# 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 September 5, 2023

### **AGENDA**

### I. APPROVAL OF MINUTES

**A.** Approval of minutes from the August 1, 2023 Site Plan Review Technical Advisory Committee Meeting.

### II. NEW BUSINESS

- A. The request of Pease Development Authority (Owner), for property located at 360 Corporate Drive requesting Construction of a three-story Healthcare Complex with approximately 52,000 GSF. to allow space for up to 10 tenants which include an Ambulatory Surgical Center, Imaging Center and Plastic Surgery Center. The project includes (125) vehicle parking spaces, (2) loading docks as well as associated paving, stormwater management, lighting, utilities and landscaping. Said property is located on Assessor Map 315 Lot 5 and lies within the Airport Business Commercial (ABC) District. (LU-23-135)
- **B.** The request of **Bantry Bay Associates LLC (Owner)**, for property located at **0 Shearwater Drive** requesting Preliminary and Final Subdivision approval for the subdivision of the 2.23 acre lot into nine (9) conforming Single-Family lots. Said property is located on Assessor Map 217 Lot 2-1900 and lies within the General Residence B (GRB) District. (LU-23-138)
- C. The request of Bantry Bay Associates LLC (Owner), for property located at 0 Shearwater Drive requesting Site Plan Review approval for the construction of nine (9) single-family dwellings with associated paving, stormwater management, lighting, utilities and landscaping. Said property is located on Assessor Map 217 Lot 2-1900 and lies within General Residence B (GRB) District (LU-23-138)

**D.** The request of Coventry Realty LLC (Owner), for property located at 111 State Street requesting A Parking Conditional Use Permit under Section 10.1112.14 to allow zero (0) parking spaces where 43 are required. Said property is located on Assessor Map 107 Lot 50 and lies within the Character District 4 (CD4) and Historic Districts. (LU-22-125)

### III. OTHER BUSINESS

### IV. ADJOURNMENT

https://us06web.zoom.us/webinar/register/WN qmpQ3vBzSDiXAJumbMT74Q

# SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE PORTSMOUTH, NEW HAMPSHIRE

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

2:00 PM August 1, 2023

### **MINUTES**

### **MEMBERS PRESENT:**

Peter Stith, Chairperson, Principle Planner; Shanti Wolph, Chief Building Inspector; Peter Britz, Environmental Planner; Director of Planning & Sustainability Department; Zachary Cronin, Assistant City Engineer, Eric Eby, Parking and Transportation Engineer; Mike Maloney; Deputy Police

Chief

**MEMBERS ABSENT**: Patrick Howe, Deputy Fire Chief; David Desfosses,

Construction Technician Supervisor

#### ADDITIONAL

**STAFF PRESENT**: Chad Putney, Fire Prevention Officer; Stefanie Casella, Planner 1; Kate Homet, Associate Environmental Planner

The meeting began at 2:01 p.m.

### I. APPROVAL OF MINUTES

**A.** Approval of minutes from the July 5, 2023 Site Plan Review Technical Advisory Committee Meeting.

E. Eby made a motion to approve the minutes as presented. P. Britz seconded the motion. The motion passed unanimously.

#### II. NEW BUSINESS

A. The request of Clyde Logue (Owner), for property located at 27 Shaw Road requesting Lot line Relocation and Subdivision as follows: Tax Map 223 Lot 18 decreasing from 34,205 square feet and 230 feet of frontage to 20, 1999 square feet and 129 feet of frontage; Map 223 Lot 18-1 decreasing from 23,149 square feet and 127 feet of frontage to 21, 241 square feet and 101 feet of frontage; and creation of a new lot with a lot area of

15,812 square feet and 101 feet of frontage. Said property is located on Assessor Map 223 Lot 18 and lies within the Single Residence B (SRB) District. (LU-23-102)

### SPEAKING TO THE APPLICATION

Eric Weinrub of Altus Engineering and Clyde Logue, property owner, presented this application. Mr. Weinrub explained the details behind the recent subdivision of the site that had been approved last year and he noted that they had recently learned from the legal department that the setbacks for this property are applied at the right of way edge. He went on to describe the previous designs/plans and how easements would affect their new plan. He also described new plans to contain stormwater management to the project's upper parcel, 170 Walker Bungalow Road.

[16:20] P. Britz mentioned that they would need stronger language on the plans for the design of the future rain garden as the committee would not be reviewing it again before the project begins.

Mr. Weinrub agreed that they would rework the language to satisfy what the committee wants it read as.

[16:53] S. Wolph asked what the mechanism would be to ensure the stormwater plan be presented, reviewed and approved by the City.

Mr. Weinrub noted that it would likely fall to the Land Use Compliance Officer within the City to ensure that gets done properly. P. Britz noted that the conditions granted with any Planning Board approval would go through that process as well.

[18:40] Z. Cronin mentioned that DPW would be performing work on Walker Bungalow Road and that any utility work associated with this project would have to wait until the DPW work is complete.

Mr. Weinrub noted that they planned to use Shaw Road for utility access. Mr. Logue also mentioned that the water line has already been installed on the upper lot, the sewer had already been installed and the poles for power lines would be installed soon.

[20:19] S. Casella asked the applicant if they knew that they were a few feet short for the frontage on the new lot.

Mr. Weinrub noted that they did know this and that they were planning to push it out 2.5 feet for the next submission.

### **PUBLIC HEARING**

[21:07] Chairman Stith opened the public hearing.

[21:27] Brady Byrd and Brian Neste, the owners of 184 Walker Bungalow Road and direct abutters, came to speak. They noted how the area being subdivided would impact their property value and would not be in line with the character of their neighborhood. Mr. Clark expressed concern for the existing stormwater users in the neighborhood.

Mr. Neste expressed concern for property values as well, along with privacy impacts and a change of the neighborhood's character. He noted that he would like to see a building envelope or footprint for any proposed buildings and expressed concerns about potential flooding.

[26:05] Sheridan Lloyd, a close abutter, expressed concern for drainage impacts and how another home could negatively impact the new sewer lines going into the neighborhood. She also expressed concern for the drain line not having aeration to percolate and not being a direct line, noting the multiple elbows before it reached the lower property were also of concern.

[34:50] Chairman Stith closed the public hearing.

### DISCUSSION AND DECISION OF THE BOARD

[35:12] P. Britz asked the applicant if they had looked at the size of the piping for its use with stormwater and whether it would be a good fit.

Mr. Weinrub noted that it had previously been sized and approved by DPW for the new sewer project. Mr. Logue noted that the pipe had increased from 6" to 8" which should help with stormwater.

[39:34] P. Britz made a motion to recommend approval with the following stipulations:

- 1. The lot lines and setbacks need to be adjusted based on the frontage.
- 2. The applicant will provide a stormwater management note on plans describing the location and requirements of the rain garden prior to Planning Board approval.
- 3. The applicant will provide a note on plans indicating that regular maintenance reports for infiltration ponds will be submitted to DPW.
- 4. A stormwater maintenance management plan shall be updated and provided prior to Planning Board approval.
- 5. Correct the size and location of the utilities and drain on plans.
- E. Eby seconded the motion. The motion passed unanimously.
  - B. The request of Lonza Biologics (Owner), for property located at 101 International Drive requesting to amend the Master Plan to reduce the overall square footage to 800,000 square feet in three buildings and reduce the height of building #1 from 3 stories to 1 story. Amended site plan approval for Phase 2 which includes fit-up of Building #1

and the utility building, construction of a temporary surface parking lot and gravel area for construction trailers, parking, and laydown area. Said property is located on Assessor Map 305 Lot 6 and lies within the Airport Business Commercial (ABC) District. (LU-23-108)

[42:30] Chairman Stith introduced this application.

### SPEAKING TO THE APPLICATION

[43:12] Neil Hansen and Colter Krzcuik of Tighe & Bond and Dave Morgan of Lonza came to present this application. Mr. Hansen went over the prior approvals received for this project from 2019 and the more recent administrative approvals. He explained that the reason they returned was due to stipulation #2.8 (the Planning Board's recommendation of approval only applies to Phases 1A and 1B) from the previous approval as they are moving beyond Phase 1B. Previous administrative approvals included changing a proposed parking garage to a utility building and increasing the stories of another garage. In Phase 1B, they amended the utility building and parking garage to be done in the first phase. In January 2023, they reduced the height of Building #1 and only half of the approved utility building was built.

Mr. Hansen explained that Phase 1A was nearly complete and that site fencing was going up for Phase 1B work. He went on to describe the status of the conditions from the last full approval along with Mr. Morgan who described the upcoming use planned for the proposed new building.

[1:08:56] Mr. Hansen went on to respond to staff comments.

• Trailer utilities need to be cut and capped once they are removed from site.

Understood.

• A 10" valve must be used on the water main connection to Corporate Drive. An 8x8 tapping sleeve and valve may be used but a 10" valve must be installed after the reducer.

They will use the 10" valve.

Third party oversight of any work performed in the right of way.

They agreed.

• A grease trap will be required if any food preparation is planned in the proposed buildings.

There is no food preparation planned for the first building so no grease trap is needed.

• Third party review of the storm water design and stamped review of post construction conditions to verify that it will perform as designed.

They are currently waiting for a third-party review to come in, their design engineer will do a review.

• Third party review of traffic study.

They noted this would be fine as it was performed for the entire master plan.

• Easement required over water mains on the property for leak detection and access to valves/shutoffs.

This was standard.

Mr. Hansen noted that the rest of the staff's comments had been answered in terms of the conditions and past stipulations.

[1:10:50] Z. Cronin suggested leaving the 8" valve open without a box to be able to access the valve.

[1:11:31] C. Putney noted that they would be requiring an NFK 241 Plan for site access, construction, and site occupancy. He also requested confirmation of the utility bridge which should be at least 13' 6". Mr. Morgan mentioned that the bridge would be about 22' and should be okay. Additionally, C. Putney noted that the fire department should have the code or key to the guard houses and gates.

### **PUBLIC HEARING**

[1:14:51] Chairman Stith opened the public hearing. No one spoke. The hearing was closed.

#### DISCUSSION AND DECISION OF THE BOARD

[1:15:20] P. Britz made a motion to recommend approval. Z. Cronin seconded the motion. The vote was unanimous.

C. The request of Banfield Realty LLC (Owner), for property located at 375 Banfield Road Preliminary and Final Subdivision approval to subdivide one lot into two lots to create the following: Proposed Lot 1 with 6.65 acres of lot area and 354 feet of street frontage and Proposed Lot 2 with 7.96 acres of lot area and 200 feet of street frontage. Said property is located on Assessor Map 266 Lot 7 and lies within the Industrial (I) District. (LU-23-107)

[1:15:53] Chairman Stith introduced the application.

#### SPEAKING TO THE APPLICATION

Rob Graham, a representative of the owner, and Joesph Coronati of Jones and Beach Engineering came to present this application for a subdivision. Mr. Coronati explained the subdivision proposal and the need for an easement for utilities on the lots which need grading and outfall. He proceeded to respond to staff comments:

• All stormwater conveyances and utilities must be constructed as previously designed and approved.

This is fine, there are no proposed changes.

• How do you intend to resolve the doctrine of merger? This must be resolved prior to Planning Board consideration

They will either prepare a declaration of covenant for both lots and/or form a new entity so that the second lot could receive an easement from the first lot and vice versa.

• Please update plans to reflect City ownership of 100 Campus Dr

Oversight, they will fix.

• Are you requesting any waivers? If so, which ones? If there are no public improvements, the bond and maintenance requirement can only be waived by the Planning Board

No waivers being requested at this point but they will be requesting a waiver from the maintenance bond requirement as requested by the legal department's consultation.

[1:19:47] Z. Cronin asked how the responsibility for cleaning up the site due to NHDES requirements would change if the lot was subdivided.

Mr. Graham responded that both lots would be owned by the same group who holds responsibility. He also mentioned that their bank for this project was Kennebunk Savings Bank who advised them that in order to finance the project, they should divide the lot. They will confirm their continued responsibility to both lots.

### **PUBLIC HEARING**

[1:22:22] Chairman Stith opened the public hearing.

[1:22:35] David Ecker of 422 Banfield Road expressed his concern for the contamination on this property and the 14" culvert that flows directly onto his property. He would like to see that everything is cleaned up before anything moves forwards such as a subdivision, which might create a conflict in the future.

[1:27:19] Chairman Stith closed the public hearing.

#### DISCUSSION AND DECISION OF THE BOARD

[1:27:26] Mr. Graham noted that they were within full compliance of NHDES requests.

[1:27:58] P. Britz said that he had reached out to NHDES about this request for a subdivision to better understand the implications and they had relayed that it is important for the owners to do the development project and the remedial testing for this site. They wanted to emphasize that it is often difficult to get responsible parties to clean up these sites and the owners of this site are agreeing to do the work and comply with NHDES recommendations and requirements.

[1:29:38] S. Wolph noted that while these types of subdivisions could come off as suspicious, this is a logistical move that is required in order to fund the cleanup and get it moving. He would vote to move this application forward to the Planning Board to get the cleanup started.

[1:30:56] P. Britz made a motion to recommend approval to the Planning Board with the following stipulations:

- 1. The necessary waivers are requested prior to Planning Board approval.
- 2. Proof of clean up responsibility required prior to Planning Board approval.
- S. Wolph seconded the motion. The motion passed unanimously.
  - D. The request of JKM Realty LLC (Owner), for property located at 700 Peverly Hill Road requesting Site Plan Approval for construction of a 3,385 square foot addition to an existing commercial building with associated site improvements. Said property is located on Assessor Map 252 Lot 2-10 and lies within the Industrial (I) District. (LU-23-109)

[1:32:36] Chairman Stith introduced this application.

#### SPEAKING TO THE APPLICATION

[1:33:03] John Chagnon of Ambit Engineering, Stuart Mitchell of SJM Construction Management and Chris Sawyer, the property, came to present this application. Mr. Chagnon noted that they had previously come before the committee for a work session on this project and he proceeded to give a brief description of the proposal and then addressed staff comments:

• Repair existing perimeter fencing where damaged.

They have added Note #2 to Sheet C3.

• *Show existing water service to the building.* 

They have added this to the updated Existing Conditions Plan.

• The existing driveway for the main building should be moved farther from the intersection of West Road and Peverly.

They noted that this driveway has worked for the last forty years and they intend to keep it as is in that location.

• Please provide a green building statement and update the application checklist or request a waiver.

They will provide one.

• Please provide a landscape plan and update the application checklist or request a waiver.

A landscaping schedule has been added to the Site Plan.

• Please note on plans where public and private infrastructure starts and ends along West Rd

A condition of approval will be added regarding this.

• Maintenance and inspection log will require regular reporting to DPW. Please update inspection and maintenance plan to reflect this requirement.

They have since deleted the "if required" from their last maintenance plan and have added "as required".

[1:48:50] C. Putney reminded the applicants that during the building permit process they would need to discuss access for the fire department through their driveway gate.

### **PUBLIC HEARING**

[1:49:12] Chairman Stith opened the public hearing. No one spoke. The public hearing was closed.

### DISCUSSION AND DECISION OF THE BOARD

[1:49:38] Z. Cronin made a motion to recommend approval to the Planning Board with the following stipulation:

1. Ownership and maintenance responsibility for drainage infrastructure to be detailed on plans and in easements.

C. Putney seconded the motion. The motion passed unanimously.

### III. ADJOURNMENT

The meeting adjourned at 3:52 PM

Respectfully submitted,

Kate E. Homet Secretary for the Technical Advisory Committee August 18, 2023

Portsmouth Technical Advisory Committee Attn: Peter Stith 1 Junkins Avenue, Suite 3<sup>rd</sup> Floor Portsmouth, NH 03801

RE: Site Plan Review
ATDG, LLC
360 Corporate Drive
Portsmouth, NG 03801

Dear Mr. Stith:

On behalf of the Applicant, ATDG, LLC, Apex Design Build respectfully submits an application for Site Plan Review for the construction of a new Medical Office Building at 360 Corporate Drive, Portsmouth, NH 03801. The Applicant is proposing a new state-of-the-art 52,401 GSF facility which features three-floors of dedicated Healthcare Space for up to (10) Healthcare Tenants which includes an Ambulatory Surgery Center, Imaging Center, and Plastic Surgery Center. Access to this site will be administered via a new entrance constructed at both Corporate Drive and International Drive and features enhancements to the public accessibility along both Corporate Drive and International Drive, along with substantial enhancement to the surrounding landscape at the respective roadways and within the site.

This building features a modern aesthetic with neutral color palette which has been carefully designed to incorporate colors from surrounding developments within the Pease Development District. Aside from the building design, the site has also been carefully planned to provide no impact to the surrounding wetlands through enhanced setbacks from wetlands and their respective buffers. Additionally, all stormwater will be retained on-site via ADS Underground Stormwater Structures, and stormwater will receive proper treatment prior to release into neighboring wetlands. The site includes (125) parking spots, dedicated delivery areas, and an Imaging Trailer location in order to provide equitable balance for the current proposed tenants. This site design also allows accommodation for future growth, along with a net-positive soil design to ensure all associated spoils/materials are retained to the site during construction activities.

Should there be any questions or concerns about the aforementioned application, please do not hesitate to reach out to me directly.

Sincerely,

Jeff Kilburg Project Director

**Encl:** Application Materials

## **Pease Development Authority** 55 International Drive, Portsmouth, NH 03801, (603) 433-6088



| Application for Site Review TRADEFORT   |  |                                     |   |
|---|--|-------------------------------------|---|
| Corporation Colo  |  |                                     | 7417711171                              |
| For PDA Use Only Date Submitted:  | Municipal Devices  | Feet                                |   |
| Application Complete:   | Municipal Review:<br>Date Forwarded:   | Fee:<br>Paid:                       | -<br>Check #:                           |
| Application Complete:   | Date Forwarded.  | Falu                                | GREEK #.                                |
|   | Applica  | nt Information                      |   |
|   |  |                                     |   |
| Applicant: ATDG, LLC - Contac   | t; Dr. Alexander Slocum  | Agent:Raquelle Kemnitz, Ap          | ex Design Build                         |
| Address:<br>1 Merrill Crossing  |  | Address:<br>9550 W Higgins Rd       | Ste 170                                 |
| Bow, NH 03304   |  | Rosemont, IL 6001                   |   |
| Business Phone: 603-777-650   | 16   | Business Phone: 847-288-01          | nn                                      |
| Mobile Phone: 603-777-6506  |  | Mobile Phone: 708-610-5000          |   |
| Fax: n/a  |  | Fax: n/a                            |   |
|   |  |                                     |   |
|   | Site I   | nformation                          |   |
|   |  |                                     |   |
| Portsmouth Tax Map: 0315-000  |  | Zone: ABC                           |   |
| Site Address / Location : 360 Co  | orporate Dr, Portsmouth, NH  | 03801                               |   |
| Site Address / Location : n/a   |  | Area of On-site Wetlands: 41,       |   |
| Area of On-site Wetlands + Wetlands Buffer Area: 86, 044 SF   |  |                                     |   |
| Activity Information  |  |                                     |   |
| Change of Use: Yes [ ] No [X] Existing Use: 9010  |  |                                     |   |
|   |  |                                     |   |
|   | Proposed   | Use: n/a                            |   |
| Description of Project: // P  | lease see attachment //  |                                     |   |
|   |  |                                     | • |
| ****  |  |                                     | ***                                     |
|   |  |                                     |   |
|   |  |                                     |   |
|   |  |                                     |   |
|   |  |                                     |   |
|   |  | tted with this application. Provide | •                                       |
|   |  |                                     | t shall supply additional copies as     |
| may be required by applic   | acie municipality. Refer to Ch   | apter 400 of PDA land Use Contr     | ois for additional information.         |
|   | = Cer  | tification                          |   |
|   | <u> </u>   | unedigii                            |   |
| I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data |  |                                     |   |
| are true and complete to the bes  | ire true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and |                                     |   |
| any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.              |  |                                     |   |
| Mexander H Slowin Ir 8/16/2023   2:06:01 PM CDT   |  |                                     |   |
| 3D12526E Sign   |  |                                     |   |
| -   | -  |                                     |   |
| Dr. Alexander Slocum  |  |                                     |   |

N:\Engineer\ ApplicationforSiteReview.xlsx

Printed Name

## **Application for Site Review Cont.**

Portsmouth Tax Map: 0315-0005-0000

Lot #: 0005

Site Address: 360 Corporate Dr, Portsmouth, NH 03801

### **Description of Project**

The proposed development will be located at 360 Corporate Drive in Portsmouth, NH on a 6.12 acre lease lot created from existing Map Lot 0315-0005-0000. The project includes a three-story Healthcare Complex which will feature approximately 52,000 GSF. As proposed, the building and parking abide by all PDA setbacks and no variances are being sought. The design includes (125) vehicle parking spaces with a total of (2) loading docks. There will be a singular below grade loading dock at the eastern extent of the building (back), which will be appropriately accommodating of a WB-62 truck configuration, as well as a loading dock at grade (parallel and separated by a retaining wall) to the below grade loading dock. This area will feature a concrete sidewalk which properly allows for unloading/loading of all delivery trucks, as well as an additional area for bicycle parking. Along the same extent of the building, the emergency backup generator will be located parallel to the recessed loading dock and the primary electrical transformer will be located parallel to the at-grade loading dock. The refuse area also resides parallel to the at-grade loading dock for easy maneuverability as well as efficient proximity to the building for staff utilization.

Site access will be provided by two new driveways; one located along International Drive and the other located along Corporate Drive. Existing sidewalks are comprised of concrete with sections of asphalt; all existing asphalt sidewalks will be appropriately removed and replaced along with the proposed site development. The aforementioned site access provides adequate flow for both deliveries as well as patient/staff accessibility across the site. The International Drive entrance provides accessibility for a WB-62, and proper sizing for maneuvers in order to deliver/pickup a mobile MRI Trailer for intermittent usage at the future Imaging Practice.



## **Authorization Form**

I, Dr. Alexander Slocum, of ATDG, LLC, authorize Apex Design Build and Allen & Major Associates, Inc., to act as an agent on behalf of ATDG, LLC. I authorize Apex Design Build and Allen & Major Associates, Inc. to sign any permit related documents and speak on my behalf regarding the proposed Medical and Ambulatory Surgery Center Project at 360 Corporate Dr, Portsmouth, New Hampshire.

-DocuSigned by:

-3D12526EBF66412...

Signature

7/20/2023 | 5:49:32 AM CDT

Date

"Green" Statement 360 Corporate Dr. Portsmouth, NH

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Apex Design Build Respectfully submits the following list of the project's "green" components for the new construction at 360 Corporate Dr., Portsmouth, NH:

- The project will meet or exceed all applicable current energy codes.
- All features, rooms, pathways, and means of conveyance will be installed to meet or exceed ADA requirements.
- The project and tenants are located with intent to maximize the usage of the public transit bus stop.
- All collected stormwater runoff is being directed, managed, and stored on-site, limiting the impact on the city stormwater system and limiting sheet flow towards the street.
- The footprint of the proposed developed area has been strategically and meticulously designed to avoid disruption of any existing Wet Lands.
- All landscaping to use native or adaptive species to limit the use of additional resources to maintain the landscaping.





Ref: 9694

August 11, 2023

Mr. Jeff Kilbury Apex Design Build 9550 West Higgins Road Suite 170 Rosemont, IL 60018

Re: Trip Generation for Medical Office Building

360 Corporate Drive

Portsmouth, New Hampshire

Dear Mr. Kilbury:

Vanasse & Associates, Inc. (VAI) has identified the traffic generation associated with the proposed Medical Office Building (hereinafter, the "Project") to be located at 360 Corporate Drive in Portsmouth, New Hampshire. The Project site is bordered by International Drive to the north, areas of open and wooden space to the east and south, and Corporate Drive to the east. The Project site was previously an office building with two curb cuts; one onto International Drive, and one onto Corporate Drive.

The Project involves the construction of a three-story medical office building where 10,000 square feet (sf) of the building is a ambulatory surgery center and 42,000 sf is medical office space. A total of 125 parking spaces are proposed. Access to the site via the Corporate Drive curb cut is expected to be for patients and medical supply vehicles, while the International Drive curb cut is expected to be for employee vehicles.

In order to develop the traffic characteristics of the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE)<sup>1</sup> for Land Use Code (LUC) 650, "Free-Standing Emergency Room" and LUC 720, "Medical-Dental Office Building" were used. Table 1 summarizes the anticipated trip generation from the proposed development.

<sup>&</sup>lt;sup>1</sup>Trip Generation, 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.

Table 1 PROJECT TRIP GENERATION

| Time Period                | Office<br>Space<br>Trips <sup>a</sup><br>(A) | Surgery<br>Center<br>Trips <sup>b</sup><br>(B) | Total<br>Trips<br>(C=A+B) |
|----------------------------|--|--|---------------------------|
|                            | (11)   | <u>(B)</u>                                     | <u>(C 11 D)</u>           |
| Weekday Daily              | 1,698  | 250  | 1,948                     |
|                            |  |  |                           |
| Weekday Morning            | g Peak Hou                                   | ır:  |                           |
| Entering                   | 87   | 6  | 93                        |
| <u>Exiting</u>             | 23   | 5  | 28                        |
| Total                      | 110  | 11   | 121                       |
| Weekday Evening Peak Hour: |  |  |                           |
| Entering                   | 50   | 7  | 57                        |
| <u>Exiting</u>             | 118  | 8  | 126                       |
| Total                      | 168  | 15   | 183                       |

<sup>&</sup>lt;sup>a</sup>Based on ITE LUC 720, Medical-Dental Offic Building; 42,000 sf. <sup>b</sup>Based on ITE LUC 650, Free-Standing Emergency Room; 10,000sf.

A comparison of previous and future trip generation of the site was conducted. Although the site is currently vacant, aerial images indicate that an office building was on site circa 2012. Estimates of the building size were obtained from aerial imagery. In order to develop the traffic characteristics of the previous site, tripgeneration statistics published by the ITE for LUC 710, "General Office Building" was used. Table 2 summarizes the anticipated change in trip generation from the previous site to the proposed development.



**Table 2 PROJECT TRIP GENERATION COMPARISON** 

| Time Period                | Previous<br>Vehicle<br>Trips <sup>a</sup> | Proposed<br>Vehicle<br>Trips <sup>b</sup> | Change<br>(Trips) |  |
|----------------------------|---|---|-------------------|--|
| Weekday<br>Daily           | 262                                       | 1,948                                     | +1,686            |  |
| Weekday Morning Peak Hour: |   |   |                   |  |
| Entering                   | 24  | 93  | +69               |  |
| Exiting                    | _3  | 28  | +25               |  |
| Total                      | 27  | 121                                       | +94               |  |
| Weekday Evening Peak Hour: |   |   |                   |  |
| Entering                   | 4   | 57  | +53               |  |
| Exiting                    | <u>22</u>                                 | 126                                       | +104              |  |
| Total                      | 26  | 183                                       | +157              |  |

<sup>&</sup>lt;sup>a</sup>Based on ITE LUC 710, General Office Building; 18,000 sf.

As shown in Table 1, the project is expected to generate 1,686 more vehicle trips (approximately 843 vehicles entering and exiting) on an average weekday (two-way, 24-hour volume), with 94 more vehicle trips (69 entering and 25 exiting) expected during the weekday morning peak hour and 157 more trips (53 entering and 104 exiting) during the weekday evening peak hour.

If you have any questions on the conclusions reached herein, feel free to contact us at <a href="mailto:sthornton@rdva.com">sthornton@rdva.com</a> thannon@rdva.com.

Sincerely,

VANASSE & ASSOCIATES, INC.

Scott W. Thornton, P.E. Principal

Thomas J. Hannon, EIT Transportation Engineer

cc: File

Attachment: Trip Calculations



<sup>&</sup>lt;sup>b</sup>Based on Table 1.



## **Free-Standing Emergency Room**

(650)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 4 Avg. 1000 Sq. Ft. GFA: 11

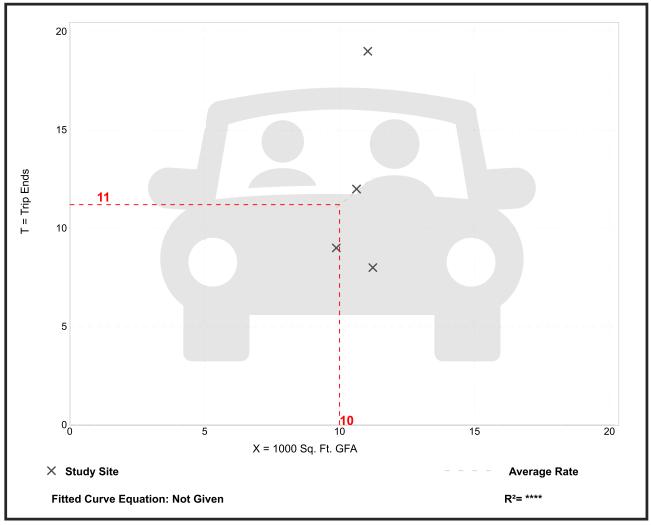
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 1.12         | 0.71 - 1.72    | 0.44               |

### **Data Plot and Equation**

### Caution - Small Sample Size



## **Free-Standing Emergency Room**

(650)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 4 Avg. 1000 Sq. Ft. GFA: 11

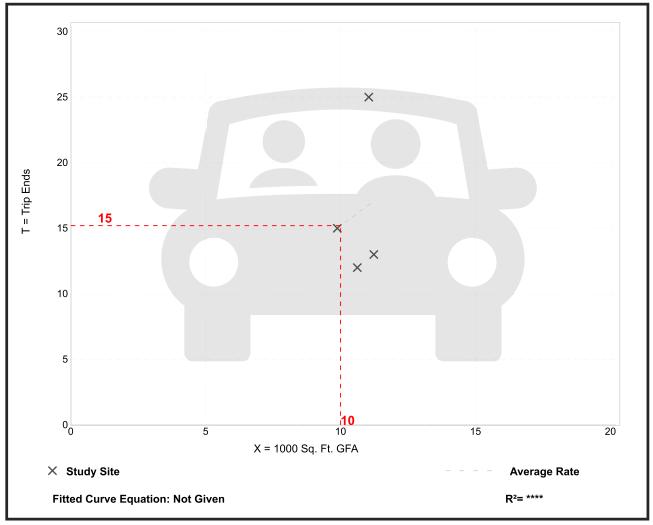
Directional Distribution: 46% entering, 54% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 1.52         | 1.13 - 2.26    | 0.54               |

### **Data Plot and Equation**

### Caution - Small Sample Size



## **Free-Standing Emergency Room**

(650)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 4 Avg. 1000 Sq. Ft. GFA: 11

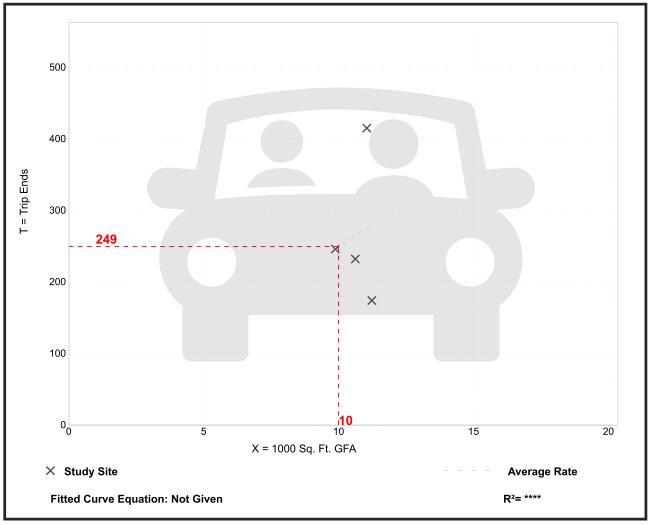
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 24.94        | 15.49 - 37.57  | 9.45               |

## **Data Plot and Equation**

### Caution - Small Sample Size



## **General Office Building**

(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.

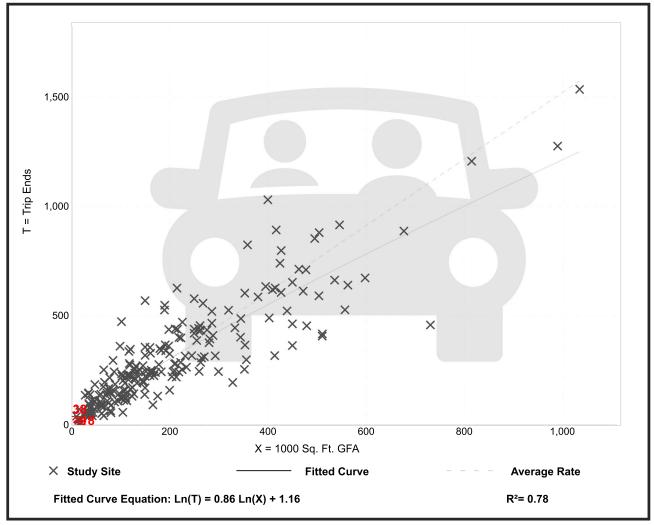
Setting/Location: General Urban/Suburban

Number of Studies: 221 Avg. 1000 Sq. Ft. GFA: 201

Directional Distribution: 88% entering, 12% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 1.52         | 0.32 - 4.93    | 0.58               |



## **General Office Building**

(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

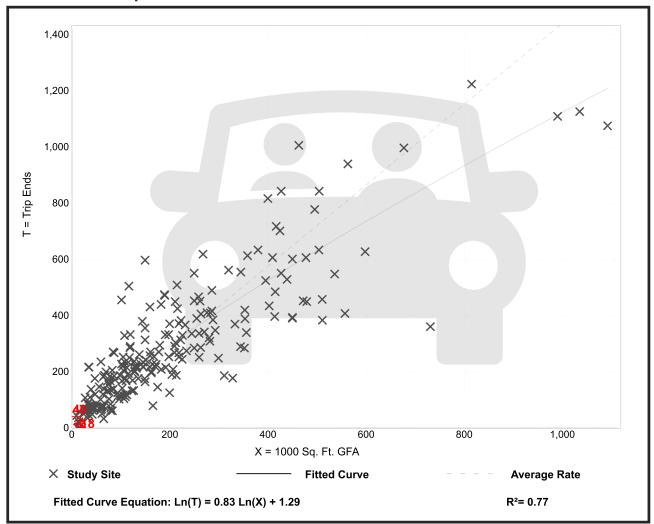
Setting/Location: General Urban/Suburban

Number of Studies: 232 Avg. 1000 Sq. Ft. GFA: 199

Directional Distribution: 17% entering, 83% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 1.44         | 0.26 - 6.20    | 0.60               |



## **General Office Building**

(710)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

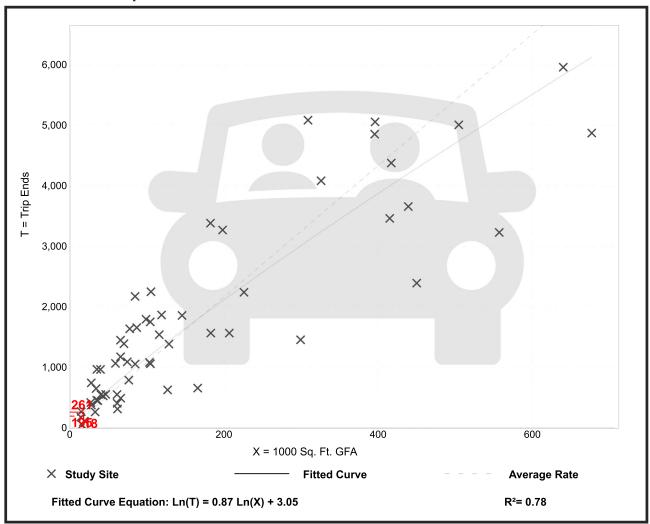
Setting/Location: General Urban/Suburban

Number of Studies: 59 Avg. 1000 Sq. Ft. GFA: 163

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 10.84        | 3.27 - 27.56   | 4.76               |



# **Medical-Dental Office Building - Stand-Alone**

(720)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.

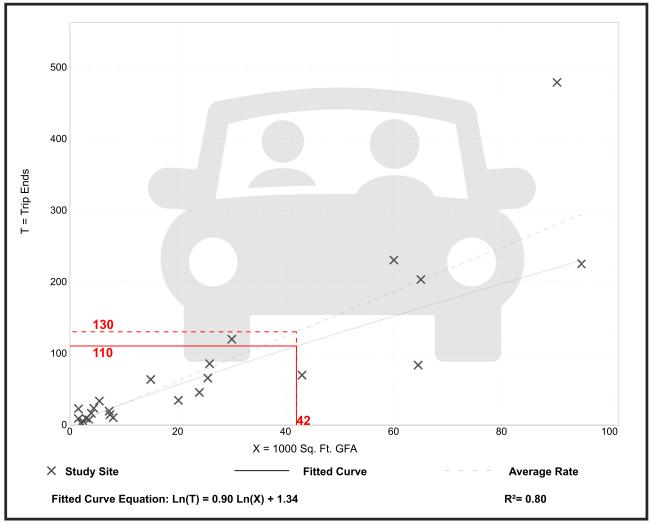
Setting/Location: General Urban/Suburban

Number of Studies: 24 Avg. 1000 Sq. Ft. GFA: 25

Directional Distribution: 79% entering, 21% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 3.10         | 0.87 - 14.30   | 1.49               |



## Medical-Dental Office Building - Stand-Alone

(720)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.

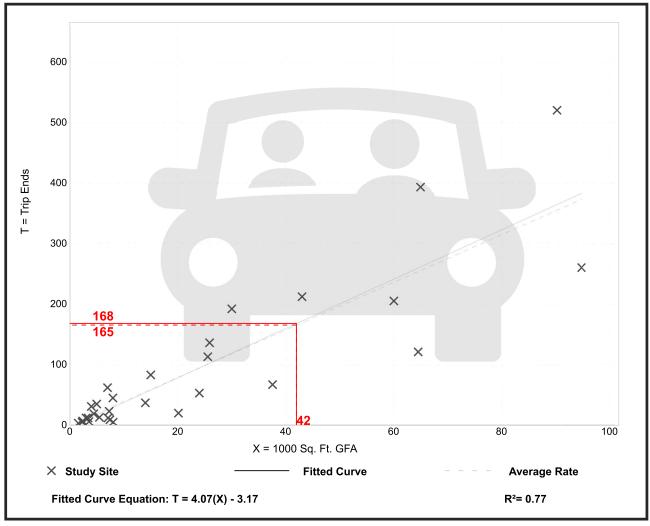
Setting/Location: General Urban/Suburban

Number of Studies: 30 Avg. 1000 Sq. Ft. GFA: 23

Directional Distribution: 30% entering, 70% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 3.93         | 0.62 - 8.86    | 1.86               |



# Medical-Dental Office Building - Stand-Alone

(720)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

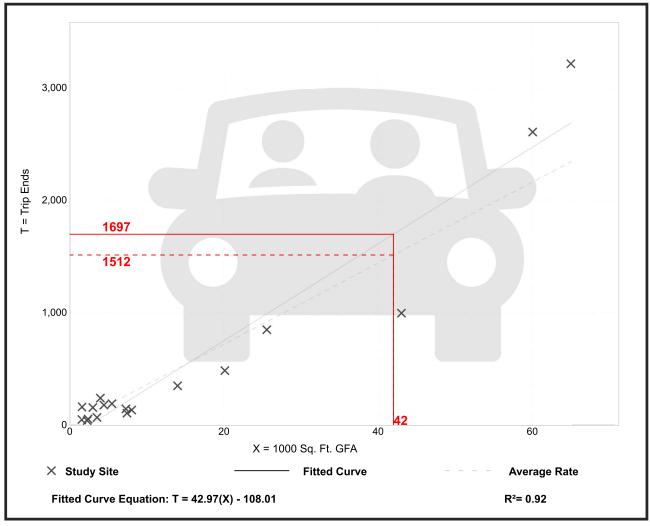
Setting/Location: General Urban/Suburban

Number of Studies: 18 Avg. 1000 Sq. Ft. GFA: 15

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 36.00        | 14.52 - 100.75 | 13.38              |





# **DRAINAGE REPORT**

ALLEN & MAJOR ASSOCIATES, INC.

ASC / Medical Office 360 Corporate Drive Portsmouth, New Hampshire



APPLICANT: ATDG, LLC 7 Sinclair Drive Exeter, NH 03833

### **PREPARED BY:**

Allen & Major Associates, Inc. 400 Harvey Road Manchester, New Hampshire 03103



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### **DRAINAGE REPORT**

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### **APPLICANT:**

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## **PREPARED BY:**

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### **ISSUED:**

August 14, 2023

### **REVISED:**

August 17, 2023

### **A&M PROJECT NO.:**

3250-01

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SECTION 1.0 - OVERVIEW

## **Executive Summary**

The purpose of this drainage report is to provide a detailed review of the stormwater runoff, both quality and quantity, as it pertains to the existing and proposed developed conditions. This report will show by means of narrative, calculations and exhibits that appropriate best management practices have been implemented into the design to mitigate the impacts from the proposed development. This report and following tables demonstrate that there is no increase in total peak rate of runoff from the site for all design storm events.

| Study Point #1 - Wetlands |        |         |         |         |
|---------------------------|--------|---------|---------|---------|
|                           | 2-Year | 10-Year | 25-Year | 50-Year |
| Existing Flow (CFS)       | 1.46   | 5.06    | 8.52    | 12.08   |
| Proposed Flow (CFS)       | 0.98   | 4.19    | 8.36    | 12.08   |
| Change (CFS)              | -0.48  | -0.87   | -0.16   | 0.00    |
| Existing Volume (CF)      | 8,284  | 22,410  | 35,999  | 50,076  |
| Proposed Volume           |        |         |         |         |
| (CF)                      | 6,482  | 20,546  | 35,010  | 50,858  |
| Change (CF)               | -1,802 | -1,864  | -989    | 782     |

| Study Point #2 - Abutter |        |         |         |         |
|--------------------------|--------|---------|---------|---------|
|                          | 2-Year | 10-Year | 25-Year | 50-Year |
| Existing Flow (CFS)      | 0.12   | 0.46    | 0.79    | 1.14    |
| Proposed Flow (CFS)      | 0.12   | 0.40    | 0.67    | 0.94    |
| Change (CFS)             | 0.00   | -0.06   | -0.12   | -0.20   |
| Existing Volume (CF)     | 612    | 1,747   | 2,860   | 4,025   |
| Proposed Volume          |        |         |         |         |
| (CF)                     | 513    | 1,354   | 2,155   | 2,981   |
| Change (CF)              | -99    | -393    | -705    | -1,044  |

| Study Point #3 - Corporate Drive |        |         |         |         |
|----------------------------------|--------|---------|---------|---------|
|                                  | 2-Year | 10-Year | 25-Year | 50-Year |
| Existing Flow (CFS)              | 0.63   | 1.76    | 2.77    | 3.78    |
| Proposed Flow (CFS)              | 0.32   | 1.04    | 1.55    | 1.99    |
| Change (CFS)                     | -0.31  | -0.72   | -1.22   | -1.79   |
| Existing Volume (CF)             | 2,479  | 5,996   | 9,234   | 12,516  |
| Proposed Volume                  |        |         |         |         |
| (CF)                             | 1,291  | 2,990   | 4,461   | 6,180   |
| Change (CF)                      | -1,188 | -3,006  | -4,773  | -6,336  |

| Study Point #4 - International Drive |        |         |         |         |
|--------------------------------------|--------|---------|---------|---------|
|                                      | 2-Year | 10-Year | 25-Year | 50-Year |
| Existing Flow (CFS)                  | 0.07   | 0.34    | 0.62    | 0.92    |
| Proposed Flow (CFS)                  | 0.06   | 0.21    | 0.34    | 0.48    |
| Change (CFS)                         | -0.01  | -0.13   | -0.28   | -0.44   |
| Existing Volume (CF)                 | 491    | 1,541   | 2,606   | 3,738   |
| Proposed Volume                      |        |         |         |         |
| (CF)                                 | 298    | 786     | 1,251   | 1,731   |
| Change (CF)                          | -193   | -755    | -1,355  | -2,007  |

### **Site Location and Description**

The overall project site is comprised of one parcel totaling approximately 6.11± acres. The parcel is listed on the City of Portsmouth's Assessors 315, as Lot 5, and is located at 360 Corporate Drive. The project proposes to develop the site into a 3-story surgical center.

The site is located east of Portsmouth International Airport, north of Great Bay Community College, and west of Hodgson Brook and Route 16. The property was previously developed for the Greater Portsmouth Transportation Management Association; to date, the building has been razed. Currently, the parcel is unoccupied and comprised of 2 existing curb cuts, a paved parking area, lawn, wetlands, and woodlands. The existing tract of land is clear-cut along its frontage on Corporate Drive, with woods and wetlands extending from the centralized portion of the parcel to the rear property line. Elevations on-site range from elevation 61 at the northwest property corner along Corporate Drive to elevation 52 at the southeast property corner, adjacent to the wetland area.

The proposed development consists of the construction of a 3-story surgical center with associated parking. The proposed building has a footprint of 16,700± square feet with gross floor area of 52,400± square feet. The proposed sitework incorporates various walls to protect the existing wetland resources on site and utilize the developable area. A total of 124 spaces are provided for the building. The proposed condition of the site accommodates loading and delivery areas for building operations.

The underlying soils were identified using the USDA Natural Resources Conservation Service (NRCS) soil survey for Rockingham County. The site is shown to primarily have a soil type of Urban Land which does not have a classified Hydrologic Soil Group. A copy of the NRCS Soil Report is included in the Appendix of this report.

| Symbol | Soil Taxonomic Name                | Hydrologic<br>Soil Group |
|--------|------------------------------------|--------------------------|
| 699    | Urban Land                         | -                        |
| 700    | Urban Land-Canton Complex, 3 to 15 |                          |
| 799    | percent slopes                     | _                        |

The saturated hydraulic conductivity (Ksat) rate assigned in the NRCS Report for Chatfield-Hollis-Canton Complex soils, which are soils identified adjacent to the site in the NRCS report, were utilized for the design infiltration rate on the site. These soils are consistent in composition with what was observed in the test pits performed by A&M and during the site-specific survey, described below. The Ksat value of this soil is 10.19 micrometers per second. This value was converted to 1.44 inches per hour which was assigned a 2x safety factor to achieve the design infiltration rate of 0.72 inches per hour. Additional soil information is provided in the NRCS Soil Report within the appendix of this report.

A site-specific soil survey was performed by TES Environmental Consultants, on August 9, 2023, to determine the on-site soil classification. It was determined that the uplands on site are predominantly hydrologic soil group "B", and include Canton fine sandy loam, Newfields fine sandy loam, and Udorthents, loamy soils. The wetland soils are hydrologic soil type "C" and are classified as Squamscott fine sandy loam. The site-specific soil survey was used for determining the Hydrologic Soil Group for the development. Please see the appendix section for the Hydrologic Soil Plans used for the drainage design. The TES Environmental Consultants survey classified the onsite soils as the following:

#### SITE SPECIFIC SOIL MAP UNIT KEY

|            |                            | Slope  | Drainage        | HISS    | Hydrologic |
|------------|----------------------------|--------|-----------------|---------|------------|
| Symbol*    | Map Unit                   | Class  | Class           | Symbol  | Soil Group |
| 42B        | Canton fine sandy loam     | 0-8%   | Well            | 221BH   | В          |
| 42C        | Canton fine sandy loam     | 8-15%  | Well            | 221CH   | В          |
| 444B       | Newfields fine sandy loam  | 0-8%   | Moderately well | 321BH   | В          |
| 444C       | Newfields fine sandy loam  | 8-15%  | Moderately well | 321CH   | В          |
| 500B/ccabb | Udorthents, loamy          | 0-8%   | Well            | 261BH   | В          |
| 500C/ccabb | Udorthents, loamy          | 8-15%  | Well            | 261CH   | В          |
| 500D/ccabb | Udorthents, loamy          | 15-25% | Well            | 261DH   | В          |
| 500E/ccabb | Udorthents, loamy          | 25% +  | Well            | 261EH   | В          |
| 500B/hchbb | Udorthents, loamy          | 0-8%   | Undeterminable  | 761BH** | B**        |
| 538B       | Squamscott fine sandy loam | 0-8%   | Poorly          | 551BH   | C          |
| 921B       | Newfields Variant (SPD)    | 0-8%   | Somewhat poorly | 421BH   | С          |

<sup>\*</sup> Refer to accompanying report for 5-unit supplemental symbol explanation.

<sup>\*\*</sup> Assumed based upon adjacent soils without impervious surfaces.

A stormwater analysis has been performed for two project site situations. The first analysis consists of the existing site conditions and the second consists of the proposed site conditions. There are four study points where the stormwater flows were analyzed. The study points and contributing watersheds are further outlined in the accompanying text and calculations.

#### Site Data for Stormwater Modeling

The proposed project will disturb approximately 181,000 square feet. This disturbance includes the construction of the proposed building, parking and drive aisles, utility improvements, and stormwater management BMP's.

The proposed watershed is comprised of approximately 90,058 square feet of impervious an increase of 72,916 square feet from the existing conditions. This impervious area includes roof cover, pavement, and sidewalks. Rainfall data used for modeling the stormwater runoff was derived from the "Extreme Precipitation Tables" from the Northeast Regional Climate Center at Cornell University. The design storm events utilized in this analysis are the 2, 10, 25, and 50-year storms. Per Env-Wq 1503.08(I), a 15% multiplier was applied to the storm events because the site is within a Coastal and Great Bay Community.

#### **Existing Site Conditions**

Stormwater runoff exits the site to four (4) different study point locations. To exhibit no increase in runoff to these points, stormwater runoff flows were analyzed at these four "Study Points." The included Existing Watershed Plan (EWS-1) outlines the boundaries and contributing watershed for the Study Points.

- 1. Study Point 1: This study point is located at the existing wetland. It is examining the contributing flow from the centralized portion of the site that discharges to the wetland area on site.
- 2. Study Point 2: This study point is located at the 320 Corporate Drive property. It is examining the contributing flow from the southern portion of the site which travels off site, to the abutter. The stormwater which flows to this study point will be captured within the drainage network of the abutting parcel.
- 3. Study Point 3: This study point is located at the Corporate Drive roadway. It is examining the contributing flow from the western portion of the site along the frontage of the property. The stormwater which flows to this study point will be

managed by the existing stormwater management facilities within the Corporate Drive right-of-way.

4. Study Point 4: This study point is located at the International Drive roadway. It is examining the contributing flow from the northeastern portion of the site. The stormwater which flows to this study point will be managed by the existing stormwater management facilities within the International Drive right-of-way.

#### **Proposed Site Conditions**

The project proposes to construct a 16,700± square foot surgical center with associated parking, lighting, utilities, and stormwater infrastructure. The proposed stormwater management facilities have been designed to control the runoff using a combination of structural and non-structural best management practices (BMPs). Runoff from the rear parking lots will be collected by deep sump catch basins, and Nyloplast drains, and directed to Infiltration System #1 or #2. These systems are comprised of Stormtech SC-310 chambers which are backfilled and surrounded with coarse washed stone. The runoff is pretreated when entering these systems through the isolator row, which is lined with filter fabric to trap sediment and debris. The majority of the roof runoff is also directed to these two systems which have been designed to infiltrate the water quality volume per Env-Wg 1504.10. Runoff beyond the water quality volume will overflow to a rip rap apron. Runoff from the front roof canopy and a portion of the front parking lot will be directed to Infiltration System #3. This system is comprised of Stormtech SC-160LP chambers and backfilled with coarse washed stone. This system is designed to infiltrate the water quality volume. Due to the location of this system, it has not been designed with an overflow. Therefore, the system has been designed to infiltrate all runoff which is directed to it, up to and including the 50-year storm event. Runoff from the remainder of the parking lot will sheet flow over the pavement to one of several Rain Guardian Turret devices before entering one of four sediment forebays which overflow to one of four bioretention systems. The Turret is a precast concrete curb inlet structure with a grate and filter screen which traps trash and large debris. The sediment forebays provide pretreatment of the runoff before entering the bioretention systems. The bioretention systems have been designed to infiltrate the required water quality volume. Runoff from the loading dock area will be collected by a deep sump catch basin and treated by a proprietary filter (Jellyfish) before discharge to a rip rap apron.

A hydrologic study of the site was conducted to determine the impact of the proposed development on the existing stormwater runoff. The study determined the rate of runoff at these study points have decreased or remain unchanged. The included Proposed Watershed Plan (PWS-1) outlines the boundaries and contributing watershed for the Study Points.





#### Methodology

The peak discharge rates were determined using techniques and data found in the following:

- 1. <u>Urban Hydrology for Small Watersheds Technical Release 55</u> by the United States Department of Agriculture Soils Conservation Service, June 1986. Runoff curve numbers and 24-hour precipitation values were obtained from this reference.
- 2. <u>HydroCAD<sup>©</sup> Stormwater Modeling System</u> by HydroCAD Software Solutions, LLC, version 10.20-3c. The HydroCAD program was used to generate the runoff hydrographs for the watershed areas, to determine discharge, stage, and storage characteristics for the bioretention system, to perform drainage routing and to combine the results of the runoff hydrographs.
- 3. <u>Soil Survey of Rockingham County, New Hampshire</u> by the United States Department of Agriculture, Natural Resources Conservation Services (NRCS). Soil types and boundaries were obtained from this reference.

#### **Peak Discharge Rates**

The stormwater runoff analysis of the existing and proposed conditions includes an estimation of the peak discharge rate from various rainfall events. Peak discharge rates were developed using TR-55 Urban Hydrology for Small Watersheds, developed by the United States Department of Commerce, Engineering Division and the HydroCAD 10.20 computer program. Further, the analysis has been prepared in accordance with the New Hampshire Stormwater Management Manual and standard engineering practices. The peak discharge rate has been estimated for each watershed during the 2, 10, 25, and 50-year storm events.

The stormwater runoff model shows that the proposed site design results in no increase in the total rate of runoff during all storm events. This is accomplished through the construction of the three infiltration systems and four bioretention systems. The table in *Section 1: Executive Summary* provides a summary of the estimated peak discharge rates for each study point during each of the design storm events. The HydroCAD worksheets for the existing and proposed drainage conditions are included within Sections 5 and 6 of this report.

#### **Performance Standards**

Stormwater performance standards have been implemented as part of the overall stormwater management plan for the proposed development. The goal of these standards is to improve water quality and protect the waters of New Hampshire from adverse impacts due to development. The performance standards are met by implementing appropriate Best Management Practices (BMPs). BMPs were designed in accordance with the NH Stormwater Management Manual and Env.Wq. 1500.

BMPs implemented in the design include:

- Deep sump catch basins
- Subsurface infiltration systems
- Rain Guardian Turret curb inlets
- Sediment Forebays
- Bioretention Systems
- Proprietary filter device (Jellyfish)
- Specific maintenance schedule

#### **Water Quality Volume (WQV)**

The Water Quality Volume (WQV) is the amount of stormwater runoff from a rainfall event that should be captured and treated to remove the majority of stormwater pollutants on an average annual basis. The recommended WQV is the volume of runoff associated with the first one-inch of rainfall, which is equivalent to capturing and treating the runoff from the 90th percentile of all rainfall.

The WQV has been calculated for the proposed site development and adequate treatment is proposed within the Infiltration System. Refer to Appendix Section 7.8 for NHDES BMP Worksheets for specific requirements.

#### **Water Quality Flow (WQF)**

The Water Quality Flow (WQF) is used to determine a flow rate associated with the WQV, for sizing flow-based treatment and pre-treatment practices.

The WQF has been calculated for the treatment train for the proposed work. Refer to Appendix Section 7.8 for NHDES BMP Worksheets for specific requirements.

#### **Groundwater Recharge Volume (GRV)**

The purpose of the groundwater recharge volume criterion is to protect groundwater resources by minimizing the loss of annual pre-development groundwater recharge as a result of the proposed development.

The required Groundwater Recharge Volume (GRV) should be based on the site soils and the following equation:

$$GRV = (A_I)(Rd)$$

#### Where:

 $A_{l}$  = the total effective area of impervious surfaces that will exist on the site after development

Rd = the groundwater recharge depth based on the USDA/NRCS hydrologic soil group, as follows:

|       | Imperviou | ıs Area For G | GRV                                |                      | AoT Requiremen       | it            |
|-------|-----------|---------------|------------------------------------|----------------------|----------------------|---------------|
| HSG   | Existing  | Proposed      | $\mathbf{A}_{\mathbf{I}_i}$ Change | <b>Rd</b> , Recharge | <b>Rd</b> , Recharge | Recharge      |
| 1130  | Area (SF) | Area (SF)     | (SF)                               | Depth (inches)       | Depth (feet)         | Required (CF) |
| Α     | 0         | 0             | 0                                  | 0.40                 | 0.0333               | 0             |
| В     | 17,142    | 90,023        | 72,881                             | 0.25                 | 0.0208               | 1,518         |
| C     | 0         | 35            | 35                                 | 0.10                 | 0.0083               | 0             |
| D     | 0         | 0             | 0                                  | 0.00                 | 0.0000               | 0             |
| Total | 17,142    | 90,058        | 72,916                             |                      |                      | 1,519         |

#### Recharge required = 1,519 ft<sup>3</sup>

#### **Provided**

Recharge provided:

 $1,582 \text{ ft}^3 \text{ (IS1)} + 4,514 \text{ ft}^3 \text{ (IS2)} + 2,057 \text{ ft}^3 \text{ (IS3)} + 2,429 \text{ ft}^3 \text{ (Bioretention 1)} + 425 \text{ ft}^3 \text{ (Bioretention 2)} + 5,898 \text{ ft}^3 \text{ (Bioretention 3)} + 2,057 \text{ ft}^3 \text{ (Bioretention 4)}$ 

= 17,994 ft<sup>3</sup> (provided) > 1,519 ft<sup>3</sup> (required)

See stage storage plots within the calculation pages in the appendix of this report.

#### **Explanation of Drainage System**

#### References:

- New Hampshire Stormwater Management Manual, Volumes 2 & 3, December 2008 and Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas In New Hampshire
- 2. **SCS TR55** (Second Ed., 1986) for runoff curve numbers.

Stormwater runoff is collected in various catch basins, curb inlet structures, and roof drains that are placed throughout the site. Runoff is then routed to an infiltration or bioretention system before recharge or discharge. The 2, 10, 25, and 50-year storm events were analyzed for existing versus proposed conditions (see Drainage Summary). See complete results in the Appendix.

#### **Deep Sump Catch Basin & Nyloplast Drains:**

Deep sump catch basins are proposed on site in order to catch and route runoff to various stormwater systems.

#### **Roof Drain:**

Roof drains are located on the buildings to capture and route clean stormwater runoff.

#### **Infiltration Systems:**

Two Stormtech SC-310 and one SC-160LP infiltration systems by ADS will be utilized to capture, treat, and infiltrate stormwater.

#### **Rain Guardian – Turret:**

The Rain Guardian – Turret is a concrete structure with inlet grate to capture trash and debris prior to discharge to the bioretention systems.

#### **Sediment Forebay:**

Sediment forebays are shallow depressions which receive runoff from the Turret structures and are placed upstream of the bioretention systems to provide pretreatment.

#### **Bioretention System:**

Four bioretention systems are proposed to collect and filter stormwater runoff using conditioned planting soil beds, gravel beds and vegetation within a shallow depression.

#### **Proprietary Filter Device (Jellyfish):**

The Jellyfish filtering device uses high flow rate membrane filtration to remove a high level and a wide variety of stormwater pollutants.





# SECTION 3.0 OPERATION AND MAINTENANCE PLAN



#### **General Information**

Allen & Major Associates, Inc. has prepared the following Operation and Maintenance Plan for the ASC / Medical Office project located at 360 Corporate Drive, Portsmouth, NH. The plan is broken down into the following major sections. The first section gives general information about ownership and responsibility (General Information). The next section describes the erosion and sediment control measures used during construction (Construction Period). The third section describes the long-term pollution prevention measures (Long Term Pollution Prevention Plan). The last section describes the maintenance requirements for the stormwater management practices (Maintenance Plan).

**Contact Information Stormwater Management System Owner:** 

ATDG, LLC 7 Sinclair Drive Exeter, NH 03833 603-799-6787

#### Notification Procedures for Change of Responsibility for O&M

The Stormwater Management System (SMS) for this project is owned by ATDG, LLC. The owner shall be legally responsible for the long-term operation and maintenance of this SMS as outlined in this Operation and Maintenance (O&M) Plan. Should ownership of the SMS change, the owner will continue to be responsible until the succeeding owner shall notify the City and Pease Development Authority (PDA) that the succeeding owner has assumed such responsibility. Upon subsequent transfers, the responsibility shall continue to be that of transferring owner until the transferee owner notifies the City of Portsmouth and Pease Development Authority of its assumption of responsibility.

In the event the SMS will serve multiple lots/owners, such as the subdivision of the existing parcel, the owner(s) shall establish an association or other legally enforceable arrangements under which the association or a single party shall have legal responsibility for the operation and maintenance of the entire SMS.



#### **Construction Period**

- 1. Contact the City of Portsmouth's Engineering Department and Pease Development Authority at least two (2) weeks prior to start of construction.
- 2. Install the catch basin filters (silt sacks) and tubular barriers as shown on the Site Preparation Plan.
- 3. Site access shall be achieved only from the designated construction entrances.
- 4. All erosion control measures shall be inspected weekly and after all rainfall events exceeding 0.25" and shall be maintained, repaired, or replaced as required or at the direction of the owner's engineer, the City's Engineer, or the Pease Development Authority's Engineer.
- 5. Sediment accumulation up-gradient of the tubular sediment barrier greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.
- 6. Catch basin filters shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sacks shall be replaced if torn or damaged.
- 7. The contractor shall comply with the General and Erosion Notes listed on the Site Development Plans.

#### **Post-Development Activities**

- Upon completion of all terrain alteration activities that direct stormwater to a particular practice, the responsible party shall initiate the O&M activities.
- 2. Paved Areas Paved areas should be swept as part of the routine site maintenance. Pavement sweeping is an excellent source control for sedimentation to the existing drainage system and is typically performed in the spring of each year following the snow melt.
- 3. Paved Areas Salt for de-icing on the paved areas during the winter months shall be limited to the minimum amount practicable. Sand containing the minimum amount of calcium chloride (or approved equivalent) needed for handling may be applied as part of the routine winter maintenance activities.



- 4. All sediments removed from site drainage facilities shall be disposed of properly, and in accordance with applicable local and state regulations.
- 5. All vegetated areas on the site shall be stabilized and maintained to control erosion. Any disturbed areas shall be re-seeded as soon as practicable.
- 6. Work within any drainage structures shall be performed in accordance with the latest OSHA regulations, and only by individuals with appropriate OSHA certification.
- 7. Maintenance Responsibilities All post-construction maintenance activities shall be documented and kept on file and made available to the proper City, PDA, and State authorities upon request.
- 8. If ownership of the property is transferred, the new owner(s) shall become the responsible party.

#### **Long-Term Pollution Prevention Plan**

The Long-Term Pollution Prevention Plan (LTPPP) has been prepared and incorporated as part of the Operation and Maintenance of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures for the LTPPP.

#### Housekeeping

The proposed site development has been designed to maintain a high level of water quality treatment for all stormwater discharge and groundwater. An Operation and Maintenance (O&M) plan has been prepared and is included in this section of the report. The Owner (or its designee) is responsible for adherence to the O&M plan in a strict and complete manner.

#### **Storing of Materials and Waste Products**

There are no proposed exterior (un-covered) storage areas. The trash and waste program for the site includes a dedicated space adjacent to the building for waste & recyclables.

#### **Vehicle Washing**

Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions, as the detergent-rich water used to wash the grime off the vehicle enters the stormwater drainage system. The proposed site

improvements do not have accommodations for outdoor car washing. Vehicle washing is not an allowable stormwater discharge under PDA's NPDES Permit with the EPA.

#### Maintenance of Lawns, Gardens and other Landscaped Areas

It should be recognized that this is a general guideline towards achieving high quality and well-groomed landscaped areas. The grounds staff / landscape contractor must recognize the shortcomings of a general maintenance plan such as this and modify and/or augment it based on weekly, monthly, and yearly observations. In order to ensure the highest quality conditions, the staff must also recognize and appreciate the need to be aware of the constantly changing conditions of the landscaping and be able to respond to them on a proactive basis. No trash or landscape debris (including lawn clippings) shall be stored or dumped within the landscaped or naturalized areas.

#### Fertilizer

Maintenance practices should be aimed at reducing environmental, mechanical and pest stresses to promote healthy and vigorous growth. When necessary, pest outbreaks should be treated with the most sensitive control measures available. Synthetic chemical controls should be used only as a last resort to organic and biological control methods. Fertilizer, synthetic chemical controls, and pest management applications (when necessary) shall be performed only by licensed applicators in accordance with the manufacturer's label instructions when environmental conditions are conducive to controlled product application.

Only slow-release organic fertilizers should be used in the landscaped areas to limit the amount of nutrients that could enter downstream resource areas. Fertilization of developed areas on site will be performed within manufacturers labeling instructions and shall not exceed an NPK ratio of 1:1:1 (i.e. Triple 10 fertilizer mix), considered a low nitrogen mixture. Additionally, the fertilizer will include a slow release element.

#### **Suggested Aeration program**

In-season aeration of lawn areas is good cultural practice and is recommended whenever feasible. It should be accomplished with a solid thin tine aeration method to reduce disruption to the use of the area. The depth of solid tine aeration is similar to core type but should be performed when the soil is somewhat drier for a greater overall effect.

Depending on the intensity of use, it can be expected that all landscaped lawn areas will need aeration to reduce compaction at least once per year. The first operation should occur in late May following the spring season. Methods of reducing compaction will vary based on the nature of the compaction. Compaction on newly

established landscaped areas is generally limited to the top 2-3" and can be alleviated using hollow core or thin tine aeration methods.

#### Landscape Maintenance Program Practices:

#### Lawn

- 1. Mow a minimum of once a week in spring, to a height of 2" to 2 1/2" high. Mowing should be frequent enough so that no more than 1/3 of the grass blade is removed at each mowing. The top growth supports the roots; the shorter the grass is cut, the less the roots will grow. Short cutting also dries out the soil and encourages weeds to germinate.
- 2. Mow approximately once every two weeks from July 1<sup>st</sup> to August 15<sup>th</sup> depending on lawn growth.
- 3. Mow on a ten-day cycle in fall, when growth is stimulated by cooler nights and increased moisture.
- 4. Do not remove grass clippings after mowing.
- 5. Keep mower blades sharp to prevent ragged cuts on grass leaves, which cause a brownish appearance and increase the chance for disease to enter a leaf.

#### Shrubs

- 1. Mulch not more than 3" depth with shredded pine or fir bark.
- 2. Hand prune annually, immediately after blooming, to remove 1/3 of the above-ground biomass (older stems). Stem removals are to occur within 6" of the ground to open up shrub and maintain two-year wood (the blooming wood).
- Hand-prune evergreen shrubs only as needed to remove dead and damaged wood and to maintain the naturalistic form of the shrub. Never mechanically shear evergreen shrubs.
- 4. Fertilize with ½ lb. slow-release fertilizer (see above section on Fertilizer) every second year.

#### Trees

- 1. Provide aftercare of new tree plantings for the first three years.
- 2. Do not fertilize trees, it artificially stimulates them (unless tree health warrants).
- 3. Water once a week for the first year; twice a month for the second; once a month for the third year.
- 4. Prune trees on a four-year cycle.

#### **Management of Deicing Chemicals and Snow**

Snow shall only be stockpiled on site. If the stockpiles of snow do not fit then snow will be disposed off-site. It will be the responsibility of the snow removal contractor to properly dispose of transported snow according NHDES. It will be the responsibility of

the snow removal contractor to follow these guidelines and all applicable laws and regulations.

The owner (or its designee) will be responsible for the clearing of the sidewalk and building entrances. The Owner may be required to use a de-icing agent such as potassium chloride to maintain a safe walking surface; however, these are to be used at the minimum amount practicable. The de-icing agent for the walkways and building entrances will be kept within the storage rooms located within the buildings. De-icing agents will not be stored outside.

To address the concerns associated with the application of chlorides and other deicing materials, NHDES recommends the development of a Road Salt and Deicing Minimization Plan when a development will create one acre or more of pavement, including parking lots and roadways. A component of the plan should include tracking the use of salt and other deicers for each storm event and compiling salt use data annually. Snow and ice management operators shall be Green SnowPro certified, trained and certified as a New Hampshire salt applicator, in accordance with Env-Wq 2203, and the UNH Technology Transfer Center online tool (<a href="http://www.roadsalt.unh.edu/Salt/">http://www.roadsalt.unh.edu/Salt/</a>).

In the spring, following snow melt, the pavement on site should be swept, with special attention paid to locations where snow was stockpiled. Snow stockpiles can contain higher sediment loads to due sanding and plowing operations, so these areas may require more sweeping than other areas. In addition to sweeping, following the snow melt, the grounds should be inspected for sediment and debris, with special attention paid to the landscaping along the perimeter of the parking areas as well as along the toe of slopes adjacent to parking areas, where debris might collect.

#### **Maintenance Plan**

#### **Documentation**

Maintenance documents shall include a completed maintenance checklist (attached) that will include any applicable notes or other documents as described in this section.

#### **Operation and Maintenance Schedule Summary**

The following is a summary of the maintenance schedule for each of the stormwater BMPs. Note all anomalies, signs of degradation, or corrective actions on the annual Maintenance Checklist.

#### **Rain Guardian - Turret:**

The Rain Guardian Turret is a concrete curb-inlet device that discharges to a bioretention system. It is recommended that the Rain Guardian - Turret be inspected at least twice per year. If observed, remove trash and debris at each inspection. Replace the grate if damaged.

#### **Deep Sump Catch Basins and Nyloplast Drains:**

These consist of a man-hole type structure that contains inlet and or outlet pipes to further advance stormwater through the proposed drainage system. The size of the pipes and invert elevations vary throughout the project site. The catch basins utilize an inlet grate that is flush to grade to capture runoff and sediment, passing the water through the system and capturing the sediment to be removed. The sediment that accumulates within the bottom of the structures needs to be cleaned periodically, before it reaches a depth of 2' or 50% of its capacity.

#### **Sediment Forebays:**

The design proposes four sediment forebays which discharge to the bioretention systems. Maintenance of sediment forebays includes:

- Inspection at least annually
- Conduct periodic mowing of embankments (generally two times per year) to control growth of woody vegetation on embankments
- Remove debris from outlet structures at least once annually
- Remove and dispose of accumulated sediment based on inspection

#### **Bioretention Area:**

It is recommended that the bioretention systems and their overflow devices be inspected at least twice per year and with any rainfall event exceeding 2.5 inches in a 24-hour period. Trash and debris observed in the bioretention area (if any) shall be removed.

The Owner or its designee shall keep records of the maintenance of the Stormwater BMPs on a yearly basis. Maintenance documents shall include a completed maintenance checklist.

#### **Proprietary Filter Device (Jellyfish)**

It is recommended that the Jellyfish be inspected quarterly during the first year of operation. The frequency of inspections during subsequent years shall be based on the plan developed during that first year. It is recommended the device be inspected after



any rainfall event exceeding 2.5 inches in a 24-hour period. The device shall be cleaned as directed by the manufacturer. An inspection and maintenance document is provided herewith.

#### **Supplemental Information**

- Operation and Maintenance Plan Schedule
- Operation and Maintenance Plan Log Form (During Construction)
- Operation & Maintenance Figure
- Anti-Icing Log Form
- UNH Extension Mechanical Control of Terrestrial Invasive Plants
- Isolator® Row Plus O&M Manual
- Jellfish® Filter Maintenance Guide

#### **OPERATION AND MAINTENANCE PLAN SCHEDULE**



Project: 3250-01

Project Address: Surgical Center - 360 Corporate Drive, Portsmouth, NH

Responsible for O&M Plan: ATDG, LLC Address: 7 Sinclair Drive, Exeter, NH 03833

Phone: (603) 799-6787

All information within table is derived from New Hampshire Stormwater Manual: Chapter 4, Sections 3 and 4

| ВМР                    | BMP OR MAINTENANCE   | SCHEDULE/  | derived from New Hampshire Stormwater Manu  NOTES  | ESTIMATED<br>ANNUAL | INSPECTION PERFORMED |  |
|------------------------|--|--|--|---------------------|----------------------|--|
| CATEGORY               | FREQUENCY ACTIVITY FREQUENCY   |  | MAINTENANCE<br>COST  | DATE:               | BY:                  |  |
| T PRACTICES            | PROPRIETARY<br>FILTER DEVICE<br>(JELLYFISH)  | Inspect quarterly, or more frequently as recommended by manufacturer. It is recommended that the unit be cleaned at least once per year.                               | Remove and legally dispose of floating debris at each inspection. Remove sediment when it reaches level specified by manufacturer. Remove floating hydrocarbons immediately whenever detected by inspection.   | \$2,000             |                      |  |
| PRETREATMENT PRACTICES | DEEP SUMP<br>CATCH BASINS &<br>NYLOPLAST<br>DRAINS                                   | May require frequent<br>maintenance. It is<br>recommended that<br>catch basins be<br>inspected at least twice<br>annually.   | Sediment should be removed when it approaches half the sump depth. If floating hydrocarbons are observed the material should be removed immediately. Damaged hoods should be replaced when noted by inspection.  | \$1,000             |                      |  |
| TREATMENT PRACTICES    | UNDERGROUND<br>INFILTRATION<br>SYSTEMS   | Inspect at least twice<br>annually and with any<br>rainfall event exceeding<br>2.5 inches in a 24-hour<br>period.  | Removal of debris from inlet and outlet structures. Removal of accumulated sediment. Inspection and repair of outlet structures and appurtenances. If system does not drain within a 72-hour period following a rainfall event, a professional should assess the facility's condition. | \$1,000             |                      |  |
| TREATMEN <sup>.</sup>  | BIORETENTION<br>SYSTEM<br>(includes Turret<br>curb-inlets &<br>sediment<br>forebays) | Inspect at least twice<br>annually and with any<br>rainfall event exceeding<br>2.5 inches in a 24-hour<br>period.  | Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection. Annually the system should be inspected for drawdown time. Trash and debris should be removed at each inspection.                                   | \$2,000             |                      |  |
| OTHER MAINTENANCE      | SNOW STORAGE   | Clear and remove snow<br>to approved storage<br>locations as necessary to<br>ensure systems are<br>working properly and<br>are protected from<br>meltwater pollutants. | Carefully select snow disposal sites before winter. Avoid dumping removed snow over catch basins, or in detention ponds, sediment forebays, rivers, wetlands, and flood plains. It is also prohibited to dump snow in the bioretention basins or gravel swales.                        | \$500               |                      |  |
| OTHER M/               | STREET<br>SWEEPING   | Clear accumulations of<br>winter sand in parking<br>lots and along roadways<br>at least once a year,<br>preferably in the spring.                                      | Sweep, power broom or vacuum paved areas. Submit information that confirms that all street sweepings have been completed in accordance with state and local requirements   | \$2,000             |                      |  |

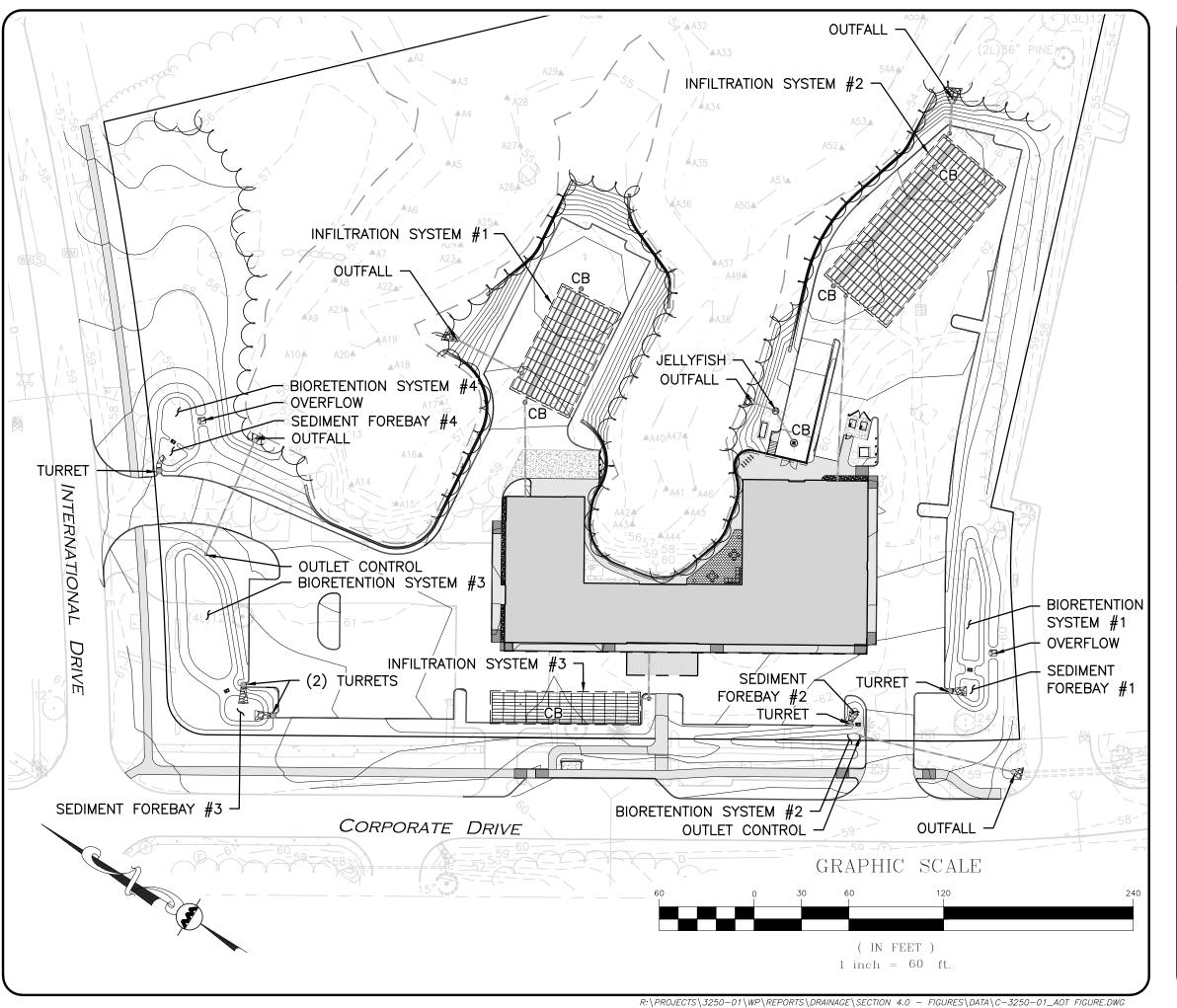
# SURGICAL CENTER 360 CORPORATE DRIVE PORTSMOUTH, NH

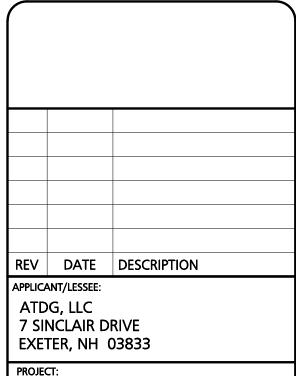
#### MAINTENANCE LOG FORM

| INSPECTOR:                          |                                   | _   |           |                               |
|-------------------------------------|-----------------------------------|---|-----------|-------------------------------|
| DATE MAINTENAN                      | ICE PERFORMED:                    |   |           |                               |
| INSPECTOR'S QUA                     | LIFICATIONS:                      |   |           |                               |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
|                                     | M                                 | AINTENANCE LOG  |           |                               |
| TYPE OF<br>MAINTENANCE<br>PERFORMED | DATE SINCE<br>LAST<br>MAINTENANCE | STAFF MEMBER<br>OR CONTRACTOR<br>WHO PERFORMED<br>MAINTENANCE | CONDITION | ISSUE<br>RESOLVED<br>(YES/NO) |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
| FOLLOW-UP REQU                      | IRED:                             |   |           | <u> </u>                      |
|                                     |                                   |   |           |                               |
|                                     |                                   |   |           |                               |
| TO BE PERFORMED                     | ) BY:                             | ON OR BEF   | ORE:      |                               |

#### NOTES:

- 1. Attach copies of maintenance work orders.
- 2. Owner must keep a minimum of the past 7 years of inspections / operations and maintenance records onsite.





#### ASC / MEDICAL OFFICE **360 CORPORATE DRIVE** PORTSMOUTH, NH

PROJECT NO. 3250-01 DATE: 08-14-23 SCALE: 1" = 60' DWG. NAME: C3250-01-FIGURES

SM CHECKED BY: **DESIGNED BY:** 

PREPARED BY ALLEN & MAJOR ASSOCIATES, INC.

civil engineering + land surveying nvironmental consulting + landscape architecture

400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500

FAX: (603) 627-5501 WOBURN, MA◆LAKEVILLE, MA◆MANCHESTER, NH

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DRAWING TITLE: **OPERATION &** 

MAINTENANCE FIGURE

SHEET No.

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### **Mechanical Control of Terrestrial Invasives Plants**

Mechanical control strategies for managing terrestial invasive plants.

The best tools and techniques for controlling invasive plants will be determined by a site's characteristics, the type of plants present, the size of the infestation, and the resources available to implement a control plan. Since each invasive plant species responds to a given control method differently, it is important to determine which methods are best suited to a situation. Often a combination of control techniques is needed, including mechanical, chemical or biological techniques.

Here we focus on prevention and mechanical methods, which are common techniques used at the start of a project, and techniques that can work on a range of projects from small to large.



It's important to begin a project with a goal in mind, in this case clearing a treeline to allow native shrubs and seedlings to thrive.

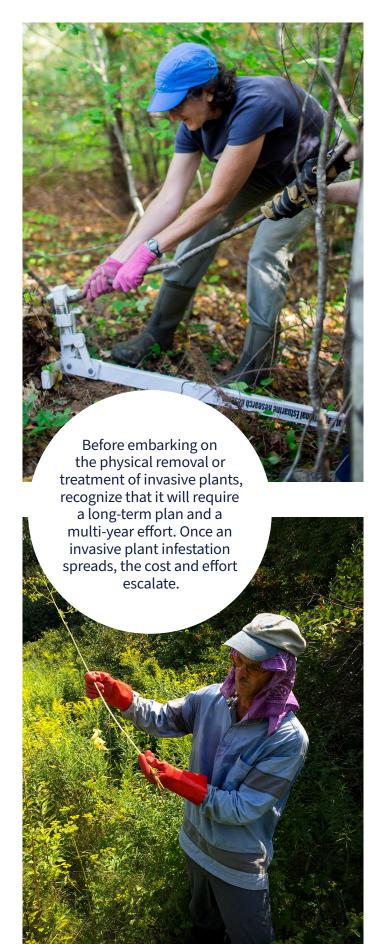
#### **Prevention**

Preventing invasive plants from getting a foothold is always the best strategy of control. It is fairly easy to snuff out a small population of invasive plants, but once the infestation spreads, the cost and effort needed to control the plants escalates and they become harder to remove. This is the idea behind "early detection and rapid response."

A major avenue for invasive plants spreading is via materials moved around by humans. A seed or fragment of an invasive plant can stow away in a potted plant or in haybales, in mulch, soil, gravel or other material, or on boots or clothing. Invasive plants can be inadvertently moved along roadsides by mowers, graders, or plows.

#### Here are some strategies to prevent invasive plants from hitching a ride to new areas:

- Know the source of purchased plants to ensure the soil is free of invasive plant material
- Compost food waste, leaves, and grass clippings and make your own wood chips to reduce the need to buy mulch, which may contain invasive seeds
- When buying or selling haybales, ask the farmer about invasive plants in their fields
- When building trails, use on-site rocks, soil, sand, and gravel whenever possible
- Consult with your town's Department of Public Works to ensure they use local materials when possible, have roadside mowing protocols for invasive plants, and employ other best practices to prevent invasive plant spread
- · Consult with your town planner to ensure zoning ordinances require developers to pay attention to invasive plants
- · When working around invasive plants, clean off tools and shoes before moving to another location, and avoid wearing clothing (such as fleece) that enables seeds to stick to you and catch a ride



#### **Mechanical Control**

Mechanical removal can be very labor intensive and may create significant site disturbance. Before embarking on the physical removal or treatment of invasive plants, recognize that it will require a long-term plan and a multi-year effort. Otherwise, efforts may not succeed and may even get worse. "Picking Our Battles: A Guide to Planning Successful Invasive Plant Projects" published by the New Hampshire Fish and Game Department is helpful in crafting a plan. Mechanical methods for controlling invasive plants usually do not require special permits or licensing. However, there are a few situations, such as around historical foundations or in wetland areas, where mechanical control requires special care and in some cases a permit if disturbing soil in sensitive areas.

Your on-site project goal when conducting mechanical control will usually be to halt seed production of the invasive plants, which can remain viable for years. The seed bank in the soil already dictates a multi-year project. Without halting seed production, the project timeframe will continue to stretch into the future. There is a lot to consider even before pulling or digging any plants. Have a vison for the future and find incremental successes along the way.

Plants that are pulled, dug, or cut should be piled on site. Depending on the size of the project, you can pile the material on a tarp or pallet or directly on the ground if there is little chance that the plants will take root. Create "weed drying stations" where non-viable, seed-free plants are piled to desiccate in the sun. Pile plants that contain seeds or other viable plant parts in separate "hot spots," where any resprouts can be easily contained. See "Methods for Disposing Non-Native Invasive Plants," by UNH Cooperative Extension for more information.

Recognize that repeat visits are almost always needed whether you use mechanical techniques, herbicides, or a combination of methods. The number of repeat treatments may depend on site conditions as well as the species of plant.

Safety is an important consideration when working with invasive plants. Woodchuck holes, barbed wire, wasp nests, poison ivy, dehydration, thorns, ticks, and skin rashes are all potential hazards. Additional care is needed when pulling plants, such as wild parsnip or giant hogweed, that can cause a severe rash if skin comes in contact with the plant sap; consider getting guidance from a professional before trying to handle these plants. Be prepared for field work: wear eye protection, long-sleeved shirt and pants, gloves, sturdy shoes, and a sun hat; carry water and a first aid kit; consider using a white 5-gallon bucket to carry your gear.



Sturdy hoes and similar tools are useful for digging out roots.



Make sure to remove the entire root system when hand pulling, which is easiest in moist soil.



When smothering a woody stem, the covering should left in place for at least one year.

#### **Methods**

#### **Hand Pulling & Digging**

Gloved hands work amazingly well on soft or small stems. Rubber kitchen gloves offer protection when pulling plants that exude sap that can cause a rash, such as wild parsnip. Soft, well-fitting garden gloves work well for pulling soft-stemmed plants such as garlic mustard or small seedlings of woody plants. Thicker work gloves are a must for larger shrubs, especially when pulling plants with thorns, such as barberry and multiflora rose.

The best approach to hand pulling is slow and steady. Reach down to the base of the plant and pull with both hands. This will help ensure that you pull up all or most of the roots. Hand-pulling is most effective if the ground is somewhat moist. Dry, hard-packed ground will often result in plants snapping off before the entire root system is extracted. Plants should be pulled when viable fruits or seeds are not present on the plant, to avoid spreading the fruits to a new spot.

Plants that are less than 2-3 inches in diameter, but too large to hand pull, can be removed by digging. Dig using traditional gardening tools, such as a mattock, hoe, or soil knife, or try specialized invasive plant tools available on the market today. Some tools use body weight to lever the root system out of the ground. When selecting a tool, consider the weight and size, as some may be cumbersome to carry around a large project area.

Areas of disturbed soil provide ideal conditions for invasive plant and weed germination. After a plant is pulled or dug up, tamp down the soil and replace any leaf litter or other native plant material. Repeat visits are essential to check for resprouts or sprouts from the soil seed bank.

#### **Smothering**

The smothering or suffocating of small seedlings or herbaceous plants may be effective with some infestations. This technique is also used with some stands of Japanese knotweed, but it requires vigilance and patience to maintain a heavy plastic layer for five continuous years. This technique will kill all vegetation in the affected area such that replanting will be required when plastic is removed.

Another smothering technique involves cutting a woody stem at six inches above ground and covering with a heavy plastic bag, tying it closed with a zip-tie. The covering should be left in place for at least one year before removing.

#### **Cutting\***

Repeated cutting of invasive shrubs and vines can help stop seed production of large plants. This may be accomplished with loppers or hand saws. With some training or supervision, weed trimmers, brush saws and chain saws may also be used.

Woody invasive shrubs will need to be cut multiple times over several years. The number of repeat treatments may depend on the site conditions as well as the species of plant. The goal is to initially stop seed production and then with each subsequent cut to reduce the plant's energy reserves. Time the first cut for late spring or early summer (before July 4th), followed by a second cut in late summer or fall (as late as November), and do the third cut the following spring.

Cut the stems at ground level or at waist height. The latter technique allows you to find the plants for the repeat treatments and it is easier on your body. Large bittersweet vines should be cut as close to the ground as possible and then cut off another 4 to 5 feet along the stem to create a gap between the ground and the treetop vines. Again, monitoring is important, so check back every year for a while.

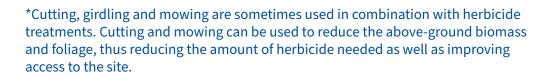
#### **Girdling\***

Girdling can be used on large invasive shrubs if other techniques are not viable. At waist height, cut into the bark approximately ¼ - ½" and all the way around the tree. Repeat 6 inches above that cut, then strip off all the bark

in between. This severs the phloem, which is the living tissue just under the bark, and cuts off the flow of sugars from the leaves to the roots. While the portion of the plant above the cut will die back it may sprout below the cut, so you will need to check back to see if there are any new sprouts. If so, just strip them off with gloved hands or use clippers and continue removing any new sprouts until the entire plant is dead. Girdling can be done with hand tools including an ax, hand saw or specialized tool. Similar to cutting, spring and early summer are the best time to girdle a plant after it has used energy from its reserves for leaf production. The bark is also more easily removed at this time of year.

#### Mowing/Shredding\*

Some large invasive plant infestations may require large equipment, such as tractors with brush or rotary mowers or excavators with special attachments (such as a "brontosaurus"). It is best to use this equipment before seed production (usually before July 4th) to avoid disturbing the soil when the plants have viable seeds. Some contractors have the ability to uproot and shred large shrubs. Others can grind shrubs down to the ground. As long as some of the root system remains in the ground, repeat visits with hand tools or other methods will be needed. When plants are top-killed, the size of the root system increases, resulting in more vigorous re-spouting after the initial mowing. In order to deplete the energy reserves, repeat





Cut woody invasives at ground level or waist height, best done late spring to early summer.



Girdling is best done in spring and early summer after a plant has used energy to produce leaves.



Use mowing equipment before seeds are produced, and avoid disturbing soil after plants have viable seeds.



Mechanical equipment has the potential to spread invasives. Inspection and cleaning is essential.



It's important to wear appropriate protective equipment when managing invasive plants, including work gloves.



A "weed drying station"

mowing is necessary. This can mean re-mowing 3-4 times a year for multiple years following the initial mow.

Mowing or shredding have the benefit of halting seed production over a large area. Make sure to ask the contractor details about their equipment, technique, and expected outcomes before embarking on a project. While it can increase the complexity of a project, depending on the plant composition on the site, you can flag and retain mature native plants during mowing projects. Skilled operators will be able to maneuver around retained plants. All mechanical equipment used in treating invasive plant infestation has the potential to transport seeds, roots, rhizomes, and spores to other sites. Equipment inspection and cleaning is essential to stop subsequent invasive plant spread.

#### **Monitoring**

Persistence and monitoring are key for all invasive plant projects to be successful. A monitoring schedule should be built into your project plan. It may be necessary to adapt your plan based on the results of your monitoring.



Always map and monitor your invasive plant control efforts.

#### References

Invasive Species Outreach Group. *Methods for Disposing Non-Native Invasive Plants*. UNH Extension, 2010.

Invasive Plant Working Group. *Picking Our Battles: A Guide to Planning Successful Invasive Plant Management Projects*. NH Fish and Game, 2015.

#### **Learn More**

For more information on invasive plants and management options, see UNH Extension's webpage *nhinvasives.org*.

#### **Photo Credits**

Many of the photos are courtesy of Ellen Snyder.

#### **About the Author**

Ellen Snyder is a certified wildlife biologist and sole owner of Ibis Wildlife Consulting.

She specializes in habitat management, invasive plant control, land stewardship planning, biodiversity conservation, and ecological writing

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Mike Bald, Got Weeds?

#### extension.unh.edu

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# Isolator® Row Plus

# **O&M Manual**





#### The Isolator® Row Plus

#### Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

#### The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row FLAMP<sup>TM</sup> (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

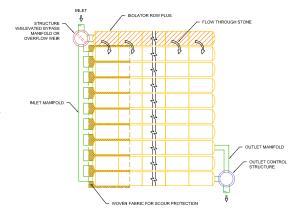
**Note:** See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.



Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.



StormTech Isolator Row PLUS with Overflow Spillway (not to scale)



#### **Isolator Row Plus Inspection/Maintenance**

#### Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

#### Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided

via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.

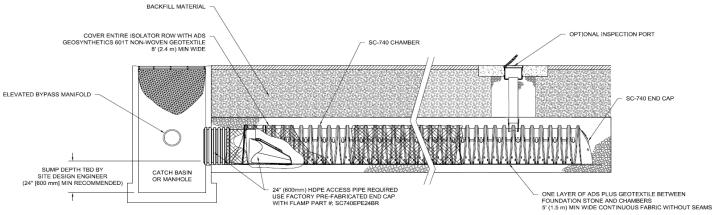






#### **StormTech Isolator Row PLUS** (not to scale)

**Note:** Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.



#### Isolator Row Plus Step By Step Maintenance Procedures

#### Step 1

Inspect Isolator Row Plus for sediment.

- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Row Plus
  - i. Remove cover from manhole at upstream end of Isolator Row Plus
  - ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
    - 1. Mirrors on poles or cameras may be used to avoid a confined space entry
    - 2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.

If not, proceed to Step 3.

#### Step 2

Clean out Isolator Row Plus using the JetVac process.

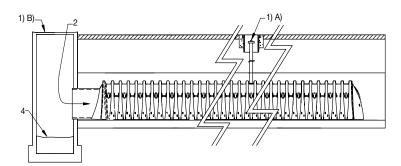
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

#### Step 3

Replace all caps, lids and covers, record observations and actions.

#### Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



#### **Sample Maintenance Log**

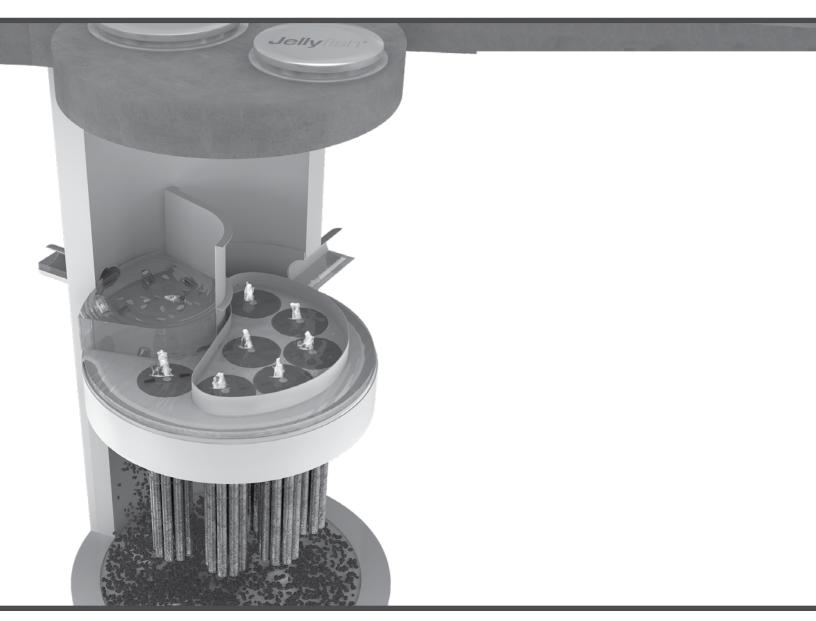
| Date    | Stadia Rod<br>Fixed point<br>to chamber<br>bottom (1) | Fixed point<br>to top of<br>sediment<br>(2) | Sedi-<br>ment<br>Depth<br>(1)–(2) | Observations/Actions  | Inspector |
|---------|---|---|-----------------------------------|---|-----------|
| 3/15/11 | 6.3 ft  | none  |                                   | New installation. Fixed point is CI frame at grade                                    | MCG       |
| 9/24/11 |   | 6.2   | 0.1 ft                            | Some grit felt  | SM        |
| 6/20/13 |   | 5.8   | o.s ft                            | Mucky feel, debris visible<br>in manhole and in Isolator<br>Row PLUS, maintenance due | NV        |
| 7/7/13  | 6.3 ft  |   | 0                                 | System jetted and vacuumed  | DJM       |

**adspipe.com** 800-821-6710

**///ADS** 



## Jellyfish® Filter Maintenance Guide





## JELLYFISH® FILTER INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

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| Inspection and Maintenance Overview | 3 |
|-------------------------------------|---|
| Inspection Procedure                | 3 |
| Maintenance Procedure               | 4 |
| Cartridge Assembly & Cleaning       | 5 |
| Inspection Process                  |   |

#### 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.

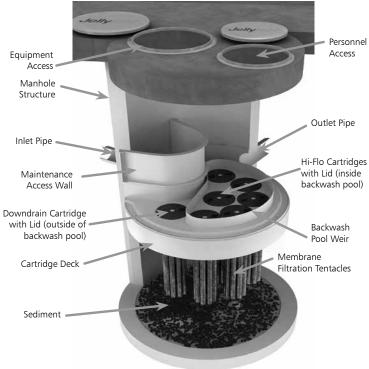
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion 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.

- 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.
- 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.
- 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:

- 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.
- 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.
- 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.
- 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.
- 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.



- 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.
- 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.
- 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

- 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.
- 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

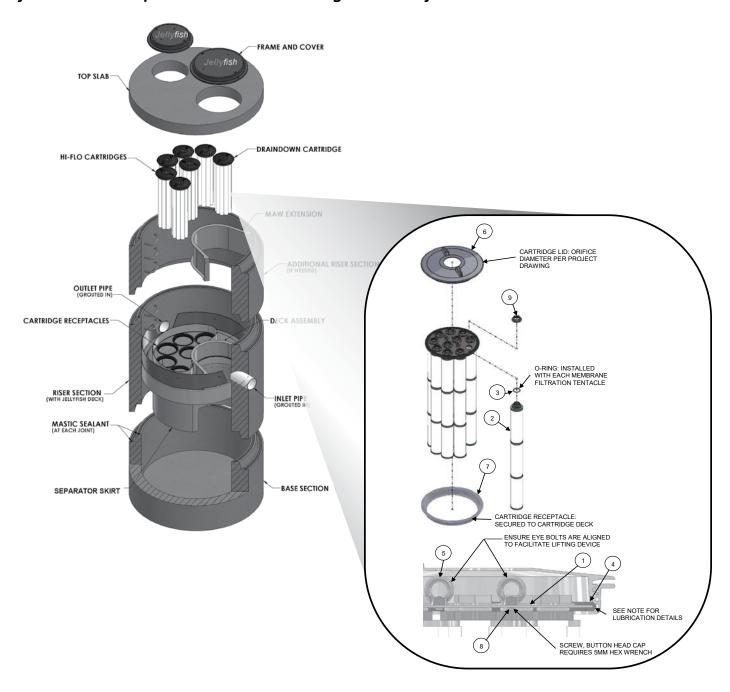


TABLE 1: BOM

| ITEM NO. | DESCRIPTION         |  |  |
|----------|---------------------|--|--|
| 1        | JF HEAD PLATE       |  |  |
| 2        | JF TENTACLE         |  |  |
| 3        | JF O-RING           |  |  |
|          | JF HEAD PLATE       |  |  |
| 4        | GASKET              |  |  |
| 5        | JF CARTRIDGE EYELET |  |  |
| 6        | JF 14IN COVER       |  |  |
| 7        | JF RECEPTACLE       |  |  |
|          | BUTTON HEAD CAP     |  |  |
| 8        | SCREW M6X14MM SS    |  |  |
| 9        | JF CARTRIDGE NUT    |  |  |

TABLE 2: APPROVED GASKET LUBRICANTS

| PART NO. MFR   |           | DESCRIPTION          |
|----------------|-----------|----------------------|
| 78713          | LA-CO     | LUBRI-JOINT          |
| 40501 HERCULES |           | DUCK BUTTER          |
| 30600          | OATEY     | PIPE LUBRICANT       |
| PSLUBXL1Q      | 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 Lide (ITem 6). 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.

|  | Jellyfish       | Filter Inspe | ction and M | laintenance Lo      | og               |  |
|--|-----------------|--------------|-------------|---------------------|------------------|--|
| Owner:   |                 |              |             | Jellyfish Model No: |                  |  |
| Location:  |                 |              |             | GPS Coordinates:    |                  |  |
| Land Use:  | Commercial:     |              | Industrial: |                     | Service Station: |  |
| Ro   | oadway/Highway: |              | Airport:    |                     | Residential:     |  |
|  |                 |              |             |                     |                  |  |
| Date/Time:   |                 |              |             |                     |                  |  |
| Inspector:   |                 |              |             |                     |                  |  |
| Maintenance Contractor:  |                 |              |             |                     |                  |  |
| Visible Oil Present: (Y/N)   |                 |              |             |                     |                  |  |
| Oil Quantity Removed:  |                 |              |             |                     |                  |  |
| Floatable Debris Present:<br>(Y/N)                                     |                 |              |             |                     |                  |  |
| Floatable Debris Removed:<br>(Y/N)                                     |                 |              |             |                     |                  |  |
| Water Depth in Backwash<br>Pool  |                 |              |             |                     |                  |  |
| Draindown Cartridges<br>externally rinsed and<br>recommissioned: (Y/N) |                 |              |             |                     |                  |  |
| New tentacles put on<br>Draindown Cartridges: (Y/N)                    |                 |              |             |                     |                  |  |
| Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)          |                 |              |             |                     |                  |  |
| New tentacles put on Hi-Flo<br>Cartridges: (Y/N)                       |                 |              |             |                     |                  |  |
| Sediment Depth Measured: (Y/N)   |                 |              |             |                     |                  |  |
| Sediment Depth (inches or mm):   |                 |              |             |                     |                  |  |
| Sediment Removed: (Y/N)  |                 |              |             |                     |                  |  |
| Cartridge Lids intact: (Y/N)   |                 |              |             |                     |                  |  |
| Observed Damage:   |                 |              |             |                     |                  |  |
| Comments:  |                 |              |             |                     |                  |  |
|  |                 |              |             |                     |                  |  |
|  |                 |              |             |                     |                  |  |





## **C**NTECH

800.338.1122 www.ContechES.com

#### Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

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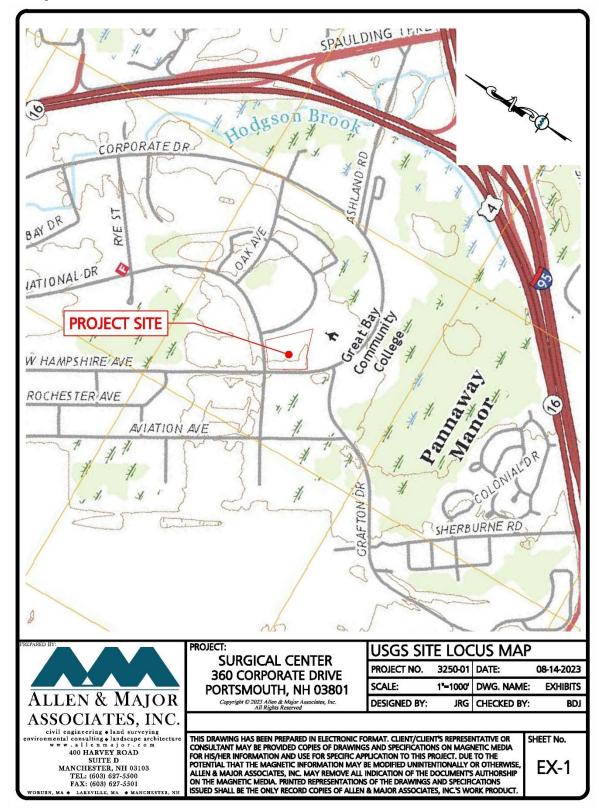
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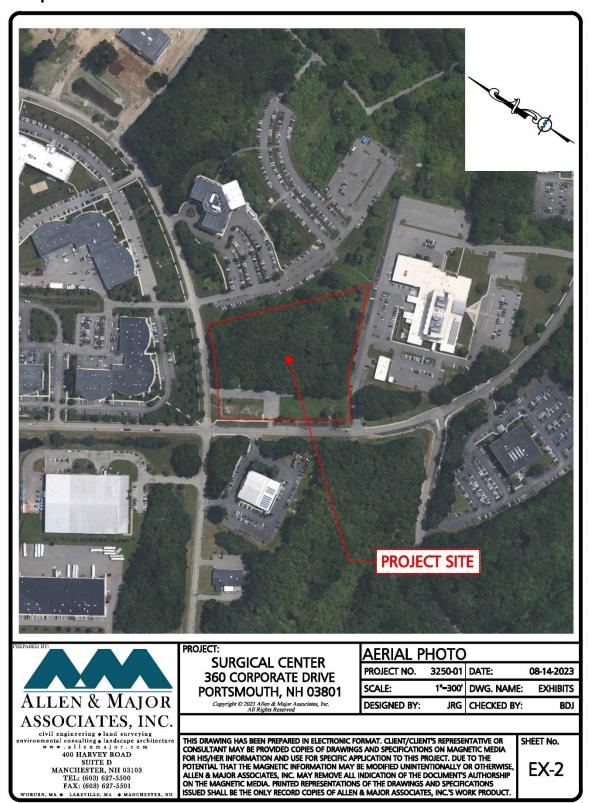
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SECTION 4.0 - FIGURES

#### **USGS Map**



#### **Aerial Map**



#### **NRCS Soils Map**





#### **LEGEND**

| Map Unit Symbol             | Map Unit Name                                     | Acres in AOI | Percent of AOI |
|-----------------------------|---|--------------|----------------|
| 699                         | Urban land  | 0.9          | 6.3%           |
| 799                         | Urban land-Canton complex, 3 to 15 percent slopes | 13.5         | 93.7%          |
| Totals for Area of Interest |   | 14.4         | 100.0%         |



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PROJECT: SURGICAL (

SURGICAL CENTER 360 CORPORATE DRIVE PORTSMOUTH, NH 03801

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| NRCS SO     | <u>AP</u> |            |  |
|-------------|-----------|------------|--|
| PROJECT NO. | 3250-01   | DATE:      |  |
| SCALE:      | 1"-200'   | DWG. NAME: |  |

SCALE: 1°-200' DWG. NAME: EXHIBITS
DESIGNED BY: JRG CHECKED BY: BDJ

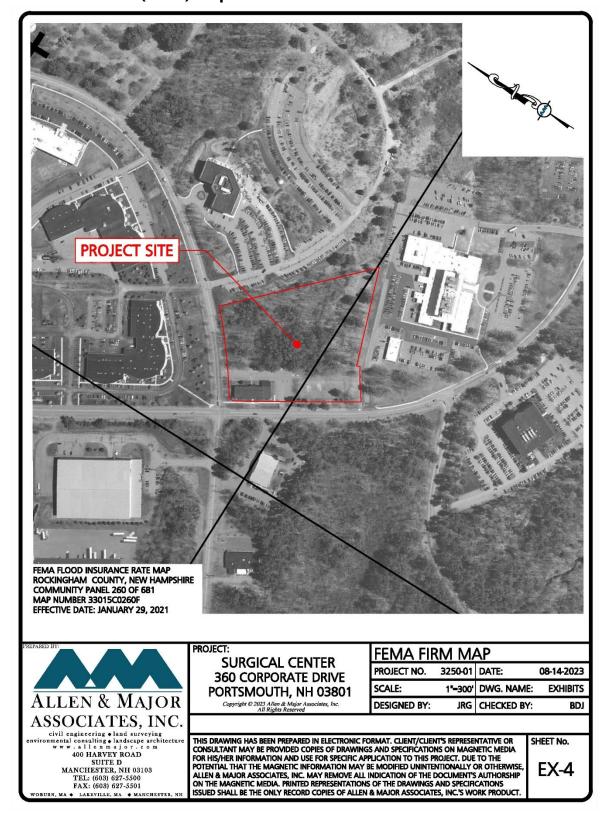
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SHEET No.

