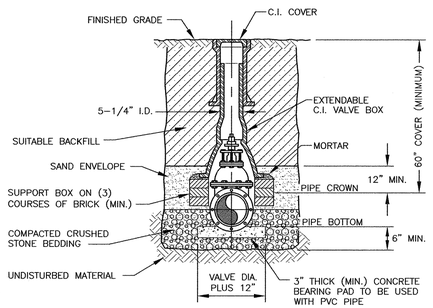
C) TRENCH SHEETING:
IF REQUIRED. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

D) MINIMUM PIPE COVER FOR UTILITY MAINS (UNLESS GOVERNED BY OTHER CODES):
6' MINIMUM FOR SEWER (IN PAVEMENT)
4' MINIMUM FOR SEWER (CROSS COUNTRY)
3' MINIMUM FOR STORMWATER DRAINS
5' MINIMUM FOR WATER MAINS

E) ALL PAVEMENT CUTS SHALL BE REPAIRED BY THE INFRARED HEAT METHOD.

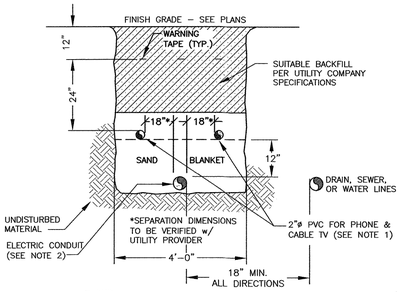
R / C4 TYPICAL PIPE TRENCH

NTS



U / C4 TYPICAL VALVE BOX INSTALLATION

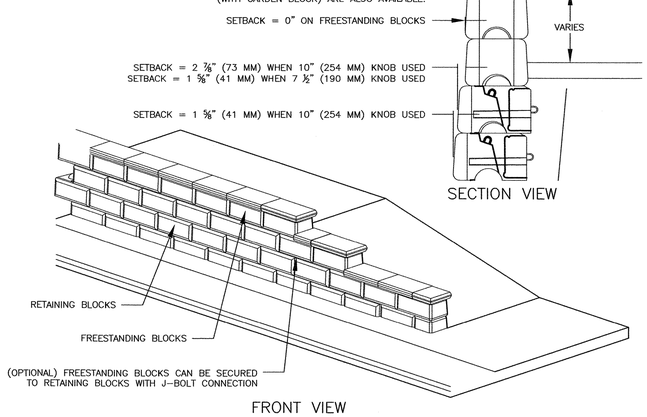
INSTALL PER PORTSMOUTH REQUIREMENTS NTS



NOTES:
1) ALL CONDUIT TO BE U.L. LISTED, SCH. 80 UNDER ALL TRAVEL WAYS, & SCH. 40 FOR THE REMAINDER.
2) NORMAL CONDUIT SIZES FOR PSNH ARE 3 INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4 INCH FOR THREE PHASE SECONDARY, AND 5 INCH FOR THREE PHASE PRIMARY.
3) ALL WORK TO CONFORM TO THE NATIONAL ELECTRICAL CODE (LATEST REVISION)
4) INSTALL A 200# PULL ROPE FOR EACH CONDUIT
5) VERIFY ALL CONDUIT SPECIFICATIONS WITH UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION.

S / C4 UTILITY TRENCH ELECTRIC/COMMUNICATIONS

NTS



W / C3 SMALL BLOCK RETAINING WALL

GENEST – BRUSSELS – UNILOCK WALL
COORDINATE COLOR WITH OWNER

NTS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	Addendum 1	6/30/25
0	ISSUED FOR COMMENT	11/20/23

REVISIONS

JOHN R. CHAGNON NO. 7937 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE: AS NOTED NOVEMBER 2023

DETAILS

D3

FB 259 PG 10

5010156 1397.04

P:\5010156 Rochdale, Properties\1397.03 - Lafayette Rd., Portsmouth, NH\2023 Site Plan 1397.03\Plans & Specs\Site\Final Set\1397.03 Details 2023.dwg 11/20/2023 4:00:14 PM, Portsmouth Printer Canon C7000i (temporary).pc3

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD PEAK DIVERSION STYLE WITH PRECAST TOP SLAB IS SHOWN. ALTERNATE OFFLINE VAULT AND/OR SHALLOW ORIENTATIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD

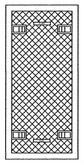
CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HI-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	1.96	1.47	0.98	0.54
DECK TO INSIDE TOP (MIN) (B)	5.00	4.00	4.00	4.00

GENERAL NOTES:
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0' - 10', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

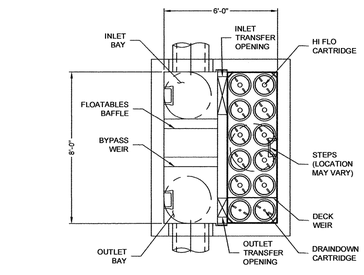
FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



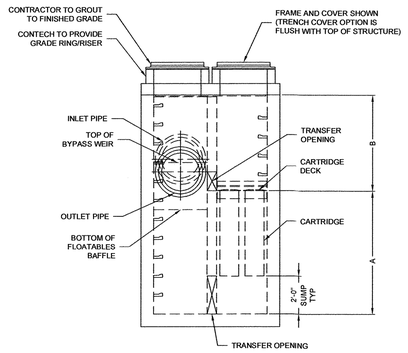
24" TRENCH COVER
(LENGTH VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID					ID
WATER QUALITY FLOW RATE (cfs)					WQFLOW
PEAK FLOW RATE (cfs)					PEAK
RETURN PERIOD OF PEAK FLOW (yrs)					RETURN
# OF CARTRIDGES REQUIRED (HF / DD)					CART
CARTRIDGE LENGTH					SIZE
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	ELEV	MAT'L	DIA	SLOPE	HGL
INLET #2	ELEV	MAT'L	DIA	SLOPE	HGL
OUTLET	ELEV	MAT'L	DIA	SLOPE	HGL
SEE GENERAL NOTES 6-7 FOR INLET AND OUTLET HYDRAULIC AND SIZING REQUIREMENTS.					
RIM ELEVATION					RIMELEV
ANTI-FLOTATION BALLAST		WIDTH			HEIGHT
		WIDTH			HEIGHT
NOTES/SPECIAL REQUIREMENTS:					
* PER ENGINEER OF RECORD					



PLAN VIEW
(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

JELLYFISH FILTER DETAIL
NTS

1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

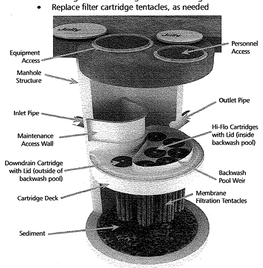
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



Note: Separator Skirt not shown

2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent.*

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

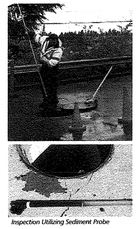
3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.



Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

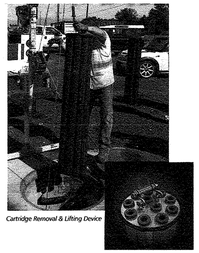
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. ***Caution: Dropping objects onto the cartridge deck may cause damage.***
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. ***Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs.***
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.



Cartridge Removal & Lifting Device

2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane.*

4. Collected rinse water is typically removed by vacuum hose.
5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

5.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. ***Caution: Do not force the cartridge downward; damage may occur.***
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

5.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

5.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

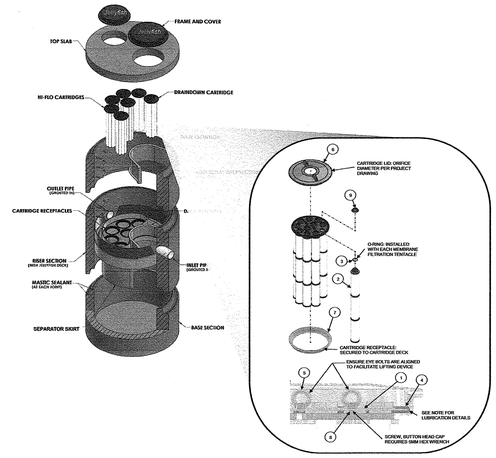


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M8X1MMM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
79713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUB3L1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:
Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lids (ITem 8). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

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APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
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REVISIONS

SCALE: AS NOTED NOVEMBER 2023

JELLYFISH DETAILS

D4

FB 259 PG 10

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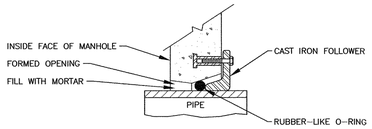
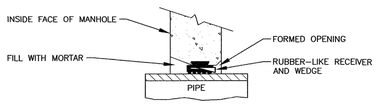
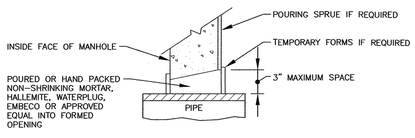
P:\Work\5010156 McNabb_Properties\1397.03 - Lafayette Rd., Portsmouth, JRC\2023 Site Plan 1397.03\Plans & Specs\Site\Final Set\1397.03 Details 2023.dwg, 11/20/2023 4:14:55 PM, Portsmouth Plotter, Canon TX5000 (temporary).pc3



RES-SEAL
(OR ACCEPTABLE SUBSTITUTE)



PRESS-WEDGE II
(OR ACCEPTABLE SUBSTITUTE)



NON-SHRINKING MORTAR
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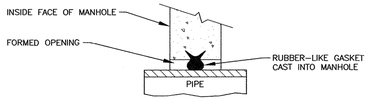

A-LOK
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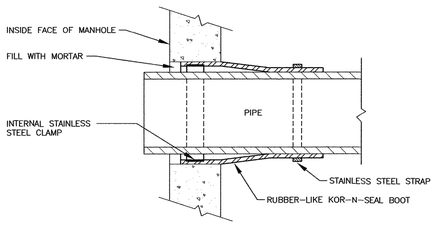
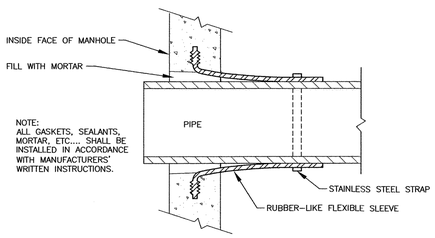
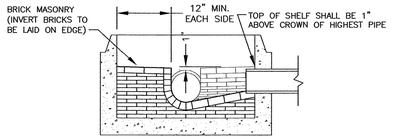


KOR-N-SEAL JOINT SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

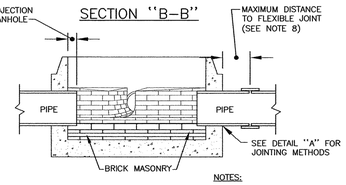


LOCK-JOINT FLEXIBLE MANHOLE SLEEVE
(OR ACCEPTABLE SUBSTITUTE)

DETAIL "A" – PIPE TO MANHOLE JOINTS

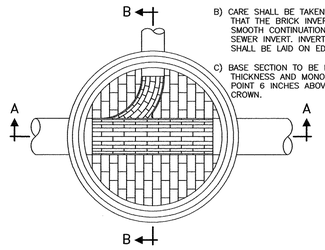


SECTION "B-B"

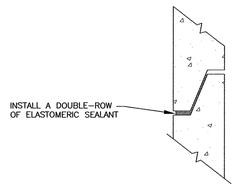


SECTION "A-A"

NOTES:
A) INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
B) CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE.
C) BASE SECTION TO BE FULL WALL THICKNESS AND MONOLITHIC TO A POINT 6 INCHES ABOVE THE PIPE CROWN.



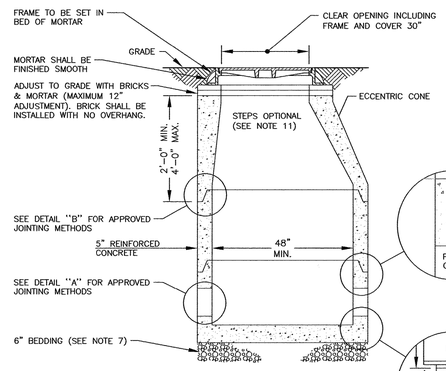
TYPICAL MANHOLE – PLAN VIEW



ELASTOMERIC SEALANT

NOTE:
ALL GASKETS AND SEALANTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

DETAIL "B" – HORIZONTAL JOINTS



TYPICAL SECTION

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

SEWER MANHOLE DETAILS

INSTALL PER PORTSMOUTH REQUIREMENTS NTS

MANHOLE NOTES

1) IT IS THE INTENTION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH AND LEAK PROOF QUALITIES CONSIDERED NECESSARY FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS, SHALL BE AS SHOWN ON THE DRAWING. MANHOLES SHALL BE AN ASSEMBLY OF PRECAST SECTIONS, WITH STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH REINFORCEMENT. IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND LOADS OF 8 TONS (H-20 LOADING) WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE. A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.

2) BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED CONCRETE IF POURED AS A COMPLETE MANHOLE.

3) PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478.

4) LEAKAGE TEST MAY NOT BE FEASIBLE, BUT SHALL CONFORM TO ENV-WQ 704.10(X) THROUGH ENV-WQ 704.10(Z).

5) INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF THE PIPE AND FLOW. AT CHANGES IN DIRECTIONS, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE AND TANGENT TO THE CENTERLINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY.

6) FRAMES AND COVERS: MANHOLE FRAMES AND COVERS SHALL BE OF HEAVY DUTY DESIGN AND PROVIDE A 30-INCH CLEAR OPENING. A THREE INCH (MINIMUM HEIGHT) WORD "SEWER" FOR SEWERS AND "DRAIN" FOR DRAINS SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER. CASTINGS SHALL CONFORM TO CLASS 30, ASTM A48.

7) BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE, FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33 STONE SIZE NO. 67.

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
20%- 55% PASSING	3/8 INCH SCREEN
0%- 10% PASSING	#4 SIEVE
0%- 5% PASSING	#8 SIEVE

WHEN ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1/2 INCH TO 1-1/2 INCH SHALL BE USED.

8) FLEXIBLE JOINT: A FLEXIBLE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES:

RCP & CI PIPE – ALL SIZES – 48"

9) SHALLOW MANHOLE: IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.

10) HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF A TYPE APPROVED BY THE ENGINEER, WHICH TYPE SHALL, IN GENERAL, DEPEND FOR WATER TIGHTNESS UPON AN ELASTOMERIC OR MASTIC-LIKE GASKET, IN 2 ROWS. APPROVED ELASTOMERIC SEALANTS ARE:

RAM-NEK
KENT SEAL NO. 2
EZ

11) PIPE TO MANHOLE JOINTS SHALL BE ONLY AS APPROVED BY THE ENGINEER AND IN GENERAL, WILL DEPEND FOR WATERTIGHTNESS UPON EITHER AN APPROVED NON-SHRINKING MORTAR OR ELASTOMERIC SEALANT.

12) THE PURPOSE OF THIS PLAN IS TO SHOW STANDARDS FOR SEWER CONSTRUCTION.

13) ALL WORK SHALL BE IN COMPLIANCE WITH NHDES CODE OF ADMINISTRATIVE RULES PART ENV-WQ 704 DESIGN OF SEWERS.

14) BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE LARGEST INCOMING PIPE.

GENERAL NOTES

1) MINIMUM PIPE SIZE FOR HOUSE SERVICE SHALL BE FOUR INCHES.

2) PIPE AND JOINT MATERIALS:

A. PLASTIC SEWER PIPE

1. PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:

ASTM STANDARDS	GENERIC PIPE MATERIAL	SIZES APPROVED
D3034	*PVC (SOLID WALL)	8" THROUGH 15" (SDR 35)
F679	PVC (SOLID WALL)	18" THROUGH 27" (T-1 & T-2)
F789	PVC (SOLID WALL)	4" THROUGH 18" (T-1 To T-3)
F794	PVC (RIBBED WALL)	8" THROUGH 36"
AWWA C900	PVC (SOLID WALL)	8" THROUGH 18"

*PVC: POLYVINYL CHLORIDE

2. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D-3212 AND SHALL BE PUSH-ON BELL AND SPIGOT TYPE.

3) DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.

4) JOINTS SHALL BE DEPENDENT UPON A NEOPRENE OR ELASTOMERIC GASKET FOR WATER TIGHTNESS. ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.

5) HOUSE SEWER INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL AS SPECIFIED IN NOTE 10. BEDDING AND REFILL FOR DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH APPROPRIATE MECHANICAL DEVICES.

6) THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE FOUNDATION AT A GRADE OF NOT LESS THAN 1/4 INCH PER FOOT. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.

7) TESTING: WHEN REQUIRED BY THE GOVERNING AUTHORITY, TESTING SHALL CONFORM TO ENV-WQ 704.07.

8) ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM HOUSE TOILETS, SINKS, LAUNDRY ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR OTHER SIMILAR CONNECTIONS CARRYING RAIN WATER, DRAINAGE OR GROUND WATER SHALL NOT BE PERMITTED.

9) HOUSE WATER SERVICE SHALL NOT BE LAID IN SAME TRENCH AS SEWER SERVICE, UNLESS IT IS ON A SHELF 12" HIGHER, AND 18" APART.

10) BEDDING: PROCESSED GRAVEL OR CRUSHED STONE, FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE FOLLOWING GRADATION (ALL STONE MUST HAVE AT LEAST 2 FRACTURED FACES):

100% PASSING	1 INCH SCREEN
90%-100% PASSING	3/4 INCH SCREEN
0%- 75% PASSING	3/8 INCH SCREEN
0%- 25% PASSING	#4 SIEVE
0%- 5% PASSING	#10 SIEVE

WHERE ORDERED BY THE ENGINEER, OVEREXCAVATE UNSTABLE TRENCH BOTTOM AND BACKFILL WITH CRUSHED STONE.

11) LOCATION: THE LOCATION OF THE TEE OR WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS METAL ROD OR PIPE SHALL BE PLACED OVER THE TEE OR WYE AS DESCRIBED IN THE TYPICAL "CHIMNEY" DETAIL, TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPE FINDER.

12) CAST-IN-PLACE CONCRETE: SHALL CONFORM TO THE REQUIREMENTS FOR CLASS A (3000 PSI) CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AS FOLLOWS:

CEMENT: 6.0 BAGS PER CUBIC YARD
WATER: 5.75 GALLONS PER BAG OF CEMENT
MAXIMUM AGGREGATE SIZE: 3/4 INCH

13) BACKFILL UP TO SUBBASE GRAVEL SHALL BE WITH EXCAVATED SOIL FROM TRENCHING OPERATIONS. COMPACT IN 8" LIFTS WITH VIBRATORY PLATE COMPACTORS TO 90% OF MODIFIED PROCTOR DENSITY. IF FINE-GRAINED, COMPACT WITH POGO STICKS OR SHEEPSFOOT ROLLERS. PLACE NO LARGE ROCKS WITHIN 24" OF PIPE. TRENCHES THAT ARE NOT ADEQUATELY COMPACTED SHALL BE RE-EXCAVATED AND BACKFILLED UNDER THE SUPERVISION OF THE DESIGN ENGINEER OR GOVERNING BODY. UNSUITABLE BACKFILL MATERIAL INCLUDES CHUNKS OF PAVEMENT, TOPSOIL, ROCKS OVER 6" IN SIZE, MUCK, PEAT OR PIECES OF PAVEMENT.

14) THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB-SITE SAFETY AND COMPLIANCE WITH GOVERNING REGULATIONS.

15) ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL. FOR TRENCH WIDTH SEE TRENCH DETAIL.

16) SAND BLANKET: CLEAN SAND, FREE FROM ORGANIC MATTER, SO GRADED THAT 90% – 100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2 INCHES IS IN CONTACT WITH THE PIPE.

17) BASE COURSE GRAVEL, IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE:

STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION.

18) IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MIN.) BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.

19) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION.

20) THE PURPOSE OF THIS PLAN IS TO SHOW STANDARDS FOR SEWER CONSTRUCTION.

21) ALL WORK SHALL BE IN COMPLIANCE WITH NHDES CODE OF ADMINISTRATIVE RULES PART ENV-WQ 704 DESIGN OF SEWERS.

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
WWW.HALEYWARD.COM
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282

NOTES:

1) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

2) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

MIXED USE DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	Addendum 1	6/30/25
0	ISSUED FOR COMMENT	11/20/23

REVISIONS

STATE OF NEW HAMPSHIRE – JOHN R. CHAGNON NO. 7851 LICENSED PROFESSIONAL ENGINEER

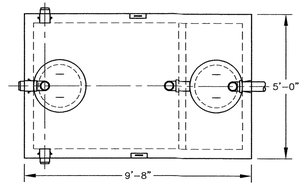
SCALE: AS NOTED NOVEMBER 2023

SEWER DETAILS D5

FB 259 PG 10

5010156 1397.04

X:\AM\5010156-Michaels, Properties\1397.01-Lafayette Rd- Portsmouth-JOC\2023 Site Plan 1397.01\Plans & Specs\SiteVisit Set\1397.03 Details 2023.dwg, 11/20/2023 1:59:14 PM, Portsmouth Plotter Canon TX5000 (tamoney).tp3

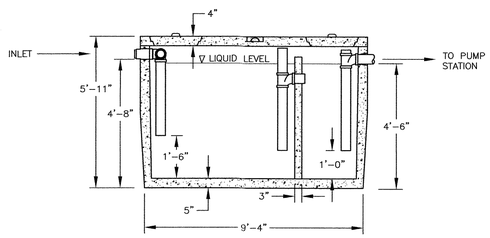


PLAN

GENERAL NOTES:

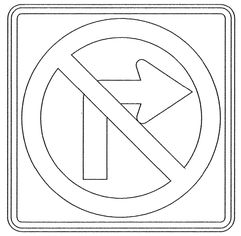
CONCRETE SPECIFICATIONS:
1) 4000 PSI @ 28 DAYS.
2) 4%–6% ENTRAINED AIR.
3) TANK PENETRATIONS ARE INTEGRALLY CAST.
4) ALL JOINTS SEALED WITH BUTYL RESIN.
5) EXTERIOR TO BE COATED.

GREASE TRAP INFORMATION:
1) TANKS SHOULD BE PUMPED AS NEEDED.
2) ACCESS COVERS SHOULD HAVE RISERS TO BRING COVER ACCESS TO GRADE.
3) TANKS CAN BE VACUUM TESTED AT AN ADDITIONAL COST.



SECTION

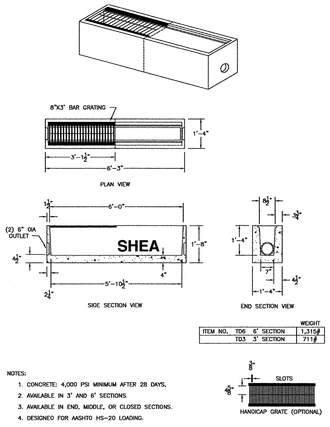
X C5 SHEA CONCRETE 1000 GALLON 2 COMP. GREASE TRAP NTS
14,825 Lbs ITEM # M1000H H20 LOAD RATED



MUTCD R3–1

SIGN TO BE MOUNTED SO BOTTOM EDGE IS NO LESS THAN 7 FEET FROM GROUND SURFACE AND EDGE NEAREST STREET IS NO LESS THAN 2 FEET LATERALLY FROM EDGE OF PAVEMENT.

Z C3 WALL MOUNTED NO RIGHT HAND TURN SIGN NTS

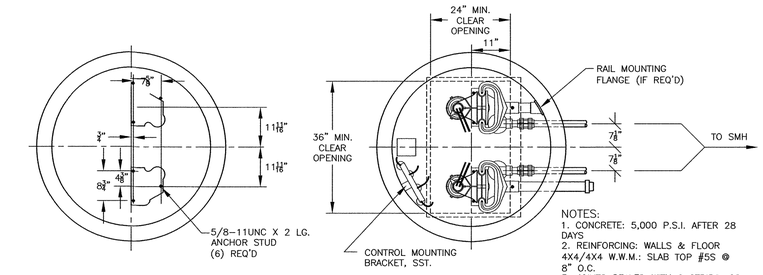


ITEM NO.		WEIGHT
TD6	6" SECTION	1,315#
TD3	3" SECTION	711#

NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. AVAILABLE IN 3" AND 6" SECTIONS.
3. AVAILABLE IN END, MIDDLE, OR CLOSED SECTIONS.
4. DESIGNED FOR AASHTO HS-20 LOADING.

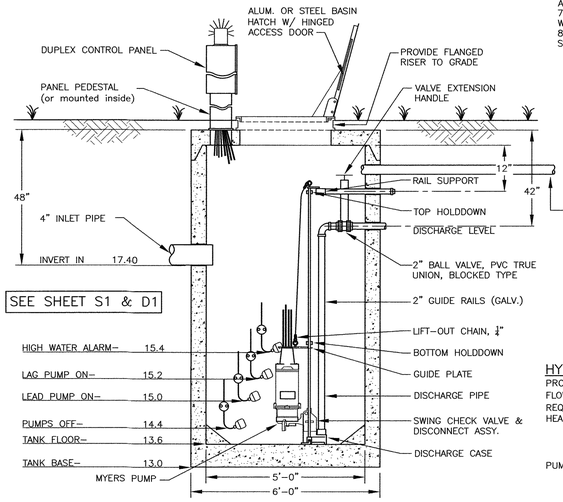
SHEA PRODUCT ID: TD3/TD6
TRENCH DRAIN 8"X16"
WEIGHT (LBS): 711#/1,315#

AA C6 STRIP DRAIN NTS



TOP VIEW

NOTES:
1. CONCRETE: 5,000 P.S.I. AFTER 28 DAYS
2. REINFORCING: WALLS & FLOOR 4X4/4X4 W.W.M.: SLAB TOP #5S @ 8" O.C.
3. JOINTS SEALED WITH 2 STRIPS .88 X .88 BUTYL RUBBER JOINT SEALANT.
4. 4" FLANGE PIPING AND VALVES.
5. PUMPS TO BE GRINDER PUMPS. PUMPS MUST MAINTAIN 3 FT/SEC MIN. VELOCITY IN FORCE MAIN.
6. EMERGENCY PUMP CONNECTION AVAILABLE IN VALVE PIT.
7. PUMP STATION TO BE TESTED FOR WATER TIGHTNESS.
8. ALL PIPING LEAVING MANHOLE SHALL BE GASKETED PIPING.

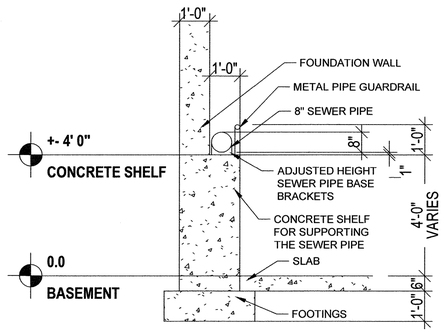


4" SDR35 GASKETED VENT PIPING. VENT TANKS TO COMMON VENT PIPE IN BUILDING WALL. TERMINATE VENT WITH MUSHROOM CAP 2'–0" ABOVE ROOFLINE / OR TO LIGHT POLE 10' ABOVE BASE

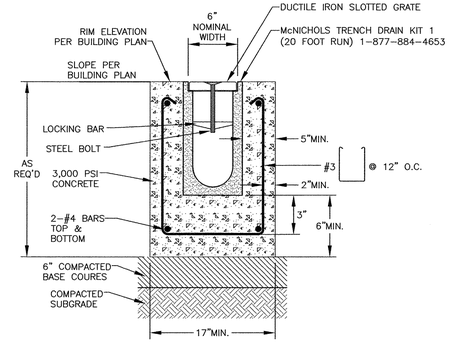
SECTION

HYDRAULIC CALCULATIONS:
PROPOSED FLOW: 500 GPD
FLOW PER DOSE: 500/6 = 83 GALLONS PER DOSE
REQUIRED STORAGE WITH 60" DIAMETER PUMP STATION: 0.6'
HEAD LOSS CALCULATION:
STATIC HEAD + FRICTION HEAD
(17.5 – 14.4) + (4 x 0.64) = 5.6'
USE EFFLUENT PUMP TO RUN AT 20 GPM
PUMP RUN TIME AT TDH = 83 GAL./20 GPM = 4.1 MINUTES

Y C5 COMMERCIAL EFFLUENT PUMP STATION OR APPROVED EQUAL NTS



BB C6 SEWER PIPE DETAIL NTS



CC C6 EVAPORATION TRENCH DETAIL NTS

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
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WWW.HALEYWARD.COM

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APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

MIXED USE DEVELOPMENT 581 LAFAYETTE ROAD PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
	REVISIONS	
5	Addendum 1	6/30/25
4	DETAIL 4	3/27/24
3	DETAIL Y, AA, BB, CC	3/5/24
2	DETAIL Z	2/21/24
1	DETAIL Y	2/6/24
0	ISSUED FOR COMMENT	1/2/24

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7551 LICENSED PROFESSIONAL ENGINEER

SCALE: AS NOTED JANUARY 2024

DETAILS D6

FB 259 PG 10

5010156 1397.04

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MIXED USE DEVELOPMENT

581 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE
SITE CONSTRUCTION
OFFSITE PUBLIC REALM IMPROVEMENTS

OWNER:
CITY OF PORTSMOUTH
PO BOX 628
PORTSMOUTH, NH 03802

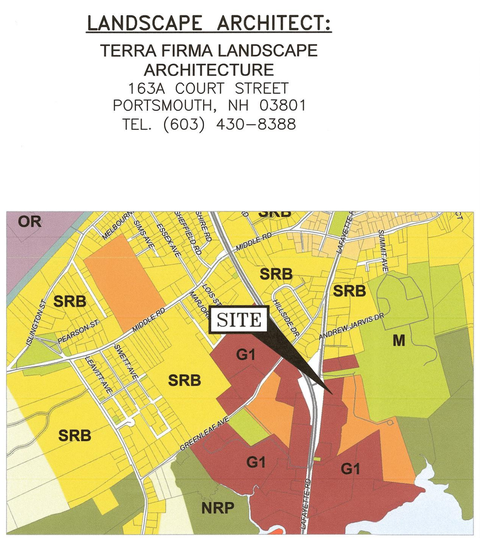
DEVELOPER:
ATLAS COMMONS, LLC
10 PLEASANT STREET
SUITE #300
PORTSMOUTH, NH 03801

LAND SURVEYOR & CIVIL ENGINEER:
HALEY WARD, INC.
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, N.H. 03801
Tel. (603) 430-9282
Fax (603) 436-2315

LIGHTING CONSULTANT:
EXPOSURE2LIGHTING
501 ISLINGTON ST UNIT 1A
PORTSMOUTH, NH 03801
TEL. (603) 759-1043

LANDSCAPE ARCHITECT:
TERRA FIRMA LANDSCAPE ARCHITECTURE
163A COURT STREET
PORTSMOUTH, NH 03801
TEL. (603) 430-8388

PERMIT LIST:
SCHOOL BOARD/CITY COUNCIL APPROVAL: PENDING
TREES & GREENERY: PENDING



Residential Districts

R	Rural
SRA	Single Residence A
SRB	Single Residence B
GRA	General Residence A
GRB	General Residence B
GRC	General Residence C
GA/MH	Garden Apartment/Mobile Hom

Mixed Residential Districts

MRO	Mixed Residential Office
MRB	Mixed Residential Business
G1	Gateway Corridor
G2	Gateway Center

Business Districts

GB	General Business
B	Business
WB	Waterfront Business

Industrial Districts

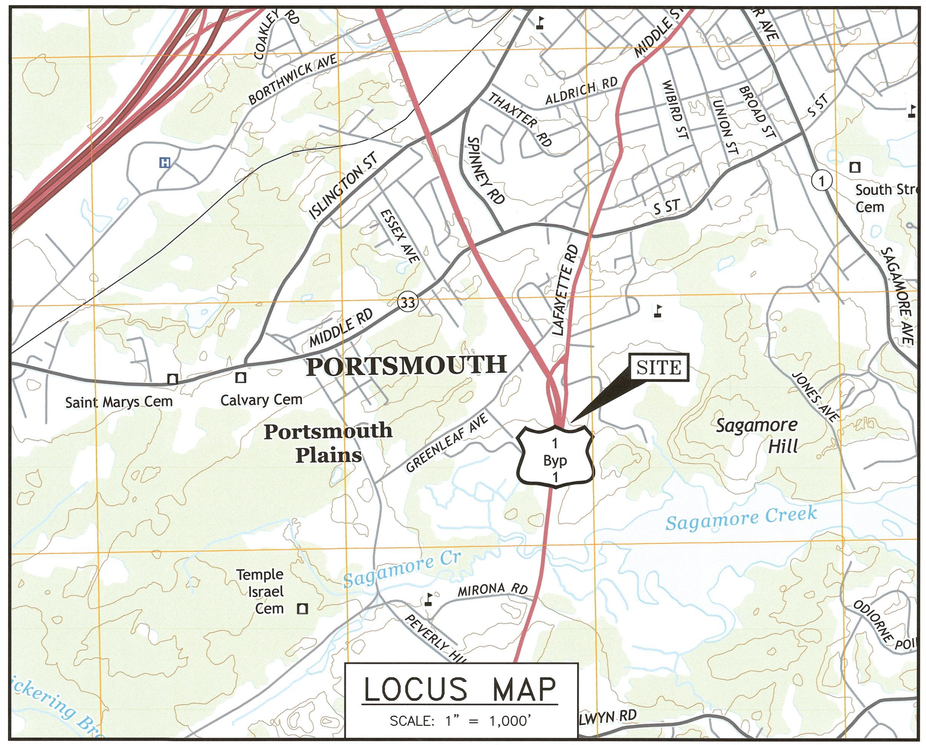
OR	Office Research
I	Industrial
WI	Waterfront Industrial

Airport Districts

AIR	Airport
AI	Airport Industrial
PI	Pease Industrial
ABC	Airport Business Commercial

Other Districts

M	Municipal
NRP	Natural Resource Protection
TC	Transportation Corridor



LOCUS MAP
SCALE: 1" = 1,000'

LEGEND:

EXISTING	PROPOSED	
		PROPERTY LINE
		SETBACK
S	S	SEWER PIPE
SL	SL	SEWER LATERAL
G	G	GAS LINE
D	D	STORM DRAIN
W	W	WATER LINE
WS	WS	WATER SERVICE
UGE	UGE	UNDERGROUND ELECTRIC
OHW	OHW	OVERHEAD ELECTRIC/WIRES
	UD	FOUNDATION DRAIN
		EDGE OF PAVEMENT (EP)
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		UTILITY POLE
		WALL MOUNTED EXTERIOR LIGHTS
		TRANSFORMER ON CONCRETE PAD
		ELECTRIC HANDHOLD
		SHUT OFFS (WATER/GAS)
	GV	GATE VALVE
	HYD	HYDRANT
CB	CB	CATCH BASIN
S	SMH	SEWER MANHOLE
D	DMH	DRAIN MANHOLE
T	TMH	TELEPHONE MANHOLE
14	14	PARKING SPACE COUNT
PM		PARKING METER
LSA		LANDSCAPED AREA
TBD	TBD	TO BE DETERMINED
CI	CI	CAST IRON PIPE
COP	COP	COPPER PIPE
DI	DI	DUCTILE IRON PIPE
PVC	PVC	POLYVINYL CHLORIDE PIPE
RCP	RCP	REINFORCED CONCRETE PIPE
AC	–	ASBESTOS CEMENT PIPE
VC	VC	VITRIFIED CLAY PIPE
EP	EP	EDGE OF PAVEMENT
EL.	EL.	ELEVATION
FF	FF	FINISHED FLOOR
INV	INV	INVERT
S =	S =	SLOPE FT/FT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL

DIG SAFE
ME – NH – RI – VT
1-888-344-7233
CALL TOLL FREE

INDEX OF SHEETS

DWG No.	
C1	OVERALL PLAN
C2	EXISTING CONDITIONS PLAN
C3	SITE PLAN
C4&C5	GRADING PLAN
C6	TREE REMOVAL PLAN
C7	TREE PLANTING PLAN
L1	LIGHTING PLAN
P1	WALKWAY PLAN & PROFILE
D1–D2	DETAILS

UTILITY CONTACTS

ELECTRIC:
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 436-7708, Ext. 555.5678
ATTN: MICHAEL BUSBY, P.E. (MANAGER)

NATURAL GAS:
UNITIL
325 WEST ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 294-5144
ATTN: DAVE BEAULIEU

CABLE:
COMCAST
155 COMMERCE WAY
PORTSMOUTH, N.H. 03801
Tel. (603) 679-5695 (X1037)
ATTN: MIKE COLLINS

SEWER & WATER:
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 427-1530
ATTN: JIM TOW

COMMUNICATIONS:
FAIRPOINT COMMUNICATIONS
JOE CONSIDINE
1575 GREENLAND ROAD
GREENLAND, N.H. 03840
Tel. (603) 427-5525

SITE CONSTRUCTION PLANS
OFFSITE PUBIC REALM IMPROVEMENTS
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

AMBIT ENGINEERING, INC.
A DIVISION OF HALEY WARD, INC.
200 Griffin Road, Unit 3
Portsmouth, NH 03801
603.430.9282
WWW.HALEYWARD.COM

PLAN SET SUBMITTAL DATE: 3 JANUARY 2025

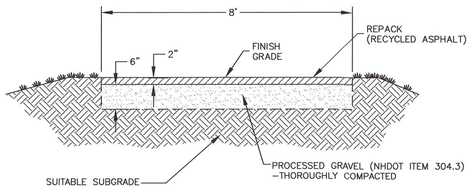
5010156 1397.04

P:\WO\5010156 McNabb, Properties\1397.04 Lafayette Rd, Portsmouth, NH\2023 Site Plan 1397.04\Plans & Specs\DWG\Site Sides\CIVIL\5010156-Dwg. 1/15/2025 1:55:57 PM, Canon IR-ADV C5535

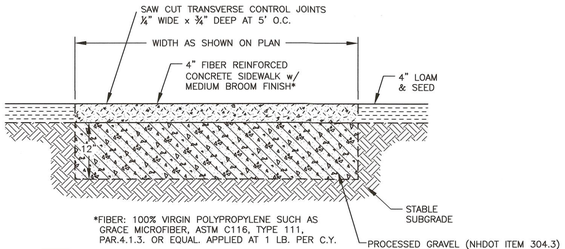
PUBLIC REALM

PUBLIC REALM IMPROVEMENT (PER SECTION 10.5B73.20.1)
LINEAR STREET FRONTAGE OF SITE: 619 FT
PROPOSED TRAIL NETWORK LENGTH: 693 FT

REQUIRED LENGTH: 619 FT
PROVIDED LENGTH: 693 FT

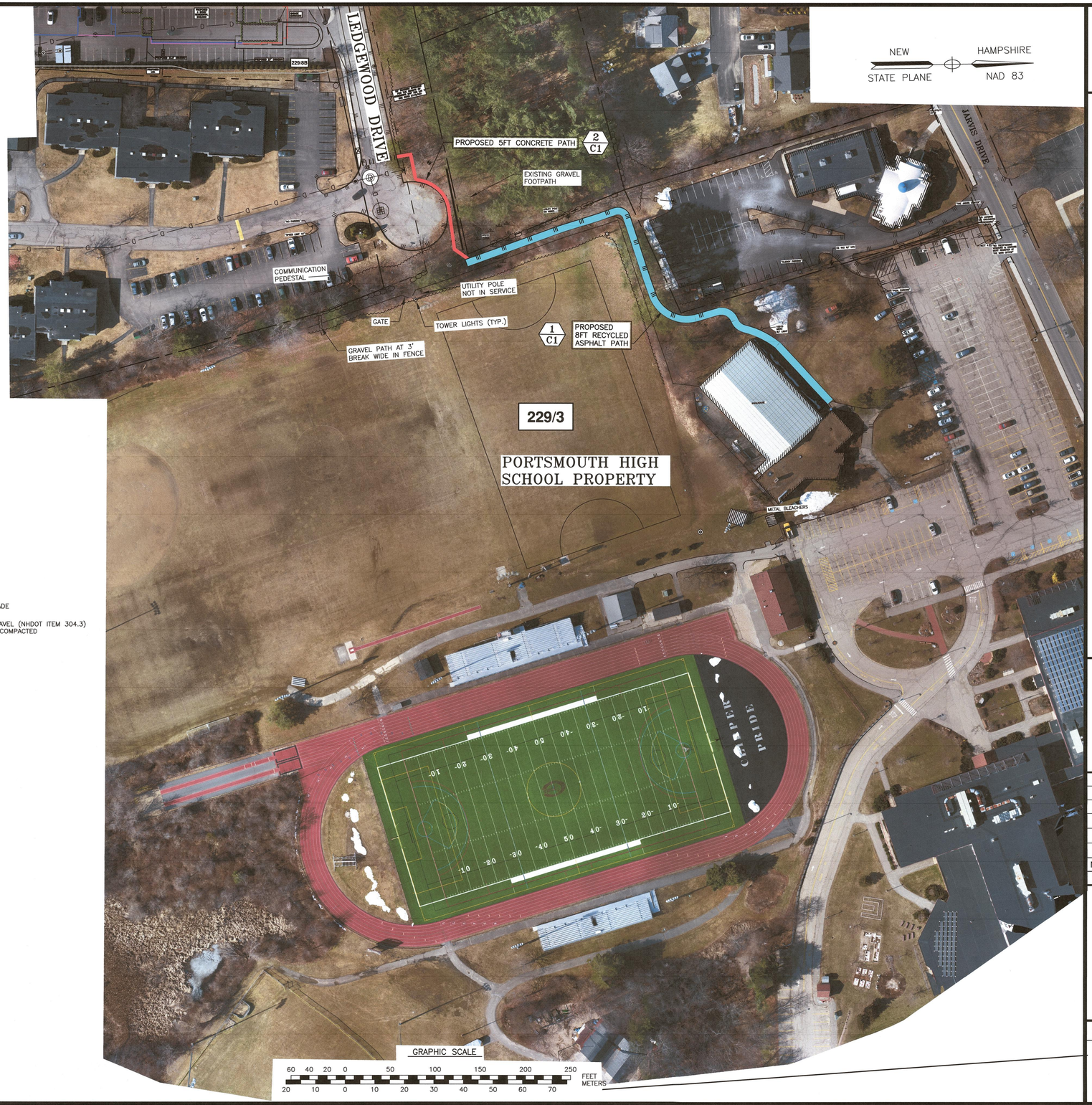


1 / C1 PATH
NTS



*FIBER: 100% VIRGIN POLYPROPYLENE SUCH AS GRACE MICROFIBER, ASTM C116, TYPE 111, PAR.4.1.3. OR EQUAL. APPLIED AT 1 LB. PER C.Y.

2 / C1 CONCRETE SIDEWALK
NTS



AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 229 AS LOT 3.

2) OWNERS OF RECORD:
CITY OF PORTSMOUTH
1 JUNKINS AVENUE
PORTSMOUTH, NH 03802
1985/379

APPLICANT
ATLAS COMMONS, LLC
10 PLEASANT STREET, SUITE 300
PORTSMOUTH, NH 03801
6474/1538

3) THE PARCEL IS NOT IN A FLOOD HAZARD ZONE AS SHOWN ON FIRM PANEL 33015C0270E, EFFECTIVE MAY 17, 2005

4) EXISTING LOT AREA: (DEVELOPMENT LOT MAP 229 LOT 8B)
98,124 S.F.
2.2526 AC

5) PARCEL IS LOCATED IN THE GATEWAY NEIGHBORHOOD CORRIDOR (G1) DISTRICT.

6) DIMENSIONAL REQUIREMENTS:
SEE ZONING ORDINANCE SECTION 10.5B22.10

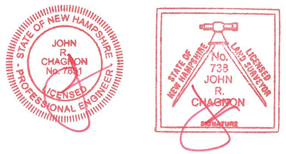
7) THE PURPOSE OF THIS PLAN IS TO SHOW PUBLIC REALM IN ACCORDANCE WITH SECTION 10.5B7320.1 ON TAX MAP 229 LOT 3.

8) PUBLIC REALM IMPROVEMENTS SHOWN HERON ARE SUBJECT TO CITY OF PORTSMOUTH SCHOOL DEPARTMENT REVIEW AND APPROVAL. FINAL DESIGN & LOCATION TO BE DETERMINED.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	6/17/24

REVISIONS



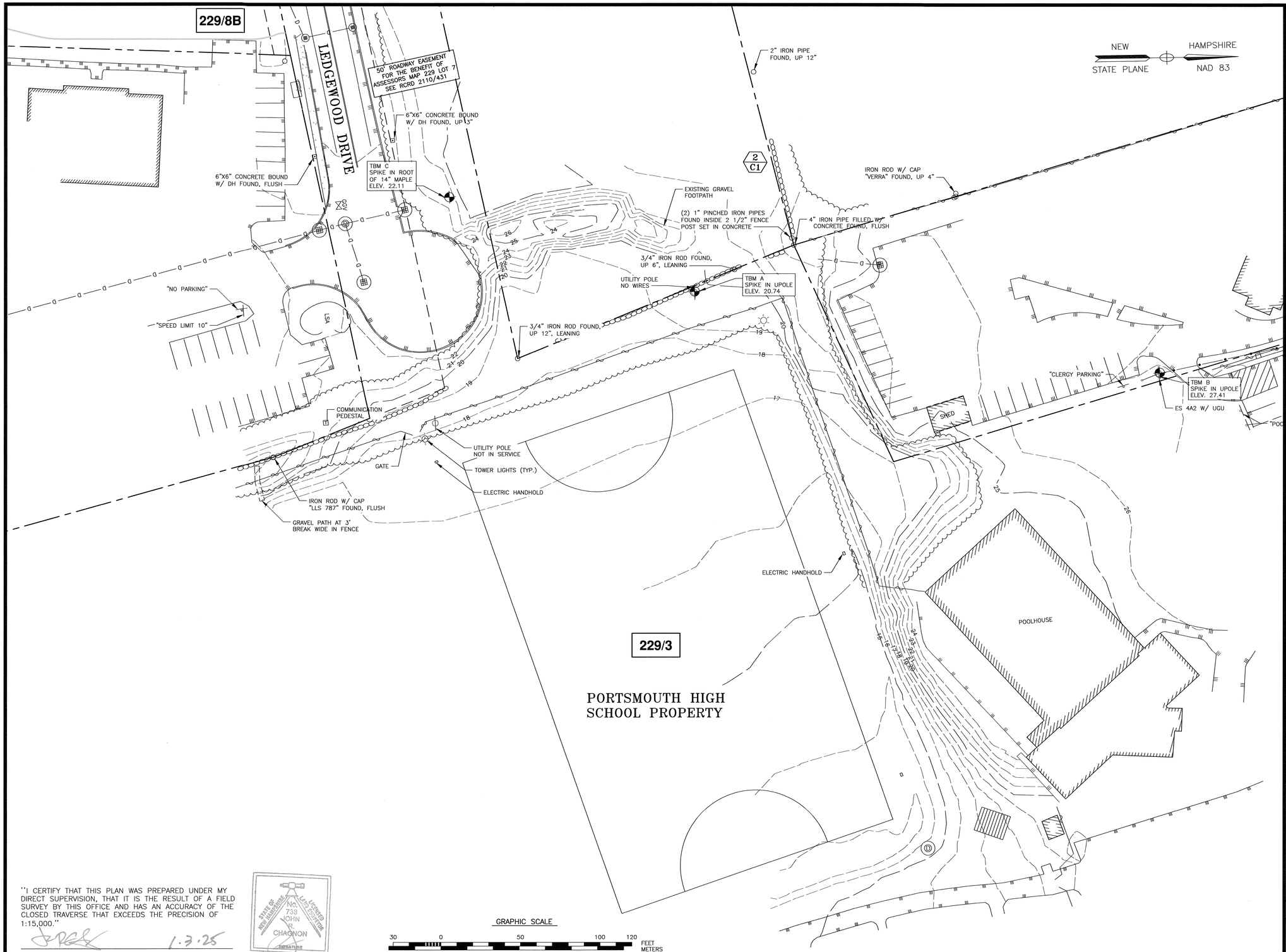
SCALE: 1"=60' JANUARY 2024

OVERALL PLAN

C1

FB 259 PG 10

5010156.1397.04



"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

JOHN R. CHAGNON, LLS — DATE 1.3.25

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — No. 738 — JOHN R. CHAGNON — SIGNATURE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
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APPLICANT
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PORTSMOUTH, NH 03801
6474/1538

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2.2526 AC

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8) PUBLIC REALM IMPROVEMENTS SHOWN HERON ARE SUBJECT TO CITY OF PORTSMOUTH SCHOOL DEPARTMENT REVIEW AND APPROVAL.

9) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ADDED TOPOGRAPHY	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

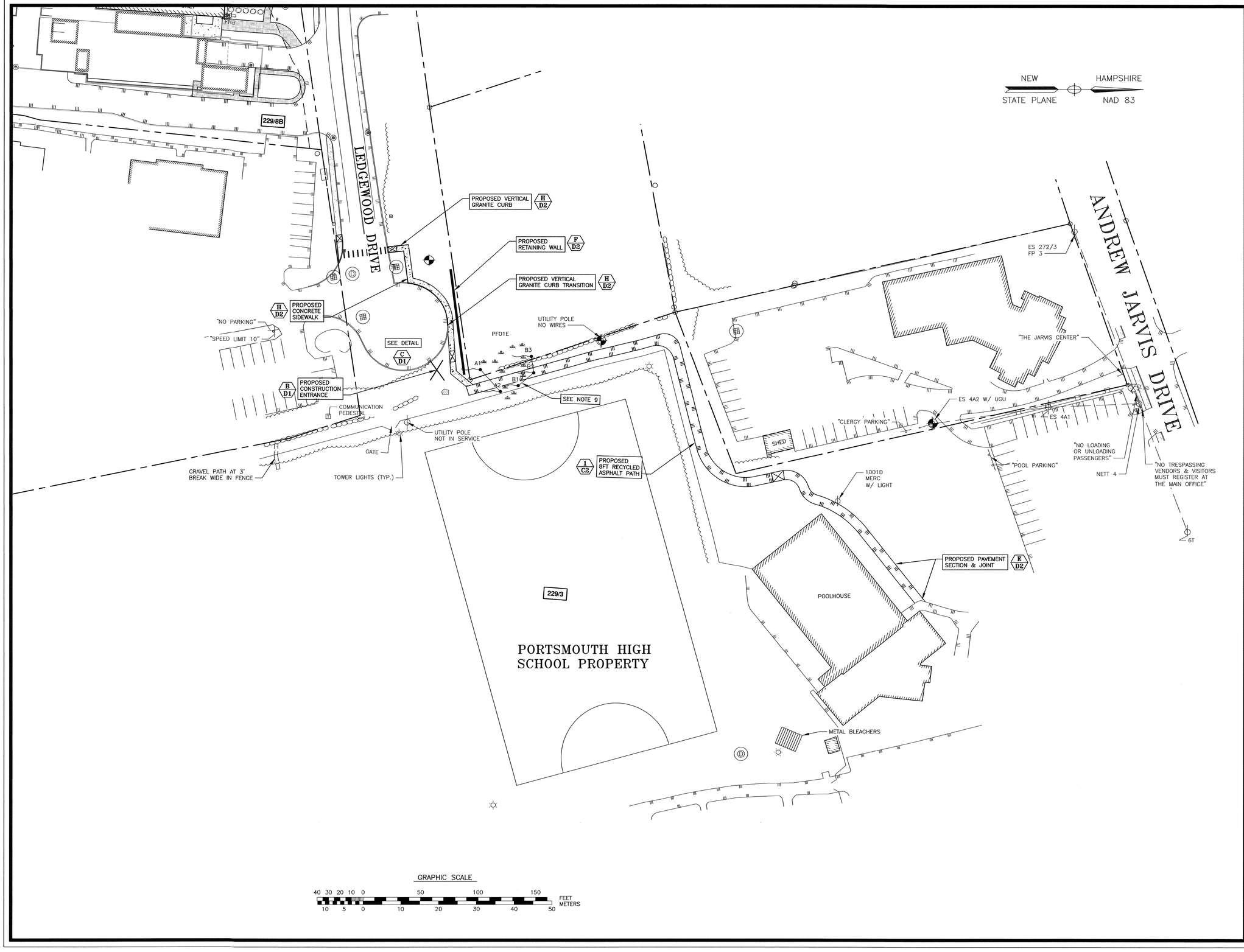
SCALE: 1"=30' NOVEMBER 2024

EXISTING CONDITIONS PLAN

C2

FB 259 PG 10

1397.04



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8) PUBLIC REALM IMPROVEMENTS SHOWN HERON ARE SUBJECT TO CITY OF PORTSMOUTH SCHOOL DEPARTMENT REVIEW AND APPROVAL.

9) SEE GRADING PLAN FOR LIMIT OF WETLAND FILL.

COMMERCIAL DEVELOPMENT 581 LAFAYETTE ROAD PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON SIGNATURE

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER

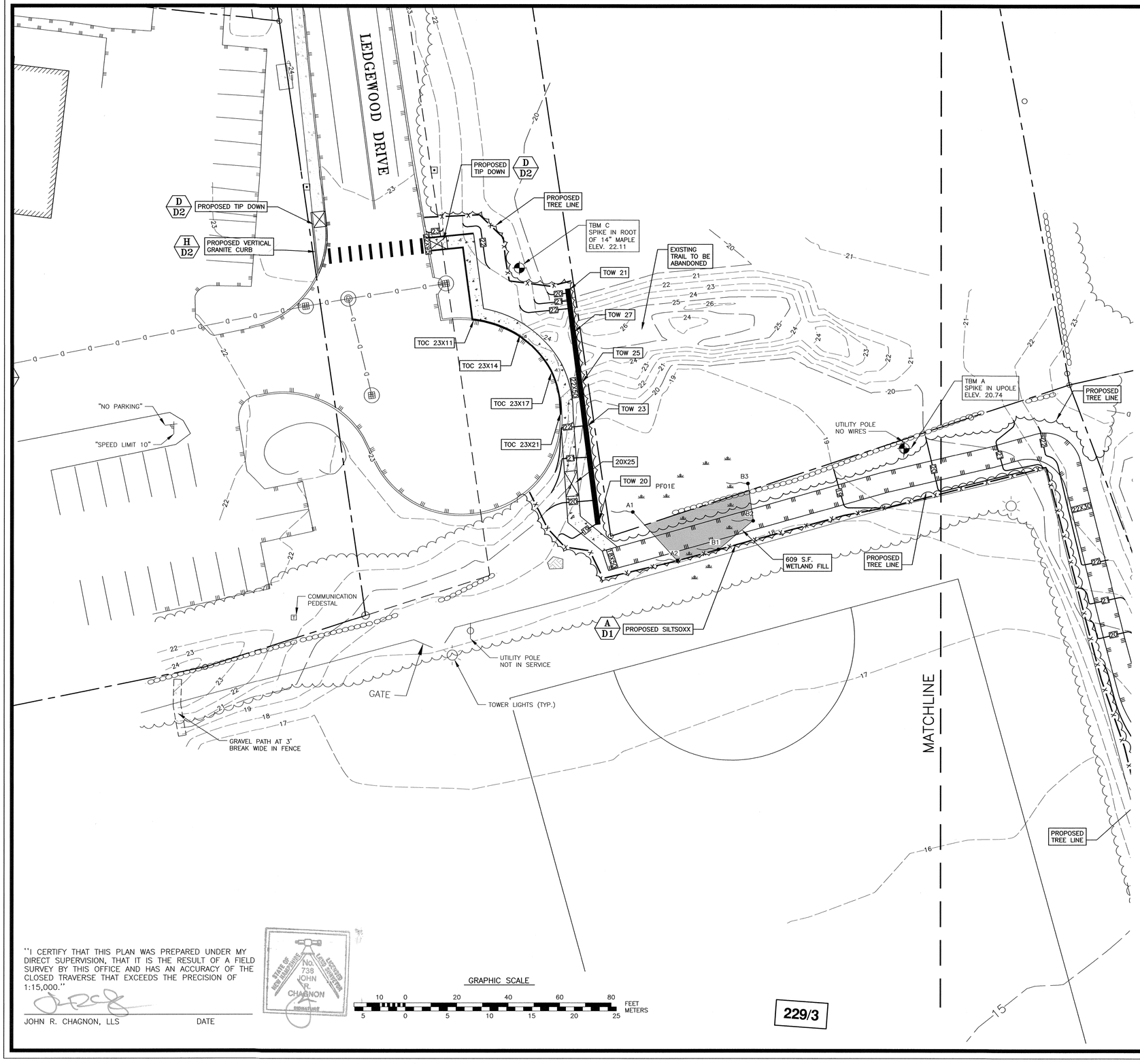
SCALE: 1"=40' NOVEMBER 2024

SITE PLAN

C3

FB 487 PG 1

5010156.1397.04



"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

JOHN R. CHAGNON, LLS DATE

229/3

WETLANDS WERE DELINEATED ON 1/7/25 BY SAM HAYDEN, CWS #321 ON THE BASIS OF HYDROPHYTIC VEGETATION, HYDRIC SOILS AND WETLAND HYDROLOGY IN ACCORDANCE WITH THE TECHNIQUES OUTLINED IN THE "CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, TECHNICAL REPORT Y-87-1", JANUARY 1987. THE HYDRIC SOIL COMPONENT WAS DETERMINED BY USING THE "FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 3", NEIWPCC WETLANDS WORK GROUP (APRIL 2004).

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) WETLAND FILL SUBJECT TO STATE AND LOCAL PERMITS.

COMMERCIAL DEVELOPMENT 581 LAFAYETTE ROAD PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER

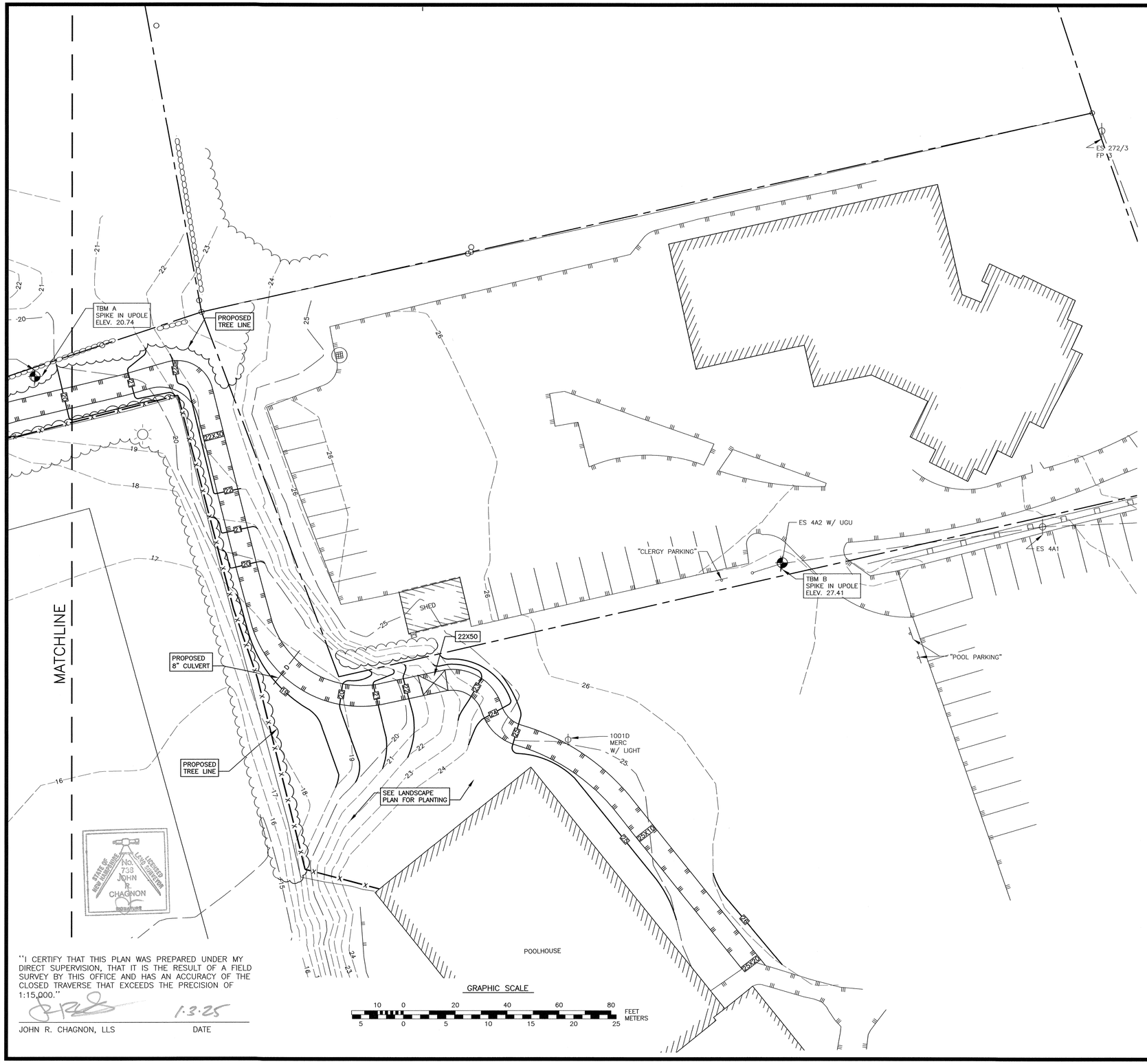
SCALE: 1"=20' NOVEMBER 2024

GRADING PLAN

C4

FB 487 PG 1

5010156.1397.04



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1.3.25

JOHN R. CHAGNON, LLS — DATE

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Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
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Fax (603) 436-2315

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COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

STATE OF NEW HAMPSHIRE — JOHN R. CHAGNON No. 7331 — LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=20' NOVEMBER 2024

GRADING PLAN

C5

FB 487 PG 1

5010156.1397.04

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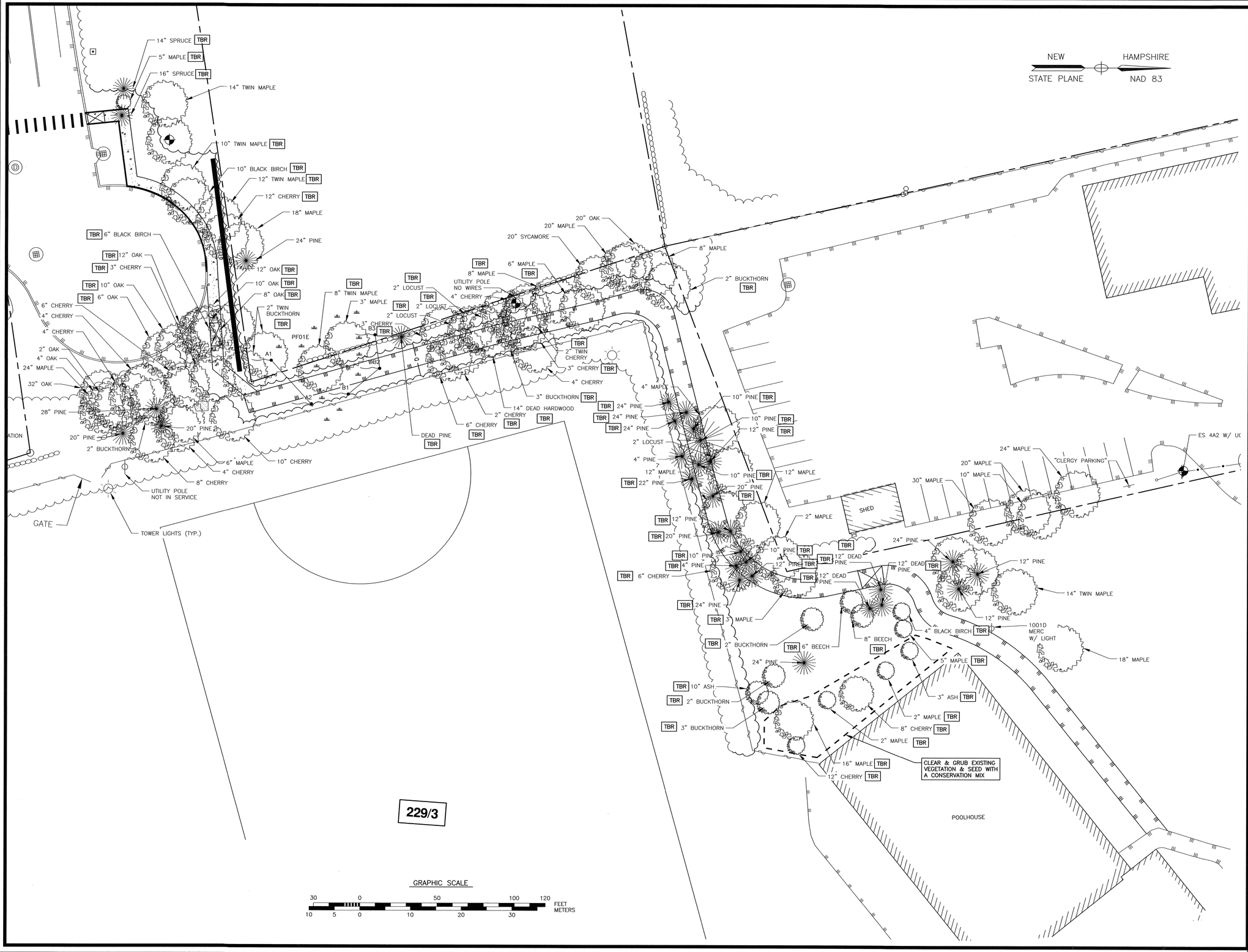

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Portsmouth, N.H. 03801-7114
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4) TREE REMOVAL SUBJECT TO REVIEW AND APPROVAL OF THE CITY OF PORTSMOUTH TREES AND GREENERY COMMITTEE.

5) INVASIVE TREES, SHRUBS, AND VINES SHALL BE CUT AS LOW AS POSSIBLE TO THE GROUND AND THE STUMP SHALL BE IMMEDIATELY PAINTED OR BRUSHED WITH AN AMPLE AMOUNT OF A "BRUSH KILLING" HERBICIDE. THE PLANT WILL DRAW THE HERBICIDE INTO THE ROOTS WHILE THE STUMP IS FRESHLY CUT.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
2	NOTE 5	2/18/25
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	12/11/24

REVISIONS

STATE OF NEW HAMPSHIRE No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR SIGNATURE

SCALE: 1"=20' NOVEMBER 2024

TREE REMOVAL PLAN

C6

FB 487 PG 1

5010156.1397.04

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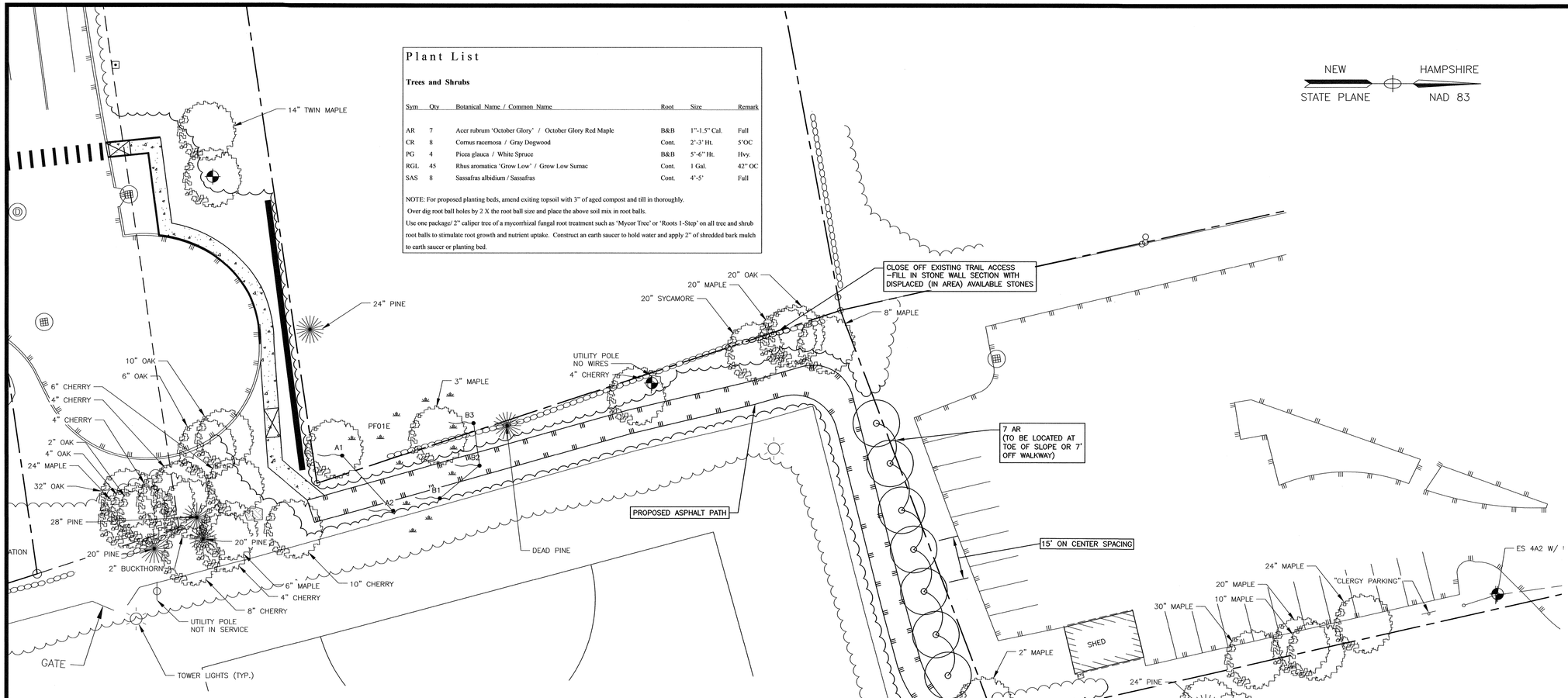
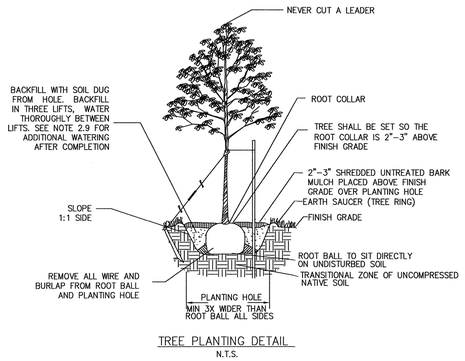
Plant List

Trees and Shrubs

Sym	Qty	Botanical Name / Common Name	Root	Size	Remark
AR	7	Acer rubrum 'October Glory' / October Glory Red Maple	B&B	1"-1.5" Cal.	Full
CR	8	Cornus racemosa / Gray Dogwood	Cont.	2'-3' Ht.	5'OC
PG	4	Picea glauca / White Spruce	B&B	5'-6" Ht.	Hvy.
RGL	45	Rhus aromatica 'Grow Low' / Grow Low Sumac	Cont.	1 Gal.	42" OC
SAS	8	Sassafras albidium / Sassafras	Cont.	4'-5'	Full

NOTE: For proposed planting beds, amend exiting topsoil with 3" of aged compost and till in thoroughly.
Over dig root ball holes by 2 X the root ball size and place the above soil mix in root balls.
Use one package/ 2" caliper tree of a mycorrhizal fungal root treatment such as 'Mycor Tree' or 'Roots 1-Step' on all tree and shrub root balls to stimulate root growth and nutrient uptake. Construct an earth saucer to hold water and apply 2" of shredded bark mulch to earth saucer or planting bed.





TREE PLANTING DETAIL
N.T.S.

PART 1 – GENERAL:

1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 – EXECUTION:

2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND – NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.

2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.

2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.

2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"–3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.

2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.

2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS – NO EXCEPTIONS.

2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.

2.8 2"–3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.

2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.

2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON–DAMAGING TO THE TREE.

2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

SEE ADDITIONAL TREE PLANTING NOTES ON SHEET D2

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4) TREE PLANTING PLAN FROM DESIGN BY TERRA FIRMA LANDSCAPE ARCHITECT DATED 1/10/25.

5) TREE PLANTING SHALL OCCUR IN SEPTEMBER OR OCTOBER AS THE SITE DOES NOT HAVE IRRIGATION.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	1/3/25
	REVISIONS	

SCALE: 1"=20' NOVEMBER 2024

TREE PLANTING PLAN

C7

FB 487 PG 1

5010156.1397.04

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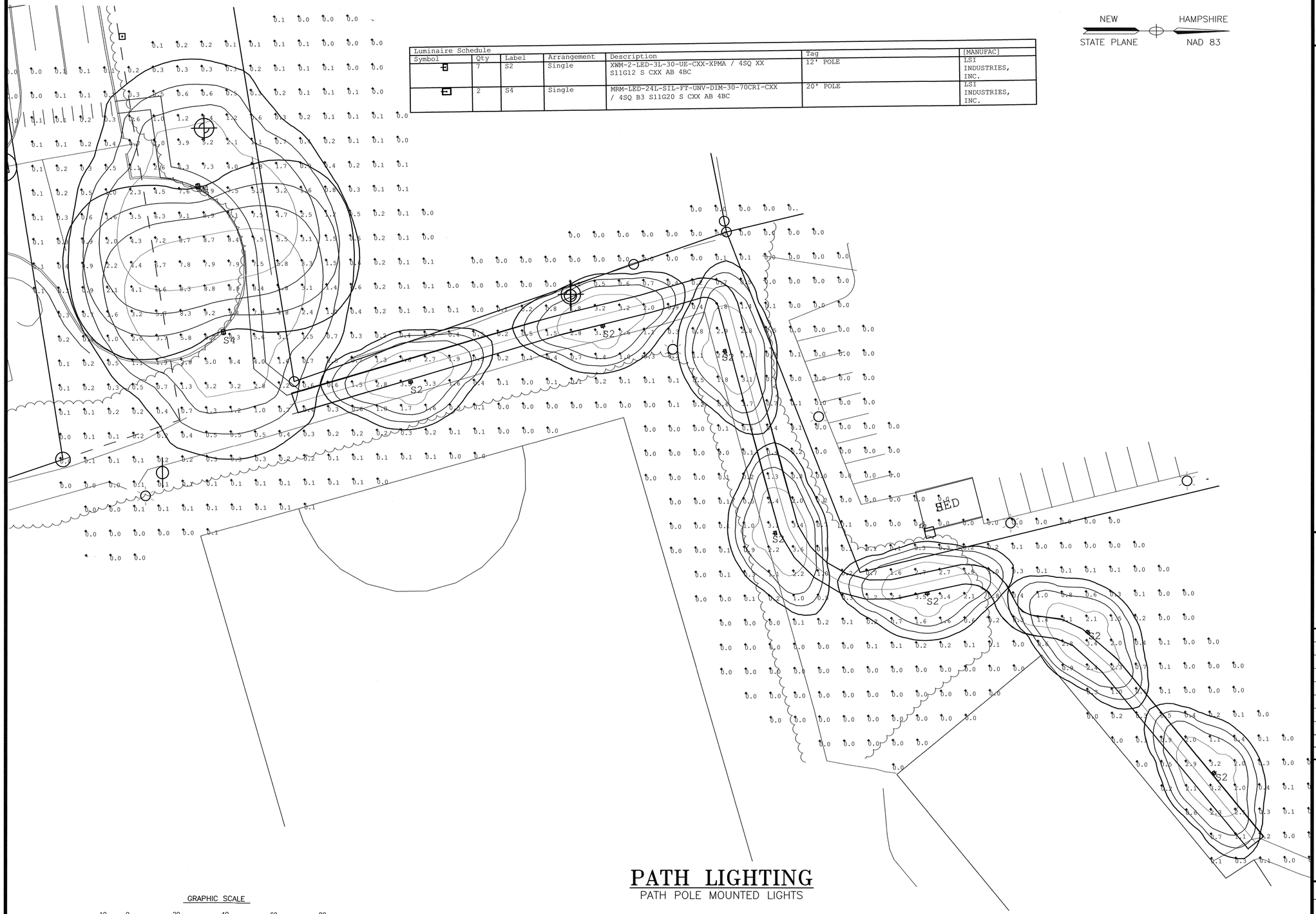
NEW HAMPSHIRE
STATE PLANE NAD 83

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Description	Tag	[MANUFAC]
	7	S2	Single	XWM-2-LED-3L-30-UE-CXX-XPMA / 4SQ XX S11G12 S CXX AB 4BC	12' POLE	LSI INDUSTRIES, INC.
	2	S4	Single	MRM-LED-24L-SIL-FT-UNV-DIM-30-70CRI-CXX / 4SQ B3 S11G20 S CXX AB 4BC	20' POLE	LSI INDUSTRIES, INC.



PATH LIGHTING
PATH POLE MOUNTED LIGHTS

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) LIGHTING DESIGN PROVIDED BY EXPOSURE ESS ON 1/7/24. CONTACT: KEN SWEENEY 603-601-8080.

2) ALL LIGHTS SHALL BE DARK SKY COMPLIANT AND DIRECTED DOWNWARD.

3) LIGHTS SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

4) NUMBERS REPRESENT INITIAL FOOTCANDLE VALUES AT 3 FEET ABOVE GRADE.

5) THIS LIGHTING PATTERN REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS.

6) BASED ON THE INFORMATION PROVIDED, ALL DIMENSIONS AND LUMINAIRE LOCATIONS SHOWN REPRESENT RECOMMENDED POSITIONS. THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING OR FUTURE FIELD CONDITIONS.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
	REVISIONS	
1	PUBLIC REALM LOCATION	1/3/25
0	ISSUED FOR COMMENT	11/21/24

SCALE: 1"=20' NOVEMBER 2024

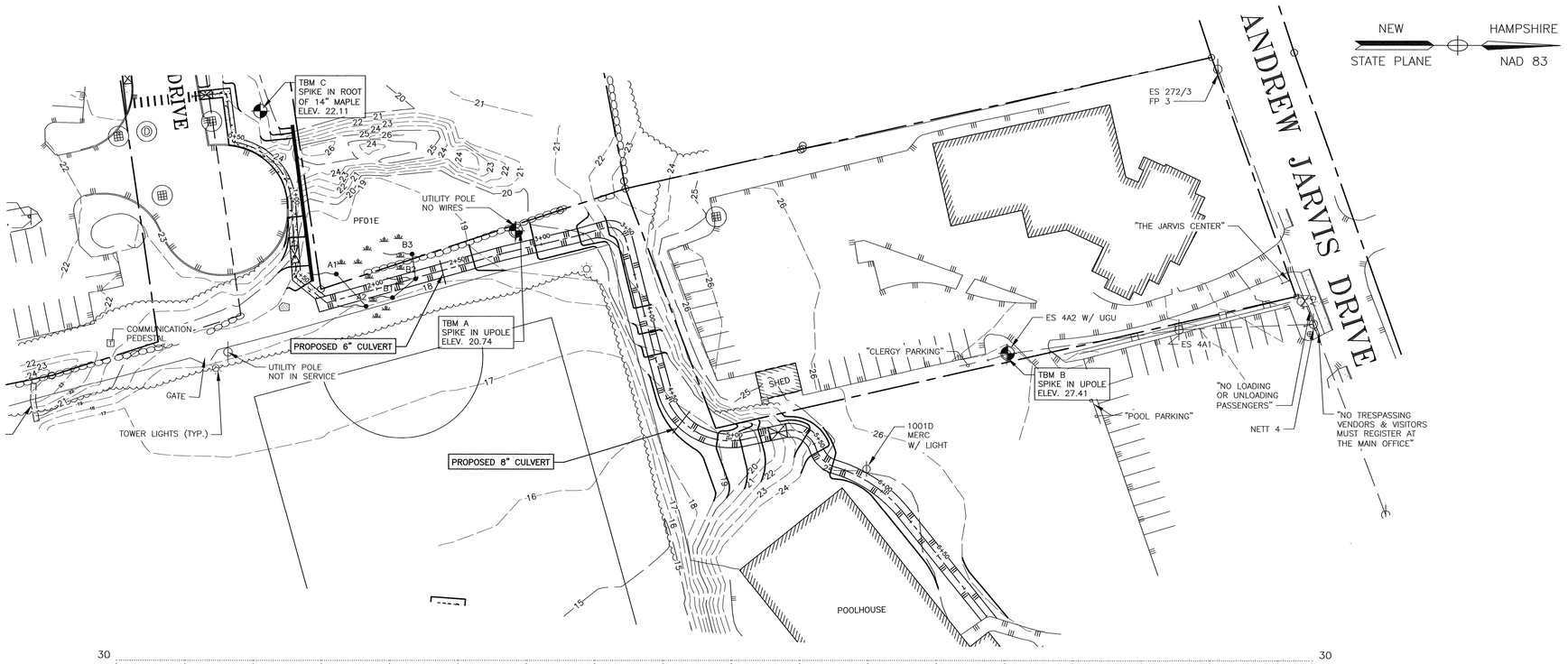
LIGHTING PLAN

L1

FB 487 PG 1

5010156.1397.04

J:\Jobs\5010156 McHugh, Properties\1397.03 - Lafayette Rd., Portsmouth, NH\2025 Site Plan 1397.03\Plans & Sheets\Site\Final Set revised 1-3-25\SITEALL 2024 Concept_exceed.dwg, 1/22/2025 3:03:29 PM, Kevin Hayden, Plotted



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200 Griffin Road - Unit 3
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Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBS.

COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	REVISED SIDEWALK & PATH	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

STATE OF NEW HAMPSHIRE
JOHN R. CRAGNON
No. 7851
LICENSED
PROFESSIONAL ENGINEER

SCALE: H1"=40' V1"=2' NOVEMBER 2024

WALKWAY
PLAN & PROFILE

P1

FB 487 PG 1

5010156.1397.04

EROSION CONTROL NOTES

CONSTRUCTION SEQUENCE

DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

IF REQUIRED THE CONTRACTOR SHALL OBTAIN AN **NPDES** PHASE II STORMWATER PERMIT AND SUBMIT A NOTICE OF INTENT (N.O.I) BEFORE BEGINNING CONSTRUCTION AND SHALL HAVE ON SITE A STORMWATER POLLUTION PREVENTION PLAN (**S.W.P.P.P.**) AVAILABLE FOR INSPECTION BY THE PERMITTING AUTHORITY DURING THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THE **S.W.P.P.P.** AND INSPECTING AND MAINTAINING ALL BMP'S CALLED FOR BY THE PLAN. THE CONTRACTOR SHALL SUBMIT A NOTICE OF TERMINATION (**N.O.T.**) FORM TO THE REGIONAL EPA OFFICE WITHIN 30 DAYS OF FINAL STABILIZATION OF THE ENTIRE SITE OR TURNING OVER CONTROL OF THE SITE TO ANOTHER OPERATOR.

THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:

1. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
2. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
3. A REPRESENTATIVE OF THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
4. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

INSTALL PERIMETER CONTROLS, i.e., SILTSOXX AND CATCH BASIN PROTECTION AROUND THE LIMITS OF DISTURBANCE BEFORE ANY EARTH MOVING OPERATIONS. THE USE OF HAYBALES IS NOT ALLOWED.

THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES. PLACE FODS AS NEEDED.

CUT AND GRUB ALL TREES, SHRUBS, SAPLINGS, BRUSH, VINES AND REMOVE OTHER DEBRIS AND RUBBISH AS REQUIRED.

ROUGH GRADE SITE.

LAYOUT AND INSTALL ELECTRICAL SERVICES. CAP AND MARK TERMINATIONS OR LOG SWING TIES.

CONNECT UTILITIES.

CONSTRUCT SIDEWALKS. PLACE CONCRETE AND BINDER LAYER OF PAVEMENT FOR PATHWAY.

REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES UPON COMPLETION OF FINAL STABILIZATION OF THE SITE.

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF CONSTRUCTING A BASKETBALL COURT AT THE END OF LEDGEWOOD DRIVE. BEGINNING AT THE COURT, A CONCRETE SIDEWALK THAT TRANSITIONS INTO RECYCLED ASPHALT WILL CONNECT TO THE PORTSMOUTH HIGH SCHOOL PARKING LOT ALONG THE RECREATION FIELD.

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 0.470 ACRES.

BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE CONSISTS OF URBAN LAND AND UDORTHENTS.

THE STORMWATER RUNOFF FROM THE SITE WILL HAVE MINIMAL IMPACT AND FLOW SIMILARLY TO THE EXISTING CONDITIONS. DRAINAGE WILL FOLLOW TOPOGRAPHY AND WILL FLOW TO THE SAGAMORE CREEK.

GENERAL CONSTRUCTION NOTES

THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.

ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.

THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DUST CONTROL: DUST CONTROL MEASURES SHALL INCLUDE BUT ARE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.
DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.
IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.

SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.

ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.

ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.

FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.

FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.

DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.

THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.

ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
- EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
- IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA.

STABILIZATION MEASURES TO BE USED INCLUDE:
- TEMPORARY SEEDING;
- MULCHING.

1. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
2. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN THESE AREAS, SILTSOXX, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
3. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILTSOXX, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

MAINTENANCE AND PROTECTION

THE SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.

SILTSOXX SHALL BE REMOVED ONCE SITE IS STABILIZED, AND DISTURBED AREAS RESULTING FROM SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.

THE CATCH BASIN INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.
SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

WINTER NOTES

ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATED GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;

AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;

STOCKPILES

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

CONCRETE WASHOUT AREA

THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:
1. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FAILITY;
2. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
3. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
4. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

ALLOWABLE NON-STORMWATER DISCHARGES

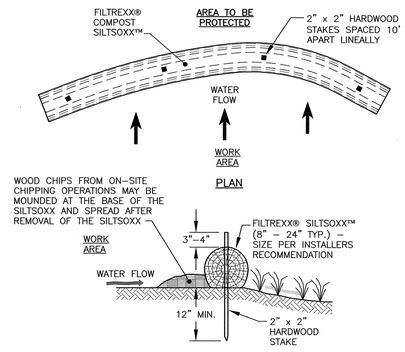
1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL

1. WASTE MATERIAL
   - ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
   - NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
   - ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
   - ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
   - SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
   - ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

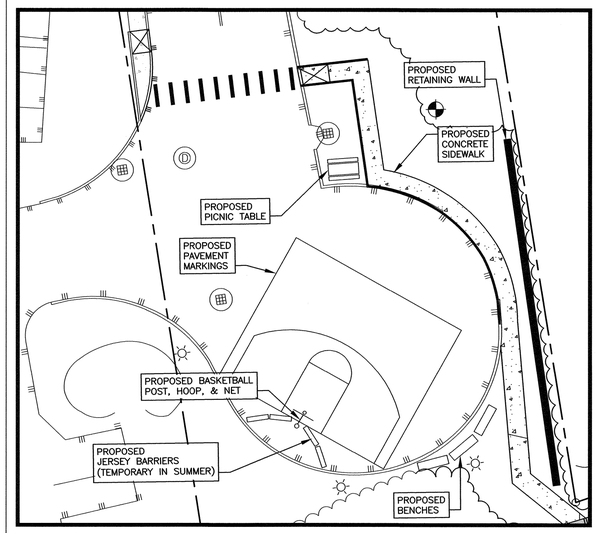
BLASTING NOTES

1. CONTRACTOR SHALL CONTACT THE NHDES AND/OR LOCAL JURISDICTION PRIOR TO COMMENCING ANY BLASTING ACTIVITIES.
2. FOR ANY PROJECT FOR WHICH BLASTING OF BEDROCK IS ANTICIPATED, THE APPLICANT SHALL SUBMIT A BLASTING PLAN THAT IDENTIFIES:
   - WHERE THE BLASTING ACTIVITIES ARE ANTICIPATED TO OCCUR;
   - THE ESTIMATED QUANTITY OF BLAST ROCK IN CUBIC YARDS; AND
   - SITE-SPECIFIC BLASTING BEST MANAGEMENT PRACTICES.



NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

A / C4 FILTREXX® SILTSOXX™ FILTRATION SYSTEM — NTS



C / C3 LEDGEWOOD IMPROVEMENTS — NTS

GRAPHIC SCALE
10 0 10 20 30 40 50 FEET
3 0 5 10 15 METERS
1"=20'

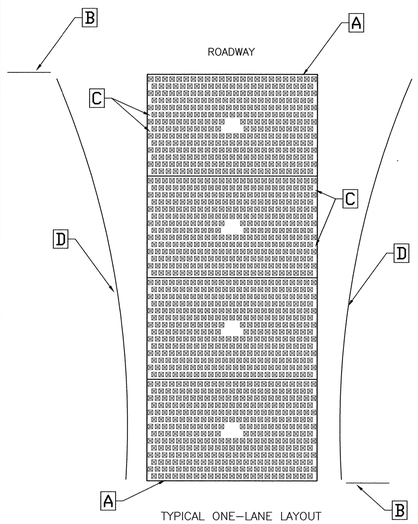
FODS TRACKOUT CONTROL SYSTEM

INSTALLATION:

THE PURPOSE AND DESIGN OF THE FODS TRACKOUT CONTROL SYSTEM IS TO EFFECTIVELY REMOVE MOST SEDIMENT FROM VEHICLE TIRES AS THEY EXIT A DISTURBED LAND AREA ONTO A PAVED STREET. THIS MANUAL IS A PLATFORM FROM WHICH TO INSTALL A FODS TRACKOUT CONTROL SYSTEM. (NOTE: THIS IS NOT A ONE SIZE FITS ALL GUIDE.) THE INSTALLATION MAY NEED TO BE MODIFIED TO MEET THE EXISTING CONDITIONS, EXPECTATIONS, OR DEMANDS OF A PARTICULAR SITE. THIS IS A GUIDELINE. ULTIMATELY THE FODS TRACKOUT CONTROL SYSTEM SHOULD BE INSTALLED SAFELY WITH PROPER ANCHORING AND SIGNS PLACED AT THE ENTRANCE AND EXIT TO CAUTION USERS AND OTHERS.

KEY NOTES:

A. FODS TRACKOUT CONTROL SYSTEM MAT.
B. FODS SAFETY SIGN.
C. ANCHOR POINT.
D. SILT OR ORANGE CONSTRUCTION FENCE.



INSTALLATION:
1. THE SITE WHERE THE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED SHOULD CORRESPOND TO BEST MANAGEMENT PRACTICES AS MUCH AS POSSIBLE. THE SITE WHERE FODS TRACKOUT CONTROL SYSTEM IS PLACED SHOULD ALSO MEET OR EXCEED THE LOCAL JURISDICTION OR STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS.
2. CALL FOR UTILITY LOCATES 3 BUSINESS DAYS IN ADVANCE OF THE OF FODS TRACKOUT CONTROL SYSTEM INSTALLATION FOR THE MARKING OF UNDERGROUND UTILITIES. CALL THE UTILITY NOTIFICATION CENTER AT 811.
3. ONCE THE SITE IS ESTABLISHED WHERE FODS TRACKOUT CONTROL SYSTEM IS TO BE PLACED, ANY EXCESSIVE UNEVEN TERRAIN SHOULD BE LEVELED OUT OR REMOVED SUCH AS LARGE ROCKS, LANDSCAPING MATERIALS, OR SUDDEN ABRUPT CHANGES IN ELEVATION.
4. THE INDIVIDUAL MATS CAN START TO BE PLACED INTO POSITION. THE FIRST MAT SHOULD BE PLACED NEXT TO THE CLOSEST POINT OF EGRESS. THIS WILL ENSURE THAT THE VEHICLE WILL EXIT STRAIGHT FROM THE SITE ONTO THE PAVED SURFACE.
8. AFTER THE FIRST MAT IS PLACED DOWN IN THE PROPER LOCATION, MATS SHOULD BE ANCHORED TO PREVENT THE POTENTIAL MOVEMENT WHILE THE ADJOINING MATS ARE INSTALLED. ANCHORS SHOULD BE PLACED AT EVERY ANCHOR POINT (IF FEASIBLE) TO HELP MAINTAIN THE MAT IN ITS CURRENT POSITION.
9. AFTER THE FIRST MAT IS ANCHORED IN ITS PROPER PLACE, AN H BRACKET SHOULD BE PLACED AT THE END OF THE FIRST MAT BEFORE ANOTHER MAT IS PLACED ADJACENT TO THE FIRST MAT.
10. ONCE THE SECOND MAT IS PLACED ADJACENT TO THE FIRST MAT, MAKE SURE THE H BRACKET IS CORRECTLY SITUATED BETWEEN THE TWO MATS, AND SLIDE MATS TOGETHER.
11. NEXT THE CONNECTOR STRAPS SHOULD BE INSTALLED TO CONNECT THE TWO MATS TOGETHER.
12. UPON PLACEMENT OF EACH NEW MAT IN THE SYSTEM, THAT MAT SHOULD BE ANCHORED AT EVERY ANCHOR POINT TO HELP STABILIZE THE MAT AND ENSURE THE SYSTEM IS CONTINUOUS WITH NO GAPS IN BETWEEN THE MATS.
13. SUCCESSIVE MATS CAN THEN BE PLACED TO CREATE THE FODS TRACKOUT CONTROL SYSTEM REPEATING THE ABOVE STEPS.

USE AND MAINTENANCE
1. VEHICLES SHOULD TRAVEL DOWN THE LENGTH OF THE TRACKOUT CONTROL SYSTEM AND NOT CUT ACROSS THE MATS.
2. DRIVERS SHOULD TURN THE WHEEL OF THEIR VEHICLES SUCH THAT THE VEHICLE WILL MAKE A SHALLOW S-TURN ROUTE DOWN THE LENGTH OF THE FODS TRACKOUT CONTROL SYSTEM.
3. MATS SHOULD BE CLEANED ONCE THE VOIDS BETWEEN THE PYRAMIDS BECOME FULL OF SEDIMENT. TYPICALLY THIS WILL NEED TO BE PERFORMED WITHIN TWO WEEKS AFTER A STORM EVENT. BRUSHING IS THE PREFERRED METHOD OF CLEANING, EITHER MANUALLY OR MECHANICALLY.
4. THE USE OF ICE MELT, ROCK SALT, SNOW MELT, DE-ICER, ETC. SHOULD BE UTILIZED AS NECESSARY DURING THE WINTER MONTHS AND AFTER A SNOW EVENT TO PREVENT ICE BUILDUP.

REMOVAL
1. REMOVAL OF FODS TRACKOUT CONTROL SYSTEM IS REVERSE ORDER OF INSTALLATION.
2. STARTING WITH THE LAST MAT, THE MAT THAT IS PLACED AT THE INNERMOST POINT OF THE SITE OR THE MAT FURTHEST FROM THE EXIT OR PAVED SURFACE SHOULD BE REMOVED FIRST.
3. THE ANCHORS SHOULD BE REMOVED.
4. THE CONNECTOR STRAPS SHOULD BE UNBOLTED AT ALL LOCATIONS IN THE FODS TRACKOUT CONTROL SYSTEM.
5. STARTING WITH THE LAST MAT IN THE SYSTEM, EACH SUCCESSIVE MAT SHOULD THEN BE MOVED AND STACKED FOR LOADING BY FORKLIFT OR EXCAVATOR ONTO A TRUCK FOR REMOVAL FROM THE SITE.

B / C3 FODS (USE AS REQUIRED) — NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

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COMMERCIAL DEVELOPMENT
581 LAFAYETTE ROAD
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	DETAIL C	1/3/25
0	ISSUED FOR COMMENT	11/21/24

REVISIONS

JOHN R. CHAGNON NO. 7651 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

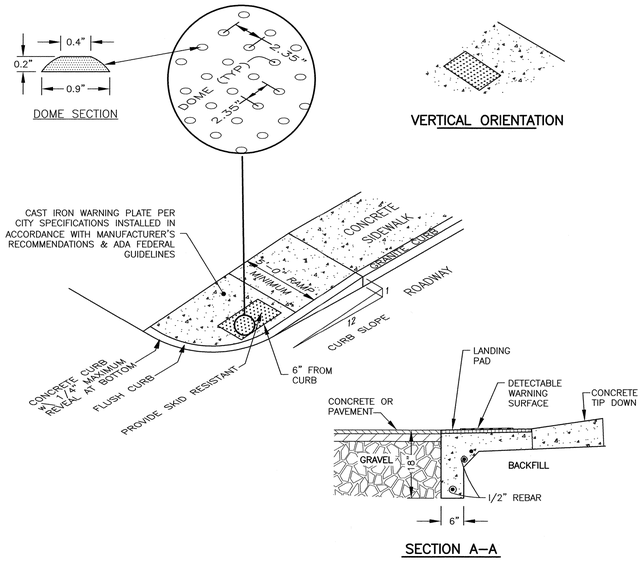
SCALE: 1"=20' NOVEMBER 2024

DETAILS D1

FB 487 PG 1

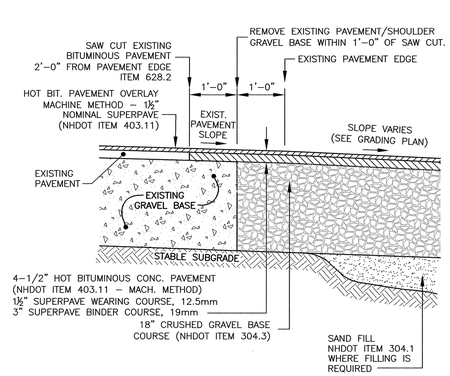
5010156.1397.04

T:\Jobs\5010156.04\Public_Properties\197 Jill Lafayette Rd - Portsmouth-NH\2023 Site Plan 197 Jill\Plans & Specs\Site\final Set revised 1-3-25\SITEFINAL 2024 Concept_Layout.dwg, 1/23/2025 9:57:14 AM, Gerald Galindo, DWG To PDF.pc3



D C4 TIP DOWN WITH WARNING STRIP

NTS



E C3 PAVEMENT SECTION AND JOINT

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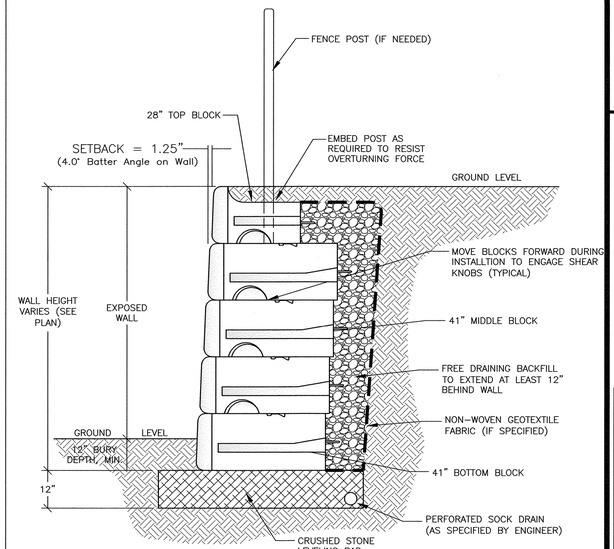
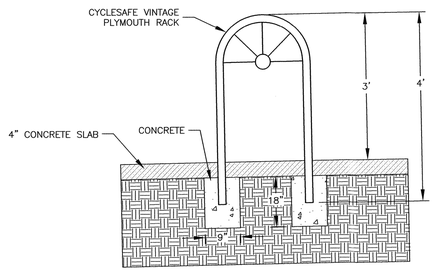


TYPICAL GRAVITY WALL w/ 41" MODULAR BLOCKS

NO SCALE

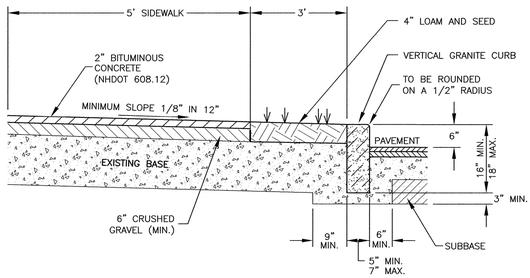
F C3 MODULAR RETAINING WALL A

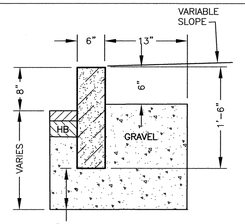
NTS



G C2 BIKE RACK

NTS





MIN. LENGTH OF CURB STONES: 3FT.
MAX. LENGTH OF CURB STONES: 10FT.
MAX. LENGTH OF STRAIGHT CURB STONES LAID ON CURVE: SEE CHART

NOTE: ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATE LENGTH.