08-14-2023

EX-3

#### Flood Insurance Rate (FIRM) Map



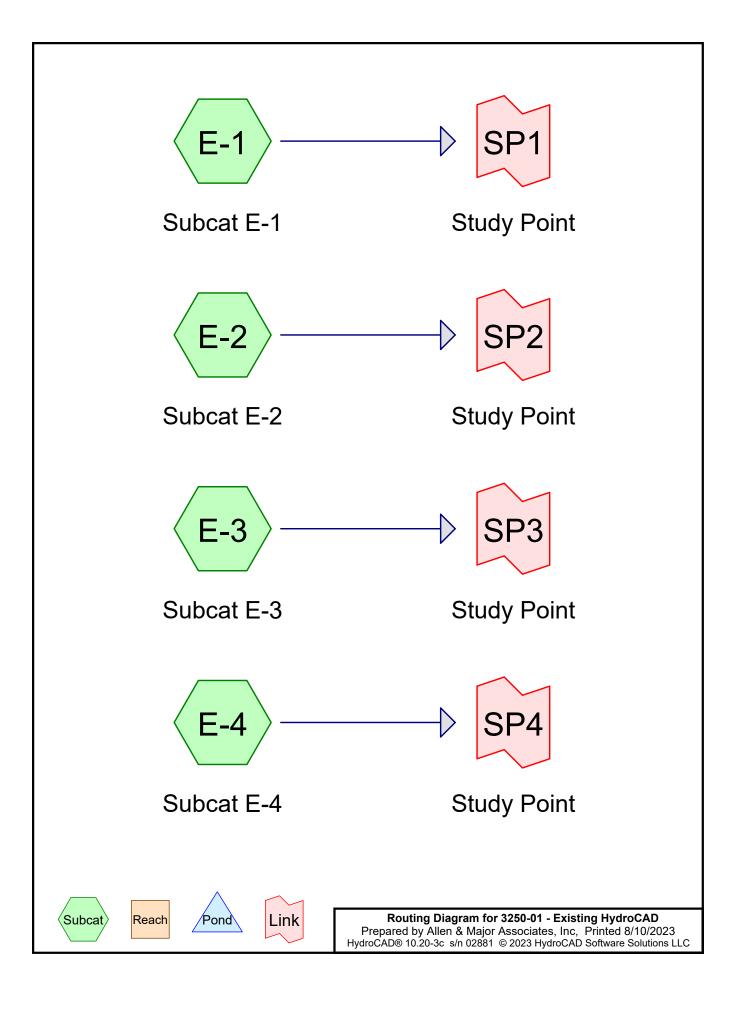




SECTION 5.0 EXISTING DRAINAGE
ANALYSIS



# **Existing HydroCAD**



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### **Rainfall Events Listing**

| Event# | Event   | Storm Type     | Curve | Mode    | Duration | B/B | Depth    | AMC |
|--------|---------|----------------|-------|---------|----------|-----|----------|-----|
| _      | Name    |                |       |         | (hours)  |     | (inches) |     |
| 1      | 2-year  | Type III 24-hr |       | Default | 24.00    | 1   | 3.69     | 2   |
| 2      | 10-year | Type III 24-hr |       | Default | 24.00    | 1   | 5.60     | 2   |
| 3      | 25-year | Type III 24-hr |       | Default | 24.00    | 1   | 7.10     | 2   |
| 4      | 50-year | Type III 24-hr |       | Default | 24.00    | 1   | 8.51     | 2   |

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### Area Listing (all nodes)

| Area    | CN | Description  |
|---------|----|--|
| (sq-ft) |    | (subcatchment-numbers)                             |
| 66,856  | 61 | >75% Grass cover, Good, HSG B (E-1, E-2, E-3, E-4) |
| 16,949  | 98 | Paved parking, HSG B (E-1, E-3)                    |
| 193     | 98 | Roofs, HSG B (E-1)                                 |
| 134,965 | 55 | Woods, Good, HSG B (E-1, E-2, E-3, E-4)            |
| 5,544   | 70 | Woods, Good, HSG C (E-1)                           |
| 224,507 | 60 | TOTAL AREA   |

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### Soil Listing (all nodes)

| Area    | Soil  | Subcatchment       |
|---------|-------|--------------------|
| (sq-ft) | Group | Numbers            |
| 0       | HSG A |                    |
| 218,963 | HSG B | E-1, E-2, E-3, E-4 |
| 5,544   | HSG C | E-1                |
| 0       | HSG D |                    |
| 0       | Other |                    |
| 224,507 |       | <b>TOTAL AREA</b>  |

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### **Ground Covers (all nodes)**

| HSG-A   | HSG-B   | HSG-C   | HSG-D   | Other   | Total   | Ground        |
|---------|---------|---------|---------|---------|---------|---------------|
| (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | Cover         |
| 0       | 66,856  | 0       | 0       | 0       | 66,856  | >75% Grass    |
|         |         |         |         |         |         | cover, Good   |
| 0       | 16,949  | 0       | 0       | 0       | 16,949  | Paved parking |
| 0       | 193     | 0       | 0       | 0       | 193     | Roofs         |
| 0       | 134,965 | 5,544   | 0       | 0       | 140,509 | Woods, Good   |
| 0       | 218,963 | 5,544   | 0       | 0       | 224,507 | TOTAL AREA    |

Sub Nun

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### Notes Listing (all nodes)

| Line# | Node<br>Number | Notes  |
|-------|----------------|--|
| 1     | Project        | For Coastal and Great Bay Communities, a 15% increase was added to each storm event per Env-Wq 1503.08(I). |

Type III 24-hr 2-year Rainfall=3.69" Prepared by Allen & Major Associates, Inc. Printed 8/10/2023 HydroCAD® 10.20-3c s/n 02881 © 2023 HydroCAD Software Solutions LLC Page 7

> Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=0.62" Subcatchment E-1: Subcat E-1

Flow Length=178' Tc=14.8 min CN=60 Runoff=1.46 cfs 8,284 cf

Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=0.53" Subcatchment E-2: Subcat E-2

Flow Length=67' Tc=8.5 min CN=58 Runoff=0.12 cfs 612 cf

Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=0.85" Subcatchment E-3: Subcat E-3

Flow Length=151' Tc=7.5 min CN=65 Runoff=0.63 cfs 2,479 cf

Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=0.41" Subcatchment E-4: Subcat E-4

Flow Length=134' Tc=13.0 min CN=55 Runoff=0.07 cfs 491 cf

Inflow=1.46 cfs 8,284 cf **Link SP1: Study Point** 

Primary=1.46 cfs 8,284 cf

Inflow=0.12 cfs 612 cf **Link SP2: Study Point** 

Primary=0.12 cfs 612 cf

Inflow=0.63 cfs 2,479 cf **Link SP3: Study Point** 

Primary=0.63 cfs 2,479 cf

Inflow=0.07 cfs 491 cf **Link SP4: Study Point** 

Primary=0.07 cfs 491 cf

Total Runoff Area = 224,507 sf Runoff Volume = 11,866 cf Average Runoff Depth = 0.63" 92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

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#### Summary for Subcatchment E-1: Subcat E-1

Runoff = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf, Depth= 0.62"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A     | rea (sf) | CN E    | Description          |              |  |  |  |  |
|-------|----------|---------|----------------------|--------------|--|--|--|--|
|       | 5,544    | 70 V    | 0 Woods, Good, HSG C |              |  |  |  |  |
| 1     | 14,320   | 55 V    | Voods, Go            | od, HSG B    |  |  |  |  |
|       | 28,424   | 61 >    | 75% Gras             | s cover, Go  | ood, HSG B                                 |  |  |  |
|       | 13,031   | 98 F    | Paved park           | ing, HSG B   |  |  |  |  |
|       | 193      | 98 F    | Roofs, HSG           | B B          |  |  |  |  |
| 1     | 61,512   | 60 V    | Veighted A           | verage       |  |  |  |  |
| 1     | 48,288   | g       | 1.81% Per            | vious Area   |  |  |  |  |
|       | 13,224   | 8       | 3.19% Impe           | ervious Area | a  |  |  |  |
|       |          |         |                      |              |  |  |  |  |
| Tc    | Length   | Slope   | Velocity             | Capacity     | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)             | (cfs)        |  |  |  |  |
| 12.2  | 50       | 0.0200  | 0.07                 |              | Sheet Flow, A-B                            |  |  |  |
|       |          |         |                      |              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 128      | 0.0270  | 0.82                 |              | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |                      |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 14.8  | 178      | Total   |                      |              |  |  |  |  |

#### **Summary for Subcatchment E-2: Subcat E-2**

Runoff = 0.12 cfs @ 12.17 hrs, Volume= 612 cf, Depth= 0.53"

Routed to Link SP2: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| Α     | rea (sf) | CN      | Description                   |           |  |  |  |  |  |
|-------|----------|---------|-------------------------------|-----------|--|--|--|--|--|
|       | 6,956    | 61      | >75% Grass cover, Good, HSG B |           |  |  |  |  |  |
|       | 6,899    | 55      | Woods, Go                     | od, HSG B |  |  |  |  |  |
|       | 13,855   | 58      | Weighted A                    | verage    |  |  |  |  |  |
|       | 13,855   |         | 100.00% Pervious Area         |           |  |  |  |  |  |
|       |          |         |                               |           |  |  |  |  |  |
| Тс    | Length   | Slope   | ,                             | Capacity  | Description                                |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                      | (cfs)     |  |  |  |  |  |
| 8.4   | 50       | 0.0500  | 0.10                          |           | Sheet Flow, A-B                            |  |  |  |  |
|       |          |         |                               |           | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |  |
| 0.1   | 17       | 0.0400  | 3.00                          |           | Shallow Concentrated Flow, B-C             |  |  |  |  |
|       |          |         |                               |           | Grassed Waterway Kv= 15.0 fps              |  |  |  |  |
| 8.5   | 67       | Total   |                               |           |  |  |  |  |  |

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#### **Summary for Subcatchment E-3: Subcat E-3**

Runoff = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf, Depth= 0.85"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A     | rea (sf) | CN E    | escription          |             |                                 |  |  |  |
|-------|----------|---------|---------------------|-------------|---------------------------------|--|--|--|
|       | 3,918    |         |                     |             |                                 |  |  |  |
|       | 169      | 55 V    | Voods, Go           | od, HSG B   |                                 |  |  |  |
|       | 30,757   | 61 >    | 75% Gras            | s cover, Go | ood, HSG B                      |  |  |  |
|       | 34,845   | 65 V    | 65 Weighted Average |             |                                 |  |  |  |
|       | 30,927   | 8       | 8.76% Per           | vious Area  |                                 |  |  |  |
|       | 3,918    | 1       | 1.24% Imp           | pervious Ar | ea                              |  |  |  |
|       |          |         | ·                   |             |                                 |  |  |  |
| Tc    | Length   | Slope   | Velocity            | Capacity    | Description                     |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)            | (cfs)       |                                 |  |  |  |
| 5.6   | 50       | 0.0200  | 0.15                |             | Sheet Flow, A-B                 |  |  |  |
|       |          |         |                     |             | Grass: Short n= 0.150 P2= 3.28" |  |  |  |
| 1.9   | 101      | 0.0300  | 0.87                |             | Shallow Concentrated Flow, B-C  |  |  |  |
|       |          |         |                     |             | Woodland Kv= 5.0 fps            |  |  |  |
| 7.5   | 151      | Total   |                     |             | ·                               |  |  |  |

#### Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.07 cfs @ 12.34 hrs, Volume= 491 cf, Depth= 0.41"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| _ | A     | rea (sf) | CN I    | Description |                              |  |  |  |  |  |  |
|---|-------|----------|---------|-------------|------------------------------|--|--|--|--|--|--|
|   |       | 718      | 61      | >75% Gras   | 75% Grass cover, Good, HSG B |  |  |  |  |  |  |
| _ |       | 13,577   | 55      | Woods, Go   | od, HSG B                    |  |  |  |  |  |  |
|   |       | 14,295   | 55      | Weighted A  | verage                       |  |  |  |  |  |  |
|   |       | 14,295   |         | 100.00% Pe  | ervious Are                  | a  |  |  |  |  |  |
|   |       |          |         |             |                              |  |  |  |  |  |  |
|   | Tc    | Length   | Slope   | ,           | Capacity                     | Description                                |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)                        |  |  |  |  |  |  |
|   | 10.4  | 50       | 0.0300  | 0.08        |                              | Sheet Flow, A-B                            |  |  |  |  |  |
|   |       |          |         |             |                              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |  |  |
|   | 2.6   | 84       | 0.0120  | 0.55        |                              | Shallow Concentrated Flow, B-C             |  |  |  |  |  |
| _ |       |          |         |             |                              | Woodland Kv= 5.0 fps                       |  |  |  |  |  |
|   | 13.0  | 134      | Total   |             |                              |  |  |  |  |  |  |

Type III 24-hr 2-year Rainfall=3.69"

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#### **Summary for Link SP1: Study Point**

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 0.62" for 2-year event

Inflow = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf

Primary = 1.46 cfs @ 12.27 hrs, Volume= 8,284 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP2: Study Point**

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 0.53" for 2-year event

Inflow = 0.12 cfs @ 12.17 hrs, Volume= 612 cf

Primary = 0.12 cfs @ 12.17 hrs, Volume= 612 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP3: Study Point**

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 0.85" for 2-year event

Inflow = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf

Primary = 0.63 cfs @ 12.13 hrs, Volume= 2,479 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 0.41" for 2-year event

Inflow = 0.07 cfs @ 12.34 hrs, Volume= 491 cf

Primary = 0.07 cfs @ 12.34 hrs, Volume= 491 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-year Rainfall=5.60" Printed 8/10/2023

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Primary=0.34 cfs 1,541 cf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment E-1: Subcat E-1 | Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=1.67" Flow Length=178' Tc=14.8 min CN=60 Runoff=5.06 cfs 22,410 cf |
|------------------------------|---|
| Subcatchment E-2: Subcat E-2 | Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=1.51" Flow Length=67' Tc=8.5 min CN=58 Runoff=0.46 cfs 1,747 cf     |
| Subcatchment E-3: Subcat E-3 | Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=2.06" Flow Length=151' Tc=7.5 min CN=65 Runoff=1.76 cfs 5,996 cf   |
| Subcatchment E-4: Subcat E-4 | Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=1.29" Flow Length=134' Tc=13.0 min CN=55 Runoff=0.34 cfs 1,541 cf   |
| Link SP1: Study Point        | Inflow=5.06 cfs 22,410 cf<br>Primary=5.06 cfs 22,410 cf   |
| Link SP2: Study Point        | Inflow=0.46 cfs 1,747 cf<br>Primary=0.46 cfs 1,747 cf   |
| Link SP3: Study Point        | Inflow=1.76 cfs 5,996 cf<br>Primary=1.76 cfs 5,996 cf   |
| Link SP4: Study Point        | Inflow=0.34 cfs 1,541 cf  |

Total Runoff Area = 224,507 sf Runoff Volume = 31,694 cf Average Runoff Depth = 1.69" 92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf Prepared by Allen & Major Associates, Inc

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#### **Summary for Subcatchment E-1: Subcat E-1**

Runoff = 5.06 cfs @ 12.22 hrs, Volume= 22,410 cf, Depth= 1.67"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A     | rea (sf) | CN E    | CN Description |             |  |  |  |  |
|-------|----------|---------|----------------|-------------|--|--|--|--|
|       | 5,544    | 70 V    | Voods, Go      | od, HSG C   |  |  |  |  |
| 1     | 14,320   | 55 V    | Voods, Go      | od, HSG B   |  |  |  |  |
|       | 28,424   | 61 >    | 75% Gras       | s cover, Go | ood, HSG B                                 |  |  |  |
|       | 13,031   | 98 F    | aved park      | ing, HSG B  |  |  |  |  |
|       | 193      | 98 F    | Roofs, HSG     | i B         |  |  |  |  |
| 1     | 61,512   | 60 V    | Veighted A     | verage      |  |  |  |  |
| 1     | 48,288   | 9       | 1.81% Per      | vious Area  |  |  |  |  |
|       | 13,224   | 8       | .19% Impe      | rvious Area | a  |  |  |  |
|       |          |         |                |             |  |  |  |  |
| Tc    | Length   | Slope   | Velocity       | Capacity    | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)       | (cfs)       |  |  |  |  |
| 12.2  | 50       | 0.0200  | 0.07           |             | Sheet Flow, A-B                            |  |  |  |
|       |          |         |                |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 128      | 0.0270  | 0.82           |             | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |                |             | Woodland Kv= 5.0 fps                       |  |  |  |
| 14.8  | 178      | Total   |                |             |  |  |  |  |

#### **Summary for Subcatchment E-2: Subcat E-2**

Runoff = 0.46 cfs @ 12.14 hrs, Volume= 1,747 cf, Depth= 1.51"

Routed to Link SP2: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| _ | A     | rea (sf) | CN I    | Description |             |  |  |  |  |
|---|-------|----------|---------|-------------|-------------|--|--|--|--|
|   |       | 6,956    | 61      | >75% Gras   | s cover, Go | ood, HSG B                                 |  |  |  |
|   |       | 6,899    | 55      | Noods, Go   | od, HSG B   |  |  |  |  |
|   |       | 13,855   | 58 \    | Neighted A  | verage      |  |  |  |  |
|   |       | 13,855   |         | 100.00% Pe  | ervious Are | a  |  |  |  |
|   |       |          |         |             |             |  |  |  |  |
|   | Тс    | Length   | Slope   | ,           | Capacity    | Description                                |  |  |  |
|   | (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |  |  |  |  |
|   | 8.4   | 50       | 0.0500  | 0.10        |             | Sheet Flow, A-B                            |  |  |  |
|   |       |          |         |             |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
|   | 0.1   | 17       | 0.0400  | 3.00        |             | Shallow Concentrated Flow, B-C             |  |  |  |
|   |       |          |         |             |             | Grassed Waterway Kv= 15.0 fps              |  |  |  |
|   | 8.5   | 67       | Total   |             |             |  |  |  |  |

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#### **Summary for Subcatchment E-3: Subcat E-3**

Runoff = 1.76 cfs @ 12.12 hrs, Volume= 5,996 cf, Depth= 2.06"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| Α     | rea (sf) | CN [    | Description |             |                                 |
|-------|----------|---------|-------------|-------------|---------------------------------|
|       | 3,918    |         |             | ing, HSG B  |                                 |
|       | 169      | 55 V    | Voods, Go   | od, HSG B   |                                 |
|       | 30,757   | 61 >    | 75% Gras    | s cover, Go | ood, HSG B                      |
|       | 34,845   | 65 V    | Veighted A  | verage      |                                 |
|       | 30,927   | 8       | 88.76% Per  | vious Area  |                                 |
|       | 3,918    | 1       | 1.24% Imp   | pervious Ar | ea                              |
|       |          |         |             |             |                                 |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                 |
| 5.6   | 50       | 0.0200  | 0.15        |             | Sheet Flow, A-B                 |
|       |          |         |             |             | Grass: Short n= 0.150 P2= 3.28" |
| 1.9   | 101      | 0.0300  | 0.87        |             | Shallow Concentrated Flow, B-C  |
|       |          |         |             |             | Woodland Kv= 5.0 fps            |
| 7.5   | 151      | Total   | •           | •           |                                 |

#### Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.34 cfs @ 12.21 hrs, Volume= 1,541 cf, Depth= 1.29"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A     | rea (sf) | CN I    | Description |             |  |  |  |  |
|-------|----------|---------|-------------|-------------|--|--|--|--|
|       | 718      | 61 :    | >75% Gras   | s cover, Go | ood, HSG B                                 |  |  |  |
|       | 13,577   | 55 \    | Noods, Go   | od, HSG B   |  |  |  |  |
|       | 14,295   | 55 \    | Neighted A  | verage      |  |  |  |  |
|       | 14,295   | •       | 100.00% Pe  | ervious Are | a  |  |  |  |
|       |          |         |             |             |  |  |  |  |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |  |  |  |  |
| 10.4  | 50       | 0.0300  | 0.08        |             | Sheet Flow, A-B                            |  |  |  |
|       |          |         |             |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 84       | 0.0120  | 0.55        |             | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |             |             | Woodland Kv= 5.0 fps                       |  |  |  |
| 13.0  | 134      | Total   |             |             |  |  |  |  |

Type III 24-hr 10-year Rainfall=5.60"

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#### **Summary for Link SP1: Study Point**

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 1.67" for 10-year event

Inflow = 5.06 cfs @ 12.22 hrs, Volume= 22,410 cf

Primary = 5.06 cfs @ 12.22 hrs, Volume= 22,410 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP2: Study Point**

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 1.51" for 10-year event

Inflow = 0.46 cfs @ 12.14 hrs, Volume= 1,747 cf

Primary = 0.46 cfs @ 12.14 hrs, Volume= 1,747 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP3: Study Point**

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 2.06" for 10-year event

Inflow = 1.76 cfs @ 12.12 hrs, Volume= 5,996 cf

Primary = 1.76 cfs @ 12.12 hrs, Volume= 5,996 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 1.29" for 10-year event

Inflow = 0.34 cfs @ 12.21 hrs, Volume= 1,541 cf

Primary = 0.34 cfs @ 12.21 hrs, Volume= 1,541 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

**Link SP4: Study Point** 

Type III 24-hr 25-year Rainfall=7.10" Printed 8/10/2023

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Inflow=0.62 cfs 2,606 cf Primary=0.62 cfs 2,606 cf

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment E-1: Subcat E-1 | Runoff Area=161,512 sf 8.19% Impervious Runoff Depth=2.67" Flow Length=178' Tc=14.8 min CN=60 Runoff=8.52 cfs 35,999 cf |
|------------------------------|---|
| Subcatchment E-2: Subcat E-2 | Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=2.48" Flow Length=67' Tc=8.5 min CN=58 Runoff=0.79 cfs 2,860 cf     |
| Subcatchment E-3: Subcat E-3 | Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=3.18" Flow Length=151' Tc=7.5 min CN=65 Runoff=2.77 cfs 9,234 cf   |
| Subcatchment E-4: Subcat E-4 | Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=2.19" Flow Length=134' Tc=13.0 min CN=55 Runoff=0.62 cfs 2,606 cf   |
| Link SP1: Study Point        | Inflow=8.52 cfs 35,999 cf<br>Primary=8.52 cfs 35,999 cf   |
| Link SP2: Study Point        | Inflow=0.79 cfs 2,860 cf<br>Primary=0.79 cfs 2,860 cf   |
| Link SP3: Study Point        | Inflow=2.77 cfs 9,234 cf<br>Primary=2.77 cfs 9,234 cf   |

Total Runoff Area = 224,507 sf Runoff Volume = 50,699 cf Average Runoff Depth = 2.71" 92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf Prepared by Allen & Major Associates, Inc

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#### Summary for Subcatchment E-1: Subcat E-1

Runoff = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf, Depth= 2.67"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN E    | CN Description |             |  |  |  |  |
|-------|----------|---------|----------------|-------------|--|--|--|--|
|       | 5,544    | 70 V    | Voods, Go      | od, HSG C   |  |  |  |  |
| 1     | 14,320   | 55 V    | Voods, Go      | od, HSG B   |  |  |  |  |
|       | 28,424   | 61 >    | 75% Gras       | s cover, Go | ood, HSG B                                 |  |  |  |
|       | 13,031   | 98 F    | aved park      | ing, HSG B  |  |  |  |  |
|       | 193      | 98 F    | Roofs, HSG     | i B         |  |  |  |  |
| 1     | 61,512   | 60 V    | Veighted A     | verage      |  |  |  |  |
| 1     | 48,288   | 9       | 1.81% Per      | vious Area  |  |  |  |  |
|       | 13,224   | 8       | .19% Impe      | rvious Area | a  |  |  |  |
|       |          |         |                |             |  |  |  |  |
| Tc    | Length   | Slope   | Velocity       | Capacity    | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)       | (cfs)       |  |  |  |  |
| 12.2  | 50       | 0.0200  | 0.07           |             | Sheet Flow, A-B                            |  |  |  |
|       |          |         |                |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 128      | 0.0270  | 0.82           |             | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |                |             | Woodland Kv= 5.0 fps                       |  |  |  |
| 14.8  | 178      | Total   |                |             |  |  |  |  |

#### **Summary for Subcatchment E-2: Subcat E-2**

Runoff = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf, Depth= 2.48"

Routed to Link SP2: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| Α     | rea (sf) | CN      | Description                   |             |  |  |  |  |  |
|-------|----------|---------|-------------------------------|-------------|--|--|--|--|--|
|       | 6,956    | 61      | >75% Grass cover, Good, HSG B |             |  |  |  |  |  |
|       | 6,899    | 55      | Woods, Go                     | od, HSG B   |  |  |  |  |  |
|       | 13,855   | 58      | Weighted A                    | verage      |  |  |  |  |  |
|       | 13,855   |         | 100.00% Pe                    | ervious Are | a  |  |  |  |  |
|       |          |         |                               |             |  |  |  |  |  |
| Тс    | Length   | Slope   | ,                             | Capacity    | Description                                |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                      | (cfs)       |  |  |  |  |  |
| 8.4   | 50       | 0.0500  | 0.10                          |             | Sheet Flow, A-B                            |  |  |  |  |
|       |          |         |                               |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |  |
| 0.1   | 17       | 0.0400  | 3.00                          |             | Shallow Concentrated Flow, B-C             |  |  |  |  |
|       |          |         |                               |             | Grassed Waterway Kv= 15.0 fps              |  |  |  |  |
| 8.5   | 67       | Total   |                               |             |  |  |  |  |  |

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#### Summary for Subcatchment E-3: Subcat E-3

Runoff = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf, Depth= 3.18"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN E    | Description |             |                                 |
|-------|----------|---------|-------------|-------------|---------------------------------|
|       | 3,918    |         |             | ing, HSG B  |                                 |
|       | 169      | 55 V    | Voods, Go   | od, HSG B   |                                 |
|       | 30,757   | 61 >    | 75% Gras    | s cover, Go | ood, HSG B                      |
|       | 34,845   | 65 V    | Veighted A  | verage      |                                 |
|       | 30,927   | 8       | 8.76% Per   | vious Area  |                                 |
|       | 3,918    | 1       | 1.24% Imp   | pervious Ar | ea                              |
|       |          |         | ·           |             |                                 |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                 |
| 5.6   | 50       | 0.0200  | 0.15        |             | Sheet Flow, A-B                 |
|       |          |         |             |             | Grass: Short n= 0.150 P2= 3.28" |
| 1.9   | 101      | 0.0300  | 0.87        |             | Shallow Concentrated Flow, B-C  |
|       |          |         |             |             | Woodland Kv= 5.0 fps            |
| 7.5   | 151      | Total   |             |             | ·                               |

#### Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf, Depth= 2.19"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN I    | Description |             |  |  |  |  |
|-------|----------|---------|-------------|-------------|--|--|--|--|
|       | 718      | 61 :    | >75% Gras   | s cover, Go | ood, HSG B                                 |  |  |  |
|       | 13,577   | 55 \    | Noods, Go   | od, HSG B   |  |  |  |  |
|       | 14,295   | 55 \    | Neighted A  | verage      |  |  |  |  |
|       | 14,295   | •       | 100.00% Pe  | ervious Are | a  |  |  |  |
|       |          |         |             |             |  |  |  |  |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |  |  |  |  |
| 10.4  | 50       | 0.0300  | 0.08        |             | Sheet Flow, A-B                            |  |  |  |
|       |          |         |             |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 84       | 0.0120  | 0.55        |             | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |             |             | Woodland Kv= 5.0 fps                       |  |  |  |
| 13.0  | 134      | Total   |             |             |  |  |  |  |

Type III 24-hr 25-year Rainfall=7.10"

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#### **Summary for Link SP1: Study Point**

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 2.67" for 25-year event

Inflow = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf

Primary = 8.52 cfs @ 12.22 hrs, Volume= 35,999 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP2: Study Point**

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 2.48" for 25-year event

Inflow = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf

Primary = 0.79 cfs @ 12.13 hrs, Volume= 2,860 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP3: Study Point**

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 3.18" for 25-year event

Inflow = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf

Primary = 2.77 cfs @ 12.11 hrs, Volume= 9,234 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 2.19" for 25-year event

Inflow = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf

Primary = 0.62 cfs @ 12.20 hrs, Volume= 2,606 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 50-year Rainfall=8.51" Printed 8/10/2023

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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment E-1: Subcat E-1 | Runoff Area=161,     | 512 sf 8.19% Imper | vious Runoff Depth=3.72"   |
|------------------------------|----------------------|--------------------|----------------------------|
|                              | Flow Length=178' Tc= | :14.8 min CN=60 F  | Runoff=12.08 cfs 50,076 cf |

Subcatchment E-2: Subcat E-2

Runoff Area=13,855 sf 0.00% Impervious Runoff Depth=3.49"
Flow Length=67' Tc=8.5 min CN=58 Runoff=1.14 cfs 4,025 cf

Subcatchment E-3: Subcat E-3

Runoff Area=34,845 sf 11.24% Impervious Runoff Depth=4.31"
Flow Length=151' Tc=7.5 min CN=65 Runoff=3.78 cfs 12,516 cf

Subcatchment E-4: Subcat E-4

Runoff Area=14,295 sf 0.00% Impervious Runoff Depth=3.14"
Flow Length=134' Tc=13.0 min CN=55 Runoff=0.92 cfs 3,738 cf

**Link SP1: Study Point**Inflow=12.08 cfs 50,076 cf
Primary=12.08 cfs 50,076 cf

Link SP2: Study Point Inflow=1.14 cfs 4,025 cf
Primary=1.14 cfs 4,025 cf

Link SP3: Study Point Inflow=3.78 cfs 12,516 cf Primary=3.78 cfs 12,516 cf

Link SP4: Study Point Inflow=0.92 cfs 3,738 cf Primary=0.92 cfs 3,738 cf

> Total Runoff Area = 224,507 sf Runoff Volume = 70,356 cf Average Runoff Depth = 3.76" 92.36% Pervious = 207,365 sf 7.64% Impervious = 17,142 sf

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#### Summary for Subcatchment E-1: Subcat E-1

Runoff = 12.08 cfs @ 12.21 hrs, Volume= 50,076 cf, Depth= 3.72"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

|       | Area (sf) | CN E    | CN Description |              |  |  |  |  |
|-------|-----------|---------|----------------|--------------|--|--|--|--|
|       | 5,544     | 70 V    | Voods, Go      | od, HSG C    |  |  |  |  |
|       | 114,320   | 55 V    | Voods, Go      | od, HSG B    |  |  |  |  |
|       | 28,424    | 61 >    | 75% Gras       | s cover, Go  | ood, HSG B                                 |  |  |  |
|       | 13,031    | 98 F    | Paved park     | ing, HSG B   |  |  |  |  |
|       | 193       | 98 F    | Roofs, HSG     | B            |  |  |  |  |
|       | 161,512   | 60 V    | Veighted A     | verage       |  |  |  |  |
|       | 148,288   | 9       | 1.81% Per      | vious Area   |  |  |  |  |
|       | 13,224    | 8       | .19% Impe      | ervious Area | a  |  |  |  |
|       |           |         |                |              |  |  |  |  |
| To    | Length    | Slope   | Velocity       | Capacity     | Description                                |  |  |  |
| (min) | (feet)    | (ft/ft) | (ft/sec)       | (cfs)        |  |  |  |  |
| 12.2  | 50        | 0.0200  | 0.07           |              | Sheet Flow, A-B                            |  |  |  |
|       |           |         |                |              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 2.6   | 128       | 0.0270  | 0.82           |              | Shallow Concentrated Flow, B-C             |  |  |  |
|       |           |         |                |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 14.8  | 178       | Total   |                |              |  |  |  |  |

#### **Summary for Subcatchment E-2: Subcat E-2**

Runoff = 1.14 cfs @ 12.13 hrs, Volume= 4,025 cf, Depth= 3.49"

Routed to Link SP2: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A     | rea (sf)                  | CN I  | CN Description  |  |   |  |  |  |  |
|-------|---------------------------|---|---|--|---|--|--|--|--|
|       | 6,956                     | 61 >  | 61 >75% Grass cover, Good, HSG B  |  |   |  |  |  |  |
|       | 6,899                     | 55 \  | 5 Woods, Good, HSG B  |  |   |  |  |  |  |
|       | 13,855                    | 58 \  | Weighted Average  |  |   |  |  |  |  |
|       | 13,855                    | •   | 100.00% Pervious Area   |  |   |  |  |  |  |
|       |                           |   |   |  |   |  |  |  |  |
| Tc    | Length                    | Slope   | Velocity  | Capacity   | Description   |  |  |  |  |
| (min) | (feet)                    | (ft/ft)   | (ft/sec)  | (cfs)  |   |  |  |  |  |
| 8.4   | 50                        | 0.0500  | 0.10  |  | Sheet Flow, A-B   |  |  |  |  |
|       |                           |   |   |  | Woods: Light underbrush n= 0.400 P2= 3.28"  |  |  |  |  |
| 0.1   | 17                        | 0.0400  | 3.00  |  | Shallow Concentrated Flow, B-C  |  |  |  |  |
|       |                           |   |   |  | Grassed Waterway Kv= 15.0 fps   |  |  |  |  |
| 8.5   | 67                        | Total   |   |  |   |  |  |  |  |
|       | Tc<br>(min)<br>8.4<br>0.1 | 6,899 13,855 13,855  Tc Length (min) (feet) 8.4 50 0.1 17 | 6,956 61 2<br>6,899 55 \<br>13,855 58 \<br>13,855 58 \<br>Tc Length Slope<br>(min) (feet) (ft/ft)<br>8.4 50 0.0500<br>0.1 17 0.0400 | 6,956 61 >75% Gras 6,899 55 Woods, Go 13,855 58 Weighted A 13,855 100.00% Po  Tc Length Slope Velocity (min) (feet) (ft/ft) (ft/sec) 8.4 50 0.0500 0.10 0.1 17 0.0400 3.00 | 6,956 61 >75% Grass cover, Go 6,899 55 Woods, Good, HSG B 13,855 58 Weighted Average 13,855 100.00% Pervious Are  Tc Length Slope Velocity Capacity (min) (feet) (ft/ft) (ft/sec) (cfs)  8.4 50 0.0500 0.10  0.1 17 0.0400 3.00 |  |  |  |  |

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#### Summary for Subcatchment E-3: Subcat E-3

Runoff = 3.78 cfs @ 12.11 hrs, Volume= 12,516 cf, Depth= 4.31"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

|                             | Α     | rea (sf) | CN Description          |                               |            |                                 |  |  |  |
|-----------------------------|-------|----------|-------------------------|-------------------------------|------------|---------------------------------|--|--|--|
|                             |       | 3,918    | 98 Paved parking, HSG B |                               |            |                                 |  |  |  |
|                             |       | 169      | 55 \                    | 5 Woods, Good, HSG B          |            |                                 |  |  |  |
|                             |       | 30,757   | 61 >                    | >75% Grass cover, Good, HSG B |            |                                 |  |  |  |
| 34,845 65 Weighted Average  |       |          |                         |                               | verage     |                                 |  |  |  |
| 30,927 88.76% Pervious Area |       |          |                         |                               | vious Area |                                 |  |  |  |
| 3,918 11.24% Impervious Are |       |          |                         |                               | ervious Ar | ea                              |  |  |  |
|                             |       |          |                         |                               |            |                                 |  |  |  |
|                             | Tc    | Length   | Slope                   | Velocity                      | Capacity   | Description                     |  |  |  |
| _                           | (min) | (feet)   | (ft/ft)                 | (ft/sec)                      | (cfs)      |                                 |  |  |  |
|                             | 5.6   | 50       | 0.0200                  | 0.15                          |            | Sheet Flow, A-B                 |  |  |  |
|                             |       |          |                         |                               |            | Grass: Short n= 0.150 P2= 3.28" |  |  |  |
|                             | 1.9   | 101      | 0.0300                  | 0.87                          |            | Shallow Concentrated Flow, B-C  |  |  |  |
| _                           |       |          |                         |                               |            | Woodland Kv= 5.0 fps            |  |  |  |
|                             | 7.5   | 151      | Total                   |                               |            |                                 |  |  |  |

#### Summary for Subcatchment E-4: Subcat E-4

Runoff = 0.92 cfs @ 12.19 hrs, Volume= 3,738 cf, Depth= 3.14"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| _                            | Α     | rea (sf) | CN I                      | I Description                   |             |  |  |  |  |  |
|------------------------------|-------|----------|---------------------------|---------------------------------|-------------|--|--|--|--|--|
|                              |       | 718      | 61                        | 1 >75% Grass cover, Good, HSG B |             |  |  |  |  |  |
| _                            |       | 13,577   | 55                        | 55 Woods, Good, HSG B           |             |  |  |  |  |  |
|                              |       | 14,295   | 4,295 55 Weighted Average |                                 |             |  |  |  |  |  |
| 14,295 100.00% Pervious Area |       |          |                           | 100.00% Pe                      | ervious Are | a  |  |  |  |  |
|                              |       |          |                           |                                 |             |  |  |  |  |  |
|                              | Tc    | Length   | Slope                     | ,                               | Capacity    | Description                                |  |  |  |  |
| _                            | (min) | (feet)   | (ft/ft)                   | (ft/sec)                        | (cfs)       |  |  |  |  |  |
|                              | 10.4  | 50       | 0.0300                    | 0.08                            |             | Sheet Flow, A-B                            |  |  |  |  |
|                              |       |          |                           |                                 |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |  |
|                              | 2.6   | 84       | 0.0120                    | 0.55                            |             | Shallow Concentrated Flow, B-C             |  |  |  |  |
| _                            |       |          |                           |                                 |             | Woodland Kv= 5.0 fps                       |  |  |  |  |
|                              | 13.0  | 134      | Total                     |                                 |             |  |  |  |  |  |

Type III 24-hr 50-year Rainfall=8.51"

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#### **Summary for Link SP1: Study Point**

Inflow Area = 161,512 sf, 8.19% Impervious, Inflow Depth = 3.72" for 50-year event

Inflow = 12.08 cfs @ 12.21 hrs, Volume= 50,076 cf

Primary = 12.08 cfs @ 12.21 hrs, Volume= 50,076 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP2: Study Point**

Inflow Area = 13,855 sf, 0.00% Impervious, Inflow Depth = 3.49" for 50-year event

Inflow = 1.14 cfs @ 12.13 hrs, Volume= 4,025 cf

Primary = 1.14 cfs @ 12.13 hrs, Volume= 4,025 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP3: Study Point**

Inflow Area = 34,845 sf, 11.24% Impervious, Inflow Depth = 4.31" for 50-year event

Inflow = 3.78 cfs @ 12.11 hrs, Volume= 12,516 cf

Primary = 3.78 cfs @ 12.11 hrs, Volume= 12,516 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 14,295 sf, 0.00% Impervious, Inflow Depth = 3.14" for 50-year event

Inflow = 0.92 cfs @ 12.19 hrs, Volume= 3,738 cf

Primary = 0.92 cfs @ 12.19 hrs, Volume= 3,738 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs



# **Existing Watershed Plan**

1 08-17-23 REVISED PER PDA COMMENTS
REV DATE DESCRIPTION

APPLICANT/LESSEE:

ATDG, LLC 7 SINCLAIR DRIVE EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO. 3250-01 DATE: 08-14-23

SCALE: 1" = 40' DWG. NAME: C-3250-01.dwg

SCALE: 1" = 40' DWG. NAME: C-3250-C

DESIGNED BY: BDJ CHECKED BY:

DESIGNED BY: BD.



civil engineering ◆ land surveying
environmental consulting ◆ landscape architecture
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WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NE

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DRAWING TITLE:

DRAWING TITLE: SHEET No.

EXISTING WATERSHED PLAN EWS-1

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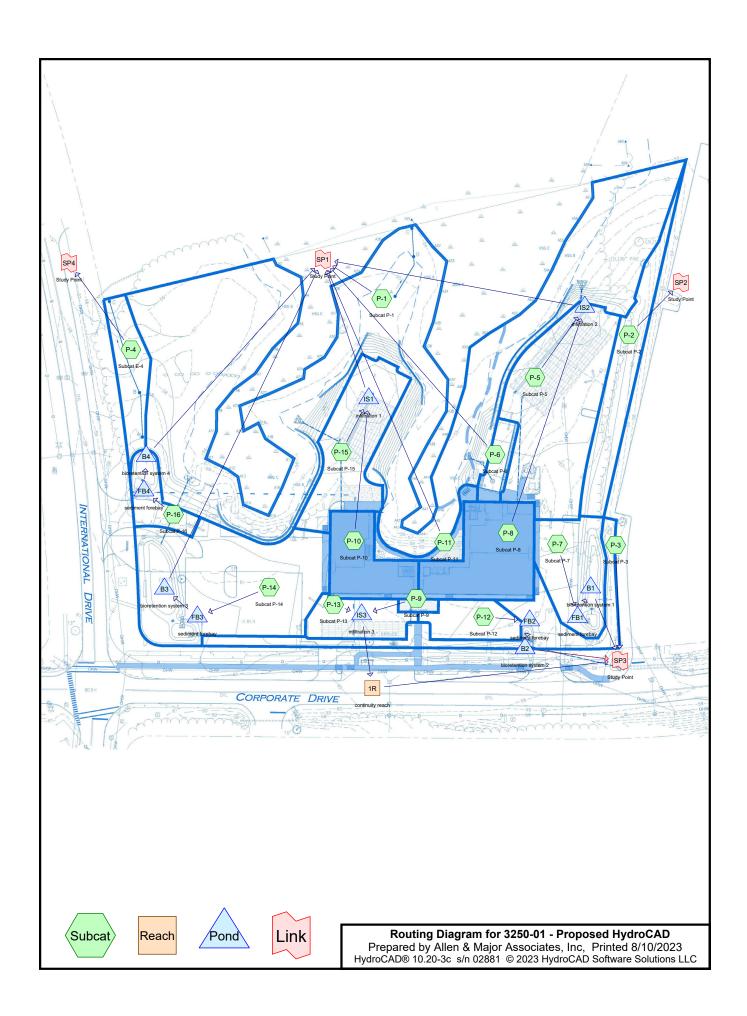




SECTION 6.0 PROPOSED DRAINAGE
ANALYSIS



# **Proposed HydroCAD**



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## **Rainfall Events Listing**

| Event# | Event   | Storm Type     | Curve | Mode    | Duration | B/B | Depth    | AMC |
|--------|---------|----------------|-------|---------|----------|-----|----------|-----|
|        | Name    |                |       |         | (hours)  |     | (inches) |     |
| 1      | 2-year  | Type III 24-hr |       | Default | 24.00    | 1   | 3.69     | 2   |
| 2      | 10-year | Type III 24-hr |       | Default | 24.00    | 1   | 5.60     | 2   |
| 3      | 25-year | Type III 24-hr |       | Default | 24.00    | 1   | 7.10     | 2   |
| 4      | 50-year | Type III 24-hr |       | Default | 24.00    | 1   | 8.51     | 2   |

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## **Area Listing (all nodes)**

| Area    | CN | Description   |
|---------|----|---|
| (sq-ft) |    | (subcatchment-numbers)  |
| 71,209  | 61 | >75% Grass cover, Good, HSG B (P-1, P-11, P-13, P-14, P-15, P-16, P-2, P-3,   |
|         |    | P-4, P-5, P-6, P-7)   |
| 478     | 74 | >75% Grass cover, Good, HSG C (P-1)   |
| 71,444  | 98 | Paved parking, HSG B (P-1, P-11, P-12, P-13, P-14, P-15, P-16, P-3, P-5, P-6, |
|         |    | P-7)  |
| 35      | 98 | Paved parking, HSG C (P-11)   |
| 18,579  | 98 | Roofs, HSG B (P-10, P-8, P-9)   |
| 57,731  | 55 | Woods, Good, HSG B (P-1)  |
| 5,030   | 70 | Woods, Good, HSG C (P-1)  |
| 224,507 | 75 | TOTAL AREA  |

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## Soil Listing (all nodes)

| Area    | Soil  | Subcatchment   |
|---------|-------|--|
| (sq-ft) | Group | Numbers  |
| 0       | HSG A |  |
| 218,963 | HSG B | P-1, P-10, P-11, P-12, P-13, P-14, P-15, P-16, P-2, P-3, P-4, P-5, P-6, P-7, |
|         |       | P-8, P-9   |
| 5,544   | HSG C | P-1, P-11  |
| 0       | HSG D |  |
| 0       | Other |  |
| 224,507 |       | TOTAL AREA   |

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## **Ground Covers (all nodes)**

| HSG-A   | HSG-B   | HSG-C   | HSG-D   | Other   | Total   | Ground        |  |
|---------|---------|---------|---------|---------|---------|---------------|--|
| (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | (sq-ft) | Cover         |  |
| <br>0   | 71,209  | 478     | 0       | 0       | 71,687  | >75% Grass    |  |
|         |         |         |         |         |         | cover, Good   |  |
| 0       | 71,444  | 35      | 0       | 0       | 71,479  | Paved parking |  |
| 0       | 18,579  | 0       | 0       | 0       | 18,579  | Roofs         |  |
| 0       | 57,731  | 5,030   | 0       | 0       | 62,761  | Woods, Good   |  |
| 0       | 218.963 | 5.544   | 0       | 0       | 224.507 | TOTAL AREA    |  |

Sub Nun

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# Pipe Listing (all nodes)

| Line# | Node   | In-Invert | Out-Invert | Length | Slope   | n     | Width    | Diam/Height | Inside-Fill | Node |
|-------|--------|-----------|------------|--------|---------|-------|----------|-------------|-------------|------|
|       | Number | (feet)    | (feet)     | (feet) | (ft/ft) |       | (inches) | (inches)    | (inches)    | Name |
| 1     | B2     | 58.00     | 57.50      | 98.0   | 0.0051  | 0.013 | 0.0      | 8.0         | 0.0         |      |
| 2     | B3     | 58.40     | 57.00      | 77.0   | 0.0182  | 0.013 | 0.0      | 8.0         | 0.0         |      |
| 3     | IS1    | 59.50     | 57.25      | 32.0   | 0.0703  | 0.013 | 0.0      | 8.0         | 0.0         |      |
| 4     | IS2    | 58.92     | 58.00      | 20.0   | 0.0460  | 0.013 | 0.0      | 12.0        | 0.0         |      |

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## Notes Listing (all nodes)

| Line#    | Node<br>Number | Notes   |
|----------|----------------|---|
| 1        | Project        | For Coastal and Great Bay Communities, a 15% increase was added to each storm event per Env-Wq 1503.08(I).  |
| 2        | B1             | GW from TP4   |
| 3        |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.             |
| 4        | B2             | GW from TP4   |
| 5        |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided.  Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.            |
| 6        | B3             | GW from TP1   |
| 7        |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided.  Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.            |
| 8        | B4             | GW assumed based on surrounding data. confirmatory TP to be performed.  |
| 9        |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.             |
| 10       | IS1            | GW elevation from TP8   |
| 11       |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.             |
| 12       | IS2            | GW from TP5   |
| 13       |                | NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.             |
| 14<br>15 | IS3            | GW from TP2 NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate. |

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Type III 24-hr 2-year Rainfall=3.69"
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LLC Page 8

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment P-1: Subcat P-1   | Runoff Area=96,521 sf 0.06% Impervious Runoff Depth=0.53" Flow Length=85' Tc=13.7 min CN=58 Runoff=0.69 cfs 4,262 cf |
|--------------------------------|--|
| Subcatchment P-10: Subcat P-10 | Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=3.46"<br>Tc=6.0 min CN=98 Runoff=0.57 cfs 2,029 cf              |
| Subcatchment P-11: Subcat P-11 | Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=2.92"<br>Tc=6.0 min CN=93 Runoff=0.17 cfs 562 cf                 |
| Subcatchment P-12: Subcat P-12 | Runoff Area=4,268 sf 100.00% Impervious Runoff Depth=3.46"<br>Tc=6.0 min CN=98 Runoff=0.34 cfs 1,229 cf              |
| Subcatchment P-13: Subcat P-13 | Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=3.46"<br>Tc=6.0 min CN=98 Runoff=0.40 cfs 1,440 cf               |
| Subcatchment P-14: Subcat P-14 | Runoff Area=24,922 sf 65.26% Impervious Runoff Depth=2.18"<br>Tc=6.0 min CN=85 Runoff=1.43 cfs 4,533 cf              |
| Subcatchment P-15: Subcat P-15 | Runoff Area=11,933 sf 98.07% Impervious Runoff Depth=3.34"<br>Tc=6.0 min CN=97 Runoff=0.95 cfs 3,324 cf              |
| Subcatchment P-16: Subcat P-16 | Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=1.86"<br>Tc=6.0 min CN=81 Runoff=0.18 cfs 573 cf                 |
| Subcatchment P-2: Subcat P-2   | Runoff Area=9,321 sf 0.00% Impervious Runoff Depth=0.66"<br>Tc=6.0 min CN=61 Runoff=0.12 cfs 513 cf                  |
| Subcatchment P-3: Subcat P-3   | Runoff Area=10,121 sf 28.87% Impervious Runoff Depth=1.25"<br>Tc=6.0 min CN=72 Runoff=0.32 cfs 1,052 cf              |
| Subcatchment P-4: Subcat E-4   | Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=0.66" Flow Length=162' Tc=9.6 min CN=61 Runoff=0.06 cfs 298 cf    |
| Subcatchment P-5: Subcat P-5   | Runoff Area=21,307 sf 97.31% Impervious Runoff Depth=3.34"<br>Tc=6.0 min CN=97 Runoff=1.70 cfs 5,936 cf              |
| Subcatchment P-6: Subcat P-6   | Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=3.02"<br>Tc=6.0 min CN=94 Runoff=0.18 cfs 602 cf                 |
| Subcatchment P-7: Subcat P-7   | Runoff Area=8,731 sf 52.04% Impervious Runoff Depth=1.79"<br>Tc=6.0 min CN=80 Runoff=0.41 cfs 1,301 cf               |
| Subcatchment P-8: Subcat P-8   | Runoff Area=10,876 sf 100.00% Impervious Runoff Depth=3.46"<br>Tc=6.0 min CN=98 Runoff=0.88 cfs 3,132 cf             |
| Subcatchment P-9: Subcat P-9   | Runoff Area=657 sf 100.00% Impervious Runoff Depth=3.46"<br>Tc=6.0 min CN=98 Runoff=0.05 cfs 189 cf                  |

| 3250-01 - Proposed HydroCAD |
|-----------------------------|
|-----------------------------|

Type III 24-hr 2-year Rainfall=3.69"

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Inflow=0.00 cfs 0 cf Reach 1R: continuity reach Outflow=0.00 cfs 0 cf

Peak Elev=58.95' Storage=548 cf Inflow=0.40 cfs 1,210 cf Pond B1: bioretention system 1

Discarded=0.04 cfs 1,210 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,210 cf

Peak Elev=60.65' Storage=502 cf Inflow=0.34 cfs 1,179 cf Pond B2: bioretention system 2

Discarded=0.02 cfs 940 cf Primary=0.11 cfs 239 cf Outflow=0.12 cfs 1,179 cf

Pond B3: bioretention system 3 Peak Elev=59.67' Storage=2,288 cf Inflow=1.39 cfs 4,335 cf

Discarded=0.09 cfs 4,335 cf Primary=0.00 cfs 0 cf Outflow=0.09 cfs 4,335 cf

Peak Elev=58.99' Storage=231 cf Inflow=0.18 cfs 529 cf Pond B4: bioretention system 4

Discarded=0.02 cfs 529 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 529 cf

Pond FB1: sediment forebay Peak Elev=59.64' Storage=125 cf Inflow=0.41 cfs 1,301 cf

Outflow=0.40 cfs 1,210 cf

Peak Elev=60.88' Storage=64 cf Inflow=0.34 cfs 1,229 cf Pond FB2: sediment forebay

Outflow=0.34 cfs 1,179 cf

Peak Elev=59.82' Storage=355 cf Inflow=1.43 cfs 4,533 cf Pond FB3: sediment forebay

Outflow=1.39 cfs 4,335 cf

Peak Elev=59.88' Storage=58 cf Inflow=0.18 cfs 573 cf Pond FB4: sediment forebay

Outflow=0.18 cfs 529 cf

Peak Elev=59.78' Storage=2,198 cf Inflow=1.52 cfs 5,354 cf Pond IS1: infiltration 1

Discarded=0.07 cfs 4,298 cf Primary=0.24 cfs 1,055 cf Outflow=0.31 cfs 5,354 cf

Pond IS2: infiltration 2 Peak Elev=58.89' Storage=4,394 cf Inflow=2.57 cfs 9,068 cf

Discarded=0.13 cfs 9,068 cf Primary=0.00 cfs 0 cf Outflow=0.13 cfs 9,068 cf

Pond IS3: infiltration 3 Peak Elev=60.25' Storage=616 cf Inflow=0.46 cfs 1,629 cf

Discarded=0.04 cfs 1,629 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 1,629 cf

Inflow=0.98 cfs 6,482 cf **Link SP1: Study Point** 

Primary=0.98 cfs 6,482 cf

**Link SP2: Study Point** Inflow=0.12 cfs 513 cf

Primary=0.12 cfs 513 cf

**Link SP3: Study Point** Inflow=0.32 cfs 1,291 cf

Primary=0.32 cfs 1,291 cf

**Link SP4: Study Point** Inflow=0.06 cfs 298 cf

Primary=0.06 cfs 298 cf

Total Runoff Area = 224,507 sf Runoff Volume = 30,977 cf Average Runoff Depth = 1.66" 59.89% Pervious = 134,448 sf 40.11% Impervious = 90,059 sf

Type III 24-hr 2-year Rainfall=3.69"

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## **Summary for Subcatchment P-1: Subcat P-1**

Runoff = 0.69 cfs @ 12.27 hrs, Volume= 4,262 cf, Depth= 0.53"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

|   | Α     | rea (sf) | CN Description |                                  |             |  |  |  |  |  |  |  |
|---|-------|----------|----------------|----------------------------------|-------------|--|--|--|--|--|--|--|
|   |       | 33,219   | 61 :           | 61 >75% Grass cover, Good, HSG B |             |  |  |  |  |  |  |  |
|   |       | 478      | 74             | >75% Gras                        | s cover, Go | ood, HSG C                                 |  |  |  |  |  |  |
|   |       | 57,731   | 55 \           | Noods, Go                        | od, HSG B   |  |  |  |  |  |  |  |
|   |       | 5,030    | 70 \           | Noods, Go                        | od, HSG C   |  |  |  |  |  |  |  |
|   |       | 63       | 98 I           | Paved park                       | ing, HSG B  |  |  |  |  |  |  |  |
|   |       | 96,521   | 58 \           | 58 Weighted Average              |             |  |  |  |  |  |  |  |
|   |       | 96,458   | Ç              | 99.94% Pervious Area             |             |  |  |  |  |  |  |  |
|   |       | 63       | (              | 0.06% Impervious Area            |             |  |  |  |  |  |  |  |
|   |       |          |                |                                  |             |  |  |  |  |  |  |  |
|   | Tc    | Length   | Slope          | Velocity                         | Capacity    | Description                                |  |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft)        | (ft/sec)                         | (cfs)       |  |  |  |  |  |  |  |
|   | 12.2  | 50       | 0.0200         | 0.07                             |             | Sheet Flow, A-B                            |  |  |  |  |  |  |
|   |       |          |                |                                  |             | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |  |  |  |
|   | 1.5   | 35       | 0.0060         | 0.39                             |             | Shallow Concentrated Flow, B-C             |  |  |  |  |  |  |
|   |       |          |                |                                  |             | Woodland Kv= 5.0 fps                       |  |  |  |  |  |  |
|   | 13.7  | 85       | Total          |                                  |             |  |  |  |  |  |  |  |

### Summary for Subcatchment P-10: Subcat P-10

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 2,029 cf, Depth= 3.46"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A            | rea (sf) | CN [    | Description             |          |                         |  |  |  |  |
|--------------|----------|---------|-------------------------|----------|-------------------------|--|--|--|--|
|              | 7,046    | 98 F    | Roofs, HSG B            |          |                         |  |  |  |  |
|              | 7,046    | 1       | 100.00% Impervious Area |          |                         |  |  |  |  |
| Tc           |          | Slope   | ,                       | Capacity | Description             |  |  |  |  |
| (min)<br>6.0 | (feet)   | (ft/ft) | (ft/sec)                | (cfs)    | Direct Entry TD 55 MIN  |  |  |  |  |
| 0.0          |          |         |                         |          | Direct Entry, TR-55 MIN |  |  |  |  |

### **Summary for Subcatchment P-11: Subcat P-11**

Runoff = 0.17 cfs @ 12.09 hrs, Volume= 562 cf, Depth= 2.92"

Routed to Link SP1: Study Point

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| A            | rea (sf) | CN     | Description            |                      |                         |  |  |  |  |  |  |  |
|--------------|----------|--------|------------------------|----------------------|-------------------------|--|--|--|--|--|--|--|
|              | 35       | 98     | Paved park             | Paved parking, HSG C |                         |  |  |  |  |  |  |  |
|              | 343      | 61     | >75% Gras              | s cover, Go          | ood, HSG B              |  |  |  |  |  |  |  |
|              | 1,933    | 98     | Paved park             | Paved parking, HSG B |                         |  |  |  |  |  |  |  |
|              | 2,310    | 93     | Weighted A             | Weighted Average     |                         |  |  |  |  |  |  |  |
|              | 343      |        | 14.84% Pervious Area   |                      |                         |  |  |  |  |  |  |  |
|              | 1,967    |        | 85.16% Impervious Area |                      |                         |  |  |  |  |  |  |  |
| Tc           | Length   | Slope  | •                      | Capacity             | Description             |  |  |  |  |  |  |  |
| <u>(min)</u> | (feet)   | (ft/ft | (ft/sec)               | (cfs)                |                         |  |  |  |  |  |  |  |
| 6.0          |          |        |                        |                      | Direct Entry, TR-55 MIN |  |  |  |  |  |  |  |

# **Summary for Subcatchment P-12: Subcat P-12**

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 1,229 cf, Depth= 3.46"

Routed to Pond FB2: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A           | rea (sf)         | CN E             | Description             |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|
|             | 4,268            | 98 F             | Paved parking, HSG B    |                   |                         |  |  |  |  |
|             | 4,268            | 1                | 100.00% Impervious Area |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |

### Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,440 cf, Depth= 3.46"

Routed to Pond IS3: infiltration 3

| A           | rea (sf)         | CN               | Description                   |                   |                         |  |  |  |  |  |
|-------------|------------------|------------------|-------------------------------|-------------------|-------------------------|--|--|--|--|--|
|             | 4,941            | 98               | Paved parking, HSG B          |                   |                         |  |  |  |  |  |
|             | 58               | 61               | >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |  |
|             | 4,999            | 98               | Weighted Average              |                   |                         |  |  |  |  |  |
|             | 58               |                  | 1.16% Pervious Area           |                   |                         |  |  |  |  |  |
|             | 4,941            | ,                | 98.84% Impervious Area        |                   |                         |  |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,                             | Capacity<br>(cfs) | Description             |  |  |  |  |  |
| 6.0         |                  |                  |                               |                   | Direct Entry, TR-55 MIN |  |  |  |  |  |

Type III 24-hr 2-year Rainfall=3.69"

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## Summary for Subcatchment P-14: Subcat P-14

Runoff 1.43 cfs @ 12.09 hrs, Volume= 4,533 cf, Depth= 2.18"

Routed to Pond FB3: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| Aı    | rea (sf)                   | CN     | Description                   |                  |                         |  |  |  |  |
|-------|----------------------------|--------|-------------------------------|------------------|-------------------------|--|--|--|--|
|       | 8,658                      | 61     | >75% Grass cover, Good, HSG B |                  |                         |  |  |  |  |
|       | 16,263                     | 98     | Paved park                    | ing, HSG B       | 3                       |  |  |  |  |
|       | 24,922                     | 85     | Weighted A                    | Weighted Average |                         |  |  |  |  |
|       | 8,658 34.74% Pervious Area |        |                               |                  |                         |  |  |  |  |
|       | 16,263                     |        | 65.26% Imp                    | ervious Are      | ea                      |  |  |  |  |
|       |                            |        |                               |                  |                         |  |  |  |  |
| Тс    | Length                     | Slope  | ,                             | Capacity         | Description             |  |  |  |  |
| (min) | (feet)                     | (ft/ft | ft) (ft/sec) (cfs)            |                  |                         |  |  |  |  |
| 6.0   |                            |        |                               |                  | Direct Entry, TR-55 MIN |  |  |  |  |

Direct Entry, TR-55 MIN

#### **Summary for Subcatchment P-15: Subcat P-15**

Runoff 0.95 cfs @ 12.09 hrs, Volume= 3,324 cf. Depth= 3.34"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

|   | A     | rea (sf) | CN     | Description |                               |                         |  |  |  |  |  |
|---|-------|----------|--------|-------------|-------------------------------|-------------------------|--|--|--|--|--|
|   |       | 230      | 61     | >75% Gras   | >75% Grass cover, Good, HSG B |                         |  |  |  |  |  |
| _ |       | 11,703   | 98     | Paved park  | Paved parking, HSG B          |                         |  |  |  |  |  |
|   |       | 11,933   | 97     | Weighted A  | Weighted Average              |                         |  |  |  |  |  |
|   |       | 230      |        |             |                               |                         |  |  |  |  |  |
|   |       | 11,703   |        | 98.07% Imp  | ervious Ar                    | ea                      |  |  |  |  |  |
|   |       |          |        |             |                               |                         |  |  |  |  |  |
|   | Tc    | Length   | Slope  | ,           | Capacity                      | Description             |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | (ft/sec)    | (cfs)                         |                         |  |  |  |  |  |
|   | 6.0   |          |        |             |                               | Direct Entry, TR-55 MIN |  |  |  |  |  |

Direct Entry, TR-55 MIN

### **Summary for Subcatchment P-16: Subcat P-16**

0.18 cfs @ 12.09 hrs. Volume= 573 cf, Depth= 1.86" Runoff

Routed to Pond FB4: sediment forebay

Type III 24-hr 2-year Rainfall=3.69"

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| Α     | rea (sf) | CN     | Description            |                               |             |  |  |  |  |  |  |
|-------|----------|--------|------------------------|-------------------------------|-------------|--|--|--|--|--|--|
|       | 1,960    | 98     | Paved parking, HSG B   |                               |             |  |  |  |  |  |  |
|       | 1,731    | 61     | >75% Gras              | >75% Grass cover, Good, HSG B |             |  |  |  |  |  |  |
|       | 3,691    | 81     | Weighted Average       |                               |             |  |  |  |  |  |  |
|       | 1,731    |        | 46.90% Pervious Area   |                               |             |  |  |  |  |  |  |
|       | 1,960    |        | 53.10% Impervious Area |                               |             |  |  |  |  |  |  |
| _     |          |        |                        |                               |             |  |  |  |  |  |  |
| Tc    | Length   | Slope  | ,                      | Capacity                      | Description |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)             | (cfs)                         |             |  |  |  |  |  |  |
|       |          |        |                        |                               |             |  |  |  |  |  |  |

6.0

**Direct Entry, TR-55 MIN** 

#### **Summary for Subcatchment P-2: Subcat P-2**

Runoff = 0.12 cfs @ 12.11 hrs, Volume=

513 cf, Depth= 0.66"

Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A           | rea (sf)         | CN E             | escription                      |                   |                         |  |  |  |  |  |
|-------------|------------------|------------------|---------------------------------|-------------------|-------------------------|--|--|--|--|--|
|             | 9,321            | 61 >             | 1 >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |  |
|             | 9,321            | 1                | 100.00% Pervious Area           |                   |                         |  |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)            | Capacity<br>(cfs) | Description             |  |  |  |  |  |
| 6.0         |                  |                  |                                 |                   | Direct Entry, TR-55 min |  |  |  |  |  |

# **Summary for Subcatchment P-3: Subcat P-3**

Runoff = 0.32 cfs @ 12.10 hrs, Volume=

1,052 cf, Depth= 1.25"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| _ | Ar    | rea (sf) | CN     | Description                   |             |             |             |  |  |  |  |
|---|-------|----------|--------|-------------------------------|-------------|-------------|-------------|--|--|--|--|
|   |       | 7,199    | 61     | >75% Grass cover, Good, HSG B |             |             |             |  |  |  |  |
| _ |       | 2,922    | 98     | Paved parking, HSG B          |             |             |             |  |  |  |  |
|   |       | 10,121   | 72     | Weighted Average              |             |             |             |  |  |  |  |
|   |       | 7,199    |        | 71.13% Pervious Area          |             |             |             |  |  |  |  |
|   |       | 2,922    |        | 28.87% Imp                    | ervious Are | ea          |             |  |  |  |  |
|   |       |          |        |                               |             |             |             |  |  |  |  |
|   | Тс    | Length   | Slope  | ,                             | Capacity    | Description |             |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | t) (ft/sec) (cfs)             |             |             |             |  |  |  |  |
|   | 0.0   |          |        |                               |             | D: 4 E 4    | TD == 14111 |  |  |  |  |

6.0

Direct Entry, TR-55 MIN

Type III 24-hr 2-year Rainfall=3.69"

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## **Summary for Subcatchment P-4: Subcat E-4**

Runoff = 0.06 cfs @ 12.17 hrs, Volume=

298 cf, Depth= 0.66"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| _ | Α           | rea (sf)         | CN I             | Description           |                              |  |  |  |  |  |  |  |
|---|-------------|------------------|------------------|-----------------------|------------------------------|--|--|--|--|--|--|--|
|   |             | 5,412            | 61 :             | >75% Gras             | 75% Grass cover, Good, HSG B |  |  |  |  |  |  |  |
|   |             | 5,412            | •                | 100.00% Pervious Area |                              |  |  |  |  |  |  |  |
|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,                     | Capacity<br>(cfs)            | Description  |  |  |  |  |  |  |
| - | 8.1         | 50               | 0.0200           |                       | , ,                          | Sheet Flow, A-B  |  |  |  |  |  |  |
| _ | 1.5         | 112              | 0.0310           | 1.23                  |                              | Grass: Dense n= 0.240 P2= 3.28"  Shallow Concentrated Flow, B-C  Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |  |
|   | 9.6         | 162              | Total            |                       |                              |  |  |  |  |  |  |  |

#### **Summary for Subcatchment P-5: Subcat P-5**

Runoff = 1.70 cfs @ 12.09 hrs, Volume= 5,936 cf, Depth= 3.34"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| Area          | (sf) CN                 | Description   | Description                   |                         |  |  |  |  |  |
|---------------|-------------------------|---------------|-------------------------------|-------------------------|--|--|--|--|--|
|               | 574 61                  | >75% Gras     | >75% Grass cover, Good, HSG B |                         |  |  |  |  |  |
| 20,7          | 733 98                  | Paved park    | ing, HSG B                    |                         |  |  |  |  |  |
| 21,3          | 307 97                  | Weighted A    | Weighted Average              |                         |  |  |  |  |  |
| ;             | 574 2.69% Pervious Area |               |                               |                         |  |  |  |  |  |
| 20,7          | 733                     | 97.31% lmp    | pervious Ar                   | ea                      |  |  |  |  |  |
| <b>T</b> . I. |                         |               | 0                             | Describe the co         |  |  |  |  |  |
|               | ngth Slo                | . ,           | Capacity                      | Description             |  |  |  |  |  |
| (min)(        | feet) (ft               | /ft) (ft/sec) | t) (ft/sec) (cfs)             |                         |  |  |  |  |  |
| 6.0           |                         |               |                               | Direct Entry, TR-55 MIN |  |  |  |  |  |

### **Summary for Subcatchment P-6: Subcat P-6**

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 602 cf, Depth= 3.02"

Routed to Link SP1 : Study Point

Type III 24-hr 2-year Rainfall=3.69"

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| A     | rea (sf) | CN     | Description                   |                      |              |            |  |  |  |  |
|-------|----------|--------|-------------------------------|----------------------|--------------|------------|--|--|--|--|
|       | 276      | 61     | >75% Grass cover, Good, HSG B |                      |              |            |  |  |  |  |
|       | 2,115    | 98     | Paved parki                   | Paved parking, HSG B |              |            |  |  |  |  |
|       | 2,391    | 94     | Weighted A                    | Weighted Average     |              |            |  |  |  |  |
|       | 276      |        | 11.55% Pervious Area          |                      |              |            |  |  |  |  |
|       | 2,115    |        | 88.45% Impervious Area        |                      |              |            |  |  |  |  |
| _     |          |        |                               |                      |              |            |  |  |  |  |
| Тс    | Length   | Slop   | ,                             | Capacity             | Description  |            |  |  |  |  |
| (min) | (feet)   | (ft/ft | t) (ft/sec) (cfs)             |                      |              |            |  |  |  |  |
| 6.0   |          |        |                               |                      | Direct Entry | TD SE MINI |  |  |  |  |

6.0

**Direct Entry, TR-55 MIN** 

#### **Summary for Subcatchment P-7: Subcat P-7**

Runoff = 0.41 cfs @ 12.09 hrs, Volume=

1,301 cf, Depth= 1.79"

Routed to Pond FB1: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A     | rea (sf) | CN      | Description                   |          |                         |  |  |  |  |  |
|-------|----------|---------|-------------------------------|----------|-------------------------|--|--|--|--|--|
|       | 4,544    | 98      | Paved parking, HSG B          |          |                         |  |  |  |  |  |
|       | 4,188    | 61      | >75% Grass cover, Good, HSG B |          |                         |  |  |  |  |  |
| •     | 8,731    | 80      | Weighted Average              |          |                         |  |  |  |  |  |
|       | 4,188    |         | 47.96% Pervious Area          |          |                         |  |  |  |  |  |
|       | 4,544    |         | 52.04% Impervious Area        |          |                         |  |  |  |  |  |
| _     |          |         |                               |          |                         |  |  |  |  |  |
| Tc    | Length   | Slope   | ,                             | Capacity | Description             |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | /ft) (ft/sec) (cfs)           |          |                         |  |  |  |  |  |
| 6.0   |          |         |                               |          | Direct Entry, TR-55 MIN |  |  |  |  |  |

# **Summary for Subcatchment P-8: Subcat P-8**

Runoff = 0.88 cfs @ 12.09 hrs, Volume= 3

3,132 cf, Depth= 3.46"

Routed to Pond IS2: infiltration 2

| Aı          | rea (sf)         | CN               | Description          |                   |                         |  |  |  |  |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------|--|--|--|--|
|             | 10,876           | 98               | 98 Roofs, HSG B      |                   |                         |  |  |  |  |
|             | 10,876           |                  | 100.00% Im           | npervious A       | ırea                    |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                      |                   | Direct Entry, TR-55 MIN |  |  |  |  |

Type III 24-hr 2-year Rainfall=3.69"

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## Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.05 cfs @ 12.09 hrs, Volume= 189 cf, Depth= 3.46"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 2-year Rainfall=3.69"

| A           | rea (sf)         | CN I             | Description             |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|
|             | 657              | 98 F             | Roofs, HSG B            |                   |                         |  |  |  |  |
|             | 657              |                  | 100.00% Impervious Area |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |

## Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 2-year event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routed to Link SP3: Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Pond B1: bioretention system 1**

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

```
8,731 sf, 52.04% Impervious, Inflow Depth = 1.66"
Inflow Area =
                                                                        for 2-year event
Inflow
                  0.40 cfs @ 12.11 hrs, Volume=
                                                          1,210 cf
                  0.04 cfs @ 13.45 hrs, Volume=
Outflow
          =
                                                          1,210 cf, Atten= 91%, Lag= 80.4 min
                  0.04 cfs @ 13.45 hrs, Volume=
Discarded =
                                                          1.210 cf
                  0.00 cfs @ 0.00 hrs, Volume=
                                                              0 cf
Primary
   Routed to Link SP3: Study Point
```

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 58.95' @ 13.45 hrs Surf.Area= 571 sf Storage= 548 cf Flood Elev= 61.00' Surf.Area= 571 sf Storage= 3,054 cf

Plug-Flow detention time= 186.1 min calculated for 1,208 cf (100% of inflow) Center-of-Mass det. time= 186.0 min (1,037.7 - 851.7)

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| Volume             | Inve           | rt Avai              | l.Storage            | Storage Description                             | on   |  |
|--------------------|----------------|----------------------|----------------------|---|--|--|
| #1<br>#2           | 58.50<br>56.50 |                      | 2,712 cf<br>343 cf   | <b>U</b> ,                                      | regular)Listed bel                                     | elow (Recalc) -Impervious<br>ow (Recalc)         |
|                    |                |                      | 3,054 cf             | Total Available Sto                             | orage  |  |
| Elevatio           |                | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)                       | Cum.Store<br>(cubic-feet)                              | Wet.Area<br>(sq-ft)                              |
| 58.50<br>59.00     | 0              | 365<br>571           | 133.0<br>142.0       | 0<br>232  | 0<br>232   | 365<br>574                                       |
| 60.00<br>61.00     |                | 1,101<br>2,286       | 180.0<br>255.0       | 822<br>1,658                                    | 1,054<br>2,712   | 1,561<br>4,166                                   |
| Elevation<br>(feet |                | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)                       | Cum.Store<br>(cubic-feet)                              | Wet.Area<br>(sq-ft)                              |
| 56.50<br>58.50     |                | 571<br>571           | 142.0<br>142.0       | 0<br>1,142                                      | 0<br>1,142   | 571<br>855                                       |
| Device             | Routing        | In                   | vert Outle           | et Devices                                      |  |  |
| #1                 | Primary        | 60                   | Head<br>2.50<br>Coef | 3.00 3.50 4.00 4                                | 0.60 0.80 1.00 1<br>4.50 5.00 5.50<br>50 2.70 2.68 2.6 | .20 1.40 1.60 1.80 2.00<br>8 2.66 2.65 2.65 2.65 |
| #2                 | Discarded      | d 56                 | .50' <b>0.72</b>     | <b>0 in/hr Exfiltration</b> ductivity to Ground | over Wetted area                                       | <u> </u>   |

**Discarded OutFlow** Max=0.04 cfs @ 13.45 hrs HW=58.95' (Free Discharge) **2=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.50' (Free Discharge) 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

## Summary for Pond B2: bioretention system 2

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

| Inflow Area =  | 4,268 sf,100.00% Impervious,  | Inflow Depth = 3.31" for 2-year event |
|----------------|-------------------------------|---------------------------------------|
| Inflow =       | 0.34 cfs @ 12.10 hrs, Volume= | 1,179 cf                              |
| Outflow =      | 0.12 cfs @ 12.36 hrs, Volume= | 1,179 cf, Atten= 65%, Lag= 16.0 min   |
| Discarded =    | 0.02 cfs @ 12.36 hrs, Volume= | 940 cf                                |
| Primary =      | 0.11 cfs @ 12.36 hrs, Volume= | 239 cf                                |
| Routed to Link | SP3 : Study Point             |                                       |

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Flood Elev= 61.00' Surf.Area= 258 sf Storage= 743 cf

Plug-Flow detention time= 234.6 min calculated for 1,177 cf (100% of inflow)

Center-of-Mass det. time= 234.7 min ( 1,009.5 - 774.8 )

| Volume   | Invert           | Avail.St           | orage            | Storage Description   | on                        |   |   |
|----------|------------------|--------------------|------------------|---|---------------------------|---|---|
| #1<br>#2 | 59.50'<br>57.50' |                    | 588 cf<br>155 cf | surface storage<br>media storage (la<br>516 cf Overall x 3                | rregular)Listed be        | pelow (Recalc) -Impervious<br>Plow (Recalc)           | S |
|          |                  | •                  | 743 cf           | Total Available St  | orage                     |   |   |
| Elevatio |                  | rf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                                   |   |
| 59.5     | 50               | 98                 | 88.0             | 0   | 0                         | 98  |   |
| 60.0     |                  | 258                | 114.0            | 86  | 86                        | 519   |   |
| 61.0     | 00               | 796                | 185.0            | 502   | 588                       | 2,215   |   |
| Elevatio |                  | rf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                                   |   |
| 57.5     | 50               | 258                | 114.0            | 0   | 0                         | 258   |   |
| 59.5     | 50               | 258                | 114.0            | 516   | 516                       | 486   |   |
| Device   | Routing          | Invert             | : Outle          | et Devices  |                           |   |   |
| #1       | Discarded        | 57.50              | 0.72             | 0 in/hr Exfiltration  | over Wetted are           | a   |   |
| #2       | Device 3         | 60.50              | 15.0             | ductivity to Ground<br><b>" Vert. overflow o</b><br>ted to weir flow at l | <b>rifice</b> C= 0.600    | 55.20' Phase-In= 0.01'                                |   |
| #3       | Primary          | 58.00              | Inlet            |   | .00' / 57.50' S= 0        | 00<br>.0051 '/'   Cc= 0.900<br>r,  Flow Area= 0.35 sf |   |

**Discarded OutFlow** Max=0.02 cfs @ 12.36 hrs HW=60.65' (Free Discharge) **1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.10 cfs @ 12.36 hrs HW=60.65' (Free Discharge)

3=Culvert (Passes 0.10 cfs of 1.69 cfs potential flow)

2=overflow orifice (Orifice Controls 0.10 cfs @ 1.30 fps)

#### **Summary for Pond B3: bioretention system 3**

#### GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 2.09" for 2-year event

Inflow = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf

Outflow = 0.09 cfs @ 14.20 hrs, Volume= 4,335 cf, Atten= 94%, Lag= 125.0 min

Discarded = 0.09 cfs @ 14.20 hrs, Volume = 4,335 cfPrimary = 0.00 cfs @ 0.00 hrs, Volume = 0 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.67' @ 14.20 hrs Surf.Area= 1,639 sf Storage= 2,288 cf

Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 304.2 min calculated for 4,329 cf (100% of inflow)

Center-of-Mass det. time= 304.2 min (1,138.5 - 834.3)

| Volume   | Invert           | Avail.   | Storage            | Storage Description                                      | า                  |                                       |
|----------|------------------|----------|--------------------|--|--------------------|---------------------------------------|
| #1<br>#2 | 59.00'<br>57.00' | Ę        | 5,886 cf<br>983 cf | surface storage (Inmedia storage (Irm 3,278 cf Overall x | egular)Listed belo | ow (Recalc) -Impervious<br>w (Recalc) |
|          |                  | 6        | 5,870 cf           | Total Available Stor                                     | rage               |                                       |
| Elevatio |                  | ırf.Area | Perim.             | Inc.Store  | Cum.Store          | Wet.Area                              |
| (fee     | t)               | (sq-ft)  | (feet)             | (cubic-feet)   | (cubic-feet)       | <u>(sq-ft)</u>                        |
| 59.0     | 0                | 1,639    | 184.0              | 0  | 0                  | 1,639                                 |
| 60.0     | 0                | 2,580    | 217.0              | 2,092  | 2,092              | 2,711                                 |
| 61.0     |                  | 5,156    | 323.0              | 3,794  | 5,886              | 7,274                                 |
|          |                  | -,       |                    | -,   | 2,222              | . ,—.                                 |
| Elevatio | n Su             | ırf.Area | Perim.             | Inc.Store  | Cum.Store          | Wet.Area                              |
| (fee     | t)               | (sq-ft)  | (feet)             | (cubic-feet)   | (cubic-feet)       | (sq-ft)                               |
| 57.0     | 0                | 1,639    | 184.0              | 0  | 0                  | 1,639                                 |
| 59.0     | 0                | 1,639    | 184.0              | 3,278  | 3,278              | 2,007                                 |
|          |                  | ,,,,,,   |                    | -,   | -,                 | _,-,-                                 |
| Device   | Routing          | Inve     | ert Outle          | et Devices   |                    |                                       |
| #1       | Device 2         | 60.8     | 0' <b>15.0</b>     | " Horiz. Orifice/Gra                                     | te C= 0.600        |                                       |
|          |                  |          | Limit              | ted to weir flow at lov                                  | w heads            |                                       |
| #2       | Primary          | 58.4     | ·0' <b>8.0"</b>    | Round Culvert L=   | 77.0' Ke= 0.500    |                                       |
|          | ,                |          |                    | / Outlet Invert= 58.4                                    |                    | 182 '/' Cc= 0.900                     |
|          |                  |          |                    | .013 Corrugated PE                                       |                    |                                       |
| #3       | Discarded        | 57.0     |                    | 0 in/hr Exfiltration                                     |                    |                                       |
| ,,,      | Diccardod        | 07.0     | _                  | ductivity to Groundw                                     |                    | 5.50' Phase-In= 0.01'                 |

**Discarded OutFlow** Max=0.09 cfs @ 14.20 hrs HW=59.67' (Free Discharge) **3=Exfiltration** (Controls 0.09 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

1=Orifice/Grate (Controls 0.00 cfs)

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## Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 0.18 cfs @ 12.11 hrs, Volume= 529 cf
Outflow = 0.02 cfs @ 13.10 hrs, Volume= 529 cf, Atten= 90%, Lag= 59.5 min
Discarded = 0.02 cfs @ 13.10 hrs, Volume= 529 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 58.99' @ 13.10 hrs Surf.Area= 516 sf Storage= 231 cf Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 151.3 min calculated for 529 cf (100% of inflow) Center-of-Mass det. time= 151.2 min (1,001.4 - 850.3)

| Volume   | Inver          | t Avail.St           | orage               | Storage Description   | on                                     |                                      |      |
|----------|----------------|----------------------|---------------------|---|--|--------------------------------------|------|
| #1<br>#2 | 59.50<br>57.50 | ,                    | 049 cf<br>310 cf    |   | regular)Listed belo                    | elow (Recalc) -Imperv<br>ow (Recalc) | ious |
|          |                | 1,:                  | 358 cf              | Total Available Sto   | orage                                  |                                      |      |
| Elevatio |                | Surf.Area<br>(sq-ft) | Perim.<br>(feet)    | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)              | Wet.Area<br>(sq-ft)                  |      |
| 59.5     | 50             | 391                  | 79.0                | 0   | 0                                      | 391                                  |      |
| 60.0     | 00             | 516                  | 88.0                | 226   | 226                                    | 518                                  |      |
| 61.0     | 00             | 1,174                | 135.0               | 823   | 1,049                                  | 1,359                                |      |
| Elevatio |                | Surf.Area<br>(sq-ft) | Perim.<br>(feet)    | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)              | Wet.Area<br>(sq-ft)                  |      |
| 57.5     | 50             | 516                  | 88.0                | 0   | 0                                      | 516                                  |      |
| 59.5     | 50             | 516                  | 88.0                | 1,032   | 1,032                                  | 692                                  |      |
| Device   | Routing        | Inver                | Outle               | et Devices  |  |                                      |      |
| #1       | Primary        | 60.75                | Head<br>2.50        | 3.00 3.50 4.00 4  | 0.60 0.80 1.00 1<br>4.50 5.00 5.50     | .20 1.40 1.60 1.80                   |      |
| #2       | Discarded      | 57.50                | 2.68<br><b>0.72</b> | f. (English) 2.38 2.<br>2.72 2.73 2.76 2<br><b>0 in/hr Exfiltration</b><br>ductivity to Groundv | 2.79 2.88 3.07 3.3<br>over Wetted area |                                      |      |

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Discarded OutFlow Max=0.02 cfs @ 13.10 hrs HW=58.99' (Free Discharge) **T\_2=Exfiltration** (Controls 0.02 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge) 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

#### Summary for Pond FB1: sediment forebay

8,731 sf, 52.04% Impervious, Inflow Depth = 1.79" for 2-year event Inflow Area =

Inflow 0.41 cfs @ 12.09 hrs, Volume= 1.301 cf

0.40 cfs @ 12.11 hrs, Volume= Outflow 1,210 cf, Atten= 2%, Lag= 1.0 min

Primary = 0.40 cfs @ 12.11 hrs, Volume= 1,210 cf

Routed to Pond B1: bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 59.64' @ 12.11 hrs Surf.Area= 249 sf Storage= 125 cf

Flood Elev= 61.00' Surf.Area= 489 sf Storage= 627 cf

Plug-Flow detention time= 52.3 min calculated for 1,208 cf (93% of inflow)

Center-of-Mass det. time= 16.1 min (851.7 - 835.7)

| Volume                  | Inv     | ert Avail.           | Storage              | Storage Description  | on                        |                     |          |
|-------------------------|---------|----------------------|----------------------|--|---------------------------|---------------------|----------|
| #1                      | 59.0    | 00'                  | 627 cf               | surface storage (  | Irregular)Listed b        | pelow (Recalc)      |          |
| Elevatio                |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |          |
| 59.00<br>60.00<br>61.00 | 0       | 146<br>318<br>489    | 45.0<br>66.0<br>84.0 | 0<br>226<br>400  | 0<br>226<br>627           | 146<br>340<br>567   |          |
| Device                  | Routing | Inve                 | ert Outle            | et Devices   |                           |                     |          |
| #1                      | Primary | 59.5                 | Head<br>2.50<br>Coef | ong x 2.0' breadth<br>d (feet) 0.20 0.40<br>3.00 3.50<br>. (English) 2.54 2.<br>3.07 3.20 3.32 | 0.60 0.80 1.00            | 1.20 1.40 1.60 1    | .80 2.00 |

Primary OutFlow Max=0.39 cfs @ 12.11 hrs HW=59.64' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.39 cfs @ 0.95 fps)

#### Summary for Pond FB2: sediment forebay

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 3.46" for 2-year event

Inflow 0.34 cfs @ 12.09 hrs, Volume= 1,229 cf

0.34 cfs @ 12.10 hrs, Volume= 1,179 cf, Atten= 0%, Lag= 0.5 min Outflow

Primary 0.34 cfs @ 12.10 hrs, Volume= 1.179 cf

Routed to Pond B2: bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Flood Elev= 61.00' Surf.Area= 130 sf Storage= 78 cf

Plug-Flow detention time= 45.3 min calculated for 1,177 cf (96% of inflow)

Center-of-Mass det. time= 21.3 min ( 774.8 - 753.5 )

| Volume             | Inv     | ert Avail.           | Storage              | Storage Description   | n                         |                     |         |
|--------------------|---------|----------------------|----------------------|---|---------------------------|---------------------|---------|
| #1                 | 59.     | 50'                  | 78 cf                | surface storage (I  | rregular)Listed be        | low (Recalc)        |         |
| Elevatior<br>(feet | · -     | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |         |
| 59.50              | 0       | 1                    | 1.0                  | 0   | 0                         | 1                   |         |
| 60.00              | )       | 28                   | 23.0                 | 6   | 6                         | 43                  |         |
| 61.00              | 0       | 130                  | 44.0                 | 73  | 78                        | 160                 |         |
| Device             | Routing | Inv                  | ert Outle            | et Devices  |                           |                     |         |
| #1                 | Primary | 60.7                 | Head<br>2.50<br>Coef | long x 2.0' breadth<br>d (feet) 0.20 0.40 0<br>3.00 3.50<br>f. (English) 2.54 2.6<br>3.07 3.20 3.32 | 0.60 0.80 1.00 1.         | 20 1.40 1.60 1.8    | 80 2.00 |

Primary OutFlow Max=0.34 cfs @ 12.10 hrs HW=60.88' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.34 cfs @ 0.90 fps)

## **Summary for Pond FB3: sediment forebay**

Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 2.18" for 2-year event

Inflow = 1.43 cfs @ 12.09 hrs, Volume= 4,533 cf

Outflow = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf, Atten= 3%, Lag= 1.3 min

Primary = 1.39 cfs @ 12.11 hrs, Volume= 4,335 cf

Routed to Pond B3: bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.82' @ 12.11 hrs Surf.Area= 536 sf Storage= 355 cf

Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 38.5 min calculated for 4,329 cf (96% of inflow)

Center-of-Mass det. time= 14.4 min (834.3 - 819.9)

| Volume       | Inv     | ert Ava              | il.Storage        | Storage Descript          | ion                    |                     |    |
|--------------|---------|----------------------|-------------------|---------------------------|------------------------|---------------------|----|
| #1           | 59.     | 00'                  | 457 cf            | surface storage           | (Irregular)Listed      | below (Recalc)      |    |
| Elevatio     |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)  | Inc.Store<br>(cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |    |
| 59.0<br>60.0 |         | 340<br>586           | 70.0<br>91.0      | 0<br>457                  | 0<br>457               | 340<br>621          |    |
| Device       | Routing | In                   | vert Outle        | et Devices                |                        |                     |    |
| #1           | Primary | 59                   | 0.50' <b>3.0'</b> | long x 2.0' bread         | th Broad-Crested       | d Rectangular We    | ir |

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2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88

2.85 3.07 3.20 3.32

Primary OutFlow Max=1.35 cfs @ 12.11 hrs HW=59.81' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 1.35 cfs @ 1.44 fps)

#### Summary for Pond FB4: sediment forebay

3,691 sf, 53.10% Impervious, Inflow Depth = 1.86" for 2-year event Inflow Area =

Inflow 0.18 cfs @ 12.09 hrs, Volume= 573 cf

Outflow 0.18 cfs @ 12.11 hrs, Volume= 529 cf, Atten= 2%, Lag= 1.0 min

0.18 cfs @ 12.11 hrs, Volume= Primary 529 cf

Routed to Pond B4: bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 59.88' @ 12.11 hrs Surf.Area= 184 sf Storage= 58 cf

Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 56.6 min calculated for 529 cf (92% of inflow)

Center-of-Mass det. time= 17.7 min (850.3 - 832.6)

| Volume         | Inv     | ert Avail            | l.Storage            | Storage Description  | on                        |                     |         |
|----------------|---------|----------------------|----------------------|--|---------------------------|---------------------|---------|
| #1             | 59.     | 50'                  | 81 cf                | surface storage (  | Irregular)Listed be       | elow (Recalc)       |         |
| Elevation (fee |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |         |
| 59.8<br>60.0   |         | 124<br>205           | 42.0<br>56.0         | 0<br>81  | 0<br>81                   | 124<br>236          |         |
| Device         | Routing | Inv                  | ert Outle            | et Devices   |                           |                     |         |
| #1             | Primary | 59.                  | Head<br>2.50<br>Coef | long x 2.0' breadth<br>d (feet) 0.20 0.40<br>3.00 3.50<br>f. (English) 2.54 2.<br>3.07 3.20 3.32 | 0.60 0.80 1.00 1          | .20 1.40 1.60 1.    | 80 2.00 |

Primary OutFlow Max=0.17 cfs @ 12.11 hrs HW=59.88' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.72 fps)

# **Summary for Pond IS1: infiltration 1**

GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Type III 24-hr 2-year Rainfall=3.69"

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| Inflow Area = | 18,979 sf, 98.79% Impervious, | Inflow Depth = 3.39" for 2-year event |
|---------------|-------------------------------|---------------------------------------|
| Inflow =      | 1.52 cfs @ 12.09 hrs, Volume= | 5,354 cf                              |
| Outflow =     | 0.31 cfs @ 12.51 hrs, Volume= | 5,354 cf, Atten= 80%, Lag= 25.4 min   |
| Discarded =   | 0.07 cfs @ 12.51 hrs, Volume= | 4,298 cf                              |
| Primary =     | 0.24 cfs @ 12.51 hrs. Volume= | 1.055 cf                              |

Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.78' @ 12.51 hrs Surf.Area= 3,088 sf Storage= 2,198 cf Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 205.6 min calculated for 5,346 cf (100% of inflow)

Center-of-Mass det. time= 205.5 min ( 964.6 - 759.1 )

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 58.60' | 2,174 cf      | 41.50'W x 74.40'L x 2.33'H Field A                                 |
|        |        |               | 7,204 cf Overall - 1,769 cf Embedded = $5,435$ cf x $40.0\%$ Voids |
| #2A    | 59.10' | 1,769 cf      | ADS_StormTech SC-310 +Cap x 120 Inside #1                          |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf      |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap          |
|        |        |               | 120 Chambers in 12 Rows  |
|        |        | 3 943 cf      | Total Available Storage  |

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 58.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01' |
| #2     | Primary   | 59.50' | 8.0" Round Culvert L= 32.0' Ke= 0.500                          |
|        | •         |        | Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf    |

Discarded OutFlow Max=0.07 cfs @ 12.51 hrs HW=59.78' (Free Discharge) 1=Exfiltration (Controls 0.07 cfs)

Primary OutFlow Max=0.24 cfs @ 12.51 hrs HW=59.78' (Free Discharge) 2=Culvert (Inlet Controls 0.24 cfs @ 1.79 fps)

## **Summary for Pond IS2: infiltration 2**

#### **GW from TP5**

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Type III 24-hr 2-year Rainfall=3.69"

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| Inflow Are | a = | 32,183 sf, 98.22% Impervious, | Inflow Depth = 3.38" | for 2-year event       |
|------------|-----|-------------------------------|----------------------|------------------------|
| Inflow     | =   | 2.57 cfs @ 12.09 hrs, Volume= | 9,068 cf             |                        |
| Outflow    | =   | 0.13 cfs @ 14.20 hrs, Volume= | 9,068 cf, Atter      | n= 95%, Lag= 126.7 min |

Discarded = 0.13 cfs @ 14.20 hrs, Volume= 9,068 cf Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 58.89' @ 14.20 hrs Surf.Area= 6,032 sf Storage= 4,394 cf Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 305.9 min calculated for 9,056 cf (100% of inflow)

Center-of-Mass det. time= 305.8 min (1,065.3 - 759.4)

| Volume | Invert | Avail.Storage | Storage Description   |
|--------|--------|---------------|---|
| #1A    | 57.70' | 4,214 cf      | 51.50'W x 117.12'L x 2.33'H Field A                             |
|        |        | ·             | 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids |
| #2A    | 58.20' | 3,538 cf      | ADS_StormTech SC-310 +Cap x 240 Inside #1                       |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf   |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap       |
|        |        |               | 240 Chambers in 15 Rows   |
|        |        | 7.750 of      | Total Available Ctarage   |

7,752 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 57.70' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01' |
| #2     | Primary   | 58.92' | <b>12.0" Round Culvert</b> L= 20.0' Ke= 0.500                  |
|        |           |        | Inlet / Outlet Invert= 58.92' / 58.00' S= 0.0460 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf    |

**Discarded OutFlow** Max=0.13 cfs @ 14.20 hrs HW=58.89' (Free Discharge) **1=Exfiltration** (Controls 0.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.70' (Free Discharge) 2=Culvert (Controls 0.00 cfs)

## **Summary for Pond IS3: infiltration 3**

#### GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 3.46" for 2-year event

Inflow = 0.46 cfs @ 12.09 hrs, Volume= 1,629 cf

Outflow = 0.04 cfs @ 13.02 hrs, Volume= 1,629 cf, Atten= 92%, Lag= 56.3 min

Discarded =  $0.04 \text{ cfs } \boxed{0}$  13.02 hrs, Volume= 1,629 cf Primary =  $0.00 \text{ cfs } \boxed{0}$  0.00 hrs, Volume= 0 cf

Routed to Reach 1R: continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.25' @ 13.02 hrs Surf.Area= 1,972 sf Storage= 616 cf

Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 123.9 min calculated for 1,627 cf (100% of inflow)

Center-of-Mass det. time= 123.8 min (877.3 - 753.5)

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 59.60' | 1,257 cf      | 20.75'W x 95.03'L x 2.00'H Field A                           |
|        |        |               | 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids  |
| #2A    | 60.10' | 800 cf        | ADS_StormTech SC-160LP +Cap x 117 Inside #1                  |
|        |        |               | Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf |
|        |        |               | Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap    |
|        |        |               | 117 Chambers in 9 Rows                                       |
|        |        |               |  |

2,057 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #0     | Primary   | 61.60' | Automatic Storage Overflow (Discharged without head)           |
| #1     | Discarded | 59.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01' |

**Discarded OutFlow** Max=0.04 cfs @ 13.02 hrs HW=60.25' (Free Discharge) **1=Exfiltration** (Controls 0.04 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

## **Summary for Link SP1: Study Point**

Inflow Area = 180,997 sf, 40.18% Impervious, Inflow Depth = 0.43" for 2-year event

Inflow = 0.98 cfs @ 12.32 hrs, Volume= 6,482 cf

Primary = 0.98 cfs @ 12.32 hrs, Volume= 6,482 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

# **Summary for Link SP2: Study Point**

Inflow Area = 9,321 sf, 0.00% Impervious, Inflow Depth = 0.66" for 2-year event

Inflow = 0.12 cfs @ 12.11 hrs, Volume= 513 cf

Primary = 0.12 cfs @ 12.11 hrs, Volume= 513 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 2-year Rainfall=3.69"

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## **Summary for Link SP3: Study Point**

Inflow Area = 28,777 sf, 60.23% Impervious, Inflow Depth = 0.54" for 2-year event

Inflow = 0.32 cfs @ 12.10 hrs, Volume= 1,291 cf

Primary = 0.32 cfs @ 12.10 hrs, Volume= 1,291 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 5,412 sf, 0.00% Impervious, Inflow Depth = 0.66" for 2-year event

Inflow = 0.06 cfs @ 12.17 hrs, Volume= 298 cf

Primary = 0.06 cfs @ 12.17 hrs, Volume= 298 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-year Rainfall=5.60"
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Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment P-1: Subcat P-1   | Runoff Area=96,521 sf 0.06% Impervious Runoff Depth=1.51" Flow Length=85' Tc=13.7 min CN=58 Runoff=2.75 cfs 12,169 cf |
|--------------------------------|---|
| Subcatchment P-10: Subcat P-10 | Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=5.36"<br>Tc=6.0 min CN=98 Runoff=0.87 cfs 3,149 cf               |
| Subcatchment P-11: Subcat P-11 | Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=4.79"<br>Tc=6.0 min CN=93 Runoff=0.27 cfs 922 cf                  |
| Subcatchment P-12: Subcat P-12 | Runoff Area=4,268 sf 100.00% Impervious Runoff Depth=5.36"<br>Tc=6.0 min CN=98 Runoff=0.52 cfs 1,907 cf               |
| Subcatchment P-13: Subcat P-13 | Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=5.36"<br>Tc=6.0 min CN=98 Runoff=0.61 cfs 2,234 cf                |
| Subcatchment P-14: Subcat P-14 | Runoff Area=24,922 sf 65.26% Impervious Runoff Depth=3.93"<br>Tc=6.0 min CN=85 Runoff=2.54 cfs 8,155 cf               |
| Subcatchment P-15: Subcat P-15 | Runoff Area=11,933 sf 98.07% Impervious Runoff Depth=5.25"<br>Tc=6.0 min CN=97 Runoff=1.46 cfs 5,216 cf               |
| Subcatchment P-16: Subcat P-16 | Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=3.52"<br>Tc=6.0 min CN=81 Runoff=0.34 cfs 1,083 cf                |
| Subcatchment P-2: Subcat P-2   | Runoff Area=9,321 sf 0.00% Impervious Runoff Depth=1.74"<br>Tc=6.0 min CN=61 Runoff=0.40 cfs 1,354 cf                 |
| Subcatchment P-3: Subcat P-3   | Runoff Area=10,121 sf 28.87% Impervious Runoff Depth=2.67"<br>Tc=6.0 min CN=72 Runoff=0.71 cfs 2,251 cf               |
| Subcatchment P-4: Subcat E-4   | Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=1.74" Flow Length=162' Tc=9.6 min CN=61 Runoff=0.21 cfs 786 cf     |
| Subcatchment P-5: Subcat P-5   | Runoff Area=21,307 sf 97.31% Impervious Runoff Depth=5.25"<br>Tc=6.0 min CN=97 Runoff=2.60 cfs 9,313 cf               |
| Subcatchment P-6: Subcat P-6   | Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=4.90"<br>Tc=6.0 min CN=94 Runoff=0.28 cfs 977 cf                  |
| Subcatchment P-7: Subcat P-7   | Runoff Area=8,731 sf 52.04% Impervious Runoff Depth=3.42"<br>Tc=6.0 min CN=80 Runoff=0.79 cfs 2,490 cf                |
| Subcatchment P-8: Subcat P-8   | Runoff Area=10,876 sf 100.00% Impervious Runoff Depth=5.36"<br>Tc=6.0 min CN=98 Runoff=1.34 cfs 4,860 cf              |
| Subcatchment P-9: Subcat P-9   | Runoff Area=657 sf 100.00% Impervious Runoff Depth=5.36"<br>Tc=6.0 min CN=98 Runoff=0.08 cfs 294 cf                   |

Type III 24-hr 10-year Rainfall=5.60"

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Inflow=0.00 cfs 0 cf Reach 1R: continuity reach Outflow=0.00 cfs 0 cf

Peak Elev=59.92' Storage=1,308 cf Inflow=0.78 cfs 2,398 cf Pond B1: bioretention system 1

Discarded=0.04 cfs 2,398 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,398 cf

Peak Elev=60.79' Storage=590 cf Inflow=0.53 cfs 1,857 cf Pond B2: bioretention system 2

Discarded=0.02 cfs 1,119 cf Primary=0.39 cfs 738 cf Outflow=0.41 cfs 1,857 cf

Pond B3: bioretention system 3 Peak Elev=60.54' Storage=4,814 cf Inflow=2.47 cfs 7,957 cf

Discarded=0.10 cfs 7,829 cf Primary=0.00 cfs 0 cf Outflow=0.10 cfs 7,829 cf

Peak Elev=59.98' Storage=526 cf Inflow=0.34 cfs 1,039 cf Pond B4: bioretention system 4

Discarded=0.02 cfs 1,039 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 1,039 cf

Pond FB1: sediment forebay Peak Elev=59.72' Storage=145 cf Inflow=0.79 cfs 2,490 cf

Outflow=0.78 cfs 2.398 cf

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Peak Elev=60.92' Storage=68 cf Inflow=0.52 cfs 1,907 cf Pond FB2: sediment forebay

Outflow=0.53 cfs 1,857 cf

Peak Elev=59.96' Storage=436 cf Inflow=2.54 cfs 8,155 cf Pond FB3: sediment forebay

Outflow=2.47 cfs 7,957 cf

Peak Elev=59.93' Storage=67 cf Inflow=0.34 cfs 1,083 cf Pond FB4: sediment forebay

Outflow=0.34 cfs 1,039 cf

Pond IS1: infiltration 1 Peak Elev=60.15' Storage=2,919 cf Inflow=2.33 cfs 8,364 cf

Discarded=0.07 cfs 5,058 cf Primary=0.95 cfs 3,307 cf Outflow=1.02 cfs 8,364 cf

Pond IS2: infiltration 2 Peak Elev=59.36' Storage=6,098 cf Inflow=3.94 cfs 14,173 cf

Discarded=0.14 cfs 11,002 cf Primary=0.76 cfs 3,172 cf Outflow=0.90 cfs 14,173 cf

Pond IS3: infiltration 3 Peak Elev=60.59' Storage=1,112 cf Inflow=0.70 cfs 2,528 cf

Discarded=0.04 cfs 2,528 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 2,528 cf

Inflow=4.19 cfs 20,546 cf **Link SP1: Study Point** 

Primary=4.19 cfs 20,546 cf

**Link SP2: Study Point** Inflow=0.40 cfs 1,354 cf

Primary=0.40 cfs 1,354 cf

Inflow=1.04 cfs 2,990 cf **Link SP3: Study Point** 

Primary=1.04 cfs 2,990 cf

**Link SP4: Study Point** Inflow=0.21 cfs 786 cf

Primary=0.21 cfs 786 cf

Total Runoff Area = 224,507 sf Runoff Volume = 57,159 cf Average Runoff Depth = 3.06" 59.89% Pervious = 134,448 sf 40.11% Impervious = 90,059 sf

Type III 24-hr 10-year Rainfall=5.60"

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## **Summary for Subcatchment P-1: Subcat P-1**

Runoff = 2.75 cfs @ 12.21 hrs, Volume= 12,169 cf, Depth= 1.51"

Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A     | rea (sf) | CN E    | CN Description |              |  |  |  |  |
|-------|----------|---------|----------------|--------------|--|--|--|--|
|       | 33,219   | 61 >    | 75% Gras       | s cover, Go  | ood, HSG B                                 |  |  |  |
|       | 478      | 74 >    | 75% Gras       | s cover, Go  | ood, HSG C                                 |  |  |  |
|       | 57,731   | 55 V    | Voods, Go      | od, HSG B    |  |  |  |  |
|       | 5,030    | 70 V    | Voods, Go      | od, HSG C    |  |  |  |  |
|       | 63       | 98 F    | Paved park     | ing, HSG B   | 3  |  |  |  |
|       | 96,521   | 58 V    | Veighted A     | verage       |  |  |  |  |
|       | 96,458   | 9       | 9.94% Per      | vious Area   |  |  |  |  |
|       | 63       | 0       | .06% Impe      | ervious Area | a  |  |  |  |
|       |          |         |                |              |  |  |  |  |
| Tc    | Length   | Slope   | Velocity       | Capacity     | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)       | (cfs)        |  |  |  |  |
| 12.2  | 50       | 0.0200  | 0.07           |              | Sheet Flow, A-B                            |  |  |  |
|       |          |         |                |              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 1.5   | 35       | 0.0060  | 0.39           |              | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |         |                |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 13.7  | 85       | Total   |                |              |  |  |  |  |

#### **Summary for Subcatchment P-10: Subcat P-10**

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 3,149 cf, Depth= 5.36"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A           | rea (sf)         | CN I             | Description          |                   |                         |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------|
|             | 7,046            | 98 I             | Roofs, HSG           | ВВ                |                         |
|             | 7,046            | •                | 100.00% Im           | pervious A        | ırea                    |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description             |
| 6.0         | (,               | (14,14)          | (14,000)             | (0.0)             | Direct Entry, TR-55 MIN |

## **Summary for Subcatchment P-11: Subcat P-11**

Runoff = 0.27 cfs @ 12.09 hrs, Volume= 922 cf, Depth= 4.79"

Routed to Link SP1: Study Point

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| A     | rea (sf) | CN     | Description            |             |                                       |  |  |  |  |
|-------|----------|--------|------------------------|-------------|---------------------------------------|--|--|--|--|
|       | 35       | 98     | Paved park             | ing, HSG C  | C                                     |  |  |  |  |
|       | 343      | 61     | >75% Gras              | s cover, Go | lood, HSG B                           |  |  |  |  |
|       | 1,933    | 98     | Paved park             | ing, HSG B  | В                                     |  |  |  |  |
|       | 2,310    | 93     | Weighted Average       |             |                                       |  |  |  |  |
|       | 343      |        | 14.84% Pervious Area   |             |                                       |  |  |  |  |
|       | 1,967    |        | 85.16% Impervious Area |             |                                       |  |  |  |  |
| т.    | 1 41-    | Clar.  |                        | Oih.        | Description                           |  |  |  |  |
| Tc    | Length   | Slope  | ,                      | Capacity    | • • • • • • • • • • • • • • • • • • • |  |  |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)             | (cfs)       |                                       |  |  |  |  |
| 6.0   |          |        |                        |             | Direct Entry, TR-55 MIN               |  |  |  |  |

## Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.52 cfs @ 12.09 hrs, Volume=

1,907 cf, Depth= 5.36"

Routed to Pond FB2: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A           | rea (sf)         | CN [             | Description             |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|
|             | 4,268            | 98 F             | Paved parking, HSG B    |                   |                         |  |  |  |  |
|             | 4,268            | 1                | 100.00% Impervious Area |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |

### Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.61 cfs @ 12.09 hrs, Volume= 2,234 cf, Depth= 5.36"

Routed to Pond IS3: infiltration 3

| A           | rea (sf)         | CN               | Description            |                   |                         |  |  |  |
|-------------|------------------|------------------|------------------------|-------------------|-------------------------|--|--|--|
|             | 4,941            | 98               | Paved park             | ing, HSG B        |                         |  |  |  |
|             | 58               | 61               | >75% Gras              | s cover, Go       | ood, HSG B              |  |  |  |
|             | 4,999            | 98               | Weighted Average       |                   |                         |  |  |  |
|             | 58               |                  | 1.16% Pervious Area    |                   |                         |  |  |  |
|             | 4,941            | ,                | 98.84% Impervious Area |                   |                         |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,                      | Capacity<br>(cfs) | Description             |  |  |  |
| 6.0         |                  |                  |                        |                   | Direct Entry, TR-55 MIN |  |  |  |

Type III 24-hr 10-year Rainfall=5.60"

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#### Summary for Subcatchment P-14: Subcat P-14

Runoff = 2.54 cfs @ 12.09 hrs, Volume= 8,155 cf, Depth= 3.93"

Routed to Pond FB3: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| Area (s    | sf) CN   | Description  | Description                  |                         |  |  |  |  |  |  |
|------------|----------|--------------|------------------------------|-------------------------|--|--|--|--|--|--|
| 8,65       | 61       | >75% Gras    | 75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
| 16,26      | 3 98     | Paved park   | aved parking, HSG B          |                         |  |  |  |  |  |  |
| 24,92      | 22 85    | Weighted A   | verage                       |                         |  |  |  |  |  |  |
| 8,65       | 58       | 34.74% Per   | vious Area                   |                         |  |  |  |  |  |  |
| 16,26      | 33       | 65.26% lmp   | ervious Ar                   | ea                      |  |  |  |  |  |  |
| <b>-</b> . |          |              |                              | B 10                    |  |  |  |  |  |  |
| Tc Len     |          | ,            | Capacity                     | Description             |  |  |  |  |  |  |
| (min)      | et) (ft/ | ft) (ft/sec) | (cfs)                        |                         |  |  |  |  |  |  |
| 6.0        |          |              |                              | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

# **Summary for Subcatchment P-15: Subcat P-15**

Runoff = 1.46 cfs @ 12.09 hrs, Volume= 5,216 cf, Depth= 5.25"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A     | rea (sf)                | CN                     | Description            | Description                  |                         |  |  |  |  |  |  |
|-------|-------------------------|------------------------|------------------------|------------------------------|-------------------------|--|--|--|--|--|--|
|       | 230                     | 61                     | >75% Gras              | 75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
|       | 11,703                  | 98                     | Paved park             | aved parking, HSG B          |                         |  |  |  |  |  |  |
|       | 11,933                  | 33 97 Weighted Average |                        |                              |                         |  |  |  |  |  |  |
|       | 230 1.93% Pervious Area |                        |                        |                              |                         |  |  |  |  |  |  |
|       | 11,703                  |                        | 98.07% Impervious Area |                              |                         |  |  |  |  |  |  |
|       |                         |                        |                        |                              |                         |  |  |  |  |  |  |
| Тс    | Length                  | Slope                  | ,                      | Capacity                     | Description             |  |  |  |  |  |  |
| (min) | (feet)                  | (ft/ft                 | (ft/sec)               | (cfs)                        |                         |  |  |  |  |  |  |
| 6.0   |                         |                        |                        |                              | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

• ,

#### **Summary for Subcatchment P-16: Subcat P-16**

Runoff = 0.34 cfs @ 12.09 hrs, Volume= 1,083 cf, Depth= 3.52"

Routed to Pond FB4: sediment forebay

Type III 24-hr 10-year Rainfall=5.60"

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| A     | rea (sf) | CN      | Description          |                              |                         |  |  |  |  |  |  |
|-------|----------|---------|----------------------|------------------------------|-------------------------|--|--|--|--|--|--|
|       | 1,960    | 98      | Paved park           | Paved parking, HSG B         |                         |  |  |  |  |  |  |
|       | 1,731    | 61      | >75% Gras            | 75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
|       | 3,691    | 81      |                      |                              |                         |  |  |  |  |  |  |
|       | 1,731    |         | 46.90% Pervious Area |                              |                         |  |  |  |  |  |  |
|       | 1,960    |         | 53.10% lmp           | ervious Ar                   | ea                      |  |  |  |  |  |  |
| Tc    | Length   | Slope   | Velocity             | Capacity                     | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)             | (cfs)                        |                         |  |  |  |  |  |  |
| 6.0   |          |         |                      |                              | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

# **Summary for Subcatchment P-2: Subcat P-2**

Runoff = 0.40 cfs @ 12.10 hrs, Volume= 1,354 cf, Depth= 1.74"

Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A           | rea (sf)         | CN E             | <b>Description</b>               |                   |                         |  |  |  |  |  |
|-------------|------------------|------------------|----------------------------------|-------------------|-------------------------|--|--|--|--|--|
|             | 9,321            | 61 >             | 61 >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |  |
|             | 9,321            | 1                | 100.00% Pervious Area            |                   |                         |  |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)             | Capacity<br>(cfs) | Description             |  |  |  |  |  |
| 6.0         |                  |                  |                                  |                   | Direct Entry, TR-55 min |  |  |  |  |  |

# **Summary for Subcatchment P-3: Subcat P-3**

Runoff = 0.71 cfs @ 12.09 hrs, Volume= 2,251 cf, Depth= 2.67"

Routed to Link SP3: Study Point

| Aı    | rea (sf) | CN I    | N Description                    |          |                         |  |  |  |  |  |  |
|-------|----------|---------|----------------------------------|----------|-------------------------|--|--|--|--|--|--|
|       | 7,199    | 61 :    | 61 >75% Grass cover, Good, HSG B |          |                         |  |  |  |  |  |  |
|       | 2,922    | 98 I    | Paved parking, HSG B             |          |                         |  |  |  |  |  |  |
|       | 10,121   | 72 \    | 72 Weighted Average              |          |                         |  |  |  |  |  |  |
|       | 7,199    | -       | 71.13% Pervious Area             |          |                         |  |  |  |  |  |  |
|       | 2,922    | :       | 28.87% Impervious Area           |          |                         |  |  |  |  |  |  |
| _     |          |         |                                  |          |                         |  |  |  |  |  |  |
| Tc    | Length   | Slope   | ,                                | Capacity | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)    |                         |  |  |  |  |  |  |
| 6.0   |          |         |                                  |          | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

Type III 24-hr 10-year Rainfall=5.60"

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## Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.21 cfs @ 12.15 hrs, Volume= 786 cf, Depth= 1.74"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| _ | Α           | rea (sf)         | CN [             | Description                      |                   |  |  |  |  |  |  |  |
|---|-------------|------------------|------------------|----------------------------------|-------------------|--|--|--|--|--|--|--|
|   |             | 5,412            | 61 >             | 61 >75% Grass cover, Good, HSG B |                   |  |  |  |  |  |  |  |
|   |             | 5,412            | •                | 100.00% Pervious Area            |                   |  |  |  |  |  |  |  |
|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,                                | Capacity<br>(cfs) | Description  |  |  |  |  |  |  |
| - | 8.1         | 50               | 0.0200           |                                  | , ,               | Sheet Flow, A-B  |  |  |  |  |  |  |
|   | 1.5         | 112              | 0.0310           | 1.23                             |                   | Grass: Dense n= 0.240 P2= 3.28"  Shallow Concentrated Flow, B-C  Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |  |
|   | 9.6         | 162              | Total            |                                  |                   |  |  |  |  |  |  |  |

#### **Summary for Subcatchment P-5: Subcat P-5**

Runoff = 2.60 cfs @ 12.09 hrs, Volume= 9,313 cf, Depth= 5.25"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

|      | Area (sf) | CN    | Description | Description                  |                         |  |  |  |  |  |  |
|------|-----------|-------|-------------|------------------------------|-------------------------|--|--|--|--|--|--|
|      | 574       | 61    | >75% Gras   | 75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
|      | 20,733    | 98    | Paved park  | aved parking, HSG B          |                         |  |  |  |  |  |  |
|      | 21,307    | 97    | Weighted A  | /eighted Average             |                         |  |  |  |  |  |  |
|      | 574       |       | 2.69% Perv  | 2.69% Pervious Area          |                         |  |  |  |  |  |  |
|      | 20,733    |       | 97.31% lmp  | pervious Ar                  | rea                     |  |  |  |  |  |  |
| _    |           |       |             |                              |                         |  |  |  |  |  |  |
|      | c Length  | Slop  | ,           | Capacity                     | Description             |  |  |  |  |  |  |
| (mii | n) (feet) | (ft/f | t) (ft/sec) | (cfs)                        |                         |  |  |  |  |  |  |
| 6.   | .0        |       |             |                              | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

Direct Entry, TR-55 MIN

### **Summary for Subcatchment P-6: Subcat P-6**

Runoff = 0.28 cfs @ 12.09 hrs, Volume= 977 cf, Depth= 4.90"

Routed to Link SP1 : Study Point

Type III 24-hr 10-year Rainfall=5.60"

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| A     | rea (sf) | CN    | Description | Description                 |              |           |  |  |  |  |  |
|-------|----------|-------|-------------|-----------------------------|--------------|-----------|--|--|--|--|--|
|       | 276      | 61    | >75% Grass  | 5% Grass cover, Good, HSG B |              |           |  |  |  |  |  |
|       | 2,115    | 98    | Paved park  | aved parking, HSG B         |              |           |  |  |  |  |  |
|       | 2,391    | 94    | Weighted A  | /eighted Average            |              |           |  |  |  |  |  |
|       | 276      |       | 11.55% Per  | 11.55% Pervious Area        |              |           |  |  |  |  |  |
|       | 2,115    |       | 88.45% Imp  | 38.45% Impervious Area      |              |           |  |  |  |  |  |
|       |          |       |             |                             |              |           |  |  |  |  |  |
| Tc    | Length   | Slop  | e Velocity  | Capacity                    | Description  |           |  |  |  |  |  |
| (min) | (feet)   | (ft/f | t) (ft/sec) | (cfs)                       |              |           |  |  |  |  |  |
| 6.0   |          |       |             |                             | Direct Entry | TD EE MIN |  |  |  |  |  |

6.0

**Direct Entry, TR-55 MIN** 

#### **Summary for Subcatchment P-7: Subcat P-7**

Runoff = 0.79 cfs @ 12.09 hrs, Volume=

2,490 cf, Depth= 3.42"

Routed to Pond FB1: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| A     | rea (sf) | CN      | Description            |                              |                         |  |  |  |  |  |  |
|-------|----------|---------|------------------------|------------------------------|-------------------------|--|--|--|--|--|--|
|       | 4,544    | 98      | Paved parking, HSG B   |                              |                         |  |  |  |  |  |  |
|       | 4,188    | 61      | >75% Ġras              | 75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
|       | 8,731    | 80      | Weighted Average       |                              |                         |  |  |  |  |  |  |
|       | 4,188    |         | 47.96% Pervious Area   |                              |                         |  |  |  |  |  |  |
|       | 4,544    | ;       | 52.04% Impervious Area |                              |                         |  |  |  |  |  |  |
| _     |          |         |                        | _                            |                         |  |  |  |  |  |  |
| Tc    | Length   | Slope   | ,                      | Capacity                     | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)               | (cfs)                        |                         |  |  |  |  |  |  |
| 6.0   |          |         |                        |                              | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

## **Summary for Subcatchment P-8: Subcat P-8**

Runoff = 1.34 cfs @ 12.09 hrs, Volume=

4,860 cf, Depth= 5.36"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

|   | Α           | rea (sf)         | CN               | Description |                   |             |          |  |
|---|-------------|------------------|------------------|-------------|-------------------|-------------|----------|--|
|   |             | 10,876           | 98               | Roofs, HSG  | ВВ                |             |          |  |
| _ |             | 10,876           |                  | 100.00% Im  | pervious A        | rea         |          |  |
|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,           | Capacity<br>(cfs) | Description |          |  |
|   |             |                  |                  |             |                   | D: 4 E 4    | TD 55 MM |  |

6.0

Direct Entry, TR-55 MIN

Type III 24-hr 10-year Rainfall=5.60"

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## Summary for Subcatchment P-9: Subcat P-9

Runoff 0.08 cfs @ 12.09 hrs, Volume= 294 cf. Depth= 5.36"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 10-year Rainfall=5.60"

| _ | Α           | rea (sf)         | CN               | Description             |                   |                         |  |  |  |  |
|---|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|
|   |             | 657              | 98               | loofs, HSG B            |                   |                         |  |  |  |  |
|   |             | 657              |                  | 100.00% Impervious Area |                   |                         |  |  |  |  |
|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |
|   | 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |

#### Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 10-year event Inflow Area =

Inflow 0.00 cfs @ 0.00 hrs, Volume=

0.00 hrs, Volume= Outflow 0.00 cfs @ 0 cf, Atten= 0%, Lag= 0.0 min

Routed to Link SP3: Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### Summary for Pond B1: bioretention system 1

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

#### [81] Warning: Exceeded Pond FB1 by 0.39' @ 14.50 hrs

Inflow Area = 8,731 sf, 52.04% Impervious, Inflow Depth = 3.30" for 10-year event

Inflow 0.78 cfs @ 12.11 hrs, Volume= 2.398 cf

0.04 cfs @ 14.36 hrs, Volume= 2,398 cf, Atten= 94%, Lag= 135.3 min Outflow

Discarded = 0.04 cfs @ 14.36 hrs, Volume= 2.398 cf 0.00 cfs @ 0.00 hrs, Volume= 0 cf Primary

Routed to Link SP3: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs. dt= 0.05 hrs Peak Elev= 59.92' @ 14.36 hrs Surf.Area= 571 sf Storage= 1,308 cf Flood Elev= 61.00' Surf.Area= 571 sf Storage= 3,054 cf

Plug-Flow detention time= 339.6 min calculated for 2,398 cf (100% of inflow)

Center-of-Mass det. time= 339.4 min (1,168.2 - 828.8)