Radius	Max. length
21'	3'
22' – 28'	4'
29' – 35'	5'
36' – 42'	6'
43' – 49'	7'
50' – 56'	8'
57' – 60'	9'
over 60'	10'

H C3 BITUMINOUS CONCRETE SIDEWALK WITH VERTICAL GRANITE CURB

NTS

City Of Portsmouth Tree Protection Plan

Definition: Practices to preserve and protect desirable trees from damage during project development.

Purpose: To preserve and protect trees which have present or future value in protection from erosion, landscape and aesthetic value, or for other environmental benefits.

I. The tree canopy/root zones of trees to be preserved shall be protected during the entire construction process.

II. Prior to the start of any site work, the contractor will erect semi- permanent fencing around tree root zones which are to be protected within the construction site. The fence shall be placed around the trees to be protected with a radius determined by the City Arborist, typically one foot of protected area for each inch of trunk diameter. This ratio can be increased or decreased per the City Arborist's discretion to further protect specimen or historic trees. The location of the fencing will be marked by the City Arborist prior to fence installation.

III. The Contractor shall be responsible for installation and maintenance of all tree protection fencing.

IV. Protective fencing shall remain undisturbed until ALL site work has been completed. The Contractor shall remove fencing at completion of project. If protective fencing is damaged, the Contractor shall immediately execute the necessary repairs to re-establish the protective fencing to original configurations.

V. All work conducted in the ground within the protection zone of any protected tree should be accomplished with hand tools only. An air excavation tool (i.e. an Airspade) shall be used for root pruning prior to machine excavation where digging abuts the dripline of specimen or historic trees.

VI. The Contractor shall be held liable for any damages to protected trees and root zones caused by unauthorized intrusions into the protected areas during construction activity. Additionally, the Contractor shall be held liable for damages incurred to any tree branches that extend over protective fencing and to any trees or other plant material located on the site and indicted on the plan to remain. The Contractor shall be held liable for all remedial measures required to treat broken limbs, or damaged trees and roots, or for unauthorized removal of existing trees or plant material, etc. All tree surgery and remedial treatments will be accomplished by the City of Portsmouth's arborists.

VII. The Contractor shall notify the City Arborist when any overhanging branches or other plant materials interfering with or risks damage due to construction activity.

VIII. No removal or encroachment into Tree Protection Enclosures shall be permitted unless coordinated with the City Arborist.

IX. Any grading, construction, demolition, remedial measures or other work that is expected to encounter tree roots shall be made in consultation with the City Arborist.

X. No machine digging shall take place within a radius of one and one-half foot for each 1-inch diameter at breast height (DBH) of any tree with a historic or specimen designation unless an air excavation tool has been used to prune roots along dripline beforehand.

XI. Any pruning of protected trees that may be required during the course of construction shall be performed by the City of Portsmouth Arborists. Coordinate pruning requests with the City Arborist.

XII. For construction projects requiring access or haul roads that must pass over the root area of trees to be retained, a roadbed shall be installed using 4 inches (minimum) of mulch or wood chips covered with approved logging mats. The roadbed shall be replenished and maintained as necessary to provide desired root zone protection. For projects requiring materials storage within the root area of trees to be retained or protected, this area shall be constructed using an approved Geotextile base covered with 4 inches (minimum) of coarse wood mulch or chips. The area shall be replenished as necessary to maintain a 4 inch (minimum) depth.

XIII. There shall be no vehicular traffic, parking, or stock piling of materials permitted under the drip line/canopy of ANY tree to be retained or protected within the construction site, unless approved tree root protection measures have been installed. Foot traffic shall be kept to a minimum under the drip line/canopy. If temporary foot traffic must be directed over the root zone of trees to be retained or protected, a pathway shall be installed using an approved Geotextile base covered with 3 inches (minimum) or mulch or wood chips. The pathway material shall be replenished as necessary to maintain a 3-inch (minimum) depth.

XIV. "Natural" or pre-construction grade should be maintained for as great a distance from the trunk of each tree as construction permits. At no time during or after construction should soil be in contact with the trunk of the tree above natural grade.

XV. When removing pavement, as little disruption of soil as necessary should be attempted.

XVI. Any required trenching which has options for trench path location should be routed in such a manner as to minimize root damage. Radial trenching (radial to the tree trunk) is less harmful than tangential trenching because it runs parallel to tree roots rather than diagonal or perpendicular to them. If roots can be worked around, cutting of roots should be avoided (i.e. place pipes and cables below uncut roots whenever possible). When possible, utilize the same trench for as many utilities as possible.

XVII. Plans must be reviewed by the City Arborist and/or the City of Portsmouth Trees and Greenery Committee, and signed off before commencement of work. Protective fencing must be approved in place before any construction will be allowed to begin.

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

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City of Portsmouth Tree Planting Requirements

The base of the City of Portsmouth Tree Planting Requirements is the *ANSI A300 Part 6 Standard Practices for Planting and Transplanting*, ANSI A300 Part 6 lays out terms and basic standards as set forth by industry but it is NOT the "end all" for the City of Portsmouth. The following are the City of Portsmouth, NH Tree Planting Requirements that are in addition to or that go beyond the ANSI A300 Part 6.

1. All planting holes shall be dug by hand- **NO MACHINES**. The only exceptions are **new** construction where new planting pits, planting beds with granite curbing, and planting sites with Silva Cells are being created. If a machine is used to dig in any of these situations and planting depth needs to be raised the material in the bottom of the planting hole MUST be firmed with machine to prevent sinking of the root ball.

2. **ALL** Wire and Burlap shall be removed from the root ball **AND** planting hole.

3. The root ball of the tree shall be worked so that the root collar of the tree is visible and no girdling roots are present.

4. The root collar of the tree shall be 2"-3" above grade of planting hole for finished depth.

5. All plantings shall be backfilled with soil from the site and amended no more than 20% with Organic Compost. The only exceptions are new construction where engineered soil is being used in conjunction with Silva Cells and where new planting beds are being created.

6. All plantings shall be backfilled in three lifts and **ALL** lifts shall be watered so the planting will be set and free of air pockets- **NO EXCEPTIONS**.

7. An earth berm shall be placed around the perimeter of the planting hole except where curbed planting beds or pits are being used.

8. 2"-3" of mulch shall be placed over the planting area.

9. At the time the planting is complete the planting shall receive additional water to ensure complete hydration of the roots, backfill material and mulch layer.

10. Stakes and guys shall be used where appropriate and/or necessary. Guy material shall be non-damaging to the tree.

11. All planting stock shall be specimen quality, free of defects, and disease or injury. The City of Portsmouth, NH reserves the right to refuse/reject any plant material or planting action that fails to meet the standards set forth in the *ANSI A300 Part 6 Standard Practices for Planting and Transplanting* and/or The City of Portsmouth, NH Planting Requirements.

COMMERCIAL DEVELOPMENT
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REVISIONS

JOHN R. CHAGNON No. 7551 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE: 1"=20' NOVEMBER 2024

DETAILS

D2

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1397.04

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JONES & BEACH ENGINEERS INC.
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

February 13, 2026

Portsmouth Technical Review Committee
Attn: Board Members
1 Junkins Avenue, Suite 3rd Floor
Portsmouth, NH 03801

RE: Amended Site Plan Application
304 Maplewood Avenue, Portsmouth, NH
Tax Map 140, Lot 7
JBE Project No. 23169

Dear Board Members,

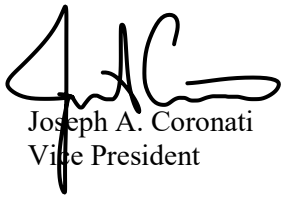
Jones & Beach Engineers, Inc., respectfully submits a Site Plan Application on behalf of the owner & applicant, 304 Maplewood LLC. The intent of this application is to remove a small portion of the rear of the building and then to construct a 1,011 S.F. office addition. The property is located in the Historic District and received HDC approval for this work in February. There is no change to the parking lot proposed, only striping to define parking spaces. The last site approval on this lot that we could find was from 1988.

The following items are provided in support of this Application:

1. Completed Site Plan (submitted online).
2. Letter of Authorization.
3. Current Deed.
4. Abutters List and Three (3) Mailing Labels each.
5. Tax Map.
6. Architectural Plans.
7. One (1) Full Size Plan Sets Folded.
8. One (1) Half Size Plan Sets Folded.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.



Joseph A. Coronati
Vice President

cc: Robert Graham, 304 Maplewood LLC (via email)

City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Applicant: 304 Maplewood LLC Date Submitted: 2/13/26

Application # (in City's online permitting): _____

Site Address: 304 Maplewood Avenue Map: 140 Lot: 7

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**		N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1B)**		
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**		N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**		N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**		N/A
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1F)**		N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**		N/A
☒	List of reference plans. **(2.5.3.1H)**		N/A
☐	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**		N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director.. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☐	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**		N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**		N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**		N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**		N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☐	Source and date of data displayed on the plan. **(2.5.4.2D)**		N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	**1. Existing Conditions: (2.5.4.3A)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.		
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.		
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).		
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).		
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).		
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.		

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.		
☒	**8. Solid Waste Facilities: (2.5.4.3H)**		
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.		
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.		
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**		
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.		
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.		
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		
☒	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).		
☒	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	Traffic Impact Study or Trip Generation Report, as required. **(3.2.1-2)**	N/A	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**		
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	
☐	Stormwater Management and Erosion Control Plan. **(7.4)**	N/A	
☐	Inspection and Maintenance Plan **(7.6.5)**	N/A	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**		
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**		
☒	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**		

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	N/A	
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." **(2.5.4.2E)**		N/A
☐	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**		N/A

Applicant's Signature: _____ **Date:** 2/13/26

Letter of Authorization

I, Robert Graham, 304 Maplewood LLC, 304 Maplewood Avenue, Portsmouth, NH 03801, authorized representative of owner of property located in Portsmouth, NH, known as Tax Map 140, Lot 7, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously mentioned property. The parcel is located at 304 Maplewood Avenue in Portsmouth, NH.

I hereby appoint Jones & Beach Engineers, Inc., as my agent to act on my behalf in the review process, to include any required signatures.

Cynthia Mix
Witness

R V Graham III
Robert Graham
Designated Agent for Manager
304 Maplewood LLC

2-13-2026
Date

Letter of Authorization

I, Banfield Realty, LLC, 304 Maplewood Avenue, Portsmouth, NH 03801, owner of property located in Portsmouth, NH, known as Tax Map 266, Lot 7, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously-mentioned property. The parcel is located on 375 Banfield Road in Portsmouth, NH.

I hereby appoint Jones & Beach Engineers, Inc., as my agent to act on my behalf in the review process, to include any required signatures.

Cynthia Lux — Witness

Banfield Realty, LLC

7-23-20 — Date

MAIL TO
PLEASE RETURN TO:
HALEY, DESMARES, GAGLIARDI & WOELFEL, PC
BOX 33

BK 4849 PG 2483

Return to:
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STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
7 THOUSAND 4 HUNDRED AND 25 DOLLARS
10 04 07 844510 $7425.00

056487

2007 OCT -4 PM 12:01

ROCKINGHAM COUNTY
REGISTRY OF DEEDS

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS that, Murray Hill Properties, Inc., a Maine Corporation having an address of PO Box 21, East Boothbay, Maine 04544, for consideration paid, grants to 304 Maplewood, LLC, a New Hampshire Limited Liability Company having an address of 304 Maplewood Avenue, Portsmouth, NH, with WARRANTY COVENANTS, the following described property:

Two certain tracts or parcels of land with the buildings thereon, situate in the City of Portsmouth, County of Rockingham and State of New Hampshire and known as 304 Maplewood Avenue, being more particularly bound and described as follows:

Tract I: Beginning on Maplewood Avenue at land now or formerly of Clara D. Moore, and running southwesterly by said land of said Moore, 86 feet to land now or formerly of Biagio Donini and Candina Donini (conveyed to the them by Frederick O. Baumgarten, et al by deed dated 05/31/35 and recorded in Volume 906, Page 430 of the Rockingham County Registry of Deeds); thence turning and running northwesterly by said last mentioned land 50' feet 4" to other land of said Doninis; thence turning and running by said last mentioned land northeasterly 42' feet to an angle, and thence northerly 32'7" to Dennett Street; thence turning and running northeasterly by said Dennett Street 23'8" to Maplewood Avenue; thence turning and running by said Maplewood Avenue, southeasterly 51', more or less to the point of beginning.

Tract II: Bounded northeasterly by Maplewood Avenue 72', more or less, northwesterly by land of Frederick O. Baumgarten and Charlotte E. Baumgarten and by land now or formerly of Biagio Donini and C.C. Donini 133 feet, more or less, southwesterly by land now or formerly of John J. Hoyt and land now or formerly of Charles W. Marden, 72 feet, more or less, southeasterly by land now or formerly of Susan B. Marvin, land now or formerly of Lydia L. Pinkham and land of said Charles V. Marden, 133 feet, more or less.

Subject to any and all easements, restrictions and covenants of record.

Meaning and intending to describe and convey the same premises as conveyed to Murray Hill Properties, Inc., by Quitclaim Deed of D. Wayne Moore dated 09/03/02 and recorded in Volume 3964, Page 671 of the Rockingham County Registry of Deeds.

Executed this 24th day of September, 2007.

Murray Hill Properties, Inc.

By: D W Moore

D. Wayne Moore, Duly Authorized

COUNTY OF Lincoln
STATE OF MAINE

On this 24 day of September, 2007, personally appeared before me, D. Wayne Moore, duly authorized President of Murray Hill Properties, Inc., a 9 Corporation, and known to me or satisfactorily proven to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

Justice of Peace/Notary Public
My commission expires: _____

Notary
My Commission Ex 2014

Property ID	Site Address	Owner Name	Owner Name 2	Owner Address	City	State	Zip
0140-0001-0000	28 DEARBORN ST	REGAN BRIAN M		28 DEARBORN ST	PORTSMOUTH	NH	03801
0140-0002-0000	41 DEARBORN ST	GOLDEN JAMES E	MCCARTHY COURTNEY E	41 DEARBORN ST	PORTSMOUTH	NH	03801
0140-0003-0000	39 DEARBORN ST	BARDONG SHAWN & MICHIYO		39 DEARBORN ST	PORTSMOUTH	NH	03801
0140-0004-0000	33 DEARBORN ST	STASIUK MICHAEL		31/33 DEARBORN ST	PORTSMOUTH	NH	03801
0140-0005-0000	21 DEARBORN ST	ALATI BRIAN J REV TRUST	ALATI BRIAN J TRUSTEE	274 NEW CASTLE AVE	PORTSMOUTH	NH	03801
0140-0006-0000	276 MAPLEWOOD AVE	SALAS RAFAEL	ABRUZESE MARIA RUTH	276 MAPLEWOOD AVE	PORTSMOUTH	NH	03801
0140-0008-0000	12 DENNETT ST	ANCTIL S CHRISTOPHER		73 EXETER RD	NORTH HAMPTON	NH	03862
0140-0009-0000	28 DENNETT ST	BENSLEY JOHN E	BENSLEY CYNTHIA S	28 DENNETT ST	PORTSMOUTH	NH	03801
0140-0010-0000	38 DENNETT ST	SHOOP ZEHRA N		PO BOX 277	KITTERY	ME	03904
0140-0011-0000	42 DENNETT ST	DEMPSEY GEORGE HENRY LIVING TRUST		42 DENNETT ST	PORTSMOUTH	NH	03801
0140-0012-0000	44 DENNETT ST	DENNETT INVESTMENT GROUP LLC		56 DENNETT ST	PORTSMOUTH	NH	03801
0140-0013-0000	56 DENNETT ST	HOERMAN FAMILY REVOCABLE TRUST OF 2019	HOERMAN WALTER A AND MARY ELLEN TRUSTEES	56 DENNETT ST	PORTSMOUTH	NH	03801
0141-0004-0000	49 DENNETT ST	VIEIRA ROBERT F	VIEIRA DIANE R	49 DENNETT ST	PORTSMOUTH	NH	03801
0141-0005-0000	31 DENNETT ST	ABSHIER NICOLE L		31 DENNETT ST	PORTSMOUTH	NH	03801
0141-0025-0000	347 MAPLEWOOD AVE	HEAD PAUL B II	HEAD HOLLY	347 MAPLEWOOD AVE	PORTSMOUTH	NH	03801
0141-0033-0000	1 MARSH LN	WHITE L MICHELLE	ZIEBARTH WALTER	3 MARSH LN	PORTSMOUTH	NH	03801
0141-0035-0000	293 MAPLEWOOD AVE	293 MAPLEWOOD AVENUE CONDOMINIUMS		295 MAPLEWOOD AVE	PORTSMOUTH	NH	03801
0141-0036-0000	287 MAPLEWOOD AVE	COOPER EVON		16 GARLAND RD	LINCOLN	MA	01773
0141-0001-0001	334 MAPLEWOOD AVE	JORDAN KATHRYN H		55 OAKWOOD DR	PORTSMOUTH	NH	03801
0141-0002-0001	348 MAPLEWOOD AVE #1	GLENNEY AARON		348 MAPLEWOOD AVE #1	PORTSMOUTH	NH	03801
0141-0002-0002	348 MAPLEWOOD AVE #2	GIBB BRIAN K		348 MAPLEWOOD AVE UNIT 2	PORTSMOUTH	NH	03801
0141-0002-0003	348 MAPLEWOOD AVE #3	DENICOLA ROBERT JR		348 MAPLEWOOD AVE #3	PORTSMOUTH	NH	03801
0141-0002-0004	348 MAPLEWOOD AVE #4	ABSHIRE DIANA C		348 MAPLEWOOD AVE APT 4	PORTSMOUTH	NH	03801
0141-0002-0005	348 MAPLEWOOD AVE #5	STANDISH DEBORAH		348 MAPLEWOOD AVE APT 5	PORTSMOUTH	NH	03801
0123-0002-0000	248 MAPLEWOOD AVE	MAPLEWOOD AVE LLC		30 SPRING ST	PORTSMOUTH	NH	03801
0123-0003-0000	258 MAPLEWOOD AVE	BVB LLC		87 RIDGE RD	YORK	ME	03909
0123-0004-0000	6 DEARBORN ST	6-10 DEARBORN STREET LLC		3 QUILL LANE STE 107	BARRINGTON	NH	03825
0123-0005-0000	22 DEARBORN ST	HUDLIN MELISSA A REV TR	HUDLIN MELISSA A TRUSTEE	256 WIBIRD ST	PORTSMOUTH	NH	03801
0123-0008-0000	259 MAPLEWOOD AVE	259 MAPLEWOOD AVENUE LLC		259 MAPLEWOOD AVE	PORTSMOUTH	NH	03801
0123-0009-0000	235 MAPLEWOOD AVE	JACKSON POINT LLC		PO BOX 1131	RYE	NH	03870
0141-0001-0000	324 MAPLEWOOD AVE	NEILA LLC		31 DENNETT ST	PORTSMOUTH	NH	03801
0141-0026-0000	335 MAPLEWOOD AVE	PETERSEN JAMES F REVOCABLE TRUST	PETERSEN JAMES F TRUSTEE	PO BOX 4516	PORTSMOUTH	NH	03802
0141-0031-0000	NORTHWEST ST	PUBLIC SERVICE CO OF NH		PO BOX 270	HARTFORD	CT	06141
0141-0034-0000	JACKSON HILL ST	35 PINES LLC		295 MAPLEWOOD AVE UNIT 1	PORTSMOUTH	NH	03801
0141-0037-0001	273 MAPLEWOOD AVE #1	NISSENBAUM & CELLETTI RV LV TR	CELLETTI MADELINE M TRUSTEE	18 WASHINGTON ST	BOXFORD	MA	01921
0141-0037-0002	273 MAPLEWOOD AVE #2	CARON JEFFREY	CARON RONDA	325 THAXTER RD	PORTSMOUTH	NH	03801
0141-0037-0003	273 MAPLEWOOD AVE #3	FORTIN ALISON A		273 MAPLEWOOD AV UNIT 3	PORTSMOUTH	NH	03801
0141-0037-0004	273 MAPLEWOOD AVE #4	COGSWELL TIMOTHY E		273 MAPLEWOOD AVE UNIT 4	PORTSMOUTH	NH	03801
0141-0002-0000	348 MAPLEWOOD AVE	OLD FRANKLIN SCHOOL CONDO MASTERCARD					
0141-0037-0000	273 MAPLEWOOD AVE	BOISVERT BRADLEY P		20 SHERBURNE RD	PORTSMOUTH	NH	03801
0141-0035-0003	295 MAPLEWOOD AVE F #3	SEE AARON & ALLYSON		293 MAPLEWOOD AVE UNIT F	PORTSMOUTH	NH	03801
0141-0035-0002	295 MAPLEWOOD AVE R #2	BASSI VICTORIA	BOUCHARD CAMERON J	295 MAPLEWOOD AVE R #2	PORTSMOUTH	NH	03801
0141-0035-0001	295 MAPLEWOOD AVE #1	35 PINES LLC		295 MAPLEWOOD AVE #1	PORTSMOUTH	NH	03801
0141-0032-0000	315 MAPLEWOOD AVE	GEREMIA PETER P		315 MAPLEWOOD AVE	PORTSMOUTH	NH	03801
0140-0012-0002	46 DENNETT ST #2	BURRA STEFANIE A		120 TOWNE ST APT #248	FAIRFIELD	CT	06902
0140-0012-0001	44 DENNETT ST #1	NORTH MILL RENTALS LLC		294 THORNTON ST	PORTSMOUTH	NH	03801
0140-0001-0001	30 DEARBORN ST	REGAN SUSAN M		30 DEARBORN ST	PORTSMOUTH	NH	03801

Jones & Beach Engineers, Inc., Attn. Joseph Coronati, PO Box 219, Stratham, NH 03885

304 Maplewood LLC, 304 Maplewood Ave., Portsmouth, NH 03801

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REGAN BRIAN M
28 DEARBORN ST
PORTSMOUTH, NH 03801

GOLDEN JAMES E MCCARTHY COURTNEY E
41 DEARBORN ST
PORTSMOUTH, NH 03801

BARDONG SHAWN & MICHIYO
39 DEARBORN ST
PORTSMOUTH, NH 03801

STASIUK MICHAEL
31/33 DEARBORN ST
PORTSMOUTH, NH 03801

ALATI BRIAN J REV TRUST ALATI BRIAN J TRUSTEE
274 NEW CASTLE AVE
PORTSMOUTH, NH 03801

SALAS RAFAEL ABRUZESE MARIA RUTH
276 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

ANCTIL S CHRISTOPHER
73 EXETER RD
NORTH HAMPTON, NH 03862

BENSLEY JOHN E BENSLEY CYNTHIA S
28 DENNETT ST
PORTSMOUTH, NH 03801

SHOOP ZEHRA N
PO BOX 277
KITTERY, ME 03904

DEMPSEY GEORGE HENRY LIVING TRUST
42 DENNETT ST
PORTSMOUTH, NH 03801

DENNETT INVESTMENT GROUP LLC
56 DENNETT ST
PORTSMOUTH, NH 03801

HOERMAN FAMILY REVOCABLE TRUST OF 2019
HOERMAN WALTER A AND MARY ELLEN TRUSTEES
56 DENNETT ST
PORTSMOUTH, NH 03801

VIEIRA ROBERT F VIEIRA DIANE R
49 DENNETT ST
PORTSMOUTH, NH 03801

ABSHIER NICOLE L
31 DENNETT ST
PORTSMOUTH, NH 03801

HEAD PAUL B II HEAD HOLLY
347 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

WHITE L MICHELLE ZIEBARTH WALTER
3 MARSH LN
PORTSMOUTH, NH 03801

293 MAPLEWOOD AVENUE CONDOMINIUMS
295 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

COOPER EVON
16 GARLAND RD
LINCOLN, MA 01773

JORDAN KATHRYN H
55 OAKWOOD DR
PORTSMOUTH, NH 03801

GLENNEY AARON
348 MAPLEWOOD AVE #1
PORTSMOUTH, NH 03801

GIBB BRIAN K
348 MAPLEWOOD AVE UNIT 2
PORTSMOUTH, NH 03801

DENICOLA ROBERT JR
348 MAPLEWOOD AVE #3
PORTSMOUTH, NH 03801

ABSHIRE DIANA C
348 MAPLEWOOD AVE APT 4
PORTSMOUTH, NH 03801

STANDISH DEBORAH
348 MAPLEWOOD AVE APT 5
PORTSMOUTH, NH 03801

MAPLEWOOD AVE LLC
30 SPRING ST
PORTSMOUTH, NH 03801

BVB LLC
87 RIDGE RD
YORK, ME 03909

6-10 DEARBORN STREET LLC
3 QUILL LANE STE 107
BARRINGTON, NH 03825

HUDLIN MELISSA A REV TR HUDLIN MELISSA A TRUSTEE
256 WIBIRD ST
PORTSMOUTH, NH 03801

259 MAPLEWOOD AVENUE LLC
259 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

JACKSON POINT LLC
PO BOX 1131
RYE, NH 03870

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NEILA LLC
31 DENNETT ST
PORTSMOUTH, NH 03801

PETERSEN JAMES F REVOCABLE TRUST PETERSEN
JAMES F TRUSTEE
PO BOX 4516
PORTSMOUTH, NH 03802

PUBLIC SERVICE CO OF NH
PO BOX 270
HARTFORD, CT 06141

35 PINES LLC
295 MAPLEWOOD AVE UNIT 1
PORTSMOUTH, NH 03801

NISSENBAUM & CELLETTI RV LV TR CELLETTI
MADELINE M TRUSTEE
18 WASHINGTON ST
BOXFORD, MA 01921

CARON JEFFREY CARON RONDA
325 THAXTER RD
PORTSMOUTH, NH 03801

FORTIN ALISON A
273 MAPLEWOOD AV UNIT 3
PORTSMOUTH, NH 03801

COGSWELL TIMOTHY E
273 MAPLEWOOD AVE UNIT 4
PORTSMOUTH, NH 03801

OLD FRANKLIN SCHOOL CONDO MASTERCARD

BOISVERT BRADLEY P
20 SHERBURNE RD
PORTSMOUTH, NH 03801

SEE AARON & ALLYSON
293 MAPLEWOOD AVE UNIT F
PORTSMOUTH, NH 03801

BASSI VICTORIA BOUCHARD CAMERON J
295 MAPLEWOOD AVE R #2
PORTSMOUTH, NH 03801

35 PINES LLC
295 MAPLEWOOD AVE #1
PORTSMOUTH, NH 03801

GEREMIA PETER P
315 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

BURRA STEFANIE A
120 TOWNE ST APT #248
FAIRFIELD, CT 06902

NORTH MILL RENTALS LLC
294 THORNTON ST
PORTSMOUTH, NH 03801

REGAN SUSAN M
30 DEARBORN ST
PORTSMOUTH, NH 03801

JONES & BEACH ENGINEERS, INC
ATTN. JOSEPH CORONATI
PO BOX 219
STRATHAM, NH 03885

304 MAPLEWOOD LLC
04 MAPLEWOOD AVE.
PORTSMOUTH, NH 03801

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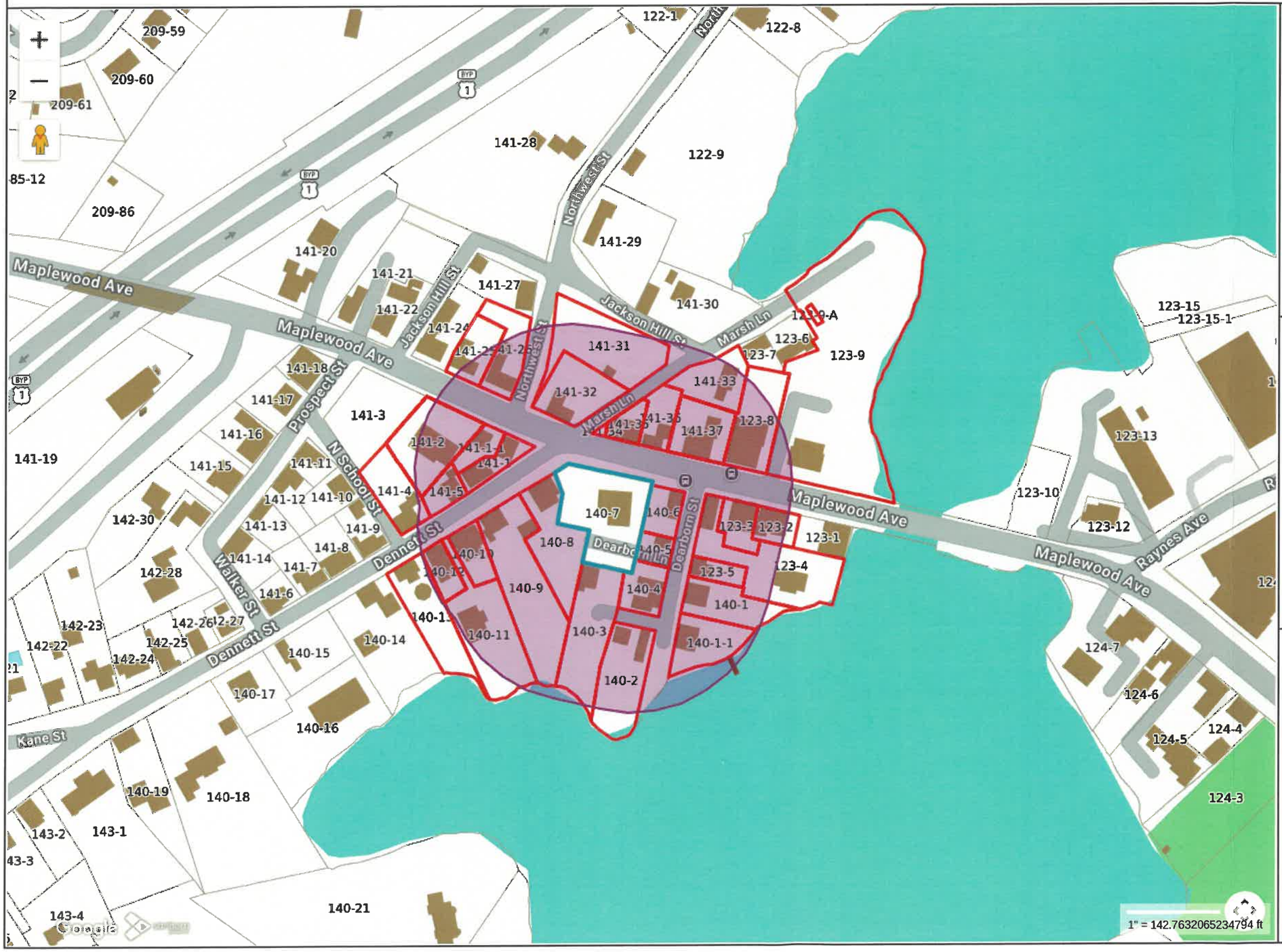


Property Information

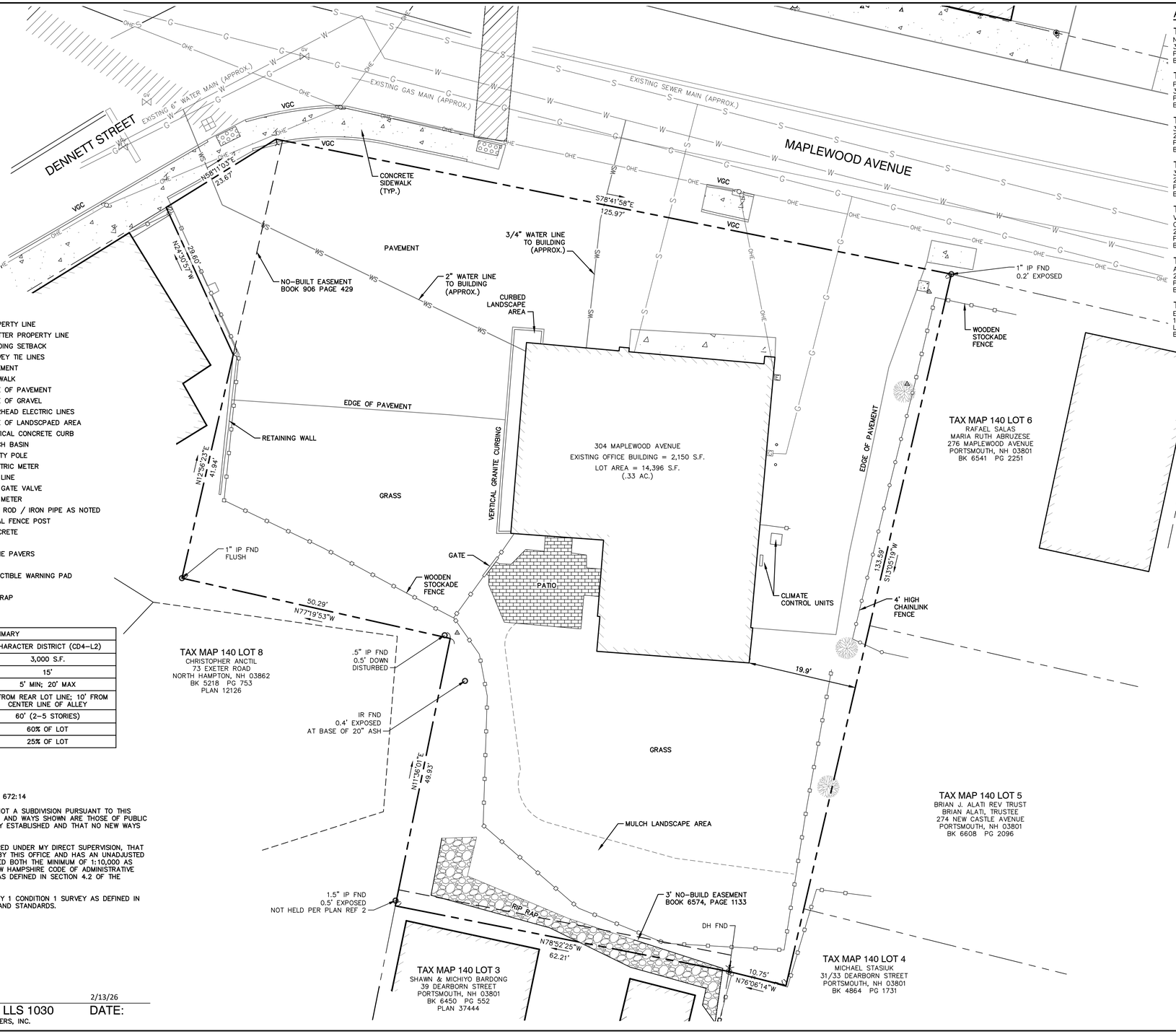
Property ID	0140-0007-0000
Location	304 MAPLEWOOD AVE
Owner	304 MAPLEWOOD LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Portsmouth, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 10/23/2025

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.



ABUTTERS NOT SHOWN:

TAX MAP 141 LOT 1
NEILA LLC
31 DENNETT STREET
PORTSMOUTH, NH 03801
BK 6415 PG 2630

TAX MAP 141 LOT 32
PETER GEREMIA
315 MAPLEWOOD AVENUE
PORTSMOUTH, NH 03801
BK 4829 PG 1699

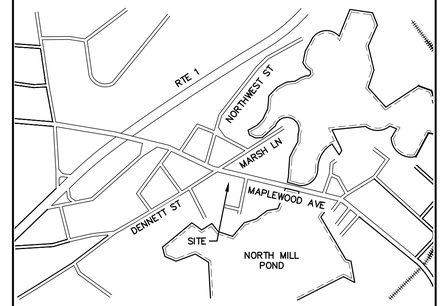
TAX MAP 141 LOT 34
35 PINES LLC
295 MAPLEWOOD AVENUE, UNIT 1
PORTSMOUTH, NH 03801
BK 6671 PG 1433

TAX MAP 141 LOT 35-1
35 PINES LLC
295 MAPLEWOOD AVENUE #1
PORTSMOUTH, NH 03801
BK 6347 PG 71

TAX MAP 141 LOT 35-2
VICTORIA BASSI
CAMERON BOUCHARD
295 MAPLEWOOD AVENUE R #2
PORTSMOUTH, NH 03801
BK 6228 PG 2499

TAX MAP 141 PG 35-3
ARRON & ALLYSON SEE
293 MAPLEWOOD AVENUE, UNIT F
PORTSMOUTH, NH 03801
BK 6411 PG 1662

TAX MAP 141 LOT 36
EVON COOPER
16 GARLAND ROAD
LINCOLN, MA 01773
BK 3261 PG 0831



LOCUS SCALE: 1"=500'

LEGEND

- PROPERTY LINE
- ABUTTER PROPERTY LINE
- BUILDING SETBACK
- SURVEY TIE LINES
- EASEMENT
- SIDEWALK
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- OHE — OVERHEAD ELECTRIC LINES
- EDGE OF LANDSCPAED AREA
- VGC — VERTICAL CONCRETE CURB
- CATCH BASIN
- UTILITY POLE
- ELECTRIC METER
- G — GV — G — GAS LINE
- GAS GATE VALVE
- GAS METER
- IRON ROD / IRON PIPE AS NOTED
- METAL FENCE POST
- CONCRETE
- STONE PAVERS
- DETECTIBLE WARNING PAD
- RIP-RAP

ZONING SUMMARY	
ZONE	CHARACTER DISTRICT (CD4–L2)
MINIMUM LOT AREA	3,000 S.F.
MAXIMUM FRONT YARD SETBACK	15'
SIDE YARD SETBACK	5' MIN; 20' MAX
MINIMUM REAR YARD SETBACK	5' FROM REAR LOT LINE; 10' FROM CENTER LINE OF ALLEY
MAXIMUM BUILDING HEIGHT	60' (2–5 STORIES)
MAXIMUM BUILDING COVERAGE	60% OF LOT
MINIMUM OPEN SPACE	25% OF LOT

NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING SITE FEATURES OF TAX MAP 140 LOT 7.
2. WATER, SEWER, AND GAS LINES WERE DRAWN IN BASED OFF OF UTILITIES SHOWN IN PLAN REF. 4 AND SHOULD BE CONSIDERED APPROXIMATE. LOCATION, DEPTH, SIZE, TYPE, EXISTENCE OR NONEXISTENCE OF UNDERGROUND UTILITIES AND/OR UNDERGROUND STORAGE TANKS WAS NOT VERIFIED BY THIS SURVEY. ALL CONTRACTORS SHOULD NOTIFY IN WRITING ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES PRIOR TO ANY EXCAVATION WORK OR CALL DIG–SAFE AT 1–888–DIG–SAFE.
3. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 33015C0259F, WITH EFFECTIVE DATE OF JANUARY, 29, 2021,
4. BASIS OF BEARING: HORIZONTAL – NH STATE PLANE. VERTICAL – NAVD88.
5. CERTAIN DATA HEREON MAY VARY FROM RECORDED DATA DUE TO DIFFERENCES IN DECLINATION, ORIENTATION, AND METHODS OF MEASUREMENT.
6. ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
7. THE TAX MAP AND LOT NUMBERS ARE BASED ON THE TOWN OF PORTSMOUTH. TAX RECORDS AND ARE SUBJECT TO CHANGE.
8. RESEARCH WAS PERFORMED AT THE TOWN OF PORTSMOUTH ASSESSOR'S OFFICE AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
9. THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
10. ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL, TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.
11. NO WETLANDS WERE OBSERVED ON THE SUBJECT PREMISES.
12. SURVEY TIE LINES SHOWN HEREON ARE NOT BOUNDARY LINES. THEY SHOULD ONLY BE USED TO LOCATE THE PARCEL SURVEYED FROM THE FOUND MONUMENTS SHOWN AND LOCATED BY THIS SURVEY.
13. WATER, SEWER, AND GAS LINES WERE DRAWN IN BASED OFF OF UTILITIES SHOWN IN PLAN REF. 4 AND SHOULD BE CONSIDERED APPROXIMATE.
14. THE EASTERLY BOUNDARY OF THE SURVEYED PROPERTY WAS DETERMINED USING THE IRON PIPE FOUND ALONG MAPLEWOOD AVENUE. EXISTING FENCES FOR LOTS 5 AND 6 CROSS THIS LINE. TITLE TO LANDS BEYOND THE FENCES IS UNCLEAR.

PLAN REFERENCES:

1. "LOT LINE RELOCATION PLAN FOR JOHN J. & CATHERINE PAUSON AND HAROLD C. & ASTRID LOUISE PASSER, 12–28 DENNETT STREET, PORTSMOUTH, NH." DATED NOVEMBER 30, 1983. PREPARED BY RICHARD P. MILLETTE AND ASSOCIATES. R.C.R.D. 12123.
2. "PLAN OF LAND PREPARED FOR MICHAEL BRANDZEL & HELEN LONG, TAX MAP 140 LOT 3, 39 DEARBORN STREET, PORTSMOUTH, NH." DATED OCTOBER 1, 2012. PREPARED BY BOUDREAU LAND SURVEYING. R.C.R.D. 37444.
3. "NO–BUILT EASEMENT PLAN, LAND OF SHAWN & MICHIYO BARDONG, TAX MAP 140 LOT 3, 39 DEARBORN STREET, PORTSMOUTH, NH." DATED JUNE 27, 2023. PREPARED BY BOUDREAU LAND SURVEYING. R.C.R.D. 44486.
4. "SITE PLAN, MEDICAL MARKET, 304 MAPLEWOOD AVE. PORTSMOUTH, NH," DATED OCTOBER 28, 1988. PREPARED BY INTERFACE DESIGNS. NOT RECORDED. ON FILE AT THE CITY OF PORTSMOUTH PLANNING DEPARTMENT. THIS PLAN NOTES THAT IS IT BASED UPON A PLAN BUT MOULTON ENGINEERING, WHICH WAS NOT FOUND BY THIS OFFICE.
5. "PLAN OF LOT, NO. 304 MAPLEWOOD AVE., PORTSMOUTH, N.H." DATED JUNE 1960. PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS. NOT RECORDED. ON FILE AT THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.

CERTIFICATION:

PURSUANT TO RSA 676:18–III AND RSA 672:14

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

I CERTIFY THAT THIS PLAT WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEED BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

STATE OF NEW HAMPSHIRE — No. 1030 — MATTHEW J. SALVUCCI — LICENSED LAND SURVEYOR — SIGNATURE

2/13/26

MATTHEW J. SALVUCCI, LLS 1030 DATE:
ON BEHALF OF JONES & BEACH ENGINEERS, INC.

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 feet

STATE PLANE

Design: XXX	Draft: KDR	Date: 01/14/26
Checked: JAC	Scale: AS SHOWN	Project No.: 23169
Drawing Name: 23169-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

PAIGE S. LIBBEY No.16670 — STATE OF NEW HAMPSHIRE — PROFESSIONAL ENGINEER — LICENSED

REV.	DATE	REVISION	BY
0	1/14/26	ISSUED FOR REVIEW	KDR

Designed and Produced in NH

Jones & Beach Engineers, Inc.

85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

Civil Engineering Services

603-772-4746

E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING CONDITIONS PLAN
Project:	TAX MAP 140, LOT 7 304 MAPLEWOOD AVE, PORTSMOUTH, NH
Owner of Record:	304 MAPLEWOOD, LLC 304 MAPLEWOOD AVE, PORTSMOUTH, NH 03801 BK 4849, PG 2483

DRAWING No.

C1

SHEET 1 OF 2
JBE PROJECT NO. 23169

ABUTTERS NOT SHOWN:

TAX MAP 141 LOT 1
NEILA LLC
31 DENNETT STREET
PORTSMOUTH, NH 03801
BK 6415 PG 2630

TAX MAP 141 LOT 32
PETER GEREMIA
315 MAPLEWOOD AVENUE
PORTSMOUTH, NH 03801
BK 4829 PG 1699

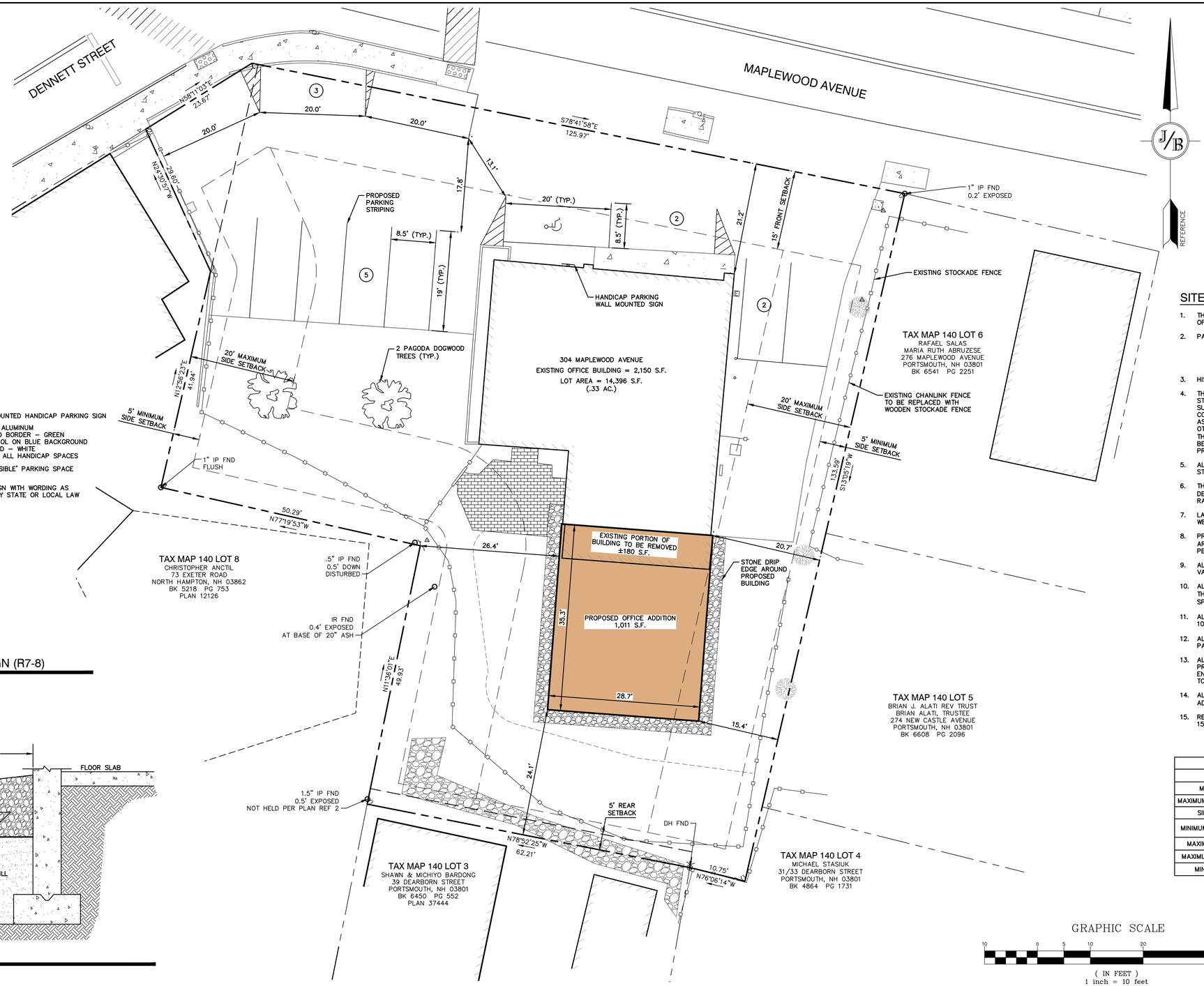
TAX MAP 141 LOT 34
35 PINES LLC
295 MAPLEWOOD AVENUE, UNIT 1
PORTSMOUTH, NH 03801
BK 6671 PG 1433

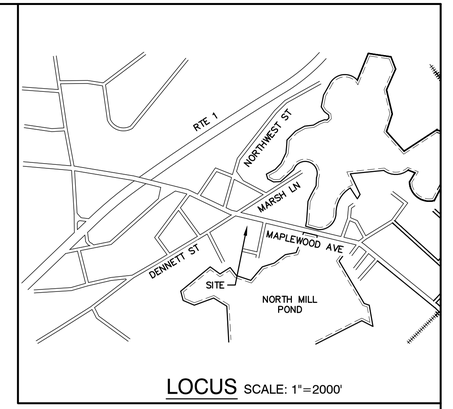
TAX MAP 141 LOT 35-1
35 PINES LLC
295 MAPLEWOOD AVENUE #1
PORTSMOUTH, NH 03801
BK 6347 PG 71

TAX MAP 141 LOT 35-2
VICTORIA BASSI
CAMERON BOUCHARD
295 MAPLEWOOD AVENUE R #2
PORTSMOUTH, NH 03801
BK 6228 PG 2499

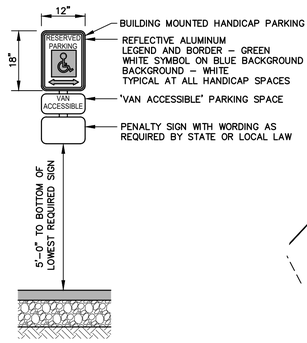
TAX MAP 141 PG 35-3
ARRON & ALLYSON SEE
293 MAPLEWOOD AVENUE, UNIT F
PORTSMOUTH, NH 03801
BK 6411 PG 1662

TAX MAP 141 LOT 36
EVON COOPER
16 GARLAND ROAD
LINCOLN, MA 01773
BK 3261 PG 0831



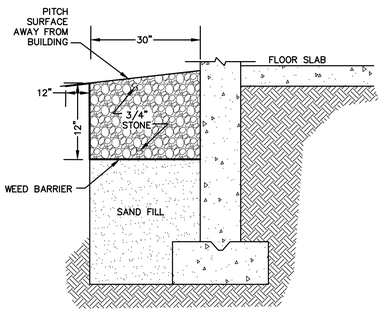


LOCUS SCALE: 1"=2000'



WALL MOUNTED
HANDICAP PARKING SIGN (R7-8)

NOT TO SCALE



DRIP EDGE DETAIL

NOT TO SCALE

SITE NOTES:

1. THE INTENT OF THIS PLAN IS TO SHOW A PROPOSED OFFICE BUILDING ADDITION TO THE EXISTING OFFICE BUILDING, AND TO SHOW PROPOSED PARKING STRIPING ON THE SITE.
2. PARKING CALCULATIONS: OFFICE USE – PROFESSIONAL, BUSINESS AND FINANCIAL SERVICES
   1 SPACE PER 350 S.F. GROSS FLOOR AREA
   2,981 S.F. GROSS FLOOR AREA / 350 S.F. PER SPACE = 9 SPACES REQUIRED
   9 PARKING SPACES REQUIRED
   12 PARKING SPACES PROVIDED
3. HISTORIC DISTRICT APPROVED ADDITION DESIGN IN FEBRUARY, 2026.
4. THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED. CONTRACTOR TO ALWAYS CONTACT DIG SAFE PRIOR TO DIGGING ONSITE OR OFFSITE TO ENSURE SAFETY AND OBEY THE LAW.
5. ALL CONSTRUCTION SHALL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
6. THE SUBJECT PARCEL IS NOT LOCATED WITHIN AN AREA HAVING A SPECIAL FLOOD HAZARD ZONE DESIGNATION BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), ON FLOOD INSURANCE RATE MAP NO. 33015C0259F, WITH EFFECTIVE DATE OF JANUARY, 29, 2021,
7. LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
8. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER, ARCHITECT AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
9. ALL PROPOSED SIGNAGE SHALL CONFORM WITH THE TOWN ZONING REGULATIONS, UNLESS A VARIANCE IS OTHERWISE REQUESTED.
10. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.) AND NHDOT STANDARDS AND SPECIFICATIONS (NON-REFLECTORIZED PAVEMENT MARKINGS), UNLESS OTHERWISE NOTED.
11. ALL PARKING STALLS SHALL BE SEPARATED USING 4" WIDE SOLID STRIPES. STRIPING SHALL BE 100% ACRYLIC TYPE, LOW VOC, FAST DRYING, IN A COLOR OF WHITE.
12. ALL STOP BARS SHALL BE 18" IN WIDTH IN A COLOR OF WHITE; ALL TRAFFIC ARROWS SHALL BE PAINTED IN A COLOR OF WHITE.
13. ALL BUILDING DIMENSIONS SHALL BE VERIFIED WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PROVIDED BY THE OWNER. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND OWNER PRIOR TO THE START OF CONSTRUCTION. BUILDING DIMENSIONS AND AREAS TO BE TO OUTSIDE OF MASONRY, UNLESS OTHERWISE NOTED.
14. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
15. REFERENCE PREVIOUSLY APPROVED SITE PLAN BY INTERFACE DESIGNS, APPROVED ON DECEMBER 15, 1988.

ZONING SUMMARY		
ZONE	CHARACTER DISTRICT (CD4-L2) – REQUIRED	PROVIDED
MINIMUM LOT AREA	3,000 S.F.	14,396 S.F. (.33 AC)
MAXIMUM FRONT YARD SETBACK	15'	21.2'
SIDE YARD SETBACK	5' MIN; 20' MAX	15.4'
MINIMUM REAR YARD SETBACK	5' FROM REAR LOT LINE; 10' FROM CENTER LINE OF ALLEY	24.1'
MAXIMUM BUILDING HEIGHT	60' (2-5 STORIES)	23.0'
MAXIMUM BUILDING COVERAGE	60% OF LOT	20.7% (2,981 S.F.)
MINIMUM OPEN SPACE	25% OF LOT	49.7% (7,156 S.F.)

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 feet

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON _____ DATE _____

Design: XXX	Draft: KDR	Date: 01/14/26
Checked: JAC	Scale: AS SHOWN	Project No.: 23169
Drawing Name: 23169-PLAN.dwg		

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.

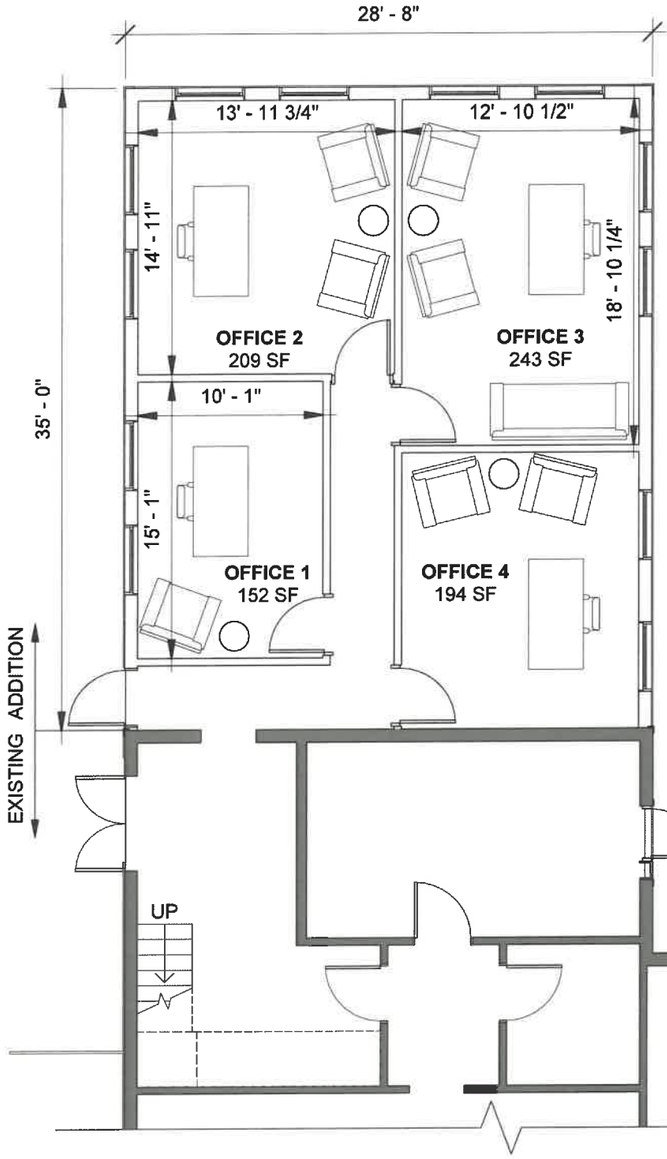
STATE OF NEW HAMPSHIRE – PAIGE S. LIBBEY No.16670 – LICENSED PROFESSIONAL ENGINEER – 03/19/2026

REV.	DATE	REVISION	BY
0	1/14/26	ISSUED FOR REVIEW	KDR

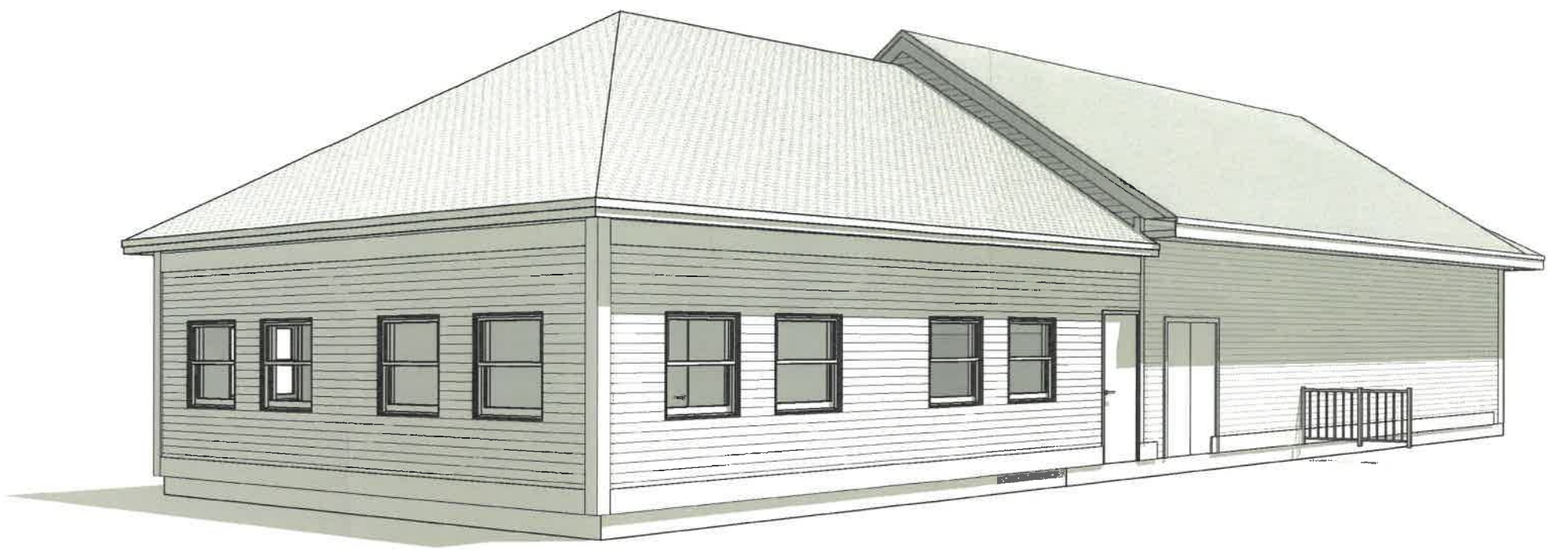
Designed and Produced in NH
Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885
Civil Engineering Services
603-772-4746
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: AMENDED SITE PLAN
Project: TAX MAP 140, LOT 7
304 MAPLEWOOD AVE, PORTSMOUTH, NH
Owner of Record: 304 MAPLEWOOD, LLC
304 MAPLEWOOD AVE, PORTSMOUTH, NH 03801
BK 4849, PG 2483

DRAWING No.
C2
SHEET 2 OF 2
JBE PROJECT NO. 23169



1 FLOOR PLAN
1/8" = 1'-0"



2 3D VIEW - ADDITION

© 2025 Portsmouth Architects

OFFICE ADDITION
304 MAPLEWOOD AVE
PORTSMOUTH, NH 03801

DRAFT

PROPOSED PLANS
HISTORIC DISTRICT COMMISSION- ADMINISTRATION
APPROVALS, FEBRUARY 2026

4 Market Street
Portsmouth, New Hampshire
603.430.0274
brought to you by
McHENRY ARCHITECTURE

A2

02/04/2026
PA: MM / MG
Project Number: 25081
AS INDICATED

Z:\Active Project Files\25081-304 MAPLEWOOD\Dwgs\2-SD\25081-304 MAPLEWOOD SD.rvt

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 13, 2026

Peter Stith, Planning Manager
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Technical Advisory Committee Review
Assessor's Map 236, Lot 74
86 Farm Lane
Altus Project No. 5719

Dear Peter,

On behalf of Flipping Bergers, LLC, Applicant and Jeanette McMastet, Owner, Altus Engineering, LLC (Altus) is pleased to submit an application for Subdivision to the City of Portsmouth Technical Advisory Committee. Flipping Bergers, LLC has an agreement to purchase the property located at 86 Farm Lane from Jeanette McMaster. They are proposing to retain the existing single-family residence and construct a new public roadway to serve two new single family homes on individual house lots.

The parcel is 0.914-acres. The parcel lies within the Single Resident B Zoning District which has a minimum 15,000 SF lot size requirement. On May 27, 2025, the Board of Adjustment granted variances from Section 10.521 to allow the development of substandard sized lots.

Prior to seeking zoning relief, Altus attended a TAC Work Session for a Preliminary review. Based on their input, we developed the conceptual subdivision plans for the variance application. Altus has now prepared a full TAC application for the development for the two new single family homes serviced from the existing Longmeadow Road right-of-way. A homeowner's association will maintain the stormwater management system that will be outside the City right-of-way. The lots will be serviced with municipal water and sewer.

The application requires two waivers from the Subdivision Regulations.

There are no wetlands on the lot or within 100-feet of the lot.

Enclosed please find the following for consideration at the March 3rd Technical Advisory Committee meeting:

Application Plan Package including:

- Letters of Authorization
- Viewpoint application (filed on-line only)
- Application fee check (filed on-line only)
- Subdivision Application checklist
- Waiver requests
- Zoning Board of Adjustment Notice of Decision
- Drainage Study
- Stormwater Inspection and Maintenance Manual
- Subdivision Plans and Details

As always, Altus looks forward to working with City staff. Please feel free to call or email me directly should you have any questions or need any additional information in advance of the meeting.

Sincerely,

ALTUS ENGINEERING, LLC

Enclosures

eCopy: Jeanette McMaster
Brett Berger

wde/5719.00 cvr ltr.docx

Letter of Authorization

Flipping Bergers LLC and Brett Berger, hereby authorize Altus Engineering, LLC to represent us as the Applicant in all matters concerning engineering and related permitting for Assessors Map 236, Lot 74 located at 86 Farm Lane in Portsmouth, New Hampshire. This authorization shall include representation at public hearings and other project-related meetings in addition to any signatures required for Federal, State and Municipal permit applications.

Signature	Brett Berger Print Name	2/10/26 Date
Witness	Print Name	Date

Letter_of_Authorization_Jeanette_MacDonald_v2

Final Audit Report 2026-02-11

Created:	2026-02-11
By:	Brett Berger (brett@flippinbergers.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAXK_MtchkaepdF1uGj67REO-kdRt0GR4x

"Letter_of_Authorization_Jeanette_MacDonald_v2" History

Document created by Brett Berger (brett@flippinbergers.com)
2026-02-11 - 5:25:30 PM GMT

Document emailed to Jeannette McMaster (jemac86@gmail.com) for signature
2026-02-11 - 5:25:33 PM GMT

Email viewed by Jeannette McMaster (jemac86@gmail.com)
2026-02-11 - 5:58:27 PM GMT

Signer Jeannette McMaster (jemac86@gmail.com) entered name at signing as Jeannette McMaster(MacDonald)
2026-02-11 - 5:59:41 PM GMT

Document e-signed by Jeannette McMaster(MacDonald) (jemac86@gmail.com)
Signature Date: 2026-02-11 - 5:59:43 PM GMT - Time Source: server

Agreement completed.
2026-02-11 - 5:59:43 PM GMT

Letter of Authorization: 86 Farm Lane

I, Jeannette McMaster (MacDonald), as the owner of the property located at 86 Farm Lane, Portsmouth, NH (assessors Map 236, Lot 74), hereby grant limited authorization to Brett Berger/Flippin Bergers LLC, to communicate and appear before the Technical Advisory Committee, Planning Board, and other municipal or regulatory bodies for purposes related to any application, engineering, subdivision review, and project discussion concerning the Property.

Such authorization includes the ability to present plans, respond to questions, and coordinate with Altus Engineering, LLC and other consultants involved in the subdivision process.

Name: Jeannette McMaster (MacDonald)

Signature: Jeannette McMaster(MacDonald)
Jeannette McMaster(MacDonald) (Feb 11, 2026 12:59:43 EST)

Date: 02/11/2026

City of Portsmouth, New Hampshire

Subdivision Application Checklist

This subdivision application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all subdivision review requirements. Please refer to the Subdivision review regulations for full details.

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: Jeanette McDonald AKA Jeanette McMaster Date Submitted: 2-13-26

Applicant: Flipping Bergers LLC

Phone Number: 9142994438 E-mail: brett@flippingbergers.com

Site Address 1: 86 Farm Lane Map: 236 Lot: 74

Site Address 2: _____ Map: _____ Lot: 74

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✔	Completed Application form. **(III.C.2-3)**	in Submission package, filed on line	N/A
✔	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**	Submission package, filed on line	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	Cover sheet, title block all sheets	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	N/A
✔	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	N/A
✔	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	
✔	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	N/A
✔	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	Existing conditions survey and Subdivision plan	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	Existing conditions survey plan	☑ Preliminary Plat ☑ Final Plat	
✔	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	Subdivision plan, Roadway Plan Utilities Plan Grading, Drainage & Erosion Control Plan	☑ Preliminary Plat ☑ Final Plat	
✔	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	Roadway Plan Grading, Drainage & Erosion Control Plan	☑ Preliminary Plat ☑ Final Plat	
✔	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	NA - Subdivision plan	☑ Preliminary Plat ☑ Final Plat	
✔	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	NA - Existing Conditions Plan Grading, Drainage & Erosion Control Plan	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	Cover Sheet	☐ Preliminary Plat ☑ Final Plat	
✔	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	NA	☐ Preliminary Plat ☑ Final Plat	
✔	Location of all permanent monuments. **(Section V.12)**	Subdivision Plan	☐ Preliminary Plat ☑ Final Plat	

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	**1. Basic Requirements: (VI.1)**	Subdivision Plan	
☑	a. Conformity to Official Plan or Map	a. meets with zoning relief	
☑	b. Hazards	b.no in a hazard zone	
☑	c. Relation to Topography	c. Grading plan	
☑	d. Planned Unit Development	d. NA	
☐	**2. Lots: (VI.2)**	a. conforming to neighborhood subdivision plan	
☐	a. Lot Arrangement	b. variance granted	
☐	b. Lot sizes		
☐	c. Commercial and Industrial Lots		
☐	**3. Streets: (VI.3)**	a. new road is within an existing ROW	
☑	a. Relation to adjoining Street System	b. ROW is existing and meets 50-foot requirement	
☑	b. Street Rights-of-Way	c. no reserve strips proposed	
☑	c. Access	d. NA	
☑	d. Parallel Service Roads	e. existing ROW is nearly perpendicular	
☑	e. Street Intersection Angles	f. no new ROW proposed	
☑	f. Merging Streets	g.NA h. NA	
☑	g. Street Deflections and Vertical Alignment	i. NA - turnaround proposed - waiver requested	
☑	h. Marginal Access Streets	j. 25' radius - complies	
☑	i. Cul-de-Sacs	k. Roadway plan	
☑	j. Rounding Street Corners		
☑	k. Street Name Signs		
☑	l. Street Names		
☑	m. Block Lengths		
☑	n. Block Widths		
☑	o. Grade of Streets		
☑	p. Grass Strips		
☑	**4. Curbing: (VI.4)**	Complies	
☑	**5. Driveways: (VI.5)**	NA	
☑	**6. Drainage Improvements: (VI.6)**	Grad., Drain. & Erosion Control Plan	
☑	**7. Municipal Water Service: (VI.7)**	Utilities Plan	
☑	**8. Municipal Sewer Service: (VI.8)**	only house services required	
☑	**9. Installation of Utilities: (VI.9)**	Detail sheets	
☑	a. All Districts		
☑	b. Indicator Tape		
☑	**10. On-Site Water Supply: (VI.10)**	NA	
☑	**11. On-Site Sewage Disposal Systems: (VI.11)**	NA	
☑	**12. Open Space: (VI.12)**	NA	
☑	a. Natural Features		
☑	b. Buffer Strips		
☑	c. Parks		
☑	d. Tree Planting		
☑	**13. Flood Hazard Areas: (VI.13)**	NA - not in a flood hazard zone	
☑	a. Permits		
☑	b. Minimization of Flood Damage		
☑	c. Elevation and Flood-Proofing Records		
☑	d. Alteration of Watercourses		
☑	**14. Erosion and Sedimentation Control (VI.14)**	Grad., Drain. & Erosion Control Plan	

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
✔ ✔ ✔	**15. Easements (VI.15)** a. Utilities b. Drainage	Subdivision plan	
✔	**16. Monuments: (VI.16)**	Subdivision plan	
✔	**17. Benchmarks: (VI.17)**	Existing conditions plan	
✔	**18. House Numbers (VI.18)**	to be provided	

Design Standards			
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
✔	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	Conforms	
✔	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Conforms	
✔	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	infrastructure in place. House services proposed	
✔	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	Per discussion with DPW Conforms	

Applicant's/Representative's Signature: Eric D. Weinrieb PE **Date:** 2-13-26

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

WAIVER REQUESTS

February 13, 2026

Re: Assessor's Map 236, Lot 74
86 Farm Lane
Altus Project No. 5719

On behalf of Flipping Bergers, LLC, Applicant and Jeanette McMaster, Owner, Altus Engineering, LLC respectfully requests the following waivers from the City of Portsmouth Subdivision Rules and Regulations

Section VI GENERAL REQUIREMENTS

3. Streets
I. Cul-de-Sacs

Requirement:
Cul-de-sacs shall be provided at the closed end with a drive-around roadway having a minimum radius for the outside curbs of at least fifty (50) feet, and a street property line radius of sixty (60) feet. The maximum length of a cul-de-sac shall generally be five hundred (500) feet unless otherwise approved by the Board. The Planning Board may require the dedication of an easement of twenty (20) feet in width from the cul-de sac to the next adjoining street to provide for utilities. No water lines serving the street shall be dead ended, where feasible.

Provided: Hammer head provided in lieu of a cul-de-sac

Requirement: From Exhibit Residential Street Minimum Standards (32-foot paved surface with a 5-foot wide sidewalk

Provided: 22-feet of pavement along roadway.

Both waivers are interconnected. The development will service only two single family homes, generating very little traffic, approximately 19 vehicle trips per day on a weekday. A 22-foot-wide roadway can adequately support the expected traffic. A hammer head turnaround has been provided to allow emergency vehicles to safely turnaround and exit the development. The site is unique as the new roadway is within an existing right-of-way. The roadway has been shifted to avoid disturbance to the abutting property that is utilizing a portion of the City right-of-way. The right-of-way extends to the north into a private development. It is doubtful that the roadway will ever be extended as a through road. A fire truck turning template plan is included in the application package that supports the narrower widths proposed. No parking signs along the road are proposed to ensure that vehicles do not block the roadway preventing

emergency vehicle access. Each lot will have ample space for a garage and visitor parking for small gatherings at each home.

Narrower roadways reduce the carbon footprint on the development, reduce stormwater runoff and pollutant loading and reduces the heat island effect on stormwater.

Servicing only 2 single family homes, constructing a sidewalk is necessary to protect pedestrians. Farm Lane and the entire neighborhood does not have a sidewalk system.

At the direction of Public Works, the water line provided to the development will be only 4-inches diameter to avoid stagnation of the potable water and is terminated at the end of the road.

A conceptual subdivision plan is included in the package that depicts a layout that could be constructed that does not require waivers. By granting the waivers, the roadway surface impervious area can be reduced by approximately 3,000 SF. The roadway will be privately owned and maintained. City maintenance vehicles will not need to access the site on a regular basis.

Respectfully submitted by,

ALTUS ENGINEERING, LLC

wde/5719 waiver.docx

CITY OF PORTSMOUTH
Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801
(603) 610-7216

ZONING BOARD OF ADJUSTMENT

May 29, 2025

Jeannette MacDonald
86 Farm Lane
Portsmouth, New Hampshire 03801

RE: **Board of Adjustment Request for property located at 86 Farm Lane, Portsmouth NH 03801 (LU-25-67)**

Dear Property Owner:

The Zoning Board of Adjustment, at its regularly scheduled meeting of **May 27, 2025**, considered your application for the property located at 86 Farm Lane whereas relief is needed to subdivide the existing property into 3 separate lots. The proposed parent lot requires the following: 1) Variance from Section 10.521 to allow a) 28-foot rear yard setback where 30 feet is required; and b) 23-foot secondary front yard where 30 feet is required. Proposed lot 1 requires the following: 2) Variance from Section 10.521 to allow a) 10,664 s.f. of lot area where 15,000 s.f. is required; b) 10,664 s.f. of lot area per dwelling unit where 15,000 s.f. is required; and c) 75 feet of continuous street frontage where 100 feet is required. Proposed lot 2 requires the following: 3) Variance from Section 10.521 to allow a) 11,250 s.f. of lot area where 15,000 s.f. is required; b) 11,250 s.f. of lot area per dwelling unit where 15,000 s.f. is required; and c) 75 feet of continuous street frontage where 100 feet is required. Said property is shown on Assessor Map 236 Lot 74 and lies within the Single Residence B (SRB) District. As a result of said consideration, the Board voted to **grant** the request as presented with the following **conditions:**

1) The approval shall be contingent upon the Planning Board approval of the subdivision and City Council acceptance of fee simple ownership of the new right-of-area proposed; and

2) The subdivision layout may change as a result of TAC and Planning Board reviews if it does not increase the zoning relief required.

The Board's decision may be appealed up to thirty (30) days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning & SustainabilityDepartment for more details about the appeals process.

Approvals may also be required from other City Commissions or Boards. Once all required approvals have been received, applicant is responsible for applying for and securing a building permit from the Inspection Department prior to starting any project work.

This approval shall expire unless a building permit is issued within a period of two (2) years from the date granted unless an extension is granted in accordance with Section 10.236 of the Zoning Ordinance.

The Findings of Fact associated with this decision are available: attached here or as an attachment in the Viewpoint project record associated with this application and on the Zoning Board of Adjustment Meeting website:

https://www.cityofportsmouth.com/planportsmouth/zoning-board-adjustment/zoning-board-adjustment-archived-meetings-and-material

The minutes and audio recording of this meeting are available by contacting the Planning & Sustainability Department.

Very truly yours,

Phyllis Eldridge, Chair of the Zoning Board of Adjustment

cc: Shanti Wolph, Chief Building Inspector

Rosann Maurice-Lentz, City Assessor
Derek Durbin, Attorney, Durbin Law Offices PLLC

THIS DRAWING SET HAS NOT BEEN
RELEASED FOR CONSTRUCTION

RESIDENTIAL SUBDIVISION

86 FARM LANE
PORTSMOUTH, NEW HAMPSHIRE

Assessor's Parcel 236, Lot 74

ISSUED FOR TAC

Plan Issue Date:

FEBRUARY 13, 2026

Owner:

JEANETTE MACDONALD
86 Farm Lane
Portsmouth, NH 03801

Applicant:

FLIPPING BERGER'S, LLC
71 Brackett Road
Portsmouth, NH 03801
(914) 299-4438

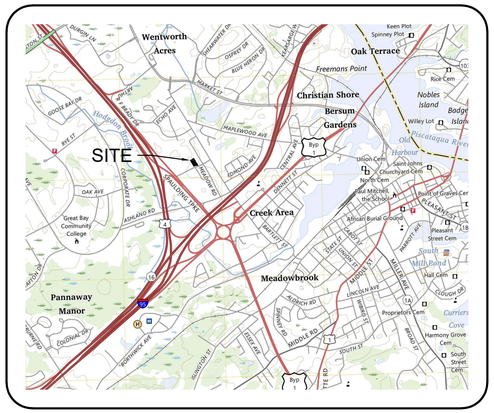
Civil Engineer:

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Surveyor:

JVA JAMES VERRA & ASSOCIATES, INC.
100 GRIFFIN ROAD, UNIT C,
PORTSMOUTH, N.H., 03801-7876
603-436-3557

JOB NO: 25-2073



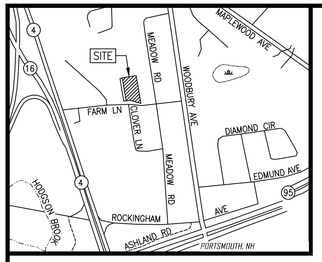
LOCUS NOT TO SCALE

Sheet Index

Title	Sheet No.:	Rev.	Date
Existing Conditions Plan	V-1	0	02/10/26
Existing Conditions Plan	V-2	0	02/10/26
Subdivision & Easement Plan	C-1	0	02/13/26
Conceptual Site Plan	C-2	0	02/13/26
Demolition & Site Preparation Plan	C-3	0	02/13/26
Roadway Plan	C-4	0	02/13/26
Grading, Drainage & Erosion Control Plan	C-5	0	02/13/26
Utilities Plan	C-6	0	02/13/26
Erosion Control Notes & Details	D-1	0	02/13/26
Detail Sheet	D-2	0	02/13/26
Detail Sheet	D-3	0	02/13/26
Detail Sheet	D-4	0	02/13/26
Detail Sheet	D-5	0	02/13/26
Detail Sheet	D-6	0	02/13/26
Vehicular Access Plan	1 of 1	0	02/13/26

Permit Summary	Submitted	Received
Portsmouth Subdivision Approval	02/13/26	–

P5719



LOCUS
(N.T.S.)

ABUTTERS

236-73
NE MARINE AND INDUSTRIAL, INC
200 SPAULDING TURNPIKE
PORTSMOUTH, NH 03801
2342/0694

236-68
SATYAJIT HEERALAL
404 CENTRE ST.
BOSTON, MA 02130
6348/2377

236-67
PETER & LIANNE M. VELEZ
141 MEADOW ROAD
PORTSMOUTH, NH 03801
3777/0273

236-66
JONATHAN A. JACKSON
159 MEADOW ROAD
PORTSMOUTH, NH 03801
4125/2573

236-47
KINNALY FAMILTY TRUST OF 2012
EDWARD G. & KAREN KINNALY,
TRUSTEES
PO BOX 834
NEW CASTLE, NH 03854
6344/2213

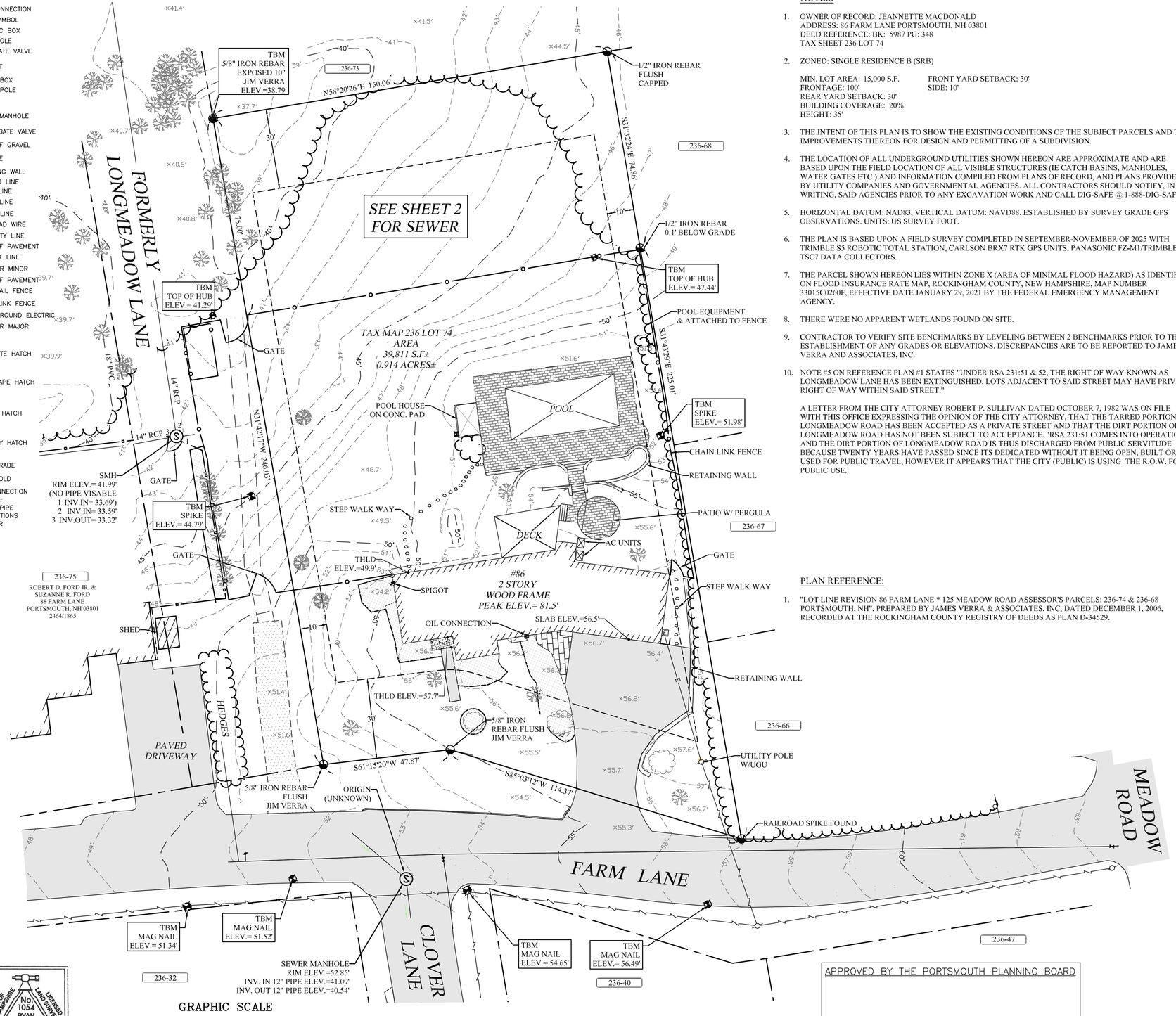
236-40
WILLIAM J. CHARLAND &
JUDITH M. PINKHAM
45 CLOVER LANE
PORTSMOUTH, NH 03801
5662/2989

236-32
DENNIS HOSKIN
JEANNE HOSKIN
50 CLOVER LANE
PORTSMOUTH, NH 03801
5394/1195

236-75
ROBERT D. FORD JR. &
SUZANNE R. FORD
88 FARM LANE
PORTSMOUTH, NH 03801
2464/1865

LEGEND

- GAS—CONNECTION
- TREE SYMBOL
- ELECTRIC BOX
- LIGHT POLE
- WATERGATE VALVE
- HYDRANT
- UTILITY BOX
- UTILITY POLE
- SIGN
- SEWER MANHOLE
- WATER GATE VALVE
- EDGE OF GRAVEL
- TREELINE
- RETAINING WALL
- ABUTTER LINE
- WATER LINE
- SEWER LINE
- SHRUB LINE
- OVERHEAD WIRE
- PROPERTY LINE
- EDGE OF PAVEMENT
- SETBACK LINE
- CONTOUR MINOR
- EDGE OF PAVEMENT
- SPLIT RAIL FENCE
- CHAIN LINK FENCE
- E — UNDERGROUND ELECTRIC
- CONTOUR MAJOR
- CONCRETE HATCH
- LANDSCAPE HATCH
- GRAVEL HATCH
- WALKWAY HATCH
- 52.1' X — SPOT GRADE
- THLD — THRESHOLD
- OIL CONNECTION
- AREA OF SEWER PIPE CONNECTIONS UNCLEAR



NH STATE PLANE COORDINATE SYSTEM
NAD 1983

NOTES:

1. OWNER OF RECORD: JEANNETTE MACDONALD
   ADDRESS: 86 FARM LANE PORTSMOUTH, NH 03801
   DEED REFERENCE: BK: 5987 PG: 348
   TAX SHEET 236 LOT 74
2. ZONED: SINGLE RESIDENCE B (SRB)

   MIN. LOT AREA: 15,000 S.F. — FRONT YARD SETBACK: 30'
   FRONTAGE: 100' — SIDE: 10'
   REAR YARD SETBACK: 30'
   BUILDING COVERAGE: 20%
   HEIGHT: 35'
3. THE INTENT OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF THE SUBJECT PARCELS AND THE IMPROVEMENTS THEREON FOR DESIGN AND PERMITTING OF A SUBDIVISION.
4. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS OF RECORD, AND PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
5. HORIZONTAL DATUM: NAD83, VERTICAL DATUM: NAVD88. ESTABLISHED BY SURVEY GRADE GPS OBSERVATIONS. UNITS: US SURVEY FOOT.
6. THE PLAN IS BASED UPON A FIELD SURVEY COMPLETED IN SEPTEMBER-NOVEMBER OF 2025 WITH TRIMBLE S5 ROBOTIC TOTAL STATION, CARLSON BRX7 RTK GPS UNITS, PANASONIC FZ-M1/TRIMBLE TSC7 DATA COLLECTORS.
7. THE PARCEL SHOWN HEREON LIES WITHIN ZONE X (AREA OF MINIMAL FLOOD HAZARD) AS IDENTIFIED ON FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 33015C0260F, EFFECTIVE DATE JANUARY 29, 2021 BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
8. THERE WERE NO APPARENT WETLANDS FOUND ON SITE.
9. CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE ESTABLISHMENT OF ANY GRADES OR ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOCIATES, INC.
10. NOTE #5 ON REFERENCE PLAN #1 STATES "UNDER RSA 231:51 & 52, THE RIGHT OF WAY KNOWN AS LONGMEADOW LANE HAS BEEN EXTINGUISHED. LOTS ADJACENT TO SAID STREET MAY HAVE PRIVATE RIGHT OF WAY WITHIN SAID STREET."

    A LETTER FROM THE CITY ATTORNEY ROBERT P. SULLIVAN DATED OCTOBER 7, 1982 WAS ON FILE WITH THIS OFFICE EXPRESSING THE OPINION OF THE CITY ATTORNEY, THAT THE TARRED PORTION OF LONGMEADOW ROAD HAS BEEN ACCEPTED AS A PRIVATE STREET AND THAT THE DIRT PORTION OF LONGMEADOW ROAD HAS NOT BEEN SUBJECT TO ACCEPTANCE. "RSA 231:51 COMES INTO OPERATION AND THE DIRT PORTION OF LONGMEADOW ROAD IS THUS DISCHARGED FROM PUBLIC SERVITUDE BECAUSE TWENTY YEARS HAVE PASSED SINCE ITS DEDICATED WITHOUT IT BEING OPEN, BUILT OR USED FOR PUBLIC TRAVEL, HOWEVER IT APPEARS THAT THE CITY (PUBLIC) IS USING THE R.O.W. FOR PUBLIC USE.

PLAN REFERENCE:

1. "LOT LINE REVISION 86 FARM LANE * 125 MEADOW ROAD ASSESSOR'S PARCELS: 236-74 & 236-68 PORTSMOUTH, NH", PREPARED BY JAMES VERRA & ASSOCIATES, INC, DATED DECEMBER 1, 2006, RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN D-34529.

SURVEYOR'S CERTIFICATION

"I HEREBY CERTIFY THAT THIS SURVEY AND PLAT WERE PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION AND IS THE RESULT OF AN ACTUAL FIELD SURVEY MADE ON THE GROUND AND HAS AN ERROR OF CLOSURE OF GREATER ACCURACY THAN ONE PART IN FIFTEEN THOUSAND (1:15,000)."

LICENSED LAND SURVEYOR — DATE: 2/10/26

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — NO. 1054 — RYAN M. FOWLER — SIGNATURE

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN — DATE

SURVEYOR:
JAMES VERRA & ASSOCIATES, INC.
100 GRIFFIN ROAD, UNIT C,
PORTSMOUTH, N.H., 03801-7876
603-436-3557

JOB NO: 25-2073

ENGINEER:
ALTUS ENGINEERING
133 Court Street — Portsmouth, NH 03801
(603) 433-2335 — www.altus-eng.com

ISSUED FOR: SUBMISSION

ISSUE DATE: 2/10/26

REVISIONS

NO.	DESCRIPTION	BY	DATE
1			

DRAWN BY: CWW
APPROVED BY: RMF
DRAWING FILE: 25-2037_EX-CON.DWG

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

APPLICANT:
BRETT BERGER
71 BRACKET ROAD
PORTSMOUTH, NH 03801

OWNER:
JEANNETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

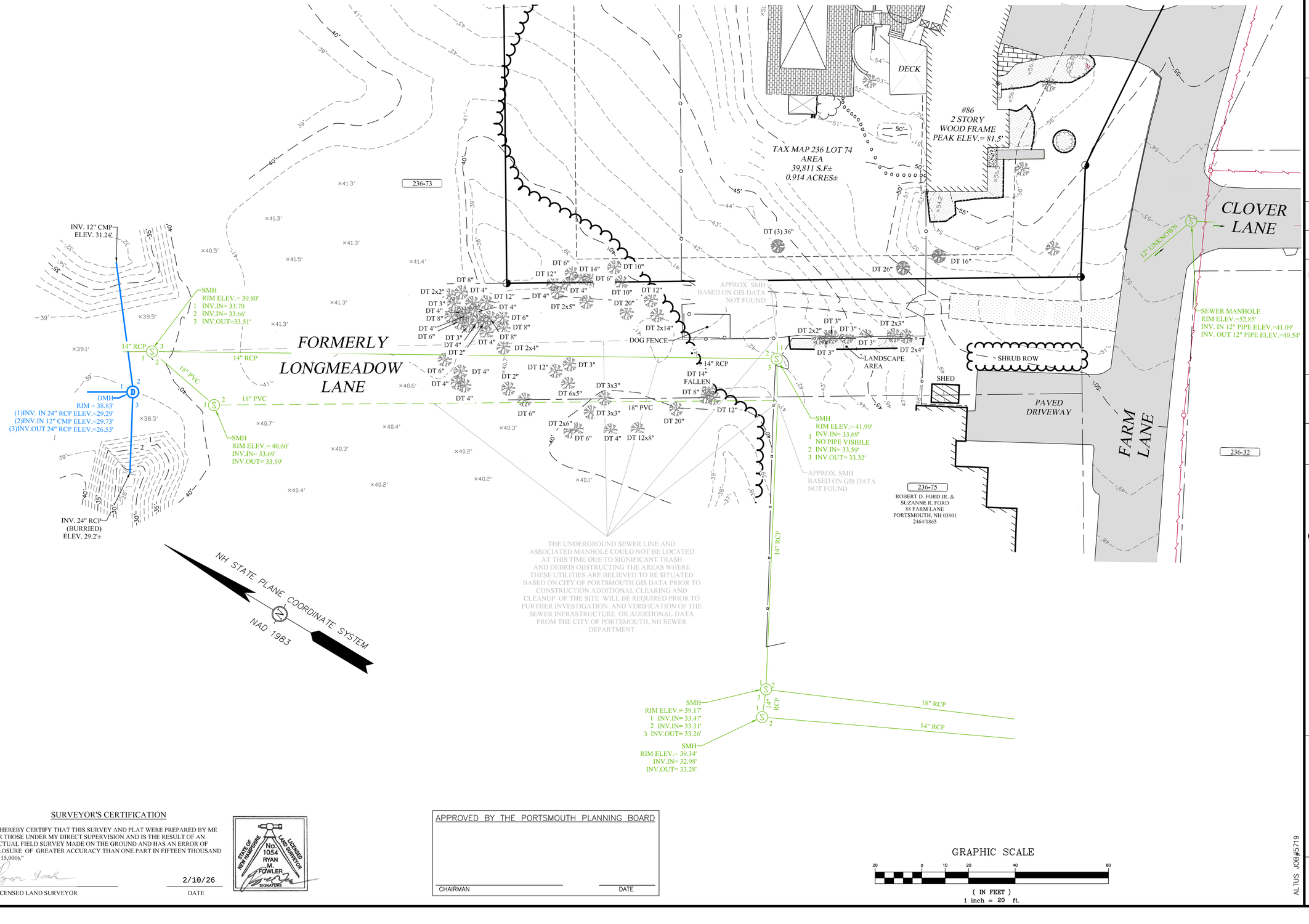
PROJECT:
86
FARM LANE
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 236 LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
EXISTING CONDITIONS PLAN

SHEET NUMBER:
V-1

ALTUS JOB#5719

J:\2025 PROJECTS\25-2037 ALTUS MCMASTER 86 FARM LN PORTSMOUTH NH_DWG\25-2073_EX.dwg 2026-02-10



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Ryan Fowler

LICENSED LAND SURVEYOR

2/10/26

DATE

STATE OF NEW HAMPSHIRE — LICENSED LAND SURVEYOR — NO. 1054 — RYAN M. FOWLER — SIGNATURE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

GRAPHIC SCALE

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(IN FEET)

1 inch = 20 ft.

J:\2025 PROJECTS\25-2037 ALTUS MCMASTER 86 FARM LN PORTSMOUTH NH_DWG\25-2073_EX.dwg 2026-02-10

ALTUS JOB#5719

SURVEYOR:

JVA
JAMES VERRA & ASSOCIATES, INC.
100 GRIFFIN ROAD, UNIT C,
PORTSMOUTH, N.H., 03801-7876
603-436-3557

JOB NO: 25-2073

ENGINEER:

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133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ISSUED FOR:
SUBMISSION

ISSUE DATE:
2/10/26

REVISIONS

NO.	DESCRIPTION	BY	DATE
1			

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APPROVED BY: RMF
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SCALE:
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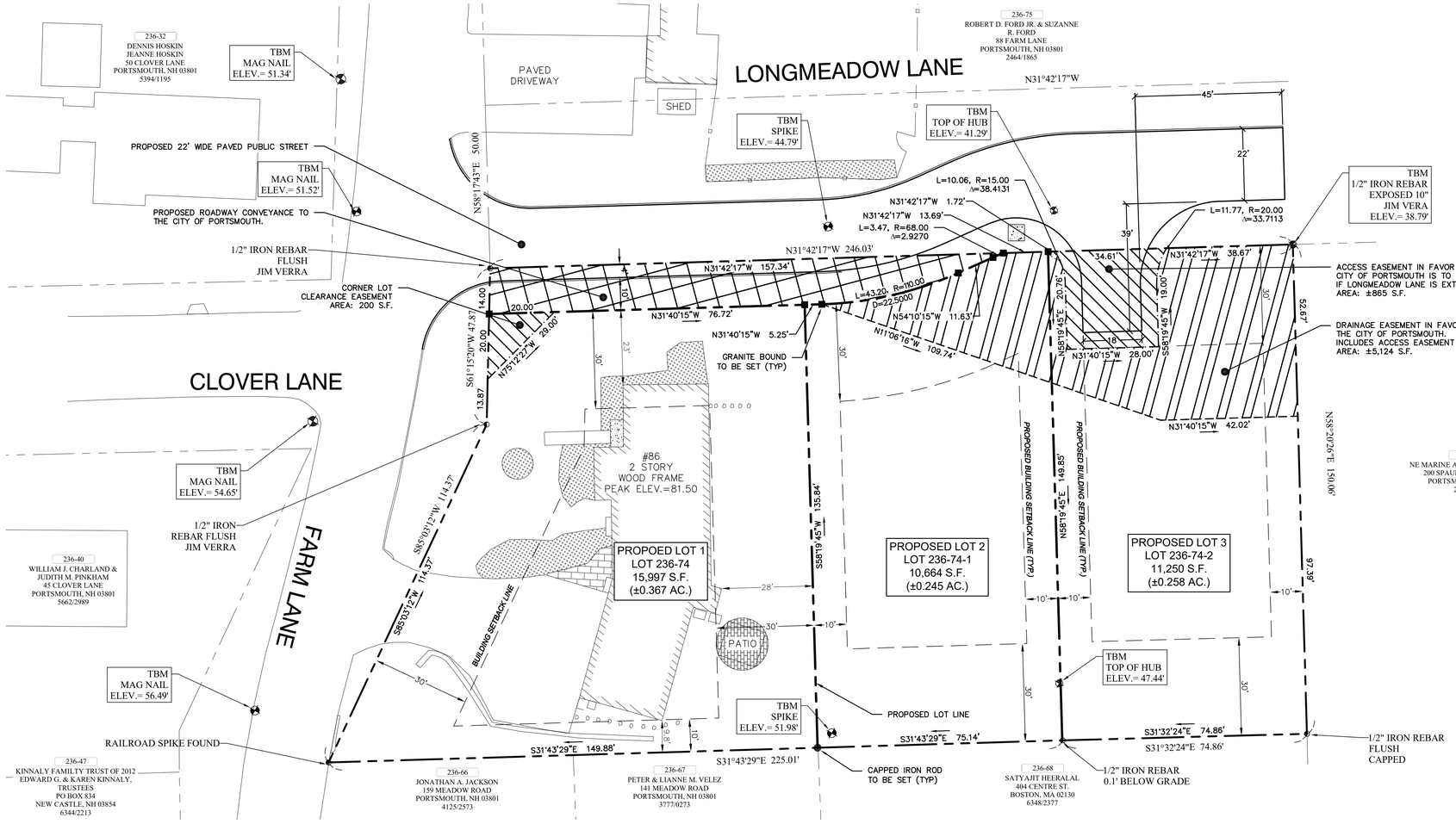
APPLICANT:
BRETT BERGER
71 BRACKET ROAD
PORTSMOUTH, NH 03801

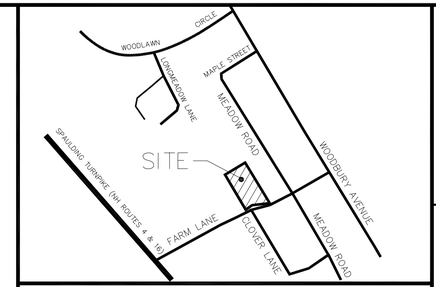
OWNER:
JEANNETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

PROJECT:
86
FARM LANE
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 236 LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
EXISTING CONDITIONS PLAN

SHEET NUMBER:
V-2





LOCUS
NOT TO SCALE

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

SUBDIVISION NOTES

1. DESIGN INTENT – THIS PLAN IS INTENDED TO DEPICT A THREE LOT RESIDENTIAL SUBDIVISION SERVICED WITH MUNICIPAL SEWER & WATER ON A NEW PUBLIC ROAD.
2. THE BASE PLAN USED HERE WAS DEVELOPED FROM THE 86 FARM LANE EXISTING CONDITIONS PLANS (V–1 & V–2), DATED 11/11/25, PROVIDED BY JAMES VERRA & ASSOCIATES, INC.
3. ZONE: SRB (SINGLE RESIDENCE B)
4. DIMENSIONAL REQUIREMENTS:

LOT AREA:	15,000 S.F.
FRONTAGE:	100'
LOT DEPTH:	100'
FRONT YARD:	30'
SIDE YARD:	10'
REAR YARD:	30'
BUILDING HEIGHT:	35' (MAX. w/SLOPED ROOF)
BUILDING COVERAGE:	20% MAX.
OPEN SPACE:	40% MIN.
WETLAND BUFFER:	NONE (WETLAND LESS THAN 10,000 S.F.)

5. PARKING REQUIREMENTS: NR (NO REQUIREMENT)
6. PARCEL IS NOT IN A FLOOD HAZARD ZONE PER FLOOD INSURANCE RATE MAP (FIRM), ROCKINGHAM COUNTY, NEW HAMPSHIRE, DATED JANUARY 29, 2021.
7. WAIVERS REQUESTED:
   7.1. SECTION IV: ROADWAY WIDTH – 32–FEET IS REQUIRED, 22–FEET IS PROVIDED.
   7.2. SECTION VI.3.i: CUL–DE–SAC REQUIRED, TURN AROUND PROVIDED.
8. AREA OF DISTURBANCE LESS THAN 43,560 S.F., COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
9. NO NEW RESIDENTIAL USES SHALL BE PERMITTED WITHIN THE CITY'S RIGHT–OF–WAY WHICH SHALL BE RESERVED EXCLUSIVELY FOR A ROADWAY AND ASSOCIATED INFRASTRUCTURE.
10. SEE THE ENTIRE SET OF PLANS RELATED TO THIS SUBDIVISION ON FILE WITH THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.
11. SNOW SHALL BE STORED AT THE EDGE OF THE ROAD OR REMOVED OFF SITE TO AN APPROVED LOCATION IF REQUIRED TO MAINTAIN SAFE ACCESS.
12. THIS PLAN SHALL BE RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
13. ALL CONDITIONS ON THIS PLAN SET SHOULD REMAIN IN EFFECT IN PERPETUITY.

VARIANCES GRANTED BY ZBA ON MAY 27, 2025:

LOT 236–74:
SECTION 10.521:
- A. TO ALLOW 28–FOOT REAR YARD SETBACK WHERE 30–FEET IS REQUIRED.
- B. TO ALLOW 23–FOOT SECONDARY FRONT YARD WHERE 30–FEET IS REQUIRED.

LOT 236–74–1:
SECTION 10.521:
- C. TO ALLOW 10,664 S.F. OF LOT AREA WHERE 15,000 S.F. IS REQUIRED.
- D. TO ALLOW 10,664 S.F. OF LOT AREA PER DWELLING UNIT WHERE 15,000 S.F. IS REQUIRED.
- E. TO ALLOW 75–FEET OF CONTIUOUS STREET FRONTAGE WHERE 100–FEET IS REQUIRED.

LOT 236–74–2:
SECTION 10.521:
- C. TO ALLOW 11,250 S.F. OF LOT AREA WHERE 15,000 S.F. IS REQUIRED.
- D. TO ALLOW 11,250 S.F. OF LOT AREA PER DWELLING UNIT WHERE 15,000 S.F. IS REQUIRED.
- E. TO ALLOW 75–FEET OF CONTIUOUS STREET FRONTAGE WHERE 100–FEET IS REQUIRED.

LOT AREAS & COVERAGES SUMMARY

EXISTING LOT AREA:

LOT 236–74: ±39,846 S.F.

EXISTING LOT TO BE SUBDIVIDED INTO THREE LOTS.

PROPOSED LOT AREAS:

LOT 236–74:	±15,997 S.F.
LOT 236–74–1:	±10,664 S.F.
LOT 236–74–2:	±11,250 S.F.
NEW CITY RIGHT–OF–WAY:	±1,935 S.F.
TOTAL:	±39,846 S.F.

BUILDING COVERAGE:

LOT 236–74:

EXISTING:	±2,960 S.F. / 39,846 S.F. = ±7.4%
PROPOSED:	±2,960 S.F. / 15,997 S.F. = ±18.5%

PROPOSED BUILDING SIZE UNKNOWN FOR LOTS 236–74–1 & 236–74–2; LOTS WILL HAVE EQUAL TO OR LESS THAN 20% BUILDING COVERAGE.

LOT 236–74–1 MAXIMUM BUILDING FOOTPRINT:	2,132 S.F.
LOT 236–74–2 MAXIMUM BUILDING FOOTPRINT:	2,250 S.F.

OPEN SPACE:

LOT 236–74 IMPERVIOUS AREAS:	EXISTING	PROPOSED
HOUSE	±2,960 S.F.	±2,960 S.F.
DRIVEWAY	±2,120 S.F.	±2,120 S.F.
WALKWAYS	±250 S.F.	±250 S.F.
PATIO	±210 S.F.	±210 S.F.
RETAINING WALL & GRAVELS	±210 S.F.	±210 S.F.
DECK	±380 S.F.	±0 S.F.
POOL AREA & HARDSCAPE	±2,525 S.F.	±0 S.F.
TOTAL	±8,655 S.F.	±5,750 S.F.

LOT 236–74:
EXISTING OPEN SPACE: (39,846 S.F. – 8,655 S.F.) / 39,846 S.F. = (±78.3%)
PROPOSED OPEN SPACE: (15,997 S.F. – 5,750 S.F.) / 15,997 S.F. = (±64.1%)

PURPOSE OF PLAN:

THE PURPOSE OF THIS PLAN IS TO SHOW THE CONDITIONS OF APPROVAL FOR THE SUBDIVISION AND THE SITE PLAN REVIEW THAT ARE REQUIRED TO BE RECORDED BY THE CITY OF PORTSMOUTH AS PART OF THEIR APPROVAL OF THE DEVELOPMENT. THESE CONDITIONS WILL RUN WITH THE NEW LOTS IN PERPETUITY.

SURVEYOR OF RECORD DATE

PLAN REFERENCES:
1. "LOT LINE REVISION, 86 FARM LANE & 125 MEADOW ROAD, ASSESSOR'S PARCELS: 236–74 & 236–68, PORTSMOUTH, NEW HAMPSHIRE, OWNERS: JEANETTE MACDONALD & WILLIAM A. & CHRIS A. LACEY." LAST REVISED JANUARY 17, 2007 AND PREPARED BY JAMES VERRA AND ASSOC., INC. RCRD PLAN #D–34529.
2. "LAND IN PORTSMOUTH, N.H. PAUL C. & ORVILLE BADGER TO SAMUEL A. & LUCILLE E. MCMASTER" DATED NOVEMBER 1951, AND PREPARED BY JOHN W. DURGIN C.E. NOT RECORDED, AND ON FILE AT JAMES VERRA AND ASSOC., INC. FN: 2107 PN: L–25.
3. "PLAN OF LOTS, PORTSMOUTH, N.H. FOR PAUL C. & ORVILLE C. BADGER" FILED MAY 24, 1954 AND PREPARED BY JOHN W. DURGIN CIVIL ENGINEERS. RCRD PLAN #02160.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

STATE OF NEW HAMPSHIRE – ERIC P. WENRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
2/13/26

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

JVA JAMES VERRA & ASSOCIATES, INC.
100 GRIFFIN ROAD, UNIT C, PORTSMOUTH, N.H., 03801–7876
603–436–3557

JOB NO: 25–2073

NOT FOR CONSTRUCTION

ISSUED FOR:
TECHNICAL ADVISORY COMMITTEE

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: PMJ
APPROVED BY: EDW
DRAWING FILE: 5719–SITE.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

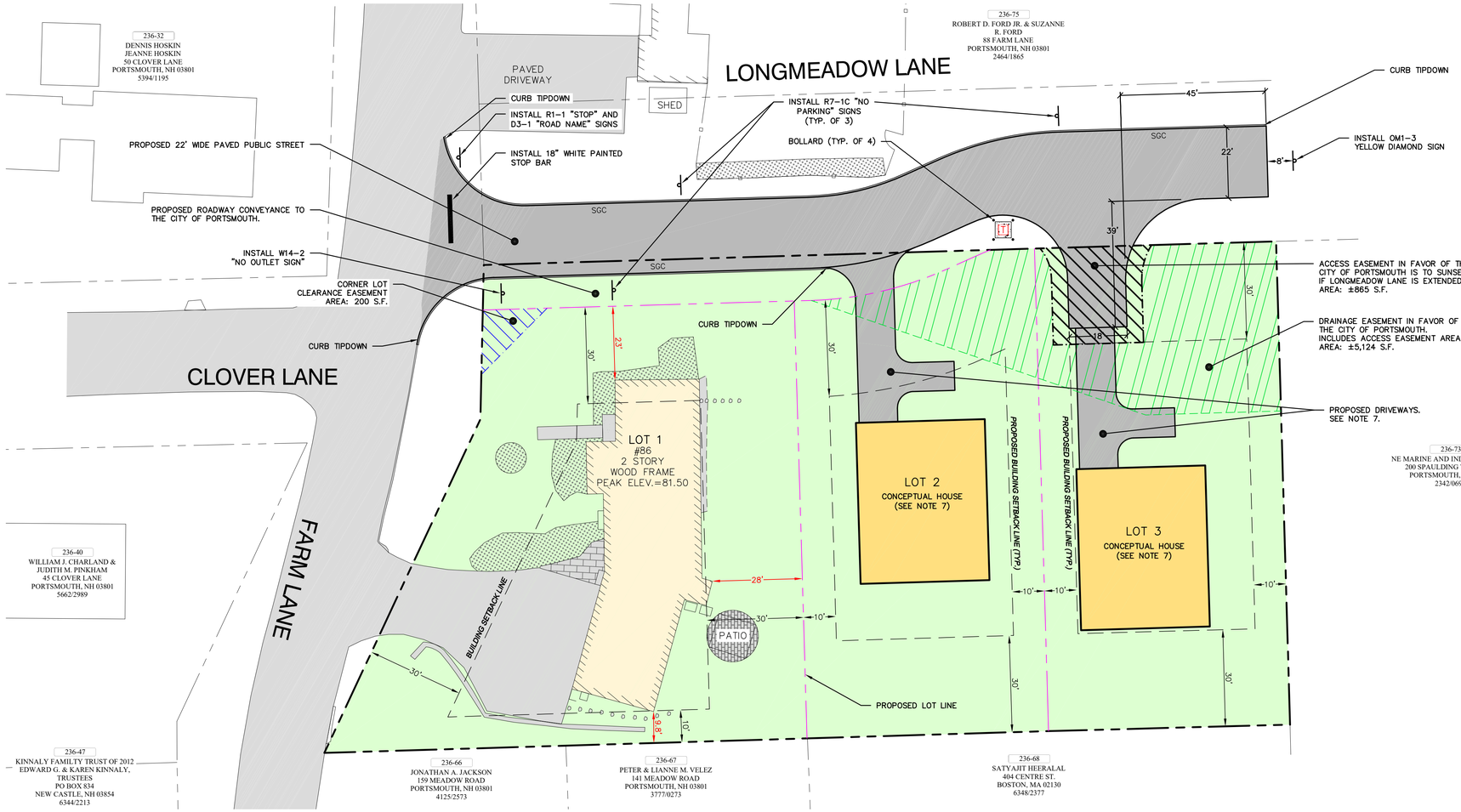
APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

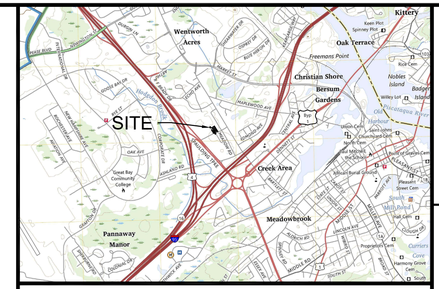
PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
SUBDIVISION & EASEMENT PLAN

SHEET NUMBER:
C-1

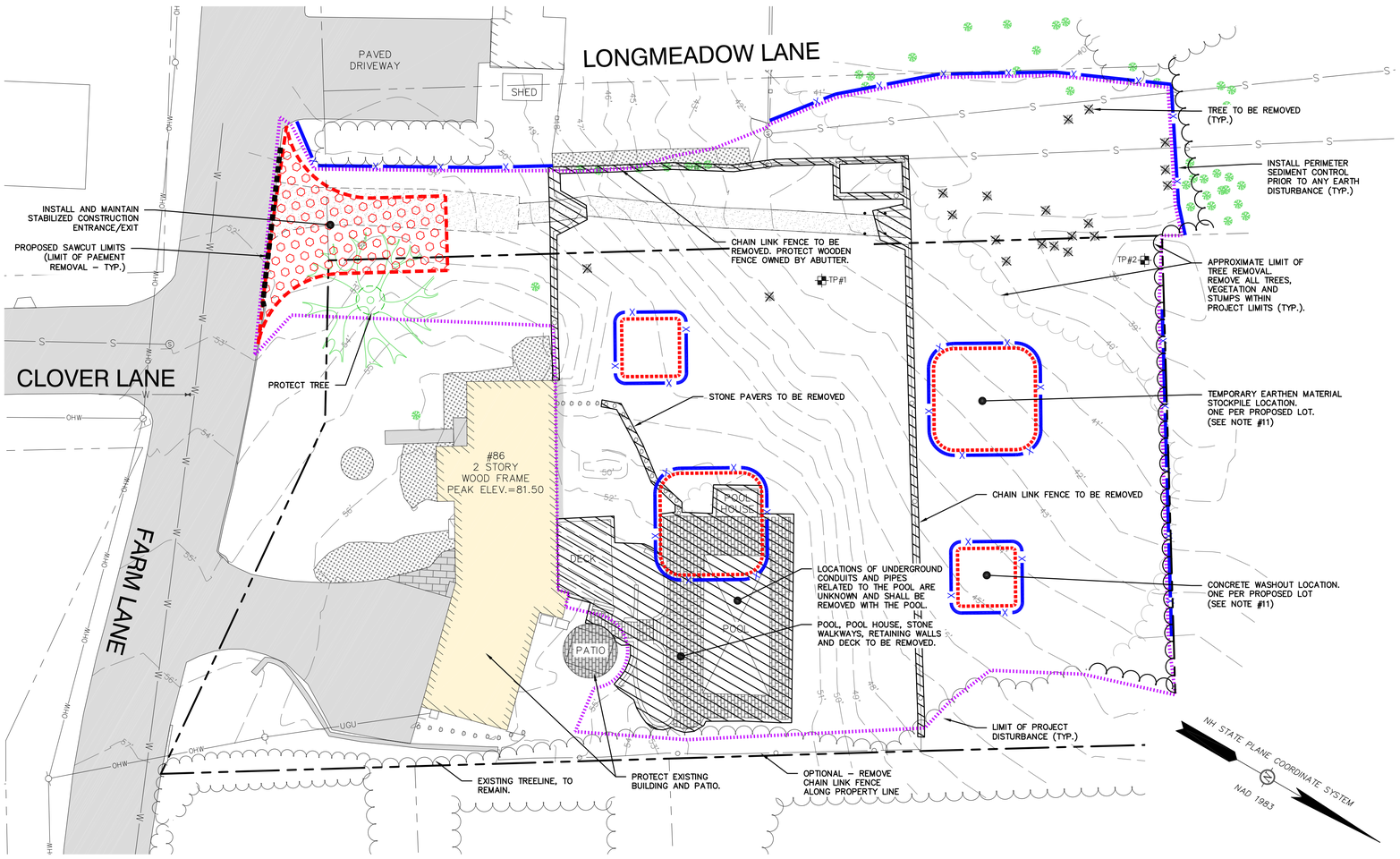
P5719




SITE
Greenleaf Ave
Islington St
Woodbury Ave
Lafayette Rd
Wentworth Acres
Oak Terrace
Freemans Point
Christian Shore
Berrum Gardens
Nobles Island
Creek Area
Meadowbrook
Pannaway Manor
Kittery
Rice Cem
Bridges
Pine Hill Cem
Proprietors Cem
Harmony Grove Cem
South Cem
Spinney Rd
Rt 1
Rt 1 Bypass
Rt 1 Bypass
Rt 1 Bypass

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- BUILDING SETBACK
- EASEMENT – CITY OF PORTSMOUTH
- 68 EXISTING CONTOUR
- 68 PROPOSED CONTOUR/INTERMEDIATE CONTOUR
- 72.00 EXISTING SPOT GRADE
- 72.00 PROPOSED SPOT GRADE
- VGC SGC EXISTING/PROPOSED BUILDING
- VGC SGC EXISTING PAVEMENT/CURB
- VGC SGC PROP. PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- EXISTING/PROPOSED PAVEMENT
- (44) 226 PARKING COUNT PER ROW/FOR TOTAL SITE
- EXISTING/PROPOSED GRAVEL
- EXISTING/PROPOSED CONCRETE
- EXISTING/PROPOSED STOCKADE FENCE
- EXISTING/PROPOSED CHAINLINK FENCE
- EXISTING TREE DRIP LINE
- PROPOSED TREE CLEARING LIMIT
- PROPOSED SAWCUT
- SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- STABILIZED CONSTRUCTION EXIT
- PROPOSED LIMIT OF DISTURBANCE
- OHW UGU EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- OHW PROPOSED OVERHEAD UTILITIES/UTILITY POLE
- UGE&T PROPOSED UNDERGROUND ELECTRIC & COMMUNICATION
- W EXISTING WATERLINE
- PW PROPOSED WATERLINE/GATE VALVE/REDUCER
- PROPOSED THRUST BLOCK/WATER SHUT-OFF/HYDRANT
- S EXISTING SEWER PIPE/MANHOLE
- S PROPOSED SEWER PIPE/MANHOLE/CLEANOUT
- D EXISTING DRAINAGE PIPE)/CB/DCB/DMH/FES
- D PROPOSED DRAINAGE HARD PIPE/CB/DCB/DMH/FES
- PROPOSED YARD DRAIN/OUTLET STRUCTURE
- PROPOSED CATCH BASIN INLET PROTECTION
- CPP FES HDWL CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
- PROPOSED GROUND SLOPE/STONE CHECK DAM
- PROPOSED RIPRAP
- PROPOSED BIORETENTION CELL
- PROPOSED STONE DRIPEDGE
- PROPOSED EROSION CONTROL BLANKET
- TEMPORARY BENCH MARK
- TP# TESTPIT



DEMOLITION & SITE PREPARATION NOTES

1. THIS PLAN IS INTENDED TO PROVIDE MINIMUM GUIDELINES FOR THE DEMOLITION OF EXISTING SITE FEATURES. UNLESS OTHERWISE NOTED TO REMAIN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL BUILDINGS, PAVEMENT, CONCRETE, CURBING, SIGNS, POLES, UTILITIES, FENCES, VEGETATION AND OTHER EXISTING FEATURES AS NECESSARY TO FULLY CONSTRUCT THE PROJECT.
2. ALL MATERIALS SCHEDULED FOR DEMOLITION REMOVAL ON PRIVATE PROPERTY SHALL BECOME PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED.
3. CITY DEMOLITION PERMIT REQUIRED PRIOR TO ANY DEMOLITION ACTIVITIES. CONTRACTOR IS NOTIFIED THAT THIS PERMIT PROCESS MAY REQUIRE A 30-DAY LEAD TIME.
4. LIMITS OF TREE CLEARING & TREES TO REMAIN SHALL BE CLEARLY MARKED PRIOR TO COMMENCING SITE WORK.
5. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
6. PERIMETER SEDIMENT CONTROLS SHALL BE INSTALLED AFTER TREE CLEARING OPERATIONS HAVE CEASED AND BEFORE ANY STUMPING, GRUBBING OR OTHER EARTH DISTURBANCE.
7. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE OR TRUCK OFFSITE. NO STUMPS SHALL BE BURIED ON THE SITE OR LEFT AT ANY DEPTH BELOW ROADWAY OR PARKING LOT SURFACES.
8. NO EARTHWORK SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
9. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY NEW HAMPSHIRE DEPARTMENT ENVIRONMENTAL SERVICES.
10. SHOULD GROUNDWATER BE ENCOUNTERED DURING EXCAVATION, APPROPRIATE BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM, ABUTTING PROPERTIES, WETLANDS OR RIVERS. A DISCHARGE PERMIT SHALL BE OBTAINED PRIOR TO DISCHARGING GROUNDWATER TO THE CITY DRAINAGE SYSTEM.
11. MATERIAL STOCKPILE & CONCRETE WASHOUT LOCATIONS SHOWN ARE CONCEPTUAL. THE CONTRACTOR MAY LOCATE STOCKPILES OR WASHOUT WHERE NECESSARY PROVIDED THAT PERIMETER SEDIMENT CONTROLS ARE PROPERLY INSTALLED.
12. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT EROSION AND PREVENT SEDIMENT, DUST, AND OTHER MATERIALS FROM LEAVING THE SITE. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE PROACTIVE MANAGEMENT OF STOCKPILES, MATERIALS PROCESSING ACTIVITIES VEHICULAR TRAFFIC, THE EXCAVATION AND PLACEMENT OF EARTH MATERIALS, SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES. THE CONTRACTOR SHALL ENSURE PERMANENT SOIL STABILIZATION.
13. ALL MATERIAL SCHEDULED TO BE REMOVED SHALL BE LEGALLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AND CODES.
14. IF HAZARDOUS MATERIALS ARE ENCOUNTERED DURING DEMOLITION AND CONSTRUCTION ACTIVITIES, THEY SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
15. CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES SCHEDULED TO REMAIN. WHERE SPECIFIED TO REMAIN, MANHOLE RIMS, CATCH BASIN GRATES, VALVE COVERS, HANDHOLES, ETC. SHALL BE ADJUSTED TO FINISH GRADE UNLESS OTHERWISE SPECIFIED.
16. THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (I.E. CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE TIMELY NOTIFICATION OF ALL PARTIES, CORPORATIONS, COMPANIES, INDIVIDUALS AND STATE AND LOCAL AUTHORITIES OWNING AND/OR HAVING JURISDICTION OVER ANY UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS TO BE DISTURBED BY DEMOLITION AND/OR CONSTRUCTION ACTIVITIES WHETHER OR NOT SAID UTILITIES ARE SUBJECT TO DEMOLITION, RELOCATION, MODIFICATION AND/OR CONSTRUCTION.
18. AT NO TIME SHALL ANY UTILITY SERVICE OR VEHICULAR ACCESS TO ADJOINING PROPERTIES BE COMPLETELY INTERRUPTED UNLESS A FULL SHUTDOWN IS COORDINATED WITH ALL AFFECTED PARTIES AND UTILITY PROVIDER(S).
19. ALL UTILITY DISCONNECTIONS, DEMOLITIONS AND RELOCATIONS SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ALL APPROPRIATE UTILITY COMPANIES, PORTSMOUTH DPW AND ABUTTING PROPERTY OWNERS. UNLESS OTHERWISE SPECIFIED, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELATED EXCAVATION, TRENCHING AND BACKFILLING.
20. CONTRACTOR SHALL SAFELY SECURE THE SITE AND WORK LIMITS DURING NON-WORK HOURS.
21. SEE GRADING, DRAINAGE & EROSION CONTROL PLAN AND DETAIL SHEETS FOR ADDITIONAL NOTES ON TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.
22. SEE THIS SHEET FOR LEGEND.
23. SEE SHEET C-6 FOR TEST PIT INFORMATION.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

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2/13/26

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PROJECT:
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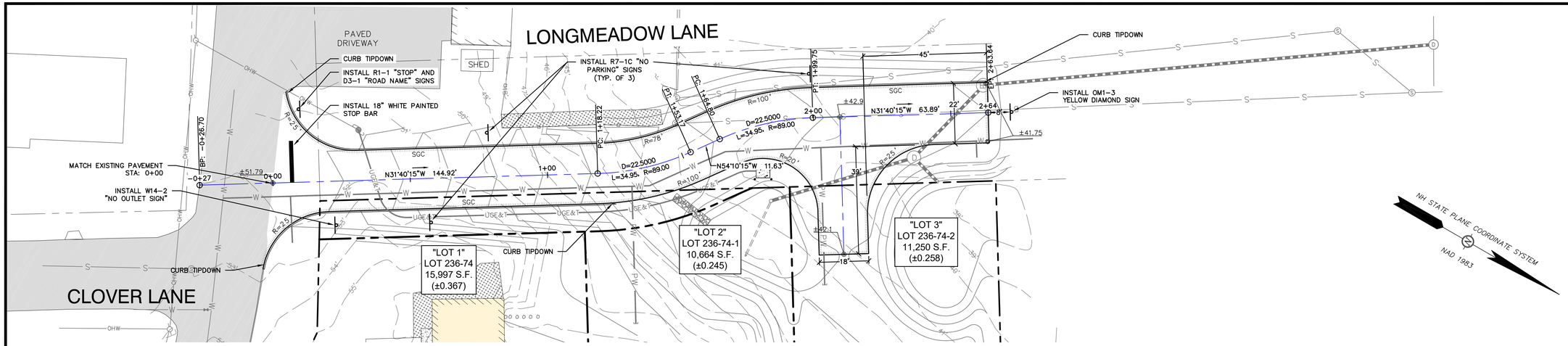
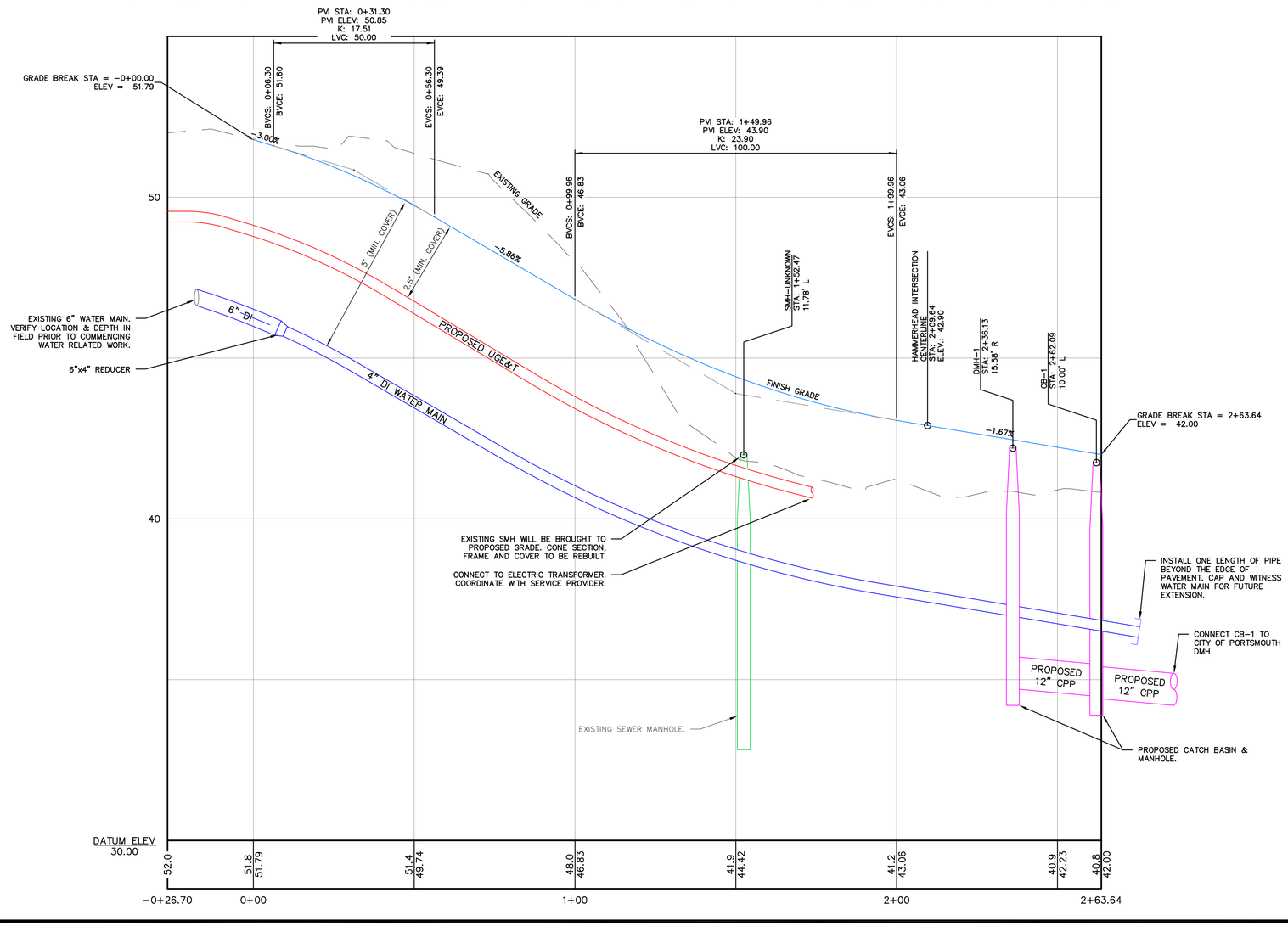
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
DEMOLITION & SITE PREPARATION PLAN

SHEET NUMBER:
C-3

P5719





ROADWAY NOTES

1. SEE SHEET C-3 FOR LEGEND.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE
(IN FEET)
1 inch = 20 feet Horiz.
1 inch = 2 feet Vert.

0 20 40
0 2 4

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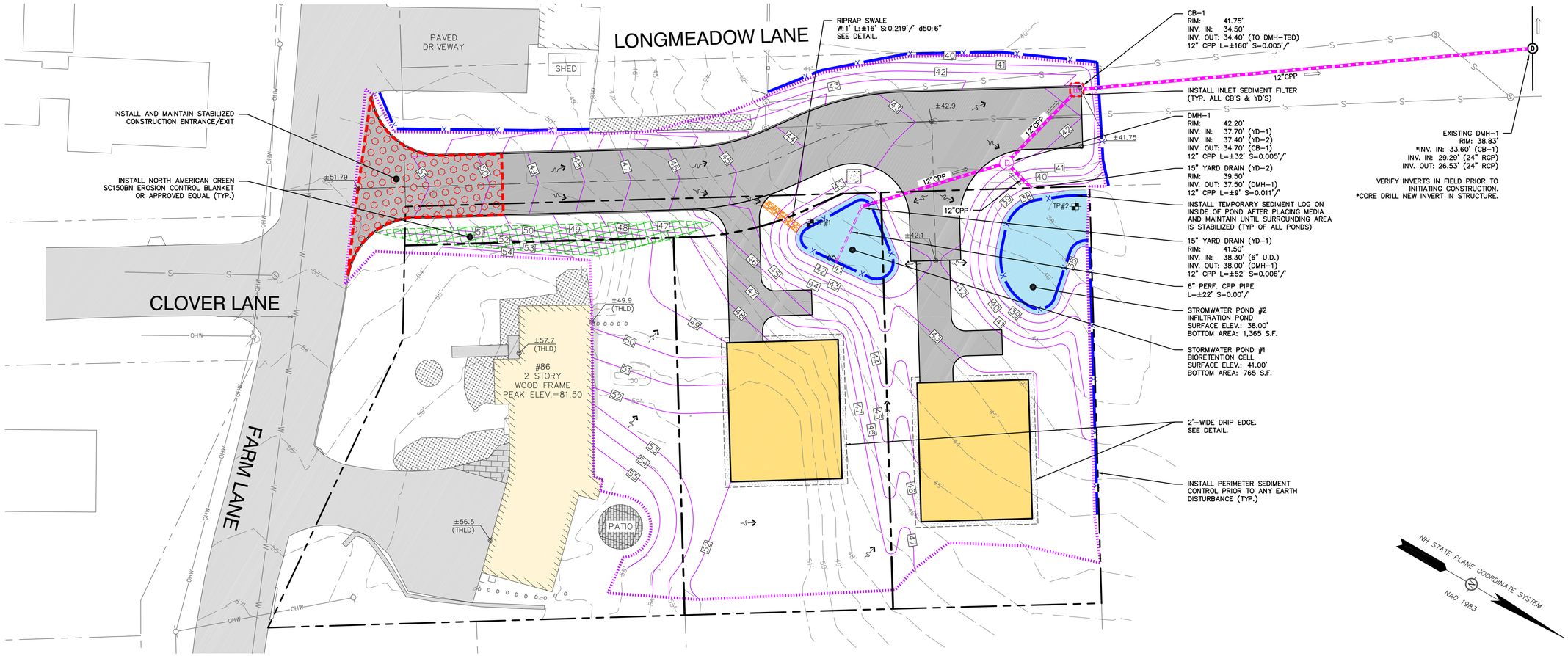
PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
ROADWAY PLAN

SHEET NUMBER:
C-4

P5719



GRADING & DRAINAGE NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE MUNICIPAL ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
5. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING UTILITIES SCHEDULED TO REMAIN. PRESERVE AND PROTECT UTILITIES TO BE RETAINED.
6. THE LIMITS OF CONSTRUCTION DISTURBANCE SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY TREE CLEARING, STUMPING, GRUBBING OR EARTH MOVING OCCURS. WHERE CONSTRUCTION IS TO TAKE PLACE WITHIN 50' OF A PROPERTY LINE, THE PROPERTY LINE SHALL BE STAKED AT 50' MINIMUM INTERVALS.
7. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
8. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
9. DEWATERING ACTIVITIES, IF REQUIRED, SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
10. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, OR PVC SDR 35 WHERE SPECIFIED. ALL STORMWATER PIPING REDUCERS, WYES AND TEES SHALL BE CONCENTRIC UNLESS OTHERWISE NOTED.
11. 2" RIGID INSULATION SHALL BE INSTALLED OVER DRAIN PIPES WHERE COVER IS < 2'.
12. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED UNLESS OTHERWISE SPECIFIED. ALL DRAINAGE STRUCTURES WITHIN PAVED AREAS SHALL BE H-20 LOADING RATED.
13. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
14. CONTRACTOR SHALL PROTECT ALL RAINGARDENS FROM CONSTRUCTION STORMWATER RUNOFF. TEMPORARY SEDIMENT BASINS SHALL BE INSTALLED DURING CONSTRUCTION. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
15. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE. ADJUST GRADING AT EMERGENCY BUILDING EXITS AS NECESSARY TO ENSURE CODE COMPLIANCE. COORDINATE WITH ARCHITECT IF RAILINGS ARE REQUIRED.
16. UNLESS OTHERWISE NOTED, THE CONTRACTOR MAY CONNECT BUILDING AND RETAINING WALL FOUNDATION DRAINS TO THE NEAREST DRAINAGE STRUCTURE PROVIDED A MINIMUM 1% SLOPE CAN BE MAINTAINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL FOUNDATION DRAINS WITH THE BUILDING AND WALL PLANS.
17. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
18. NO SNOW SHALL BE STORED IN ANY STORMWATER POND OR ANY OTHER STORMWATER BMP.
19. SEE SHEET C-3 FOR LEGEND.

EROSION & SEDIMENT CONTROL NOTES

1. AREA OF DISTURBANCE = ±36,000 S.F. NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED, INCLUDING LOT DEVELOPMENT.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED AT ALL CULVERT ENTRANCES AND IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
4. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIDEGRADEABLE.
5. ALL EROSION CONTROL BLANKETS SHALL BE BY NORTH AMERICAN GREEN OR EQUAL AS APPROVED IN WRITING BY THE ENGINEER.
6. ALL SWALES WITH SLOPES OF 5% OR GREATER SHALL BE STABILIZED WITH RIPRAP PER THE DETAILS. ALL OTHER SWALES SHALL BE STABILIZED WITH NORTH AMERICAN GREEN SC150BN EROSION CONTROL BLANKET.
7. THE STORMWATER PONDS SHOWN IN THIS PLAN SET SHALL BE CONSTRUCTED BEFORE EARTHWORK COMMENCES ON THE REMAINDER OF THE SITE. THE CONTRACTOR MAY USE THE POND AS A SEDIMENTATION POND UNTIL THE SITE IS STABILIZED. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM. SILT SOXX SHALL BE INSTALLED AROUND THE PERIMETER OF THE STORMWATER BASINS.
8. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM; WITH THE EXCEPTION OF DETENTION PONDS SHOULD A SEDIMENTATION POND BE REQUIRED.
9. TEMPORARY SEDIMENT LOG (SILTSOXX OR EQUAL APPROVED BY THE ENGINEER) SHALL BE INSTALLED AROUND THE INLETS OFF ALL CULVERTS AND THE BOTTOM PERIMETERS OF ALL STORMWATER PONDS. THESE MEASURES ARE TO REMAIN IN PLACE UNTIL ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
10. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS.
11. MATERIAL STOCKPILE & CONCRETE WASHOUT LOCATIONS SHOWN ARE CONCEPTUAL. THE CONTRACTOR MAY LOCATE STOCKPILES OR WASHOUT WHERE NECESSARY PROVIDED THAT PERIMETER SEDIMENT CONTROLS ARE PROPERLY INSTALLED.
12. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND HAY MULCH OR EROSION CONTROL BLANKET USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
13. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
14. SEE DEMOLITION & SITE PREPARATION PLAN AND DETAIL SHEETS FOR ADDITIONAL SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.

TEST PIT LOGS

EVALUATED BY ERIC D. WEINRIEB (PERMIT #809) ON JANUARY 14, 2026
WITNESSED BY DAVID DESFOSSES (TEST PIT 1 ONLY)

TEST PIT 1
0-9" 7.5 YR 3/3 – DARK BROWN GRASS MATT AND FINE SANDY LOAM, FRIABLE, GRANULAR
9-24" 7.5 YR 3/4 – DARK BROWN FINE SANDY LOAM, FRIABLE, GRANULAR
24-60" 5 YR 4/3 – REDDISH BROWN CLAYEY LOAM FIRM, MASSIVE WITH PROMINENT MOTTLES THROUGHOUT
60" STOPPED

ESTIMATED SEASONAL HIGH WATER TABLE – 24"
ROOTS – OOC TO 40"
OBSERVED WATER – 40"
LEDGE – NONE

TEST PIT 2
0-8" 10 YR 2/2 – VERY DARK BROWN GRASS MATT AND FINE LOAMY SAND, FRIABLE, GRANULAR
8-17" 5 YR 3/3 – DARK REDDISH BROWN LOAMY SAND, SINGLE GRAIN, LOOSE
17-33" 5 YR 6/4 – LIGHT REDDISH BROWN FINE SAND, SINGLE GRAIN, LOOSE
33-55" 5 YR 4/3 REDDISH BROWN CLAYEY LOAM, FIRM, MASSIVE WITH PROMINENT MOTTLES STARTING AT 43"
55" STOPPED

ESTIMATED SEASONAL HIGH WATER TABLE – 43"
ROOTS – NOT DOCUMENTED
OBSERVED WATER – 50"
LEDGE – NONE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE
20 0 10 20 40 80
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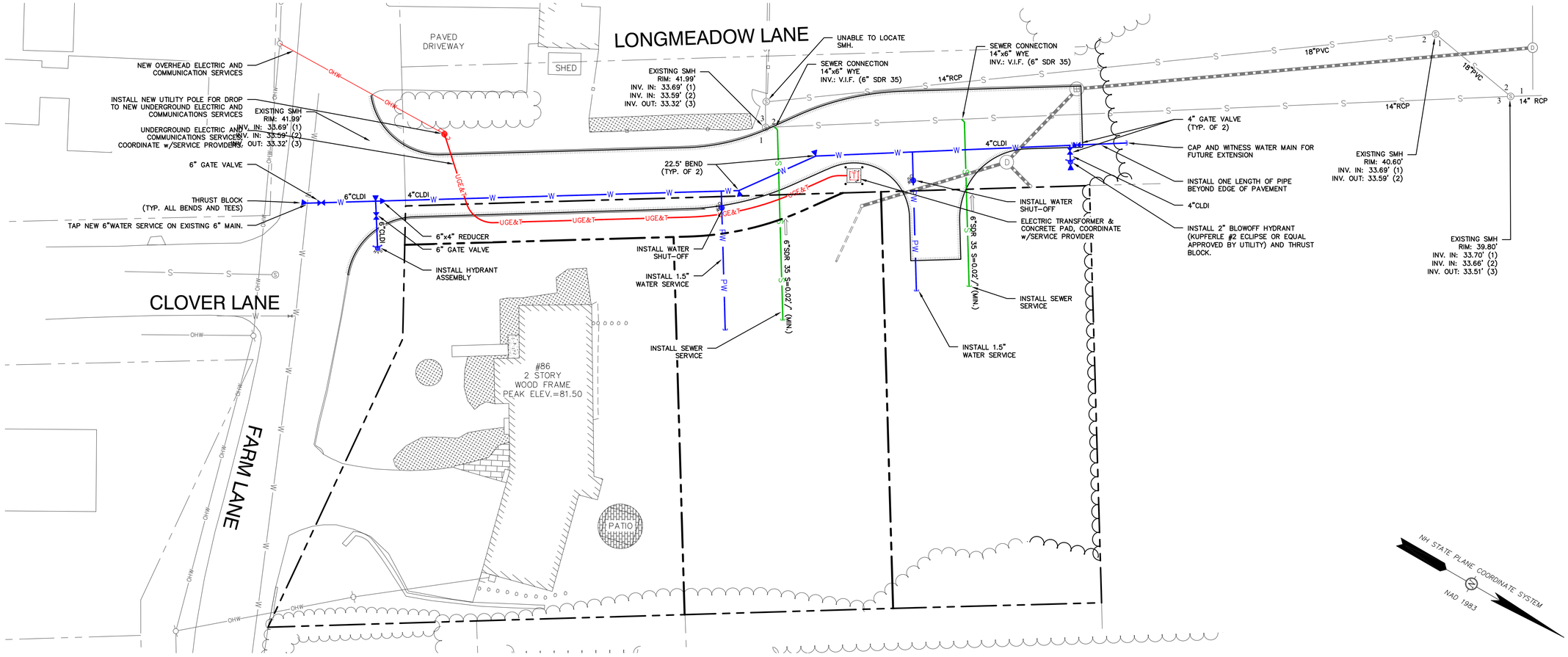
C-5

P5719



UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (I.E. CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, LOCAL DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER, WASTEWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, LOCAL DPW AND APPROPRIATE UTILITIES.
3. WATER: PORTSMOUTH DPW WATER DIVISION, DOUG SPARKS, (603) 427-1409.
4. SEWER: PORTSMOUTH DPW SEWER DIVISION, DOUG SPARKS, (603) 427-1409.
5. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
6. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
7. ELECTRICAL: EVERSOURCE, JOSHUA LAHAIE, (603) 332-7551.
8. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
10. THE APPLICANT SHALL AGREE TO PAY FOR THE SERVICES OF A THIRD-PARTY OVERSIGHT ENGINEER, TO BE SELECTED BY THE CITY, TO MONITOR THE INSTALLATION OF UTILITIES INCLUDING SEWER, WATER AND DRAINAGE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS THE CITY OF PORTSMOUTH POLICE DEPARTMENT AND/OR DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
13. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LASTEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
14. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL, OSHA, AND LOCAL REGULATIONS.
15. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE OWNER, CONTRACTOR, DPW AND APPROPRIATE UTILITY COMPANIES.
16. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
17. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW DUCTILE IRON WATERLINE SHALL BE WRAPPED WITH A WATER TIGHTPOLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
18. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
19. ALL MEANS, METHODS, MATERIALS AND INSTALLATION OF NEW SEWER LATERALS SHALL BE APPROVED AND WITNESSED BY PORTSMOUTH DPW PRIOR TO BACKFILLING. SEWER LATERALS MAY BE CONSTRUCTED IN THE SAME TRENCH PROVIDED THAT A MINIMUM SEPARATION OF 3' IS MAINTAINED AND THE LINES ARE LOCATED ON THEIR RESPECTIVE LOTS IN THEIR ENTIRETY.
30. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"-THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
31. THE CONTRACTOR SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
32. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL HANDHOLES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS IN ORDER TO RENDER THE FULL INSTALLATION OF COMPLETE AND OPERATIONAL UTILITY AND DRAINAGE SYSTEMS.
33. UNLESS OTHERWISE DETERMINED BY THE UTILITY PROVIDER, ALL ELECTRICAL TRANSFORMERS AND SWITCHES SHALL REMAIN THE PROPERTY OF THE UTILITY.
34. THE INSTALLATION OF ELECTRIC POWER AND COMMUNICATIONS LINES SHALL BE UNDERGROUND THROUGHOUT THE SITE, COORDINATE WITH UTILITY PROVIDER.
35. THE CONTRACTOR SHALL CONFIRM ALL UTILITY LINE AND CONDUIT SIZES WITH THE MEP PLANS AND SERVICE PROVIDERS PRIOR TO INSTALLATION. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.
36. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES. COLORS SHALL MATCH THE RESPECTIVE UTILITY PROVIDERS.
37. SEE SHEET C-3 FOR LEGEND.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINREB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
TECHNICAL ADVISORY COMMITTEE

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-SITE.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C-6

P5719

PROJECT NAME AND LOCATION

Owner:

JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

Applicant:

FLIPPING BERGER'S, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801

DESCRIPTION

The project consists of the development of two residential properties on Farm Lane. The existing single-family home at 86 Farm Lane is to remain. The proposed buildings will be modern single family homes. Stormwater will be managed and treated with stormwater ponds. Site improvements include underground utilities, landscaping and associated site improvements.

DISTURBED AREA

The total area to be disturbed on the parcels and for the roadway, lot development, drainage, and utility construction is approximately ±36,000 S.F. The combined disturbed area DOES NOT exceed 43,560 SF (1 acre), thus a SWPPP will NOT be required for compliance with the USEPA-NPDES Construction General Permit. All local requirements for stormwater and erosion control during construction are still required.

NPDES CONSTRUCTION GENERAL PERMIT

Not required for this project.

SEQUENCE OF MAJOR ACTIVITIES

1. Hold a pre-construction meeting with City & stake holders.
2. Install temporary erosion control measures, including drain inlet protection, silt fences, and stabilized construction exit/entrance.
3. Remove existing pool, pool house, deck, stone staircases, retaining walls, and chain link fence.
4. Clear and Grub vegetated areas per plan; Strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales, mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete. Remove debris. Remove pavement and structures intended to be removed within the initial work limits.
5. Construct utility infrastructure. Rough grade lot to prepare for site development. Stabilize swales and stormwater managment systems prior to directing flow to them.
6. Construct roadway infrastrucutre and foundations.
7. Loam and see remaining disturbed areas in roadway.
8. Construct buildings.
9. When all construction activity is complete and site is stabilized, remove all silt fences and temporary structures and sediment that has been trapped by these devices.

NAME OF RECEIVING WATER

The site drainage discharges into an unnamed wetland that eventually discharges to Hodgeson Brook.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual", dated February 2025. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from silt fence or other barriers when it has reached one-third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed;

    – or –

    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
    a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
    b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6"screen and a minimum of 70 %, maximum of 85%, passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.
2. Seeding –
   a. Utilize annual rye grass at a rate of 40 lbs/acre.
   b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
   c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.
3. Maintenance –
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
   a. See detail.
   b. Install per manufacturer's requirements.
2. Silt Fence (if used)
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM-51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM-52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM-51	0.3 gal/sf/min (min)

   * Requirements reduced by 50 percent after six (6) months of installation.

   Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

   b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

   c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

   d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

   e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

   f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

   g. The trench shall be backfilled and the soil compacted over the filter fabric.

   h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.
4. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
   c. Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.
   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.
2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

   Agricultural Limestone @ 100 lbs. per 1,000 s.f.
   10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.
3. Seed Mixture (See Landscape Drawings for additional information):
   3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
   3.2. Seed mixture shall consist of
      a. 1/3 Kentucky blue,
      b. 1/3 perennial rye, and
      c. 1/3 fine fescue.
   3.1. Turf type tall fescue is unacceptable.
4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

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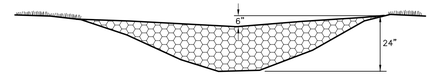
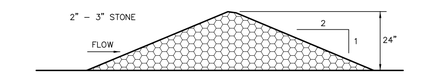
Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2-5 Years
Vegetated Areas				
Inspect all slopes and embankments	x		x	
Replant bare areas or areas with sparse growth	x		x	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x	
Stormwater Channels				
Inspect ditches, swales and other open stormwater channels	x	x	x	
Remove any obstructions and accumulated sediments or debris	x	x		
Control vegetated growth and woody vegetation		x		
Repair any erosion of the ditch lining		x		
Mow vegetated ditches		x		
Remove woody vegetation growing through riprap		x		
Repair any slumping side slopes		x		
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x		
Culverts				
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove woody vegetation growing through riprap		x		
Roadways and Parking Surfaces				
Remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand either manually or by a front-end loader	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment contained in water bars or open-top culverts	x			
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x			
Runoff Infiltration Facilities				
Remove dead vegetation and any accumulated sediment (normally at the entrance to the garden) to allow for new growth	x			
Weed; add additional hardwood mulch to suppress weeds	x	x		
Mow turf three (3) times a growing season				
Aerate area with deep tines, if water ponds on the surface for more than 24 hours during the first year or for a length of 72 hours		x		
Vegetative Swale				
Mow grass swales monthly				
Inspect swale following significant rainfall event	x	x	x	
Control vegetated growth and woody vegetation	x	x		
Repair any erosion of the ditch	x	x		
Remove debris and liter as necessary				

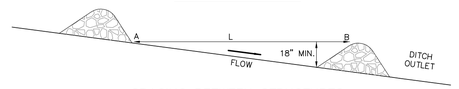
NOTE:
ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24-HOUR PERIOD OR 0.25 INCHES IN A ONE-HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.



CROSS-SECTION



STRUCTURE DETAIL



SPACING BETWEEN STRUCTURES

1. L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION
2. CHECK DAM SHALL BE CONSTRUCTED OF 2" TO 3" STONE WITH COMPLETE COVERAGE OF DITCH OR SWALE TO INSURE THAT THE CENTER OF THE STRUCTURE IS LOWER THAN THE EDGES.

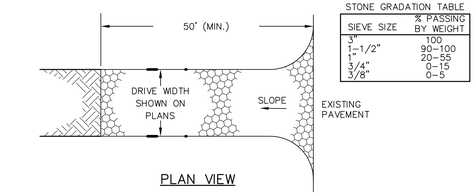
MAINTENANCE

TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED, AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

CONSTRUCTION SPECIFICATIONS

1. *STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.*
2. *CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.*
3. *SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.*
4. *STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.*

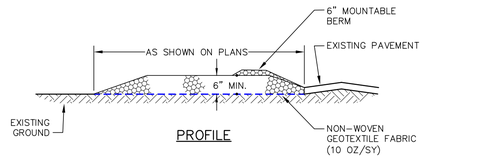
TEMPORARY EROSION CONTROL CHECK DAM — NOT TO SCALE



PLAN VIEW

STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
3"	100
1-1/2"	90–100
1"	20–55
3/4"	0–15
3/8"	0–5



PROFILE

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. LENGTH – DETAILED ON PLANS (50 FOOT MINIMUM) OR AS SHOWN ON PLANS.
3. THICKNESS – SIX (6) INCHES (MINIMUM).
4. WIDTH – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. FILTER FABRIC – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. SURFACE WATER CONTROL – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS-OF-WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT — NOT TO SCALE

P5719

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STATE OF NEW HAMPSHIRE
ERIC D. WEINREB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
PRELIMINARY REVIEW

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: RLH/PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

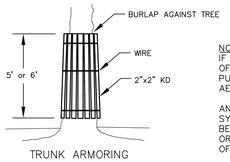
OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKETT ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
EROSION CONTROL NOTES & DETAILS

SHEET NUMBER:
D-1

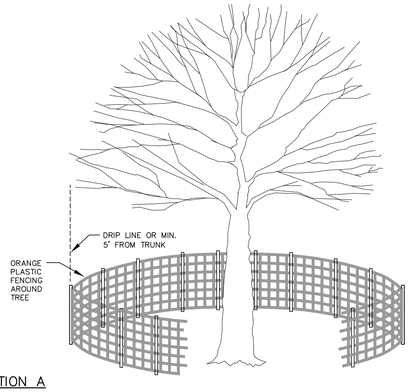


OPTION B

NOTE:
IF SOIL BECOMES COMPATCED OVER THE ROOT ZONE OF ANY TREE, THE GROUND SHOULD BE AERATED BY PUNCHING SMALL HOLES IN IT WITH SUITABLE AERATING EQUIPMENT.

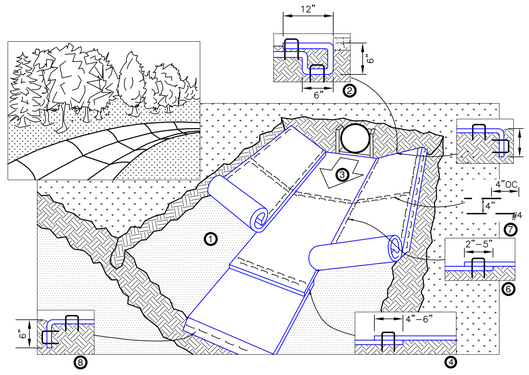
ANY DAMAGE TO THE CROWN, TRUNK OR ROOT SYSTEM OF ANY TREE RETAINED ON SITE SHOULD BE REPAIRED IMMEDIATELY. CONSULT A FORESTER OR TREE SPECIALIST FOR MORE SERIOUS DAMAGE OF TREES.

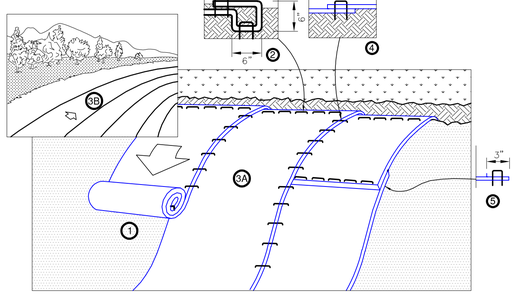
CONTRACTOR TO USE OPTION A OR B WHERE SUITABLE AND/OR AS DIRECTED BY THE ENGINEER.



OPTION A

TREE PROTECTION DETAILS NOT TO SCALE





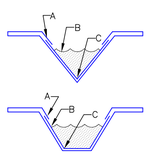
NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET - SLOPE NOT TO SCALE

NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO INSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



CRITICAL POINTS:

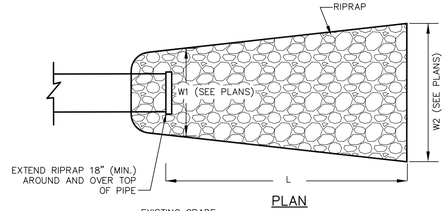
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTES:

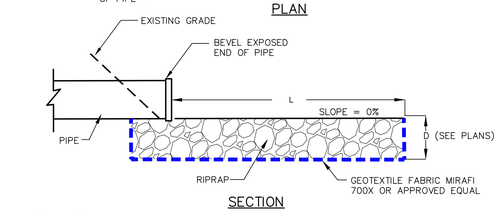
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET - SWALE NOT TO SCALE



PLAN



SECTION

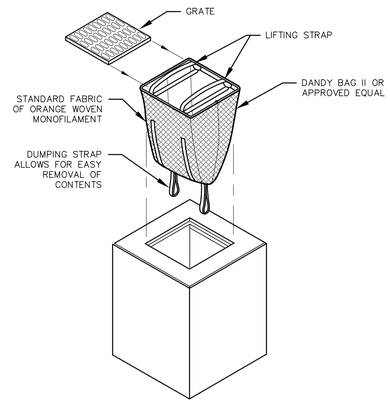
MAINTENANCE

THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. BEVEL EXPOSED END OF PIPE FLUSH WITH GRADE.

RIPRAP OUTLET PROTECTION NOT TO SCALE



INSTALLATION AND MAINTENANCE:

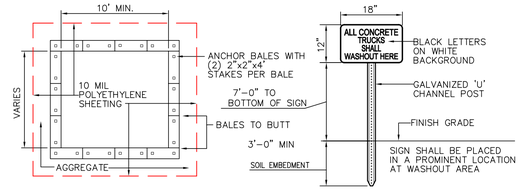
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

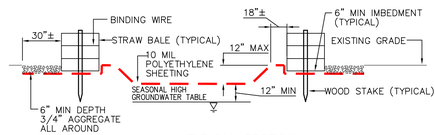
UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION NOT TO SCALE



PLAN WASHOUT SIGN

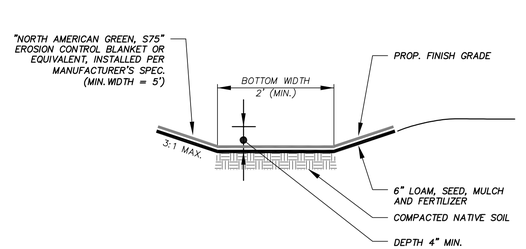


TYPICAL SECTION

NOTES

1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

CONCRETE WASHOUT NOT TO SCALE



NOTES:

1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.
8. APPLY LIME AND FERTILIZER AS NEEDED TO MAINTAIN VIGOROUS GROWTH.

GRASSED SWALE NOT TO SCALE

P5719

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22" x 34" - NOT TO SCALE
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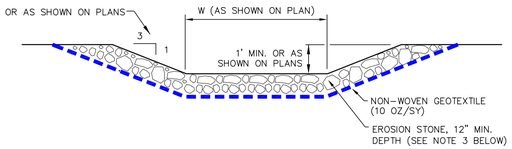
PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D-2

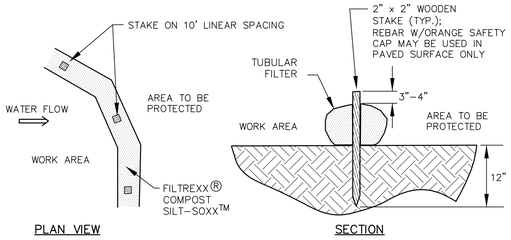


NOTES

1. CONSTRUCT RIP RAP LINED SWALE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE RIP RAP LINED SWALE SHALL MEET THE GRADATION SHOWN ON THE PLANS.
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP SWALE

NOT TO SCALE

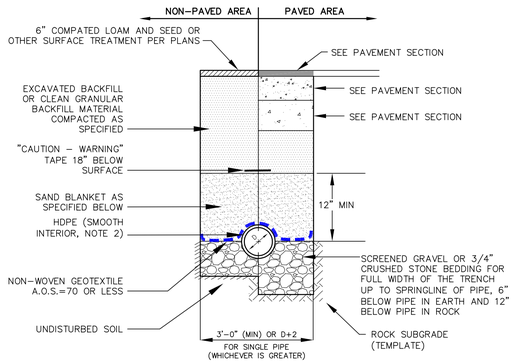


NOTES:

1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER DETAIL

NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

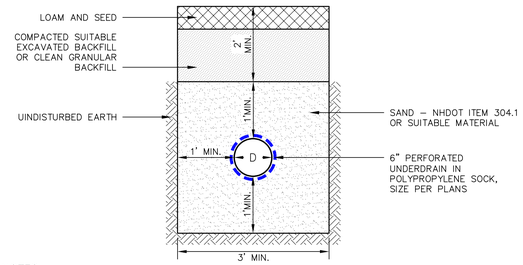
SAND BLANKET/BARRIER	
SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*	
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE TRENCH

NOT TO SCALE

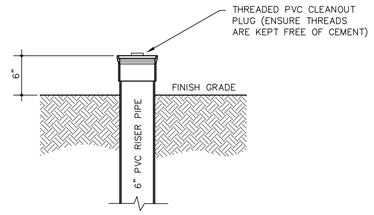


NOTES:

1. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

BIO. CELL UNDERDRAIN TRENCH

NOT TO SCALE

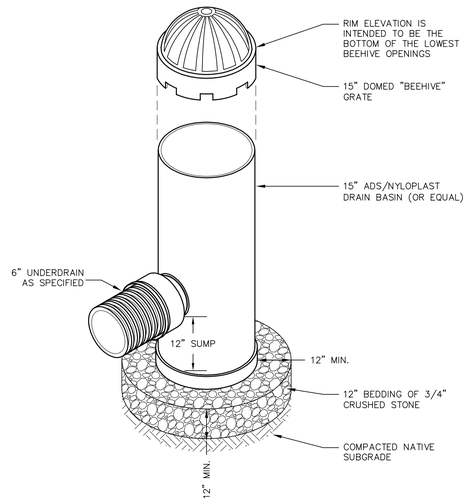


NOTES

1. THIS DETAIL IS INTENDED FOR USE WITH BIORETENTION POND UNDERDRAINS ONLY. SEE OTHER DETAILS FOR CLEANOUTS IN OTHER AREAS.
2. CLEANOUT LOCATIONS ARE MARKED "CO" ON STORMWATER MANAGEMENT PLANS.
3. CLEANOUTS MAY NOT BE SET TO FINISH GRADE WITHOUT APPROVAL FROM THE ENGINEER.

BIORETENTION U.D. CLEANOUT ("CO")

NOT TO SCALE

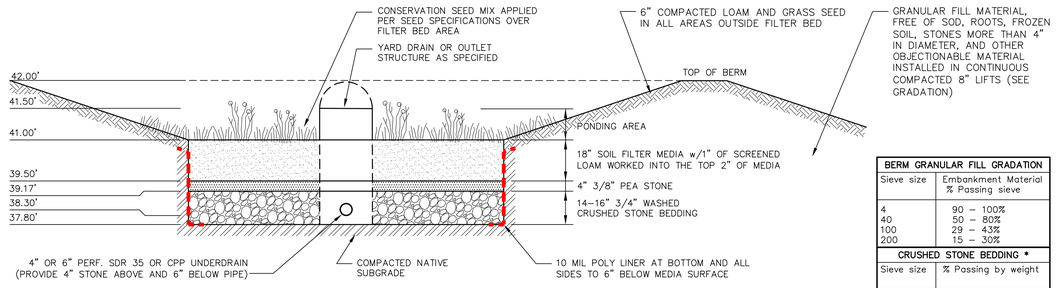


NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N-12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.
6. INLET AND OUTLET GEOMETRY MAY NOT BE SYMMETRICAL. ALL INLETS AND OUTLET LOCATIONS SHALL CONFORM TO THE LINES AND ANGLES SHOWN ON THE PLANS.

YARD DRAIN ("YD")

NOT TO SCALE



BERM GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90 – 100%
40	50 – 80%
100	29 – 43%
200	15 – 30%
CRUSHED STONE BEDDING *	
Sieve size	% Passing by weight
1"	100%
3/4"	90 – 100%
3/8'	20 – 55%
#4	0 – 10%
#8	0 – 5%

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 NHDOT STANDARD SPECIFICATIONS

FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 – 55%		
Loamy sand topsoil, with fines as indicated	20 – 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Loamy coarse sand	70 – 80%	10	85 – 100%
		20	70 – 100%
		60	15 – 40%
		200	8 – 15%

NOTES

1. WHEN CONTRACTOR EXCAVATES BIORETENTION POND AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE BIORETENTION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
4. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE BIORETENTION POND DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF BIORETENTION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

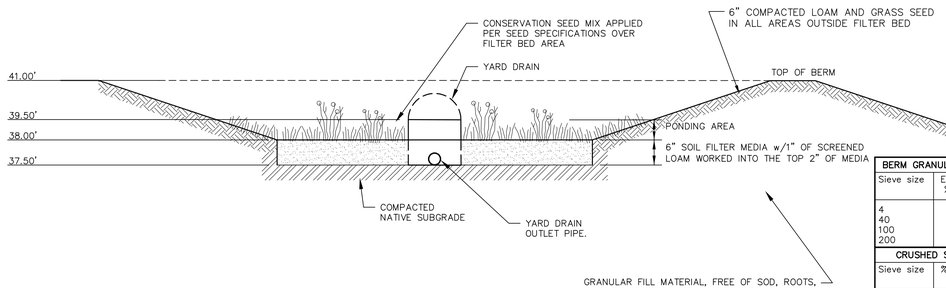
- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, WEED WHACKING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES. BERM AREAS ARE TO BE MOWED TWICE ANNUALLY.

DESIGN REFERENCES

- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, FEBRUARY 2025 AS AMENDED.

BIORETENTION CELL (STORMWATER POND #1)

NOT TO SCALE



BERM GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
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40	50 – 80%
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200	15 – 30%
CRUSHED STONE BEDDING *	
Sieve size	% Passing by weight
1"	100%
3/4"	90 – 100%
3/8'	20 – 55%
#4	0 – 10%
#8	0 – 5%

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 NHDOT STANDARD SPECIFICATIONS

FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C-33 concrete sand	50 – 55%		
Loamy sand topsoil, with fines as indicated	20 – 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Loamy coarse sand	70 – 80%	10	85 – 100%
		20	70 – 100%
		60	15 – 40%
		200	8 – 15%

NOTES

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6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

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DESIGN REFERENCES

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INFILTRATION POND (STORMWATER POND #2)

NOT TO SCALE

P5719

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINREB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
PRELIMINARY REVIEW

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: RLH/PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

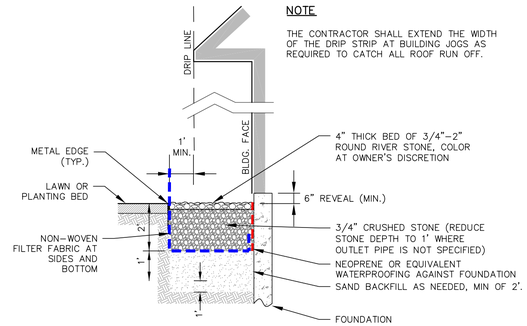
OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

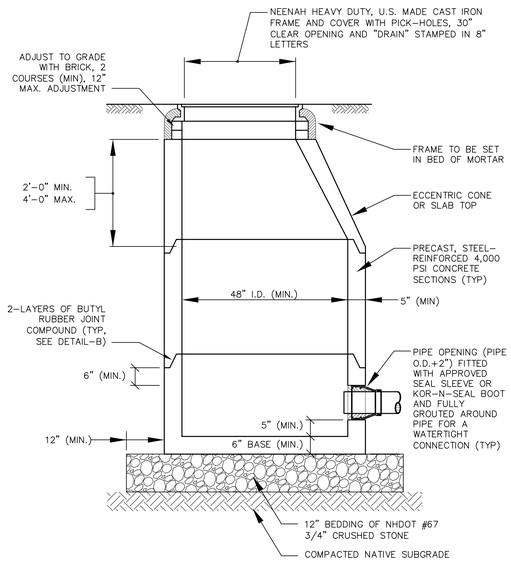
TITLE:
DETAIL SHEET

SHEET NUMBER:
D-3



STONE DRIP EDGE

NOT TO SCALE

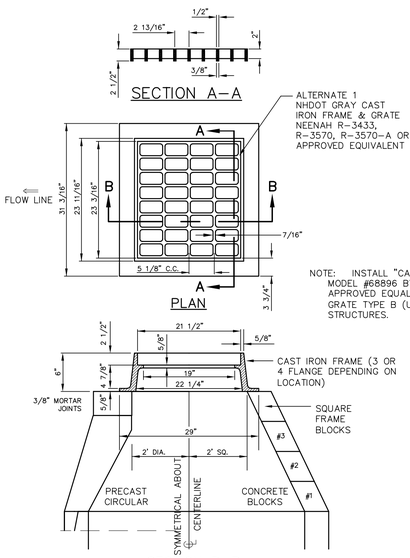


NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 psi).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. ALL MANHOLE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H-20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4 FT OF GRADE.
7. NO MANHOLE STEPS.

DRAIN MANHOLE ("DMH")

NOT TO SCALE



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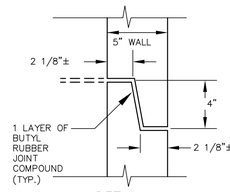
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.

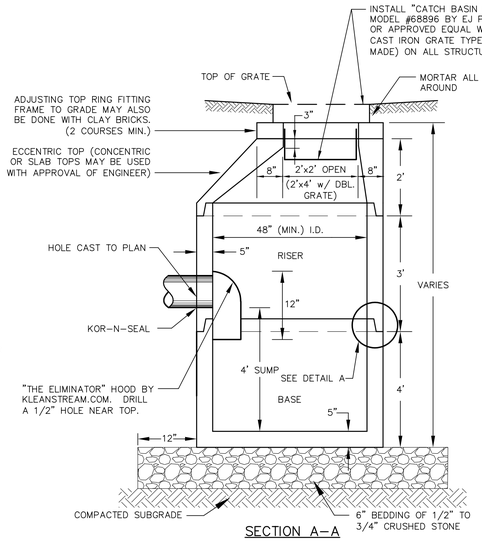
DEEP SUMP CATCH BASIN

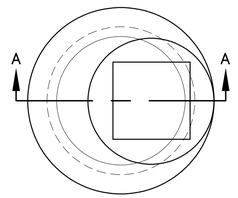
NOT TO SCALE



DETAIL A

(TONGUE & GROOVE JOINT)





PLAN-ECCENTRIC CONE

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

NOT FOR CONSTRUCTION

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71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
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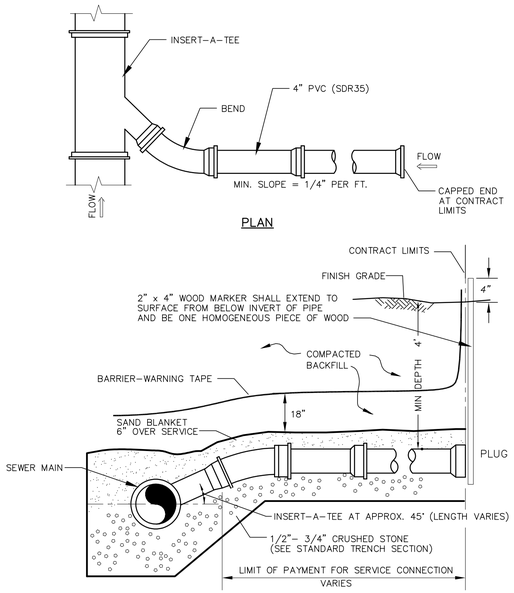
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D-4

P5719



SEWER SERVICE CONNECTION

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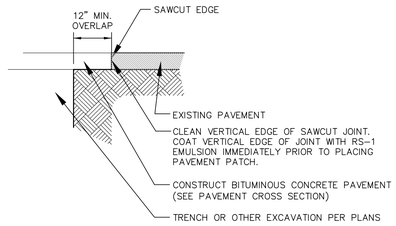
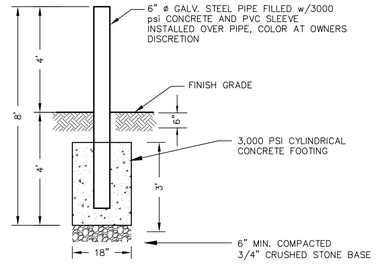


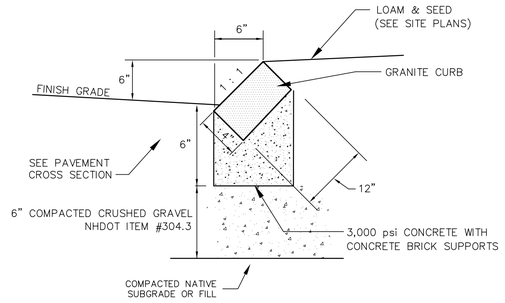
TYPICAL PAVEMENT SAWCUT

NOT TO SCALE



BOLLARD

NOT TO SCALE



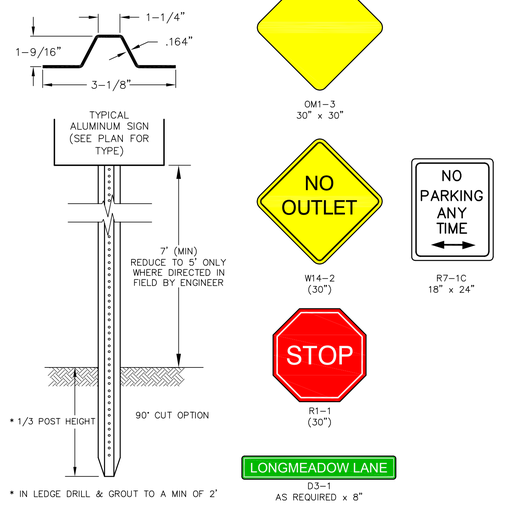
NOTES

1. SEE SITE PLAN FOR LIMITS OF CURBING
2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

SLOPED GRANITE CURB

NOT TO SCALE



LENGTH: AS REQUIRED

WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)

HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH

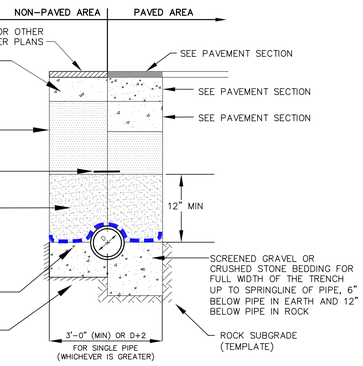
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 – 1080)

NOTES

1. ALL SIGNS SHALL MEET THE REQUIREMENTS OF AND BE INSTALLED AS INDICATED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION.
2. WHEN PLACED PERPENDICULAR TO A TRAVELLED WAY OR SIDEWALK, SIGN EDGE SHALL BE NO CLOSER THAN 2' TO THE EDGE OF PAVEMENT. GREATER MINIMUM DISTANCE MAY BE REQUIRED IN CERTAIN LOCATIONS.

SIGN DETAILS

NOT TO SCALE



NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
3. MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

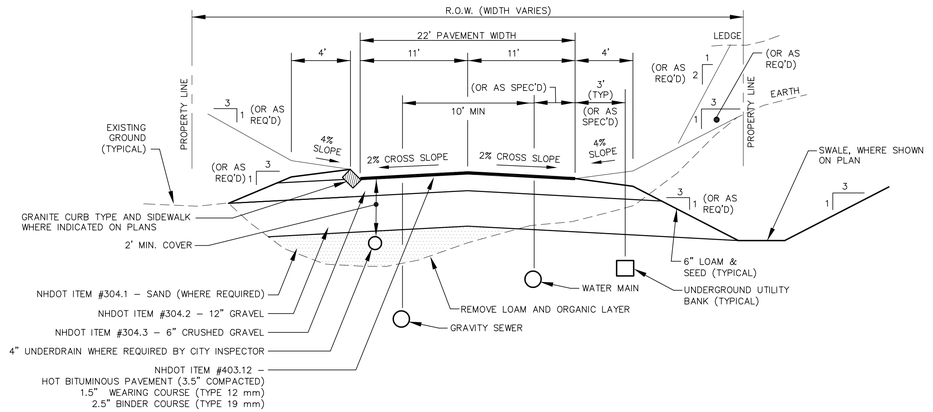
* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

SEWER TRENCH

NOT TO SCALE

STANDARD TRENCH NOTES

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT ONLY IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
7. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
8. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG
   CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
9. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
10. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.
11. THE CONTRACTOR SHALL INSTALL TRENCH DAMS IN ACCORDANCE WITH NHDES REGULATIONS.
12. ALL GRAVITY SEWER INSTALLATIONS SHALL BE TESTED IN ACCORDANCE WITH NHDES ENV-WQ 704.06.



NOTES

1. EACH GRAVEL BASE COURSE TO BE CONSTRUCTED AT THE PAVEMENT CROSS SLOPE.
2. REMOVE LEDGE 18" BELOW LOWEST WORK BEING INSTALLED.
3. REMOVE ALL LOAM, CLAY, MUCK, ORGANIC, YIELDING OR OTHERWISE UNSTABLE MATERIAL TO A MINIMUM OF 24" BELOW FINISH GRADE. ADDITIONAL DEPTH MAY BE REQUIRED BY THE GEOTECHNICAL REPORT (IF AVAILABLE) OR THE ENGINEER. SUCH ADDITIONAL REMOVAL SHALL REQUIRE THE PLACEMENT OF COMPACTED SAND OR GRAVEL BORROW APPROVED BY THE ENGINEER TO THE BOTTOM OF SUBGRADE.
4. THE OVER-EXCAVATION OF UNSUITABLE MATERIAL BEYOND THAT SPECIFIED ABOVE, THE INSTALLATION OF UNDERDRAINAGE, AND/OR THE INSTALLATION OF GEOTEXTILE FABRIC SHALL BE PROVIDED UPON DETERMINATION OF THE ENGINEER.
5. FILL BELOW PAVEMENT SUBGRADE SHALL BE SAND OR GRANULAR BORROW COMPACTED PER DOT REQUIREMENTS.
6. SITEWORK CONTRACTOR SHALL COORDINATE GEOTECHNICAL ENGINEERING INSPECTIONS PRIOR TO PLACING GRAVELS.
7. SUBGRADE SHALL BE FREE OF VOIDS THAT ALLOW MOVEMENT AND/OR SETTLEMENT OF MATERIALS.
8. SUBGRADE SHALL BE ROLLED WITH A MINIMUM OF SIX PASSES OF A 10-TON VIBRATORY COMPACTOR OPERATING AT PEAK RATED FREQUENCY OR BY OTHER MEANS APPROVED BY THE ENGINEER.
9. SUBGRADE SHALL BE PROOF-ROLLED WITH A FULLY LOADED DUMP TRUCK PRIOR TO PLACEMENT OF SELECT GRAVELS. PROOF-ROLLING SHALL BE WITNESSED AND APPROVED BY THE ENGINEER.
10. BITUMINOUS PAVEMENT SHALL BE COMPACTED TO 90 TO 97 PERCENT OF ITS THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D-2041. THE BASE AND SUBBASE MATERIALS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THEIR MAXIMUM DRY DENSITIES AS DETERMINED BY ASTM D-1557. COMPACTION TESTING SHALL BE PERFORMED BY A GEOTECHNICAL ENGINEER FOR ALL MATERIAL COURSES AND THE RESULTS APPROVED BY THE ENGINEER PRIOR TO PLACING THE SUBSEQUENT COURSE.
11. TACK COAT SHALL BE APPLIED BETWEEN SUCCESSIVE LIFTS OF ASPHALT PAVEMENT.

TYPICAL ROADWAY CROSS SECTION

NOT TO SCALE

P5719

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ERIC D. WEINREB No. 7634 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR: PRELIMINARY REVIEW

ISSUE DATE: FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: RLH/PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

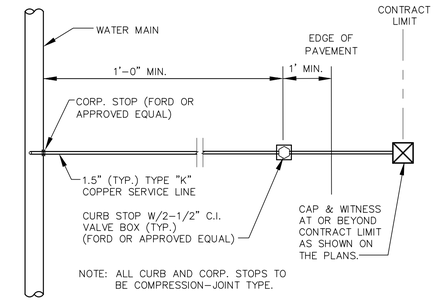
OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

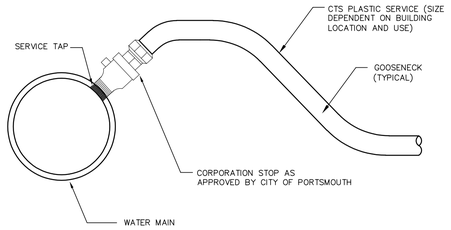
PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

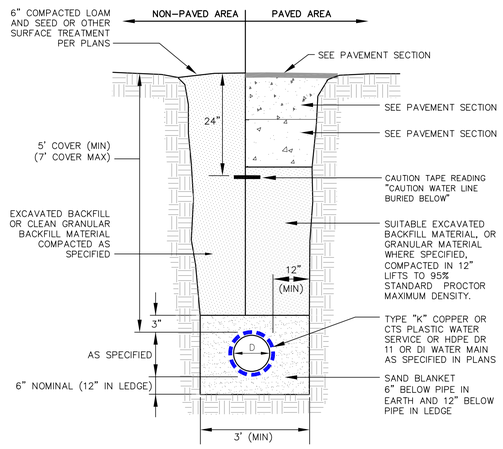
SHEET NUMBER:
D-5



NOTE: ALL MATERIALS AND SPECIFICATIONS SHALL CONFORM TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS AND REQUIREMENTS. VERIFY PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES.



WATER SERVICE CONNECTION NOT TO SCALE



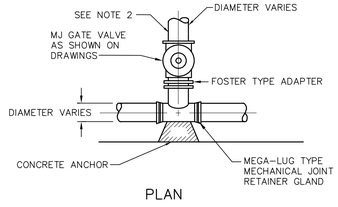
SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL TRENCHING AND BACKFILL SHALL CONFORM WITH THE STANDARDS OF EXETER DPW.

WATER MAIN TRENCH NOT TO SCALE

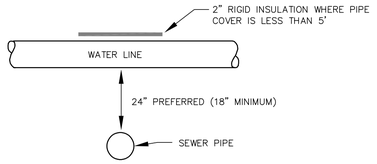


PLAN

NOTES:

1. GATE VALVES SHALL OPEN RIGHT, PER CITY STANDARDS.
2. BRANCH PIPING SHALL BE MECHANICALLY RESTRAINED AS NOTED UNDER THRUST BLOCK DETAIL REQUIREMENTS.

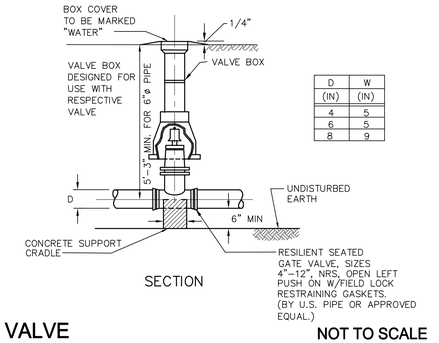
TEE & GATE VALVE ASSEMBLY NOT TO SCALE



NOTES

1. A MINIMUM HORIZONTAL DISTANCE OF 10 FEET SHALL BE MAINTAINED BETWEEN WATER AND SEWER MAINS. A MINIMUM VERTICAL DISTANCE WITH WATER ABOVE SEWER SHALL BE MAINTAINED.
2. SEWER PIPE JOINTS SHALL BE LOCATED A MINIMUM OF 6 FEET HORIZONTALLY FROM WATER MAIN.
3. IF THE REQUIRED CONFIGURATION CANNOT BE MET, THE SEWER MAIN SHALL BE CONSTRUCTED TO MEET THE NHDES REQUIREMENTS FOR FORCE MAIN CONSTRUCTION.

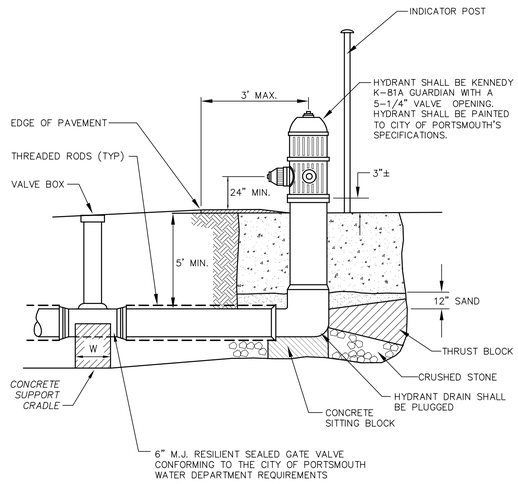
WATER MAIN / SEWER CROSSING NOT TO SCALE



D (IN)	W (IN)
4	5
6	5
8	9

SECTION

WATER VALVE NOT TO SCALE

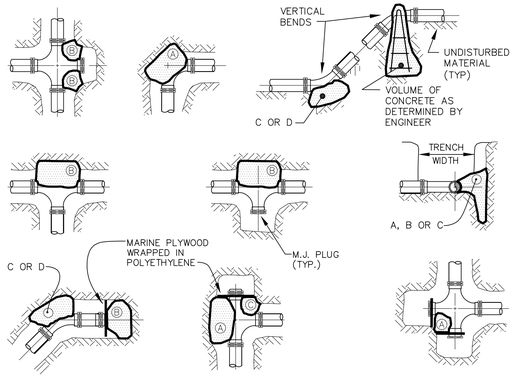


D (IN)	W (IN)
4	5
6	5
8	9

NOTES

1. HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF THE CITY OF PORTSMOUTH WATER & FIRE DEPARTMENTS.
2. GATE VALVES & HYDRANTS TO OPEN RIGHT (CLOCKWISE).

FIRE HYDRANT NOT TO SCALE

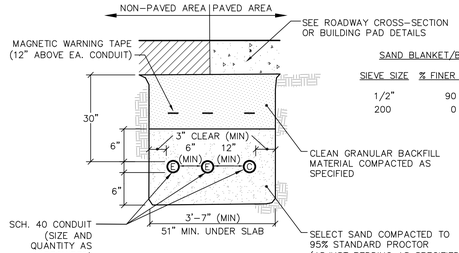


TEST PRESSURE = 150 psi	SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL					
	REACTION TYPE	PIPE SIZE				
		4"	6"	8"	10"	12"
	A 90°	0.89	2.19	3.82	11.14	17.24
	B 180°	0.65	1.55	2.78	8.38	12.00
	C 45°	0.48	1.19	2.12	6.02	9.32
	D 22-1/2°	0.25	0.60	1.06	3.08	4.74
	E 11-1/4°	0.13	0.30	0.54	1.54	2.38

NOTES

1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. NO JOINTS SHALL BE COVERED WITH CONCRETE. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
3. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
4. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. PRECAST THRUST BLOCKS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER AND LOCAL WATER DEPARTMENT.

THRUST BLOCKING NOT TO SCALE



SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

NOTES

1. ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
2. ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
3. BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
4. A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
5. SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
6. TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY, AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
7. ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
8. ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
9. UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
10. ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

ELECTRIC / COMMUNICATION TRENCH NOT TO SCALE

P5719

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APPROVED BY: EDW
DRAWING FILE: 5719-DETAILS.DWG

SCALE:
22" x 34" - NOT TO SCALE
11" x 17" - NOT TO SCALE

OWNER:
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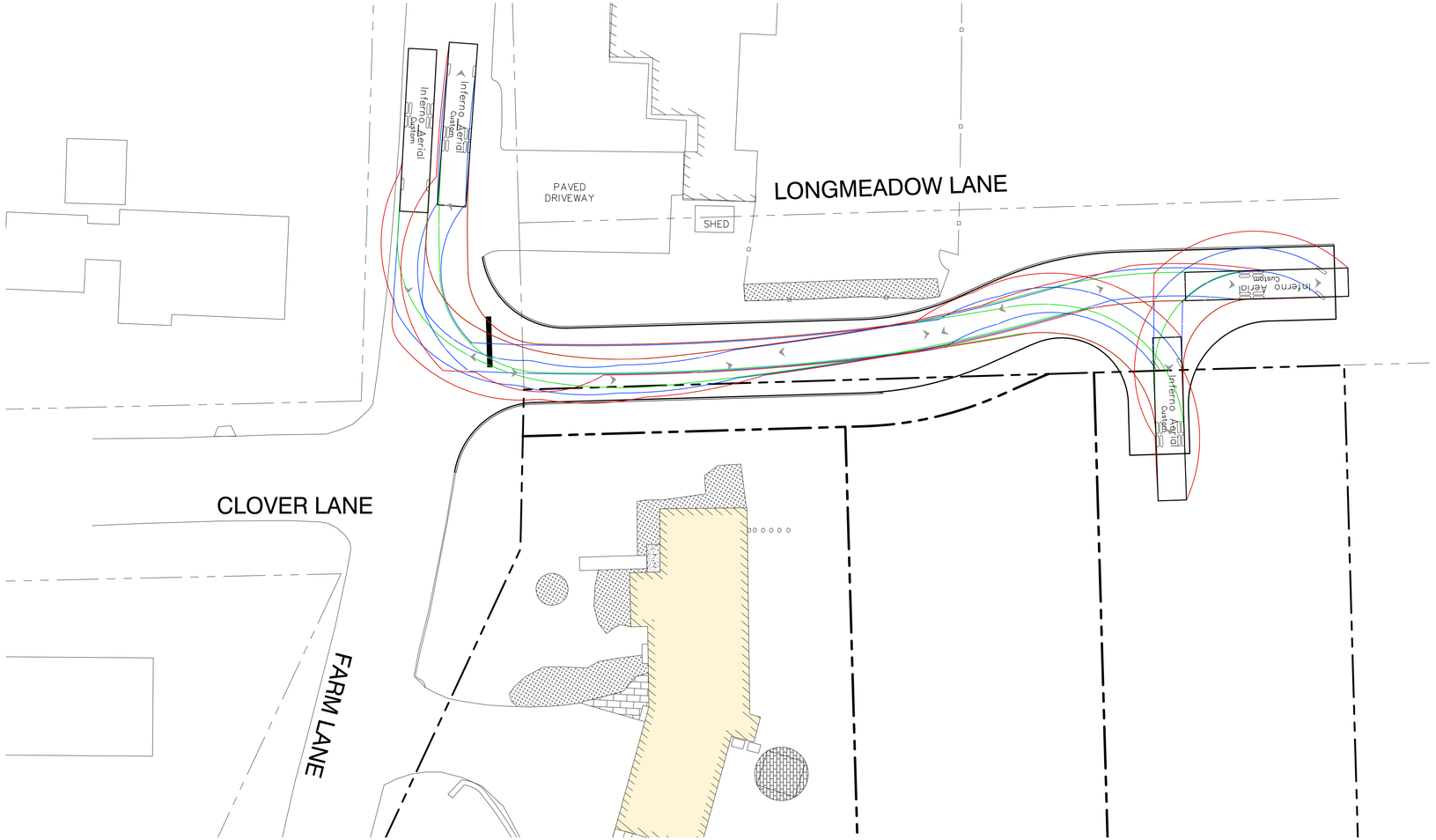
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
DETAIL SHEET

SHEET NUMBER:
D-6

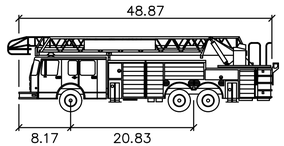


DESIGN VEHICLE PROFILE

FRONT TRACK

REAR TRACK

VEHICLE BODY/OVERHANG



Inferno Aerial

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 41.0

TURNING MOVEMENT NOTES

1. THE GRAPHIC VEHICLE PROFILE SHOULD NOT BE CONSIDERED A COMPLETELY ACCURATE VISUAL DEPICTION OF THE DESIGN VEHICLE AND IS ONLY INTENDED TO CONVEY A GENERIC REPRESENTATION OF ITS GENERAL APPEARANCE.
2. THE INFERNO AERIAL WAS SELECTED AS THE DESIGN VEHICLE DUE TO IT MEETING THE DIMENSIONS OF THE LARGEST VEHICLE EXPECTED TO ACCESS THE PROJECT SITE. THIS IS INTENDED TO DEMONSTRATE THAT THE PROJECT AS DESIGNED SHOULD BE ABLE TO ADEQUATELY ACCOMMODATE ANY VEHICLE UP TO AND INCLUDING THIS DESIGN VEHICLE.
3. TURNING MOTIONS SHOWN WERE GENERATED USING AUTOTURN SOFTWARE BY TRANSOFT SOLUTIONS, INC.

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE

20 10 20 40 80

(IN FEET)

ALTUS ENGINEERING
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ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
TECHNICAL ADVISORY COMMITTEE

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-SITE.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
VEHICULAR ACCESS PLAN

SHEET NUMBER:
1 OF 1

P5719

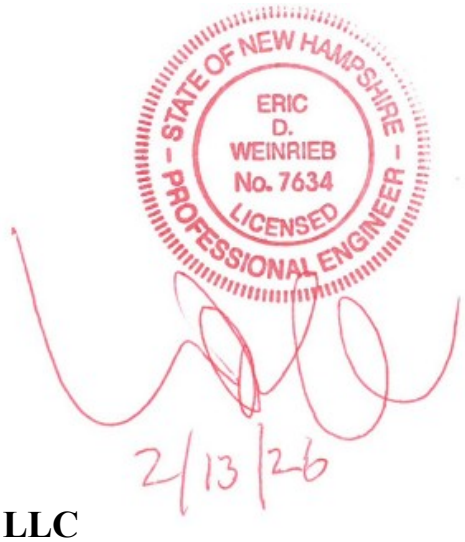
DRAINAGE ANALYSIS

FOR

86 FARM LANE SUBDIVISION

86 Farm Lane
Portsmouth, NH 03801

February 13, 2026



Prepared For:
Flipping Berger's, LLC
71 Bracket Road
Portsmouth, NH 03801

Prepared By:
Altus Engineering, LLC
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335

ALTUS ENGINEERING

Altus Project 5719

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- Calculation Methods
- Disclaimer
- Drainage Analysis
- Conclusions

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USGS Location Map

Section 3 Drainage Analysis, Pre-Development

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Section 5 Precipitation Table

Section 6 NRCS Soils Report

Section 7 Stormwater Operations and Maintenance Plan
Inspection Form
Stormwater Management Plan

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- Pre-Development Watershed and Soils Plan
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ALTUS ENGINEERING

Section 1

Narrative

ALTUS ENGINEERING

PROJECT DESCRIPTION

Flipping Berger's, LLC is proposing to construct a new subdivision behind an existing single-family residence at 86 Farm Lane in Portsmouth. The ±0.914-acre parcel is identified as Tax Map 236, Lot 74 and is located in the Single Residence B zone. The lot is located on Farm Lane between the Spaulding Turnpike and Woodbury Avenue and hosts a two-story residential home, pool, deck and patio.

The proposal includes the construction of a new 265'-long and 22'-wide public roadway and two new lots. The existing single-family residence is to remain. The existing pool, deck and patio will be removed to allow for the area behind the existing house to be subdivided. The new roadway will be located on City owned property currently identified as *Longmeadow Lane;* which is a paper street. Additional improvements to the site also include new water, electric and stormwater infrastructure.

Stormwater infrastructure will consist of one infiltration pond, one bioretention cell, one drain manhole and one deep sump catch basin. The infiltration pond and bioretention cell are utilizing infiltration to treat stormwater and control flows and each also includes a yard drain to be connected into the City's drainage system to handle flows during large storms. Additionally, the bioretention cell includes a perforated underdrain to collect stormwater after it has been treated. All stormwater runoff from new impervious surfaces will be directed to the infiltration pond, bioretention cell or deep sump catch basin. The proposed buildings will also utilize a stone drip edge to capture runoff from the roof. This proposed stormwater management system will provide adequate stormwater treatment and will meet or reduce peak flows leaving the site for each point of analysis except for at the City owned drainage system analysis point (POA #4), more information is provided under the Post-Development section of this report.

Site Soils

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey indicates that soil on this parcel is a mix of Udorthents, Smooth (299) and Urban Land – Canton (799). The Urban Land – Canton is certified as Hydraulic Soil Group A (HSG-A). Udorthents, Smooth, do not have a HSG provided by the NRCS, due to the lack of information regarding this soil type it has been assumed that this soil type is consistent with surrounding soil types and thus is modeled as HSG-A.

Two test pits were completed on the property for the design of the stormwater infrastructure. The test pits logged for the stormwater infrastructure design consisted of dark brown grass matt ranging from 0" to 9" below existing grade, a mix of red/brown loam and sand ranging from 9" to 33", and red/brown clayey loam ranging from 33" to 60". No ledge was observed in either of them. Groundwater was observed between 40" and 50" below existing grade and estimated seasonal high-water table was observed between 24" and 43" below existing grade.

Pre-Development (Existing Conditions)

The property is bounded by other residential properties to the northeast, Longmeadow Lane paper street to the southwest, woods to the northwest, and Farm Lane to south-southeast. Of the ±0.914-acre parcel, less than a half-acre has been disturbed by the existing building, pool, patio, deck and associated pavement; the remainder of the lot is a mix of lawn and some woods. There is no stormwater infrastructure currently located on the property or on Farm Lane.

Longmeadow Lane is a 50'-wide paper street is located between 86 & 88 Farm Lane; it extends approx. 800' to the northwest toward the intersection with Woodlawn Circle and Hillcrest Drive. The paper street has been partially developed by abutting residents near Farm Lane, consisting of a grave driveway, fencing, landscaping, a portion of a shed and a portion of driveway. Development of the paper street ends approx. 200' from Farm Lane and transitions into undeveloped woodland. There is an existing drain manhole located within the paper street right-of-way approx. 425' from Farm Lane. There is also an existing sewer system located within the right-of-way that is active.

The existing site hydrology is characterized by three sub-catchments as delineated on the accompanying "Pre-Development Watershed and Soils Plan". Site runoff was analyzed at three Point of Analysis (POA). The analysis area for the site expands beyond the limits of the existing lot and City paper street based on contours obtained by James Verra & Associates, Inc. from the Existing Conditions Plan and from contours provided by City of Portsmouth GIS showing off lot flows contributing to POA's on this site.

POA #1 is located in the southern corner of the analysis area near the intersection of Farm Lane and Clover Lane. The catchment that contributes to POA #1 consists of half of the existing house, the front yard of the existing house, part of Farm Lane and some areas of the adjacent properties. POA #2 is located along the northwest boundary of the analysis area along the 88 Farm Lane property line. The catchment that contributes to POA #2 consists a small portion of the side yard of the existing house and portion of the City's paper street. POA #3 is located in the northwest corner of the existing lot shared with the paper street at a large depression located on the property line that appears to be storing and infiltrating stormwater runoff. This existing natural depression in the land is modeled as Pond #3 in the pre-analysis. The catchment that contributes to POA #3 consists of half of the existing house, the entire backyard including the pool/patio area, a portion of the City's paper street, and the yards/roofs of abutting properties to the northeast that are fronted on Meadow Road. POA #4 is located at the City owned drain manhole located in the paper street right-of-way, no flows from the existing site discharge to the City drainage system.