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| Volume   | Invert           | Avail                            | .Storage           | Storage Description  | on                  |                                    |        |  |  |  |
|----------|------------------|----------------------------------|--------------------|----------------------|---------------------|------------------------------------|--------|--|--|--|
| #1<br>#2 | 58.50'<br>56.50' |                                  | 2,712 cf<br>343 cf | media storage (Ir    | regular)Listed bel  | elow (Recalc) -Impe<br>ow (Recalc) | rvious |  |  |  |
|          |                  |                                  |                    | 1,142 cf Overall x   | 30.0% Voids         |                                    |        |  |  |  |
|          |                  | 3,054 cf Total Available Storage |                    |                      |                     |                                    |        |  |  |  |
| Elevatio | n Si             | urf.Area                         | Perim.             | Inc.Store            | Cum.Store           | Wet.Area                           |        |  |  |  |
| (fee     | t)               | (sq-ft)                          | (feet)             | (cubic-feet)         | (cubic-feet)        | (sq-ft)                            |        |  |  |  |
| 58.5     | 0                | 365                              | 133.0              | 0                    | 0                   | 365                                |        |  |  |  |
| 59.0     | 0                | 571                              | 142.0              | 232                  | 232                 | 574                                |        |  |  |  |
| 60.0     | 0                | 1,101                            | 180.0              | 822                  | 1,054               | 1,561                              |        |  |  |  |
| 61.0     | 0                | 2,286                            | 255.0              | 1,658                | 2,712               | 4,166                              |        |  |  |  |
| Elevatio | n Si             | urf.Area                         | Perim.             | Inc.Store            | Cum.Store           | Wet.Area                           |        |  |  |  |
| (fee     | t)               | (sq-ft)                          | (feet)             | (cubic-feet)         | (cubic-feet)        | (sq-ft)                            |        |  |  |  |
| 56.5     | 0                | 571                              | 142.0              | 0                    | 0                   | 571                                |        |  |  |  |
| 58.5     | 0                | 571                              | 142.0              | 1,142                | 1,142               | 855                                |        |  |  |  |
| Device   | Routing          | Inv                              | ert Outle          | et Devices           |                     |                                    |        |  |  |  |
| #1       | Primary          | 60.                              | 70' <b>4.0'</b> l  | ong x 5.0' breadt    | h Broad-Crested     | Rectangular Weir                   |        |  |  |  |
|          | ,                |                                  |                    |                      |                     | .20 1.40 1.60 1.80                 | 2.00   |  |  |  |
|          |                  |                                  | 2.50               | 3.00 3.50 4.00 4     | 1.50 5.00 5.50      |                                    |        |  |  |  |
|          |                  |                                  | Coef               | . (English) 2.34 2.  | 50 2.70 2.68 2.6    | 8 2.66 2.65 2.65                   | 2.65   |  |  |  |
|          |                  |                                  | 2.65               | 2.67 2.66 2.68 2     | 2.70 2.74 2.79 2.8  | 38                                 |        |  |  |  |
| #2       | Discarded        | 56.                              | 50' <b>0.72</b>    | 0 in/hr Exfiltration | over Wetted area    | 1                                  |        |  |  |  |
|          |                  |                                  | Cond               | ductivity to Ground  | water Elevation = 5 | 55.20' Phase-In=                   | 0.01'  |  |  |  |
|          |                  |                                  |                    |                      |                     |                                    |        |  |  |  |

**Discarded OutFlow** Max=0.04 cfs @ 14.36 hrs HW=59.92' (Free Discharge) **2=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### Summary for Pond B2: bioretention system 2

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[79] Warning: Submerged Pond FB2 Primary device # 1 by 0.04'

4,268 sf,100.00% Impervious, Inflow Depth = 5.22" for 10-year event Inflow Area = Inflow 0.53 cfs @ 12.09 hrs, Volume= 1,857 cf 0.41 cfs @ 12.17 hrs, Volume= Outflow 1,857 cf, Atten= 22%, Lag= 4.3 min Discarded = 0.02 cfs @ 12.17 hrs, Volume= 1,119 cf 0.39 cfs @ 12.17 hrs, Volume= 738 cf Primary

Routed to Link SP3: Study Point

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Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.79' @ 12.17 hrs Surf.Area= 258 sf Storage= 590 cf Flood Elev= 61.00' Surf.Area= 258 sf Storage= 743 cf

Plug-Flow detention time= 186.8 min calculated for 1,855 cf (100% of inflow)

Center-of-Mass det. time= 187.1 min ( 949.2 - 762.1 )

| Volume         | Invert           | Avail.Sto            | orage                | Storage Description  | n                         |  |  |  |
|----------------|------------------|----------------------|----------------------|--|---------------------------|--|--|--|
| #1<br>#2       | 59.50'<br>57.50' |                      | 88 cf<br>55 cf       | surface storage (Irmedia storage (Irm<br>516 cf Overall x 30   | regular)Listed bel        | elow (Recalc) -Impervious<br>ow (Recalc) |  |  |
|                |                  | 7                    | 43 cf                | Total Available Sto  | rage                      |  |  |  |
| Elevatio       |                  | rf.Area F<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                      |  |  |
| 59.5<br>60.0   | 50               | 98                   | 88.0<br>114.0        | 0<br>86  | 0<br>86                   | 98<br>519                                |  |  |
| 61.0           |                  |                      | 185.0                | 502  | 588                       | 2,215                                    |  |  |
| Elevation (fee |                  | rf.Area F<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store (cubic-feet)    | Wet.Area<br>(sq-ft)                      |  |  |
| 57.5<br>59.5   |                  | 258                  | 114.0<br>114.0       | 0<br>516   | 0<br>516                  | 258<br>486                               |  |  |
| Device         | Routing          | Invert               | Outle                | et Devices   |                           |  |  |  |
| #1             | Discarded        | 57.50'               | -                    | 0 in/hr Exfiltration   |                           |  |  |  |
| #2             | Device 3 60.50'  |                      | 15.0                 | 15.0" Vert. overflow orifice C= 0.600  |                           |  |  |  |
| #3             | 3 Primary 58.00' |                      | <b>8.0"</b><br>Inlet | imited to weir flow at low heads <b>8.0" Round Culvert</b> L= 98.0' Ke= 0.500  nlet / Outlet Invert= 58.00' / 57.50' S= 0.0051 '/' Cc= 0.900  = 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |                           |  |  |  |

**Discarded OutFlow** Max=0.02 cfs @ 12.17 hrs HW=60.78' (Free Discharge) **1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.38 cfs @ 12.17 hrs HW=60.78' (Free Discharge) 3=Culvert (Passes 0.38 cfs of 1.74 cfs potential flow)

2=overflow orifice (Orifice Controls 0.38 cfs @ 1.82 fps)

# **Summary for Pond B3: bioretention system 3**

GW from TP1

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Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 3.83" for 10-year event

Inflow = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf

Outflow = 0.10 cfs @ 15.34 hrs, Volume= 7,829 cf, Atten= 96%, Lag= 193.5 min

Discarded = 0.10 cfs @ 15.34 hrs, Volume= 7,829 cf Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.54' @ 15.34 hrs Surf.Area= 1,639 sf Storage= 4,814 cf

Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 510.6 min calculated for 7,818 cf (98% of inflow)

Center-of-Mass det. time= 501.2 min (1,315.5 - 814.3)

| Volume           | Invert              | Avail.S             | torage            | Storage Description  | n                          |  |  |
|------------------|---------------------|---------------------|-------------------|--|----------------------------|--|--|
| #1<br>#2         | 59.00'<br>57.00'    |                     | ,886 cf<br>983 cf | surface storage (I<br>media storage (Irr<br>3,278 cf Overall x   | <b>egular)</b> Listed belo | elow (Recalc) -Impervious<br>ow (Recalc) |  |
|                  |                     | 6,                  | ,870 cf           | Total Available Sto  | rage                       |  |  |
| Elevatio<br>(fee |                     | urf.Area<br>(sq-ft) | Perim.<br>(feet)  | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft <u>)</u>              |  |
| 59.0             |                     | 1,639               | 184.0             | 0  | 0                          | 1,639                                    |  |
| 60.0             | 0                   | 2,580               | 217.0             | 2,092  | 2,092                      | 2,711                                    |  |
| 61.0             | 0                   | 5,156               | 323.0             | 3,794  | 5,886                      | 7,274                                    |  |
| Elevatio<br>(fee |                     | urf.Area<br>(sq-ft) | Perim.<br>(feet)  | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)                      |  |
| 57.0             | 00                  | 1,639               | 184.0             | 0  | 0                          | 1,639                                    |  |
| 59.0             |                     | 1,639               | 184.0             | 3,278  | 3,278                      | 2,007                                    |  |
| Device           | Routing             | Inver               | t Outle           | et Devices   |                            |  |  |
| #1               | Device 2            | 60.80               |                   | " Horiz. Orifice/Gra   |                            |  |  |
| #2               | Primary             | Primary 58.40'      |                   | Limited to weir flow at low heads  8.0" Round Culvert L= 77.0' Ke= 0.500  Inlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900                               |                            |  |  |
| #3               | #3 Discarded 57.00' |                     | )' <b>0.72</b>    | ne 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf  0.720 in/hr Exfiltration over Wetted area  Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01' |                            |  |  |

**Discarded OutFlow** Max=0.10 cfs @ 15.34 hrs HW=60.54' (Free Discharge) **3=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.00' (Free Discharge)

2=Culvert (Controls 0.00 cfs)

1=Orifice/Grate (Controls 0.00 cfs)

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# Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB4 by 0.16' @ 13.85 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 3.38" for 10-year event

Inflow = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf

Outflow = 0.02 cfs @ 13.76 hrs, Volume= 1,039 cf, Atten= 93%, Lag= 99.1 min

Discarded = 0.02 cfs @ 13.76 hrs, Volume= 1,039 cf Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.98' @ 13.76 hrs Surf.Area= 516 sf Storage= 526 cf Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 253.4 min calculated for 1,038 cf (100% of inflow)

Center-of-Mass det. time= 253.3 min (1,080.6 - 827.3)

| Volume             | Invert           | Avail             | l.Storage            | Storage Description       | n                         |                                     |         |
|--------------------|------------------|-------------------|----------------------|---------------------------|---------------------------|-------------------------------------|---------|
| #1<br>#2           | 59.50'<br>57.50' |                   | 1,049 cf<br>310 cf   |                           | regular)Listed be         | elow (Recalc) -Impe<br>low (Recalc) | ervious |
|                    |                  |                   | 1,358 cf             |                           |                           |                                     |         |
| Elevatior<br>(feet |                  | f.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                 |         |
| 59.50              |                  | 391               | 79.0                 | 0                         | 0                         | 391                                 |         |
| 60.00              |                  | 516               | 88.0                 | 226                       | 226                       | 518                                 |         |
| 61.00              | )                | 1,174             | 135.0                | 823                       | 1,049                     | 1,359                               |         |
| Elevation          | n Sur            | f.Area            | Perim.               | Inc.Store                 | Cum.Store                 | Wet.Area                            |         |
| (feet              | )                | (sq-ft)           | (feet)               | (cubic-feet)              | (cubic-feet)              | (sq-ft)                             |         |
| 57.50              | )                | 516               | 88.0                 | 0                         | 0                         | 516                                 |         |
| 59.50              | )                | 516               | 88.0                 | 1,032                     | 1,032                     | 692                                 |         |
| Device             | Routing          | ln۱               | ert Outle            | et Devices                |                           |                                     |         |
| #1                 | Primary          | 60.               | .75' <b>5.0'</b>     | long x 4.0' breadth       | n Broad-Crested           | Rectangular Weir                    |         |
|                    | ,                |                   | Head                 | d (feet) 0.20 0.40 (      | 0.60 0.80 1.00            | 1.20 1.40 1.60 1.8                  | 0 2.00  |
|                    |                  |                   | 2.50                 | 3.00 3.50 4.00 4.         | .50 5.00 5.50             |                                     |         |
|                    |                  |                   | Coef                 | f. (English) 2.38 2.5     | 54 2.69 2.68 2.6          | 67 2.67 2.65 2.66                   | 2.66    |
|                    |                  |                   | 2.68                 | 2.72 2.73 2.76 2.         | .79 2.88 3.07 3.          | .32                                 |         |
| #2                 |                  |                   | 0 in/hr Exfiltration | over Wetted are           | a                         |                                     |         |

Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Type III 24-hr 10-year Rainfall=5.60"

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**Discarded OutFlow** Max=0.02 cfs @ 13.76 hrs HW=59.98' (Free Discharge) **2=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### **Summary for Pond FB1: sediment forebay**

Inflow Area = 8,731 sf, 52.04% Impervious, Inflow Depth = 3.42" for 10-year event

Inflow = 0.79 cfs @ 12.09 hrs, Volume= 2,490 cf

Outflow = 0.78 cfs @ 12.11 hrs, Volume= 2,398 cf, Atten= 1%, Lag= 0.8 min

Primary = 0.78 cfs @ 12.11 hrs, Volume= 2,398 cf

Routed to Pond B1: bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.72' @ 12.11 hrs Surf.Area= 263 sf Storage= 145 cf

Flood Elev= 61.00' Surf.Area= 489 sf Storage= 627 cf

Plug-Flow detention time= 32.7 min calculated for 2,398 cf (96% of inflow)

Center-of-Mass det. time= 11.8 min (828.8 - 817.0)

| Volume               | Inv     | ert Avail.           | Storage              | Storage Description       | on                        |  |  |
|----------------------|---------|----------------------|----------------------|---------------------------|---------------------------|--|--|
| #1                   | 59.     | 00'                  | 627 cf               | surface storage (         | Irregular)Listed be       | elow (Recalc)  |  |
| Elevatio             |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)  |  |
| 59.0<br>60.0<br>61.0 | 00      | 146<br>318<br>489    | 45.0<br>66.0<br>84.0 | 0<br>226<br>400           | 0<br>226<br>627           | 146<br>340<br>567  |  |
| Device               | Routing | Inve                 | ert Outle            | et Devices                |                           |  |  |
| #1                   | Primary | 59.5                 | Head<br>2.50<br>Coef | 3.00 3.50                 | 0.60 0.80 1.00 1          | Rectangular Weir 1.20 1.40 1.60 1.80 2 1.66 2.70 2.77 2.89 2.8 |  |

Primary OutFlow Max=0.77 cfs @ 12.11 hrs HW=59.72' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.77 cfs @ 1.18 fps)

### **Summary for Pond FB2: sediment forebay**

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 5.36" for 10-year event

Inflow = 0.52 cfs @ 12.09 hrs, Volume= 1,907 cf

Outflow = 0.53 cfs @ 12.09 hrs, Volume= 1,857 cf, Atten= 0%, Lag= 0.5 min

Primary = 0.53 cfs @ 12.09 hrs, Volume= 1,857 cf

Routed to Pond B2: bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-year Rainfall=5.60"

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Peak Elev= 60.92' @ 12.09 hrs Surf.Area= 119 sf Storage= 68 cf

Flood Elev= 61.00' Surf.Area= 130 sf Storage= 78 cf

Plug-Flow detention time= 32.3 min calculated for 1,855 cf (97% of inflow)

Center-of-Mass det. time= 15.9 min ( 762.1 - 746.2 )

| <u>Volume</u>      | Inv     | <u>ert Avail.</u>                               | Storage          | Storage Description  | 1                      |                     |  |
|--------------------|---------|---|------------------|--|------------------------|---------------------|--|
| #1                 | 59.     | 50'   | 78 cf            | surface storage (li  | regular)Listed belo    | ow (Recalc)         |  |
| Elevatior<br>(feet | -       | Surf.Area<br>(sq-ft)                            | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)  | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |  |
| 59.50              | )       | 1   | 1.0              | 0  | 0                      | 1                   |  |
| 60.00              | )       | 28  | 23.0             | 6  | 6                      | 43                  |  |
| 61.00              | )       | 130   | 44.0             | 73   | 78                     | 160                 |  |
| Device             | Routing | Inv   | ert Outle        | et Devices   |                        |                     |  |
| #1                 | Primary | 60.75' <b>3.0' l</b> o<br>Head<br>2.50<br>Coef. |                  | ong x 2.0' breadth<br>d (feet) 0.20 0.40 0<br>3.00 3.50<br>f. (English) 2.54 2.6<br>3.07 3.20 3.32 | 0.60 0.80 1.00 1.2     | 20 1.40 1.60 1.80   |  |

Primary OutFlow Max=0.52 cfs @ 12.09 hrs HW=60.92' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.52 cfs @ 1.04 fps)

# **Summary for Pond FB3: sediment forebay**

Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 3.93" for 10-year event

Inflow = 2.54 cfs @ 12.09 hrs, Volume= 8,155 cf

Outflow = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf, Atten= 3%, Lag= 1.2 min

Primary = 2.47 cfs @ 12.11 hrs, Volume= 7,957 cf

Routed to Pond B3: bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.96' @ 12.11 hrs Surf.Area= 576 sf Storage= 436 cf

Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 25.6 min calculated for 7,957 cf (98% of inflow)

Center-of-Mass det. time= 11.1 min (814.3 - 803.2)

| Volume           | Inv     | ert Avai             | I.Storage        | Storage Description       | on                     |                     |   |
|------------------|---------|----------------------|------------------|---------------------------|------------------------|---------------------|---|
| #1               | 59.0    | 00'                  | 457 cf           | surface storage           | (Irregular)Listed I    | pelow (Recalc)      |   |
| Elevatio<br>(fee |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |   |
| 59.0<br>60.0     |         | 340<br>586           | 70.0<br>91.0     | 0<br>457                  | 0<br>457               | 340<br>621          |   |
| Device           | Routing | In                   | vert Outle       | et Devices                |                        |                     |   |
| #1               | Primary | 59                   | .50' <b>3.0'</b> | long x 2.0' breadt        | h Broad-Crested        | l Rectangular Wei   | r |

Type III 24-hr 10-year Rainfall=5.60"

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2.50 3.00 3.50

Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88

2.85 3.07 3.20 3.32

Primary OutFlow Max=2.42 cfs @ 12.11 hrs HW=59.96' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 2.42 cfs @ 1.76 fps)

### **Summary for Pond FB4: sediment forebay**

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 3.52" for 10-year event

Inflow = 0.34 cfs @ 12.09 hrs, Volume= 1,083 cf

Outflow = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf, Atten= 1%, Lag= 0.8 min

Primary = 0.34 cfs @ 12.10 hrs, Volume= 1,039 cf

Routed to Pond B4: bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 59.93' @ 12.11 hrs Surf.Area= 192 sf Storage= 67 cf

Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 35.8 min calculated for 1,039 cf (96% of inflow)

Center-of-Mass det. time= 13.0 min (827.3 - 814.4)

| Volume         | Inv     | <u>ert Avail.</u>    | Storage              | Storage Description       | า                      |  |  |
|----------------|---------|----------------------|----------------------|---------------------------|------------------------|--|--|
| #1             | 59.     | 50'                  | 81 cf                | surface storage (I        | rregular)Listed belo   | ow (Recalc)  |  |
| Elevation (fee |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft)  |  |
| 59.6<br>60.0   |         | 124<br>205           | 42.0<br>56.0         | 0<br>81                   | 0<br>81                | 124<br>236   |  |
| Device         | Routing | Inv                  | ert Outle            | et Devices                |                        |  |  |
| #1             | Primary | 59.8                 | Head<br>2.50<br>Coef | 3.00 3.50                 | 0.60 0.80 1.00 1.2     | ectangular Weir<br>20 1.40 1.60 1.80 2<br>2.70 2.77 2.89 2.8 |  |

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=59.92' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.33 cfs @ 0.90 fps)

# **Summary for Pond IS1: infiltration 1**

GW elevation from TP8

Type III 24-hr 10-year Rainfall=5.60"

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| Inflow Area = | 18,979 sf, 98.79% Impervious, | Inflow Depth = 5.29" for 10-year event |
|---------------|-------------------------------|--|
| Inflow =      | 2.33 cfs @ 12.09 hrs, Volume= | 8,364 cf                               |
| Outflow =     | 1.02 cfs @ 12.27 hrs, Volume= | 8,364 cf, Atten= 56%, Lag= 11.3 min    |
| Discarded =   | 0.07 cfs @ 12.27 hrs, Volume= | 5,058 cf                               |
| Primary =     | 0.95 cfs @ 12.27 hrs, Volume= | 3,307 cf                               |

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.15' @ 12.27 hrs Surf.Area= 3,088 sf Storage= 2,919 cf Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 167.8 min calculated for 8,353 cf (100% of inflow)

Center-of-Mass det. time= 167.9 min ( 918.7 - 750.7 )

| Volume | Invert | Avail.Storage | Storage Description   |
|--------|--------|---------------|---|
| #1A    | 58.60' | 2,174 cf      | 41.50'W x 74.40'L x 2.33'H Field A                            |
|        |        |               | 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf x 40.0% Voids |
| #2A    | 59.10' | 1,769 cf      | ADS_StormTech SC-310 +Cap x 120 Inside #1                     |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap     |
|        |        |               | 120 Chambers in 12 Rows                                       |
|        |        | 3.943 cf      | Total Available Storage                                       |

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 58.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01' |
| #2     | Primary   | 59.50' | <b>8.0" Round Culvert</b> L= 32.0' Ke= 0.500                   |
|        |           |        | Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf    |

**Discarded OutFlow** Max=0.07 cfs @ 12.27 hrs HW=60.14' (Free Discharge) 1=Exfiltration (Controls 0.07 cfs)

Primary OutFlow Max=0.94 cfs @ 12.27 hrs HW=60.14' (Free Discharge) 2=Culvert (Inlet Controls 0.94 cfs @ 2.73 fps)

# **Summary for Pond IS2: infiltration 2**

#### **GW from TP5**

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| Inflow Area = | 32,183 sf, 98.22% Impervious, | Inflow Depth = 5.28" | for 10-year event |
|---------------|-------------------------------|----------------------|-------------------|
| Inflow =      | 3.94 cfs @ 12.09 hrs Volume=  | 14 173 cf            | •                 |

Outflow = 0.90 cfs @ 12.48 hrs, Volume= 14,173 cf, Atten= 77%, Lag= 23.9 min

Discarded =  $0.14 \text{ cfs } \overline{\textcircled{0}}$  12.48 hrs, Volume= 11,002 cf Primary =  $0.76 \text{ cfs } \overline{\textcircled{0}}$  12.48 hrs, Volume= 3,172 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.36' @ 12.48 hrs Surf.Area= 6,032 sf Storage= 6,098 cf

Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 274.0 min calculated for 14,154 cf (100% of inflow)

Center-of-Mass det. time= 274.3 min (1,025.2 - 751.0)

| Volume | Invert | Avail.Storage | Storage Description   |
|--------|--------|---------------|---|
| #1A    | 57.70' | 4,214 cf      | 51.50'W x 117.12'L x 2.33'H Field A                             |
|        |        | ·             | 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids |
| #2A    | 58.20' | 3,538 cf      | ADS_StormTech SC-310 +Cap x 240 Inside #1                       |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf   |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap       |
|        |        |               | 240 Chambers in 15 Rows   |
|        |        | 7 750 of      | Total Available Ctarers   |

7,752 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 57.70' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01' |
| #2     | Primary   | 58.92' | <b>12.0" Round Culvert</b> L= 20.0' Ke= 0.500                  |
|        | •         |        | Inlet / Outlet Invert= 58.92' / 58.00' S= 0.0460 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf    |

Discarded OutFlow Max=0.14 cfs @ 12.48 hrs HW=59.36' (Free Discharge) 1=Exfiltration (Controls 0.14 cfs)

Primary OutFlow Max=0.75 cfs @ 12.48 hrs HW=59.36' (Free Discharge) 2=Culvert (Inlet Controls 0.75 cfs @ 2.26 fps)

# **Summary for Pond IS3: infiltration 3**

#### GW from TP2

Type III 24-hr 10-year Rainfall=5.60"

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Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 5.36" for 10-year event

Inflow = 0.70 cfs @ 12.09 hrs, Volume= 2,528 cf

Outflow = 0.04 cfs @ 13.80 hrs, Volume= 2,528 cf, Atten= 94%, Lag= 102.8 min

Discarded =  $0.04 \text{ cfs } \bar{\textcircled{0}}$  13.80 hrs, Volume= 2,528 cf Primary =  $0.00 \text{ cfs } \bar{\textcircled{0}}$  0.00 hrs, Volume= 0 cf

Routed to Reach 1R: continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.59' @ 13.80 hrs Surf.Area= 1,972 sf Storage= 1,112 cf

Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 230.6 min calculated for 2,528 cf (100% of inflow)

Center-of-Mass det. time= 230.5 min ( 976.7 - 746.2 )

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 59.60' | 1,257 cf      | 20.75'W x 95.03'L x 2.00'H Field A                           |
|        |        |               | 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids  |
| #2A    | 60.10' | 800 cf        | ADS_StormTech SC-160LP +Cap x 117 Inside #1                  |
|        |        |               | Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf |
|        |        |               | Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap    |
|        |        |               | 117 Chambers in 9 Rows                                       |
|        |        |               |  |

2,057 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |  |
|--------|-----------|--------|--|--|
| #0     | Primary   | 61.60' | Automatic Storage Overflow (Discharged without head)           |  |
| #1     | Discarded | 59.60' | 0.720 in/hr Exfiltration over Surface area                     |  |
|        |           |        | Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01' |  |

**Discarded OutFlow** Max=0.04 cfs @ 13.80 hrs HW=60.59' (Free Discharge) 1=Exfiltration (Controls 0.04 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

# **Summary for Link SP1: Study Point**

Inflow Area = 180,997 sf, 40.18% Impervious, Inflow Depth = 1.36" for 10-year event

Inflow = 4.19 cfs @ 12.24 hrs, Volume= 20,546 cf

Primary = 4.19 cfs @ 12.24 hrs, Volume= 20,546 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

# **Summary for Link SP2: Study Point**

Inflow Area = 9,321 sf, 0.00% Impervious, Inflow Depth = 1.74" for 10-year event

Inflow = 0.40 cfs @ 12.10 hrs, Volume= 1,354 cf

Primary = 0.40 cfs @ 12.10 hrs, Volume= 1,354 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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# **Summary for Link SP3: Study Point**

Inflow Area = 28,777 sf, 60.23% Impervious, Inflow Depth = 1.25" for 10-year event

Inflow = 1.04 cfs @ 12.12 hrs, Volume= 2,990 cf

Primary = 1.04 cfs @ 12.12 hrs, Volume= 2,990 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### **Summary for Link SP4: Study Point**

Inflow Area = 5,412 sf, 0.00% Impervious, Inflow Depth = 1.74" for 10-year event

Inflow = 0.21 cfs @ 12.15 hrs, Volume= 786 cf

Primary = 0.21 cfs @ 12.15 hrs, Volume= 786 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-year Rainfall=7.10" Printed 8/10/2023 s LLC Page 48

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment P-1: Subcat P-1   | Runoff Area=96,521 sf 0.06% Impervious Runoff Depth=2.48" Flow Length=85' Tc=13.7 min CN=58 Runoff=4.79 cfs 19,927 cf |
|--------------------------------|---|
| Subcatchment P-10: Subcat P-10 | Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=6.86"<br>Tc=6.0 min CN=98 Runoff=1.10 cfs 4,029 cf               |
| Subcatchment P-11: Subcat P-11 | Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=6.27"<br>Tc=6.0 min CN=93 Runoff=0.35 cfs 1,207 cf                |
| Subcatchment P-12: Subcat P-12 | Runoff Area=4,268 sf 100.00% Impervious Runoff Depth=6.86"<br>Tc=6.0 min CN=98 Runoff=0.67 cfs 2,440 cf               |
| Subcatchment P-13: Subcat P-13 | Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=6.86"<br>Tc=6.0 min CN=98 Runoff=0.78 cfs 2,858 cf                |
| Subcatchment P-14: Subcat P-14 | Runoff Area=24,922 sf 65.26% Impervious Runoff Depth=5.35"<br>Tc=6.0 min CN=85 Runoff=3.41 cfs 11,107 cf              |
| Subcatchment P-15: Subcat P-15 | Runoff Area=11,933 sf 98.07% Impervious Runoff Depth=6.74"<br>Tc=6.0 min CN=97 Runoff=1.86 cfs 6,704 cf               |
| Subcatchment P-16: Subcat P-16 | Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=4.90"<br>Tc=6.0 min CN=81 Runoff=0.47 cfs 1,507 cf                |
| Subcatchment P-2: Subcat P-2   | Runoff Area=9,321 sf 0.00% Impervious Runoff Depth=2.77"<br>Tc=6.0 min CN=61 Runoff=0.67 cfs 2,155 cf                 |
| Subcatchment P-3: Subcat P-3   | Runoff Area=10,121 sf 28.87% Impervious Runoff Depth=3.91"<br>Tc=6.0 min CN=72 Runoff=1.05 cfs 3,301 cf               |
| Subcatchment P-4: Subcat E-4   | Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=2.77" Flow Length=162' Tc=9.6 min CN=61 Runoff=0.34 cfs 1,251 cf   |
| Subcatchment P-5: Subcat P-5   | Runoff Area=21,307 sf 97.31% Impervious Runoff Depth=6.74"<br>Tc=6.0 min CN=97 Runoff=3.32 cfs 11,971 cf              |
| Subcatchment P-6: Subcat P-6   | Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=6.39"<br>Tc=6.0 min CN=94 Runoff=0.37 cfs 1,273 cf                |
| Subcatchment P-7: Subcat P-7   | Runoff Area=8,731 sf 52.04% Impervious Runoff Depth=4.79"<br>Tc=6.0 min CN=80 Runoff=1.09 cfs 3,483 cf                |
| Subcatchment P-8: Subcat P-8   | Runoff Area=10,876 sf 100.00% Impervious Runoff Depth=6.86"<br>Tc=6.0 min CN=98 Runoff=1.70 cfs 6,218 cf              |
| Subcatchment P-9: Subcat P-9   | Runoff Area=657 sf 100.00% Impervious Runoff Depth=6.86"<br>Tc=6.0 min CN=98 Runoff=0.10 cfs 376 cf                   |

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Type III 24-hr 25-year Rainfall=7.10"

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Inflow=0.00 cfs 0 cf Reach 1R: continuity reach

Outflow=0.00 cfs 0 cf

Peak Elev=60.45' Storage=1,997 cf Inflow=1.08 cfs 3,391 cf Pond B1: bioretention system 1 Discarded=0.05 cfs 3,391 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,391 cf

Peak Elev=60.84' Storage=627 cf Inflow=0.67 cfs 2,390 cf Pond B2: bioretention system 2

Discarded=0.02 cfs 1,230 cf Primary=0.55 cfs 1,160 cf Outflow=0.57 cfs 2,390 cf

Pond B3: bioretention system 3 Peak Elev=60.85' Storage=6,151 cf Inflow=3.75 cfs 10,909 cf

Discarded=0.11 cfs 9,059 cf Primary=0.17 cfs 1,128 cf Outflow=0.28 cfs 10,187 cf

Peak Elev=60.42' Storage=800 cf Inflow=0.47 cfs 1,463 cf Pond B4: bioretention system 4

Discarded=0.03 cfs 1,463 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,463 cf

Pond FB1: sediment forebay Peak Elev=59.77' Storage=159 cf Inflow=1.09 cfs 3,483 cf

Outflow=1.08 cfs 3.391 cf

Peak Elev=60.95' Storage=72 cf Inflow=0.67 cfs 2,440 cf Pond FB2: sediment forebay

Outflow=0.67 cfs 2,390 cf

Peak Elev=60.11' Storage=457 cf Inflow=3.41 cfs 11,107 cf Pond FB3: sediment forebay

Outflow=3.75 cfs 10,909 cf

Peak Elev=59.96' Storage=72 cf Inflow=0.47 cfs 1,507 cf Pond FB4: sediment forebay

Outflow=0.47 cfs 1,463 cf

Pond IS1: infiltration 1 Peak Elev=60.55' Storage=3,472 cf Inflow=2.96 cfs 10,733 cf

Discarded=0.08 cfs 5,525 cf Primary=1.42 cfs 5,208 cf Outflow=1.50 cfs 10,733 cf

Pond IS2: infiltration 2 Peak Elev=59.68' Storage=6,910 cf Inflow=5.01 cfs 18,189 cf

Discarded=0.15 cfs 11,921 cf Primary=1.92 cfs 6,268 cf Outflow=2.07 cfs 18,189 cf

Pond IS3: infiltration 3 Peak Elev=60.97' Storage=1,549 cf Inflow=0.88 cfs 3,234 cf

Discarded=0.04 cfs 3,234 cf Primary=0.00 cfs 0 cf Outflow=0.04 cfs 3,234 cf

Inflow=8.36 cfs 35,010 cf **Link SP1: Study Point** 

Primary=8.36 cfs 35,010 cf

**Link SP2: Study Point** Inflow=0.67 cfs 2,155 cf

Primary=0.67 cfs 2,155 cf

**Link SP3: Study Point** Inflow=1.55 cfs 4,461 cf

Primary=1.55 cfs 4,461 cf

**Link SP4: Study Point** Inflow=0.34 cfs 1,251 cf

Primary=0.34 cfs 1,251 cf

Total Runoff Area = 224,507 sf Runoff Volume = 79,808 cf Average Runoff Depth = 4.27" 59.89% Pervious = 134,448 sf 40.11% Impervious = 90,059 sf

Type III 24-hr 25-year Rainfall=7.10"

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# **Summary for Subcatchment P-1: Subcat P-1**

Runoff = 4.79 cfs @ 12.20 hrs, Volume= 19,927 cf, Depth= 2.48"

Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN Description |             |              |  |  |  |
|-------|----------|----------------|-------------|--------------|--|--|--|
|       | 33,219   | 61 >           | 75% Grass   | s cover, Go  | ood, HSG B                                 |  |  |
|       | 478      | 74 >           | 75% Grass   | s cover, Go  | ood, HSG C                                 |  |  |
|       | 57,731   | 55 V           | Voods, Goo  | od, HSG B    |  |  |  |
|       | 5,030    | 70 V           | Voods, Goo  | od, HSG C    |  |  |  |
|       | 63       | 98 F           | Paved parki | ing, HSG B   |  |  |  |
|       | 96,521   | 58 V           | Veighted A  | verage       |  |  |  |
|       | 96,458   | g              | 9.94% Per   | vious Area   |  |  |  |
|       | 63       | C              | .06% Impe   | ervious Area | a  |  |  |
|       |          |                | •           |              |  |  |  |
| Tc    | Length   | Slope          | Velocity    | Capacity     | Description                                |  |  |
| (min) | (feet)   | (ft/ft)        | (ft/sec)    | (cfs)        |  |  |  |
| 12.2  | 50       | 0.0200         | 0.07        |              | Sheet Flow, A-B                            |  |  |
|       |          |                |             |              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |
| 1.5   | 35       | 0.0060         | 0.39        |              | Shallow Concentrated Flow, B-C             |  |  |
|       |          |                |             |              | Woodland Kv= 5.0 fps                       |  |  |
| 13.7  | 85       | Total          |             |              |  |  |  |

# Summary for Subcatchment P-10: Subcat P-10

Runoff = 1.10 cfs @ 12.09 hrs, Volume= 4,029 cf, Depth= 6.86"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description |  |  |  |
|---|-------------|------------------|------------------|----------------------|-------------------|-------------|--|--|--|
|   | Τ.          | 7,046            |                  | 100.00% Im           | •                 |             |  |  |  |
| _ |             | 7.040            |                  | ·                    |                   |             |  |  |  |
|   |             | 7,046            | 98               | Roofs, HSG B         |                   |             |  |  |  |
| _ | Α           | rea (sf)         | CN               | Description          |                   |             |  |  |  |

# Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 1,207 cf, Depth= 6.27"

Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

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| A            | rea (sf) | CN     | Description            |                      |                         |  |  |  |  |
|--------------|----------|--------|------------------------|----------------------|-------------------------|--|--|--|--|
|              | 35       | 98     | Paved park             | ing, HSG C           |                         |  |  |  |  |
|              | 343      | 61     | >75% Gras              | s cover, Go          | ood, HSG B              |  |  |  |  |
|              | 1,933    | 98     | Paved park             | Paved parking, HSG B |                         |  |  |  |  |
|              | 2,310    | 93     | Weighted Average       |                      |                         |  |  |  |  |
|              | 343      |        | 14.84% Pervious Area   |                      |                         |  |  |  |  |
|              | 1,967    |        | 85.16% Impervious Area |                      |                         |  |  |  |  |
| Tc           | Length   | Slope  | •                      | Capacity             | Description             |  |  |  |  |
| <u>(min)</u> | (feet)   | (ft/ft | ) (ft/sec)             | (cfs)                |                         |  |  |  |  |
| 6.0          |          |        |                        |                      | Direct Entry, TR-55 MIN |  |  |  |  |

# Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 2,440 c

2,440 cf, Depth= 6.86"

Routed to Pond FB2: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| _ | Α           | rea (sf)         | CN I             | Description             |                   |                         |  |  |  |
|---|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|
|   |             | 4,268            | 98 I             | Paved parking, HSG B    |                   |                         |  |  |  |
|   |             | 4,268            |                  | 100.00% Impervious Area |                   |                         |  |  |  |
| _ | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |
|   | 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |

# Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.78 cfs @ 12.09 hrs, Volume= 2,858 cf, Depth= 6.86"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A           | rea (sf)         | CN               | Description                   |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------------|-------------------|-------------------------|--|--|--|--|
|             | 4,941            | 98               | Paved parking, HSG B          |                   |                         |  |  |  |  |
|             | 58               | 61               | >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |
|             | 4,999            | 98               | Weighted Average              |                   |                         |  |  |  |  |
|             | 58               |                  | 1.16% Pervious Area           |                   |                         |  |  |  |  |
|             | 4,941            | ,                | 98.84% Imp                    | ervious Ar        | ea                      |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | ,                             | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                               |                   | Direct Entry, TR-55 MIN |  |  |  |  |

Type III 24-hr 25-year Rainfall=7.10"

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# Summary for Subcatchment P-14: Subcat P-14

Runoff 3.41 cfs @ 12.09 hrs, Volume= 11,107 cf, Depth= 5.35"

Routed to Pond FB3: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| Aı    | rea (sf) | CN     | Description                   |             |                         |  |  |  |  |
|-------|----------|--------|-------------------------------|-------------|-------------------------|--|--|--|--|
|       | 8,658    | 61     | >75% Grass cover, Good, HSG B |             |                         |  |  |  |  |
|       | 16,263   | 98     | Paved parking, HSG B          |             |                         |  |  |  |  |
|       | 24,922   | 85     | Weighted Average              |             |                         |  |  |  |  |
|       | 8,658    |        | 34.74% Per                    | vious Area  |                         |  |  |  |  |
|       | 16,263   |        | 65.26% Imp                    | ervious Are | ea                      |  |  |  |  |
|       |          |        |                               |             |                         |  |  |  |  |
| Тс    | Length   | Slope  | ,                             | Capacity    | Description             |  |  |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)                    | (cfs)       |                         |  |  |  |  |
| 6.0   |          |        |                               |             | Direct Entry, TR-55 MIN |  |  |  |  |

Direct Entry, TR-55 MIN

### **Summary for Subcatchment P-15: Subcat P-15**

Runoff 1.86 cfs @ 12.09 hrs, Volume= 6,704 cf, Depth= 6.74"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

|   | A     | rea (sf) | CN     | Description      |                               |                         |  |  |  |  |  |
|---|-------|----------|--------|------------------|-------------------------------|-------------------------|--|--|--|--|--|
|   |       | 230      | 61     | >75% Gras        | >75% Grass cover, Good, HSG B |                         |  |  |  |  |  |
| _ |       | 11,703   | 98     | Paved park       | Paved parking, HSG B          |                         |  |  |  |  |  |
|   |       | 11,933   | 97     | Weighted Average |                               |                         |  |  |  |  |  |
|   |       | 230      |        | 1.93% Perv       | ious Area                     |                         |  |  |  |  |  |
|   |       | 11,703   |        | 98.07% Imp       | ervious Ar                    | ea                      |  |  |  |  |  |
|   |       |          |        |                  |                               |                         |  |  |  |  |  |
|   | Tc    | Length   | Slope  | ,                | Capacity                      | Description             |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | (ft/sec)         | (cfs)                         |                         |  |  |  |  |  |
|   | 6.0   |          |        |                  |                               | Direct Entry, TR-55 MIN |  |  |  |  |  |

Direct Entry, TR-55 MIN

# **Summary for Subcatchment P-16: Subcat P-16**

0.47 cfs @ 12.09 hrs. Volume= 1,507 cf, Depth= 4.90" Runoff

Routed to Pond FB4: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

Type III 24-hr 25-year Rainfall=7.10"

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| _ | А     | rea (sf) | CN     | Description                   |              |                   |           |  |  |  |  |  |
|---|-------|----------|--------|-------------------------------|--------------|-------------------|-----------|--|--|--|--|--|
|   |       | 1,960    | 98     | Paved parking, HSG B          |              |                   |           |  |  |  |  |  |
| _ |       | 1,731    | 61     | >75% Grass cover, Good, HSG B |              |                   |           |  |  |  |  |  |
|   |       | 3,691    | 81     | Weighted Average              |              |                   |           |  |  |  |  |  |
|   |       | 1,731    |        | 46.90% Pei                    | vious Area   |                   |           |  |  |  |  |  |
|   |       | 1,960    |        | 53.10% Imp                    | pervious Are | ea                |           |  |  |  |  |  |
|   | _     |          |        |                               |              |                   |           |  |  |  |  |  |
|   | Тс    | Length   | Slope  | ,                             | Capacity     | Description       |           |  |  |  |  |  |
|   | (min) | (feet)   | (ft/ft | ) (ft/sec)                    | (cfs)        |                   |           |  |  |  |  |  |
|   | 0.0   |          |        |                               |              | Discost Fratery T | D CC MINI |  |  |  |  |  |

6.0 **Direct Entry, TR-55 MIN** 

### **Summary for Subcatchment P-2: Subcat P-2**

Runoff = 0.67 cfs @ 12.10 hrs, Volume= 2,155 cf, Depth= 2.77"

Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A           | rea (sf)         | CN E             | Description                   |                   |                         |  |  |  |  |  |  |
|-------------|------------------|------------------|-------------------------------|-------------------|-------------------------|--|--|--|--|--|--|
|             | 9,321            | 61 >             | >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |  |  |
|             | 9,321            | 1                | 100.00% Pervious Area         |                   |                         |  |  |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)          | Capacity<br>(cfs) | Description             |  |  |  |  |  |  |
| 6.0         |                  |                  |                               |                   | Direct Entry, TR-55 min |  |  |  |  |  |  |

# **Summary for Subcatchment P-3: Subcat P-3**

Runoff = 1.05 cfs @ 12.09 hrs, Volume= 3,301 cf, Depth= 3.91"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN     | Description                   |             |                         |  |  |  |  |  |  |
|-------|----------|--------|-------------------------------|-------------|-------------------------|--|--|--|--|--|--|
|       | 7,199    | 61     | >75% Grass cover, Good, HSG B |             |                         |  |  |  |  |  |  |
|       | 2,922    | 98     | Paved parking, HSG B          |             |                         |  |  |  |  |  |  |
|       | 10,121   | 72     | Weighted Average              |             |                         |  |  |  |  |  |  |
|       | 7,199    |        | 71.13% Pervious Area          |             |                         |  |  |  |  |  |  |
|       | 2,922    |        | 28.87% Imp                    | pervious Ar | ea                      |  |  |  |  |  |  |
|       |          |        |                               |             |                         |  |  |  |  |  |  |
| Tc    | Length   | Slope  | ,                             | Capacity    | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)                    | (cfs)       |                         |  |  |  |  |  |  |
| 6.0   |          |        |                               |             | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

Type III 24-hr 25-year Rainfall=7.10"

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# Summary for Subcatchment P-4: Subcat E-4

Runoff = 0.34 cfs @ 12.15 hrs, Volume= 1,251 cf, Depth= 2.77"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| _                                      | Α           | rea (sf)         | CN E             | Description          |                   |  |   |  |  |
|--|-------------|------------------|------------------|----------------------|-------------------|--|---|--|--|
| 5,412 61 >75% Grass cover, Good, HSG B |             |                  |                  |                      |                   |  |   |  |  |
|  |             | 5,412            | 1                | 00.00% Pe            | a                 |  |   |  |  |
|  | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description  |   |  |  |
| -                                      | 8.1         | 50               | 0.0200           | 0.10                 | , ,               | Sheet Flow, A-B Grass: Dense n= 0.240 P2= 3.28"                | _ |  |  |
|  | 1.5         | 112              | 0.0310           | 1.23                 |                   | Shallow Concentrated Flow, B-C Short Grass Pasture Kv= 7.0 fps |   |  |  |
| _                                      | 9.6         | 162              | Total            |                      |                   |  |   |  |  |

### **Summary for Subcatchment P-5: Subcat P-5**

Runoff = 3.32 cfs @ 12.09 hrs, Volume= 11,971 cf, Depth= 6.74"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN                      | Description           | Description                  |             |  |  |  |  |  |  |  |
|-------|----------|-------------------------|-----------------------|------------------------------|-------------|--|--|--|--|--|--|--|
|       | 574      | 61                      | >75% Gras             | 75% Grass cover, Good, HSG B |             |  |  |  |  |  |  |  |
|       | 20,733   | 98                      | Paved park            | Paved parking, HSG B         |             |  |  |  |  |  |  |  |
|       | 21,307   | 97                      | Weighted A            | eighted Average              |             |  |  |  |  |  |  |  |
|       | 574      |                         | 2.69% Pervious Area   |                              |             |  |  |  |  |  |  |  |
|       | 20,733   |                         | 97.31% Imp            | pervious Ar                  | rea         |  |  |  |  |  |  |  |
| _     |          |                         |                       |                              |             |  |  |  |  |  |  |  |
| Тс    | Length   | Slope                   | ,                     | Capacity                     | Description |  |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft                  | ft/ft) (ft/sec) (cfs) |                              |             |  |  |  |  |  |  |  |
| 6.0   |          | Direct Entry, TR-55 MIN |                       |                              |             |  |  |  |  |  |  |  |

\_ ....**,**, ......

# **Summary for Subcatchment P-6: Subcat P-6**

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 1,273 cf, Depth= 6.39"

Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

Type III 24-hr 25-year Rainfall=7.10"

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|   | Α     | rea (sf) | CN     | Description             |                              |             |  |  |  |  |  |  |
|---|-------|----------|--------|-------------------------|------------------------------|-------------|--|--|--|--|--|--|
| _ |       | 276      | 61     | >75% Gras               | 75% Grass cover, Good, HSG B |             |  |  |  |  |  |  |
| _ |       | 2,115    | 98     | Paved parking, HSG B    |                              |             |  |  |  |  |  |  |
|   |       | 2,391    | 94     | Weighted A              | Veighted Average             |             |  |  |  |  |  |  |
|   |       | 276      |        | 11.55% Pei              | vious Area                   | a           |  |  |  |  |  |  |
|   |       | 2,115    |        | 88.45% Imp              | pervious Ar                  | rea         |  |  |  |  |  |  |
|   | _     |          |        |                         |                              |             |  |  |  |  |  |  |
|   | Tc    | Length   | Slope  | ,                       | Capacity                     | Description |  |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | ft/ft) (ft/sec) (cfs)   |                              |             |  |  |  |  |  |  |
|   | 6.0   |          |        | Direct Entry, TR-55 MIN |                              |             |  |  |  |  |  |  |

Direct Entry, TR-55 MIN

### **Summary for Subcatchment P-7: Subcat P-7**

1.09 cfs @ 12.09 hrs, Volume= 3,483 cf, Depth= 4.79" Runoff

Routed to Pond FB1: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| A     | rea (sf) | CN                      | Description                   |            |             |  |  |  |  |  |  |
|-------|----------|-------------------------|-------------------------------|------------|-------------|--|--|--|--|--|--|
|       | 4,544    | 98                      | Paved parking, HSG B          |            |             |  |  |  |  |  |  |
|       | 4,188    | 61                      | >75% Grass cover, Good, HSG B |            |             |  |  |  |  |  |  |
|       | 8,731    | 80                      | Weighted Average              |            |             |  |  |  |  |  |  |
|       | 4,188    |                         | 47.96% Pervious Area          |            |             |  |  |  |  |  |  |
|       | 4,544    | ;                       | 52.04% lmp                    | ervious Ar | ea          |  |  |  |  |  |  |
| _     |          | 01                      |                               |            | B           |  |  |  |  |  |  |
| Tc    | Length   | Slope                   | ,                             | Capacity   | Description |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft)                 | (ft/ft) (ft/sec) (cfs)        |            |             |  |  |  |  |  |  |
| 6.0   |          | Direct Entry, TR-55 MIN |                               |            |             |  |  |  |  |  |  |

# **Summary for Subcatchment P-8: Subcat P-8**

1.70 cfs @ 12.09 hrs, Volume= 6,218 cf, Depth= 6.86" Runoff

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| Ar          | rea (sf)         | CN I             | Description          |                   |                         |  |  |  |  |  |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------|--|--|--|--|--|
|             | 10,876           | 98 F             | 98 Roofs, HSG B      |                   |                         |  |  |  |  |  |
|             | 10,876           | •                | 100.00% Im           | npervious A       | rea                     |  |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description             |  |  |  |  |  |
| 6.0         |                  |                  |                      |                   | Direct Entry, TR-55 MIN |  |  |  |  |  |

Type III 24-hr 25-year Rainfall=7.10"

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# Summary for Subcatchment P-9: Subcat P-9

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 376 cf, Depth= 6.86"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 25-year Rainfall=7.10"

| _ | Α           | rea (sf)         | CN               | Description             |                   |                         |  |  |  |  |  |
|---|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|--|
|   |             | 657              | 98               | Roofs, HSG              | oofs, HSG B       |                         |  |  |  |  |  |
|   |             | 657              |                  | 100.00% Impervious Area |                   |                         |  |  |  |  |  |
|   | Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |  |
|   | 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |  |

### Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 25-year event

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routed to Link SP3: Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### **Summary for Pond B1: bioretention system 1**

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

#### [81] Warning: Exceeded Pond FB1 by 0.92' @ 15.25 hrs

Inflow Area = 8,731 sf, 52.04% Impervious, Inflow Depth = 4.66" for 25-year event

Inflow = 1.08 cfs @ 12.10 hrs, Volume= 3,391 cf

Outflow = 0.05 cfs @ 15.04 hrs, Volume= 3,391 cf, Atten= 95%, Lag= 175.9 min

Discarded = 0.05 cfs @ 15.04 hrs, Volume= 3,391 cf Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Link SP3: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.45' @ 15.04 hrs Surf.Area= 571 sf Storage= 1,997 cf Flood Elev= 61.00' Surf.Area= 571 sf Storage= 3,054 cf

Plug-Flow detention time= 455.3 min calculated for 3,386 cf (100% of inflow) Center-of-Mass det. time= 455.6 min (1,273.1 - 817.5)

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| Volume            | Invert           | Avail.               | .Storage  | prage Storage Description                        |                           |                     |       |  |  |  |
|-------------------|------------------|----------------------|---|--|---------------------------|---------------------|-------|--|--|--|
| #1<br>#2          | 58.50'<br>56.50' |                      | 2,712 cf<br>343 cf  |  |                           |                     |       |  |  |  |
|                   |                  |                      | 3,054 cf  | Total Available Sto                              | orage                     |                     |       |  |  |  |
| Elevatio<br>(fee  |                  | rf.Area<br>(sq-ft)   | Perim.<br>(feet)  | Inc.Store<br>(cubic-feet)                        | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |       |  |  |  |
| 58.5              |                  | 365                  | 133.0   | 0  | 0                         | 365                 |       |  |  |  |
| 59.0              |                  | 571                  | 142.0   | 232  | 232                       | 574                 |       |  |  |  |
| 60.0              |                  | 1,101                | 180.0   | 822  | 1,054                     | 1,561               |       |  |  |  |
| 61.0              | 00               | 2,286                | 255.0   | 1,658  | 2,712                     | 4,166               |       |  |  |  |
| Elevatio<br>(fee  |                  | rf.Area<br>(sq-ft)   | Perim.<br>(feet)  | Inc.Store<br>(cubic-feet)                        | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |       |  |  |  |
| 56.5              |                  | 571                  | 142.0   | 0  | 0                         | 571                 |       |  |  |  |
| 58.5              |                  | 571                  | 142.0   | 1,142  | 1,142                     | 855                 |       |  |  |  |
| 50.5              | ,0               | 57 1                 | 172.0   | 1,172  | 1,172                     | 000                 |       |  |  |  |
| Device            | Routing          | Inv                  | ert Outle   | et Devices                                       |                           |                     |       |  |  |  |
| #1 Primary 60.70' |                  | Head<br>2.50<br>Coef | 4.0' 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 |  |                           |                     |       |  |  |  |
| #2                | Discarded        | 56.                  |   | <b>0 in/hr Exfiltration</b> ductivity to Groundv |                           |                     | 0.01' |  |  |  |

**Discarded OutFlow** Max=0.05 cfs @ 15.04 hrs HW=60.45' (Free Discharge) **2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=56.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

### Summary for Pond B2: bioretention system 2

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[79] Warning: Submerged Pond FB2 Primary device # 1 by 0.09'

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 6.72" for 25-year event Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,390 cf

Outflow = 0.57 cfs @ 12.15 hrs, Volume= 2,390 cf, Atten= 15%, Lag= 3.3 min Discarded = 0.02 cfs @ 12.15 hrs, Volume= 1,230 cf

Primary = 0.55 cfs @ 12.15 hrs, Volume= 1,160 cf

Routed to Link SP3 : Study Point

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Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.84' @ 12.15 hrs Surf.Area= 258 sf Storage= 627 cf Flood Elev= 61.00' Surf.Area= 258 sf Storage= 743 cf

Plug-Flow detention time= 166.0 min calculated for 2,387 cf (100% of inflow)

Center-of-Mass det. time= 166.4 min (922.4 - 756.0)

| Volume  | Invert           | Avail.9 | Storage          | Storage Description  | า                   |                                       |
|---|------------------|---------|------------------|--|---------------------|---------------------------------------|
| #1<br>#2                                      | 59.50'<br>57.50' |         | 588 cf<br>155 cf | surface storage (In<br>media storage (Irr<br>516 cf Overall x 30 | egular)Listed belo  | ow (Recalc) -Impervious<br>w (Recalc) |
|   |                  |         | 743 cf           | Total Available Stor   | rage                |                                       |
| Elevatio                                      |                  | f.Area  | Perim.           | Inc.Store  | Cum.Store           | Wet.Area                              |
| (fee  | et)              | (sq-ft) | (feet)           | (cubic-feet)   | (cubic-feet)        | (sq-ft)                               |
| 59.5  | 50               | 98      | 88.0             | 0  | 0                   | 98                                    |
| 60.0  |                  | 258     | 114.0            | 86   | 86                  | 519                                   |
| 61.0  |                  | 796     | 185.0            | 502  | 588                 | 2,215                                 |
| 0   |                  |         |                  |  |                     | _,                                    |
| Elevation                                     | n Sur            | f.Area  | Perim.           | Inc.Store  | Cum.Store           | Wet.Area                              |
| (fee  | et)              | (sq-ft) | (feet)           | (cubic-feet)   | (cubic-feet)        | (sq-ft)                               |
| 57.5  | 50               | 258     | 114.0            | 0  | 0                   | 258                                   |
| 59.5  |                  | 258     | 114.0            | 516  | 516                 | 486                                   |
|   |                  |         |                  |  |                     |                                       |
| Device  | Routing          | Inve    | ert Outle        | et Devices   |                     |                                       |
| #1  | Discarded        | 57.5    | 0.7 <b>2</b>     | 0 in/hr Exfiltration o   | over Wetted area    |                                       |
|   |                  |         | Cond             | ductivity to Groundw   | ater Elevation = 55 | 5.20' Phase-In= 0.01'                 |
| #2  | Device 3         | 60.5    | 0' <b>15.0</b>   | " Vert. overflow ori   | fice C= 0.600       |                                       |
|   |                  |         | Limit            | ted to weir flow at lov  | w heads             |                                       |
| #3  | Primary          | 58.0    | <b>0.8</b> '0'   | Round Culvert L=   | 98.0' Ke= 0.500     |                                       |
|   | •                |         | Inlet            | / Outlet Invert= 58.0  | 0' / 57.50' S= 0.0  | 051 '/' Cc= 0.900                     |
| n= 0.013 Corrugated PE, smooth interior, Flow |                  |         |                  |  |                     | Flow Area= 0.35 sf                    |

**Discarded OutFlow** Max=0.02 cfs @ 12.15 hrs HW=60.84' (Free Discharge) **1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=0.55 cfs @ 12.15 hrs HW=60.84' (Free Discharge)

3=Culvert (Passes 0.55 cfs of 1.76 cfs potential flow)

2=overflow orifice (Orifice Controls 0.55 cfs @ 2.00 fps)

.

# **Summary for Pond B3: bioretention system 3**

GW from TP1

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24,922 sf, 65.26% Impervious, Inflow Depth = 5.25" for 25-year event Inflow Area =

Inflow 3.75 cfs @ 12.10 hrs, Volume= 10.909 cf

Outflow 0.28 cfs @ 13.15 hrs, Volume= 10,187 cf, Atten= 92%, Lag= 62.9 min

0.11 cfs @ 13.15 hrs, Volume= Discarded = 9.059 cf Primary 0.17 cfs @ 13.15 hrs, Volume= 1,128 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.85' @ 13.15 hrs Surf.Area= 1,639 sf Storage= 6,151 cf

Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 512.2 min calculated for 10,187 cf (93% of inflow)

Center-of-Mass det. time= 476.9 min (1,281.1 - 804.2)

| Volume   | Invert           | Avail.S             | Storage            | Storage Description   | า                         |                                       |  |  |  |
|----------|------------------|---------------------|--------------------|---|---------------------------|---------------------------------------|--|--|--|
| #1<br>#2 | 59.00'<br>57.00' |                     | 5,886 cf<br>983 cf | surface storage (Immedia storage (Irr<br>3,278 cf Overall x   | egular)Listed belov       | ow (Recalc) -Impervious<br>w (Recalc) |  |  |  |
|          |                  | 6                   | 6,870 cf           | Total Available Sto   | rage                      |                                       |  |  |  |
| Elevatio |                  | urf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                   |  |  |  |
| 59.0     | 00               | 1,639               | 184.0              | 0   | 0                         | 1,639                                 |  |  |  |
| 60.0     | 00               | 2,580               | 217.0              | 2,092   | 2,092                     | 2,711                                 |  |  |  |
| 61.0     | 00               | 5,156               | 323.0              | 3,794   | 5,886                     | 7,274                                 |  |  |  |
| Elevatio |                  | urf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)                   |  |  |  |
| 57.0     | 00               | 1,639               | 184.0              | 0   | 0                         | 1,639                                 |  |  |  |
| 59.0     | 00               | 1,639               | 184.0              | 3,278   | 3,278                     | 2,007                                 |  |  |  |
| Device   | Routing          | Inve                | ert Outle          | et Devices  |                           |                                       |  |  |  |
| #1       | Device 2         | 60.8                |                    | " Horiz. Orifice/Gra  |                           |                                       |  |  |  |
| #2       | Primary          | 58.40' <b>8.</b> 0  |                    | Limited to weir flow at low heads  3.0" Round Culvert L= 77.0' Ke= 0.500  nlet / Outlet Invert= 58.40' / 57.00' S= 0.0182 '/' Cc= 0.900                                     |                           |                                       |  |  |  |
| #3       | Discarded        | rded 57.00'         |                    | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf <b>0.720 in/hr Exfiltration over Wetted area</b> Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.01' |                           |                                       |  |  |  |

Discarded OutFlow Max=0.11 cfs @ 13.15 hrs HW=60.85' (Free Discharge) **T**—3=Exfiltration ( Controls 0.11 cfs)

Primary OutFlow Max=0.16 cfs @ 13.15 hrs HW=60.85' (Free Discharge)

**-2=Culvert** (Passes 0.16 cfs of 2.10 cfs potential flow)

1=Orifice/Grate (Weir Controls 0.16 cfs @ 0.76 fps)

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# Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB4 by 0.60' @ 14.35 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 4.76" for 25-year event

Inflow = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf

Outflow = 0.03 cfs @ 14.25 hrs, Volume= 1,463 cf, Atten= 94%, Lag= 129.0 min

Discarded = 0.03 cfs @ 14.25 hrs, Volume = 1,463 cfPrimary = 0.00 cfs @ 0.00 hrs, Volume = 0 cf

Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.42' @ 14.25 hrs Surf.Area= 516 sf Storage= 800 cf Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 343.6 min calculated for 1,461 cf (100% of inflow)

Center-of-Mass det. time= 343.7 min (1,159.8 - 816.1)

| Volume   | Inver     | t Avai    | il.Storage       | Storage Description   | on               |                    |         |
|----------|-----------|-----------|------------------|---|------------------|--------------------|---------|
| #1       | 59.50     |           | 1,049 cf         | surface storage (Irregular)Listed below (Recalc) -Impervious media storage (Irregular)Listed below (Recalc) |                  |                    |         |
| #2       | 57.50     | ).        | 310 cf           | media storage (ir<br>1,032 cf Overall x   |                  | low (Recalc)       |         |
|          |           |           | 1,358 cf         | Total Available Sto   | orage            |                    |         |
| Elevatio | n S       | Surf.Area | Perim.           | Inc.Store   | Cum.Store        | Wet.Area           |         |
| (fee     | t)        | (sq-ft)   | (feet)           | (cubic-feet)  | (cubic-feet)     | (sq-ft)            |         |
| 59.5     | 50        | 391       | 79.0             | 0   | 0                | 391                |         |
| 60.0     | 0         | 516       | 88.0             | 226   | 226              | 518                |         |
| 61.0     | 0         | 1,174     | 135.0            | 823   | 1,049            | 1,359              |         |
| Elevatio | n S       | Surf.Area | Perim.           | Inc.Store   | Cum.Store        | Wet.Area           |         |
| (fee     | t)        | (sq-ft)   | (feet)           | (cubic-feet)  | (cubic-feet)     | (sq-ft)            |         |
| 57.5     | 60        | 516       | 88.0             | 0   | 0                | 516                |         |
| 59.5     | 0         | 516       | 88.0             | 1,032   | 1,032            | 692                |         |
| Device   | Routing   | In        | vert Outle       | et Devices  |                  |                    |         |
| #1       | Primary   | 60        | .75' <b>5.0'</b> | long x 4.0' breadt  | h Broad-Crested  | Rectangular Weir   |         |
|          | -         |           |                  |   |                  | 1.20 1.40 1.60 1.8 | 30 2.00 |
|          |           |           | 2.50             | 3.00 3.50 4.00 4  | .50 5.00 5.50    |                    |         |
|          |           |           | Coef             | f. (English) 2.38 2.  | 54 2.69 2.68 2.6 | 67 2.67 2.65 2.66  | 2.66    |
|          |           |           |                  | 2.72 2.73 2.76 2  |                  | · • —              |         |
| #2       | Discarded | 57        | .50' <b>0.72</b> | 20 in/hr Exfiltration over Wetted area  |                  |                    |         |

Conductivity to Groundwater Elevation = 55.50' Phase-In= 0.10'

Type III 24-hr 25-year Rainfall=7.10"

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**Discarded OutFlow** Max=0.03 cfs @ 14.25 hrs HW=60.42' (Free Discharge) **2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge) 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

# **Summary for Pond FB1: sediment forebay**

Inflow Area = 8,731 sf, 52.04% Impervious, Inflow Depth = 4.79" for 25-year event

Inflow = 1.09 cfs @ 12.09 hrs, Volume= 3,483 cf

Outflow = 1.08 cfs @ 12.10 hrs, Volume= 3,391 cf, Atten= 1%, Lag= 0.8 min

Primary = 1.08 cfs @ 12.10 hrs, Volume= 3,391 cf

Routed to Pond B1: bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 59.77' @ 12.10 hrs Surf.Area= 273 sf Storage= 159 cf

Flood Elev= 61.00' Surf.Area= 489 sf Storage= 627 cf

Plug-Flow detention time= 25.4 min calculated for 3,387 cf (97% of inflow)

Center-of-Mass det. time= 10.1 min (817.5 - 807.4)

| Volume               | Inv     | ert Avail.                             | Storage              | Storage Description       | n                          |   |
|----------------------|---------|--|----------------------|---------------------------|----------------------------|---|
| #1                   | 59.0    | 00'                                    | 627 cf               | surface storage (I        | <b>rregular)</b> Listed be | low (Recalc)  |
| Elevatio<br>(fee     |         | Surf.Area<br>(sq-ft)                   | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)   |
| 59.0<br>60.0<br>61.0 | 0       | 146<br>318<br>489                      | 45.0<br>66.0<br>84.0 | 0<br>226<br>400           | 0<br>226<br>627            | 146<br>340<br>567   |
| Device               | Routing | Inve                                   | ert Outle            | et Devices                |                            |   |
| #1                   | Primary | 59.50' <b>3.0</b><br>Hea<br>2.5<br>Coo |                      | 3.00 3.50                 | 0.60 0.80 1.00 1.          | Rectangular Weir<br>20 1.40 1.60 1.80 2.00<br>6 2.70 2.77 2.89 2.88 |

Primary OutFlow Max=1.07 cfs @ 12.10 hrs HW=59.77' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.07 cfs @ 1.33 fps)

# **Summary for Pond FB2: sediment forebay**

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 6.86" for 25-year event

Inflow = 0.67 cfs @ 12.09 hrs, Volume= 2,440 cf

Outflow = 0.67 cfs @ 12.09 hrs, Volume= 2,390 cf, Atten= 0%, Lag= 0.5 min

Primary = 0.67 cfs @ 12.09 hrs, Volume= 2,390 cf

Routed to Pond B2: bioretention system 2

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Flood Elev= 61.00' Surf.Area= 130 sf Storage= 78 cf

Plug-Flow detention time= 26.5 min calculated for 2,390 cf (98% of inflow)

Center-of-Mass det. time= 13.2 min ( 756.0 - 742.8 )

| <u>Volume</u>      | Inv     | ert Avail.                                   | Storage          | Storage Description   | n                      |                     |         |
|--------------------|---------|--|------------------|---|------------------------|---------------------|---------|
| #1                 | 59.     | 50'  | 78 cf            | surface storage (I  | rregular)Listed be     | low (Recalc)        |         |
| Elevatior<br>(feet | · -     | Surf.Area<br>(sq-ft)                         | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)   | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |         |
| 59.50              | 0       | 1  | 1.0              | 0   | 0                      | 1                   |         |
| 60.00              | )       | 28   | 23.0             | 6   | 6                      | 43                  |         |
| 61.00              | 0       | 130  | 44.0             | 73  | 78                     | 160                 |         |
| Device             | Routing | Inv  | ert Outle        | et Devices  |                        |                     |         |
| #1                 | Primary | 60.75' <b>3.0' I</b><br>Head<br>2.50<br>Coef |                  | long x 2.0' breadth<br>d (feet) 0.20 0.40 0<br>3.00 3.50<br>f. (English) 2.54 2.6<br>3.07 3.20 3.32 | 0.60 0.80 1.00 1.      | 20 1.40 1.60 1.8    | 80 2.00 |

Primary OutFlow Max=0.66 cfs @ 12.09 hrs HW=60.95' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.66 cfs @ 1.12 fps)

# **Summary for Pond FB3: sediment forebay**

[93] Warning: Storage range exceeded by 0.11'

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 5.35" for 25-year event

Inflow = 3.41 cfs @ 12.09 hrs, Volume= 11.107 cf

Outflow = 3.75 cfs @ 12.10 hrs, Volume= 10,909 cf, Atten= 0%, Lag= 0.5 min

Primary = 3.75 cfs @ 12.10 hrs, Volume= 10,909 cf

Routed to Pond B3: bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.11' @ 12.10 hrs Surf.Area= 586 sf Storage= 457 cf

Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 20.4 min calculated for 10,894 cf (98% of inflow)

Center-of-Mass det. time= 9.6 min (804.2 - 794.6)

| Volume              | Invert | Avail.S         | Storage          | Storage Descripti         | on                     |                     |
|---------------------|--------|-----------------|------------------|---------------------------|------------------------|---------------------|
| #1                  | 59.00' |                 | 457 cf           | surface storage           | (Irregular)Listed      | below (Recalc)      |
| Elevation<br>(feet) |        | .Area<br>sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |
| 59.00               | ,      | 340             | 70.0             | 0                         | 0                      | 340                 |
| 60.00               |        | 586             | 91.0             | 457                       | 457                    | 621                 |

Type III 24-hr 25-year Rainfall=7.10"

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| Device | Routing | Invert | Outlet Devices  |
|--------|---------|--------|---|
| #1     | Primary | 59.50' | 3.0' long x 2.0' 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  |
|        |         |        | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88  |
|        |         |        | 2.85 3.07 3.20 3.32   |

Primary OutFlow Max=3.70 cfs @ 12.10 hrs HW=60.11' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 3.70 cfs @ 2.03 fps)

### **Summary for Pond FB4: sediment forebay**

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 4.90" for 25-year event

Inflow = 0.47 cfs @ 12.09 hrs, Volume= 1,507 cf

Outflow = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf, Atten= 1%, Lag= 0.8 min

Primary = 0.47 cfs @ 12.10 hrs, Volume= 1,463 cf

Routed to Pond B4: bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.96' @ 12.10 hrs Surf.Area= 197 sf Storage= 72 cf

Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 28.2 min calculated for 1,463 cf (97% of inflow)

Center-of-Mass det. time= 11.1 min ( 816.1 - 805.0 )

| Volume   | Inv     | ert Avail            | .Storage         | Storage Description                                     | on                        |                     |        |  |
|----------|---------|----------------------|------------------|---|---------------------------|---------------------|--------|--|
| #1       | 59.     | 50'                  | 81 cf            | surface storage (                                       | (Irregular)Listed b       | elow (Recalc)       |        |  |
| Elevatio |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)                               | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |        |  |
| 59.5     | -       | 124                  | 42.0             | 0   | 0                         | 124                 |        |  |
| 60.0     | 00      | 205                  | 56.0             | 81  | 81                        | 236                 |        |  |
| Device   | Routing | Inv                  | ert Outle        | et Devices  |                           |                     |        |  |
| #1       | Primary | mary 59.80'          |                  | 3.0' long x 2.0' breadth Broad-Crested Rectangular Weir |                           |                     |        |  |
|          |         |                      |                  |   | 0.60 0.80 1.00            | 1.20 1.40 1.60 1.80 | ) 2.00 |  |
|          |         |                      |                  | 3.00 3.50   |                           |                     |        |  |
|          |         |                      |                  | f. (English) 2.54 2.<br>3.07 3.20 3.32                  | .61 2.61 2.60 2.          | 66 2.70 2.77 2.89   | 2.88   |  |
|          |         |                      | 2.03             | 0.01 0.20 0.02  |                           |                     |        |  |

Primary OutFlow Max=0.46 cfs @ 12.10 hrs HW=59.95' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.46 cfs @ 1.00 fps)

### **Summary for Pond IS1: infiltration 1**

#### GW elevation from TP8

Type III 24-hr 25-year Rainfall=7.10"

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| Inflow Area = | 18,979 sf, 98.79% Impervious, | Inflow Depth = 6.79" | for 25-year event |
|---------------|-------------------------------|----------------------|-------------------|
| Inflow =      | 2.96 cfs @ 12.09 hrs, Volume= | 10,733 cf            |                   |

Outflow = 1.50 cfs @ 12.23 hrs, Volume= 10,733 cf, Atten= 49%, Lag= 8.8 min

Discarded = 0.08 cfs @ 12.23 hrs, Volume= 5,525 cf Primary = 1.42 cfs @ 12.23 hrs, Volume= 5,208 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.55' @ 12.23 hrs Surf.Area= 3,088 sf Storage= 3,472 cf Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 151.5 min calculated for 10,733 cf (100% of inflow)

Center-of-Mass det. time= 151.3 min (898.1 - 746.7)

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 58.60' | 2,174 cf      | 41.50'W x 74.40'L x 2.33'H Field A                                 |
|        |        |               | 7,204 cf Overall - 1,769 cf Embedded = $5,435$ cf x $40.0\%$ Voids |
| #2A    | 59.10' | 1,769 cf      | ADS_StormTech SC-310 +Cap x 120 Inside #1                          |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf      |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap          |
|        |        |               | 120 Chambers in 12 Rows  |
|        |        | 3.943 cf      | Total Available Storage  |

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 58.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01' |
| #2     | Primary   | 59.50' | 8.0" Round Culvert L= 32.0' Ke= 0.500                          |
|        | •         |        | Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf    |

**Discarded OutFlow** Max=0.08 cfs @ 12.23 hrs HW=60.55' (Free Discharge) 1=Exfiltration (Controls 0.08 cfs)

Primary OutFlow Max=1.42 cfs @ 12.23 hrs HW=60.55' (Free Discharge) 2=Culvert (Inlet Controls 1.42 cfs @ 4.07 fps)

# **Summary for Pond IS2: infiltration 2**

#### GW from TP5

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Inflow Area = 32,183 sf, 98.22% Impervious, Inflow Depth = 6.78" for 25-year event

Inflow = 5.01 cfs @ 12.09 hrs, Volume= 18,189 cf

Outflow = 2.07 cfs @ 12.30 hrs, Volume= 18,189 cf, Atten= 59%, Lag= 12.7 min

Discarded = 0.15 cfs @ 12.30 hrs, Volume= 11,921 cf Primary = 1.92 cfs @ 12.30 hrs, Volume= 6,268 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.68' @ 12.30 hrs Surf.Area= 6,032 sf Storage= 6,910 cf

Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 239.2 min calculated for 18,164 cf (100% of inflow)

Center-of-Mass det. time= 239.5 min ( 986.5 - 746.9 )

| Volume | Invert | Avail.Storage | Storage Description   |
|--------|--------|---------------|---|
| #1A    | 57.70' | 4,214 cf      | 51.50'W x 117.12'L x 2.33'H Field A                             |
|        |        | ·             | 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids |
| #2A    | 58.20' | 3,538 cf      | ADS_StormTech SC-310 +Cap x 240 Inside #1                       |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf   |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap       |
|        |        |               | 240 Chambers in 15 Rows   |
|        |        | 7.750 of      | Total Available Ctarage   |

7,752 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 57.70' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01' |
| #2     | Primary   | 58.92' | <b>12.0" Round Culvert</b> L= 20.0' Ke= 0.500                  |
|        | •         |        | Inlet / Outlet Invert= 58.92' / 58.00' S= 0.0460 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf    |

**Discarded OutFlow** Max=0.15 cfs @ 12.30 hrs HW=59.68' (Free Discharge) **1=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=1.92 cfs @ 12.30 hrs HW=59.68' (Free Discharge) 2=Culvert (Inlet Controls 1.92 cfs @ 2.98 fps)

# **Summary for Pond IS3: infiltration 3**

#### GW from TP2

Type III 24-hr 25-year Rainfall=7.10"

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Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 6.86" for 25-year event

Inflow = 0.88 cfs @ 12.09 hrs, Volume= 3,234 cf

Outflow = 0.04 cfs @ 14.23 hrs, Volume= 3,234 cf, Atten= 95%, Lag= 128.3 min

Discarded = 0.04 cfs @ 14.23 hrs, Volume = 3,234 cfPrimary = 0.00 cfs @ 0.00 hrs, Volume = 0 cf

Routed to Reach 1R: continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.97' @ 14.23 hrs Surf.Area= 1,972 sf Storage= 1,549 cf

Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 314.5 min calculated for 3,229 cf (100% of inflow)

Center-of-Mass det. time= 314.5 min (1,057.2 - 742.8)

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 59.60' | 1,257 cf      | 20.75'W x 95.03'L x 2.00'H Field A                           |
|        |        |               | 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids  |
| #2A    | 60.10' | 800 cf        | ADS_StormTech SC-160LP +Cap x 117 Inside #1                  |
|        |        |               | Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf |
|        |        |               | Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap    |
|        |        |               | 117 Chambers in 9 Rows                                       |
|        |        |               |  |

2,057 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #0     | Primary   | 61.60' | Automatic Storage Overflow (Discharged without head)           |
| #1     | Discarded | 59.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01' |

**Discarded OutFlow** Max=0.04 cfs @ 14.23 hrs HW=60.97' (Free Discharge) 1=Exfiltration (Controls 0.04 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

# **Summary for Link SP1: Study Point**

Inflow Area = 180,997 sf, 40.18% Impervious, Inflow Depth = 2.32" for 25-year event

Inflow = 8.36 cfs @ 12.22 hrs, Volume= 35,010 cf

Primary = 8.36 cfs @ 12.22 hrs, Volume= 35,010 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

# **Summary for Link SP2: Study Point**

Inflow Area = 9,321 sf, 0.00% Impervious, Inflow Depth = 2.77" for 25-year event

Inflow = 0.67 cfs @ 12.10 hrs, Volume= 2,155 cf

Primary = 0.67 cfs @ 12.10 hrs, Volume= 2,155 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-year Rainfall=7.10"

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### **Summary for Link SP3: Study Point**

Inflow Area = 28,777 sf, 60.23% Impervious, Inflow Depth = 1.86" for 25-year event

Inflow = 1.55 cfs @ 12.11 hrs, Volume= 4,461 cf

Primary = 1.55 cfs @ 12.11 hrs, Volume= 4,461 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

### **Summary for Link SP4: Study Point**

Inflow Area = 5,412 sf, 0.00% Impervious, Inflow Depth = 2.77" for 25-year event

Inflow = 0.34 cfs @ 12.15 hrs, Volume= 1,251 cf

Primary = 0.34 cfs @ 12.15 hrs, Volume= 1,251 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

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Type III 24-hr 50-year Rainfall=8.51" Printed 8/10/2023 Page 68

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

| Subcatchment P-1: Subcat P-1   | Runoff Area=96,521 sf 0.06% Impervious Runoff Depth=3.49" Flow Length=85' Tc=13.7 min CN=58 Runoff=6.90 cfs 28,043 cf |
|--------------------------------|---|
| Subcatchment P-10: Subcat P-10 | Runoff Area=7,046 sf 100.00% Impervious Runoff Depth=8.27"<br>Tc=6.0 min CN=98 Runoff=1.32 cfs 4,856 cf               |
| Subcatchment P-11: Subcat P-11 | Runoff Area=2,310 sf 85.16% Impervious Runoff Depth=7.67"<br>Tc=6.0 min CN=93 Runoff=0.42 cfs 1,476 cf                |
| Subcatchment P-12: Subcat P-12 | Runoff Area=4,268 sf 100.00% Impervious Runoff Depth=8.27"<br>Tc=6.0 min CN=98 Runoff=0.80 cfs 2,942 cf               |
| Subcatchment P-13: Subcat P-13 | Runoff Area=4,999 sf 98.84% Impervious Runoff Depth=8.27"<br>Tc=6.0 min CN=98 Runoff=0.94 cfs 3,445 cf                |
| Subcatchment P-14: Subcat P-14 | Runoff Area=24,922 sf 65.26% Impervious Runoff Depth=6.71"<br>Tc=6.0 min CN=85 Runoff=4.22 cfs 13,928 cf              |
| Subcatchment P-15: Subcat P-15 | Runoff Area=11,933 sf 98.07% Impervious Runoff Depth=8.15"<br>Tc=6.0 min CN=97 Runoff=2.23 cfs 8,104 cf               |
| Subcatchment P-16: Subcat P-16 | Runoff Area=3,691 sf 53.10% Impervious Runoff Depth=6.22"<br>Tc=6.0 min CN=81 Runoff=0.59 cfs 1,915 cf                |
| Subcatchment P-2: Subcat P-2   | Runoff Area=9,321 sf 0.00% Impervious Runoff Depth=3.84"<br>Tc=6.0 min CN=61 Runoff=0.94 cfs 2,981 cf                 |
| Subcatchment P-3: Subcat P-3   | Runoff Area=10,121 sf 28.87% Impervious Runoff Depth=5.14"<br>Tc=6.0 min CN=72 Runoff=1.37 cfs 4,339 cf               |
| Subcatchment P-4: Subcat E-4   | Runoff Area=5,412 sf 0.00% Impervious Runoff Depth=3.84" Flow Length=162' Tc=9.6 min CN=61 Runoff=0.48 cfs 1,731 cf   |
| Subcatchment P-5: Subcat P-5   | Runoff Area=21,307 sf 97.31% Impervious Runoff Depth=8.15"<br>Tc=6.0 min CN=97 Runoff=3.98 cfs 14,471 cf              |
| Subcatchment P-6: Subcat P-6   | Runoff Area=2,391 sf 88.45% Impervious Runoff Depth=7.79"<br>Tc=6.0 min CN=94 Runoff=0.44 cfs 1,552 cf                |
| Subcatchment P-7: Subcat P-7   | Runoff Area=8,731 sf 52.04% Impervious Runoff Depth=6.10"<br>Tc=6.0 min CN=80 Runoff=1.38 cfs 4,442 cf                |
| Subcatchment P-8: Subcat P-8   | Runoff Area=10,876 sf 100.00% Impervious Runoff Depth=8.27"<br>Tc=6.0 min CN=98 Runoff=2.04 cfs 7,495 cf              |
| Subcatchment P-9: Subcat P-9   | Runoff Area=657 sf 100.00% Impervious Runoff Depth=8.27"<br>Tc=6.0 min CN=98 Runoff=0.12 cfs 453 cf                   |

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|-----------------------------|
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Type III 24-hr 50-year Rainfall=8.51"

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Reach 1R: continuity reach

Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond B1: bioretention system 1 Peak Elev=60.73' Storage=2,484 cf Inflow=1.37 cfs 4,350 cf Discarded=0.05 cfs 3,984 cf Primary=0.05 cfs 267 cf Outflow=0.10 cfs 4,251 cf

Pond B2: bioretention system 2 Peak Elev=60.88' Storage=655 cf Inflow=0.80 cfs 2,891 cf

Discarded=0.02 cfs 1,318 cf Primary=0.67 cfs 1,573 cf Outflow=0.69 cfs 2,891 cf

Pond B3: bioretention system 3 Peak Elev=60.97' Storage=6,723 cf Inflow=4.22 cfs 13,730 cf

Discarded=0.11 cfs 9,415 cf Primary=0.92 cfs 3,403 cf Outflow=1.03 cfs 12,818 cf

Pond B4: bioretention system 4 Peak Elev=60.74' Storage=1,082 cf Inflow=0.59 cfs 1,871 cf

Discarded=0.03 cfs 1,871 cf Primary=0.00 cfs 0 cf Outflow=0.03 cfs 1,871 cf

Pond FB1: sediment forebay Peak Elev=59.82' Storage=171 cf Inflow=1.38 cfs 4,442 cf

Outflow=1.37 cfs 4,350 cf

Pond FB2: sediment forebay Peak Elev=60.97' Storage=75 cf Inflow=0.80 cfs 2,942 cf

Outflow=0.80 cfs 2,891 cf

Pond FB3: sediment forebay Peak Elev=60.16' Storage=457 cf Inflow=4.22 cfs 13,928 cf

Outflow=4.22 cfs 13,730 cf

Pond FB4: sediment forebay Peak Elev=59.98' Storage=78 cf Inflow=0.59 cfs 1,915 cf

Outflow=0.59 cfs 1,871 cf

Pond IS1: infiltration 1 Peak Elev=60.93' Storage=3,942 cf Inflow=3.55 cfs 12,960 cf

Discarded=0.08 cfs 5,893 cf Primary=1.76 cfs 7,067 cf Outflow=1.84 cfs 12,960 cf

Pond IS2: infiltration 2 Peak Elev=60.02' Storage=7,729 cf Inflow=6.02 cfs 21,966 cf

Discarded=0.16 cfs 12,650 cf Primary=2.94 cfs 9,315 cf Outflow=3.10 cfs 21,966 cf

Pond IS3: infiltration 3 Peak Elev=61.49' Storage=1,974 cf Inflow=1.06 cfs 3,898 cf

Discarded=0.05 cfs 3,898 cf Primary=0.00 cfs 0 cf Outflow=0.05 cfs 3,898 cf

Link SP1: Study Point Inflow=12.08 cfs 50,858 cf

Primary=12.08 cfs 50,858 cf

Link SP2: Study Point Inflow=0.94 cfs 2,981 cf

Primary=0.94 cfs 2,981 cf

Link SP3: Study Point Inflow=1.99 cfs 6,180 cf

Primary=1.99 cfs 6,180 cf

Link SP4: Study Point Inflow=0.48 cfs 1,731 cf

Primary=0.48 cfs 1,731 cf

Total Runoff Area = 224,507 sf Runoff Volume = 102,173 cf Average Runoff Depth = 5.46" 59.89% Pervious = 134,448 sf 40.11% Impervious = 90,059 sf

Type III 24-hr 50-year Rainfall=8.51"

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# **Summary for Subcatchment P-1: Subcat P-1**

Runoff = 6.90 cfs @ 12.20 hrs, Volume= 28,043 cf, Depth= 3.49"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A     | rea (sf) | CN Description |             |              |  |  |  |  |
|-------|----------|----------------|-------------|--------------|--|--|--|--|
|       | 33,219   | 61 >           | 75% Grass   | s cover, Go  | ood, HSG B                                 |  |  |  |
|       | 478      | 74 >           | 75% Grass   | s cover, Go  | ood, HSG C                                 |  |  |  |
|       | 57,731   | 55 V           | Voods, Goo  | od, HSG B    |  |  |  |  |
|       | 5,030    | 70 V           | Voods, Goo  | od, HSG C    |  |  |  |  |
|       | 63       | 98 F           | Paved parki | ing, HSG B   |  |  |  |  |
|       | 96,521   | 58 V           | Veighted A  | verage       |  |  |  |  |
|       | 96,458   | g              | 9.94% Per   | vious Area   |  |  |  |  |
|       | 63       | C              | .06% Impe   | ervious Area | a  |  |  |  |
|       |          |                | •           |              |  |  |  |  |
| Tc    | Length   | Slope          | Velocity    | Capacity     | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft)        | (ft/sec)    | (cfs)        |  |  |  |  |
| 12.2  | 50       | 0.0200         | 0.07        |              | Sheet Flow, A-B                            |  |  |  |
|       |          |                |             |              | Woods: Light underbrush n= 0.400 P2= 3.28" |  |  |  |
| 1.5   | 35       | 0.0060         | 0.39        |              | Shallow Concentrated Flow, B-C             |  |  |  |
|       |          |                |             |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 13.7  | 85       | Total          |             |              |  |  |  |  |

# Summary for Subcatchment P-10: Subcat P-10

Runoff = 1.32 cfs @ 12.09 hrs, Volume= 4,856 cf, Depth= 8.27"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A            | rea (sf) | CN [    | Description             |          |                         |  |  |  |  |
|--------------|----------|---------|-------------------------|----------|-------------------------|--|--|--|--|
|              | 7,046    | 98 F    | Roofs, HSG B            |          |                         |  |  |  |  |
|              | 7,046    | 1       | 100.00% Impervious Area |          |                         |  |  |  |  |
| Tc           |          | Slope   | ,                       | Capacity | Description             |  |  |  |  |
| (min)<br>6.0 | (feet)   | (ft/ft) | (ft/sec)                | (cfs)    | Direct Entry TD 55 MIN  |  |  |  |  |
| 0.0          |          |         |                         |          | Direct Entry, TR-55 MIN |  |  |  |  |

# Summary for Subcatchment P-11: Subcat P-11

Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,476 cf, Depth= 7.67"

Routed to Link SP1: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

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| A            | rea (sf) | CN     | Description            |                               |                         |  |  |  |  |  |  |
|--------------|----------|--------|------------------------|-------------------------------|-------------------------|--|--|--|--|--|--|
|              | 35       | 98     | Paved park             | Paved parking, HSG C          |                         |  |  |  |  |  |  |
|              | 343      | 61     | >75% Gras              | >75% Grass cover, Good, HSG B |                         |  |  |  |  |  |  |
|              | 1,933    | 98     | Paved park             | Paved parking, HSG B          |                         |  |  |  |  |  |  |
|              | 2,310    | 93     | Weighted Average       |                               |                         |  |  |  |  |  |  |
|              | 343      |        | 14.84% Pervious Area   |                               |                         |  |  |  |  |  |  |
|              | 1,967    |        | 85.16% Impervious Area |                               |                         |  |  |  |  |  |  |
| Tc           | Length   | Slope  | •                      | Capacity                      | Description             |  |  |  |  |  |  |
| <u>(min)</u> | (feet)   | (ft/ft | (ft/sec)               | (cfs)                         |                         |  |  |  |  |  |  |
| 6.0          |          |        |                        |                               | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

# Summary for Subcatchment P-12: Subcat P-12

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 2,94

2,942 cf, Depth= 8.27"

Routed to Pond FB2: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A           | rea (sf)         | CN [             | CN Description          |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|-------------------------|--|--|--|--|
|             | 4,268            | 98 F             | 98 Paved parking, HSG B |                   |                         |  |  |  |  |
|             | 4,268            | 1                | 100.00% Impervious Area |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                         |                   | Direct Entry, TR-55 MIN |  |  |  |  |

### Summary for Subcatchment P-13: Subcat P-13

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 3,445 cf, Depth= 8.27"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A            | rea (sf) | CN I    | Description                   |          |                         |  |  |  |  |  |
|--------------|----------|---------|-------------------------------|----------|-------------------------|--|--|--|--|--|
|              | 4,941    | 98      | Paved parking, HSG B          |          |                         |  |  |  |  |  |
|              | 58       | 61 :    | >75% Grass cover, Good, HSG B |          |                         |  |  |  |  |  |
|              | 4,999    | 98 \    | Weighted Average              |          |                         |  |  |  |  |  |
|              | 58       |         | 1.16% Pervious Area           |          |                         |  |  |  |  |  |
|              | 4,941    | ,       | 98.84% Impervious Area        |          |                         |  |  |  |  |  |
| Tc           | Length   | Slope   | ,                             | Capacity | Description             |  |  |  |  |  |
| <u>(min)</u> | (feet)   | (ft/ft) | (ft/sec)                      | (cfs)    |                         |  |  |  |  |  |
| 6.0          |          |         |                               |          | Direct Entry, TR-55 MIN |  |  |  |  |  |

Type III 24-hr 50-year Rainfall=8.51"

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# Summary for Subcatchment P-14: Subcat P-14

Runoff 4.22 cfs @ 12.09 hrs, Volume= 13,928 cf, Depth= 6.71"

Routed to Pond FB3: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| Area (s    | sf) CN   | Description  | Description            |                         |  |  |  |  |  |
|------------|----------|--------------|------------------------|-------------------------|--|--|--|--|--|
| 8,65       | 61       | >75% Gras    | s cover, Go            | ood, HSG B              |  |  |  |  |  |
| 16,26      | 3 98     | Paved park   | ing, HSG B             |                         |  |  |  |  |  |
| 24,92      | 22 85    | Weighted A   | Weighted Average       |                         |  |  |  |  |  |
| 8,65       | 58       | 34.74% Per   | 34.74% Pervious Area   |                         |  |  |  |  |  |
| 16,26      | 33       | 65.26% lmp   | 65.26% Impervious Area |                         |  |  |  |  |  |
| <b>-</b> . |          |              |                        | B 10                    |  |  |  |  |  |
| Tc Len     |          | ,            | Capacity               | Description             |  |  |  |  |  |
| (min)      | et) (ft/ | ft) (ft/sec) | t) (ft/sec) (cfs)      |                         |  |  |  |  |  |
| 6.0        |          |              |                        | Direct Entry, TR-55 MIN |  |  |  |  |  |

# **Summary for Subcatchment P-15: Subcat P-15**

Runoff 2.23 cfs @ 12.09 hrs, Volume= 8,104 cf, Depth= 8.15"

Routed to Pond IS1: infiltration 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

|   | A     | rea (sf) | CN     | Description            |                               |                         |  |  |  |  |  |
|---|-------|----------|--------|------------------------|-------------------------------|-------------------------|--|--|--|--|--|
|   |       | 230      | 61     | >75% Gras              | >75% Grass cover, Good, HSG B |                         |  |  |  |  |  |
| _ |       | 11,703   | 98     | Paved park             | Paved parking, HSG B          |                         |  |  |  |  |  |
|   |       | 11,933   | 97     | Weighted Average       |                               |                         |  |  |  |  |  |
|   |       | 230      |        | 1.93% Pervious Area    |                               |                         |  |  |  |  |  |
|   |       | 11,703   |        | 98.07% Impervious Area |                               |                         |  |  |  |  |  |
|   |       |          |        |                        |                               |                         |  |  |  |  |  |
|   | Tc    | Length   | Slope  | ,                      | Capacity                      | Description             |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | (ft/sec)               | (cfs)                         |                         |  |  |  |  |  |
|   | 6.0   |          |        |                        |                               | Direct Entry, TR-55 MIN |  |  |  |  |  |

Direct Entry, TR-55 MIN

# **Summary for Subcatchment P-16: Subcat P-16**

0.59 cfs @ 12.09 hrs. Volume= 1,915 cf, Depth= 6.22" Runoff

Routed to Pond FB4: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

Type III 24-hr 50-year Rainfall=8.51"

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|   | Α     | rea (sf) | CN     | Description                   |          |                  |            |  |  |  |  |
|---|-------|----------|--------|-------------------------------|----------|------------------|------------|--|--|--|--|
| • |       | 1,960    | 98     | Paved parking, HSG B          |          |                  |            |  |  |  |  |
|   |       | 1,731    | 61     | >75% Grass cover, Good, HSG B |          |                  |            |  |  |  |  |
|   |       | 3,691    |        | Weighted Average              |          |                  |            |  |  |  |  |
|   |       | 1,731    |        | 46.90% Pervious Area          |          |                  |            |  |  |  |  |
|   |       | 1,960    |        | 53.10% Impervious Area        |          |                  |            |  |  |  |  |
|   | Тс    | Length   | Slope  | ,                             | Capacity | Description      |            |  |  |  |  |
|   | (min) | (feet)   | (ft/ft | ) (ft/sec)                    | (cfs)    |                  |            |  |  |  |  |
|   | 0.0   |          |        |                               |          | Discost Fraterio | TD CC MINI |  |  |  |  |

6.0

**Direct Entry, TR-55 MIN** 

### **Summary for Subcatchment P-2: Subcat P-2**

Runoff = 0.94 cfs @ 12.10 hrs, Volume=

2,981 cf, Depth= 3.84"

Routed to Link SP2 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A           | rea (sf)         | CN E             | Description                   |                   |                         |  |  |  |  |
|-------------|------------------|------------------|-------------------------------|-------------------|-------------------------|--|--|--|--|
|             | 9,321            | 61 >             | >75% Grass cover, Good, HSG B |                   |                         |  |  |  |  |
|             | 9,321            | 1                | 100.00% Pervious Area         |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)          | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                  |                               |                   | Direct Entry, TR-55 min |  |  |  |  |

# **Summary for Subcatchment P-3: Subcat P-3**

Runoff = 1.37 cfs @ 12.09 hrs, Volume=

4,339 cf, Depth= 5.14"

Routed to Link SP3: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| _ | Area (s   | sf) CN | Description                       |
|---|-----------|--------|-----------------------------------|
|   | 7,19      | 99 61  | >75% Grass cover, Good, HSG B     |
| _ | 2,92      | 22 98  | Paved parking, HSG B              |
|   | 10,12     | 21 72  | Weighted Average                  |
|   | 7,19      | 99     | 71.13% Pervious Area              |
|   | 2,92      | 22     | 28.87% Impervious Area            |
|   |           |        |                                   |
|   | Tc Len    | _      | ope Velocity Capacity Description |
| _ | (min) (fe | et) (f | ft/ft) (ft/sec) (cfs)             |
|   | 0.0       |        |                                   |

6.0

Direct Entry, TR-55 MIN

Type III 24-hr 50-year Rainfall=8.51"

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#### **Summary for Subcatchment P-4: Subcat E-4**

Runoff = 0.48 cfs @ 12.14 hrs, Volume= 1,731 cf, Depth= 3.84"

Routed to Link SP4: Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| _ | Α                                      | rea (sf)         | CN E             | Description           |                   |  |  |  |  |  |  |  |
|---|--|------------------|------------------|-----------------------|-------------------|--|--|--|--|--|--|--|
|   | 5,412 61 >75% Grass cover, Good, HSG B |                  |                  |                       |                   |  |  |  |  |  |  |  |
|   |  | 5,412            | 1                | 100.00% Pervious Area |                   |  |  |  |  |  |  |  |
|   | Tc<br>(min)                            | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)  | Capacity<br>(cfs) | Description  |  |  |  |  |  |  |
| - | 8.1                                    | 50               | 0.0200           | 0.10                  | ,                 | Sheet Flow, A-B  |  |  |  |  |  |  |
| _ | 1.5                                    | 112              | 0.0310           | 1.23                  |                   | Grass: Dense n= 0.240 P2= 3.28"  Shallow Concentrated Flow, B-C  Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |  |
|   | 9.6                                    | 162              | Total            |                       |                   |  |  |  |  |  |  |  |

#### **Summary for Subcatchment P-5: Subcat P-5**

Runoff = 3.98 cfs @ 12.09 hrs, Volume= 14,471 cf, Depth= 8.15"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A     | rea (sf) | CN                      | Description      | scription              |                         |  |  |  |  |  |  |
|-------|----------|-------------------------|------------------|------------------------|-------------------------|--|--|--|--|--|--|
|       | 574      | 61                      | >75% Gras        | s cover, Go            | ood, HSG B              |  |  |  |  |  |  |
|       | 20,733   | 98                      | Paved park       | ved parking, HSG B     |                         |  |  |  |  |  |  |
|       | 21,307   | 97                      | Weighted Average |                        |                         |  |  |  |  |  |  |
|       | 574      | 574 2.69% Pervious Area |                  |                        |                         |  |  |  |  |  |  |
|       | 20,733   |                         | 97.31% Imp       | 97.31% Impervious Area |                         |  |  |  |  |  |  |
| _     |          |                         |                  |                        |                         |  |  |  |  |  |  |
| Тс    | Length   | Slope                   | ,                | Capacity               | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft                  | ) (ft/sec)       | (cfs)                  |                         |  |  |  |  |  |  |
| 6.0   |          |                         |                  |                        | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

\_ ....**,**, ......

#### Summary for Subcatchment P-6: Subcat P-6

Runoff = 0.44 cfs @ 12.09 hrs, Volume= 1,552 cf, Depth= 7.79"

Routed to Link SP1 : Study Point

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

Type III 24-hr 50-year Rainfall=8.51"

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| _ | Α     | rea (sf) | CN     | Description |                        |              |           |  |  |  |  |  |  |
|---|-------|----------|--------|-------------|------------------------|--------------|-----------|--|--|--|--|--|--|
|   |       | 276      | 61     | >75% Grass  | s cover, Go            | od, HSG B    |           |  |  |  |  |  |  |
|   |       | 2,115    | 98     | Paved park  | ved parking, HSG B     |              |           |  |  |  |  |  |  |
|   |       | 2,391    | 94     | Weighted A  | eighted Average        |              |           |  |  |  |  |  |  |
|   |       | 276      |        | 11.55% Per  | 11.55% Pervious Area   |              |           |  |  |  |  |  |  |
|   |       | 2,115    |        | 88.45% Imp  | 88.45% Impervious Area |              |           |  |  |  |  |  |  |
|   |       |          |        |             |                        |              |           |  |  |  |  |  |  |
|   | Tc    | Length   | Slope  | ,           | Capacity               | Description  |           |  |  |  |  |  |  |
| _ | (min) | (feet)   | (ft/ft | ) (ft/sec)  | (cfs)                  |              |           |  |  |  |  |  |  |
|   | 6.0   |          |        |             |                        | Direct Entry | TD EE MIN |  |  |  |  |  |  |

6.0 **Direct Entry, TR-55 MIN** 

#### **Summary for Subcatchment P-7: Subcat P-7**

Runoff = 1.38 cfs @ 12.09 hrs, Volume= 4,442 cf, Depth= 6.10"

Routed to Pond FB1: sediment forebay

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| A     | rea (sf) | CN      | Description            | •           |                         |  |  |  |  |  |  |
|-------|----------|---------|------------------------|-------------|-------------------------|--|--|--|--|--|--|
|       | 4,544    | 98      | Paved park             | ing, HSG B  | }                       |  |  |  |  |  |  |
|       | 4,188    | 61      | >75% Ġras              | s cover, Go | ood, HSG B              |  |  |  |  |  |  |
|       | 8,731    | 80      | Weighted A             | verage      |                         |  |  |  |  |  |  |
|       | 4,188    |         | 47.96% Pervious Area   |             |                         |  |  |  |  |  |  |
|       | 4,544    | ;       | 52.04% Impervious Area |             |                         |  |  |  |  |  |  |
| _     |          |         |                        |             |                         |  |  |  |  |  |  |
| Tc    | Length   | Slope   | ,                      | Capacity    | Description             |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | t/ft) (ft/sec) (cfs)   |             |                         |  |  |  |  |  |  |
| 6.0   |          |         |                        |             | Direct Entry, TR-55 MIN |  |  |  |  |  |  |

#### **Summary for Subcatchment P-8: Subcat P-8**

Runoff = 2.04 cfs @ 12.09 hrs, Volume= 7,495 cf, Depth= 8.27"

Routed to Pond IS2: infiltration 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

| Ar          | ea (sf)          | CN I             | Description          |                   |                         |
|-------------|------------------|------------------|----------------------|-------------------|-------------------------|
|             | 10,876           | 98 I             | Roofs, HSG           | ВВ                |                         |
| -           | 10,876           |                  | 100.00% In           | npervious A       | rea                     |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description             |
| 6.0         |                  |                  |                      |                   | Direct Entry, TR-55 MIN |

Type III 24-hr 50-year Rainfall=8.51"

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#### Summary for Subcatchment P-9: Subcat P-9

Runoff 0.12 cfs @ 12.09 hrs, Volume= 453 cf. Depth= 8.27"

Routed to Pond IS3: infiltration 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Type III 24-hr 50-year Rainfall=8.51"

|             | rea (sf)         | CN [                      | Description          |                   |                         |  |  |  |  |
|-------------|------------------|---------------------------|----------------------|-------------------|-------------------------|--|--|--|--|
|             | 657              | 98 F                      | Roofs, HSG B         |                   |                         |  |  |  |  |
|             | 657              | 7 100.00% Impervious Area |                      |                   |                         |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft)          | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description             |  |  |  |  |
| 6.0         |                  |                           |                      |                   | Direct Entry, TR-55 MIN |  |  |  |  |

#### Summary for Reach 1R: continuity reach

[40] Hint: Not Described (Outflow=Inflow)

5,656 sf, 98.97% Impervious, Inflow Depth = 0.00" for 50-year event Inflow Area =

Inflow 0.00 cfs @ 0.00 hrs, Volume=

0.00 hrs, Volume= Outflow 0.00 cfs @ 0 cf, Atten= 0%, Lag= 0.0 min

Routed to Link SP3: Study Point

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### Summary for Pond B1: bioretention system 1

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

#### [81] Warning: Exceeded Pond FB1 by 1.18' @ 13.85 hrs

Inflow Area = 8,731 sf, 52.04% Impervious, Inflow Depth = 5.98" for 50-year event

Inflow 1.37 cfs @ 12.10 hrs, Volume= 4.350 cf

0.10 cfs @ 13.53 hrs, Volume= 4,251 cf, Atten= 93%, Lag= 85.6 min Outflow

Discarded = 0.05 cfs @ 13.53 hrs, Volume= 3.984 cf 0.05 cfs @ 13.53 hrs, Volume= 267 cf Primary

Routed to Link SP3: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs. dt= 0.05 hrs Peak Elev= 60.73' @ 13.53 hrs Surf.Area= 571 sf Storage= 2,484 cf Flood Elev= 61.00' Surf.Area= 571 sf Storage= 3,054 cf

Plug-Flow detention time= 488.5 min calculated for 4,245 cf (98% of inflow)

Center-of-Mass det. time= 475.4 min (1,285.0 - 809.6)

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| Volume   | Inve         | ert Avai             | I.Storage            | Storage Descripti   | on                     |                                     |          |  |
|----------|--------------|----------------------|----------------------|---|------------------------|-------------------------------------|----------|--|
| #1<br>#2 | 58.5<br>56.5 |                      | 2,712 cf<br>343 cf   |   | rregular)Listed be     | pelow (Recalc) -Im<br>elow (Recalc) | pervious |  |
|          |              |                      | 3,054 cf             | Total Available St  | orage                  |                                     |          |  |
| Elevatio |              | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)   | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft)                 |          |  |
| 58.5     | 50           | 365                  | 133.0                | 0   | 0                      | 365                                 |          |  |
| 59.0     | 00           | 571                  | 142.0                | 232   | 232                    | 574                                 |          |  |
| 60.0     | 00           | 1,101                | 180.0                | 822   | 1,054                  | 1,561                               |          |  |
| 61.0     | 00           | 2,286                | 255.0                | 1,658   | 2,712                  | 4,166                               |          |  |
| Elevatio |              | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)   | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft)                 |          |  |
| 56.5     | 50           | 571                  | 142.0                | 0   | 0                      | 571                                 |          |  |
| 58.5     | 50           | 571                  | 142.0                | 1,142   | 1,142                  | 855                                 |          |  |
| Device   | Routing      | ln                   | vert Outle           | et Devices  |                        |                                     |          |  |
| #1       | ·            |                      | Head<br>2.50<br>Coet | 4.0' 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 |                        |                                     |          |  |
| #2       | Discarde     | d 56                 | .50' <b>0.72</b>     | <b>0 in/hr Exfiltration</b> ductivity to Ground   | n over Wetted are      | a                                   | ı= 0.01' |  |

**Discarded OutFlow** Max=0.05 cfs @ 13.53 hrs HW=60.73' (Free Discharge) **2=Exfiltration** (Controls 0.05 cfs)

Primary OutFlow Max=0.05 cfs @ 13.53 hrs HW=60.73' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.05 cfs @ 0.40 fps)

#### **Summary for Pond B2: bioretention system 2**

#### GW from TP4

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[79] Warning: Submerged Pond FB2 Primary device # 1 by 0.13'

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 8.13" for 50-year event Inflow = 0.80 cfs @ 12.09 hrs, Volume= 2,891 cf

Outflow = 0.69 cfs @ 12.15 hrs, Volume= 2,891 cf, Atten= 14%, Lag= 3.1 min Discarded = 0.02 cfs @ 12.15 hrs, Volume= 1,318 cf

Primary = 0.67 cfs @ 12.15 hrs, Volume= 1,573 cf

Routed to Link SP3 : Study Point

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Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.88' @ 12.15 hrs Surf.Area= 258 sf Storage= 655 cf Flood Elev= 61.00' Surf.Area= 258 sf Storage= 743 cf

Plug-Flow detention time= 152.7 min calculated for 2,891 cf (100% of inflow)

Center-of-Mass det. time= 152.6 min (904.5 - 751.9)

| Volume                                    | Invert           | Avail.Sto            | orage            | Storage Description   | n  |                     |  |  |  |  |
|---|------------------|----------------------|------------------|---|--|---------------------|--|--|--|--|
| #1<br>#2                                  | 59.50'<br>57.50' |                      | 88 cf<br>55 cf   | media storage (Iri  | surface storage (Irregular)Listed below (Recalc) -Impervious media storage (Irregular)Listed below (Recalc) 516 cf Overall x 30.0% Voids |                     |  |  |  |  |
|   |                  | 7                    | 43 cf            | Total Available Sto   | rage   |                     |  |  |  |  |
| Elevatio                                  |                  | rf.Area F<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft) |  |  |  |  |
| 59.5<br>60.0                              | 50               | 98                   | 88.0<br>114.0    | 0<br>86   | 0<br>86  | 98<br>519           |  |  |  |  |
| 61.0                                      |                  |                      | 185.0            | 502   | 588  | 2,215               |  |  |  |  |
| Elevation (fee                            |                  | rf.Area F<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)   | Cum.Store (cubic-feet)   | Wet.Area<br>(sq-ft) |  |  |  |  |
| 57.5<br>59.5                              |                  | 258                  | 114.0<br>114.0   | 0<br>516  | 0<br>516   | 258<br>486          |  |  |  |  |
| Device                                    | Routing          | Invert               | Outle            | et Devices  |  |                     |  |  |  |  |
| #1  | Discarded        | 57.50'               | -                | <b>0 in/hr Exfiltration</b> ductivity to Groundw  |  |                     |  |  |  |  |
| #2  | Device 3         | 60.50'               | 15.0             | " Vert. overflow ori  | ifice C= 0.600   | 70.20               |  |  |  |  |
| #3 Primary 58.00' <b>8.0''</b><br>Inlet / |                  |                      |                  | ted to weir flow at low heads  Round Culvert L= 98.0' Ke= 0.500  / Outlet Invert= 58.00' / 57.50' S= 0.0051 '/' Cc= 0.900  0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf |  |                     |  |  |  |  |

**Discarded OutFlow** Max=0.02 cfs @ 12.15 hrs HW=60.88' (Free Discharge) 1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=0.67 cfs @ 12.15 hrs HW=60.88' (Free Discharge) **-3=Culvert** (Passes 0.67 cfs of 1.77 cfs potential flow) 2=overflow orifice (Orifice Controls 0.67 cfs @ 2.10 fps)

#### Summary for Pond B3: bioretention system 3

GW from TP1

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

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Inflow Area = 24,922 sf, 65.26% Impervious, Inflow Depth = 6.61" for 50-year event

Inflow = 4.22 cfs @ 12.09 hrs, Volume= 13,730 cf

Outflow = 1.03 cfs @ 12.50 hrs, Volume= 12,818 cf, Atten= 76%, Lag= 24.8 min

Discarded = 0.11 cfs @ 12.50 hrs, Volume= 9,415 cf Primary = 0.92 cfs @ 12.50 hrs, Volume= 3,403 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.97' @ 12.50 hrs Surf.Area= 1,639 sf Storage= 6,723 cf

Flood Elev= 61.00' Surf.Area= 1,639 sf Storage= 6,870 cf

Plug-Flow detention time= 424.2 min calculated for 12,800 cf (93% of inflow)

Center-of-Mass det. time= 389.5 min (1,186.6 - 797.1)

| Volume   | Invert           | Avail.S             | Storage                 | Storage Description  | า                                     |                                       |
|----------|------------------|---------------------|-------------------------|--|---------------------------------------|---------------------------------------|
| #1<br>#2 | 59.00'<br>57.00' |                     | 5,886 cf<br>983 cf      | surface storage (Immedia storage (Irr<br>3,278 cf Overall x          | egular)Listed belov                   | ow (Recalc) -Impervious<br>w (Recalc) |
|          |                  | 6                   | 6,870 cf                | Total Available Sto  | rage                                  |                                       |
| Elevatio |                  | urf.Area<br>(sq-ft) | Perim.<br>(feet)        | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)             | Wet.Area<br>(sq-ft)                   |
| 59.0     | 00               | 1,639               | 184.0                   | 0  | 0                                     | 1,639                                 |
| 60.0     | 00               | 2,580               | 217.0                   | 2,092  | 2,092                                 | 2,711                                 |
| 61.0     | 00               | 5,156               | 323.0                   | 3,794  | 5,886                                 | 7,274                                 |
| Elevatio |                  | urf.Area<br>(sq-ft) | Perim.<br>(feet)        | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)             | Wet.Area<br>(sq-ft)                   |
| 57.0     | 00               | 1,639               | 184.0                   | 0  | 0                                     | 1,639                                 |
| 59.0     | 00               | 1,639               | 184.0                   | 3,278  | 3,278                                 | 2,007                                 |
| Device   | Routing          | Inve                | ert Outle               | et Devices   |                                       |                                       |
| #1       | Device 2         | 60.8                |                         | " Horiz. Orifice/Gra   |                                       |                                       |
| #2       | Primary          | 58.4                | 0' <b>8.0"</b><br>Inlet | red to weir flow at low<br>Round Culvert L=<br>/ Outlet Invert= 58.4 | 77.0' Ke= 0.500<br>0' / 57.00' S= 0.0 |                                       |
| #3       | Discarded        | 57.0                | 0' <b>0.72</b>          | .013 Corrugated PE  O in/hr Exfiltration of  ductivity to Groundw    | over Wetted area                      |                                       |

**Discarded OutFlow** Max=0.11 cfs @ 12.50 hrs HW=60.97' (Free Discharge) **3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=0.91 cfs @ 12.50 hrs HW=60.97' (Free Discharge)

-2=Culvert (Passes 0.91 cfs of 2.14 cfs potential flow)
-1=Orifice/Grate (Weir Controls 0.91 cfs @ 1.35 fps)

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#### Summary for Pond B4: bioretention system 4

GW assumed based on surrounding data. confirmatory TP to be performed.