Post-Development (Proposed Conditions)

The post-development conditions were analyzed at the same discharge points as the pre-development conditions. The post-development watersheds are delineated on the accompanying "Post-Development Watershed and Soils Plan". Modifications to the delineated areas and associated ground cover were made to sub-catchments to account for the improvements to the property.

The purpose of this project is to subdivide the existing lot at 86 Farm Lane into three lots and install a new road for the two newly created lots behind the existing home. The existing home is to remain and access is provided by Farm Lane. This project includes the design of the new road but does not include design for the development of the two new lots. Stormwater management areas will be installed on both of the new lots to control stormwater flows from the new lots and road. A drainage easement will granted to the City for maintenance of the stormwater infrastructure.

Impervious areas for the three lots was estimated/assumed to properly size the stormwater infrastructure. The impervious area for Lot 1, which includes the existing home, patio and driveway, is estimated to be 5,685 S.F.

For the two undeveloped lots, conceptual homes and driveways are shown. Conceptual house footprints were determined by sizing the home close to the maximum allowable building footprint (20%) for the lot. Both homes are assumed to have a footprint of 2,000 S.F. which is less than 20% for each lot. Conceptual driveways are designed to meet City of Portsmouth driveway standards and provide access to the conceptual homes.

Based on these assumptions, if the impervious area for any of the lots exceeds the impervious area assumed than an individual stormwater management plan for the lot will be required. Total impervious area assumed for Lot 2 is 2,660 S.F. and for Lot 3 it is 3,170 S.F.

As shown on the attached Post-Development Watershed and Soils Plan, the site was divided into five post-development sub-catchment areas. The catchment (1) that contributes to POA #1 in the pre-development conditions was reduced in size and remains the only catchment contributing to this POA. The catchment (2) that contributes to POA #2 in the pre-development conditions was reduced in size and remains the only catchment contributing to this POA.

The catchment (3) that contributes to POA #3 in the pre-development conditions was reduced in size and remains the only catchment contributing to this POA. This catchment includes the existing natural depression identified in the pre-development conditions that is POA #3. The natural depression will be expanded within the limits of the existing lot and yard drain connected

to the City's drainage system will be installed. No changes to the natural depression shall occur on abutting property. Furthermore, **Table 2** below shows the difference in water elevation in the natural depression from pre to post conditions. This table demonstrates that the water level in the depression will not be adversely affected in post-development conditions.

In the pre-development conditions, no existing flows from the lot are contributing to POA #4, however, post-development conditions redirect a considerable amount of the analysis area to this POA. Catchments 4.1 and 4.2 contribute directly to POA #4 in post-development conditions; these catchments include the majority of the proposed roadway, the bioretention cell and deep sump catch basin. POA #3 indirectly contributes to POA #4 as well, through the utilization of the yard drain to be installed in the natural depression and connected into the closed drainage system discharging to the City's drain manhole (POA #4). No flows from POA #3 are expected to discharge to the City's drainage system up to the 25-year storm. The yard drain is being utilized as an emergency backup to protect abutting properties. Stormwater treatment is being achieved through the use of an infiltration pond, bioretention cell and deep sump catch basins. Stone drip edges may be installed around the homes for Lots 2 and 3 to provide additional stormwater management and treatment but are not required as part of the designed stormwater management.

Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plan set. Recommended erosion control measures are based upon the latest edition of the "*New Hampshire Stormwater Manual* prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, & 25 - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change. A time span of 0 to 48 hours was analyzed at 0.01-hour increments.

Disclaimer

Altus Engineering notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. **Table 1** below compares pre- and post-development peak rates at the Points of Analysis identified on the plans for the 2, 10 & 25-year storm events. **Table 2** below compares the water elevation in the existing natural depression from pre- to post-development conditions for the 2, 10 & 25-year storm events.

Table 1 - Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Year Storm (3.06-inch)	10-Year Storm (5.59-inch)	25-Year Storm (7.08-inch)
POA 1			
PRE	0.17	0.93	1.49
POST	0.02	0.07	0.11
CHANGE	-0.15	-0.86	-1.38
POA 2			
PRE	0.00	0.05	0.18
POST	0.00	0.02	0.08
CHANGE	0.00	-0.03	-0.10
POA 3			
PRE	0.00	0.00	0.00
POST	0.00	0.00	0.00
CHANGE	0.00	0.00	0.00
POA 4			
PRE	0.00	0.00	0.00
POST	0.18	1.79	3.42
CHANGE	0.18	1.79	3.42

As the above **Table 1** demonstrates, the proposed peak rates of runoff at all points of analysis will match or be decreased from the existing conditions for POA's #1, 2 & 3. POA #4 will have an increased peak rate of runoff as no runoff contributed to this area in the pre-development conditions. The City drainage system that is receiving the flow at POA #4 is a culvert that is located perpendicular to the paper street and connects a low-lying area on the northeast side of the paper street to the southwest side of the street. Based on the City's GIS layers, this drainage system appears to collect several other upstream catchments, consisting of both closed and open drainage systems. Altus Engineering believes that the City drainage system can handled the minor increase in flow rate at POA #4.

Table 2 – Stormwater Elevation Comparison
Natural Depression Water Elevation for Type III 24-Hour Storm Events

Storm Size	Pre-Development Peak Elevation (ft)	Post-Development Peak Elevation (ft)	Change in Elevation (ft)
2-Year	38.04	38.00	-0.04
10-Year	39.00	38.48	-0.52
25-Year	39.69	38.96	-0.73

Table 2 above demonstrates that the water elevation in the modified natural depression will not be adversely affected by the proposed improvements and that water levels will remain close to or less than pre-development conditions.

CONCLUSION

This proposed development of the property located at 86 Farm Lane in Portsmouth, New Hampshire will not have adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Additionally, runoff from impervious surfaces will be treated using the infiltration pond, bioretention cell and deep sump catch basin to improve the quality of runoff leaving the site. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control.

Section 2

Aerial Photo and USGS Map

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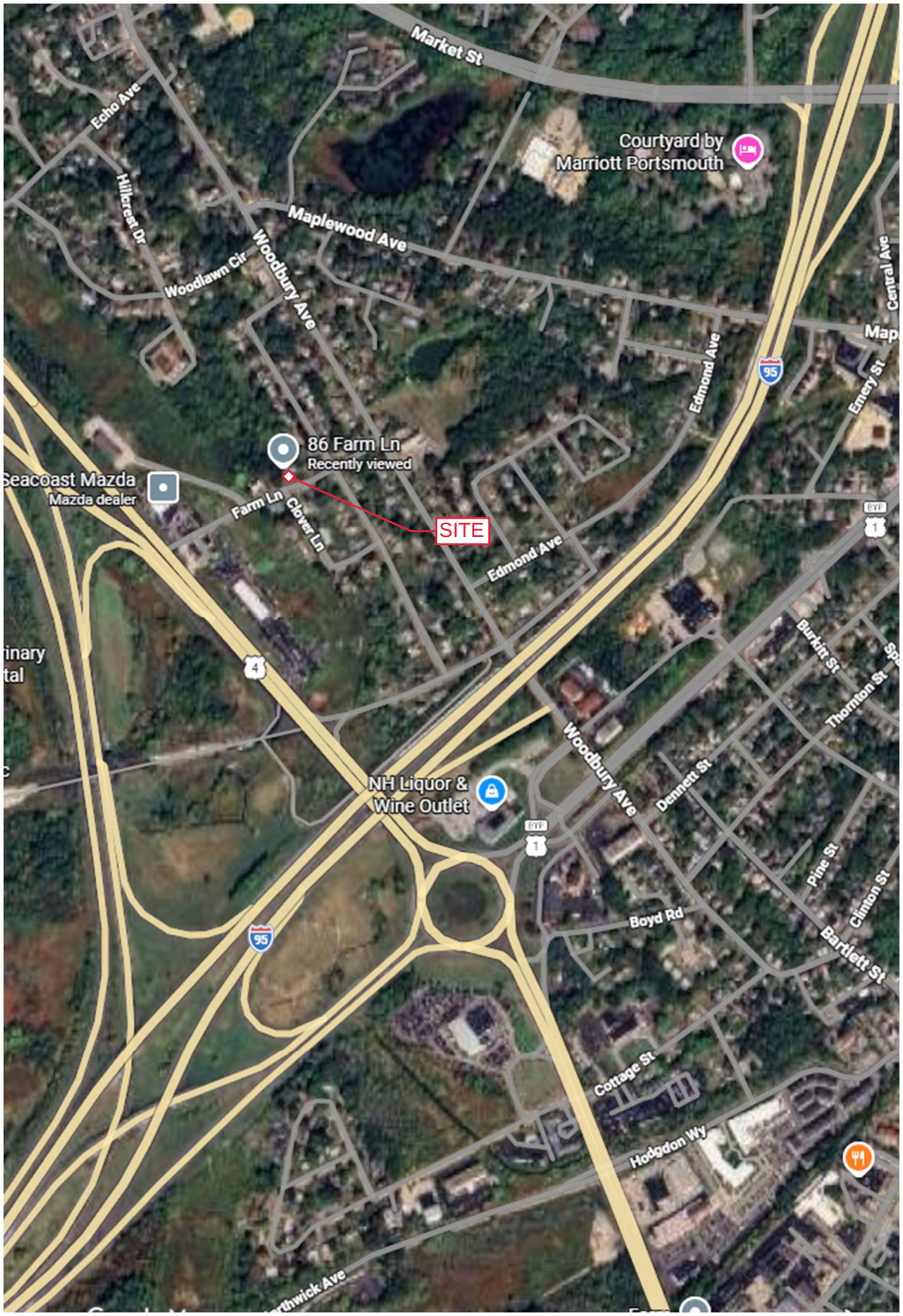
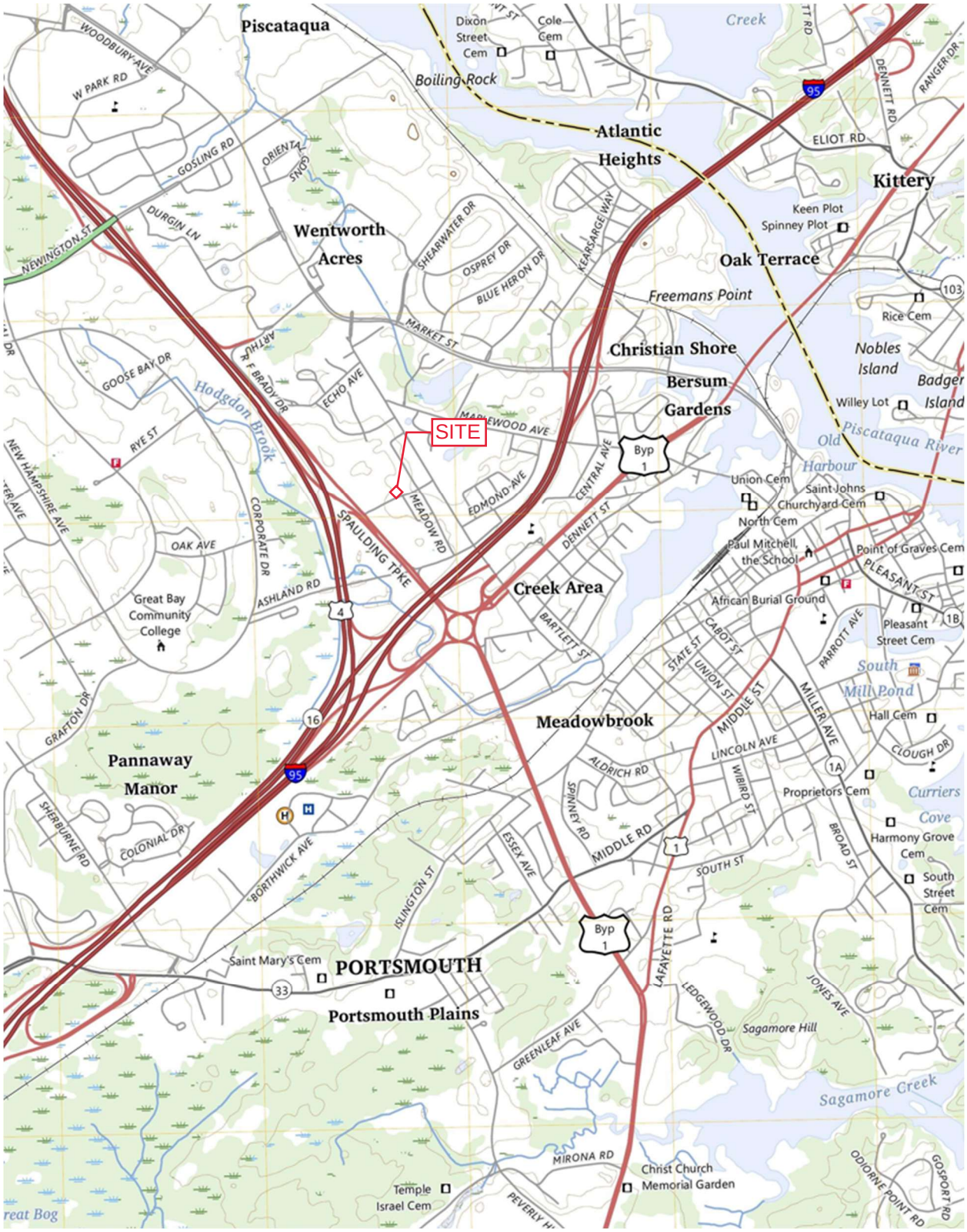

Market St
Echo Ave
Hillcrest Dr
Woodlawn Cir
Woodbury Ave
Maplewood Ave
Courtyard by
Marriott Portsmouth
Edmond Ave
Central Ave
Emery St
95
86 Farm Ln
Recently viewed
Seacoast Mazda
Mazda dealer
Farm Ln
Clover Ln
SITE
Edmond Ave
BYP
1
4
Burkitt St
Thornton St
Woodbury Ave
NH Liquor &
Wine Outlet
Dennett St
Pine St
Clinton St
Boyd Rd
Bartlett St
Cottage St
Hodgdon Wy


SITE
Piscataqua
Boiling Rock
Atlantic Heights
Kittery
Wentworth Acres
Oak Terrace
Freemans Point
Christian Shore
Bersum Gardens
Nobles Island
Badger Island
Old Piscataqua River
Harbour
Creek Area
Meadowbrook
Pannaway Manor
PORTSMOUTH
Portsmouth Plains
Great Bay Community College
Hodgdon Brook
Sagamore Hill
Sagamore Creek
South Mill Pond
Curriers Cove
Dixon Street Cem
Cole Cem
Keen Plot
Spinney Plot
Rice Cem
Willey Lot
Union Cem
Saint Johns Churchyard Cem
North Cem
Paul Mitchell, the School
Point of Graves Cem
African Burial Ground
Pleasant Street Cem
Hall Cem
Proprietors Cem
Harmony Grove Cem
South Street Cem
Saint Mary's Cem
Temple Israel Cem
Christ Church Memorial Garden
Byp 1
95
103
4
16
33
1
1A
1B
WOODBURY AVE
W PARK RD
GOSLING RD
DURGIN LN
NEWINGTON ST
ORIENTAL GDNS
SHEARWATER DR
OSPREY DR
BLUE HERON DR
KEARSARGE WAY
MARKET ST
ARTHUR R F BRADY DR
ECHO AVE
GOOSE BAY DR
RYE ST
NEW HAMPSHIRE AVE
CORPORATE DR
OAK AVE
ASHLAND RD
SPAULDING TPKE
MEADOW RD
EDMOND AVE
MAPLEWOOD AVE
CENTRAL AVE
DENNETT ST
BARTLETT ST
STATE ST
CABOT ST
UNION ST
MIDDLE ST
MILLER AVE
PARROTT AVE
PLEASANT ST
LINCOLN AVE
WIBIRD ST
ALDRICH RD
SPINNEY RD
MIDDLE RD
SOUTH ST
BROAD ST
CLOUGH DR
GRAFTON DR
SHERBURNE RD
COLONIAL DR
BORTHWICK AVE
ISLINGTON ST
ESSEX AVE
LAFAYETTE RD
LEDGEWOOD DR
JONES AVE
GREENLEAF AVE
MIRONA RD
PEVERLY HILL
ODIORNE POINT RD
GOSPORT RD
DENNETT RD
RANGER DR
ELIOT RD
Creek

Section 3

Drainage Calculations

Pre-Development:
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

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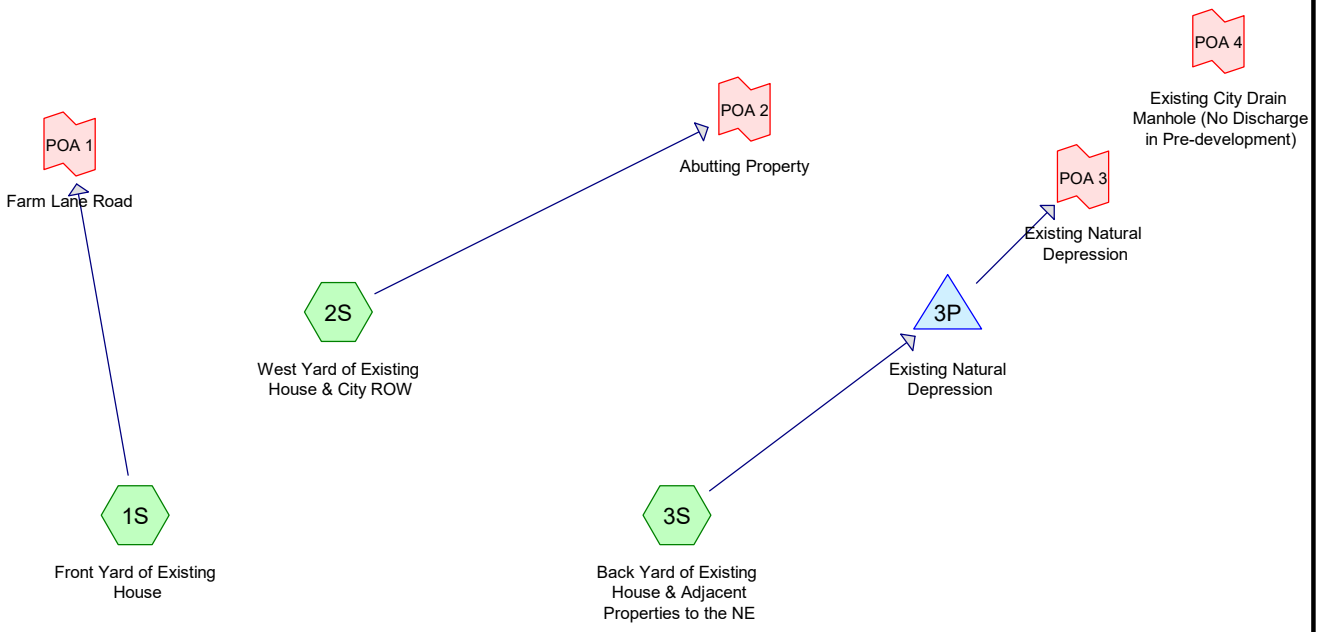

Subcat Reach Pond Link

Routing Diagram for 5719-PRE
Prepared by Altus Engineering, Printed 2/10/2026
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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Front Yard of Existing Runoff Area=18,227 sf 43.70% Impervious Runoff Depth=0.50"
Flow Length=296' Tc=6.0 min CN=64 Runoff=0.17 cfs 0.017 af

Subcatchment 2S: West Yard of Existing Runoff Area=10,114 sf 11.00% Impervious Runoff Depth=0.01"
Flow Length=215' Tc=6.0 min CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Back Yard of Existing Runoff Area=69,276 sf 11.36% Impervious Runoff Depth=0.01"
Flow Length=407' Tc=6.0 min CN=43 Runoff=0.00 cfs 0.002 af

Pond 3P: Existing Natural Depression Peak Elev=38.04' Storage=19 cf Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Link POA 1: Farm Lane Road Inflow=0.17 cfs 0.017 af
Primary=0.17 cfs 0.017 af

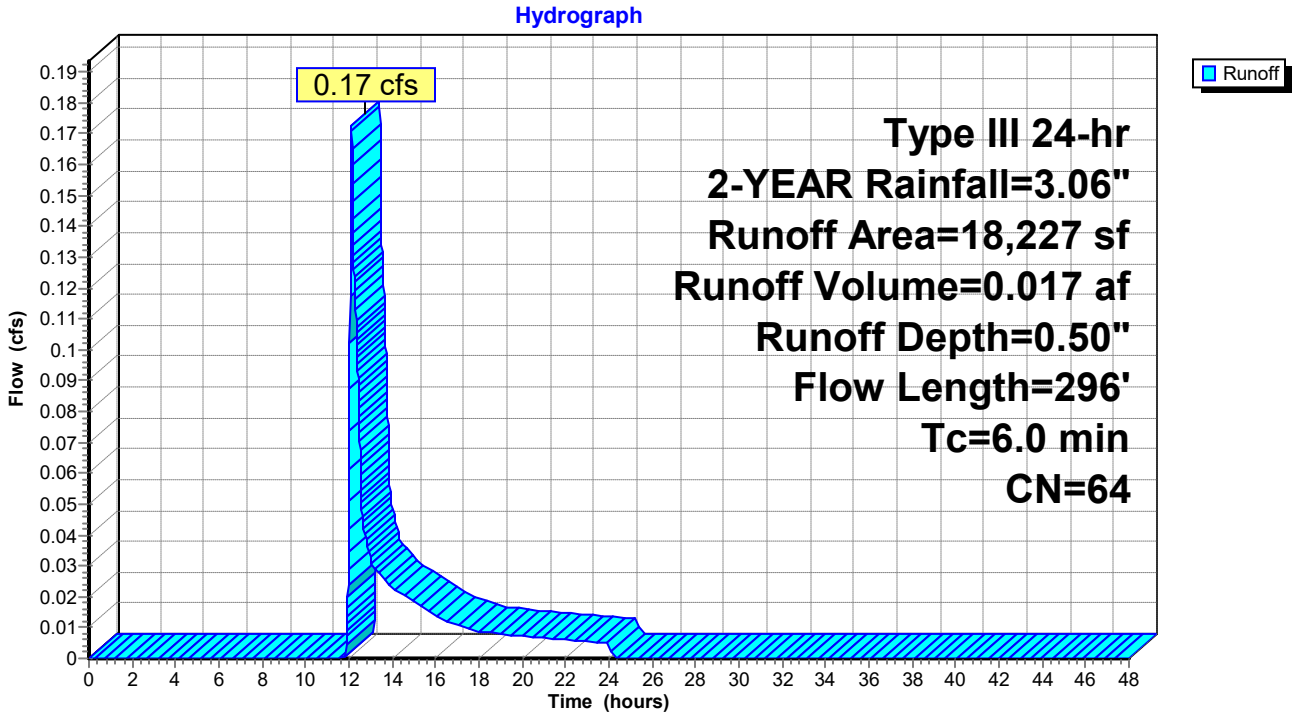
Link POA 2: Abutting Property Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

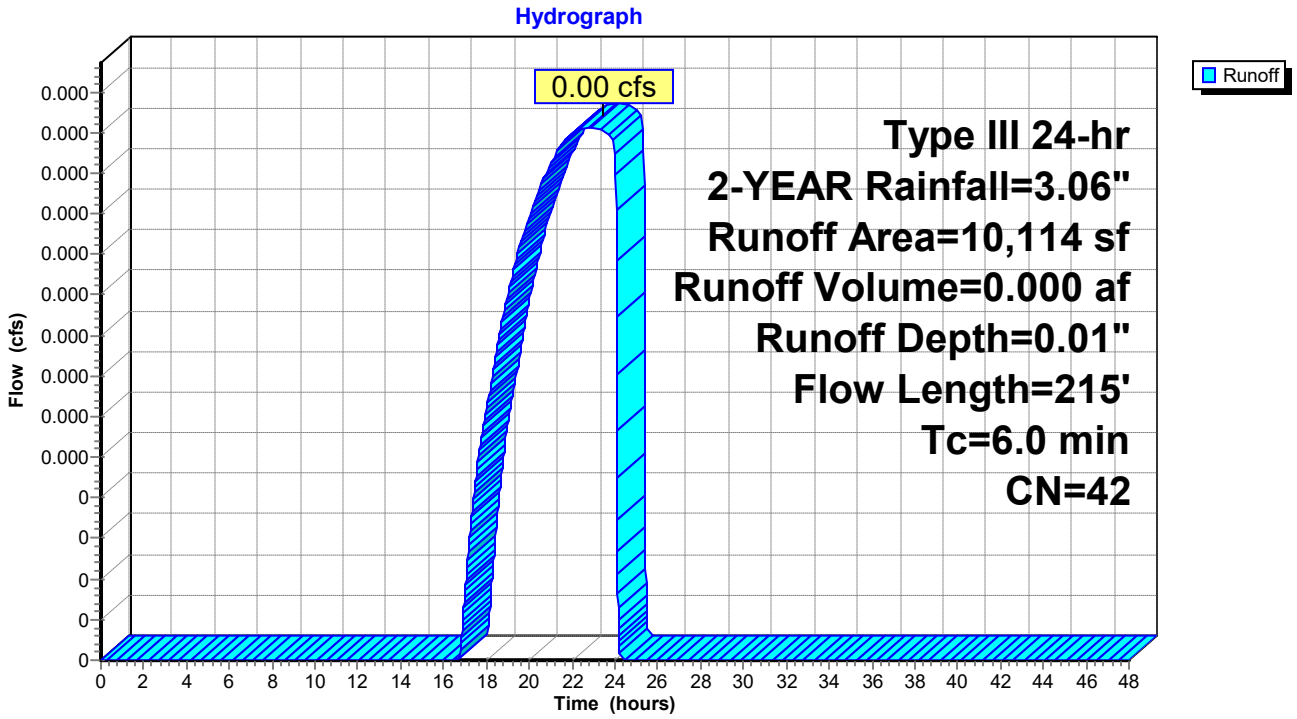
Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)
Primary=0.00 cfs 0.000 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.019 af Average Runoff Depth = 0.10"
82.64% Pervious = 1.852 ac 17.36% Impervious = 0.389 ac

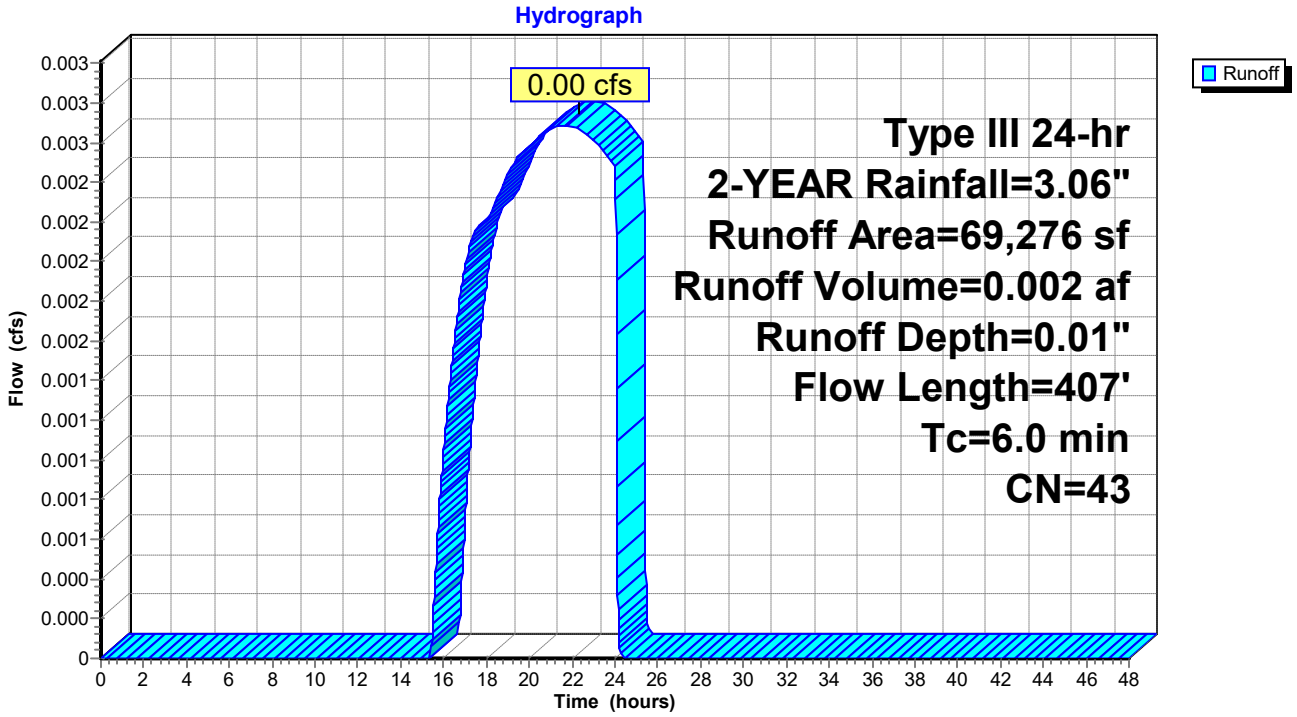
Subcatchment 1S: Front Yard of Existing House



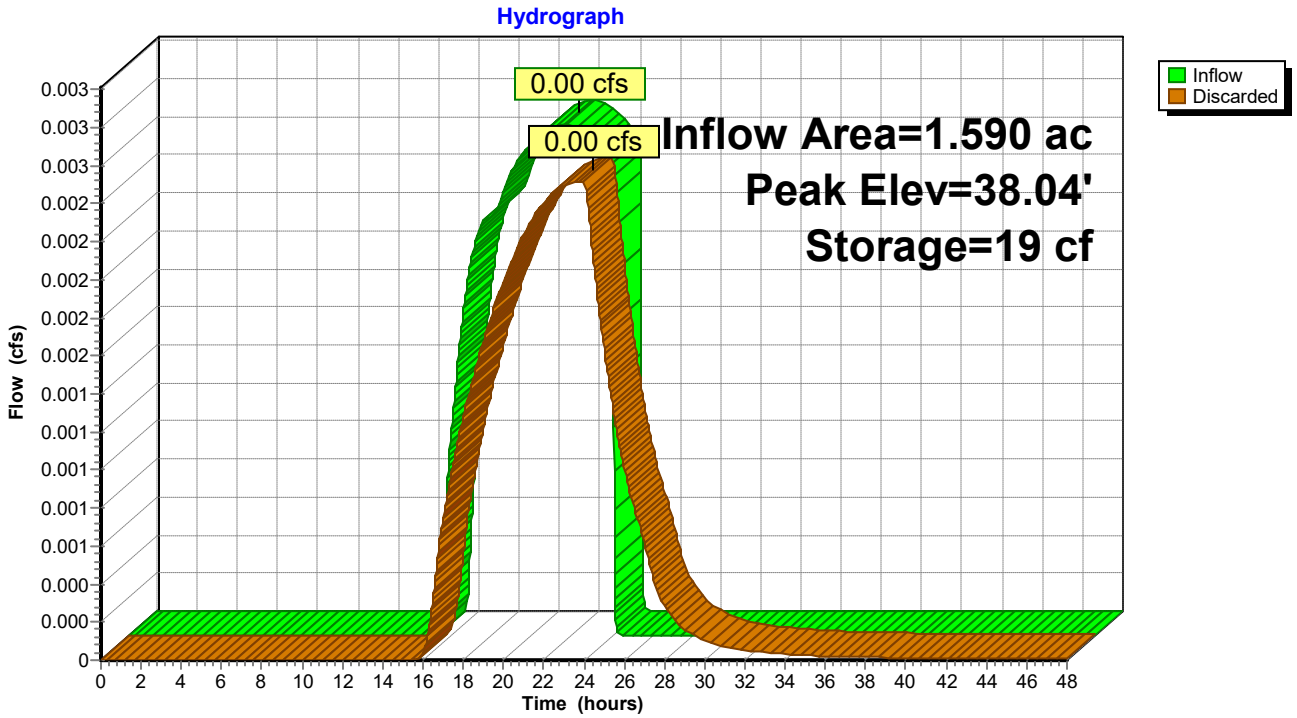
Subcatchment 2S: West Yard of Existing House & City ROW



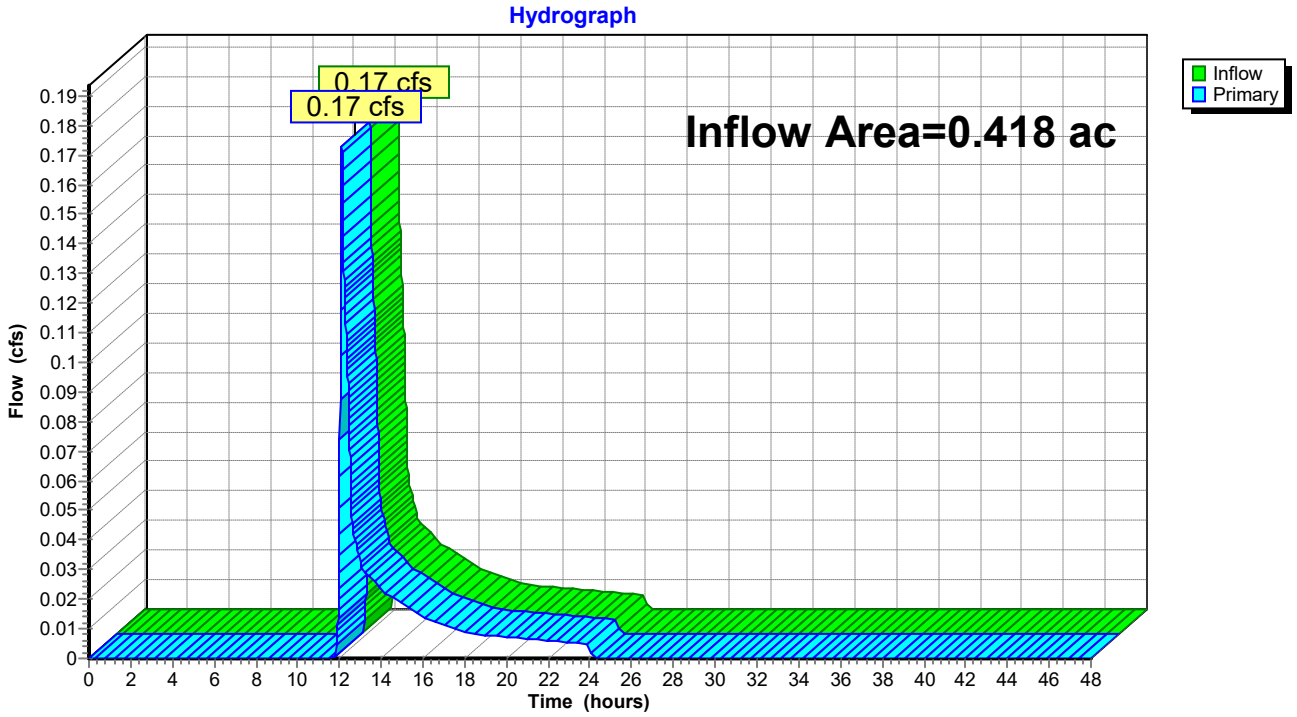
Subcatchment 3S: Back Yard of Existing House & Adjacent Properties to the NE



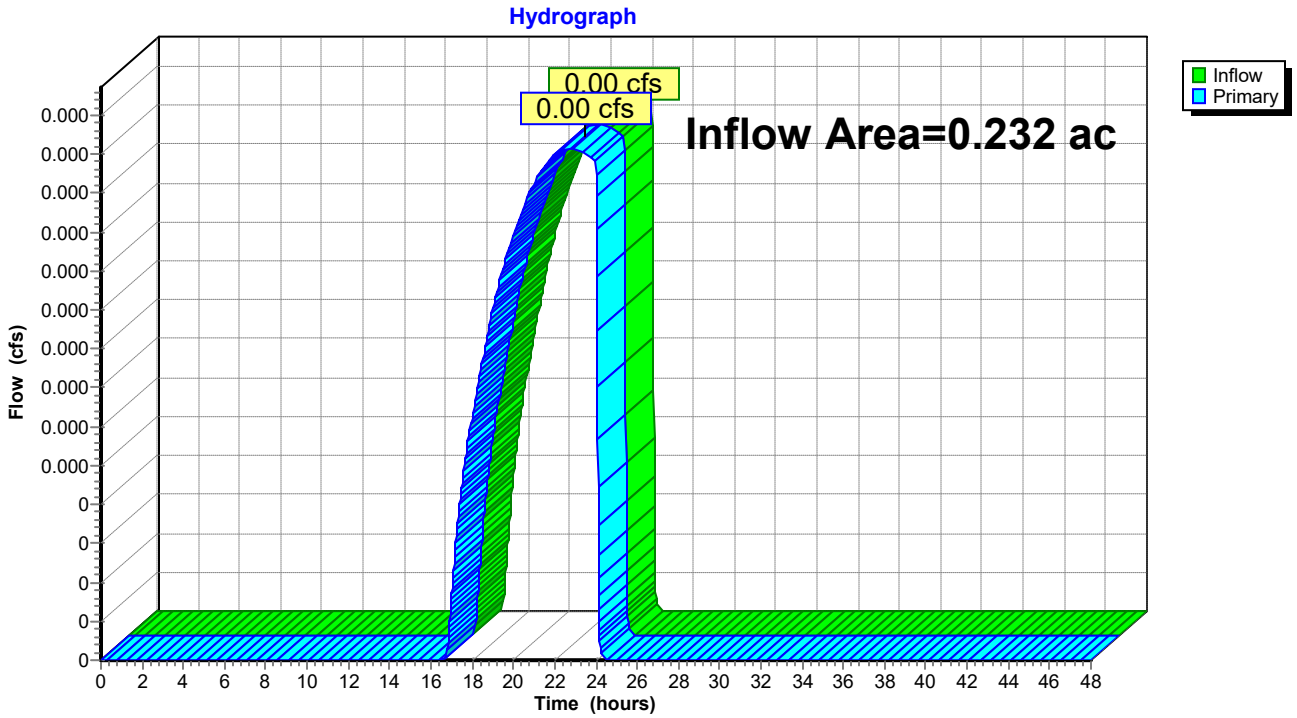
Pond 3P: Existing Natural Depression



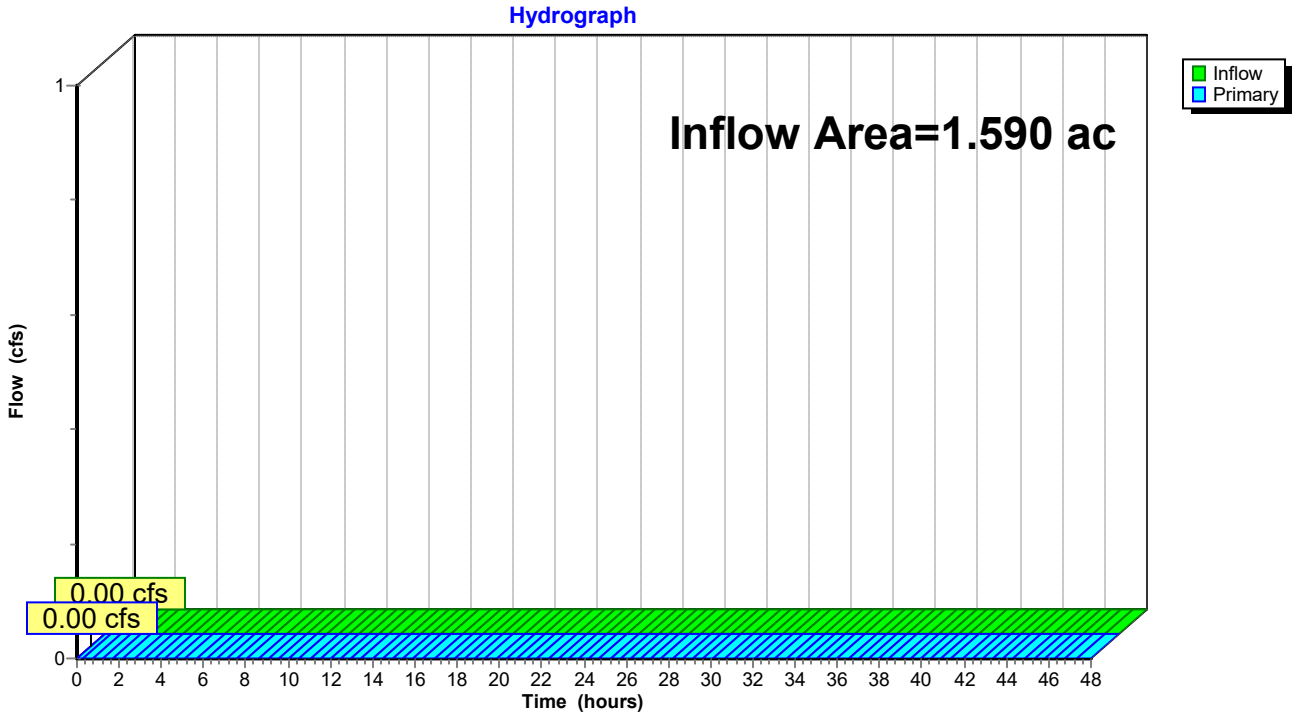
Link POA 1: Farm Lane Road



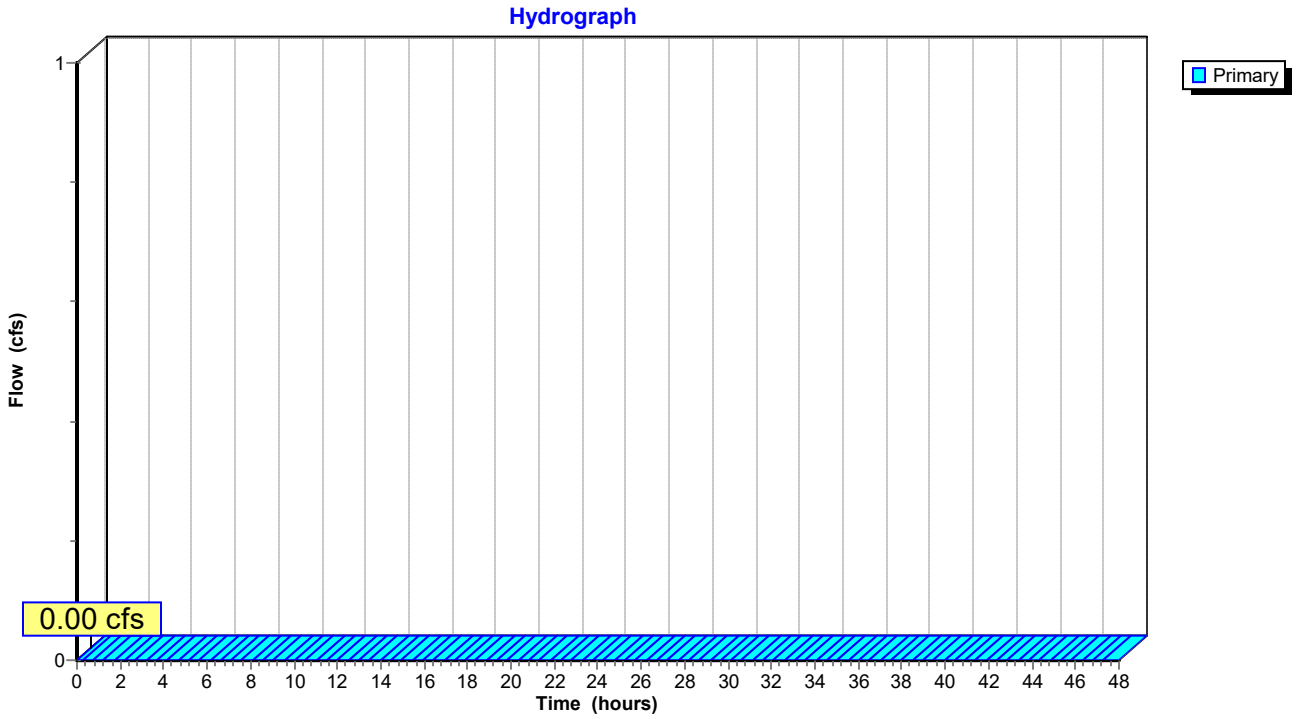
Link POA 2: Abutting Property

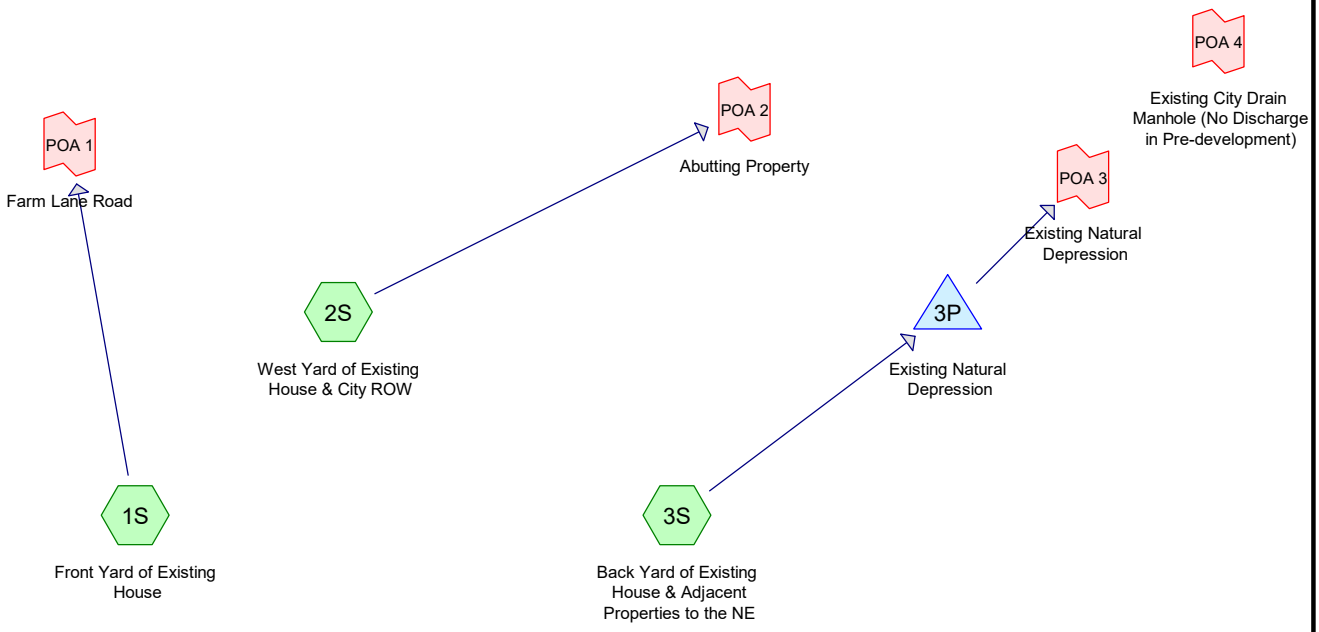


Link POA 3: Existing Natural Depression



Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)





Subcat Reach Pond Link

Routing Diagram for 5719-PRE
Prepared by Altus Engineering, Printed 2/10/2026
HydroCAD® 10.20-8a s/n 01222 © 2025 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.201	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
0.253	98	Paved parking, HSG A (1S, 2S, 3S)
0.136	98	Roofs, HSG A (1S, 2S, 3S)
0.651	30	Woods, Good, HSG A (1S, 2S, 3S)
2.241	**47**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.241	HSG A	1S, 2S, 3S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.241		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Front Yard of Existing Runoff Area=18,227 sf 43.70% Impervious Runoff Depth=1.98"
Flow Length=296' Tc=6.0 min CN=64 Runoff=0.93 cfs 0.069 af

Subcatchment 2S: West Yard of Existing Runoff Area=10,114 sf 11.00% Impervious Runoff Depth=0.48"
Flow Length=215' Tc=6.0 min CN=42 Runoff=0.05 cfs 0.009 af

Subcatchment 3S: Back Yard of Existing Runoff Area=69,276 sf 11.36% Impervious Runoff Depth=0.53"
Flow Length=407' Tc=6.0 min CN=43 Runoff=0.40 cfs 0.071 af

Pond 3P: Existing Natural Depression Peak Elev=39.00' Storage=913 cf Inflow=0.40 cfs 0.071 af
Outflow=0.09 cfs 0.071 af

Link POA 1: Farm Lane Road Inflow=0.93 cfs 0.069 af
Primary=0.93 cfs 0.069 af

Link POA 2: Abutting Property Inflow=0.05 cfs 0.009 af
Primary=0.05 cfs 0.009 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)
Primary=0.00 cfs 0.000 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.149 af Average Runoff Depth = 0.80"
82.64% Pervious = 1.852 ac 17.36% Impervious = 0.389 ac

Summary for Subcatchment 1S: Front Yard of Existing House

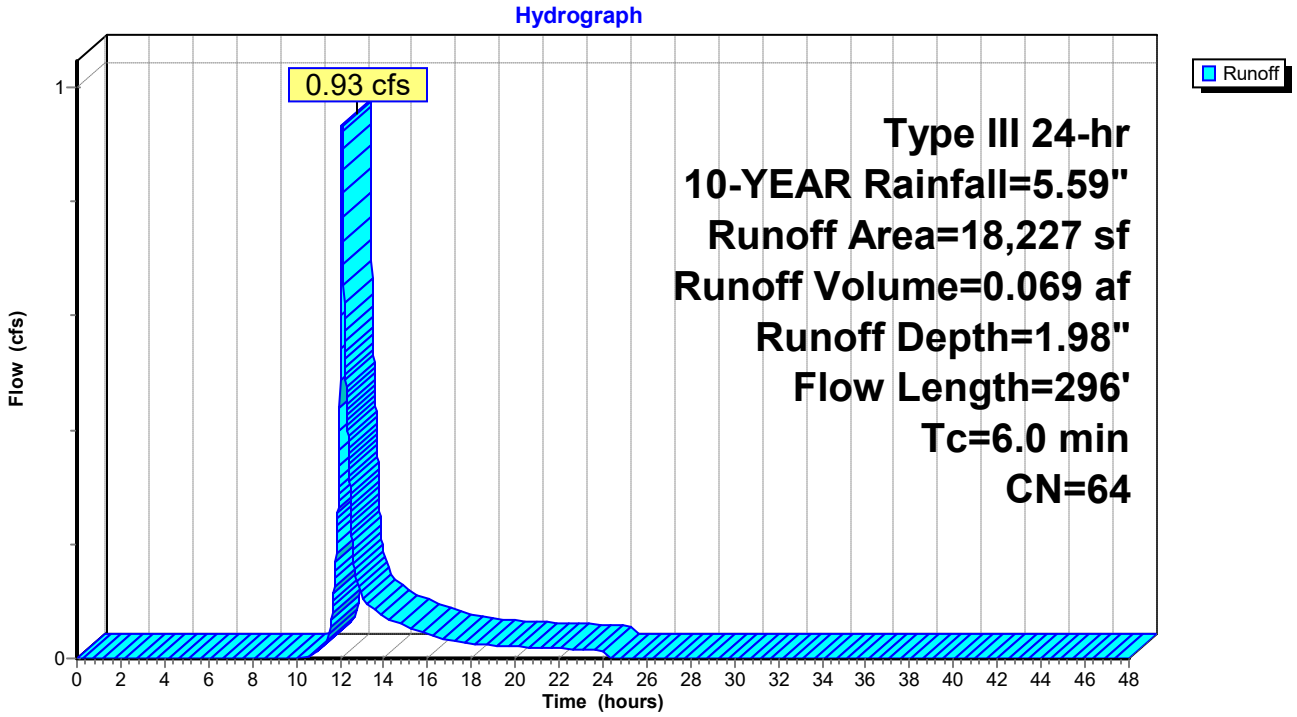
Runoff = 0.93 cfs @ 12.09 hrs, Volume= 0.069 af, Depth= 1.98"
Routed to Link POA 1 : Farm Lane Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
1,635	98	Roofs, HSG A
6,330	98	Paved parking, HSG A
8,838	39	>75% Grass cover, Good, HSG A
1,424	30	Woods, Good, HSG A
18,227	64	Weighted Average
10,262		56.30% Pervious Area
7,965		43.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	13	0.5000	3.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
0.4	62	0.1130	2.35		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.2	15	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	30	0.0580	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	110	0.0340	3.74		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.4	25	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0210	2.33		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	21	0.0600	1.71		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	8	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
2.3	296	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: Front Yard of Existing House



Summary for Subcatchment 2S: West Yard of Existing House & City ROW

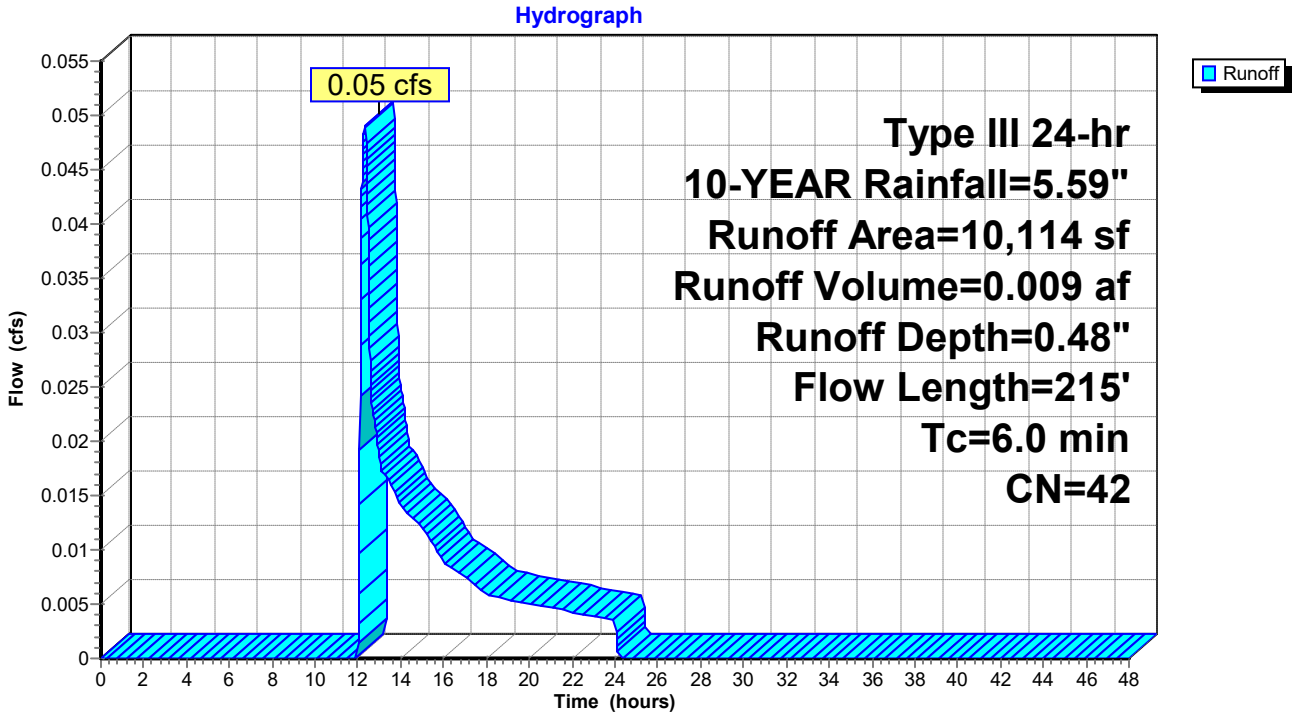
Runoff = 0.05 cfs @ 12.31 hrs, Volume= 0.009 af, Depth= 0.48"
Routed to Link POA 2 : Abutting Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
184	98	Roofs, HSG A
929	98	Paved parking, HSG A
5,516	39	>75% Grass cover, Good, HSG A
3,485	30	Woods, Good, HSG A
10,114	42	Weighted Average
9,001		89.00% Pervious Area
1,113		11.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	13	0.5000	3.24		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
0.5	56	0.0850	2.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	12	0.0420	3.30		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	12	0.0420	1.43		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.0680	1.30		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.8	100	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.1590	1.99		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.8	215	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 2S: West Yard of Existing House & City ROW



Summary for Subcatchment 3S: Back Yard of Existing House & Adjacent Properties to the NE

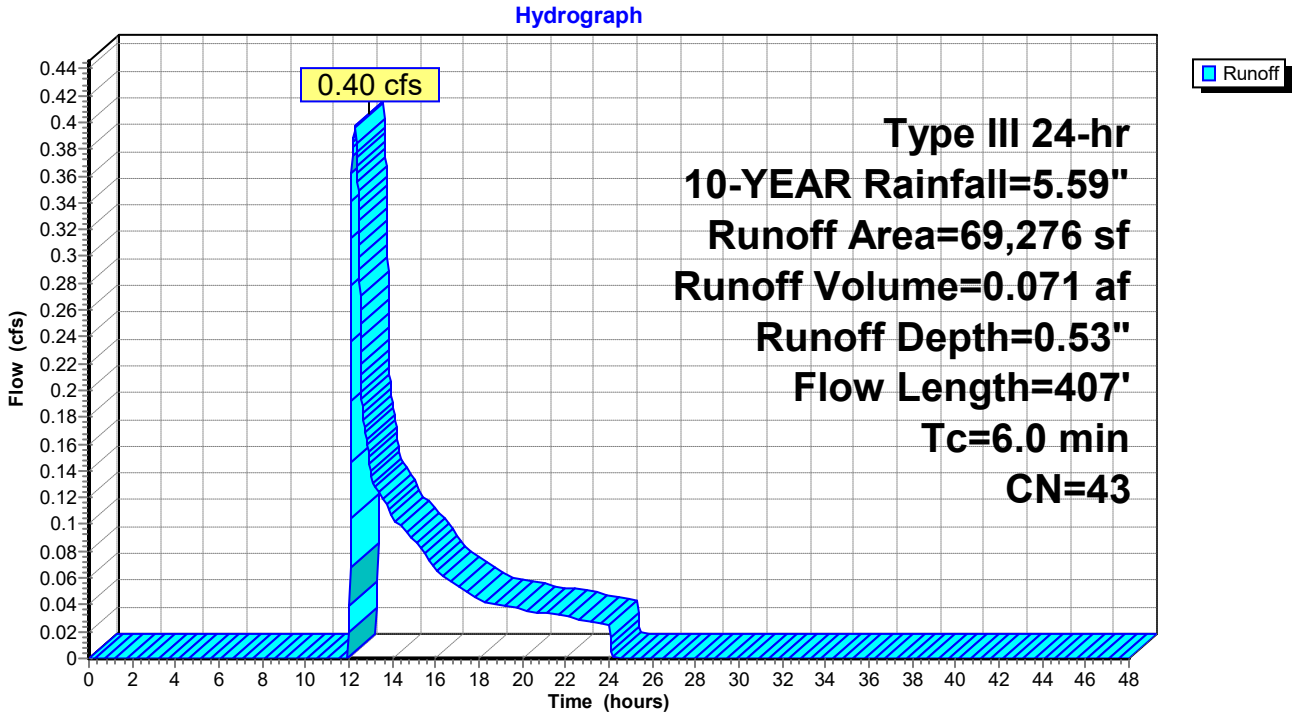
Runoff = 0.40 cfs @ 12.29 hrs, Volume= 0.071 af, Depth= 0.53"
Routed to Pond 3P : Existing Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
4,095	98	Roofs, HSG A
3,772	98	Paved parking, HSG A
37,970	39	>75% Grass cover, Good, HSG A
23,439	30	Woods, Good, HSG A
69,276	43	Weighted Average
61,409		88.64% Pervious Area
7,867		11.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.5000	3.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
0.5	63	0.0990	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0650	1.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.8	48	0.0420	1.02		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.1170	2.39		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	108	0.0670	1.81		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	56	0.0450	1.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
4.4	407	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3S: Back Yard of Existing House & Adjacent Properties to the NE



Summary for Pond 3P: Existing Natural Depression

Inflow Area = 1.590 ac, 11.36% Impervious, Inflow Depth = 0.53" for 10-YEAR event
Inflow = 0.40 cfs @ 12.29 hrs, Volume= 0.071 af
Outflow = 0.09 cfs @ 15.09 hrs, Volume= 0.071 af, Atten= 78%, Lag= 168.2 min
Discarded = 0.09 cfs @ 15.09 hrs, Volume= 0.071 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 39.00' @ 15.09 hrs Surf.Area= 1,452 sf Storage= 913 cf

Plug-Flow detention time= 163.4 min calculated for 0.071 af (100% of inflow)
Center-of-Mass det. time= 163.3 min (1,104.0 - 940.8)

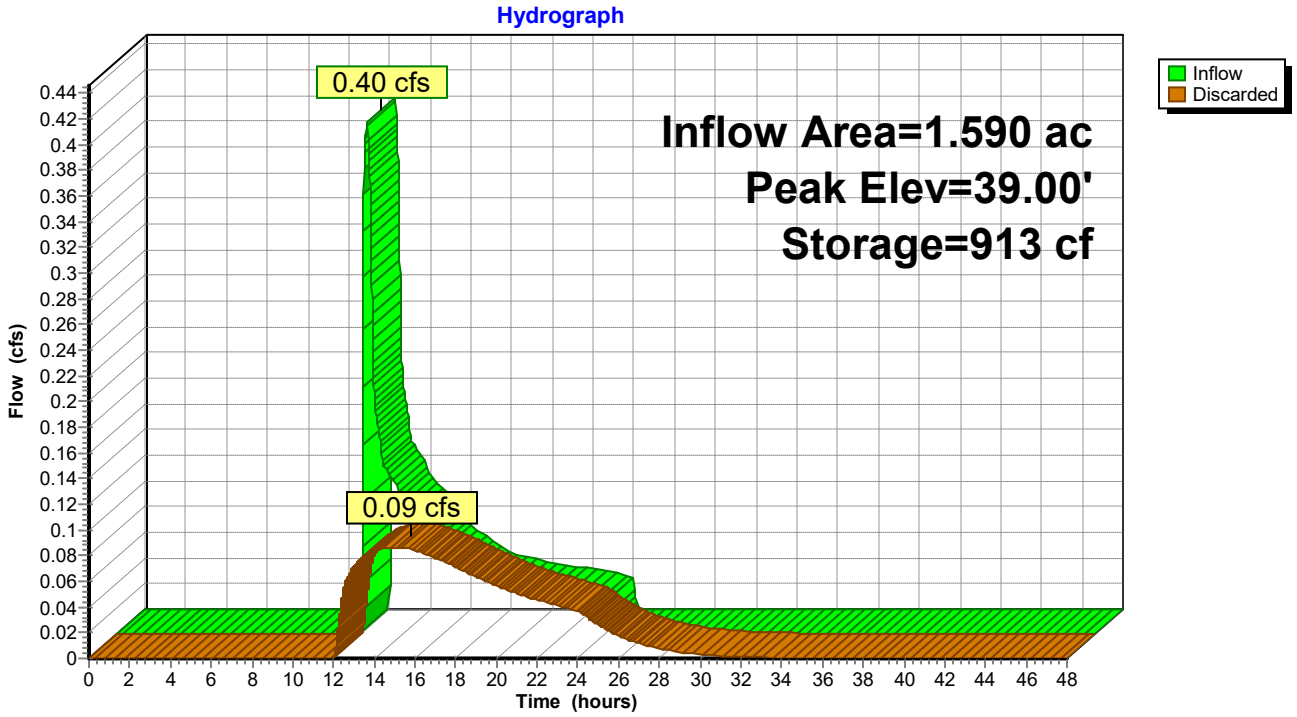
Volume	Invert	Avail.Storage	Storage Description
#1	38.00'	3,129 cf	**Existing Natural Depression (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.00	461	0	0	461
39.00	1,447	908	908	1,453
40.00	3,097	2,220	3,129	3,111

Device	Routing	Invert	Outlet Devices
#1	Discarded	38.00'	**3.750 in/hr Exfiltration over Wetted area above 38.00'** Excluded Wetted area = 461 sf Phase-In= 0.01'

Discarded OutFlow Max=0.09 cfs @ 15.09 hrs HW=39.00' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.09 cfs)

Pond 3P: Existing Natural Depression

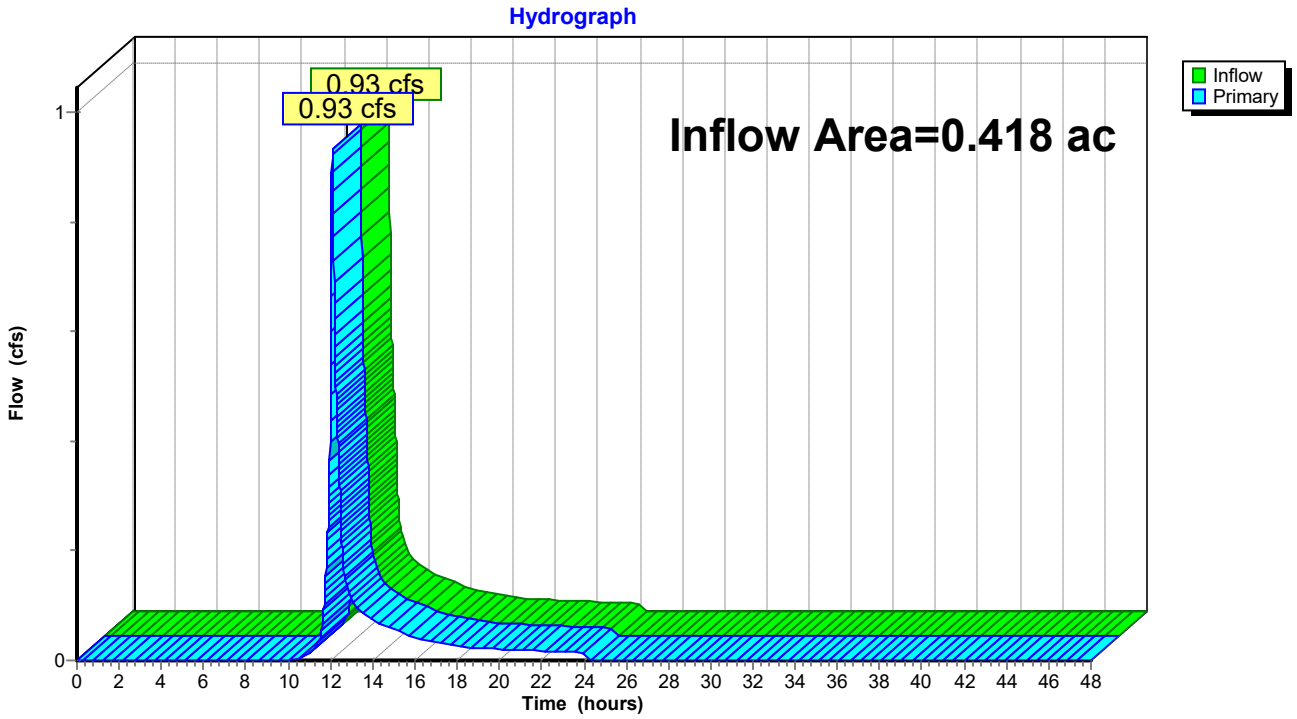


Summary for Link POA 1: Farm Lane Road

Inflow Area = 0.418 ac, 43.70% Impervious, Inflow Depth = 1.98" for 10-YEAR event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.069 af
Primary = 0.93 cfs @ 12.09 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 1: Farm Lane Road

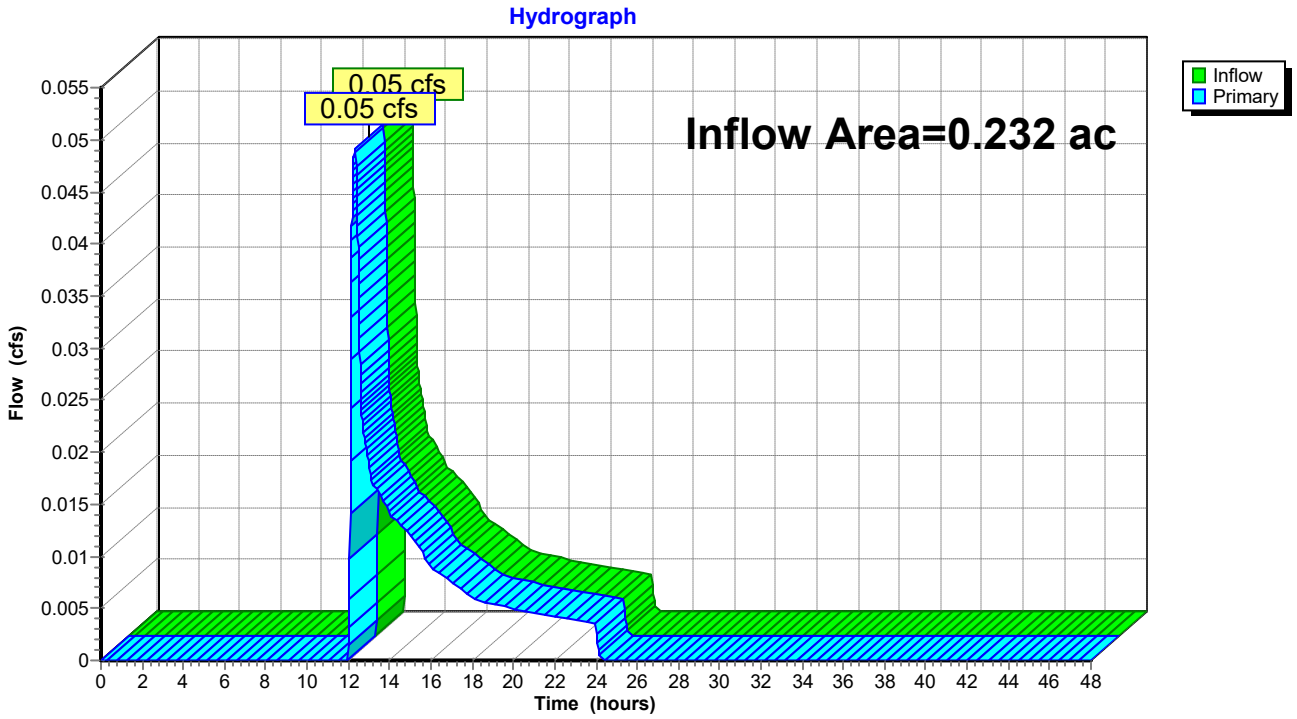


Summary for Link POA 2: Abutting Property

Inflow Area = 0.232 ac, 11.00% Impervious, Inflow Depth = 0.48" for 10-YEAR event
Inflow = 0.05 cfs @ 12.31 hrs, Volume= 0.009 af
Primary = 0.05 cfs @ 12.31 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 2: Abutting Property

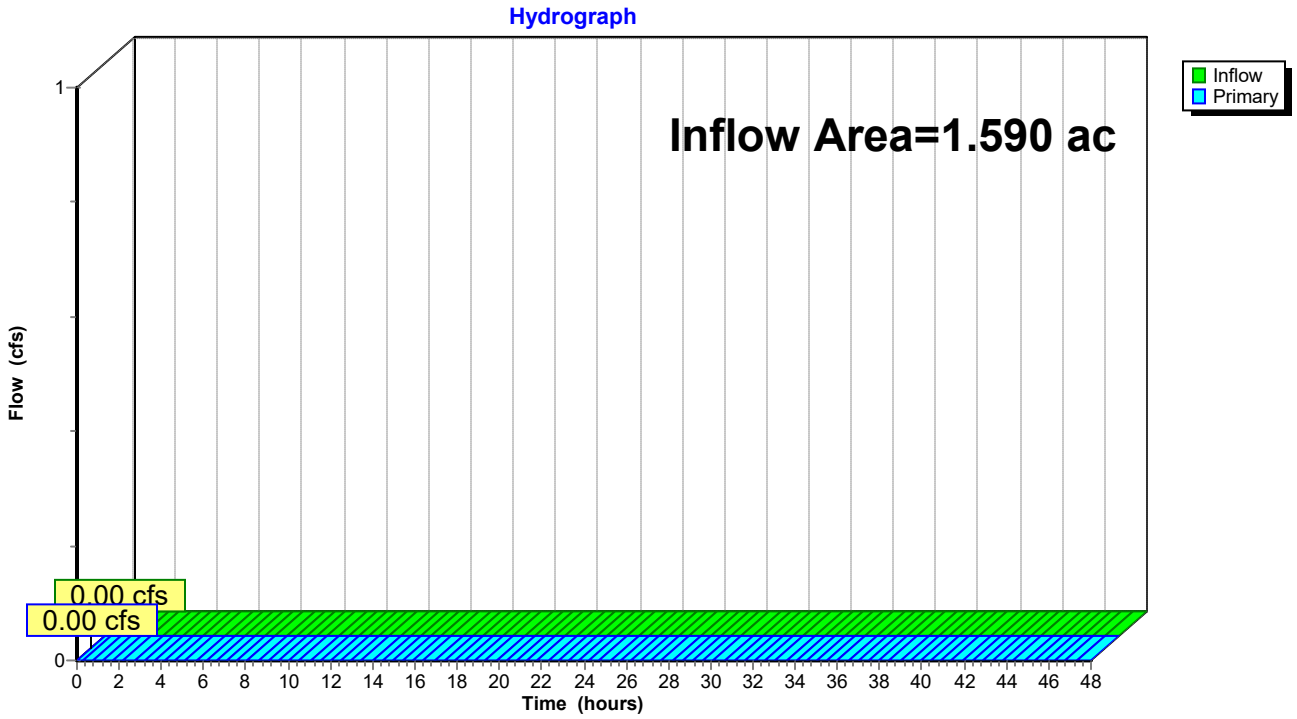


Summary for Link POA 3: Existing Natural Depression

Inflow Area = 1.590 ac, 11.36% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 3: Existing Natural Depression

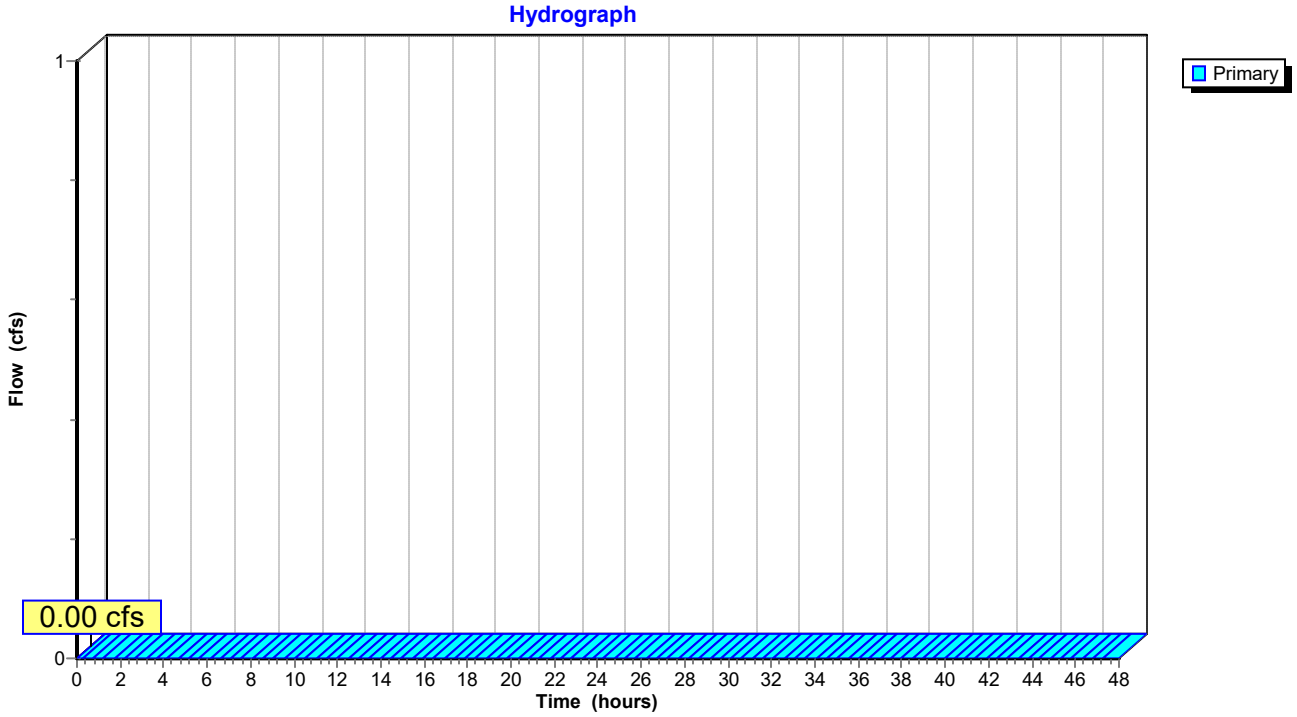


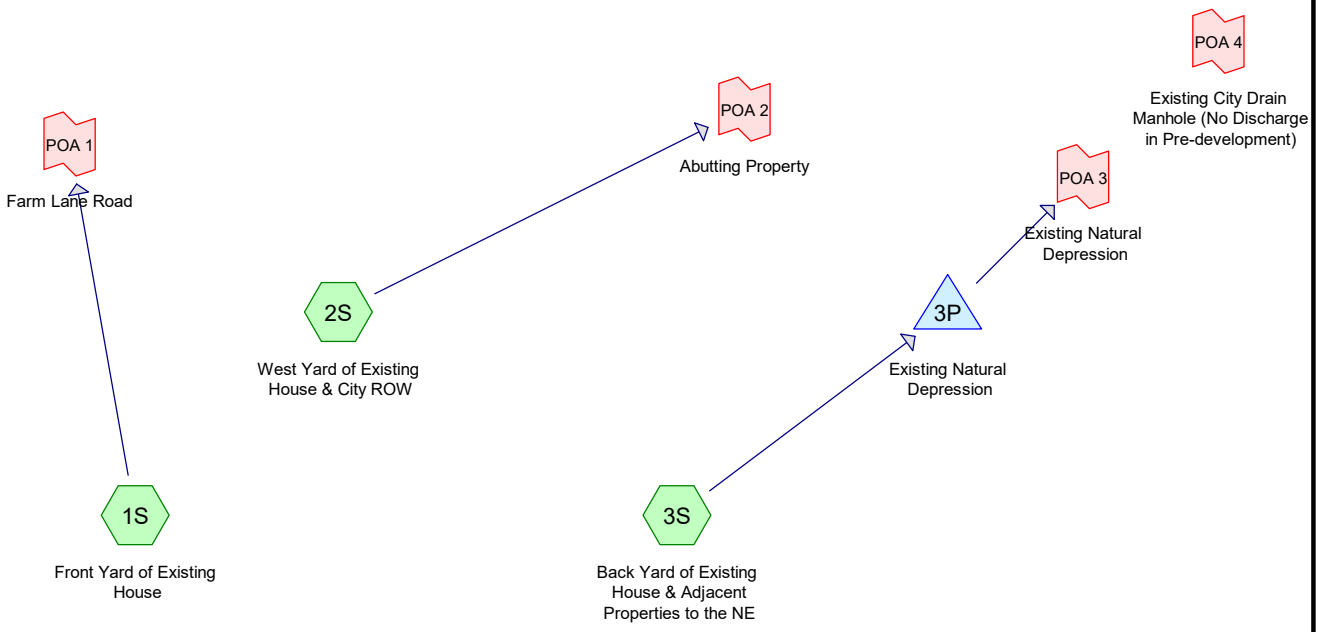
Summary for Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)





Subcat Reach Pond Link

Routing Diagram for 5719-PRE
Prepared by Altus Engineering, Printed 2/10/2026
HydroCAD® 10.20-8a s/n 01222 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Front Yard of Existing Runoff Area=18,227 sf 43.70% Impervious Runoff Depth=3.06"
Flow Length=296' Tc=6.0 min CN=64 Runoff=1.49 cfs 0.107 af

Subcatchment 2S: West Yard of Existing Runoff Area=10,114 sf 11.00% Impervious Runoff Depth=1.03"
Flow Length=215' Tc=6.0 min CN=42 Runoff=0.18 cfs 0.020 af

Subcatchment 3S: Back Yard of Existing Runoff Area=69,276 sf 11.36% Impervious Runoff Depth=1.11"
Flow Length=407' Tc=6.0 min CN=43 Runoff=1.43 cfs 0.147 af

Pond 3P: Existing Natural Depression Peak Elev=39.69' Storage=2,257 cf Inflow=1.43 cfs 0.147 af
Outflow=0.18 cfs 0.147 af

Link POA 1: Farm Lane Road Inflow=1.49 cfs 0.107 af
Primary=1.49 cfs 0.107 af

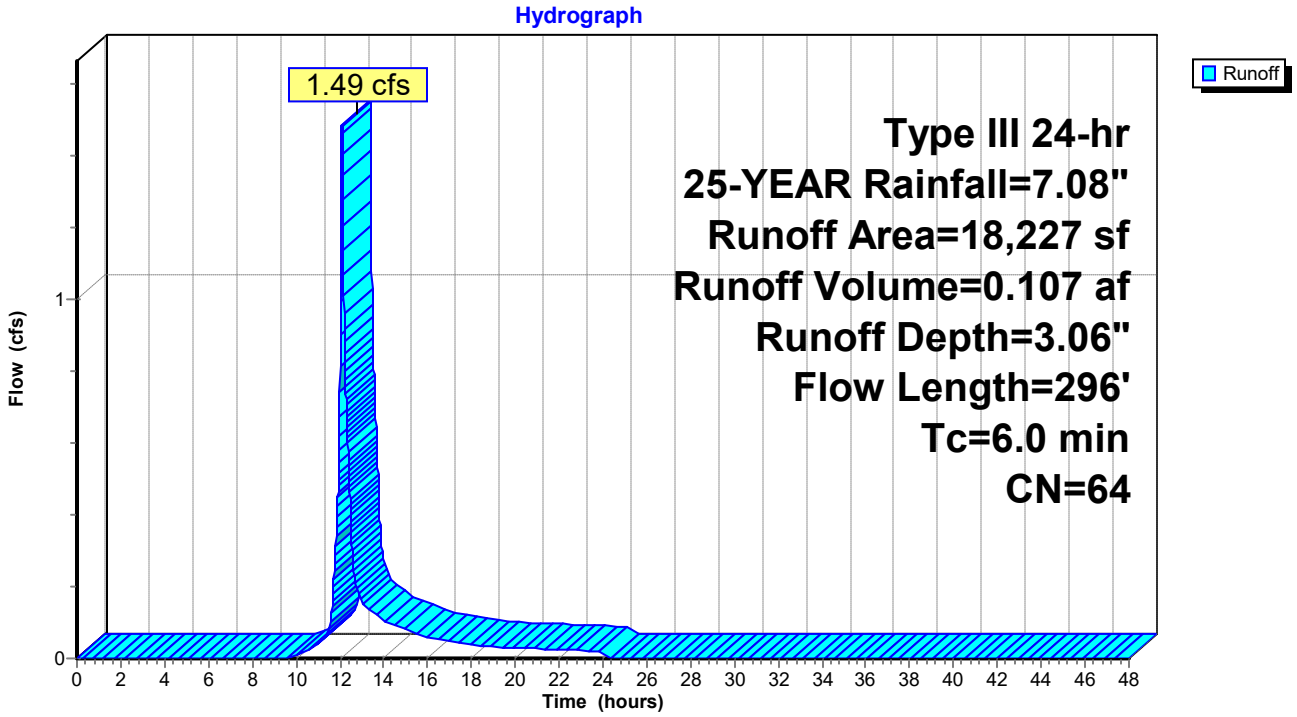
Link POA 2: Abutting Property Inflow=0.18 cfs 0.020 af
Primary=0.18 cfs 0.020 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

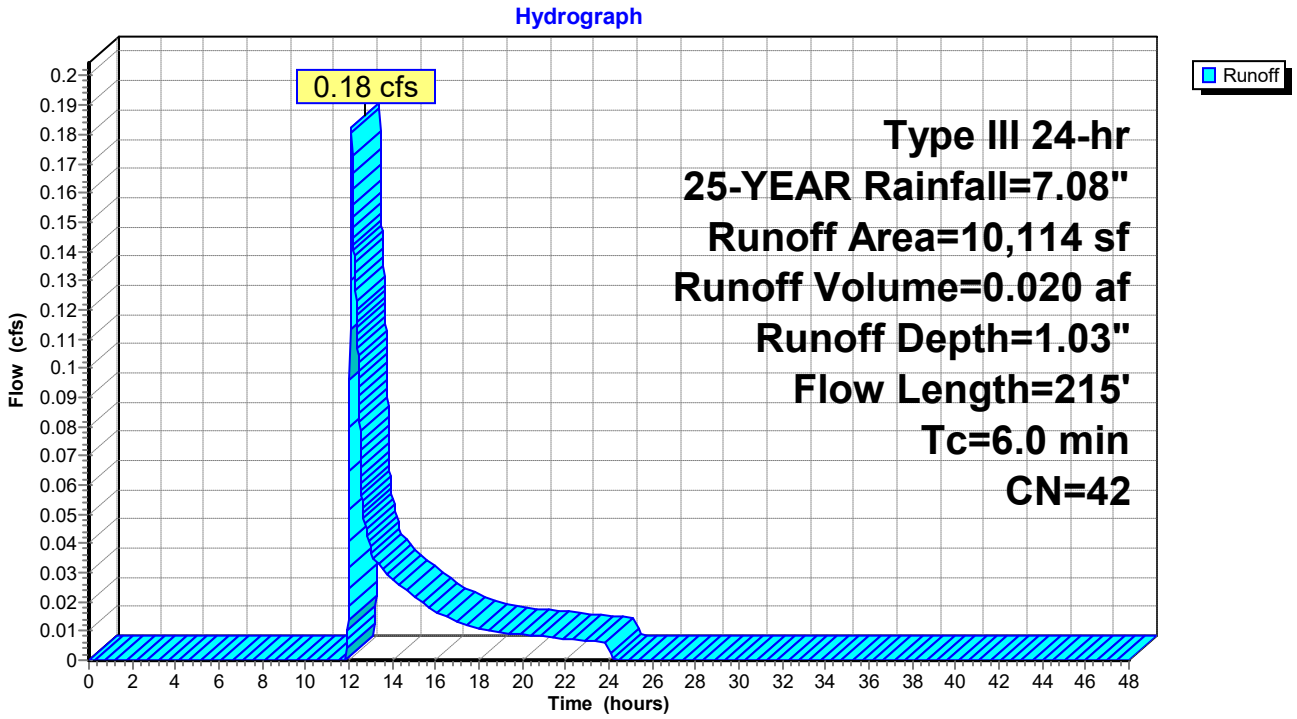
Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)
Primary=0.00 cfs 0.000 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.274 af Average Runoff Depth = 1.47"
82.64% Pervious = 1.852 ac 17.36% Impervious = 0.389 ac

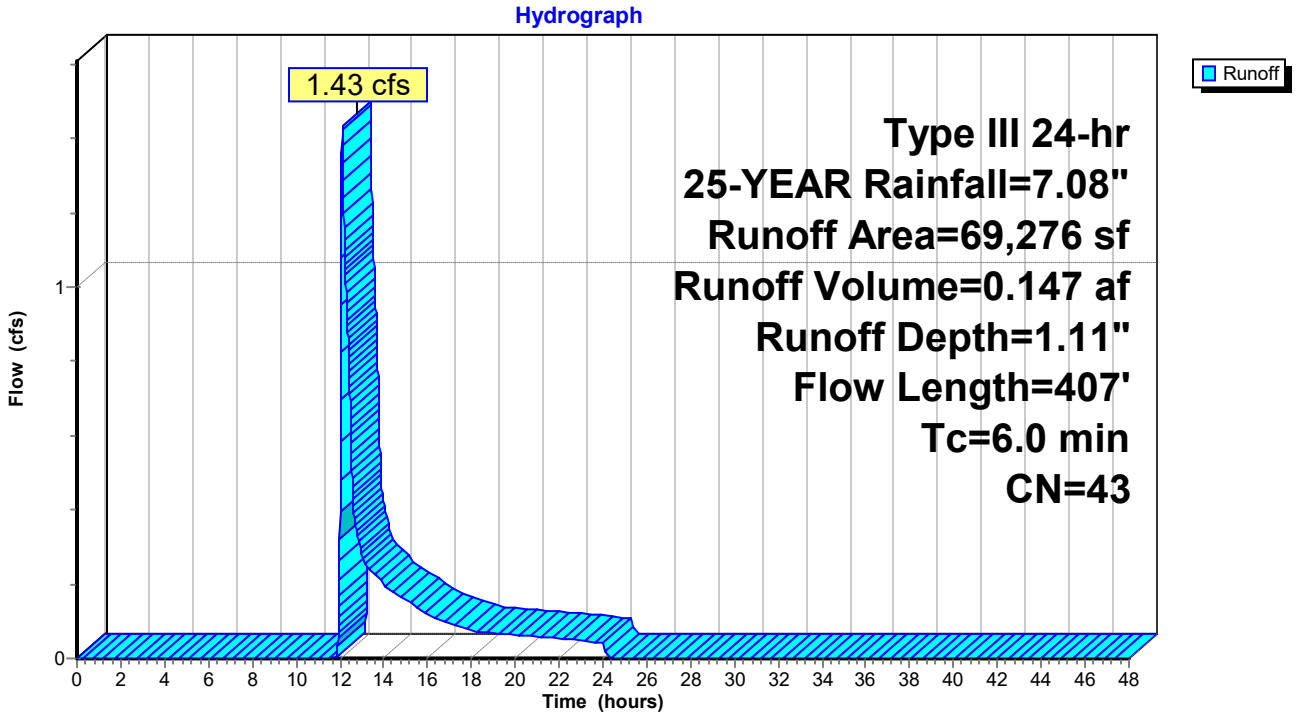
Subcatchment 1S: Front Yard of Existing House



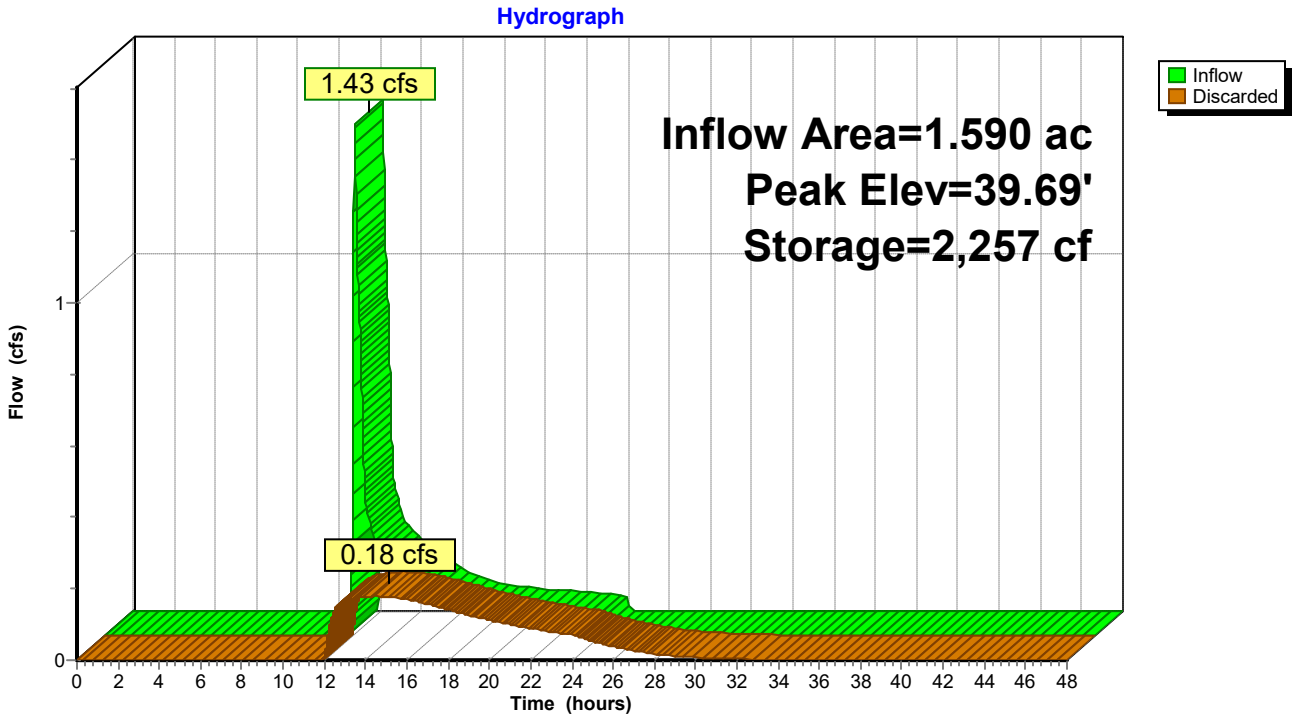
Subcatchment 2S: West Yard of Existing House & City ROW



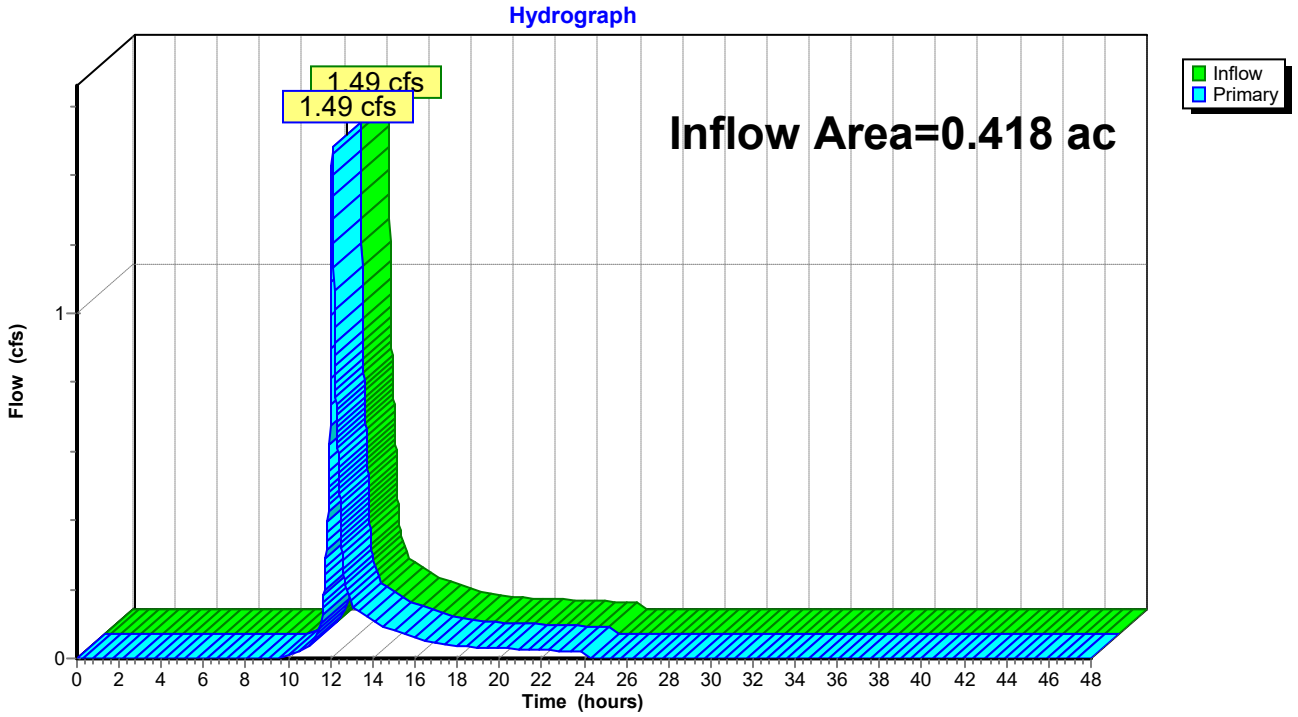
Subcatchment 3S: Back Yard of Existing House & Adjacent Properties to the NE



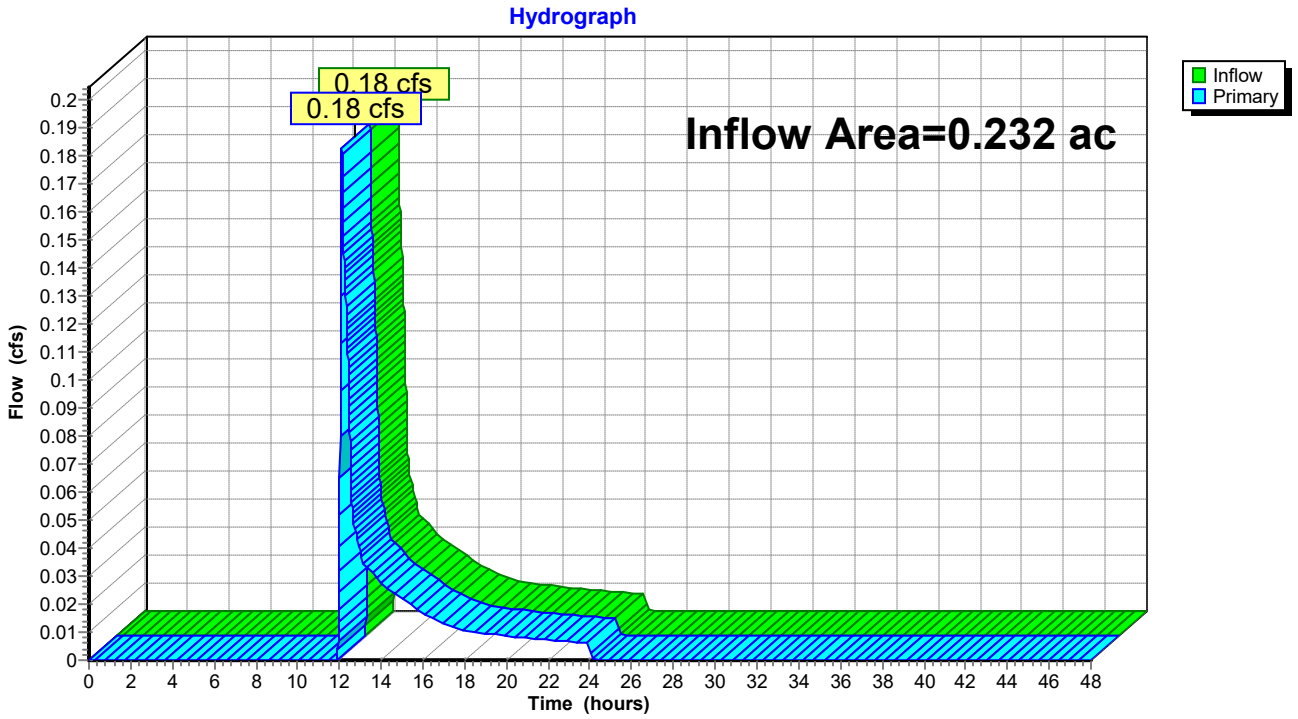
Pond 3P: Existing Natural Depression



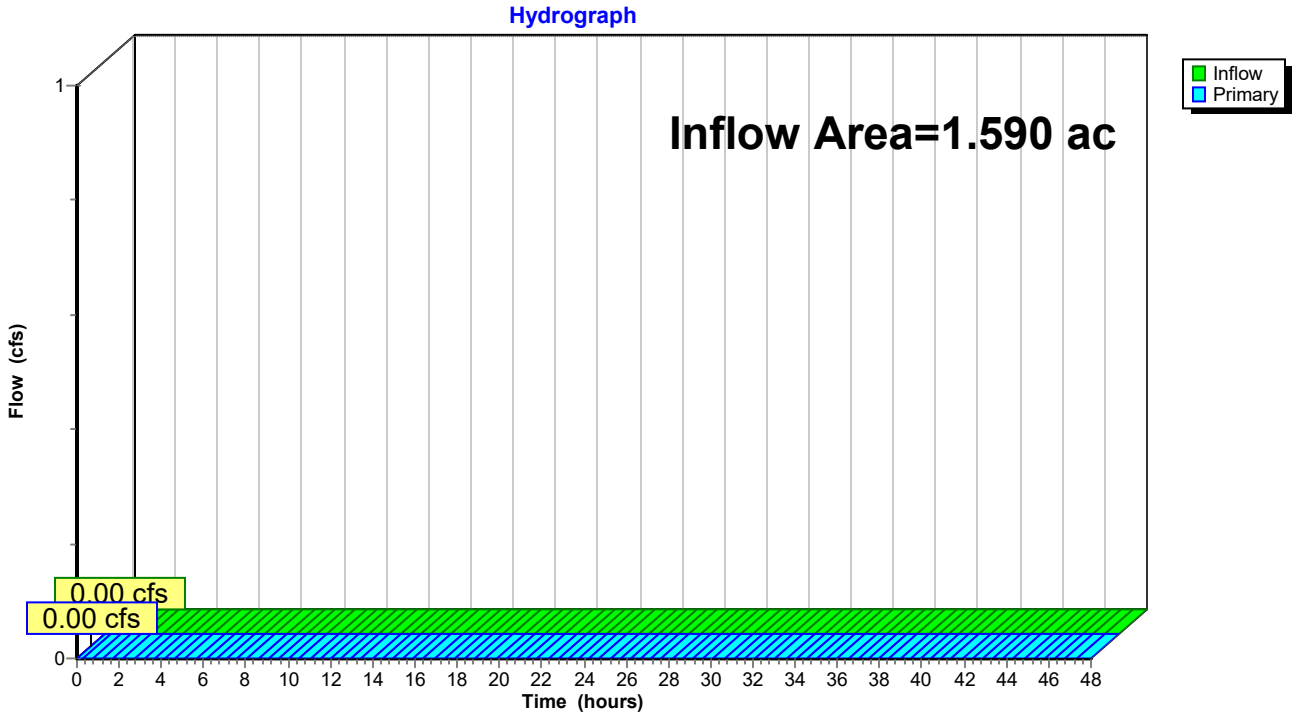
Link POA 1: Farm Lane Road



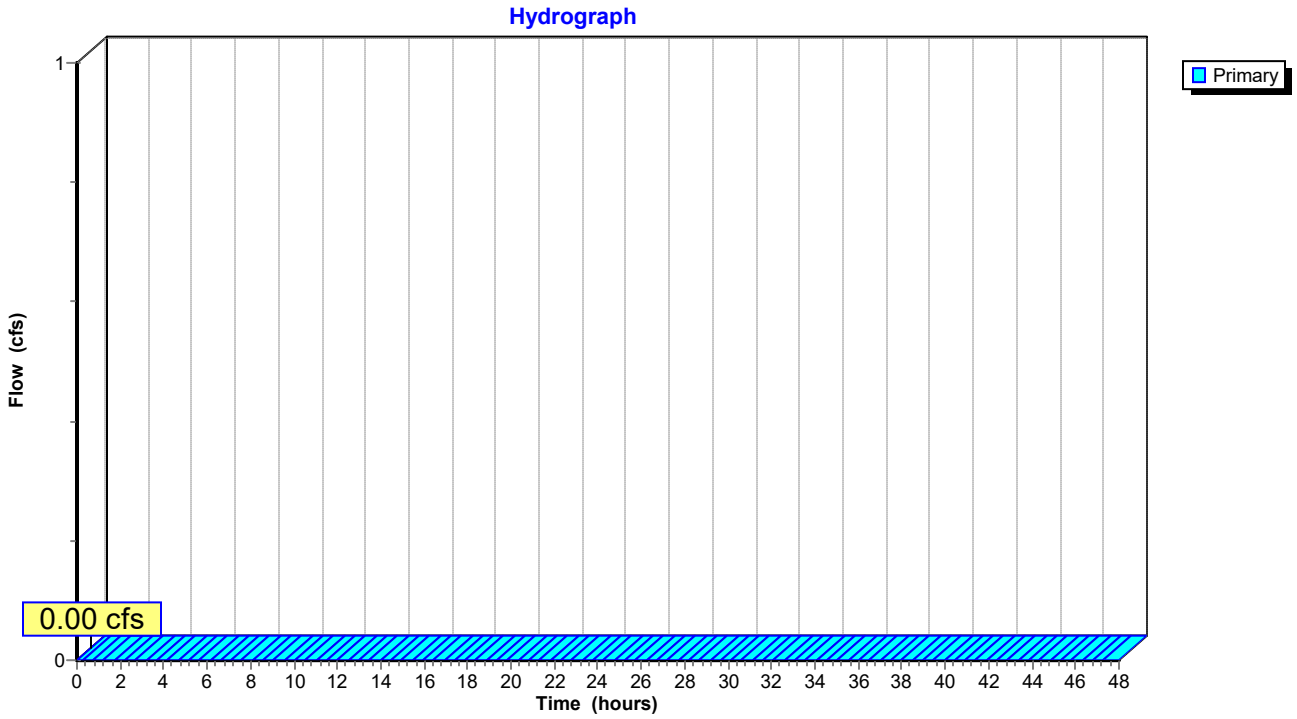
Link POA 2: Abutting Property



Link POA 3: Existing Natural Depression



Link POA 4: Existing City Drain Manhole (No Discharge in Pre-development)

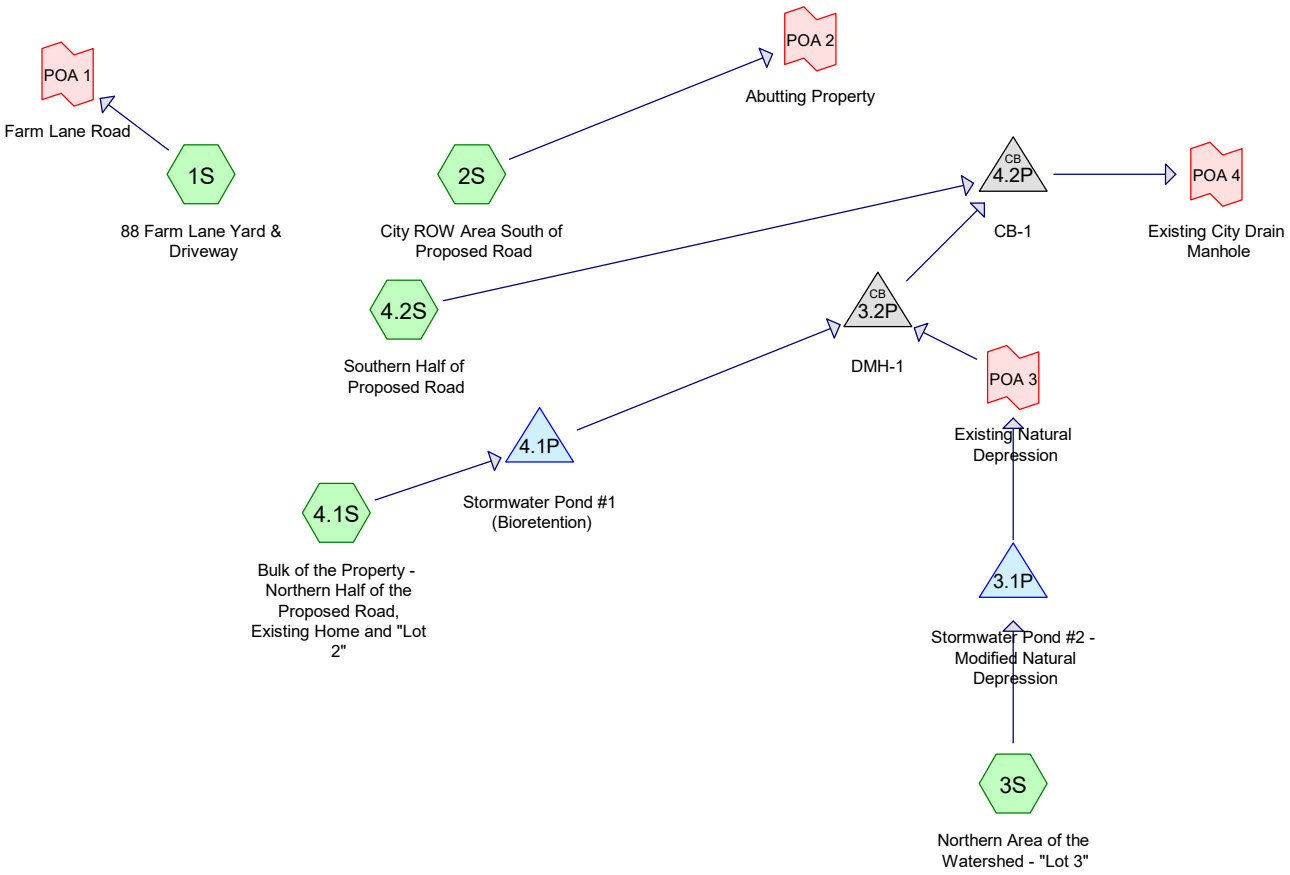


Section 4

Drainage Calculations

Post-Development:
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

ALTUS
ENGINEERING



Subcat Reach Pond Link

Routing Diagram for 5719-POST
Prepared by Altus Engineering, Printed 2/12/2026
HydroCAD® 10.20-8a s/n 01222 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 88 Farm Lane Yard & Runoff Area=1,046 sf 57.07% Impervious Runoff Depth=0.80"
Flow Length=25' Tc=6.0 min CN=71 Runoff=0.02 cfs 0.002 af

Subcatchment 2S: City ROW Area South of Runoff Area=5,028 sf 6.21% Impervious Runoff Depth=0.00"
Flow Length=136' Tc=6.4 min CN=41 Runoff=0.00 cfs 0.000 af

Subcatchment 3S: Northern Area of the Runoff Area=31,903 sf 14.72% Impervious Runoff Depth=0.02"
Flow Length=251' Tc=6.0 min CN=44 Runoff=0.00 cfs 0.001 af

Subcatchment 4.1S: Bulk of the Property - Runoff Area=55,254 sf 29.57% Impervious Runoff Depth=0.21"
Flow Length=370' Tc=6.0 min CN=55 Runoff=0.10 cfs 0.022 af

Subcatchment 4.2S: Southern Half of Runoff Area=4,386 sf 76.11% Impervious Runoff Depth=1.57"
Flow Length=283' Tc=6.0 min CN=84 Runoff=0.18 cfs 0.013 af

Pond 3.1P: Stormwater Pond #2 - Modified Peak Elev=38.00' Storage=34 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond 3.2P: DMH-1 Peak Elev=34.78' Inflow=0.02 cfs 0.022 af
12.0" Round Culvert n=0.012 L=32.0' S=0.0063 '/' Outflow=0.02 cfs 0.022 af

Pond 4.1P: Stormwater Pond #1 (Bioretention) Peak Elev=41.51' Storage=502 cf Inflow=0.10 cfs 0.022 af
Outflow=0.02 cfs 0.022 af

Pond 4.2P: CB-1 Peak Elev=34.64' Inflow=0.18 cfs 0.035 af
12.0" Round Culvert n=0.012 L=160.0' S=0.0050 '/' Outflow=0.18 cfs 0.035 af

Link POA 1: Farm Lane Road Inflow=0.02 cfs 0.002 af
Primary=0.02 cfs 0.002 af

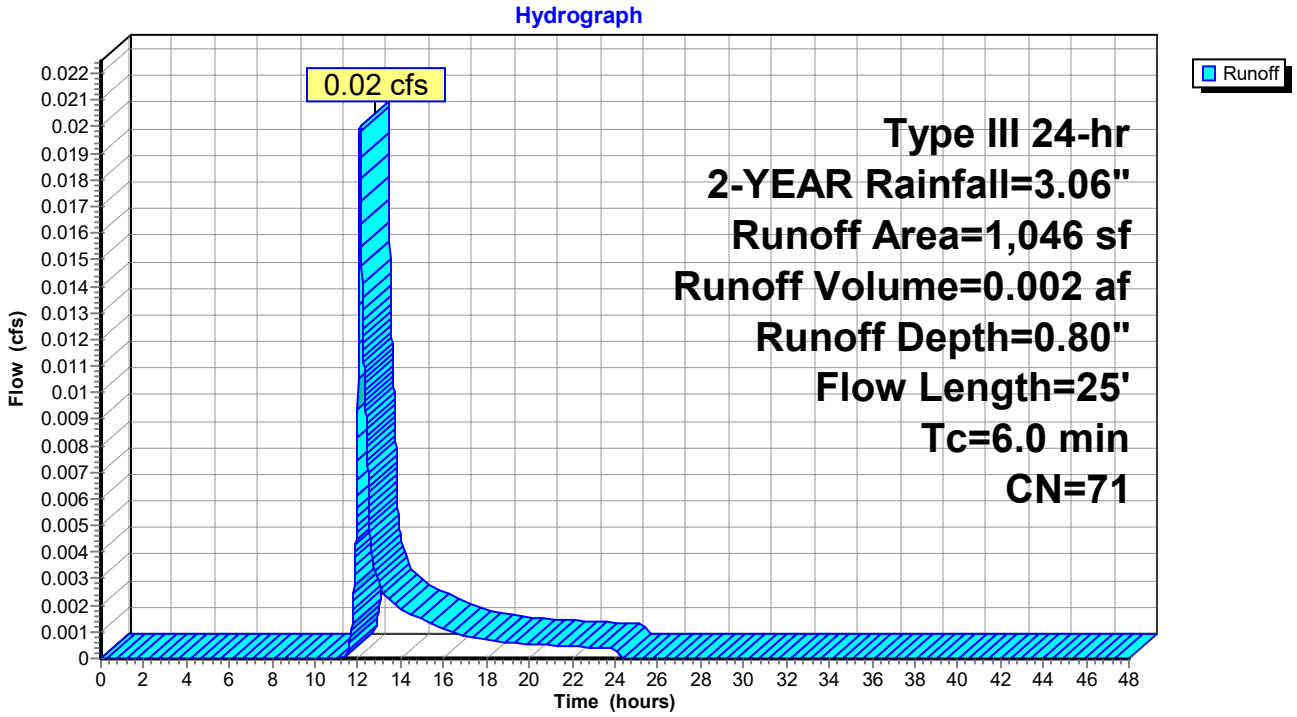
Link POA 2: Abutting Property Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

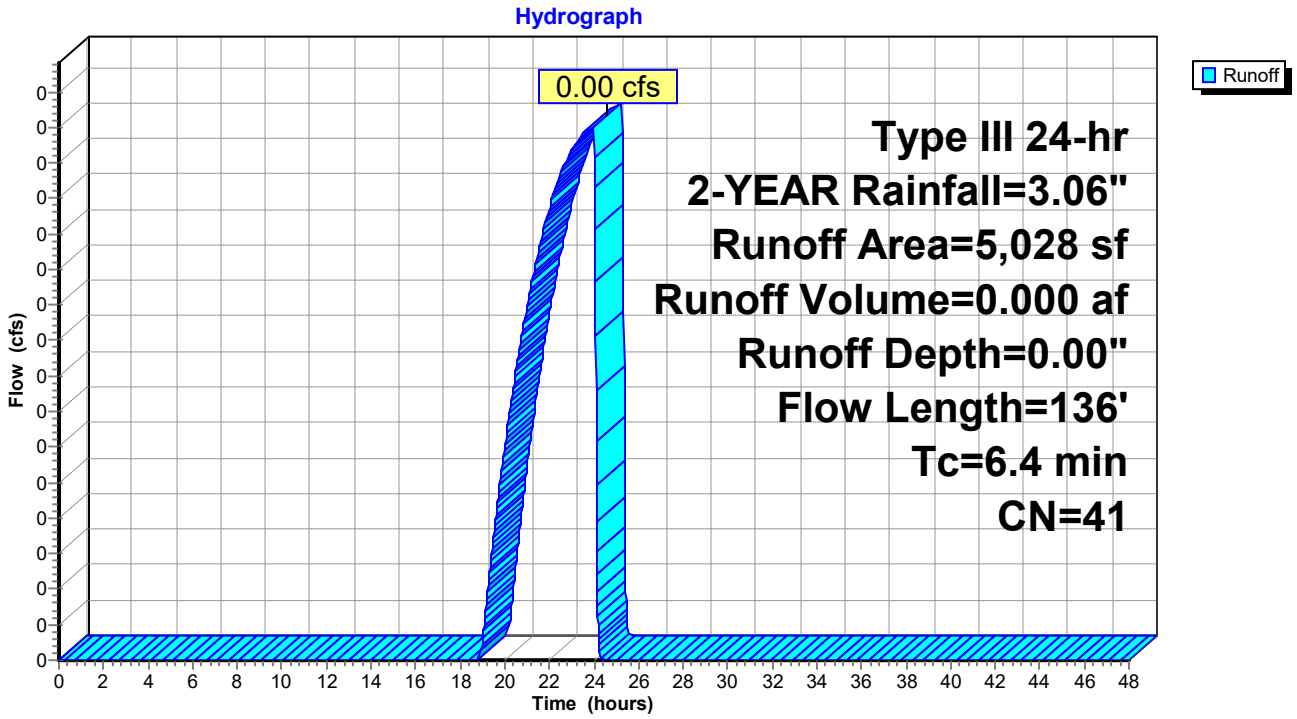
Link POA 4: Existing City Drain Manhole Inflow=0.18 cfs 0.035 af
Primary=0.18 cfs 0.035 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.038 af Average Runoff Depth = 0.20"
74.10% Pervious = 1.661 ac 25.90% Impervious = 0.580 ac

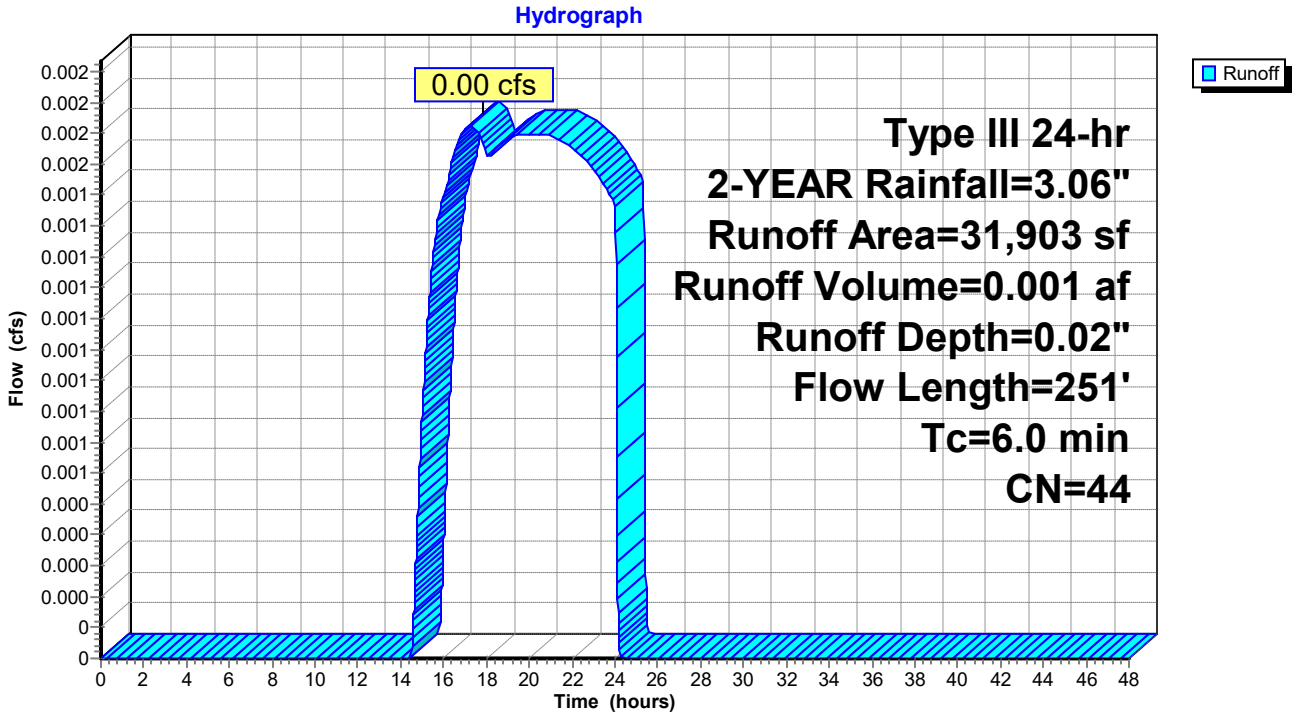
Subcatchment 1S: 88 Farm Lane Yard & Driveway



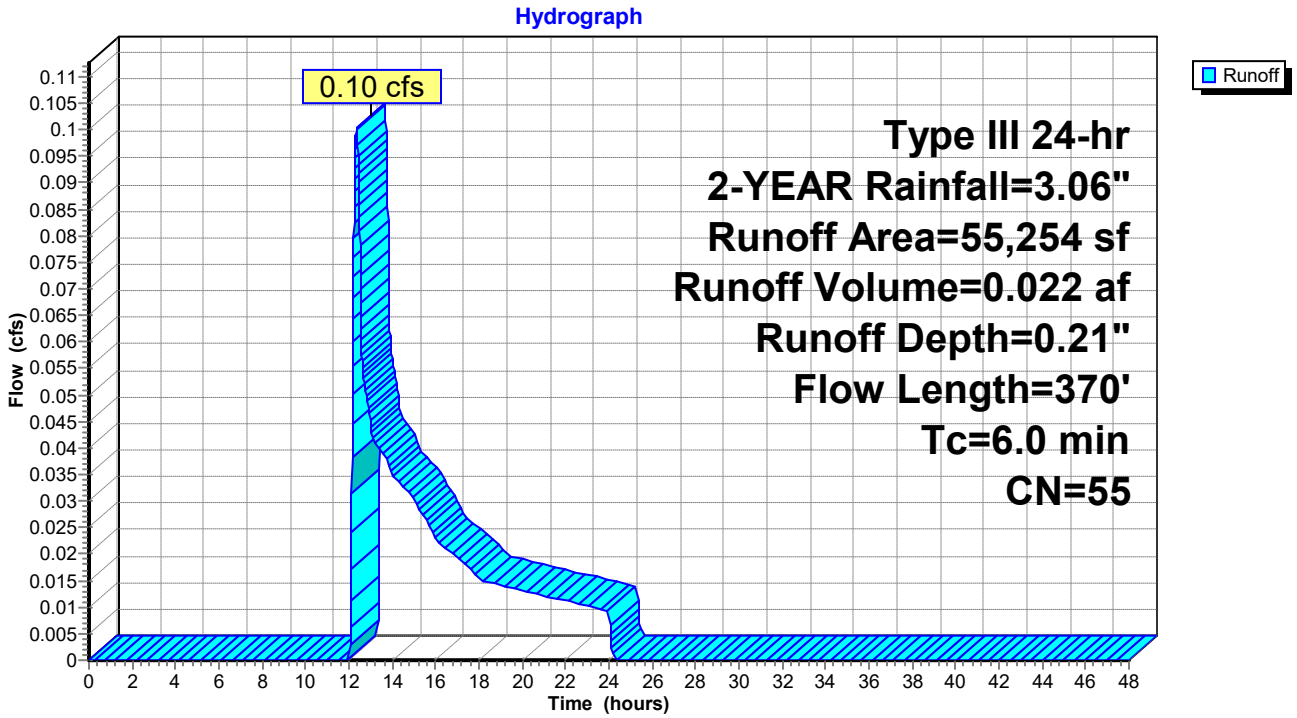
Subcatchment 2S: City ROW Area South of Proposed Road



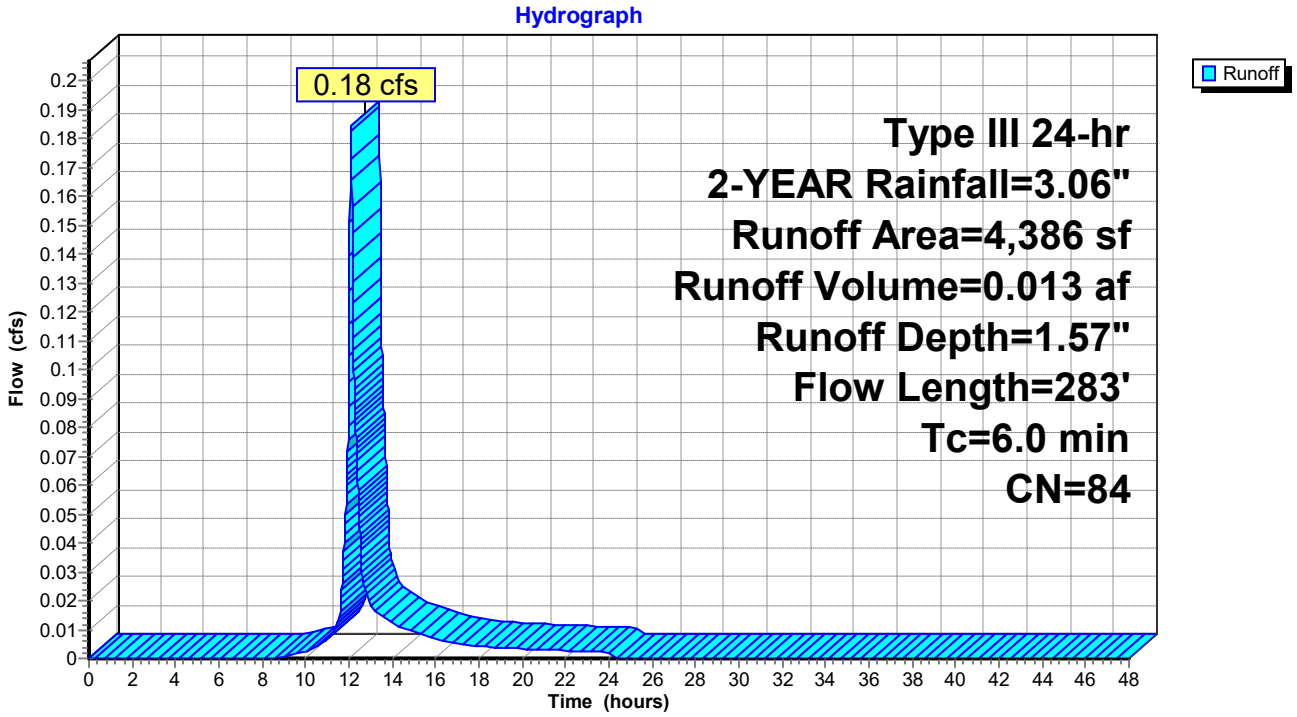
Subcatchment 3S: Northern Area of the Watershed - "Lot 3"



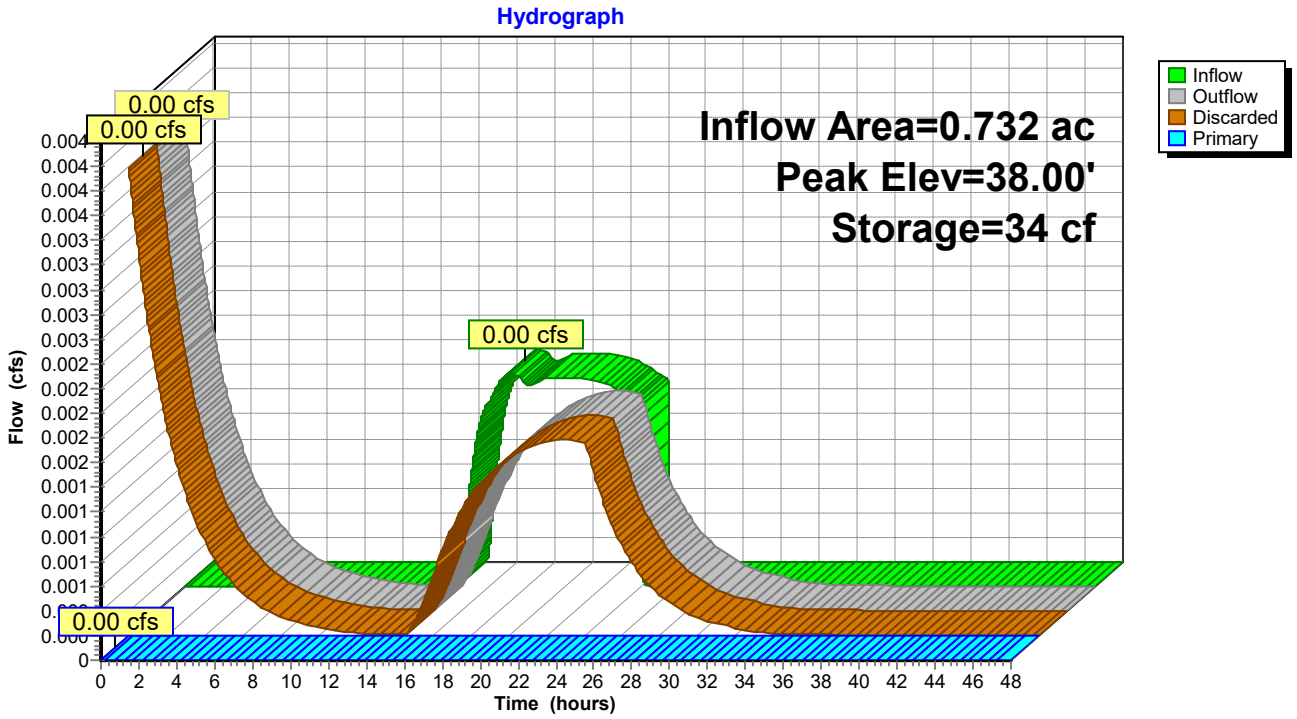
Subcatchment 4.1S: Bulk of the Property - Northern Half of the Proposed Road, Existing Home and "Lot 2"



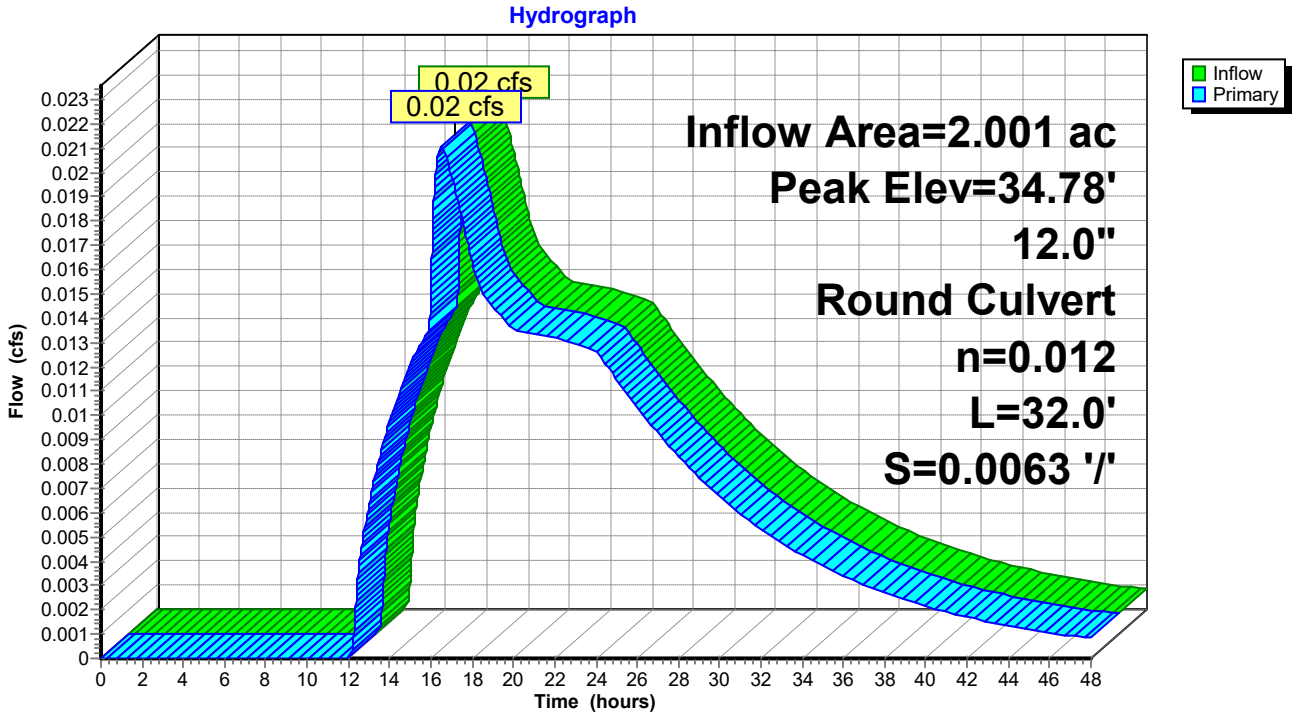
Subcatchment 4.2S: Southern Half of Proposed Road



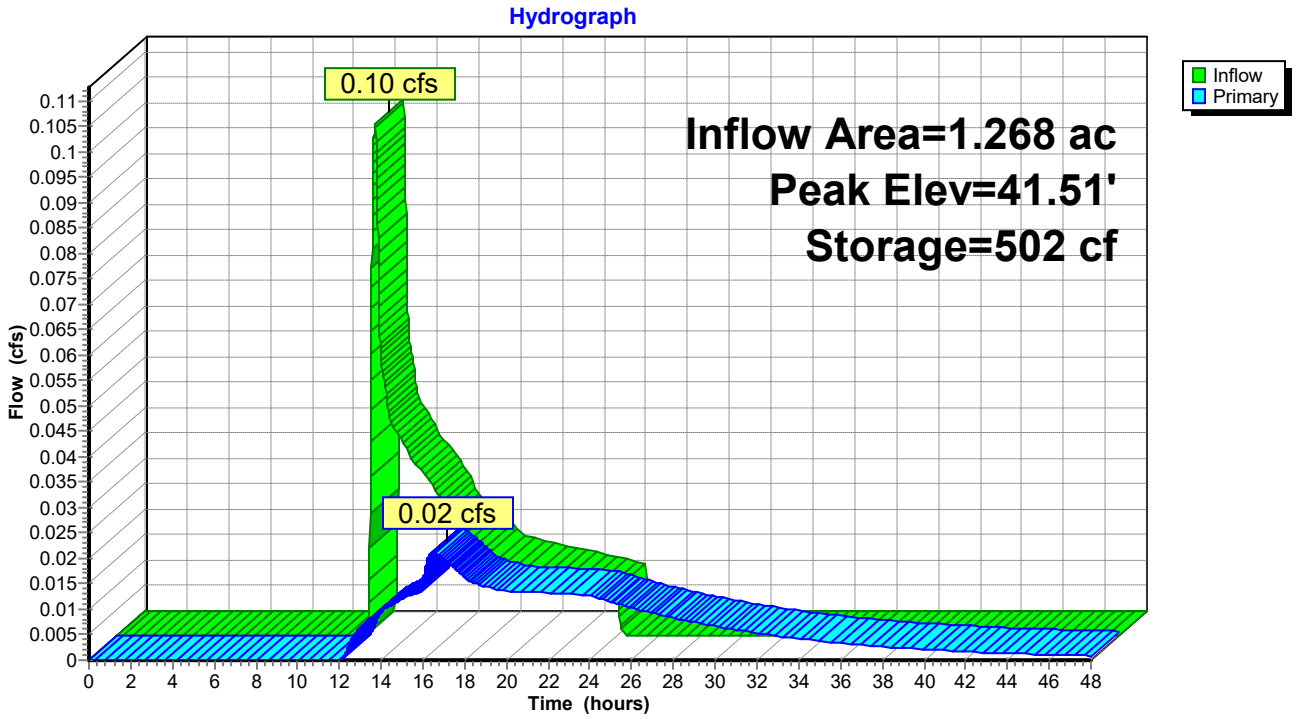
Pond 3.1P: Stormwater Pond #2 - Modified Natural Depression



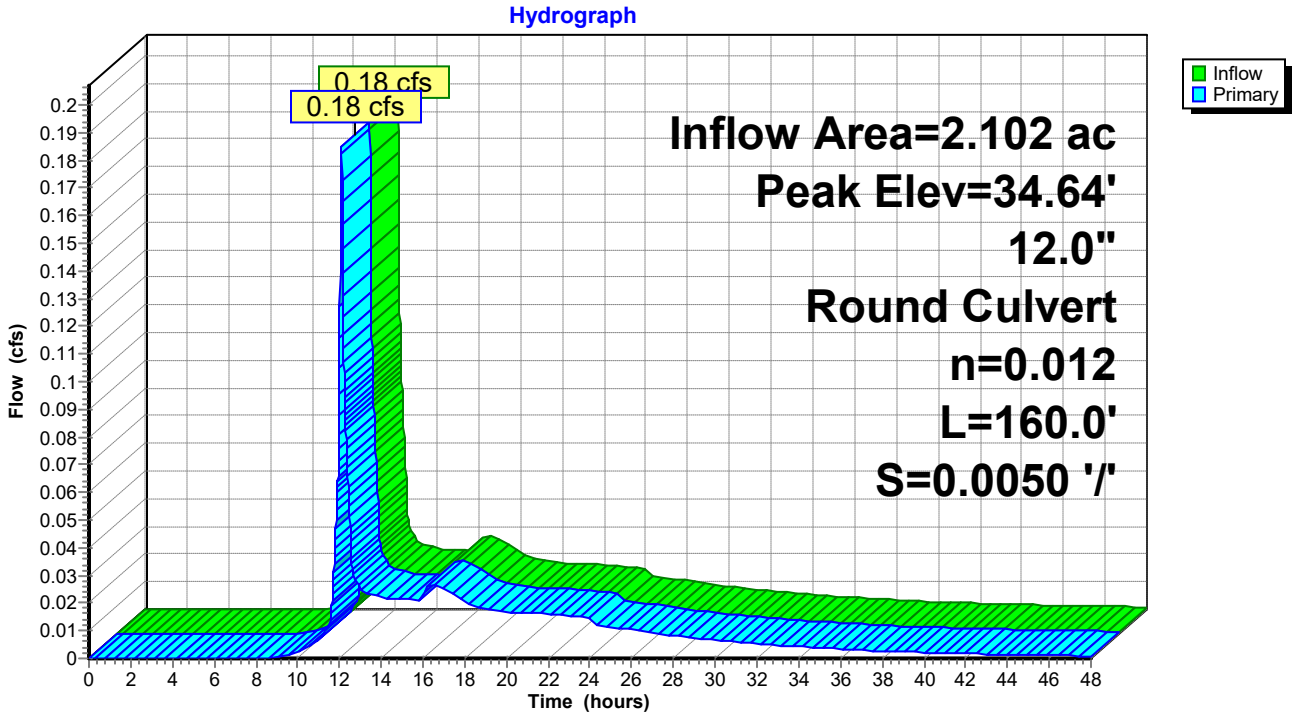
Pond 3.2P: DMH-1



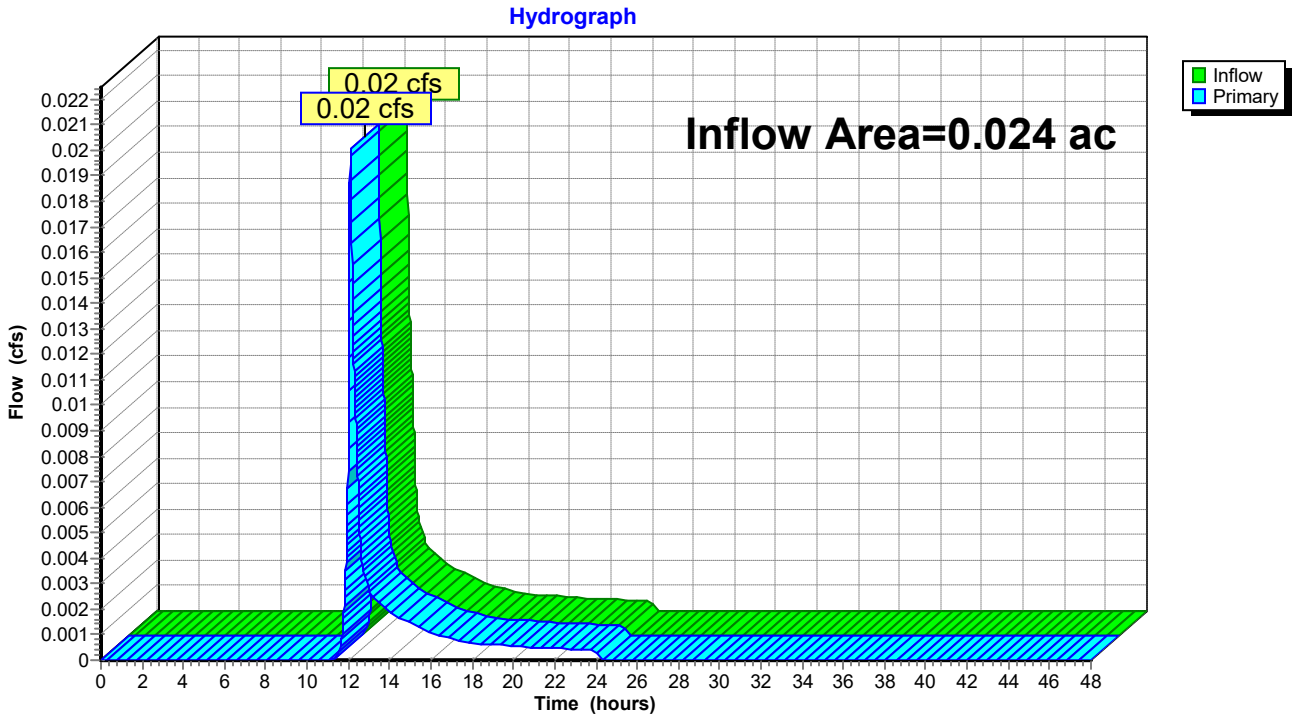
Pond 4.1P: Stormwater Pond #1 (Bioretention)



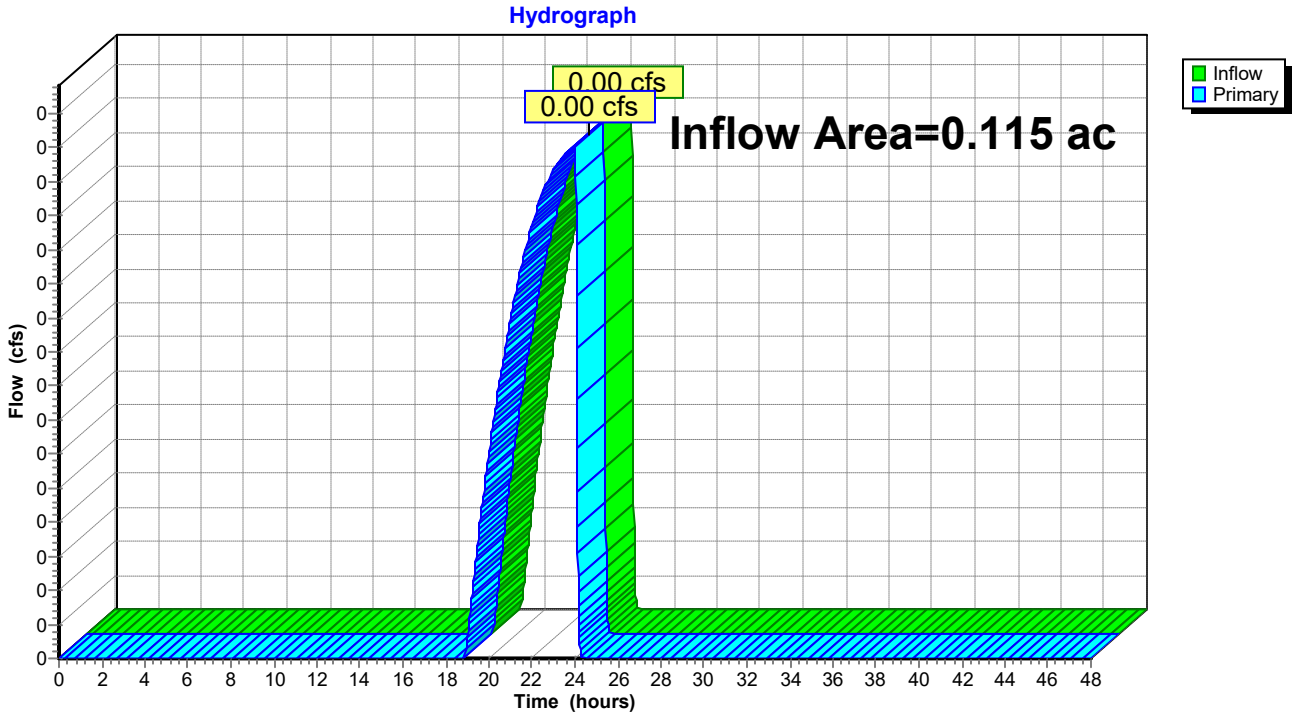
Pond 4.2P: CB-1



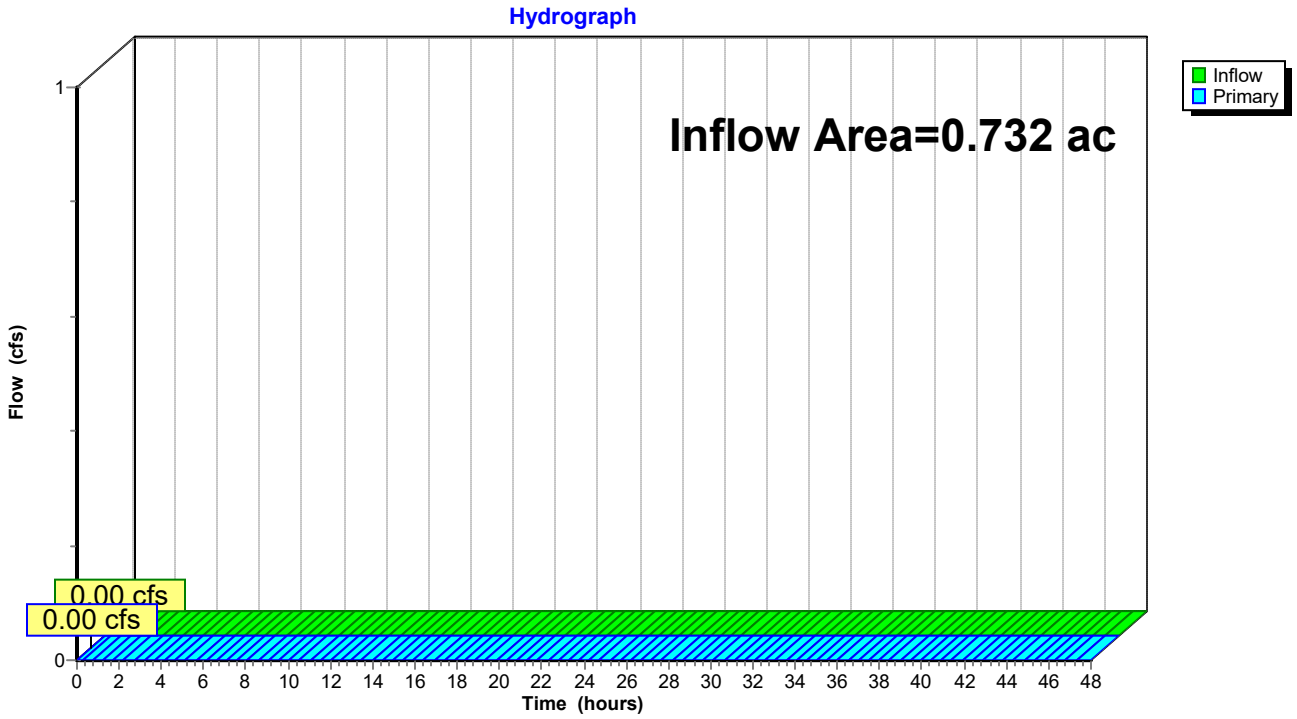
Link POA 1: Farm Lane Road



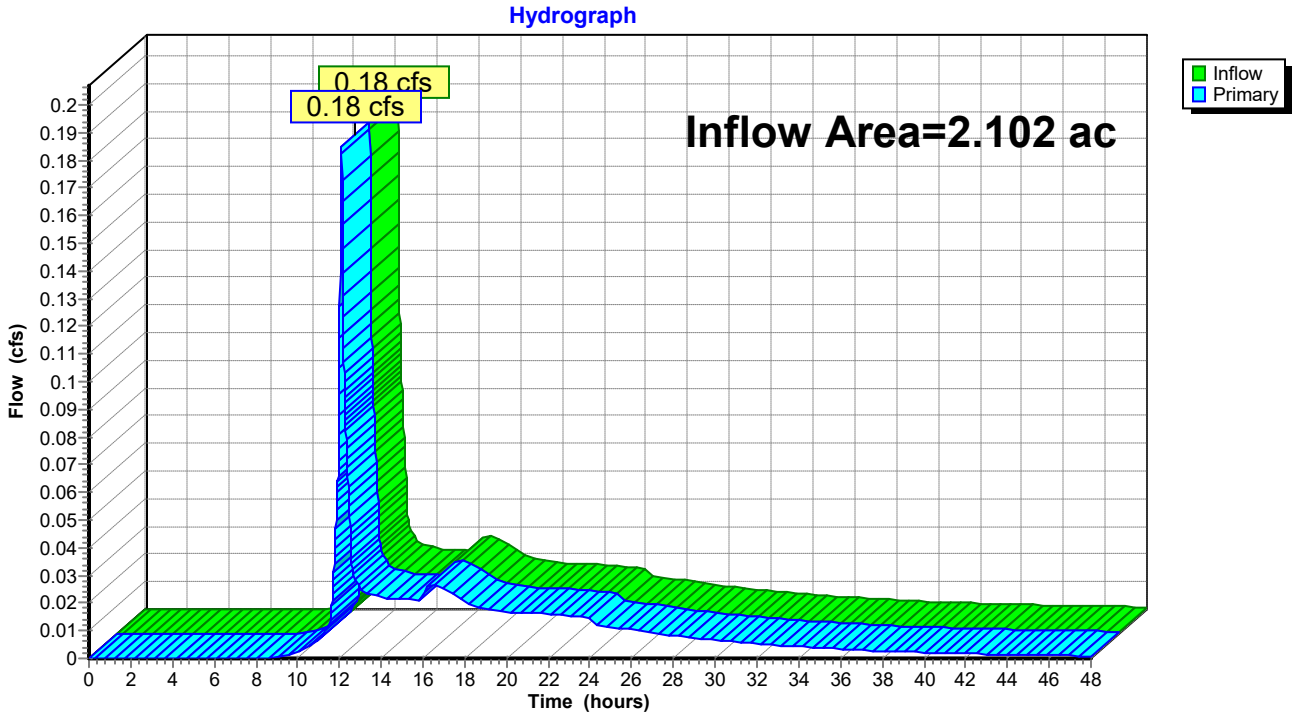
Link POA 2: Abutting Property

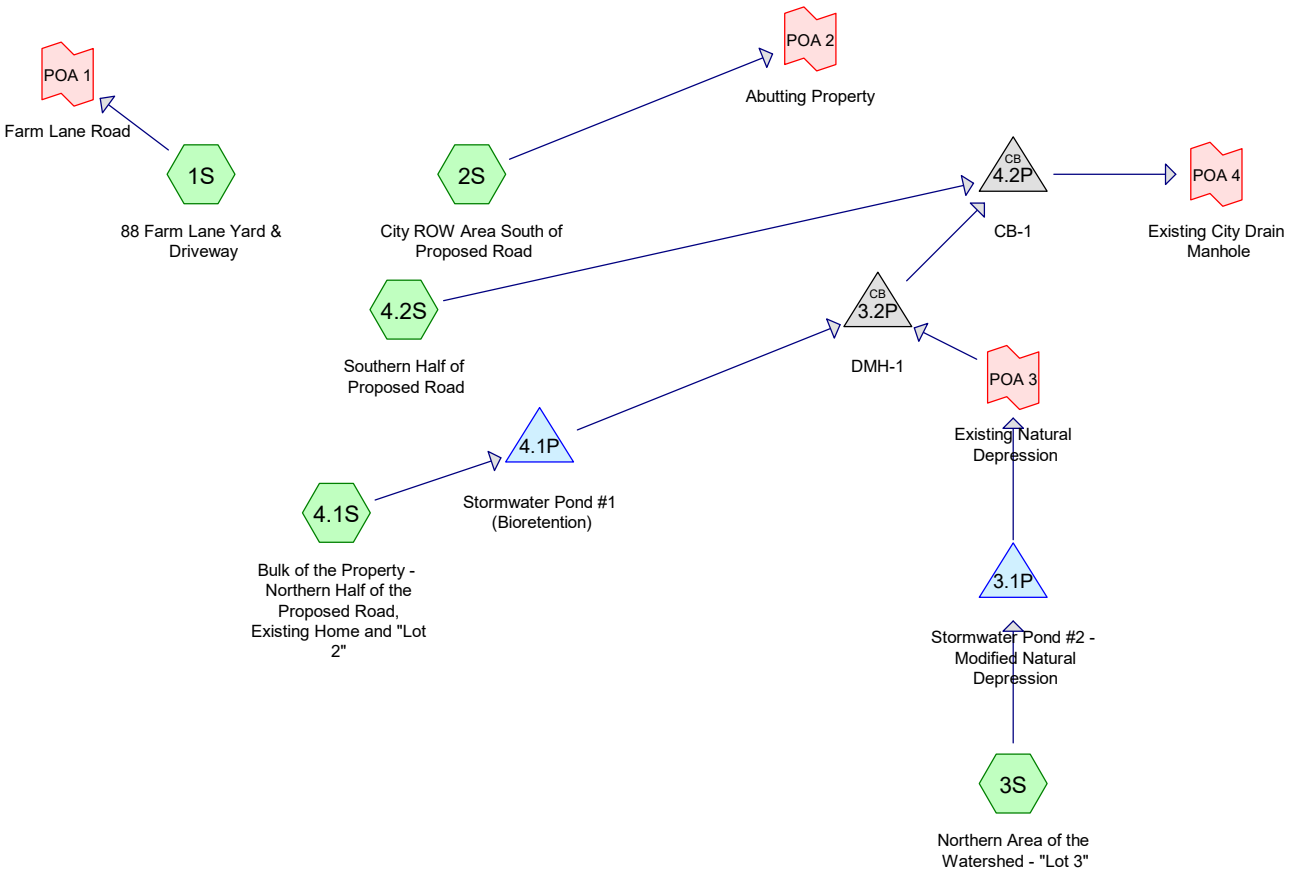


Link POA 3: Existing Natural Depression



Link POA 4: Existing City Drain Manhole





Subcat Reach Pond Link

Routing Diagram for 5719-POST
Prepared by Altus Engineering, Printed 2/12/2026
HydroCAD® 10.20-8a s/n 01222 © 2025 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.165	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S, 4.1S, 4.2S)
0.353	98	Paved parking, HSG A (1S, 2S, 3S, 4.1S, 4.2S)
0.228	98	Roofs, HSG A (2S, 3S, 4.1S)
0.495	30	Woods, Good, HSG A (1S, 2S, 3S, 4.1S)
2.241	**52**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.241	HSG A	1S, 2S, 3S, 4.1S, 4.2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.241		**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 88 Farm Lane Yard & Runoff Area=1,046 sf 57.07% Impervious Runoff Depth=2.57"
Flow Length=25' Tc=6.0 min CN=71 Runoff=0.07 cfs 0.005 af

Subcatchment 2S: City ROW Area South of Runoff Area=5,028 sf 6.21% Impervious Runoff Depth=0.43"
Flow Length=136' Tc=6.4 min CN=41 Runoff=0.02 cfs 0.004 af

Subcatchment 3S: Northern Area of the Runoff Area=31,903 sf 14.72% Impervious Runoff Depth=0.59"
Flow Length=251' Tc=6.0 min CN=44 Runoff=0.23 cfs 0.036 af

Subcatchment 4.1S: Bulk of the Property - Runoff Area=55,254 sf 29.57% Impervious Runoff Depth=1.29"
Flow Length=370' Tc=6.0 min CN=55 Runoff=1.65 cfs 0.136 af

Subcatchment 4.2S: Southern Half of Runoff Area=4,386 sf 76.11% Impervious Runoff Depth=3.81"
Flow Length=283' Tc=6.0 min CN=84 Runoff=0.45 cfs 0.032 af

Pond 3.1P: Stormwater Pond #2 - Modified Peak Elev=38.48' Storage=767 cf Inflow=0.23 cfs 0.036 af
Discarded=0.02 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.037 af

Pond 3.2P: DMH-1 Peak Elev=35.51' Inflow=1.43 cfs 0.136 af
12.0" Round Culvert n=0.012 L=32.0' S=0.0063 '/' Outflow=1.43 cfs 0.136 af

Pond 4.1P: Stormwater Pond #1 (Bioretention) Peak Elev=41.73' Storage=735 cf Inflow=1.65 cfs 0.136 af
Outflow=1.43 cfs 0.136 af

Pond 4.2P: CB-1 Peak Elev=35.22' Inflow=1.79 cfs 0.168 af
12.0" Round Culvert n=0.012 L=160.0' S=0.0050 '/' Outflow=1.79 cfs 0.168 af

Link POA 1: Farm Lane Road Inflow=0.07 cfs 0.005 af
Primary=0.07 cfs 0.005 af

Link POA 2: Abutting Property Inflow=0.02 cfs 0.004 af
Primary=0.02 cfs 0.004 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link POA 4: Existing City Drain Manhole Inflow=1.79 cfs 0.168 af
Primary=1.79 cfs 0.168 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.213 af Average Runoff Depth = 1.14"
74.10% Pervious = 1.661 ac 25.90% Impervious = 0.580 ac

Summary for Subcatchment 1S: 88 Farm Lane Yard & Driveway

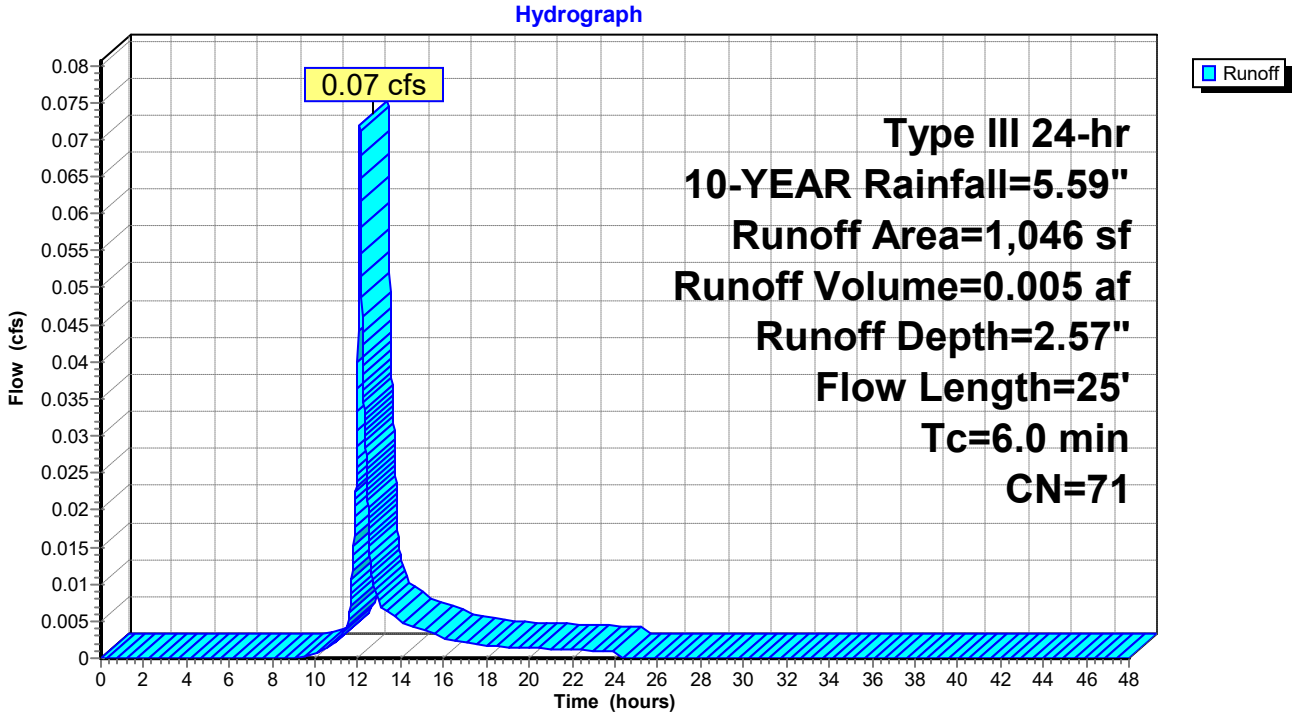
Runoff = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af, Depth= 2.57"
Routed to Link POA 1 : Farm Lane Road

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
0	98	Roofs, HSG A
597	98	Paved parking, HSG A
274	39	>75% Grass cover, Good, HSG A
175	30	Woods, Good, HSG A
1,046	71	Weighted Average
449		42.93% Pervious Area
597		57.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	14	0.0710	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.06"
0.1	11	0.0680	1.41		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
2.8	25	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 1S: 88 Farm Lane Yard & Driveway



Summary for Subcatchment 2S: City ROW Area South of Proposed Road

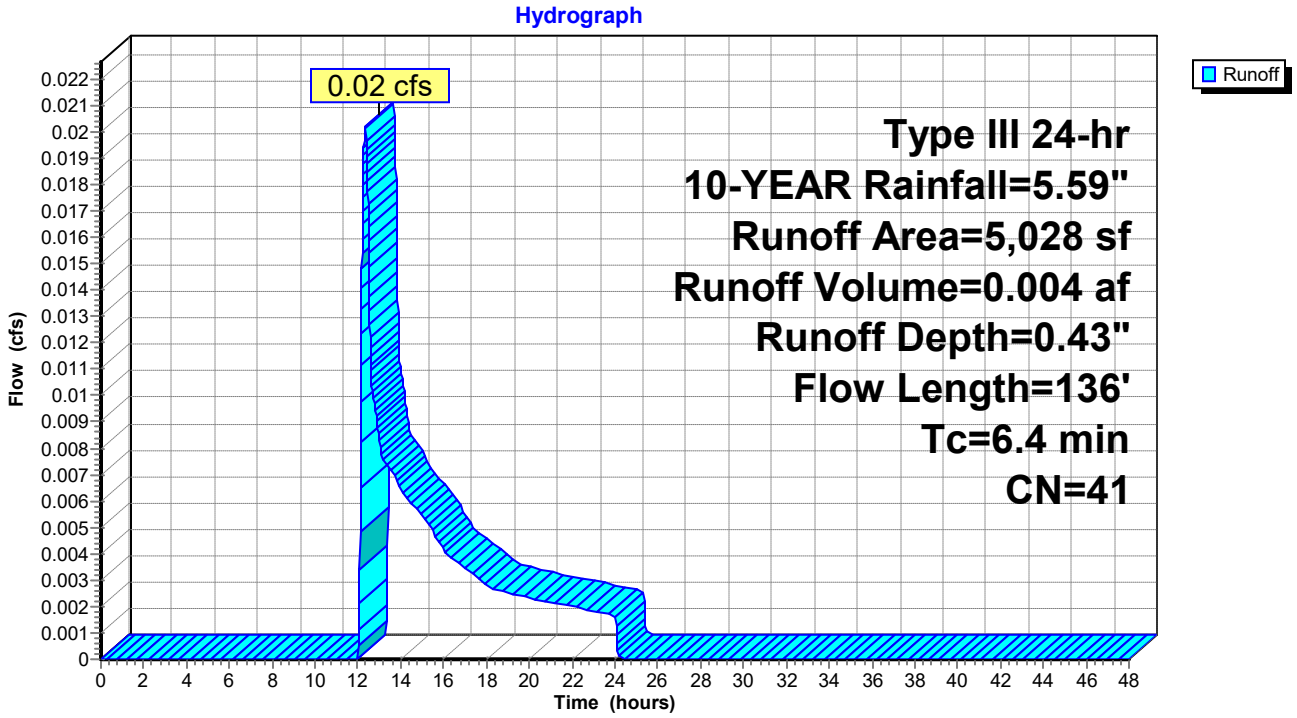
Runoff = 0.02 cfs @ 12.34 hrs, Volume= 0.004 af, Depth= 0.43"
Routed to Link POA 2 : Abutting Property

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
53	98	Roofs, HSG A
259	98	Paved parking, HSG A
3,963	39	>75% Grass cover, Good, HSG A
753	30	Woods, Good, HSG A
5,028	41	Weighted Average
4,716		93.79% Pervious Area
312		6.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	25	0.0400	0.08		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.06"
0.8	100	0.0880	2.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.1	11	0.1590	1.99		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.4	136	Total			

Subcatchment 2S: City ROW Area South of Proposed Road



Summary for Subcatchment 3S: Northern Area of the Watershed - "Lot 3"

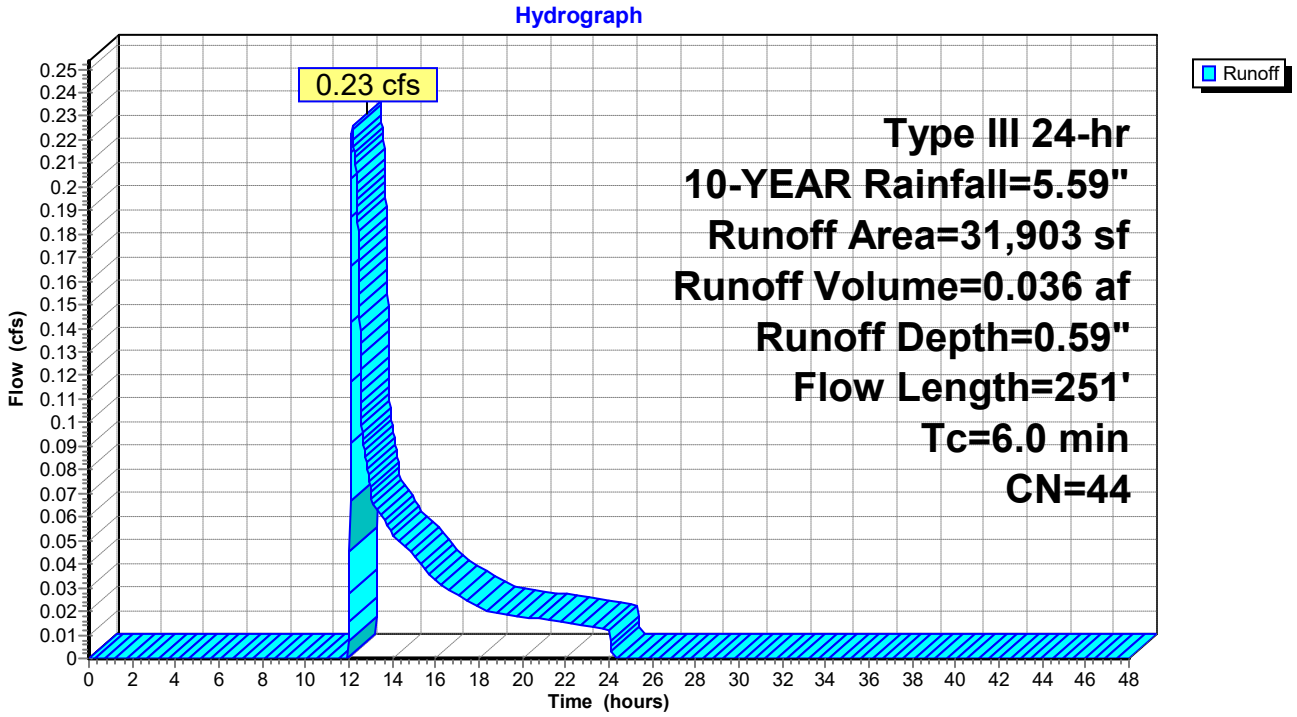
Runoff = 0.23 cfs @ 12.15 hrs, Volume= 0.036 af, Depth= 0.59"
Routed to Pond 3.1P : Stormwater Pond #2 - Modified Natural Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
3,001	98	Roofs, HSG A
1,695	98	Paved parking, HSG A
14,435	39	>75% Grass cover, Good, HSG A
12,772	30	Woods, Good, HSG A
31,903	44	Weighted Average
27,207		85.28% Pervious Area
4,696		14.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	23	0.1740	0.29		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.06"
0.6	73	0.0750	1.92		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	32	0.1330	1.82		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.6	60	0.0630	1.76		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	63	0.0440	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.8	251	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 3S: Northern Area of the Watershed - "Lot 3"



ary for Subcatchment 4.1S: Bulk of the Property - Northern Half of the Proposed Road, Existing Home and

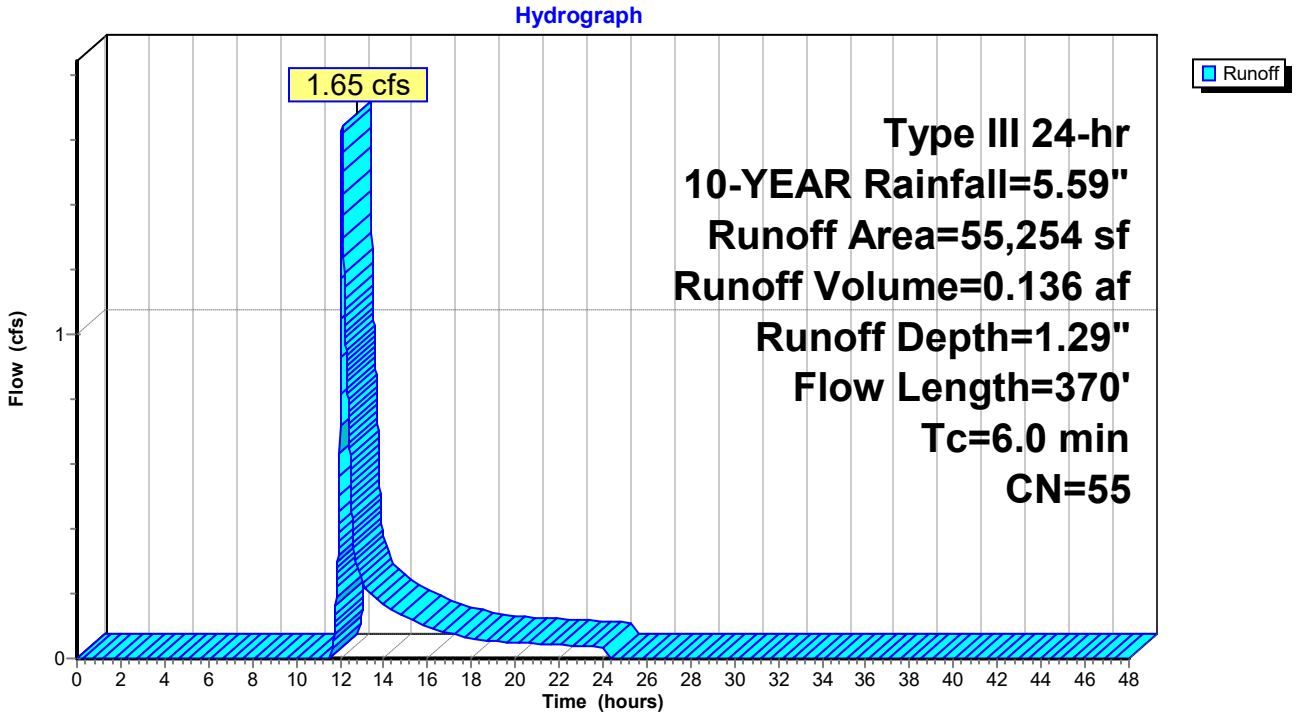
Runoff = 1.65 cfs @ 12.10 hrs, Volume= 0.136 af, Depth= 1.29"
Routed to Pond 4.1P : Stormwater Pond #1 (Bioretention)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
6,858	98	Roofs, HSG A
9,483	98	Paved parking, HSG A
31,047	39	>75% Grass cover, Good, HSG A
7,866	30	Woods, Good, HSG A
55,254	55	Weighted Average
38,913		70.43% Pervious Area
16,341		29.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	10	0.5000	3.08		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
0.5	63	0.0990	2.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	42	0.0650	1.27		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.0800	1.98		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	25	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	36	0.0560	1.66		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	31	0.0810	1.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.1	113	0.0580	1.69		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.6	370	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4.1S: Bulk of the Property - Northern Half of the Proposed Road, Existing Home and "Lot 2"



Summary for Subcatchment 4.2S: Southern Half of Proposed Road

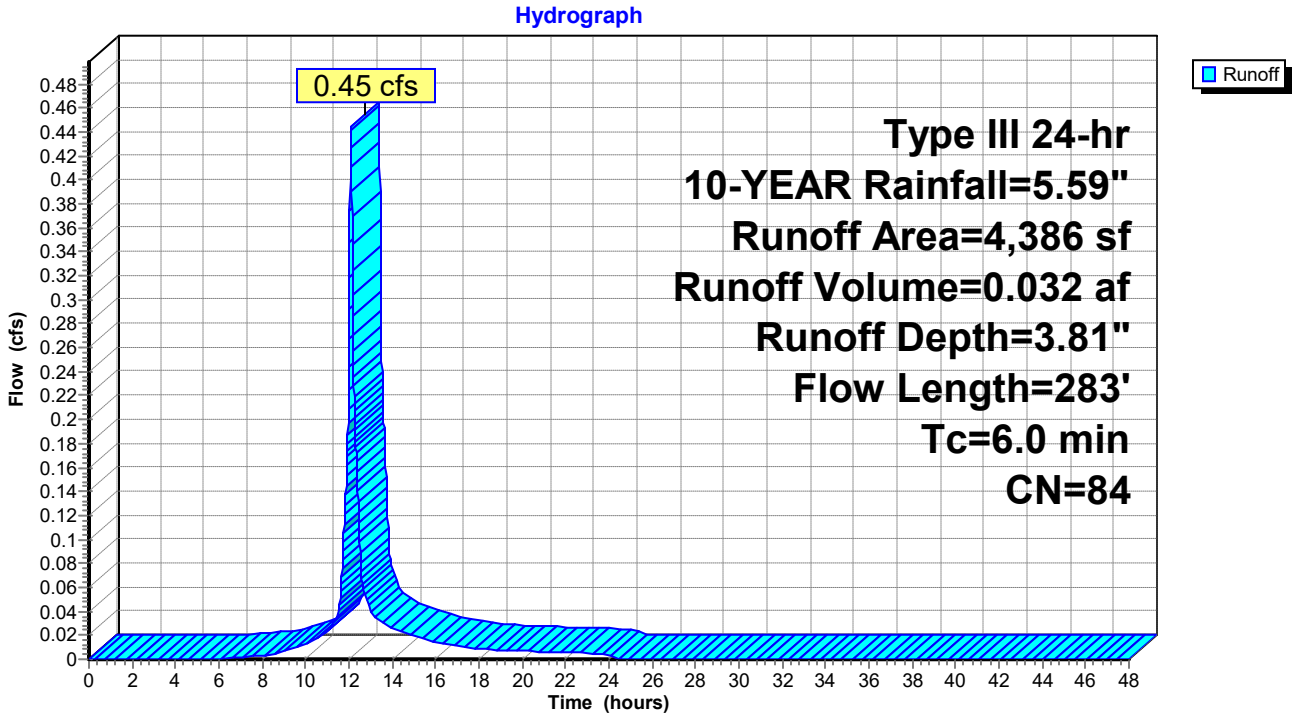
Runoff = 0.45 cfs @ 12.09 hrs, Volume= 0.032 af, Depth= 3.81"
Routed to Pond 4.2P : CB-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YEAR Rainfall=5.59"

Area (sf)	CN	Description
0	98	Roofs, HSG A
3,338	98	Paved parking, HSG A
1,048	39	>75% Grass cover, Good, HSG A
0	30	Woods, Good, HSG A
4,386	84	Weighted Average
1,048		23.89% Pervious Area
3,338		76.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	33	0.0300	1.27		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.06"
0.6	163	0.0490	4.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	87	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
1.5	283	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 4.2S: Southern Half of Proposed Road



Summary for Pond 3.1P: Stormwater Pond #2 - Modified Natural Depression

Inflow Area = 0.732 ac, 14.72% Impervious, Inflow Depth = 0.59" for 10-YEAR event
Inflow = 0.23 cfs @ 12.15 hrs, Volume= 0.036 af
Outflow = 0.02 cfs @ 17.45 hrs, Volume= 0.037 af, Atten= 89%, Lag= 317.9 min
Discarded = 0.02 cfs @ 17.45 hrs, Volume= 0.037 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link POA 3 : Existing Natural Depression

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 38.00' Surf.Area= 1,364 sf Storage= 34 cf
Peak Elev= 38.48' @ 17.45 hrs Surf.Area= 1,716 sf Storage= 767 cf (733 cf above start)
Flood Elev= 41.00' Surf.Area= 4,608 sf Storage= 8,345 cf (8,311 cf above start)

Plug-Flow detention time= 464.5 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 437.2 min (1,371.0 - 933.8)

Volume	Invert	Avail.Storage	Storage Description
#1	37.50'	8,345 cf	**Modified Existing Depression (Conic)** Listed below (Recalc)

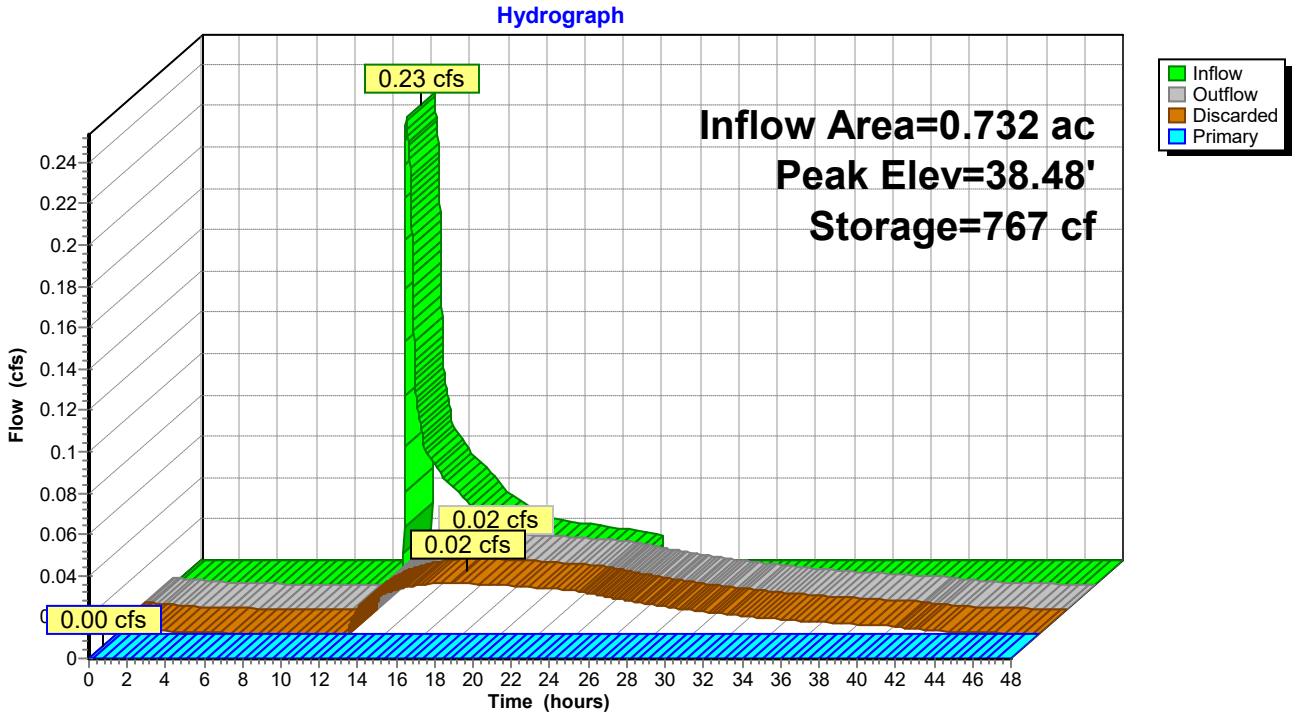
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
37.50	1,364	0.0	0	0	1,364
38.00	1,364	5.0	34	34	1,429
39.00	2,148	100.0	1,741	1,775	2,227
40.00	3,230	100.0	2,671	4,446	3,325
41.00	4,608	100.0	3,899	8,345	4,720

Device	Routing	Invert	Outlet Devices
#1	Discarded	37.50'	**2.500 in/hr Exfiltration through Media to Ground over Wetted area above 37.50'** Excluded Wetted area = 1,364 sf Phase-In= 0.01'
#2	Primary	37.50'	**12.0" Round Outlet to DMH-1 (Culvert)** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.50' / 37.40' S= 0.0111 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#3	Device 2	39.50'	**15.0" Horiz. 15" Yard Drain Rim (Orifice)** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 17.45 hrs HW=38.48' (Free Discharge)
↑—**1=Exfiltration through Media to Ground** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Outlet to DMH-1 (Culvert)** (Passes 0.00 cfs of 0.76 cfs potential flow)
↑—**3=15" Yard Drain Rim (Orifice)** (Controls 0.00 cfs)

Pond 3.1P: Stormwater Pond #2 - Modified Natural Depression



Summary for Pond 3.2P: DMH-1

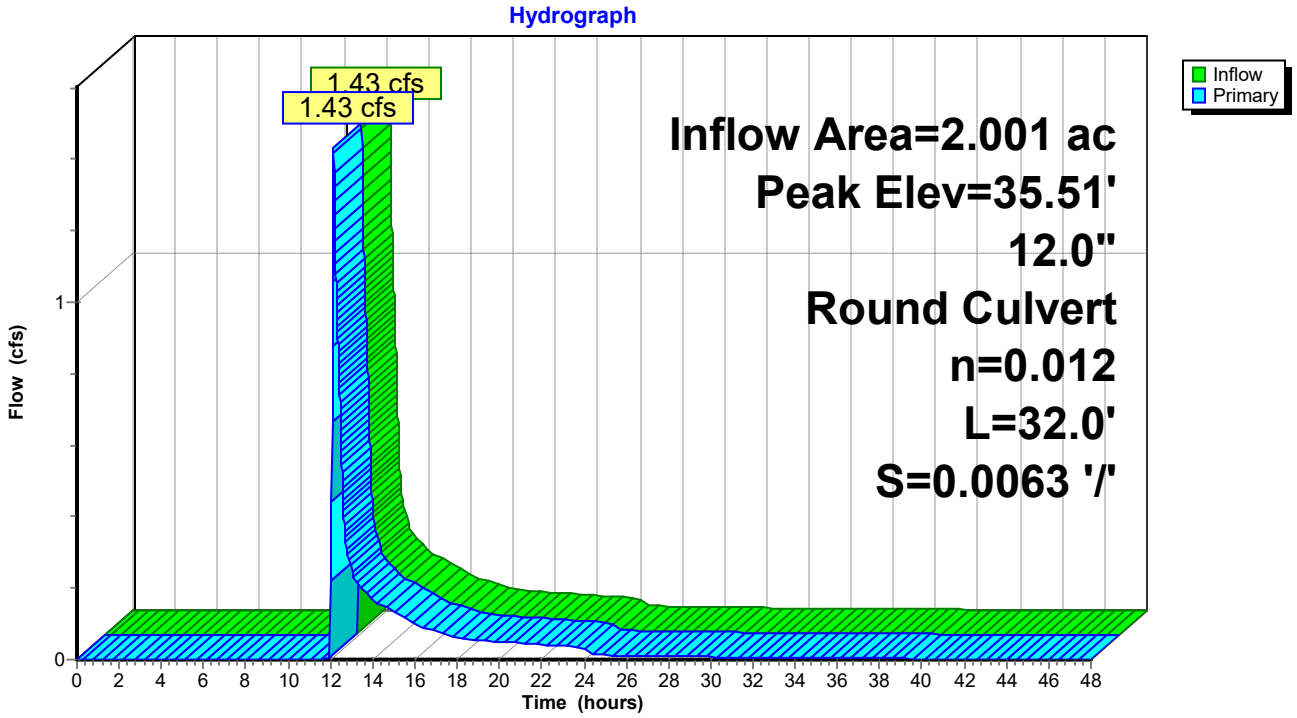
Inflow Area = 2.001 ac, 24.14% Impervious, Inflow Depth > 0.81" for 10-YEAR event
Inflow = 1.43 cfs @ 12.15 hrs, Volume= 0.136 af
Outflow = 1.43 cfs @ 12.15 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min
Primary = 1.43 cfs @ 12.15 hrs, Volume= 0.136 af
Routed to Pond 4.2P : CB-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 35.51' @ 12.15 hrs
Flood Elev= 42.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.70'	**12.0" Round Outlet to CB (Culvert)** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.70' / 34.50' S= 0.0063 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.43 cfs @ 12.15 hrs HW=35.51' TW=35.22' (Dynamic Tailwater)
↑—**1=Outlet to CB (Culvert)** (Outlet Controls 1.43 cfs @ 2.89 fps)

Pond 3.2P: DMH-1



Summary for Pond 4.1P: Stormwater Pond #1 (Bioretention)

Inflow Area = 1.268 ac, 29.57% Impervious, Inflow Depth = 1.29" for 10-YEAR event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.136 af
Outflow = 1.43 cfs @ 12.15 hrs, Volume= 0.136 af, Atten= 13%, Lag= 2.9 min
Primary = 1.43 cfs @ 12.15 hrs, Volume= 0.136 af
Routed to Pond 3.2P : DMH-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Starting Elev= 41.00' Surf.Area= 764 sf Storage= 57 cf
Peak Elev= 41.73' @ 12.15 hrs Surf.Area= 1,104 sf Storage= 735 cf (678 cf above start)
Flood Elev= 42.00' Surf.Area= 1,246 sf Storage= 1,053 cf (995 cf above start)

Plug-Flow detention time= 96.4 min calculated for 0.134 af (99% of inflow)
Center-of-Mass det. time= 86.3 min (969.1 - 882.7)

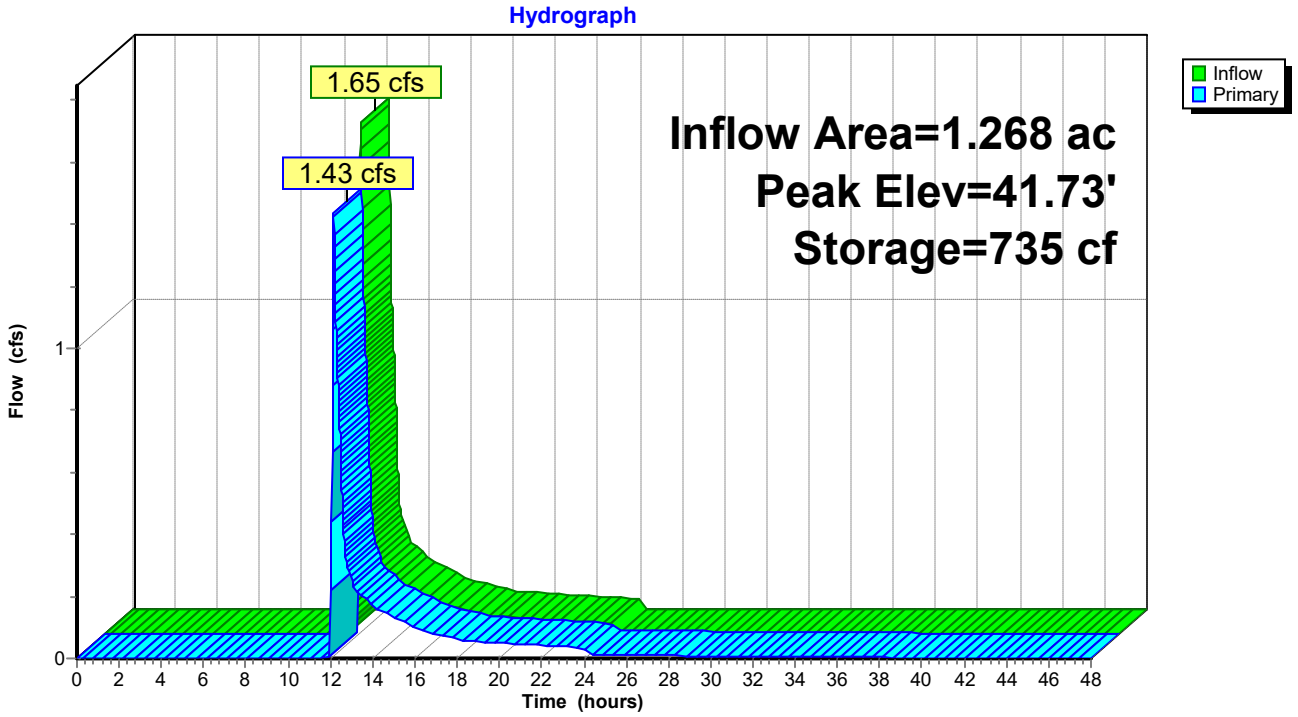
Volume	Invert	Avail.Storage	Storage Description
#1	39.50'	1,053 cf	**Bioretention Cell (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.50	764	0.0	0	0	764
41.00	764	5.0	57	57	911
42.00	1,246	100.0	995	1,053	1,406

Device	Routing	Invert	Outlet Devices
#1	Primary	38.00'	**12.0" Round Outlet to DMH (Culvert)** L= 52.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.00' / 37.70' S= 0.0058 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	38.30'	**6.0" Vert. Underdrain (Orifice)** C= 0.600 Limited to weir flow at low heads
#3	Device 2	41.00'	**2.500 in/hr Exfiltration through Media over Wetted area above 41.00'** Excluded Wetted area = 911 sf Phase-In= 0.01'
#4	Device 1	41.50'	**15.0" Horiz. 15" Yard Drain Rim (Orifice)** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.43 cfs @ 12.15 hrs HW=41.73' TW=35.51' (Dynamic Tailwater)
- **1=Outlet to DMH (Culvert)** (Passes 1.43 cfs of 6.45 cfs potential flow)
- **2=Underdrain (Orifice)** (Passes 0.02 cfs of 1.69 cfs potential flow)
  - **3=Exfiltration through Media** (Exfiltration Controls 0.02 cfs)
- **4=15" Yard Drain Rim (Orifice)** (Weir Controls 1.41 cfs @ 1.57 fps)

Pond 4.1P: Stormwater Pond #1 (Bioretention)



Summary for Pond 4.2P: CB-1

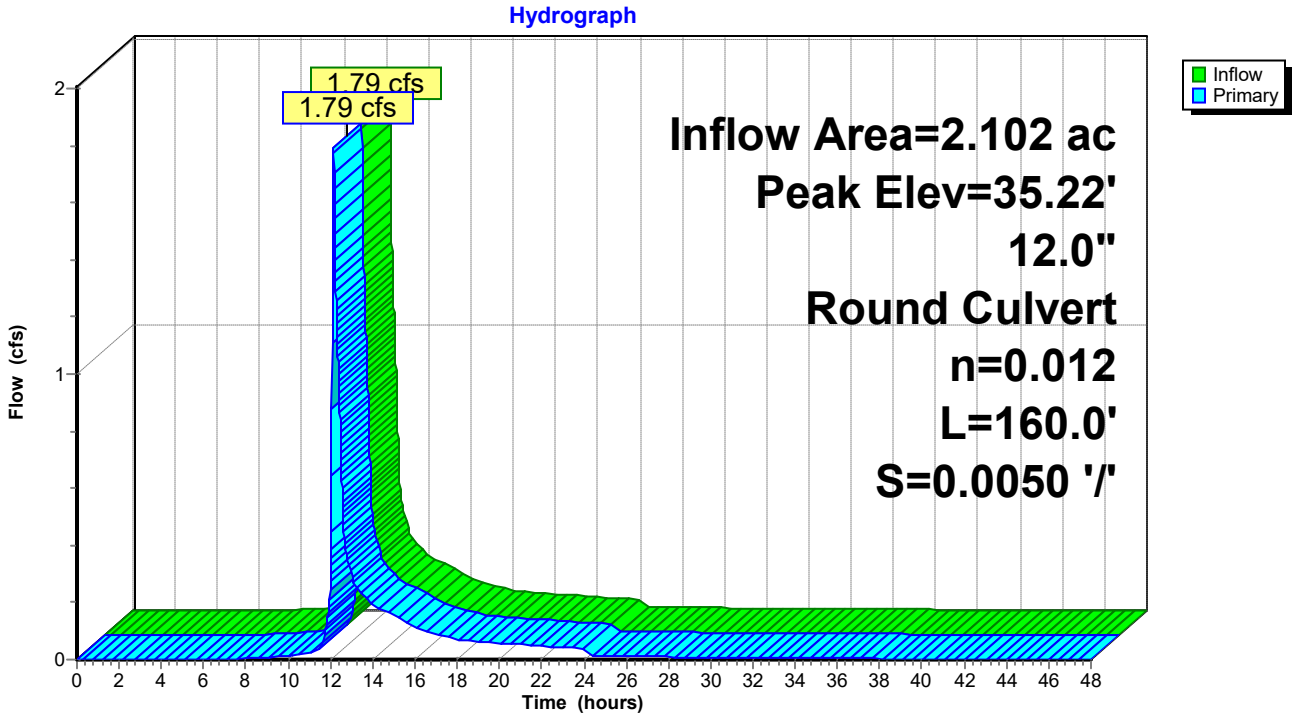
Inflow Area = 2.102 ac, 26.63% Impervious, Inflow Depth > 0.96" for 10-YEAR event
Inflow = 1.79 cfs @ 12.14 hrs, Volume= 0.168 af
Outflow = 1.79 cfs @ 12.14 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min
Primary = 1.79 cfs @ 12.14 hrs, Volume= 0.168 af
Routed to Link POA 4 : Existing City Drain Manhole

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 35.22' @ 12.14 hrs
Flood Elev= 41.75'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.40'	**12.0" Round Outlet Pipe to City DMH (Culvert)** L= 160.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.40' / 33.60' S= 0.0050 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.79 cfs @ 12.14 hrs HW=35.22' TW=0.00' (Dynamic Tailwater)
1=Outlet Pipe to City DMH (Culvert) (Barrel Controls 1.79 cfs @ 3.54 fps)

Pond 4.2P: CB-1

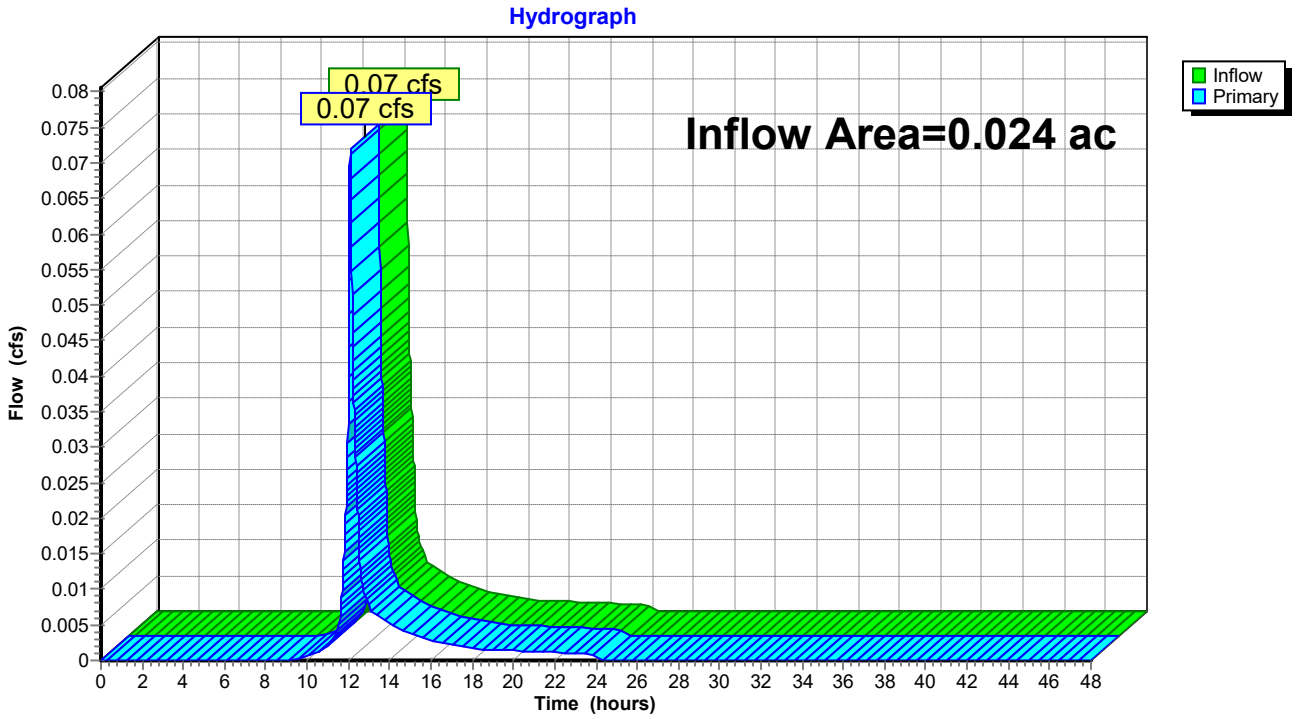


Summary for Link POA 1: Farm Lane Road

Inflow Area = 0.024 ac, 57.07% Impervious, Inflow Depth = 2.57" for 10-YEAR event
Inflow = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af
Primary = 0.07 cfs @ 12.09 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 1: Farm Lane Road