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

[81] Warning: Exceeded Pond FB4 by 0.92' @ 14.95 hrs

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 6.08" for 50-year event

Inflow = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf

Outflow = 0.03 cfs @ 14.81 hrs, Volume= 1,871 cf, Atten= 95%, Lag= 162.5 min

Discarded = 0.03 cfs @ 14.81 hrs, Volume= 1,871 cf Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routed to Link SP1 : Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.74' @ 14.81 hrs Surf.Area= 516 sf Storage= 1,082 cf Flood Elev= 61.00' Surf.Area= 516 sf Storage= 1,358 cf

Plug-Flow detention time= 429.4 min calculated for 1,868 cf (100% of inflow)

Center-of-Mass det. time= 429.6 min ( 1,237.8 - 808.2 )

| Volume   | Inve              | <u>ert Avai</u>      | I.Storage            | Storage Description  | on  |                                     |       |  |
|----------|-------------------|----------------------|----------------------|--|---|-------------------------------------|-------|--|
| #1<br>#2 | 59.5<br>57.5      |                      | 1,049 cf<br>310 cf   |  | regular)Listed belo   | elow (Recalc) -Imper<br>ow (Recalc) | vious |  |
|          |                   |                      | 1,358 cf             | Total Available St   | orage   |                                     |       |  |
| Elevatio |                   | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)                 |       |  |
| 59.5     | 50                | 391                  | 79.0                 | 0  | 0   | 391                                 |       |  |
| 60.0     | 00                | 516                  | 88.0                 | 226  | 226   | 518                                 |       |  |
| 61.0     | 00                | 1,174                | 135.0                | 823  | 1,049   | 1,359                               |       |  |
| Elevatio |                   | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)                 |       |  |
| 57.5     | 50                | 516                  | 88.0                 | 0  | 0   | 516                                 |       |  |
| 59.5     | 50                | 516                  | 88.0                 | 1,032  | 1,032   | 692                                 |       |  |
| Device   | Routing           | Inv                  | vert Outle           | et Devices   |   |                                     |       |  |
| #1       | #1 Primary 60.75' |                      | Head<br>2.50<br>Coef | 5.0' long x 4.0' breadth Broad-Crested Rectangular Weir<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50 4.00 4.50 5.00 5.50<br>Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 |   |                                     |       |  |
| #2       | Discarde          | ed 57                | .50' <b>0.72</b>     | 0 in/hr Exfiltration   | 2.79  2.88  3.07  3.3<br>n <b>over Wetted area</b><br>water Elevation = 5 |                                     | .10'  |  |

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Discarded OutFlow Max=0.03 cfs @ 14.81 hrs HW=60.74' (Free Discharge) **T\_2=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=57.50' (Free Discharge) 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

#### Summary for Pond FB1: sediment forebay

8,731 sf, 52.04% Impervious, Inflow Depth = 6.10" for 50-year event Inflow Area =

Inflow 1.38 cfs @ 12.09 hrs, Volume= 4,442 cf

1.37 cfs @ 12.10 hrs, Volume= Outflow 4,350 cf, Atten= 0%, Lag= 0.7 min

Primary = 1.37 cfs @ 12.10 hrs, Volume= 4,350 cf

Routed to Pond B1: bioretention system 1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Peak Elev= 59.82' @ 12.10 hrs Surf.Area= 281 sf Storage= 171 cf

Flood Elev= 61.00' Surf.Area= 489 sf Storage= 627 cf

Plug-Flow detention time= 21.5 min calculated for 4,350 cf (98% of inflow)

Center-of-Mass det. time= 9.0 min ( 809.6 - 800.6 )

| Volume               | Inv     | ert Avail.           | Storage              | Storage Description             | on                        |   |         |
|----------------------|---------|----------------------|----------------------|---------------------------------|---------------------------|---|---------|
| #1                   | 59.     | 00'                  | 627 cf               | surface storage (               | Irregular)Listed b        | elow (Recalc)   |         |
| Elevatio             |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet)       | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft)   |         |
| 59.0<br>60.0<br>61.0 | 00      | 146<br>318<br>489    | 45.0<br>66.0<br>84.0 | 0<br>226<br>400                 | 0<br>226<br>627           | 146<br>340<br>567   |         |
| Device               | Routing | Inve                 | ert Outle            | et Devices                      |                           |   |         |
| #1                   | Primary | 59.5                 | Head<br>2.50<br>Coef | I (feet) 0.20 0.40<br>3.00 3.50 | 0.60 0.80 1.00            | <b>Rectangular Weir</b> 1.20 1.40 1.60 1.866 2.70 2.77 2.89 | 30 2.00 |

Primary OutFlow Max=1.36 cfs @ 12.10 hrs HW=59.81' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 1.36 cfs @ 1.45 fps)

#### **Summary for Pond FB2: sediment forebay**

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 4,268 sf,100.00% Impervious, Inflow Depth = 8.27" for 50-year event

Inflow 0.80 cfs @ 12.09 hrs, Volume= 2.942 cf

0.80 cfs @ 12.09 hrs, Volume= 2,891 cf, Atten= 0%, Lag= 0.5 min Outflow

0.80 cfs @ 12.09 hrs, Volume= Primary 2,891 cf

Routed to Pond B2: bioretention system 2

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Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.97' @ 12.09 hrs Surf.Area= 126 sf Storage= 75 cf Flood Elev= 61.00' Surf.Area= 130 sf Storage= 78 cf

Plug-Flow detention time= 22.7 min calculated for 2,891 cf (98% of inflow)

Center-of-Mass det. time= 11.5 min (751.9 - 740.5)

| Volume   | Inv     | ert Avail.           | Storage          | Storage Description    | า                      |                     |         |
|----------|---------|----------------------|------------------|------------------------|------------------------|---------------------|---------|
| #1       | 59.     | 50'                  | 78 cf            | surface storage (I     | rregular)Listed be     | low (Recalc)        |         |
| Elevatio |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |         |
| 59.5     | 50      | 1                    | 1.0              | 0                      | 0                      | 1                   |         |
| 60.0     | 00      | 28                   | 23.0             | 6                      | 6                      | 43                  |         |
| 61.0     | 00      | 130                  | 44.0             | 73                     | 78                     | 160                 |         |
| Device   | Routing | Inve                 | ert Outle        | et Devices             |                        |                     |         |
| #1       | Primary | 60.7                 |                  | ong x 2.0' breadth     |                        |                     |         |
|          |         |                      | Head             | d (feet) 0.20 0.40 (   | ).60 0.80 1.00 1.      | 20 1.40 1.60 1.8    | 30 2.00 |
|          |         |                      | 2.50             | 3.00 3.50              |                        |                     |         |
|          |         |                      | Coef             | . (English) 2.54 2.6   | 31 2.61 2.60 2.66      | 3 2.70 2.77 2.89    | 2.88    |
|          |         |                      | 2.85             | 3.07 3.20 3.32         |                        |                     |         |

Primary OutFlow Max=0.79 cfs @ 12.09 hrs HW=60.97' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.79 cfs @ 1.19 fps)

#### **Summary for Pond FB3: sediment forebay**

[93] Warning: Storage range exceeded by 0.16'

24,922 sf, 65.26% Impervious, Inflow Depth = 6.71" for 50-year event Inflow Area =

Inflow =

4.22 cfs @ 12.09 hrs, Volume= 13,928 cf 4.22 cfs @ 12.09 hrs, Volume= 13,730 cf, 13,730 cf, Atten= 0%, Lag= 0.0 min Outflow

Primary = 4.22 cfs @ 12.09 hrs, Volume= 13.730 cf

Routed to Pond B3: bioretention system 3

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.16' @ 12.09 hrs Surf.Area= 586 sf Storage= 457 cf Flood Elev= 61.00' Surf.Area= 586 sf Storage= 457 cf

Plug-Flow detention time= 17.4 min calculated for 13,711 cf (98% of inflow)

Center-of-Mass det. time= 8.7 min (797.1 - 788.4)

| Volume    | Invert | Avail.Storage | e Storage Descript | tion              |                |  |
|-----------|--------|---------------|--------------------|-------------------|----------------|--|
| #1        | 59.00' | 457 d         | f surface storage  | (Irregular)Listed | below (Recalc) |  |
| Elevation | Surf.A | Area Perir    | n. Inc.Store       | Cum.Store         | Wet.Area       |  |
| (feet)    | (se    | q-ft) (fee    | t) (cubic-feet)    | (cubic-feet)      | (sq-ft)        |  |
| 59.00     |        | 340 70        | 0 0                | 0                 | 340            |  |
| 60 00     |        | 586 91        | 0 457              | 457               | 621            |  |

Type III 24-hr 50-year Rainfall=8.51"

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| Device | Routing | Invert | Outlet Devices  |
|--------|---------|--------|---|
| #1     | Primary | 59.50' | 3.0' long x 2.0' 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  |
|        |         |        | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88  |
|        |         |        | 2.85 3.07 3.20 3.32   |

Primary OutFlow Max=4.12 cfs @ 12.09 hrs HW=60.15' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 4.12 cfs @ 2.11 fps)

#### **Summary for Pond FB4: sediment forebay**

Inflow Area = 3,691 sf, 53.10% Impervious, Inflow Depth = 6.22" for 50-year event

Inflow = 0.59 cfs @ 12.09 hrs, Volume= 1,915 cf

Outflow = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf, Atten= 0%, Lag= 0.7 min

Primary = 0.59 cfs @ 12.10 hrs, Volume= 1,871 cf

Routed to Pond B4: bioretention system 4

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 59.98' @ 12.10 hrs Surf.Area= 202 sf Storage= 78 cf Flood Elev= 60.00' Surf.Area= 205 sf Storage= 81 cf

Plug-Flow detention time= 23.5 min calculated for 1,868 cf (98% of inflow)

Center-of-Mass det. time= 9.9 min ( 808.2 - 798.3 )

Volume Invert Avail Storage Storage Description

| volume         | III     | vert Avall.          | Storage              | Storage Description       | 1                      |                     |  |  |
|----------------|---------|----------------------|----------------------|---------------------------|------------------------|---------------------|--|--|
| #1             | 59      | .50'                 | 81 cf                | surface storage (li       | rregular)Listed belo   | ow (Recalc)         |  |  |
| Elevation (fee |         | Surf.Area<br>(sq-ft) | Perim.<br>(feet)     | Inc.Store<br>(cubic-feet) | Cum.Store (cubic-feet) | Wet.Area<br>(sq-ft) |  |  |
| 59.6<br>60.0   |         | 124<br>205           | 42.0<br>56.0         | 0<br>81                   | 0<br>81                | 124<br>236          |  |  |
| Device         | Routing | g Inv                | ert Outle            | et Devices                |                        |                     |  |  |
| #1             | Primary | 59.8                 | Head<br>2.50<br>Coef | -                         |                        |                     |  |  |

Primary OutFlow Max=0.59 cfs @ 12.10 hrs HW=59.98' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.59 cfs @ 1.08 fps)

#### **Summary for Pond IS1: infiltration 1**

#### GW elevation from TP8

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Type III 24-hr 50-year Rainfall=8.51"

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| Inflow Area = | 18,979 sf, 98.79% Impervious, | Inflow Depth = 8.19" | for 50-year event |
|---------------|-------------------------------|----------------------|-------------------|
| Inflow =      | 3.55 cfs @ 12.09 hrs, Volume= | 12,960 cf            |                   |

Outflow = 1.84 cfs @ 12.23 hrs, Volume= 12,960 cf, Atten= 48%, Lag= 8.4 min

Discarded = 0.08 cfs @ 12.23 hrs, Volume= 5,893 cf Primary = 1.76 cfs @ 12.23 hrs, Volume= 7,067 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.93' @ 12.23 hrs Surf.Area= 3,088 sf Storage= 3,942 cf Flood Elev= 60.93' Surf.Area= 3,088 sf Storage= 3,939 cf

Plug-Flow detention time= 139.9 min calculated for 12,942 cf (100% of inflow)

Center-of-Mass det. time= 140.2 min (884.2 - 744.0)

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 58.60' | 2,174 cf      | 41.50'W x 74.40'L x 2.33'H Field A                                   |
|        |        |               | 7,204 cf Overall - 1,769 cf Embedded = 5,435 cf $\times$ 40.0% Voids |
| #2A    | 59.10' | 1,769 cf      | ADS_StormTech SC-310 +Cap x 120 Inside #1                            |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf        |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap            |
|        |        |               | 120 Chambers in 12 Rows  |
|        |        | 3.943 cf      | Total Available Storage  |

#### Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 58.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 54.60' Phase-In= 0.01' |
| #2     | Primary   | 59.50' | <b>8.0" Round Culvert</b> L= 32.0' Ke= 0.500                   |
|        | •         |        | Inlet / Outlet Invert= 59.50' / 57.25' S= 0.0703 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf    |

Discarded OutFlow Max=0.08 cfs @ 12.23 hrs HW=60.93' (Free Discharge) 1=Exfiltration (Controls 0.08 cfs)

Primary OutFlow Max=1.76 cfs @ 12.23 hrs HW=60.93' (Free Discharge) 2=Culvert (Inlet Controls 1.76 cfs @ 5.03 fps)

#### **Summary for Pond IS2: infiltration 2**

#### GW from TP5

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Type III 24-hr 50-year Rainfall=8.51"

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Inflow Area = 32,183 sf, 98.22% Impervious, Inflow Depth = 8.19" for 50-year event

Inflow = 6.02 cfs @ 12.09 hrs, Volume= 21,966 cf

Outflow = 3.10 cfs @ 12.23 hrs, Volume= 21,966 cf, Atten= 49%, Lag= 8.6 min

Discarded = 0.16 cfs @ 12.23 hrs, Volume= 12,650 cf Primary = 2.94 cfs @ 12.23 hrs, Volume= 9,315 cf

Routed to Link SP1: Study Point

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 60.02' @ 12.23 hrs Surf.Area= 6,032 sf Storage= 7,729 cf

Flood Elev= 60.03' Surf.Area= 6,032 sf Storage= 7,744 cf

Plug-Flow detention time= 216.5 min calculated for 21,935 cf (100% of inflow)

Center-of-Mass det. time= 216.9 min (961.1 - 744.2)

| Volume | Invert | Avail.Storage | Storage Description   |
|--------|--------|---------------|---|
| #1A    | 57.70' | 4,214 cf      | 51.50'W x 117.12'L x 2.33'H Field A                             |
|        |        | ·             | 14,074 cf Overall - 3,538 cf Embedded = 10,536 cf x 40.0% Voids |
| #2A    | 58.20' | 3,538 cf      | ADS_StormTech SC-310 +Cap x 240 Inside #1                       |
|        |        |               | Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf   |
|        |        |               | Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap       |
|        |        |               | 240 Chambers in 15 Rows   |
|        |        | 7.750 of      | Total Available Ctarage   |

7,752 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #1     | Discarded | 57.70' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 53.70' Phase-In= 0.01' |
| #2     | Primary   | 58.92' | <b>12.0" Round Culvert</b> L= 20.0' Ke= 0.500                  |
|        |           |        | Inlet / Outlet Invert= 58.92' / 58.00' S= 0.0460 '/' Cc= 0.900 |
|        |           |        | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf    |

Discarded OutFlow Max=0.16 cfs @ 12.23 hrs HW=60.02' (Free Discharge) 1=Exfiltration (Controls 0.16 cfs)

Primary OutFlow Max=2.93 cfs @ 12.23 hrs HW=60.02' (Free Discharge) 2=Culvert (Inlet Controls 2.93 cfs @ 3.73 fps)

#### **Summary for Pond IS3: infiltration 3**

#### GW from TP2

NRCS Soil Report shows the site to be Urban Land soil type. No Ksat is provided. Assumed Ksat for adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes. 10.1993 micrometers per second = 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

Type III 24-hr 50-year Rainfall=8.51"

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Inflow Area = 5,656 sf, 98.97% Impervious, Inflow Depth = 8.27" for 50-year event

Inflow = 1.06 cfs @ 12.09 hrs, Volume= 3,898 cf

Outflow = 0.05 cfs @ 14.57 hrs, Volume= 3,898 cf, Atten= 95%, Lag= 149.1 min

Discarded = 0.05 cfs @ 14.57 hrs, Volume = 3,898 cfPrimary = 0.00 cfs @ 0.00 hrs, Volume = 0 cf

Routed to Reach 1R: continuity reach

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs Peak Elev= 61.49' @ 14.57 hrs Surf.Area= 1,972 sf Storage= 1,974 cf

Flood Elev= 61.60' Surf.Area= 1,972 sf Storage= 2,057 cf

Plug-Flow detention time= 382.6 min calculated for 3,893 cf (100% of inflow)

Center-of-Mass det. time= 382.7 min (1,123.2 - 740.5)

| Volume | Invert | Avail.Storage | Storage Description  |
|--------|--------|---------------|--|
| #1A    | 59.60' | 1,257 cf      | 20.75'W x 95.03'L x 2.00'H Field A                           |
|        |        |               | 3,944 cf Overall - 800 cf Embedded = 3,144 cf x 40.0% Voids  |
| #2A    | 60.10' | 800 cf        | ADS_StormTech SC-160LP +Cap x 117 Inside #1                  |
|        |        |               | Effective Size= 18.0"W x 12.0"H => 0.96 sf x 7.12'L = 6.8 cf |
|        |        |               | Overall Size= 25.0"W x 12.0"H x 7.56'L with 0.44' Overlap    |
|        |        |               | 117 Chambers in 9 Rows                                       |
|        |        |               |  |

2,057 cf Total Available Storage

Storage Group A created with Chamber Wizard

| Device | Routing   | Invert | Outlet Devices   |
|--------|-----------|--------|--|
| #0     | Primary   | 61.60' | Automatic Storage Overflow (Discharged without head)           |
| #1     | Discarded | 59.60' | 0.720 in/hr Exfiltration over Surface area                     |
|        |           |        | Conductivity to Groundwater Elevation = 55.60' Phase-In= 0.01' |

**Discarded OutFlow** Max=0.05 cfs @ 14.57 hrs HW=61.49' (Free Discharge) **1=Exfiltration** (Controls 0.05 cfs)

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=59.60' (Free Discharge)

#### **Summary for Link SP1: Study Point**

Inflow Area = 180,997 sf, 40.18% Impervious, Inflow Depth = 3.37" for 50-year event

Inflow = 12.08 cfs @ 12.20 hrs, Volume= 50.858 cf

Primary = 12.08 cfs @ 12.20 hrs, Volume= 50,858 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP2: Study Point**

Inflow Area = 9,321 sf, 0.00% Impervious, Inflow Depth = 3.84" for 50-year event

Inflow = 0.94 cfs @ 12.10 hrs, Volume= 2,981 cf

Primary = 0.94 cfs @ 12.10 hrs, Volume= 2,981 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Type III 24-hr 50-year Rainfall=8.51"

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#### **Summary for Link SP3: Study Point**

Inflow Area = 28,777 sf, 60.23% Impervious, Inflow Depth = 2.58" for 50-year event

Inflow = 1.99 cfs @ 12.10 hrs, Volume= 6,180 cf

Primary = 1.99 cfs @ 12.10 hrs, Volume= 6,180 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

#### **Summary for Link SP4: Study Point**

Inflow Area = 5,412 sf, 0.00% Impervious, Inflow Depth = 3.84" for 50-year event

Inflow = 0.48 cfs @ 12.14 hrs, Volume= 1,731 cf

Primary = 0.48 cfs @ 12.14 hrs, Volume= 1,731 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs



#### **Proposed Watershed Plan**

1 08-17-23 REVISED PER PDA COMMENTS
REV DATE DESCRIPTION

APPLICANT/LESSEE:

ATDG, LLC 7 SINCLAIR DRIVE EXETER, NH 03833

PROJECT:

ASC / MEDICAL OFFICE
360 CORPORATE DRIVE
TAX MAP 315, LOT 5
PORTSMOUTH, NH 03801

PROJECT NO. 3250-01 DATE: 08-14-23

SCALE: 1" = 40' DWG. NAME: C-3250-01.dwg

SCALE: 1" = 40' DWG. NAME: 0

DESIGNED BY: BDJ CHECKED BY:



ASSOCIATES, INC.

civil engineering • land surveying
environmental consulting • landscape architecture

nmental consulting ◆ landscape architectu www.allenmajor.com 400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, NE

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DRAWING TITLE:

1 inch = 40 ft.

PROPOSED WATERSHED PLAN PWS-1

SHEET No.

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SECTION 7.0 - APPENDIX



#### **AoT Application & AoT Permit**



### ALTERATION OF TERRAIN PERMIT APPLICATION



Water Division/ Alteration of Terrain Bureau/ Land Resources Management Check the Status of your Application: <a href="www.des.nh.gov/onestop">www.des.nh.gov/onestop</a>

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

|                                   |                              |                      | File                              | Number:         |  |  |
|-----------------------------------|------------------------------|----------------------|-----------------------------------|-----------------|--|--|
| Administrative                    | Administrative               | Administrativ        | ve Che                            | ck No.          |  |  |
| Use<br>Only                       | Use<br>Only                  | Use<br>Only          | Amo                               | ount:           |  |  |
|                                   |                              |                      | Initia                            | als:            |  |  |
| 1. APPLICANT INFORMATION (INT     | ENDED PERMIT HOLDER)         |                      |                                   |                 |  |  |
| Applicant Name: ATDG, LLC         |                              | Contact Name: Dr. A  | lex Slocum                        |                 |  |  |
| Email: ahslocum@gmail.com         |                              | Daytime Telephone: ( | (603) 799-6787                    |                 |  |  |
| Mailing Address: 7 Sinclair Drive |                              |                      |                                   |                 |  |  |
| Town/City: Exeter                 |                              |                      | State: NH                         | Zip Code: 03833 |  |  |
| 2. APPLICANT'S AGENT INFORMA      | TION If none, check here:    |                      | ·                                 |                 |  |  |
| Business Name: Apex Design Build  | I                            | Contact Name: Raqu   | elle Kemnitz, Proj                | ect Coordinator |  |  |
| Email: raquellek@apexdesignbuild  | d.net                        | Daytime Telephone:   | 708.610.5000                      |                 |  |  |
| Address: 9550 W. Higgins Road, St | te 170                       |                      |                                   |                 |  |  |
| Town/City: Rosemont               |                              |                      | State: IL                         | Zip Code: 60018 |  |  |
| 3. PROPERTY OWNER INFORMATI       | ON (IF DIFFERENT FROM APPLIC | CANT)                |                                   |                 |  |  |
| Applicant Name: Pease Developm    | ent Authority                | Contact Name: Mich   | ael Mates                         |                 |  |  |
| Email: m.mates@peasedev.org       |                              | Daytime Telephone: ( | (603) 433-6088                    |                 |  |  |
| Mailing Address: 55 International | Drive                        |                      |                                   |                 |  |  |
| Town/City: Portsmouth             |                              |                      | State: NH                         | Zip Code: 03801 |  |  |
| 4. PROPERTY OWNER'S AGENT IN      | FORMATION If none, ch        | eck here: 🔀          | ·                                 |                 |  |  |
| Business Name:                    |                              | Contact Name:        | Contact Name:                     |                 |  |  |
| Email:                            |                              | Daytime Telephone:   | Daytime Telephone:                |                 |  |  |
| Address:                          |                              |                      |                                   |                 |  |  |
| Town/City:                        |                              |                      | State:                            | Zip Code:       |  |  |
| 5. CONSULTANT INFORMATION         | If none, check here:         |                      |                                   | •               |  |  |
| Engineering Firm: Allen & Major A | associates, Inc.             | Contact Name: Brian  | Contact Name: Brian D. Jones, PE  |                 |  |  |
| Email: bjones@allenmajor.com      |                              | Daytime Telephone: ( | Daytime Telephone: (603) 627-5500 |                 |  |  |
| Address: 400 Harvey Road, Suite D | )                            |                      |                                   |                 |  |  |
| Town/City: Manchester             |                              |                      | State: NH                         | Zip Code: 03103 |  |  |
|                                   |                              |                      | •                                 |                 |  |  |

| 6. PROJECT TYPE  |                |                        |                    |                       |                                 |  |  |
|--|----------------|------------------------|--------------------|-----------------------|---------------------------------|--|--|
| Excavation Only Residential  |                |                        | Golf Course        | e Schoo               | ol Municipal                    |  |  |
| <u> </u>   | Conversion     | Other:                 |                    |                       |                                 |  |  |
| 7. PROJECT LOCATION INFORMATION  |                |                        |                    |                       |                                 |  |  |
| Project Name: ASC / Medical Office   |                |                        |                    |                       |                                 |  |  |
| Street/Road Address: 360 Corporate I   | <br>Drive      |                        |                    |                       |                                 |  |  |
| Town/City: Portsmouth  |                | Cou                    | ınty: Rockinghan   | <br>n                 |                                 |  |  |
| Tax Map: 315   | Block:         |                        | Lot Number: 5      |                       | Unit:                           |  |  |
| Location Coordinates: 43.073484, -70.  |                | ☐ Latitude/Lo          |                    | UTM [                 | State Plane                     |  |  |
| Post-development, will the proposed pro  |                |                        |                    |                       |                                 |  |  |
| 1. Stream or Wetland   |                |                        | X Yes              | Withdrawa             |                                 |  |  |
| Purpose: Treated, stormwater disch   | narge          |                        | ☐ No               |                       |                                 |  |  |
| 2. Man-made pond created by impour   | nding a stream | or wetland             | Yes                | ☐ Withdrawa           | l Discharge                     |  |  |
| Purpose:   |                |                        | ⊠ No               |                       |                                 |  |  |
| 3. Unlined pond dug into the water tal   | ble            |                        | Yes                | ☐ Withdrawa           | l Discharge                     |  |  |
| Purpose:   |                |                        | ⊠ No               |                       |                                 |  |  |
| Post-development, will the proposed pro  |                |                        |                    |                       |                                 |  |  |
| <ul> <li>A surface water impaired for phosphorus a<br/>cause net increase in phosphorus a</li> </ul>   |                |                        | s - include inform | nation to demonst     | rate that project will not      |  |  |
| A Class A surface water or Outstanding   | _              |                        | Yes - include in   | formation to dem      | onstrate that project will not  |  |  |
| cause net increase in phosphorus a   | nd/or nitroge  |                        | _                  |                       |                                 |  |  |
| A lake or pond not covered previously  | ? 🛛 No         | Yes - include info     | ormation to demo   | onstrate that proje   | ect will not cause net increase |  |  |
| in phosphorus in the lake or pond Is the project a High Load area?   | es 🕅 No        |                        |                    |                       |                                 |  |  |
| If yes, specify the type of high load  |                | ivity:                 |                    |                       |                                 |  |  |
| Is the project within a Water Supply Inta  | ke Protection  | Area (WSIPA)?          | Yes Yes            | ⊠ No                  |                                 |  |  |
| Is the project within a Groundwater Pro  |                |                        | Xes                | No                    |                                 |  |  |
| Will the well setbacks identified in E   | -              |                        |                    | ☐ No                  |                                 |  |  |
| Note: Guidance document titled " <u>Using</u> restrictions in these areas, read Chapter  |                |                        |                    | ' is available online | e. For more details on the      |  |  |
| Is any part of the property within the 10  |                |                        | No                 |                       |                                 |  |  |
| If yes: Cut volume: cubic  |                | <del></del> -          |                    |                       |                                 |  |  |
| Fill volume: cubic   |                |                        |                    |                       |                                 |  |  |
| Project IS within ¼ mile of a design   | nated river    | Name of River:         |                    |                       |                                 |  |  |
| Project is <b>NOT</b> within ¼ mile of a de  | esignated rive | er                     |                    |                       |                                 |  |  |
| Project IS within a Coastal/Great B  | ay Region co   | mmunity - include in   | fo required by E   | nv-Wq 1503.08(l)      | if applicable                   |  |  |
| Project is <b>NOT</b> within a Coastal/Great Bay Region community  |                |                        |                    |                       |                                 |  |  |
| 8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")  |                |                        |                    |                       |                                 |  |  |
| The project proposes to construct a 3-story surgical center with associated parking. The proposed building has a footprint of 16,700± square feet with a gross floor area of 52,400± square feet. The proposed sitework incorporates various walls to protect the existing wetland resources |                |                        |                    |                       |                                 |  |  |
| on site and utilize the developable area.  |                | e proposed sitework ii | icorporates variot | us wans to protect    | the existing wetland resources  |  |  |
|  |                |                        |                    |                       |                                 |  |  |
|  |                |                        |                    |                       |                                 |  |  |
| 9. IF APPLICABLE, DESCRIBE ANY WO  | RK STARTED     | PRIOR TO RECEIVING     | PERMIT             |                       |                                 |  |  |
| N/A  |                |                        |                    |                       |                                 |  |  |

| 10. ADDITIONAL REQUIRED INFORMATION  |  |   |  |  |  |
|--|--|---|--|--|--|
| A. Date a copy of the application was sent to the (Attach proof of delivery)   | municipality as required by Env  | /-Wq 1503.05  | (e)¹: <u>08/ /2023.</u>  |  |  |
| B. Date a copy of the application was sent to the  | local river advisory committee   | if required by  | Env-Wq 1503.05(e) <sup>2</sup> :/  |  |  |
| (Attach proof of delivery)   |  |   |  |  |  |
| C. Type of plan required: Land Conversion  | Detailed Development 🔲 Ex  | cavation, Gra   | ding & Reclamation Steep Slope   |  |  |
| D. Additional plans required: Stormwater Dra   | ainage & Hydrologic Soil Groups  | Source C  | Control Chloride Management  |  |  |
| E. Total area of disturbance: 181,000 square fee   | t  |   |  |  |  |
| <ul> <li>F. Additional impervious cover as a result of the coverage).</li> <li>Total final impervious cover: 90,058 square features.</li> </ul>  |  | e the "-" sym   | bol to indicate a net reduction in impervious  |  |  |
| G. Total undisturbed cover: 116,074 square feet  |  |   |  |  |  |
| H. Number of lots proposed: <u>0</u>   |  |   |  |  |  |
| I. Total length of roadway: <u>0</u> linear feet   |  |   |  |  |  |
| J. Name(s) of receiving water(s): Wetland  |  |   |  |  |  |
| K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.  |  |   |  |  |  |
| Type of Approval   | Application Filed?   | Status  |  |  |  |
| '' ''  |  |   |  |  |  |
|  |  | Pending   | If Issued:   |  |  |
| 1. Water Supply Approval   | Yes No NA  | Pending   | If Issued:  Permit number:   |  |  |
| Water Supply Approval     Wetlands Permit  |  | Pending   |  |  |  |
|  | Yes No NA  | Pending   | Permit number:   |  |  |
| 2. Wetlands Permit   | Yes No NA  Yes No NA   | Pending   | Permit number: Permit number:  |  |  |
| Wetlands Permit     Shoreland Permit   | Yes         No         NA           Yes         No         NA           Yes         No         NA  | Pending   | Permit number: Permit number: Permit number:   |  |  |
| Wetlands Permit     Shoreland Permit     UIC Registration  | Yes         No         N/A           Yes         No         N/A           Yes         No         N/A           Yes         No         N/A  | Pending   | Permit number: Permit number: Permit number: Registration date:  |  |  |
| 2. Wetlands Permit  3. Shoreland Permit  4. UIC Registration  5. Large/Small Community Well Approval   | Yes         No         N/A   | Pending   | Permit number: Permit number: Permit number: Registration date: Approval letter date:  |  |  |
| 2. Wetlands Permit  3. Shoreland Permit  4. UIC Registration  5. Large/Small Community Well Approval  6. Large Groundwater Withdrawal Permit   | Yes         No         N/A           Yes         No   |   | Permit number: Permit number: Permit number: Registration date: Approval letter date: Permit number: Permit number:  |  |  |
| 2. Wetlands Permit  3. Shoreland Permit  4. UIC Registration  5. Large/Small Community Well Approval  6. Large Groundwater Withdrawal Permit  7. Other:  | Yes No No/A  | langered or o   | Permit number: Permit number: Permit number: Registration date: Approval letter date: Permit number: Permit number: f concern: N/A Surface Water Impairment layer turned on, list  |  |  |
| 2. Wetlands Permit  3. Shoreland Permit  4. UIC Registration  5. Large/Small Community Well Approval  6. Large Groundwater Withdrawal Permit  7. Other:  L. List all species identified by the Natural Herita  M. Using NHDES's Web GIS OneStop program (wy the impairments identified for each receiving)   | Yes No No/A  Yes No No  ge Bureau as threatened or end  ww2.des.state.nh.us/gis/onesto water. If no pollutants are liste  | dangered or o   | Permit number: Permit number: Permit number: Registration date: Approval letter date: Permit number: Permit number: f concern: N/A Surface Water Impairment layer turned on, list  |  |  |
| 2. Wetlands Permit  3. Shoreland Permit  4. UIC Registration  5. Large/Small Community Well Approval  6. Large Groundwater Withdrawal Permit  7. Other:  L. List all species identified by the Natural Herita  M. Using NHDES's Web GIS OneStop program (worth the impairments identified for each receiving N/A  N. Did the applicant/applicant's agent have a present of the staff member: N/A | Yes No N/A  Yes No N/A | dangered or o  p/), with the d, enter "N/A  staff?  timated quant | Permit number:  Permit number:  Permit number:  Registration date:  Approval letter date:  Permit number:  Permit number:  f concern: N/A  Surface Water Impairment layer turned on, list ."  Yes No  tity of blast rock: cubic yards  pdf |  |  |

<sup>&</sup>lt;sup>1</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

<sup>&</sup>lt;sup>2</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

| 11. CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)  |
|---|
| LOOSE:  |
| <ul> <li>Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)</li> <li>Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm</li> <li>Color copy of a USGS map with the property boundaries outlined (1" = 2,000' scale)</li> <li>If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.</li> </ul>                   |
| BIND IN A REPORT IN THE FOLLOWING ORDER:  |
| <ul> <li>Copy of the signed application form &amp; application checklist (des.nh.gov/organization/divisions/water/aot/index.htm)</li> <li>Copy of the check</li> <li>Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)</li> <li>Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points</li> <li>Web GIS printout with the "Surface Water Impairments" layer turned on -</li></ul>  |
| <ul> <li>☑ Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]</li> <li>☑ Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches):         <ul> <li>(http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)</li> <li>☑ Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]</li> <li>☑ Source control plan</li> </ul> </li> </ul> |
| PLANS:  One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)  Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)  Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)   |
| 100-YEAR FLOODPLAIN REPORT:  All information required in Env-Wq 1503.09, submitted as a separate report.  |
| ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE  See Checklist for Details  |
| REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS  |

**INCLUDED WITH SUBMITTAL.** 

| 12. REQUIRED SIGNATURES  |  |
|--|--|
| By initialing here, I acknowledge that I am re in PDF format on a CD within one week afte  | equired by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department r permit approval.   |
| By signing below, I certify that:  |  |
| <ul> <li>The information contained in or otherwise subreknowledge and belief;</li> </ul>   | mitted with this application is true, complete, and not misleading to the best of my   |
| ,  | nplete, or misleading information constitutes grounds for the department to deny the boased on the information, and/or refer the matter to the board of professional engineers all engineer; and |
| • I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. |  |
| APPLICANT  | APPLICANT'S AGENT:   |
| Signature:   | Date:  |
| Name (print or type): Raquelle Kemnitz   | Title: Project Coordinator   |
| PROPERTY OWNER   | PROPERTY OWNER'S AGENT:  |
| Signature:   | Date:  |
| Name (print or type):  | Title:   |

## ATTACHMENT A: ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply.

| DESIGN PLANS  |
|---|
| ☑ Plans printed on 34 - 36" by 22 - 24" white paper   |
| □ PE stamp  |
|   |
| ☐ Temporary erosion control measures  |
| Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual. |
| Pre-existing 2-foot contours  |
| Proposed 2-foot contours  |
| ☐ Drainage easements protecting the drainage/treatment structures   |
| Compliance with the Wetlands Bureau, RSA 482- A <a href="http://des.nh.gov/organization/divisions/water/wetlands/index.htm">http://des.nh.gov/organization/divisions/water/wetlands/index.htm</a> . Note that artificial detention in wetlands is not allowed.    |
| Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. <a href="http://des.nh.gov/organization/divisions/water/wetlands/cspa">http://des.nh.gov/organization/divisions/water/wetlands/cspa</a>  |
| Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.   |
| Check to see if any proposed ponds need state Dam permits. <a href="http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf">http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf</a>  |
| DETAILS   |
| Typical roadway x-section   |
| Detention basin with inverts noted on the outlet structure  |
| Stone berm level spreader   |
| Outlet protection – riprap aprons   |
| A general installation detail for an erosion control blanket  |
| Silt fences or mulch berm   |
| Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.   |
| Hay bale barriers   |
| Stone check dams  |
| Gravel construction exit  |
|   |
| The treatment BMP's proposed  |
| Any innovative BMP's proposed   |

# NHDES-W-01-003 CONSTRUCTION SEQUENCE/EROSION CONTROL Note that 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.

Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized.
 Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site).
 Note that all ditches and swales shall be stabilized prior to directing runoff to them.

Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.

Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade

 $oxed{oxed}$  Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall.

 $igstyle{igstyle}$  Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information.

Note that perimeter controls shall be installed prior to earth moving operations.

Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized.

Note the definition of the word "stable"

Example note: 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.
- Note the limit of time an area may be exposed Example note: All areas shall be stabilized within 45 days of initial disturbance.
- Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified)
- Provide winter construction notes that meet or exceed our standards.

#### **Standard Winter Notes:**

- 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.
- 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.

| Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence |
|---|
| until after the roadway has the base course to design elevation and the associated drainage is complete and stable." – This note is |
| applicable to single/duplex family subdivisions, when lot development is not part of the permit.                                    |

#### **DRAINAGE ANALYSES**

| Please double-side $8 \frac{1}{2}$ " × 11" sheets where possible but, <b>do not</b> reduce the text such that more than one page fits on one side.   |
|--|
| □ PE stamp   |
| Rainfall amount obtained from the Northeast Regional Climate Center- <a href="http://precip.eas.cornell.edu/">http://precip.eas.cornell.edu/</a> . Include extreme precipitation table as obtained from the above referenced website.  |
| ☑ Drainage analyses, in the following order:   |
| Pre-development analysis: Drainage diagram.  |
| Pre-development analysis: Area Listing and Soil Listing.   |
| Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.  |
| Pre-development analysis: Full summary of the 10-year storm.   |
| Post-development analysis: Drainage diagram.   |
| Post-development analysis: Area Listing and Soil Listing.  |
| Post-development analysis: Node listing for the 2-year, 10-year and 50-year.   |
| Post-development analysis: Full summary of the 10-year storm.  |
| Review the Area Listing and Soil Listing reports   |
| Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.   |
| There is the same or less HSG A soil area after development (check for each HSG).  |
| There is the same or less "woods" cover in the post-development.   |
| Undeveloped land was assumed to be in "good" condition.  |
| The amount of impervious cover in the analyses is correct.   |
| Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense? |
| Check the storage input used to model the ponds.   |
| Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.  |
| igstyle igstyle Check the outlet structure proposed and make sure it matches that modeled.   |
| igstyle Check to see if the total areas in the pre and post analyses are same.   |
| Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).   |
| PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS  |
| Plans printed on 34 - 36" by 22 - 24" on white paper.  |
| Submit these plans separate from the soil plans.   |
| A north arrow.   |
|  |
| ☐ Labeled subcatchments, reaches and ponds.  |
| ☑ Tc lines.  |
| A clear delineation of the subcatchment boundaries.  |
| Roadway station numbers.   |
| Culverts and other conveyance structures.  |

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

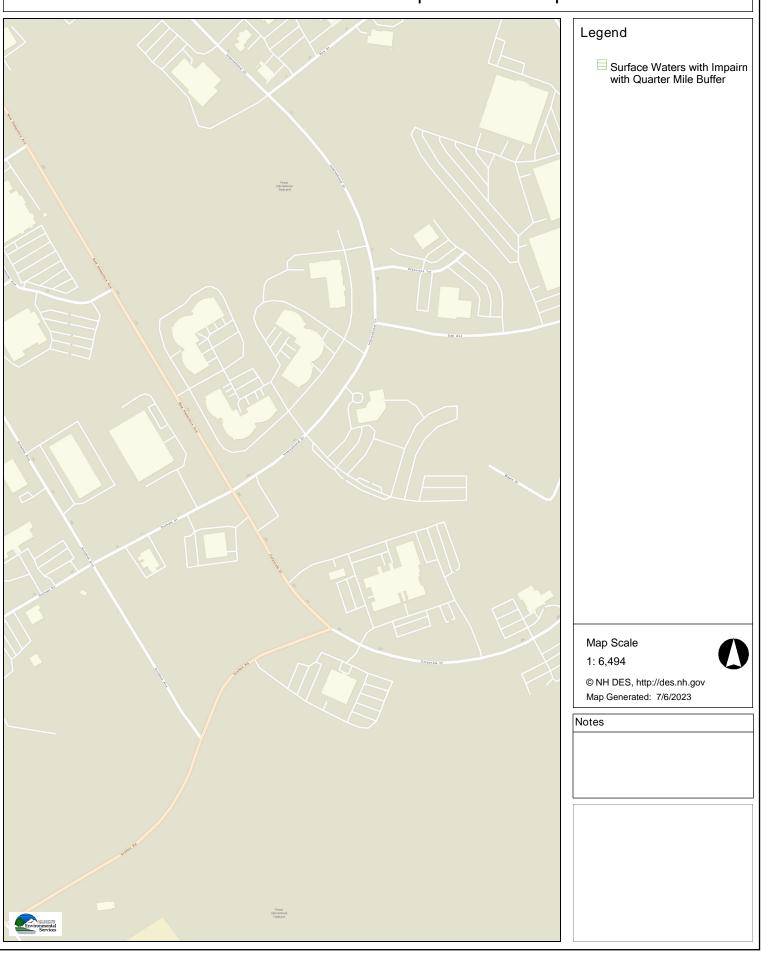
NHDES-W-01-003

| NHDES-W-01-003  11" × 17"sheets suitable, as long as it is readable.   |
|--|
| Submit these plans separate from the drainage area plans.  |
| 🔀 A north arrow.   |
| ☑ A scale.   |
| Name of the soil scientist who performed the survey and date the soil survey took place.   |
| 2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.   |
| Delineation of the soil boundaries and wetland boundaries.   |
| Delineation of the subcatchment boundaries.  |
| Soil series symbols (e.g., 26).  |
| A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).   |
| The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).   |
| Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:   |
| Drainage report is not needed if site does not have off-site flow.   |
| 5 foot contours allowed rather than 2 foot.  |
| No PE stamp needed on the plans.   |
| Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.  |
| Add reclamation notes.   |
| See NRCS publication titled: <i>Vegetating New Hampshire Sand and Gravel Pits</i> for a good resource, it is posted online at: <a href="http://des.nh.gov/organization/divisions/water/aot/categories/publications">http://des.nh.gov/organization/divisions/water/aot/categories/publications</a> . |
| ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE  |
| If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.  |
| If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.  |
| If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.  |
| If project is within a Coastal/Great Bay Region community, include info required by Env-Wq 1503.08(I) if applicable.   |



#### **Surface Water Impairment Map**

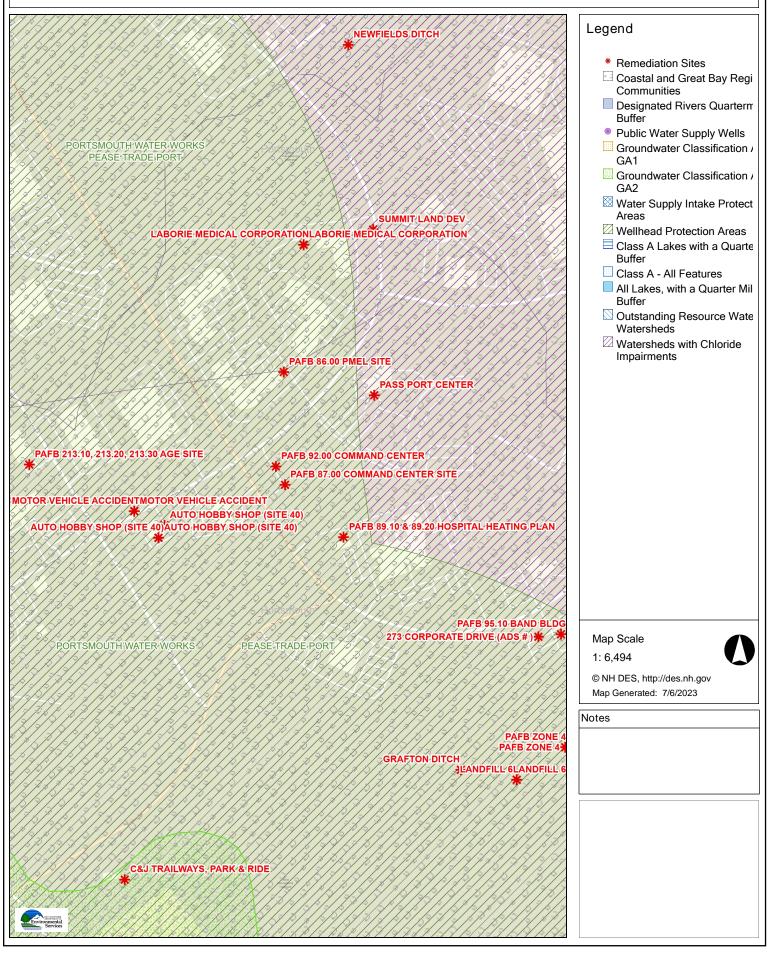
#### Surface Waters with Impairments Map





#### **AoT Screening Layers Map**

#### **AoT Screening Layers**





#### **Natural Heritage Data Check**

#### New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

To: steven mayer

250 Commercial Street Manchester, NH 03101

From: NH Natural Heritage Bureau

**Date:** 6/29/2023 (This letter is valid through 6/29/2024)

Re: Review by NH Natural Heritage Bureau of request dated 6/29/2023

**Permit Types:** Alteration of Terrain Permit

Sewer Connection Permit Stormwater Pollution Prevention

Portsmouth

NHB ID: NHB23-1980

Applicant: steven mayer

Location: Portsmouth

Tax Map: 315, Tax Lot: 5 Address: 360 Corporate Drive

Proj. Description: The project includes the construction of a 3 story medical use building with a

footprint of approximately 15,754 square feet. The project will construct approximately 125 parking spaces, required utilities, lighting, and stormwater

infrastructure

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

#### New Hampshire Natural Heritage Bureau NHB DataCheck Results Letter

#### MAP OF PROJECT BOUNDARIES FOR: NHB23-1980





#### **NRCS Web Soil Survey**



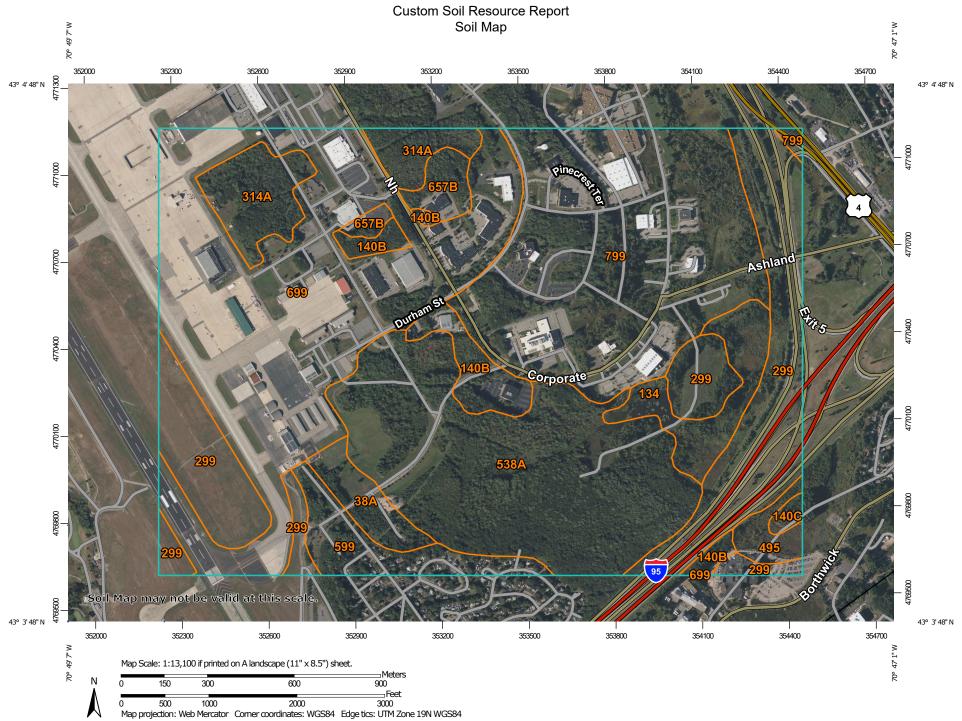
Natural Resources Conservation

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





#### 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**

(o)

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

Ŷ

Wet Spot Other

Δ

Special Line Features

#### **Water Features**

Streams and Canals

#### Transportation

Rails

---

Interstate Highways

**US Routes** 

Major Roads

00

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 25, Sep 12, 2022

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 |  |
|---|---|--------------|----------------|--|
| 38A   | Eldridge fine sandy loam, 0 to 3 percent slopes               | 15.2         | 1.8%           |  |
| 134   | Maybid silt loam  | 27.2         | 3.2%           |  |
| 140B  | Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky | 24.6         | 2.9%           |  |
| 140C Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky |   | 2.5          | 0.3%           |  |
| 299   | Udorthents, smoothed  | 129.9        | 15.3%          |  |
| 314A  | Pipestone sand, 0 to 5 percent slopes                         | 36.8         | 4.3%           |  |
| 495   | Natchaug mucky peat, 0 to 2 percent slopes                    | 9.1          | 1.1%           |  |
| 538A  | Squamscott fine sandy loam, 0 to 5 percent slopes             | 161.0        | 18.9%          |  |
| 599   | Urban land-Hoosic complex, 3 to 15 percent slopes             | 26.6         | 3.1%           |  |
| 657B  | Ridgebury fine sandy loam, 3 to 8 percent slopes, very stony  | 12.6         | 1.5%           |  |
| 699   | Urban land  | 224.0        | 26.3%          |  |
| 799   | Urban land-Canton complex, 3 to 15 percent slopes             | 182.2        | 21.4%          |  |
| Totals for Area of Interest   |   | 851.8        | 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.

## 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 Physical Properties**

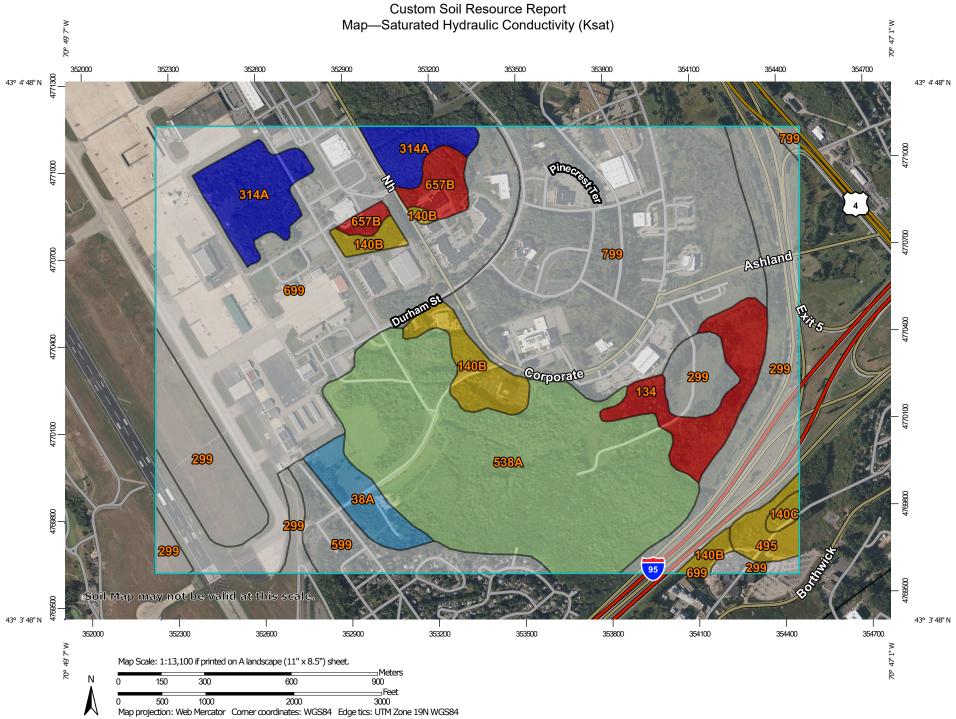
Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

## Saturated Hydraulic Conductivity (Ksat)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.



#### MAP LEGEND

#### Area of Interest (AOI)

#### Area of Interest (AOI)

#### Soils

#### Soil Rating Polygons

<= 4.5628

> 4.5628 and <= 10.1993

> 10.1993 and <= 28.6840

> 28.6840 and <= 35.3528

> 35.3528 and <= 91 7222

Not rated or not available

#### Soil Rating Lines

<= 4.5628

> 4.5628 and <= 10.1993

> 10.1993 and <= 28.6840

> 28.6840 and <= 35.3528

> 35.3528 and <= 91 7222

Not rated or not available

#### **Soil Rating Points**

<= 4.5628

> 4.5628 and <= 10.1993

> 10.1993 and <= 28.6840

> 28.6840 and <= 35.3528

> 35.3528 and <= 91.7222

Not rated or not available

#### **Water Features**

Streams and Canals

#### Transportation

Rails

Interstate Highways

**US Routes** 

Major Roads

Local Roads  $\sim$ 

#### 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 25, Sep 12, 2022

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—Saturated Hydraulic Conductivity (Ksat)**

| Map unit symbol          | Map unit name  | Rating (micrometers per second) | Acres in AOI | Percent of AOI |
|--------------------------|--|---------------------------------|--------------|----------------|
| 38A                      | Eldridge fine sandy loam,<br>0 to 3 percent slopes                   | 35.3528                         | 15.2         | 1.8%           |
| 134                      | Maybid silt loam   | 1.0099                          | 27.2         | 3.2%           |
| 140B                     | Chatfield-Hollis-Canton<br>complex, 0 to 8<br>percent slopes, rocky  | 10.1993                         | 24.6         | 2.9%           |
| 140C                     | Chatfield-Hollis-Canton<br>complex, 8 to 15<br>percent slopes, rocky | 10.1993                         | 2.5          | 0.3%           |
| 299                      | Udorthents, smoothed   |                                 | 129.9        | 15.3%          |
| 314A                     | Pipestone sand, 0 to 5 percent slopes                                | 91.7222                         | 36.8         | 4.3%           |
| 495                      | Natchaug mucky peat, 0 to 2 percent slopes                           | 7.3000                          | 9.1          | 1.1%           |
| 538A                     | Squamscott fine sandy loam, 0 to 5 percent slopes                    | 28.6840                         | 161.0        | 18.9%          |
| 599                      | Urban land-Hoosic<br>complex, 3 to 15<br>percent slopes              |                                 | 26.6         | 3.1%           |
| 657B                     | Ridgebury fine sandy<br>loam, 3 to 8 percent<br>slopes, very stony   | 4.5628                          | 12.6         | 1.5%           |
| 699                      | Urban land   |                                 | 224.0        | 26.3%          |
| 799                      | Urban land-Canton<br>complex, 3 to 15<br>percent slopes              |                                 | 182.2        | 21.4%          |
| Totals for Area of Inter | est  |                                 | 851.8        | 100.0%         |

### Rating Options—Saturated Hydraulic Conductivity (Ksat)

Units of Measure: micrometers per second
Aggregation Method: Dominant Component
Component Percent Cutoff: None Specified

Tie-break Rule: Fastest
Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 100

Units of Measure: Inches

#### 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:

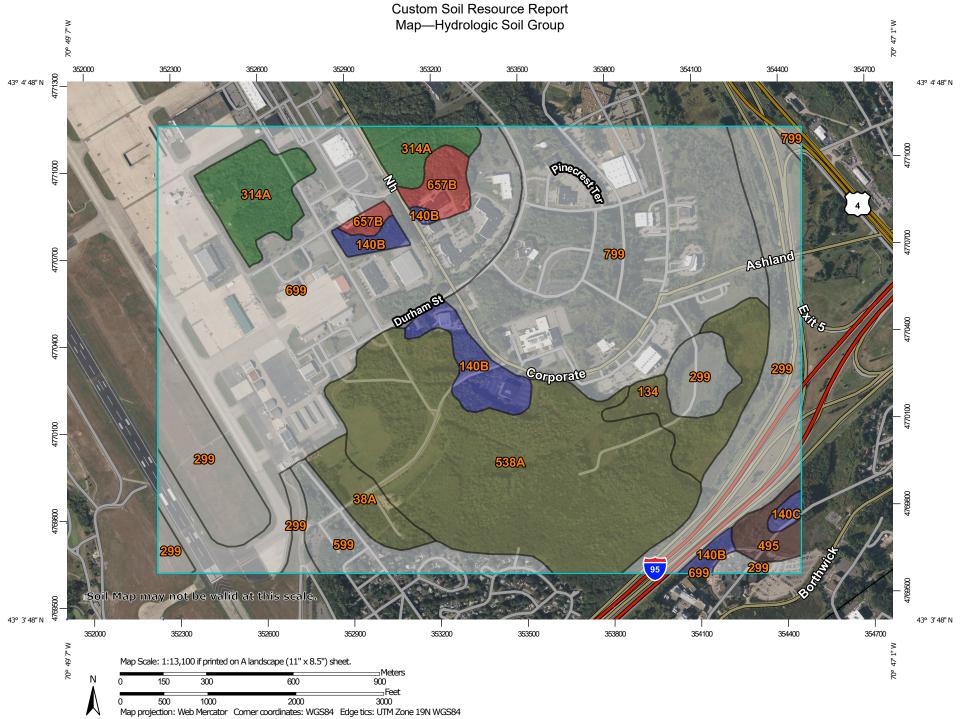
Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

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 LEGEND MAP INFORMATION Area of Interest (AOI) The soil surveys that comprise your AOI were mapped at С 1:24.000. Area of Interest (AOI) C/D Soils D Warning: Soil Map may not be valid at this scale. Soil Rating Polygons Not rated or not available Α Enlargement of maps beyond the scale of mapping can cause **Water Features** A/D misunderstanding of the detail of mapping and accuracy of soil Streams and Canals line placement. The maps do not show the small areas of В contrasting soils that could have been shown at a more detailed Transportation scale. B/D Rails ---Interstate Highways Please rely on the bar scale on each map sheet for map C/D **US Routes** measurements. Major Roads Source of Map: Natural Resources Conservation Service Not rated or not available Local Roads Web Soil Survey URL: -Coordinate System: Web Mercator (EPSG:3857) Soil Rating Lines Background Aerial Photography 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 Not rated or not available Survey Area Data: Version 25, Sep 12, 2022 **Soil Rating Points** Soil map units are labeled (as space allows) for map scales Α 1:50.000 or larger. A/D Date(s) aerial images were photographed: Jun 19, 2020—Sep 20. 2020 B/D 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 |
|--------------------------|--|--------|--------------|----------------|
| 38A                      | Eldridge fine sandy loam,<br>0 to 3 percent slopes                   | C/D    | 15.2         | 1.8%           |
| 134                      | Maybid silt loam   | C/D    | 27.2         | 3.2%           |
| 140B                     | Chatfield-Hollis-Canton<br>complex, 0 to 8<br>percent slopes, rocky  | В      | 24.6         | 2.9%           |
| 140C                     | Chatfield-Hollis-Canton<br>complex, 8 to 15<br>percent slopes, rocky | В      | 2.5          | 0.3%           |
| 299                      | Udorthents, smoothed   |        | 129.9        | 15.3%          |
| 314A                     | Pipestone sand, 0 to 5 percent slopes                                | A/D    | 36.8         | 4.3%           |
| 495                      | Natchaug mucky peat, 0 to 2 percent slopes                           | B/D    | 9.1          | 1.1%           |
| 538A                     | Squamscott fine sandy loam, 0 to 5 percent slopes                    | C/D    | 161.0        | 18.9%          |
| 599                      | Urban land-Hoosic<br>complex, 3 to 15<br>percent slopes              |        | 26.6         | 3.1%           |
| 657B                     | Ridgebury fine sandy<br>loam, 3 to 8 percent<br>slopes, very stony   | D      | 12.6         | 1.5%           |
| 699                      | Urban land   |        | 224.0        | 26.3%          |
| 799                      | Urban land-Canton<br>complex, 3 to 15<br>percent slopes              |        | 182.2        | 21.4%          |
| Totals for Area of Inter | est  |        | 851.8        | 100.0%         |

## Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Site Photographs



Image 1 - Aerial Image



Image 2 - View from Corporate & International Intersection



Image 3 - View from 320 Corporate Drive



## **NHDES Groundwater Recharge Volume Calculations**



# GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

|        | ac     | Area of HSG A soil that was replaced by impervious cover                     | 0.40" |
|--------|--------|--|-------|
| 1.67   | ac     | Area of HSG B soil that was replaced by impervious cover                     | 0.25" |
| 0.00   | ac     | Area of HSG C soil that was replaced by impervious cover                     | 0.10" |
|        | ac     | Area of HSG D soil or impervious cover that was replaced by impervious cover | 0.0"  |
| 0.25   | inches | Rd = Weighted groundwater recharge depth                                     |       |
| 0.4184 | ac-in  | GRV = AI * Rd  |       |
| 1,519  | cf     | GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")                              |       |

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

| Provided:  |
|--|
| Bioretention System 1 = 2,429 cf                             |
| Bioretention System 2 = 425 cf                               |
| Bioretention System 3 = 5,898 cf                             |
| Bioretention System 4 = 1,089 cf                             |
| Infiltration System 1 = 1,582 cf                             |
| Infiltration System 2 = 4,514 cf                             |
| Infiltration System 3 = 2,057 cf                             |
| Total Provided = 17,994 cf > 1,519 cf required               |
| see stage storage spreadsheets in following appendix section |
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#### **NHDES BMP Worksheets**



# BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: Bioretention System 1

Enter the node name in the drainage analysis if applicable.

|               | Litter the node name in the drainage analysis it applicable.              |                       |
|---------------|---|-----------------------|
| 0.20 ac       | A = Area draining to the practice   |                       |
| 0.10 ac       | A <sub>I</sub> = Impervious area draining to the practice                 |                       |
| 0.52 deci     | mal I = Percent impervious area draining to the practice, in decimal form |                       |
| 0.52 unit     | less Rv = Runoff coefficient = 0.05 + (0.9 x I)                           |                       |
| 0.10 ac-ir    | 1 WQV= 1" x Rv x A  |                       |
| 377 cf        | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")                           |                       |
| 38 cf         | 10% x WQV (check calc for sediment forebay)                               |                       |
| 94 cf         | 25% x WQV (check calc for water stored in saturated zone)                 |                       |
| Sediment Fore | Bebay Method of Pretreatment  |                       |
| 92 cf         | If pretrt is sed forebay: V <sub>SED</sub> (sediment forebay volume)      | ≥ 10%WQV              |
| 2,429 cf      | Volume below lowest orifice <sup>1</sup>                                  | ≥ 100%WQV             |
| 343 cf        | Water stored in voids of saturated zone                                   | ≥ 26%WQV              |
| 0.01 cfs      | $2Q_{avg} = 2*WQV / 24 hrs * (1hr / 3600 sec)^2$                          |                       |
| 58.60 ft      | E <sub>WQV</sub> = Elevation of WQV (attach stage-storage table)          |                       |
| 0.03 cfs      | $Q_{WQV}$ = Discharge at the $E_{WQV}$ (attach stage-discharge table)     | < 2Q <sub>wqv</sub>   |
| 6.98 hou      | $T_{ED}$ = Drawdown time of extended detention = $2WQV/Q_{WQV}$           | ≥ 24-hrs              |
| 24.00 in      | Depth of Filter Media   | <u>&gt;</u> 18"       |
| 3.00 :1       | Pond side slopes  | <u>&gt;</u> 3:1       |
|               | What mechanism is proposed to prevent the outlet structure from clo       | gging (applicable for |
| N/A           | orifices/weirs with a dimension of $\leq 6$ ")?                           |                       |
| 60.73 ft      | Peak elevation of the 50-year storm event $(E_{50})$                      |                       |
| 61.00 ft      | Berm elevation of the pond  |                       |
| YES           | $E_{50} \le $ the berm elevation?   | ← yes                 |
|               |   |                       |

<sup>1.</sup> Volume stored above the wetland soil and below the high flow by-pass.

| Designer's Notes: |  |  |  |
|-------------------|--|--|--|
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#### Stage-Area-Storage for Pond FB1: sediment forebay

| 146  | Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) | Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) |
|--|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 59.02         149         3         60.08         330         252           59.06         154         9         60.12         337         266           59.08         157         12         60.14         340         273           59.10         160         15         60.16         343         279           59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.16         169         25         60.22         352         300           59.18         172         29         60.24         356         307           59.20         175         32         60.26         359         314           59.21         178         36         60.28         362         322           59.22         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372  |                     |                    |                         |                     |                    |                         |
| 59.04         152         6         60.10         333         259           59.08         157         12         60.14         340         273           59.10         160         15         60.16         343         279           59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.18         172         29         60.24         356         307           59.20         175         32         60.26         359         314           59.22         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         30.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.34         197         58         60.40         382         366           59.35         200         62         60.42         385   |                     |                    |                         |                     |                    |                         |
| 59.06         154         9         60.12         337         266           59.08         157         12         60.14         340         273           59.10         160         15         60.16         343         279           59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.16         169         25         60.22         352         300           59.18         172         29         60.24         356         307           59.20         175         32         60.26         359         314           59.21         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.35         200         62         60.42         385   |                     |                    |                         |                     |                    |                         |
| 59.08         157         12         60.14         340         273           59.10         160         15         60.16         343         279           59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.18         172         29         60.24         356         307           59.20         175         32         60.26         359         311           59.21         178         36         60.28         362         322           59.24         181         39         60.30         365         322           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.34         197         58         60.40         382         366           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385  |                     |                    |                         |                     |                    |                         |
| 59.10         160         15         60.16         343         279           59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.16         169         25         60.22         352         300           59.20         175         32         60.26         359         314           59.20         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389  |                     |                    |                         |                     |                    |                         |
| 59.12         163         19         60.18         346         286           59.14         166         22         60.20         349         293           59.16         169         25         60.22         352         300           59.18         172         29         60.26         359         314           59.20         175         32         60.26         359         314           59.22         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392  |                     |                    |                         |                     |                    |                         |
| 59.14         166         22         60.20         349         293           59.16         169         25         60.22         352         300           59.18         172         29         60.24         356         307           59.20         175         32         60.26         359         314           59.22         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.48         396  |                     |                    |                         |                     |                    |                         |
| 59.16         169         25         60.24         356         307           59.20         175         32         60.26         359         314           69.22         178         36         60.26         359         314           69.24         181         39         60.30         365         322           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.48         217         83         60.52         402  |                     |                    |                         |                     |                    |                         |
| 59.18         172         29         60.26         359         314           59.20         175         32         60.26         359         314           59.21         178         36         60.28         362         322           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           69.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.42         383         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.42         210         74         60.48         396         397           59.42         210         74         60.50         399  |                     |                    |                         |                     |                    |                         |
| 59.20         175         32         60.26         359         314           59.22         178         36         60.28         362         322           59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.42         217         83         60.52         402         413           59.42         217         83         60.52         402  |                     |                    |                         |                     |                    |                         |
| 59.22         178         36         60.28         362         322           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.48         220         87         60.52         402         413           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413  |                     |                    |                         |                     |                    |                         |
| 59.24         181         39         60.30         365         329           59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.50         224         92         60.56         409         430           59.51         227         96         60.58         413  |                     |                    |                         |                     |                    |                         |
| 59.26         184         43         60.32         369         336           59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.36         200         62         60.40         382         366           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.48         220         87         60.54         402         413           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.55         234         105         60.62         420  |                     |                    |                         |                     |                    |                         |
| 59.28         187         47         60.34         372         344           59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.48         220         87         60.54         402         413           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413  |                     |                    |                         |                     |                    |                         |
| 59.30         191         50         60.36         375         351           59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.58         238         110         60.64         427  |                     |                    |                         |                     |                    |                         |
| 59.32         194         54         60.38         379         359           59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.48         220         87         60.54         406         421           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.51         231         101         60.60         416         446           59.58         238         110         60.61         427  |                     |                    |                         |                     |                    |                         |
| 59.34         197         58         60.40         382         366           59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.52         227         96         60.58         413         438           59.52         234         105         60.62         420         454           459.58         238         110         60.64         423   |                     |                    |                         |                     |                    |                         |
| 59.36         200         62         60.42         385         374           59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.56         234         105         60.62         420         454           59.58         238         110         60.64         423         463           59.60         241         115         60.66         427         471           59.62         245         120         60.88         430 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>                 |                     |                    |                         |                     |                    |                         |
| 59.38         204         66         60.44         389         382           59.40         207         70         60.46         392         390           59.42         210         74         60.48         396         397           59.44         214         79         60.50         399         405           59.46         217         83         60.52         402         413           59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.56         234         105         60.62         420         454           59.58         238         110         60.64         423         463           59.60         241         115         60.66         427         471           59.62         245         120         60.68         430         480           59.64         238         125         60.70         434 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>                |                     |                    |                         |                     |                    |                         |
| 59.42       210       74       60.48       396       397         59.44       214       79       60.50       399       405         59.46       217       83       60.52       402       413         59.48       220       87       60.54       406       421         59.50       224       92       60.56       409       430         59.52       227       96       60.58       413       438         59.54       231       101       60.60       416       446         59.56       234       105       60.62       420       454         59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515<   |                     |                    | 66                      |                     |                    |                         |
| 59.44       214       79       60.50       399       405         59.46       217       83       60.52       402       413         59.48       220       87       60.54       406       421         59.50       224       92       60.56       409       430         59.52       227       96       60.58       413       438         59.54       231       101       60.60       416       446         59.56       234       105       60.62       420       454         59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.68       256       135       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.80       452       533   | 59.40               | 207                | 70                      | 60.46               | 392                | 390                     |
| 59.46       217       83       60.52       402       413         59.48       220       87       60.54       406       421         59.50       224       92       60.56       409       430         59.52       227       96       60.58       413       438         59.54       231       101       60.60       416       446         59.56       234       105       60.62       420       454         59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.68       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.78       274       161       60.80       452       53   | 59.42               | 210                |                         | 60.48               | 396                |                         |
| 59.48         220         87         60.54         406         421           59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.56         234         105         60.62         420         454           59.58         238         110         60.64         423         463           59.60         241         115         60.66         427         471           59.62         245         120         60.68         430         480           59.64         248         125         60.70         434         489           59.66         252         130         60.72         437         497           59.68         256         135         60.74         441         506           59.70         259         140         60.76         445         515           59.72         263         145         60.78         448         524           59.78         271         156         60.82         4   | 59.44               | 214                | 79                      | 60.50               | 399                | 405                     |
| 59.50         224         92         60.56         409         430           59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.56         234         105         60.62         420         454           59.58         238         110         60.64         423         463           59.60         241         115         60.66         427         471           59.62         245         120         60.68         430         480           59.64         248         125         60.70         434         489           59.66         252         130         60.72         437         497           59.68         256         135         60.74         441         506           59.70         259         140         60.76         445         515           59.72         263         145         60.78         448         524           59.74         267         151         60.80         452         533           59.76         271         156         60.82  | 59.46               |                    |                         | 60.52               | 402                |                         |
| 59.52         227         96         60.58         413         438           59.54         231         101         60.60         416         446           59.56         234         105         60.62         420         454           59.58         238         110         60.64         423         463           59.60         241         115         60.66         427         471           59.62         245         120         60.68         430         480           59.64         248         125         60.70         434         489           59.66         252         130         60.72         437         497           59.68         256         135         60.74         441         506           59.70         259         140         60.76         445         515           59.72         263         145         60.78         448         524           59.74         267         151         60.80         452         533           59.76         271         156         60.82         456         542           59.78         274         161         60.86 <td< td=""><td></td><td></td><td></td><td>60.54</td><td>406</td><td></td></td<> |                     |                    |                         | 60.54               | 406                |                         |
| 59.54       231       101       60.60       416       446         59.56       234       105       60.62       420       454         59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.84       286       178       60.90       470 <t< td=""><td>59.50</td><td></td><td></td><td></td><td></td><td></td></t<>   | 59.50               |                    |                         |                     |                    |                         |
| 59.56       234       105       60.62       420       454         59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>  |                     |                    |                         |                     |                    |                         |
| 59.58       238       110       60.64       423       463         59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>  |                     |                    |                         |                     |                    |                         |
| 59.60       241       115       60.66       427       471         59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.90       298       196       60.96       481 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>  |                     |                    |                         |                     |                    |                         |
| 59.62       245       120       60.68       430       480         59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.81       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.85       290       184       60.92       474       588         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>  |                     |                    |                         |                     |                    |                         |
| 59.64       248       125       60.70       434       489         59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.90       298       196       60.94       478       598         59.92       302       202       60.98       485       617         59.96       310       214       59.98       61.00  |                     |                    |                         |                     |                    |                         |
| 59.66       252       130       60.72       437       497         59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.90       298       196       60.94       478       598         59.92       302       202       60.98       485       617         59.96       310       214         59.98       314       220         60.00       318       226  |                     |                    |                         |                     |                    |                         |
| 59.68       256       135       60.74       441       506         59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.96       310       214         59.98       314       220         60.00       318       226  |                     |                    |                         |                     |                    |                         |
| 59.70       259       140       60.76       445       515         59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.96       310       214       59.98       61.00       489       627         59.98       314       220       60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.72       263       145       60.78       448       524         59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.94       306       208       61.00       489       627         59.96       310       214       59.98       61.00       489       627         59.98       314       220       60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.74       267       151       60.80       452       533         59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.96       310       214       59.98       61.00       489       627         59.98       314       220       60.00       318       226       60.02       321       233       233  |                     |                    |                         |                     |                    |                         |
| 59.76       271       156       60.82       456       542         59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.96       310       214       59.98       61.00       489       627         59.98       314       220       60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.78       274       161       60.84       459       551         59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.94       306       208       61.00       489       627         59.98       310       214       59.98       60.00       318       226         60.02       321       233       233       60.00  |                     |                    |                         |                     |                    |                         |
| 59.80       278       167       60.86       463       560         59.82       282       173       60.88       467       570         59.84       286       178       60.90       470       579         59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.94       306       208       61.00       489       627         59.96       310       214       59.98       60.00       318       226         60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.82     282     173     60.88     467     570       59.84     286     178     60.90     470     579       59.86     290     184     60.92     474     588       59.88     294     190     60.94     478     598       59.90     298     196     60.96     481     608       59.92     302     202     60.98     485     617       59.94     306     208     61.00     489     627       59.96     310     214       59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.84     286     178     60.90     470     579       59.86     290     184     60.92     474     588       59.88     294     190     60.94     478     598       59.90     298     196     60.96     481     608       59.92     302     202     60.98     485     617       59.94     306     208     61.00     489     627       59.96     310     214       59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.86       290       184       60.92       474       588         59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.94       306       208       61.00       489       627         59.96       310       214       59.98       314       220         60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.88       294       190       60.94       478       598         59.90       298       196       60.96       481       608         59.92       302       202       60.98       485       617         59.94       306       208       61.00       489       627         59.96       310       214       59.98       314       220         60.00       318       226       60.02       321       233  |                     |                    |                         |                     |                    |                         |
| 59.90     298     196     60.96     481     608       59.92     302     202     60.98     485     617       59.94     306     208     61.00     489     627       59.96     310     214     59.98     314     220       60.00     318     226     60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.92     302     202     60.98     485     617       59.94     306     208     61.00     489     627       59.96     310     214       59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.94     306     208     61.00     489     627       59.96     310     214       59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.96     310     214       59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         |                     |                    |                         |
| 59.98     314     220       60.00     318     226       60.02     321     233  |                     |                    |                         | 01.00               | 703                | 021                     |
| 60.00 318 226<br>60.02 321 233   |                     |                    |                         |                     |                    |                         |
| 60.02 321 233  |                     |                    |                         |                     |                    |                         |
|  |                     |                    |                         |                     |                    |                         |
|  |                     |                    |                         |                     |                    |                         |
|  |                     |                    |                         |                     |                    |                         |

### Stage-Area-Storage for Pond B1: bioretention system 1

| Elevation (feet)         Wetted (sq-ft)         Storage (cubic-feet)         Elevation (feet)         Wetted (sq-ft)         Storage (cubic-feet)           56.50         571         0         59.15         855         665           56.55         578         9         59.20         855         698           56.60         585         17         59.25         855         732           56.65         592         26         59.30         855         767           56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.15         663         111         59.80         855         1,188           57.20 |
|--|
| 56.50         571         0         59.15         855         665           56.55         578         9         59.20         855         698           56.60         585         17         59.25         855         732           56.65         592         26         59.30         855         767           56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,140           57.15         663         111         59.80         855         1,188           57.20         670         120         59.85         855<                           |
| 56.55         578         9         59.20         855         698           56.60         585         17         59.25         855         732           56.65         592         26         59.30         855         767           56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,140           57.15         663         111         59.80         855         1,188           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90                                    |
| 56.60         585         17         59.25         855         732           56.65         592         26         59.30         855         767           56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,238           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90                                |
| 56.65         592         26         59.30         855         767           56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,238           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90         855         1,342           57.30         685         137         59.95                             |
| 56.70         599         34         59.35         855         803           56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,188           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90         855         1,342           57.30         685         137         59.95         855         1,342  |
| 56.75         607         43         59.40         855         840           56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,238           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90         855         1,342           57.30         685         137         59.95         855         1,342   |
| 56.80         614         51         59.45         855         879           56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,188           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90         855         1,342           57.30         685         137         59.95         855         1,342  |
| 56.85         621         60         59.50         855         919           56.90         628         69         59.55         855         961           56.95         635         77         59.60         855         1,003           57.00         642         86         59.65         855         1,047           57.05         649         94         59.70         855         1,093           57.10         656         103         59.75         855         1,140           57.15         663         111         59.80         855         1,188           57.20         670         120         59.85         855         1,238           57.25         678         128         59.90         855         1,289           57.30         685         137         59.95         855         1,342   |
| 56.90       628       69       59.55       855       961         56.95       635       77       59.60       855       1,003         57.00       642       86       59.65       855       1,047         57.05       649       94       59.70       855       1,093         57.10       656       103       59.75       855       1,140         57.15       663       111       59.80       855       1,188         57.20       670       120       59.85       855       1,238         57.25       678       128       59.90       855       1,289         57.30       685       137       59.95       855       1,342  |
| 56.95     635     77     59.60     855     1,003       57.00     642     86     59.65     855     1,047       57.05     649     94     59.70     855     1,093       57.10     656     103     59.75     855     1,140       57.15     663     111     59.80     855     1,188       57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342   |
| 57.00     642     86     59.65     855     1,047       57.05     649     94     59.70     855     1,093       57.10     656     103     59.75     855     1,140       57.15     663     111     59.80     855     1,188       57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342  |
| 57.05     649     94     59.70     855     1,093       57.10     656     103     59.75     855     1,140       57.15     663     111     59.80     855     1,188       57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342   |
| 57.10     656     103     59.75     855     1,140       57.15     663     111     59.80     855     1,188       57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342  |
| 57.15     663     111     59.80     855     1,188       57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342  |
| 57.20     670     120     59.85     855     1,238       57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342  |
| 57.25     678     128     59.90     855     1,289       57.30     685     137     59.95     855     1,342  |
| 57.30 685 137 59.95 855 1,342  |
|  |
| E7 2E 600 146   60 00 0EE 4 006  |
| 57.35 692 146 60.00 855 1,396  |
| 57.40 699 154 60.05 855 1,453  |
| 57.45 706 163 60.10 855 1,511  |
| 57.50 713 171 60.15 855 1,573  |
| 57.55 720 180 60.20 855 1,637  |
| 57.60 727 188 60.25 855 1,703  |
| 57.65     734     197     60.30     855     1,772  |
| 57.70 741 206 60.35 855 1,844  |
| 57.75 749 214 60.40 855 1,919  |
| 57.80  |
| 57.85 763 231 60.50 855 2,077  |
| 57.90 770 240 60.55 855 2,161  |
| 57.95 777 248 60.60 855 2,247  |
| 58.00 784 257 60.65 855 2,337  |
| 58.05 791 266 60.70 855 2,429  |
| 58.10 798 274 60.75 855 2,525  |
| 58.15     805     283     60.80     855     2,624       58.20     812     291     60.85     855     2,727  |
| 58.20     812     291     60.85     855     2,727       58.25     820     300     60.90     855     2,832  |
| 58.30 827 308 60.95 855 2,942  |
| 58.35 834 317 61.00 855 <b>3,054</b>   |
| 58.40 841 325  |
| 58.45 848 334  |
| 58.50 <b>855</b> 343   |
| 58.55 855 361  |
| 58.60 855 381  |
| 58.65 855 402  |
| 58.70 855 423  |
| 58.75 855 446  |
| 58.80 855 469  |
| 58.85 855 494  |
| 58.90 855 520  |
| 58.95 855 547  |
| 59.00 855 575  |
| 59.05 855 604  |
| 59.10 855 634  |
| J  |

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## Stage-Discharge for Pond B1: bioretention system 1

| Clayation           | Discharge          | Discorded          | Drimon           | Flavation           | Discharge          | Discorded          | Drimon           |
|---------------------|--------------------|--------------------|------------------|---------------------|--------------------|--------------------|------------------|
| Elevation<br>(feet) | Discharge<br>(cfs) | Discarded<br>(cfs) | Primary<br>(cfs) | Elevation<br>(feet) | Discharge<br>(cfs) | Discarded<br>(cfs) | Primary<br>(cfs) |
| 56.50               | 0.00               | 0.00               | 0.00             | 59.15               | 0.04               | 0.04               | 0.00             |
| 56.55               | 0.00               | 0.00               | 0.00             | 59.20               | 0.04               | 0.04               | 0.00             |
| 56.60               | 0.01               | 0.01               | 0.00             | 59.25               | 0.04               | 0.04               | 0.00             |
| 56.65               | 0.01               | 0.01               | 0.00             | 59.30               | 0.04               | 0.04               | 0.00             |
| 56.70               | 0.01               | 0.01               | 0.00             | 59.35               | 0.04               | 0.04               | 0.00             |
| 56.75               | 0.01               | 0.01               | 0.00             | 59.40               | 0.04               | 0.04               | 0.00             |
| 56.80               | 0.01               | 0.01               | 0.00             | 59.45               | 0.04               | 0.04               | 0.00             |
| 56.85               | 0.01               | 0.01               | 0.00             | 59.50               | 0.04               | 0.04               | 0.00             |
| 56.90               | 0.01               | 0.01               | 0.00             | 59.55               | 0.04               | 0.04               | 0.00             |
| 56.95               | 0.01               | 0.01               | 0.00             | 59.60               | 0.04               | 0.04               | 0.00             |
| 57.00               | 0.01               | 0.01               | 0.00             | 59.65               | 0.04               | 0.04               | 0.00             |
| 57.05               | 0.02               | 0.02               | 0.00             | 59.70               | 0.04               | 0.04               | 0.00             |
| 57.10               | 0.02               | 0.02               | 0.00             | 59.75               | 0.04               | 0.04               | 0.00             |
| 57.15               | 0.02               | 0.02               | 0.00             | 59.80               | 0.04               | 0.04               | 0.00             |
| 57.20               | 0.02               | 0.02               | 0.00             | 59.85               | 0.04               | 0.04               | 0.00             |
| 57.25               | 0.02               | 0.02               | 0.00             | 59.90               | 0.04               | 0.04               | 0.00             |
| 57.30               | 0.02               | 0.02               | 0.00             | 59.95               | 0.05               | 0.05               | 0.00             |
| 57.35               | 0.02               | 0.02               | 0.00             | 60.00               | 0.05               | 0.05               | 0.00             |
| 57.40               | 0.02               | 0.02               | 0.00             | 60.05               | 0.05               | 0.05               | 0.00             |
| 57.45               | 0.02               | 0.02               | 0.00             | 60.10               | 0.05               | 0.05               | 0.00             |
| 57.50               | 0.02               | 0.02               | 0.00             | 60.15               | 0.05               | 0.05               | 0.00             |
| 57.55               | 0.02               | 0.02               | 0.00             | 60.20               | 0.05               | 0.05               | 0.00             |
| 57.60               | 0.02               | 0.02               | 0.00             | 60.25               | 0.05               | 0.05               | 0.00             |
| 57.65               | 0.02               | 0.02               | 0.00             | 60.30               | 0.05               | 0.05               | 0.00             |
| 57.70               | 0.02               | 0.02               | 0.00             | 60.35               | 0.05               | 0.05               | 0.00             |
| 57.75               | 0.02               | 0.02               | 0.00             | 60.40               | 0.05               | 0.05               | 0.00             |
| 57.80               | 0.02               | 0.02               | 0.00             | 60.45               | 0.05               | 0.05               | 0.00             |
| 57.85               | 0.02               | 0.02               | 0.00             | 60.50               | 0.05               | 0.05               | 0.00             |
| 57.90               | 0.02               | 0.02               | 0.00             | 60.55               | 0.05               | 0.05               | 0.00             |
| 57.95               | 0.02               | 0.02               | 0.00             | 60.60               | 0.05               | 0.05               | 0.00             |
| 58.00               | 0.03               | 0.03               | 0.00             | 60.65               | 0.05               | 0.05               | 0.00             |
| 58.05               | 0.03               | 0.03               | 0.00             | 60.70               | 0.05               | 0.05               | 0.00             |
| 58.10<br>58.15      | 0.03<br>0.03       | 0.03<br>0.03       | 0.00<br>0.00     | 60.75<br>60.80      | 0.16<br>0.35       | 0.05<br>0.05       | 0.10<br>0.30     |
| 58.20               | 0.03               | 0.03               | 0.00             | 60.85               | 0.60               | 0.05               | 0.50             |
| 58.25               | 0.03               | 0.03               | 0.00             | 60.90               | 0.89               | 0.05               | 0.84             |
| 58.30               | 0.03               | 0.03               | 0.00             | 60.95               | 1.24               | 0.05               | 1.19             |
| 58.35               | 0.03               | 0.03               | 0.00             | 61.00               | 1.65               | 0.06               | 1.59             |
| 58.40               | 0.03               | 0.03               | 0.00             | 01.00               | 1.00               | 0.00               | 1.00             |
| 58.45               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.50               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.55               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.60               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.65               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.70               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.75               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.80               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.85               | 0.03               | 0.03               | 0.00             |                     |                    |                    |                  |
| 58.90               | 0.04               | 0.04               | 0.00             |                     |                    |                    |                  |
| 58.95               | 0.04               | 0.04               | 0.00             |                     |                    |                    |                  |
| 59.00               | 0.04               | 0.04               | 0.00             |                     |                    |                    |                  |
| 59.05               | 0.04               | 0.04               | 0.00             |                     |                    |                    |                  |
| 59.10               | 0.04               | 0.04               | 0.00             |                     |                    |                    |                  |
|                     |                    |                    | '                |                     |                    |                    |                  |



# BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: Bioretention System 2

Enter the node name in the drainage analysis if applicable.

|               | Effice the flode flame in the draifiage analysis if applicable.            |                       |
|---------------|--|-----------------------|
| 0.10 ac       | A = Area draining to the practice  |                       |
| 0.10 ac       | A <sub>I</sub> = Impervious area draining to the practice                  |                       |
| 1.00 dec      | imal I = Percent impervious area draining to the practice, in decimal form |                       |
| 0.95 unit     | Rv = Runoff coefficient = 0.05 + (0.9 x I)                                 |                       |
| 0.09 ac-i     | m WQV= 1" x Rv x A   |                       |
| 338 cf        | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")                            |                       |
| 34 cf         | 10% x WQV (check calc for sediment forebay)                                |                       |
| 84 cf         | 25% x WQV (check calc for water stored in saturated zone)                  |                       |
| Sediment Fore | ebay Method of Pretreatment  |                       |
| 50 cf         | If pretrt is sed forebay: V <sub>SED</sub> (sediment forebay volume)       | ≥ 10%WQV              |
| 425 cf        | Volume below lowest orifice <sup>1</sup>                                   | ≥ 100%WQV             |
| 155 cf        | Water stored in voids of saturated zone                                    | ≥ 26%WQV              |
| 0.01 cfs      | 2Q <sub>avg</sub> = 2* WQV / 24 hrs * (1hr / 3600 sec) <sup>2</sup>        |                       |
| 60.40 ft      | E <sub>WQV</sub> = Elevation of WQV (attach stage-storage table)           |                       |
| 0.02 cfs      | $Q_{WQV}$ = Discharge at the $E_{WQV}$ (attach stage-discharge table)      | < 2Q <sub>wqv</sub>   |
| 9.39 hou      | $T_{ED}$ = Drawdown time of extended detention = $2WQV/Q_{WQV}$            | ≥ 24-hrs              |
| 24.00 in      | Depth of Filter Media  | <u>≥</u> 18"          |
| 3.00 :1       | Pond side slopes   | <u>&gt;</u> 3:1       |
|               | What mechanism is proposed to prevent the outlet structure from clo        | gging (applicable for |
| N/A           | orifices/weirs with a dimension of $\leq$ 6")?                             |                       |
| 60.88 ft      | Peak elevation of the 50-year storm event ( $E_{50}$ )                     |                       |
| 61.00 ft      | Berm elevation of the pond   |                       |
| YES           | $E_{50} \le $ the berm elevation?  | ← yes                 |
|               |  |                       |

<sup>1.</sup> Volume stored above the wetland soil and below the high flow by-pass.

| Designer's Notes: |  |  |  |
|-------------------|--|--|--|
|                   |  |  |  |
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|                   |  |  |  |
|                   |  |  |  |

Last Revised: Sept 2020

## Stage-Area-Storage for Pond FB2: sediment forebay

| Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) | Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 59.50               | 1                  | 0                       | 60.03               | 30                 | 7                       |
| 59.51               | 1                  | Ő                       | 60.04               | 31                 | 7                       |
| 59.52               | 1                  | Ő                       | 60.05               | 31                 | 7                       |
| 59.53               | 2                  | 0                       | 60.06               | 32                 | 8                       |
| 59.54               | 2                  | 0                       | 60.07               | 33                 | 8                       |
|                     |                    |                         |                     |                    |                         |
| 59.55<br>50.56      | 2<br>2             | 0                       | 60.08               | 33                 | 8                       |
| 59.56               | 2                  | 0                       | 60.09               | 34                 | 9                       |
| 59.57               | 3                  | 0                       | 60.10               | 35                 | 9                       |
| 59.58               | 3                  | 0                       | 60.11               | 36                 | 9                       |
| 59.59               | 3                  | 0                       | 60.12               | 36                 | 10                      |
| 59.60               | 3                  | 0                       | 60.13               | 37                 | 10                      |
| 59.61               | 4                  | 0                       | 60.14               | 38                 | 10                      |
| 59.62               | 4                  | 0                       | 60.15               | 39                 | 11                      |
| 59.63               | 4                  | 0                       | 60.16               | 39                 | 11                      |
| 59.64               | 5                  | 0                       | 60.17               | 40                 | 11                      |
| 59.65               | 5                  | 0                       | 60.18               | 41                 | 12                      |
| 59.66               | 6                  | 0                       | 60.19               | 42                 | 12                      |
| 59.67               | 6                  | 1                       | 60.20               | 42                 | 13                      |
| 59.68               | 6                  | 1                       | 60.21               | 43                 | 13                      |
| 59.69               | 7                  | 1                       | 60.22               | 44                 | 14                      |
| 59.70               | 7                  | 1                       | 60.23               | 45                 | 14                      |
| 59.71               | 8                  | 1                       | 60.24               | 46                 | 14                      |
| 59.72               | 8                  | 1                       | 60.25               | 46                 | 15                      |
| 59.73               | 9                  | 1                       | 60.26               | 47                 | 15                      |
| 59.74               | 9                  | 1                       | 60.27               | 48                 | 16                      |
| 59.75               | 10                 | 1                       | 60.28               | 49                 | 16                      |
| 59.76               | 10                 | 1                       | 60.29               | 50                 | 17                      |
| 59.77               | 11                 | 1                       | 60.30               | 51                 | 17                      |
| 59.78               | 12                 | 1                       | 60.31               | 52                 | 18                      |
| 59.79               | 12                 | 2                       | 60.32               | 53                 | 18                      |
| 59.80               | 13                 | 2                       | 60.33               | 53                 | 19                      |
| 59.81               | 13                 | 2                       | 60.34               | 54                 | 19                      |
| 59.82               | 14                 | 2                       | 60.35               | 55                 | 20                      |
| 59.83               | 15                 | 2                       | 60.36               | 56                 | 21                      |
| 59.84               | 15                 | 2                       | 60.37               | 57                 | 21                      |
| 59.85               | 16                 | 2                       | 60.38               | 58                 | 22                      |
| 59.86               | 17                 | 3                       | 60.39               | 59                 | 22                      |
| 59.87               | 17                 | 3                       | 60.40               | 60                 | 23                      |
| 59.88               | 18                 | 3                       | 60.41               | 61                 | 23                      |
| 59.89               | 19                 | 3                       | 60.42               | 62                 | 24                      |
| 59.90               | 20                 | 3                       | 60.43               | 63                 | 25                      |
| 59.91               | 20                 | 4                       | 60.44               | 64                 | 25                      |
| 59.92               | 21                 | 4                       | 60.45               | 65                 | 26                      |
| 59.93               | 22                 | 4                       | 60.46               | 66                 | 27                      |
| 59.94               | 23                 | 4                       | 60.47               | 67                 | 27                      |
| 59.95               | 24                 | 4                       | 60.48               | 68                 | 28                      |
| 59.96<br>59.96      | 24<br>24           | 5                       | 60.49               | 69                 | 29                      |
| 59.97               | 25<br>25           | 5                       | 60.50               | 70                 | 29<br>29                |
| 59.98               | 26<br>26           | 5<br>5                  | 60.51               | 70<br>71           | 30                      |
| 59.99<br>59.99      | 20<br>27           | 5<br>5                  | 60.52               | 71                 | 31                      |
| 60.00               | 27<br>28           | 6                       |                     | 72                 | 31                      |
|                     | 26<br>29           | 6                       | 60.53               | 73<br>74           | 32                      |
| 60.01               | 29<br>29           | 6                       | 60.54<br>60.55      | 74<br>75           |                         |
| 60.02               | 29                 | Ö                       | 60.55               | 75                 | 33                      |
|                     |                    |                         | •                   |                    |                         |

### Stage-Area-Storage for Pond FB2: sediment forebay (continued)

| Elevation | Surface | Storage      |
|-----------|---------|--------------|
| (feet)    | (sq-ft) | (cubic-feet) |
| 60.56     | 76      | 34           |
| 60.57     | 77      | 34           |
| 60.58     | 78      | 35           |
| 60.59     | 79      | 36           |
| 60.60     | 80      | 37           |
| 60.61     | 81      | 38           |
| 60.62     | 82      | 38           |
| 60.63     | 84      | 39           |
| 60.64     | 85      | 40           |
| 60.65     | 86      | 41           |
| 60.66     | 87      | 42           |
| 60.67     | 88      | 43           |
| 60.68     | 89      | 44           |
| 60.69     | 90      | 45           |
| 60.70     | 92      | 45           |
| 60.71     | 93      | 46           |
| 60.72     | 94      | 47           |
| 60.73     | 95      | 48           |
| 60.74     | 96      | 49<br>50     |
| 60.75     | 97      | 50           |
| 60.76     | 99      | 51           |
| 60.77     | 100     | 52           |
| 60.78     | 101     | 53           |
| 60.79     | 102     | 54           |
| 60.80     | 104     | 55           |
| 60.81     | 105     | 56           |
| 60.82     | 106     | 57           |
| 60.83     | 107     | 58           |
| 60.84     | 109     | 59           |
| 60.85     | 110     | 61           |
| 60.86     | 111     | 62           |
| 60.87     | 113     | 63           |
| 60.88     | 114     | 64           |
| 60.89     | 115     | 65           |
| 60.90     | 116     | 66           |
| 60.91     | 118     | 67           |
| 60.92     | 119     | 69           |
| 60.93     | 120     | 70           |
| 60.94     | 122     | 71           |
| 60.95     | 123     | 72           |
| 60.96     | 124     | 73           |
| 60.97     | 126     | 75           |
| 60.98     | 127     | 76           |
| 60.99     | 129     | 77           |
| 61.00     | 130     | 78           |

### Stage-Area-Storage for Pond B2: bioretention system 2

| Elevation      | Wetted     | Storage      | Elevation      | Wetted     | Storage      |
|----------------|------------|--------------|----------------|------------|--------------|
| (feet)         | (sq-ft)    | (cubic-feet) | (feet)         | (sq-ft)    | (cubic-feet) |
| 57.50          | 258        | 0            | 60.15          | 486        | 284          |
| 57.55<br>57.60 | 264<br>269 | 4<br>8       | 60.20<br>60.25 | 486<br>486 | 300<br>318   |
| 57.60<br>57.65 | 209<br>275 | 12           | 60.25          | 486<br>486 | 337          |
| 57.03<br>57.70 | 281        | 15           | 60.35          | 486        | 357<br>357   |
| 57.75          | 287        | 19           | 60.40          | 486        | 378          |
| 57.73<br>57.80 | 292        | 23           | 60.45          | 486        | 401          |
| 57.85          | 298        | 27           | 60.50          | 486        | 425          |
| 57.90          | 304        | 31           | 60.55          | 486        | 450          |
| 57.95          | 309        | 35           | 60.60          | 486        | 476          |
| 58.00          | 315        | 39           | 60.65          | 486        | 504          |
| 58.05          | 321        | 43           | 60.70          | 486        | 534          |
| 58.10          | 326        | 46           | 60.75          | 486        | 565          |
| 58.15          | 332        | 50           | 60.80          | 486        | 597          |
| 58.20          | 338        | 54           | 60.85          | 486        | 631          |
| 58.25          | 344        | 58           | 60.90          | 486        | 667          |
| 58.30          | 349        | 62           | 60.95          | 486        | 704          |
| 58.35          | 355        | 66<br>70     | 61.00          | 486        | 743          |
| 58.40<br>58.45 | 361<br>366 | 70<br>74     | 61.05<br>61.10 | 486<br>486 | 743<br>743   |
| 58.50          | 372        | 74<br>77     | 61.15          | 486        | 743<br>743   |
| 58.55          | 378        | 81           | 61.20          | 486        | 743          |
| 58.60          | 383        | 85           | 61.25          | 486        | 743          |
| 58.65          | 389        | 89           | 61.30          | 486        | 743          |
| 58.70          | 395        | 93           | 61.35          | 486        | 743          |
| 58.75          | 401        | 97           | 61.40          | 486        | 743          |
| 58.80          | 406        | 101          | 61.45          | 486        | 743          |
| 58.85          | 412        | 104          | 61.50          | 486        | 743          |
| 58.90          | 418        | 108          | 61.55          | 486        | 743          |
| 58.95          | 423        | 112          | 61.60          | 486        | 743          |
| 59.00          | 429        | 116          | 61.65          | 486        | 743          |
| 59.05<br>59.10 | 435<br>440 | 120<br>124   | 61.70<br>61.75 | 486<br>486 | 743<br>743   |
| 59.15<br>59.15 | 446        | 124          | 01.75          | 400        | 743          |
| 59.20          | 452        | 132          |                |            |              |
| 59.25          | 458        | 135          |                |            |              |
| 59.30          | 463        | 139          |                |            |              |
| 59.35          | 469        | 143          |                |            |              |
| 59.40          | 475        | 147          |                |            |              |
| 59.45          | 480        | 151          |                |            |              |
| 59.50          | 486        | 155          |                |            |              |
| 59.55          | 486        | 160          |                |            |              |
| 59.60          | 486        | 166          |                |            |              |
| 59.65          | 486        | 172          |                |            |              |
| 59.70<br>59.75 | 486<br>486 | 180<br>188   |                |            |              |
| 59.75<br>59.80 | 486<br>486 | 197          |                |            |              |
| 59.85          | 486        | 206          |                |            |              |
| 59.90          | 486        | 217          |                |            |              |
| 59.95          | 486        | 228          |                |            |              |
| 60.00          | 486        | 241          |                |            |              |
| 60.05          | 486        | 254          |                |            |              |
| 60.10          | 486        | 268          |                |            |              |
|                |            |              | 1              |            |              |

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## Stage-Discharge for Pond B2: bioretention system 2

| Elevation      | Discharge    | Discarded    | Primary      | Elevation      | Discharge           | Discarded           | Primary             |
|----------------|--------------|--------------|--------------|----------------|---------------------|---------------------|---------------------|
| (feet)         | (cfs)        | (cfs)        | (cfs)        | (feet)         | (cfs)               | (cfs)               | (cfs)               |
| 57.50          | 0.00         | 0.00         | 0.00         | 60.15          | 0.02                | 0.02                | 0.00                |
| 57.55          | 0.00         | 0.00         | 0.00         | 60.20          | 0.02                | 0.02                | 0.00                |
| 57.60          | 0.00         | 0.00         | 0.00         | 60.25          | 0.02                | 0.02                | 0.00                |
| 57.65          | 0.00         | 0.00         | 0.00         | 60.30          | 0.02                | 0.02                | 0.00                |
| 57.70          | 0.01         | 0.01         | 0.00         | 60.35          | 0.02                | 0.02                | 0.00                |
| 57.75          | 0.01         | 0.01         | 0.00         | 60.40          | 0.02                | 0.02                | 0.00                |
| 57.80          | 0.01         | 0.01         | 0.00         | 60.45          | 0.02                | 0.02                | 0.00                |
| 57.85          | 0.01         | 0.01         | 0.00         | 60.50          | 0.02                | 0.02                | 0.00                |
| 57.90          | 0.01         | 0.01         | 0.00         | 60.55          | 0.03                | 0.02                | 0.01                |
| 57.95          | 0.01         | 0.01         | 0.00         | 60.60          | 0.07                | 0.02                | 0.05                |
| 58.00          | 0.01         | 0.01         | 0.00         | 60.65          | 0.13                | 0.02                | 0.11                |
| 58.05          | 0.01         | 0.01         | 0.00         | 60.70          | 0.21                | 0.02                | 0.19                |
| 58.10          | 0.01         | 0.01         | 0.00         | 60.75          | 0.31                | 0.02                | 0.30                |
| 58.15          | 0.01         | 0.01         | 0.00         | 60.80          | 0.44                | 0.02                | 0.42                |
| 58.20          | 0.01         | 0.01         | 0.00         | 60.85          | 0.58                | 0.02                | 0.57                |
| 58.25          | 0.01         | 0.01         | 0.00         | 60.90          | 0.75                | 0.02                | 0.73                |
| 58.30          | 0.01         | 0.01         | 0.00         | 60.95          | 0.93                | 0.02                | 0.91                |
| 58.35          | 0.01         | 0.01         | 0.00         | 61.00          | 1.12                | 0.02                | 1.10                |
| 58.40          | 0.01         | 0.01         | 0.00         | 61.05          | 1.33                | 0.02                | 1.31                |
| 58.45          | 0.01         | 0.01         | 0.00         | 61.10          | 1.55                | 0.02                | 1.54                |
| 58.50          | 0.01         | 0.01         | 0.00         | 61.15          | 1.79                | 0.02                | 1.77                |
| 58.55          | 0.01         | 0.01         | 0.00         | 61.20          | 1.86                | 0.02                | 1.84                |
| 58.60          | 0.01         | 0.01         | 0.00         | 61.25          | 1.87                | 0.02                | 1.85                |
| 58.65          | 0.01         | 0.01         | 0.00         | 61.30          | 1.89                | 0.02                | 1.87                |
| 58.70          | 0.01         | 0.01         | 0.00         | 61.35          | 1.90                | 0.02                | 1.88                |
| 58.75          | 0.01         | 0.01         | 0.00         | 61.40          | 1.92                | 0.02                | 1.90                |
| 58.80          | 0.01         | 0.01         | 0.00         | 61.45          | 1.93                | 0.02                | 1.91                |
| 58.85          | 0.01         | 0.01         | 0.00         | 61.50          | 1.95                | 0.02                | 1.93                |
| 58.90          | 0.01         | 0.01         | 0.00         | 61.55          | 1.96                | 0.02                | 1.94                |
| 58.95          | 0.01         | 0.01         | 0.00         | 61.60          | 1.97                | 0.02                | 1.95                |
| 59.00          | 0.01         | 0.01         | 0.00         | 61.65          | 1.99                | 0.02                | 1.97                |
| 59.05<br>59.10 | 0.01<br>0.01 | 0.01<br>0.01 | 0.00<br>0.00 | 61.70<br>61.75 | 2.00<br><b>2.02</b> | 0.02<br><b>0.02</b> | 1.98<br><b>2.00</b> |
| 59.10          | 0.01         | 0.01         | 0.00         | 01.75          | 2.02                | 0.02                | 2.00                |
| 59.13          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.25          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.30          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.35          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.40          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.45          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.50          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.55          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.60          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.65          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.70          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.75          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.80          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.85          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.90          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 59.95          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 60.00          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 60.05          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |
| 60.10          | 0.01         | 0.01         | 0.00         |                |                     |                     |                     |



# BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: Bioretention System 3

Enter the node name in the drainage analysis if applicable.

|          |          | Enter the node name in the dramage analysis it applicable.            |                        |
|----------|----------|---|------------------------|
| 0.57     |          | A = Area draining to the practice                                     |                        |
| 0.37     | ac       | A <sub>I</sub> = Impervious area draining to the practice             |                        |
| 0.65     | decimal  | I = Percent impervious area draining to the practice, in decimal form |                        |
| 0.64     | unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I)                            |                        |
| 0.36     | ac-in    | WQV= 1" x Rv x A  |                        |
| 1,324    | cf       | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")                       |                        |
| 132      | cf       | 10% x WQV (check calc for sediment forebay)                           |                        |
| 331      | cf       | 25% x WQV (check calc for water stored in saturated zone)             |                        |
| Sediment | Forebay  | Method of Pretreatment  |                        |
| 198      | cf       | If pretrt is sed forebay: V <sub>SED</sub> (sediment forebay volume)  | ≥ 10%WQV               |
| 5,898    | cf       | Volume below lowest orifice <sup>1</sup>                              | ≥ 100%WQV              |
| 983      | cf       | Water stored in voids of saturated zone                               | ≥ 26%WQV               |
| 0.03     | cfs      | $2Q_{avg} = 2*WQV / 24 hrs * (1hr / 3600 sec)^2$                      |                        |
| 59.20    | ft       | E <sub>WQV</sub> = Elevation of WQV (attach stage-storage table)      |                        |
| 0.08     | cfs      | $Q_{WQV}$ = Discharge at the $E_{WQV}$ (attach stage-discharge table) | < 2Q <sub>wqv</sub>    |
| 9.19     | hours    | $T_{ED}$ = Drawdown time of extended detention = 2WQV/ $Q_{WQV}$      | <u>&gt;</u> 24-hrs     |
| 24.00    | in       | Depth of Filter Media   | <u>&gt;</u> 18"        |
| 3.00     | :1       | Pond side slopes  | <u>&gt;</u> 3:1        |
|          |          | What mechanism is proposed to prevent the outlet structure from clo   | ogging (applicable for |
| N/       | /A       | orifices/weirs with a dimension of $\leq 6$ ")?                       |                        |
| 60.97    | ft       | Peak elevation of the 50-year storm event (E <sub>50</sub> )          |                        |
| 61.00    | ft       | Berm elevation of the pond  |                        |
| YES      |          | $E_{50} \le the berm elevation?$                                      | ← yes                  |
|          |          |   |                        |

<sup>1.</sup> Volume stored above the wetland soil and below the high flow by-pass.

| Designer's Notes: |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|
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### Stage-Area-Storage for Pond FB3: sediment forebay

| Elevation      | Surface           | Storage           | Elevation      | Surface    | Storage      |
|----------------|-------------------|-------------------|----------------|------------|--------------|
| (feet)         | (sq-ft)           | (cubic-feet)      | (feet)         | (sq-ft)    | (cubic-feet) |
| 59.00          | 340               | 0                 | 60.06          | 586        | 457          |
| 59.02          | 344               | 7                 | 60.08          | 586        | 457          |
| 59.04          | 349               | 14                | 60.10          | 586        | 457          |
| 59.06          | 353               | 21                | 60.12          | 586        | 457          |
| 59.08          | 357               | 28                | 60.14          | 586        | 457          |
| 59.10          | 362               | 35                | 60.16          | 586        | 457          |
| 59.12          | 366               | 42                | 60.18          | 586        | 457          |
| 59.14          | 370               | 50                | 60.20          | 586        | 457          |
| 59.16          | 375               | 57                | 60.22          | 586        | 457          |
| 59.18          | 379               | 65                | 60.24          | 586        | 457          |
| 59.20          | 384               | 72                | 60.26          | 586        | 457          |
| 59.22          | 388               | 80                | 60.28          | 586        | 457          |
| 59.24          | 393               | 88                | 60.30          | 586        | 457          |
| 59.26          | 398               | 96                | 60.32          | 586        | 457          |
| 59.28          | 402               | 104               | 60.34          | 586        | 457          |
| 59.30          | 407               | 112               | 60.36          | 586        | 457          |
| 59.32          | 411               | 120               | 60.38          | 586        | 457          |
| 59.34          | 416               | 128               | 60.40          | 586        | 457<br>457   |
| 59.36          | 421               | 137               | 60.42          | 586        | 457<br>457   |
| 59.38          | 426               | 145               | 60.44<br>60.46 | 586        | 457<br>457   |
| 59.40<br>59.42 | 430<br>435        | 154<br>162        | 60.48          | 586        | 457<br>457   |
| 59.42<br>59.44 | 435<br>440        | 171               | 60.50          | 586<br>586 | 457<br>457   |
| 59.44<br>59.46 | 445               | 180               | 60.52          | 586        | 457<br>457   |
| 59.48          | 450               | 189               | 60.54          | 586        | 457<br>457   |
| 59.50          | 455               | 198               | 60.56          | 586        | 457<br>457   |
| 59.52          | 460               | 207               | 60.58          | 586        | 457          |
| 59.54          | 465               | 216               | 60.60          | 586        | 457          |
| 59.56          | 470               | 226               | 60.62          | 586        | 457          |
| 59.58          | 475               | 235               | 60.64          | 586        | 457          |
| 59.60          | 480               | 245               | 60.66          | 586        | 457          |
| 59.62          | 485               | 254               | 60.68          | 586        | 457          |
| 59.64          | 490               | 264               | 60.70          | 586        | 457          |
| 59.66          | 495               | 274               | 60.72          | 586        | 457          |
| 59.68          | 500               | 284               | 60.74          | 586        | 457          |
| 59.70          | 505               | 294               | 60.76          | 586        | 457          |
| 59.72          | 510               | 304               | 60.78          | 586        | 457          |
| 59.74          | 516               | 314               | 60.80          | 586        | 457          |
| 59.76          | 521               | 325               | 60.82          | 586        | 457          |
| 59.78          | 526               | 335               | 60.84          | 586        | 457          |
| 59.80          | 531               | 346               | 60.86          | 586        | 457          |
| 59.82          | 537               | 356               | 60.88          | 586        | 457          |
| 59.84          | 542               | 367               | 60.90          | 586        | 457          |
| 59.86          | 548               | 378               | 60.92          | 586        | 457          |
| 59.88          | 553               | 389               | 60.94          | 586        | 457          |
| 59.90          | 558               | 400               | 60.96          | 586        | 457          |
| 59.92          | 564               | 411               | 60.98          | 586        | 457          |
| 59.94          | 569               | 423               | 61.00          | 586        | 457          |
| 59.96          | 575               | 434               |                |            |              |
| 59.98          | 580               | 446<br>457        |                |            |              |
| 60.00<br>60.02 | <b>586</b><br>586 | <b>457</b><br>457 |                |            |              |
| 60.02          | 586               | 457<br>457        |                |            |              |
| 00.04          | 300               | 437               |                |            |              |

## Stage-Area-Storage for Pond B3: bioretention system 3

| Elevation      | Wetted         | Storage        | Elevation      | Wetted         | Storage        |
|----------------|----------------|----------------|----------------|----------------|----------------|
| (feet)         | (sq-ft)        | (cubic-feet)   | (feet)         | (sq-ft)        | (cubic-feet)   |
| 57.00          | 1,639          | 0              | 59.65          | 2,007          | 2,235          |
| 57.05          | 1,648          | 25             | 59.70          | 2,007          | 2,347          |
| 57.10          | 1,657          | 49             | 59.75          | 2,007          | 2,462          |
| 57.15          | 1,667          | 74             | 59.80          | 2,007          | 2,580          |
| 57.20          | 1,676          | 98             | 59.85          | 2,007          | 2,700          |
| 57.25          | 1,685          | 123            | 59.90          | 2,007          | 2,822          |
| 57.30          | 1,694          | 148            | 59.95          | 2,007          | 2,947          |
| 57.35          | 1,703          | 172            | 60.00          | 2,007          | 3,075          |
| 57.40          | 1,713          | 197            | 60.05          | 2,007          | 3,207          |
| 57.45          | 1,722          | 221            | 60.10          | 2,007          | 3,344          |
| 57.50          | 1,731          | 246            | 60.15          | 2,007          | 3,487          |
| 57.55          | 1,740          | 270            | 60.20          | 2,007          | 3,635          |
| 57.60          | 1,749          | 295            | 60.25          | 2,007          | 3,789          |
| 57.65          | 1,759          | 320            | 60.30          | 2,007          | 3,949          |
| 57.70          | 1,768          | 344            | 60.35          | 2,007          | 4,115          |
| 57.75<br>57.80 | 1,777          | 369            | 60.40          | 2,007          | 4,287          |
| 57.80          | 1,786          | 393            | 60.45          | 2,007          | 4,466          |
| 57.85<br>57.00 | 1,795          | 418<br>443     | 60.50<br>60.55 | 2,007<br>2,007 | 4,650          |
| 57.90<br>57.95 | 1,805<br>1,814 | 467            | 60.60          | •              | 4,842<br>5,030 |
| 58.00          |                | 492            | 60.65          | 2,007<br>2,007 | 5,039<br>5,244 |
| 58.05          | 1,823<br>1,832 | 516            | 60.70          | 2,007          | 5,244<br>5,455 |
| 58.10          | 1,841          | 541            | 60.75          | 2,007          | 5,433<br>5,673 |
| 58.15          | 1,851          | 565            | 60.80          | 2,007          | 5,898          |
| 58.20          | 1,860          | 590            | 60.85          | 2,007          | 6,130          |
| 58.25          | 1,869          | 615            | 60.90          | 2,007          | 6,369          |
| 58.30          | 1,878          | 639            | 60.95          | 2,007          | 6,616          |
| 58.35          | 1,887          | 664            | 61.00          | 2,007          | 6,870          |
| 58.40          | 1,897          | 688            | 01.00          | 2,001          | 0,070          |
| 58.45          | 1,906          | 713            |                |                |                |
| 58.50          | 1,915          | 738            |                |                |                |
| 58.55          | 1,924          | 762            |                |                |                |
| 58.60          | 1,933          | 787            |                |                |                |
| 58.65          | 1,943          | 811            |                |                |                |
| 58.70          | 1,952          | 836            |                |                |                |
| 58.75          | 1,961          | 860            |                |                |                |
| 58.80          | 1,970          | 885            |                |                |                |
| 58.85          | 1,979          | 910            |                |                |                |
| 58.90          | 1,989          | 934            |                |                |                |
| 58.95          | 1,998          | 959            |                |                |                |
| 59.00          | 2,007          | 983            |                |                |                |
| 59.05          | 2,007          | 1,066          |                |                |                |
| 59.10          | 2,007          | 1,152          |                |                |                |
| 59.15          | 2,007          | 1,239          |                |                |                |
| 59.20          | 2,007          | 1,328          |                |                |                |
| 59.25          | 2,007          | 1,420          |                |                |                |
| 59.30          | 2,007          | 1,514          |                |                |                |
| 59.35<br>50.40 | 2,007          | 1,610          |                |                |                |
| 59.40<br>50.45 | 2,007          | 1,708          |                |                |                |
| 59.45          | 2,007          | 1,809          |                |                |                |
| 59.50<br>59.55 | 2,007<br>2,007 | 1,912<br>2,017 |                |                |                |
|                |                |                |                |                |                |
| 59.60          | 2,007          | 2,125          |                |                |                |

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## Stage-Discharge for Pond B3: bioretention system 3

| (feet)   (cfs)   (cf | Elevation | Discharge | Discarded | Primary | Elevation | Discharge | Discarded | Primary |
|--|-----------|-----------|-----------|---------|-----------|-----------|-----------|---------|
| 57.05         0.03         0.03         0.00         59.70         0.09         0.09         0.00           57.15         0.03         0.03         0.00         59.75         0.09         0.09         0.00           57.25         0.03         0.03         0.00         59.85         0.09         0.09         0.00           57.25         0.03         0.03         0.00         59.95         0.09         0.09         0.00           57.35         0.03         0.03         0.00         60.00         0.99         0.09         0.00           57.35         0.03         0.03         0.00         60.00         0.99         0.09         0.00           57.40         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.50         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.75         0.04 <td>(feet)</td> <td>(cfs)</td> <td>(cfs)</td> <td>(cfs)</td> <td>(feet)</td> <td>(cfs)</td> <td>(cfs)</td> <td>(cfs)</td>  | (feet)    | (cfs)     | (cfs)     | (cfs)   | (feet)    | (cfs)     | (cfs)     | (cfs)   |
| 57.10         0.03         0.03         0.00         59.75         0.09         0.09         0.00           57.15         0.03         0.03         0.00         59.80         0.09         0.09         0.00           57.25         0.03         0.03         0.00         59.90         0.09         0.09         0.00           57.35         0.03         0.03         0.00         60.00         0.09         0.09         0.00           57.40         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.15         0.10         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.15         0.10         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75 <td>57.00</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>59.65</td> <td>0.09</td> <td>0.09</td> <td>0.00</td>  | 57.00     | 0.00      | 0.00      | 0.00    | 59.65     | 0.09      | 0.09      | 0.00    |
| 57.15         0.03         0.03         0.00         59.80         0.09         0.09         0.00           57.25         0.03         0.03         0.00         59.85         0.09         0.09         0.00           57.35         0.03         0.03         0.00         59.95         0.09         0.09         0.00           57.40         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.10         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.85         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.85         0.04         0.04 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.20         0.03         0.03         0.00         \$9.90         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.09         0.00         57.30         0.03         0.03         0.00         59.95         0.09         0.09         0.00         57.35         0.04         0.04         0.00         60.00         0.09         0.09         0.00         57.40         0.04         0.04         0.00         60.00         0.09         0.09         0.00         57.40         0.04         0.04         0.00         60.10         0.10         0.10         0.10         0.00         57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.10         0.00         57.55         0.04         0.04         0.00         60.15         0.10         0.10         0.00         57.55         0.04         0.04         0.00         60.15         0.10         0.10         0.00         57.55         0.04         0.04         0.00         60.25         0.10         0.10         0.00         57.55         0.04         0.04         0.00         60.33         0.10         0.10         0  |           |           |           |         |           |           |           |         |
| 57.25         0.03         0.03         0.00         59.90         0.09         0.09         0.00           57.35         0.03         0.03         0.00         59.95         0.09         0.09         0.00           57.40         0.04         0.04         0.00         60.00         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.30         0.03         0.03         0.00         69.95         0.09         0.09         0.00           57.35         0.03         0.03         0.00         60.00         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.30         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.33         0.10         0.10         0.00           57.76         0.04         0.04         0.00         60.40         0.10         0.10         0.00           57.80         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.95         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td>59.85</td> <td></td> <td></td> <td></td>   |           |           |           |         | 59.85     |           |           |         |
| 57.35         0.03         0.04         0.04         0.00         60.00         0.09         0.09         0.00           57.40         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.15         0.10         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.66         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.70         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05         0.05         0.00         60.55         0.11         0.11         0.00   |           |           |           |         | 59.90     |           |           |         |
| 57.40         0.04         0.04         0.00         60.05         0.09         0.09         0.00           57.45         0.04         0.04         0.00         60.10         0.10         0.10         0.00           57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.80         0.05         0.05         0.00         60.40         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           58.05         0.05         0.05 <td>57.30</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>   | 57.30     |           |           |         |           |           |           |         |
| 57.45         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.30         0.10         0.10         0.00           57.70         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.80         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.85         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.85         0.05         0.05         0.00         60.55         0.11         0.11         0.00           58.00         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.50         0.04         0.04         0.00         60.15         0.10         0.10         0.00           57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.70         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.80         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.10         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.55         0.04         0.04         0.00         60.20         0.10         0.10         0.00           57.65         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.76         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.80         0.04         0.04         0.00         60.40         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.55         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.15         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.60         0.04         0.04         0.00         60.25         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.80         0.04         0.04         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.10         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.06         0.06 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.65         0.04         0.04         0.00         60.30         0.10         0.10         0.00           57.70         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.40         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.45         0.10         0.10         0.00           57.90         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.70         0.04         0.04         0.00         60.35         0.10         0.10         0.00           57.75         0.04         0.04         0.00         60.40         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.90         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.01         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.75         0.04         0.04         0.00         60.40         0.10         0.10         0.00           57.85         0.05         0.05         0.05         0.00         60.45         0.10         0.10         0.00           57.90         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.66         0.11         0.11         0.00           58.10         0.05         0.05         0.00         60.70         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.85         0.25         0.11         0.11         0.00           58.25         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.45 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.80         0.04         0.05         0.05         0.00         60.45         0.10         0.10         0.00           57.85         0.05         0.05         0.00         60.50         0.10         0.10         0.00           57.95         0.05         0.05         0.00         60.55         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.66         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.25         0.06         0.05         0.00         60.85         0.21         0.11         0.11         0.00           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.14         58.30         0.06         0.06         0.00         60.95         0.86         0.11         0.75         58.45         0.06         0.  |           |           |           |         |           |           |           |         |
| 57.85         0.05         0.05         0.00         60.50         0.10         0.00           57.90         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.20         0.06         0.06         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.85         0.25         0.11         0.14           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.85         0.06         0.06         0.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.90         0.05         0.05         0.00         60.55         0.11         0.11         0.00           57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.70         0.11         0.11         0.00           58.10         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.25         0.06         0.05         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.14           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.75         0.07         0.07 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.95         0.05         0.05         0.00         60.60         0.11         0.11         0.00           58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.05         0.05         0.05         0.00         60.70         0.11         0.11         0.00           58.10         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.14           58.30         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.35         0.06         0.06         0.00         60.95         0.86         0.11         1.15           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.75         0.07         0.07 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 58.00         0.05         0.05         0.00         60.65         0.11         0.11         0.00           58.10         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.20         0.06         0.06         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.14           58.25         0.06         0.06         0.00         60.95         0.86         0.11         0.14           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.35         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.40         0.06         0.06         0.00         68.00         0.00         58.55         0.06         0.06         0.00           58.75 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>   |           |           |           |         |           |           |           |         |
| 58.05         0.05         0.05         0.00         60.70         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.25         0.06         0.06         0.00         60.85         0.25         0.11         0.14           58.30         0.06         0.06         0.00         60.90         0.52         0.11         0.41           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.40         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.60         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.70         0.07         0.07         0.00         58.85         0.07         0.07         0.00           58.85         0.07         0.07 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 58.10         0.05         0.05         0.00         60.75         0.11         0.11         0.00           58.15         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.41           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.50         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.60         0.06         0.06         0.00         58.55         0.06         0.06         0.00           58.75         0.06         0.06         0.00         68.70         0.07         0.07           58.80         0.07         0.07         0.00         58.85         0.07         0.07         0.00           58.95         0.07         0.07         0.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 58.15         0.05         0.05         0.00         60.80         0.11         0.11         0.00           58.20         0.05         0.05         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.41           58.35         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.40         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.50         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.60         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.70         0.06         0.06         0.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00         60.00   |           |           |           |         |           |           |           |         |
| 58.20         0.05         0.05         0.00         60.85         0.25         0.11         0.14           58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.41           58.30         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.35         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.40         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.45         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.60         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.65         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.75         0.06         0.06         0.00         61.00         0.00         61.00         0.00         61.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.00         0.0  |           |           |           |         |           |           |           |         |
| 58.25         0.06         0.06         0.00         60.90         0.52         0.11         0.41           58.30         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.35         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.40         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.45         0.06         0.06         0.00         0.00         58.50         0.06         0.06         0.00         58.60         0.06         0.00         0.00         58.60         0.06         0.00         0.00         58.65         0.06         0.06         0.00         0.00         58.70         0.07         0.07         0.00         58.75         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.95         0.07         0.07         0.00         59.00         0.07         0.07         0.00         59.00         0.07         0.07         0.00         59.15         0.08         0.08         0.00         59.30         0.08  |           |           |           |         |           |           |           |         |
| 58.30         0.06         0.06         0.00         60.95         0.86         0.11         0.75           58.35         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.40         0.06         0.06         0.00         58.50         0.06         0.00         0.00         58.50         0.06         0.00         0.00         58.55         0.06         0.06         0.00         58.60         0.06         0.00         0.00         58.60         0.06         0.00         0.00         58.70         0.07         0.07         0.00         58.75         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.85         0.07         0.07         0.00         58.95         0.07         0.07         0.00         58.95         0.07         0.07         0.00         59.00         0.07         0.07         0.00         59.15         0.08         0.08         0.00         59.25         0.08         0.08         0.00         59.35         0.08   |           |           |           |         |           |           |           |         |
| 58.35         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.40         0.06         0.06         0.00         61.00         1.26         0.11         1.15           58.45         0.06         0.06         0.00   |           |           |           |         |           |           |           |         |
| 58.40       0.06       0.06       0.00         58.45       0.06       0.06       0.00         58.50       0.06       0.06       0.00         58.55       0.06       0.06       0.00         58.60       0.06       0.06       0.00         58.70       0.07       0.07       0.00         58.75       0.07       0.07       0.00         58.80       0.07       0.07       0.00         58.85       0.07       0.07       0.00         58.90       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 58.45       0.06       0.06       0.00         58.50       0.06       0.06       0.00         58.55       0.06       0.06       0.00         58.60       0.06       0.06       0.00         58.70       0.07       0.07       0.00         58.75       0.07       0.07       0.00         58.80       0.07       0.07       0.00         58.85       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         | 61.00     | 1.26      | 0.11      | 1.15    |
| 58.50         0.06         0.06         0.00           58.55         0.06         0.06         0.00           58.60         0.06         0.06         0.00           58.70         0.07         0.07         0.00           58.75         0.07         0.07         0.00           58.80         0.07         0.07         0.00           58.85         0.07         0.07         0.00           58.90         0.07         0.07         0.00           59.00         0.07         0.07         0.00           59.05         0.07         0.07         0.00           59.10         0.07         0.07         0.00           59.15         0.08         0.08         0.00           59.20         0.08         0.08         0.00           59.30         0.08         0.08         0.00           59.35         0.08         0.08         0.00           59.40         0.08         0.08         0.00           59.45         0.08         0.08         0.00           59.55         0.08         0.08         0.00  |           |           |           |         |           |           |           |         |
| 58.55         0.06         0.06         0.00           58.60         0.06         0.06         0.00           58.65         0.06         0.06         0.00           58.70         0.07         0.07         0.00           58.75         0.07         0.07         0.00           58.80         0.07         0.07         0.00           58.90         0.07         0.07         0.00           58.95         0.07         0.07         0.00           59.00         0.07         0.07         0.00           59.05         0.07         0.07         0.00           59.10         0.07         0.07         0.00           59.15         0.08         0.08         0.00           59.25         0.08         0.08         0.00           59.35         0.08         0.08         0.00           59.35         0.08         0.08         0.00           59.40         0.08         0.08         0.00           59.50         0.08         0.08         0.00           59.55         0.08         0.08         0.00  |           |           |           |         |           |           |           |         |
| 58.60       0.06       0.06       0.00         58.65       0.06       0.06       0.00         58.70       0.07       0.07       0.00         58.75       0.07       0.07       0.00         58.80       0.07       0.07       0.00         58.95       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 58.65       0.06       0.07       0.00         58.70       0.07       0.07       0.00         58.75       0.07       0.07       0.00         58.80       0.07       0.07       0.00         58.85       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 58.70         0.07         0.07         0.00           58.75         0.07         0.07         0.00           58.80         0.07         0.07         0.00           58.85         0.07         0.07         0.00           58.90         0.07         0.07         0.00           58.95         0.07         0.07         0.00           59.00         0.07         0.07         0.00           59.05         0.07         0.07         0.00           59.10         0.07         0.07         0.00           59.15         0.08         0.08         0.00           59.20         0.08         0.08         0.00           59.30         0.08         0.08         0.00           59.35         0.08         0.08         0.00           59.40         0.08         0.08         0.00           59.45         0.08         0.08         0.00           59.50         0.08         0.08         0.00           59.55         0.08         0.08         0.00   |           |           |           |         |           |           |           |         |
| 58.75       0.07       0.07       0.00         58.80       0.07       0.07       0.00         58.85       0.07       0.07       0.00         58.90       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 58.80       0.07       0.07       0.00         58.85       0.07       0.07       0.00         58.90       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 58.85       0.07       0.07       0.00         58.90       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 58.90       0.07       0.07       0.00         58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 58.95       0.07       0.07       0.00         59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 59.00       0.07       0.07       0.00         59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 59.05       0.07       0.07       0.00         59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00   |           |           |           |         |           |           |           |         |
| 59.10       0.07       0.07       0.00         59.15       0.08       0.08       0.00         59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 59.15     0.08     0.08     0.00       59.20     0.08     0.08     0.00       59.25     0.08     0.08     0.00       59.30     0.08     0.08     0.00       59.35     0.08     0.08     0.00       59.40     0.08     0.08     0.00       59.45     0.08     0.08     0.00       59.50     0.08     0.08     0.00       59.55     0.08     0.08     0.00   |           |           |           |         |           |           |           |         |
| 59.20       0.08       0.08       0.00         59.25       0.08       0.08       0.00         59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 59.25     0.08     0.08     0.00       59.30     0.08     0.08     0.00       59.35     0.08     0.08     0.00       59.40     0.08     0.08     0.00       59.45     0.08     0.08     0.00       59.50     0.08     0.08     0.00       59.55     0.08     0.08     0.00   |           |           |           |         |           |           |           |         |
| 59.30       0.08       0.08       0.00         59.35       0.08       0.08       0.00         59.40       0.08       0.08       0.00         59.45       0.08       0.08       0.00         59.50       0.08       0.08       0.00         59.55       0.08       0.08       0.00  |           |           |           |         |           |           |           |         |
| 59.35     0.08     0.08     0.00       59.40     0.08     0.08     0.00       59.45     0.08     0.08     0.00       59.50     0.08     0.08     0.00       59.55     0.08     0.08     0.00   |           |           |           |         |           |           |           |         |
| 59.40     0.08     0.08     0.00       59.45     0.08     0.08     0.00       59.50     0.08     0.08     0.00       59.55     0.08     0.08     0.00  |           |           |           |         |           |           |           |         |
| 59.45     0.08     0.00       59.50     0.08     0.08     0.00       59.55     0.08     0.08     0.00  |           |           |           |         |           |           |           |         |
| 59.50  |           |           |           |         |           |           |           |         |
| 59.55 0.08 0.08 0.00   |           |           |           |         |           |           |           |         |
|  |           |           |           |         |           |           |           |         |
|  | 59.60     | 0.09      | 0.09      | 0.00    |           |           |           |         |



# BIORETENTION SYSTEM WITH INTERNAL STORAGE RESERVOIR (UNH Stormwater Center Specification)

Type/Node Name: Bioretention System 4

Enter the node name in the drainage analysis if applicable.

|          |          | Litter the node name in the drainage analysis it applicable.          |                        |
|----------|----------|---|------------------------|
| 0.08     | _        | A = Area draining to the practice                                     |                        |
| 0.04     | ac       | A <sub>I</sub> = Impervious area draining to the practice             |                        |
| 0.53     | decimal  | I = Percent impervious area draining to the practice, in decimal form |                        |
| 0.53     | unitless | Rv = Runoff coefficient = $0.05 + (0.9 \times I)$                     |                        |
| 0.04     | ac-in    | WQV= 1" x Rv x A  |                        |
| 162      | cf       | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")                       |                        |
| 16       | cf       | 10% x WQV (check calc for sediment forebay)                           |                        |
| 41       | cf       | 25% x WQV (check calc for water stored in saturated zone)             |                        |
| Sediment | Forebay  | Method of Pretreatment  |                        |
| 44       | cf       | If pretrt is sed forebay: V <sub>SED</sub> (sediment forebay volume)  | ≥ 10%WQV               |
| 1,089    | cf       | Volume below lowest orifice <sup>1</sup>                              | ≥ 100%WQV              |
| 310      | cf       | Water stored in voids of saturated zone                               | ≥ 26%WQV               |
| 0.00     | cfs      | $2Q_{avg} = 2*WQV / 24 hrs * (1hr / 3600 sec)^2$                      |                        |
| 58.55    | ft       | E <sub>WQV</sub> = Elevation of WQV (attach stage-storage table)      |                        |
| 0.01     | cfs      | $Q_{WQV}$ = Discharge at the $E_{WQV}$ (attach stage-discharge table) | < 2Q <sub>WQV</sub>    |
| 9.02     | hours    | $T_{ED}$ = Drawdown time of extended detention = 2WQV/ $Q_{WQV}$      | <u>&gt;</u> 24-hrs     |
| 24.00    | in       | Depth of Filter Media   | ≥ 18"                  |
| 3.00     | :1       | Pond side slopes  | <u>&gt;</u> 3:1        |
|          | -        | What mechanism is proposed to prevent the outlet structure from clo   | ogging (applicable for |
| N        | /A       | orifices/weirs with a dimension of $\leq 6$ ")?                       |                        |
| 60.74    | ft       | Peak elevation of the 50-year storm event (E <sub>50</sub> )          |                        |
| 61.00    | ft       | Berm elevation of the pond  |                        |
| YES      |          | $E_{50} \le $ the berm elevation?                                     | ← yes                  |
|          |          |   |                        |

<sup>1.</sup> Volume stored above the wetland soil and below the high flow by-pass.

| Designer's Notes: |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|
|                   |  |  |  |  |  |  |
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|                   |  |  |  |  |  |  |
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|                   |  |  |  |  |  |  |
|                   |  |  |  |  |  |  |
|                   |  |  |  |  |  |  |

Last Revised: Sept 2020

### Stage-Area-Storage for Pond FB4: sediment forebay

| Elevation       | Surface        | Storage           |
|-----------------|----------------|-------------------|
| (feet)<br>59.50 | (sq-ft)<br>124 | (cubic-feet)<br>0 |
| 59.51           | 125            | 1                 |
| 59.52           | 127            | 3                 |
| 59.53<br>59.54  | 128<br>130     | 4<br>5            |
| 59.55<br>59.55  | 131            | 6                 |
| 59.56           | 133            | 8                 |
| 59.57           | 134            | 9                 |
| 59.58<br>59.59  | 136<br>137     | 10<br>12          |
| 59.60           | 139            | 13                |
| 59.61           | 140            | 15                |
| 59.62           | 142            | 16                |
| 59.63<br>59.64  | 143<br>145     | 17<br>19          |
| 59.65           | 146            | 20                |
| 59.66           | 148            | 22                |
| 59.67<br>59.68  | 149<br>151     | 23<br>25          |
| 59.66<br>59.69  | 151            | 25<br>26          |
| 59.70           | 154            | 28                |
| 59.71           | 156            | 29                |
| 59.72<br>59.73  | 157<br>159     | 31<br>32          |
| 59.74           | 160            | 34                |
| 59.75           | 162            | 36                |
| 59.76<br>59.77  | 164            | 37                |
| 59.77<br>59.78  | 165<br>167     | 39<br>41          |
| 59.79           | 169            | 42                |
| 59.80           | 170            | 44                |
| 59.81<br>59.82  | 172<br>174     | 46<br>47          |
| 59.83           | 174            | 49                |
| 59.84           | 177            | 51                |
| 59.85           | 179            | 53                |
| 59.86<br>59.87  | 180<br>182     | 54<br>56          |
| 59.88           | 184            | 58                |
| 59.89           | 185            | 60                |
| 59.90           | 187            | 62                |
| 59.91<br>59.92  | 189<br>191     | 64<br>66          |
| 59.93           | 192            | 67                |
| 59.94           | 194            | 69                |
| 59.95<br>59.96  | 196<br>198     | 71<br>73          |
| 59.97           | 200            | 75<br>75          |
| 59.98           | 201            | 77                |
| 59.99           | 203            | 79                |
| 60.00           | 205            | 81                |

## Stage-Area-Storage for Pond B4: bioretention system 4

| Elevation      | Wetted     | Storage      | Elevation      | Wetted     | Storage      |
|----------------|------------|--------------|----------------|------------|--------------|
| (feet)         | (sq-ft)    | (cubic-feet) | (feet)         | (sq-ft)    | (cubic-feet) |
| 57.50          | 516        | 0            | 58.03          | 563        | 82           |
| 57.51          | 517        | 2            | 58.04          | 564        | 84           |
| 57.52          | 518        | 3            | 58.05          | 564        | 85           |
| 57.53          | 519        | 5            | 58.06          | 565        | 87           |
| 57.54          | 520        | 6            | 58.07          | 566        | 88           |
| 57.55<br>57.56 | 520<br>521 | 8<br>9       | 58.08          | 567        | 90           |
| 57.56<br>57.57 | 521<br>522 | 11           | 58.09<br>58.10 | 568<br>569 | 91<br>93     |
| 57.58          | 522<br>523 | 12           | 58.11          | 570        | 94           |
| 57.59          | 524        | 14           | 58.12          | 571        | 96           |
| 57.60          | 525        | 15           | 58.13          | 571        | 98           |
| 57.61          | 526        | 17           | 58.14          | 572        | 99           |
| 57.62          | 527        | 19           | 58.15          | 573        | 101          |
| 57.63          | 527        | 20           | 58.16          | 574        | 102          |
| 57.64          | 528        | 22           | 58.17          | 575        | 104          |
| 57.65          | 529        | 23           | 58.18          | 576        | 105          |
| 57.66          | 530        | 25           | 58.19          | 577        | 107          |
| 57.67          | 531        | 26           | 58.20          | 578        | 108          |
| 57.68          | 532        | 28           | 58.21          | 578        | 110          |
| 57.69          | 533        | 29           | 58.22          | 579<br>500 | 111          |
| 57.70<br>57.71 | 534<br>534 | 31<br>33     | 58.23<br>58.24 | 580<br>581 | 113<br>115   |
| 57.71<br>57.72 | 535<br>535 | 33<br>34     | 58.25          | 582        | 116          |
| 57.73          | 536        | 36           | 58.26          | 583        | 118          |
| 57.74          | 537        | 37           | 58.27          | 584        | 119          |
| 57.75          | 538        | 39           | 58.28          | 585        | 121          |
| 57.76          | 539        | 40           | 58.29          | 586        | 122          |
| 57.77          | 540        | 42           | 58.30          | 586        | 124          |
| 57.78          | 541        | 43           | 58.31          | 587        | 125          |
| 57.79          | 542        | 45           | 58.32          | 588        | 127          |
| 57.80          | 542        | 46           | 58.33          | 589        | 128          |
| 57.81          | 543        | 48           | 58.34          | 590        | 130          |
| 57.82          | 544        | 50           | 58.35          | 591        | 132          |
| 57.83          | 545        | 51<br>52     | 58.36          | 592        | 133          |
| 57.84<br>57.85 | 546<br>547 | 53<br>54     | 58.37<br>58.38 | 593<br>593 | 135<br>136   |
| 57.86          | 548        | 56           | 58.39          | 594        | 138          |
| 57.87          | 549        | 57           | 58.40          | 595        | 139          |
| 57.88          | 549        | 59           | 58.41          | 596        | 141          |
| 57.89          | 550        | 60           | 58.42          | 597        | 142          |
| 57.90          | 551        | 62           | 58.43          | 598        | 144          |
| 57.91          | 552        | 63           | 58.44          | 599        | 146          |
| 57.92          | 553        | 65           | 58.45          | 600        | 147          |
| 57.93          | 554        | 67           | 58.46          | 600        | 149          |
| 57.94          | 555        | 68           | 58.47          | 601        | 150          |
| 57.95          | 556        | 70<br>74     | 58.48          | 602        | 152          |
| 57.96          | 556        | 71<br>72     | 58.49          | 603        | 153          |
| 57.97<br>57.98 | 557<br>558 | 73<br>74     | 58.50<br>58.51 | 604<br>605 | 155<br>156   |
| 57.99<br>57.99 | 559        | 74<br>76     | 58.52          | 606        | 158          |
| 58.00          | 560        | 70<br>77     | 58.53          | 607        | 159          |
| 58.01          | 561        | 79           | 58.54          | 608        | 161          |
| 58.02          | 562        | 80           | 58.55          | 608        | 163          |
|                |            |              |                |            |              |

## **Stage-Area-Storage for Pond B4: bioretention system 4 (continued)**

| Elevation<br>(feet) | Wetted<br>(sq-ft) | Storage<br>(cubic-feet) | Elevation<br>(feet) | Wetted<br>(sq-ft) | Storage<br>(cubic-feet) |
|---------------------|-------------------|-------------------------|---------------------|-------------------|-------------------------|
| 58.56               | 609               | 164                     | 59.09               | 656               | 246                     |
| 58.57               | 610               | 166                     | 59.10               | 657               | 248                     |
| 58.58               | 611               | 167                     | 59.11               | 658               | 249                     |
| 58.59               | 612               | 169                     | 59.12               | 659               | 251                     |
| 58.60               | 613               | 170                     | 59.13               | 659               | 252                     |
| 58.61               | 614               | 172                     | 59.14               | 660               | 254                     |
| 58.62               | 615               | 173                     | 59.15               | 661               | 255                     |
| 58.63               | 615               | 175                     | 59.16               | 662               | 257                     |
| 58.64               | 616               | 176                     | 59.17               | 663               | 259                     |
| 58.65               | 617               | 178                     | 59.18               | 664               | 260                     |
| 58.66               | 618               | 180                     | 59.19               | 665               | 262                     |
| 58.67               | 619               | 181                     | 59.20               | 666               | 263                     |
| 58.68               | 620               | 183                     | 59.21               | 666               | 265                     |
| 58.69               | 621               | 184                     | 59.22               | 667               | 266                     |
| 58.70               | 622               | 186                     | 59.23               | 668               | 268                     |
| 58.71               | 622               | 187                     | 59.24               | 669               | 269                     |
| 58.72               | 623               | 189                     | 59.25               | 670               | 271                     |
| 58.73               | 624               | 190                     | 59.26               | 671               | 272                     |
| 58.74               | 625               | 192                     | 59.27               | 672               | 274                     |
| 58.75               | 626               | 194                     | 59.28               | 673               | 276                     |
| 58.76               | 627               | 195                     | 59.29               | 674               | 277                     |
| 58.77               | 628               | 197                     | 59.30               | 674               | 279                     |
| 58.78               | 629               | 198                     | 59.31               | 675               | 280                     |
| 58.79               | 630               | 200                     | 59.32               | 676               | 282                     |
| 58.80               | 630               | 201                     | 59.33               | 677               | 283                     |
| 58.81               | 631               | 203                     | 59.34               | 678               | 285                     |
| 58.82               | 632               | 204                     | 59.35               | 679               | 286                     |
| 58.83               | 633               | 206                     | 59.36               | 680               | 288                     |
| 58.84               | 634               | 207                     | 59.37               | 681               | 289                     |
| 58.85               | 635               | 209                     | 59.38               | 681               | 291                     |
| 58.86               | 636               | 211                     | 59.39               | 682               | 293                     |
| 58.87               | 637               | 212                     | 59.40               | 683               | 294                     |
| 58.88               | 637               | 214                     | 59.41               | 684               | 296                     |
| 58.89               | 638               | 215                     | 59.42               | 685               | 297                     |
| 58.90               | 639               | 217                     | 59.43               | 686               | 299                     |
| 58.91               | 640               | 218                     | 59.44               | 687               | 300                     |
| 58.92               | 641               | 220                     | 59.45               | 688               | 302                     |
| 58.93               | 642               | 221                     | 59.46               | 688               | 303                     |
| 58.94               | 643               | 223                     | 59.47               | 689               | 305                     |
| 58.95               | 644               | 224                     | 59.48               | 690               | 307                     |
| 58.96               | 644               | 226                     | 59.49               | 691               | 308                     |
| 58.97               | 645               | 228                     | 59.50               | 692               | 310                     |
| 58.98               | 646               | 229                     | 59.51               | 692               | 314                     |
| 58.99               | 647               | 231                     | 59.52               | 692               | 317                     |
| 59.00               | 648               | 232                     | 59.53               | 692               | 321                     |
| 59.01               | 649               | 234                     | 59.54               | 692               | 325                     |
| 59.02               | 650<br>651        | 235                     | 59.55               | 692               | 329                     |
| 59.03               | 651               | 237<br>238              | 59.56<br>50.57      | 692               | 333<br>338              |
| 59.04<br>59.05      | 652<br>652        | 238<br>240              | 59.57<br>50.58      | 692<br>692        | 338<br>342              |
| 59.05<br>59.06      | 653               | 240<br>241              | 59.58<br>59.59      | 692<br>692        | 342<br>346              |
| 59.00<br>59.07      | 654               | 243                     | 59.60               | 692               | 350                     |
| 59.07<br>59.08      | 655               | 245<br>245              | 59.61               | 692               | 354                     |
| 00.00               | 000               | 240                     | 55.61               | 002               | 004                     |
|                     |                   |                         |                     |                   |                         |

### Stage-Area-Storage for Pond B4: bioretention system 4 (continued)

| Elevation      | Wetted     | Storage      | Elevation      | Wetted     | Storage      |
|----------------|------------|--------------|----------------|------------|--------------|
| (feet)         | (sq-ft)    | (cubic-feet) | (feet)         | (sq-ft)    | (cubic-feet) |
| 59.62          | 692        | 358          | 60.15          | 692        | 619          |
| 59.63          | 692        | 362          | 60.16          | 692        | 625          |
| 59.64          | 692        | 367          | 60.17          | 692        | 631          |
| 59.65          | 692        | 371          | 60.18          | 692        | 637          |
| 59.66          | 692        | 375          | 60.19          | 692        | 643          |
| 59.67          | 692        | 379          | 60.20          | 692        | 650          |
| 59.68          | 692        | 384          | 60.21          | 692        | 656          |
| 59.69          | 692        | 388          | 60.22          | 692        | 662          |
| 59.70          | 692        | 393          | 60.23          | 692        | 669          |
| 59.71          | 692        | 397          | 60.24          | 692        | 675          |
| 59.72          | 692        | 401          | 60.25          | 692        | 682          |
| 59.73          | 692        | 406          | 60.26          | 692        | 688          |
| 59.74          | 692        | 410          | 60.27          | 692        | 695          |
| 59.75          | 692        | 415          | 60.28          | 692        | 702          |
| 59.76          | 692        | 419          | 60.29          | 692        | 708          |
| 59.77          | 692        | 424          | 60.30          | 692        | 715          |
| 59.78          | 692        | 428          | 60.31          | 692        | 722          |
| 59.79          | 692        | 433          | 60.32          | 692        | 729          |
| 59.80          | 692        | 438          | 60.33          | 692        | 736          |
| 59.81          | 692        | 442          | 60.34          | 692        | 743          |
| 59.82          | 692        | 447          | 60.35          | 692        | 750<br>757   |
| 59.83          | 692        | 452<br>456   | 60.36          | 692        | 757          |
| 59.84          | 692        | 456<br>461   | 60.37          | 692        | 765          |
| 59.85          | 692<br>692 | 461<br>466   | 60.38          | 692<br>692 | 772          |
| 59.86<br>59.87 | 692        | 466<br>471   | 60.39<br>60.40 | 692<br>692 | 779<br>787   |
| 59.88          | 692        | 476          | 60.41          | 692        | 797<br>794   |
| 59.89          | 692        | 480          | 60.42          | 692<br>692 | 802          |
| 59.90          | 692        | 485          | 60.43          | 692        | 810          |
| 59.91          | 692        | 490          | 60.44          | 692        | 817          |
| 59.92          | 692        | 495          | 60.45          | 692        | 825          |
| 59.93          | 692        | 500          | 60.46          | 692        | 833          |
| 59.94          | 692        | 505          | 60.47          | 692        | 841          |
| 59.95          | 692        | 510          | 60.48          | 692        | 849          |
| 59.96          | 692        | 515          | 60.49          | 692        | 857          |
| 59.97          | 692        | 520          | 60.50          | 692        | 865          |
| 59.98          | 692        | 525          | 60.51          | 692        | 873          |
| 59.99          | 692        | 530          | 60.52          | 692        | 881          |
| 60.00          | 692        | 536          | 60.53          | 692        | 889          |
| 60.01          | 692        | 541          | 60.54          | 692        | 898          |
| 60.02          | 692        | 546          | 60.55          | 692        | 906          |
| 60.03          | 692        | 551          | 60.56          | 692        | 915          |
| 60.04          | 692        | 557          | 60.57          | 692        | 923          |
| 60.05          | 692        | 562          | 60.58          | 692        | 932          |
| 60.06          | 692        | 568          | 60.59          | 692        | 941          |
| 60.07          | 692        | 573          | 60.60          | 692        | 949          |
| 60.08          | 692        | 579          | 60.61          | 692        | 958          |
| 60.09          | 692        | 584          | 60.62          | 692        | 967          |
| 60.10          | 692        | 590          | 60.63          | 692        | 976          |
| 60.11          | 692        | 596          | 60.64          | 692        | 985          |
| 60.12          | 692        | 601          | 60.65          | 692        | 994          |
| 60.13          | 692        | 607          | 60.66          | 692        | 1,003        |
| 60.14          | 692        | 613          | 60.67          | 692        | 1,012        |
|                |            |              | •              |            |              |

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## **Stage-Area-Storage for Pond B4: bioretention system 4 (continued)**

| Elevation | Wetted  | Storage      |
|-----------|---------|--------------|
| (feet)    | (sq-ft) | (cubic-feet) |
| 60.68     | 692     | 1,022        |
| 60.69     | 692     | 1,031        |
| 60.70     | 692     | 1,041        |
| 60.71     | 692     | 1,050        |
| 60.72     | 692     | 1,060        |
| 60.73     | 692     | 1,069        |
| 60.74     | 692     | 1,079        |
| 60.75     | 692     | 1,089        |
| 60.76     | 692     | 1,099        |
| 60.77     | 692     | 1,109        |
| 60.78     | 692     | 1,119        |
| 60.79     | 692     | 1,129        |
| 60.80     | 692     | 1,139        |
| 60.81     | 692     | 1,149        |
| 60.82     | 692     | 1,160        |
| 60.83     | 692     | 1,170        |
| 60.84     | 692     | 1,181        |
| 60.85     | 692     | 1,191        |
| 60.86     | 692     | 1,202        |
| 60.87     | 692     | 1,212        |
| 60.88     | 692     | 1,223        |
| 60.89     | 692     | 1,234        |
| 60.90     | 692     | 1,245        |
| 60.91     | 692     | 1,256        |
| 60.92     | 692     | 1,267        |
| 60.93     | 692     | 1,278        |
| 60.94     | 692     | 1,289        |
| 60.95     | 692     | 1,301        |
| 60.96     | 692     | 1,312        |
| 60.97     | 692     | 1,324        |
| 60.98     | 692     | 1,335        |
| 60.99     | 692     | 1,347        |
| 61.00     | 692     | 1,358        |

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## Stage-Discharge for Pond B4: bioretention system 4

| (feet)         (cfs)         (cfs) <t< th=""><th>Elevation</th><th>Discharge</th><th>Discarded</th><th>Primary</th><th>Elevation</th><th>Discharge</th><th>Discarded</th><th>Primary</th></t<> | Elevation | Discharge | Discarded | Primary | Elevation | Discharge | Discarded | Primary |
|--|-----------|-----------|-----------|---------|-----------|-----------|-----------|---------|
| 57.51         0.00         0.00         0.00         58.05         0.01         0.01         0.00           57.52         0.00         0.00         0.00         58.05         0.01         0.01         0.00           57.53         0.00         0.00         0.00         58.06         0.01         0.01         0.00           57.55         0.00         0.00         0.00         58.08         0.01         0.01         0.00           57.56         0.01         0.01         0.00         58.09         0.01         0.01         0.00           57.57         0.01         0.01         0.00         58.10         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.60         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.62         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.52         0.00         0.00         0.00         58.05         0.01         0.01         0.00           57.53         0.00         0.00         0.00         58.06         0.01         0.01         0.00           57.54         0.00         0.00         0.00         58.07         0.01         0.01         0.00           57.55         0.01         0.01         0.00         58.08         0.01         0.01         0.00           57.56         0.01         0.01         0.00         58.10         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.53         0.00         0.00         0.00         58.06         0.01         0.01         0.00           57.54         0.00         0.00         0.00         58.07         0.01         0.01         0.00           57.55         0.00         0.01         0.00         58.08         0.01         0.01         0.00           57.57         0.01         0.01         0.00         58.10         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.59         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.54         0.00         0.00         0.00         58.07         0.01         0.01         0.00           57.55         0.00         0.00         58.08         0.01         0.01         0.00           57.56         0.01         0.01         0.01         0.00         58.09         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.59         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00         58.16         0.01         0.01         0.00         58.16         0.01         0.01         0.00         58.16         0.01         0.01         0.00         58.18         0.01         0.01         0.00         58.18         0.01         0.01         0.00         58.18         0.01         0.01         0.00         58.18         0.01         0.01         0.00         58.18         0.01  |           |           |           |         |           |           |           |         |
| 57.55         0.00         0.00         58.08         0.01         0.01         0.00           57.56         0.01         0.01         0.00         58.09         0.01         0.01         0.00           57.57         0.01         0.01         0.00         58.10         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.60         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.67         0.01         0.01         0.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.56         0.01         0.01         0.00         58.09         0.01         0.01         0.00           57.57         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.00         58.11         0.01         0.01         0.00         55.59         0.01         0.01         0.00         58.12         0.01         0.01         0.00         57.60         0.01         0.01         0.00         58.13         0.01         0.01         0.00         57.61         0.01         0.01         0.00         58.14         0.01         0.01         0.00         57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00         57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00         57.64         0.01         0.01         0.00         58.18         0.01         0.01         0.00         57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00         57.66         0.01         0.01         0.00         58.18         0.01         0.01         0.00         57.67         0.01         0.01         0.0   |           |           |           |         |           |           |           |         |
| 57.57         0.01         0.01         0.00         58.10         0.01         0.01         0.00           57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.60         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.69         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.58         0.01         0.01         0.00         58.11         0.01         0.01         0.00           57.59         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.60         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.69         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.59         0.01         0.01         0.00         58.12         0.01         0.01         0.00           57.60         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.61         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.60         0.01         0.01         0.00         58.13         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.61         0.01         0.01         0.00         58.14         0.01         0.01         0.00           57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.62         0.01         0.01         0.00         58.15         0.01         0.01         0.00           57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.64         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.67         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.63         0.01         0.01         0.00         58.16         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.75         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.64         0.01         0.01         0.00         58.17         0.01         0.01         0.00           57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.76         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.65         0.01         0.01         0.00         58.18         0.01         0.01         0.00           57.66         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.66         0.01         0.01         0.00         58.19         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.77         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.67         0.01         0.01         0.00         58.20         0.01         0.01         0.00           57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.77         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td>58.18</td> <td></td> <td></td> <td></td>   |           |           |           |         | 58.18     |           |           |         |
| 57.68         0.01         0.01         0.00         58.21         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.89         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.69         0.01         0.01         0.00         58.22         0.01         0.01         0.00           57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.81         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.70         0.01         0.01         0.00         58.23         0.01         0.01         0.00           57.71         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.71         0.01         0.01         0.00         58.24         0.01         0.01         0.00           57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.83         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.72         0.01         0.01         0.00         58.25         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.84         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.73         0.01         0.01         0.00         58.26         0.01         0.01         0.00           57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.85         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.74         0.01         0.01         0.00         58.27         0.01         0.01         0.00           57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.75         0.01         0.01         0.00         58.28         0.01         0.01         0.00           57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.76         0.01         0.01         0.00         58.29         0.01         0.01         0.00           57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.87         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.77         0.01         0.01         0.00         58.30         0.01         0.01         0.00           57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.87         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.78         0.01         0.01         0.00         58.31         0.01         0.01         0.00           57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.79         0.01         0.01         0.00         58.32         0.01         0.01         0.00           57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.99         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.80         0.01         0.01         0.00         58.33         0.01         0.01         0.00           57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.81         0.01         0.01         0.00         58.34         0.01         0.01         0.00           57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.92         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.82         0.01         0.01         0.00         58.35         0.01         0.01         0.00           57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.83         0.01         0.01         0.00         58.36         0.01         0.01         0.00           57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.84         0.01         0.01         0.00         58.37         0.01         0.01         0.00           57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.95         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.85         0.01         0.01         0.00         58.38         0.01         0.01         0.00           57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.86         0.01         0.01         0.00         58.39         0.01         0.01         0.00           57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.97         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.87         0.01         0.01         0.00         58.40         0.01         0.01         0.00           57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.99         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.88         0.01         0.01         0.00         58.41         0.01         0.01         0.00           57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           58.00         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.89         0.01         0.01         0.00         58.42         0.01         0.01         0.00           57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.51         0.01         0.01         0.00           58.00         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.90         0.01         0.01         0.00         58.43         0.01         0.01         0.00           57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.01         0.01         0.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  |           |           |           |         |           |           |           |         |
| 57.91         0.01         0.01         0.00         58.44         0.01         0.01         0.00           57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.53         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.92         0.01         0.01         0.00         58.45         0.01         0.01         0.00           57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.93         0.01         0.01         0.00         58.46         0.01         0.01         0.00           57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.94         0.01         0.01         0.00         58.47         0.01         0.01         0.00           57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.95         0.01         0.01         0.00         58.48         0.01         0.01         0.00           57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.96         0.01         0.01         0.00         58.49         0.01         0.01         0.00           57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.97         0.01         0.01         0.00         58.50         0.01         0.01         0.00           57.98         0.01         0.01         0.00         58.51         0.01         0.01         0.00           57.99         0.01         0.01         0.00         58.52         0.01         0.01         0.00           58.00         0.01         0.01         0.00         58.53         0.01         0.01         0.00           58.01         0.01         0.01         0.00         58.54         0.01         0.01         0.00  |           |           |           |         |           |           |           |         |
| 57.98     0.01     0.01     0.00     58.51     0.01     0.01     0.00       57.99     0.01     0.01     0.00     58.52     0.01     0.01     0.00       58.00     0.01     0.01     0.00     58.53     0.01     0.01     0.00       58.01     0.01     0.01     0.00     58.54     0.01     0.01     0.00  |           |           |           |         |           |           |           |         |
| 57.99     0.01     0.01     0.00     58.52     0.01     0.01     0.00       58.00     0.01     0.01     0.00     58.53     0.01     0.01     0.00       58.01     0.01     0.01     0.00     58.54     0.01     0.01     0.00  |           |           |           |         |           |           |           |         |
| 58.00     0.01     0.01     0.00     58.53     0.01     0.01     0.00       58.01     0.01     0.01     0.00     58.54     0.01     0.01     0.00  |           |           |           |         |           |           |           |         |
| 58.01 0.01 0.01 0.00 58.54 0.01 0.01 0.00  |           |           |           |         |           |           |           |         |
|  |           |           |           |         |           |           |           |         |
| 30.02 0.01 0.01 0.00 38.55 0.01 0.01 0.00  |           |           |           |         |           |           |           |         |
|  | 36.02     | 0.01      | 0.01      | 0.00    | 30.35     | 0.01      | 0.01      | 0.00    |



## INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: Infiltration System 1

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

|               | Harris 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1   |                            |
|---------------|--|----------------------------|
| yes           | Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?                    | ← yes                      |
| 0.43 ac       | A = Area draining to the practice  |                            |
| 0.43 ac       | A <sub>I</sub> = Impervious area draining to the practice                                      |                            |
| 0.99 decimal  | I = Percent impervious area draining to the practice, in decimal form                          |                            |
| 0.94 unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I)   |                            |
| 0.41 ac-in    | WQV= 1" x Rv x A   |                            |
| 1,471 cf      | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")  |                            |
| 368 cf        | 25% x WQV (check calc for sediment forebay volume)   |                            |
| Isolator Row  | Method of pretreatment? (not required for clean or roof runoff)                                |                            |
| * cf          | V <sub>SED</sub> = Sediment forebay volume, if used for pretreatment                           | > 25%WQV                   |
| 1,582 cf      | V = Volume <sup>1</sup> (attach a stage-storage table)   | ≥ WQV                      |
| 3,088 sf      | A <sub>SA</sub> = Surface area of the bottom of the pond                                       | _                          |
| 0.72 iph      | Ksat <sub>DESIGN</sub> = Design infiltration rate <sup>4</sup>                                 |                            |
| 7.9 hours     | I <sub>DRAIN</sub> = Drain time = V / (A <sub>SA</sub> * I <sub>DESIGN</sub> )                 | < 72-hrs                   |
| 58.60 feet    | E <sub>BTM</sub> = Elevation of the bottom of the basin  | _                          |
| 54.60 feet    | E <sub>SHWT</sub> = Elevation of SHWT (if none found, enter the lowest elevation of the test   | pit)                       |
| 51.60 feet    | E <sub>ROCK</sub> = Elevation of bedrock (if none found, enter the lowest elevation of the tes | t pit)                     |
| 4.00 feet     | D <sub>SHWT</sub> = Separation from SHWT   | <u>&gt;</u> * <sup>3</sup> |
| 7.0 feet      | D <sub>ROCK</sub> = Separation from bedrock  | <u>&gt;</u> * <sup>3</sup> |
| N/A ft        | D <sub>amend</sub> = Depth of amended soil, if applicable due high infiltation rate            | > 24"                      |
| N/A ft        | $D_T$ = Depth of trench, if trench proposed  | 4 - 10 ft                  |
| yes Yes/No    | If a trench or underground system is proposed, has observation well been provide               |                            |
|               | If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.                  |                            |
| N/A Yes/No    | If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?                    | ← yes                      |
| N/A :1        | If a basin is proposed, pond side slopes.  | <u>≥</u> 3:1               |
| 60.15 ft      | Peak elevation of the 10-year storm event (infiltration can be used in analysis)               |                            |
| 60.93 ft      | Peak elevation of the 50-year storm event (infiltration can be used in analysis)               |                            |
| 60.93 ft      | Elevation of the top of the practice (if a basin, this is the elevation of the berm)           |                            |
| YES           | 10 peak elevation < Elevation of the top of the trench? <sup>5</sup>                           | ← yes                      |
| YES           | If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?                            | ← yes                      |
|               |  |                            |

- 1. Volume below the lowest invert of the outlet structure and excludes forebay volume
- 2. Ksat<sub>DESIGN</sub> includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- 4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- 5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

| Designer's Notes: | *All pavement runoff is pretreated by the isolator row |
|-------------------|--|
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NHDES Alteration of Terrain Last Revised: March 2019

# Stage-Area-Storage for Pond IS1: infiltration 1

| Elevation      | Surface        | Storage        |
|----------------|----------------|----------------|
| (feet)         | (sq-ft)        | (cubic-feet)   |
| 58.60          | 3,088          | 0              |
| 58.65          | 3,088          | 62             |
| 58.70          | 3,088          | 124            |
| 58.75          | 3,088          | 185            |
| 58.80<br>58.85 | 3,088<br>3,088 | 247<br>309     |
| 58.90          | 3,088          | 371            |
| 58.95          | 3,088          | 432            |
| 59.00          | 3,088          | 494            |
| 59.05          | 3,088          | 556            |
| 59.10          | 3,088          | 618            |
| 59.15          | 3,088          | 741            |
| 59.20          | 3,088          | 864            |
| 59.25          | 3,088          | 986            |
| 59.30          | 3,088          | 1,108          |
| 59.35<br>59.40 | 3,088<br>3,088 | 1,228<br>1,347 |
| 59.45          | 3,088          | 1,465          |
| 59.50          | 3,088          | 1,582          |
| 59.55          | 3,088          | 1,697          |
| 59.60          | 3,088          | 1,811          |
| 59.65          | 3,088          | 1,923          |
| 59.70          | 3,088          | 2,034          |
| 59.75          | 3,088          | 2,143          |
| 59.80          | 3,088          | 2,250          |
| 59.85          | 3,088          | 2,355          |
| 59.90<br>59.95 | 3,088<br>3,088 | 2,457<br>2,557 |
| 60.00          | 3,088          | 2,654          |
| 60.05          | 3,088          | 2,749          |
| 60.10          | 3,088          | 2,839          |
| 60.15          | 3,088          | 2,925          |
| 60.20          | 3,088          | 3,005          |
| 60.25          | 3,088          | 3,080          |
| 60.30          | 3,088          | 3,151          |
| 60.35          | 3,088          | 3,219          |
| 60.40<br>60.45 | 3,088<br>3,088 | 3,284<br>3,346 |
| 60.50          | 3,088          | 3,408          |
| 60.55          | 3,088          | 3,470          |
| 60.60          | 3,088          | 3,532          |
| 60.65          | 3,088          | 3,593          |
| 60.70          | 3,088          | 3,655          |
| 60.75          | 3,088          | 3,717          |
| 60.80          | 3,088          | 3,779          |
| 60.85          | 3,088          | 3,840          |
| 60.90          | 3,088          | 3,902          |



# INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: Infiltration System 2

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

|               | Harris 1 - | •                          |
|---------------|---|----------------------------|
| yes           | Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?   | ← yes                      |
| 0.74 ac       | A = Area draining to the practice<br>$A_1$ = Impervious area draining to the practice   |                            |
| 0.73 ac       |   |                            |
| 0.98 decimal  | I = Percent impervious area draining to the practice, in decimal form   |                            |
| 0.93 unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I)  |                            |
| 0.69 ac-in    | WQV= 1" x Rv x A  |                            |
| 2,505 cf      | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")   |                            |
| 626 cf        | 25% x WQV (check calc for sediment forebay volume)  |                            |
| Isolator Row  | Method of pretreatment? (not required for clean or roof runoff)   |                            |
| * cf          | V <sub>SED</sub> = Sediment forebay volume, if used for pretreatment  | > 25%WQV                   |
| 4,514 cf      | V = Volume <sup>1</sup> (attach a stage-storage table)  | > WQV                      |
| 6,032 sf      | A <sub>SA</sub> = Surface area of the bottom of the pond  | _ ,                        |
| 0.72 iph      | Ksat <sub>DESIGN</sub> = Design infiltration rate <sup>4</sup>  |                            |
| 6.9 hours     | I <sub>DRAIN</sub> = Drain time = V / (A <sub>SA</sub> * I <sub>DESIGN</sub> )  | < 72-hrs                   |
| 57.70 feet    | E <sub>BTM</sub> = Elevation of the bottom of the basin   | _                          |
| 53.70 feet    | E <sub>SHWT</sub> = Elevation of SHWT (if none found, enter the lowest elevation of the test  | oit)                       |
| 49.73 feet    | E <sub>ROCK</sub> = Elevation of bedrock (if none found, enter the lowest elevation of the tes  | t pit)                     |
| 4.00 feet     | D <sub>SHWT</sub> = Separation from SHWT  | <u>&gt;</u> * <sup>3</sup> |
| 8.0 feet      | D <sub>ROCK</sub> = Separation from bedrock   | <u>&gt;</u> * <sup>3</sup> |
| N/A ft        | D <sub>amend</sub> = Depth of amended soil, if applicable due high infiltation rate   | > 24"                      |
| N/A ft        | D <sub>T</sub> = Depth of trench, if trench proposed  | _<br>4 - 10 ft             |
| yes Yes/No    | If a trench or underground system is proposed, has observation well been provide  |                            |
|               | If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.   |                            |
| N/A Yes/No    | If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?   | ← yes                      |
| N/A :1        | If a basin is proposed, pond side slopes.   | <u>&gt;</u> 3:1            |
| 59.36 ft      | Peak elevation of the 10-year storm event (infiltration can be used in analysis)  |                            |
| 60.02 ft      | Peak elevation of the 50-year storm event (infiltration can be used in analysis)  |                            |
| 60.03 ft      | Elevation of the top of the practice (if a basin, this is the elevation of the berm)  |                            |
| YES           | 10 peak elevation < Elevation of the top of the trench? <sup>5</sup>  | ← yes                      |
| YES           | If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?   | ← yes                      |
|               |   |                            |

- 1. Volume below the lowest invert of the outlet structure and excludes forebay volume
- 2. Ksat<sub>DESIGN</sub> includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- 4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- 5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

| Designer's Notes: | *All pavement runoff is pretreated by the isolator row |
|-------------------|--|
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NHDES Alteration of Terrain Last Revised: March 2019

# **Stage-Area-Storage for Pond IS2: infiltration 2**

| (feet)         (sq-ft)         (cubic-feet)         (feet)         (sq-ft)         (cubic-feet)           57,70         6,032         0         58.23         6,032         1.402           57,72         6,032         48         58.25         6,032         1.499           57,73         6,032         72         58.26         6,032         1.499           57,75         6,032         17         58.27         6,032         1.548           57,76         6,032         145         58.29         6,032         1.645           57,77         6,032         143         58.31         6,032         1.645           57,77         6,032         193         58.31         6,032         1.790           57,78         6,032         2241         58.33         6,032         1.790           57,80         6,032         2241         58.33         6,032         1.780           57,81         6,032         234         458,34         6,032         1.887           57,83         6,032         314         58.36         6,032         1.983           57,84         6,032         338         58.37         6,032         2.03  | Elevation | Surface | Storage      | Elevation | Surface | Storage |
|---|-----------|---------|--------------|-----------|---------|---------|
| 57.71         6,032         24         58.24         6,032         1,450           57.73         6,032         72         58.26         6,032         1,459           57.74         6,032         97         58.27         6,032         1,548           57.75         6,032         121         58.28         6,032         1,548           57.76         6,032         145         58.29         6,032         1,645           57.77         6,032         149         58.30         6,032         1,693           57.78         6,032         193         58.31         6,032         1,742           57.79         6,032         241         58.33         6,032         1,742           57.80         6,032         241         58.33         6,032         1,887           57.81         6,032         2250         58.35         6,032         1,985           57.83         6,032         334         58.36         6,032         1,983           57.84         6,032         338         58.37         6,032         1,983           57.85         6,032         362         58.38         6,032         2,079           57.86   |           |         | (cubic-feet) |           |         |         |
| 57.72         6,032         48         58.25         6,032         1,459           57.73         6,032         72         58.26         6,032         1,499           57.74         6,032         121         58.28         6,032         1,596           57.76         6,032         145         58.29         6,032         1,645           57.78         6,032         169         58.30         6,032         1,645           57.79         6,032         213         58.31         6,032         1,742           57.79         6,032         241         58.32         6,032         1,790           57.80         6,032         2265         58.34         6,032         1,887           57.81         6,032         290         58.35         6,032         1,935           57.83         6,032         334         58.37         6,032         1,983           57.84         6,032         338         58.37         6,032         1,935           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         344         58.41         6,032         2,175           57.88 <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>       |           |         | -            |           |         |         |
| 57.73         6,032         72         58.26         6,032         1,499           57.74         6,032         121         58.28         6,032         1,548           57.75         6,032         145         58.29         6,032         1,645           57.77         6,032         169         58.30         6,032         1,645           57.78         6,032         193         58.31         6,032         1,742           57.79         6,032         241         58.33         6,032         1,742           57.80         6,032         2241         58.33         6,032         1,887           57.81         6,032         2250         58.35         6,032         1,935           57.83         6,032         314         58.36         6,032         1,935           57.84         6,032         338         58.37         6,032         1,983           57.85         6,032         338         58.37         6,032         1,983           57.85         6,032         3362         58.38         6,032         2,079           57.86         6,032         344         58.41         6,032         2,127           57.87<  |           |         |              |           |         |         |
| 57.74         6.032         97         58.27         6.032         1,548           57.75         6.032         121         58.29         6.032         1,596           57.76         6.032         145         58.29         6.032         1,645           57.78         6.032         193         58.31         6.032         1,790           57.79         6.032         217         58.32         6.032         1,790           57.80         6.032         241         58.33         6.032         1,887           57.81         6.032         290         58.34         6.032         1,983           57.82         6.032         334         58.36         6,032         1,983           57.83         6.032         338         58.37         6.032         1,983           57.84         6.032         362         58.38         6.032         1,983           57.85         6.032         386         58.39         6.032         2,079           57.86         6.032         386         58.39         6.032         2,175           57.87         6.032         443         58.41         6.032         2,270           57.89 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>        |           |         |              |           |         |         |
| 57.76         6.032         121         58.28         6.032         1,596           57.76         6.032         145         58.29         6.032         1,645           57.77         6.032         169         58.30         6.032         1,742           57.79         6.032         217         58.32         6.032         1,749           57.80         6.032         241         58.33         6.032         1,839           57.81         6.032         290         58.34         6.032         1,839           57.82         6.032         290         58.35         6.032         1,935           57.83         6.032         314         58.36         6.032         1,935           57.84         6.032         388         58.37         6.032         2,031           57.85         6.032         386         58.39         6.032         2,079           57.86         6.032         386         58.39         6.032         2,127           57.87         6.032         434         58.41         6.032         2,223           57.88         6.032         458         58.42         6.032         2,236           57.91 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.76         6,032         145         58.29         6,032         1,645           57.77         6,032         169         58.30         6,032         1,693           57.78         6,032         217         58.32         6,032         1,742           57.80         6,032         241         58.33         6,032         1,839           57.81         6,032         290         58.35         6,032         1,983           57.82         6,032         290         58.35         6,032         1,983           57.83         6,032         338         58.37         6,032         1,983           57.84         6,032         338         58.37         6,032         2,031           57.85         6,032         362         58.38         6,032         2,177           57.86         6,032         386         58.99         6,032         2,175           57.87         6,032         410         58.40         6,032         2,175           57.87         6,032         458         58.42         6,032         2,175           57.88         6,032         458         58.42         6,032         2,318           57.90 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.77         6,032         169         58.30         6,032         1,693           57.78         6,032         193         58.31         6,032         1,742           57.79         6,032         241         58.32         6,032         1,839           57.81         6,032         265         58.34         6,032         1,887           57.82         6,032         290         58.35         6,032         1,935           57.83         6,032         314         58.36         6,032         1,935           57.84         6,032         388         58.37         6,032         2,931           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.99         6,032         2,127           57.87         6,032         346         58.49         6,032         2,127           57.88         6,032         448         58.41         6,032         2,223           57.89         6,032         458         58.42         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.78         6,032         193         58.31         6,032         1,742           57.79         6,032         241         58.32         6,032         1,790           57.80         6,032         265         58.34         6,032         1,887           57.82         6,032         290         58.35         6,032         1,935           57.83         6,032         314         58.36         6,032         1,983           57.84         6,032         338         58.37         6,032         2,031           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.39         6,032         2,127           57.87         6,032         410         58.40         6,032         2,127           57.88         6,032         458         58.41         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         55         58.44         6,032         2,318           57.92         6,032         531         58.45         6,032         2,413           57.93 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>        |           |         |              |           |         |         |
| 57.79         6,032         217         58.32         6,032         1,790           57.80         6,032         241         58.33         6,032         1,839           57.81         6,032         265         58.34         6,032         1,935           57.83         6,032         314         58.36         6,032         1,935           57.84         6,032         362         386         58.37         6,032         2,031           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.39         6,032         2,175           57.87         6,032         434         58.40         6,032         2,270           57.89         6,032         434         58.41         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,318           57.92         6,032         555         58.46         6,032         2,413           57.93         6,032         579         58.47         6,032         2,507   |           |         |              |           |         |         |
| 57.80         6,032         241         58.33         6,032         1,887           57.81         6,032         290         58.35         6,032         1,985           57.83         6,032         314         58.36         6,032         1,983           57.84         6,032         338         58.37         6,032         2,079           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.39         6,032         2,127           57.87         6,032         410         58.40         6,032         2,273           57.89         6,032         458         58.41         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         55         58.44         6,032         2,318           57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         55         58.46         6,032         2,413           57.94         6,032         603         58.48         6,032         2,55           57.96  |           |         |              |           |         |         |
| 57.81         6,032         265         58.34         6,032         1,935           57.82         6,032         290         58.35         6,032         1,935           57.83         6,032         314         58.36         6,032         2,031           57.85         6,032         386         58.38         6,032         2,079           57.86         6,032         410         58.40         6,032         2,177           57.87         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,270           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         55         57.92         6,032         2,31         58.44         6,032         2,413           57.92         6,032         55         58.45         6,032         2,460         57.94         6,032         2,55         57.95         6,032         2,50         57.95         6,032         627         58.49         6,032         2,55   |           |         |              |           |         |         |
| 57.82         6,032         290         58.35         6,032         1,935           57.84         6,032         338         58.37         6,032         2,031           57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.39         6,032         2,127           57.87         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,273           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,413           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         507         58.44         6,032         2,460           57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         603         58.48         6,032         2,602           57.97 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.83         6,032         314         58.36         6,032         1,983           57.84         6,032         362         58.37         6,032         2,031           57.85         6,032         386         58.39         6,032         2,175           57.86         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,223           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         458         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,507           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         675         58.49         6,032         2,649           57.97 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.84         6,032         338         58.37         6,032         2,031           57.85         6,032         362         58.38         6,032         2,127           57.86         6,032         410         58.40         6,032         2,175           57.87         6,032         434         58.41         6,032         2,223           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         531         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,460           57.92         6,032         555         58.46         6,032         2,507           57.93         6,032         555         58.47         6,032         2,557           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         676         58.51         6,032         2,742           58.00 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.85         6,032         362         58.38         6,032         2,079           57.86         6,032         386         58.39         6,032         2,127           57.87         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,223           57.89         6,032         483         58.42         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,507           57.95         6,032         603         58.48         6,032         2,507           57.96         6,032         603         58.48         6,032         2,602           57.97         6,032         676         58.51         6,032         2,649           57.99 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.86         6,032         386         58.39         6,032         2,127           57.87         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,223           57.89         6,032         458         58.42         6,032         2,318           57.90         6,032         483         58.43         6,032         2,365           57.91         6,032         557         58.44         6,032         2,365           57.92         6,032         551         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,507           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,649           57.97         6,032         651         58.50         6,032         2,649           57.99         6,032         700         58.52         6,032         2,742           58.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.87         6,032         410         58.40         6,032         2,175           57.88         6,032         434         58.41         6,032         2,227           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,460           57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,507           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         651         58.50         6,032         2,695           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,742           58.01 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.88         6,032         434         58.41         6,032         2,223           57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         557         58.44         6,032         2,465           57.92         6,032         555         58.46         6,032         2,460           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         651         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,649           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,882           58.03 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.89         6,032         458         58.42         6,032         2,270           57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         551         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,507           57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         676         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,649           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,882           58.03 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.90         6,032         483         58.43         6,032         2,318           57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,555           57.96         6,032         651         58.50         6,032         2,602           57.97         6,032         676         58.51         6,032         2,602           57.98         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,742           58.00         6,032         724         58.53         6,032         2,882           58.01         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,974           58.05 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.91         6,032         507         58.44         6,032         2,365           57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,507           57.94         6,032         579         58.47         6,032         2,555           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         651         58.50         6,032         2,602           57.97         6,032         676         58.51         6,032         2,649           57.98         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,882           58.01         6,032         772         58.55         6,032         2,882           58.03         6,032         772         58.56         6,032         2,974           58.05         6,032         82         382         3,021         3,067           58.06  |           | ,       |              |           |         |         |
| 57.92         6,032         531         58.45         6,032         2,413           57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         579         58.47         6,032         2,555           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         651         58.50         6,032         2,649           57.97         6,032         676         58.51         6,032         2,695           57.98         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,885           58.02         6,032         772         58.55         6,032         2,885           58.03         6,032         772         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         3,021           58.06         6,032         844         58.58         6,032         3,021           58.06 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.93         6,032         555         58.46         6,032         2,460           57.94         6,032         579         58.47         6,032         2,557           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         651         58.50         6,032         2,602           57.97         6,032         676         58.51         6,032         2,695           57.98         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,974           58.04         6,032         824         58.57         6,032         2,974           58.06         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.57         6,032         3,047           58.06 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.94         6,032         579         58.47         6,032         2,507           57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         651         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,649           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         7796         58.56         6,032         2,974           58.05         6,032         820         58.57         6,032         3,021           58.06         6,032         844         58.58         6,032         3,021           58.06         6,032         893         58.60         6,032         3,158           58.09 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> |           |         |              |           |         |         |
| 57.95         6,032         603         58.48         6,032         2,555           57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         651         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,695           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         772         58.55         6,032         2,835           58.02         6,032         772         58.56         6,032         2,928           58.04         6,032         820         58.56         6,032         2,928           58.04         6,032         844         58.58         6,032         3,021           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         893         58.60         6,032         3,112           58.07         6,032         893         58.60         6,032         3,114           58.08 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.96         6,032         627         58.49         6,032         2,602           57.97         6,032         651         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,695           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,882           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.61         6,032         3,112           58.08         6,032         917         58.61         6,032         3,249           58.11 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.97         6,032         651         58.50         6,032         2,649           57.98         6,032         676         58.51         6,032         2,695           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,249           58.10         6,032         941         58.62         6,032         3,249           58.11 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.98         6,032         676         58.51         6,032         2,695           57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,249           58.11         6,032         965         58.63         6,032         3,249           58.11 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>       |           |         |              |           |         |         |
| 57.99         6,032         700         58.52         6,032         2,742           58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,021           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,249           58.10         6,032         941         58.62         6,032         3,249           58.11         6,032         1,013         58.65         6,032         3,340           58.13<  |           |         |              |           |         |         |
| 58.00         6,032         724         58.53         6,032         2,789           58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,021           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,112           58.08         6,032         941         58.62         6,032         3,249           58.10         6,032         941         58.62         6,032         3,249           58.11         6,032         1,013         58.65         6,032         3,340           58.12         6,032         1,037         58.66         6,032         3,345           58.1  |           |         |              |           |         |         |
| 58.01         6,032         748         58.54         6,032         2,835           58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         1,013         58.65         6,032         3,340           58.12         6,032         1,037         58.66         6,032         3,340           58.13         6,032         1,062         58.67         6,032         3,430           58  |           |         |              |           |         |         |
| 58.02         6,032         772         58.55         6,032         2,882           58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         1,013         58.65         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,340           58.14         6,032         1,062         58.67         6,032         3,430   |           |         |              |           |         |         |
| 58.03         6,032         796         58.56         6,032         2,928           58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,340           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,430           58.14         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520   |           |         |              |           |         |         |
| 58.04         6,032         820         58.57         6,032         2,974           58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,340           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,106         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>   |           |         |              |           |         |         |
| 58.05         6,032         844         58.58         6,032         3,021           58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,158         58.71         6,032         3,665   |           |         |              |           |         |         |
| 58.06         6,032         869         58.59         6,032         3,067           58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,430           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,158         58.71         6,032         3,665           58.19         6,032         1,182         58.72         6,032         3,698   |           |         |              |           |         |         |
| 58.07         6,032         893         58.60         6,032         3,112           58.08         6,032         917         58.61         6,032         3,158           58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,134         58.70         6,032         3,565           58.18         6,032         1,158         58.71         6,032         3,609           58.20         6,032         1,206         58.73         6,032         3,698   |           |         |              |           |         |         |
| 58.09         6,032         941         58.62         6,032         3,204           58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,134         58.70         6,032         3,565           58.18         6,032         1,158         58.71         6,032         3,609           58.19         6,032         1,182         58.72         6,032         3,698           58.20         6,032         1,206         58.73         6,032         3,742   | 58.07     |         | 893          | 58.60     |         |         |
| 58.10         6,032         965         58.63         6,032         3,249           58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,134         58.70         6,032         3,565           58.18         6,032         1,158         58.71         6,032         3,609           58.19         6,032         1,182         58.72         6,032         3,698           58.20         6,032         1,206         58.73         6,032         3,742   | 58.08     | 6,032   | 917          | 58.61     | 6,032   | 3,158   |
| 58.11         6,032         989         58.64         6,032         3,295           58.12         6,032         1,013         58.65         6,032         3,340           58.13         6,032         1,037         58.66         6,032         3,385           58.14         6,032         1,062         58.67         6,032         3,430           58.15         6,032         1,086         58.68         6,032         3,475           58.16         6,032         1,110         58.69         6,032         3,520           58.17         6,032         1,134         58.70         6,032         3,565           58.18         6,032         1,158         58.71         6,032         3,609           58.19         6,032         1,182         58.72         6,032         3,698           58.20         6,032         1,206         58.73         6,032         3,742           58.21         6,032         1,255         58.74         6,032         3,742   | 58.09     |         | 941          | 58.62     |         |         |
| 58.12       6,032       1,013       58.65       6,032       3,340         58.13       6,032       1,037       58.66       6,032       3,385         58.14       6,032       1,062       58.67       6,032       3,430         58.15       6,032       1,086       58.68       6,032       3,475         58.16       6,032       1,110       58.69       6,032       3,520         58.17       6,032       1,134       58.70       6,032       3,565         58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,698         58.20       6,032       1,206       58.73       6,032       3,742         58.21       6,032       1,255       58.74       6,032       3,742   |           | 6,032   |              | 58.63     | 6,032   |         |
| 58.13       6,032       1,037       58.66       6,032       3,385         58.14       6,032       1,062       58.67       6,032       3,430         58.15       6,032       1,086       58.68       6,032       3,475         58.16       6,032       1,110       58.69       6,032       3,520         58.17       6,032       1,134       58.70       6,032       3,565         58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.14       6,032       1,062       58.67       6,032       3,430         58.15       6,032       1,086       58.68       6,032       3,475         58.16       6,032       1,110       58.69       6,032       3,520         58.17       6,032       1,134       58.70       6,032       3,565         58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.15       6,032       1,086       58.68       6,032       3,475         58.16       6,032       1,110       58.69       6,032       3,520         58.17       6,032       1,134       58.70       6,032       3,565         58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.16       6,032       1,110       58.69       6,032       3,520         58.17       6,032       1,134       58.70       6,032       3,565         58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.17     6,032     1,134     58.70     6,032     3,565       58.18     6,032     1,158     58.71     6,032     3,609       58.19     6,032     1,182     58.72     6,032     3,654       58.20     6,032     1,206     58.73     6,032     3,698       58.21     6,032     1,255     58.74     6,032     3,742   |           |         |              |           |         |         |
| 58.18       6,032       1,158       58.71       6,032       3,609         58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.19       6,032       1,182       58.72       6,032       3,654         58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.20       6,032       1,206       58.73       6,032       3,698         58.21       6,032       1,255       58.74       6,032       3,742   |           |         |              |           |         |         |
| 58.21 6,032 1,255 58.74 6,032 3,742   |           |         |              |           |         |         |
|   |           |         |              |           |         |         |
| 30.22 0,032 1,304 30.75 0,032 3,760   |           |         |              |           |         |         |
|   | JU.ZZ     | 0,032   | 1,304        | 30.73     | 0,032   | 3,700   |

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# **Stage-Area-Storage for Pond IS2: infiltration 2 (continued)**

| Elevation      | Surface        | Storage        | Elevation      | Surface        | Storage        |
|----------------|----------------|----------------|----------------|----------------|----------------|
| (feet)         | (sq-ft)        | (cubic-feet)   | (feet)         | (sq-ft)        | (cubic-feet)   |
| 58.76          | 6,032          | 3,830          | 59.29          | 6,032          | 5,888          |
| 58.77          | 6,032          | 3,874          | 59.30          | 6,032          | 5,919          |
| 58.78          | 6,032          | 3,918          | 59.31          | 6,032          | 5,949          |
| 58.79          | 6,032          | 3,961          | 59.32          | 6,032          | 5,979          |
| 58.80          | 6,032          | 4,005          | 59.33          | 6,032          | 6,008          |
| 58.81          | 6,032          | 4,048          | 59.34          | 6,032          | 6,037          |
| 58.82          | 6,032          | 4,091          | 59.35          | 6,032          | 6,066          |
| 58.83          | 6,032          | 4,134          | 59.36          | 6,032          | 6,094          |
| 58.84<br>58.85 | 6,032<br>6,032 | 4,177<br>4,220 | 59.37<br>59.38 | 6,032<br>6,032 | 6,122<br>6,150 |
| 58.86          | 6,032          | 4,262          | 59.39          | 6,032          | 6,177          |
| 58.87          | 6,032          | 4,305          | 59.40          | 6,032          | 6,204          |
| 58.88          | 6,032          | 4,347          | 59.41          | 6,032          | 6,231          |
| 58.89          | 6,032          | 4,389          | 59.42          | 6,032          | 6,258          |
| 58.90          | 6,032          | 4,431          | 59.43          | 6,032          | 6,284          |
| 58.91          | 6,032          | 4,472          | 59.44          | 6,032          | 6,311          |
| 58.92          | 6,032          | 4,514          | 59.45          | 6,032          | 6,337          |
| 58.93          | 6,032          | 4,555          | 59.46          | 6,032          | 6,363          |
| 58.94          | 6,032          | 4,597          | 59.47          | 6,032          | 6,388          |
| 58.95          | 6,032          | 4,638          | 59.48          | 6,032          | 6,414          |
| 58.96          | 6,032          | 4,678          | 59.49          | 6,032          | 6,439          |
| 58.97          | 6,032          | 4,719          | 59.50          | 6,032          | 6,464          |
| 58.98          | 6,032          | 4,759          | 59.51          | 6,032          | 6,489          |
| 58.99          | 6,032          | 4,800          | 59.52          | 6,032          | 6,514          |
| 59.00          | 6,032          | 4,840          | 59.53          | 6,032          | 6,538          |
| 59.01          | 6,032          | 4,880          | 59.54          | 6,032          | 6,562          |
| 59.02          | 6,032<br>6,032 | 4,919          | 59.55          | 6,032<br>6,032 | 6,586          |
| 59.03<br>59.04 | 6,032          | 4,959<br>4,998 | 59.56<br>59.57 | 6,032          | 6,610<br>6,635 |
| 59.05          | 6,032          | 5,037          | 59.58          | 6,032          | 6,659          |
| 59.06          | 6,032          | 5,076          | 59.59          | 6,032          | 6,683          |
| 59.07          | 6,032          | 5,114          | 59.60          | 6,032          | 6,707          |
| 59.08          | 6,032          | 5,152          | 59.61          | 6,032          | 6,731          |
| 59.09          | 6,032          | 5,190          | 59.62          | 6,032          | 6,755          |
| 59.10          | 6,032          | 5,228          | 59.63          | 6,032          | 6,779          |
| 59.11          | 6,032          | 5,266          | 59.64          | 6,032          | 6,803          |
| 59.12          | 6,032          | 5,303          | 59.65          | 6,032          | 6,828          |
| 59.13          | 6,032          | 5,340          | 59.66          | 6,032          | 6,852          |
| 59.14          | 6,032          | 5,377          | 59.67          | 6,032          | 6,876          |
| 59.15          | 6,032          | 5,414          | 59.68          | 6,032          | 6,900          |
| 59.16          | 6,032          | 5,450          | 59.69          | 6,032          | 6,924          |
| 59.17          | 6,032          | 5,486          | 59.70          | 6,032          | 6,948          |
| 59.18          | 6,032          | 5,522          | 59.71          | 6,032          | 6,972          |
| 59.19          | 6,032          | 5,557          | 59.72          | 6,032          | 6,996          |
| 59.20          | 6,032          | 5,592          | 59.73          | 6,032          | 7,021          |
| 59.21<br>59.22 | 6,032          | 5,627          | 59.74<br>59.75 | 6,032          | 7,045<br>7,069 |
| 59.23          | 6,032<br>6,032 | 5,661<br>5,695 | 59.76          | 6,032<br>6,032 | 7,009          |
| 59.24          | 6,032          | 5,728          | 59.77          | 6,032          | 7,093<br>7,117 |
| 59.25          | 6,032          | 5,761          | 59.78          | 6,032          | 7,117<br>7,141 |
| 59.26          | 6,032          | 5,794          | 59.79          | 6,032          | 7,165          |
| 59.27          | 6,032          | 5,826          | 59.80          | 6,032          | 7,189          |
| 59.28          | 6,032          | 5,857          | 59.81          | 6,032          | 7,214          |
|                | •              | •              |                | •              | •              |

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# **Stage-Area-Storage for Pond IS2: infiltration 2 (continued)**

| Elevation | Surface | Storage      |
|-----------|---------|--------------|
| (feet)    | (sq-ft) | (cubic-feet) |
| 59.82     | 6,032   | 7,238        |
| 59.83     | 6,032   | 7,262        |
| 59.84     | 6,032   | 7,286        |
| 59.85     | 6,032   | 7,310        |
| 59.86     | 6,032   | 7,334        |
| 59.87     | 6,032   | 7,358        |
| 59.88     | 6,032   | 7,382        |
| 59.89     | 6,032   | 7,407        |
| 59.90     | 6,032   | 7,431        |
| 59.91     | 6,032   | 7,455        |
| 59.92     | 6,032   | 7,479        |
| 59.93     | 6,032   | 7,503        |
| 59.94     | 6,032   | 7,527        |
| 59.95     | 6,032   | 7,551        |
| 59.96     | 6,032   | 7,575        |
| 59.97     | 6,032   | 7,600        |
| 59.98     | 6,032   | 7,624        |
| 59.99     | 6,032   | 7,648        |
| 60.00     | 6,032   | 7,672        |
| 60.01     | 6,032   | 7,696        |
| 60.02     | 6,032   | 7,720        |
| 60.03     | 6,032   | 7,744        |



# INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: Infiltration System 3

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

|                    | 11  | •                  |
|--------------------|---|--------------------|
| yes                | Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?                 | ← yes              |
| 0.13 ac<br>0.13 ac | A = Area draining to the practice A <sub>I</sub> = Impervious area draining to the practice |                    |
|                    |   |                    |
| 0.99 decimal       | I = Percent impervious area draining to the practice, in decimal form                       |                    |
| 0.94 unitless      | Rv = Runoff coefficient = 0.05 + (0.9 x I)  |                    |
| 0.12 ac-in         | WQV= 1" x Rv x A  |                    |
| 443 cf             | WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")   |                    |
| 111 cf             | 25% x WQV (check calc for sediment forebay volume)  |                    |
| Isolator Row       | Method of pretreatment? (not required for clean or roof runoff)                             |                    |
| ** cf              | V <sub>SED</sub> = Sediment forebay volume, if used for pretreatment                        | <u>&gt;</u> 25%WQV |
| 2,057 cf           | V = Volume <sup>1</sup> (attach a stage-storage table)                                      | ≥ WQV              |
| 1,972 sf           | A <sub>SA</sub> = Surface area of the bottom of the pond                                    |                    |
| 0.72 iph           | Ksat <sub>DESIGN</sub> = Design infiltration rate <sup>2</sup>                              |                    |
| 3.7 hours          | $I_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})$  | <u>&lt;</u> 72-hrs |
| 59.60 feet         | E <sub>BTM</sub> = Elevation of the bottom of the basin                                     |                    |
| 55.60 feet         | $E_{SHWT}$ = Elevation of SHWT (if none found, enter the lowest elevation of the test $I$   |                    |
| 53.40 feet         | $E_{ROCK}$ = Elevation of bedrock (if none found, enter the lowest elevation of the tes     | t pit)             |
| 4.00 feet          | D <sub>SHWT</sub> = Separation from SHWT  | ≥ * <sup>3</sup>   |
| 6.2 feet           | D <sub>ROCK</sub> = Separation from bedrock   | ≥ * <sup>3</sup>   |
| N/A ft             | D <sub>amend</sub> = Depth of amended soil, if applicable due high infiltation rate         | ≥ <b>24</b> "      |
| N/A ft             | $D_T$ = Depth of trench, if trench proposed   | 4 - 10 ft          |
| yes Yes/No         | If a trench or underground system is proposed, has observation well been provide            | led? <b>←yes</b>   |
| N/A                | If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.               | ← yes              |
| N/A Yes/No         | If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?                 | ← yes              |
| N/A :1             | If a basin is proposed, pond side slopes.   | <u>&gt;</u> 3:1    |
| 60.59 ft           | Peak elevation of the 10-year storm event (infiltration can be used in analysis)            |                    |
| 61.49 ft           | Peak elevation of the 50-year storm event (infiltration can be used in analysis)            |                    |
| 61.60 ft           | Elevation of the top of the practice (if a basin, this is the elevation of the berm)        |                    |
| YES                | 10 peak elevation < Elevation of the top of the trench? <sup>5</sup>                        | ← yes              |
| YES                | If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?                         | ← yes              |

- 1. Volume below the lowest invert of the outlet structure and excludes forebay volume
- 2. Ksat<sub>DESIGN</sub> includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
- 3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
- 4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
- 5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

| Designer's Notes: | "All pavement runoff is pretreated by the isolator row |
|-------------------|--|
|                   |  |
|                   |  |
|                   |  |

NHDES Alteration of Terrain Last Revised: March 2019

# Stage-Area-Storage for Pond IS3: infiltration 3

| Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) | Elevation<br>(feet) | Surface<br>(sq-ft) | Storage<br>(cubic-feet) |
|---------------------|--------------------|-------------------------|---------------------|--------------------|-------------------------|
| 59.60               | 1,972              | 0                       | 60.66               | 1,972              | 1,202                   |
| 59.62               | 1,972              | 16                      | 60.68               | 1,972              | 1,228                   |
| 59.64               | 1,972              | 32                      | 60.70               | 1,972              | 1,254                   |
| 59.66               | 1,972              | 47                      | 60.72               | 1,972              | 1,279                   |
| 59.68               | 1,972              | 63                      | 60.74               | 1,972              | 1,303                   |
| 59.70               | 1,972              | 79                      | 60.76               | 1,972              | 1,328                   |
| 59.72               | 1,972              | 95                      | 60.78               | 1,972              | 1,352                   |
| 59.74               | 1,972              | 110                     | 60.80               | 1,972              | 1,375                   |
| 59.76               | 1,972              | 126                     | 60.82               | 1,972              | 1,398                   |
| 59.78               | 1,972              | 142                     | 60.84               | 1,972              | 1,421                   |
| 59.80               | 1,972              | 158                     | 60.86               | 1,972              | 1,443                   |
| 59.82               | 1,972              | 174                     | 60.88               | 1,972              | 1,464                   |
| 59.84               | 1,972              | 189                     | 60.90               | 1,972              | 1,485                   |
| 59.86               | 1,972              | 205                     | 60.92               | 1,972              | 1,505                   |
| 59.88               | 1,972              | 221                     | 60.94               | 1,972              | 1,524                   |
| 59.90               | 1,972              | 237                     | 60.96               | 1,972              | 1,543                   |
| 59.92               | 1,972              | 252                     | 60.98               | 1,972              | 1,561                   |
| 59.94               | 1,972              | 268                     | 61.00               | 1,972              | 1,579                   |
| 59.96               | 1,972              | 284                     | 61.02               | 1,972              | 1,597                   |
| 59.98               | 1,972              | 300                     | 61.04               | 1,972              | 1,614                   |
| 60.00               | 1,972              | 315                     | 61.06               | 1,972              | 1,630                   |
| 60.02               | 1,972              | 331                     | 61.08               | 1,972              | 1,647                   |
| 60.04               | 1,972              | 347                     | 61.10               | 1,972              | 1,663                   |
| 60.06               | 1,972              | 363                     | 61.12               | 1,972              | 1,679                   |
| 60.08               | 1,972              | 379                     | 61.14               | 1,972              | 1,695                   |
| 60.10               | 1,972              | 394                     | 61.16               | 1,972              | 1,710                   |
| 60.12               | 1,972              | 425                     | 61.18               | 1,972              | 1,726                   |
| 60.14               | 1,972              | 456                     | 61.20               | 1,972              | 1,742                   |
| 60.16               | 1,972              | 486                     | 61.22               | 1,972              | 1,758                   |
| 60.18               | 1,972              | 517                     | 61.24               | 1,972              | 1,773                   |
| 60.20               | 1,972              | 548                     | 61.26               | 1,972              | 1,789                   |
| 60.22               | 1,972              | 578                     | 61.28               | 1,972              | 1,805                   |
| 60.24               | 1,972              | 608                     | 61.30               | 1,972              | 1,821                   |
| 60.26               | 1,972              | 638                     | 61.32               | 1,972              | 1,837                   |
| 60.28               | 1,972              | 668                     | 61.34               | 1,972              | 1,852                   |
| 60.30               | 1,972              | 698                     | 61.36               | 1,972              | 1,868                   |
| 60.32               | 1,972              | 728                     | 61.38               | 1,972              | 1,884                   |
| 60.34               | 1,972              | 757                     | 61.40               | 1,972              | 1,900                   |
| 60.36               | 1,972              | 786                     | 61.42               | 1,972              | 1,915                   |
| 60.38               | 1,972              | 816                     | 61.44               | 1,972              | 1,931                   |
| 60.40               | 1,972              | 845                     | 61.46               | 1,972              | 1,947                   |
| 60.42               | 1,972              | 873                     | 61.48               | 1,972              | 1,963                   |
| 60.44               | 1,972              | 902                     | 61.50               | 1,972              | 1,979                   |
| 60.46               | 1,972              | 930                     | 61.52               | 1,972              | 1,994                   |
| 60.48               | 1,972              | 959                     | 61.54               | 1,972              | 2,010                   |
| 60.50               | 1,972              | 987                     | 61.56               | 1,972              | 2,026                   |
| 60.52               | 1,972<br>1,972     | 1,015<br>1,042          | 61.58               | 1,972              | 2,042                   |
| 60.54               |                    | ,                       | 61.60               | 1,972              | 2,057                   |
| 60.56<br>60.58      | 1,972<br>1,972     | 1,069<br>1,097          |                     |                    |                         |
| 60.60               | 1,972              | 1,123                   |                     |                    |                         |
| 60.62               | 1,972              | 1,150                   |                     |                    |                         |
| 60.64               | 1,972              | 1,176                   |                     |                    |                         |
| 30.04               | 1,012              | 1,170                   |                     |                    |                         |
|                     |                    |                         |                     |                    |                         |



# 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 (i.e. for a technology which is not a stormwater wetland, infiltration practice, etc.)

# Water Quality Volume (WQV)

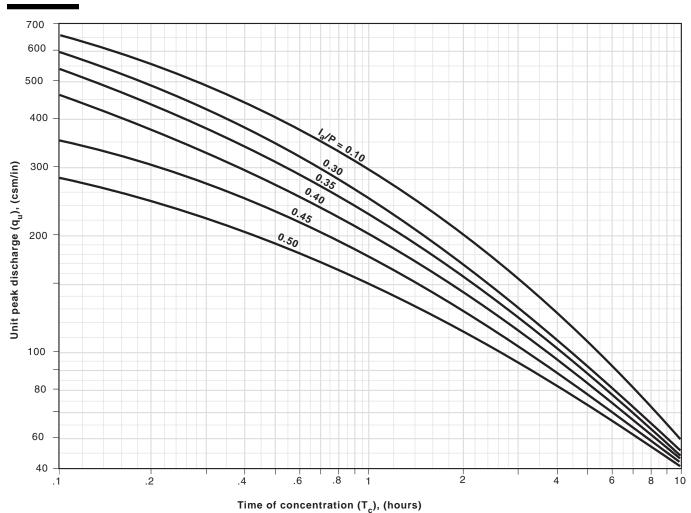
| 0.05 ac       | A = Area draining to the practice                                     |
|---------------|---|
| 0.05 ac       | A <sub>I</sub> = Impervious area draining to the practice             |
| 0.88 decimal  | I = Percent impervious area draining to the practice, in decimal form |
| 0.85 unitless | Rv = Runoff coefficient = 0.05 + (0.9 x I)                            |
| 0.05 ac-in    | WQV= 1" x Rv x A  |
| 169 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".  |
| 0.85  | inches                  | Q = Water quality depth. Q = WQV/A  |
| 99    | unitless                | CN = Unit peak discharge curve number. CN = $1000/(10+5P+10Q-10*[Q^2 + 1.25*Q*P]^{0.5})$  |
| 0.1   | inches                  | S = Potential maximum retention. S = (1000/CN) - 10   |
| 0.029 | inches                  | la = Initial abstraction. la = 0.2S   |
| 6.0   | minutes                 | $T_c$ = Time of Concentration   |
| 700.0 | cfs/mi <sup>2</sup> /in | $q_{\scriptscriptstyle u}$ is the unit peak discharge. Obtain this value from TR-55 exhibits 4-II and 4-III.                    |
| 0.051 | cfs                     | WQF = $q_u \times WQV$ . Conversion: to convert "cfs/mi <sup>2</sup> /in * ac-in" to "cfs" multiply by 1mi <sup>2</sup> /640ac. |

| Designer's Notes: Calculations for WQ-01                                   |
|--|
| The Jellyfish JF4 with 15" cartridges has a treatment capacity of 0.05 cfs |
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 $\textbf{Exhibit 4-III} \ \ \text{Unit peal discharge } (q_u) \ \text{for NRCS (SCS) type III rainfall distribution}$ 





# **Rip-Rap Apron / Energy Dissipation / Stability Calculations**



Project No.
Project Description

Calculated By

Checked By

3250-01

 Surgical Center

 360 Corporate Drive, Portsmouth, NH

 SM
 Date
 08/09/23

 BDJ
 Date
 08/09/23

Sheet

1 of 10

Outlet # FES-01 (from HydroCAD IS1)

Q10 = 0.95 cfs  $T_w = 0.33$  fee

 $D_o = 8$  inches

### **Design Criteria**

### **Apron Dimensions**

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= 2 feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

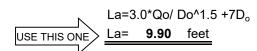
Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D<sub>o</sub> is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:



- 4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:
  - a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.



| Project No.                | 3250-01                             | Sheet | 2 of 10  |
|----------------------------|-------------------------------------|-------|----------|
| <b>Project Description</b> | otion Surgical Center               |       |          |
|                            | 360 Corporate Drive, Portsmouth, NH |       |          |
| Calculated By              | SM                                  | Date  | 08/09/23 |
| Checked By                 | BDJ                                 | Date  | 08/09/23 |

- 6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.
- 7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.
- 8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

### Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d<sub>50</sub>=0.02\*Q^4/3/(Tw\*D<sub>o</sub>)

 $d_{50}$ = 1.02 inches USE 3 inches

d<sub>50</sub> minimum 3 inches

#### Where:

d<sub>50</sub> is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet Q is the discharge from the pipe or channel in cubic feet per second  $D_{\circ}$  is the diameter of the pipe or width of the channel in feet

- 2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size.
- 3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

 $d = 1.5*(1.5*d_{50}(largest stone size))$ 

d = **7** inches\*

\* must use a minimum of 6"

Rock Rip Rap Gradation

| - 4 |                     |         |            |        |
|-----|---------------------|---------|------------|--------|
|     | % of weight smaller |         |            |        |
|     | than the given size | size of | f stone in | inches |
|     | 100                 | 4.5     | to         | 6.0    |
|     | 85                  | 3.9     | to         | 5.4    |
|     | 50                  | 3.0     | to         | 4.5    |
|     | 15                  | 0.9     | to         | 1.5    |

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)



Project No.
Project Description

Calculated By

 Surgical Center

 360 Corporate Drive, Portsmouth, NH

 SM
 Date
 08/09/23

 BDJ
 Date
 08/09/23

Sheet

3 of 10

Checked By

FES-02 (from HydroCAD IS2)

Q10 = 0.76 cfs

 $T_w = 0.5$  feet

3250-01

 $D_o = 12$  inches

### Design Criteria

Outlet #

### **Apron Dimensions**

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= 3 feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

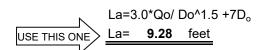
Where:

La is the length of the apron

Q is the discharge from the pipe or channel

Do is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:



- 4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:
  - a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.



| Project No.                | 3250-01                             | Sheet | 4 of 10  |
|----------------------------|-------------------------------------|-------|----------|
| <b>Project Description</b> | Surgical Center                     |       |          |
|                            | 360 Corporate Drive, Portsmouth, NH |       |          |
| Calculated By              | SM                                  | Date  | 08/09/23 |
| Checked By                 | BDJ                                 | Date  | 08/09/23 |

- 6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.
- 7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.
- 8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

### Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d<sub>50</sub>=0.02\*Q^4/3/(Tw\*D<sub>o</sub>)

 $d_{50}$ = **0.33** inches **USE 3** inches

d<sub>50</sub> minimum 3 inches

#### Where:

d<sub>50</sub> is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet Q is the discharge from the pipe or channel in cubic feet per second  $D_{\circ}$  is the diameter of the pipe or width of the channel in feet

- 2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size.
- 3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

 $d = 1.5*(1.5*d_{50}(largest stone size))$ 

d = **7** inches\*

\* must use a minimum of 6"

Rock Rip Rap Gradation

| % of weight smaller |         |          |        |
|---------------------|---------|----------|--------|
| than the given size | size of | stone in | inches |
| 100                 | 4.5     | to       | 6.0    |
| 85                  | 3.9     | to       | 5.4    |
| 50                  | 3.0     | to       | 4.5    |
| 15                  | 0.9     | to       | 1.5    |

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)



 Project No.
 3250-01
 Sheet
 5 of 10

 Project Description
 Surgical Center
 360 Corporate Drive, Portsmouth, NH

 Calculated By
 SM
 Date
 08/09/23

 Checked By
 BDJ
 Date
 08/09/23

Outlet # FES-03 (from HydroCAD P-6)

Q10 = 0.28 cfs  $T_w = 0.33$  fee

 $D_o = 8$  inches

### Design Criteria

### **Apron Dimensions**

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= 2 feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

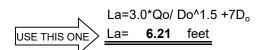
Where:

La is the length of the apron

Q is the discharge from the pipe or channel

D<sub>o</sub> is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:



- 4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:
  - a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.



| Project No.                | 3250-01                             | Sheet | 6 of 10  |
|----------------------------|-------------------------------------|-------|----------|
| <b>Project Description</b> | Surgical Center                     |       |          |
|                            | 360 Corporate Drive, Portsmouth, NH |       |          |
| Calculated By              | SM                                  | Date  | 08/09/23 |
| Checked By                 | BDJ                                 | Date  | 08/09/23 |

- 6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.
- 7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.
- 8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

### Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

d<sub>50</sub>=0.02\*Q^4/3/(Tw\*D<sub>o</sub>)

 $d_{50}$ = **0.20** inches **USE 3** inches

d<sub>50</sub> minimum 3 inches

#### Where:

d<sub>50</sub> is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet Q is the discharge from the pipe or channel in cubic feet per second  $D_{\circ}$  is the diameter of the pipe or width of the channel in feet

- 2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size.
- 3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

d = 1.5\*(1.5\*d<sub>50</sub>(largest stone size))

d = **7** inches\*

\* must use a minimum of 6"

Rock Rip Rap Gradation

| % of weight smaller |         |          |        |
|---------------------|---------|----------|--------|
| than the given size | size of | stone in | inches |
| 100                 | 4.5     | to       | 6.0    |
| 85                  | 3.9     | to       | 5.4    |
| 50                  | 3.0     | to       | 4.5    |
| 15                  | 0.9     | to       | 1.5    |

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)



Project No. 3250-01

Project Description Surgical Center
360 Corporate Drive, Portsmouth, NH

Calculated By Checked By 
 360 Corporate Drive, Portsmouth, NH

 SM
 Date
 08/09/23

 BDJ
 Date
 08/09/23

Sheet

7 of 10

Outlet # FES-04 (from HydroCAD B2)

Q10 = 0.39 cfs  $T_w = 0.33$  fee

 $D_o = 8$  inches

### Design Criteria

### **Apron Dimensions**

The dimensions of the apron at the outlet of the pipe shall be determined as follows:

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= 2 feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

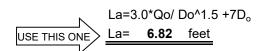
Where:

La is the length of the apron

Q is the discharge from the pipe or channel

Do is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:



- 4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:
  - a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3\*Do+0.4\*La W= **4.73** feet

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.



| Project No.                | 3250-01                             | Sheet 8 of 10 |          |
|----------------------------|-------------------------------------|---------------|----------|
| <b>Project Description</b> | Surgical Center                     |               |          |
|                            | 360 Corporate Drive, Portsmouth, NH |               |          |
| Calculated By              | SM                                  | Date          | 08/09/23 |
| Checked By                 | BDJ                                 | Date          | 08/09/23 |

- 6.) The side of the apron in a well-defined channel shall be 2:1 (horizontal to vertical) or flatter. The height of the structural lining along the channel sides shall begin at the elevation equal to the top of conduit and taper down to the channel bottom through the length of the apron.
- 7.) The bottom grade of the apron shall be level (0% grade). No overfall is allowable at the end of the apron.
- 8.) The apron shall be located so that there are no bends in the horizontal alignment of the apron.

### Rock Riprap

The following criteria shall be used to determine the dimensions of the rock riprap used for the apron:

1.) The median stone diameter shall be determined using the formula:

 $d_{50}=0.02*Q^4/3/(Tw*D_0)$ 

 $d_{50}$ = **0.31** inches **USE 3** inches

d<sub>50</sub> minimum 3 inches

#### Where:

d<sub>50</sub> is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet Q is the discharge from the pipe or channel in cubic feet per second  $D_{\circ}$  is the diameter of the pipe or width of the channel in feet

- 2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size.
- 3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

d = 1.5\*(1.5\*d<sub>50</sub>(largest stone size))

d = **7** inches\*

\* must use a minimum of 6"

Rock Rip Rap Gradation

| -, |                     |         |            |        |
|----|---------------------|---------|------------|--------|
|    | % of weight smaller |         |            |        |
|    | than the given size | size of | f stone in | inches |
|    | 100                 | 4.5     | to         | 6.0    |
|    | 85                  | 3.9     | to         | 5.4    |
|    | 50                  | 3.0     | to         | 4.5    |
|    | 15                  | 0.9     | to         | 1.5    |

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)



Project No. **Project Description** 

Calculated By

Checked By

Surgical Center 360 Corporate Drive, Portsmouth, NH Date

3250-01

BDJ

08/09/23 08/09/23

Sheet

Date

9 of 10

Outlet # FES-05 (from HydroCAD B3)

Q10 =0.00 cfs 0.00

 $D_o =$ 8 inches

### Design Criteria

### **Apron Dimensions**

The dimensions of the apron at the outlet of the pipe shall be determined as

1.) The width of the apron at the outlet of the pipe or channel shall be 3 times the diameter of the pipe of width of the channel.

W= feet

2.) The length of the apron shall be determined from the following formula when the tailwater depth at the outlet of the pipe or channel is less than one-half the diameter of the pipe or one-half the width of the channel:

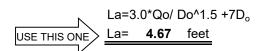
Where:

La is the length of the apron

Q is the discharge from the pipe or channel

Do is the diameter of pipe of width of channel

3.) When the depth of the tailwater at the outlet of the pipe or channel is equal to or greater than one-half the diameter of the pipe or the width of the channel. Then the following formula applies:



- 4.) Where there is no well defined channel downstream of the outlet, the width of the downstream end of the apron shall be determined as follows:
  - a. For minimum tailwater conditions where the tailwater depth is less than the elevation of the center of the pipe:

b. For maximum tailwater conditions where the tailwater depth is greater than the elevation of the center of the pipe:

W=3\*Do+0.4\*La 3.87

5.) Where there is a stable well-defined channel downstream of the apron, the bottom of the apron shall be equal to the width of the channel.



| Project No.                | 3250-01                             | Sheet | 10 of 10 |
|----------------------------|-------------------------------------|-------|----------|
| <b>Project Description</b> | Surgical Center                     |       |          |
|                            | 360 Corporate Drive, Portsmouth, NH |       |          |
| Calculated By              | SM                                  | Date  | 08/09/23 |
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 $d_{50}$ = **0.00** inches **USE 3** inches

d<sub>50</sub> minimum 3 inches

#### Where:

d<sub>50</sub> is the median stone diameter in feet

Tw is the tailwater depth above the invert of the pipe channel in feet Q is the discharge from the pipe or channel in cubic feet per second  $D_{\rm o}$  is the diameter of the pipe or width of the channel in feet

- 2.) Fifty percent by weight of the riprap mixture shall be smaller the than median size stone designated as  $d_{50}$ . The largest stone size in the mixture shall be 1.5 times the  $d_{50}$  size.
- 3.) The quality and gradation of the rock, the thickness of the riprap lining, filter material and the quality of the stone shall meet the requirements in the Rock Riprap BMP. The minimum depth shall be 6 inches or 1.5 times the largest stone size in the mixture whichever is larger (d).

Thickness of the riprap

 $d = 1.5*(1.5*d_{50}(largest stone size))$ 

d = **7** inches\*

\* must use a minimum of 6"

Rock Rip Rap Gradation

| % of weight smaller |         |          |        |
|---------------------|---------|----------|--------|
| than the given size | size of | stone in | inches |
| 100                 | 4.5     | to       | 6.0    |
| 85                  | 3.9     | to       | 5.4    |
| 50                  | 3.0     | to       | 4.5    |
| 15                  | 0.9     | to       | 1.5    |

Formulas Used (Reference NHDES Handbook, Pages 7-114, 7-115)



# **Site Specific Soil Survey Report**

# TES ENVIRONMENTAL CONSULTANTS, L.L.C.

# Environmental Planning and Permitting Soil and Wetlands Investigation

# SITE-SPECIFIC SOIL SURVEY REPORT

performed at

ATDG, LLC Tax Map 315, Lot 5 360 Corporate Drive Portsmouth, New Hampshire

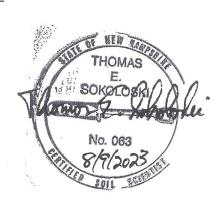
prepared for

Allen & Major Associates, Inc. 250 Commercial Street Manchester, New Hampshire

TES Project # 23-0031

1494 Route 3A, Unit 1 Bow, NH 03304 (603) 856-8925

tom@tesenviro.comcastbiz.net



August 9, 2023

Mr. Brian D. Jones, P.E. Allen & Major Associates, Inc. 400 Harvey Road Manchester, New Hampshire 03103

RE: Site Specific Soil Map for ATDG, LLC

Tax Map 315, Lot 5; 360 Corporate Drive, Portsmouth, New Hampshire

Dear Mr. Jones:

On August 9, 2023 I performed field work on the above-referenced property for a Site Specific Soil Survey as you requested. This parcel was depicted on an Existing Conditions Plan and surveyed boundary map printed at a scale of 1" = 40', with a 1-foot contour interval, which served as the field base map for the soil survey. Ample ground control for the soil survey was provided by the flagged wetland boundaries, tree lines, a stone wall, trails, individual trees and boulders and development features on and adjacent to the site including edge of pavement, a shed, utility poles, storm drains, concrete piers and property boundary markers.

This Site Specific Soil Survey was completed utilizing SSSNNE Special Publication No. 3; Site Specific Soil Mapping Standards for New Hampshire and Vermont, Version 7.0, March 2021. The soil legend used for this soil map conforms to the New Hampshire State-Wide Numerical Soils Legend, Issue #10, January 2011 established and maintained by the Natural Resources Conservation Service.

The purpose of this soil survey was to provide information for an Alteration of Terrain permit application related to planned site development. Field work for this survey included the examination of numerous soil profiles via hand dug spade pits and soil auger borings taken at intervals sufficient to delineate the boundaries between soil map units. The NRCS Soil Survey of Rockingham County, New Hampshire was reviewed to determine the soils that have been mapped on and in the vicinity of the site, which were entirely Urban Land-Canton complex (799). As would be expected, Site Specific Soil mapping observations revealed discrepancies with the broad-scaled NRCS mapping. Altered soils are present, mainly in the western portion of the mapping area, moderately well drained soils exist adjacent to and between site wetlands, and poorly drained soils are present within wetlands in the central portion of the site. All New Hampshire-jurisdictional wetlands on the parcel were previously delineated by others, and I concurred with the delineation.

The following report includes a Site Specific Soil Map Key with accompanying Hydrologic Soil Groups and High Intensity Soil Survey codes, as well as soil map unit descriptions. The general soil conditions on the site consist of nearly level to moderately sloping lands having soils formed in loamy glacial till deposits. As noted in the above paragraph, altered soils are found along the lot frontage along Corporate Drive, consisting of regraded land extending approximately 140-160 feet east from Corporate Drive. Most of this area is lawn, although an asphalt-paved parking

lot exists in the northwest corner of the site. The remainder of the site is forested, with two wetland drainageways originating at the rear of the regraded portion of the site to the eastern property boundary. Site soils were mostly found to be derived from loamy, loose glacial till deposits, with the poorly drained soils in the wetlands having a loam to silt loam substratum likely derived from glaciomarine deposits

If you have any questions regarding the soils on this site and the accompanying report, please contact our office.

Very truly yours,

Thomas E. Sokoloski

New Hampshire Certified Soil Scientist No. 63

### SITE SPECIFIC SOIL MAP UNIT KEY

|            |                            | Slope  | Drainage        | HISS   | Hydrologic |
|------------|----------------------------|--------|-----------------|--------|------------|
| Symbol*    | Map Unit                   | Class  | Class           | Symbol | Soil Group |
| 42B        | Canton fine sandy loam     | 0-8%   | Well            | 221BH  | В          |
| 42C        | Canton fine sandy loam     | 8-15%  | Well            | 221CH  | В          |
| 444B       | Newfields fine sandy loam  | 0-8%   | Moderately well | 321BH  | В          |
| 444C       | Newfields fine sandy loam  | 8-15%  | Moderately well | 321CH  | В          |
| 500B/ccabb | Udorthents, loamy          | 0-8%   | Well            | 261BH  | В          |
| 500C/ccabb | Udorthents, loamy          | 8-15%  | Well            | 261CH  | В          |
| 500D/ccabb | Udorthents, loamy          | 15-25% | Well            | 261DH  | В          |
| 500E/ccabb | Udorthents, loamy          | 25% +  | Well            | 261EH  | В          |
| 500B/hchbb | Udorthents, loamy          | 0-8%   | Undeterminable  | 761BH* | * B**      |
| 538B       | Squamscott fine sandy loam | 0-8%   | Poorly          | 551BH  | C          |
| 921B       | Newfields Variant (SPD)    | 0-8%   | Somewhat poorly | 421BH  | C          |
|            |                            |        |                 |        |            |

<sup>\*</sup> Refer to accompanying report for 5-unit supplemental symbol explanation.

This detailed Site-Specific Soil Map, prepared on August 9, 2023 by Thomas E. Sokoloski, Certified Soil Scientist #063 of TES Environmental Consultants, L.L.C. in Bow, New Hampshire, conforms to the standards of SSSNNE Publication No. 3, Version 7.0, "Site-Specific Soil Mapping Standards for New Hampshire and Vermont", March 2021. This map has been prepared to comply with soil mapping requirements of RSA 485 A: 17 and NHDES Env-Wq 1500, Alteration of Terrain. See accompanying report for methodology, map symbol legend, and interpretations. Use of the map symbol denominators for disturbed or altered soils, where given, is at the discretion of the Certified Soil Scientist.

This map product is within the technical standards of the National Cooperative Soil Survey. It is a special purpose product, intended for use in support of a New Hampshire Alteration Terrain permit application. It was produced by a certified Soil Scientist, and is not a product of the USDA Natural Resources Conservation Service. There is a narrative report that accompanies this map.

<sup>\*\*</sup> Assumed based upon adjacent soils without impervious surfaces.

# Supplemental Symbols

The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

### Symbol 1: Drainage Class

a-Excessively Well Drained

b-Somewhat Excessively Drained

c-Well Drained

d-Moderately Well Drained

e-Somewhat Poorly Drained

f-Poorly Drained

g-Very Poorly Drained

h-Not Determined

### Symbol 2 -: Parent Material (of naturally formed soil only, if present)

a-No natural soil within 60"

b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)

c-Glacial Till Material (active ice)

d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)

e-Loamy/sandy over silt/clay deposits

f-Marine Silt and clay deposits (ocean waters)

g-Alluvial Deposits (floodplains)

h-Organic Materials-Fresh water Bogs, etc

i- Organic Materials-Tidal Marsh

### Symbol 3: Restrictive/Impervious Layers

a-None

b-Bouldery surface with more than 15% of the surface covered with boulders

c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hardpan, platy structure or clayey texture with consistence of at least firm, i.e. more than 20 newtons. For other examples of soil characteristics that qualify for restrictive layer, see "Soil Manual for Site evaluations in NH" 2nd

Ed., page 3-17, figure 2-14

d-Bedrock in the soil profile 0-20 inches

e-Bedrock in the soil profile 20-60 inches

f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types

g-Subject to Flooding

h –man-made impervious surface including pavement, concrete, or built-up surfaces (i.e. buildings) with no morphological restrictive layer within control section

#### Symbol 4 Estimated Ksat\* (most restrictive layer excluding symbol 3h above).

a- High

b-Moderate

c-Low

d-Not determined

\*See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

#### Symbol 5: Hydrologic Soil Group\*

a-Group A

b-Group B

c-Group C

d-Group D

e-Not determined

<sup>\*</sup>excluding man-made impervious/restrictive layers

Map Unit Symbol:

42

Map Unit Name:

Canton fine sandy loam

Landscape Settings:

Upland slopes and crests, forests or fields

Surface Features:

None

Drainage Class:

Well

Parent Material:

Loamy glacial till material with no mineral restrictive features (hardpan)

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

| Depth   | <u>Horizon</u> | Color    | <u>Texture</u> | Structure    | Consistency  | Redox  | Notes       |
|---------|----------------|----------|----------------|--------------|--------------|--------|-------------|
| 0-2"    | Oe             | 10YR 2/2 |                |              |              |        | Forest duff |
| 2-10"   | Ap             | 10YR 2/2 | Sandy loam     | Granular     | Very friable | None   |             |
| 10-28"  | Bw             | 10YR 5/6 | Sandy loam     | Blocky       | Friable      | None   |             |
| 28-40"- | + C            | 2.5Y 6/4 | Loamy sand     | Single grain | Loose        | None w | ithin 40"   |

Groundwater not encountered. SHWT below 40".

Southern portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski

Map Unit Symbol:

444

Map Unit Name:

Newfields fine sandy loam

Landscape Settings:

Lower slopes of glacial till uplands, forests or fields

Surface Features:

None

Drainage Class:

Moderately well

Parent Material:

Loamy glacial till material with no mineral restrictive features (hardpan)

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Small inclusions of somewhat poorly drained soils along wetland boundaries, mostly in northern and eastern portions of site, less than 5% of map unit.

Additional Notes: Typical observed soil profile description:

| <u>Depth</u> | <u>Horizon</u> | Color    | <u>Texture</u> | Structure    | Consistency  | Redox  | Notes       |
|--------------|----------------|----------|----------------|--------------|--------------|--------|-------------|
| 0-2"         | Oe             | 10YR 2/2 |                |              |              |        | Forest duff |
| 2-8"         | A              | 10YR 2/2 | Sandy loam     | Granular     | Very friable | None   |             |
| 10-22"       | Bw             | 10YR 5/6 | Sandy loam     | Blocky       | Friable      | None   |             |
| 22-40"       | + C            | 2.5Y 5/3 | Loamy sand     | Single grain | Loose        | 10YR 5 | /6          |

Groundwater not encountered. SHWT 15-40".

Across most of forested uplands adjacent to site wetlands on Tax Map 315, Lot 5.

Thomas E. Sokoloski

Map Unit Symbol:

500BE/ccabb

Map Unit Name:

Udorthents, loamy

Landscape Settings:

Regraded or filled land surfaces

Surface Features:

Fill material

Drainage Class:

Well

Parent Material:

Filled or regraded glacial till material with no mineral restrictive features

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

| <u>Depth</u> | <u>Horizon</u> | Color    | <u>Texture</u> | Structure    | Consistency  | Redox       | Notes |
|--------------|----------------|----------|----------------|--------------|--------------|-------------|-------|
| 0-8"         | Af             | 10YR 3/3 | Sandy loam     | Granular     | Very friable | None        | Fill  |
| 8-18"        | Bw             | 10YR 5/6 | Sandy loam     | Blocky       | Friable      | None        |       |
| 18-40"-      | + C            | 2.5Y 6/4 | Loamy sand     | Single grain | Loose        | None within | n 40" |

Groundwater not encountered. SHWT below 40".

Western and southern portions of Tax Map 315, Lot 5.

Thomas E. Sokoloski

Map Unit Symbol:

500B/hchbb

Map Unit Name:

Udorthents, loamy

Landscape Settings:

Developed, impervious land surfaces (buildings, pavement)

Surface Features:

Buildings and pavement

Drainage Class:

Undeterminable (assumed to be well drained as are adjacent soils)

Parent Material:

Filled or regraded glacial till material with no mineral restrictive features

(hardpan)

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

Soil not observed due to impervious surface.

Western portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski

Map Unit Symbol:

538

Map Unit Name:

Squamscott fine sandy loam

Landscape Settings: Low-lying portions of forests or fields; wetlands

Surface Features:

None

Drainage Class:

Poorly

Parent Material:

Loamy glacial till material with silty substrata (glaciomarine deposits)

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

None.

Additional Notes: Typical observed soil profile description:

| <u>Depth</u> | <u>Horizon</u> | Color    | <u>Texture</u> | Structure | Consistency  | Redox    | Notes |
|--------------|----------------|----------|----------------|-----------|--------------|----------|-------|
| 0-1"         | Oa             | 10YR 2/1 |                |           |              |          | Muck  |
| 1-6"         | A              | 10YR 2/1 | Sandy loam     | Granular  | Very friable | None     |       |
| 6-15" +      | Bg             | 10YR 5/2 | Sandy loam     | Blocky    | Friable      | 10YR 5/6 |       |
| 15-30"-      | + Cg           | 2.5Y 5/2 | Loam/silt loam | Massive   | Friable      | 10YR 5/6 |       |

Groundwater at 14". SHWT above surface.

Central portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski

Map Unit Symbol:

921

Map Unit Name:

Newfields Variant (Somewhat Poorly Drained)

Landscape Settings:

Low-lying portions of forests or fields; adjacent to wetlands

Surface Features:

None

Drainage Class:

Somewhat poorly

Parent Material:

Loamy glacial till material with no mineral restrictive features (hardpan)

Complex:

Yes ()

No(X)

Nature of Dissimilar Inclusions, Locations and Estimated Percent:

Additional Notes: Typical observed soil profile description:

| Depth   | <u>Horizon</u> | Color    | Texture    | Structure    | Consistency  | Redox  | Notes         |
|---------|----------------|----------|------------|--------------|--------------|--------|---------------|
| 0-2"    | Oe             | 10YR 2/2 |            |              |              |        | Forest duff   |
| 2-10"   | A              | 10YR 2/2 | Sandy loam | Granular     | Very friable | None   |               |
| 10-20"  | Bw             | 10YR 5/4 | Sandy loam | Blocky       | Friable      | 10YR 5 | /6            |
| 20-28"- | + C1           | 2.5Y 6/3 | Loamy sand | Single grain | Loose        | 10YR 5 | /6 & 2.5Y 5/2 |
| 28-40"  | C2             | 2.5Y 5/2 | Silt loam  | Massive      | Friable      | 10YR 5 | /8            |

Groundwater at 25". SHWT between 12-15".

Southern portion of Tax Map 315, Lot 5.

Thomas E. Sokoloski



# **Infiltration Feasibility Report**

# **Infiltration Feasibility Report**

The project proposes seven systems that require infiltration to function properly. These systems are identified on the plans as Infiltration System 1, 2, and 3, as well as a bioretention system 1, 2, 3, and 4.

## **Infiltration System 1**

# 1. Location of the practice

Infiltration System 1 – This system is located in the center of the site, behind the proposed building, below the proposed parking lot.

## 2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 1 is relatively flat. Existing elevations where the system is proposed range from 57 to 58.

## 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 1 is 3,087 ± S.F. and 2 test pits were dug in the vicinity of the proposed practice. These pits are identified on the plans as TP7 and TP8.

# 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP7 at 40" below grade, or elevation 54.5. Bedrock/refusal was not encountered in TP7, which was advanced to a depth of 72" below grade.

The seasonal high-water table was observed in TP8 at 36" below grade, or elevation 54.6. Bedrock/refusal was not encountered in TP8, which was advanced to a depth of 72" below grade.

# 5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 7 (                | Test Pit 7 (TP7)                                 |  |  |  |  |
|-----------------------------|--|--|--|--|--|
| Existing Gr                 | ound Elevation: 57.8                             |  |  |  |  |
| Date: 07-1                  | 7-2023   |  |  |  |  |
| Depth                       | Description                                      |  |  |  |  |
| 0-3"                        | Leaf litter                                      |  |  |  |  |
| 3-8"                        | Sandy loam, massive friable, dry                 |  |  |  |  |
| 8-14"                       | Sandy loam, massive friable, dry                 |  |  |  |  |
| 14-72"                      | 14-72" Sandy loam, massive friable, dry to moist |  |  |  |  |
| ESHWT: 40" (Elevation 54.5) |  |  |  |  |  |
| Weep: None                  |  |  |  |  |  |
| Bedrock/Refusal: None       |  |  |  |  |  |

| Test Pit 8 (                                     | Test Pit 8 (TP8)                 |  |  |  |  |
|--|----------------------------------|--|--|--|--|
| Existing Gr                                      | Existing Ground Elevation: 57.6  |  |  |  |  |
| Date: 07-17-2023                                 |                                  |  |  |  |  |
| Depth  | Description                      |  |  |  |  |
| 0-3"   | Leaf litter                      |  |  |  |  |
| 3-6"   | Sandy loam, massive friable, dry |  |  |  |  |
| 6-12"  | Sandy loam, massive friable, dry |  |  |  |  |
| 12-72" Sandy loam, massive friable, dry to moist |                                  |  |  |  |  |
| FSHWT: 36" (Flevation 54.6)                      |                                  |  |  |  |  |

ESHWT: 36" (Elevation 54.6)

Weep: None

Bedrock/Refusal: None

# 6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

# **Infiltration System 2**

### 1. Location of the practice

Infiltration System 2 – This system is located on the southeast side of the site, behind the proposed building and below the proposed parking lot.