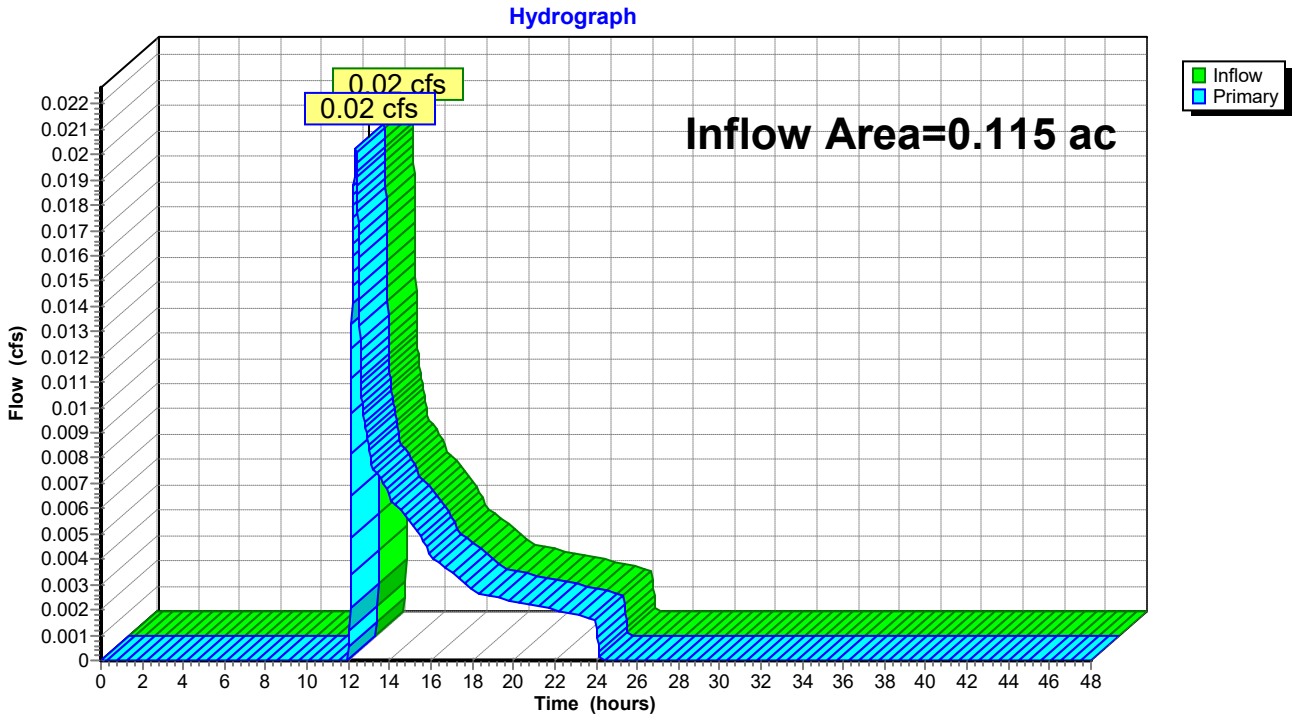


Summary for Link POA 2: Abutting Property

Inflow Area = 0.115 ac, 6.21% Impervious, Inflow Depth = 0.43" for 10-YEAR event
Inflow = 0.02 cfs @ 12.34 hrs, Volume= 0.004 af
Primary = 0.02 cfs @ 12.34 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 2: Abutting Property

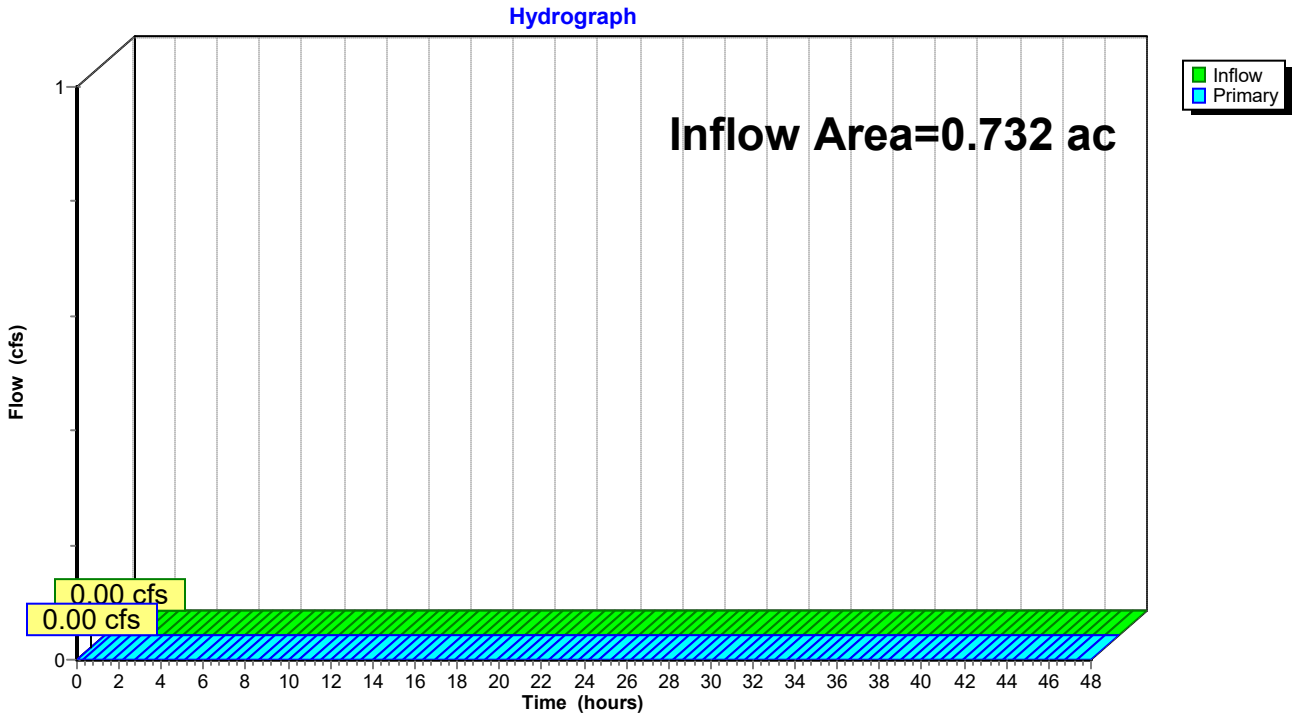


Summary for Link POA 3: Existing Natural Depression

Inflow Area = 0.732 ac, 14.72% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Routed to Pond 3.2P : DMH-1

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 3: Existing Natural Depression

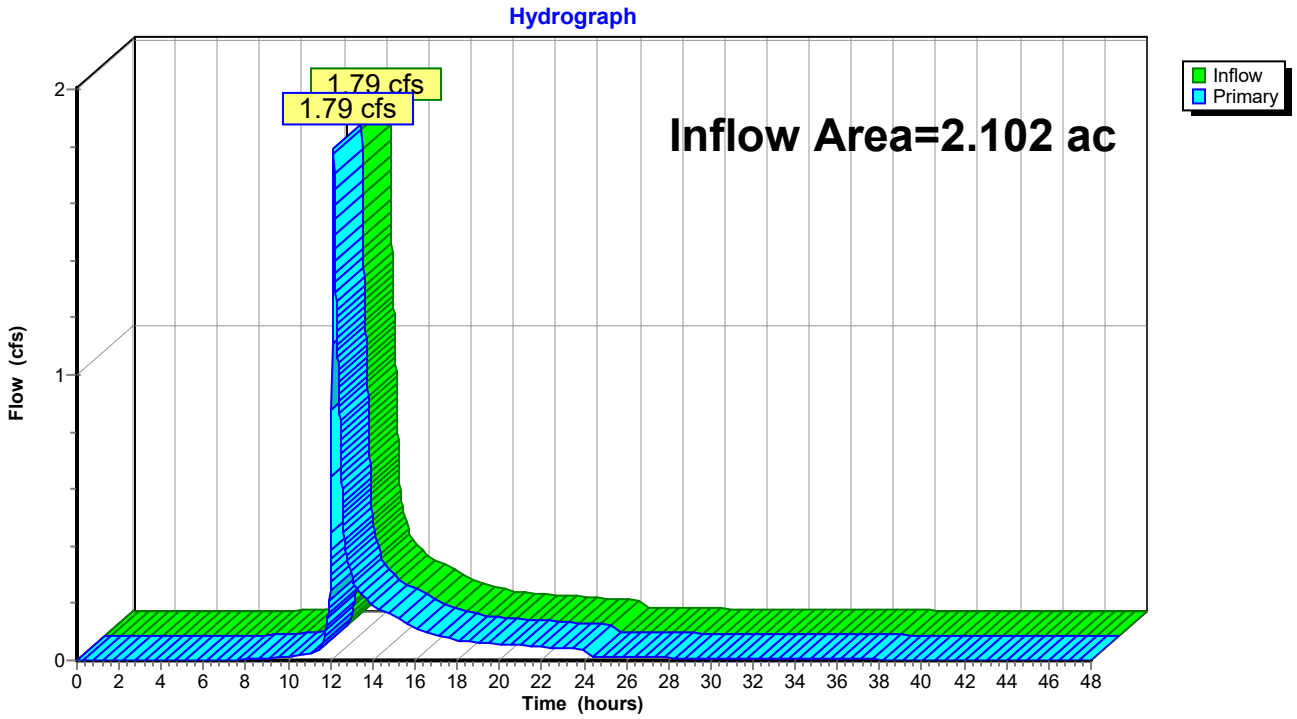


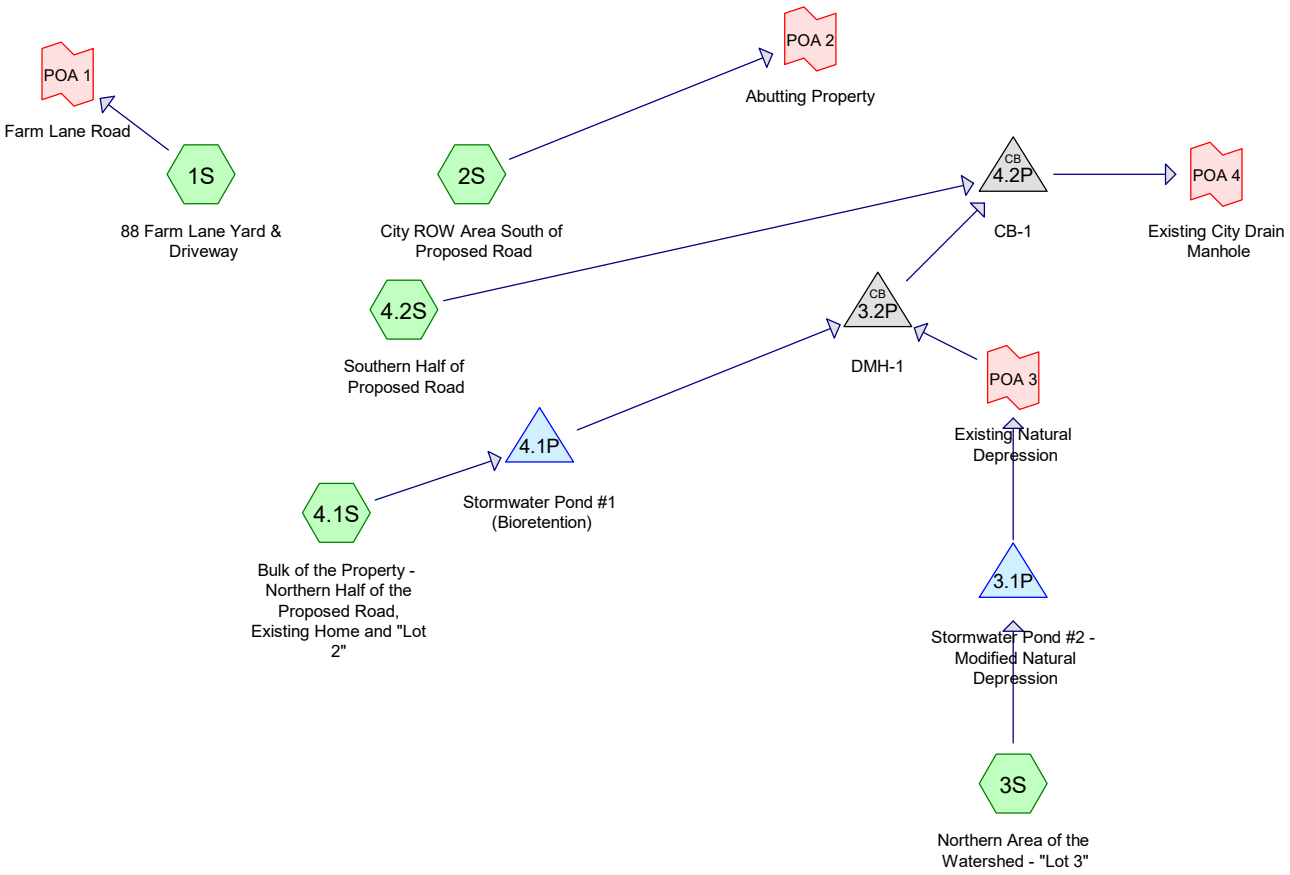
Summary for Link POA 4: Existing City Drain Manhole

Inflow Area = 2.102 ac, 26.63% Impervious, Inflow Depth > 0.96" for 10-YEAR event
Inflow = 1.79 cfs @ 12.14 hrs, Volume= 0.168 af
Primary = 1.79 cfs @ 12.14 hrs, Volume= 0.168 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Link POA 4: Existing City Drain Manhole





Subcat Reach Pond Link

Routing Diagram for 5719-POST
Prepared by Altus Engineering, Printed 2/12/2026
HydroCAD® 10.20-8a s/n 01222 © 2025 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: 88 Farm Lane Yard & Runoff Area=1,046 sf 57.07% Impervious Runoff Depth=3.79"
Flow Length=25' Tc=6.0 min CN=71 Runoff=0.11 cfs 0.008 af

Subcatchment 2S: City ROW Area South of Runoff Area=5,028 sf 6.21% Impervious Runoff Depth=0.95"
Flow Length=136' Tc=6.4 min CN=41 Runoff=0.08 cfs 0.009 af

Subcatchment 3S: Northern Area of the Runoff Area=31,903 sf 14.72% Impervious Runoff Depth=1.19"
Flow Length=251' Tc=6.0 min CN=44 Runoff=0.75 cfs 0.073 af

Subcatchment 4.1S: Bulk of the Property - Runoff Area=55,254 sf 29.57% Impervious Runoff Depth=2.17"
Flow Length=370' Tc=6.0 min CN=55 Runoff=3.03 cfs 0.230 af

Subcatchment 4.2S: Southern Half of Runoff Area=4,386 sf 76.11% Impervious Runoff Depth=5.22"
Flow Length=283' Tc=6.0 min CN=84 Runoff=0.60 cfs 0.044 af

Pond 3.1P: Stormwater Pond #2 - Modified Peak Elev=38.96' Storage=1,682 cf Inflow=0.75 cfs 0.073 af
Discarded=0.05 cfs 0.073 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.073 af

Pond 3.2P: DMH-1 Peak Elev=36.88' Inflow=2.87 cfs 0.229 af
12.0" Round Culvert n=0.012 L=32.0' S=0.0063 '/' Outflow=2.87 cfs 0.229 af

Pond 4.1P: Stormwater Pond #1 (Bioretention) Peak Elev=41.87' Storage=891 cf Inflow=3.03 cfs 0.230 af
Outflow=2.87 cfs 0.229 af

Pond 4.2P: CB-1 Peak Elev=36.30' Inflow=3.42 cfs 0.273 af
12.0" Round Culvert n=0.012 L=160.0' S=0.0050 '/' Outflow=3.42 cfs 0.273 af

Link POA 1: Farm Lane Road Inflow=0.11 cfs 0.008 af
Primary=0.11 cfs 0.008 af

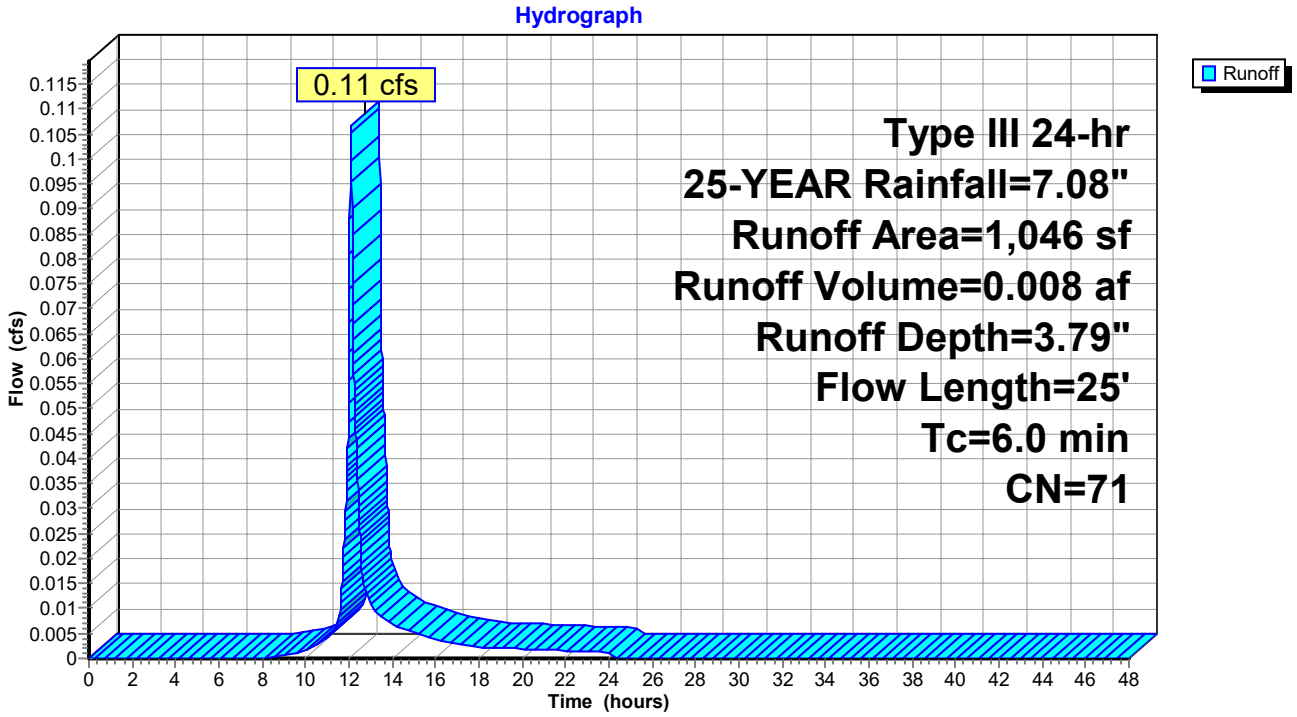
Link POA 2: Abutting Property Inflow=0.08 cfs 0.009 af
Primary=0.08 cfs 0.009 af

Link POA 3: Existing Natural Depression Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

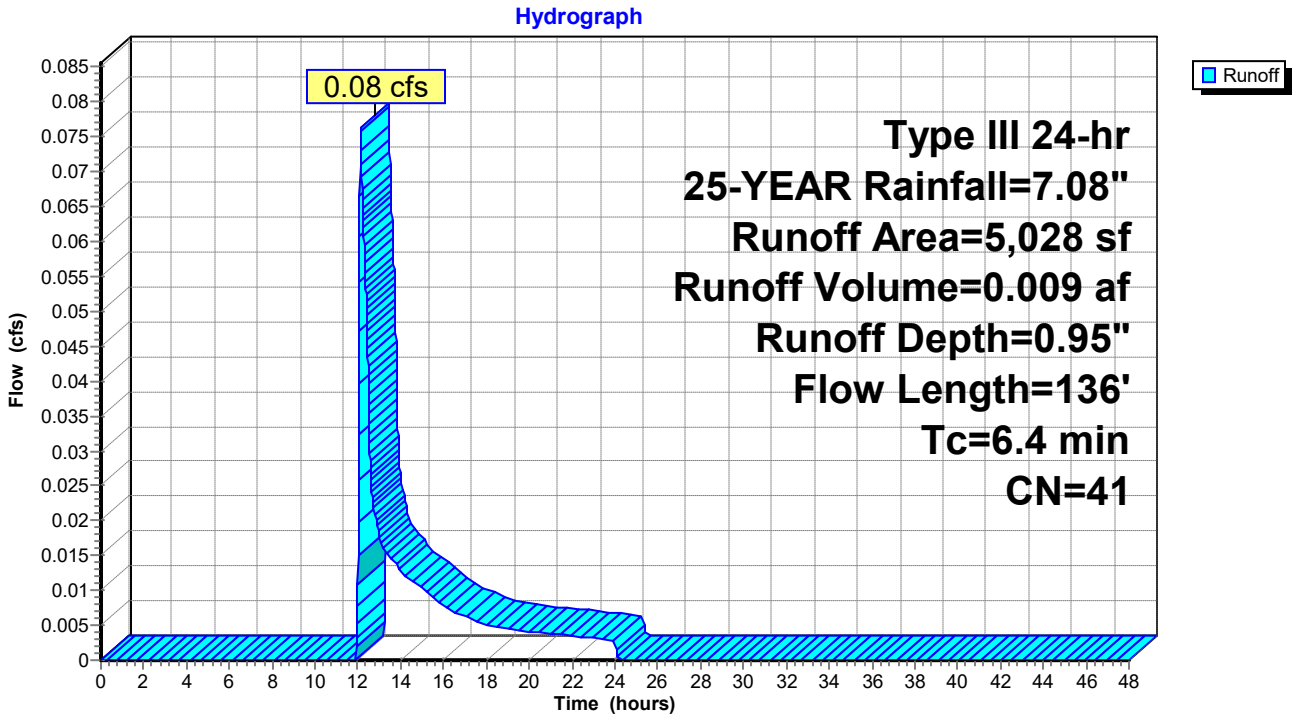
Link POA 4: Existing City Drain Manhole Inflow=3.42 cfs 0.273 af
Primary=3.42 cfs 0.273 af

Total Runoff Area = 2.241 ac Runoff Volume = 0.363 af Average Runoff Depth = 1.94"
74.10% Pervious = 1.661 ac 25.90% Impervious = 0.580 ac

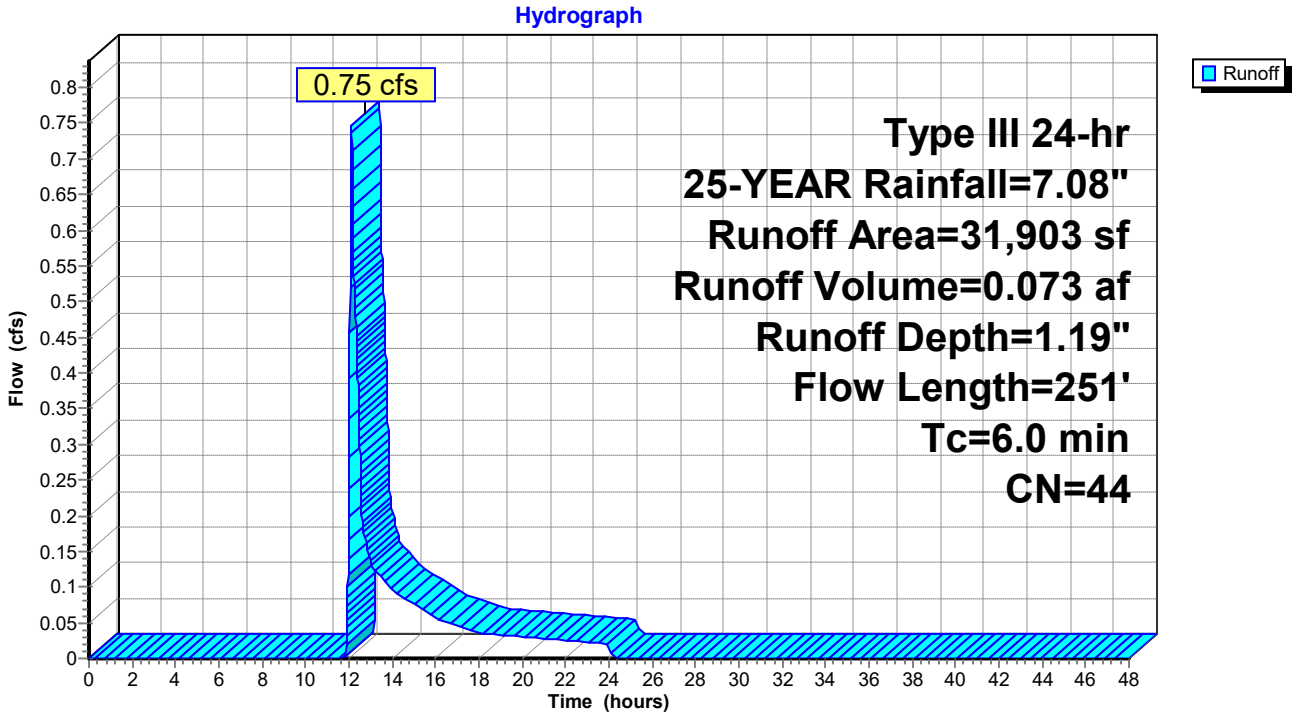
Subcatchment 1S: 88 Farm Lane Yard & Driveway



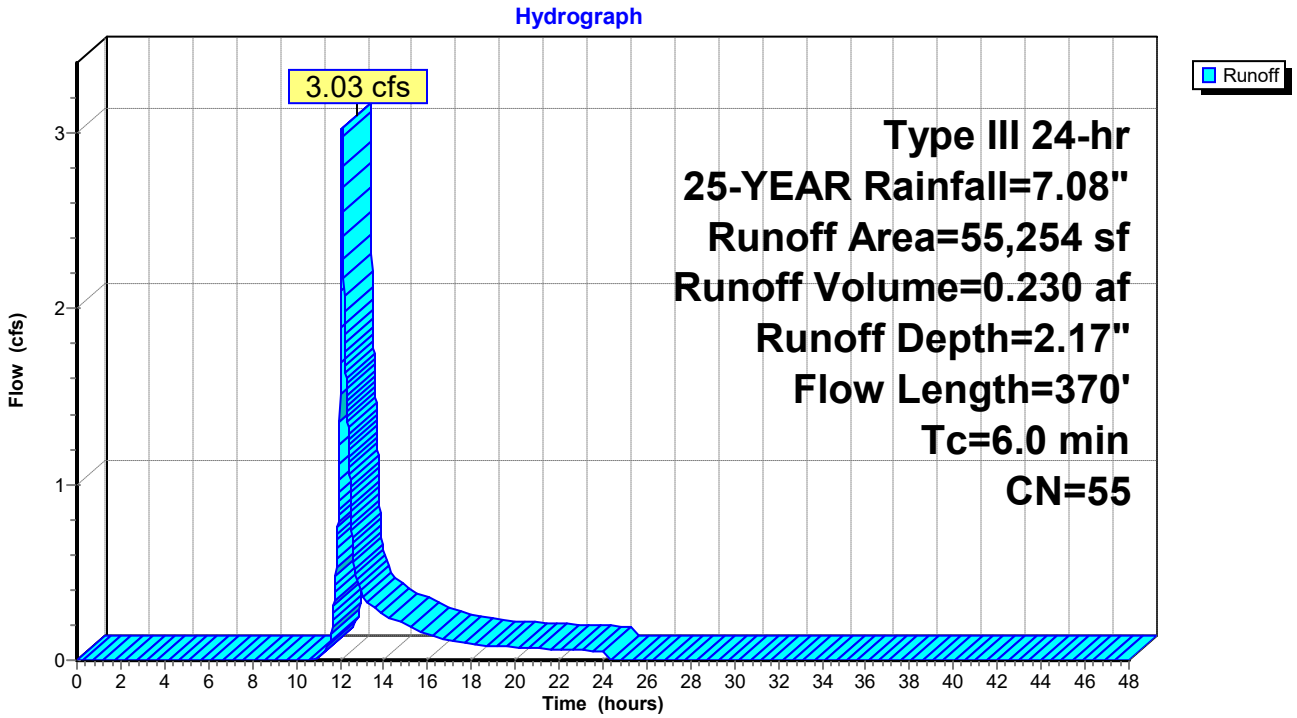
Subcatchment 2S: City ROW Area South of Proposed Road



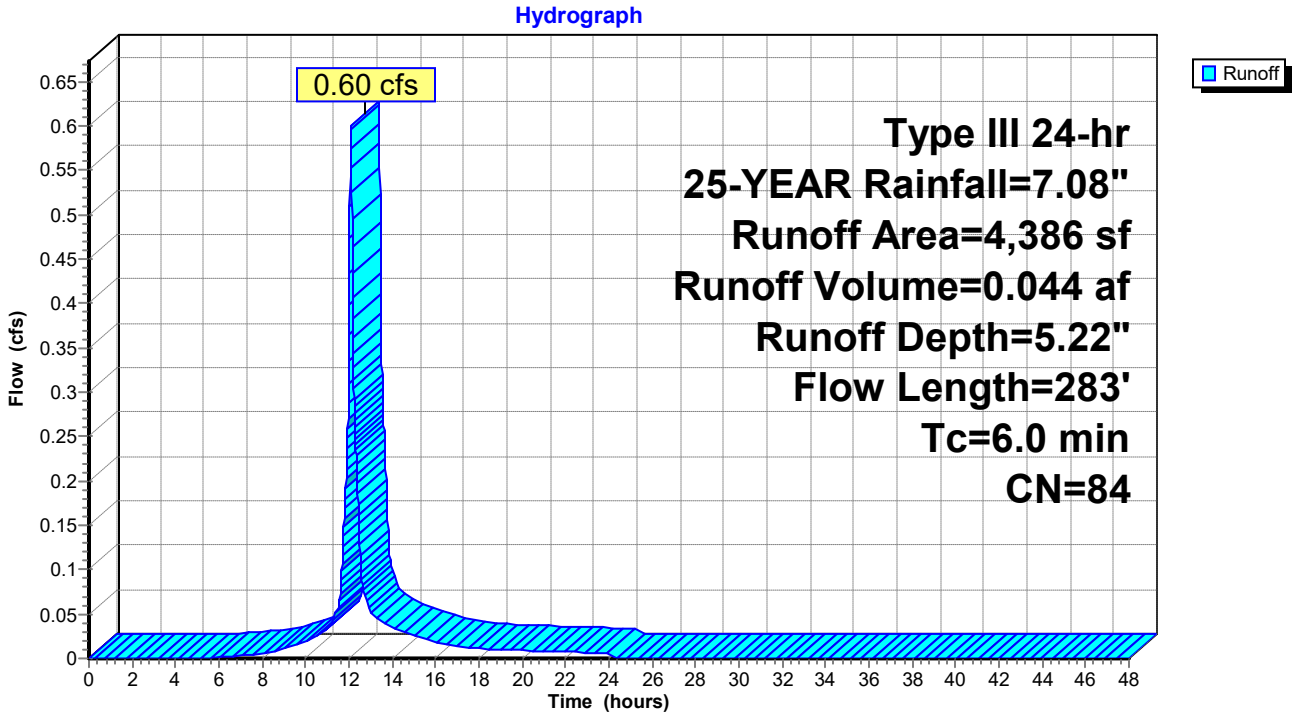
Subcatchment 3S: Northern Area of the Watershed - "Lot 3"



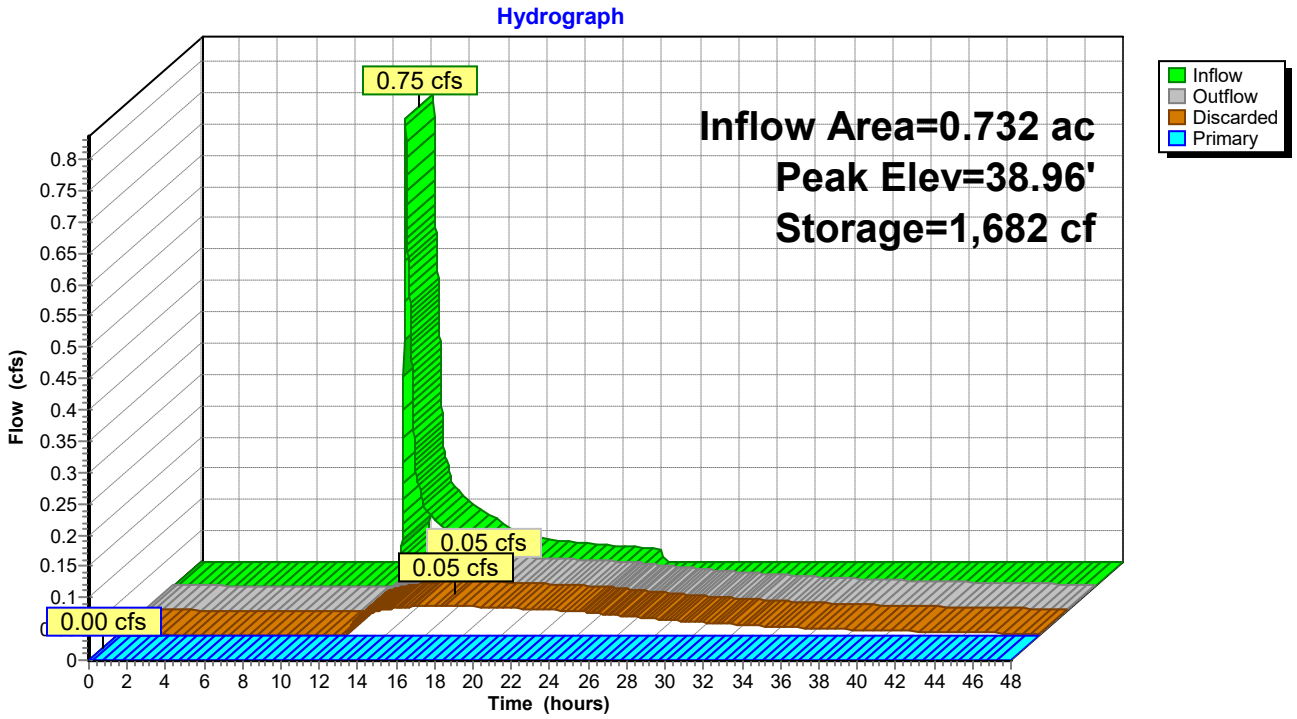
Subcatchment 4.1S: Bulk of the Property - Northern Half of the Proposed Road, Existing Home and "Lot 2"



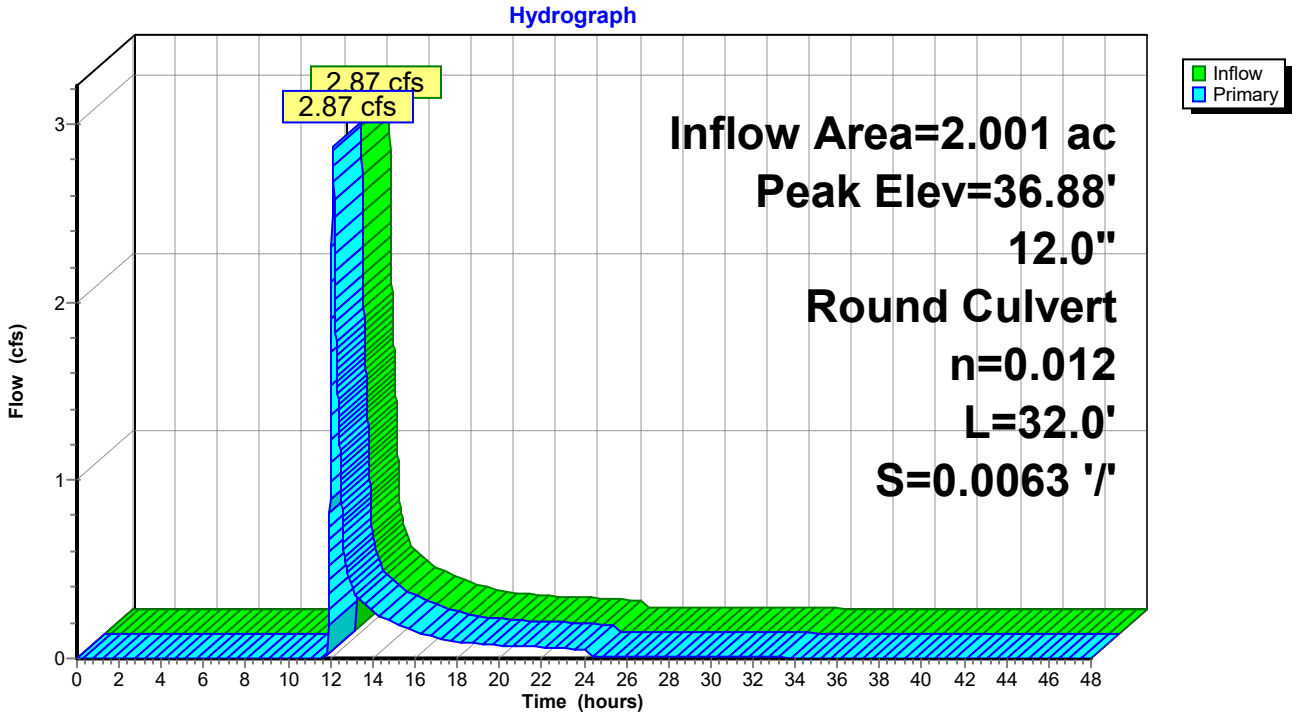
Subcatchment 4.2S: Southern Half of Proposed Road



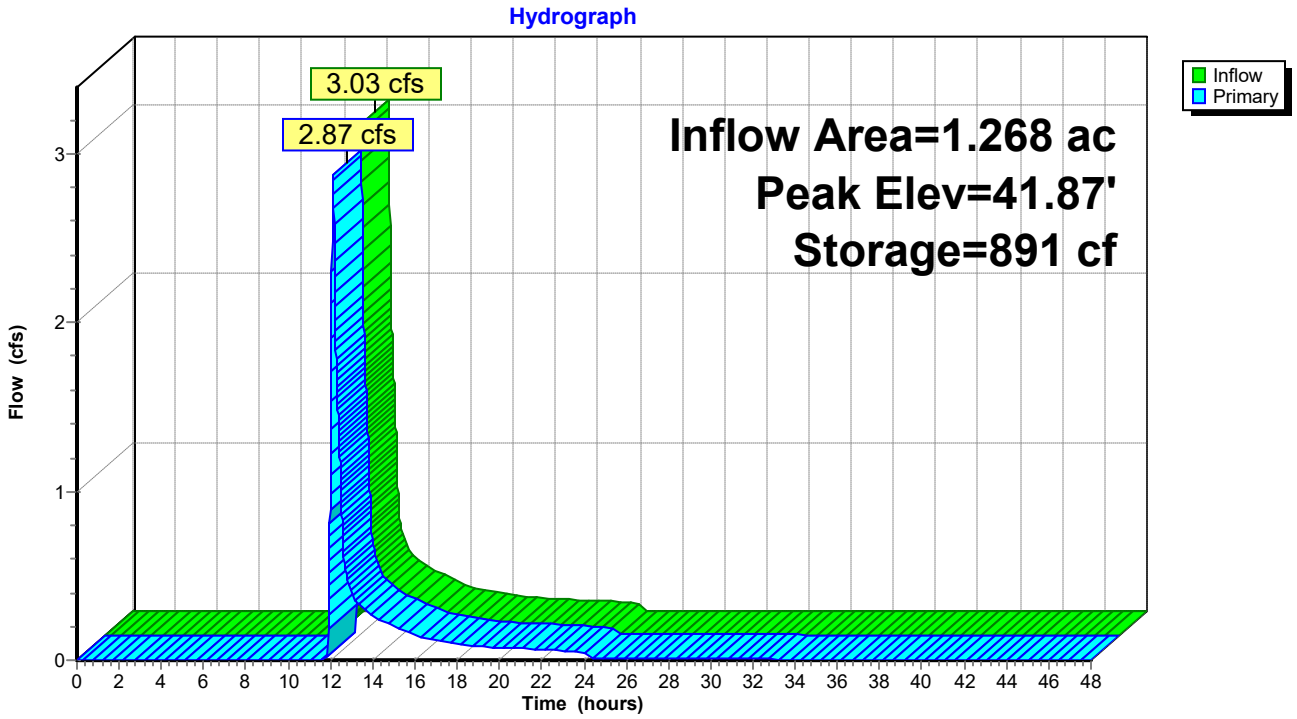
Pond 3.1P: Stormwater Pond #2 - Modified Natural Depression



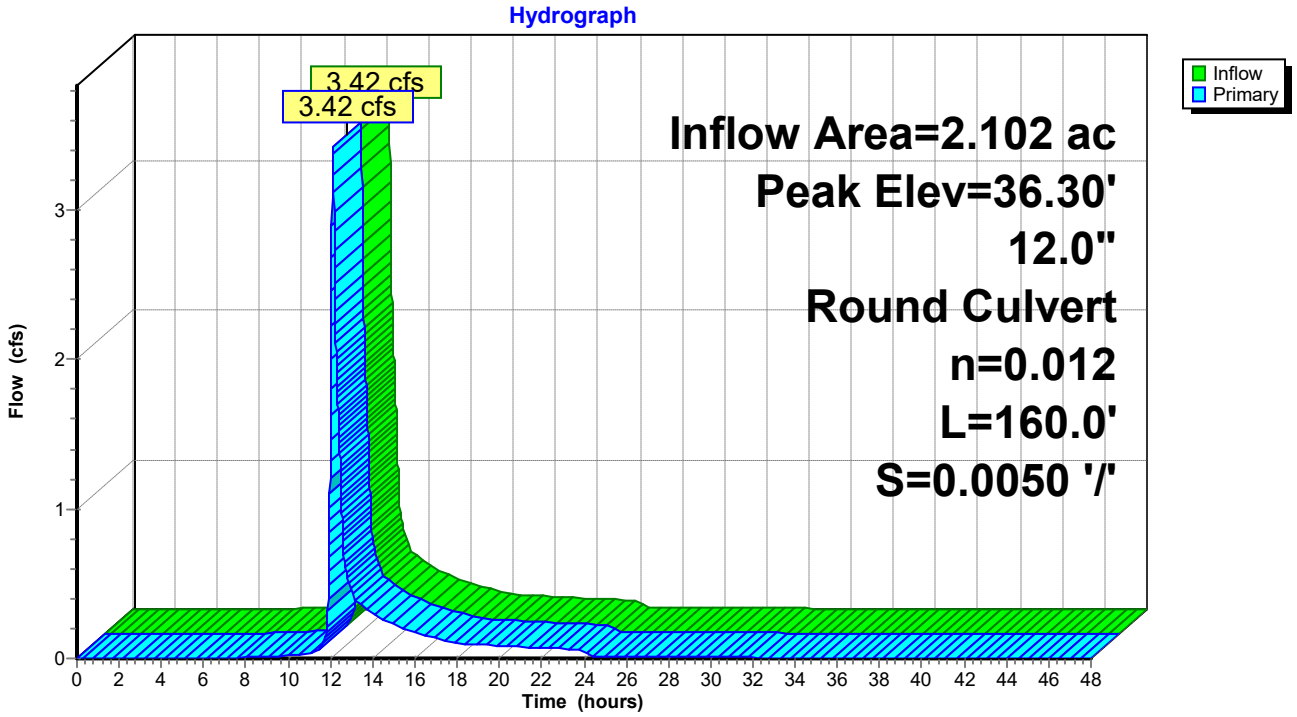
Pond 3.2P: DMH-1



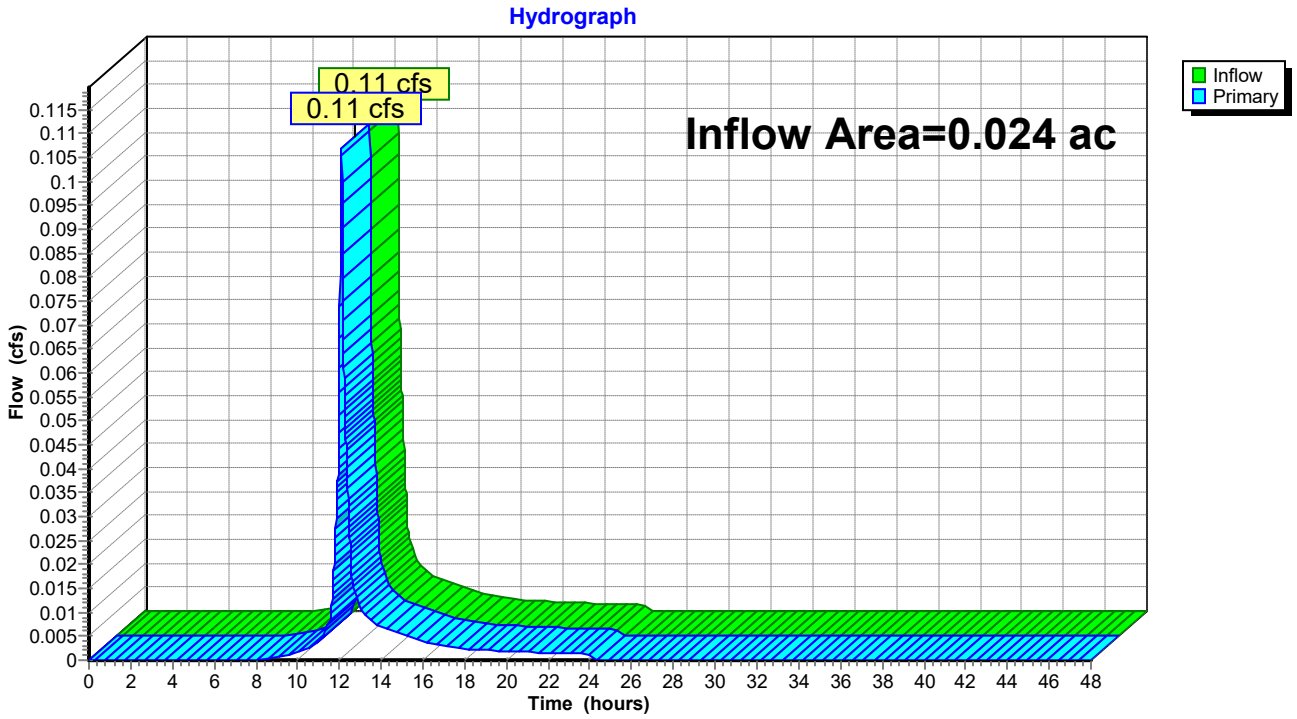
Pond 4.1P: Stormwater Pond #1 (Bioretention)



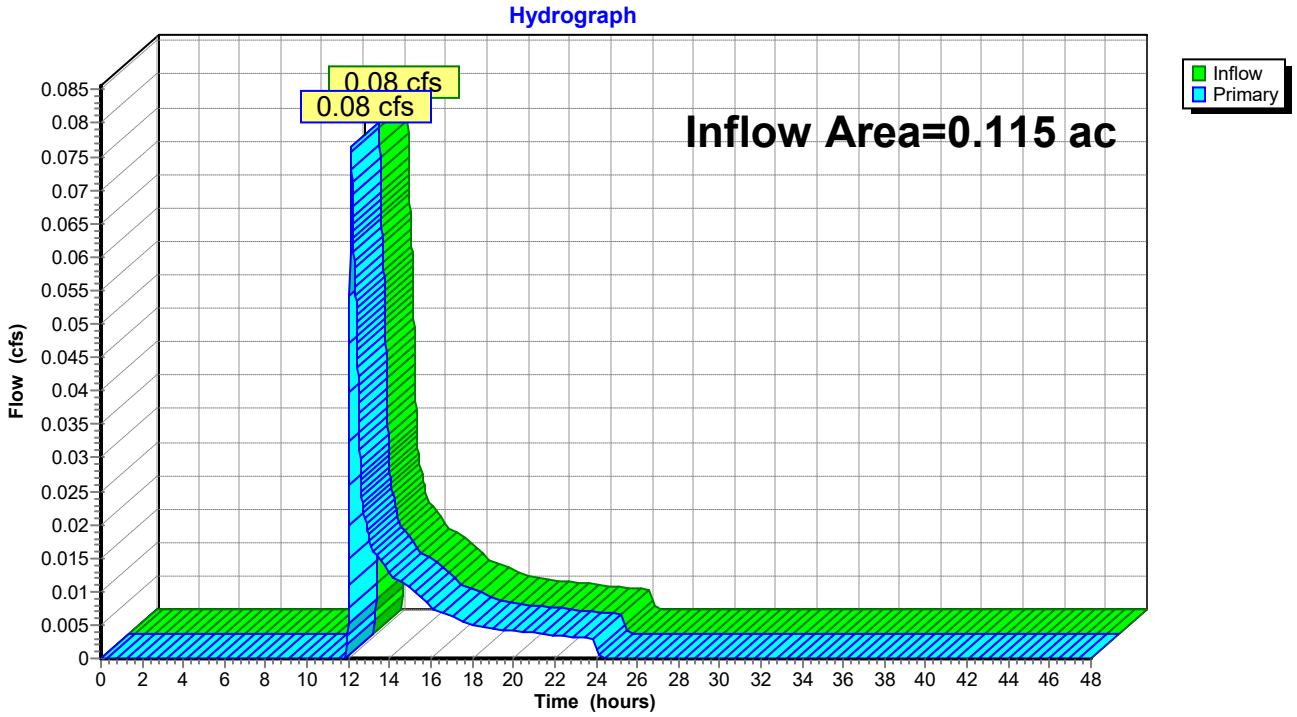
Pond 4.2P: CB-1



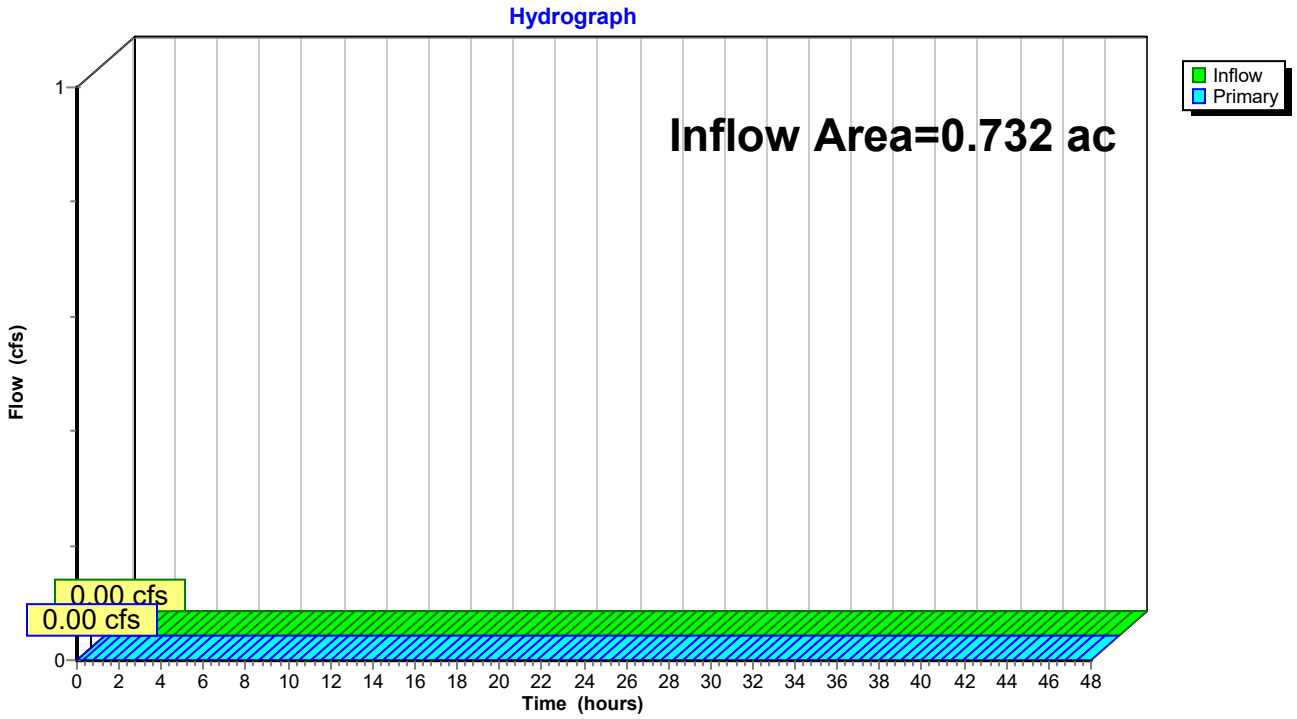
Link POA 1: Farm Lane Road



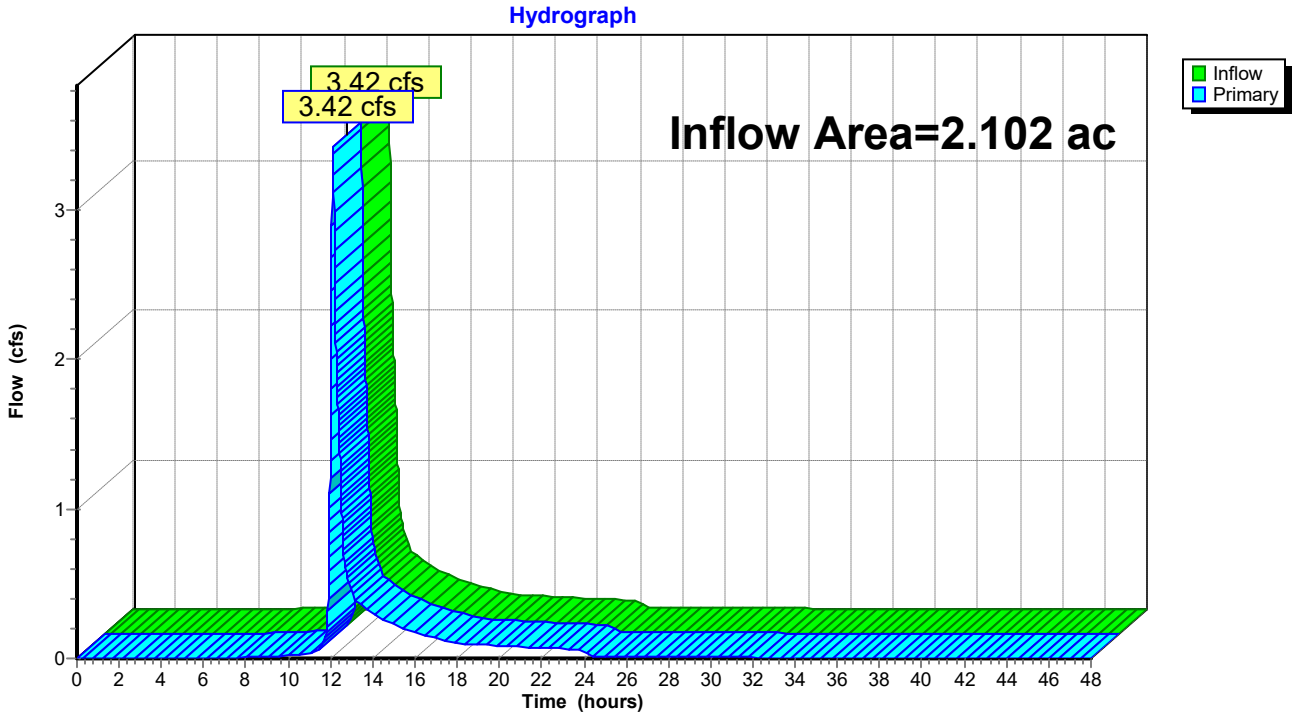
Link POA 2: Abutting Property



Link POA 3: Existing Natural Depression



Link POA 4: Existing City Drain Manhole



Section 5

Precipitation Table

ALTUS ENGINEERING

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point	
Smoothing	Yes
State	
Location	
Latitude	43.079 degrees North
Longitude	70.784 degrees West
Elevation	10 feet
Date/Time	Wed Jan 21 2026 13:34:59 GMT-0500 (Eastern Standard Time)

PRECIPITATION ESTIMATES INCREASED BY 15% FOR COSTAL COMMUNITY

2- YEAR: 2.66 * 1.15 = 3.06
10 - YEAR: 4.86 * 1.15 = 5.59
25 - YEAR: 6.16 * 1.15 = 7.08
50 - YEAR: 7.38 * 1.15 = 8.49

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.91	**1yr**	2.35	2.80	3.21	3.93	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.94	2.48	3.20	3.56	**2yr**	2.84	3.42	3.93	4.67	5.31	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.06	4.57	**5yr**	3.59	4.39	5.03	5.92	6.69	**5yr**
10yr	0.41	0.65	0.82	1.11	1.44	1.88	**10yr**	1.25	1.72	2.22	2.88	3.74	4.86	5.52	**10yr**	4.30	5.31	6.06	7.09	7.96	**10yr**
25yr	0.48	0.76	0.96	1.33	1.76	2.32	**25yr**	1.52	2.13	2.76	3.61	4.72	6.16	7.08	**25yr**	5.45	6.81	7.77	9.00	10.03	**25yr**
50yr	0.53	0.85	1.09	1.53	2.06	2.74	**50yr**	1.77	2.51	3.27	4.30	5.64	7.38	8.56	**50yr**	6.53	8.24	9.38	10.78	11.96	**50yr**
100yr	0.60	0.97	1.25	1.76	2.40	3.22	**100yr**	2.07	2.96	3.86	5.11	6.73	8.84	10.36	**100yr**	7.82	9.96	11.33	12.93	14.26	**100yr**
200yr	0.67	1.09	1.41	2.03	2.80	3.80	**200yr**	2.41	3.49	4.58	6.09	8.05	10.59	12.52	**200yr**	9.37	12.04	13.69	15.50	17.00	**200yr**
500yr	0.79	1.30	1.69	2.46	3.44	4.72	**500yr**	2.97	4.35	5.71	7.65	10.18	13.46	16.11	**500yr**	11.91	15.49	17.58	19.72	21.47	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.67	2.22	2.50	**1yr**	1.96	2.41	2.85	3.16	3.87	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.45	**2yr**	2.70	3.32	3.81	4.54	5.06	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.74	3.78	4.19	**5yr**	3.35	4.03	4.71	5.53	6.23	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.37	4.86	**10yr**	3.87	4.68	5.43	6.41	7.19	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.35	1.86	2.10	2.77	3.55	4.68	5.90	**25yr**	4.14	5.67	6.64	7.79	8.68	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.09	3.96	5.28	6.82	**50yr**	4.67	6.56	7.73	9.04	10.02	**50yr**
100yr	0.54	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.42	2.63	3.44	4.38	5.93	7.88	**100yr**	5.25	7.57	8.99	10.51	11.56	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.97	2.75	2.93	3.82	4.84	6.63	9.10	**200yr**	5.87	8.75	10.45	12.22	13.36	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.37	**500yr**	2.34	3.29	3.41	4.37	5.53	7.70	11.00	**500yr**	6.81	10.58	12.75	14.95	16.16	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.26	1.74	2.21	2.99	3.14	**1yr**	2.65	3.02	3.58	4.37	5.04	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.69	**2yr**	3.03	3.55	4.07	4.82	5.63	**2yr**
5yr	0.40	0.61	0.76	1.05	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.33	4.94	**5yr**	3.83	4.75	5.36	6.35	7.13	**5yr**
10yr	0.47	0.72	0.89	1.24	1.60	1.97	**10yr**	1.38	1.92	2.27	3.10	3.94	5.33	6.17	**10yr**	4.72	5.93	6.77	7.81	8.72	**10yr**
25yr	0.57	0.87	1.08	1.54	2.03	2.55	**25yr**	1.75	2.50	2.94	4.06	5.12	7.80	8.29	**25yr**	6.90	7.97	9.07	10.29	11.36	**25yr**
50yr	0.66	1.01	1.26	1.81	2.44	3.10	**50yr**	2.10	3.04	3.58	4.97	6.27	9.77	10.39	**50yr**	8.65	9.99	11.33	12.66	13.90	**50yr**
100yr	0.78	1.18	1.48	2.14	2.93	3.77	**100yr**	2.53	3.69	4.35	6.12	7.69	12.24	13.01	**100yr**	10.83	12.51	14.15	15.61	17.02	**100yr**
200yr	0.91	1.37	1.74	2.52	3.51	4.60	**200yr**	3.03	4.50	5.30	7.53	9.42	15.36	16.31	**200yr**	13.59	15.69	17.69	19.23	20.83	**200yr**
500yr	1.13	1.68	2.16	3.14	4.47	5.97	**500yr**	3.85	5.83	6.88	9.94	12.37	20.77	22.01	**500yr**	18.38	21.16	23.77	25.35	27.24	**500yr**

Powered by ACIS Northeast Regional Climate Center

Section 6

NRCS Soils Report

ALTUS ENGINEERING

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

January 8, 2026

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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799—Urban land-Canton complex, 3 to 15 percent slopes.....10
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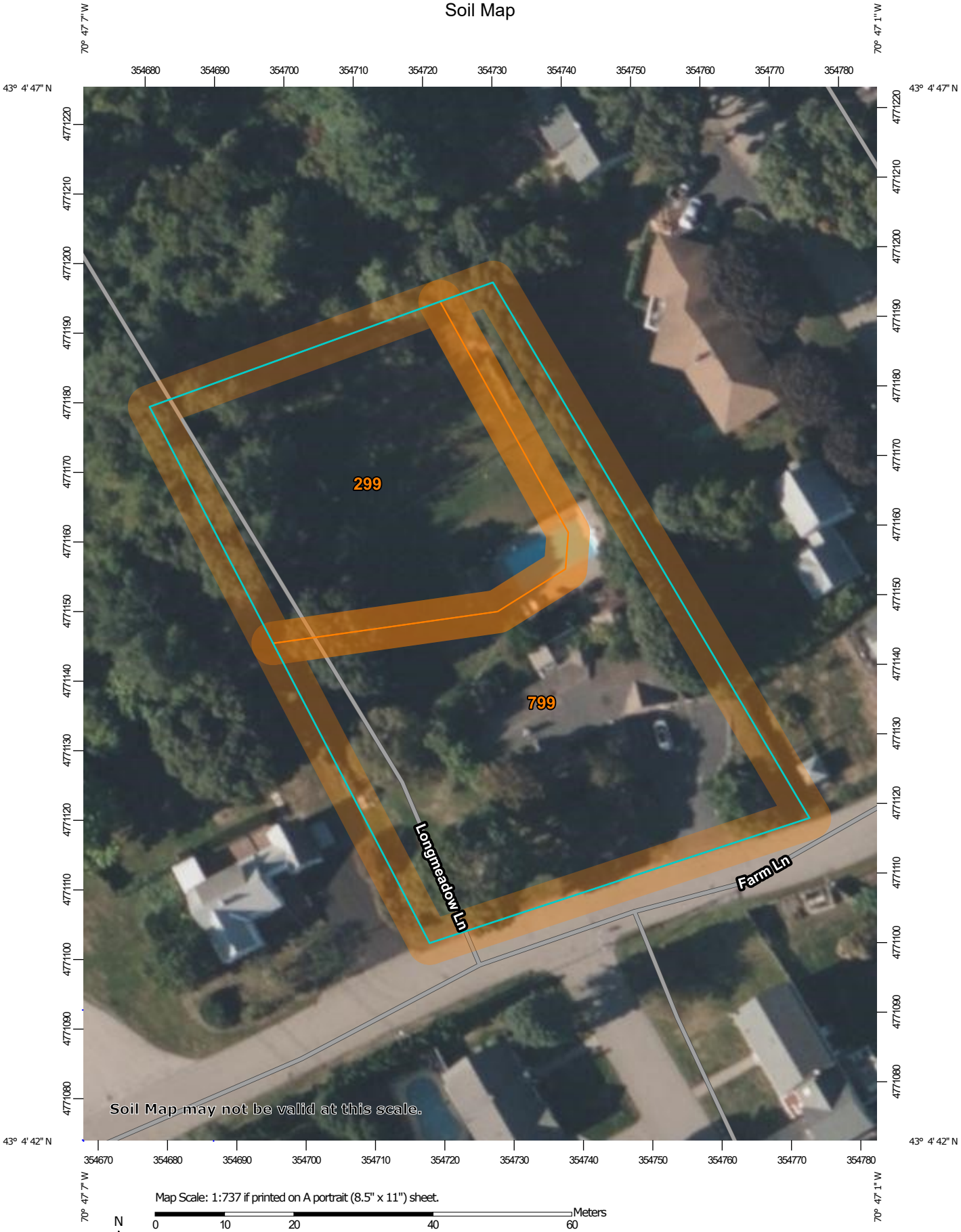
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:737 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 28, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
299	Udorthents, smoothed	0.5	39.4%
799	Urban land-Canton complex, 3 to 15 percent slopes	0.7	60.6%
Totals for Area of Interest		**1.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

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Section 7

Stormwater Operations & Maintenance Plan Inspection Form Stormwater Management Plan

ALTUS ENGINEERING

STORMWATER INSPECTION AND MAINTENANCE MANUAL

86 Farm Lane Subdivision
Tax Map 236, Lot 74

OWNER:
Flipping Berger's, LLC.
71 Bracket Road
Portsmouth, NH 03801

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner:	*Jeanette MacDonald*		*-*
	Name	*Company*	*Phone*
Inspection:	*Flipping Berger's, LLC*		*(914) 299-4438*
	Name	*Company*	*Phone*
Maintenance:	*Flipping Berger's, LLC*		*(603) 299-4438*
	Name	*Company*	*Phone*

NOTES:

Photographs of each stormwater BMP are to be taken at each inspection and submitted with the annual inspection reports.

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

ALTUS ENGINEERING

STORMWATER PONDS/CELLS (AKA RAINGARDENS) BIORETENTION & INFILTRATION

Function – Bioretention and infiltration ponds provide treatment to runoff prior to directing it to stormwater systems by filtering sediment and suspended solids, trapping them in the bottom of the garden and in the filter media itself. Additional treatment is provided by the native water-tolerant vegetation which removes nutrients and other pollutants through bio-uptake. Stormwater detention and infiltration can also be provided as the filtering process slows runoff, decreases the peak rate of discharge and promotes groundwater recharge.

Bioretention and infiltration ponds shall be managed (Per AGR 3800 and RSA 430:53) to: prevent and control the spread of invasive plant, insect, and fungal species; minimize the adverse environmental and economic effects invasive species cause to agriculture, forests, wetlands, wildlife, and other natural resources of the state; and protect the public from potential health problems attributed to certain invasive species.

Maintenance

- Inspect annually and after significant rainfall events.
- If a raingarden does not completely drain within 72-hours following a rainfall event, then a qualified professional shall be retained to assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the filter media. Filter media shall be replaced with material matching the specification on the design drawings or the NHDES Stormwater Manual.
- Replace any riprap dislodged from spillways, inlets and outlets.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Mowing of any grassed area in or adjacent to a raingarden, including its berm, shall be performed at least twice per year (when areas are not inundated) to keep the vegetation in vigorous condition. The cut grass shall be removed to prevent the decaying organic litter from clogging the filter media or choking other vegetation.
- Select vegetation should be maintained in healthy condition. This may include pruning, removal and replacement of dead or diseased vegetation.
- Remove any invasive species, Per AGR 3800 and RSA 430:53.
- Remove any hard wood growth from raingardens.

DRAINAGE PIPES

Function – Drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.

DEEP SUMP CATCH BASINS

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

RIP RAP OUTLETS, SWALES AND BUFFERS

Function – Rip rap outlets slow the velocity of runoff, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect riprap and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminates. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.
- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply fertilizer to frozen ground.
- Clean up any fertilizer spills.
- Do not allow fertilizer to be broadcast into water bodies.
- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet waste, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

CONTROL OF INVASIVE PLANTS

Function – Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Maintenance

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in the attached “Methods for Disposing Non-Native Invasive Plants” prepared by the UNH Cooperative Extension.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drainpipes that may have accumulated during construction.
- Once in operation, all paved areas of the site should be swept at least once annually at the end of winter/early spring prior to significant spring rains.

APPPENDIX

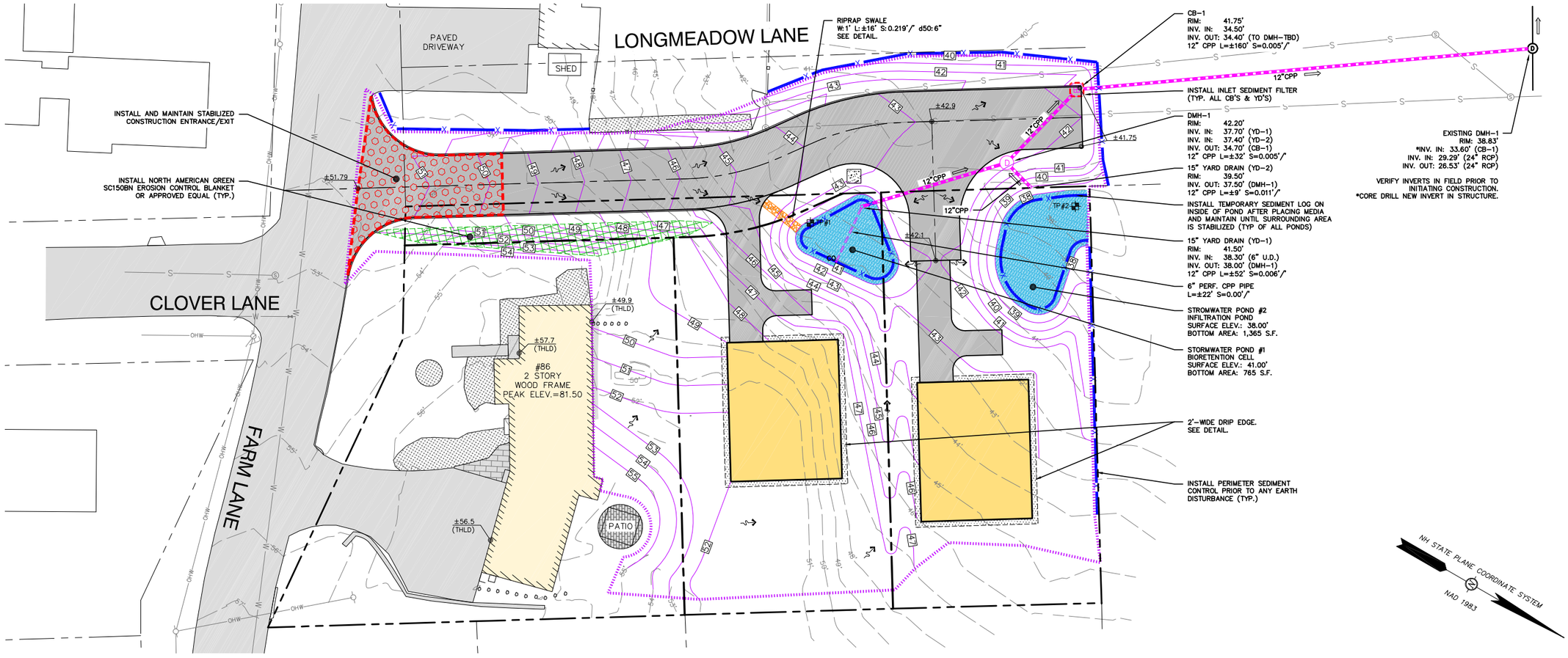
A. Stormwater System Operations and Maintenance Report
B. Stormwater Management Plan

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information			
Project Name			
Owner			
Inspector's Name(s)			
Inspector's Contact Information			
Date of Inspection		**Start Time:**	**End Time:**
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment			
Notes:			

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject		**Status**	**Notes**
A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:			*Notes/ Action taken:*
1	Do the current site conditions reflect the attached site plan?	❑Yes ❑No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	❑Yes ❑No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	❑Yes ❑No	

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Bioretention Cell/ Infiltration Pond	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Deep Sump Catch Basins	❑Yes ❑No		
	Riprap Outlets, Swales and Buffers	❑Yes ❑No		
	Vegetative Swales	❑Yes ❑No		
	Site Vegetation & Landscaping	❑Yes ❑No		



GRADING & DRAINAGE NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. A PRE-CONSTRUCTION CONFERENCE WITH THE DEVELOPER, THE DESIGN ENGINEER, THE EARTHWORK CONTRACTOR AND THE MUNICIPAL ENGINEER SHALL OCCUR PRIOR TO ANY EARTH DISTURBING ACTIVITY.
4. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
5. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING UTILITIES SCHEDULED TO REMAIN. PRESERVE AND PROTECT UTILITIES TO BE RETAINED.
6. THE LIMITS OF CONSTRUCTION DISTURBANCE SHALL BE STAKED, FLAGGED AND CLEARLY IDENTIFIED PRIOR TO ANY TREE CLEARING, STUMPING, GRUBBING OR EARTH MOVING OCCURS. WHERE CONSTRUCTION IS TO TAKE PLACE WITHIN 50' OF A PROPERTY LINE, THE PROPERTY LINE SHALL BE STAKED AT 50' MINIMUM INTERVALS.
7. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
8. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
9. DEWATERING ACTIVITIES, IF REQUIRED, SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS AND GUIDELINES.
10. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, OR PVC SDR 35 WHERE SPECIFIED. ALL STORMWATER PIPING REDUCERS, WYES AND TEES SHALL BE CONCENTRIC UNLESS OTHERWISE NOTED.
11. 2" RIGID INSULATION SHALL BE INSTALLED OVER DRAIN PIPES WHERE COVER IS < 2'.
12. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED UNLESS OTHERWISE SPECIFIED. ALL DRAINAGE STRUCTURES WITHIN PAVED AREAS SHALL BE H-20 LOADING RATED.
13. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
14. CONTRACTOR SHALL PROTECT ALL RAINGARDENS FROM CONSTRUCTION STORMWATER RUNOFF. TEMPORARY SEDIMENT BASINS SHALL BE INSTALLED DURING CONSTRUCTION. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
15. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE. ADJUST GRADING AT EMERGENCY BUILDING EXITS AS NECESSARY TO ENSURE CODE COMPLIANCE. COORDINATE WITH ARCHITECT IF RAILINGS ARE REQUIRED.
16. UNLESS OTHERWISE NOTED, THE CONTRACTOR MAY CONNECT BUILDING AND RETAINING WALL FOUNDATION DRAINS TO THE NEAREST DRAINAGE STRUCTURE PROVIDED A MINIMUM 1% SLOPE CAN BE MAINTAINED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL FOUNDATION DRAINS WITH THE BUILDING AND WALL PLANS.
17. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
18. NO SNOW SHALL BE STORED IN ANY STORMWATER POND OR ANY OTHER STORMWATER BMP.
19. SEE SHEET C-3 FOR LEGEND.

EROSION & SEDIMENT CONTROL NOTES

1. AREA OF DISTURBANCE = ±36,000 S.F. NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED, INCLUDING LOT DEVELOPMENT.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED AT ALL CULVERT ENTRANCES AND IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
4. ALL EROSION CONTROL BLANKETS AND FASTENERS SHALL BE BIDEGRADEABLE.
5. ALL EROSION CONTROL BLANKETS SHALL BE BY NORTH AMERICAN GREEN OR EQUAL AS APPROVED IN WRITING BY THE ENGINEER.
6. ALL SWALES WITH SLOPES OF 5% OR GREATER SHALL BE STABILIZED WITH RIPRAP PER THE DETAILS. ALL OTHER SWALES SHALL BE STABILIZED WITH NORTH AMERICAN GREEN SC150BN EROSION CONTROL BLANKET.
7. THE STORMWATER PONDS SHOWN IN THIS PLAN SET SHALL BE CONSTRUCTED BEFORE EARTHWORK COMMENCES ON THE REMAINDER OF THE SITE. THE CONTRACTOR MAY USE THE POND AS A SEDIMENTATION POND UNTIL THE SITE IS STABILIZED. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM. SILT SOXX SHALL BE INSTALLED AROUND THE PERIMETER OF THE STORMWATER BASINS.
8. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM; WITH THE EXCEPTION OF DETENTION PONDS SHOULD A SEDIMENTATION POND BE REQUIRED.
9. TEMPORARY SEDIMENT LOG (SILTSOXX OR EQUAL APPROVED BY THE ENGINEER) SHALL BE INSTALLED AROUND THE INLETS OFF ALL CULVERTS AND THE BOTTOM PERIMETERS OF ALL STORMWATER PONDS. THESE MEASURES ARE TO REMAIN IN PLACE UNTIL ALL CONTRIBUTING AREAS HAVE BEEN STABILIZED.
10. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS.
11. MATERIAL STOCKPILE & CONCRETE WASHOUT LOCATIONS SHOWN ARE CONCEPTUAL. THE CONTRACTOR MAY LOCATE STOCKPILES OR WASHOUT WHERE NECESSARY PROVIDED THAT PERIMETER SEDIMENT CONTROLS ARE PROPERLY INSTALLED.
12. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND HAY MULCH OR EROSION CONTROL BLANKET USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
13. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
14. SEE DEMOLITION & SITE PREPARATION PLAN AND DETAIL SHEETS FOR ADDITIONAL SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.

TEST PIT LOGS

EVALUATED BY ERIC D. WEINRIEB (PERMIT #809) ON JANUARY 14, 2026
WITNESSED BY DAVID DESFOSSES (TEST PIT 1 ONLY)

TEST PIT 1
0-9" 7.5 YR 3/3 – DARK BROWN GRASS MATT AND FINE SANDY LOAM, FRIABLE, GRANULAR
9-24" 7.5 YR 3/4 – DARK BROWN FINE SANDY LOAM, FRIABLE, GRANULAR
24-60" 5 YR 4/3 – REDDISH BROWN CLAYEY LOAM FIRM, MASSIVE WITH PROMINENT MOTTLES THROUGHOUT
60" STOPPED

ESTIMATED SEASONAL HIGH WATER TABLE – 24"
ROOTS – OOC TO 40"
OBSERVED WATER – 40"
LEDGE – NONE

TEST PIT 2
0-8" 10 YR 2/2 – VERY DARK BROWN GRASS MATT AND FINE LOAMY SAND, FRIABLE, GRANULAR
8-17" 5 YR 3/3 – DARK REDDISH BROWN LOAMY SAND, SINGLE GRAIN, LOOSE
17-33" 5 YR 6/4 – LIGHT REDDISH BROWN FINE SAND, SINGLE GRAIN, LOOSE
33-55" 5 YR 4/3 REDDISH BROWN CLAYEY LOAM, FIRM, MASSIVE WITH PROMINENT MOTTLES STARTING AT 43"
55" STOPPED

ESTIMATED SEASONAL HIGH WATER TABLE – 43"
ROOTS – NOT DOCUMENTED
OBSERVED WATER – 50"
LEDGE – NONE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN *DATE*

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
TECHNICAL ADVISORY COMMITTEE

ISSUE DATE:
FEBRUARY 13, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	PMJ	02/13/26

DRAWN BY: PMJ
APPROVED BY: EDW
DRAWING FILE: 5719-SITE.dwg

SCALE:
22" x 34" - 1" = 20'
11" x 17" - 1" = 40'

OWNER:
JEANETTE MACDONALD
86 FARM LANE
PORTSMOUTH, NH 03801

APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
GRADING, DRAINAGE & EROSION CONTROL PLAN

SHEET NUMBER:
C-5

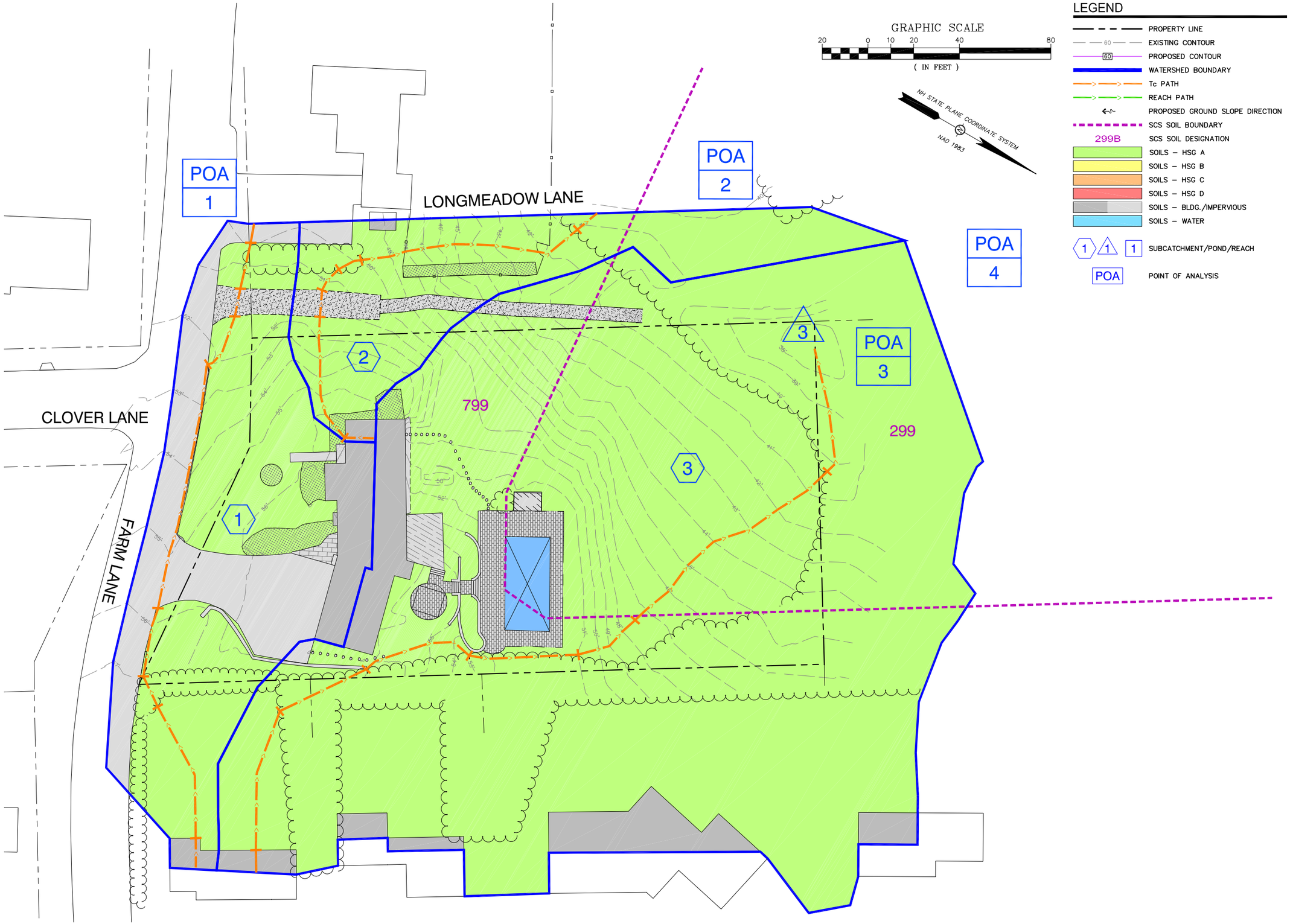
P5719

Section 8

Watershed Plans

Pre-Development Watershed and Soils Plan
Post-Development Watershed and Soils Plan

ALTUS
ENGINEERING



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STATE OF NEW HAMPSHIRE – ERIC D. WEINREB No. 7634 LICENSED PROFESSIONAL ENGINEER
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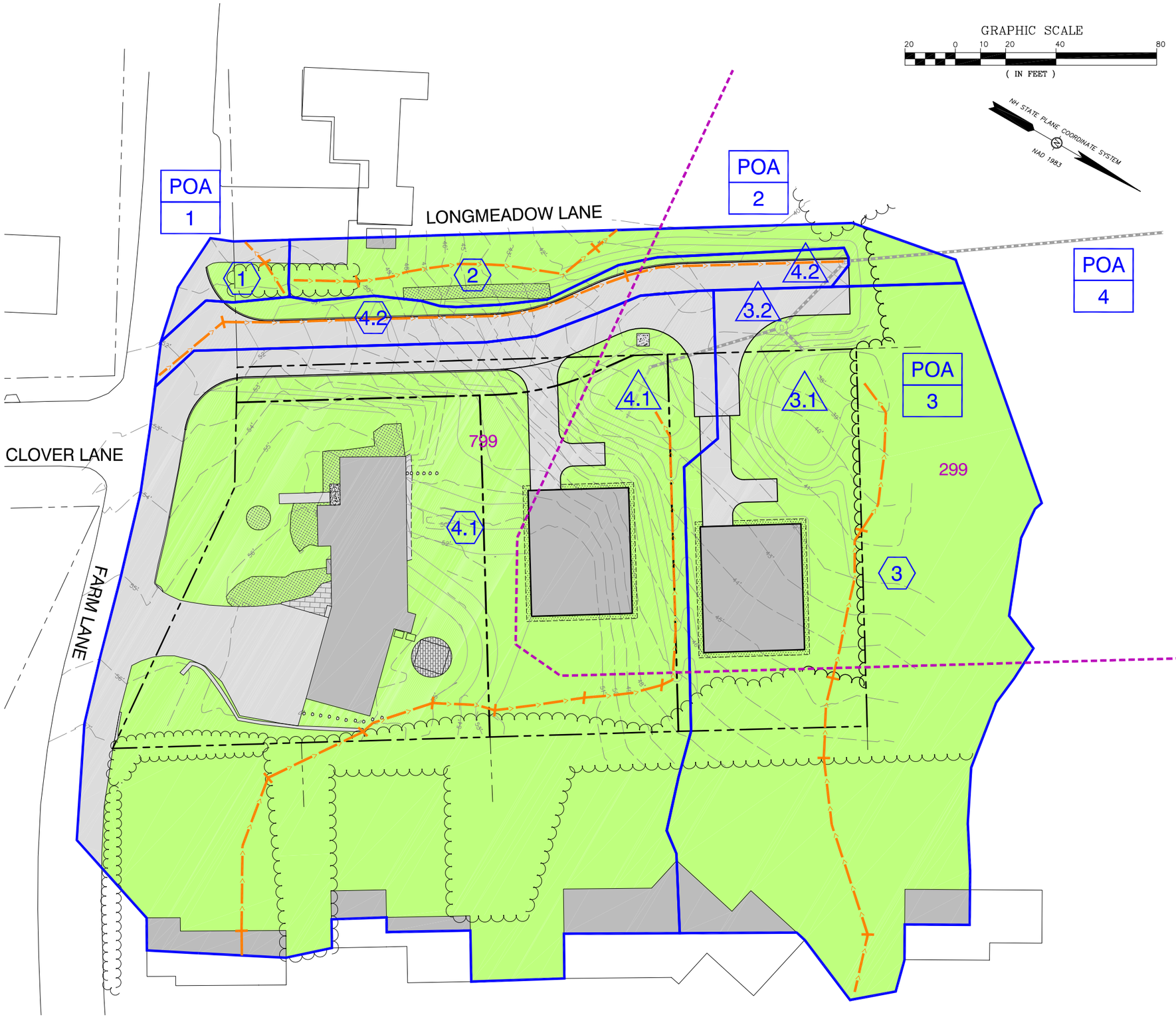
APPLICANT:
FLIPPING BERGER'S, LLC
71 BRACKET ROAD
PORTSMOUTH, NH 03801

PROJECT:
86 FARM LANE
SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
PRE-DEVELOPMENT WATERSHED & SOILS PLAN

SHEET NUMBER:
WS-1

P5719



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2/13/26

NOT FOR CONSTRUCTION

ISSUED FOR:
TECHNICAL ADVISORY COMMITTEE

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PROJECT:
86 FARM LANE SUBDIVISION
TAX MAP 236, LOT 74
86 FARM LANE
PORTSMOUTH, NH 03801

TITLE:
POST-DEVELOPMENT WATERSHED & SOILS PLAN

SHEET NUMBER:
WS-2

P5719

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

February 12, 2026

Mr. Peter Britz, Director of Planning & Sustainability
City of Portsmouth Planning & Sustainability Department
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Site Plan Amendment
Assessor's Map 266, Lot 5
St Patrick Academy Library Expansion
315 Banfield Road
Altus Project #P4801.3

Mr. Britz:

On behalf of the Hope for Tomorrow Foundation (HFTF) and the Saint Patrick Academy, Altus Engineering, LLC (Altus) is pleased to submit plans for a Library Expansion at Saint Patrick Academy. The proposed project will construct a new library addition totaling approximately 2,115 square feet and includes renovations to the existing building to provide new bathrooms adjacent to the library. This library is to serve the current enrollment and there will be no increase to students or staffing. As shown in the architectural plans, there will be a "bell tower" on the northwest corner of the building. It is noted that the bell is an aesthetic feature and is not functional, as any sound will be from a speaker in the tower. Additionally, there are no modifications to the existing driveway or parking. There is a paved walkway around the building that will be relocated to accommodate the new building footprint.

In 2017 and 2019, Altus worked for HFTF for the permitting and construction of the new Saint Patrick Academy and Gymnasium respectively. Both projects required NHDES Alteration of Terrain permit for stormwater management and a system of porous pavements and multiple raingardens were design and installed to manage post-development flows below the pre-development conditions. This project will increase the impervious coverage 0.04%, from 15.9% to 16.3%. Altus has updated the drainage model from the 2019 analysis to include the new building addition. The results show that the Peak flows for all storm events continue to provide a decreases compared to the pre-development conditions. Altus also has reviewed the downstream structures and raingarden and eth have the capacity to handle the minor increase. A Drainage Memorandum has been prepared and is included in this submittal.

Altus looks forward to meeting with the Technical Advisory Committee at the March 3, 2026 meeting and working with the City on this project. Please feel free to call or email me in advance of the meeting should you have any questions or need any additional information.

Sincerely,
ALTUS ENGINEERING, LLC

Cory D. Belden, PE
Principal

wde/4801 TAC work session cvr ltr.doc

Enclosure

Ecopy: James Melone, St Patrick Academy
Bryan Laroche, Oak Point Associates, Inc.

Letter of Authorization

I, James Melone, authorized representative for Hope for Tomorrow Foundation (HFTF), hereby authorize Altus Engineering, LLC and Oak Point Associates, Inc. of Portsmouth, New Hampshire to represent HFTF in all matters concerning engineering, architecture and related permitting for the development of 315 Banfield Road in Portsmouth, NH. The property is identified on the Assessor's Maps as Tax Map 266, Lot 5. This authorization shall include any meetings or signatures required for permit applications.

Signature	James Melone Print Name	2/12/24 Date

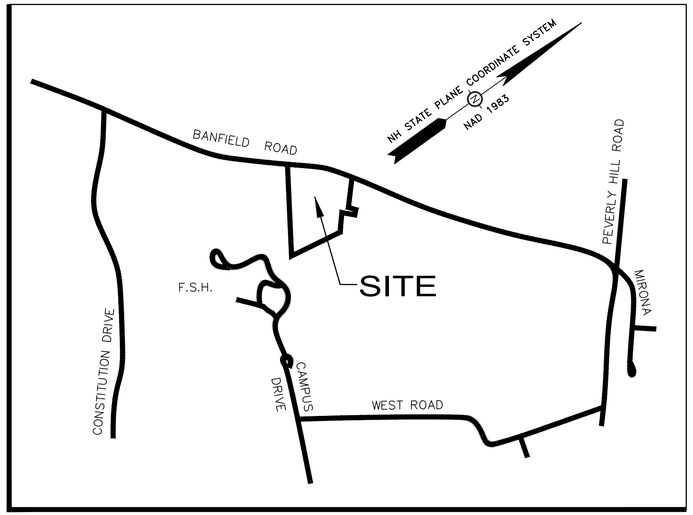
Site Plan Amendment

SAINT PATRICK ACADEMY LIBRARY EXPANSION

315 Banfield Road
Portsmouth, New Hampshire
Assessor's Parcel 266 - 5

Plan Issued Date:

February 12, 2026 *Technical Advisory Committee*



Locus Map
Scale: Not to Scale

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
As–Built Plan (by JVA)	1 of 1	0	11/04/21
Overall Site Plan	C–1	0	02/12/26
Site Plan	C–2	0	02/12/26
Grading and Utilities Plan	C–3	0	02/12/26
Erosion Control Notes & Details	D–1	0	02/12/26
Detail Sheet	D–2	0	02/12/26
Architectural Plans by Oak Point Associates			
Floor Plan	AE101	0	02/04/26
Roof Plan	AE121	0	02/04/26
North and West Exterior Elevations	AE201	0	02/04/26
South Exterior Elevation	AE202	0	02/04/26

Owner:

HOPE FOR
TOMORROW FOUNDATION
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801
(603) 436–0739

Applicant:

SAINT PATRICK ACADEMY
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801
(603) 436–0739

Civil Engineer:

ALTUS
ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

Architect:

OAK POINT ASSOCIATES
85 MIDDLE STREET
PORTSMOUTH, N.H. 03801
603.431.4849

Surveyor:

James Verra and
Associates, Inc.
LAND SURVEYORS
101 SHATTUCK WAY – SUITE 8
NEWINGTON, N.H. 03801– 7876
603–436–3557

Permit Summary

Site Plan Amendment Permit – Submitted February 13, 2026
Building Permit – to be filed by contractor
USEPA CGP / NOI is not required – Site disturbance is less than 1 acre

4801.3DETAILS.DWG

P4801.3

SEWER TABLE

SMH #P1
RIM EL= 58.57
(1) INV IN 6"PCV= 47.08
(2) INV OUT 6"PVC= 47.07

SMH #5
RIM EL= 49.45
(1) INV IN 6"PVC= 44.40
(2) INV IN 8"PVC= 43.30
(3) INV OUT 8"PVC= 43.24

DRAIN TABLE

DMH #1
RIM EL= 53.01
(1) INV IN 12"HDPE= 48.43
(2) INV OUT 12"HDPE= 48.41

DMH #2
RIM EL= 48.21
(1) INV IN 12"HDPE= 43.86
(2) INV IN 12"HDPE= 43.56
(3) INV OUT 12"HDPE= 44.06

OUTLET STRUCTURE B
RIM EL= 47.67
(1) INV OUT 12"HDPE= 44.12

CB #1
RIM EL= 54.12
(1) INV IN 12"HDPE= 50.6±
(2) INV IN 6"PVC= 50.52
(3) INV IN 12"HDPE= 49.44
(4) INV OUT 12"HDPE= 49.28

CB #2
RIM EL= 53.60
(1) INV OUT 12"HDPE= 49.85

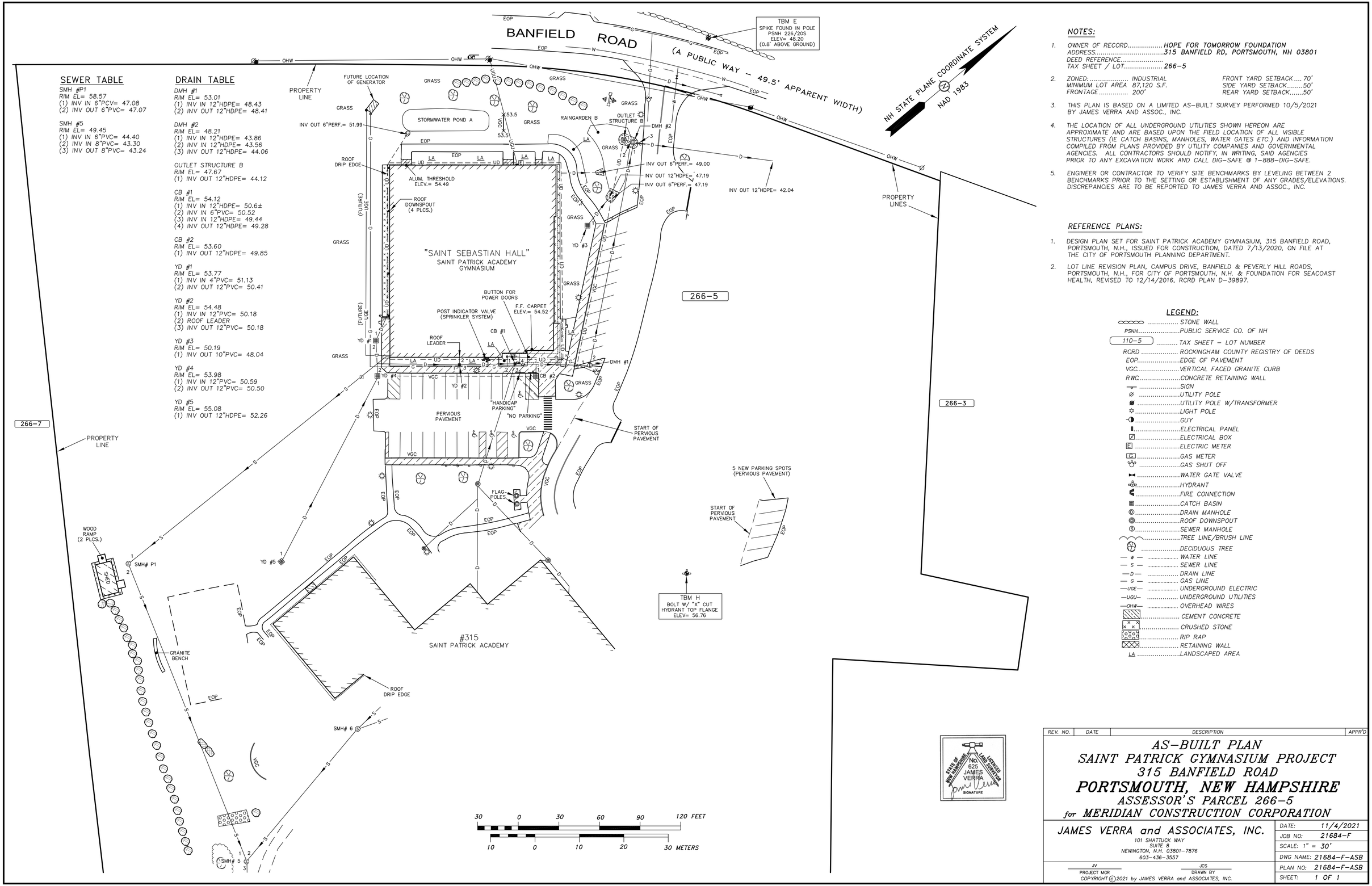
YD #1
RIM EL= 53.77
(1) INV IN 4"PVC= 51.13
(2) INV OUT 12"PVC= 50.41

YD #2
RIM EL= 54.48
(1) INV IN 12"PVC= 50.18
(2) ROOF LEADER
(3) INV OUT 12"PVC= 50.18

YD #3
RIM EL= 50.19
(1) INV OUT 10"PVC= 48.04

YD #4
RIM EL= 53.98
(1) INV IN 12"PVC= 50.59
(2) INV OUT 12"PVC= 50.50

YD #5
RIM EL= 55.08
(1) INV OUT 12"HDPE= 52.26



NOTES:

1. *OWNER OF RECORD.....HOPE FOR TOMORROW FOUNDATION*
   ADDRESS.....315 BANFIELD RD, PORTSMOUTH, NH 03801
   DEED REFERENCE.....
   TAX SHEET / LOT.....266-5
2. *ZONED:..... INDUSTRIAL* — *FRONT YARD SETBACK.... 70'*
   MINIMUM LOT AREA 87,120 S.F. — *SIDE YARD SETBACK.....50'*
   FRONTAGE..... 200' — *REAR YARD SETBACK.....50'*
3. *THIS PLAN IS BASED ON A LIMITED AS-BUILT SURVEY PERFORMED 10/5/2021 BY JAMES VERRA AND ASSOC., INC.*
4. *THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.*
5. *ENGINEER OR CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.*

REFERENCE PLANS:

1. *DESIGN PLAN SET FOR SAINT PATRICK ACADEMY GYMNASIUM, 315 BANFIELD ROAD, PORTSMOUTH, N.H., ISSUED FOR CONSTRUCTION, DATED 7/13/2020, ON FILE AT THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.*
2. *LOT LINE REVISION PLAN, CAMPUS DRIVE, BANFIELD & PEVERLY HILL ROADS, PORTSMOUTH, N.H., FOR CITY OF PORTSMOUTH, N.H. & FOUNDATION FOR SEACOAST HEALTH, REVISED TO 12/14/2016, RCRD PLAN D-39897.*

LEGEND:

- ..... *STONE WALL*
- *PSNH*.....*PUBLIC SERVICE CO. OF NH*
- *110-5* ..... *TAX SHEET - LOT NUMBER*
- *RCRD*..... *ROCKINGHAM COUNTY REGISTRY OF DEEDS*
- *EOP*.....*EDGE OF PAVEMENT*
- *VGC*.....*VERTICAL FACED GRANITE CURB*
- *RWC*.....*CONCRETE RETAINING WALL*
- .....*SIGN*
- .....*UTILITY POLE*
- .....*UTILITY POLE W/TRANSFORMER*
- .....*LIGHT POLE*
- .....*GUY*
- .....*ELECTRICAL PANEL*
- .....*ELECTRICAL BOX*
- .....*ELECTRIC METER*
- .....*GAS METER*
- .....*GAS SHUT OFF*
- .....*WATER GATE VALVE*
- .....*HYDRANT*
- .....*FIRE CONNECTION*
- .....*CATCH BASIN*
- .....*DRAIN MANHOLE*
- .....*ROOF DOWNSPOUT*
- .....*SEWER MANHOLE*
- .....*TREE LINE/BRUSH LINE*
- .....*DECIDUOUS TREE*
- *— W —* ..... *WATER LINE*
- *— S —* ..... *SEWER LINE*
- *— D —* ..... *DRAIN LINE*
- *— G —* ..... *GAS LINE*
- *—UGE—* ..... *UNDERGROUND ELECTRIC*
- *—UGU—* ..... *UNDERGROUND UTILITIES*
- *—OHW—* ..... *OVERHEAD WIRES*
- ..... *CEMENT CONCRETE*
- ..... *CRUSHED STONE*
- ..... *RIP RAP*
- ..... *RETAINING WALL*
- *LA* .....*LANDSCAPED AREA*

STATE OF NEW HAMPSHIRE — No. 625 JAMES VERRA — LICENSED LAND SURVEYOR — SIGNATURE

REV. NO.	DATE	DESCRIPTION	APPR'D

AS-BUILT PLAN
SAINT PATRICK GYMNASIUM PROJECT
315 BANFIELD ROAD
PORTSMOUTH, NEW HAMPSHIRE
ASSESSOR'S PARCEL 266-5
for MERIDIAN CONSTRUCTION CORPORATION

JAMES VERRA and ASSOCIATES, INC.
101 SHATTUCK WAY
SUITE 8
NEWINGTON, N.H. 03801-7876
603-436-3557

DATE:	*11/4/2021*
JOB NO:	*21684-F*
SCALE:	*1" = 30'*
DWG NAME:	*21684-F-ASB*
PLAN NO:	*21684-F-ASB*
SHEET:	*1 OF 1*

JV — PROJECT MGR — *XCS* — DRAWN BY

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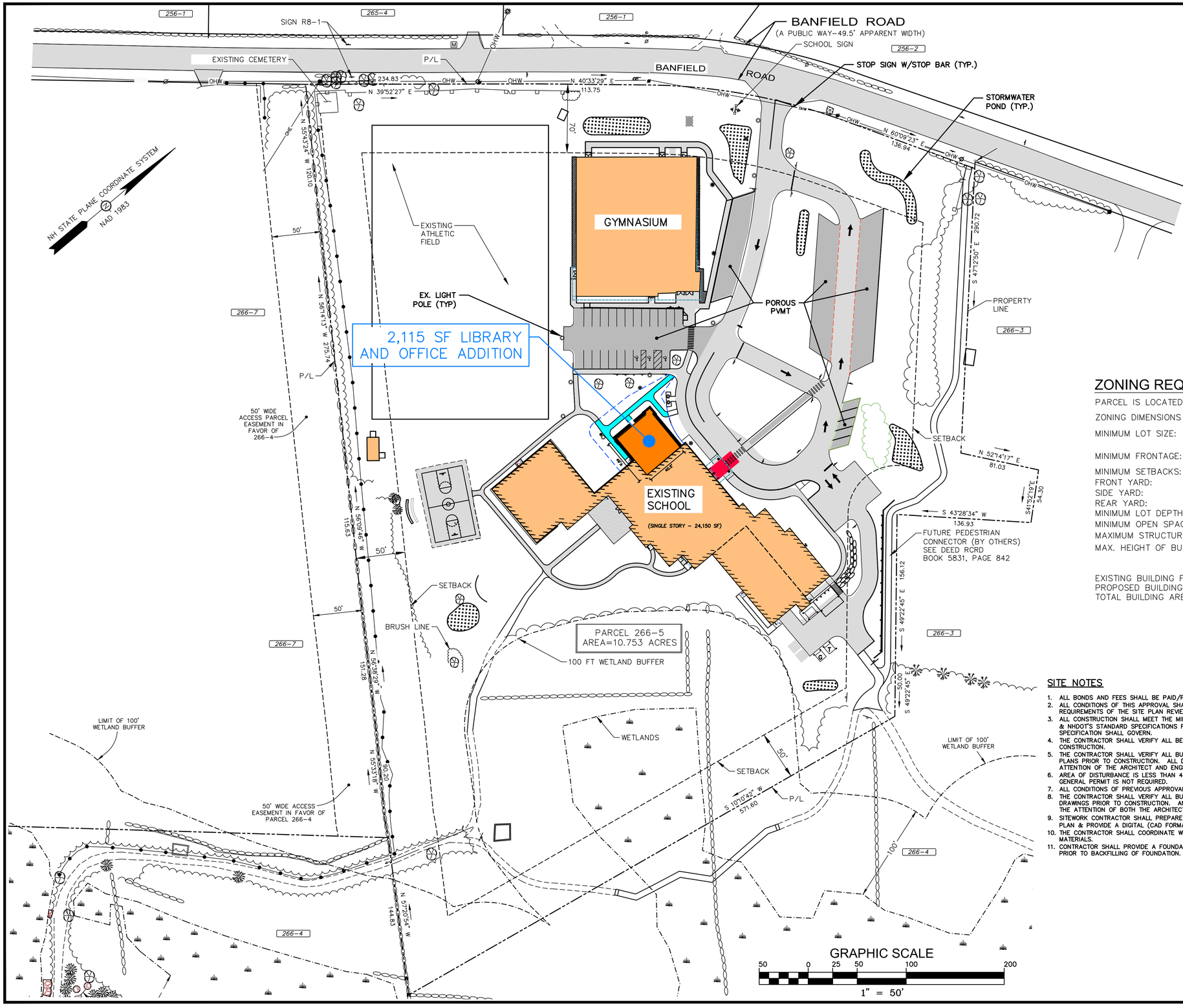

ZONING REQUIREMENTS:

PARCEL IS LOCATED IN THE INDUSTRIAL (I) ZONE

ZONING DIMENSIONS	REQUIRED	PROVIDED
MINIMUM LOT SIZE:	87,120 SF (2.0 ACRES)	468,400 SF (10.75 ACRES)
MINIMUM FRONTAGE:	200'	695.6'
MINIMUM SETBACKS:		
FRONT YARD:	70'	±71'
SIDE YARD:	50'	±68'
REAR YARD:	50'	±144'
MINIMUM LOT DEPTH	100'	587'
MINIMUM OPEN SPACE:	20%	±74%
MAXIMUM STRUCTURE COVERAGE:	50%	9.3%
MAX. HEIGHT OF BUILDING:	70'	<40'

EXISTING BUILDING FOOTPRINT:	±41,440 SF
PROPOSED BUILDING:	±2,115 SF
TOTAL BUILDING AREA:	±43,555 SF

SITE NOTES

1. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
2. ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
3. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
4. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
6. AREA OF DISTURBANCE IS LESS THAN 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
7. ALL CONDITIONS OF PREVIOUS APPROVALS SHALL CONTINUE TO APPLY.
8. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
9. SITEWORK CONTRACTOR SHALL PREPARE A LICENSED LAND SURVEYOR (LLS) STAMPED AS–BUILT SITE PLAN & PROVIDE A DIGITAL (CAD FORMAT) COPY FOR THE CITY'S G.I.S. DATA BASE.
10. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER REGARDING DROP OFF AND PICK UP TIMES FOR MATERIALS.
11. CONTRACTOR SHALL PROVIDE A FOUNDATION CERTIFICATE TO THE ENGINEER & CITY OF PORTSMOUTH PRIOR TO BACKFILLING OF FOUNDATION.