## 2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 2 is moderately sloped. Existing elevations where the system is proposed range from 55 to 61.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 2 is 6,031± S.F. and 2 test pits were dug in the vicinity of the proposed practice. These pits are identified on the plans as TP5 and TP6.

### 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP5 at 36" below grade, or elevation 53.7. Bedrock/refusal was not encountered in TP5, which was advanced to a depth of 72" below grade.

The seasonal high-water table was observed in TP6 at 34" below grade, or elevation 53.6. Bedrock/refusal was not encountered in TP6, which was advanced to a depth of 80" below grade.

### 5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 5 (TP5)                |   |  |
|---------------------------------|---|--|
| Existing Ground Elevation: 56.7 |   |  |
| Date: 07-17-2023                |   |  |
| Depth                           | Description                               |  |
| 0-3"                            | Leaf litter                               |  |
| 3-9"                            | Sandy loam, massive friable, dry          |  |
| 9-14"                           | Sandy loam, massive friable, dry          |  |
| 14-72"                          | Sandy loam, massive friable, dry to moist |  |
| ESHWT: 36" (Elevation 53.7)     |   |  |
| Weep: None                      |   |  |
| Bedrock/Refusal: None           |   |  |

| Test Pit 6 ( | TP6)                                      |  |
|--------------|---|--|
| `            | Existing Ground Elevation: 56.4           |  |
| Date: 07-17  | 7-2023                                    |  |
| Depth        | Description                               |  |
| 0-3"         | Leaf litter                               |  |
| 3-10"        | Sandy loam, massive friable, dry          |  |
| 10-16"       | Sandy loam, massive friable, dry          |  |
| 16-80"       | Sandy loam, massive friable, dry to moist |  |
| ECH/V/T· 3/  | "(Floyation 52.6)                         |  |

ESHWT: 34" (Elevation 53.6)

Weep: None

Bedrock/Refusal: None

### 6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

### **Infiltration System 3**

### 1. Location of the practice

Infiltration System 3 – This system is located on the west side of the site, between the proposed building and Corporate Drive, below the proposed parking lot.

### 2. Existing topography at the location of the practice

The existing topography within the area of Infiltration System 3 is relatively flat. Existing elevations where the system is proposed range from 61 to 62.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the bottom of Infiltration System 3 is 1,971± S.F. and 1 test pit was dug in the vicinity of the proposed practice. This pit is identified on the plans as TP2.

### 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP2 at 70" below grade, or elevation 55.6. Bedrock/refusal was not encountered in TP2, which was advanced to a depth of 96" below grade.

### 5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 2 (TP2)                |                                       |  |
|---------------------------------|---------------------------------------|--|
| Existing Ground Elevation: 61.4 |                                       |  |
| Date: 07-17-2023                |                                       |  |
| Depth                           | Description                           |  |
| 0-80"                           | Loamy sand (fill), dry to moist       |  |
| 80-82"                          | Buried organics                       |  |
| 82-96"                          | Fine sandy loam, massive, firm, moist |  |
| ESHWT: 70" (Elevation 55.6)     |                                       |  |
| Weep: None                      |                                       |  |
| Bedrock/Refusal: None           |                                       |  |

### 6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

### **Bioretention System 1**

### 1. Location of the practice

Bioretention System 1 – This system is located on the south side of the site, between the parking lot and the southerly property line.

### 2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 1 is relatively flat. Existing elevations where the system is proposed range from 60 to 61.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of Bioretention System 1 is  $571\pm$  S.F. and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP4.

### 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP4 at 67" below grade, or elevation 55.2. Bedrock/refusal was not encountered in TP4, which was advanced to a depth of 96" below grade.

### 5. Profile Description

Bedrock/Refusal: None

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 4 (                    | TP4)                                   |  |
|---------------------------------|--|--|
| Existing Ground Elevation: 60.8 |  |  |
| Date: 07-1                      | 7-2023                                 |  |
| Depth                           | Description                            |  |
| 0-18"                           | Loamy sand (fill), dry                 |  |
| 18-24"                          | Sandy loam, massive friable, dry       |  |
| 24-32"                          | Sandy loam, massive friable, dry       |  |
| 32-48"                          | Sandy loam, massive friable, dry       |  |
| 48-96"                          | Sandy loam, massive firm, dry to moist |  |
| ESHWT: 67                       | " (Elevation 55.2)                     |  |
| Weep: None                      |  |  |
| 1                               |  |  |

### 6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

### **Bioretention System 2**

### 1. Location of the practice

Bioretention System 2 – This system is located on the west side of the site, between the parking lot and Corporate Drive.

### 2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 2 is relatively flat. Existing elevations where the system is proposed range from 61 to 61.5.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system which uses infiltration is  $258\pm$  S.F. and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP3.

### 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP3 at 76" below grade, or elevation 55.9. Bedrock/refusal was not encountered in TP3, which was advanced to a depth of 94" below grade.

### 5. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 3 (TP3)                |  |  |
|---------------------------------|--|--|
| Existing Ground Elevation: 62.2 |  |  |
| Date: 07-17                     | 7-2023   |  |
| Depth                           | Description                                      |  |
| 0-60"                           | Loamy sand (fill), dry, some construction debris |  |
| 60-94"                          | Sandy loam, massive, firm, dry to moist          |  |
| ESHWT: 76                       | " (Elevation 55.9)                               |  |
| Weep: None                      |  |  |
| Bedrock/Re                      | Bedrock/Refusal: None                            |  |

### 6. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

### **Bioretention System 3**

### 1. Location of the practice

Bioretention System 3 – This system is located in the northwest corner of the site, near the intersection of Corporate Drive and International Drive.

### 2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 3 is relatively flat. Existing elevations where the system is proposed range from 60 to 61.5.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system which uses infiltration is  $1,639 \pm S.F.$  and 1 test pit was dug in the vicinity of the proposed practice. The pit is identified on the plans as TP1.

### 4. Seasonal high-water table (SHWT) and bedrock elevations

The seasonal high-water table was observed in TP1 at 72" below grade, or elevation 55.5. Bedrock/refusal was not encountered in TP1, which was advanced to a depth of 96" below grade.

### 7. Profile Description

Test pits were completed on 07-17-2023 and observed by Allen & Major Associates.

| Test Pit 1 (TP1)                |  |  |
|---------------------------------|--|--|
| Existing Ground Elevation: 61.5 |  |  |
| Date: 07-17                     | 7-2023   |  |
| Depth                           | Description                                      |  |
| 0-48"                           | Loamy sand (fill), dry, some construction debris |  |
| 48-96"                          | Sandy loam, massive, firm, dry to moist          |  |
| ESHWT: 72                       | " (Elevation 55.5)                               |  |
| Weep: None                      |  |  |
| Bedrock/Re                      | Bedrock/Refusal: None                            |  |

### 5. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.

### **Bioretention System 4**

### 1. Location of the practice

Bioretention System 4 – This system is located on the north side of the site, near the proposed driveway entrance to International Drive.

### 2. Existing topography at the location of the practice

The existing topography within the area of Bioretention System 4 is relatively flat. Existing elevations where the system is proposed range from 58.5 to 59.

### 3. Test pit location

In accordance with Env-Wq 1504.13, NHDES requires that a minimum number of test pits be dug in the location of each system, depending on the size of the proposed system.

The footprint of the system that uses infiltration is 516± S.F. At this time no test pits have been performed in the vicinity of this practice. With that said, soils and depths to SHWT on site are consistent throughout and so it is reasonable to expect this system to function properly as designed. It has been noted on the plan that one confirmatory test pit shall be performed within the footprint of the practice prior to construction.

### 4. Summary of field-testing data used to determine the infiltration rate

The NRCS Soil Report shows the site to be Urban Land soil type, for which no Ksat value is provided. Given the test pit results, it was assumed that the Ksat value for the adjacent Chatfield-Hollis-Canton Complex, 0-8% slopes would be applicable. The Ksat value provided in the Soil Report for this soil type is 10.1993 micrometers per second which equals 1.445 inches per hour. A 2x safety factor was applied and 0.72 inches per hour was used for the design exfiltration rate.



### **Registration and Notification Form for Storm Water Infiltration to Groundwater**

NHDES-W-03-135



### REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (5H1)



**Groundwater Discharge Program** 

RSA/Rule: RSA 485-A:6, VII; 485:3, X; Env-Wq 402

**Applicant Information** 

| · · · · · · · · · · · · · · · · · · ·     |                             |            |  |
|---|-----------------------------|------------|--|
| Name: ATDG, LLC                           | Daytime Phone: 603-799-6787 |            |  |
| Mailing Address: 1 Merrill Crossing       |                             |            |  |
| City: Bow                                 | State: NH                   | ZIP: 03304 |  |
| Contact Person Name: Alexander Slocum     | Email: ahslocum@gmail.com   |            |  |
| Contact Person Phone Number: 603-777-6506 | Fax Number:                 |            |  |

**Facility Information** 

| Name: ASC / Medical Office                                    |           |            |
|---|-----------|------------|
| Address: 360 Corporate Drive                                  |           |            |
| City: Portsmouth  | State: NH | ZIP: 03801 |
| Property Tax Map: 315 Lot Number: 5                           |           |            |
| Latitude & Longitude of discharge point(s): 43.073484, -70.80 | 1090      |            |

Facility Owner Information (complete only if different than applicant)

| Owner Name: same as applicant | Daytime Phone: |             |   |
|-------------------------------|----------------|-------------|---|
| Mailing Address:              |                |             | _ |
| City/Town:                    | State:         | State: ZIP: |   |
| Contact Person Name:          | Email:         | Email:      |   |
| Contact Person Phone Number:  | Fax Number:    | Fax Number: |   |

### Property Owner (complete only if different then Applicant)

| Name: Pease Development Authority    | Daytime Phone: | Daytime Phone: |  |
|--------------------------------------|----------------|----------------|--|
| Mailing Address: 360 Corporate Drive |                | · ·            |  |
| City: Portsmouth                     | State: NH      | ZIP: 03801     |  |
| Contact Person Name:                 | Email:         | Email:         |  |
| Contact Person Phone Number:         | Fax Number:    | Fax Number:    |  |

### Facility Operator's Information (complete only if different than applicant)

| Facility Operator Name: same as applicant | Daytime Phone: |      |
|---|----------------|------|
| Mailing Address:                          | ***            |      |
| City:                                     | State:         | ZIP: |

Complete this form if you are using a drywell or other subsurface infiltration structures to recharge stormwater to the ground or groundwater. If a completed Underground Injection Control (UIC) registration form was submitted to the Alteration of Terrain Bureau for this project, then one is not required to be sent directly to the Drinking Water and Groundwater Bureau (DWGB).

NHDES-W-03-135

## REGISTRATION AND NOTIFICATION FORM FOR STORMWATER INFILTRATION TO GROUNDWATER (attach additional sheets, as necessary, for responses to questions below)

Please provide a complete description of the facility including historic uses, any former contamination and/or ongoing remedial action at the site.

The site was used as an officer's quarters on Pease Air Base when the base was operational. The AoT screening layers show two remedial actions on the site, "PAFB 92.00 Command Center", and "PAFB 87.00 Command Center Site". There is no known ongoing remedial action being performed on the site.

Please provide information concerning the location of the infiltration activity, include Locus map (i.e. USGS map).

Infiltration systems 1-3 are located on the east and west sides of the site, below the proposed parking lot. Bioretention Systems 1-4 are located around the perimeter of the site, adjacent to the proposed parking lot.

Please describe the pretreatment system, if any, and capacity of the system.

All runoff directed to the four infiltration systems enters through an isolator row lined with fabric, which prevents migration of sediment to the rest of the system. Runoff directed to the four bioretention systems will be pretreated by one of four sediment forebays.

Please describe the materials and products used for the subsurface infiltration structure (i.e., pipe and stone leachfield, plastic chamber units, concrete drywell, etc.).

The four infiltration systems are designed as ADS Stormtech SC-310 and SC-160 chambers. As mentioned above, the inlet (isolator) rows are lined with filter fabric for pretreatment. The systems are backfilled with coarse stone which provides additional storage volume. The bioretention systems include 24" of filter media, per Env-Wq 1508.07(k)(4), and underlaid with coarse gravel and pea gravel, per NH Stormwater Manual, Chapter 4.3c.

Please describe the disposal method and location. Include a site plan showing: the infiltration structure, any other on-site infiltration structures, dimensions, depth to groundwater (if known), adjacent septic system(s), and drinking water source(s).

Stormwater runoff will be infiltrated using the systems described above. There are no known existing septic systems, and the project will connect to the existing municipal sewer system. Drinking water will be provided by a municipal connection. Site plans are provided which show locations of the various systems, as well as test pit data that was used in the design.

Please provide information concerning methods and schedule for periodic inspection and/or maintenance.

A complete Operation & Maintenance Plan is included with the AoT submittal which outlines the methods and schedule of inspections.

### **Applicant/Owner Certification Statement and Signature**

By signing this application, the signer certifies that the information contained in or otherwise submitted with this application is true, complete and not misleading to the best of the signer's knowledge and belief.

By signing this application, the signer understands that submission of false, incomplete or misleading information is grounds for:

- Denying the application;
- Revoking any application that is granted based on the information; and
- If the signer is acting as or on behalf of a listed engineer as defined in Env-C 502.10, debarring the listed engineer from the roster.

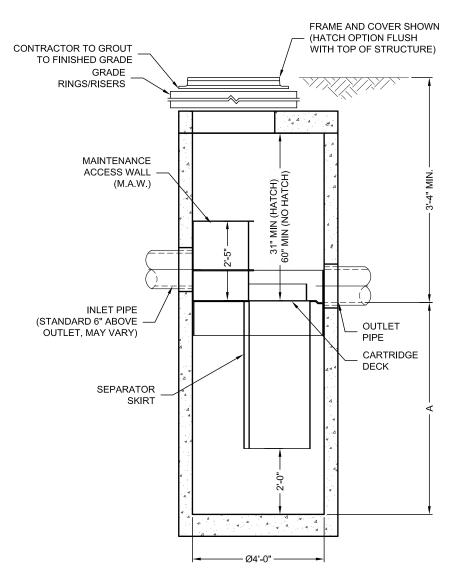
By signing the application, the signer and applicant agree to comply with all applicable rules and conditions of this permit and to not discharge to the holding tank(s) until written permission from the department has been received.

| Signature of Facility Owner or Contact | Date                       |
|--|----------------------------|
| Alexander H Slocum Ir                  | 8/16/2023   1:59:46 PM CDT |
| DocuSigned by:                         |                            |



### Jellyfish Standard Detail Treatment Capacity

### **PLAN VIEW**



### **SECTION A-A**

### Jellyfish® Filter

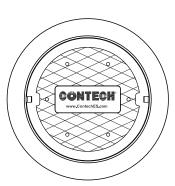
THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENT NO. 8,287,726, 8,221,618 & US 8,123,935; OTHER INTERNATIONAL PATENTS PENDING

### JELLYFISH DESIGN NOTES

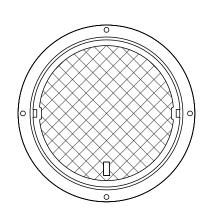
JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE SELECTION AND THE NUMBER OF CARTRIDGES. THE STANDARD MANHOLE STYLE IS SHOWN. Ø48" MANHOLE JELLYFISH PEAK TREATMENT CAPACITY IS 0.45 CFS. IF THE SITE CONDITIONS EXCEED 0.45 CFS AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

#### CARTRIDGE SELECTION

| CARTRIDGE DEPTH                                 | 54"         | 40"          | 27"          | 15"          |
|---|-------------|--------------|--------------|--------------|
| OUTLET INVERT TO STRUCTURE INVERT (A)           | 6'-5"       | 5'-3"        | 4'-2"        | 3'-2"        |
| FLOW RATE HIGH-FLO / DRAINDOWN (cfs) (per cart) | 0.18 / 0.09 | 0.13 / 0.065 | 0.09 / 0.045 | 0.05 / 0.025 |
| MAX. CARTS HIGH-FLO / DRAINDOWN                 | 2 / 1       |              |              |              |







<u>HATCH</u> (Ø36" CAST INTO SLAB) N.T.S.

| STRUCTURE ID *   |            |         |        |   |        |  |  |  |  |  |  |
|------------------|------------|---------|--------|---|--------|--|--|--|--|--|--|
| WATER QUALITY    | / FLOW RAT | F (cfs) | 1      |   | *      |  |  |  |  |  |  |
| PEAK FLOW RAT    |            | L (CI3) | 1      |   | *      |  |  |  |  |  |  |
| RETURN PERIO     |            |         | (v.rc) |   | *      |  |  |  |  |  |  |
|                  |            |         | (3 /   |   | * / *  |  |  |  |  |  |  |
| # OF CARTRIDG    |            | יט (חר  | (טט ו  |   | *      |  |  |  |  |  |  |
| CARTRIDGE SIZE * |            |         |        |   |        |  |  |  |  |  |  |
| PIPE DATA:       | D          | IAMETER |        |   |        |  |  |  |  |  |  |
| INLET PIPE #1    | *          |         | *      |   | *      |  |  |  |  |  |  |
| INLET PIPE #2    | *          |         | *      |   | *      |  |  |  |  |  |  |
| OUTLET PIPE      | *          |         | *      |   | *      |  |  |  |  |  |  |
| RIM ELEVATION    |            |         |        |   | *      |  |  |  |  |  |  |
| ANTI-FLOTATION   | N BALLAST  |         | WIDTH  | Т | HEIGHT |  |  |  |  |  |  |
|                  |            |         | *      |   | *      |  |  |  |  |  |  |
| NOTES/SPECIAL    | REQUIREM   | ENTS:   |        |   |        |  |  |  |  |  |  |

#### GENERAL NOTES:

- 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' - 3', 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-478 AND AASHTO LOAD FACTOR DESIGN METHOD.
- 6. 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 (LIFTING CLUTCHES PROVIDED)
- 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. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.
- E. 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 AT (866) 740-3318.



800-338-1122 513-645-7000 513-645-7993 FAX

JELLYFISH JF4 STANDARD DETAIL OFFLINE CONFIGURATION



### **TSS and Nitrogen Worksheets**



| Project No.                | 3250-01         | Sheet | 1 of 4    |
|----------------------------|-----------------|-------|-----------|
| <b>Project Description</b> | Surgical Center |       |           |
|                            |                 |       |           |
| <b>Calculated By</b>       | SM              | Date  | 8/10/2023 |
| Checked By                 | BDJ             | Date  | 8/10/2023 |
|                            |                 |       |           |

### **TSS REMOVAL CALULATIONS**

The calculations provide the TSS removal rate for the treatment train with Infiltration systems

| Stormwater Management BMP | TSS Removal rate        |
|---------------------------|-------------------------|
| Street Sweeping           | 5 %                     |
| Deep Sump Catch Basins    | 15 %                    |
| Infiltration System       | 90 %                    |
| Average Annual Load       | = 100%                  |
| Street Sweeping           | = 5.0 % Removal Rate    |
|                           | 95.0 % TSS Load Remains |
| TSS Load Remaining        | = 95.0 %                |
| Deep Sump Catch Basins    | = 15.0 % Removal Rate   |
|                           | 80.8 % TSS Load Remains |
| TSS Load Remaining        | = 80.8 %                |
| Infiltration System       | = 90.0 % Removal Rate   |
|                           | 8.1 % TSS Load Remains  |

Initial TSS Load - Percentage of TSS Remaining = Final TSS Removal Rate

100 - 8.1 = 91.9 %



| Project No.                | 3250-01         | Sheet | 2 of 4    |  |  |
|----------------------------|-----------------|-------|-----------|--|--|
| <b>Project Description</b> | Surgical Center |       |           |  |  |
|                            |                 |       |           |  |  |
| <b>Calculated By</b>       | SM              | Date  | 8/10/2023 |  |  |
| Checked By                 | BDJ             | Date  | 8/10/2023 |  |  |
|                            |                 |       |           |  |  |

### **TSS REMOVAL CALULATIONS**

The calculations provide the TSS removal rate for the treatment train with Bioretention systems

| Stormwater Management BMP              | TSS Removal rate                                 |
|--|--|
| Street Sweeping<br>Bioretention        | 5 %<br>90 %                                      |
| Average Annual Load<br>Street Sweeping | = 100%<br>= <u>5.0</u> % Removal Rate            |
|  | 95.0 % TSS Load Remains                          |
| TSS Load Remaining                     | = 95.0 %   |
| Bioretention                           | = <u>90.0</u> % Removal Rate                     |
|  | 9.5 % TSS Load Remains                           |
| Initial TSS Load - Percer              | entage of TSS Remaining = Final TSS Removal Rate |

Initial TSS Load - Percentage of TSS Remaining = Final TSS Removal Rate 100 - 9.5 = 90.5 %



| Project No.                | 3250-01         | Sheet | 3 of 4    |
|----------------------------|-----------------|-------|-----------|
| <b>Project Description</b> | Surgical Center |       |           |
|                            |                 |       |           |
| Calculated By              | SM              | Date  | 8/10/2023 |
| Checked By                 | BDJ             | Date  | 8/10/2023 |
|                            |                 |       |           |

### **Nitrogen REMOVAL CALULATIONS**

The calculations provide the Nitrogen removal rate for the treatment train with Infiltration systems

| Stormwater Management BMP   | Nitrogen Removal rate                    |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Deep Sump Catch Basins<br>Infiltration System                                 | 5 %<br>60 %                              |  |  |  |  |  |  |  |  |  |  |  |
| Average Annual Load<br>Deep Sump Catch Basins                                 | = 100.0 %<br>= <u>5.0</u> % Removal Rate |  |  |  |  |  |  |  |  |  |  |  |
|   | 95.0 % Nitrogen Load Remains             |  |  |  |  |  |  |  |  |  |  |  |
| Nitrogen Load Remaining<br>Infiltration System                                | = 95.0 %<br>= 60.0 % Removal Rate        |  |  |  |  |  |  |  |  |  |  |  |
|   | 38.0 % Nitrogen Load Remains             |  |  |  |  |  |  |  |  |  |  |  |
| Initial Nitrogen Load - Percentage of Nitrogen Remaining = Final Removal Rate |  |  |  |  |  |  |  |  |  |  |  |  |
| 100 - 38.0  | = 62.0 %                                 |  |  |  |  |  |  |  |  |  |  |  |



| Project No.                | 3250-01         | Sheet | 4 of 4    |  |  |
|----------------------------|-----------------|-------|-----------|--|--|
| <b>Project Description</b> | Surgical Center |       |           |  |  |
|                            |                 |       |           |  |  |
| <b>Calculated By</b>       | SM              | Date  | 8/10/2023 |  |  |
| Checked By                 | BDJ             | Date  | 8/10/2023 |  |  |
|                            |                 |       |           |  |  |

### **Nitrogen REMOVAL CALULATIONS**

The calculations provide the Nitrogen removal rate for the treatment train with Bioretention systems

Stormwater Management BMP

Bioretention

Nitrogen Removal rate

65 %

Nitrogen Load Remaining
Bioretention

= 100.0 %
= 65.0 % Removal Rate

35.0 % Nitrogen Load Remains

Initial Nitrogen Load - Percentage of Nitrogen Remaining = Final Removal Rate

100 - 35.0 = 65.0 %



### **Pipe Sizing Calculations**

### **Surgical Center**

 $V = 1.486/n*R^{^{2/3}}*S^{^{1/2}}$ 

360 Corporate Drive, Portsmouth, NH

Allen & Major Associates, Inc. A&M Project Number: 3250-01

**Drainage Pipe Design Analysis** 



Date: 10-Aug-23

Created By: SM Checked By: BDJ Approved By: BDJ

### Manning's Formula

Where: V is the velocity in Ft/sec.

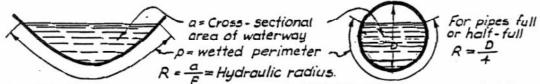
n is Manning's coefficient of friction

 $Q = V^*A$  R is the Hydraulic Radius (25-Year storm) S is the slope of the pipe

R = Area/Wetted Perimeter Where: Area = Pi\*(R/12)2

Wetted Perimeter = 2\*Pi\*R/12

| PIPE   | Q <sub>design</sub> | n     | Diameter | Α                  | Wp   | R    | S           | $Q_{full}$ | Q <sub>full</sub> <sup>3</sup> Q <sub>design</sub> | $V_{\text{full}}$ | $Q_d/Q_f$ | Results   | $V_{\text{design}}$ | V <sub>design</sub> ≤ | 12 ft/s |
|--------|---------------------|-------|----------|--------------------|------|------|-------------|------------|--|-------------------|-----------|-----------|---------------------|-----------------------|---------|
|        | (cfs)               |       | (inches) | (ft <sup>2</sup> ) | (ft) | (ft) | (feet/foot) | (cfs)      |  | (ft/s)            |           | Fig. 4-4A | (ft/s)              |                       |         |
| DMH-01 | 1.42                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0142      | 1.44       | OK   | 4.13              | 0.99      | 1.15      | 4.74                | OK                    |         |
| DMH-03 | 1.92                | 0.013 | 12       | 0.79               | 3.14 | 0.25 | 0.0484      | 7.84       | OK   | 9.98              | 0.24      | 0.80      | 7.98                | OK                    |         |
| OCS-01 | 0.55                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0050      | 0.85       | OK   | 2.45              | 0.64      | 1.06      | 2.59                | OK                    |         |
| OCS-02 | 0.17                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0181      | 1.63       | OK   | 4.66              | 0.10      | 0.59      | 2.75                | OK                    |         |
| RD-01  | 1.10                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0145      | 1.46       | OK   | 4.17              | 0.76      | 1.10      | 4.59                | OK                    |         |
| RD-02  | 1.70                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0208      | 1.74       | OK   | 4.99              | 0.98      | 1.15      | 5.74                | OK                    |         |
| RD-03  | 0.10                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0113      | 1.28       | OK   | 3.68              | 80.0      | 0.55      | 2.02                | OK                    |         |
| WQ-01  | 0.37                | 0.013 | 8        | 0.35               | 2.09 | 0.17 | 0.0052      | 0.87       | OK   | 2.50              | 0.42      | 0.94      | 2.35                | OK                    | •       |



SECTION OF ANY OPEN CHANNEL

SECTION OF CIRCULAR PIPE

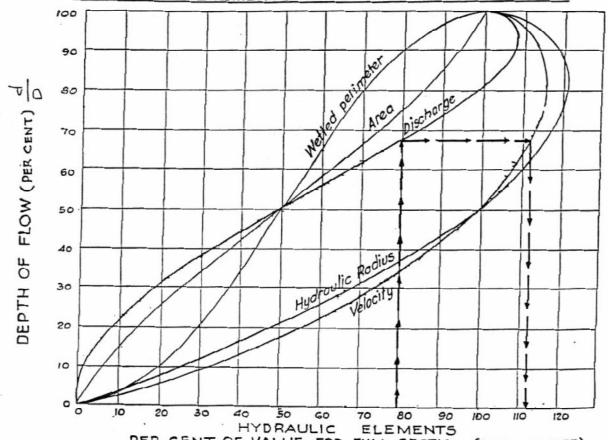
V = Average or mean velocity in feet per second.

Q = a V = Discharge of pipe or channel in cubic feet per second (c.f.s.).

n = Coefficient of roughness of pipe or channel surface, see Table A-Pg.18-68.

S = Slope of Hydraulic Gradient (water surface in open channels or pipes not under pressure, same as slope of channel or pipe invert only when flow is uniform in constant section.

### HYDRAULIC ELEMENTS OF CHANNEL SECTIONS.



PER CENT OF VALUE FOR FULL SECTION (APPROXIMATE)

EXAMPLE: Given: Discharge = 12 c.f.s. through a pipe which has capacity flowing full of 15 c.f.s. at a velocity of 7.0 ft. per sec. Required to find V for Q = 12 c.f.s.

Descentage of full discharge = \frac{12}{15} = 80\%. Enter chart at 80\% of value for full section of Hydraulic Elements, find V = 112.5\% x7=7.9 ft. per sec.

VALUES OF HYDRAULIC ELEMENTS OF CIRCULAR SECTION

Figure 4-4A



### **Extreme Precipitation Tables**

## **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

Latitude43.073 degrees NorthLongitude70.802 degrees West

**Elevation** 10 feet

**Date/Time** Mon Jul 03 2023 09:22:30 GMT-0400 (Eastern Daylight Time)

### **Extreme Precipitation Estimates**

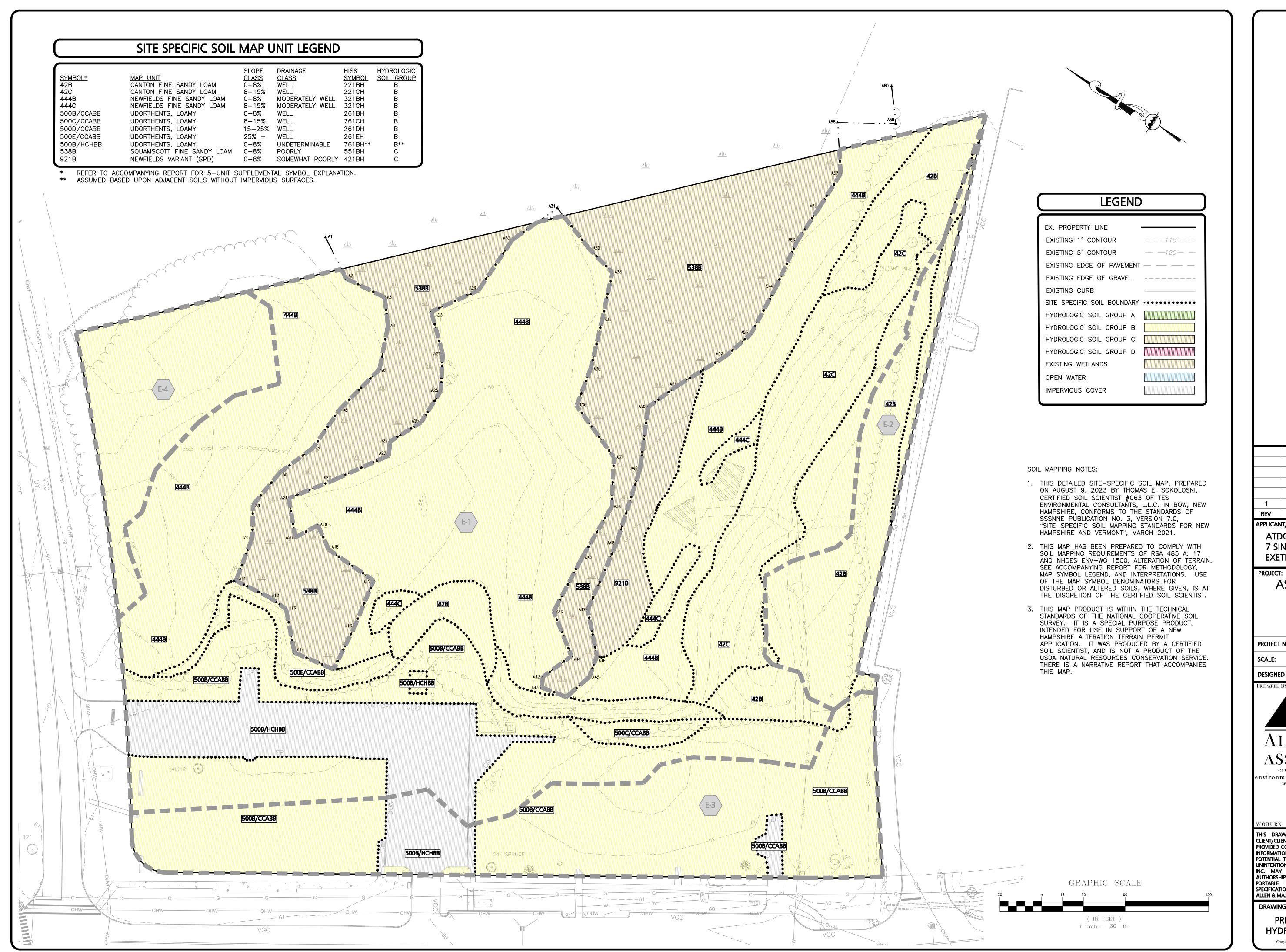
|       | 5min | 10min | 15min | 30min | 60min | 120min |       | 1hr  | 2hr  | 3hr  | 6hr  | 12hr  | 24hr  | 48hr  |       | 1day  | 2day  | 4day  |
|-------|------|-------|-------|-------|-------|--------|-------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| 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  | 2.92  | 1yr   | 2.35  | 2.81  | 3.21  |
| 2yr   | 0.32 | 0.50  | 0.62  | 0.81  | 1.02  | 1.30   | 2yr   | 0.88 | 1.18 | 1.52 | 1.94 | 2.49  | 3.21  | 3.57  | 2yr   | 2.84  | 3.43  | 3.93  |
| 5yr   | 0.37 | 0.58  | 0.73  | 0.97  | 1.24  | 1.60   | 5yr   | 1.07 | 1.46 | 1.88 | 2.43 | 3.14  | 4.07  | 4.57  | 5yr   | 3.60  | 4.40  | 5.03  |
| 10yr  | 0.41 | 0.64  | 0.81  | 1.11  | 1.44  | 1.88   | 10yr  | 1.25 | 1.72 | 2.22 | 2.88 | 3.74  | 4.87  | 5.53  | 10yr  | 4.31  | 5.31  | 6.07  |
| 25yr  | 0.47 | 0.75  | 0.96  | 1.33  | 1.76  | 2.32   | 25yr  | 1.52 | 2.13 | 2.76 | 3.62 | 4.73  | 6.17  | 7.10  | 25yr  | 5.46  | 6.82  | 7.78  |
| 50yr  | 0.53 | 0.85  | 1.09  | 1.52  | 2.05  | 2.74   | 50yr  | 1.77 | 2.51 | 3.27 | 4.30 | 5.65  | 7.40  | 8.58  | 50yr  | 6.55  | 8.25  | 9.40  |
| 100yr | 0.60 | 0.97  | 1.25  | 1.76  | 2.39  | 3.22   | 100yr | 2.06 | 2.96 | 3.86 | 5.11 | 6.74  | 8.86  | 10.38 | 100yr | 7.84  | 9.98  | 11.35 |
| 200yr | 0.67 | 1.09  | 1.41  | 2.02  | 2.79  | 3.80   | 200yr | 2.41 | 3.49 | 4.58 | 6.09 | 8.06  | 10.62 | 12.55 | 200yr | 9.40  | 12.07 | 13.71 |
| 500yr | 0.79 | 1.30  | 1.69  | 2.45  | 3.43  | 4.71   | 500yr | 2.96 | 4.34 | 5.71 | 7.66 | 10.19 | 13.50 | 16.15 | 500yr | 11.95 | 15.53 | 17.61 |

### **Lower Confidence Limits**

|   |      | 5min | 10min | 15min | 30min | 60min | 120min |      | 1hr  | 2hr  | 3hr  | 6hr  | 12hr | 24hr | 48hr |      | 1day | 2day | 4day |
|---|------|------|-------|-------|-------|-------|--------|------|------|------|------|------|------|------|------|------|------|------|------|
|   | 1yr  | 0.23 | 0.36  | 0.44  | 0.59  | 0.73  | 0.89   | 1yr  | 0.63 | 0.87 | 0.92 | 1.32 | 1.66 | 2.23 | 2.53 | 1yr  | 1.97 | 2.43 | 2.85 |
|   | 2yr  | 0.32 | 0.49  | 0.60  | 0.81  | 1.00  | 1.19   | 2yr  | 0.86 | 1.16 | 1.37 | 1.82 | 2.34 | 3.05 | 3.46 | 2yr  | 2.70 | 3.32 | 3.82 |
| ſ | 5yr  | 0.35 | 0.54  | 0.67  | 0.92  | 1.17  | 1.40   | 5yr  | 1.01 | 1.37 | 1.61 | 2.13 | 2.74 | 3.80 | 4.21 | 5yr  | 3.36 | 4.05 | 4.71 |
|   | 10yr | 0.39 | 0.59  | 0.73  | 1.03  | 1.32  | 1.60   | 10yr | 1.14 | 1.56 | 1.81 | 2.40 | 3.07 | 4.38 | 4.89 | 10yr | 3.88 | 4.70 | 5.46 |



### **Hydrologic Soil Maps**



08-17-23 | REVISED PER PDA COMMENTS REV DATE DESCRIPTION APPLICANT/LESSEE:

EXETER, NH 03833

ATDG, LLC

7 SINCLAIR DRIVE

ASC / MEDICAL OFFICE 360 CORPORATE DRIVE **TAX MAP 315, LOT 5** PORTSMOUTH, NH 03801

3250-01 DATE: 08-14-23 PROJECT NO.

1" = 30' DWG. NAME: C-3250-01.dwg SCALE:

DESIGNED BY: BDJ CHECKED BY:

ALLEN & MAJOR ASSOCIATES, INC.

nvironmental consulting ◆ landscape architecture www.allenmajor.com 400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

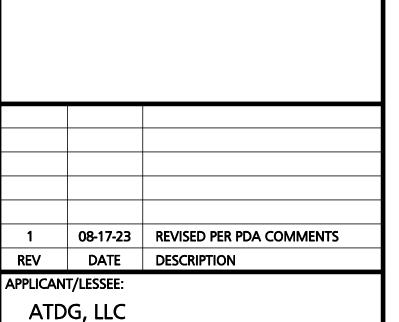
WOBURN, MA ◆ LAKEVILLE, MA ◆ MANCHESTER, N

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**DRAWING TITLE:** 

SHEET No. PRE-CONSTRUCTION HYDROLOGIC SOIL PLAN

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7 SINCLAIR DRIVE EXETER, NH 03833 PROJECT:

ASC / MEDICAL OFFICE 360 CORPORATE DRIVE **TAX MAP 315, LOT 5** PORTSMOUTH, NH 03801

3250-01 DATE: PROJECT NO. 08-14-23 1" = 30' DWG. NAME: C-3250-01.dwg SCALE: BDJ CHECKED BY: DESIGNED BY:



civil engineering • land surveying environmental consulting + landscape architecture www.allenmajor.com 400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

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DRAWING TITLE:

SHEET No. POST-CONSTRUCTION HSP-2 HYDROLOGIC SOIL PLAN

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August 21, 2023

To: Michael Mates, PE A&M Project #: 3250-01

Pease Development Authority Re: ASC / Medical Office

55 International Drive 360 Corporate Drive
Portsmouth, NH 03801 Portsmouth, NH
PDA Response Letter

**Copy:** August Consulting, PLLC

Dear Mr. Mates

Allen & Major Associates, Inc. is in receipt of your comments, provided via email on August 16, 2023. Please find A&M's responses to these comments below. The initial comments are provided along with A&M's responses in **bold**.

On the cover sheet PDA is listed as the owner. The term owner is used numerous times
throughout the documents. In most cases it means ATDG not PDA. Please change the tile for
PDA from "Owner" to "Lessor" and the title for ATG to "Applicant/Lessee". In addition, please
revise PDA's address to 55 International Drive.

### The information above has been revised as requested.

2. Provide a copy of the wetland report.

### This has been provided by Apex/Fraggle Rock.

3. Provide Photometrics Plan.

### The Photometrics Plan is now included in the Civil Site Development plan set.

4. The Existing Conditions Plan was not included in the drawing set. This needs to be included and it should show the Airport District (not the Airport Zone) for tax purposes. In addition, this plan should show existing monuments and call out any monuments to be set per section 502.03b2 of the PDA Land Use Controls as well as meets and bounds of the property.

### The Existing Conditions Plan is now included in the Civil Site Development plan set.

5. On C-101 the numbering under Alteration of Terrain Notes is off.

### The numbering has been fixed.

6. On C-101 note 10 specifies erosion control inspections after every 0.5" of rain. The NPDES CGP requires this after a 0.25" rain event. Please revise.

### The note has been revised as requested.

7. Replace snow fence at the wetland buffers with chain link fence. We want to make absolutely sure no one mistakenly enters the wetland or buffer during construction. That would require an after the fact wetland and/or conditional use permit. This has happened before and we do not want it to happen again. The chain link is much more effective for preventing encroachment than snow fence.

### The plan has been revised to indicate chain link fence, in lieu of snow fence, as requested.

8. Drawing C-101 is difficult to follow; where does the fencing stop (it runs into the notes on the top of the page)? What is the dashed line running adjacent to the property line on International

Dr? It's difficult to discern the hatch for clear and grub. It would help to have a line type that identifies the limit of disturbance on the plan the area of disturbance in a note.

The plan viewport has been expanded to show the extent of temporary fence. The dashed line shows the limit of tree clearing. The clear and grub hatch has been made more discernable. Tubular barriers indicate the limit of disturbance. The area of disturbance has been noted on the plan, see C-101.

9. In notes 7 on C-102 and 5 on C-103, please add that these designs shall be submitted to PDA for review. Please note that a building permit is required for any walls over 4' high.

### These notes have been revised as requested.

10. On C-102, revise "Brick Sidewalk" to "Brick Patio" in the legend.

### The legend has been revised as requested.

11. Add a note to the plans stating: The contractor shall clean the entire stormwater system of all sediment and debris, within the limit of work upon completion of construction.

### The note has been added as requested, see note #7 on sheet C-103.

12. Add a note to the plans stating: Upon completion of construction and prior to the issuance of Certificate of Occupancy or release of bond, the applicant shall submit a letter to the Pease Development Authority, signed and stamped by a professional engineer, stating construction has been completed in conformance with the approved plans.

### The note has been added as requested, see note #9 on sheet C-102.

13. Add a note to the plans stating: The contractor shall acquire a PDA Dig Permit before any disturbance can take place. Allow 7 calendar days for processing.

### See General Sequence of Construction note #2, C-101.

14. Add a note to the plans stating: Contractor to obtain a NPDES Construction General Permit prior to construction. PDA shall be provided with a copy of the SWPPP and NOI.

### **See General Sequence of Construction note #3, C-101.**

15. Add a note to the plans stating: Submission of multiple 7460-1's to the FAA will be required for the construction of the building and temporary use of a crane. Allow a minimum of 45 days for processing.

### The note has been added as requested, see note #10 on C-102.

16. Add a note to the plans stating: Before **ANY** dewatering is performed, the contractor shall file and obtain a Temporary Groundwater Discharge Permit from NHDES. Coordination between the applicant, PDA, NHDES and the Air Force is necessary prior to filing this application. Update note 5 on detail 4 on sheet C-505 accordingly.

# The notes have been added/revised as requested. See Erosion Control and Sediment Control note #8, C-101. Note #5 on detail 4 on sheet C-505 was revised.

17. Add a note to the plans stating: The applicant shall coordinate with the City of Portsmouth to confirm adequacy of radio signal strength for emergency services. Amplifiers may be required to boost signal strength, which, if necessary, shall be provided and installed by the applicant.

### The note was added as requested, see note #11 on sheet C-102.

18. Add a note to the plans stating: The applicant shall submit as-built plans on reproducible mylar and in digital format (AutoCAD .dwg format) on CD to PDA upon completion of the project. Asbuilts shall be prepared and certified by a registered New Hampshire land surveyor or professional engineer. An electronic file of the site layout shall be submitted to the City of Portsmouth's GIS department.

### The note was added as requested, see note #12 on sheet C-102.

19. It's understood that fill will need to be brought onto the site and excess is not expected, however, there may be unsuitable soils that cannot be incorporated in to the site and need to be stockpiled. Please designate an excess soil disposal area with its capacity. In addition, please provide cut and fill calculations for the project.

# See Note #8 on C-103 for the net amount of fill anticipated for the projec.t A note has been added to the plan view indicating the capacity available in the excess spoil area in the northern corner of the property.

20. Add a note to the plans stating: All excess excavated soil material shall remain on site and shall be placed in the excess soil berm as shown on the Site Plans. No existing soils shall be removed from the project site.

### The note has been added as requested, see note #9 on C-103.

21. Please add back the sidewalk adjacent to International Drive. I realize someone at the TAC workshop mentioned it could be deleted but it needs to remain because it's required by the PDA Land Use Controls section 405.02j2.

### The sidewalk has been added back to the plans.

22. Please provide square foot areas of the two onsite wetlands.

### The wetland area has been noted on sheet C-102.

23. Snow storage does not seem adequate and conflicts with landscaping in some areas. If there is not sufficient area, please add a note stating that snow will be removed and disposed of legally off site.

### Snow storage conflicts with landscaping have been resolved. Also, see note #13 on sheet C-102.

24. Identify the type of curbing surrounding the building.

### Curbing type has been identified, see C-102.

25. Label curve radii.

### Curb radii have been labeled on C-102.

26. Additional spot grades will be helpful on C-103.

### Additional spot grades have been added to C-103.

27. Please take a look at the grading and drainage at the south corner of the site in the vicinity of the driveway off of Corporate Drive. There is a section of proposed drive that runs offsite and is not treated. Please capture this and send it to treatment. In addition, the overflow for Bioretention System #1 is directed to the driveway of the abutter. This is not ideal and could cause icing issues if the flow enters the offsite drive. Please consider other options. Confirm that there is no increase in flow to the double culvert that passes beneath the colleges driveway.

The pavement runoff which flows to the Corporate Drive roadway is de minimis. The stormwater management design for the project exceeds treatment requirements and therefore, in aggregate, the project is an improvement over the existing conditions. The overflow from Bioretention System 1 overflows toward an existing swale that flows to the culvert that passes beneath the college's driveway. The flow to Corporate Drive is reduced by using infiltration. See Study Point #3 in the drainage report.

28. The outlet pipe for Bioretention System # 2 seems like it may conflict with the utility duct bank. The utility duct bank can vary in elevation in the event of a conflict.

29. Show proposed tree lines on appropriate drawings.

### The tree line has been added as requested.

30. Specify all sidewalks to be PCC per PDA requirements.

# The sidewalk detail has been revised to reflect this request. See Note #5 on the concrete sidewalk detail, C-501.

31. Will salt be stored on site?

### The applicant has indicated that salt will not be stored on site.

32. Remove crosswalk from driveway on corporate.

### The crosswalk has been removed as requested.

33. The wetlands and buffers are screened on some drawings. These need to be in a bold line type on all drawings. Furthermore, there should be notes on the drawings that state there is no wetland or wetland buffer disturbance associated with this project but wetlands and buffers are present on site. Take extreme care not to impact these resources.

### The wetlands have been darkened on the plans. Also, see note #9 on C-101.

34. The site feature labeled miscellaneous threaded rod near bus stop is the remnants of an old fire hydrant. Coordinate with DPW to determine if it should be removed or if a new hydrant should be installed.

#### This has been noted, see sheet C-101.

35. Add truck turning exhibits for right turns into the site and left turns out of the site.

### The truck turning plan has been revised as requested.

36. Update sewer and drain manhole details to include a formed invert at the bottom of the structures.

# The sewer manhole detail shows a formed invert at the bottom of the structure. The drain manhole does not, which is typical for drain manholes because pipes come in at differing elevations.

37. Add note to C101 indicating the transformer may still hold PCB's which need to be handled and disposed of per applicable rules and regulations.

### The potential for PCB's has been noted as requested.

38. Add tapers on Corporate Drive into and out of the bus stop.

#### Tapers have been added as requested.

39. There are two concrete sidewalk details on C-501. One is labeled offsite and the other onsite and the only difference is the welded wire fabric vs. the fiber. Only the fiber reinforcement should be used and the onsite and offsite sidewalks should match.

### The onsite detail has been removed. The offsite detail is now the only sidewalk detail.

40. Detail 8 on C-501 indicates certain dimensions vary and references "PLAN". Add dimensions or indicate what plan is being referred to.

### The detail has been revised as requested.

41. Add bike rack detail.

### A bike rack detail has been added, see detail 3 on sheet C-503.

42. It's noted that monument signage is being shown on the plans. This type of signage does not get approved until just before the building is occupied. Any approval you receive from site review does not include the signage.

### Understood. Signage is shown for coordination purposes.

43. The sign on Corporate Drive looks like its connected to primary electric. Please clarify.

# The electrical conduit for the sign in question has been revised to show it coming from the building.

44. There are two connection shown to existing electric, one on the abutting property. Has Eversource asked for this? Please explain the intent.

### Apex has coordinated with Eversource and this was shown at their request.

45. A check dam detail has been provided but not called out on the plans.

## The detail is included in case it is directed by the design engineer during construction to address field conditions.

- 46. In the O&M Plan, please make the following revisions:
  - a. There are numerous mentions of coordination/notification with/to the City of Portsmouth for a variety reasons. Please add that PDA should also be part of any coordination/notifications.

### These have been revised as requested to include PDA in any notifications/coordination.

b. As in item 6 above the plan also mentions the 0.5" threshold. Please revise to match CGP requirements.

### The note has been revised as requested.

c. Revise Note 6 on page 18 to require installation of silt sacks in CB's adjacent to the site, not only if it appears to be happening.

### The note has been revised as requested.

d. Please add to the vehicle washing section on page 19 that vehicle washing is not an allowable stormwater discharge under PDA's NPDES Permit with EPA.

### The note has been added as requested, see page 20 of the O&M.

e. In regards to the section on snow, add that: The snow and ice management operators must be Green SnowPro certified by the UNH Technology Transfer Center and also be a New Hampshire certified salt applicator.

The note has been added as requested, see page 22 of the O&M.

Very Truly Yours,

**ALLEN & MAJOR ASSOCIATES, INC.** 

Brian D. Jones, P.E.

Senior Project Manager

#### Attachments:

- 1. ASC / Medical Office Site Development Plans, Revision 1, dated August 17, 2023
- 2. ASC / Medical Office Drainage Report, Revision 1, dated August 17, 2023



# 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: ATDG, LLC (Contact: Dr. Alexander Slocum) Date Submitted: 08 / 2 | 1 / 2023                    |                  |
|---|-----------------------------|------------------|
| Application # (in City's online permitting):  | 0315-                       |                  |
| Site Address: 360 Corporate Dr, Portsmouth, NH 03801                                | 0005-<br>_ Map: <u>0000</u> | Lot: <u>0005</u> |

|   | Application Requirements   |  |                     |  |
|---|--|--|---------------------|--|
| N | Required Items for Submittal   | Item Location<br>(e.g. Page or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |
|   | Complete <u>application</u> form submitted via the City's web-based permitting program (2.5.2.1(2.5.2.3A)  | Application form to be submitted online.             | 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) | Application documents to be submitted online.        | N/A                 |  |

|   | Site Plan Review Application Required Information  |   |                     |  |
|---|--|---|---------------------|--|
| Ø | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |
|   | Statement that lists and describes "green" building components and systems. (2.5.3.1B)   | See seperate attachment                                   |                     |  |
|   | 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) | Sheet G0-0  | N/A                 |  |
|   | Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1D)   | Refer to Civil Sheets                                     | N/A                 |  |

| Site Plan Review Application Required Information |  |   |                     |
|---|--|---|---------------------|
| M   | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |
|   | Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1E)   | Sheet G0-0  | 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) | To be provided by Pease<br>Development Authority          | N/A                 |
|   | Names, addresses and telephone numbers of all professionals involved in the site plan design.  (2.5.3.1G)  | Sheet G0-0  | N/A                 |
|   | List of reference plans. (2.5.3.1H)  | Refer to Civil Sheets                                     | N/A                 |
|   | List of names and contact information of all public or private utilities servicing the site. (2.5.3.1)   | Sheet G0-0  | N/A                 |

| Site Plan Specifications |   |   |                     |
|--------------------------|---|---|---------------------|
| N                        | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>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) | 24 inches by 36 inches                                    | Υ                   |
|                          | Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans.  (2.5.4.1B)   | Noted   | 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)                    | Refer to Civil Sheets                                     | N/A                 |
|                          | Plans shall be drawn to scale and stamped by a NH licensed civil engineer. (2.5.4.1D)   | Refer to Civil Sheets                                     | N/A                 |
|                          | Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)  | See all applicable sheets                                 | N/A                 |
|                          | Title (name of development project), north point, scale, legend. (2.5.4.2A)   | Sheet G0-0  | N/A                 |
|                          | Date plans first submitted, date and explanation of revisions. (2.5.4.2B)   | See revision schedule on all sheet                        | N/A                 |
|                          | Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)  | Noted   | N/A                 |
|                          | Source and date of data displayed on the plan. (2.5.4.2D)   | Refer to Civil Sheets                                     | N/A                 |

|   | Site Plan Specifications – Required Exhibits and Data  |   |                     |  |  |  |
|---|--|---|---------------------|--|--|--|
| Ø | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |  |  |
|   | <ol> <li>Existing Conditions: (2.5.4.3A)</li> <li>Surveyed plan of site showing existing natural and built features;</li> <li>Existing building footprints and gross floor area;</li> <li>Existing parking areas and number of parking spaces provided;</li> <li>Zoning district boundaries;</li> <li>Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre;</li> <li>Existing impervious and disturbed areas;</li> <li>Limits and type of existing vegetation;</li> <li>Wetland delineation, wetland function and value assessment (including vernal pools);</li> <li>SFHA, 100-year flood elevation line and BFE data, as required.</li> </ol> | Refer to Civil Sheets                                     |                     |  |  |  |
|   | <ul> <li>2. Buildings and Structures: (2.5.4.3B)</li> <li>Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;</li> <li>Elevations: Height, massing, placement, materials, lighting, façade treatments;</li> <li>Total Floor Area;</li> <li>Number of Usable Floors;</li> <li>Gross floor area by floor and use.</li> </ul>   | See A-Sheets  |                     |  |  |  |
|   | <ul> <li>3. Access and Circulation: (2.5.4.3C)</li> <li>Location/width of access ways within site;</li> <li>Location of curbing, right of ways, edge of pavement and sidewalks;</li> <li>Location, type, size and design of traffic signing (pavement markings);</li> <li>Names/layout of existing abutting streets;</li> <li>Driveway curb cuts for abutting prop. and public roads;</li> <li>If subdivision; Names of all roads, right of way lines and easements noted;</li> <li>AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).</li> </ul>  | Refer to Civil Sheets                                     |                     |  |  |  |
|   | <ul> <li>4. Parking and Loading: (2.5.4.3D)</li> <li>Location of off street parking/loading areas, landscaped areas/buffers;</li> <li>Parking Calculations (# required and the # provided).</li> </ul>   | Refer to Civil Sheets                                     |                     |  |  |  |
|   | <ul> <li>5. Water Infrastructure: (2.5.4.3E)</li> <li>Size, type and location of water mains, shut-offs, hydrants &amp; Engineering data;</li> <li>Location of wells and monitoring wells (include protective radii).</li> </ul>   | Refer to Civil Sheets                                     |                     |  |  |  |
|   | 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.   | Refer to Civil Sheets                                     |                     |  |  |  |

| cuSign E | nvelope ID: 37A33504-52C6-45BF-84A5-D5AEE5F412B5  |                              |
|----------|---|------------------------------|
|          | <ul> <li>7. Utilities: (2.5.4.3G)</li> <li>The size, type and location of all above &amp; below ground utilities;</li> <li>Size type and location of generator pads, transformers and other fixtures.</li> </ul>  | Refer to Civil<br>Sheets     |
|          | 8. Solid Waste Facilities: (2.5.4.3H)   | N/A                          |
|          | The size, type and location of solid waste facilities.  | N/A                          |
|          | <ul> <li>9. Storm water Management: (2.5.4.3I)</li> <li>The location, elevation and layout of all storm-water drainage.</li> <li>The location of onsite snow storage areas and/or proposed offsite snow removal provisions.</li> <li>Location and containment measures for any salt storage facilities</li> <li>Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.</li> </ul> | Refer to Civil Sheets        |
|          | <ul> <li>Outdoor Lighting: (2.5.4.3J)</li> <li>Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.</li> </ul>  | See Photometric<br>Plan      |
|          | 11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)  | See Photometric<br>Plan      |
|          | <ul> <li>12. Landscaping: (2.5.4.3K)</li> <li>Identify all undisturbed area, existing vegetation and that which is to be retained;</li> <li>Location of any irrigation system and water source.</li> </ul>  | Refer to Lanscaping<br>Plans |
|          | <ul> <li>13. Contours and Elevation: (2.5.4.3L)</li> <li>Existing/Proposed contours (2 foot minimum) and finished grade elevations.</li> </ul>  | Refer to Civil Sheets        |
|          | <ul> <li>14. Open Space: (2.5.4.3M)</li> <li>Type, extent and location of all existing/proposed open space.</li> </ul>  | Refer to Civil Sheets        |
|          | 15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)  | Refer to Civil Sheets        |
|          | <ul> <li>16. Character/Civic District (All following information shall be included): (2.5.4.3P)</li> <li>Applicable Building Height (10.5A21.20 &amp; 10.5A43.30);</li> <li>Applicable Special Requirements (10.5A21.30);</li> <li>Proposed building form/type (10.5A43);</li> <li>Proposed community space (10.5A46).</li> </ul>   | Refer to Civil Sheets        |
|          | <ul> <li>17. Special Flood Hazard Areas (2.5.4.3Q)</li> <li>The proposed development is consistent with the need to minimize flood damage;</li> <li>All public utilities and facilities are located and construction to minimize or eliminate flood damage;</li> </ul>  | Refer to Civil Sheets        |

flood hazards.

Adequate drainage is provided so as to reduce exposure to

|   | Other Required Information   |   |                  |
|---|--|---|------------------|
| Ø | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waive<br>Request |
|   | Traffic Impact Study or Trip Generation Report, as required. (3.2.1-2)   | See separate attachment                                   |                  |
|   | Indicate where Low Impact Development Design practices have been incorporated. (7.1)   | Refer to Civil Sheets                                     |                  |
|   | 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)  | Refer to Civil Sheets                                     |                  |
|   | Inspection and Maintenance Plan (7.6.5)  | Refer to Civil Sheets                                     |                  |
|   |  | (e.g. Page/line or<br>Plan Sheet/Note #)                  | Request          |
|   | 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;  |   |                  |
|   | <ul> <li>Information on composition and quantity of water demand<br/>and wastewater generated;</li> </ul>  |   |                  |
|   | Information on air, water or land pollutants to be   |   |                  |
|   | discharged, including standards, quantity, treatment and/or controls;  |   |                  |
|   | <ul> <li>Estimates of traffic generation and counts pre- and post-<br/>construction;</li> </ul>  |   |                  |
|   | Estimates of noise generation;   |   |                  |
|   | A Stormwater Management and Erosion Control Plan;  |   |                  |
|   | <ul> <li>Endangered species and archaeological / historical studies;</li> </ul>  |   |                  |
|   | <ul> <li>Wetland and water body (coastal and inland) delineations;</li> </ul>  |   |                  |
|   | Environmental impact studies.  | I   |                  |

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

(2.5.3.2B)

site. (2.5.3.2D)

| V | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |
|---|---|---|---------------------|
|   | A list of any required state and federal permit applications required for the project and the status of same.  (2.5.3.2E)   |   |                     |
|   | 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)   | Refer to Civil Sheets                                     | 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." |   | N/A                 |

Applicant's Signature: Liepander & Slowm Jr Date: 8/18/2023 | 9:49:26 AM CDT

## ADTG, LLC DR. ALEX SLOCUM

360 CORPORATE DR. PORTSMOUTH, NH 03801

#### FLOOR ARE OF PROPERTY OWNER & APPLICANT INFO **ACCESSIBILITY APPLICABLE** DRAWING INDEX **PROJECT** NOTES **BUILDING CODES** APPLICANT/ LESSEE: DR. ALEXANDER SLOCUM - ATDG, LLC 1 MERRILL CROSSING, BOW, NH 03304 603-777-6506 ALL FIXTURES AND ACCESSORIES SHALL BE MOUNTED IN ACCORDANCE WITH ALL CITY / VILLAGE ADOPTED ACCESSIBILITY REGULATIONS. APPLICABLE BUILDING CODES INTERNATIONAL BUILDING CODE 2018 (BIC) INTERNATIONAL BENERY CONSERVATION CODE 2018 (BCC) INTERNATIONAL MECHANICAL CODE 2018 (INC) INTERNATIONAL MECHANICAL CODE 2018 (INC) INTERNATIONAL PLUMBING CODE 2018 (INC) INTERNATIONAL RESIDENTIAL CODE 2018 (INC) INTERNATIONAL RESIDENTIAL CODE 2018 (INC) INTERNATIONAL CODES 2020 AMENDMENTS PROPOSED GROSS FLOOR AREA SHEET NO. DRAWING NAME OVERALL GROSS AREA: 52 401 SE LESSOR: PEASE DEVELOPMENT AUTHORITY COVER PAGE EXTERIOR RENDERINGS EXTERIOR RENDERINGS SITE DEVELOPMENT PLANS FOR SURGICAL CENTER - FRST FLOOR MAGING SUITE AREA: 2,437 SF TENANT SUITE 1 AREA: 2,754 SF TENANT SUITE 2 AREA: 4,577 SF TENANT SUITE 3 AREA: 2,661 SF PUBLIC AREA: 4,2645 OVERALE FREST FLOOR GROSS AREA: 16,723 SF 55 INTERNATIONAL DR, PORTSMOUTH, NH 03801 603-433-6088 ALL THRESHOLDS MUST COMPLY WITH CITY/VILLAGE ADOPTED ACCESSIBILITY REGULATIONS. 1 OF 1 EXISTING CONDITIONS PLAN C-100 SITE SPECIFIC SOIL MAPPING C-100 SITE SPECIFIC SOIL IMPPING C-101 SITE PREPARATION PLAN C-102 LAYOUT & MATERIALS PLAN C-103 GRADING & DRAINAGE PLAN C-104 UTILITIES PLAN & SEWER PROFILE C-105 TRUCK TURNING PLAN "STATE FIRE CODE" AS DEFINED IN NH RSA 153:1 VFA, WHICH INCLUDES THE ADOPTION BY REFERENCE OF THE LIFE SAFETY CODE NPPA 101; 2018 AND THE UNIFORM FIRE CODE NPPA 1, 2018 EDITIONS. INFO OF PROFESSIONALS INVOLVED IN THE SITE PLAN DESIGN - SECOND FLOOR TENANT SUITE 4 AREA: 2,385 SF TENANT SUITE 5 AREA: 2,660 SF ASC AREA: 9,566 SF PUBLIC AREA: 3,228 SF DESIGN. ARCHITECTURE. AND CONSTRUCTION FIRM: JEFF KILBURG, PROJECT DIRECTOR APEX DESIGN BUILD 9550 W HIGGINS RD STE 170, ROSEMONT, IL 60018 847-288-9100 PIER PROTECTION SYSTEM CONTRACTOR SPAIL PROFILE A COMPLETE CONTRACTOR SPAIL PROFILE A COMPLETE CONTRACTOR SPAIL PROFILE FROM THE 4-WAN TO BE THROUGH THE ETWAN FAGE. ALL SPRINGER LIBES TO BE IN COMPLIANCE WITH A COMPLETE COMPLETE COMPLETE MAY COMPLETE COMPLETE FOR SPAIN STATE SHOT CONTRACTOR TO SUBMIT COMPLETE SHOT TO SUBLIDE AND PIER DEPT. FOR APPROVAL BY FIRE SUPPRESSION CONTRACTOR - PRODITY LTS. DEPTAGES OF CONTRACTOR - PRODITY LTS. DEPTAGES ON CONTRACTOR - PRODITY LTS. DEPTAGES AND CONTRACTOR - IN CELLING. OVERALL SECOND FLOOR GROSS AREA: 17,839 SF -THIRD FLOOR: TENANT SUITE 6 AREA: 4,163 SF TENANT SUITE 7 AREA: 3,668 SF MEDICAL CLINIC & MED SPA: 7,112 SF CIVIL ENGINEER: BRIAN JONES, SENIOR PROJECT MA ALLEN & MAJOR ASSOCIATES, INC 400 HARVEY ROAD MANCHESTER, NH 03103 PUBLIC AREA: 2,896 SF DVERALL THIRD FLOOR GROSS AREA: 17,839 SF SURVEYOR: DOUCET SURVEY LLC 102 KENT PLACE NEWMARKET, NH 03857 SPRINKER HEADS, FOR POSITION IN CELINO. FIRE ALARM SYSTEM AN AUTOMATIC ARID MANUAL, FIEE ALARM SYSTEMIA ESIZING WITHIN THE BRULDING WILL BE FROWDED FOR PERMITTING OUTSIDE OF THESE DEWINNES, AN AUTOMATIC SYSTEM ACCORDANCE WITH THE PROVISIONS OF THE MICHAEL BRULDING CODE AND FIFA 72 ACCORDANCE WITH THE PROVISIONS OF THE ACCORDANCE WITH THE PROVISIONS OF THE MICHAEL BRULDING CODE, E.F. H. I. M. R. S. AND LI, MARINGS SEC. 997.2, MINTERPATIONAL BRULDING CODE, A. MANUAL MANTARED IN THE FOLLOWING OCCUPANCES E. F. H. I. I. M. R. I. R. Z. AND. S. (AMENDA MANTARED IN THE FOLLOWING) OCCUPANCES E. F. H. I. I. Z. S. M. R. I. R. Z. AND. S. (AMENDA MANTARED IN THE FOLLOWING) OCCUPANCES E. F. H. I. I. Z. S. M. R. I. R. Z. AND. S. (AMENDA MANTARED IN THE FOLLOWING) OCCUPANCES SUS WILL ALSO PERVIONED ALL RECORDS SINGER AND CAPROUND ALL A1-4.6 A1-4.7 A1-4.8 UTILITY PROVIDERS WATER SERVICE: CITY OF PORTSMOUTH 680 PEVERLY HILL RD, PORTSMOUTH, NH 03801 SCOPE OF WORK SEWER SERVICE: CITY OF PORTSMOUTH ARCHITECTURAL SCOPE-3-STORY TYPE II-B SLAB ON GRADE MEDICAL OFFICE BUILDING WITH NEW SITE WORK AND LANDSCAPING TO ACCOMMODATE NEW BUILDING 680 PEVERLY HILL RD, PORTSMOUTH, NH 03801 GAS SERVICES: UNITIL 325 WEST RD, PORTSMOUTH, NH 03801 888-301-7700 ELECTRIC SERVICES: EVERSOURCE 800-662-7764 PO BOX 330, MANCHESTER, NH 03105-0330 DRAFTING SYMBOLS **LOCATION MAP** PROJECT RENDERING DETAIL TITLE DESIGNATION SPOT ELEVATION MARK NORTH ARROW MATERIAL DESIGNATIONS # TITLE # - #" = 1' - 0' #' - #" SEE RCP FARTH EXISTING MASONRY SECTION CUT DETAIL DESIGNATION $\langle \omega \rangle$ WALL TYPE DESIGNATION ĊΧ DOOR NUMBER DESIGNATION STEEL GRANULAR FILL ⊗ WINDOW TYPE DESIGNATION (B) KEY NOTE TAG Project number ELEVATION DETAIL DESIGNATION XX FINISH TAG CONCRETE BATT INSULATION ◬ REVISION TAG Drawn by LINE TYPES FACE BRICK RIGID INSULATION — OBJECT LINE

HIDDEN LINE (DENOTATES SOMETHING LOCATED BELOW OR BEHIND)

PHANTOM LINE (DENOTATES SOMETHING LOCATED ABOVE OR IN FRONT) CENTER LINE

CALLOUT DETAIL DESIGNATION

C.M.U.

GYPSUM BOARD

apex

9550 W.Higgins Rd. 170

ADTG, LLC

360 CORPORATE DR. PORTSMOLITH NH 03801

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| 1 | TAC WORKSHOP REVIEW | 07/25/2023 |
|---|---------------------|------------|
| 2 | TAC PUBLIC HEARING  | 08/21/2023 |
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Issue Date Author

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12" = 1'-0"

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Scale





**apex**DESIGN > BUILD

9550 W.Higgins Rd. 170 Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR. PORTSMOUTH , NH 03801

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| No. | Description         | Date       |
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| 1   | TAC WORKSHOP REVIEW | 07/25/2023 |
| 2   | TAC PUBLIC HEARING  | 08/21/2023 |
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EXTERIOR RENDERINGS

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| No. | Description         | Date       |
|-----|---------------------|------------|
| 1   | TAC WORKSHOP REVIEW | 07/25/2023 |
| 2   | TAC PUBLIC HEARING  | 08/21/2023 |
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Project number

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APPLICANT/LESSEE: ATDG, LLC 7 SINCLAIR DRIVE EXETER, NH 03833

LESSOR:
PEASE DEVELOPMENT AUTHORITY
55 INTERNATIONAL DRIVE
PORTSMOUTH, NH 03801

ARCHITECT:
APEX DESIGN BUILD
9550 W. HIGGINS ROAD. SUITE 170
ROSEMONT, IL 60018

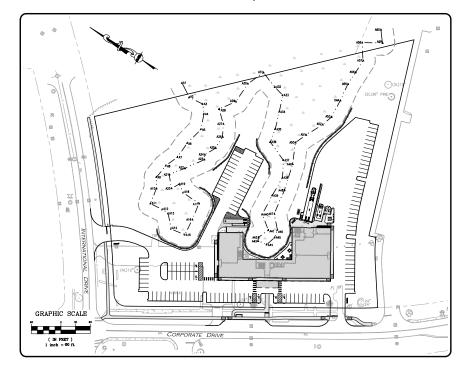
CIVIL ENGINEER / LANDSCAPE ARCHITECT ALLEN & MAJOR ASSOCIATES, INC. 400 HARVEY ROAD MANCHESTER, NH 03103 (603) 627-5500

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

UTILITY PROVIDERS:
NATURAL GAS:
UNITIL CORP.
ELECTRIC:
ELECTRIC:
ELECHNO:
CONSOLIDATED COMMUNICATIONS

# SITE DEVELOPMENT PLANS FOR ASC / MEDICAL OFFICE

360 CORPORATE DRIVE TAX MAP 315, LOT 5 PORTSMOUTH, NH 03801

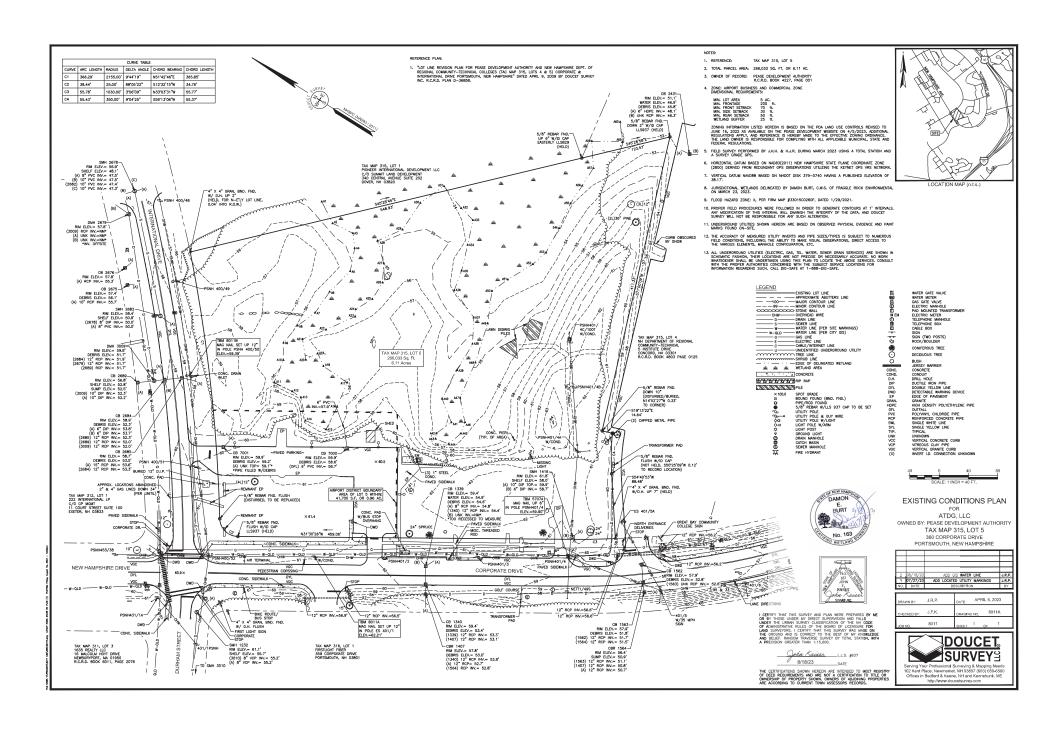


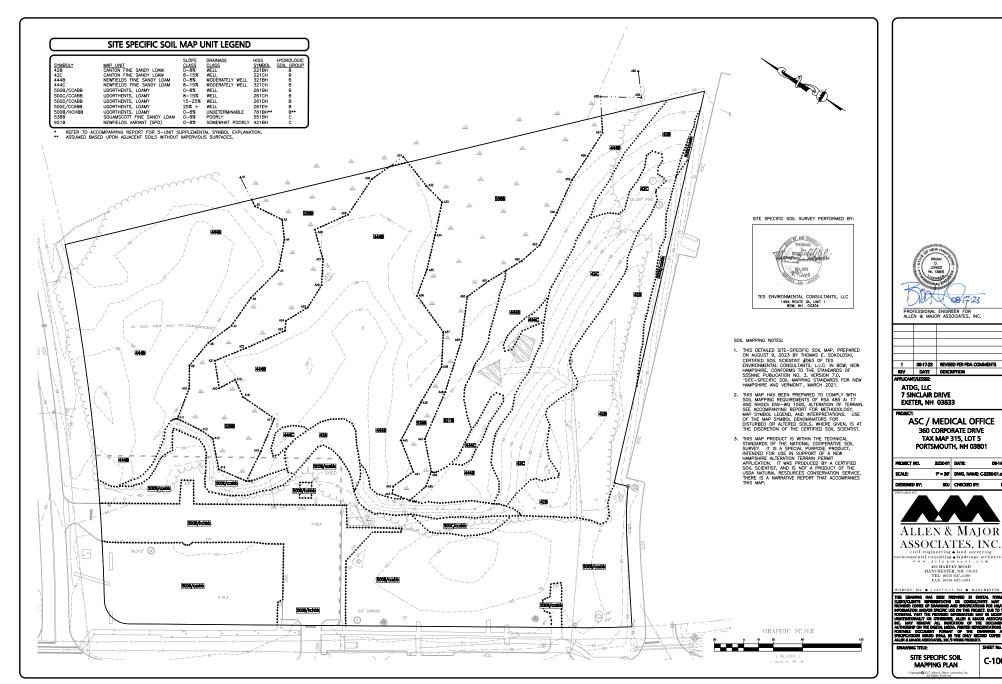
| LIST OF DRAWINGS               |           |          |          |  |  |
|--------------------------------|-----------|----------|----------|--|--|
| DRAWING TITLE                  | SHEET NO. | ISSUED   | REV 1    |  |  |
| EXISTING CONDITIONS PLAN       | 1 OF 1    | 08-14-23 | 08-17-23 |  |  |
| SITE SPECIFIC SOIL MAPPING     | C-100     | 08-14-23 | 08-17-23 |  |  |
| SITE PREPARATION PLAN          | C101      | 08-14-23 | 08-17-23 |  |  |
| LAYOUT & MATERIALS PLAN        | C-102     | 08-14-23 | 08-17-23 |  |  |
| GRADING & DRAINAGE PLAN        | C-103     | 08-14-23 | 08-17-23 |  |  |
| UTILITIES PLAN & SEWER PROFILE | C-104     | 08-14-23 | 08-17-23 |  |  |
| TRUCK TURNING PLAN             | C-105     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | G501      | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-502     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-503     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-504     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-505     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-506     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-507     | 08-14-23 | 08-17-23 |  |  |
| DETAILS                        | C-508     | 08-14-23 | 08-17-23 |  |  |
| LANDSCAPE PLAN                 | L-101     | 08-14-23 | 08-17-23 |  |  |
| LANDSCAPE NOTES                | L-102     | 08-14-23 | 08-17-23 |  |  |
| LANDSCAPE DETAILS              | L-501     | 08-14-23 | 08-17-23 |  |  |





ISSUED FOR SITE PLAN REVIEW: AUGUST 14, 2023 REVISED PER PDA COMMENTS: AUGUST 17, 2023







TAX MAP 315, LOT 5 PORTSMOUTH, NH 03801

3250-01 DATE:

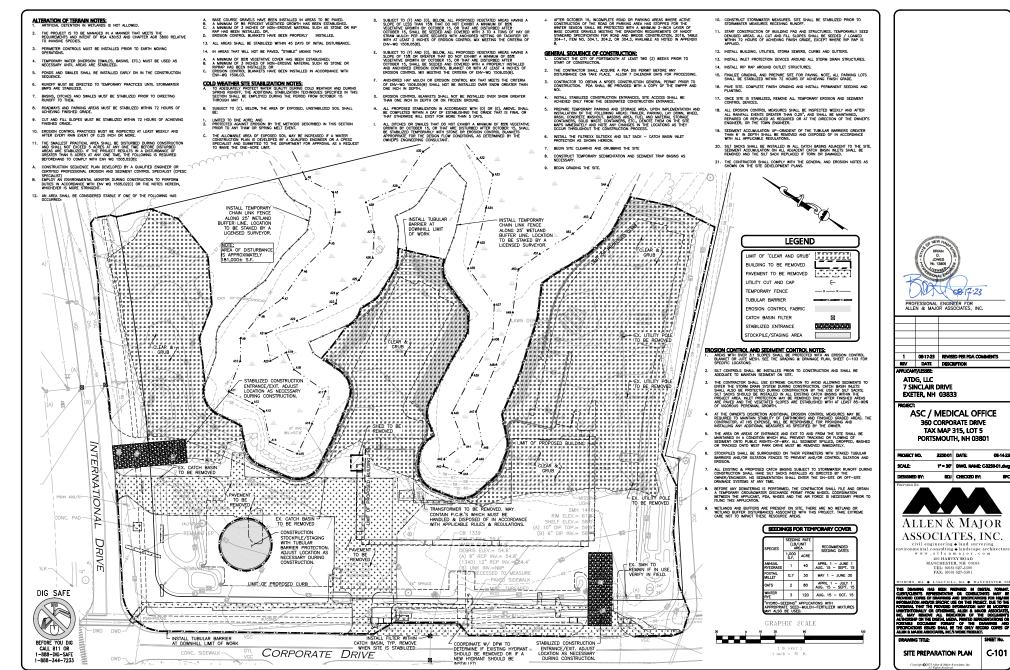
w. allenmajor.c 400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

SITE SPECIFIC SOIL

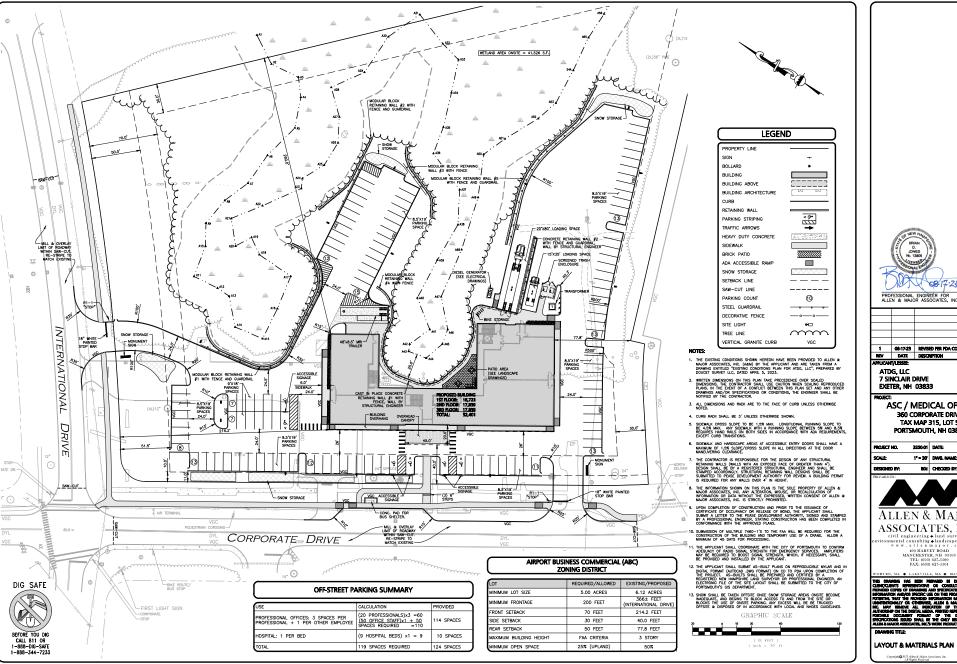
MAPPING PLAN

C-100

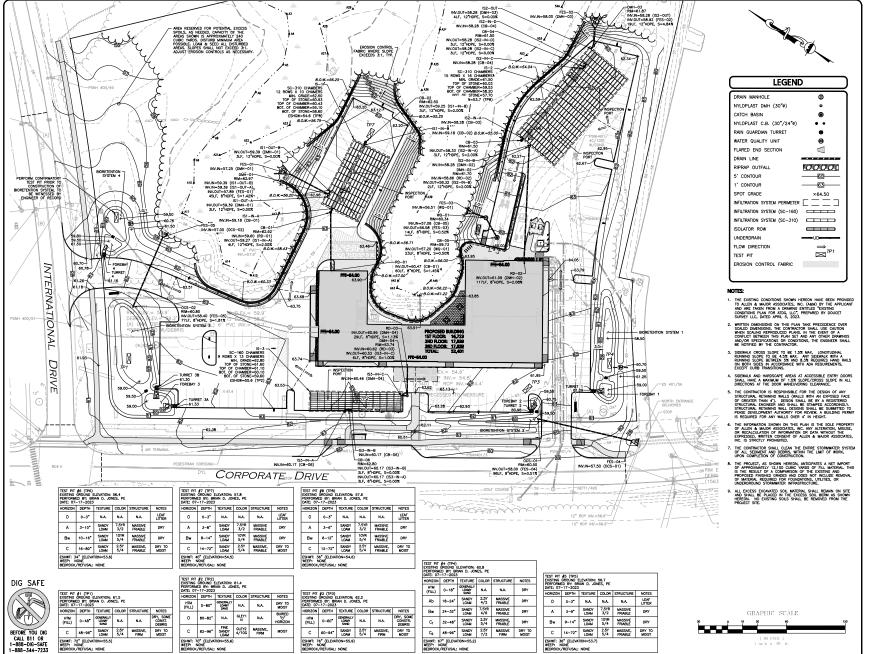
1" - 30" DWG. NAME: C825001.dw BOJ CHECKED BY:



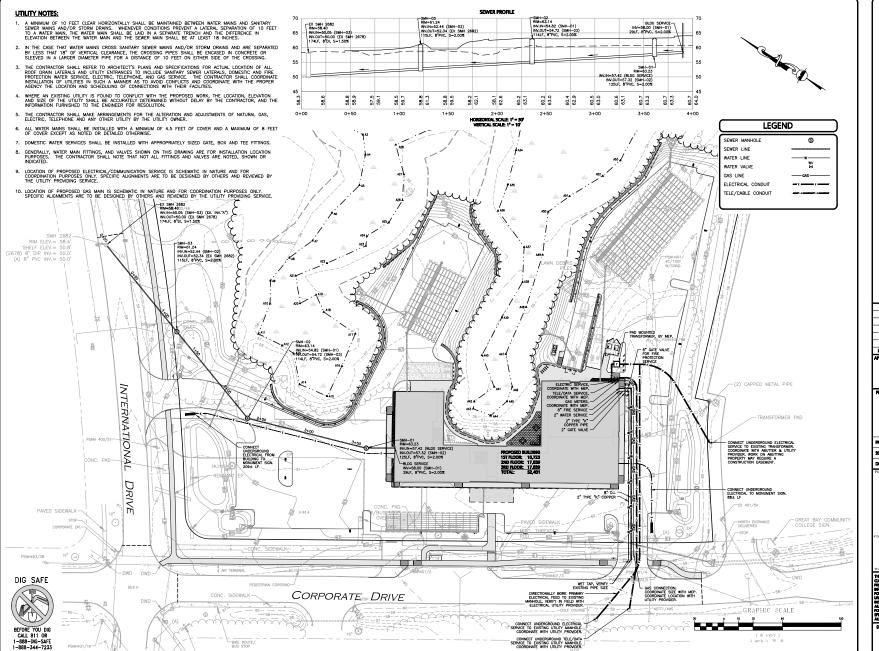
08-14-23



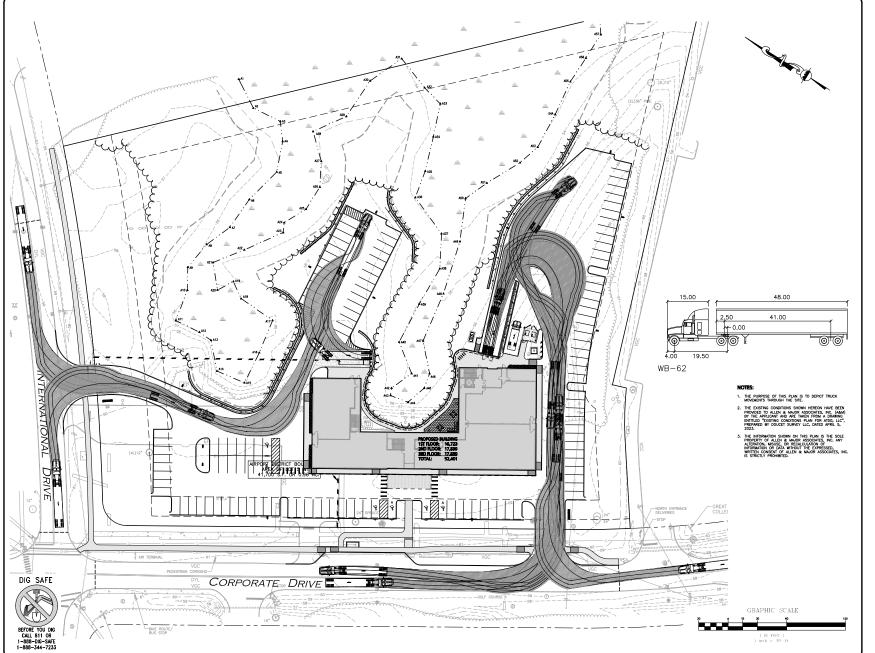




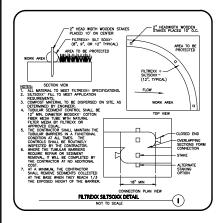


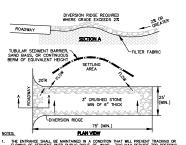






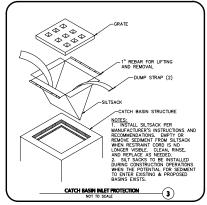


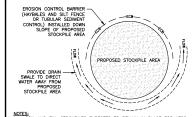




- WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTERING THE PUBLIC RIGHT-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

STABILIZED CONSTRUCTION ENTRANCE **(2**) NOT TO SCALE



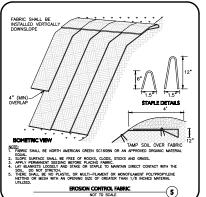


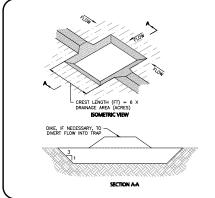
NOTES:

1. SOIL AND FILL STOCKPILES EXPECTED TO REMAIN IN PLACE FOR LESS THAN 90 DAYS SHALL BE COVERED WITH HAY AND MULCH (AT 100LBS/1,000 SF), OR WITH AN ANCHORED TARP WITHIN 7 DAYS OR PRIOR TO ANY ANNIVALL.

SOIL AND FILL STOCKPILES EXPECTED TO REMAIN IN PLACE FOR 90 DAYS OR MORE SHALL BE SEEDED WITH WINTER RYE (FOR FALL SEEDING AT 3L8/1,000 SF) OR GATS (FOR SUMMER SEEDING AT 7L8/1,000 SF) AND THEN COVERED WITH HAY MULCH (AT 100L8/1,000 SF) OR AN ANCHORED TARP WITHIN 7 DAYS OR PRIOR TO ANY RAINFALL

NOT TO SCALE **(4**)





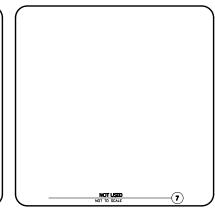
NOTES:

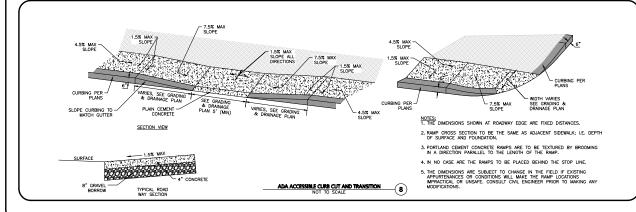
1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.

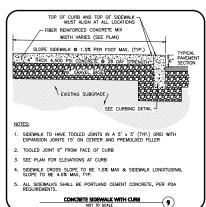
- THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
- THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
- THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER, AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
- THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
- THE TRAP SHALL BE CLEANED WHEN 50% OF THE ORIGINAL VOLUME IS FILLED.

THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AN STABILIZED.

TEMPORARY EARTH OUTLET SEDIMENT TRAP (6)



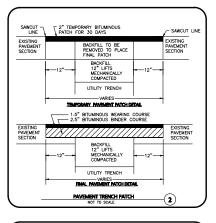






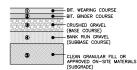
C-501

DETAILS



| LAYER<br>NUMBER | LAYER DESCRIPTION   | LAYER<br>THICKNESS<br>(INCHES) |
|-----------------|---|--------------------------------|
| 1               | BITUMINOUS WEARING COURSE  (4* AGGREGATE - NHOOT PRE-APPROVED MIX DESIGN) | 1.5"                           |
| 2               | BITUMINOUS BINDER COURSE (X* AGGREGATE - NHDOT PRE-APPROVED MIX DESIGN)   | 1.5"                           |
|                 | CRUSHED GRAVEL (BASE COURSE)<br>(NHDOT ITEM 304.3)                        | 6.0"                           |
| 4               | GRAVEL BORROW (SUBBASE COURSE)<br>(NHDOT ITEM 304.2)                      | 12"                            |
| 5               | CLEAN GRANULAR FILL MATERIAL OR APPROVED<br>ON-SITE MATERIALS (SUBGRADE)  | AS<br>NECESSARY                |

| NHDOT GRADATION SPECIFICATION |                           |                |                            |
|-------------------------------|---------------------------|----------------|----------------------------|
|                               | PERCENT                   | PASSING B      | Y WEIGHT                   |
| SIEVE                         | CLEAN<br>GRANULAR<br>FILL | BASE<br>COURSE | SELECT<br>GRANULAR<br>FILL |
| 8"                            | 100                       | 100            | 100                        |
| 3"                            | 70-100                    | 100            | 70-100                     |
| i.                            | 40-100                    | 40-80          | 40-90                      |
| No. 4                         | 25-100                    | 30-70          | 25-80                      |
| No. 10                        | 15-95                     | 20-60          | 15-70                      |
| No. 40                        | 10-70                     | 10-30          | 5-40                       |
| No. 200                       | 0-15                      | 3-10           | 0-12                       |

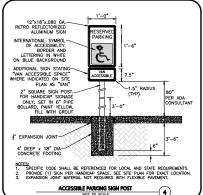


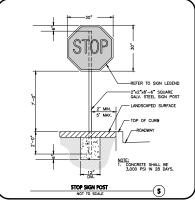
NOTES:

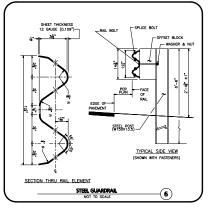
IF A GOTTECHNICAL REPORT IS PREPARED THE RECOMMENDATIONS WITHIN THAT REPORT SHALL SUPERCEDE RECOMMENDATIONS HEREIN. THE CONTRACTOR SHALL HAVE AND REVIEW A COPY OF THE GEOTECHNICAL REPORT AND COMPLY WITH THE RECOMMENDATIONS THEREIN.

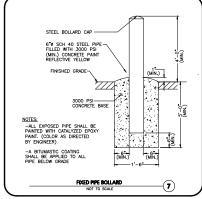
- TOPSOIL SHALL BE REMOVED BENEATH ALL PAVEMENT AREAS TO EXPOSE THE NATURALLY-OCCURRING SOILS OR ACCEPTABLE ON-SITE FILL MATERIALS.
- THE SUBGRADE SHOULD BE PROOFROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER USING AT LEAST 4 PASSES OF A 10-TON VIBRATORY ROLLER. AREAS OF THE SUBGRADE THAT WEAVE OR "ROLL" EXCESSIVELY SHOULD BE OVEREXCHANTED AND REPLACED WITH DRIER CLEAN GRANULAR FILL MATERIAL
- THE PAVEMENT SUBGRADE CONSISTING OF THE SPECIFIED CLEAN GRANULAR FILL SHALL BE, PLACED IN 12" MAXIMUM LIFTS AND COMPACTED TO A DRY DENSITY OF AT LEAST 95 PERCENT OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM DESIGNATION 0-1557.
- PAVEMENT AND GRAVEL SPECIFICATIONS WITHIN THE CITY RIGHT-OF-WAY ARE TO BE DESIGNATED BY THE CITY'S DESIGN CONSULTANT FOR THE ROUNDABOUT PROJECT.

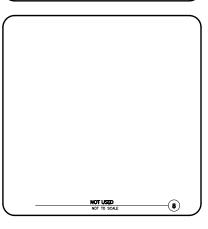


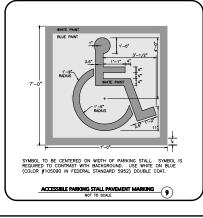


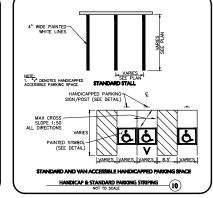


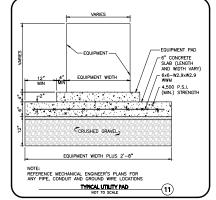




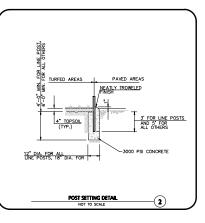


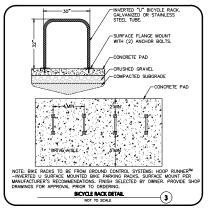


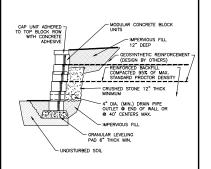












- THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE STRUCTURAL DESIGN OF THE MODULAR BLOCK RETAINING WALLS.
- WALLS THREE FEET OR GREATER IN HEIGHT SHALL BE DESIGNED BY A NEW HAMPSHIRE REGISTERED PROFESSIONAL STRUCTURAL ENGINEER.
- 3. WALL DESIGNS AND CALCULATIONS SHALL BE PROVIDED TO THE PROJECT GEOTECHNICAL ENGINEER TO CONFIRM THAT GEOTECHNICAL RECOMENDATIONS HAVE BEEN PROPERLY INCLUDED.
- WALL DESIGNS AND CALCULATIONS SHALL BE PROVIDED TO THE PROJECT CIVIL ENGINEER TO CONFIRM ELEVATIONS AND ALIGNMENT HAVE BEEN PROPERLY INCLUDED.
- SMALL BLOCK UNITS SHALL BE THE SQUARE FOOT PRODUCT BY VERSA-LOK OR APPROVED EQUAL.
- 6. WALL HEIGHT WITHOUT REINFORCEMENT SHALL BE LIMITED TO  $3^{\circ}$  EXPOSED FACE.
- INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

TYPICAL "SMALL BLOCK" RETAINING WALL NOT TO SCALE

(5)

| NEW PAVEMENT OR<br>TO MATCH<br>SAW CUT JOINT WITH<br>APPLIED BEFOR | EXISTING, AS<br>SPECIFIED<br>FEMULSION— | PAVED UNPA                 | VED MOUND_BACKFILL 6*±  |
|--|---|----------------------------|---|
| EXISTING MIN PAVEMENT VARIES                                       | COMPACTED GR *SUITABLE MATERIAL         | 6<br>6<br>MIN<br>AVEL      | MINIMUM BURIAL DEPTH — SEE NOTE (FINISH GRADE TO TOP OF PIPE) |
| 12"+2D<br>   | **SELECT<br>MATERIAL<br>LINING MATERIA  |                            | HAND PLACED<br>AND COMPACTED                                  |
|  |   | 18"+D (MIN)<br>24"+D (MAX) | "D" PIPE DIAMETER  UNDISTURBED  SOIL OR ROCK                  |

| CONDITION & PIPE                  | **SELECT MATERIAL  | LINING MATERIAL  | Y-DIMENSION |
|-----------------------------------|--------------------|------------------|-------------|
| DUCTILE IRON "ORDINARY SOIL"      | TYPE I, II, OR III | SAND OR TYPE III | 3"          |
| RCP<br>"ORDINARY SOIL"            | TYPE II OR III     | SAND OR TYPE III | 3"          |
| ALL PIPE OVER<br>BEDROCK OR LEDGE | TYPE II OR III     | SAND OR TYPE III | 8"          |
| DUCTILE IRON IN<br>CLAY OR MUCK   | TYPE II OR III     | SAND             | 4"          |
| RCP IN CLAY                       | TYPE II OR III     | SAND             | 8"          |
| ALL PLASTICS                      | TYPE III           | SAND OR TYPE III | 6"          |

- ALL PURSIES.

  SUITABLE MATERIAL SHALL CONTAIN NO STONE GREATER THAN 4" IN DIMETER, NO FROZEN LUMPS, AND ONLY MINOR AMOUNTS OF CLAY OF ORGANIC MATERIAL ALL MATERIAL TO BE PLACED IN MAY 8" LIFTS NAD COMPACTED BEFORE PLACING INSEXT LIFT.

  "TITELL LIMITEGIAL, SHALL BE STITER GRAVEL OR EXCANATED MATERIAL CONTAINING NO STONES GREATER THAN 1.5" DIMETER, NO

  "TITELL I MATERIAL, SHALL BE CLEAN, HARD, CRUSHED OR NATURAL STONE WITH A GRADATION BY WEIGHT OF 100X PASSING A 1.5"

  SQUARE OPENING, NOT MORE THAN 25X PASSING A 2" OPENING, AND NOT MORE THAN 3X PASSING A" 5" SOURCE OPENING.

  "TITELL I MATERIAL SHALL BE CLEAN, HARD, CRUSHED STONE FREE FROM CONTINUES AND THOOGHET WISHED WITH A GRADATION BY WEIGHT OF 100X PASSING A 1" SOURCE OPENING.

TRENCH DETAIL NOT TO SCALE 4

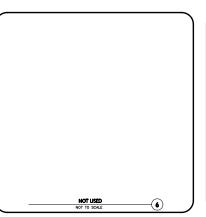
NOTES.

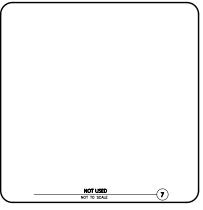
1. MINAUM BURIAL DEPTH (FRISH CRADE TO TOP OF PIPE)
GRAVITY PIPE – SEE PLAN OR PROFILE
PRESSURE PIPE UNDER PANNG – 4'
PRESSURE PIPE BENEATH UNPAVED – 3'

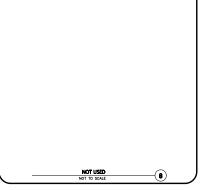
WHERE BACKFILL IS DESIGNATED AS COMPACTED, THIS MEANS 90 TO 95% STANDARD PROCTOR. AASHTO T-99. ALL FILL PLACED BELOW PIPES AND STRUCTURES MUST MEET THIS REQUIREMENT.

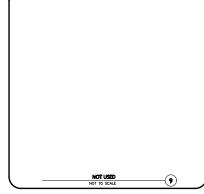
FOR ALL TRENCHES WITH A GRADE GREATER THAN 4% AND/OR WHERE GROUNDWATER IS APPARENT, INSTALL CLAY DAMS AROUND THE PIPE AT 100' INTERVALS.

4. BACKFILL AS PER DCED-R100 AND REFERENCED AS STANDARD











1 08-17-23 REVISED PER PDA COMMENTS REV DATE DESCRIPTION

ATDG, LLC 7 SINCLAIR DRIVE EXETER, NH 03833

ASC / MEDICAL OFFICE 360 CORPORATE DRIVE TAX MAP 315, LOT 5 PORTSMOUTH, NH 03801

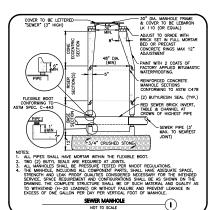
| MOJECT NO.  | 325001   | DATE           | 08-14-23  |
|-------------|----------|----------------|-----------|
| CALE:       | AS SHOWN | DWG. NAME: C82 | 50-01.dwg |
| ESIGNED BY: | 80.1     | CHECKED BY:    | RPC       |
| REPARED BY: | M        | M              | _         |
| ALL         | EN &     | MAJC           | R         |
|             |          | TES, IN        |           |

vironmental consulting dandscape architectu www.allenmajor.com

400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

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DETAILS



ADJUST AS REQUIRED TO FINISHED GRADE WITH TYPE SS SEWER BRICK 1 COURSE MAX OR

12 MAX. (CONCRETE COLLARS AND BARKELI BLOCKS ARE NOT ACCEPTABLE). THE MAXIMUM ALLOWABLE ADJUSTMENT SHALL BE 12 INCHES. ALL BRICKS AND RINGS SHALL BE SET IN FLORE BEDS OF TYPE II MORTAR CEMENT,

PRECAST CONCRETE
SECTIONS TO CONFORM TO—
ASTM C-478, CONCRETE
OF 4000 P.S.I. IN 28
DAYS 0.12 SQ. IN. PER
LINEAR FOOT
CIRCUMFERENTIAL STEEL
REINFORCEMENT

5" MIN. WALL THICKNESS

12" OF 3/4" CRUSHED STONE PARTIALLY WRAPPED IN MIRAFI 1100N FILTER FABRIC. TUCK FABRIC 12" (MIN) UNDER EDGE OF THE STRUCTURE

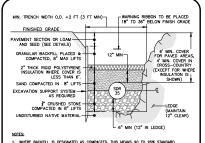
PRECAST CONCRETE RING (2 RINGS MAX.), 12" MAX. (CONCRETE COLLARS AND BARREL

3 1/2

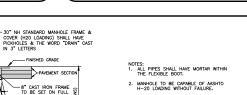
CONE ECCENTRIC SECTION

48" DIA. (MIN)

3/4" CRUSHED STONE



- WHERE BACKFILL IS DESIGNATED AS COMPACTED, THIS NEARS 90 TO 95% STANDARD PROCTOR. AGSHTO T-99, ALL FILL PLACED BELOW PIPES AND STRUCTURES MUST MEET THIS RECOMMENDENT.
- FOR ALL TRENCHES WITH A GRADE GREATER THAN 4% AND/OR WHERE GROUNDWATER IS APPARENT, INSTALL CLAY DAMS AROUND THE PIPE AT 100° INTERVALS.
- CRUSHED STONE SHALL BE CLEAN, HARD, FREE FROM COATINGS AND THOROUGHLY WASHED WITH A GRADATION BY WEIGHT OF 100% PASSING A 1" SQUARE OPENING, AND 0 TO 5% PASSING A 1" SQUARE OPENING. SEWER TRENCH DETAIL NOT TO SCALE

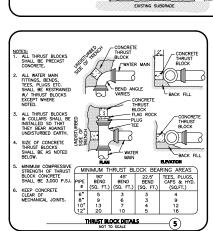


- STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN. FT. (BOTH WAYS).

(2)

- 4. BASE SECTION SHALL BE MONOLITHIC
- 5. ANY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW CUTTING AND/OR CORING. THE USE OF JACKHAMMERS, HAMMERS, AND CHISELS WILL NOT BE ALLOWED.

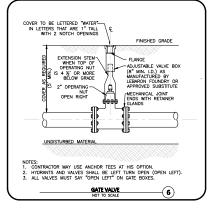




FRAME AND GRATE TO BE 24" x 24"-HEAVY DUTY FROM NEENAH FOUNDARY.

ABRIC 12" (MIN) UNDER EDGE OF

FINISH GRADE



CATCH BASIN STRUCTURE TO BE CAPABLE OF AASHTO H-20 LOADING WITHOUT FAILURE.

CATCH BASINS IN RADBURN STREET SHALL BE EQUIPPED WITH HIGH FLOW FRAME AND GRATES (TYPE F).

-(3)

IN./LIN.FT. (BOTH WAYS).

STANDARD CATCH BASIN

3. BASE SECTION SHALL BE MONOLITHIC 4. ANY ADJUSTMENTS DURING CONSTRUCTION WILL E DONE BY SAW CUTTING AND/OR CORING, THE US OF JACKHAMMERS, HAMMERS, AND CHISELS WILL NOT BE ALLOWED.

-ADJUST AS REQUIRED TO FINISHED GRADE WITH TYPE SS SEWER BRICK 1 COURSE MAX OR PRECAST CONCRETE RING (2 RINGS MAX.), 12" MAX. (CONCRETE COLLARS AND BARREL BLOCKS AR NOT ACCEPTABLE). THE MAXIMUM ALLOWABLE ADJUSTMENT SHALL BE 12 NICHES, ALL BRICKS AND RINGS SHALL BE SET IN PLUE BEDS OF TYPE II MORTRAC CIMENT

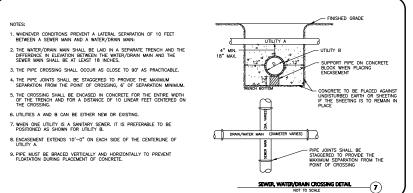
PIPE (DIAMETER

OUTSIDE DIAMETER PLUS 2 INCHES

KENT SEAL OR MORTAR JOINT (TYP.)

DRAIN P VARIES)

3/4" CRUSHED STONE



FINISHED GRADE

- 8" CAST IRON FRAME
TO BE SET ON FULL
BED OF MORTAR
AND SEALED
WITH MORTAR.

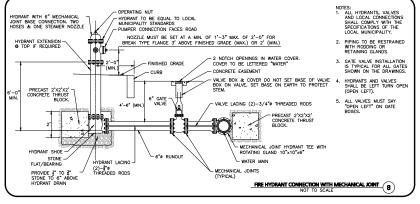
KENT SEAL OR MORTAR JOINT (TYP.)

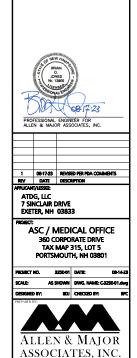
FLEXIBLE BOOT CONFORMING TO ASTM SPEC. C-443 —DRAIN PIPE

(DIAMETER VARIES)

OUTSIDE DIAMETER PLUS 2 INCHES

(SEE NOTE 2)



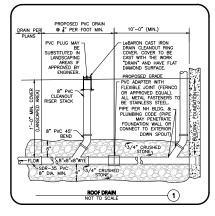


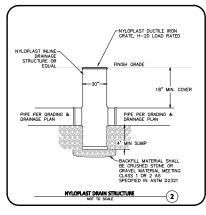
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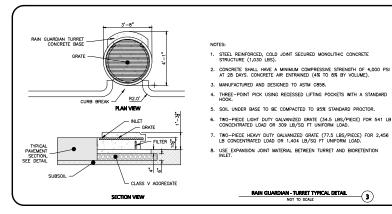
THE DRAWNS HAS BEEN PREMISED IN CHIEFAT PORMAT.
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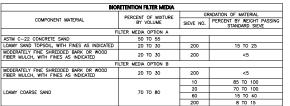
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DETAILS

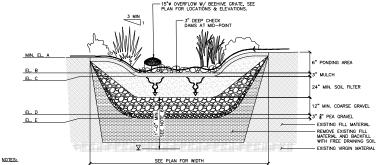






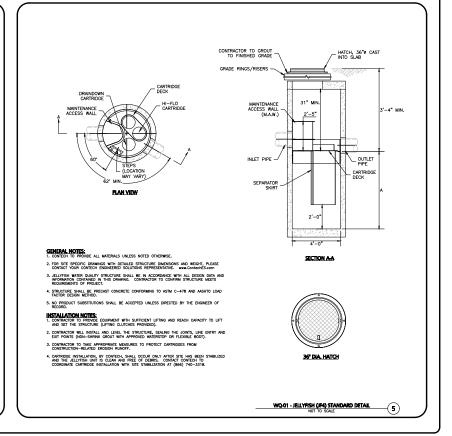


| ELEV. ID | BR #1 | BR #2 | BR #3 | BR #4 |
|----------|-------|-------|-------|-------|
| Α        | 61.25 | 61.25 | 61.00 | 61.50 |
| В        | 58.75 | 59.75 | 59.25 | 59.75 |
| С        | 58.50 | 59.50 | 59.00 | 59.50 |
| D        | 55.50 | 56.50 | 56.00 | 56.50 |
| Ε        | 55.25 | 56.25 | 55.75 | 56.25 |



- 1. SEE LANDSCAPE PLAN FOR PLANT TYPES.
- GRADING, AND PLANTING OF BIORETENTION SHALL BE COMPLETED IN EARLY PHASES OF CONSTRUCTION. PLANTS AND SEED ON SLOPES AND BOTTOM OF BASIN MUST BE ESTABLISHED PRIOR TO CONNECTION STORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA. PLANTS AND SEED MIX SHALL HAVE A MINIMUM OF 6 MONTHS GROWING, BE ESTABLISHED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO CONNECTIONS OSTORM DRAINAGE SYSTEM OUTLETS TO BIORETENTION AREA.
- EROSION CONTROL MEASURES AS SHOWN ON THE EROSION CONTROL PLAN, SHALL BE IN PLACE PRIOR TO ANY REGRADING ACTIVITY.
- EXCAVATION, FILLING AND PLANTING SHALL OCCUR IN THE DRY. WATER LEVELS MUST BE LOWERED IN THE BIORETENTION AREA BY RELYING ON DRY SEASON AND OR DRY SPELLS; OR MAY BE ACCOMPLISHED THROUGH THE USE OF DEWATERING METHODS. CONTRACTOR SHALL SUBMIT SHOP DRAWNINGS OF ANY DEWATERING METHODS OR SERVICE AND APPROVAL PRIOR TO CONSTRUCTION.
- WATER FROM ANY DEWATERING OPERATION SHALL BE TREATED TO REDUCE TOTAL SUSPENDED SOLDS AND BE IN COMPLIANCE WITH STATE AND FEDERAL STANDARDS, BEFORE ANY DEWATERING IS PERFORMED, THE CONTRACTOR SHALL FILE AND DETAIN A TEMPORARY REQUIREMENT HEAR PROCESS AND THE AIR FORCE IS NECESSARY PRIOR TO RELINE THIS PERSON SHAPE.
- A MINIMUM OF 1 FOOT SEPARATION BETWEEN THE BOTTOM OF THE PRACTICE AND SEASONAL HIGH WATER TABLE SHALL BE PROVIDED, VERIFY IN FIELD. IF SEPARATION CAN NOT BE ACHIEVED, SET UNDERDRAIN AT BOTTOM OF FOARSE GRAVEL LAYER, CMIT PEA GRAVEL LAYER, AND PROVIDE IMPERMEABLE LINER AT BOTTOM OF PRACTICE.







ASC / MEDICAL OFFICE

360 CORPORATE DRIVE

**TAX MAP 315, LOT 5** 

PORTSMOUTH, NH 03801

325001 DATE:

ALLEN & MAJOR

ASSOCIATES, INC.

W. allen major.c 400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

THE DRAWING HAS BEEN PRETMIED IN DIRECTAL FORMAT.
CURRYCUMPUS INTERESPRIATING OR COMPACTANTS HAVE BE PROVIDED COMES OF COMMISSION OF COMPACTANTON FOR HIS PRODUCT, DUE TO THE INFORMATION AND/OR SPECIFIC USE ON THIS PROJECT, DUE TO THE

DETAILS

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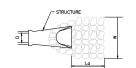
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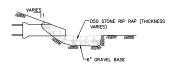
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SCALE:

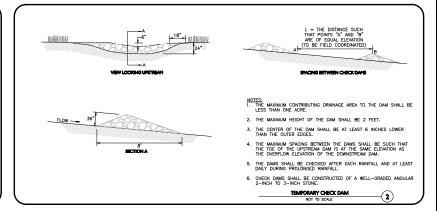
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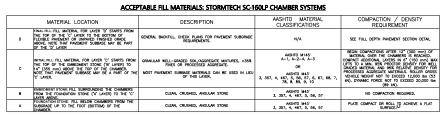




| RIP-RAP SIZING CHART |     |      |     |     |           |  |  |  |
|----------------------|-----|------|-----|-----|-----------|--|--|--|
| STRUCTURE            | D   | La   | w   | D50 | THICKNESS |  |  |  |
| FES-01               | 8"  | 10"  | 10" | 3"  | 7"        |  |  |  |
| FES-02               | 12" | 10'  | 12' | 3"  | 7"        |  |  |  |
| FES-03               | 8"  | 6.5" | 8'  | 3"  | 7"        |  |  |  |
| FES-04               | 8*  | 7'   | 8'  | 3"  | 7"        |  |  |  |
| EEC OF               |     | ٠,   | 7'  | 7*  | -,        |  |  |  |

RIPRAP OUTFALL APRON **(1**)

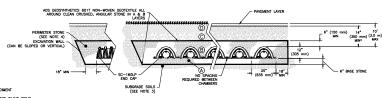




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### INSPECTION & MAINTENANCE

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  B. AL RECONSTRUCTED SO IN TRISTCHIAM FOR
- STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
  A A FRED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PRETERED B. APPLY MULTIPE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN C. WICKLOWN STRUCTURE SUMP AS REQUIRED.
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS: RECORD ORSERVATIONS AND ACTIONS STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES LIPSTREAM OF THE STORMTECH SYSTEM

## NOTES

- INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION, ADJUST THE INSPECTION INTERVA BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
- 2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS

### SC-160LP STORMTECH CHAMBER SPECIFICATIONS

- 1. CHAMBERS SHALL BE STORMTECH SC-160LP.
- 3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNDESTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFED IN THE ASHITO LAFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12:12, ARE MET FOR: 1) LONG-DURATION LOAD LOADS AND 2) SHORT—DURATION LIVE LOADS, BASED ON THE ASHITO DESIGN TRUCK WITH CONSIDERATION FOR PRIMARY TAN WALLIFFLY EVENUE PRESENCES.

STORMTECH HIGHLY RECOMMENDS
FLEXSTORM INSERTS IN ANY UPSTREAM
STRUCTURES WITH OPEN CRATES

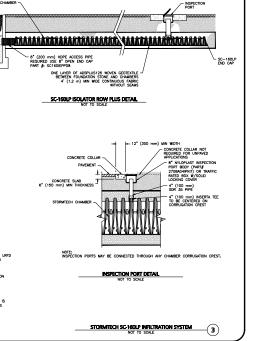
4 SUMP DEPTH

CATCH BASIN OR MANHOLE

- MINIORIO CONTE 2) MANDRAM PROMOREN (75-71) CONTRI COUR NOU NO 2) ALLONGOLL CONTRI MINI PROMOLI (1-MELT) ASSITUD LESSAN INCOL.

  1 TO MANTAN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE RITCHAN, INTERDUCKING STACKING LUCS.

  1 TO DESIGNE A SCRUER, AND HANDRING RESTALLATION AND BASOFILL, THE HEGHT OF THE CHAMBERS CHAMBER CHAM
- 9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY



Systems, Inc.



C-506

DETAILS

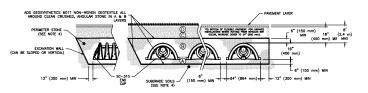
|   | MATERIAL LOCATION  | DESCRIPTION  | AASHTO MATERIAL CLASSIFICATIONS   | COMPACTION / DENSITY REQUIREMENT   |
|---|--|--|---|--|
| D | FINAL FILL: FILL MATERIAL FOR LAYER 'D'<br>STARTS FROM THE TOP OF THE 'C' LAYER TO<br>THE BOTTOM OF FLEXIBLE PAVEMENT OR<br>UNPAYED FINISHED GRADE ABOVE. NOTE THAT<br>PAVEMENT SUBBASE MAY BE PART OF THE 'D'<br>LAYER. | ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR<br>PER ENGINEER'S PLANS. CHECK PLANS FOR<br>PAVEMENT SUBGRADE REQUIREMENTS.  | N/A   | PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.  |
| С | INITIAL FALL-FILL MATERIAL FOR LAYER "C" STARTS FROM THE TOP OF THE EMBERMENT STONE ("B" LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER, NOTE THAT PAYEMENT SUBBASE MAY BE A PART OF THE "C" LAYER.                 | GRANULAR WELL-GRADED SOIL/AGGREGATE<br>MIXTURES, <35% FINES OR PROCESSED<br>AGGREGATE.  MOST PAVEMENT SUBBASE MATERALS CAN BE<br>USED IN LIEU OF THIS LAYER. | AASHTO M145' A-1, A-2-4, A-3 OR 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 | BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIA UVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (155 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED STATEMENT OF THE CHAMBERS OF THE COMPACT OF THE CHAMBERS OF THE |
| В | EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.   | CLEAN, CRUSHED, ANGULAR STONE  | AASHTO M43'<br>3, 357, 4, 467, 5, 56, 57  | NO COMPACTION REQUIRED.  |
| A | FOUNDATION STONE: FILL BELOW CHAMBERS<br>FROM THE SUBGRADE UP TO THE FOOT<br>(BOTTOM) OF THE CHAMBER.  | CLEAN, CRUSHED, ANGULAR STONE  | AASHTO M43 <sup>1</sup><br>3, 357, 4, 467, 5, 56, 57                                      | PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. <sup>2,3</sup>  |

PLEASE NOTE:
1. THE LISTED ANSHTO DESIGNATIONS ARE FOR GRIDATIONS ONLY. THE STONE MUST ALSO BE CLEIN, CRUSHED, ANDURA. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE. "CLEIN, CRUSHED, ANDURA NO. 4 (AMSHTO MAS) STONE".

- MA) STORY."

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  MAY S



- 1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE). "STANDARD SPECIFICATION FOR CORRUGATED WALL
- SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL
- 3. CORDINATE WITH THE PROJECT GETECHNICAL ENGINEER FOR ASSESSING THE BEARING RESISTANCE (ALLOMABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STOKE WITH CONSIDERATION FOR THE MANGE OF EMPETER SOIL MOSTINE CONDITIONS.

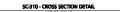
  4. PERMILETER STOKE MUST BE EXTENDED HORDZONICALLY TO THE EXCHANGING MALE FOR BOTH VERTICAL MID SUCPED EXCANSION WALLS.

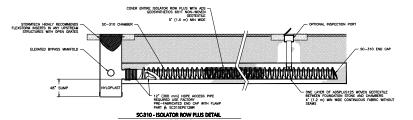
- PERMITTE STORE MUST BE CETIONED INFOCUMENT TO THE DOWNTON MULT FOR BOTH VERTICE. AND SCIPPED DOWNTON WALLS.

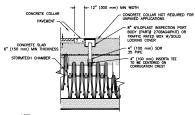
  CONTINUENT OF MUNIOR AND ASSESSMENDERS SERVING MONE HOUSING, CHANGES SHALL HIME EXTENSION, RETELLICORIS STACKHOL LUCS.

  10 DISURE A SICURE JOHN CHANGE MISTALLIZOR AND BEOFFLE, THE FEBRIT OF THE CHANGES JOHN SHALL, INTO BE LESS THAN 27.

  10 DISURE OF THE INTERRITY OF THE ACH SHAPE LOWER DESTINATION, b) THE AND STRYPESS CONSTITUTE AS DETTION BY SCIENCE AS OF ASTM 72922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/17/1X. AND ) TO RESST CHANGES DEFORMED SHAPE AS DETAILED AS SCIENCE AS DESTINATION AND THE ADMINISTRATION AS DEFORMED AS SCIENCE AS DESTINATION AS DETAILS IN SCIENCE AS DESTINATION AS DETAILS IN SCIENCE AS DESTINATION AS DESTINATION AS DETAILS TO SCIENCE AS DESTINATION AS DEFORMED AS DESTINATION AS DEFORMED. AS DESTINATION AS DEFORMED AS DESTINATION AS DEFORMED AS DESTINATION AS DEFORMED. AS DESTINATION AS DEFORMED AS DESTINATION AS DEFORMED AS DEFORMED AS DEFORMED.

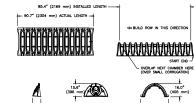






NOTE: INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

A<sup>®</sup> PVC INSPECTION PORT



34.0" X 16.0" X 85.4" (864 mm X 406 mm X 2169



| PART#                          | STUB            | A                 | В             | С            |
|--------------------------------|-----------------|-------------------|---------------|--------------|
| SC310EPE06T /<br>SC310EPE06TPC | 6" (150         | 9.6" (244         | 5.8" (147 mm) |              |
| SC310EPE06B /<br>SC310EPE06BPC | mm) mm)         |                   |               | 0.5" (13 mm) |
| SC310EPE08T /<br>SC310EPE08TPC | 8" (200         | 11.9" (302        | 3.5" (89 mm)  |              |
| SC310EPE08B /<br>SC310EPE08BPC | mm)             | mm) mm)           |               | 0.6" (15 mm) |
| SC310EPE10T /<br>SC310EPE10TPC | 10" (250        | 12.7" (323        | 1.4" (36 mm)  |              |
| SC310EPE10B /<br>SC310EPE10BPC | mm)             | mm)               |               | 0.7" (18 mm) |
| SC310EPE12B                    | 12" (300<br>mm) | 13.5" (343<br>mm) |               | 0.9" (23 mm) |
| SC310EPE12BR                   | 12" (300<br>mm) | 13.5" (343<br>mm) |               | 0.9" (23 mm) |

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMITCH AT 1-888-892-2694.

FOR THE SC310EPE128 THE 12\* (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25\* (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

TECHNICAL SPECIFICATIONS

#### SC-310 STORMTECH CHAMBER SPECIFICATIONS

- 1. CHAMBERS SHALL BE STORMTECH SC-310.
- 2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
- 3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUCATED WALL STORMWATER COLLECTION CHAMBERS."
- 4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS LINORSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION
- THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-PURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE ASSHTUDESHON TRACK WITH CONSIGNATION FOR MEYER LOAD UNLIFIEL WHICH PERSENCES.
- CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUPATED WALL STORMANDER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLIDE: 1) INSTANTABOLS (c.I. MR) AMERIO DESIGN TRUCK LIVE LOAD ON MINIMAL COMPEZ DIAMONIUM PREMINENT (75—70 COVER LOAD AND 3) ALLOWABLE CONFINE WITH PRAMED (1—MEEK) AMERIO DESIGN TRUCK.
- REQUIREMENTS FOR IMMODIAG AND RESIZILATION.

  REQUIREMENTS FOR IMMODIAG AND RESIZILATION.

  REQUIREMENTS FOR IMMODIAG AND RESIZILATION AND HANGLING, CHARBERS SHALL HAVE INTERFAL, INTERLOCING STACHING LIGS.

  10 DISBURE A SECURE JOINT DURING INSTALLATION AND BACKEL, THE HEIGHT OF THE CHARBER JOINT SHALL HOT BE LESS THAN 2?.

  11 DISBURE IN RETRIENT OF THE AND SHAPE LARBIN CHARLATION, b) THE AND INSTRUSS CONSISTS SHALL BE CHARBER THAN OF DUAL TO 400 LBS/TT/R. THE ASC IS DISTRICT IN STRUCKED LESS OF ASSIST SHALL BE PRODUCED FROM RETLETION COLOR.

  CHARBERS SHALL BE PRODUCED FROM RETLETIFIC COLOR.
- ONLY CHARGES SHALL BE PROJUCED FIND REJECTION GOLD ON TILLION COLORS.

  ONLY CHARGES THAT ARE APPROVED IT THE STEE EGGS DESIGNESS WILL BE ALDIEDL. UPON REQUEST BY THE SITE DESIGN DIAMETER OF OWNER, THE CHARGES MANUFACTURES SHALL SUBMIT A STRUCTURE, DALLIFON FOR APPROVAL BEFORE COLUMBING STO THE PROJECT SITE AS FOLLOWS:

  HE STRUCTURE SHALL SHALL BE ALDIED SHALL SHALL BE ADMITTANT FOR APPROVAL BEFORE COLUMBING SHALL SHALL SHALL BE ADMITTANT FOR THE SHA
- 9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.



STORMITECH SC310 CHAMBER INFILTRATION SYSTEM NOT TO SCALE



DETAILS

#### SECTION 33 36 00 - SANITARY SEWER SYSTEMS

PART 1 GENERAL 1.01 PRODUCTS

UESCHPILING

A. THE GOOK MORE THIS SECTION SHALL INCLIDE THE FLANISHING OF ALL MATERIAL, LIBOR, EQUIPMENT AND SUPPLIES AND THE PERFORMANCE OF ALL OPERATIONS TO PROVIDE A COMPLETE MORNING SYSTEM AS REQUIRED BY THE DOWNINGS AND DETAILS AND AS SPECIFED HEREIN, IN GENERAL, TO INCLIDE THE FOLLOWING THE PLALIFORM STEPS AND AS SPECIFED HEREIN, IN GENERAL, TO INCLIDE THE PLALIFORM STEPS AND AS SPECIFED HEREIN, IN GENERAL, TO INCLIDE THE PLALIFORM STEPS AND AS SPECIFED HEREIN, IN GENERAL, TO INCLIDE THE

SANITARY SEWER SYSTEM FROM 5 FEET OUTSIDE THE BUILDING TO POINT OF TERMINATION AS SHOWN
ON THE DRAWNINGS.

2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF THE LOCAL DEPARTMENT OF PUBLIC WORKS AND INDES.

1.03 RELATED WORK: A SECTION 31 23 00 - FARTHWORK

1.04 RELATED DOCUMENTS:

A. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE MUNICIPALITY.

B. ALL WORK FOR ITEMS NOT OTHERWISE COVERED BY 1.03.A ABOVE SHALL CONTORM TO THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION (LATEST EDITION).

C. ALL WORK SHALL CONFORM TO THE PERMITS ISSUED BY THE STATE OF NEW HAMPSHIRE DEPARTMENT OF ENGROMENTAL SERVICES.

A KNOWN INDERFREUND AND SURFACE UTILITY LINES ARE INDICATED ON THE DRAWNOS. INFORMATION ON THE DRAWNOS RELATING TO EXISTING UTILITY LINES AND SERVICES IS FROM THE BEST SOURCE PRESENTLY AVAILABLE. ALL SUCH INFORMATION IS FURNISHED. ONLY FOR INFORMATION AND IS NOT QUIENTIFIED CONFIDENCE WITH UTILITY COMPANIES, DIE SIFE AND THEIR CONTRICTIONS, AND EXCAVATE TEST PITS AS REQUIRED TO EXTERNATE DATA COLORIDORS OF DESTRUCTION UTILITIES.

REQUEST TO STEWNER, DATE LOCATION OF COSTING UTUTES.

It is above, some time warmound proving sowner companies, account or time towner. The province of the pr

D. UNDERPIN ADJACENT STRUCTURE(S), INCLUDING UTILITY SERVICE LINES, WHICH MAY BE DAMAGED BY

F. PROMPTLY NOTIFY THE OWNER OF UNEXPECTED SUB-SURFACE CONDITION

1.06 QUALITY ASSURANCE:

A STANDARDS: COMPLY WITH STANDARDS SPECIFIED IN THIS SECTION. PROVIDE SHOP DRAWINGS TO THE OWNER OR OWNER'S REPRESENTATIVE.

B. QUALIFICATIONS OF INSTALLERS: USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE RECESSARY CRAFTS AND WHO ARE COMPLITELY FAMULAR WITH THE SPECIFIED REQUIREMENTS AND METHODS FOR PROPER PERFORMANCE OF THE WORK OF THIS SECTION.

C. OBTINI OWNER OR OWNER'S REPRESENTATIVE'S ACCEPTANCE OF INSTALLED AND TESTED SITE DRAINAGE SYSTEM PRIOR TO BUCKFILLING.

A PRODUCT DATA:

1. COMPLETE MATERIALS LIST OF ALL ITEMS PROPOSED TO BE FURNISHED AND INSTALLED UNDER THIS

MANUFACTURER'S SPECIFICATIONS AND OTHER DATA REQUIRED TO DEMONSTRATE COMPLIANCE WITH THE SPECIFIED REQUIREMENTS.

3. MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES. B. TESTING AND INSPECTION REPORTS.

1. LEGIBLY MARK DRAWINGS TO RECORD ACTUAL CONSTRUCTION.

2. INDICATE HORIZONTAL AND VERTICAL LOCATIONS REFERENCED TO PERMANENT SURFACE IMPROVEMENTS.

3. INFINITEY FIELD CHANGES OF DIMENSIONS AND DETAILS AND CHANGES MADE BY CHANGE ORDER.

A THE WORK SHALL BE SO PERFORMED THAT THE PROCESS OF THE DITINE PROJECT CONSTRUCTION, INCLUDING ALL CITIER TRADES, SHALL NOT BE DELAYED AND NOT INTERFERED WITH, MATERIALS AND WHICH AND AS DIRECTED. THE PROJECT OF THE PROJECT OF INSTALLED PROMPTLY WHICH AND AS DIRECTED.

B. ALL WORK SHALL BE COORDINATED WITH OTHERS TRADES. THE WORK IN THIS SECTION SHALL AT NO TIME INTERRUPT THE NORMAL OPPRATIONS OF COSTING BUILDINGS.

2.01 POLYMNYL CHLORIDE PIPE (PVC):

A PVC PIPE SHALL BE MADE FROM VIRGIN PLASTIC AND SHALL CONFORM TO ASTM D1784. SOLID PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D3034 SDR 35. PERFORATED PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D2729 SDR 35.

B. STANDARD NOMINAL LENGTHS OF PIPE SHALL BE A MINIMUM OF 10 FEET.

D. PIPE SHALL BE TISTED IN ACCORDANCE WITH SECTION 10 OF ASTM 12412 STANDARD METHOD OF "TEST FOR EXTERNAL LOCKING PROPERTIES OF PLASTIC PIPE BY PRANLEL-PLATE LOCKING". THE MINIMUM VAULE OF PIPE STIFFNESS AT 5% DEFLECTION COMPUTED FROM DATA OBTAINED FROM THE ABOVE TESTING PROCEDURE SHALL BE IN ACCORDANCE WITH ASTM 12412.

2.02 DUCTUE IRON (D.L.) SEWER PIPE:

A ANS/AWMA C151/ A21.51 CLASS 52 WITH CEMENT LINING CONFORMING TO ANSI A21.4. PRESSURE CLASS SHALL BE ANSI PRESSURE CLASS 350. PROTECTIVE COATING ON EXTERIOR SHALL BE APPROVED 3.0 BITUMENTS OF COALT TAR ENABLE CONFORMED ON ANSI A21.4 AND A21.10

B. FITTINGS FOR DUCTLE IRON PIPE SHALL BE DUCTLE IRON SHORT BODY FITTINGS CONFORMING TO ANSI A21.4. THICKNESS CLASS SHALL BE ANSI PRESSURE CLASS 30.4.

2.03 HIGH DENSITY POLYETHYLENE (HDPE)

A FORCE MAINS AND LOW PRESSURE SEWERS SHALL BE TREATED AS GRAVITY SEWERS FOR PURPOSES OF FOUNDATION BEDDING AND BACKFUL REQUIREMENTS.

B. HDPE PIPE USED FOR FORCE MAINS AND LOW PRESSURE SEWERS SHALL CONFORM TO ASTM 03035-03A.

A CAST RON SOIL PIPE SHALL BE ASTM A 74, EXTRA HEAVY TYPE, INSIDE ROMANAL DIAMETER AS SPECIFIED ON CONSTRUCTION DRAWNINGS, BEIL AND SPIROT END. JOHTS SHALL BE IN CONFORMANCE WITH ANNA C111, RUBBER GASKET JOHN DEWICES.

2.05 PIPE JOINTS AND FITTINGS: A. DUCTILE IRON FITTINGS SHALL BE WECHANICAL JOINTS. ALL FITTINGS SHALL BE RESTRAINED OR RODDED.

B. DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI 21.10 AND 21.11 (AWWA C110 AND AWWA C111).

C. HDPE AND PVC FITTINGS SHALL BE WATERTIGHT, STRUCTURAL INTEGRITY AND JOINT CONFIGURATION SHALL

BE IDENTICAL TO THAT OF PIPE.

A PREOST CONCRETE MANDLE, CATCH BISIN, LEACHING CATCH BISIN BISE, AND LEACHING PIT SE RISES SCITCING AND CORE SCETCINGS SHALL BE CONSTRUCTED OF A MINIMAL COMPRESSES STREM ACOD PSA 17 SE DONG, ARE DIFFINED CONCRETE WITH HOP REINFORCEM AND LETTER CHELLS. SE SHALL BE FURNISHED WITH "O'R RISEBER CONSETTS. LETTING HOLLS IN ALL SECTIONS SHALL BE WITH MODISHEM MORTEM AFTER SCETCINGS ARE IN PLACE."

B. CLASS 'A' CONCRETE: ASTM C94. ALL CONCRETE SHALL BE CLASS A UNLESS STATED OTHERWISE.

1. STRENGTH : 3000 PSI @ 28 DAYS
2. CEMENT CONTENT : TYPE II, 8.5 SACKS/CY (MIN) 5. COARSE AGGREGATE : ASTN C33 SIZE #67

C. CLASS 'B' CONCRETE: 1. STRENGTH : 3000 PSI @ 28 DAYS 2. CEMENT CONTENT : TYPE II, 6.0 SACKS/CY (MIN)

3. W/C RATIO : 0.488 (MAX) 4. FINE AGGREGATE : ASTM C33 COARSE ACCRECATE . ASTM C33 SIZE 487

D. REINFORCING STEEL: ASTM A615, A616, OR A185.

. PRECAST CONCRETE: ASTM C478 EXCEPT AS SPECIFIED OTHERWISE.

TABLES AND INVERTS SHALL BE CONSTRUCTED OF BRICK, SHALL HAVE THE SAME SHAPE OF THE PIPE THAT ARE CONNECTED AND ANY CHANGE IN SIZE OR DIRECTION SHALL BE GRADUAL AND EVEN.

G. PRECAST STRUCTURES SHALL BE ABLE TO WITHSTAND H-20 LOADING. , Horizontal joints between sections of precast concrete barrels shall be of an overlapping type, sealed for water-tightness using a double row of an elastomeric or mastic-like sea and

PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:

1. ELASTOMERIC, RUBBER SLEEVE WITH WATERTICHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;

CAST INTO THE WALL OR SECURED WITH STANLESS STEEL CLAMPS\
 ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE RY COMPRESSION OF THE RING.

A. PIPE TO MANHOLE JOINTS SHALL BE ONE OF THE FOLLOWING OR APPROVED EQUAL:

a. KOR — N — SEAL

b. LOCK JOINT

PRESS WEDGE II

A. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C 150-05, TYPE H.

HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES:

C. SAND SHILL BE CLEAN, HIND, DURNELE PARTICLES AND WITH NOT MORE THAN SX IN VOLUME OF MICH. 
ALVA WOO THEN BOLTERINGUA MINERALS. THE SAND SHILL BE GAMOED FROM FINE TO COURSE 30 THAT 
WIEN TESTED DIPY, IT WILL CONTROM TO THE LIMITS OF ASTM CAS-O3 STAMOMO SPECIFICATIONS FOR 
CONCRETE, THE ACRORAGIATS.

D. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED ADDITION;

1 PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE-

a. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
b. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PART HYDRATED LIME

WATER SHALL BE FREE FROM OILS, ACIDS, ALKALIS OR ORGANIC MATTER, AND SHALL BE CLEAN AND

F. BRICK SHALL BE SOUND, HARD AND UNFORMLY BURNED, REQULAR AND UNFORM IN SHAPE AND SIZE, OF COMPACT TEXTURE AND SATISFACTORY TO THE OWNER OR OWNER'S REPRESENTATIVE. BRICKS SHALL BE USED UNLESS OTHERWISE PREMITTED.

2.08 MANHOLE STEPS: (NOT USED)

2.09 MANHOLE FRAMES AND COVERS:
A OKTINGS SHAPL BE OF GOOD QUALITY, STRONG, TOUGH EVENLY GRANED, SMOOTH CHST ROW, FREE FROM SOLE, LAND DEFECTS OF ANY KIND. CASTINGS SHALL BE THORROUGHLY CLEMED AND ALL FRANCE SMEPACES SHALL BE MACHINED TO A TRUE PLANED SURFACE AND SHALL SEAT AT ALL PORTS WITHOUT ROOTS.

8. CASTINGS SHALL NOT BE ACCEPTABLE IF THE ACTUAL WEIGHT IS LESS THAN 95% OF THE THEORETICAL WEIGHT OF THE CASTINGS SHOWN ON THE DRAWINGS, CONTRACTOR SHALL FURNISH INVOICES TO THE OWNER SHOWNO TRUE WEIGHTS, CRETINED BY THE SUPPLIER.

C. CAST IRON SHALL CONFORM TO ASTM A48, CLASS 30 AND FRAMES, COVERS AND GRATES SHALL BE ABLE TO WITHSTAND H-20 LOADING. D. PROMDE A 30 INCH DAWLETER CLEAR OPENING. SEWER MANHOLE COVERS SHALL HAVE THE WORD "SEWER" IN 3" LETTERS CAST INTO THE TOP SURFACE.

A. FORCE MAINS FOR CONSTANT SPEED PUMPS SHALL BE SIZED TO YIELD A CLEANSING VELOCITY OF 3 FEET PER SECOND OR GREATER AT DESIGN PUMP CAPACITY. B. FORCE MAINS SHALL ENTER THE GRAVITY SEWER SYSTEM AT THE FLOW LINE OF THE RECEIVING MANHOLE.

C. TO PREVENT AR LOCKING, FORCE MAINS SHALL BE PROVIDED WITH AN AUTOMATIC AIR RELIEF WALVE AT EACH HIGH POINT, INSTALLED WITHIN A MANHOLE STRUCTURE THAT MEETS THE DESIGN REQUIREMENTS OF ENV-WQ 70-112 THROUGH ENV-MQ 70-11.

D. EARNE MAINE CHAIL BE DROWNED WITH A DRINNING BLOW-OUR AT EARLY INW. DOINT THAT +HAS A PROPERLY VALVED CONNECTION FOR A VACUUM TRUCK OR OTHER SUITABLE CONTAINMENT DEVICE; ·IS INSTALLED WITHIN A MANHOLE STRUCTURE THAT MEETS THE DESIGN REQUIREMENTS OF ENV-WQ 704.12

THROUGH ENV-WO 704.17, WITH SUFFICIENT SPACE FOR HANDLING THE DISPLACED WASTE WITHOUT DANGER OF POLLUTION OR HEALTH HAZARD E. FORCE MAINS SHALL BE DESIGNED IN ACCORDANCE WITH ENV-WQ 704.07, CONSTRUCTED WITH MATERIALS AS SPECIFIED IN ENV-WQ 704.08, AND TESTED AS SPECIFIED IN ENV-WQ 704.09.

THRUST BLOCKS MADE FROM INORGANIC, CORROSION—RESISTANT MATERIAL SHALL BE PLACED AT ALL BENDS, ELBOWS, TEES, AND JUNCTIONS.

G. FORCE MAINS SHALL BE DESIGNED TO WITHSTAND HYDROSTATIC PRESSURES OF AT LEAST 2.5 TIMES THE DESIGN TOTAL DYNAMIC HEAD:

WRT 3 EXECUTION

A. OBTAIN DETAILED INFORMATION FROM THE MANUFACTURERS OF APPARATUS AS TO THE PROPER METHOD OF INSTALLING AND CONNECTING SAME.

B. CAREFULLY STORE MATERIAS. AND EQUIPMENT WHICH ARE NOT IMMEDIATELY INSTALLED AFTER DELIVERY. CLOSE OFEN ENDS OF WORK WITH TEMPORARY COVERS OR PLUG DURING CONSTRUCTION TO PREVENT ENTRY OF COSTRUCTION MATERIAL.

C. ANY DEFECTIVE PIPE, FITTING OR DRAIN APPARATUS THAT IS DISCOVERED AFTER IT HAS BEEN INSTALLED OR HAS BEEN INSTALLED IMPROPERLY, SHALL BE REMOVED AND REPLACED WITH NON-DEFECTIVE PARTS TO THE SAINSACTION OF THE OWNER OR OWNER'S REPRESENTATIVE AT THE CONTRACTION'S EMPENSE.

D. TRENCHES SHALL BE KEPT FREE OF WATER AND AS DRY AS POSSIBLE DURING THE INSTALLATION OF THE BEDDING MATERIAL, PIPE AND JOINTING FOR AS LONG A PERIOD AS REQUIRED. PIPE SHALL NOT BE LAID IN WAITER OR WHEN TRENCH CONDITIONS ARE UNSUITABLE FOR THE WORK.

E. PROMDE ALL INSPECTION AGENTS AT LEAST 24 HOURS NOTICE PRIOR TO WORK BEGINNING, INSPECTOR SHALL BE ON-SITE DURING ANY/ALL EXCAVATION, INSTALLATION, BACKFILL, AND TESTING OF ALL SEMERAGE PIPES, MANULES, AND APPLIETIANCES.

NO BACKFILING SHALL TAKE PLACE, UNLESS OTHERWISE ORDERED BY THE OWNER OR OWNER'S REPRESENTATIVE, UNTIL THE INSPECTION HAS BEEN COMPLETED.

G. EXCAMATION, BACKFILL AND PIPE BEDDING MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 31 23 00, EARTHWORK. 3.02 LAYING PIPE:

A THIS WORK SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY FOR THE COMPLETE INSTALLATION OF DRAIN LINES IN ACCORDANCE WITH THESE SPECIFICATIONS, THE MUNICIPALITY AND OTHER AUTHORITES HAMING JURISDICTION.

B. ALL PIPE SHALL BE SOUND AND CLEAN BEFORE INSTALLING. WHEN LAYING OF PIPE IS NOT IN PROGRESS,

INCLUDING LUNCH TIME, THE OPEN ENDS OF THE PIPE SHALL BE CLOSED BY WATERTICHT PLUGS OR OTHER APPROVED MEANS.

C. THE FULL LENGTH OF PIPE SHALL REST SOLIDLY ON THE UNDISTURBED TRENCH BOTTOM, WITH RECESSES EXCRIPTED TO ACCOMMODATE BELLS, COUPLINGS AND JOINTS. BLOCKING WILL NOT BE PERMITTED.

D. PIPE SHALL BE LAID TRUE TO THE SPECIFIED LINES AND GRADES. THE BELL END SHALL BE TOWARD THE RISING GRADE AND EACH SECTION OF PIPE SHALL HAVE A FIRM BEARING THROUGHOUT ITS LENGTH. MATERIAL PLACED AROUND AND LUNGET THE PIPE SHALL BE FREE OF STONES. ROCKS SHALL NO ROLLED INTO TRENCHES AND ALLOWED TO DROP DATO PIPES. PIPE SHALL BE BEDDED IN \$\(^2\) STONE TO SPRING LINE OF PIPE AND THEN BURIED IN CLEAN SAND FREE OF STONES, STONE AND SAND SANL BE IN ACCORDANCE WITH ENT-MY 704.11(a) AND (b).

RESTRICTION OF HER DEBOTY POSTTYPHENE POPE SHALL BE IN LOCKSERVICE WITH ACTIV DOZS1 AND AS RECOMMENDED BY THE PIPE WARMACHERE. BACKFLL SHALL BE IN ACCORDANCE WITH ACTIV DOZS1 AND AS RECOMMENDED BY THE PIPE WARMACHERE. BACKFLL SHALL BY BE ACCORDANCE WITH SECTION 31 22 OF LAWRINGTON AS A REPORT LAWRING THE PARCE IN SEX NOT LIFTS AND COMPRETED TO 500 KM MINUTED STOKE IN SHOWLD AS PER AND ASSETT AS A PER ASSETT AS A PE

THE CONTRACTOR MAY USE A LASER BEAM TO ASSIST IN SETTING THE PIPE, PROVIDED HE CAN DEMONSTRATE SATISFACTION YOUL IN ITS USE. THE USE OF STRING LEVELS, HAND LEVELS, CAMPIDITIES LEVELS ON DITHER RELATIVELY CRUDE DEVICES FOR TRANSFERRING GRODE OR SETTING PIPE WILL NOT BE PROMITTED.

PRIMATION . HE SHAPE CONTROLLE PER, EDDRO, SHALL CONSIST OF CHETALLY PREPARED, AND OF THE PER SHAPE AND AND AND OF HE, DEDDRO OF THE PER SHAPE AND AND OF HE, DEDDRO OF THE PER SHAPE AND SHAPE AND OF THE PER SHAPE AND SHAPE AND SHAPE AND OF THE PER SHAPE AND S

3.03 SEWER MANHOLES: A SEMER MANHOLES, DRUM MANHOLES, CATCH BUSINS AND INSPECTION MANHOLES SHALL BE BUILT TO THE LINES, GRAPES, DIMENSIONS AND DESIGN SHOWN ON THE PLANS WITH THE NECESSARY FRAMES, COVERS AND GRAPES.

MANHOLE AND CATCH BASIN BASES SHALL BE PLACED ON 6 INCHES OF COMPACTED BEDDING MATERIAL. C. PRECAST SECTIONS SHALL BE SET SO AS TO BE VERTICAL AND IN TRUE ALIGNMENT WITH A 1/4 INCH MAXMAUN TOLERANCE TO BE ALLOWED. THE PRECAST SECTIONS SHALL BE INSTALLED IN A MANNER THAT WILL RESULT IN A MAINTENENT JOINT.

. WHERE HOLES MUST BE CULT IN THE PRECAST SECTIONS TO ACCOMMODATE PIPES, CUTTING SHALL BE DONE PRIOR TO SETTING THEM IN PLACE TO PREVENT ANY SUBSEQUENT JARRING WHICH MAY LOOSEN THE JOINTS.

A MORRAY SHALL BE MIXED ONLY IN SUCH QUANTITY AS MAY BE REQUIRED FOR MANEDATE USE AND USED BEFORE THE NITML SET HAS TAKEN PLACE. MORRAY SHALL NOT BE RETAINED FOR NOME THAN ONE HOUR AND SHALL BE CONSISTENT HOUSED OVER WITH A SHAPL, ON THE WITH LISED.

8. BROCK MASCHET SHALL BE PROTECTED FROM 100 ARPO DRYING BY APPROVED MEANS AND SHALL BE PROTECTED FROM MATHER AND FROST AS REQUIRED.

RAMES AND COVERS: MANORE FRANKS — SWALL BE SET WITH THE TOPS CONFORMED ACCURATELY TO THE GROCK OF THE CONCERNMENT OF THE TOP OF THE MACROSEY AND A FALL BE D'OF MERRIES SOT THAT THE STATE CONCERNMENT AND THE APPLICATION OF THE MANORE MARKET AND THE APPLICATION OF THE THE APPLICATION

B. MANHOLE COVERS SHALL BE LEFT IN PLACE IN THE FRAMES ON COMPLETION OF OTHER WORK AT THE MANHOLES.

D. COVERS AND GRATES SHALL BE SET IN THE FRAMES, SEATING BEING CLEANED BEFORE COVERS AND GRATES ARE SET.

A. THE MINIMUM SIZE FOR THE BUILDING SEWER SERVICE CONNECTION SHALL BE 6".

THE MINIMUM SLOPE FOR THE BUILDING SEWER SERVICE SHALL BE 1/4" PER, FOOT, UNLESS OTHERWISE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE, BEFORE BOXPELLING, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR SO THAT HE CAN IMME THE RECESSIVE REQUIREMENTS TO LOCATE THE OFFSHICL LICEN. IN ADDITION, AN APPROVED FOREOUS ROO OF PIE SHALL BE PLACED OPEN THE PLUGGED OFFSHIG AT THE PROPERTY LINE, EXTRIBUTION TO WITHIN 2 NORES OF THE PLACE ADDRESS.

1. PROXIMITY TO WATER LINES: THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OF PRIVATE POTABLE WATER SUPPLY SYSTEM AND A SENER OR SENER APPURITENANCE WHICH MOULD PERMIT THE PASSAGE OF SENAGE OF POLITIZED WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SENER OR SENER MARHOLE.

 NO SEWER SHALL BE LOCATED WITHIN THE WELL PROTECTIVE RADII ESTABLISHED IN ENV-WS 300 FOR ANY PUBLIC WATER SUPPLY WELLS OR WITHIN 100 FEET OF ANY PRINATE WATER SUPPLY WELL. 2) SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.

PROFESSION WILE WAY.

3) A DEVANTON FROM THE SEPARATION REQUIREMENTS OF (1) OR (2) ABOVE SHALL BE ALCINED WEERE NECESSARY TO ANDID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROMODE THAT THE SCHIER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE WAY CONSTRUCTED ON DEVENTY SPECIFIED IN DW-PMG 70A.0.

b. WHENEVER SENDERS MUST CROSS MATER MAINS, THE SENDER SHALL BE CONSTRUCTED AS FOLLOWS: c. VERTICAL SEPARATION OF THE SENDER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH MATER MAINE SHAPE. . SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

. HOWEVER, SHOULD CONSTRUCTION OPERATIONS REVEAL OR EXPOSE A MATERLINE MAIN OR SERVICE RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FEET HORIZONTALLY FROM THE PROPOSES SEWER INSTALLATION AND WHERE IT IS NOT PRACTICABLE TO RELOCATE THE SEWER, THE FOLLOWING METHODS OF PROTECTION MUST BE EMPLOYED:

 If the above separation cannot be achieved, the sewer shall be ductile iron pipe of the same size shall be utilized. Appropriate manufactured fittings shall be employed to adapt the iron pipe to the contract sewer pipe. THE MAN THE 10 THE LATINGUE SEMEN PPE.

2) WHEREVER THE WINTERLINE CORSESS OVER THE MISS SEMEN WITH LESS THAN 18 INCHES OF SEMENATION, THE SEMEN PIPE FOR A DISTANCE OF 6 FEET ON EACH SIDE OF THE WATERINE SWALL BE CLASS 50 DUCHLE ROWN PIPE. APPROPRIATE MANAFACTED STITMES SHALL BE DEMONSTOR TO AMOUNT THE MICH FROM PIPE TO THE CONTINUES SEMENATION.

AMOUNT THE MICH PIPE TO THE CONTINUES SEMENATION. AN ALTERNATIVE, THE WATERLINE MAY BE MADE THE TO ANOTHER THE CONTINUES SEMENATION.

3) SHOULD THE WATERLINE IN EITHER SITUATION BE AT OR BELOW THE SEMER ELEVATION, THE WATERLINE OR THE SEMER MUST BE RELOCATED TO ACHIEVE 10 FT. SEPARATION OR THE WATERLINE BASETLY.

3.07 GRAVITY SEWER PIPE TESTING: A ALL NEW CRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE ART TESTS.

LOW-PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH: . ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEMER LINES USING LOW-PRESSURE AIR; OR 2. UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, 'LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE'
(1998)

CLEANED AND VISUALLY INSPECTED USING A LAMP TEST AND BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER; AND

2. TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE. D. ALL PLASTIC SEMER PIPE SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION. THE MAXAMUM ALLOMAGE DEFLECTION OF FLEXIBLE SHIRE PIPE SHALL BE 5% OF AVERAGE HADDE DIMETER. A RIGO BALL OR MANDREL WITH A DUMBLITER OF ALL IZEST 95% OF THE AVERAGE HADDE DIMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLURS DEVICES.

SECURITION OF THE THE PROCESSION OF THE SECURITION OF THE PROCESSION OF THE TOWN OFF THE TOWN OFF THE PROCESSION OF THE

ALLEPTIMES OF ALL WORK.

1, YSUAL INSPECTION — AN INSPECTION OF THE INTEROR OF THE COMPLETED SANTARY SEMER PPE BY
DIRECT YOUR INSPECTION SHALL BE MORE FOR ALL PIPE INSTALLED FROM MARKACE TO MAINTAIL AND
POR SERVICE LATERALS. ANY LEATIS, EMPRISHED OF LAGON RECESSION FOR SIGH INSPECTION SHALL
BE PROVIDED OF THE CONTRINCTOR. CAMERY MORE TO BE PEPFORMED OF THIS CONTRINCTOR.

PROCEDURE:

d. Shut air supply off and allow at least 2 minutes for air pressure to stabilize.

DETERMINE TIME IN SECONDS WITH STOPWATCH FOR PRESSURE TO FALL 0.5 PSIG SO THAT PRESSURE AT END OF TIME IS AT OR ABOVE 3.0 PSIG.

| 1       | 2       | 3       | - 4    |        |         |        |        |         |         |        |
|---------|---------|---------|--------|--------|---------|--------|--------|---------|---------|--------|
| Fipe    | Minimum | Length  | Time   |        |         |        |        |         |         |        |
| Dimeter | Time    | Gar.    | for    |        |         |        |        |         |         |        |
| (n.)    | minnee  | Miciano | Longer |        |         |        |        |         |         |        |
|         |         | Tine    | Length |        |         |        |        |         |         |        |
|         |         | (ft)    | Hec.)  | 100 () | 150 ft. | 510 ft | 250 f. | 300 ft. | 350 ft. | 400 ); |
| - 4     | 1:53    | 597     | 190L   | 1:53   | 1.53    | 1:53   | 1:53   | 153     | 1:53    | 1:53   |
| 6       | 2:50    | 398     | \$27L  | 2:50   | 2:50    | 2:50   | 2:50   | 2.50    | 2:50    | 2:51   |
| 8       | 3:47    | 294     | 760L   | 3:47   | 3:47    | 3:47   | 3:47   | 3.48    | 4:26    | 5:04   |
| 10      | 4:43    | 231     | 1187L  | 4:43   | 4.43    | 4:43   | 4:57   | 556     | 6:55    | 7:51   |
| 12      | 5:40    | 190     | 1709L  | 5:40   | 5.40    | 5:42   | 7:08   | 833     | 9:58    | 11:34  |
| 15      | 7:05    | 1.57    | 26711. | 7:05   | 7:15    | 8:54   | 11:00  | 12:21   | 15:35   | 17:48  |
| 18      | 8:30    | 131     | 38461. | 8:30   | 9:17    | 12:49  | 16:0   | 15:14   | 22:26   | 25:28  |
| 24      | 11:20   | 95      | 2671L  | 11:24  | 1757    | 22:48  | 28:34  | 34:11   | 39:53   | 45:15  |

3. SAFETY PRECAUTIONS:

LOW-PRESSURE AR TEST MAY BE DANGEROUS TO PERSONNEL IF, THROUGH LACK OF UNDERSTANDING OR CARELESSNESS, LINE IS OVERPRESSURED OR PLUGS ARE INSTALLED MEMOGREY, IT DETERMENT MEMOGRAPH THE VARIOUS PLUGS BE INSTALLED SO AS TO PERCENT THE VARIOUS PLUGS BE INSTALLED SO AS TO PERCENT THE VARIOUS PLUGS BY INSTALLED SO AS TO PERCENT THE VARIOUS AS EXPERTED OF PROPERTY OF PROJECTION OF PROPERTY PROJURTIONS. AS DAMPLE OF HAZARD, FORCE OF 201-LB IS EXERTED ON 8-IN. PULG BY MEMORY, PRESSURE OF 5 PS. U GREENER FOLLOWING SPECT PROJURTIONS.

a. NO PERSON SHALL BE ALLOWED IN MANHOLES DURING TEST OR WHEN PLUGGED PIPE IS UNDER

B. GAUGES, AIR PIPING MANIFOLDS AND VALVES SHALL BE LOCATED AT TOP OF GROUND.

c. INSTALL AND BRACE PLUGS SECURELY.

GROUNDWATER ELEVATION: IF PIPELINE TO BE TESTED IS BELOW GROUNDWATER LEVEL, STARTING TEST PRESSURE SHALL BE INCREASED BY 0.433 PSI FOR EACH FOOT GROUNDWATER LEVEL IS ABOVE INVERT OF SEWER PIPE. IN NO CASE SHALL STARTING TEST PRESSURE STORED 9.0 PSI.

THE VIEW SHILL SHAPING TEST PRESSAME DOCED B.O. POPO.

THE DETERMINATION OF GROUPMENT ELOSS, OBSERVATION PRES MAY BE PLACED IN THE THEORY THE DESCRIPTION OF BEAUTIFUL OF SECURITY OF SECU

. ACCEPTANCE OF INSTALLATION:

6. TEST EQUIPMENT: NECESSARY EQUIPMENT TO PERFORM AIR TEST IN ACCORDANCE WITH SPECIFICATIONS SHALL BE PROVIDED BY CONTRACTOR. TEST CAUGE SHALL PRETERRIEN HAVE NOREMENTAL DIVISION OF 0.10 PS and HAVE NO.COCK SHALL TEST GAUGE BE USED HIGH HIS HOST HAVE NOREMENTAL DIVISIONS OF ORELITE THAN 0.25 PS. CAUGE SHALL BE OF SUFFICIENT SIZE IN ORDER TO DETERMINE THIS ACCURACY.

7. SUBMITTALS: FURNISH 1 COPY OF GRAVITY SEMER AND MANHOLE TEST RESULTS TO OWNER AND GOVERNING AGENCY UPON COMPLETION OF GRAVITY SEWER SYSTEM BACKFILLING OPERATIONS.

SANITARY MANHOLE TESTING:

A. MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.

THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING: C. THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES HG: AND

 THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH HG PRESSURE DROP TO 9 INCHES HG SHALL BE: a. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;

b. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND c. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP; THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED ABOVE.

4. NO INVERTS SHALL BE INSTALLED UNTIL MANHOLE TESTING HAS BEEN SATISFACTORILY COMPLETED.

08-17-23 PROFESSIONAL ENGINEER FOR ALLEN & MAJOR ASSOCIATES, INC.

ATDG. H.C. 7 SINCLAIR DRIVE

> ASC / MEDICAL OFFICE 360 CORPORATE DRIVE **TAX MAP 315, LOT 5** PORTSMOUTH, NH 03801

| SCALE:       | AS SHOWN | DWG. NAME: C8250- | 01.c |
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ANY FOREIGN MATERIAL FOUND IN THE INTERIOR OF THE SEMER, ANY DIRT, DEBRIS OR OTHER OBJECTS SHALL BE REMOVED BY THE CONTINUENCE VISIBLE DEFECTS SUCH AS BROKEN PIPE SCHOOLS, SHELL BLASS OR OTHER DEFECTS SHALL BE MOTED, CORRECTED AND THE PIPE RE-INSPECTIONS, VISIBLE LEMS OR OTHER

A PLUC PIPE OUTLETS WITH SUITABLE TEST PLUCS. ARACE FACH PLUC SECURELY

PIECE OFFICE OFFICE OF THE OFFICE OF THE OFFICE OFFI c. ADD AR SLOWLY TO PORTION OF PIPE UNDER TEST UNTIL INTERNAL PRESSURE OF LINE IS RAISED TO APPROXIMATELY 4 PSIG. BUT LESS THAN 5 PSIG.

WHEN PRESSURE HAS STABILIZED AND IS AT OR ABOVE STARTING TEST PRESSURE OF 3.5 PSI, START TEST.

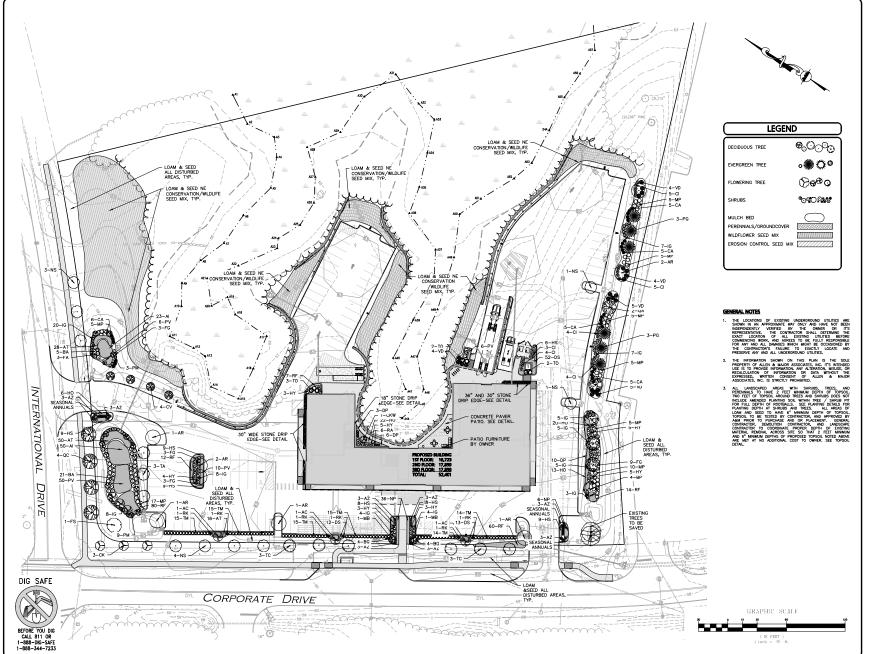
g. COMPARE OBSERVED TIME WITH MINIMUM ALLOWABLE TIMES IN CHART BELOW FOR PASS/FAIL DETERMINATION.

AIR TESTING PASS/FAIL TESTING CRITERIA

| 3:17 2:47 3:47 2:48 4:29 5:88<br>5:10 5:42 7:98 5:32 5:38 11:14   |
|---|
| 250 250 250 250 250 250 251<br>317 247 341 748 420 598<br>413 443 447 556 655 254<br>540 544 760 833 058 1134 |
| 443 4:42 4:57 556 6:55 7:51<br>5:40 5:42 7:68 833 9:58 11:14  |
|   |

1 08-17-23 REVISED PER PDA COMMENTS REV DATE DESCRIPTION

EXETER, NH 03833





#### PEASE DEVELOPMENT CONTROLS REGULATIONS:

(a) LANDSCAPING

(1) APPROPRIATE LANDSCAPING SHALL BE PROVIDED IN ACCORDANCE WITH AN APPROVED LANDSCAPING PLAN.

(2) LANDSCAPING TREATMENT SHALL CONSIST OF NATURAL VEGETATION OR FEATURES, GROUND COVER. SHRUBS AND TREES AS APPROPRIATE.

(3) LANDSCAPING PLANS SHALL MEET THE REQUIREMENTS OF SECTION 405.03 OF THE PEASE DEVELOPMENT AUTHORITY SITE PLAN REGULATIONS. (b) SCREENING

APPROPRIATE BUFFERS SHALL BE PROVIDED AND MAINTAINED TO SCREEN THE FOLLOWING

FROM ADJOINING PROPERTIES:

a) ANY OFF-STREET PARKING OR LOADING AREA b) ALL OUTDOOR AREAS OR FACILITIES FOR THE STORAGE OF FUEL, SOLID WASTE, MATERIALS

PRODUCTS. c) ANY COMMERCIAL PARKING LOT.

d) ANY PRINCIPAL USE NOT CONDUCTED WHOLLY WITHIN A BUILDING.

1. E) AS OTHERWISE REQUIRED BY THE BOARD

### PEASE DEVELOPMENT SITE PLAN REGULATIONS:

405.03

SCREENING AND LANDSCAPING

(a) LANDSCAPING PLAN

(1) A LANDSCAPING PLAN SHALL BE SUBMITTED AS PART OF THE SITE PLAN APPLICATION.

PLAN SHALL IDENTIFY EXISTING AND PROPOSED LANDSCAPING ELEMENTS AND SHOW LOCATION AND PLANTING AND/OR CONSTRUCTION DETAILS. WHERE EXISTING PLANTINGS ARE TO BE RETAINED, PROPOSED METHODS OF PROTECTING SUCH PLANTINGS DURING CONSTRUCTION SHALL BE INCLUDED WHERE APPLICABLE

(2) LANDSCAPING SHALL RE CONCEIVED IN A TOTAL PATTERN THROUGHOLD THE SITE INTEGRATING THE VARIOUS ELEMENTS OF SITE DESIGN, PRESERVING AND ENHANCING THE PARTICULAR IDENTITY OF THE SITE, AND CREATING A PLEASING SITE CHARACTER.

(3) LANDSCAPING MAY INCLUDE PLANT MATERIALS SLICH AS TREES SHRUBS GROUND COVERS, PERENNIALS, AND ANNUALS, AND OTHER MATERIALS SUCH AS ROCKS, WATER, SCULPTURE, ART, WALLS, FENCES, PAVING MATERIALS AND STREET FURNITURE.

(4) ALL PARKING LOTS CONSTRUCTED OR REDEVELOPED AT PEASE SHALL MEET THE FOLLOWING REQUIREMENTS:

a) SCREENING: ALL PARKING LOTS CONTAINING MORE THAN 25 PARKING SPACES SHALL BE APPROPRIATELY SCREENED FROM ADJACENT PROPERTIES AND ROADWAYS WITH LANDSCAPE BERMS AND/OR PLANTINGS IN ORDER TO MINIMIZE THE AESTHETIC IMPACT OF THE PARKING LOT

b) LANDSCAPED ISLANDS: ALL PARKING ROWS CONTAINING MORE THAN 10. SPACES SHALL HAVE LANDSCAPED ISLANDS THE SIZE OF A PARKING SPACE AT BOTH ENDS OF THE ROW

c) LENGTH OF ROWS: NO PARKING LOT SHALL CONTAIN MORE THAN 18 PARKING SPACES IN A ROW WITHOUT THE INCLUSION OF A LANDSCAPED ISLAND OF THE SAME SIZE AS THE PARKING SPACES IN THAT ROW.

d) MULTIPLE PARKING AISLES: THERE MUST BE A 12' WIDE LANDSCAPED STRIP BETWEEN EVERY SECOND ROW OF DOUBLE STACKED PARKING.

e)LANDSCAPE ISLANDS EXCEPT THAT THE CURBING MAY BE INTERRUPTED TO ALLOW FOR INFILTRATION OF STORMWATER.

(B) SCREENING (1) SCREENING SHALL BE PROVIDED FOR ALL DEVELOPMENT OF LAND IN ORDER TO MINIMIZE ADVERSE VISUAL IMPACTS.

(2) STRUCTURES VISIBLE FROM A PUBLIC STREET SHALL BE PARTIALLY SCREENED WITH FLOWERING OR EVERGREEN SHRURS

(3) SOLID WASTE COLLECTION EQUIPMENT, PUMP STATIONS, OUTDOOR STORAGE AND OTHER OUTDOOR USES VISIBLE FROM A PUBLIC STREET SHALL BE SCREENED WITH A SOLID FENCE AND/OR EVERGREEN SHRUBS.

#### PLANTING SCHEDULE -TREES, SHRUBS, GROUNDCOVERS & PERENNIALS

| DECI  | DUOUS TRE | EES  |                                     |              |                      |                        |
|-------|-----------|--|-------------------------------------|--------------|----------------------|------------------------|
| KEY   | QUANTITY  | BOTANICAL NAME                             | COMMON NAME                         | MIN. SIZE    | SPACING              | COMMENTS               |
| AR    | 8         | ACER RUBRUM 'RED SUNSET'                   | RED SUNSET MAPLE                    | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| AC    | 6         | AMELANCHIER CANADENSIS                     | SERVICEBERRY                        | 6-7' HT.     | AS SHOWN             | B&B, MULTISTER         |
| BP    | 4         | BETULA PAPYRIFERA                          | PAPER BIRCH                         | 12-14' HT.   | AS SHOWN             | B&B, MULTISTE          |
| СК    | 3         | CORNUS KOUSA                               | KOUSA DOGWOOD                       | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| CKW   | 1         | CORNUS KOUSA 'WOLF EYES'                   | WOLF EYES KOUSA<br>DOGWOOD          | 2"-2.5" CAL. | AS SHOWN             | B&B-SPECIMEN           |
| cv    | 4         | CHIONANTHUS VIRGINICUS                     | WHITE FRINGE TREE                   | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| FA    | 3         | FRANKLINIA ALATAMAHA                       | FRANKLIN TREE                       | 6-7' HT.     | AS SHOWN             | B&B                    |
| FS    | 1         | FAGUS SYLVATICA 'RIVERSII'                 | RIVER'S PURPLE BEECH                | 2"-2.5" CAL. | AS SHOWN             | 8&8                    |
| мв    | 2         | MAGNOLIA 'BUTTERFLY'                       | BUTTERFLY MAGNOLIA                  | 6-7' HT.     | AS SHOWN             | 8&8                    |
| QA    | 2         | QUERCUS ALBA                               | WHITE OAK                           | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| QC    | 4         | QUERCUS COCCINEA                           | SCARLET OAK                         | 2"-2.5" CAL. | AS SHOWN             | 8&8                    |
| NS    |           | NYSSA SYLVATICA 'GREEN<br>GABLE'           | GREEN GABLE TUPELO                  | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| TC    |           | TILIA CORDATA 'GREENSPIRE'                 | GREENSPIRE LINDEN                   | 2"-2.5" CAL. | AS SHOWN             | B&B                    |
| EVER  | GREEN TRE | ES   |                                     |              |                      |                        |
| PG    | 6         | PICEA GLAUCA                               | WHITE SPRUCE                        | 7-8' HT.     | AS SHOWN             | B&B                    |
| то    |           | THUJA OCCIDENTALIS 'NORTH<br>POLE'         | NORTH POLE ARBORVITAE               | 5-6' HT.     | AS SHOWN             | B&B                    |
| SHRU  |           | TOLL                                       |                                     |              |                      |                        |
| ΑZ    | 24        | AZALEA 'DELAWARE WHITE'                    | DELAWARE WHITE AZALEA               | <b>#</b> 5   | AS SHOWN             | POT                    |
| BG    | 8         | BUXUS 'GREEN GEM'                          | GREEN GEM BOXWOOD                   | #5           | AS SHOWN             | B&B                    |
| CA    | 25        | CLETHRA ALNIFOLIA                          | HUMMINGBIRD<br>SUMMERSWEET          | #5           | AS SHOWN             | POT                    |
| CI    |           | 'HUMMINGBIRD'<br>CORNUS SERICEA 'ALLEMAN'S | ALLEMAN'S COMPACT RED               | #5           | AS SHOWN             | POT                    |
| FG    |           | COMPACTA' FOTHERGILLA GARDENII             | OSIER DOGWOOD<br>DWARF FOTHEREGILLA | 2-2.5'       | AS SHOWN             | B&B                    |
| HY    | 32        | HYDRANGEA ARBORESCENS                      | INCREDIBALL HYDRANGEA               | #5           | AS SHOWN             | BAB                    |
| IG    | 79        | 'INCREDIBALL'<br>ILEX GLABRA 'SHAMROCK'    | SHAMROCK INKBERRY                   | #5           | AS SHOWN             | B&B                    |
| MP    | 57        | MYRICA PENSYLVANICA                        | BAYBERRY                            | 2.5'-3' HT.  | AS SHOWN             | BAR                    |
| RA    | 6         | RHODODENDRON 'APRIL ROSE'                  | APRIL ROSE<br>RHODODENDRON          | 2.5'-3' HT.  | AS SHOWN             | B&B                    |
| PM    | 12        | PRUNUS MARITIMA                            | BEACH PLUM                          | #10          | AS SHOWN             | POT                    |
| RK    |           | PINK DOUBLE KNOCK OUT                      | PINK DOUBLE KNOCK OUT               | #3           | AS SHOWN             | POT                    |
| TM    |           | TAXUS MEDIA 'GREENWAVE'                    | ROSE<br>GREENWAVE YEW               | 18-24*       | AS SHOWN             | B&B                    |
| VD VD |           | VIBURNUM DENTATUM 'BLUE                    | BLUE MUFFIN VIBURNUM                | 3-4' HT.     | AS SHOWN             | B&B                    |
|       | NNIALS/GR | MUFFIN'                                    | BLOE MOFFIN VIBORINOM               | 3=4 mi.      | AS SHOWN             | Dato                   |
| AI    |           | ASCLEPIAS INCARNATA                        | ROSE MILK WEED                      | #2           | 36" O.C.             | STAGGERED              |
| AT    |           | ASCLEPIAS TUBEROSA                         | BUTTERFLY WEED                      | #2           | 24" O.C.             | STAGGERED              |
| AH    |           | AMSONIA HUBRICHTII                         | THREAD-LEAFED BLUESTAR              | #2           |                      |                        |
| BA    |           | BAPTISIA AUSTRALIS                         | BLUE FALSE INDIGO                   | #2           | 24° O.C.<br>AS SHOWN | STAGGERED<br>STAGGERED |
| PV    |           | PANICUM VIRGATUM                           | SWITCH GRASS                        |              |                      |                        |
| DP    |           | DENSTEADTIA PUNCTILOBA                     |                                     | #3           | 36" O.C.             | STAGGERED              |
| DS DS |           |  | HAYSCENTED FERN                     | #2           | 24" O.C.             | STAGGERED              |
| -     |           | SPOROBOLUS HETEROLEPIS                     | PRAIRIE DROPSEED                    | #2           | 24" O.C.             | STAGGERED              |
| HO    |           | HOSTA 'GUACAMOLE' HEMEROCALLIS 'BIG TIME   | GUACAMOLE HOSTA                     | #2           | 24" O.C.             | STAGGERED              |
| HS    | 36        | HAPPY'                                     | BIG TIME HAPPY DAYLILLY             | #2           | 24" O.C.             | STAGGERED              |
| NP    |           | NEPETA 'PURRSIAN BLUE'                     | PURRSIAN BLUE CATMINT               | #2           | 24" O.C.             | STAGGERED              |
| RF    | 173       | RUDBECKIA FULGIDA FULGIDA                  | BLACK EYED SUSAN                    | #2           | 24" O.C.             | STAGGERED              |

'ANNUALS / SEASONAL COLOR TO BE "MIDNIGHT FROST" MIX BY PROVEN WINNERS OR EQUAL.

#### CONSERVATION WILDLIFF SEED MIX:

NEW ENGLAND CONSERVATION / WILDLIFE MIX
(BY NEW ENGLAND WETLAND PLANTS INC. - NEWP.COM)
APPLICATION RATE: 25 LBS/ACRE | 1750 SQ FT/LB

| ITEM | BOTANICAL NAME                      | COMMON NAME               | INDICATOR |
|------|-------------------------------------|---------------------------|-----------|
| 1.   | ELYMUS VIRGINICUS                   | VIRGINIA WILD RYE         | FACW      |
| 2.   | CHAMAECRISTA FASCICULATA            | PARTRIDGE PEA             | FACU      |
| 3.   | FESTUCA RUBRA                       | RED FESCUE                | FACU      |
| 4.   | SCHIZACHYRIUM SCOPARIUM             | LITTLE BLUESTEM           | FACU      |
| 5.   | ANDROPOGON GERARDII                 | BIG BLUESTEM              | FACU      |
| 6.   | PANICUM VIRGATUM                    | SWITCH GRASS              | FAC       |
| 7.   | DESMODIUM PANICULATUM               | PANICLEDLEAF TICK TREFOIL | FACU      |
| 8.   | SORGHASTRUM NUTANS                  | INDIAN GRASS              | FACU      |
| 9.   | VERBENA HASTATA                     | BLUE VERVAIN              | FACW      |
|      | ASCLEPIAS TUBEROSA                  | BUTTERFLY MILKWEED        |           |
| 11.  | RUDBECKIA HIRTA                     | BLACK EYED SUSAN          | FACU      |
| 12.  | HELENIUM AUTUMNALE                  | FALL SNEEZEWEED           | FACW      |
| 13.  | ASTERPILOSUS/SYMPHYOTRICHUM PILOSUM | HEATH ASTER               | FACU      |
| 14.  | SOLIDAGO JUNCEA                     | EARLY GOLDENROD           |           |
| 15.  | AGROSTIS PERENNANS                  | UPLAND BENTGRASS          | FACU      |
|      |                                     |                           |           |

THE NEW ENGLAND CONSERVATION/WILDLIFE MIX PROVIDES A PERMANENT COVER OF GRASSES, WILDFLOWERS, AND LEGUMES. FOR BOTH GOOD EROSION CONTROL AND WILDLIFE HABITAT VALUE. THE MIX IS DESIGNED TO BE A NO MANTENANCE SEEDING, AND IS APPROPRIATE FOR CUT AND FILL SLOPES, DETENTION BASIN SIDE SLOPES, AND ISTURBED AREAS ADJACENT OF COMMERCIAL AND

#### LANDSCAPE NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY/TOWN OF PORTSMOUTH, NH. PLANTING PLAN IS DIAGRAMMATIC IN NATURE, FINAL PLACEMENT OF PLANTS TO BE APPROVED BY THE LANDSCAPE ARCHITECT IN THE FIELD.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES, ANY PERMITTING AGENCIES, AND "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS IN ADVANCE OF ANY WORK THAT WILL REQUIRE EXCAVATION. CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE OF NAY CONFLICTS IN WRITINS.
- NO PLANT MATERIAL SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
- ANY TREES NOTED AS "SEAL OR SELECTED SPECIMEN" SHALL BE TAGGED AND SEALED BY THE LANDSCAPE ARCHITECT.
- ALL TREES SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE NOTED OR APPROVED BY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
- CONTRACTOR SHALL VERIFY QUANTITIES SHOWN ON PLANT LIST. QUANTITIES SHOWN ON PLANS SHALL GOVERN OVER PLANT LIST.
- ANY PROPOSED PLANT SUBSTITUTIONS MUST BE APPROVED IN WRITING BY OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT.
- ALL PLANT MATERIALS INSTALLED SHALL MEET THE GUIDELINES ESTABLISHED BY THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY AMERICANHORT (LATEST EDITION).
- ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF ACCEPTANCE. ANY PLANT MATERIALS WHICH DIE WITHIN THE ONE YEAR PLANT GUARANTEE PERIOD WILL BE REPLACED BY THE LANDSCAPE CONTRACTOR. OWNERS TO COORDINATE DIRECTLY WITH THE LANDSCAPE CONTRACTOR FOR REPLACEMENT PLANTINGS.
- 10. ALL DISTURBED AREAS NOT OTHERWISE NOTED SHALL RECEIVE 6" OF SUITABLE LOAM &
- LAWNS WITH 3:1 OR GREATER SLOPES SHALL BE PROTECTED WITH AN EROSION CONTROL BLANKET.
- ANY FALL TRANSPLANTING HAZARD PLANTS SHALL BE DUG IN THE SPRING AND STORED FOR FALL PLANTING.
- TREES SHALL HAVE A MINIMUM CALIPER AS INDICATED ON THE PLANTING SCHEDULE TAKEN ONE FOOT ABOVE THE ROOT CROWN.
- ALL PLANT BEDS AND TREE SAUCERS TO RECEIVE 3" OF PINE BARK MULCH. GROUNDCOVER AREAS SHALL RECEIVE 1" OF PINE BARK MULCH.
- 15. ALL DECIDUOUS TREES ADJACENT TO WALKWAYS AND ROADWAYS SHALL HAVE A BRANCHING PATTERN TO ALLOW FOR A MINIMUM OF 7' OF CLEARANCE BETWEEN THE GROUND AND THE
- 16. ALL TREE STAKES SHALL BE STAINED DARK BROWN.
- CONTRACTOR RESPONSIBLE FOR WATERING AND RESEEDING OF BARE SPOTS UNTIL A UNIFORM STAND OF VEGETATION IS ESTABLISHED AND ACCEPTED.
- ALL PARKING ISLANDS PLANTED WITH SHRUBS SHALL HAVE 24" OF TOP SOIL. FINISH GRADE SHALL BE SLOPED TO SIX INCHES (6") ABOVE THE TOP OF CURB.
- SOIL SAMPLES, TESTS, AND SHOP DRAWINGS SHALL BE PROVIDED TO THE LANDSCAPE ARCHITECT OR THE OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.
- SLOPES AT 2:1 SHOULD HAVE 6" LOAM & SEED. SEEDING OF 2:1 SLOPES SHALL OCCUR IN THE DRY & AFTER SLOPES ARE COMPACTED.
- 22. PRIOR TO LAYING TOPSOIL, ALL SUBSOIL (BELOW PROPOSED TOPSOIL) TO BE TILLED TO A DEPTH OF AT LEAST 18" TO REMOVE CONSTRUCTION COMPACTION AND ALLOW FOR PROPER DRAINAGE OF TOPSOILS.
- DYNAMANGE OF TOPPOLICES.

  2.3. ALL SECRIBOR TO BE COMPLETED 'IN SEASON' BETWEEN APRIL 1 TO JUNE 15 OR AUGUST 15 TO OCTOBER 1, EXCEPT FOR RE-SECRING OF BARE SPOTS, AT ALL SLOPED APRIS. CONTRACTOR TO INSTALL COCOUNT FIBER JUTE MESH NETTING ON ALL SLOPES 3.1 AND GREATER, HYDROSCED ALL EXPOSED APRAS. AND SOIL STABILIZER "FLEXTERRA HP-FGM" AS AMANIFACTURED BY "PROFILE" TO HYDROSCED (AT RATE OF 3,000 LBS PER ACRE). CONTRACTOR ROSS DE RESPONSIBLE FOR RE-GRADING AND RE-SECRIBOR ALL DISTURBED, ENOCED, OF BARE SPOTS, UNITS, SLOPES ARE FULLIF STADE CONTRACTOR RESPONSIBLE FOR RE-PROFILE CONTRACTOR RESPONSIBLE FOR RESPO
- AFTER SEEDING, ALL AREAS TO BE LIGHTLY MULCHED WITH WEED FREE STRAW & CONTINUALLY WATERED EVERY DAY SO THAT SEED IS KEPT MOIST UNTIL SEED IS ESTABLISHED & APPROVED BY A&M LANDSCAPE ARCHITECT (USE NO HAY).
- IF THERE IS NO PROPOSED IRRIGATION SYSTEM AFTER PLANTINGS & LAWNS & SEEDED AREAS HAVE BEEN INSTALLED, LANDSCAPE CONTRACTOR RESPONSIBLE TO TEMPORARILY WATER ALL INSTALLED PLANTINGS, SEEDED AREAS, & LAWN AREAS MIN. 4 TIMES A WEEK DURING INITIAL ESTABLISHMENT PERIOD OF 6 MONTHS AFTER ALL LANDSCAPING IS INSTALLED.
- INSTALLED.

  ALL PROFOSED LANDSCAPE AREAS INCLUDING MOWED LAWNS, TREES, SHRUB BEDS, AND HALL PROFOSED LANDSCAPE AREAS INCLUDING MOWED LAWNS, TREES, SHRUB BEDS, AND HALL PROFOSED LAWNS TO BE OFFICE AND LAWNSCAPE ARCHITECT, BRIGATION SYSTEM STO, BE OWNER, THE ARCHITECT LAWNS AND HALL PROFOSED LAW
- NELIS, AND A WAN SENDING TO SHIT DH' INRIGATION DURING FAIN EVENTS.

  SEEDING OF BIORETHINION A PETENTION AREAS & OTHER SLOPE AREAS SHALL OCCUR IN
  THE DRY & AFTER SLOPES ARE COMPACIED. IT IS MINORIFAIT, THAT THE BIORETHY PROPOSED
  AREAS, ELECTRON BASIN ES SCIENCE AT THE BEANING OF THE PROPECT & PROPOS
  OTHER SLOPED AREAS WILL NEED A MINIMUM OF 6 MONTHS TO INITIALLY ESTREAMSH FROM
  OTHER SLOPED AREAS WILL NEED A MINIMUM OF 6 MONTHS TO INITIALLY ESTREAMSH FROM
  OTHER SLOPED AREAS WILL NEED A MINIMUM OF 6 MONTHS TO INITIALLY ESTREAMSH FROM
  FALLING. LIGHTLY PAKE SOIL TO ENSURE GOOD SEED-TO-SOIL CONTACT. SEE SEED MIX
  DETAIL NOTES.
- DEFECTION OF THE SEED WITH DRY DETICTION BISNS, WITER LEVELS MAY BE OWNERED IN THE DETENTION AREAS BY RETURN ON DRY SEASON MOO OF DRY SPELLS, OR MAY BE ACCOMPLISHED THROUGH THE USE OF DEWATERION METHODS. CONTRACTOR SHALL SHUT SHOP DRAWNINGS OF ANY DEWATERION DEVELOPED FOR THE DEVELOPMENT OF THE SHALL SHAL
- 29. NO SOIL MATERIAL TO BE REMOVED OFF SITE PER PEASE DEVELOPMENT REGULATIONS.



08-17-23 REVISED PER PDA COMMENTS REV DATE DESCRIPTION

ATDG LLC 7 SINCLAIR DRIVE EXETER, NH 03833

PROJECT NO. 325001 DATE:

ASC / MEDICAL OFFICE 360 CORPORATE DRIVE TAX MAP 315, LOT 5 PORTSMOUTH, NH 03801

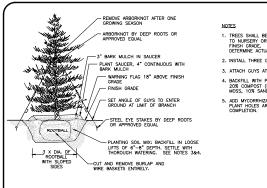
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| ı | ASSC                    | CIA        | TEC     | INC |

480 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

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LANDSCAPE NOTES & DETAILS | L-401



-ARBOR TIES BY DEEP ROOTS OR APPROVED EQUAL

REMOVE STAKES AFTER ONE GROWING SEASON

4" EARTH SAUCER WITH BARK MULCH

REINFORCED RUBBER HOSE

-3 POSTS FOR ALL TREES 3" CALIPER & OVER

-3" BARK MILICH

X DIA. OF

3 X DIA.

ROOTBALL WITH SLOPED SIDES

ROOTBAL REINFORG TREE PIT

(2) MIN. 2" X 2" X 8-WOOD POSTS FOR TREES UNDER 3" \_\_\_\_

6" MIN. TOPSOIL, NEW OR EXISTING

UNDISTURBED SOII-

10'-0" FOR TREES > 3" CAL. 8'0" FOR TREES 3" CAL AND UNDER

CALIPER

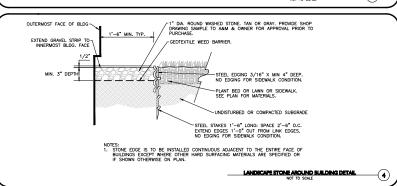
- TREES SHALL BEAR SAME RELATIONSHIP TO FINISH GRADE AS IT BORE TO NURSERY OR FIELD GRADE. ROOT FLARE SHALL BE 2" ABOVE FINISH GRADE. REMOVE SOIL FROM TRUNK FLARE OF TREE TO DETERMINE ACTUAL TOP OF ROOTBALL AREA.
- 2. INSTALL THREE GUYS PER TREE; EQUALLY SPACED AROUND BALL
- 3. ATTACH GUYS AT 2/3 HEIGHT OF TREE.
- BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOIL, 20% COMPOST (LEAVES & ORGANIC MATERIAL, NO ASH) 20% PEAT MOS, 10% SAND.
- 5. ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION.

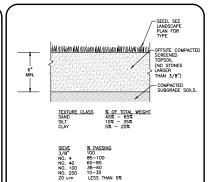


- ALL TREES SHALL HAVE THE SAME RELATIONSHIP TO FINISH GRADE AFTER PLANTING AS THEY HAD AT THE ORIGINAL NURSERY SETTING, ROOT FLARE SHALL BE 27 ABOVE FINISH GRADE, REMOVE SOLI FROM TRUNK FLARE OF TREE TO DETERMINE ACTUAL ROOTBALL AREA.
- BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOIL, 20% COMPOST (LEAVES & ORGANIC MATERIAL, NO ASH) 20% PEAT MOSS, 10% SAND.
- ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION.
- 4. SEE MATERIALS PLAN AND DETAILS PLANS FOR STREET TREE PLANTING IN WITH TREE GRATES DETAIL.

DECIDUOUS TREE PLANTING DETAIL

NOT TO SCALE (3)





 $\frac{\text{NOTES};}{\text{1. TOP OF LOAM (TOPSOIL)}}$  is finish grade.

ALL TOPSOL (BOTH ONSITE AND OFFSITE SOURCES) SHALL BE COMPOSED OF A NATURAL, FERTILE, FRABEL SOIL TYPICAL OF COLUMNATED TOPSOLES OF THE LOCALITY, OFFSITE SOIL SHALL BE SOIL SHALL BE SOIL SHALL BE SOME SHALL BE SOME SHALL BE SHALL BE SOME SHALL BE TAKEN FROM A WELL-DRANKE, ARMABLE SITE, FREE OF SHISDILL SHALL BE TAKEN FROM A WELL-DRANKE, ARMABLE SITE, FREE OF SHISDILL SHALL SHALL BE SHALL

LESS THAN 5%

- 3. THE CONTRACTOR SHALL PROVIDE THE OWNER / LANDSCAPE ARCHITECT WITH TOPSOIL TEST RESULTS (RECOMMEND UNASS AMHERST SOIL TESTING LAB) FOR APPROVAL PRIOR TO OBTAINING AND PLACING THE SOIL. IF ANY TOPSOIL IS PURCHASED OR PLACED PLACING THE SOIL. IF ANY TOPSOIL IS PURCHASED OR PLACED PRIOR TO APPROVAL BY OWNER J. LANDSCAPE ARCHITECT, IT IS AT CONTRACTORS RISK, AND IT CAN BE REMOVED AT NO ADDITIONAL COST IO THE OWNER. IF THE PLANTING SOIL, (BOTH ONSITE AND COST IO THE OWNER. IF THE PLANTING SOIL, BOTH ONSITE AND ADMITTANCE AND ADMITTANCE AND ADMITTANCE AND ADMITTANCE AND ADMITTANCE AND ADMITTANCE TO MEET THE ADDITION OF SAND, COMPOST, JUNESTONE, OR ALUMINUM, SULFATE TO BERN, IT METHIN THE SECRIFICATIONS OR ALUMINUM, SULFATE TO BERN, IT METHIN THE SECRIFICATIONS THAT AND ADDITIONAL COST TO
- TOPSOIL SHALL HAVE A PH VALUE BETWEEN 5.5 AND 6.5. TOPSOIL SHALL CONTAIN BETWEEN 4% AND 6% ORGANIC MATTER OF TOTAL DRY WEIGHT AND SHALL CONFORM TO THE FOLLOWING GRADATION AND TEXTURE CLASS ABOVE.

TOPSOIL FOR LAWN, TREES, SHRUBS, & PERENNIALS
NOT TO SCALE

NOTES:

ALL SHRUBS SHALL HAVE THE SAME RELATIONSHIP TO FINISH GRADE

ATTER PLANTING AS THEY HAD AT THE ORIGINAL NURSERY SETTING. SET

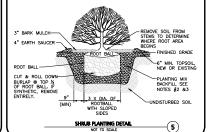
SHRUB 1<sup>-2</sup> ABOVE FINISH GRADE.

BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 50% NATIVE TOPSOLIT

CALLED A CALL

2. BACKFILL WITH PLANTING MIX. PLANT MIX TO BE: 30% NATIVE. 107-501L, 20% COMPOST (LEMES & ORGANIC MATERIAL, NO SSH) 20% FEAT MOSS, 10% SAND.

ADD MYCORRHIZA SOIL ADDITIVES AND SLOW RELEASE FERTILIZER WHEN PLANT HOLES ARE 50% FILLED AND WATER THOROUGHLY AT COMPLETION. SHRUB BEST TO HAVE 24" MIN. OF CONTINUOUS PLANTING SOIL.



#### LOAM AND SEEDING NOTES:

CONTRACTOR SHALL SEED ALL DISTURBED AREAS NOT NOTED TO RECEIVE OTHER MATERIALS, AND AT AREAS SHOWN ON THE PLAN PER SPECIFICATIONS BELOW

SCIENTIFIC NAME COMMON NAME PROPORTION PERCENT

|                            | 0.                          | WEIGHT | PURITY |             |
|----------------------------|-----------------------------|--------|--------|-------------|
|                            |                             | WEIGHT | FORITI | GERMINATION |
| FESTUCA RUBRA<br>"RUBRA"   | CREEPING RED FESCUE         | 37%    | 95%    | 90%         |
| PAO PRAENTENSIS<br>"BARON" | BARON KENTUCKY<br>BLUEGRASS | 40%    | 85%    | 90%         |
| LOUUM PERENNE<br>"PALMER"  | PALMER PERENNIA<br>RYEGRASS | 15%    | 95%    | 90%         |
| FESTUCA RUBRA              | WILMA CHEWINGS              | 8%     | 95%    | 80%         |

COMMUTATA MILLAN

1, SEED TO BE SPREAD AT MINIMUM RATE OF 5 LBS. PER 1000 SQ. FT.

2. SEEDING TO BE COMPLETED "IN SEASON" BETWEEN APRIL 170 JUNE 15 OR

AUGUST 15 TO OCTOBER 1, EXCEPT FOR RESERVEN OF BARE STOSTS. IF

UNABLE TO SEED WITHIN THESE TMETRALES, CONTRACTOR TO INSTALL

LEPOSED ARRAS, ADO SOLI STABILIZER "FLUX TERRA HEP-FOR SOLAL

STABILIZER" AS MANUFACTURED BY "PROFILE" TO INTROCEDE (AT RATE OF

3.000 LIS PER ACRE), AT NO ADDITIONAL COST TO THE OWNER, THE STABLES AND THE ALL OR STABILIZER "AS MANUFACTURED BY "PROFILE" TO THE OWNER, THE STABLES AND THEN ALSO BE RESPONSIBLE FOR RE-GRADING AND RE-SEEDING ALL

DISTURBED, EFORDED, OR RABE SPOTS WITHIN NEXT COST TO OWNER.

OF LAWN AREAS INCLUBING, WATERING, ADDITE OFFRILIZERS AND LONG OF LAWN AREAS INCLUBING, WATERING, ADDITE THE STRING AREAS, LIMIT OF THE ALL OF SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ON MOWING AT NO ADDITIONAL COST TO OWNER.

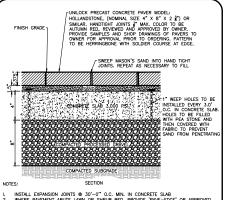
OF LAWN AREAS INCLUDING, WATERING, ADDITE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ON THE RESTOR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING PER PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO BE SPREAD AT THE RATE OF 100 POLITOS PER 1000 SQ. FT OR AS ONE OF THE TESTING PER PER 1000 SQ. FT OR AS ONE OF THE TESTING ABOVE, LIMIT TO STABLE OF THE TESTING ABOVE.

SABLAL CONTAINS THE PER PER PER PER PER PER PER SOL SY PROBLEM. THE TOW

SHALL CONTAIN THE FOLLOWING PERCENTAGES BY WEIGHT: NITROGEN (N) STALL DOWNING THE VECTION OF THE VEC

SIEVE.

LIAWN AREAS TO BE SEEDED BY SOWING EVENLY WITH AN APPROVED MECHANICAL SEEDER AT THE RATE OF TEN POUNDS PER 1000 SQUARE SOCIATION OF RESPONSIBLE FOR WATERING, MOWING, AND RESEDING CLAWN BARE SPOTS UNTIL A UNIFORM, HEALTHY STAND OF GRASS IS ESTABLISHED AND ACCEPTED.



INSTALL EXPANSION JOINTS @ 30'-0" O.C. MIN. IN CONCRETE SLAB WHERE PARCHENT ABUTS LAWN OR SHRUB BED, PROVIDE "PARC-EDGE" OR APPROVED IT "WEEP MOLES TO BE INSTALLED EXPERT 3.0" O.C. IN CONCRETE SLAB. HOLES TO BE FILLED WITH GRAWEL AND THEN COVER WITH FABRIC TO PREVENT SAND. FROM PROFITERITION.

PEDESTRIAN CONCRETE PAVERS OR EQUAL NOT TO SCALE

6

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PROFESSIONAL LANDSCAPE ARCHITECT FOR ALLEN & MAJOR ASSOCIATES, INC.

1 08-17-29 REVISED MER POA COMMENTS
REV DATE DESCRIPTION

ASC / MEDICAL OFFICE

360 CORPORATE DRIVE

TAX MAP 315, LOT 5 PORTSMOUTH, NH 03801

325001 DATE:

ALLEN & MAJOR

ASSOCIATES, INC.

400 HARVEY ROAD MANCHESTER, NH 03103 TEL: (603) 627-5500 FAX: (603) 627-5501

AS SHOWN DWG, NAME: L-3250-01.dwg

BOD CHECKED BY:

08-14-23

ATDG LLC

PROJECT NO.

SCALE:

7 SINCLAIR DRIVE

EXETER, NH 03833

LANDSCAPE NOTES & DETAILS | L-501





Tot, Watts 417

248 434

1040

0.900 17920

XWM-FT-LED-18L-40

W-FT

LSI INDUSTRIES, INC.

BUG Rating B2-U1-G0

B2-U0-G3 B2-U0-G3 B2-U0-G2

**Design Build** Project:
NEW HAMPSHIRE PROJECT

Date:8/9/2023

Units Fc

Illuminance

Scale: NTS Page 1 of 1

### PROJECT ENERGY CODE INFORMATION

| CLIMATE ZONE   | ZONE DA                        |    |
|----------------|--------------------------------|----|
| DOES THE BUILD | ING INCLUDE GROUP R OCCUPANCY? | NO |

| OPAQUE ENVELOPE ITEM                         | REQUIRED R-VALUE  | ACTUAL R-VALUE    |  |  |
|--|-------------------|-------------------|--|--|
| ROOF<br>(ATTIC AND OTHER)                    | R38               | NA .              |  |  |
| WALLS ABOVE GRADE<br>(WOOD FRAMED AND OTHER) | R13 + R7.5ci      | R13+R10ci         |  |  |
| WALLS BELOW GRADE                            | R7.5ci            | R7.5ci            |  |  |
| SLAB-ON-GRADE FLOORS<br>(UNHEATED SLABS)     | R10 FOR 24" BELOW | R10 FOR 24" BELOW |  |  |
| OPAQUE DOORS<br>(NONSWINGING)                | R4.75             | R8                |  |  |
| OPAQUE DOORS<br>(SWINGING)                   | 0.37 U-VALUE      | 0.37 U-VALUE      |  |  |

| ENVELOPE FENESTRATION                  | REQUIRED | ACTUAL |  |  |
|--|----------|--------|--|--|
| FIXED FENESTRATION                     | 0.38     | 0.38   |  |  |
| OPERABLE FENESTRATION                  | 0.45     | 0.45   |  |  |
| ENTRANCE DOORS                         | 0.77     | 0.77   |  |  |
| SHGC - NORTH ORIENTATION<br>(PF < 0.2) | 0.51     | 0.53   |  |  |
| SHGC - SEW ORIENTATION (PF < 0.2)      | 0.38     | 0.38   |  |  |
| SKYLIGHTS U-FACTOR                     | 0.50     | N/A    |  |  |
| SKYLIGHTS SHGC                         | 0.40     | N/A    |  |  |

#### EXTERIOR FINISH SCHEDULE

1. EQUAL PRODUCTS ARE ACCPETABLE AFTER IT HAS BEEN SUBMITTED & APPROVED BY ARCHITECT.

#### ALL PRODUCTS TO BE INSTALLED PER MANUFACTURER REQUIREMENTS

| TAG       | MATERIAL                       | MFG.   | SPECIFICATION / DESCRIPTION   | LOCATION                  | REMARKS                               |
|-----------|--------------------------------|--|---|---------------------------|---------------------------------------|
| EXT. AP-1 | ACM PANEL                      | STACBOND   | ACM PANEL, SEE ELEVATIONS FOR DIMENSOINS, FINISH: DUSTY GREY  | PER ELEVATIONS            | SEE ELEVATIONS FOR DIMENISONS         |
| EXT. AP-2 | ACM PANEL                      | STACBOND   | ACM PANEL, SEE ELEVATIONS FOR DIMENSOINS, FINISH: ANTHRACITE GREY   | PER ELEVATIONS            | SEE ELEVATIONS FOR DIMENISONS         |
| EXT. BR-1 | FACE BRICK                     | SPAULDING BRICK  | BELGIAN GRAY WIRE CUT FACE BRICK  | PER ELEVATIONS            | SEE ELEVATIONS                        |
| EXT. CP-1 | METAL COPING                   | MORIN  | ALUMINUM CUSTOM BENT METLA SHEET, FINISH: MATCH WITH EXT. AP-1  | PER ELEVATIONS            | SEE ELEVATIONS FOR DIMENISONS         |
| EXT. CP-2 | PREFAB, CANOPY                 | AWNEX  | COLLORADO SYSTEM, CANTILEVERED, 10° FLAT, OUTLET DRAINAGE, LED<br>LIGHT WITH OUTRIGGER, FINISH: BLACK HORIZON | PER ELEVATIONS            | SEE ELEVATIONS AND RCP FOR DIMENISONS |
| EXT. CS-1 | STONE SILL                     | ROCKCAST   | BY ROCKCAST, SL-7315, 6" D X 3 5/8" H, FINISH: LIGHT GREY   | PER ELEVATIONS            |                                       |
| EXT, MP-1 | EXPOSED FASTNER METAL<br>PANEL | PACCLAD  | PACCLAD PETERSON M-36 WITH TRIMS, FINISH: MUSKET GREY   | PER ELEVATIONS            |                                       |
| EXT. R-1  | TPO ROOFING                    | HOLCIM   | PROFILE: HOLCIM TPO SELF ADHERED MEMBRANE   | PER ROOF PLAN             |                                       |
| EXT. RR-1 | ROD RAILING                    | VIEW RAIL  | STAINLESS ROD RAILING, FINISH: STAINLESS  | PER PLAN AND<br>ELEVATION | SEE ELEVATIONS FOR DIMENISONS         |
| EXT. SF-1 | SOFFIT                         | STACBOND   | ACM PANEL, SEE ELEVATIONS FOR DIMENSOINS, FINISH: DUSTY GREY  | PER RCP                   | SEE ELEVATIONS FOR DIMENISONS         |
| EXT, VF-1 | VINYL FENCE                    | CHESTERFIELD SMOOTH PRIVACY FENCE; 6' HIGH; COLOR: WHITE; FLAT EXTERNAL CAP; |   | PER ELEVATIONS            |                                       |
| EXT. VG-1 | VINYL FENCE GATE               | CERTAINTEED  | CHESTERFIELD SMOOTH STRAIGHT GATES PRIVACY, 12" CLEAR FENCE GATE:<br>8" HIGH; COLOR: GRAY                     | PER ELEVATIONS            | 12' LONG CUSTOM DESIGN                |
| EXT. VG-2 | VINYL FENCE GATE               | CERTAINTEED  | CHESTERFIELD SMOOTH STRAIGHT GATES PRIVACY, 6' CLEAR FENCE GATE;<br>6' HIGH; COLOR: GRAY                      | PER ELEVATIONS            |                                       |

#### STOREFRONT SCHEDULE

| I, REFER TO APPROVED COMPONENT BOOK FOR MORE DETAILED WINDOW SPECIFICATION INFORMATION.                                      |              |                      |  |  |   |  |   |  |  |
|--|--------------|----------------------|--|--|---|--|---|--|--|
| TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, REFER TO A1-4.3, A1-4.5, AND A1-4.8 EXTERIOR ELEVATION. |              |                      |  |  |   |  |   |  |  |
| TAG  | WIDTH        | HEIGHT               | SILL<br>HEIGHT   | WINDOW   | MATERIAL  | FRAME<br>MATERIAL  | REMARKS Remarks   |  |  |
|  | 3' - 11 1/4" | 7 - 6"               | 3"-0"  | A  | TEMPERED<br>GLASS   | METAL  | TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 4" X 7" -6"       | SEE EXT. ELEVATIONS FOR LOCATIONS.   |  |
|  | 1' - 11 1/4" | 7' - 6"              | 3"-0"  | A  | TEMPERED<br>GLASS   | HOLLOW<br>METAL  | TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 2" X 7" -6"       | SEE EXT. ELEVATIONS FOR LOCATIONS.   |  |
|  | 4'- 5 1/4"   | 7 - 6"               | 3,-0,,   | Α .  | TEMPERED<br>GLASS   | HOLLOW<br>METAL  | TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 4'-6" X 7"<br>-6" | SEE EXT. ELEVATIONS FOR LOCATIONS.   |  |
|  | 5 - 11 1/2*  | 7" - 6"              | 31-01  | A  | TEMPERED<br>GLASS   | HOLLOW<br>METAL  | TUBELITE: T14000 SERIES STOREFRONT 2" X 4 1/2", FINISH: DARK BRONZE, DIMENSION: 6" X 7" -6"       | SEE EXT, ELEVATIONS FOR LOCATIONS.   |  |
|  | BELITE:      | TAG WIDTH 3'-11 1/4' | BELITE: T14000 SERIES ST  TAG WIDTH HEIGHT  3 - 11 11/4* 7' - 6"  4' - 5 11/4* 7' - 6" | TAG   WIDTH   HEIGHT   HEIGH | TAGE     TAGE | BELITE: T14000 SERIES STOREERONT 2" X 4 1/2", FINA TAG WIDTH HEIGHT WHOOM HEIGHT TYPE MATERIAL  2*11146* 7".6" 3".0" A TEMPERE  4*5146* 7".6" 3".0" A TEMPERE  4*5146* 7".6" 3".0" A TEMPERE  8*51146* 7".6" 3".0" A TEMPERE | Selectific 14000 Series STOREFRONT 2" X 4 12" FINSH: DAR  | Relific Ti 4000 SERIES STOREFRONT 2" X 1/2" FINSH-DARK BRONZE, REFER TO A1-4.3, A1-4.5, AND A1-4.8 EXTERIOR ELEVATION.   A |  |

## EXT LIGHT FIXTURE SCHEDULE

| TAG         | DESCRIPTION             | MANUFACTURER   | MODEL  | LAMP           | LAMP WATTAGE COLOR TEMPERATURE |       | QTY | IMAGE | REMARKS  | LOCATION |
|-------------|-------------------------|----------------|--|----------------|--------------------------------|-------|-----|-------|--|----------|
| EX.<br>LT-1 | OUTDOOR WALL SCENCE     | KUZCO LIGHTING | MFR ID: AT797-8K, PINISH: BLACK; HEIGHT: 72* | LED BUILT IN   | 92 W                           | 3000K | 2   |       | SEE ELEVATIONS FOR LOCATION                          |          |
| EX.<br>LT-2 | LED OUTDOOR WALL LIGHT  | DAZUMA         | SKU: LI000684-01814, FINISH: GRAY            | INTEGRATED LED | 2 W                            | 3000K | 3   |       | SEE ELEVATIONS FOR<br>LOCATION                       |          |
| EX.<br>LT-3 | OUTDOOR WALL SCONCE     | KUZCO LIGHTING | MFRID: AT7955-BK, FINISH: BLACK, HEIGHT: 35° | LED BUILT IN   | 41 W                           | 3000K | 4   | 1     | SEE ELEVATIONS FOR LOCATION                          |          |
| EX.<br>LT-5 | WALLPACK LIGHT          | LSI INDUSTRIES | XWM-FT4ED-18L-10. FINISH: GUN METAL          | LED            | 37 W                           | 4000K | 8   |       | SEE ELEVATIONS FOR LOCATION                          |          |
| EX.<br>LT-6 | 5° RECESSED CAN FIXTURE | SATCO          | S:9726                                       | LED BUILT IN   | 11 W                           | 4000K | 27  |       | TO BE INSTALLED WITH<br>SATCO 59540 HOUSING;<br>840L |          |

# WINDOW TYPES WINDOW TYPE "D1" IN-LINE SLIDER, SINGLE W/ FIXED WINDOW TYPE "D2" IN-LINE SLIDER, DOUBLE WINDOW TYPE 'E' AWNING WINDOW TYPE "G" WINDOW TYPE "H" TILT-TURN INTEGRAL LOUVER

#### SUBCONTRACTOR NOTES

**apex**DESIGN > BUILD

9550 W.Higgins Rd. 170 Rosemont, IL 60018

ADTG, LLC

360 CORPORATE DR. PORTSMOUTH , NH 03801

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| No.      |                     | Date       |
|----------|---------------------|------------|
| 1        | TAC WORKSHOP REVIEW | 07/25/2023 |
| 2        | TAC PUBLIC HEARING  | 08/21/2023 |
|          |                     |            |
|          |                     |            |
|          |                     |            |
| $\vdash$ |                     |            |
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| _        |                     |            |
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**EXTERIOR** SCHEDULES

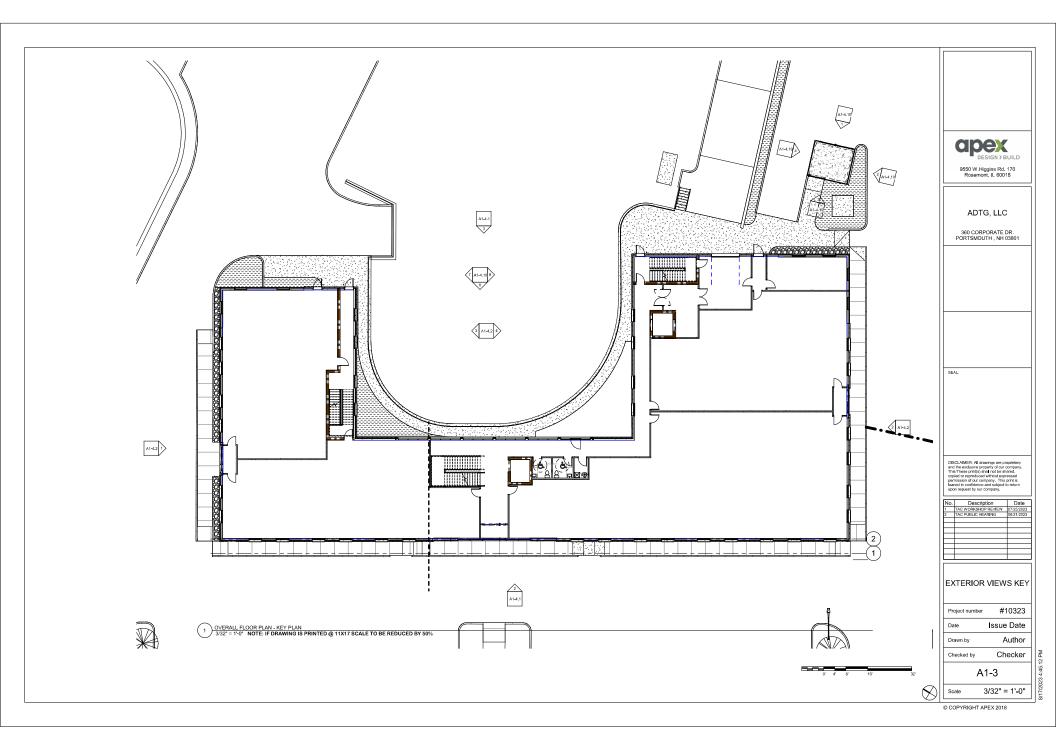
#10323 Project number Issue Date

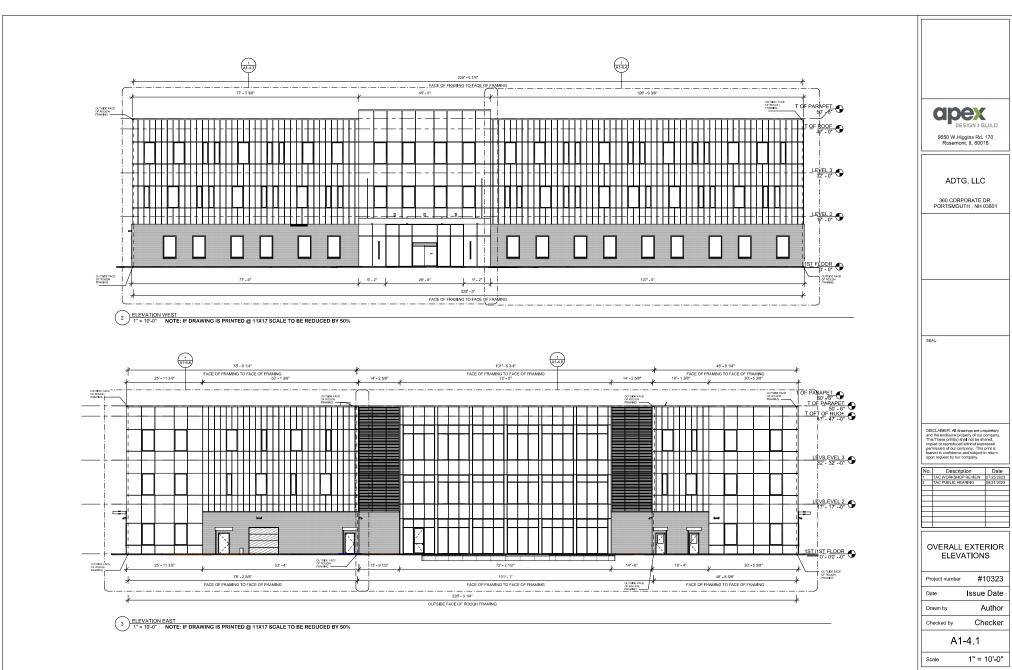
Drawn by Author

Checked by Checker

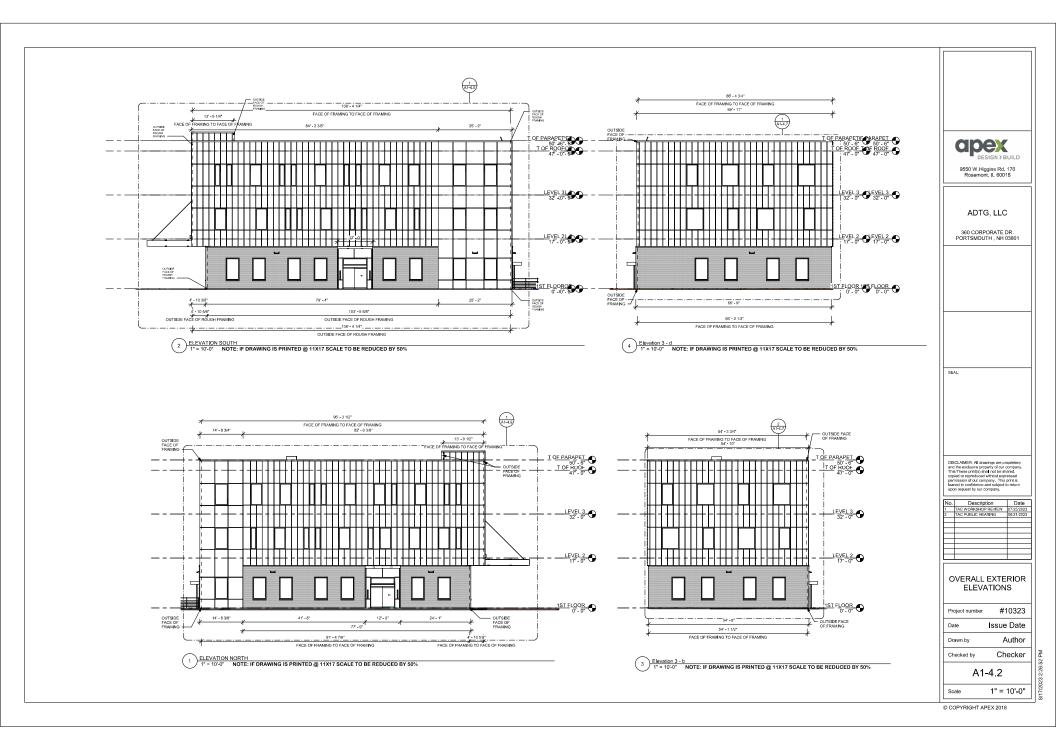
A1-2 As indicated Scale

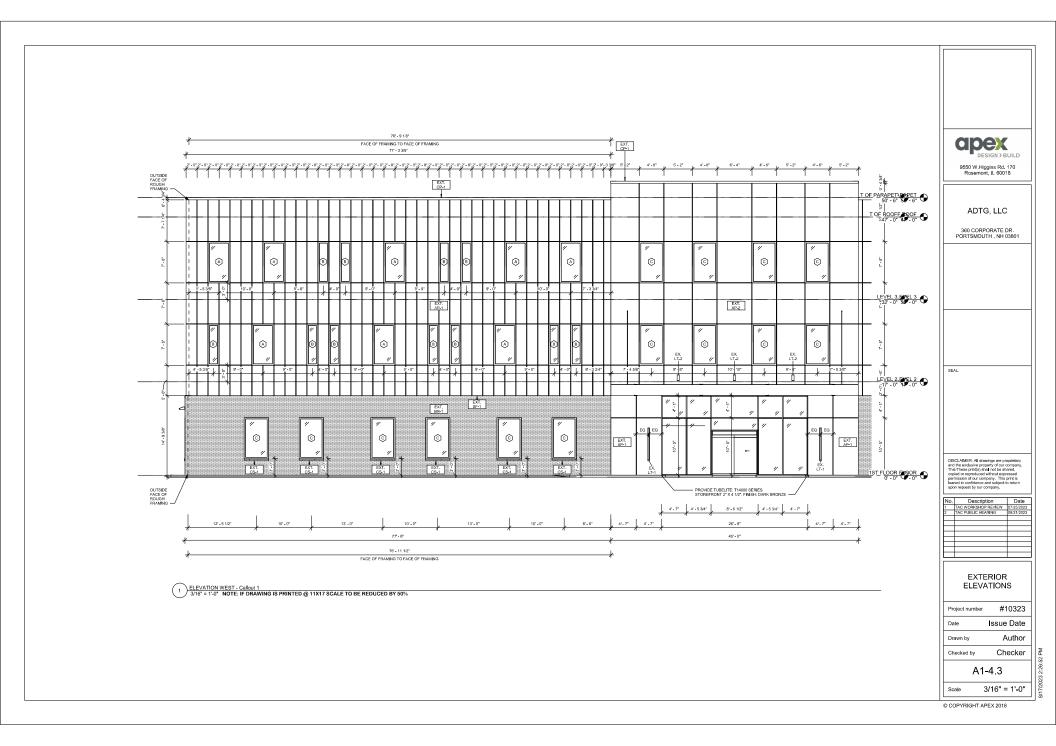
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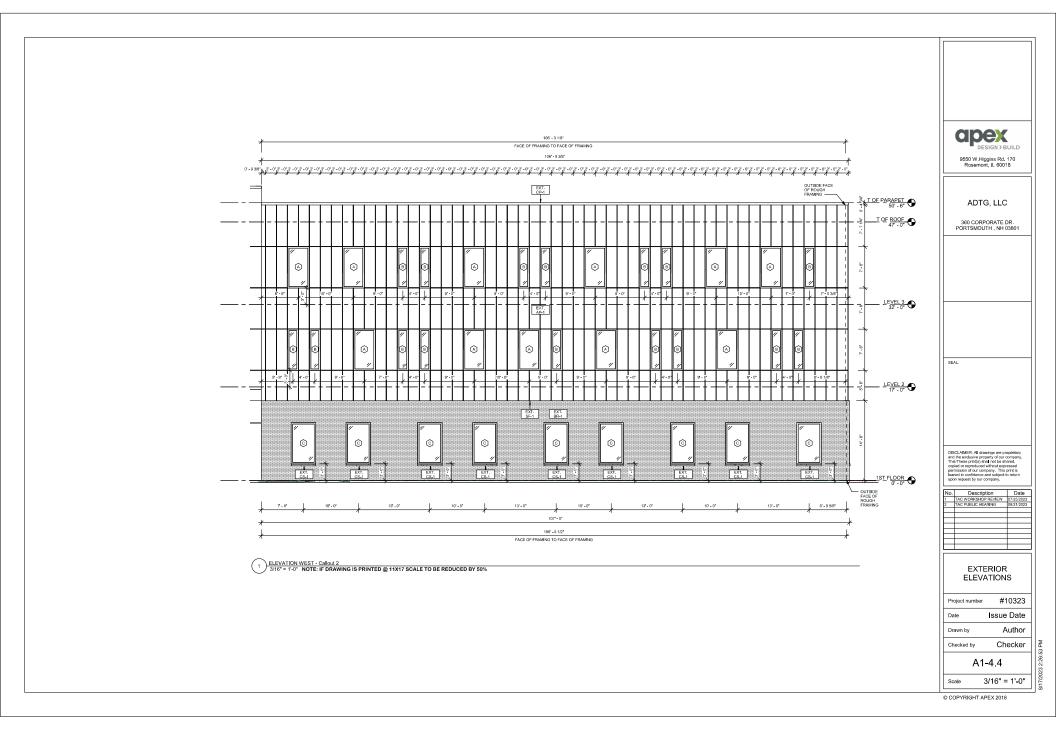


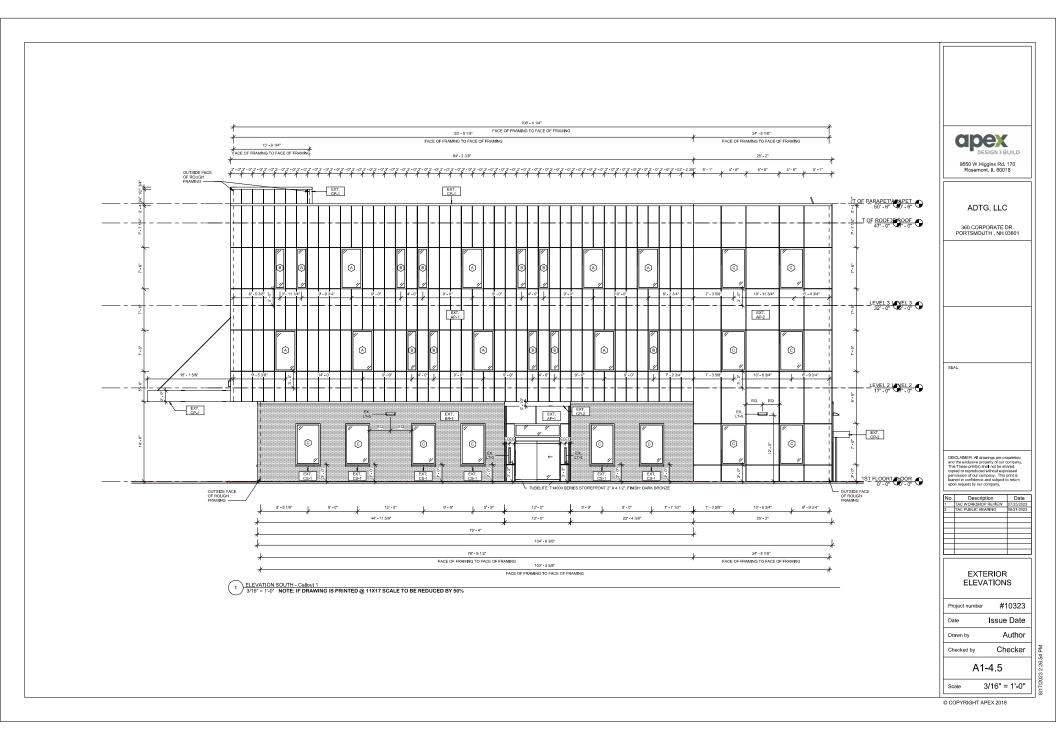


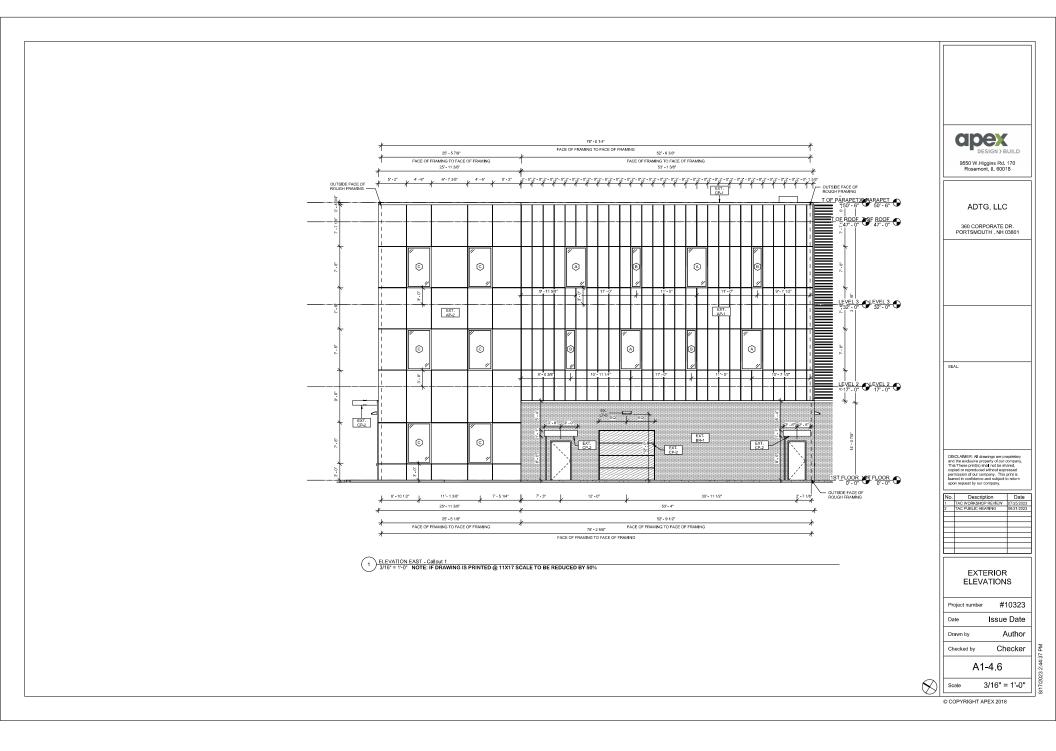
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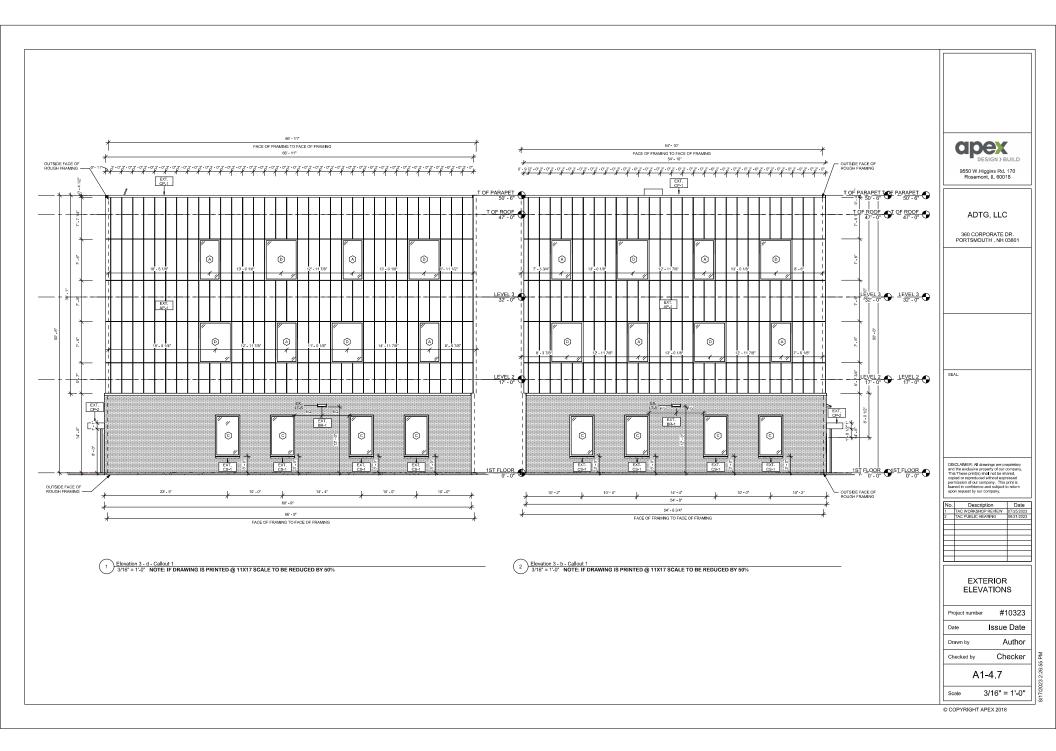


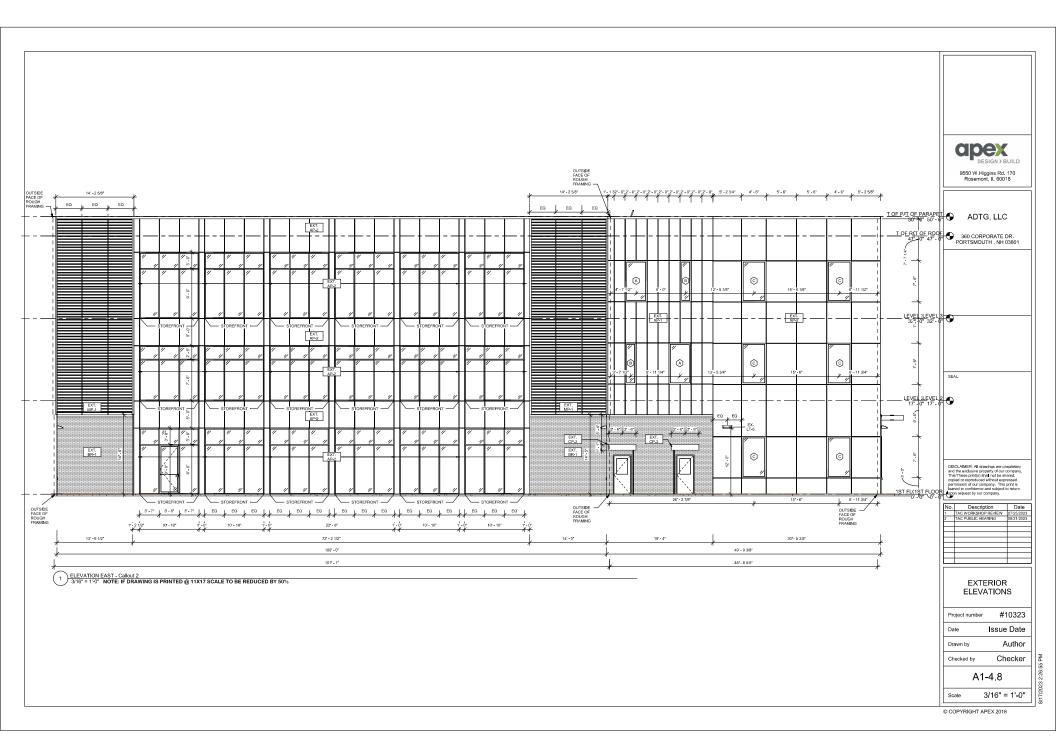


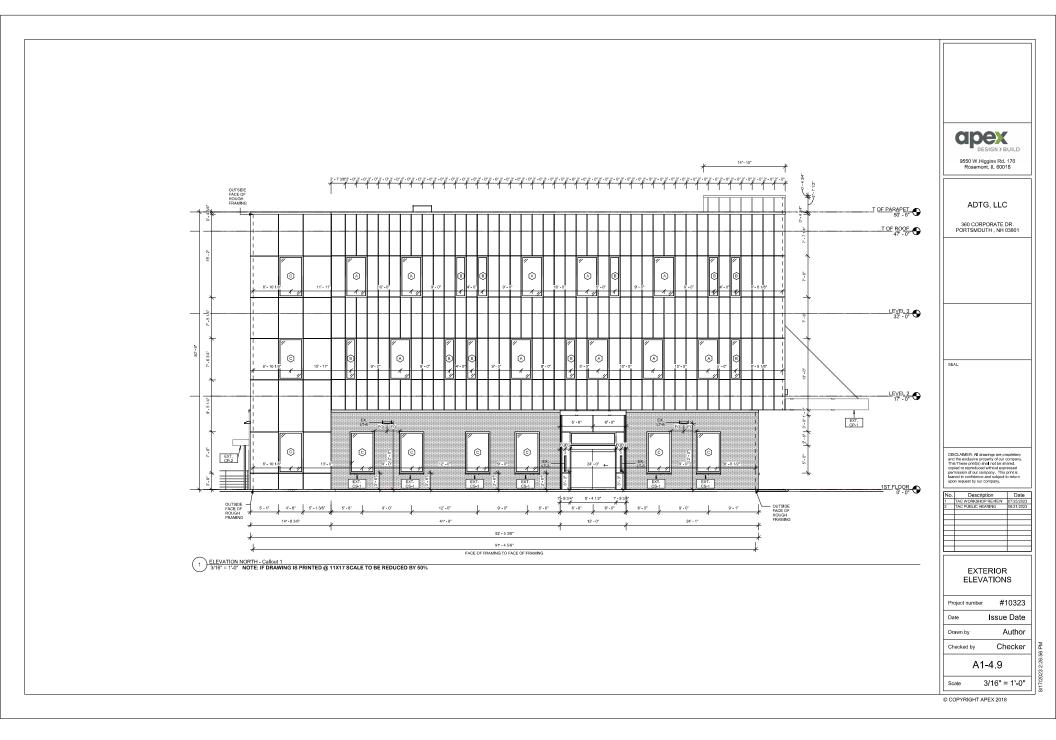


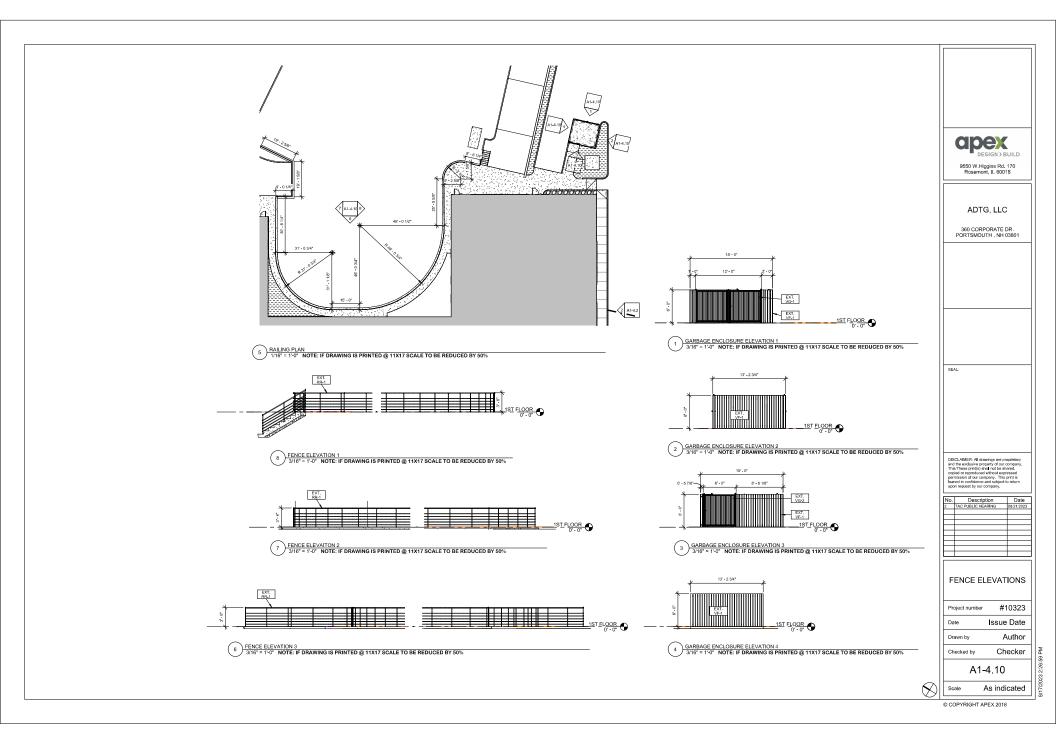


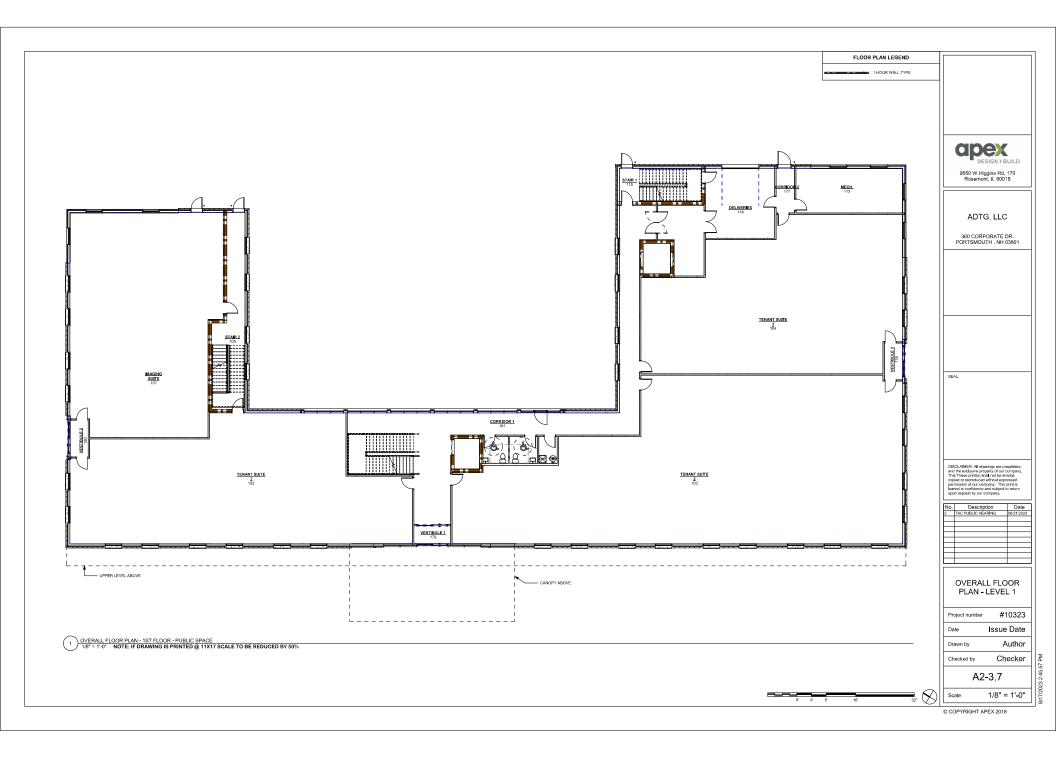


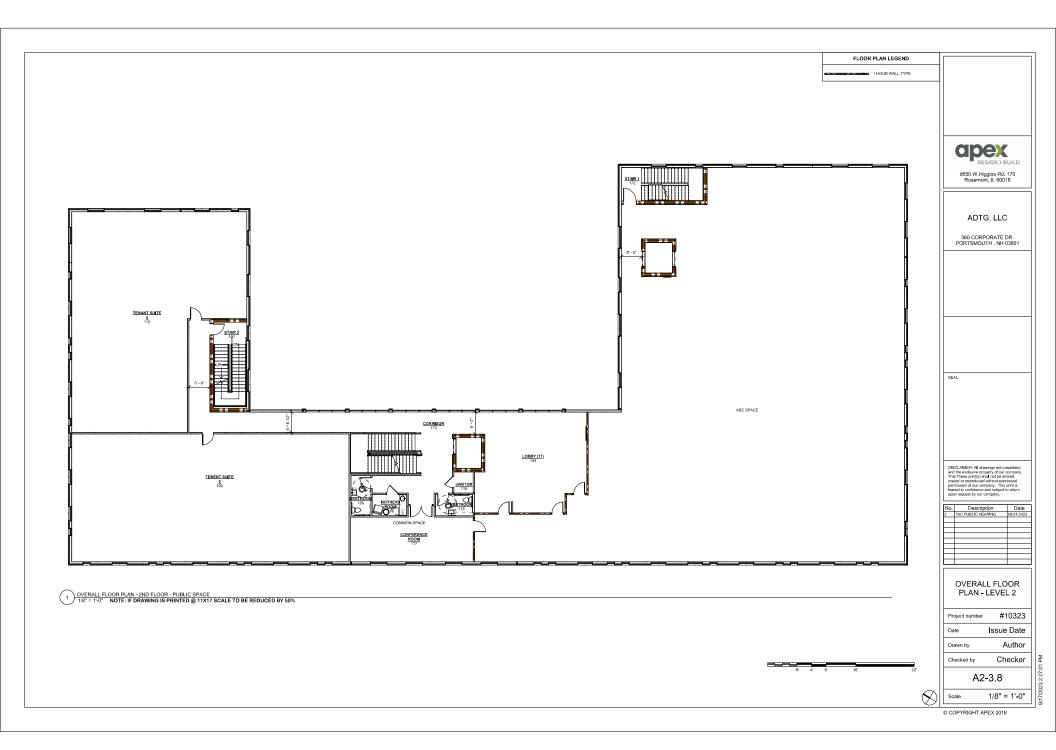


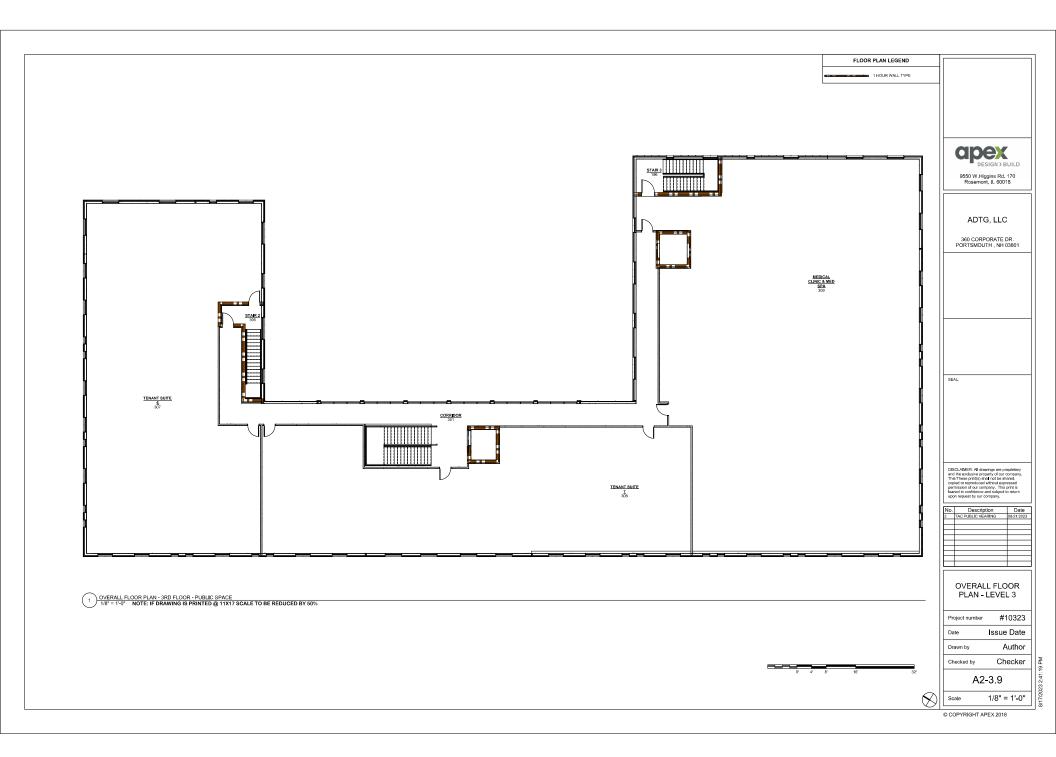














C5194-001 August 21, 2023

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

# Re: Site Review & Subdivision Applications Proposed Single-Family Subdivision, Shearwater Drive, Portsmouth, NH

Dear Peter,

On behalf of Chinburg Properties (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 Subdivision Permit for the above referenced project:

- One (1) full size & one (1) half size copy of the Site Plan Set, dated August 21, 2023;
- Owner Authorization Letter, dated August 1, 2023;
- Applicant Authorization Letter, dated August 1, 2023:
- Site Review Checklist, dated August 21, 2023;
- Subdivision Checklist, dated August 21, 2023;
- Application Fee Calculation Form;
- Unitil Will Service Letter, dated August 14, 2023;
- Prototypical Architectural Plans, dated August 21, 2023:

The proposed project is located along Shearwater Drive on a parcel of land identified as Map 217 Block 2 Lot 1900 on the City of Portsmouth Tax Maps. The existing parcel had seven (7) existing buildings consisting of (5) duplexes, (1) 4-unit, and (1) 6-unit buildings that were previously demolished earlier this year. The project includes the subdivision of the 2.23 acre lot into nine (9) Single-Family lots and the construction of the associated residential buildings, stormwater management, landscaping, and utilities. All proposed buildings and lots have been designed to meet or exceed the current zoning and site review requirements.