P4801.3

ENGINEER:
ALTUS ENGINEERING
133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

CORY D. BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
2/12/26

ISSUED FOR: SITE PLAN AMENDMENT

ISSUE DATE: FEBRUARY 12, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	CDB	02/12/26

DRAWN BY: CDB
APPROVED BY: CDB
DRAWING FILE: 4801.3 DETAILS.DWG

SCALE:
22" x 34" – 1" = 50'
11" x 17" – 1" = 100'

OWNER:
HOPE FOR TOMORROW FOUNDATION
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801
ASSESSOR'S PARCEL 266–5

APPLICANT:
SAINT PATRICK ACADEMY
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

PROJECT:
SAINT PATRICK ACADEMY
LIBRARY EXPANSION
315 BANFIELD ROAD
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 266–5

TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
C-1

NH STATE PLANE COORDINATE SYSTEM
NAD 1983

GYMNASIUM

BALL FIELD

EX. DRAIN LINE (TYP)

EX. CATCH BASIN (TYP.)

RELOCATED 5 FT BIT SIDEWALK

5' X 5' CONC LANDING PAD (TYP, SEE DTLS)

NEW SEWER (SEE GRADING AND UTILITY PLAN)

APPROX LIMITS OF DISTURBANCE. RESTORE ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES

"VISITOR"

"HANDICAP PARKING"

CB# 3

MATCH EX. ELEVATION

PROPOSED DRIP EDGE

±56.45'

CB# YD 7

CB# YD 2

FF ELV= 56.97

EX. SIDEWALK

EX. LIGHT POLE TO REMAIN (TYP.)

POSSIBLY MINI-SPLIT CONDENSOR UNIT LOCATION (IF NOT ROOF MOUNTED)

49.1'±

40.5'

PROPOSED LIBRARY ADDITION (2,115± SF)

SMH
RIM=58.9
INV. IN = 46.98
INV. OUT = 46.88

FF CONCRETE (ENTRY)
ELEV= 56.97

FF GRANITE (ENTRY)
ELEV= 56.97
#315
SAINT PATRICK ACADEMY

ROOF OVERHANG

ROCKS & METAL DEBRIS

N 56°09'46" W

SMH# 6

8" GRAVITY SEWER

EX. SMH# 5

GRAPHIC SCALE
20 0 10 20 40 80
1" = 20'

P4801.3

ENGINEER:

ALTUS ENGINEERING

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(603) 433-2335 www.altus-eng.com

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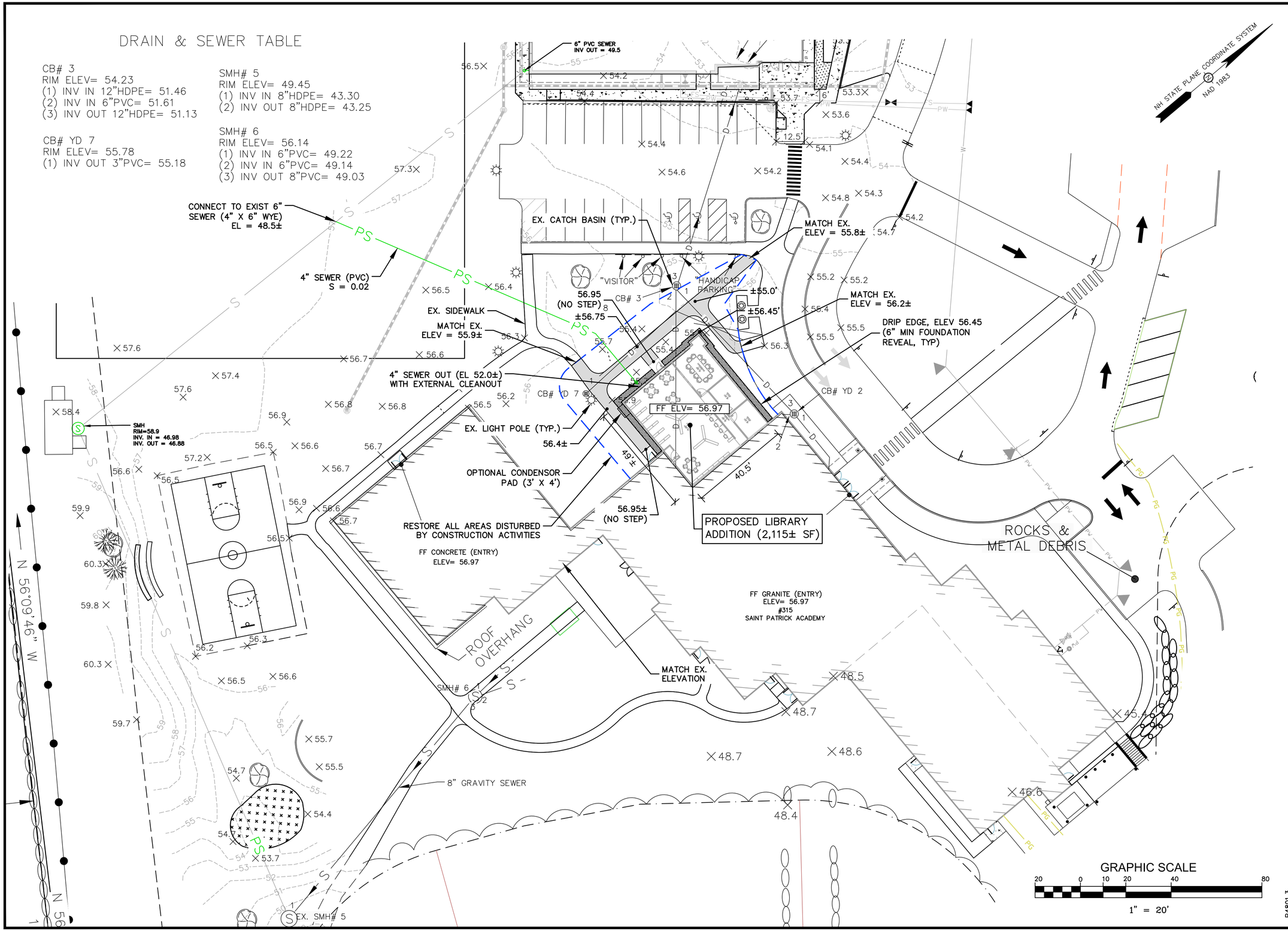
PROJECT:
SAINT PATRICK ACADEMY
LIBRARY EXPANSION
315 BANFIELD ROAD
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 266–5

TITLE:
SITE PLAN

SHEET NUMBER:
C-2



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SAINT PATRICK ACADEMY
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

PROJECT:
SAINT PATRICK ACADEMY LIBRARY EXPANSION
315 BANFIELD ROAD
PORTSMOUTH, N.H.
ASSESSOR'S PARCEL 266–5

TITLE:
GRADING AND UTILITIES PLAN

SHEET NUMBER:
C-3

SEDIMENT AND EROSION CONTROL NOTES

CONSTRUCTION SEQUESNCE / EROSION CONTROL

- PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
- TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC) MUST BE USED AS NECESSARY UNTIL AREAS ARE STABILIZED.
- ALL PAVED AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL DISTURBED AREAS SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE
- ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
- THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 43,000 SQUARE FEET AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
- AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - ** BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED.
  - ** A MINIMUM OF 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED.
  - ** A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED.
  - ** OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from silt fence or other barriers when it has reached one-third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed; – or –
    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
    a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
    b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100% dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 %, maximum of 85% passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –

Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.

2. Seeding –
    a. Utilize annual rye grass at a rate of 40 lbs/acre.
    b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
    c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

3. Maintenance – Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
    a. See detail.
    b. Install per manufacturer's requirements.

2. Silt Fence (if used)

a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM-51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM-52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM-51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

g. The trench shall be backfilled and the soil compacted over the filter fabric.

h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation –

Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

4. Maintenance –

a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

c. Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.

d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

1. Bedding – stones larger than 1½", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.

2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

    Agricultural Limestone @ 100 lbs. per 1,000 s.f.
    10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (See Landscape Drawings for additional information):

3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.

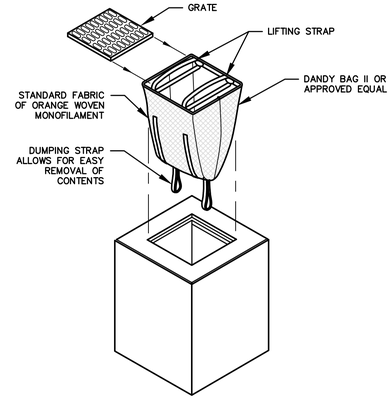
3.2. Seed mixture shall consist of
    a. 1/3 Kentucky blue,
    b. 1/3 perennial rye, and
    c. 1/3 fine fescue.

3.1. Turf type tall fescue is unacceptable.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After October 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



INSTALLATION AND MAINTENANCE:

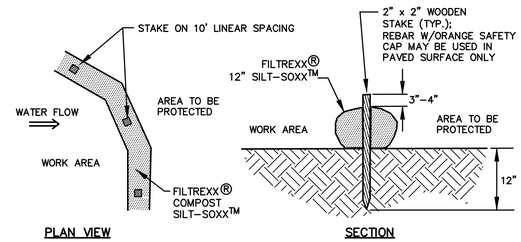
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION NOT TO SCALE



NOTES:
1. SILTSOXX OR APPROVED EQUAL MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER NOT TO SCALE

P4801.3

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

CORY D. BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE
2/12/26

ISSUED FOR:
SITE PLAN AMENDMENT

ISSUE DATE:
FEBRUARY 12, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	CDB	02/12/26

DRAWN BY: CDB
APPROVED BY: CDB
DRAWING FILE: 4801.3 DETAILS.DWG

SCALE:
NOT TO SCALE

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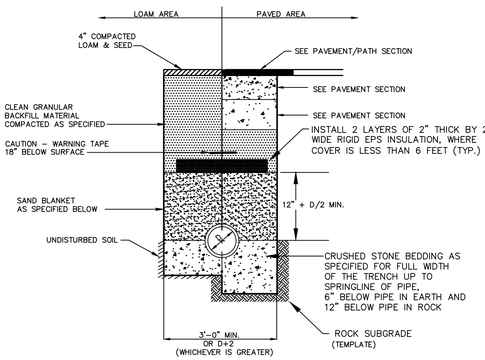
TITLE:
EROSION CONTROL NOTES & DETAILS

SHEET NUMBER:
D-1



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

CRUSHED STONE BEDDING *

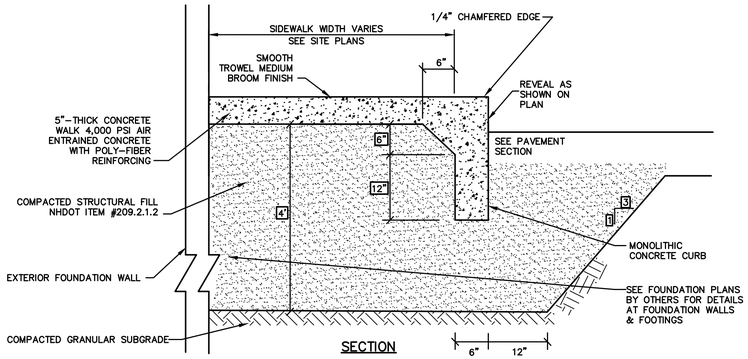
SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

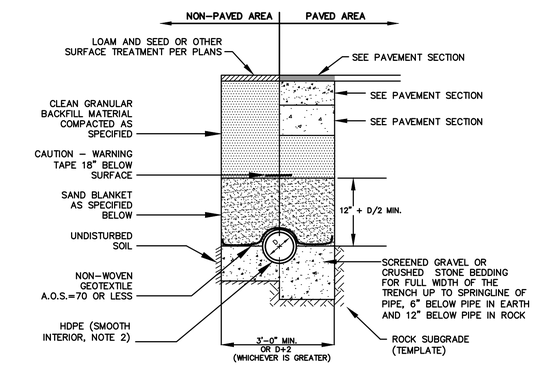
SEWER TRENCH SECTION NOT TO SCALE

STANDARD TRENCH NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, STONE SIZE NO. 67.
   100% PASSING 1 INCH SCREEN
   90 – 100% PASSING 3/4 INCH SCREEN
   20 – 55% PASSING 3/8 INCH SCREEN
   0–10% PASSING #4 SIEVE
   0–5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90 – 100% PASSES 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST–IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO CITY'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.



CONCRETE SLAB (SIDEWALK) DETAILS @ BLDG. ENTRANCES NOT TO SCALE



NOTES:
1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL PIPE SHALL BE HDPE WITH SMOOTH INTERIOR AND CORRUGATED EXTERIOR, ADS TYPE N–12 OR APPROVED EQUAL.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
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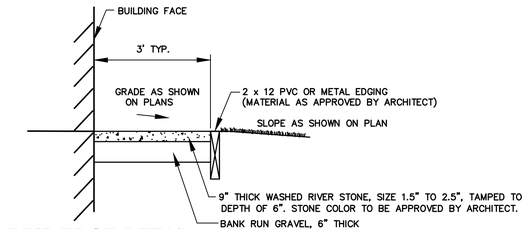
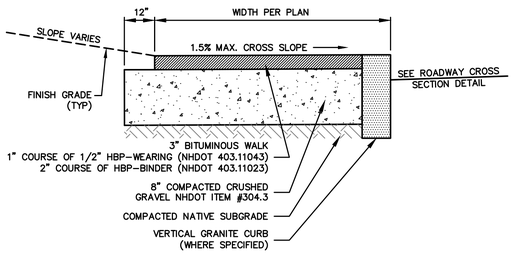
* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

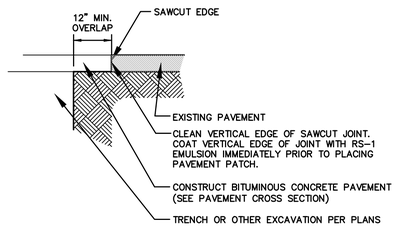
STORM DRAIN TRENCH NOT TO SCALE



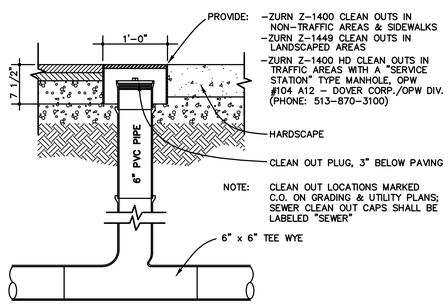
DRIP EDGE DETAIL NOT TO SCALE



BITUMINOUS SIDEWALK NOT TO SCALE



TYPICAL PAVEMENT SAWCUT NOT TO SCALE



CLEANOUT DETAIL NOT TO SCALE

P4801.3

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CORY D BELDEN No. 14239 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
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0	INITIAL SUBMISSION	CDB	02/12/26

DRAWN BY: CDB
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SCALE:
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OWNER:
HOPE FOR TOMORROW FOUNDATION
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APPLICANT:
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PROJECT:
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LIBRARY EXPANSION
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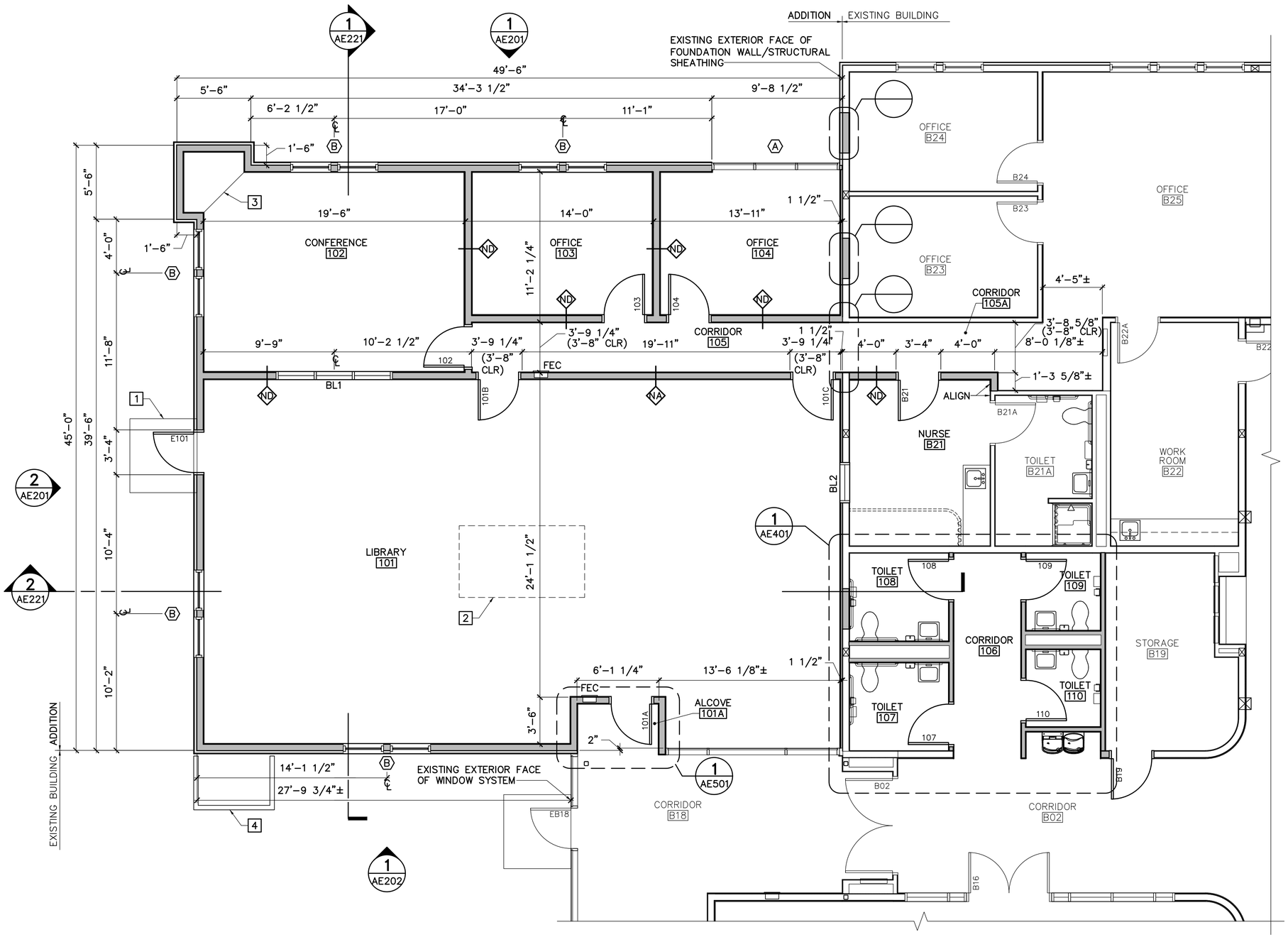
ASSESSOR'S PARCEL 266–5

TITLE:
DETAIL SHEET

SHEET NUMBER:
D-2

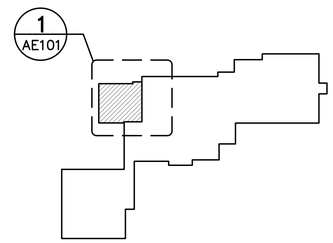


GENERAL NOTES

1. SEE SHEET G-003 FOR GENERAL CONSTRUCTION NOTES.
2. SEE SHEET AE001 FOR WALL TYPES AND GENERAL WALL TYPE NOTES.
3. SEE SHEET AE601 FOR DOOR SCHEDULE.
4. SEE SHEET AE621 FOR WINDOW AND BORROWED LITE TYPES.
5. SEE SHEET AE641 FOR FINISH SCHEDULES.

KEYNOTES (THIS SHEET ONLY)

1. REINFORCED CONCRETE EXTERIOR STOOP, SEE STRUCTURAL SHEETS.
2. SKYLIGHT ABOVE, SEE ROOF PLAN.
3. BUILT-IN STORAGE.
4. 6'-0" HIGH ARCHITECTURAL SCREENING, CARRY (14) LINEAR FEET AND (1) GATE WITH LATCH.



KEY PLAN
NOT TO SCALE

PLAN NORTH

1 AE101 PARTIAL FLOOR PLAN
SCALE: 1/4"=1'-0"

GRAPHIC SCALE
1/4"=1'-0"
4' 2' 0 4' 8'
CHECK GRAPHIC SCALE BEFORE USING

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

04 Feb, 2026 - 2:28pm
Z:\22402.05\22402.05-AE101.dwg

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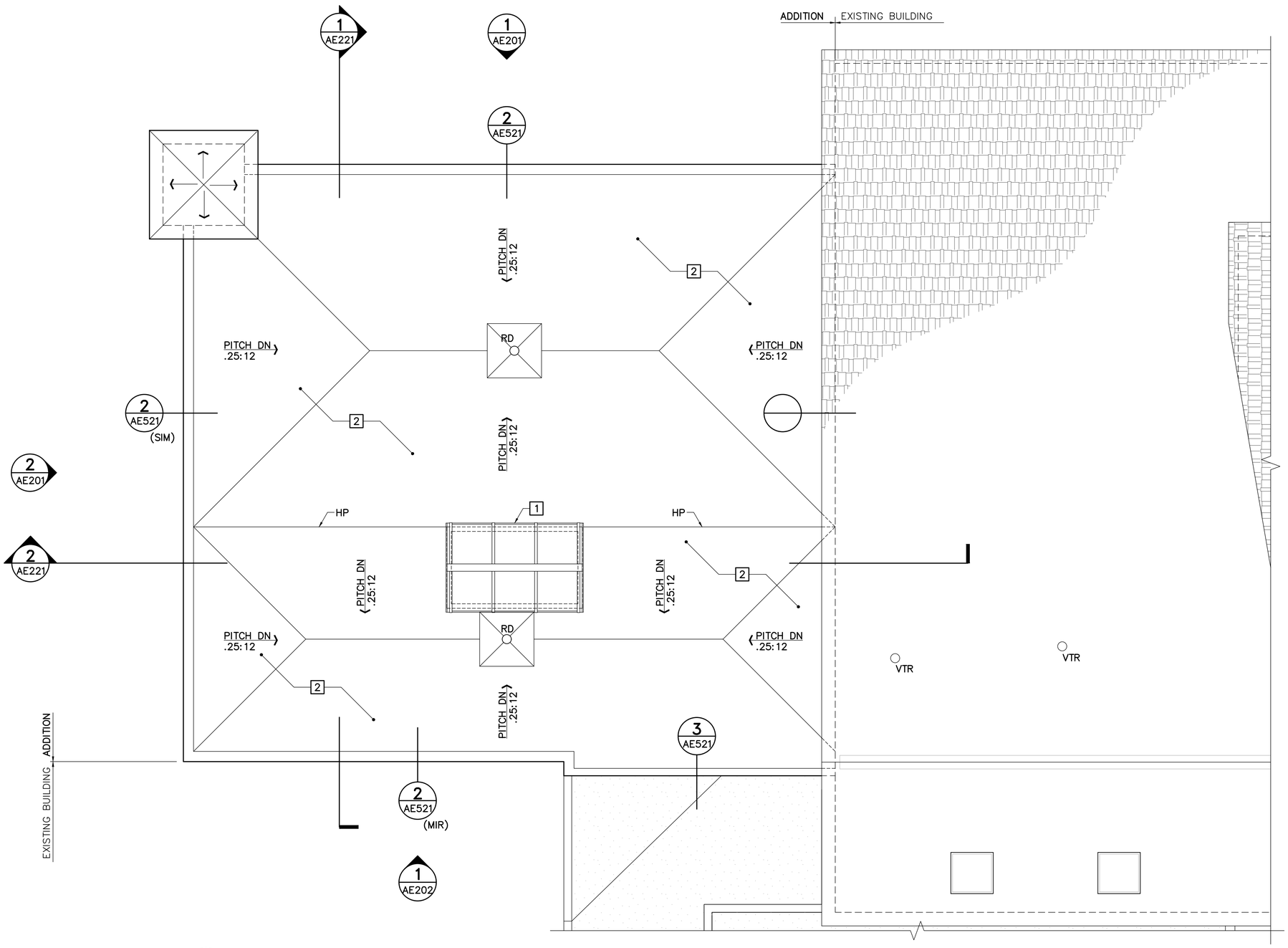
DRAWN BY: RMT
CHECKED BY: XXX
PROJECT: 22402.05

SAINT PATRICK ACADEMY
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

SAINT PATRICK ACADEMY
LIBRARY EXPANSION
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

FLOOR PLAN

SCALE: AS NOTED
DATE: 02-04-26
DWG.: AE101
SHEET: X OF XX



GENERAL NOTES

1. SEE SHEET S–002 FOR COMPONENT AND CLADDING DESIGN PRESSURES.
2. SEE SHEET AE641 FOR EXTERIOR FINISH SCHEDULE.

KEYNOTES (THIS SHEET ONLY)

1 CURB MOUNTED SKYLIGHT, SEE SHEET AE623.

2 EPDM ROOF SYSTEM, SEE DETAIL 1/AE521.

ROOF LEGEND

- EXISTING ASPHALT SHINGLE ROOF SYSTEM
- EXISTING EPDM MEMBRANE ROOF SYSTEM
- ROOF PITCH
- RD — ROOF DRAIN SEE DETAIL 5/AE521
- HP — HIGH POINT
- VTR — VENT THROUGH ROOF SEE DETAIL 4/AE521

1 AE121 **PARTIAL ROOF PLAN**
SCALE: 1/4"=1'–0"

KEY PLAN
NOT TO SCALE

PLAN NORTH

GRAPHIC SCALE
1/4"=1'–0"
4' 2' 0 4' 8'
CHECK GRAPHIC SCALE BEFORE USING

NO.	DATE	DESCRIPTION	BY
		REVISIONS	

04 Feb, 2026 – 1:20pm
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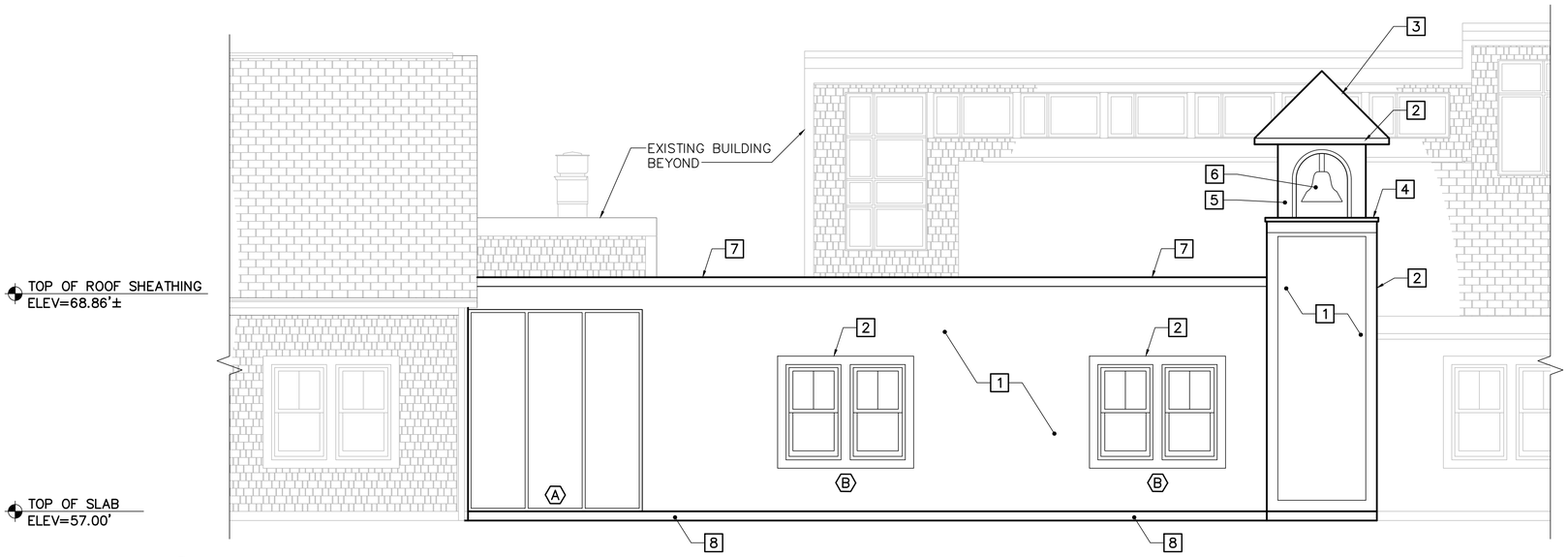
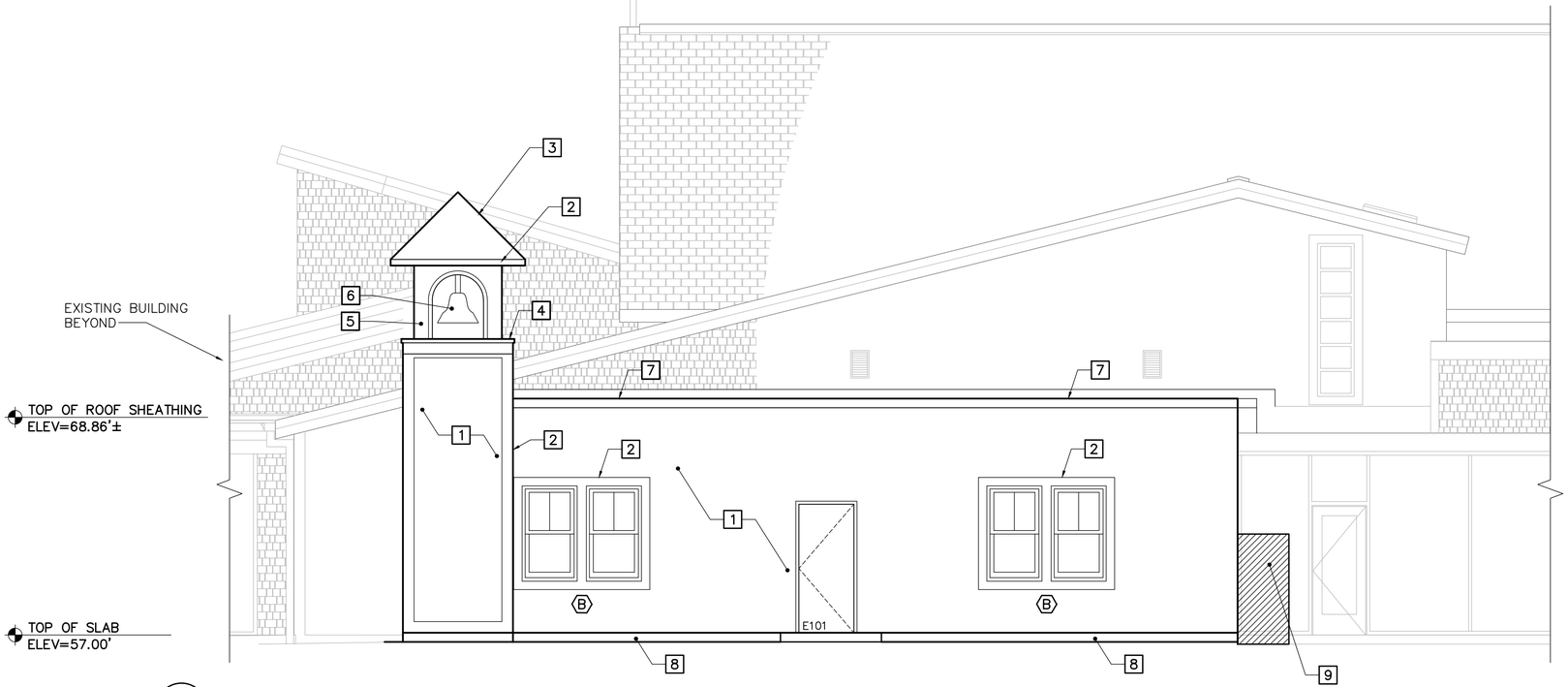
PORTSMOUTH, N.H. 03801

ROOF PLAN

SCALE: AS NOTED
DATE: 02-04-26
DWG.: AE121
SHEET: X OF XX



1 NORTH EXTERIOR ELEVATION
AE101,AE121 AE201 SCALE: 1/4"=1'-0"



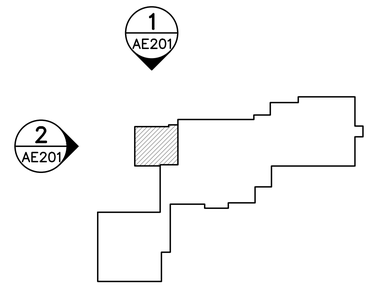
2 WEST EXTERIOR ELEVATION
AE101,AE121 AE201 SCALE: 1/4"=1'-0"

GENERAL NOTES

1. SEE SHEET AE621 FOR WINDOW TYPES.
2. SEE SHEET AE641 FOR EXTERIOR FINISH SCHEDULE.

KEYNOTES (SHEETS AE201 AND AE202)

1. VINYL SHINGLE SIDING, COLOR TO MATCH EXISTING SCHOOL.
2. 1x PVC TRIM.
3. ASPHALT SHINGLE ROOF SYSTEM.
4. PRECAST CONCRETE SILL
5. STEEL FRAMED BELL TOWER WITH PVC TRIM.
6. 2'-0" STATIONARY ALUMINUM BELL.
7. PREFINISHED METAL FASCIA WITH DRIP EDGE.
8. CEMENTITIOUS FINISH SYSTEM OVER FOUNDATION INSULATION.
9. 6'-0" HIGH ARCHITECTURAL SCREENING, CARRY (14) LINEAR FEET AND (1) GATE WITH LATCH.



KEY PLAN
NOT TO SCALE
PLAN NORTH

GRAPHIC SCALE
1/4"=1'-0" 4' 2' 0 4' 8'
CHECK GRAPHIC SCALE BEFORE USING

NO.	DATE	DESCRIPTION	BY

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04 Feb, 2026 – 2:31pm
Z:\22402.05\22402.05-AE201.dwg

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DRAWN BY: RMT
CHECKED BY: XXX
PROJECT: 22402.05

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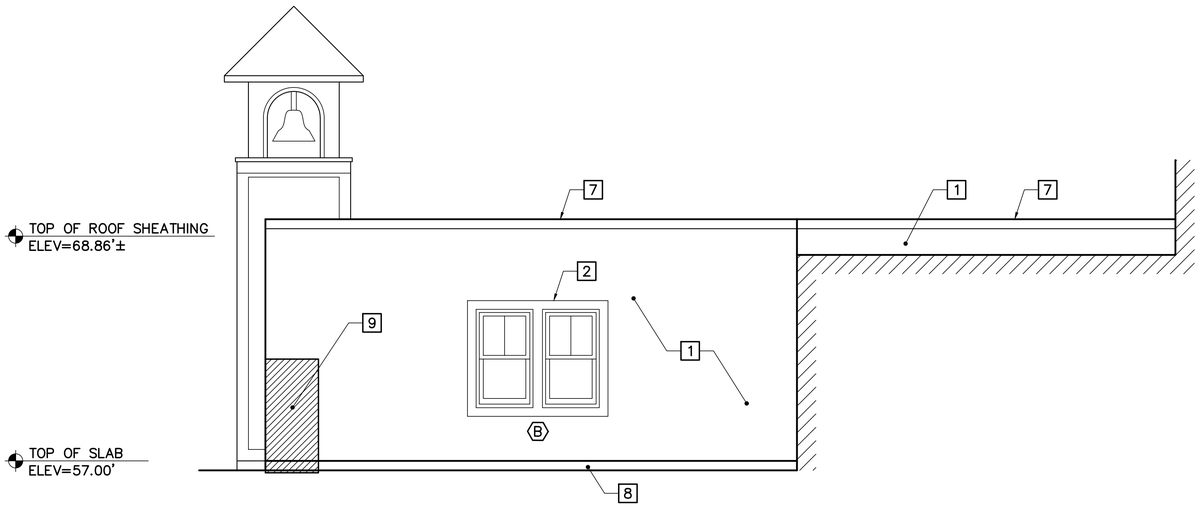
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

SAINT PATRICK ACADEMY LIBRARY EXPANSION
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

NORTH AND WEST EXTERIOR ELEVATIONS

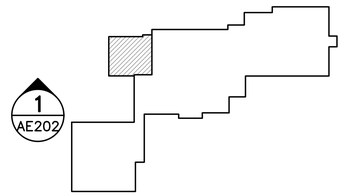
SCALE: AS NOTED
DATE: 02-04-26
DWG.: AE201
SHEET: X OF XX



1 SOUTH EXTERIOR ELEVATION
AE101,AE121 AE202 SCALE: 1/4"=1'-0"

GENERAL NOTES

1. SEE SHEET AE201 FOR KEYNOTES.
2. SEE SHEET AE621 FOR WINDOW TYPES.
3. SEE SHEET AE641 FOR EXTERIOR FINISH SCHEDULE.



KEY PLAN
NOT TO SCALE

PLAN NORTH

GRAPHIC SCALE
4' 2' 0 4' 8'
1/4"=1'-0"
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SOUTH EXTERIOR ELEVATION

SCALE: AS NOTED
DATE: 02-04-26
DWG.: AE202
SHEET: X OF XX

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

DRAINAGE MEMOMANDUM

Saint Patrick Academy Library Expansion
315 Banfield Road, Portsmouth, NH
Assessor's Parcel 266-5

February 12, 2026

Table of Contents

- Project Description
- Drainage Analysis
  - Stormwater Modeling Summary
- Conclusion
- Attachments
  - A) HydroCAD Routing Diagram
  - B) BMP Worksheet for Raingarden #1
  - C) Stage Storage Table for Raingaden #1
  - D) Peak Flow Results at Point of Analysis #1
  - E) Revised Post-Development Watershed Plan

PROJECT DESCRIPTION

In 2019, the Hope for Tomorrow Foundation (HFTF) and Saint Patrick Academy (Academy) developed a 200-student school at 315 Banfield Road, followed by construction of a gymnasium in 2020 on the 10.7-acre property. The Academy now plans to construct a new library addition totaling approximately 2,115 square feet. The proposed total lot impervious coverage will increase from 15.9% to 16.3% with the proposed addition. The proposed site improvements will not necessitate any additional parking. Stormwater from the proposed roof area will be managed through internal roof drains, directed to an existing catch basin, and routed through a previously installed raingarden for treatment. Altus has incorporated the new library addition into the drainage model to review the capacity of the raingarden. The peak elevation of the raingarden has only a 0.03 foot (3/8") increase as a result of the building addition for the 50-year storm event. Therefore, the raingarden has adequate capacity to manage the slight increase in flow. The stormwater management system for the site still provides a decrease in the peak discharge rates for all storms analyzed compared to the 2020 Pre-Development site condition. All rainfall intensities also include the 15% increase for Seacoast communities.

Drainage Analysis

In 2020, for the construction of the St. Patrick Academy gymnasium, a NHDES Alteration of Terrain permit was approved (AoT-1786, dated April 10, 2020) . A comprehensive drainage study was prepared for the permit that modeled the Pre-Development and Post Development site conditions. Per NHDES AoT regulations, the site is compliant if the impervious area does not increase by more than 5% or 2,500 square feet. Therefore, an amendment to the AoT permit is not required for this permit.

Env-Wq-1503.21.d.4 - As compared to the project as originally approved, the total impervious area has decreased, remained the same, or increased by the smaller of 5% or 2,500 square feet.

As noted in the project description, Altus has updated the drainage model to include the new building addition. Utilizing the updated model, Altus has reviewed the existing Raingarden #1 for storage capacity and WQV treatment requirements. The BMP worksheet and storage table are included as an attachment. With the increase impervious are for the library, the required WQV increased slightly to 2,035 cubic feet of storage. The raingarden provides 2,238 cubic feet and therefore meets the WQV requirement. As noted, the peak elevation of the 50 year storm only resulted in an increase of 0.03 ft. Therefore the capacity is also adequate to accommodate the library. Lastly the peak flows were compared to the pre-development flows from the 2020 AoT permit application at the Point of Analysis #1. The results below show that the Peak flows for all storm events continue to provide a decrease compared to the pre-development conditions.

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Yr Storm (3.71 inch)	10-Yr Storm (5.64 inch)	25-Yr Storm (7.14 inch)	50-Yr Storm (8.57 inch)
POA #1 – Banfield Road				
Pre (2020)	6.15	12.60	16.66	25.51
Post (2020)	5.85	11.76	15.74	24.33
Post (Library-2025)	5.97	11.85	15.79	24.38
New Net Change	**-0.18**	**-0.75**	**-0.87**	**-1.13**

As the above table demonstrates, the proposed peak rates of runoff will be decreased from the existing conditions of the site at the analysis point for all analyzed storm events. All storms are analyses utilizing the 15% increase to rainfall intensities for Seacoast communities.

Conclusion

This proposed 2,115 square foot library addition at Saint Patrick Academy, located at 335 Banfield Road in Portsmouth, NH will not have an adverse effect on abutting properties and infrastructure as a result of stormwater runoff. Post-construction peak rates of runoff from the site will remain lower than the Pre-development conditions for all analyzed storm events, including the 15% increase to rainfall for seacoast communities. The construction of a comprehensive stormwater drainage system will provide the required treatment to stormwater runoff. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control.

Attachments

The following attachments are included for reference:

A) HydroCAD Routing Diagram
B) BMP Worksheet for Raingarden #1
C) Stage Storage Table for Raingaden #1
D) Peak Flow Results at Point of Analysis #1
E) Revised Post-Development Watershed Plan

Prepared by:

ALTUS ENGINEERING, LLC

Cory D. Belden, P.E.

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Raingarden #1 (HydroCAD Pond RG1) - Updated for 2026 Library**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable

YES		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.06(b)?	
3.47	ac	A = Area draining to the practice[1]	
0.43	ac	A_I = Impervious area draining to the practice	
0.12	decimal	I = percent impervious area draining to the practice, in decimal form	
0.16	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.56	ac-in	WQV= 1" x Rv x A	
2,035	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
509	cf	25% x WQV (check calc for sediment forebay volume)	
1,526	cf	75% x WQV (check calc for surface sand filter volume)	
sumps		Method of Pretreatment? (not required for clean or roof runoff)	
	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
1,000	sf	A_{SA} = surface area of the practice	
1.00	iph	I_{DESIGN} = design infiltration rate[2]	
	Yes/No	If I_{DESIGN} is < 0.50 iph, has an underdrain been provided?	
24.4	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← ≤ 72-hrs
39.25	feet	E_{FC} = elevation of the bottom of the filter course material	
38.25	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
37.75	feet	E_{BTM} = elevation of the bottom of the practice (i.e., bottom of the stone reservoir).	
37.00	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
34.00	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course[3]	← ≥ 1'
5.25	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course[3]	← ≥ 1'
2.25	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course[3]	← ≥ 1'
0.75	feet	$D_{BTM\ to\ SHWT}$ = depth to SHWT from the bottom of the practice[3]	← ≥ 2'
42.24	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
43.00	ft	Elevation of the top of the practice	
YES		10 peak elevation ≤ Elevation of the top of the practice	← yes

If a surface sand filter is proposed:

YES	ac	Drainage Area check.	← < 10 ac
	cf	V = volume of storage[4, 5] (attach a stage-storage table)	← ≥ 75%WQV
	inches	D_{FC} = filter course thickness	← 18"
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← yes
		The filter shall not be covered in grass. What is covering the filter?	

If an underground sand filter is proposed:

YES	ac	Drainage Area check.	← < 10 ac
	cf	V = volume of storage[4, 5] (attach a stage-storage table)	← ≥ 75%WQV
	inches	D_{FC} = filter course thickness	← 24"
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← yes

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
2,238	cf	V = volume of storage[4, 5] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18"**
Sheet	D-5	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥2:1**
Sheet	LS101	Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
-	:1	ratio of the contributing area to the pervious surface area	← **5:1**
	inches	D_{FC} = filter course thickness	← **12"**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

1. If the practice is a tree box filter, the drainage area shall be < 0.1 acre

2. Rate of the limiting layer (either the filter course or the underlying soil). See Vol. 2 of the NH Stormwater Manual, Ch. 2-4, for guidance on determining the infiltration rate.

3. If not within a GPA or WSIPA: SHWT/Bedrock must be at least 1 foot below the filter course material (or an underdrain must drain the SHWT to at least one foot below the filter course material). If within a GPA or WSIPA: SHWT must be at least two feet below the bottom of the practice OR the filter course material must be at least twice as thick as required and the SHWT must be at least one foot below the filter course material.

4. Volume without depending on infiltration. The storage above the filter media shall not include the volume above the outlet structure, if any.

5. The volume includes the storage above the filter but below the invert of the outlet structure (if any), the filter media voids, and the pretreatment area.

Designer's Notes:

Stage-Area-Storage for Pond RG1: Raingarden 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
37.50	1,000	0
37.60	1,000	33
37.70	1,000	66
37.80	1,000	99
37.90	1,000	132
38.00	1,000	165
38.10	1,000	198
38.20	1,000	231
38.30	1,000	264
38.40	1,000	297
38.50	1,000	330
38.60	1,000	363
38.70	1,000	396
38.80	1,000	429
38.90	1,000	462
39.00	1,000	495
39.10	1,000	528
39.20	1,000	561
39.30	1,000	594
39.40	1,000	627
39.50	1,000	660
39.60	1,000	693
39.70	1,000	726
39.80	1,000	759
39.90	1,000	792
40.00	1,000	825
40.10	1,000	858
40.20	1,000	891
40.30	1,000	924
40.40	1,000	957
40.50	1,000	990
40.60	1,000	1,000
40.70	1,000	1,010
40.80	1,000	1,031
40.90	1,000	1,064
41.00	1,000	1,098
41.10	1,080	1,278
41.20	1,160	1,458
41.30	1,240	1,637
41.40	1,320	1,817
41.50	1,400	1,998
41.60	1,480	2,178
41.70	1,560	2,358
41.80	1,640	2,537
41.90	1,720	2,717
42.00	1,800	2,898
42.10	1,880	3,078
42.20	1,960	3,258
42.30	2,040	3,437
42.40	2,120	3,617
42.50	2,200	3,798
42.60	2,280	3,978
42.70	2,360	4,158
42.80	2,440	4,337
42.90	2,520	4,517
43.00	**2,600**	**4,698**

41.75 outlet / WQV = 2478 cf

Summary for Link POA1: POA #1

Inflow Area = 5.529 ac, 31.57% Impervious, Inflow Depth > 1.45" for 2-Year event
Inflow = 5.97 cfs @ 12.16 hrs, Volume= 0.670 af
Primary = 5.97 cfs @ 12.16 hrs, Volume= 0.670 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA1: POA #1

Inflow Area = 5.529 ac, 31.57% Impervious, Inflow Depth > 2.98" for 10-Year event
Inflow = 11.85 cfs @ 12.14 hrs, Volume= 1.372 af
Primary = 11.85 cfs @ 12.14 hrs, Volume= 1.372 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA1: POA #1

Inflow Area = 5.529 ac, 31.57% Impervious, Inflow Depth > 4.24" for 25-Year event
Inflow = 15.79 cfs @ 12.14 hrs, Volume= 1.954 af
Primary = 15.79 cfs @ 12.14 hrs, Volume= 1.954 af, Atten= 0%, Lag= 0.0 min

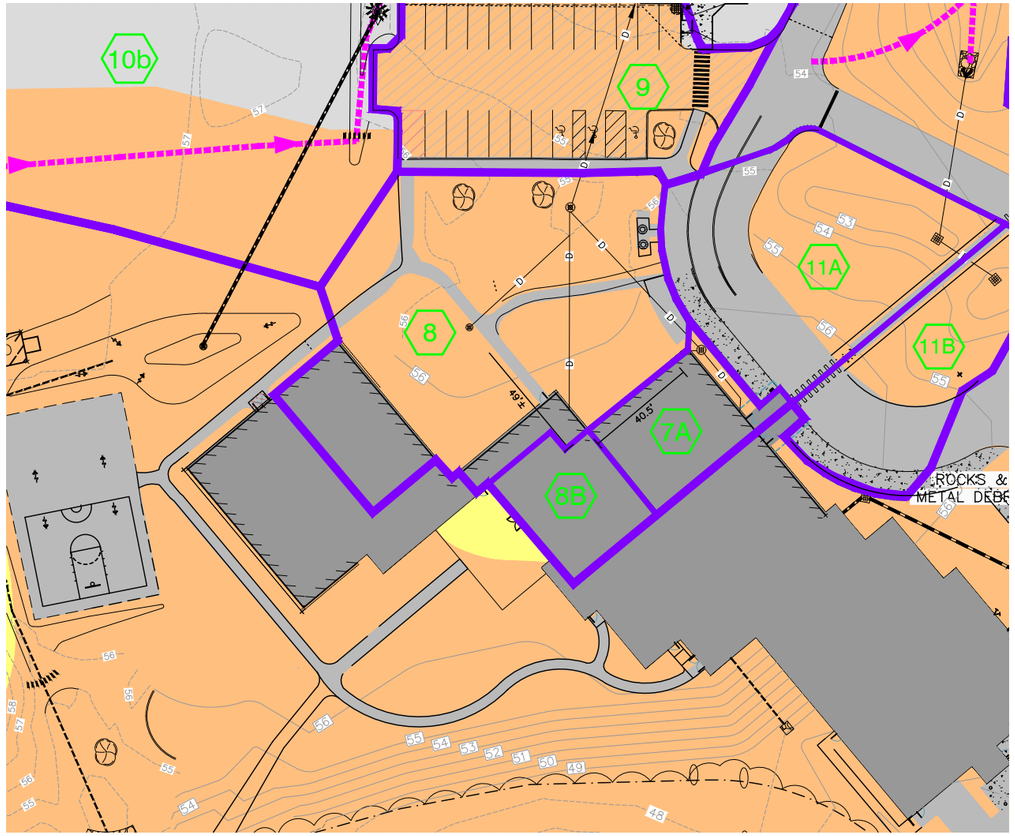
Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

Summary for Link POA1: POA #1

Inflow Area = 5.529 ac, 31.57% Impervious, Inflow Depth > 5.49" for 50-Year event
Inflow = 24.38 cfs @ 12.17 hrs, Volume= 2.530 af
Primary = 24.38 cfs @ 12.17 hrs, Volume= 2.530 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-30.00 hrs, dt= 0.05 hrs

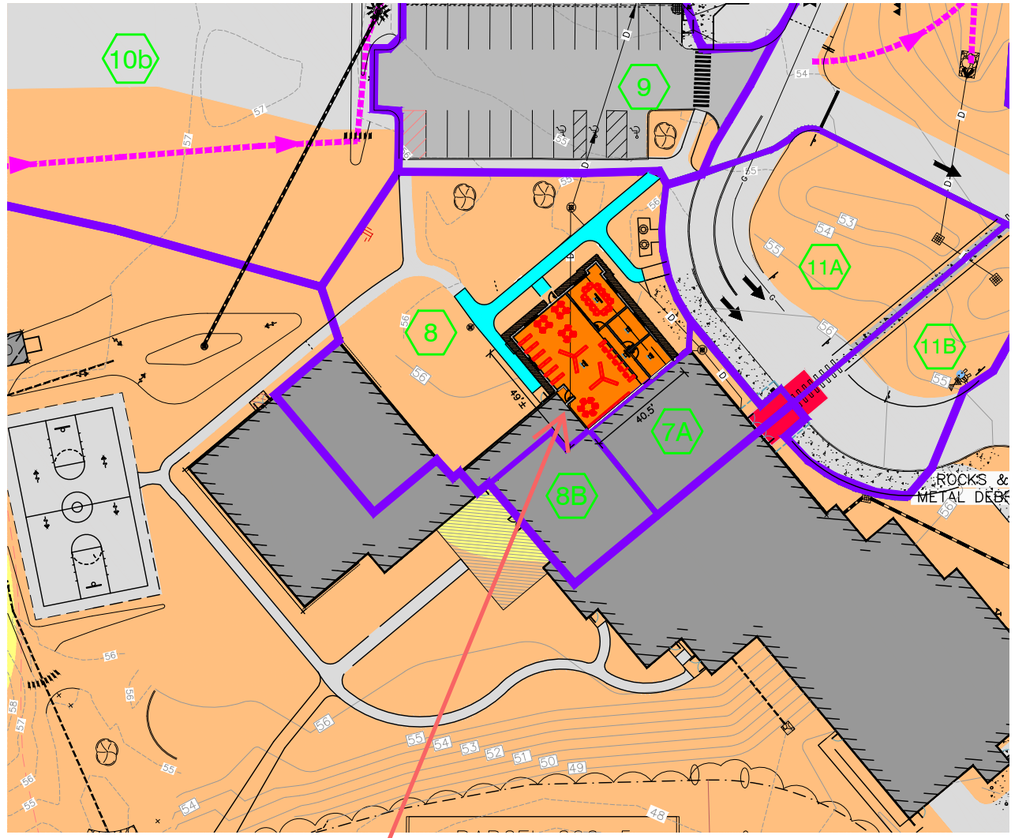
PRE



LEGEND

- WATERSHED BOUNDARY
- Tc PATH
- (1) SUBCATCHMENT
- (1) POND
- [1] REACH
- SOILS – HSG B
- SOILS – HSG C
- SOILS – IMPERVIOUS PAVE/BLDG
- LIBRARY ADDITION

POST



NOTES

1. SITE SPECIFIC SOILS SURVEY PERFORMED BY JOSEPH W. NOEL, CSS #017, NOVEMBER – DECEMBER 2016.
2. WETLANDS DELINEATED BY JOESPH W. NOEL, CWS #086, SEPTEMBER 2016.
3. THE LEFT SIDE OF THE PLAN DEPICTS THE SITE BEFORE THE LIBRARY AND THE RIGHT DEPICTS THE SITE AFTER THE LIBRARY IS CONSTRUCTED

30 0 30 60 90 120 FEET

NH STATE PLANE COORDINATE SYSTEM NAD 1983

P4801

ENGINEER:

ALTUS ENGINEERING

133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

ISSUED FOR: DRAINAGE MEMO

ISSUE DATE: FEBRUARY 12, 2026

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	DRAINAGE MEMO	CDB	02/12/26

DRAWN BY: JMG
APPROVED BY: CDB
DRAWING FILE: 4801EC.DWG

SCALE:
22" x 34" – 1" = 30'
11" x 17" – 1" = 60'

OWNER:

HOPE FOR
TOMORROW FOUNDATION
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

APPLICANT:

SAINT
PATRICK
ACADEMY
315 BANFIELD ROAD
PORTSMOUTH, N.H. 03801

PROJECT:

LIBRARY
EXPANSION
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TITLE:

REVISED
POST-DEVELOPMENT
WATERSHED
PLAN

SHEET NUMBER:

WS-3

February 13, 2026

Peter Stith, TAC Committee Chair
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

RE: Request for TAC Review
Richards Avenue & South Street
Subdivision Application

Dear Mr. Stith and Technical Advisory Committee (TAC) Members,

On behalf of Chinburg Development, we are pleased to submit the attached **Subdivision Application** for the above-mentioned project and request that we be placed on the agenda for your **March 3, 2026** TAC Meeting. The property is shown on the City of Portsmouth Assessors Map 112 as Lot 24A.

PROJECT OVERVIEW

The project consists of subdividing the existing lot located at Richards Avenue and South Street into two lots for residential development. The existing site has a total area of 17,459 square feet. The site is currently undeveloped with a fenced perimeter, grass and various trees. Once subdivided, the project includes the construction of a single-family dwelling with associated walkways and driveways on each lot. Preliminary building footprints, site layouts, drainage and utilities are shown in the attached submittal to show compliance with the ordinance. Final layouts and design will be prepared and submitted with the building permits. The development of the site will comply with the applicable design, safety, and operational standards, including building code compliance. We believe that the residential development will complement the surrounding neighborhood.

SITE ZONING

The project is within the City of Portsmouth General Residence A (GRA) District which allows for residential development. The proposed project is consistent with the surrounding neighborhood which is predominantly single family residential. As proposed the subdivision meets all zoning requirements.

PARKING

Each residence will have a two car garage in addition to two driveway parking spaces for a total of four parking spaces per dwelling.

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VEHICULAR AND PEDESTRIAN CIRCULATION

Each residence will be accessed by their own 20-foot-wide paved driveway with a turnaround. Pedestrian access will be provided by new walkways to the front door of each residence.

SCREENING AND LANDSCAPING

The site landscaping is still in the preliminary design stages but will generally feature perimeter plantings to provide screening for the proposed residences. Supplemental landscaping is proposed around the houses and patios. All landscaping will be consistent with traditional local residential design and will match the surrounding neighborhood.

WATER AND SEWAGE SYSTEMS

Each residence will be served by municipal water located within South Street. Each residence will be served by municipal sewer located in Richards Avenue. An easement is provided at the rear of Lot 1 to allow for the installation of sewer to Lot 2

STORMWATER MANAGEMENT

A Ferguson R-Tank MD (or approved equal) underground stormwater detention system is proposed to collect runoff from impervious surfaces and provided a reduction in runoff rates due to the increased impervious cover. The existing site predominantly drains to the west into the Richards Avenue stormwater system with a small portion draining offsite onto abutting properties to the north. In the developed condition, stormwater flow rates are reduced to pre-development flow rates. See the attached Stormwater Management and Erosion Control Plan for additional information. The stormwater design is preliminary and intended to show compliance with the subdivision regulations. An updated design will be provided with the building permit submittal.

SITE LIGHTING

Site lighting will be designed at minimum levels to provide a welcoming and safe pedestrian experience and not create excess lighting within the neighborhood.

SITE UTILITIES

Natural gas, electric, and communications services will be installed underground from South Street to serve the residences.

SOLID WASTE

Solid waste will be collected through curb side pickup.

SUBMISSION

The submission includes Plans, the Subdivision Application Checklist, a Tax Map, an Aerial Map and a Drainage Management and Erosion Control Plan.

The following drawings are included in our submission:

- C000 – Cover Sheet
- C001 – General Notes, Legend & Abbreviations
- V101 – Conditions Plan – This plan shows the existing conditions at the site.
- Subdivision Plan – This plan shows the proposed subdivision and easement.
- C101 – Site Layout Plan – This plan shows the proposed site development.
- C102 – Grading, Drainage, & Utility Plan – This plan shows the proposed stormwater improvements and utilities.
- C501 & C502 – Construction Details
- C701 & C702 – Pre- & Post-Development Hydrology Plans – These plans show the existing and proposed drainage areas and flow paths.

We look forward to Technical Advisory Committee review of this submission and look forward to an in-person presentation at your meeting.

Sincerely,
Haley Ward, Inc.

Shawn Tobey, PE
Southern Maine & New Hampshire Land Development Manager

Docusign Envelope ID: 74BF2736-263B-47A0-9CAD-E92D7A3B4937

Letter of Authorization

We, J. Paul Griffin Family Trust, owners of the properties at Map and Lot 0112-024A South Street Portsmouth, NH, do hereby authorize the following parties to act as agents on our behalf for the above-described property in order to apply for any necessary state and local applications or permits on the subject property relative to the development of said parcel:

Chinburg Development Newmarket, NH

Haley Ward Engineering, Portsmouth, NH

Exeter Environmental Newfields, NH

And all other agents as appointed by Chinburg Development

as agents to act on my behalf in matters to be discussed with the City of Portsmouth, State Departments and other Land Use Boards concerning the property previously mentioned and to access the subject property for completion of Due Diligence and in accordance with any work required for said permits.

I hereby appoint the above referenced parties as my agent to act on my behalf in the review process, to include any required signatures.

DocuSigned by:

FBC537F1FC574DC...

J. Paul Griffin Family Trust

10/7/2025

Date

City of Portsmouth, New Hampshire

Subdivision Application Checklist

This subdivision application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all subdivision review requirements. Please refer to the Subdivision review regulations for full details.

Applicant Responsibilities (Section III.C): Applicable fees are due upon application submittal along with required number of copies of the Preliminary or final plat and supporting documents and studies. Please consult with Planning staff for submittal requirements.

Owner: J. Paul Family Trust - Peter J. Griffin, Trustee Date Submitted: 2/13/26

Applicant: Chinburg Development c/o Shawna Sammis

Phone Number: 603-868-5995 x31 E-mail: ssammis@chinburg.com

Site Address 1: 0 South Street Map: 112 Lot: 24A

Site Address 2: 0 Richards Avenue Map: 112 Lot: 24A

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
✓	Completed Application form. **(III.C.2-3)**	Submitted Online	N/A
✓	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(III.C.4)**	Submitted Online	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Name and address of record owner, any option holders, descriptive name of subdivision, engineer and/or surveyor or name of person who prepared the plat. **(Section IV.1/V.1)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	N/A

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	**Preliminary Plat** Names and addresses of all adjoining property owners. **(Section IV.2)** **Final Plat** Names and addresses of all abutting property owners, locations of buildings within one hundred (100) feet of the parcel, and any new house numbers within the subdivision. **(Section V.2)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	North point, date, and bar scale. **(Section IV.3/V3)**	Required on all Plan Sheets	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Zoning classification and minimum yard dimensions required. **(Section IV.4/V.4)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	**Preliminary Plat** Scale (not to be smaller than one hundred (100) feet = 1 inch) and location map (at a scale of 1" = 1000'). **(Section IV.5)** **Final Plat** Scale (not to be smaller than 1"=100'), Location map (at a scale of 1"=1,000') showing the property being subdivided and its relation to the surrounding area within a radius of 2,000 feet. Said location map shall delineate all streets and other major physical features that my either affect or be affected by the proposed development. **(Section V.5)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location and approximate dimensions of all existing and proposed property lines including the entire area proposed to be subdivided, the areas of proposed lots, and any adjacent parcels in the same ownership. **(Section IV.6)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	
✓	Dimensions and areas of all lots and any and all property to be dedicated or reserved for schools, parks, playgrounds, or other public purpose. Dimensions shall include radii and length of all arcs and calculated bearing for all straight lines. **(Section V.6/ IV.7)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	N/A
✓	Location, names, and present widths of all adjacent streets, with a designation as to whether public or private and approximate location of existing utilities to be used. Curbs and sidewalks shall be shown. **(Section IV.8/V.7)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✓	Location of significant physical features, including bodies of water, watercourses, wetlands, railroads, important vegetation, stone walls and soils types that my influence the design of the subdivision. **(Section IV.9/V.8)**	Subdivision Plan & C101 Site Layout Plan	☑ Preliminary Plat ☑ Final Plat	
✓	**Preliminary Plat** Proposed locations, widths and other dimensions of all new streets and utilities, including water mains, storm and sanitary sewer mains, catch basins and culverts, street lights, fire hydrants, sewerage pump stations, etc. **(Section IV.10)** **Final Plat** Proposed locations and profiles of all proposed streets and utilities, including water mains, storm and sanitary sewer mains, catchbasins and culverts, together with typical cross sections. Profiles shall be drawn to a horizontal scale of 1"=50' and a vertical scale of 1"=5', showing existing centerline grade, existing left and right sideline grades, and proposed centerline grade. **(Section V.9)**	C101 Site Layout Plan & C102 Grading, Drainage, & Utility Plan	☑ Preliminary Plat ☑ Final Plat	
✓	When required by the Board, the plat shall be accompanied by profiles of proposed street grades, including extensions for a reasonable distance beyond the subject land; also grades and sizes of proposed utilities. **(Section IV.10)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✓	Base flood elevation (BFE) for subdivisions involving greater than five (5) acres or fifty (50) lots. **(Section IV.11)**	N/A	☑ Preliminary Plat ☑ Final Plat	
✓	For subdivisions of five (5) lots or more, or at the discretion of the Board otherwise, the preliminary plat shall show contours at intervals no greater than two (2) feet. Contours shall be shown in dotted lines for existing natural surface and in solid lines for proposed final grade, together with the final grade elevations shown in figures at all lot corners. If existing grades are not to be changed, then the contours in these areas shall be solid lines. **(Section IV.12/ V.12)**	V101 Ex. Cond. Plan & C102 Grading, Drainage, & Utility Plan	☑ Preliminary Plat ☑ Final Plat	

Requirements for Preliminary/Final Plat				
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Required for Preliminary / Final Plat**	**Waiver Requested**
✔	Dates and permit numbers of all necessary permits from governmental agencies from which approval is required by Federal or State law. **(Section V.10)**	C000 Cover Sheet	☐ Preliminary Plat ☑ Final Plat	
✔	For subdivisions involving greater than five (5) acres or fifty (50) lots, the final plat shall show hazard zones and shall include elevation data for flood hazard zones. **(Section V.11)**	N/A	☐ Preliminary Plat ☑ Final Plat	
✔	Location of all permanent monuments. **(Section V.12)**	Subdivision Plan	☐ Preliminary Plat ☑ Final Plat	

General Requirements[1]			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	**1. Basic Requirements: (VI.1)** a. Conformity to Official Plan or Map b. Hazards c. Relation to Topography d. Planned Unit Development	C101 Site Layout Plan	
☐	**2. Lots: (VI.2)** a. Lot Arrangement b. Lot sizes c. Commercial and Industrial Lots	Subdivision Plan	
☐	**3. Streets: (VI.3)** a. Relation to adjoining Street System b. Street Rights-of-Way c. Access d. Parallel Service Roads e. Street Intersection Angles f. Merging Streets g. Street Deflections and Vertical Alignment h. Marginal Access Streets i. Cul-de-Sacs j. Rounding Street Corners k. Street Name Signs l. Street Names m. Block Lengths n. Block Widths o. Grade of Streets p. Grass Strips	Subdivision Plan	
☐	**4. Curbing: (VI.4)**	C101 Site Layout Plan	
☐	**5. Driveways: (VI.5)**	C101 Site Layout Plan	
☐	**6. Drainage Improvements: (VI.6)**	C102 Grading, Drainage & Utility Plan	
☐	**7. Municipal Water Service: (VI.7)**	C102 Grading, Drainage & Utility Plan	
☐	**8. Municipal Sewer Service: (VI.8)**	C102 Grading, Drainage & Utility Plan	
☐	**9. Installation of Utilities: (VI.9)** a. All Districts b. Indicator Tape	C501 & C502 Construction Details	
☐	**10. On-Site Water Supply: (VI.10)**	N/A	
☐	**11. On-Site Sewage Disposal Systems: (VI.11)**	N/A	
☐	**12. Open Space: (VI.12)** a. Natural Features b. Buffer Strips c. Parks d. Tree Planting	C101 Site Layout Plan	
☐	**13. Flood Hazard Areas: (VI.13)** a. Permits b. Minimization of Flood Damage c. Elevation and Flood-Proofing Records d. Alteration of Watercourses	N/A Not in a Flood Hazard Area	
☐	**14. Erosion and Sedimentation Control (VI.14)**	C102 Grading, Drainage & Utility Plan	

☑	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	**15. Easements (VI.15)** a. Utilities b. Drainage	Subdivision Plan	
☐	**16. Monuments: (VI.16)**	Subdivision Plan	
☐	**17. Benchmarks: (VI.17)**	V101 & C102	
☐	**18. House Numbers (VI.18)**	TBD	

Design Standards			
	Required Items for Submittal	**Indicate compliance and/or provide explanation as to alternative design**	**Waiver Requested**
☐	**1. Streets have been designed according to the design standards required under Section (VII.1).** a. Clearing b. Excavation c. Rough Grade and Preparation of Sub-Grade d. Base Course e. Street Paving f. Side Slopes g. Approval Specifications h. Curbing i. Sidewalks j. Inspection and Methods	No proposed streets.	
☐	**2. Storm water Sewers and Other Drainage Appurtenances have been designed according to the design standards required under Section (VII.2).** a. Design b. Standards of Construction	Stormwater designed to reduce offsite runoff up to the 50-yr storm	
☐	**3. Sanitary Sewers have been designed according to the design standards required under Section (VII.3).** a. Design b. Lift Stations c. Materials d. Construction Standards	Two individual services are proposed.	
☐	**4. Water Mains and Fire Hydrants have been designed according to the design standards required under Section (VII.4).** a. Connections to Lots b. Design and Construction c. Materials d. Notification Prior to Construction	No hydrants are proposed.	

Applicant's/Representative's Signature: _____ **Date:** 2/13/26

[1] See City of Portsmouth, NH Subdivision Rules and Regulations for details.

SUBJECT LOT

SPRING ST
MILLER AVE
BERSUM LN
RICHARDS AVE
SHERBURNE AVE
LINCOLN AVE
ELWYN AVE
MCNABB CT
SOUTH ST
CLOUGH DR
HAVEN RD

130-22 130-23 130-3 130-4 130-7 130-8 130-9 130-10 131-29 131-30 131-31 131-32 131-33 131-34 131-35 131-36 130-2 130-1 113-7 113-6 113-5 113-4 113-3 113-2 113-1 113-32 113-33 113-34 113-35 111-18 111-17 111-16 111-15

13 0.141 ac · 12 0.136 ac · 11 0.284 ac · 10 0.140 ac · 9 0.143 ac · 8 0.158 ac · 7 0.146 ac · 6 0.297 ac · 60 0.301 ac · 5 0.183 ac · 3 0.157 ac · 4 0.133 ac · 14 0.197 ac · 15 0.196 ac · 16 0.195 ac · 17 0.198 ac · 18 0.229 ac · 19 0.195 ac · 20 0.195 ac · 21 0.205 ac · 22 0.183 ac · 23 0.591 ac · 24 0.345 ac · 24A 0.400 ac · 29 0.268 ac · 30 0.129 ac · 31 0.119 ac · 32 0.121 ac · 33 0.123 ac · 34 0.125 ac · 35 0.128 ac · 36 0.130 ac · 37 0.134 ac · 38 0.063 ac · 39 0.123 ac · 40 0.125 ac · 41 0.129 ac · 42 0.067 ac · 43 0.082 ac · 44 0.080 ac · 45 0.113 ac · 46 0.117 ac · 47 0.118 ac · 48 0.118 ac · 49 0.117 ac · 50 0.114 ac · 51 0.138 ac · 52 0.138 ac · 53 0.167 ac · 54 0.284 ac · 55 0.197 ac · 56 0.073 ac · 57 0.073 ac · 58 0.063 ac · 59 0.070 ac · 1 0.187 ac · 2 0.273 ac · 27 0.108 ac · 28 0.110 ac

Partial Legend

See the cover sheet for the complete legend.

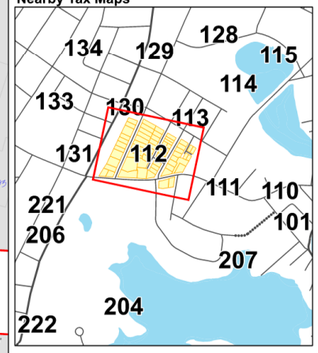
- **7-5A** Lot or lot-unit number
- *2.56 ac* Parcel area in acres (ac) or square feet (sf)
- Address number
- 233-137 Parcel number from a neighboring map
- 68' Parcel line dimension
- SIMS AVE Street name
- Parcel/Parcel boundary
- Parcel/ROW boundary
- Water boundary
- Structure (1994 data)
- Parcel covered by this map
- Parcel from a neighboring map (see other map for current status)

0 50 100 Feet

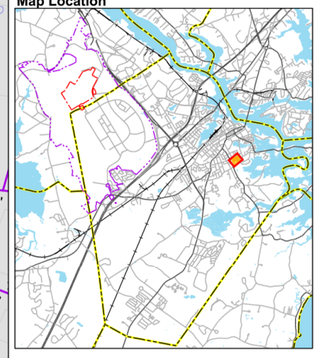
0 20 40 Meters

This map is for assessment purposes only. It is not intended for legal description or conveyance.
Parcels are mapped as of April 1.
Building footprints are 2006 data and may not represent current structures.
Streets appearing on this map may be paper (unbuilt) streets.
Lot numbers take precedence over address numbers. Address numbers shown on this map may not represent posted or legal addresses.

Nearby Tax Maps

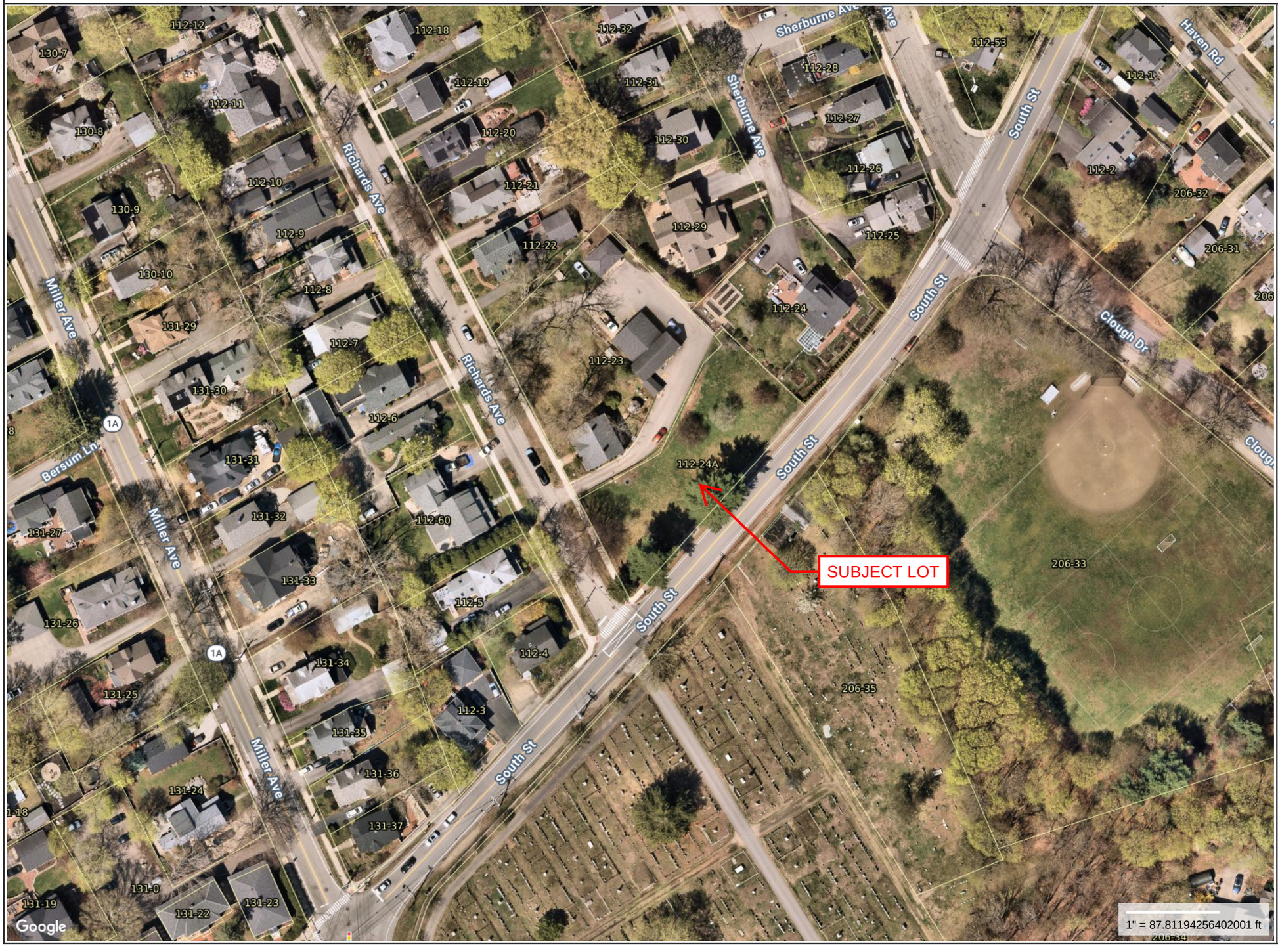


Map Location



Portsmouth, New Hampshire
2025

Tax Map 112



MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Portsmouth, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated 10/23/2025

Print map scale is approximate. Critical layout or measurement activities should not be done using this resource.

HALEY WARD

STORMWATER MANAGEMENT AND EROSION CONTROL PLAN

TO THE CITY OF PORTSMOUTH
FOR RICHARDS AVENUE & SOUTH STREET
Map 112, Lot 24A | Portsmouth, NH

APPLICANT:
Chinburg Development
3 Penstock Way
Newmarket, NH 03847

February 13, 2026
JN: 5010220.003

REPORT PREPARED BY:
Haley Ward, Inc.
200 Griffin Road, Unit 14 | Portsmouth, NH 03801

EXECUTIVE SUMMARY

This drainage analysis examines the pre-development (existing) and post-development (proposed) stormwater drainage patterns for the proposed residential redevelopment project at the intersection of Richards Avenue & South Street in Portsmouth, NH. The site is shown on the City of Portsmouth Assessor's Tax Map 112 as Lot 24A. The total size of the existing lot is approximately 17,459 square feet.

The development will subdivide the existing lot and provide for the construction of two (2) single-family homes, with associated landscaping, utilities, and driveways. The new buildings will be serviced by public water and sewer. The development has the potential to increase stormwater runoff to adjacent properties and therefore must be designed in a manner to prevent that occurrence. This will be done primarily by capturing stormwater runoff and routing it through appropriate stormwater facilities, designed to ensure that there will be no significant increase in peak runoff from the site as a result of this project.

Due to the number of lots created and the size of the project, post-construction stormwater management design standards and enhanced stormwater treatment standards are not applicable. The intent of this stormwater design is to comply with the requirements of Section 7.6.1.4 of the City of Portsmouth Site Plan Review Ordinance as related to post-development peak rate of runoff reduction.

INTRODUCTION / PROJECT DESCRIPTION

This drainage report is designed to assist the owner, planning board, contractor, regulatory reviewer, and others in understanding the impact of the proposed development project on local surface water runoff. Bounding the site to the north and east are developed residential properties. The site is bound to the south and west by Richards Avenue and South Street.

The proposed development will include the construction of single-family homes, decks, driveways, sidewalks, and patios causing an increase in impervious cover. To offset the increase, an underground stormwater detention system has been designed for each lot. The detention systems will collect all roof runoff from either drip strips with underdrains or gutters with downspouts. The detention systems will also collect stormwater runoff from the driveways through catch basins. As a placeholder, the underground detention systems are based on a series of Ferguson R-Tank HD units wrapped in crushed stone with controlled outlet structures. The site layouts and drainage designs are preliminary and intended for planning purposes only to show compliance with the zoning ordinances.

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The applicant shall submit final site/stormwater design plans with an Operations and Maintenance Plan for review and approval as part of the Building Permit application.
This report includes information about the existing site necessary to analyze stormwater runoff and to design any required mitigation. The report includes maps of pre-development and post-development watersheds, subcatchment areas and calculations of runoff. The report will provide a narrative of the stormwater runoff and describe numerically and graphically the surface water runoff patterns for this site. Proposed stormwater management structures and methods will also be described, as well as erosion and sediment control practices. To fully understand the proposed site development the reader should also review the complete site plan set in addition to this report.

METHODOLOGY

"Extreme Precipitation" values from The Northeast Regional Climate Center (Cornell University) have been used for modeling purposes. These values have been used in this analysis, with a 15% addition to comply with local ordinances.

This report uses the US Soil Conservation Service (SCS) Method for estimating stormwater runoff. The SCS method is published in The National Engineering Handbook (NEH), Section 4 "Hydrology" and includes the Technical Release No. 20, (TR-20) "Computer Program for Project Formulation Hydrology", and Technical Release No. 55 (TR-55) "Urban Hydrology for Small Watersheds" methods. This report uses the HydroCAD version 10.20 program, written by HydroCAD Software Solutions LLC, Chocorua, N.H., to apply these methods for the calculation of runoff and for pond modeling. Rainfall data and runoff curve numbers are taken from "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire."

Time of Concentration (Tc) is calculated by entering measured flow path data such as flow path type, length, slope and surface characteristics into the HydroCAD program. For the purposes of this report, a minimum time of concentration of 5 minutes is used.

The storm events used for the calculations in this report are the 2-year, 10-year, and 50-year (24-hour) storms. Watershed basin boundaries have been delineated using topographic maps prepared by Haley Ward and field observations to confirm.

SITE SPECIFIC INFORMATION

Based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Soil Survey of Rockingham County, New Hampshire the site is made up of one soil type:

Soil Symbol	Soil Name and Slopes
799	Urban land-Canton complex (3-15% slopes)

A "Type B" hydrologic rating was assumed for the stormwater modelling.

The physical characteristics of the existing lot consist of slopes from 3 to 20%, with the lot generally sloping down from South Street to the northwest. Elevations on the site range from 21 to 29 feet above mean sea level. The western portion of the site drains to the city stormwater system within Richards Avenue. The eastern portion of the site drains to north onto abutting residential properties.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map, Panel 33015C0259F, the project site is not in a special flood hazard area.

There are no protected natural resources on or directly adjacent to the subject property.

PRE-DEVELOPMENT DRAINAGE

In the pre-development condition, the site has been analyzed as two (2) subcatchment watershed basins based on localized topography and discharge location. A Pre-Development Hydrology map and HydroCAD model results have been provided.

Subcatchment 1 represents the western half of the site and includes undeveloped grass area. This area drains northwest and into the City's stormwater system within Richards Avenue. (Summation Point 1.)

Subcatchment 2 represents the eastern half of the site which drains offsite to the north onto abutting residential properties. (Summation Point 2.)

POST-DEVELOPMENT DRAINAGE

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. In the post-development condition, the site has been analyzed as four (4) subcatchment basins. A Post-Development Hydrology map and HydroCAD model results have been provided.

Subcatchment 1A continues to represent the reduced western portion of the site draining to the Richards Avenue stormwater system

Subcatchment 1B represents the proposed dwelling and driveway draining to the underground detention system of proposed Lot 1.

Subctachment 1C represents the proposed dwelling and driveway draining to the underground detention system of proposed Lot 2.

Subcatchment 2 continues to represent the reduced eastern half of the site which drains offsite to the north onto abutting residential properties.

RUNOFF COMPARISON

Table 1: Pre-Development to Post-Development Comparison

	Q2 (CFS)		Q10 (CFS)		Q50 (CFS)		
Design Point	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Description**
SP1	0.17	0.16	0.53	0.53	1.22	1.17	Richards Ave Stormwater System
SP2	0.08	0.08	0.25	0.21	0.57	0.47	Offsite Flow to the Northeast

As shown in Table 1, post-development runoff rates are similar or less than those observed under pre-development conditions.

EROSION AND SEDIMENT CONTROL PRACTICES

During construction, the potential for erosion exists due to stormwater runoff. The contractor will be required to inspect and maintain all necessary erosion control measures, as well as installing any additional measures as required. All erosion control practices shall conform to "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire." Some examples of erosion and sediment control measures to be utilized for this project during construction may include:

- Silt Soxx (or approved alternative) located at the toe of disturbed slopes
- Stabilized construction entrance at access point to the site
- Temporary mulching and seeding for disturbed areas
- Spraying water over disturbed areas to minimize wind erosion

After construction, permanent stabilization will be accomplished by permanent seeding, landscaping, and surfacing the access drives and parking areas with asphalt paving and other areas with impervious walkways.

CONCLUSION

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. With the design of the underground detention systems, the post- development runoff rates are effectively equivalent to the pre-development runoff rates. Erosion and sediment control practices will be implemented for both the temporary condition during construction and for final stabilization after construction. Therefore, there are no negative impacts to downstream receptors or adjacent properties anticipated as a result of this project.

REFERENCES

1. Comprehensive Environmental Inc. and New Hampshire Department of Environmental Services. *New Hampshire Stormwater Manual (Volumes 1, 2 and 3)*, December 2008 (Revision 1.0).
2. Minnick, E.L. and H.T. Marshall. *Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire*, prepared by Rockingham County Conservation District, prepared for New Hampshire Department of Environmental Services, in cooperation with USDA Soil Conservation Service, August 1992.
3. HydroCAD Software Solution, LLC. *HydroCAD Stormwater Modeling System Version10.20* copyright 2013.

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Metadata for Point

Smoothing	Yes
State	
Location	
Latitude	43.065 degrees North
Longitude	70.76 degrees West
Elevation	10 feet
Date/Time	Mon Feb 09 2026 10:52:59 GMT-0500 (Eastern Standard Time)

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.93	**1yr**	2.36	2.82	3.23	3.95	4.56	**1yr**
2yr	0.32	0.50	0.62	0.82	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.49	3.22	3.58	**2yr**	2.85	3.44	3.95	4.69	5.34	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.43	3.14	4.07	4.59	**5yr**	3.61	4.41	5.05	5.95	6.72	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.89	**10yr**	1.25	1.73	2.23	2.90	3.76	4.88	5.54	**10yr**	4.32	5.33	6.10	7.13	7.99	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.34	**25yr**	1.53	2.15	2.78	3.64	4.75	6.18	7.12	**25yr**	5.47	6.84	7.83	9.05	10.07	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.76	**50yr**	1.79	2.53	3.30	4.33	5.67	7.40	8.60	**50yr**	6.55	8.27	9.45	10.84	12.00	**50yr**
100yr	0.60	0.97	1.25	1.77	2.42	3.26	**100yr**	2.09	2.98	3.91	5.17	6.78	8.87	10.40	**100yr**	7.85	10.00	11.42	13.00	14.31	**100yr**
200yr	0.68	1.10	1.43	2.05	2.83	3.85	**200yr**	2.44	3.52	4.63	6.14	8.10	10.63	12.58	**200yr**	9.41	12.09	13.80	15.59	17.06	**200yr**
500yr	0.80	1.32	1.72	2.49	3.49	4.78	**500yr**	3.01	4.39	5.78	7.73	10.25	13.51	16.18	**500yr**	11.96	15.56	17.74	19.84	21.54	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.24	2.50	**1yr**	1.99	2.41	2.87	3.19	3.91	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.33	3.07	3.46	**2yr**	2.71	3.33	3.83	4.56	5.09	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.80	4.20	**5yr**	3.36	4.04	4.73	5.55	6.26	**5yr**
10yr	0.39	0.59	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.80	2.39	3.05	4.38	4.88	**10yr**	3.88	4.69	5.46	6.43	7.22	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.75	3.53	4.74	5.91	**25yr**	4.20	5.69	6.68	7.83	8.71	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.53	2.12	2.35	3.07	3.92	5.36	6.83	**50yr**	4.74	6.57	7.77	9.09	10.06	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.47	**100yr**	1.74	2.41	2.63	3.41	4.34	6.03	7.89	**100yr**	5.34	7.58	9.03	10.56	11.61	**100yr**
200yr	0.59	0.89	1.13	1.64	2.28	2.82	**200yr**	1.97	2.75	2.94	3.77	4.78	6.77	9.11	**200yr**	5.99	8.76	10.50	12.30	13.43	**200yr**
500yr	0.69	1.02	1.32	1.91	2.72	3.36	**500yr**	2.35	3.29	3.41	4.30	5.44	7.88	11.01	**500yr**	6.97	10.58	12.81	15.06	16.27	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.20	2.99	3.17	**1yr**	2.64	3.05	3.59	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.87	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.71	**2yr**	3.03	3.57	4.10	4.85	5.64	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.59	1.88	2.54	3.25	4.35	4.97	**5yr**	3.85	4.78	5.39	6.38	7.17	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.11	3.96	5.35	6.21	**10yr**	4.73	5.97	6.83	7.85	8.76	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.52	2.96	4.07	5.15	7.78	8.35	**25yr**	6.88	8.03	9.15	10.35	11.42	**25yr**
50yr	0.67	1.02	1.27	1.83	2.47	3.13	**50yr**	2.13	3.06	3.60	5.00	6.33	9.74	10.46	**50yr**	8.62	10.06	11.44	12.74	13.97	**50yr**
100yr	0.79	1.20	1.50	2.16	2.97	3.82	**100yr**	2.56	3.73	4.38	6.16	7.77	12.18	13.10	**100yr**	10.78	12.60	14.30	15.71	17.10	**100yr**
200yr	0.93	1.39	1.77	2.56	3.57	4.66	**200yr**	3.08	4.56	5.34	7.59	9.55	15.28	16.43	**200yr**	13.52	15.80	17.90	19.36	20.93	**200yr**
500yr	1.15	1.71	2.20	3.20	4.55	6.05	**500yr**	3.92	5.92	6.94	10.03	12.57	20.63	22.17	**500yr**	18.26	21.32	24.09	25.52	27.35	**500yr**

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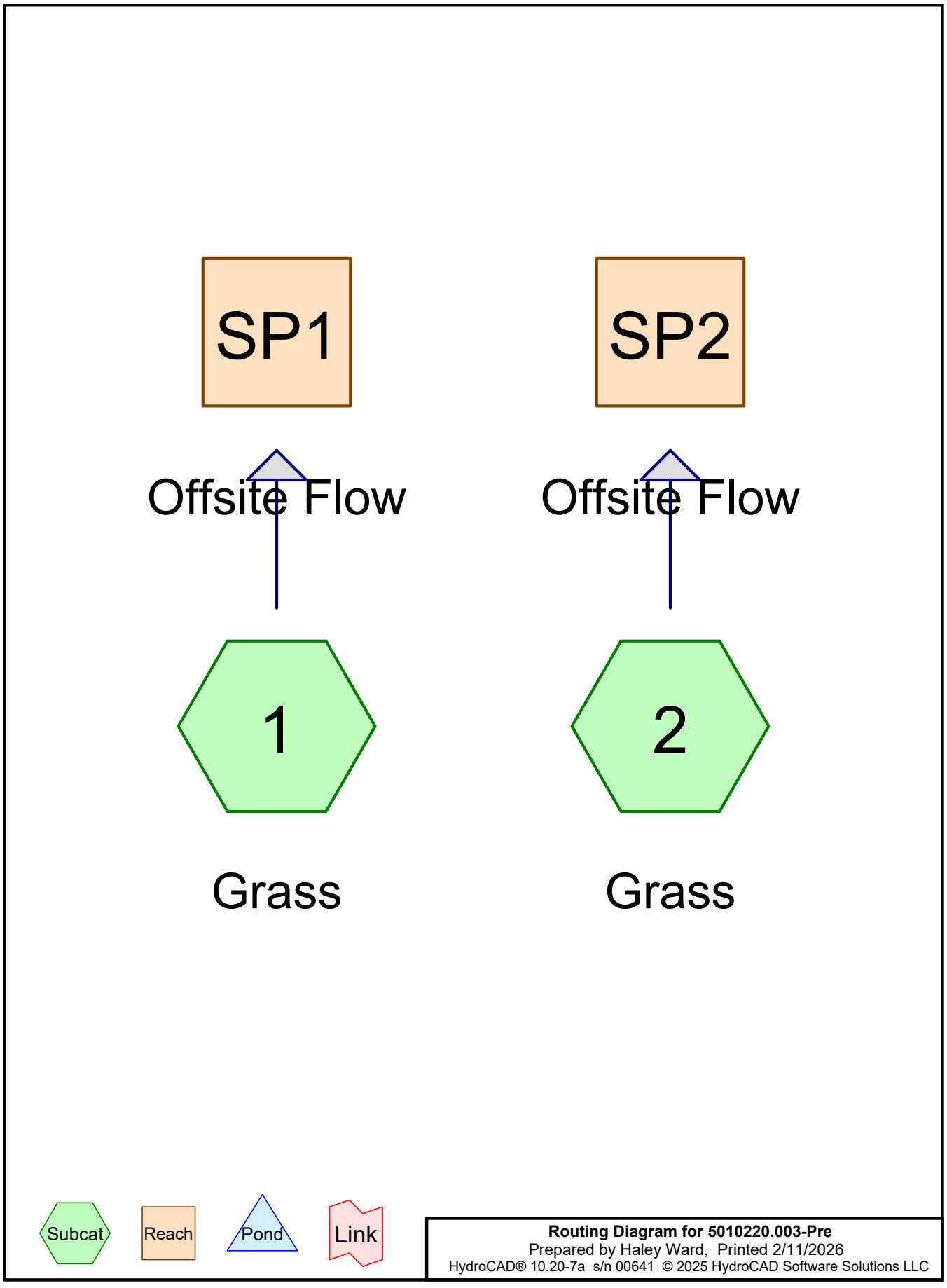
Northeast Regional Climate Center



Routing Diagram for 5010220.003-Pre
Prepared by Haley Ward, Printed 2/11/2026
HydroCAD® 10.20-7a s/n 00641 © 2025 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
17,460	61	>75% Grass cover, Good, HSG B (1, 2)

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
17,460	HSG B	1, 2
0	HSG C	
0	HSG D	
0	Other	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Grass Runoff Area=11,895 sf 0.00% Impervious Runoff Depth>0.66"
Tc=5.0 min CN=61 Runoff=0.17 cfs 659 cf

Subcatchment2: Grass Runoff Area=5,565 sf 0.00% Impervious Runoff Depth>0.66"
Tc=5.0 min CN=61 Runoff=0.08 cfs 308 cf

Reach SP1: Offsite Flow Inflow=0.17 cfs 659 cf
Outflow=0.17 cfs 659 cf

Reach SP2: Offsite Flow Inflow=0.08 cfs 308 cf
Outflow=0.08 cfs 308 cf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Grass Runoff Area=11,895 sf 0.00% Impervious Runoff Depth>1.75"
Tc=5.0 min CN=61 Runoff=0.53 cfs 1,732 cf

Subcatchment2: Grass Runoff Area=5,565 sf 0.00% Impervious Runoff Depth>1.75"
Tc=5.0 min CN=61 Runoff=0.25 cfs 810 cf

Reach SP1: Offsite Flow Inflow=0.53 cfs 1,732 cf
Outflow=0.53 cfs 1,732 cf

Reach SP2: Offsite Flow Inflow=0.25 cfs 810 cf
Outflow=0.25 cfs 810 cf

Summary for Subcatchment 1: Grass

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 1,732 cf, Depth> 1.75"
Routed to Reach SP1 : Offsite Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
11,895	61	>75% Grass cover, Good, HSG B
11,895		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 2: Grass

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 810 cf, Depth> 1.75"
Routed to Reach SP2 : Offsite Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
5,565	61	>75% Grass cover, Good, HSG B
5,565		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach SP1: Offsite Flow

Inflow Area = 11,895 sf, 0.00% Impervious, Inflow Depth > 1.75" for 10-Yr event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 1,732 cf
Outflow = 0.53 cfs @ 12.09 hrs, Volume= 1,732 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach SP2: Offsite Flow

Inflow Area = 5,565 sf, 0.00% Impervious, Inflow Depth > 1.75" for 10-Yr event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 810 cf
Outflow = 0.25 cfs @ 12.09 hrs, Volume= 810 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

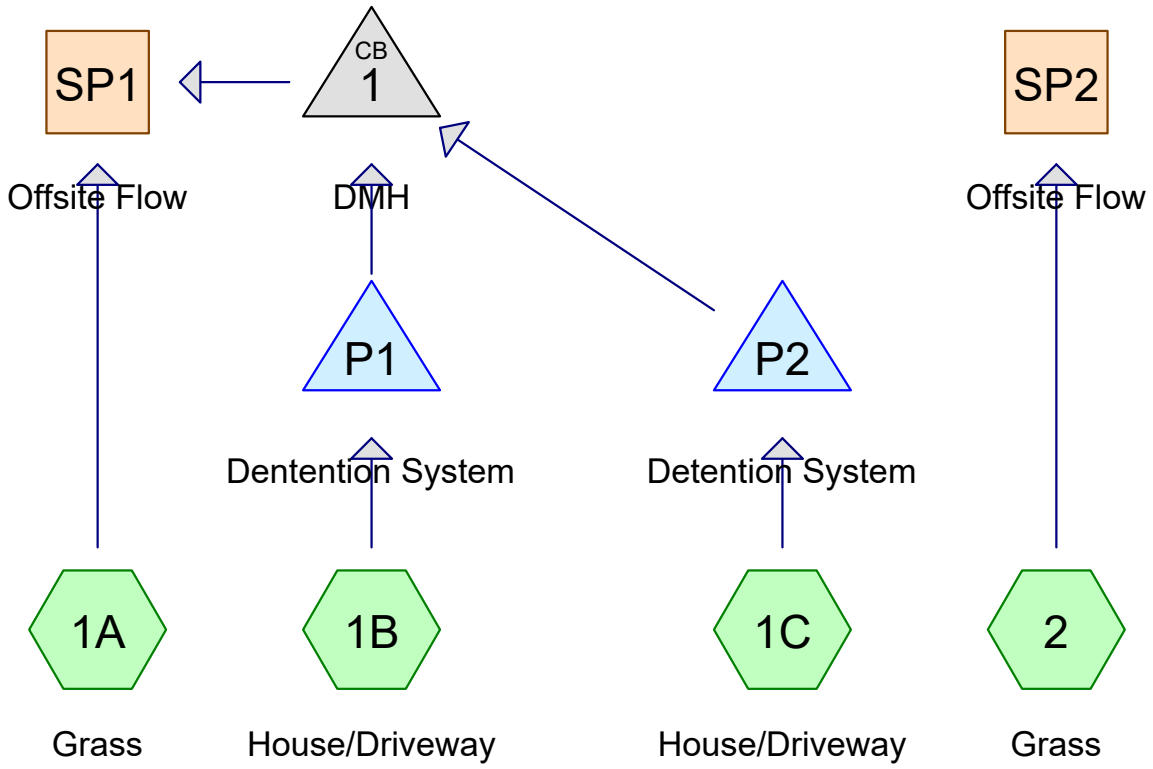
Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Grass Runoff Area=11,895 sf 0.00% Impervious Runoff Depth>3.84"
Tc=5.0 min CN=61 Runoff=1.22 cfs 3,801 cf

Subcatchment2: Grass Runoff Area=5,565 sf 0.00% Impervious Runoff Depth>3.84"
Tc=5.0 min CN=61 Runoff=0.57 cfs 1,778 cf

Reach SP1: Offsite Flow Inflow=1.22 cfs 3,801 cf
Outflow=1.22 cfs 3,801 cf

Reach SP2: Offsite Flow Inflow=0.57 cfs 1,778 cf
Outflow=0.57 cfs 1,778 cf



Subcat Reach Pond Link

Routing Diagram for 5010220.003-Post
Prepared by Haley Ward, Printed 2/11/2026
HydroCAD® 10.20-7a s/n 00641 © 2025 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
11,665	61	>75% Grass cover, Good, HSG B (1A, 1B, 1C, 2)
5,795	98	Paved parking, HSG B (1B, 1C, 2)

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
17,460	HSG B	1A, 1B, 1C, 2
0	HSG C	
0	HSG D	
0	Other	

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: Grass Runoff Area=6,365 sf 0.00% Impervious Runoff Depth>0.66"
Tc=5.0 min CN=61 Runoff=0.09 cfs 352 cf

Subcatchment1B: House/Driveway Runoff Area=3,740 sf 74.33% Impervious Runoff Depth>2.54"
Tc=5.0 min CN=89 Runoff=0.25 cfs 792 cf

Subcatchment1C: House/Driveway Runoff Area=3,225 sf 82.64% Impervious Runoff Depth>2.83"
Tc=5.0 min CN=92 Runoff=0.24 cfs 760 cf

Subcatchment2: Grass Runoff Area=4,130 sf 8.47% Impervious Runoff Depth>0.81"
Tc=5.0 min CN=64 Runoff=0.08 cfs 278 cf

Reach SP1: Offsite Flow Inflow=0.16 cfs 975 cf
Outflow=0.16 cfs 975 cf

Reach SP2: Offsite Flow Inflow=0.08 cfs 278 cf
Outflow=0.08 cfs 278 cf

Pond 1: DMH Peak Elev=19.24' Inflow=0.09 cfs 622 cf
12.0" Round Culvert n=0.013 L=105.0' S=0.0267 '/' Outflow=0.09 cfs 622 cf

Pond P1: Dentention System Peak Elev=24.13' Storage=251 cf Inflow=0.25 cfs 792 cf
Discarded=0.02 cfs 465 cf Primary=0.05 cfs 326 cf Outflow=0.06 cfs 791 cf

Pond P2: Detention System Peak Elev=24.05' Storage=237 cf Inflow=0.24 cfs 760 cf
Discarded=0.02 cfs 463 cf Primary=0.04 cfs 296 cf Outflow=0.06 cfs 759 cf

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: Grass Runoff Area=6,365 sf 0.00% Impervious Runoff Depth>1.75"
Tc=5.0 min CN=61 Runoff=0.28 cfs 927 cf

Subcatchment1B: House/Driveway Runoff Area=3,740 sf 74.33% Impervious Runoff Depth>4.36"
Tc=5.0 min CN=89 Runoff=0.43 cfs 1,358 cf

Subcatchment1C: House/Driveway Runoff Area=3,225 sf 82.64% Impervious Runoff Depth>4.68"
Tc=5.0 min CN=92 Runoff=0.39 cfs 1,259 cf

Subcatchment2: Grass Runoff Area=4,130 sf 8.47% Impervious Runoff Depth>1.99"
Tc=5.0 min CN=64 Runoff=0.21 cfs 684 cf

Reach SP1: Offsite Flow Inflow=0.53 cfs 2,298 cf
Outflow=0.53 cfs 2,298 cf

Reach SP2: Offsite Flow Inflow=0.21 cfs 684 cf
Outflow=0.21 cfs 684 cf

Pond 1: DMH Peak Elev=19.39' Inflow=0.34 cfs 1,371 cf
12.0" Round Culvert n=0.013 L=105.0' S=0.0267 '/' Outflow=0.34 cfs 1,371 cf

Pond P1: Dentention System Peak Elev=24.77' Storage=370 cf Inflow=0.43 cfs 1,358 cf
Discarded=0.02 cfs 625 cf Primary=0.18 cfs 731 cf Outflow=0.20 cfs 1,356 cf

Pond P2: Detention System Peak Elev=24.66' Storage=349 cf Inflow=0.39 cfs 1,259 cf
Discarded=0.02 cfs 617 cf Primary=0.16 cfs 640 cf Outflow=0.18 cfs 1,258 cf

Summary for Subcatchment 1A: Grass

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 927 cf, Depth> 1.75"
Routed to Reach SP1 : Offsite Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
6,365	61	>75% Grass cover, Good, HSG B
6,365		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 1B: House/Driveway

Runoff = 0.43 cfs @ 12.07 hrs, Volume= 1,358 cf, Depth> 4.36"
Routed to Pond P1 : Dentention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
2,780	98	Paved parking, HSG B
960	61	>75% Grass cover, Good, HSG B
3,740	89	Weighted Average
960		25.67% Pervious Area
2,780		74.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 1C: House/Driveway

Runoff = 0.39 cfs @ 12.07 hrs, Volume= 1,259 cf, Depth> 4.68"
Routed to Pond P2 : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
2,665	98	Paved parking, HSG B
560	61	>75% Grass cover, Good, HSG B
3,225	92	Weighted Average
560		17.36% Pervious Area
2,665		82.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 2: Grass

Runoff = 0.21 cfs @ 12.09 hrs, Volume= 684 cf, Depth> 1.99"
Routed to Reach SP2 : Offsite Flow

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=5.61"

Area (sf)	CN	Description
3,780	61	>75% Grass cover, Good, HSG B
350	98	Paved parking, HSG B
4,130	64	Weighted Average
3,780		91.53% Pervious Area
350		8.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Reach SP1: Offsite Flow

Inflow Area = 13,330 sf, 40.85% Impervious, Inflow Depth > 2.07" for 10-Yr event
Inflow = 0.53 cfs @ 12.16 hrs, Volume= 2,298 cf
Outflow = 0.53 cfs @ 12.16 hrs, Volume= 2,298 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach SP2: Offsite Flow

Inflow Area = 4,130 sf, 8.47% Impervious, Inflow Depth > 1.99" for 10-Yr event
Inflow = 0.21 cfs @ 12.09 hrs, Volume= 684 cf
Outflow = 0.21 cfs @ 12.09 hrs, Volume= 684 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1: DMH

Inflow Area = 6,965 sf, 78.18% Impervious, Inflow Depth = 2.36" for 10-Yr event
Inflow = 0.34 cfs @ 12.24 hrs, Volume= 1,371 cf
Outflow = 0.34 cfs @ 12.24 hrs, Volume= 1,371 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.34 cfs @ 12.24 hrs, Volume= 1,371 cf
Routed to Reach SP1 : Offsite Flow

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Peak Elev= 19.39' @ 12.24 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	19.10'	**12.0" Round Culvert** L= 105.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.10' / 16.30' S= 0.0267 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.34 cfs @ 12.24 hrs HW=19.39' (Free Discharge)
↑—**1=Culvert** (Inlet Controls 0.34 cfs @ 1.82 fps)

Summary for Pond P1: Dentention System

Inflow Area = 3,740 sf, 74.33% Impervious, Inflow Depth > 4.36" for 10-Yr event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 1,358 cf
Outflow = 0.20 cfs @ 12.24 hrs, Volume= 1,356 cf, Atten= 53%, Lag= 9.8 min
Discarded = 0.02 cfs @ 12.24 hrs, Volume= 625 cf
Primary = 0.18 cfs @ 12.24 hrs, Volume= 731 cf
Routed to Pond 1 : DMH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 24.77' @ 12.24 hrs Surf.Area= 228 sf Storage= 370 cf

Plug-Flow detention time= 43.8 min calculated for 1,353 cf (100% of inflow)
Center-of-Mass det. time= 43.1 min (832.2 - 789.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.50'	161 cf	**9.87'W x 23.11'L x 3.82'H Field A** 872 cf Overall - 469 cf Embedded = 403 cf x 40.0% Voids
#2A	23.00'	446 cf	**Ferguson R-Tank HD 2** x 54 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 54 Chambers in 6 Rows
		607 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	22.60'	**12.0" Round Culvert** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.60' / 22.50' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	23.00'	**1.3" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	24.30'	**2.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	25.70'	**4.0' long Weir** 2 End Contraction(s)
#5	Discarded	22.50'	**2.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.02 cfs @ 12.24 hrs HW=24.77' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.18 cfs @ 12.24 hrs HW=24.77' (Free Discharge)
└**1=Culvert** (Passes 0.18 cfs of 4.89 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 6.31 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.12 cfs @ 2.87 fps)
  └**4=Weir** (Controls 0.00 cfs)

Summary for Pond P2: Detention System

Inflow Area = 3,225 sf, 82.64% Impervious, Inflow Depth > 4.68" for 10-Yr event
Inflow = 0.39 cfs @ 12.07 hrs, Volume= 1,259 cf
Outflow = 0.18 cfs @ 12.24 hrs, Volume= 1,258 cf, Atten= 55%, Lag= 10.2 min
Discarded = 0.02 cfs @ 12.24 hrs, Volume= 617 cf
Primary = 0.16 cfs @ 12.24 hrs, Volume= 640 cf
Routed to Pond 1 : DMH

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 24.66' @ 12.24 hrs Surf.Area= 228 sf Storage= 349 cf

Plug-Flow detention time= 43.8 min calculated for 1,258 cf (100% of inflow)
Center-of-Mass det. time= 43.1 min (821.0 - 777.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	22.50'	161 cf	**9.87'W x 23.11'L x 3.82'H Field A** 872 cf Overall - 469 cf Embedded = 403 cf x 40.0% Voids
#2A	23.00'	446 cf	**Ferguson R-Tank HD 2** x 54 Inside #1 Inside= 15.7"W x 33.9"H => 3.52 sf x 2.35'L = 8.3 cf Outside= 15.7"W x 33.9"H => 3.70 sf x 2.35'L = 8.7 cf 54 Chambers in 6 Rows
		607 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	19.30'	**12.0" Round Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 19.30' / 19.20' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	23.00'	**1.3" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	24.30'	**2.8" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	25.70'	**4.0' long Weir** 2 End Contraction(s)
#5	Discarded	22.50'	**2.000 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.02 cfs @ 12.24 hrs HW=24.66' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.16 cfs @ 12.24 hrs HW=24.66' (Free Discharge)
└**1=Culvert** (Passes 0.16 cfs of 8.34 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 6.10 fps)
  ├**3=Orifice/Grate** (Orifice Controls 0.10 cfs @ 2.37 fps)
  └**4=Weir** (Controls 0.00 cfs)

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1A: Grass Runoff Area=6,365 sf 0.00% Impervious Runoff Depth>3.84"
Tc=5.0 min CN=61 Runoff=0.65 cfs 2,034 cf

Subcatchment1B: House/Driveway Runoff Area=3,740 sf 74.33% Impervious Runoff Depth>7.18"
Tc=5.0 min CN=89 Runoff=0.68 cfs 2,239 cf

Subcatchment1C: House/Driveway Runoff Area=3,225 sf 82.64% Impervious Runoff Depth>7.54"
Tc=5.0 min CN=92 Runoff=0.60 cfs 2,028 cf

Subcatchment2: Grass Runoff Area=4,130 sf 8.47% Impervious Runoff Depth>4.19"
Tc=5.0 min CN=64 Runoff=0.47 cfs 1,442 cf

Reach SP1: Offsite Flow Inflow=1.17 cfs 4,706 cf
Outflow=1.17 cfs 4,706 cf

Reach SP2: Offsite Flow Inflow=0.47 cfs 1,442 cf
Outflow=0.47 cfs 1,442 cf

Pond 1: DMH Peak Elev=19.51' Inflow=0.67 cfs 2,672 cf
12.0" Round Culvert n=0.013 L=105.0' S=0.0267 '/' Outflow=0.67 cfs 2,672 cf

Pond P1: Dentention System Peak Elev=25.73' Storage=545 cf Inflow=0.68 cfs 2,239 cf
Discarded=0.02 cfs 803 cf Primary=0.39 cfs 1,434 cf Outflow=0.41 cfs 2,237 cf

Pond P2: Detention System Peak Elev=25.49' Storage=501 cf Inflow=0.60 cfs 2,028 cf
Discarded=0.02 cfs 789 cf Primary=0.28 cfs 1,237 cf Outflow=0.30 cfs 2,026 cf

70° 45' 26" W
70° 45' 22" W
43° 4' 3" N
43° 4' 0" N
356930
356940
356950
356960
356970
356980
356990
357000
356920
4769820
4769810
4769800
4769790
4769780
4769770
4769760
4769750
4769740
4769730
4769720
799
Richards Ave
South St
Soil Map may not be valid at this scale.
Map Scale: 1:526 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 5 10 20 30
Feet
0 25 50 100 150
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 28, Sep 9, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
799	Urban land-Canton complex, 3 to 15 percent slopes	0.5	100.0%
Totals for Area of Interest		**0.5**	**100.0%**

CHINBURG DEVELOPMENT
PROPOSED 2 LOT SUBDIVISION

RICHARDS AVENUE & SOUTH STREET, PORTSMOUTH, NH

PROJECT INFORMATION

CIVIL ENGINEER
HALEY WARD, INC.
ATTN: SHAWN TOBEY, PE.
200 GRIFFIN ROAD, UNIT 14
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.430.9282

SURVEYOR
HALEY WARD, INC.
ATTN: PHILLIP YETMAN, PLS
200 GRIFFIN ROAD, UNIT 14
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.430.9282

OWNER
J. PAUL GRIFFIN FAMILY TRUST
(AKA THE GRIFFIN FAMILY TRUST)
PETER J. GRIFFIN, TRUSTEE
P.O. BOX 149
PORTSMOUTH, NH 03801

APPLICANT
CHINBURG DEVELOPMENT
3 PENSTOCK WAY
NEWMARKET, NH 03857

LOCATION MAP

INDEX OF DRAWINGS

C000	COVER SHEET
C001	GENERAL NOTES, LEGEND & ABBREVIATIONS
V101	EXISTING CONDITIONS PLAN
	SUBDIVISION PLAN
C101	SITE LAYOUT PLAN
C102	GRADING, DRAINAGE, & UTILITY PLAN
C501	CONSTRUCTION DETAILS
C502	CONSTRUCTION DETAILS
C701	PRE-DEVELOPMENT HYDROLOGY PLAN
C702	POST-DEVELOPMENT HYDROLOGY PLAN

PERMITS & APPROVALS
CITY OF PORTSMOUTH - TAC WORKSHOP: COMPLETED
CITY OF PORTSMOUTH - TAC REVIEW: PENDING
CITY OF PORTSMOUTH - PLANNING BOARD: PENDING

UTILITY PROVIDERS

WATER & SEWER
CITY OF PORTSMOUTH DEPT. OF PUBLIC WORKS
ATTN: DOUG SPARKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.427.1530

ELECTRIC
EVERSOURCE
ATTN: NICHOLAS KOSKO
1700 LAFAYETTE ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.436.7708, EXT. 3327565

CABLE
XFINITY BY COMCAST
ATTN: MIKE COLLINS
180 GREENLEAF AVENUE
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.266.2278

COMMUNICATIONS
CONSOLIDATED COMMINICATIONS
ATTN: BENJAMIN WILLS
1575 GREENLAND ROAD
GREENLAND, NEW HAMPSHIRE 03840
T: 603.427.5525

NATURAL GAS
UNITIL
ATTN: DAVE BEAULIEU
325 WEST ROAD
PORTSMOUTH, NEW HAMPSHIRE 03801
T: 603.294.5144

ISSUED FOR PERMITTING
FEBRUARY 13, 2026

HALEY WARD
www.haleyward.com

PORTSMOUTH APPROVAL CONDITIONS NOTE:
ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

CONSTRUCTION SEQUENCE

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. INSTALL SILT SOXX TO CONTROL EROSION AND SEDIMENTATION PRIOR TO ANY EARTH MOVING ACTIVITIES.
3. REMOVE EXISTING SITE FEATURES TO BE REMOVED.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.
5. CUT AND REMOVE ALL TREES, SHRUBS, AND OTHER DEBRIS AS REQUIRED.
6. STRIP AND STOCKPILE LOAM FROM SITE. STOCKPILES SHALL BE SURROUNDED WITH SILT SOXX TO CONTROL SEDIMENT RUN OFF.
7. ROUGH GRADE SITE AND CONSTRUCT DRAINAGE STRUCTURES, AND UNDERGROUND STORMWATER DETENTION. INSTALL AND MAINTAIN EROSION CONTROL DEVICES AS SHOWN ON THE PLANS. ALL PERMANENT DITCHES, AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM. CONSTRUCT BUILDING FOUNDATIONS.
8. LOAM AND SEED DISTURBED AREAS. CUT AND FILL SLOPES SHALL BE SEEDED IMMEDIATELY AFTER THEIR CONSTRUCTION.
9. CONSTRUCT UTILITIES, BUILDINGS AND PAVEMENT BASE COURSE.
10. PLANT LANDSCAPING.
11. CONSTRUCT PAVEMENT WEARING COURSE.
12. REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

PROJECT DESCRIPTION

1. THE PROJECT CONSISTS OF SUBDIVIDING THE EXISTING LOT INTO TWO LOTS AND CONSTRUCTING TWO SINGLE FAMILY HOMES WITH ASSOCIATED SITE IMPROVEMENTS.
2. THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 15,500 SQUARE FEET.
3. BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE CONSIST OF URBAN LAND - CANTON COMPLEX SOILS WITH AN ASSUMED HYDROLOGIC SOIL GROUP RATING OF C.
4. THE STORMWATER RUNOFF FROM THE SITE WILL FOLLOW EXISTING PATTERNS AND DISCHARGE OFFSITE TO THE ABUTTING PARCEL AND INTO THE CITY STORMWATER SYSTEM IN RICHARDS AVENUE.

GENERAL CONSTRUCTION NOTES

1. THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
2. DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.
3. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.
4. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
5. DUST CONTROL MEASURES SHALL INCLUDE BUT ARE NOT LIMITED TO SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS. IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.
6. SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.
7. ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.
8. ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.
9. FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.
10. FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.
11. DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.
12. THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.
13. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
14. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
    - BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
    - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
    - A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
    - EROSION CONTROL BLANKETS HAVE BEEN INSTALLED.
    - IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
15. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA.
16. STABILIZATION MEASURES TO BE USED INCLUDE:
    - TEMPORARY SEEDING;
    - MULCHING.
17. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
18. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN THESE AREAS, SILTSOXX, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
19. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILTSOXX, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

MAINTENANCE AND PROTECTION

1. THE SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
2. SILTSOXX SHALL BE REMOVED ONCE SITE IS STABILIZED, AND DISTURBED AREAS RESULTING FROM SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.
3. THE CATCH BASIN INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

WINTER NOTES

1. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATED GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
3. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;

STOCKPILES

1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.
4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

CONCRETE WASHOUT AREA

THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE:

1. THE CONCRETE DELIVERY TRUCKS SHALL, WHENEVER POSSIBLE, USE WASHOUT FACILITIES AT THEIR OWN PLANT OR DISPATCH FAILITY;
2. IF IT IS NECESSARY, SITE CONTRACTOR SHALL DESIGNATE SPECIFIC WASHOUT AREAS AND DESIGN FACILITIES TO HANDLE ANTICIPATED WASHOUT WATER;
3. CONTRACTOR SHALL LOCATE WASHOUT AREAS AT LEAST 150 FEET AWAY FROM STORM DRAINS, SWALES AND SURFACE WATERS OR DELINEATED WETLANDS;
4. INSPECT WASHOUT FACILITIES DAILY TO DETECT LEAKS OR TEARS AND TO IDENTIFY WHEN MATERIALS NEED TO BE REMOVED.

UTILITY NOTES

1. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
2. COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY.
3. SEE GRADING AND DRAINAGE PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
5. ALL WORK WITHIN CITY R.O.W. SHALL BE COORDINATED WITH CITY OF PORTSMOUTH
6. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
7. EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
8. ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
9. THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH BUILDING DRAWINGS AND UTILITY COMPANIES.
10. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
11. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
12. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATED TO THE OWNER PRIOR TO THE COMPLETION OF PROJECT.
13. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED IN THESE DRAWING TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
14. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
15. A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS WATER ABOVE SEWER.
16. SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVED AREAS.
17. GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
18. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
19. ALL SEWER PIPES WITH LESS THAN 6' COVER SHALL BE INSULATED.
20. CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
21. SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER IN COORDINATION WITH THE SITE CIVIL ENGINEER.
22. CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
23. FINAL REVIEW OF ALL UTILITIES SHALL BE MADE DURING THE REQUIRED SEWER CONNECTION PERMIT PROCESS IN COORDINATION WITH DEPARTMENT OF PUBLIC WORKS.
24. ALL WORK PERFORMED IN THE PUBLIC RIGHT-OF-WAY SHALL BE BUILT TO DEPARTMENT OF PUBLIC WORKS STANDARDS.
25. THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.
26. UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.
27. IRRIGATION, IF SUPPLIED, WILL BE PROVIDED ON A SEPARATE METERED SERVICE. DESIGNS OF IRRIGATION WILL BE PROVIDED BY THE LANDSCAPE CONTRACTOR AT THE TIME OF CONSTRUCTION.

ALLOWABLE NON-STORMWATER DISCHARGES

1. FIRE-FIGHTING ACTIVITIES;
2. FIRE HYDRANT FLUSHING;
3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
4. WATER USED TO CONTROL DUST;
5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
11. UNCONTAMINATED EXCAVATION DEWATERING;
12. LANDSCAPE IRRIGATION.

WASTE DISPOSAL

1. WASTE MATERIAL
    - ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
    - NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
    - ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
2. HAZARDOUS WASTE
    - ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
    - SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.
3. SANITARY WASTE
    - ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

BLASTING NOTES

1. CONTRACTOR SHALL CONTACT THE NHDES AND/OR LOCAL JURISDICTION PRIOR TO COMMENCING ANY BLASTING ACTIVITIES.
2. FOR ANY PROJECT FOR WHICH BLASTING OF BEDROCK IS ANTICIPATED, THE APPLICANT SHALL SUBMIT A BLASTING PLAN THAT IDENTIFIES:
    - WHERE THE BLASTING ACTIVITIES ARE ANTICIPATED TO OCCUR;
    - THE ESTIMATED QUANTITY OF BLAST ROCK IN CUBIC YARDS; AND
    - SITE-SPECIFIC BLASTING BEST MANAGEMENT PRACTICES.

ABBREVIATIONS

@	AT	MAX.	MAXIMUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	MH	MANHOLE
APPROX.±	APPROXIMATELY	MIN	MINIMUM
BLDG	BUILDING	N	NORTHING
		NE	NORTHEAST
CL	CENTERLINE	NHDOT	NH DEPT. OF TRANSPORTATION
CB	CATCH BASIN	N.T.S.	NOT TO SCALE
CLR	CLEAR	NWT	NON WOVEN GEOTEXTILE
CMP	CORRUGATED METAL PIPE		
CO	CLEANOUT	OD	OUTSIDE DIAMETER
CPE	CORRUGATED POLYETHYLENE	O.C.	ON CENTER
		OH	OVERHEAD
DI	DUCTILE IRON	OZ	OUNCES
DIA.	DIAMETER	PERF	PERFORATED
		PSF	POUNDS PER SQUARE FOOT
		PSI	POUNDS PER SQUARE INCH
E	EASTING	PVC	POLYVINYL CHLORIDE
EL	ELEVATION	PL	PROPERTY LINE
EFM	EXISTING FORCE MAIN	POH	PROPOSED OVERHEAD ELECTRIC
EPS	EXTRUDED POLYSTYRENE	PUGE	PROPOSED UNDERGROUND ELECTRIC
FM	FORCEMAIN	R	RADIUS
GAL	GALLON	S	SLOPE
GALV	GALVANIZED	SCL	STORMWATER COLLECTION LINE
		SCS	STORMWATER COLLECTION SYSTEM
GPH	GALLONS PER HOUR	SDR	STANDARD DIMENSION RATIO
GPM	GALLONS PER MINUTE	SE	SOUTHEAST
		SHT	SHEET
HDPE	HIGH DENSITY POLYETHYLENE	SQ	SQUARE
HP	HORSEPOWER	SS	STAINLESS STEEL
		SY	SQUARE YARD
ID	INSIDE DIAMETER		
IN.	INCHES	TBM	TEMPORARY BENCH MARK
INT.	INTERSECTION	TOC	TOP OF CONCRETE
INV.	INVERT	TYP	TYPICAL

LEGEND:

ITEMS SHOWN MAY NOT APPEAR ON PLANS

DESCRIPTION	EXISTING	PROPOSED
PROPERTY LINE		
BENCHMARK		
SURVEY STATION		
IRON PIN		
DRILL HOLE		
BOUND		
TEST PIT	TP	TP
SEWER MANHOLE	S / SMH	S / SMH
GAS VALVE	GV	GV
UTILITY POLE		
GUY ANCHOR		
ELECTRICAL MANHOLE	E	E
TRANSFORMER	TR	TR
PULL BOX	P	P
WELL	W	W
WATER VALVE	WV	WV
WATER SHUTOFF		
HYDRANT		
AIR RELIEF VALVE		
DRAINAGE MANHOLE	D	D
CATCH BASIN		
CURB INLET		
PARKING LIGHT		
FLOOD LIGHT		
SITE LIGHT		
SIGN		
TRASH CAN		
FLAGPOLE		
MONITORING WELL	MW	MW
EDGE OF GRAVEL		
EDGE OF PAVEMENT		
CURBING		
MAJOR FOOT CONTOUR	100	100
MINOR FOOT CONTOUR	98	98
WATERLINE	W	W
STORM DRAIN	SD	SD
UNDER DRAIN	UD	UD
SANITARY SEWER	SS	SS
FORCE MAIN	FM	FM
OVERHEAD UTILITIES	OHU	OHU
UNDERGROUND UTILITIES	UGE	UGU
GAS LINE	GAS	GAS
CHAIN LINK FENCE	X	X
GUARDRAIL		
SILT FENCE		SF
TREE LINE		
GRAVEL SURFACE		
PAVED SURFACE		
CONCRETE SURFACE		
BUILDING FOOTPRINT		
WETLANDS	WL	
RIPRAP		

ZONING MAP

Legend

Character Districts

Character-Based Zoning Area (Refer to Zoning Map Sheet 2 of 2 Character Districts Regulating Plan)

Residential Districts

R	Rural	
SRA	Single Residence A	
SRB	Single Residence B	
GRA	General Residence A	
GRB	General Residence B	
GRC	General Residence C	
GA/MH	Garden Apartment/Mobile Home Park	

Other Districts

M	Municipal
NRP	Natural Resource Protection
TC	Transportation Corridor

REV.	DATE	DESCRIPTION	BY	CHK
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

GENERAL NOTES, LEGEND & ABBREVIATIONS

STATE OF NEW HAMPSHIRE — SHAWN M. TOBEY No. 14121 — PROFESSIONAL ENGINEER — 2/13/26

DATE	SCALE
2026.02.13	NTS

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C001** REV. **1**

FILE LOCATION: P:\HAN\01220-CHINBURG_BUILDERS\0030-419 RICHARDS AVE. & G SOUTH PAY\2-CAD_FILES\04-CIVIL\01220.003-C-CV.DWG, 2026.02.13, 10:00 AM

LEGEND:

DESCRIPTION	EXISTING
1234/123	DEED BOOK/PAGE
N/F	NOW OR FORMALLY
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
TBS	TO BE SET
TYP.	TYPICAL
DYL	DOUBLE YELLOW LINE
ELV.	ELEVATION
FF	FINISHED FLOOR
LSA	LANDSCAPE AREA
SGC	SLOPED GRANITE CURB
SWL	SINGLE WHITE LINE
VGC	VERTICAL GRANITE CURB
BENCHMARK	
BOUND	
IRON ROD/PIPE FOUND	
RAILROAD SPIKE	
MAP 21 LOT 8	
SET 5/8" REBAR WITH SURVEYOR'S CAP	
CATCH BASIN	
DRAIN MANHOLE	
SEWER MANHOLE	
GAS/ELECTRIC METER	
GAS/WATER SHUTOFF	
GATE VALVE	
HYDRANT	
LIGHT POLE	
UTILITY POLE	
SIGN	
TREES	
APPROXIMATE EXTERIOR PROPERTY LINE	
PROPERTY LINE	
OVERHEAD UTILITY LINE	OHU OHU
EDGE OF PAVEMENT	
EDGE OF GRAVEL	
MAJOR FOOT CONTOUR	100
MINOR FOOT CONTOUR	98
STONE WALL	
TREELINE	
GAS LINE	GAS GAS

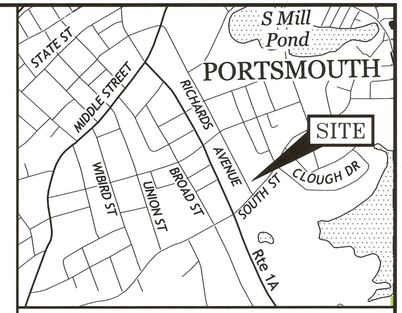
LINE TABLE:

LINE	BEARING	DISTANCE
L1	N46°01'10"W	11.67'
L2	N42°33'08"E	9.71'

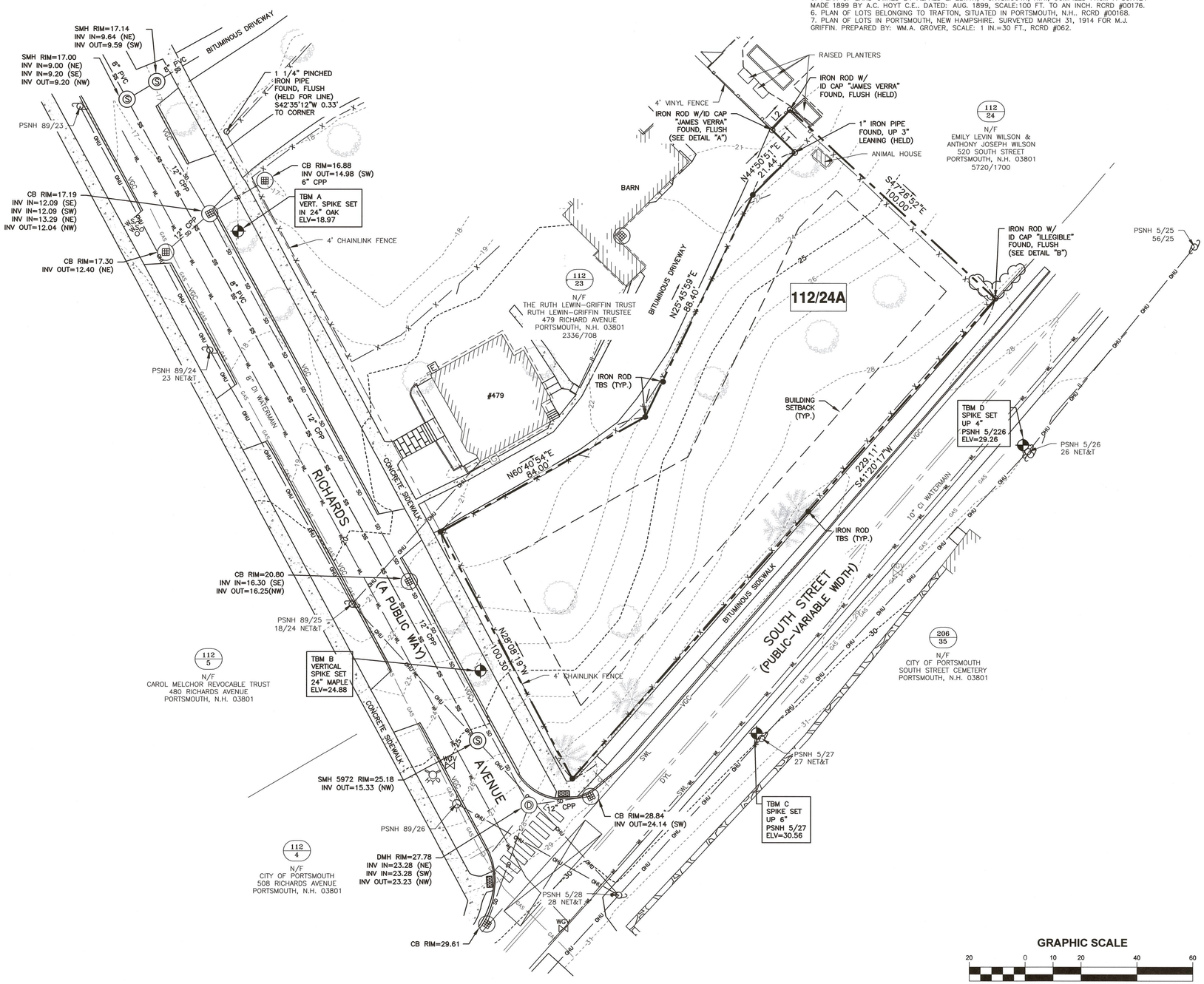
PLAN REFERENCES:

1. LOT LINE REVISION PLAN 520 SOUTH STREET PORTSMOUTH, NEW HAMPSHIRE. ASSESSOR'S PARCELS 112-24 & 112-29 FOR: NEAL I. KATZ LIVING TRUST, NEAL I. KATZ TRUSTEE. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 10-27-2014, SCALE: 1"=20'. RCRD D-38647.
2. LOT LINE REVISION SOUTH STREET PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 9/24/98, SCALE: 1"=30'. RCRD D-26740.
3. SUBDIVISION & LOT LINE REVISION PLAN OF LAND, SOUTH STREET & ELWYN AVENUE, PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 4/21/97, SCALE: 1"=30'. RCRD D-25545.
4. STANDARD BOUNDARY SURVEY TAX MAP 112-LOT 20, OWNERS OF RECORD: THOMAS A. NIES REVOCABLE TRUST OF 2010 & DENISE M. NIES REVOCABLE TRUST OF 2010. 419 RICHARDS AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE. PREPARED BY: AMBIT ENGINEERING, INC., DATED: APRIL 2019 AND REVISED 4/25/19. SCALE: 1"=10'. NOT RECORDED.
5. PLAN OF LAND OWNED BY ALFRED L. ELWYN, PORTSMOUTH, N.H., COMPILED FROM A SURVEY MADE 1899 BY A.C. HOYT C.E.. DATED: AUG. 1899, SCALE:100 FT. TO AN INCH. RCRD #00176.
6. PLAN OF LOTS BELONGING TO TRAFTON, SITUATED IN PORTSMOUTH, N.H.. RCRD #00168.
7. PLAN OF LOTS IN PORTSMOUTH, NEW HAMPSHIRE. SURVEYED MARCH 31, 1914 FOR M.J. GRIFFIN. PREPARED BY: WM.A. GROVER, SCALE: 1 IN.=30 FT., RCRD #062.

NORTH NAD83(2011)
GRID NHSPC



LOCATION MAP SCALE: 1" = 1,000'



GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

NOTES:

1. PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 112 AS LOT 24A.
2. OWNER OF RECORD:
   J. PAUL GRIFFIN FAMILY TRUST
   (AKA THE GRIFFIN FAMILY TRUST)
   PETER J. GRIFFIN, TRUSTEE
   P.O. BOX 149
   PORTSMOUTH, N.H. 03801
   DEED BOOK 6640, PAGE 1025
3. PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F. EFFECTIVE JANUARY 29, 2021.
4. EXISTING LOT AREA:
   17,459 S.F.
   0.4008 ACRES
5. PARCEL IS LOCATED IN THE GENERAL RESIDENCE A (GRA) DISTRICT.
6. DIMENSIONAL REQUIREMENTS:

MINIMUM LOT AREA		7,500 S.F.
MINIMUM STREET FRONTAGE:		100 FEET
MINIMUM DEPTH		70 FEET
SETBACKS:	FRONT	15 FEET
	SIDE	10 FEET
	REAR	20 FEET
MAXIMUM STRUCTURE HEIGHT:		
	FLAT ROOF	30 FEET
	SLOPPED ROOF	35 FEET
	ROOF APPURTENANCE	8 FEET
MAXIMUM BUILDING COVERAGE		25%
MINIMUM OPEN SPACE		30%

7. THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULTS OF AN EXISTING CONDITIONS SURVEY OF ASSESSOR'S MAP 112, LOT 24A IN THE CITY OF PORTSMOUTH.
8. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
9. ABUTTER INFORMATION TAKEN FROM THE CITY OF PORTSMOUTH ASSESSORS GIS WEB SITE.
10. BOUNDARY LINES SHOWN HEREON ARE FROM PLAN REFERENCE 2.

STATE OF NEW HAMPSHIRE No. 1122 PHILLIP A. YETMAN LICENSED LAND SURVEYOR

``I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

PHILLIP A. YETMAN, LLS 1122 — 2/12/2026 DATE

REV.	DATE	DESCRIPTION	BY	
2	2/10/2026	UPDATE UTILITIES	PAY	PAY
1	8/12/25	UPDATE OWNER INFORMATION AND DEED REFERENCE	RJB	PAY
0	6/12/25	ISSUED FOR COMMENT	RJB	PAY

DRAWING ISSUE STATUS

SITE SURVEY

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
WWW.HALEYWARD.COM
200 Griffin Road, Unit 14
Portsmouth, NH 03801
603-430-9282

PROJECT

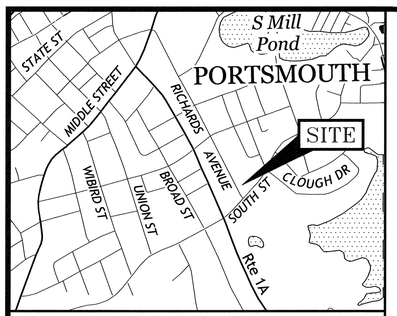
J. PAUL GRIFFIN FAMILY TRUST
SOUTH STREET PORTSMOUTH, N.H.

TITLE

EXISTING CONDITIONS PLAN

DATE: JUNE 2025	SCALE: 1"=20'
DRAWN BY: RJB	DESIGNED BY: ---
CHECKED BY: PAY	
PROJECT No.: 5010561.001	FIELD BOOK / PAGE: FB 478 PG 14
DRAWING No.: V101	REV.: 3

FILE LOCATION: P:\#5010561_J_PAUL_GRIFFIN_FAMILY_TRUST\001-SOUTH ST - PORTSMOUTH - PAY\02-CAD_FILES\5010561-V-EC.DWG, 2026.02.12, 4:59 PM



LOCATION MAP SCALE: 1" = 1,000'

LEGEND:

DESCRIPTION	EXISTING
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
1234/123	DEED BOOK/PAGE
N/F	NOW OR FORMALLY
TBS	TO BE SET
TYP.	TYPICAL
VGC	VERTICAL GRANITE CURB
FENCE	X X
OVERHEAD UTILITY LINE	OHU OHU

LENGTH TABLE

LINE	BEARING	DISTANCE
L1	N46°01'10"W	11.67'
L2	N42°33'08"E	9.71'

APPROVED BY THE PORTSMOUTH PLANNING BOARD

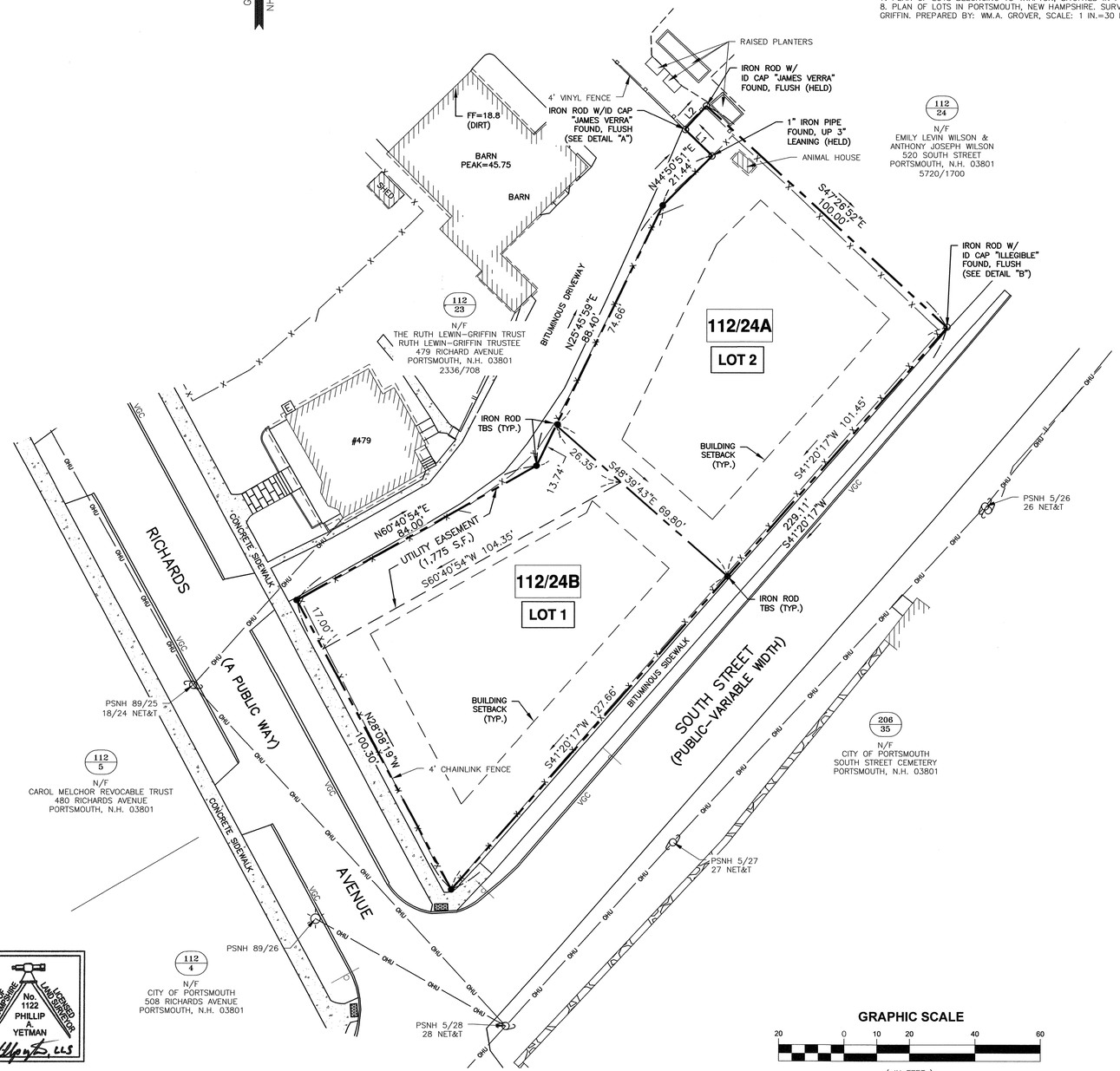
CHAIRMAN DATE

"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

PHILLIP A. YETMAN, LLS 1122 DATE 2/12/2026

STATE OF NEW HAMPSHIRE No. 1122 PHILLIP A. YETMAN LICENSED LAND SURVEYOR

NORTH NAD83(2011) — GRID NHSPC



GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

PLAN REFERENCES:

1. LOT LINE RELOCATION PLAN TAX MAP 112 – LOT 23 & 24A, MAP 112, LOT 23 OWNERS: THE RUTH LEWIN–GRIFFIN TRUST, MICHAEL GRIFFIN, ESTATE EXECUTIVE; MAP 112, LOT24A, J. PAUL GRIFFIN FAMILY TRUST (AKA THE GRIFFIN FAMILY TRUST) PETER J. GRIFFIN, TRUSTEE, 479 RICHARDS AVENUE & SOUTH STREET CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM STATE OF NEW HAMPSHIRE DATED NOVEMBER 31, 2025.
2. LOT LINE REVISION PLAN 520 SOUTH STREET PORTSMOUTH, NEW HAMPSHIRE. ASSESSOR'S PARCELS 112–24 & 112–29 FOR: NEAL I. KATZ LIVING TRUST, NEAL I. KATZ TRUSTEE. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 10–27–2014, SCALE: 1"=20'. RCRD D–38647.
3. LOT LINE REVISION SOUTH STREET PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 9/24/98, SCALE: 1"=30'. RCRD D–26740.
4. SUBDIVISION & LOT LINE REVISION PLAN OF LAND, SOUTH STREET & ELWYN AVENUE PORTSMOUTH, NEW HAMPSHIRE FOR GRIFFIN FAMILY CORP.. PREPARED BY: JAMES VERRA AND ASSOCIATES, INC., DATED: 4/21/97, SCALE: 1"=30'. RCRD D–25545.
5. STANDARD BOUNDARY SURVEY TAX MAP 112–LOT 20, OWNERS OF RECORD: THOMAS A. NIES REVOCABLE TRUST OF 2010 & DENISE M. NIES REVOCABLE TRUST OF 2010. 419 RICHARDS AVENUE, CITY OF PORTSMOUTH, COUNTY OF ROCKINGHAM, STATE OF NEW HAMPSHIRE. PREPARED BY: AMBIT ENGINEERING, INC., DATED: APRIL 2019 AND REVISED 4/25/19. SCALE: 1"–10'. NOT RECORDED.
6. PLAN OF LAND OWNED BY ALFRED L. ELWYN, PORTSMOUTH, N.H., COMPILED FROM A SURVEY MADE 1899 BY A.C. HOYT C.E.. DATED: AUG. 1899, SCALE:100 FT. TO AN INCH. RCRD #00176.
7. PLAN OF LOTS BELONGING TO TRAFTON, SITUATED IN PORTSMOUTH, N.H.. RCRD #00168.
8. PLAN OF LOTS IN PORTSMOUTH, NEW HAMPSHIRE. SURVEYED MARCH 31, 1914 FOR M.J. GRIFFIN. PREPARED BY: WM.A. GROVER, SCALE: 1 IN.=30 FT., RCRD #062.

HALEY WARD
ENGINEERING | ENVIRONMENTAL | SURVEYING
200 Griffin Rd. Unit 14
Portsmouth, New Hampshire 03801
603.430.9282
WWW.HALEYWARD.COM

NOTES:

1. PARCELS ARE SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 112. LOT 24A.
2. OWNER OF RECORD MAP 112, LOT 24A, SOUTH STREET:
   J. PAUL GRIFFIN FAMILY TRUST
   (AKA THE GRIFFIN FAMILY TRUST)
   PETER J. GRIFFIN, TRUSTEE
   P.O. BOX 149
   PORTSMOUTH, N.H. 03801
   DEED BOOK 6640, PAGE 1025
3. PARCELS ARE NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F. EFFECTIVE JANUARY 29, 2021.
4. EXISTING LOT AREA: 17,459 S.F. 0.4008 ACRES

   PROPOSED LOT AREA:

   MAP 112, LOT 24A

LOT 1	8,894 S.F.	0.2042 ACRES
LOT 2	8,566 S.F.	0.1966 ACRES

5. PARCELS ARE LOCATED IN THE GENERAL RESIDENCE A (GRA) DISTRICT.
6. DIMENSIONAL REQUIREMENTS:

MINIMUM LOT AREA		7,500 S.F.
MINIMUM STREET FRONTAGE:		100 FEET
MINIMUM DEPTH		70 FEET
SETBACKS:	FRONT	15 FEET
	SIDE	10 FEET
	REAR	20 FEET
MAXIMUM STRUCTURE HEIGHT:		
	FLAT ROOF	30 FEET
	SLOPPED ROOF	35 FEET
	ROOF APPURTENANCE	8 FEET
MAXIMUM BUILDING COVERAGE		25%
MINIMUM OPEN SPACE		30%

7. THE PURPOSE OF THIS PLAN IS TO SHOW A 2 LOT SUBDIVISION OF ASSESSOR'S MAP 112, LOT 24A IN THE CITY OF PORTSMOUTH.
8. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
9. ABUTTER INFORMATION TAKEN FROM THE CITY OF PORTSMOUTH ASSESSORS GIS WEBSITE.

REV.	DATE	DESCRIPTION	BY	CHK.
0	02/10/2026	ISSUED FOR COMMENT	PAY	PAY

DRAWING ISSUE STATUS

SITE SURVEY

SUBDIVISION PLAN OF LAND TAX MAP 112 – LOT 24A

OWNER:

MAP 112, LOT 24A
J. PAUL GRIFFIN FAMILY TRUST
(AKA THE GRIFFIN FAMILY TRUST)
PETER J. GRIFFIN, TRUSTEE
PROPERTY LOCATED AT:
SOUTH STREET
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE: 1" = 20' FEBRUARY 2026

FB 478 PG 14 5010220.003

P:\NHS\5010561-J.Paul_Griffin_Family_Trust\001 South St, Portsmouth - PAYAZ-CAD_Files\5010561-V-1-E.dwg, 2/12/2026 2:47:15 PM

SITE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW A PRELIMINARY RESIDENTIAL DEVELOPMENT WITH ASSOCIATED SITE IMPROVEMENTS, GRADING, DRAINAGE, AND UTILITIES TO SHOW COMPLIANCE WITH THE ZONING ORDINANCE. THE FINAL DESIGN SHALL BE SUBMITTED AND APPROVED AS PART OF THE BUILDING PERMIT APPLICATION.
2. REFER TO DWG C001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
3. PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 112 AS LOT 24A.
4. OWNER OF RECORD:
   J. PAUL GRIFFIN FAMILY TRUST
   (AKA THE GRIFFIN FAMILY TRUST)
   PETER J. GRIFFIN, TRUSTEE
   P.O. BOX 149
   PORTSMOUTH, NH 03801
   DEED BOOK 6640, PAGE 1025
5. PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259F. EFFECTIVE JANUARY 29, 2021.
6. EXISTING LOT AREA:
   17,459 S.F.
   0.4008 ACRES
7. PARCEL IS LOCATED IN THE GENERAL RESIDENCE A (GRA) DISTRICT.
8. DIMENSIONAL REQUIREMENTS:

MINIMUM LOT AREA		7,500 S.F.
MINIMUM STREET FRONTAGE:		100 FEET
MINIMUM DEPTH		70 FEET
SETBACKS:	FRONT	15 FEET
	SIDE	10 FEET
	REAR	20 FEET
MAXIMUM STRUCTURE HEIGHT:		
	FLAT ROOF	30 FEET
	SLOPPED ROOF	35 FEET
	ROOF APPURTENANCE	8 FEET
MAXIMUM BUILDING COVERAGE		25%
MINIMUM OPEN SPACE		30%

9. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
10. ABUTTER INFORMATION TAKEN FROM THE CITY ASSESSORS GIS WEBSITE.
11. TRASH PICKUP TO BE CURBSIDE.
12. EACH DWELLING UNIT TO INCLUDE (2) CAR PARKING WITHIN ATTACHED GARAGE AND (2) SURFACE PARKING SPACES WITHIN DRIVEWAY.

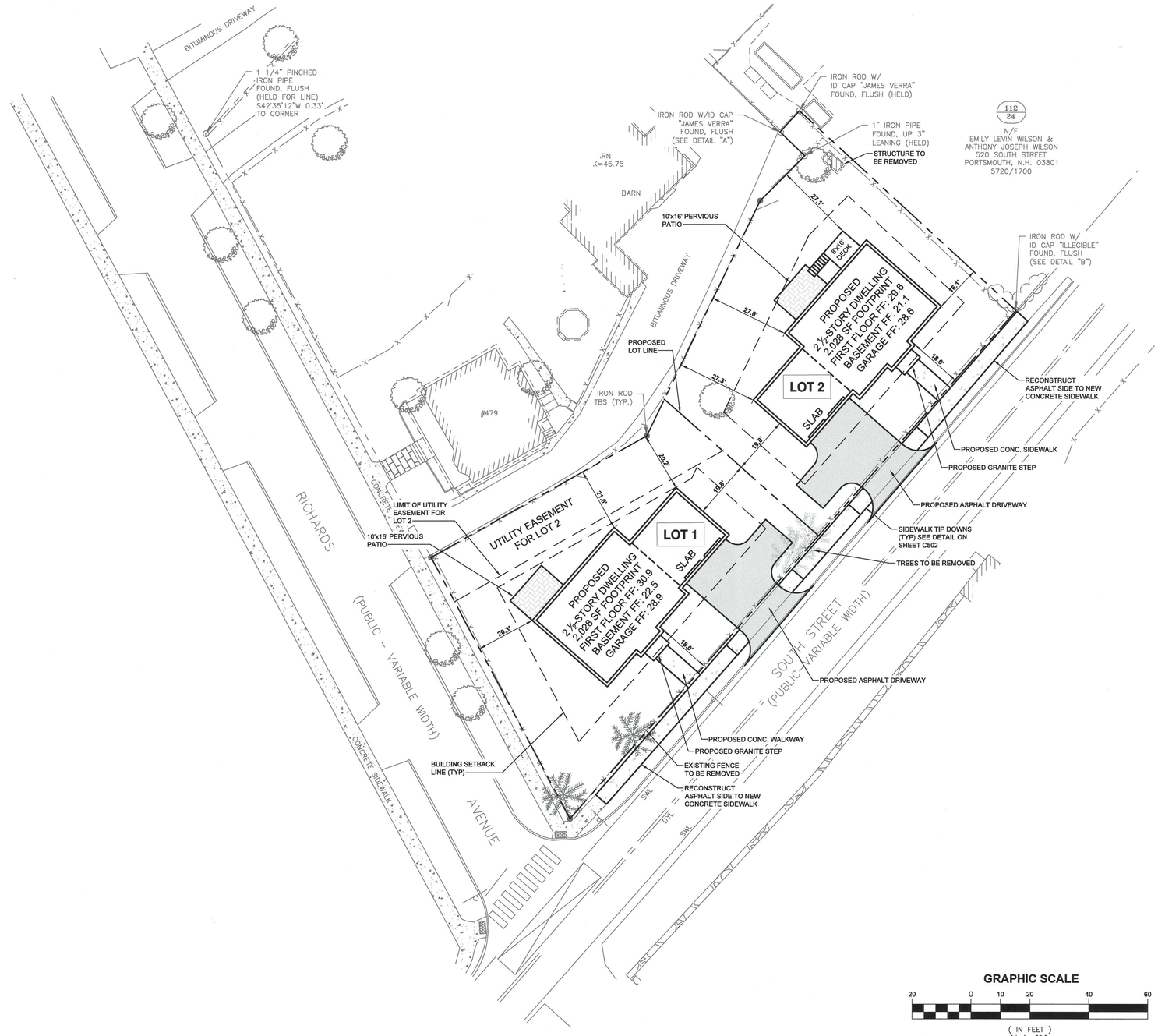
TABLE OF DIMENSIONAL STANDARDS:

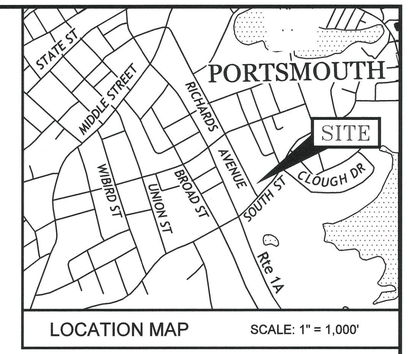
REGULATION	REQUIREMENT	LOT (1)	LOT (2)
MIN. LOT AREA	7,500 S.F.	8,894 S.F.	8,565 S.F.
STREET FRONTAGE	100.0 FEET	228.0 FEET	101.4 FEET
MIN. FRONT SETBACK	15.0 FEET	18.0 FEET	18.0 FEET
MIN. SIDE SETBACK	10.0 FEET	19.8 FEET	16.2 FEET
MIN. REAR SETBACK	20.0 FEET	20.2 FEET	27.0 FEET
MAX. HEIGHT SLOPED ROOF	35.0 FEET	< 35.0 FEET	< 35.0 FEET
MAX. BUILDING COVERAGE [1]	25%	22.8%	24.9%
MIN. OPEN SPACE	30%	66.9%	64.4%

DIMENSIONAL NOTES:
1. MAX. BUILDING COVERAGE INCLUDES DECK AND STAIR.

IMPERVIOUS SURFACE AREAS:
(TO PROPERTY LINES)

COVERAGE	LOT (1)	LOT (2)
PAVEMENT	639 S.F	639 S.F.
WALKWAYS	84 S.F.	84 S.F.
PATIOS	160 S.F.	160 S.F.
STOOP	32 S.F.	32 S.F.
DECKS	0 S.F.	104 S.F.
BUILDINGS	2,028 S.F.	2,028 S.F.
TOTAL	2,943 S.F.	3,047 S.F.
% LOT COVERAGE	33.1%	35.6%





LOCATION MAP SCALE: 1" = 1,000'

"I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000."

JOHN R. CHAGNON, LLS — DATE 2.13.26

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN — DATE

GRAPHIC SCALE
20 0 10 20 40 60
(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS
ISSUED FOR REVIEW

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT
PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

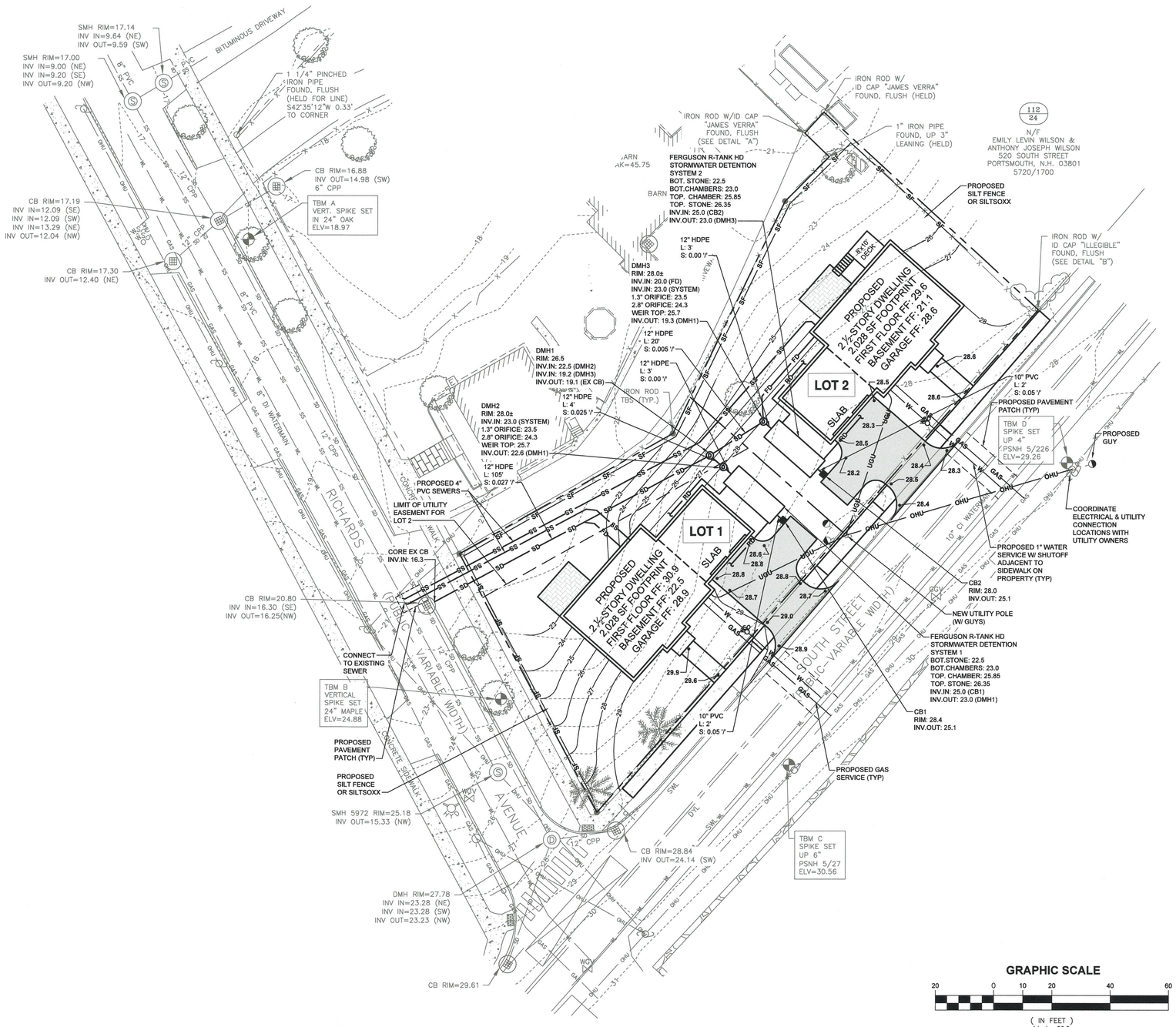
TITLE
SITE LAYOUT PLAN

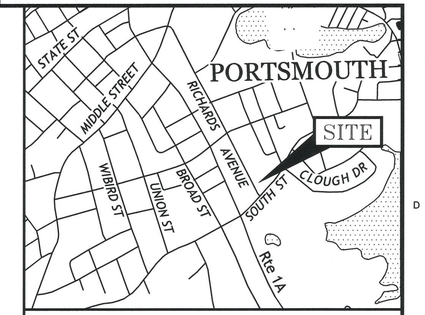
DATE	2026.02.13
SCALE	1" = 20'
DRAWN BY	JHV
DESIGNED BY	JHV
CHECKED BY	SMT
PROJECT No.	5010220.003
DRAWING No.	C101
REV.	1

FILE LOCATION: P:\#PROJ\5010220-CHINBURG_BUILDER\5020-479 RICHARDS AVE. & 0 SOUTH\HALEY\CAD_FILES\04-CIVIL\5010220.003-C-SP.DWG, 2026.02.13, 10:03 AM

DRAINAGE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DETAIL A PRELIMINARY STORMWATER SYSTEM AND SITE UTILITIES TO SHOW COMPLIANCE WITH THE ZONING ORDINANCE. THE FINAL DESIGN SHALL BE SUBMITTED AND APPROVED AS PART OF THE BUILDING PERMIT APPLICATION.
2. REFER TO DWG C001 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
3. THE FOOTING DRAINS SHALL BE CONNECTED TO THE ONSITE OUTLET PIPE AS SHOWN.
4. ALL ROOF RUNOFF SHALL BE DIRECTED TO THE UNDERGROUND STORMWATER DETENTION SYSTEM BY EITHER DRIP STRIPS WITH UNDERDRAIN OR A GUTTER (WITH DOWNSPOUTS) COLLECTION SYSTEM.
5. VERTICAL DATUM IS NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GNSS OBSERVATIONS.
6. PORTSMOUTH STORMWATER CONNECTION PERMIT REQUIRED.





LOCATION MAP SCALE: 1" = 1,000'

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY WITHIN 100 FEET OF UNDERGROUND UTILITIES. THE EXCAVATOR IS RESPONSIBLE TO MAINTAIN MARKS. DIG SAFE TICKETS EXPIRE IN THIRTY DAYS.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR REVIEW

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

GRADING, DRAINAGE, & UTILITY PLAN

STATE OF NEW HAMPSHIRE SHAWN M. TOBEY No. 14121 LICENSED PROFESSIONAL ENGINEER 2/13/26

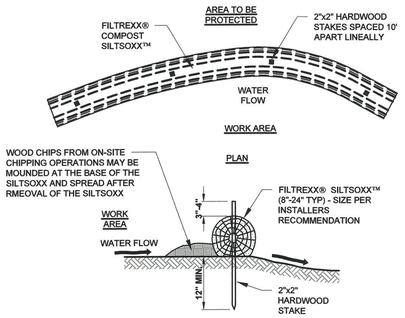
DATE	SCALE
2026.02.13	1" = 20'

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C102** REV. **1**

FILE LOCATION: P:\#HISTORIC\5010220-CHINBURG_BUILDERS\003-479 RICHARDS AVE. & 0 SOUTH\PAY\02-CAD_FILES\04-CIVIL\001\0222\003-C-SP.DWG, 2026.02.13, 10:03 AM

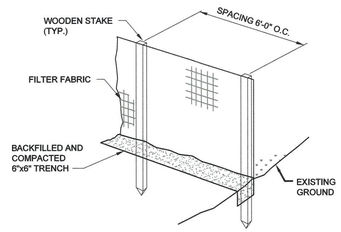


NOTES:

1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

FILTREXX SILTSOXX DETAIL

N.T.S.

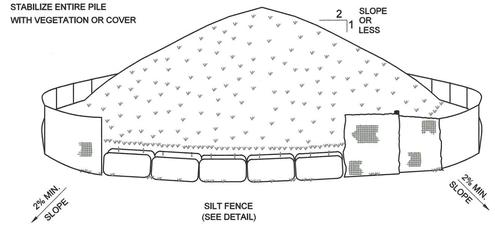


NOTES:

1. KEY FABRIC IN A 6"x6" TRENCH W/BACKFILL AND COMPACT.
2. SILT FENCE SHALL BE A 3' FENCE WITH A MINIMUM GRAB STRENGTH OF 120 LBS.

SILT FENCE DETAIL

N.T.S.

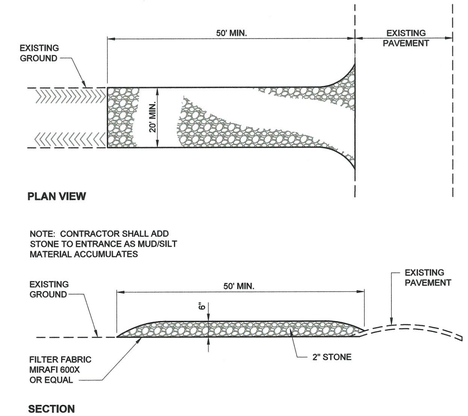


INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED W/ EITHER SILT FENCING, THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SILT FENCE DETAIL ON THIS SHEET
5. TEMPORARILY STABILIZE AS NOTED IN SPECIFICATIONS

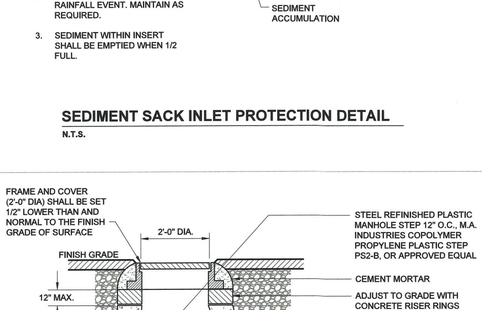
TEMPORARY STOCKPILE AREA

N.T.S.



STABILIZED CONSTRUCTION ENTRANCE DETAIL

N.T.S.

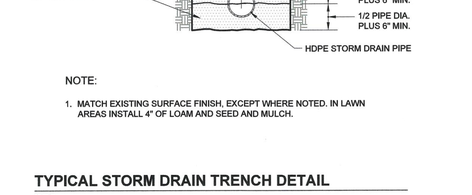


NOTES:

1. CATCH BASIN PROTECTION TO BE "SILTSACK" BY ACF ENVIRONMENTAL OR APPROVED EQUAL.
2. INSPECT INSERT AFTER EACH RAINFALL EVENT. MAINTAIN AS REQUIRED.
3. SEDIMENT WITHIN INSERT SHALL BE EMPTIED WHEN 1/2 FULL.

SEDIMENT SACK INLET PROTECTION DETAIL

N.T.S.

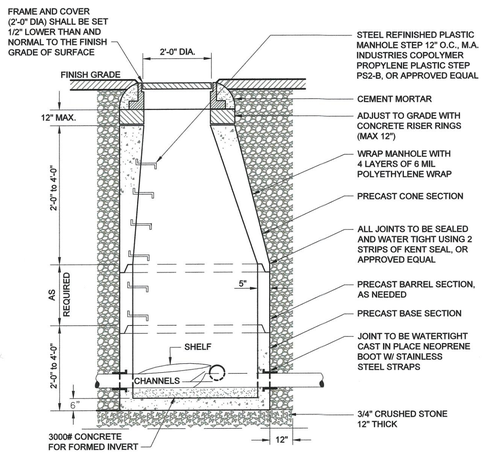


NOTE:

1. MATCH EXISTING SURFACE FINISH, EXCEPT WHERE NOTED. IN LAWN AREAS INSTALL 4" OF LOAM AND SEED AND MULCH.

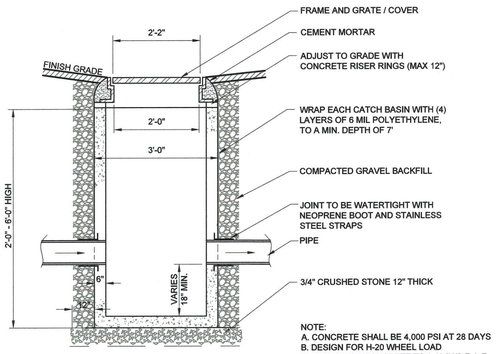
TYPICAL STORM DRAIN TRENCH DETAIL

N.T.S.



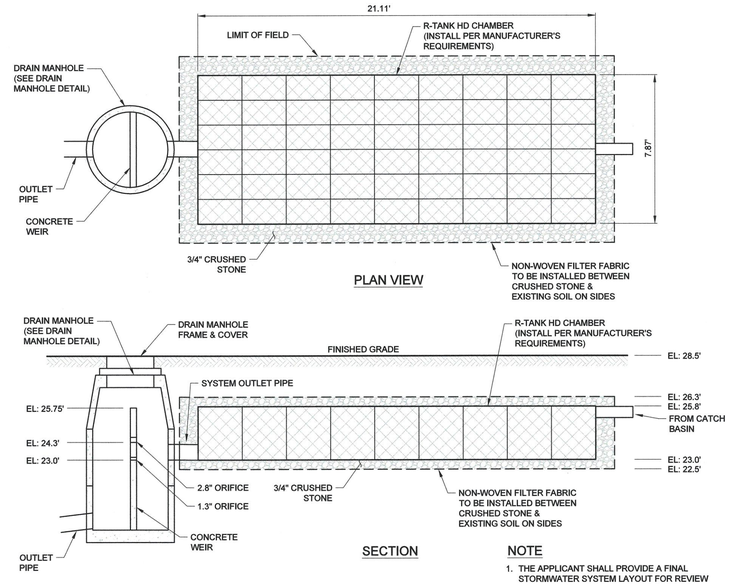
TYPICAL MANHOLE DETAIL

N.T.S.



TYPICAL CATCH BASIN DETAIL

N.T.S.



NOTE

1. THE APPLICANT SHALL PROVIDE A FINAL STORMWATER SYSTEM LAYOUT FOR REVIEW AND APPROVAL BY THE CITY AS PART OF THE BUILDING PERMIT APPLICATION

UNDERGROUND STORMWATER DETENTION SYSTEM DETAILS

N.T.S.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

CONSTRUCTION DETAILS

STATE OF NEW HAMPSHIRE — SHAWN M. TOBEY No. 14121 — LICENSED PROFESSIONAL ENGINEER — 2/13/26

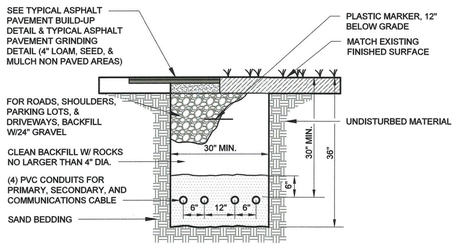
DATE	SCALE
2026.02.13	NTS

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C501** REV. **1**

FILE LOCATION: P:\#HISTORY\2020-CHINBURG_BUILDER\5000s\5010-47 RICHARDS AVE, & SOUTH\4-PW\02-CAD_FILES\4-CIVIL\5010220.003-C-DET.DWG, 2026.02.13, 10:04 AM

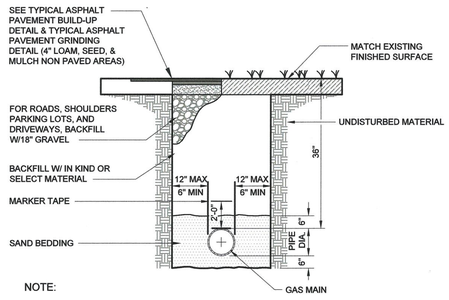


NOTES:

1. SIZE, NUMBER, MATERIAL, AND ARRANGEMENT OF CONDUIT SHALL BE COORDINATED WITH INDIVIDUAL UTILITIES.
2. ALL ELECTRICAL CONDUIT AND STRUCTURES SHALL BE WATER TIGHT.

TYPICAL UNDERGROUND UTILITY TRENCH DETAIL

N.T.S.

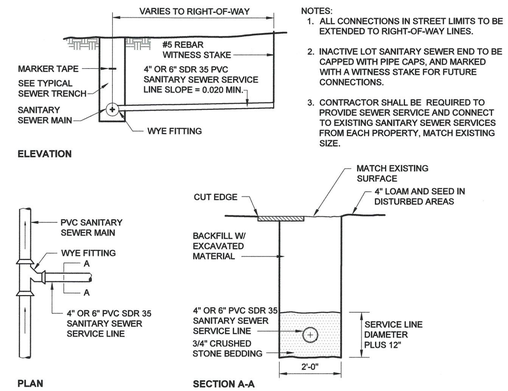


NOTE:

1. COMPACT ALL GRANULAR MATERIAL AND BACKFILL TO 95%.
2. SIDE CLEARANCE APPLICABLE TO BACKHOE OPERATIONS.

TYPICAL GAS TRENCH DETAIL

N.T.S.

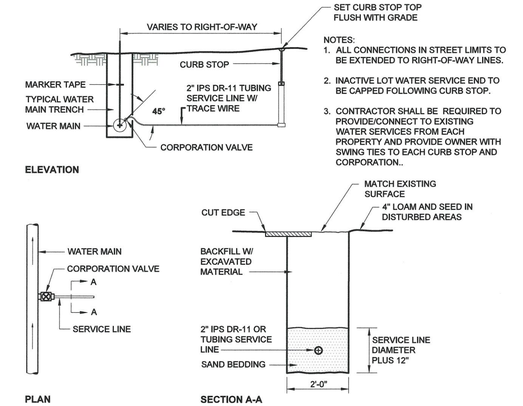


NOTES:

1. ALL CONNECTIONS IN STREET LIMITS TO BE EXTENDED TO RIGHT-OF-WAY LINES.
2. INACTIVE LOT SANITARY SEWER END TO BE CAPPED WITH PIPE CAPS, AND MARKED WITH A WITNESS STAKE FOR FUTURE CONNECTIONS.
3. CONTRACTOR SHALL BE REQUIRED TO PROVIDE SEWER SERVICE AND CONNECT TO EXISTING SANITARY SEWER SERVICES FROM EACH PROPERTY, MATCH EXISTING SIZE.

TYPICAL SANITARY SEWER SERVICE DETAIL

N.T.S.



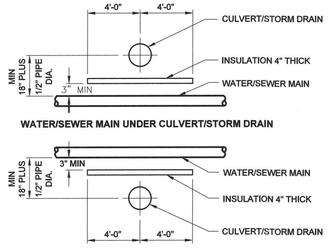
NOTES:

1. ALL CONNECTIONS IN STREET LIMITS TO BE EXTENDED TO RIGHT-OF-WAY LINES.
2. INACTIVE LOT WATER SERVICE END TO BE CAPPED FOLLOWING CURB STOP.
3. CONTRACTOR SHALL BE REQUIRED TO PROVIDE/CONNECT TO EXISTING WATER SERVICES FROM EACH PROPERTY AND PROVIDE OWNER WITH SWING TIES TO EACH CURB STOP AND CORPORATION..

TYPICAL WATER SERVICE DETAIL

N.T.S.

NOTE:
2" RIGID INSULATION SHALL BE BLUEBOARD S.M. EXTRUDED POLYSTYRENE, R-10 RATING BY DOW CO. OR APPROVED EQUAL.



WATER/SEWER MAIN UNDER CULVERT/STORM DRAIN

WATER/SEWER MAIN ABOVE CULVERT/STORM DRAIN

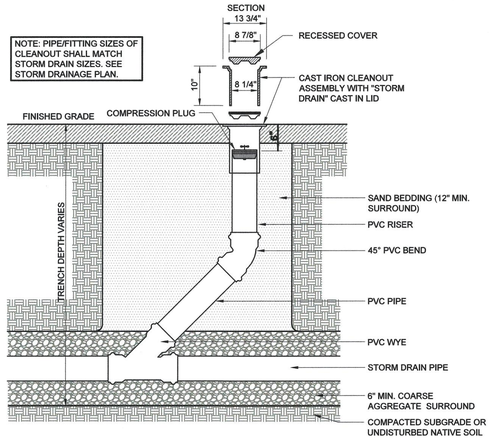
NOTES:

1. 2" RIGID INSULATION SHALL BE BLUEBOARD S.M. EXTRUDED POLYSTYRENE, R-10 RATING BY DOW CO. OR APPROVED EQUAL.
2. INSULATION TO BE 2 FEET WIDE FOR PIPES LESS THAN 6 INCHES IN DIAMETER AND 4 FEET WIDE FOR PIPES 6 INCHES IN DIAMETER AND LARGER, OR AS DIRECTED BY THE ENGINEER.

TYPICAL PIPE CROSSING INSULATION DETAIL

N.T.S.

NOTE: PIPE/FITTING SIZES OF CLEANOUT SHALL MATCH STORM DRAIN SIZES. SEE STORM DRAINAGE PLAN.



STORM DRAIN CLEANOUT DETAIL

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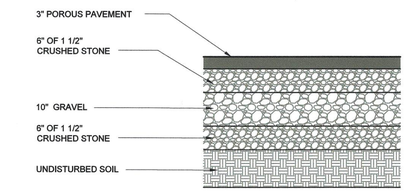
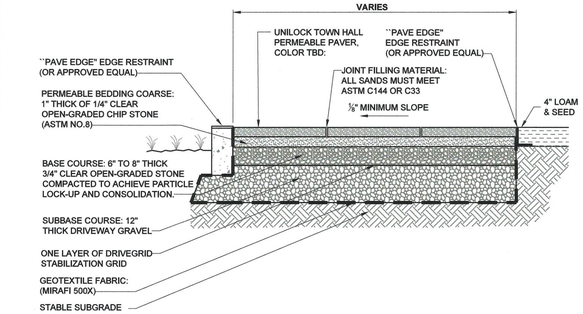


NOTES:

1. CONTRACTOR TO PROTECT POROUS ASPHALT FROM CONTAMINATION WITH SEDIMENT DURING CONSTRUCTION.
2. IF POROUS ASPHALT BECOMES CONTAMINATED DURING CONSTRUCTION, CONTRACTOR SHALL REMOVE AND REPLACE AT NO ADDITIONAL COST TO THE OWNER.

POROUS PAVEMENT DETAIL

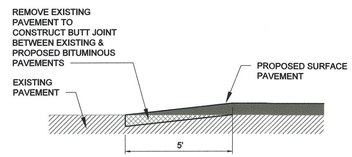
N.T.S.



NOTES:
1) UNILOCK (OR APPROVED EQUAL).
2) INSTALLED PER MANUFACTURERS INSTRUCTIONS.

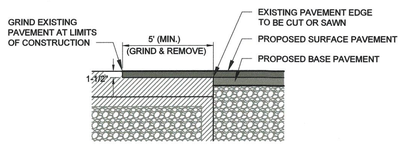
UNILOCK PERVIOUS PAVER DETAIL

N.T.S.



TYPICAL ASPHALT PAVEMENT BUTT JOINT DETAIL

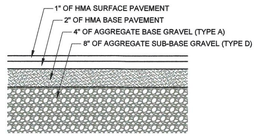
N.T.S.



NOTES:
1. EXTEND NEW SURFACE PAVEMENT ACROSS BUTT JOINT BASE COURSE.
2. PROVIDE TACK COAT ON ALL SURFACES OF EXISTING PAVEMENT TO BE COVERED.

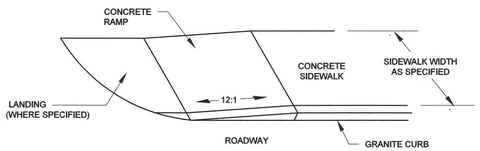
TYPICAL ASPHALT PACEMENT GRINDING DETAIL

N.T.S.



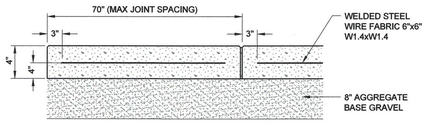
TYPICAL DRIVEWAY PAVING DETAIL

N.T.S.



TYPICAL SIDEWALK TIP DOWNS

N.T.S. (NON INTERSECTION)



TYPICAL CONCRETE SIDEWALK DETAIL

N.T.S.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR PERMITTING

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

CONSTRUCTION DETAILS

STATE OF NEW HAMPSHIRE – SHAWN M. TOBEY No. 14121 – LICENSED PROFESSIONAL ENGINEER – 2/13/26

DATE	SCALE
2026.02.13	NTS

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C502** REV. **1**

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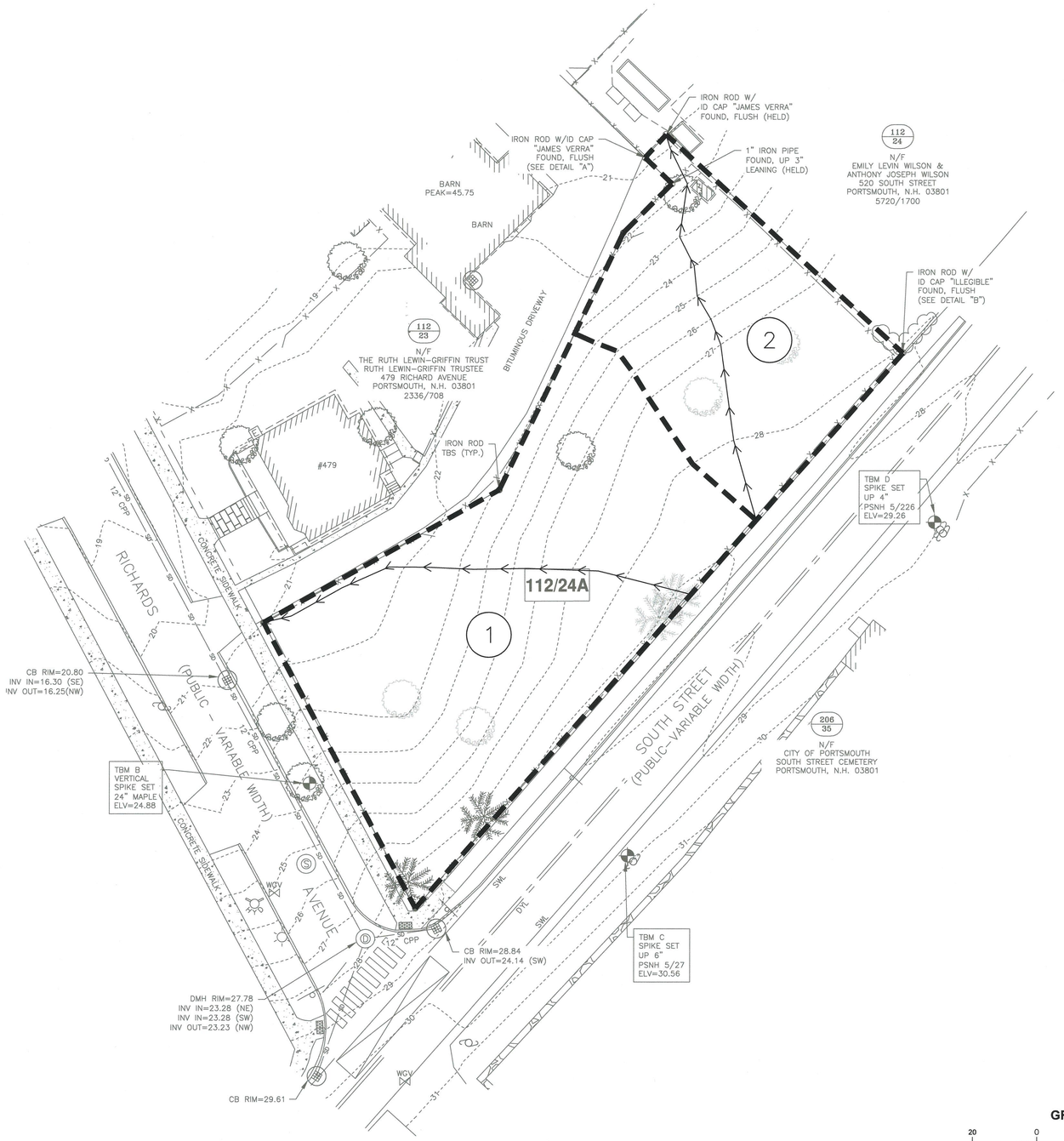

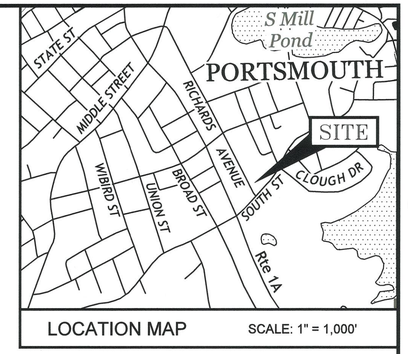

LOCATION MAP SCALE: 1" = 1,000'

PRE LEGEND:

- PROPERTY LINE
- WATERSHED BOUNDARY LINE
- (1) WATERSHED DESIGNATION
- TIME OF CONCENTRATION FLOW PATH

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR REVIEW

HALEY WARD
WWW.HALEYWARD.COM
200 Griffin Rd., Unit 14
Portsmouth, New Hampshire 03801
603.430.9282

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

PRE-DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE — SHAWN M. TOBEY No. 14121 — PROFESSIONAL ENGINEER — 2/13/26

DATE	SCALE
2026.02.13	1" = 20'

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C701** REV. **1**

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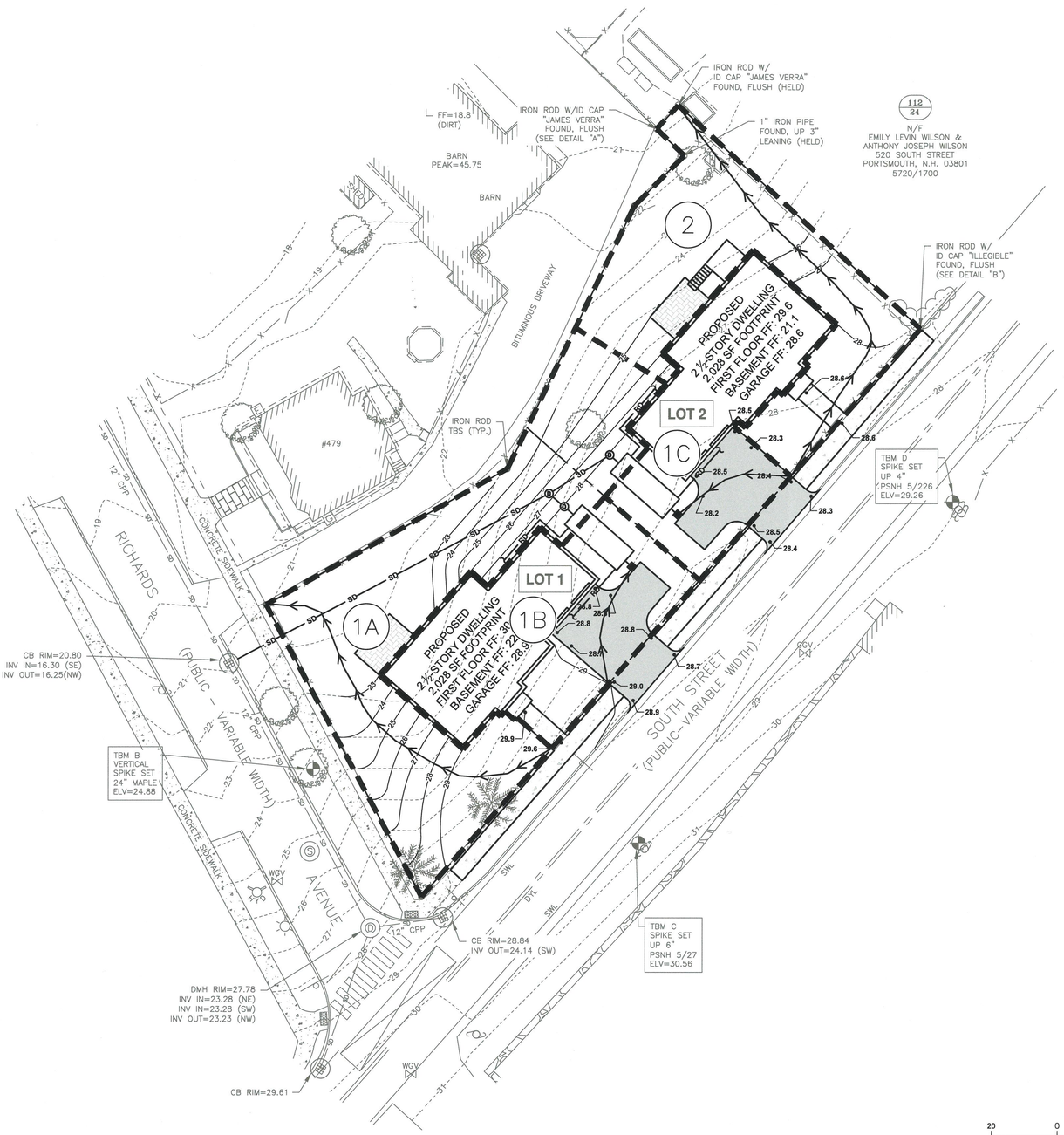

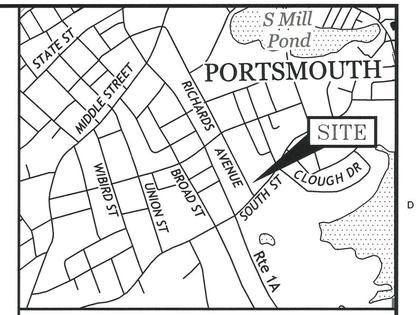

LOCATION MAP SCALE: 1" = 1,000'

POST LEGEND:

- PROPERTY LINE
- WATERSHED BOUNDARY LINE
- (1) WATERSHED DESIGNATION
- TIME OF CONCENTRATION FLOW PATH

GRAPHIC SCALE

20 0 10 20 40 60

(IN FEET)
1 inch = 20 ft.

REV.	DATE	DESCRIPTION	BY	CHK.
1	2026.02.13	ISSUED FOR COMMENT	JHV	SMT

DRAWING ISSUE STATUS

ISSUED FOR REVIEW

HALEY WARD

WWW.HALEYWARD.COM

One Merchants Plaza, Suite 704
Portsmouth, New Hampshire 03801
603.889.1821

PROJECT

PROPOSED 2 LOT SUBDIVISION
RICHARDS AVE & SOUTH ST, PORTSMOUTH NH

TITLE

POST-DEVELOPMENT HYDROLOGY PLAN

STATE OF NEW HAMPSHIRE
SHAWN M. TOBEY
No. 14121
LICENSED PROFESSIONAL ENGINEER
2/13/26

DATE	SCALE
2026.02.13	1" = 20'

DRAWN BY	DESIGNED BY	CHECKED BY
JHV	JHV	SMT

PROJECT No. 5010220.003

DRAWING No. **C702** REV. **1**

FILE LOCATION: P:\NH\5010220-CHINBURG_BUILDERS\003-479 RICHARDS AVE. & 0 SOUTH-PAY\02-CAD_FILES\04-CIVIL\5010220.003-C-HY.DWG, 2026.02.13, 10:07 AM