The enclosed Site Plan Set includes nine (9) prototypical building layouts and designs. The final building location, size, and styles are to be determined prior to the issuance of a building permit. The applicant's intent is to provide the prospective buyer with the option of choosing any building layout that fits within the building setbacks and all applicable City of Portsmouth Site Plan and Zoning requirements.

Under separate cover, a Site Plan Review application fee in the amount of \$3,073.14, a Subdivision application fee in the amount of \$2,400.00 will be delivered to the Planning Department. A copy of the application fee calculation form is enclosed.



We respectfully request to be placed on the TAC meeting agenda for September 5, 2023. If you have any questions or need any additional information, please contact Neil Hansen by phone at (603) 294-9213 or by email at <a href="mailto:nahansen@tighebond.com">nahansen@tighebond.com</a>.

Neil A. Hansen, PE

Project Manager

Sincerely,

TIGHE & BOND, INC.

Patrick M. Crimmins, PE

Vice President

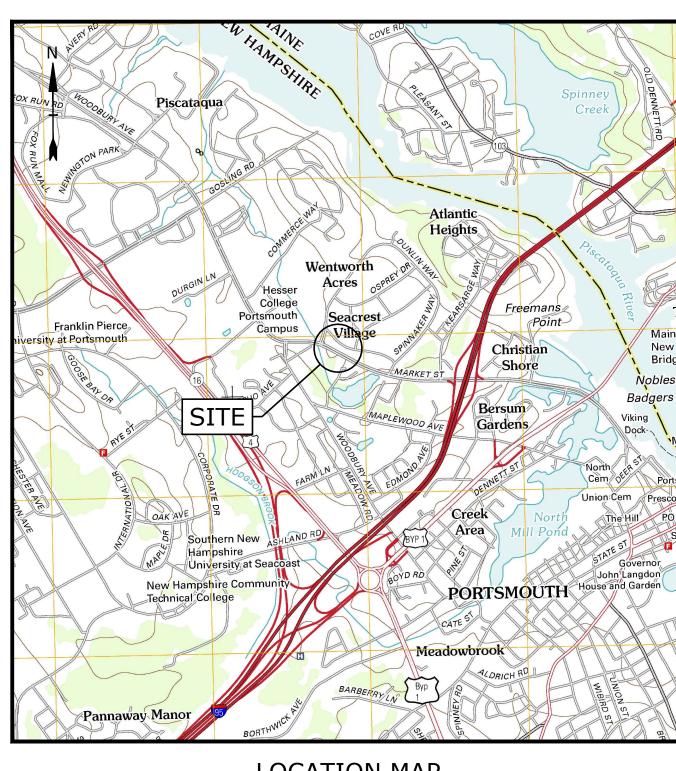
Copy: Chinburg Properties (via email)

# PROPOSED SINGLE-FAMILY SUBDIVISION

# SHEARWATER DRIVE PORTSMOUTH, NEW HAMPSHIRE AUGUST 1, 2023 LAST REVISED: AUGUST 21, 2023

| LIST OF DRAWINGS |   |           |  |  |  |
|------------------|---|-----------|--|--|--|
| SHEET NO.        | SHEET NO. SHEET TITLE                     |           |  |  |  |
|                  | COVER SHEET                               | 8/21/2023 |  |  |  |
| 1 OF 1           | SUBDIVISION PLAN                          | 8/17/2023 |  |  |  |
| 1 OF 1           | EXISTING CONDITIONS PLAN                  | 8/17/2023 |  |  |  |
| G-100            | GENERAL NOTES AND LEGEND                  | 8/21/2023 |  |  |  |
| C-101            | EXISTING CONDITIONS & DEMOLITION PLAN     | 8/21/2023 |  |  |  |
| C-102            | SITE PLAN                                 | 8/21/2023 |  |  |  |
| C-103            | GRADING, DRAINAGE, & EROSION CONTROL PLAN | 8/21/2023 |  |  |  |
| C-104            | UTILITIES PLAN                            | 8/21/2023 |  |  |  |
| C-105            | LANDSCAPE PLAN                            | 8/21/2023 |  |  |  |
| C-201            | DRAINAGE EASEMENT LPAN                    | 8/21/2023 |  |  |  |
| C-501            | EROSION CONTROL NOTES AND DETAILS SHEET   | 8/21/2023 |  |  |  |
| C-502            | DETAILS SHEET                             | 8/21/2023 |  |  |  |
| C-503            | DETAILS SHEET                             | 8/21/2023 |  |  |  |
| C-504            | DETAILS SHEET                             | 8/21/2023 |  |  |  |
| C-505            | DETAILS SHEET                             | 8/21/2023 |  |  |  |

| LIST OF PERMITS         |               |      |  |  |
|-------------------------|---------------|------|--|--|
| LOCAL                   | STATUS        | DATE |  |  |
| SITE PLAN REVIEW PERMIT | NOT SUBMITTED |      |  |  |
| SUBDIVISION PERMIT      | NOT SUBMITTED |      |  |  |
| FEDERAL                 |               |      |  |  |
| EPA - NPDES CGP (SWPPP) | NOT SUBMITTED |      |  |  |



LOCATION MAP
SCALE: 1" = 2,000'

# PREPARED BY:

# Tighe&Bond

177 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE 03801
603-433-8818

# **OWNER:**

BANTRY BAY ASSOCIATION LLC 540 NORTH COMMERCIAL ST MANCHESTER, NH 03101

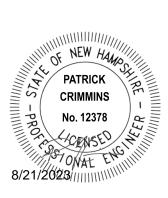
# **APPLICANT:**

CHINBURG PROPERTIES
3 PENSTOCK WAY
NEWMARKET, NH 03857

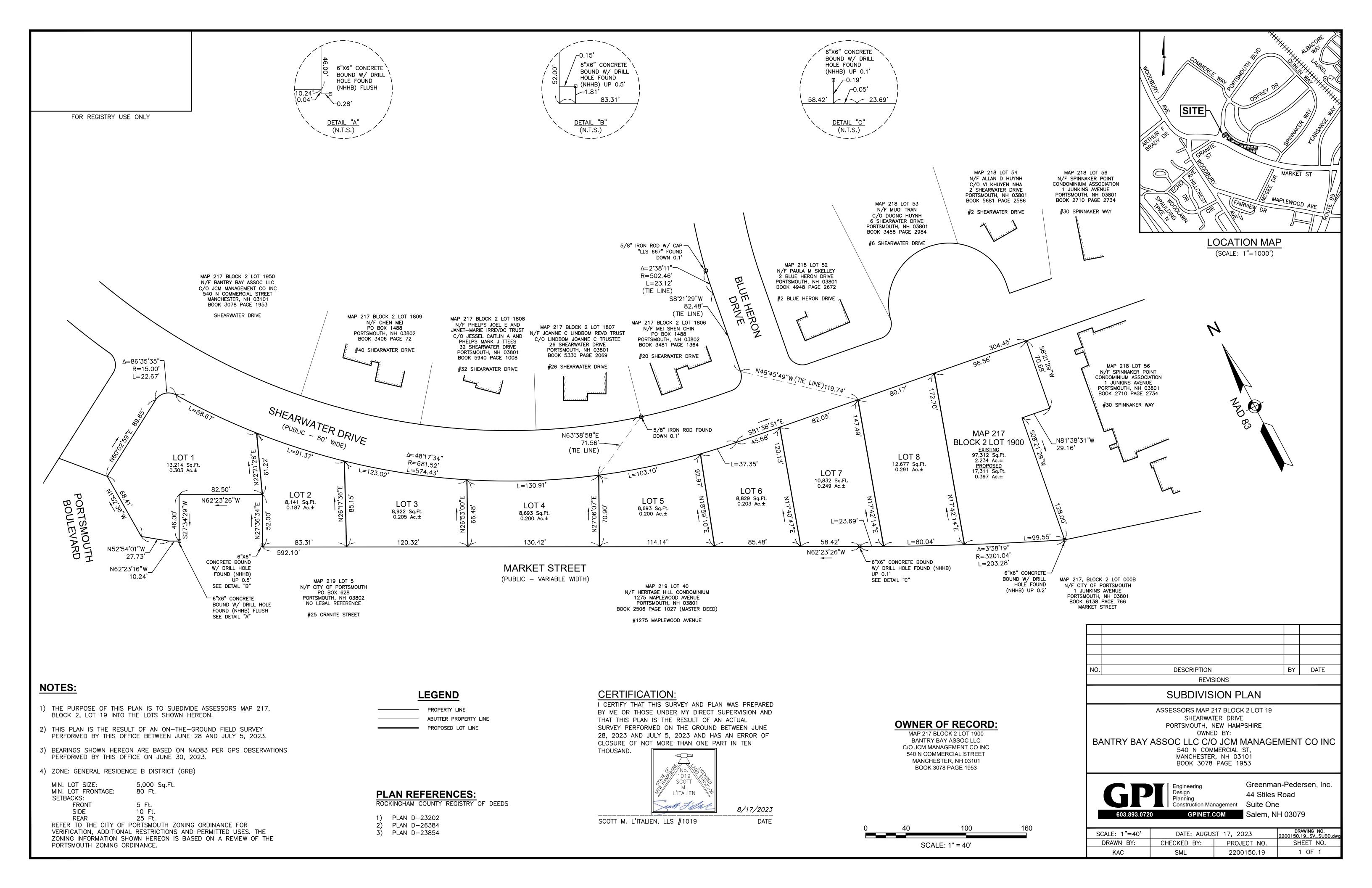
# **SURVEYOR:**

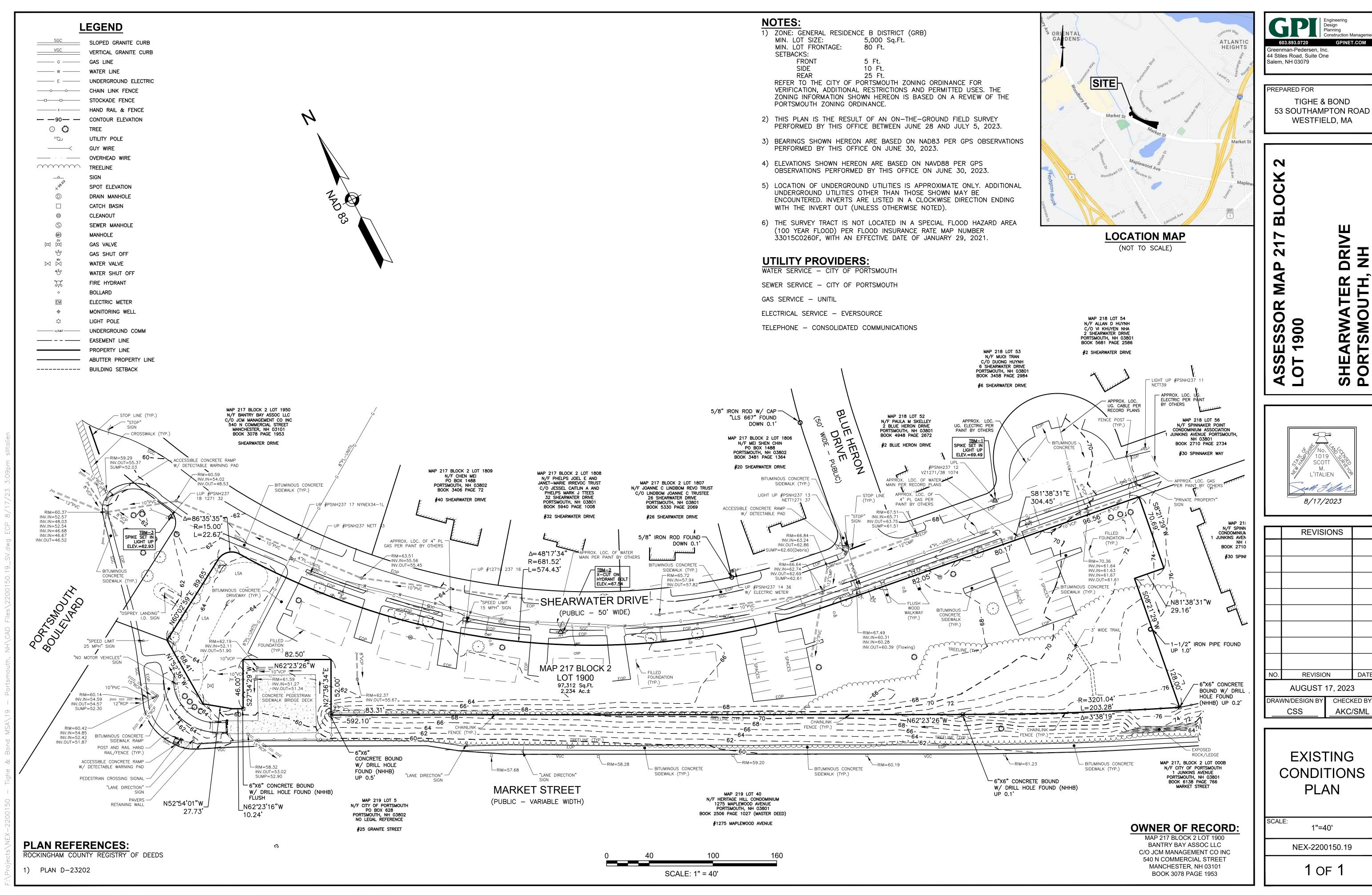
GREENMAN-PEDERSEN, INC.
44 STILES ROAD, SUITE ONE
SALEM, NH 03079





TAC SUBMISSION
COMPLETE SET 15 SHEETS





53 SOUTHAMPTON ROAD

|     | . (2 )       |          |        |
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| NO. | REVISIO      | N        | DATE   |
|     | AUGUST       | 17, 2023 | 3      |
| RAV | WN/DESIGN BY | CHECK    | KED BY |
|     | CSS          | _AKC     | /SML_  |
|     |              |          |        |

**CONDITIONS** 

- 1. THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE 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.
- 2. COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
- 3. THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES. 4. 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. 5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT
- 6. 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 7. 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.
- 8. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS. 9. 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 OF ROAD AND BRIDGE
- 10. 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
- 11. CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
- 12. SEE EXISTING CONDITIONS PLAN FOR BENCH MARK INFORMATION.
- 13. APPLICANT SHALL SUBMIT, AS PART OF THE FINAL POST APPROVAL PROCEDURES, RELEVANT PTAP INFORMATION USING THE MOST RECENT ONLINE DATA PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER. THE PLANNING DEPARTMENT SHALL BE NOTIFIED AND COPIED OF THE PTAP DATA SUBMITTAL.

- 1. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES. 2. 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
- 3. COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY. 4. 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. 5. 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.
- 6. 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.
- 7. ALL UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED. 8. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR
- UTILITY IS 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. 9. 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.
- 10. 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, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
- 11. 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.
- 12. 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.
- 13. PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT 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 THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER
- 14. 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. 15. 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. 16. THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

- PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
- ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
- 3. SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
- 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. CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
- 6. COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.

WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY

- 7. SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
- 8. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED. 9. THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE
- 10. ALL TREES PLANTED ARE TO BE INSTALLED UNDER THE SUPERVISION OF THE CITY OF PORTSMOUTH DPW USING STANDARD INSTALLATION METHODS.

# **GRADING AND DRAINAGE NOTES:**

1. COMPACTION REQUIREMENTS: BELOW PAVED OR CONCRETE AREAS TRENCH BEDDING MATERIAL AND

SAND BLANKET BACKFILL BELOW LOAM AND SEED AREAS

- \* 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) UNLESS OTHERWISE
- 3. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
- 4. 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.
- 5. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
- 6. ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
- 7. ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS. 8. CONTRACTOR TO FIELD VERIFY OUTLET INVERT PRIOR TO CONSTRUCTION.

# **EROSION CONTROL NOTES**

1. SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

- COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY
- NATURAL GAS UNITIL
- WATER/SEWER CITY OF PORTSMOUTH
- ELECTRIC EVERSOURCE • COMMUNICATIONS - COMCAST/CONSOLIDATED COMMUNICATIONS/FIRST LIGHT
- 2. ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
- 3. 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.
- 4. ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED
- 5. CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION. 6. CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
- 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 THE BUILDING DRAWINGS AND
- THE APPLICABLE UTILITY COMPANIES. 10. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
- 11. 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
- 12. CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES. 13. 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
- 14. SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN
- 15. HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
- 16. COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
- 17. ALL SEWER PIPE WITH LESS THAN 6' OF COVER IN PAVED AREAS OR LESS THAT 4' OF COVER IN UNPAVED AREAS SHALL BE
- 18. 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
- 19. IF THE EXISTING WATER LINE IS LESS THAN 1" IN DIAMETER, IT SHALL BE CAPPED AT THE MAIN AND NEW 1" COPPER LINE AND WATER SHUT OFF VALVE SHALL BE CONSTRUCTED.
- 20. ALL WATER LINES SHALL BE EQUIPPED WITH WATER SHUT OF VALVES LOCATED WITH IN THE CITY RIGHT OF WAY.

- 1. THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER AND OR THE CITY OF PORTSMOUTH TREES & PUBLIC GREENERY COMMITTEE. ALL PLANTS SHALL BE NURSERY GROWN.
- 2. ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
- PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST
- REVISION. 4. PLANT MATERIAL SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO
- 5. THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS
- SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY. 6. THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE
- REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED. 7. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
- 8. THREE INCHES (3") OF BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER
- AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED. 9. LANDSCAPING SHALL BE LOCATED WITHIN 150 FT OF EXTERIOR HOSE ATTACHMENT OR SHALL BE PROVIDED WITH AN IRRIGATION
- 10. SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 11. TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
- 12. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
- 13. TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES.
- 14. 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. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.

15 EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN LINDISTURBED. ALL EXISTING TREES AND SHRUBS SHOWN TO

- REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN. WHICH IS REMOVED DURING CONSTRUCTION. SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB. 16. THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND
- SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR
- 17. UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT
- 18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
- 21. PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

# **EXISTING CONDITIONS PLAN NOTES:**

1. EXISTING CONDITIONS ARE BASED ON A FIELD SURVEY PERFORMED BY GPI, SEE REFERENCE PLAN #1.

# **REFERENCE PLANS:** 1. "EXISTING CONDITIONS PLAN - MAP 217 BLOCK 2 LOT 1900" PREPARED BY GPI, DATED JULY 19, 2023.

# VERIFY IN FIELD

TO BE REMOVED BUILDING TYPICAL **GROSS FOOT PRINT** COORDINATE CURB RADIUS VERTICAL GRANITE CURB SLOPED GRANITE CURB HIGH-DENSITY POLYETHYLENE FINISH FLOOR

**ABBREVIATIONS** 

BLDG

COORD

30'R

SGC

**HDPE** 

PROPOSED CONSTRUCTION EXIT

APPROXIMATE LIMIT OF

PROPOSED SAWCUT

PROPOSED SILT SOCK

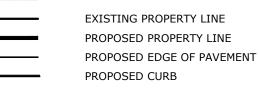
BE MILLED AND OVERLAID

PAVEMENT TO BE REMOVED

APPROXIMATE LIMIT OF PAVEMENT TO

LIMIT OF WORK

**LEGEND** 



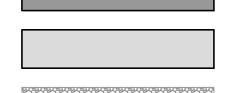
PROPOSED BUILDING

PROPOSED BITUMINOUS

PAVEMENT SECTION

PROPOSED MILL AND

OVERLAY SECTION

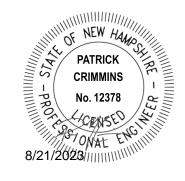


PROPOSED DRIP EDGE PROPOSED MAJOR CONTOUR LINE PROPOSED MINOR CONTOUR LINE PROPOSED DRAIN LINE (TYP) INLET PROTECTION SILT SACK PROPOSED DRAIN MANHOLE PROPOSED YARD DRAIN EXISTING STORM DRAIN EXISTING SANITARY SEWER EXISTING WATER EXISTING GAS EXISTING UNDERGROUND ELECTRIC EXISTING OVERHEAD UTILITY PROPOSED SANITARY SEWER PROPOSED WATER PROPOSED GAS APPROXIMATE SANITARY SEWER APPROXIMATE WATER APPROXIMATE STORM DRAIN EXISTING CATCHBASIN EXISTING DRAIN MANHOLE EXISTING SEWER MANHOLE EXISTING WATER VALVE EXISTING HYDRANT EXISTING ELECTRIC MANHOLE EXISTING TELEPHONE MANHOLE PROPOSED SEWER MANHOLE PROPOSED WATER VALVE PROPOSED HYDRANT PROPOSED LIGHT POLE BASE PROPOSED SPOT GRADES PROPOSED FIRE HYDRANT PROPOSED WATER SHUT OFF

PROPOSED SEWER CLEAN OUT

PROPOSED TREE PROTECTION BARRIER

PROPOSED TREE





**PROPOSED** SINGLE-FAMILY **SUBDIVISION** 

**CHINBURG PROPERTIES** 

SHEARWATER DRIVE, PORTSMOUTH, NH

| 1    | 8/21/2023 | TAC Submission     |
|------|-----------|--------------------|
| ARK  | DATE      | DESCRIPTION        |
| ROJE | CT NO:    | C5194-001          |
| ATE: |           | 08/01/2023         |
| ILE: | C5        | 194-001_C-DSGN.dwg |

**GENERAL NOTES** 

NHW/CJK

NAH

PMC

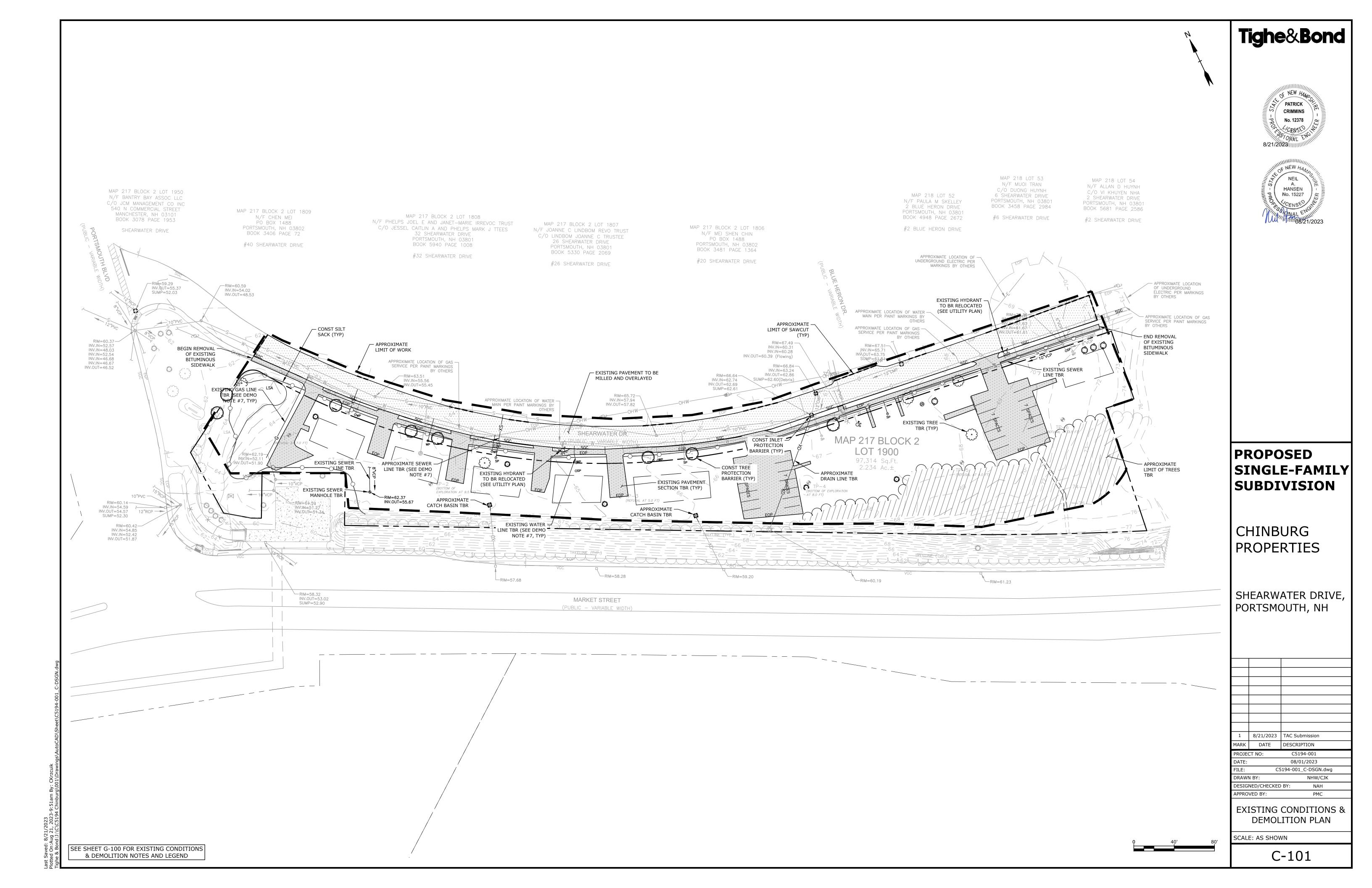
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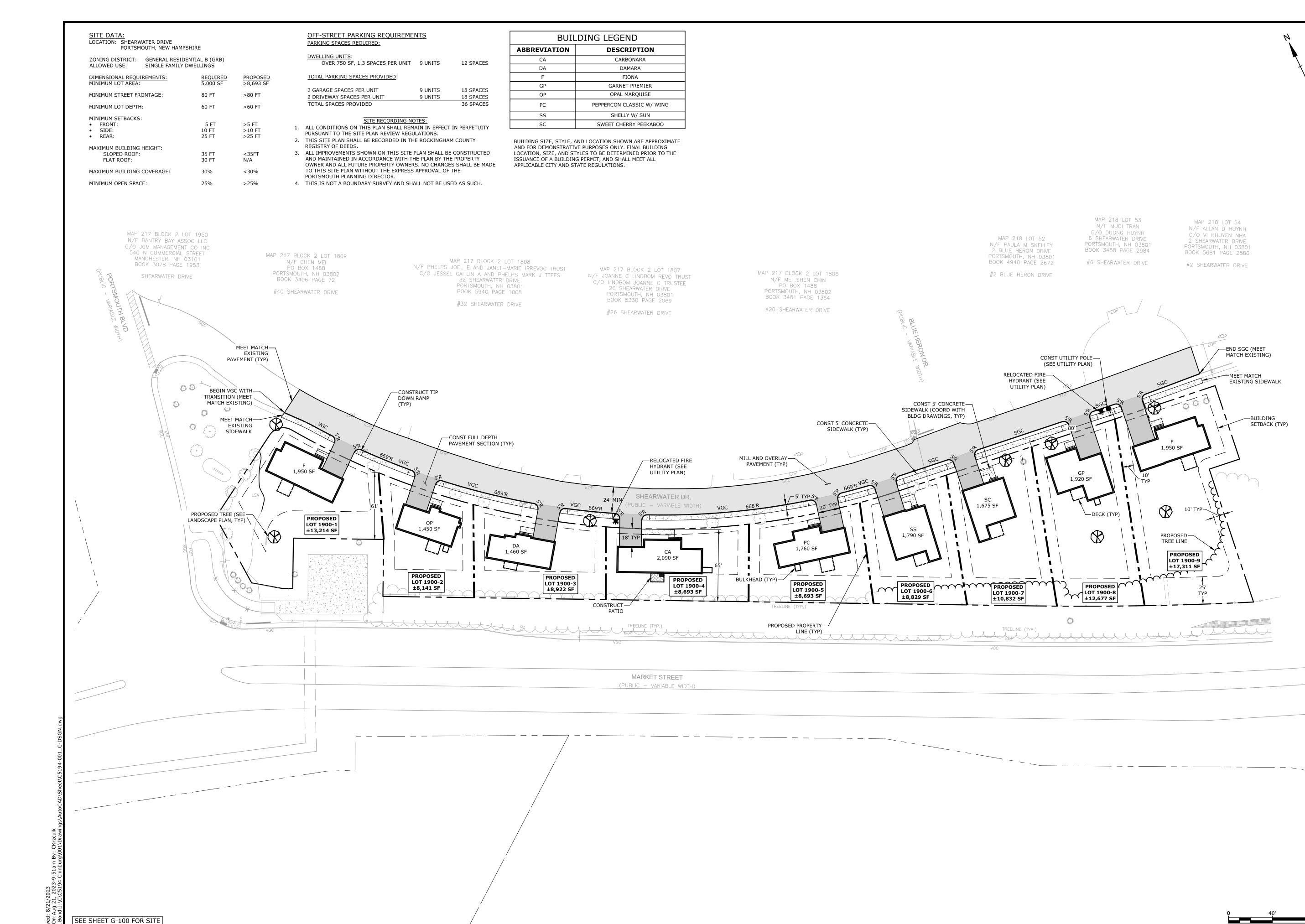
DESIGNED/CHECKED BY:

DRAWN BY:

APPROVED BY:

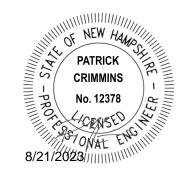
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PLAN NOTES AND LEGEND

Tighe&Bond





# PROPOSED SINGLE-FAMILY SUBDIVISION

CHINBURG PROPERTIES

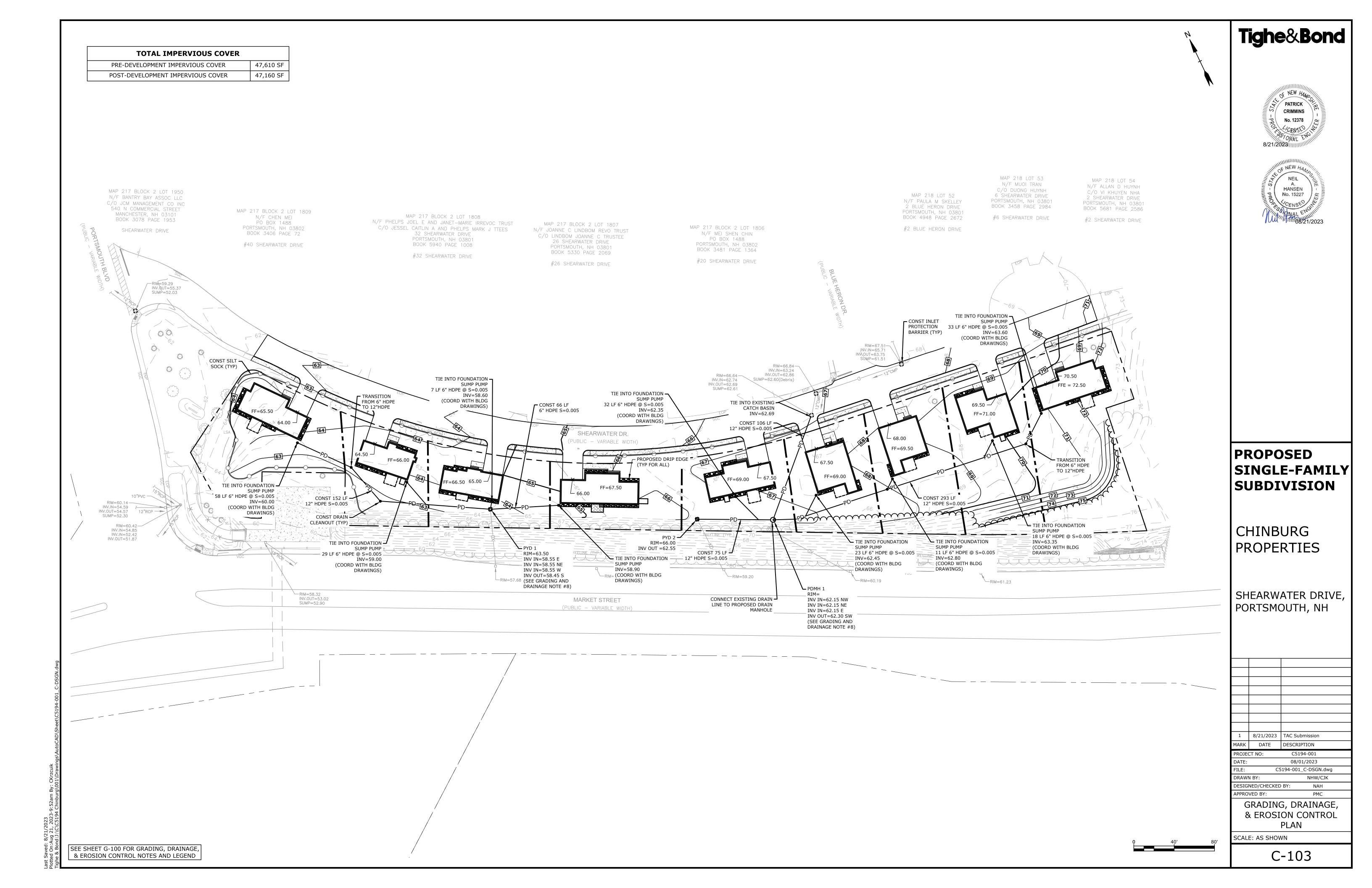
SHEARWATER DRIVE, PORTSMOUTH, NH

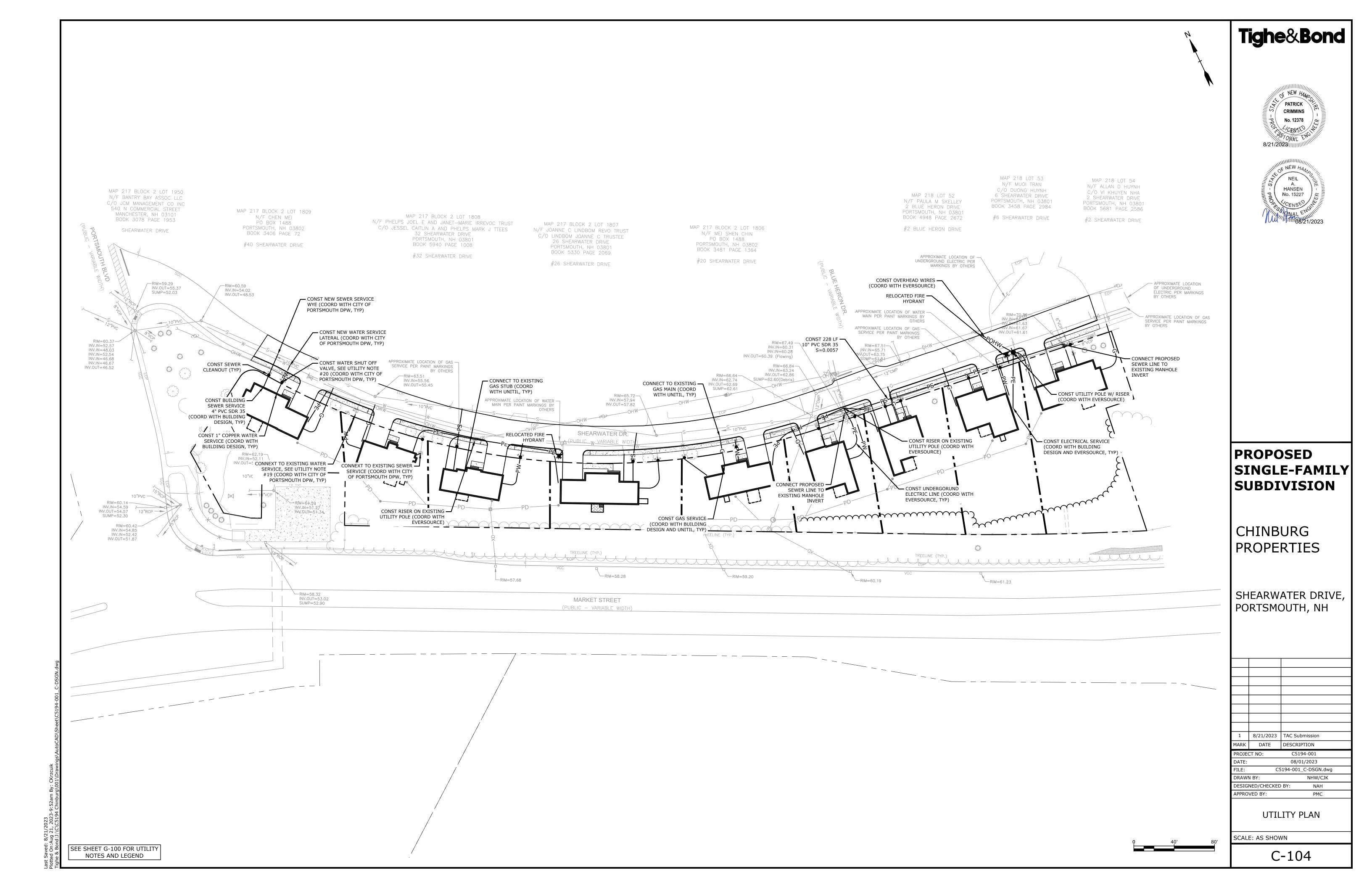
| 1     | 8/21/2023                | TAC Submission     |  |
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| MARK  | DATE                     | DESCRIPTION        |  |
| PROJE | CT NO:                   | C5194-001          |  |
| DATE: |                          | 08/01/2023         |  |
| FILE: | C5                       | 194-001_C-DSGN.dwg |  |
| DRAWI | DRAWN BY: NHW/CJK        |                    |  |
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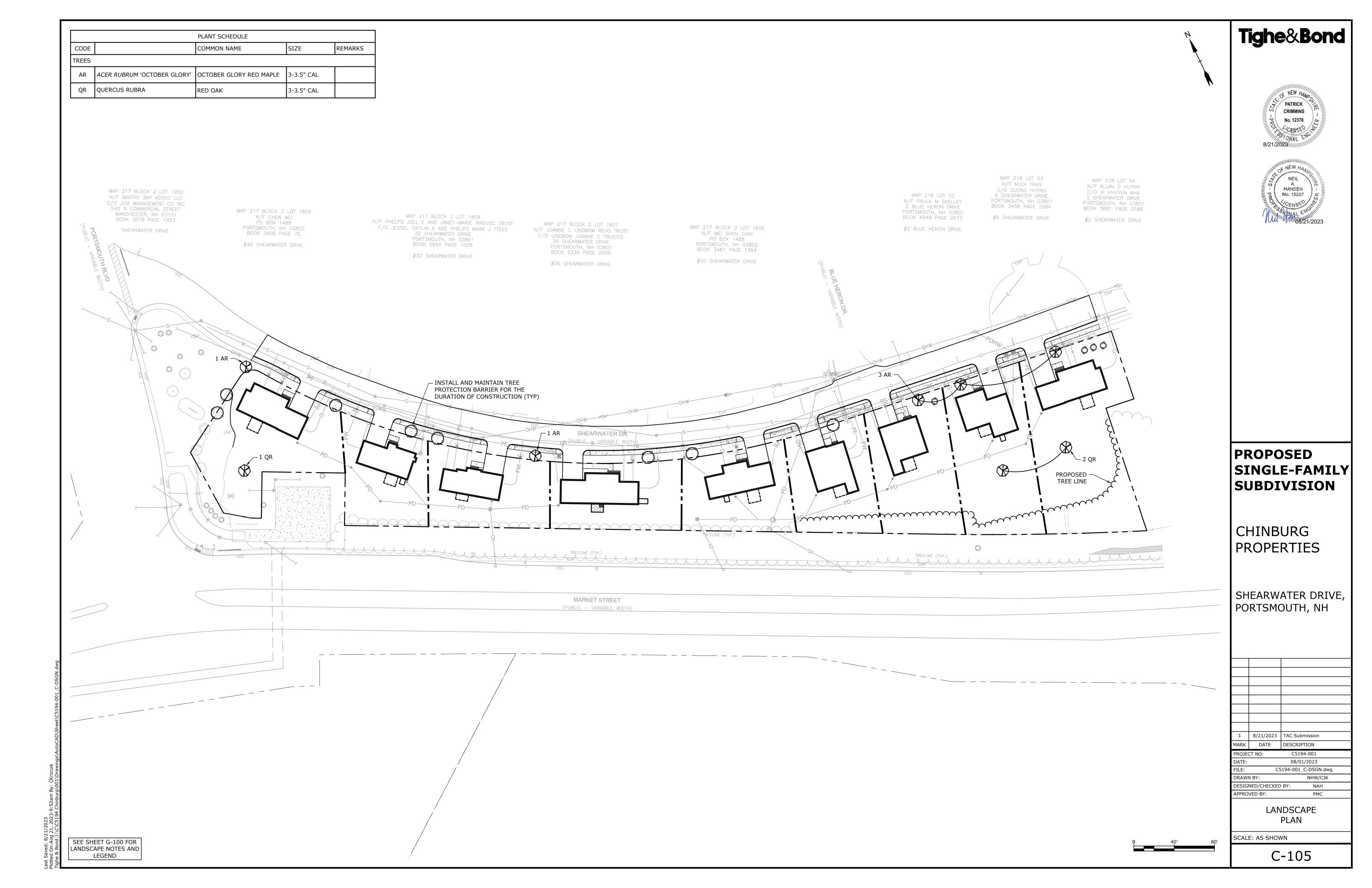
SITE PLAN

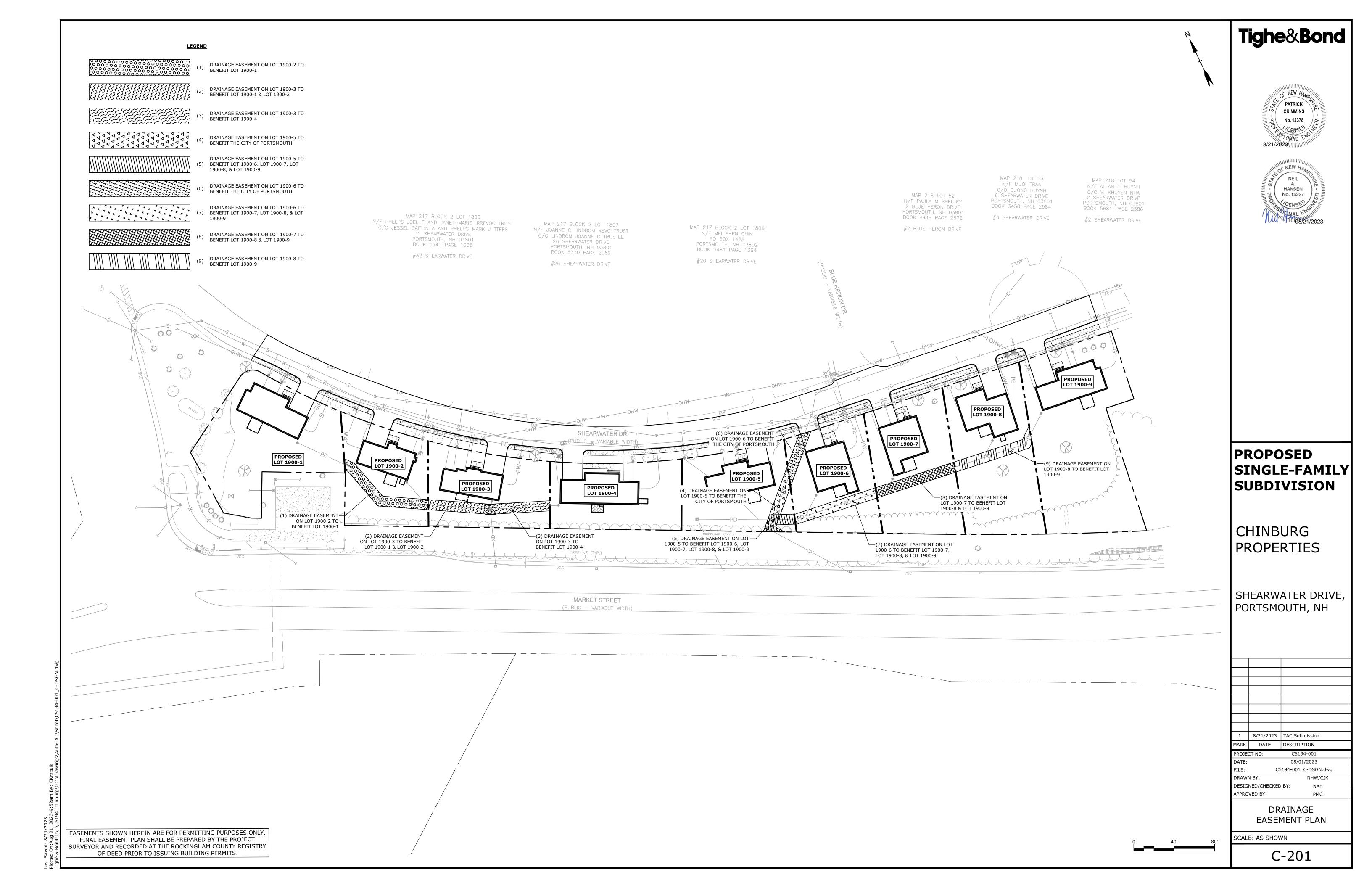
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APPROVED BY:









PROJECT APPLICANT: CHINBURG PROPERTIES

3 PENSTOCK WAY NEWMARKET, NH 03857 PROJECT NAME: PROPOSED SINGLE-FAMILY SUBDIVISION

PROJECT MAP / LOT: MAP 217 BLOCK 2 / LOT 1900 PROJECT ADDRESS: SHEARWATER DRIVE

PORTSMOUTH, NH 03801 PROJECT LATITUDE: 43°-05'-10" N PROJECT LONGITUDE: 70°-46'-59" W

# PROJECT DESCRIPTION

THE PROJECT CONSISTS OF SUBDIVIDING THE EXISTING LOT INTO NINE (9) INDIVIDUAL PARCELS, THEN CONSTRUCTING A SINGLE-FAMILY HOME ON EACH. THE PROJECT ALSO CONSISTS OF IMPROVEMENTS TO SHEARWATER DRIVE.

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 2.2 ACRES.

# **SOIL CHARACTERISTICS**

BASED ON THE USCS WEB SOIL SURVEY THE SOILS ON SITE CONSIST OF URBAN LAND WHICH IS WELL DRAINED SOILS WITH A HYDROLOGIC SOIL GROUP RATING OF A.

# NAME OF RECEIVING WATERS

THE STORMWATER RUNOFF FROM THE SITE WILL BE DISCHARGED VIA A CLOSED DRAINAGE SYSTEM TO THE CITY OF PORTSMOUTH'S CLOSED DRAINAGE SYSTEM WHICH ULTIMATELY FLOWS TO THE PISCATAQUA RIVER.

# **CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:**

- CUT AND CLEAR TREES. 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
- 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.
- CLEAR AND DISPOSE OF DEBRIS.
- CONSTRUCT TEMPORARY CULVERTS AND DIVERSION CHANNELS AS REQUIRED. GRADE AND GRAVEL ROADWAYS AND PARKING AREAS - ALL ROADS AND PARKING AREA SHALL
- BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. BEGIN PERMANENT AND TEMPORARY SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, PERIMETER EROSION CONTROL MEASURES, SEDIMENT TRAPS, ETC., MULCH AND SEED AS REQUIRED.
- SEDIMENT TRAPS AND/OR BASINS SHALL BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL SOILS ARE STABILIZED.
- FINISH PAVING ALL ROADWAYS AND PARKING LOTS.
- INSPECT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES.
- COMPLETE PERMANENT SEEDING AND LANDSCAPING.
- REMOVE TRAPPED SEDIMENTS FROM COLLECTOR DEVICES AS APPROPRIATE AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES.

# THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.

**SPECIAL CONSTRUCTION NOTES:** 

- 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.

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.

PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS

- FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL. 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. 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 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. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION
- CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND
- 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. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1

# STABILIZATION:

- 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
- 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.
- 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;
- 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 1. FIRE-FIGHTING ACTIVITIES; 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; 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.
- ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
- 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 1. WASTE MATERIAL: 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.

- . 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
- 3. DUST CONTROL MEASURES SHALL BE UTILIZED SO AS TO PREVENT THE MIGRATION OF DUST FROM THE SITE TO ABUTTING AREAS.

- 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

# .. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE(S) PRIOR TO ANY EXCAVATION ACTIVITIES.

.. TEMPORARY GRASS COVER: A. SEEDBED PREPARATION

**OFF SITE VEHICLE TRACKING:** 

- 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; 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:

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

# 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;
- HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AS INDICATED ABOVE 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: 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:**

- THE FOLLOWING ARE THE ONLY NON-STORMWATER DISCHARGES ALLOWED. ALL OTHER NON-STORMWATER DISCHARGES ARE PROHIBITED ON SITE: 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:**

- FIRE HYDRANT FLUSHING;
- WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
- WATER USED TO CONTROL DUST;
- 5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING 6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
- 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.

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. 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
- 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: 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
  - 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 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; WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF
- 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;

b. FERTILIZERS:

USE;

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
  - (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED
  - (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS
- 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.
- 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

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- PLASTIC BIN TO AVOID SPILLS. c. PAINTS: i. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR
- 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;
- 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:
- AND MAINTENANCE AT AN OFF-SITE FACILITY; b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS

e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;

a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING

- 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;
- f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID. **EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES**

- 1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ONSITE AT ALL TIMES.
- THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT
- SHALL BE FOLLOWED AS PART OF THIS PROJECT: A. 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;
- AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR; C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR
- MAINTENANCE AND REPAIR ACTIVITIES; D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.

SILT SOCK-

(12" TYPICAL)

**WORK AREA** 

COIR MAT INLET FILTER

Z X

CATCH BASIN GRATE—

(DIMENSIONS VARY)

TO CATCH BASIN

GRATE (TYP)

SOCK

FLOW /

WATER >

PATRICK

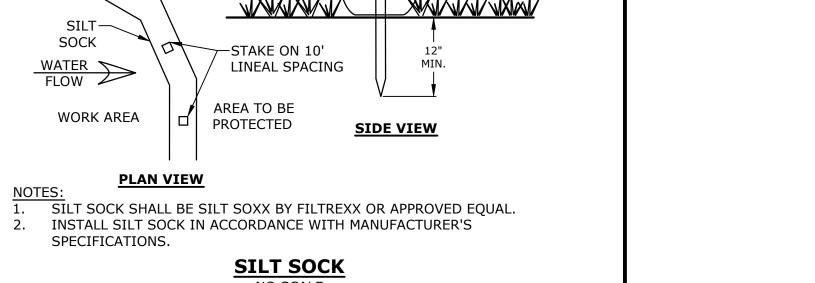
**CRIMMINS** 

No. 12378

CENSE ONAL EN

8/21/2023////





1. COIR MAT INLET FILTER SHALL BE

STORM WATER INLET FILTER BY

**BLOCKSOM & CO. OR APPROVED** 

INSTALL AND MAINTAIN INLET

**INLET PROTECTION** 

NO SCALE

PROTECTION IN ACCORDANCE WITH

MANUFACTURER'S SPECIFICATIONS.

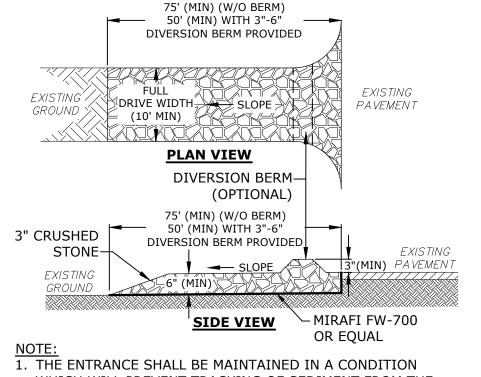
AREA TO BE

PROTECTED

# **PROPOSED SINGLE-FAMILY SUBDIVISION**

**CHINBURG PROPERTIES** 

SHEARWATER DRIVE, PORTSMOUTH, NH



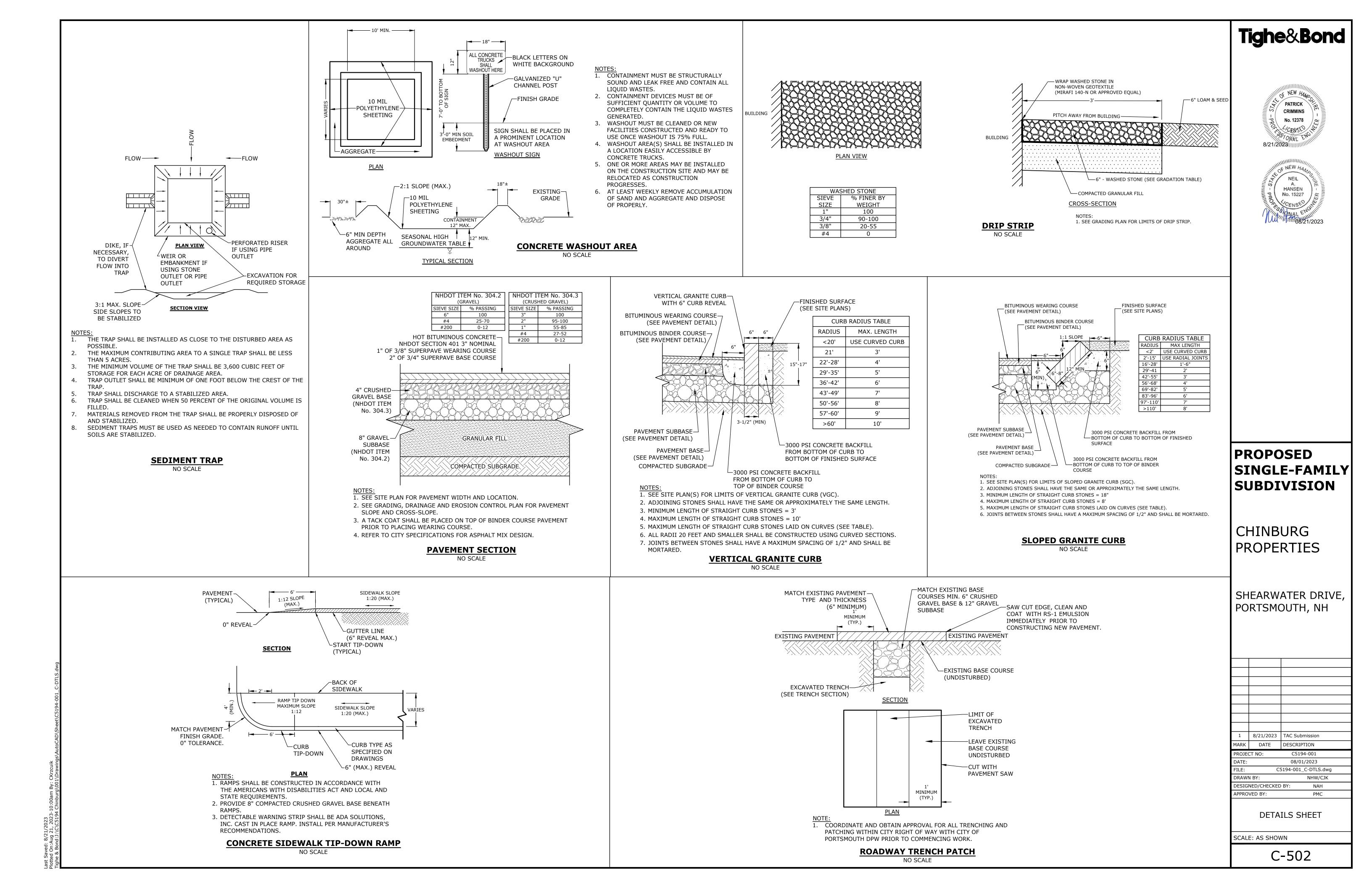
WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE. WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS

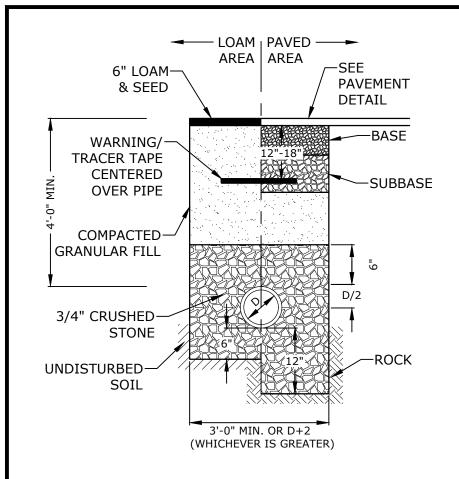
STABILIZED CONSTRUCTION EXIT NO SCALE

C-501

1 8/21/2023 TAC Submission MARK DATE DESCRIPTION ROJECT NO: C5194-001 08/01/2023 C5194-001\_C-DTLS.dwg DRAWN BY NHW/CJK DESIGNED/CHECKED BY: NAH APPROVED BY: PMC

**EROSION CONTROL NOTES** AND DETAILS SHEET SCALE: AS SHOWN



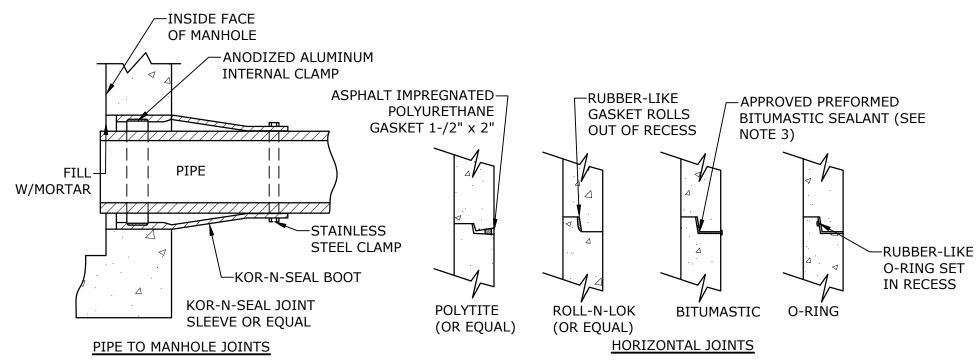


CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.

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

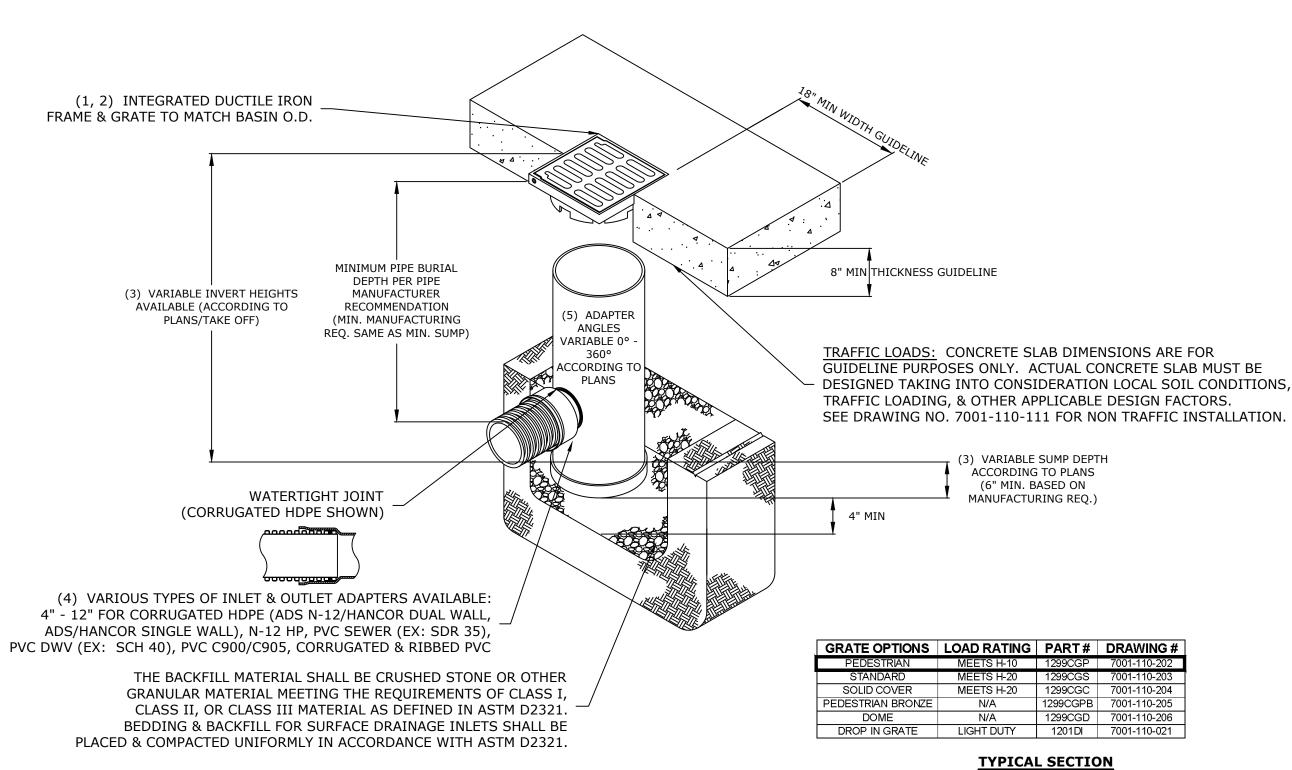
NO SCALE



- 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



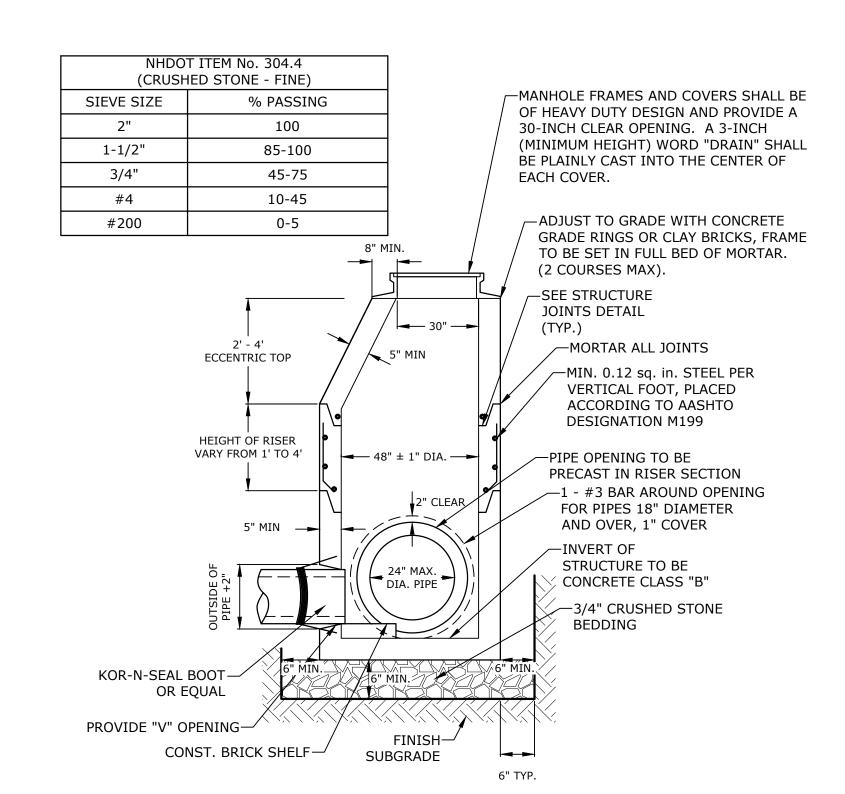
1 - GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05,

WITH THE EXCEPTION OF THE BRONZE GRATE. 2 - FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05

SEE DRAWING NO. 7001-110-065

- 3 DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS.
- 4 DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL),
- N-12 HP, & PVC SEWER. 5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.

**YARD DRAIN** 



- ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
- 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. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS)
- THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
- OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE
- 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

# **PROPOSED SINGLE-FAMILY SUBDIVISION**

PATRICK

**CRIMMINS** 

No. 12378

HANSEN

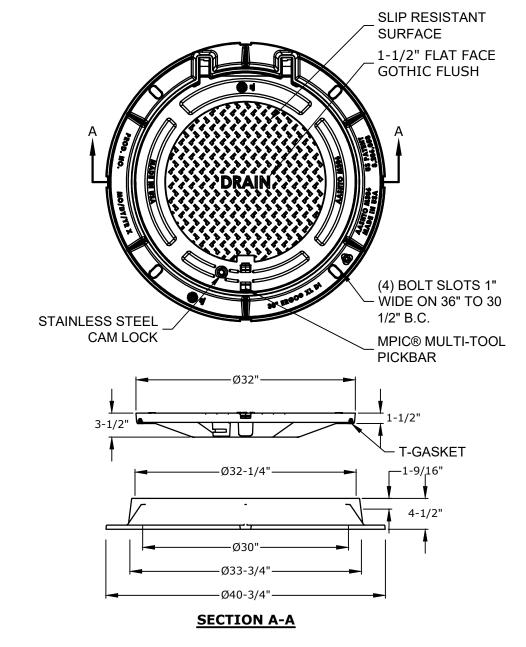
No. 15227

CONSED

8/21/2023////

# **CHINBURG PROPERTIES**

SHEARWATER DRIVE, PORTSMOUTH, NH



# 1. MANHOLE FRAME AND COVER SHALL BE 32" HINGED ERGO XL

- BY EJ CO. ALL DIMENSIONS ARE NOMINAL.
- 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.

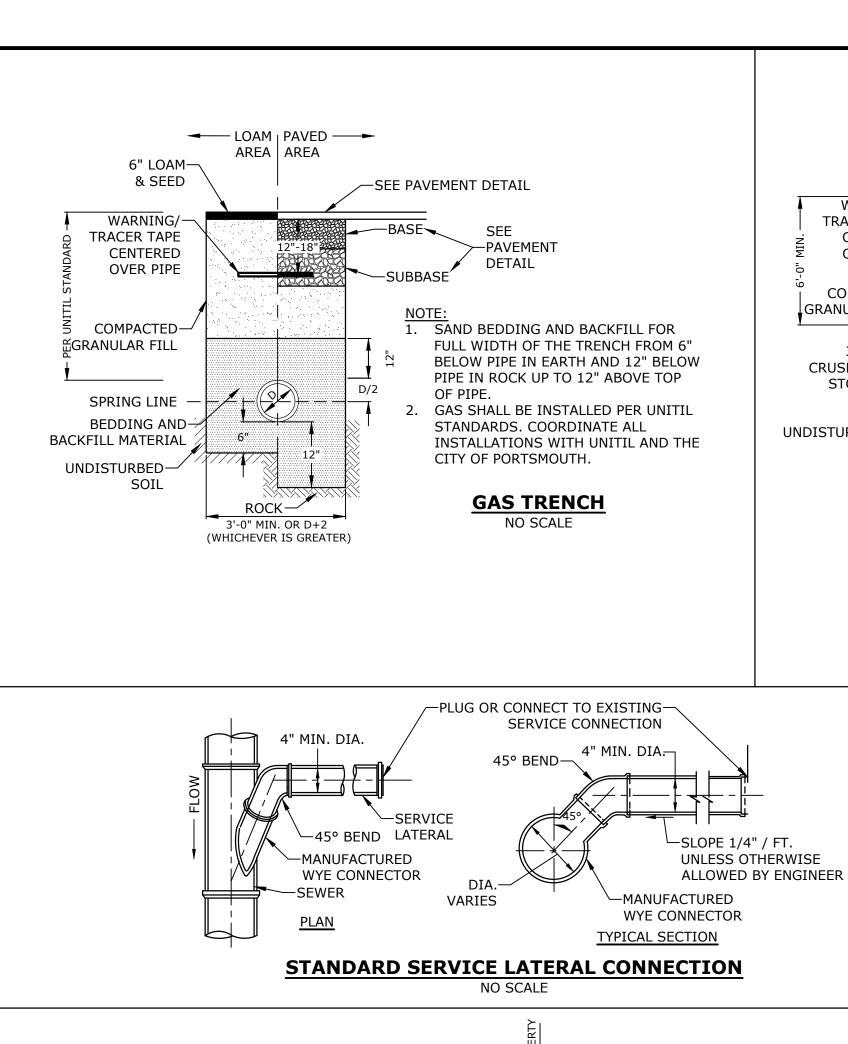
**DRAIN MANHOLE FRAME & COVER** 

NO SCALE

8/21/2023 TAC Submission MARK DATE DESCRIPTION PROJECT NO: C5194-001 08/01/2023 C5194-001\_C-DTLS.dwg DRAWN BY: NHW/CJK DESIGNED/CHECKED BY: NAH APPROVED BY: PMC

**DETAILS SHEET** 

SCALE: AS SHOWN



2" RIGID FOAM INSULATION-

1" COPPER-

PROVIDE 2 CU. FT. OF-

SCREENED GRAVEL

NOTE:

1. ALL WATER SERVICE CONNECTIONS SHALL CONFORM TO THE CITY OF PORTSMOUTH STANDARDS.

WATER SERVICE CONNECTION

NO SCALE

FIRE HYDRANT

NO SCALE

SERVICE LINE

HYDRANT-

-VALVE BOX

6" MIN.

CRUSHED STONE-

15"x15"x4" CONCRETE BASE-

—WATER MAIN

CORPORATION-

THRUST BLOCK

WATER MAIN

6" MJ GATE VALVE-

(SEE DETAIL)

STOP

-FINISHED GRADE

-CURB STOP AND BOX

PORTSMOUTH DPW

—BALL VALVE CURB STOP

BRONZE FLARED TYPE

COMPRESSION FITTINGS

NOTE:

-THRUST BLOCK

(SEE DETAIL)

12" CRUSHED STONE

-HYDRANT DRAIN

TO BE PLUGGED

BELOW HYDRANT

-DRAIN PIT - 3' DIA. x 2'

COMPRESSION (NO DRAIN)

COORDINATE TYPE AND

LOCATION WITH CITY OF

-SERVICE LINE

PIPE SIZE AND TYPE

COPPER SERVICE LINE

-COUPLER AS REQUIRED FOR

1. HYDRANT TO BE KENNEDY TYPE K-81,

PORTSMOUTH FIRE DEPARTMENT.

CITY STANDARD SPECIFICATIONS

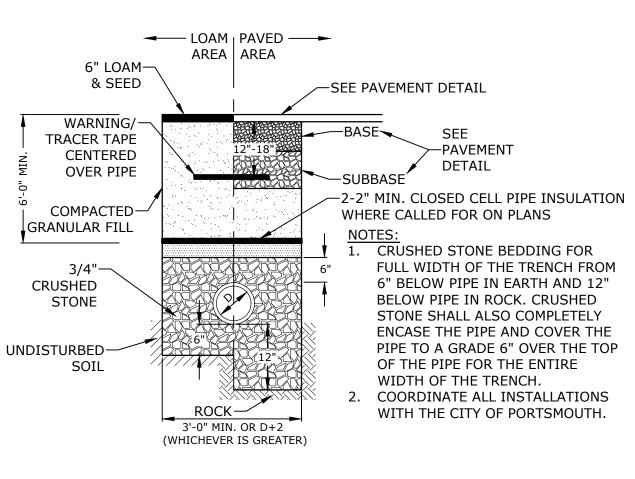
DEPARTMENT AND CITY OF

RIGHT OPEN (NO EQUAL). COORDINATE

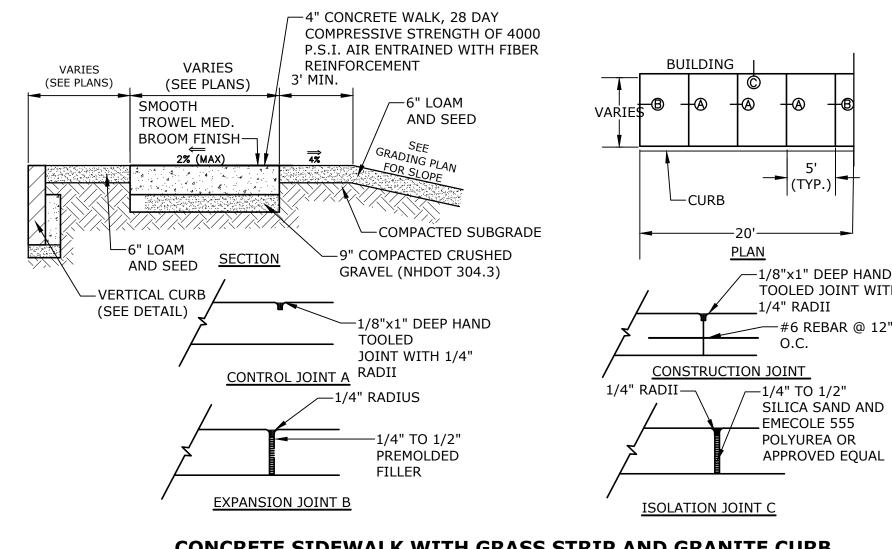
WITH CITY OF PORTSMOUTH WATER

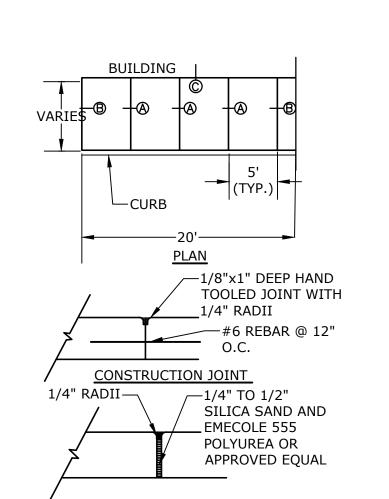
2. PAINT HYDRANT IN ACCORDANCE WITH

AFTER INSTALLATION AND TESTING.

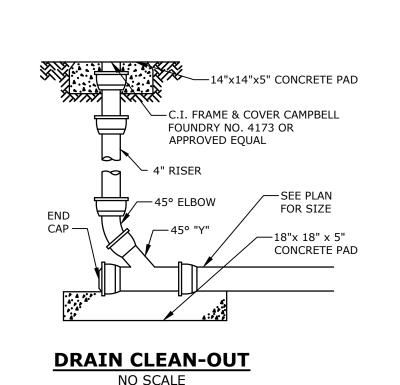


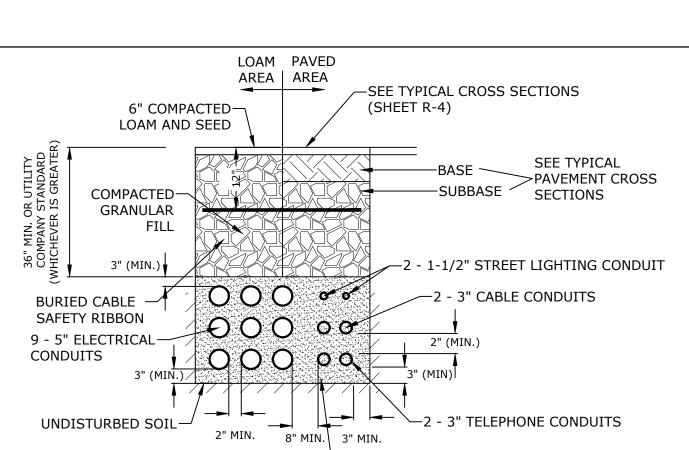
**SEWER SERVICE TRENCH** 

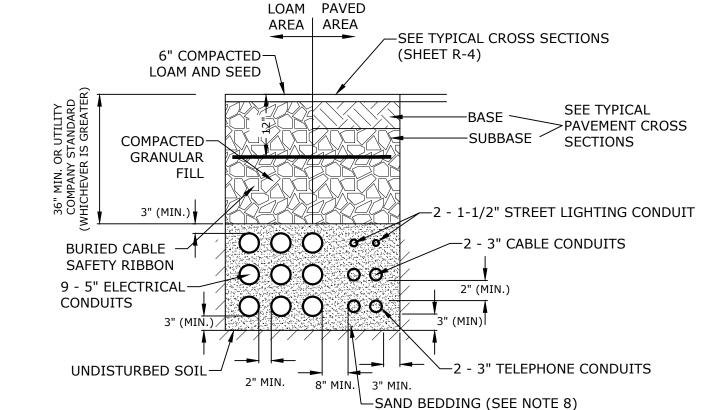




CONCRETE SIDEWALK WITH GRASS STRIP AND GRANITE CURB







NUMBER, MATERIAL, AND SIZE OF UTILITY CONDUITS TO BE DETERMINED BY LOCAL UTILITY OR AS SHOWN ON ELECTRICAL DRAWINGS. CONTRACTOR TO PROVIDE ONE SPARE CONDUIT FOR EACH UTILITY TO BUILDING. DIMENSIONS SHOWN REPRESENT OWNERS MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS MAY BE GREATER BASED ON UTILITY COMPANY STANDARDS, BUT SHALL NOT BE LESS THAN THOSE SHOWN. 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. UTILITY COMPANY MUST BE GIVEN THE OPPORTUNITY TO INSPECT THE CONDUIT PRIOR TO BACKFILL

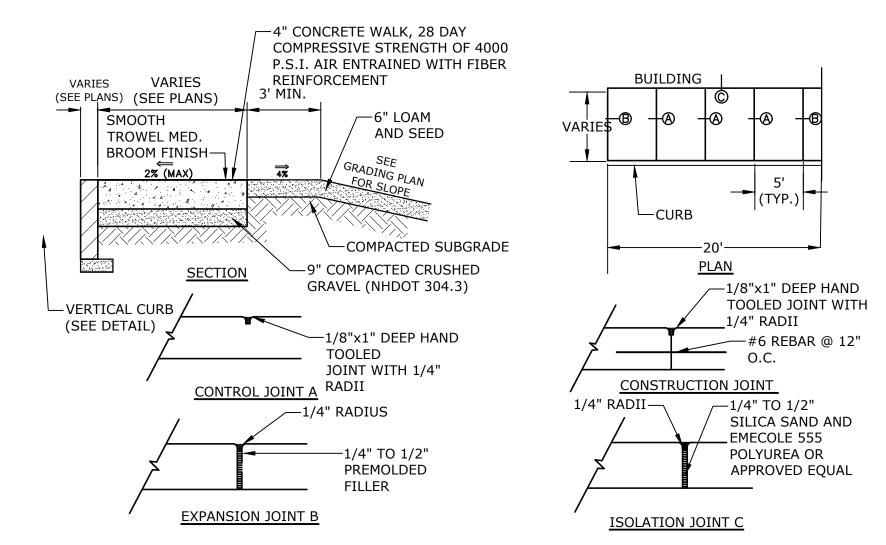
THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD THE UTILITY COMPANY BE UNABLE TO

INSTALL ITS CABLE IN A SUITABLE MANNER. 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.

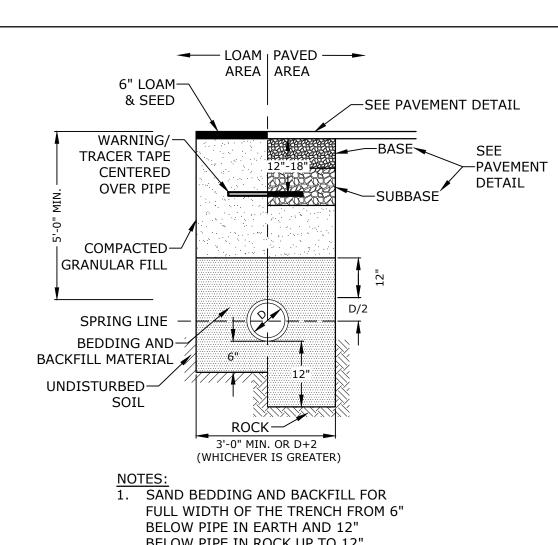
SAND BEDDING TO BE REPLACED WITH CONCRETE ENCASEMENT WHERE COVER IS LESS THAN 3 FEET, WHEN LOCATED BELOW PAVEMENT, OR WHERE SHOWN ON THE UTILITIES PLAN.

ALL 90° SWEEPS WILL BE MADE USING RIGID GALVANIZED STEEL. SWEEPS WITH A 36 TO 48 INCH

**ELECTRICAL AND COMMUNICATION CONDUIT** NO SCALE



**CONCRETE SIDEWALK WITHOUT GRASS STRIP WITH GRANITE CURB** 



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 WAIN TRENCH

NO SCALE

No. 12378 CENSED ONAL EX 8/21/2023///// NEIL

HANSEN

No. 15227

Tighe&Bond

OF NEW HAME

PATRICK

CRIMMINS

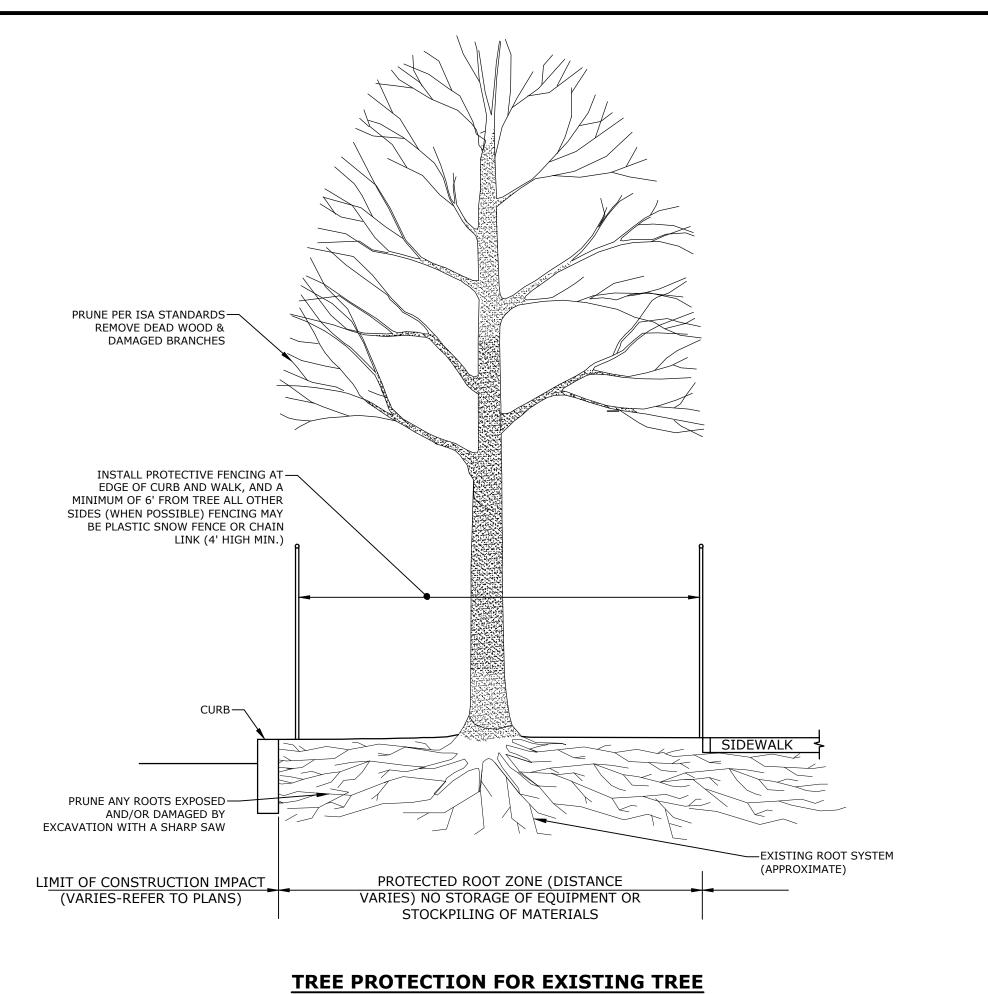
# **PROPOSED SINGLE-FAMILY SUBDIVISION**

**CHINBURG PROPERTIES** 

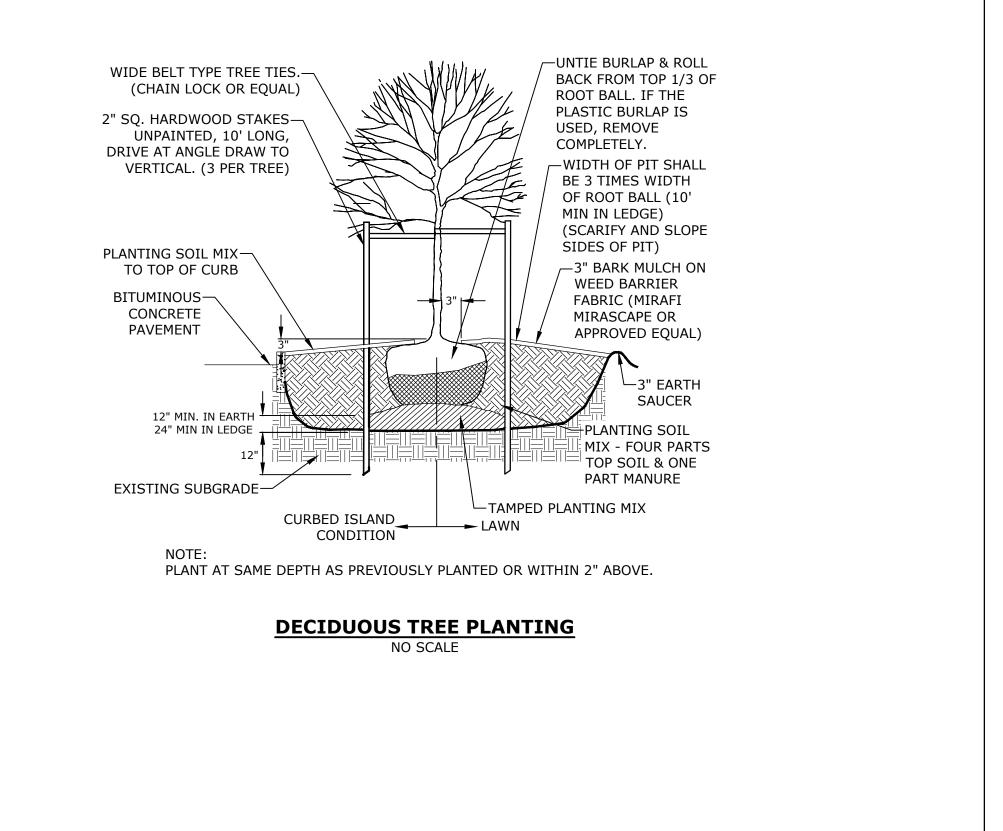
SHEARWATER DRIVE, PORTSMOUTH, NH

| 1                          | 8/21/2023             | TAC Submission |  |
|----------------------------|-----------------------|----------------|--|
| MARK                       | DATE                  | DESCRIPTION    |  |
| PROJE                      | PROJECT NO: C5194-001 |                |  |
| DATE: 08/01/2023           |                       |                |  |
| FILE: C5194-001_C-DTLS.dwg |                       |                |  |
| DRAWI                      | N BY:                 | NHW/CJK        |  |
| DESIG                      | NED/CHECKED           | BY: NAH        |  |
| APPRO                      | VED BY:               | PMC            |  |
| DETAILS SHEET              |                       |                |  |

SCALE: AS SHOWN







# Tighe&Bond





# PROPOSED SINGLE-FAMILY SUBDIVISION

CHINBURG PROPERTIES

SHEARWATER DRIVE, PORTSMOUTH, NH

| 1         | 8/21/2023 | TAC Submission      |
|-----------|-----------|---------------------|
| MARK      | DATE      | DESCRIPTION         |
| PROJEC    | CT NO:    | C5194-001           |
| DATE:     |           | 08/01/2023          |
| FILE:     | C!        | 5194-001_C-DTLS.dwg |
| DRAWN BY: |           | NHW/CJK             |

**DETAILS SHEET** 

NAH

PMC

SCALE: AS SHOWN

DESIGNED/CHECKED BY:

APPROVED BY:

# **Owner's Letter of Authorization**

This letter is to authorize <u>Chinburg Properties</u> (Applicant) to represent the interest of <u>Bantry Bay Assoc LLC</u> (owner) in all site design and permitting matters for the proposed subdivision and development project located at Shearwater Drive in Portsmouth, New Hampshire on a parcel of land identified as Tax Map 217 Block 2 Lot 1900. This authorization shall include any required signatures for local, state and federal permit applications.

| John C Madden | dotloop verified<br>07/31/23 8:53 PM ADT<br>T3Q8-ENTB-I9XF-SIFG | John C. Madden |      |
|---------------|---|----------------|------|
| Sign          | ature   | Print Name     | Date |
| Colton Gove   | dotloop verified<br>07/31/23 8:02 PM EDT<br>PRVL-UPND-TPFR-4TAW | Colton Gove    |      |
| Witr          | 1855  | Print Name     | Date |

(C5194-001\_Owner Authorization Form.docx)

# **Agent Letter of Authorization**

| I, <u>Eric Chinburg</u> , of <u>Chinburg Properties</u> (Applicant) hereby give <u>Tighe &amp; Bond</u> (site/civil Engineer) permission to be my agent in all site design and permitting matters for the proposed subdivision and development project located at Shearwater Drive in Portsmouth, New Hampshire on a parcel of land identified as Tax Map 217 Block 2 Lot 1900. This authorization shall include any required signatures for local, state and federal permit applications. |          |               |      |  |
|--|----------|---------------|------|--|
| Eric J Chinburg  dottoop verifie 07/29/23 10:06 AUQB-4CWG-4  | AM EDT   | Eric Chinburg |      |  |
| Signature  |          | Print Name    | Date |  |
|  |          |               | ٦    |  |
| dotloop verifi<br>07/29/23 10:0<br>52J9-58AD-W   | 8 AM EDT | Colton Gove   |      |  |
| Witness  |          | Print Name    | Date |  |



# 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 preapplication 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. <u>Waiver requests must be submitted in writing with appropriate justification</u>.

| Name of Applicant: Chinburg Properties              | Date Submitted: August 21, 2023 |         |
|---|---------------------------------|---------|
| Application # (in City's online permitting): LU 23- |                                 | Block 2 |
| Site Address: 0 Shearwater Drive                    | Map: _217 _ Lot: _              |         |

|   | Application Requirements   |  |                     |  |  |  |
|---|--|--|---------------------|--|--|--|
| Ø | Required Items for Submittal   | Item Location<br>(e.g. Page or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |  |  |
| Ø | Complete <u>application</u> form submitted via the City's web-based permitting program (2.5.2.1 <b>(2.5.2.3A)</b>  | Enclosed   | N/A                 |  |  |  |
| Ø | 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   |   |                     |  |  |  |
|---|---|---|---------------------|--|--|--|
| Ø | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |  |  |
| A | Statement that lists and describes "green" building components and systems. (2.5.3.1B)  | Enclosed  | Yes                 |  |  |  |
| Ø | 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) | Prototypical<br>Architectural Plans                       | N/A                 |  |  |  |
| A | Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1D)  | Existing Conditions<br>Sheet 1 OF 1                       | N/A                 |  |  |  |

|   | Site Plan Review Application Required Info  | ormation  |                     |
|---|---|---|---------------------|
| Ø | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |
| V | Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1E)  | Enclosed<br>Cover Sheet                                   | N/A                 |
| Ø | nes and addresses (including Tax Map and Lot number and ing districts) of all direct abutting property owners (including perties located across abutting streets) and holders of existing Sheet 1 OF 1 servation, preservation or agricultural preservation restrictions acting the subject property. |   | N/A                 |
| V | Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1G)  | Cover Sheet   | N/A                 |
| A | List of reference plans. (2.5.3.1H)   | General Notes<br>Sheet G-100                              | N/A                 |
| V | List of names and contact information of all public or private utilities servicing the site. (2.5.3.11)   | General Notes<br>Sheet G-100                              | N/A                 |

|   | Site Plan Specifications  |   |                     |  |
|---|---|---|---------------------|--|
| Ø | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |
| Ø | 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<br>sheets                            | N/A                 |  |
| 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<br>sheets                            | N/A                 |  |
| N | 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 Plan Sheet 1 OF 1                     | N/A                 |  |
| Ø | Plans shall be drawn to scale and stamped by a NH licensed civil engineer. (2.5.4.1D)   | Required on all plan<br>sheets                            | N/A                 |  |
| Ø | Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)  | N/A   | N/A                 |  |
| V | Title (name of development project), north point, scale, legend. (2.5.4.2A)   | Required on all plan sheets                               | N/A                 |  |
| Ø | Date plans first submitted, date and explanation of revisions. <b>(2.5.4.2B)</b>  | Required on all plan sheets                               | N/A                 |  |
| V | Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)  | Required on all plan<br>sheets                            | N/A                 |  |
| Ø | Source and date of data displayed on the plan. (2.5.4.2D)   | Required on all plan<br>sheets                            | N/A                 |  |

|                 | Site Plan Specifications – Required Exhibits and Data  |  |                     |  |  |
|-----------------|--|--|---------------------|--|--|
| V               | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #)      | Waiver<br>Requested |  |  |
|                 | <ul> <li>Existing Conditions: (2.5.4.3A)</li> <li>Surveyed plan of site showing existing natural and built features;</li> <li>Existing building footprints and gross floor area;</li> <li>Existing parking areas and number of parking spaces provided;</li> <li>Zoning district boundaries;</li> <li>Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre;</li> <li>Existing impervious and disturbed areas;</li> <li>Limits and type of existing vegetation;</li> <li>Wetland delineation, wetland function and value assessment (including vernal pools);</li> <li>SFHA, 100-year flood elevation line and BFE data, as required.</li> </ul> | Existing Conditions<br>Plan Sheet 1 OF 1                       |                     |  |  |
| <b>\sqrt{1}</b> | <ul> <li>2. Buildings and Structures: (2.5.4.3B)</li> <li>Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;</li> <li>Elevations: Height, massing, placement, materials, lighting, façade treatments;</li> <li>Total Floor Area;</li> <li>Number of Usable Floors;</li> <li>Gross floor area by floor and use.</li> </ul>   | Site Plan Sheet<br>C-102 & Prototypical<br>Architectural Plans |                     |  |  |
|                 | <ul> <li>3. Access and Circulation: (2.5.4.3C)</li> <li>Location/width of access ways within site;</li> <li>Location of curbing, right of ways, edge of pavement and sidewalks;</li> <li>Location, type, size and design of traffic signing (pavement markings);</li> <li>Names/layout of existing abutting streets;</li> <li>Driveway curb cuts for abutting prop. and public roads;</li> <li>If subdivision; Names of all roads, right of way lines and easements noted;</li> <li>AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).</li> </ul>  | Site Plan Sheet<br>C-102                                       |                     |  |  |
| Ø               | <ul> <li>4. Parking and Loading: (2.5.4.3D)</li> <li>Location of off street parking/loading areas, landscaped areas/buffers;</li> <li>Parking Calculations (# required and the # provided).</li> </ul>   | Site Plan Sheet<br>C-102                                       |                     |  |  |
| $\square$       | <ul> <li>5. Water Infrastructure: (2.5.4.3E)</li> <li>Size, type and location of water mains, shut-offs, hydrants &amp; Engineering data;</li> <li>Location of wells and monitoring wells (include protective radii).</li> </ul>   | Utilities Plan Sheet<br>C-104                                  |                     |  |  |
| $\square$       | <ul> <li>Sewer Infrastructure: (2.5.4.3F)</li> <li>Size, type and location of sanitary sewage facilities &amp; Engineering data, including any onsite temporary facilities during construction period.</li> </ul>  | Utilities Plan Sheet<br>C-104                                  |                     |  |  |

|     |   |                      | 1 |
|-----|---|----------------------|---|
|     | 7. Utilities: (2.5.4.3G)  | Utilities Plan Sheet |   |
|     | The size, type and location of all above & below ground utilities;      Size type and location of apparatus gode transferment and others. | C-104                |   |
|     | <ul> <li>Size type and location of generator pads, transformers and other<br/>fixtures.</li> </ul>  |                      |   |
| Н   |   |                      |   |
| ш   | 8. Solid Waste Facilities: (2.5.4.3H)   | N/A                  |   |
|     | The size, type and location of solid waste facilities.  | N/A                  |   |
|     | 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- cite snow removed provisions.  | Utilities Plan Sheet |   |
|     | <ul><li>site snow removal provisions.</li><li>Location and containment measures for any salt storage facilities</li></ul>                 | C-104                |   |
|     | 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   | N/A                  |   |
|     | and any other areas of the site) and photometric plan.  |                      |   |
|     | <b>11.</b> Indicate where dark sky friendly lighting measures have been implemented. <b>(10.1)</b>  | N/A                  |   |
|     | 12. Landscaping: (2.5.4.3K)   |                      |   |
| ╽┕╴ | Identify all undisturbed area, existing vegetation and that   | Landscape Plan Sheet |   |
|     | which is to be retained;  | C-105                |   |
|     | <ul> <li>Location of any irrigation system and water source.</li> </ul>   | 0 100                |   |
|     | 13. Contours and Elevation: (2.5.4.3L)  | Grading, Drainage, & |   |
|     | <ul> <li>Existing/Proposed contours (2 foot minimum) and finished</li> </ul>  | Erosion Control Plan |   |
|     | grade elevations.   | C-105                |   |
|     | 14. Open Space: (2.5.4.3M)  | Site Plan Sheet      |   |
|     | <ul> <li>Type, extent and location of all existing/proposed open space.</li> </ul>  | C-102                |   |
|     | 15. All easements, deed restrictions and non-public rights of   | Drainage Easement    |   |
|     | ways. (2.5.4.3N)  | Plan Sheet C-201     |   |
|     | 16. Character/Civic District (All following information shall be  |                      |   |
|     | included): (2.5.4.3P)   |                      |   |
|     | <ul> <li>Applicable Building Height (10.5A21.20 &amp; 10.5A43.30);</li> </ul>   | Site Plan Sheet      |   |
|     | Applicable Special Requirements (10.5A21.30);  Programmed by idding forms (type (10.5A43));   | C-102                |   |
|     | <ul> <li>Proposed building form/type (10.5A43);</li> <li>Proposed community space (10.5A46).</li> </ul>                                   |                      |   |
|     | Froposed community space (10.3A40).   |                      |   |
|     | 17. Special Flood Hazard Areas (2.5.4.3Q)   |                      |   |
| _   | <ul> <li>The proposed development is consistent with the need to</li> </ul>   |                      |   |
|     | minimize flood damage;  |                      |   |
|     | All public utilities and facilities are located and construction to   | N/A                  |   |
|     | <ul><li>minimize or eliminate flood damage;</li><li>Adequate drainage is provided so as to reduce exposure to</li></ul>                   |                      |   |
|     | flood hazards.  |                      |   |
|     |   |                      |   |

|   | Other Required Information   |   |                     |  |  |
|---|--|---|---------------------|--|--|
| V | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>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)   | Grading, Drainage, & Erosion Control Plan C               | 105                 |  |  |
|   | 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)  | Grading, Drainage, & Erosion Control Plan C-              | 105                 |  |  |
|   | Inspection and Maintenance Plan (7.6.5)  | N/A   |                     |  |  |

|   | Final Site Plan Approval Required Information   |  |                     |  |
|---|---|--|---------------------|--|
| V | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #)  | Waiver<br>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  |                     |  |
|   | <ul> <li>Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: <ul> <li>Calculations relating to stormwater runoff;</li> <li>Information on composition and quantity of water demand and wastewater generated;</li> <li>Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls;</li> <li>Estimates of traffic generation and counts pre- and post-construction;</li> <li>Estimates of noise generation;</li> <li>A Stormwater Management and Erosion Control Plan;</li> <li>Endangered species and archaeological / historical studies;</li> <li>Wetland and water body (coastal and inland) delineations;</li> <li>Environmental impact studies.</li> </ul> </li> <li>(2.5.3.2B)</li> </ul> | N/A  |                     |  |
|   | 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)   | Unitil Will Serve Letter has<br>been included. The<br>applicant is currently<br>working with Eversource<br>to get a will serve letter. |                     |  |

|                         | Final Site Plan Approval Required Info   | 1   |                     |
|-------------------------|--|---|---------------------|
| $\overline{\mathbf{A}}$ | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>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<br>C-102                                  | 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   |                     |
|                         |  | Site Plan Sheet<br>C-102                                  | N/A                 |

| Applicant's Signature: | 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: Bantry Bay Association LLC  | Date Submitted: <u>8/21/2023</u> | <b>J</b>                   |
|------------------------------------|----------------------------------|----------------------------|
| Applicant: Chinburg Properties     |                                  |                            |
| Phone Number: 603-969-9148         | E-mail: _massia@chinburg.com     |                            |
| Site Address 1: 0 Shearwater Drive |                                  | Block 2<br>p: 217 Lot 1900 |
| Site Address 2: TBD                | Ma                               | p: Lot:                    |

|          | Application Requirements  |  |                     |  |
|----------|---|--|---------------------|--|
| Ø        | Required Items for Submittal  | Item Location<br>(e.g. Page or<br>Plan Sheet/Note #) | Waiver<br>Requested |  |
| ✓        | Completed Application form. (III.C.2-3)   | Enclosed   | N/A                 |  |
| <b>V</b> | 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) | Enclosed   | N/A                 |  |

| Requirements for Preliminary/Final Plat |  |   |   |                     |
|---|--|---|---|---------------------|
| Ø                                       | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Required for<br>Preliminary / Final<br>Plat | Waiver<br>Requested |
| <b>V</b>                                | 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   | ☑ Preliminary Plat ☑ Final Plat             | N/A                 |

|             | Requirements for Pro  | eliminary/Final Plat   |   |                     |
|-------------|---|--|---|---------------------|
| V           | Required Items for Submittal  | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #)            | Required for<br>Preliminary / Final<br>Plat | Waiver<br>Requested |
| \<br>\<br>\ | 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<br>Sheet 1 OF 1                                  | ☑ Preliminary Plat ☑ Final Plat             | N/A                 |
| <b>V</b>    | North point, date, and bar scale. (Section IV.3/V3)   | Required on all Plan Sheets  | ☑ Preliminary Plat ☑ Final Plat             | N/A                 |
| <b>V</b>    | Zoning classification and minimum yard dimensions required. (Section IV.4/V.4)  | Site Plan Sheet<br>C-102   | ☑ 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 Plan Sheet 1 OF 1  Subdivision Plan Sheet 1 OF 1 | ☑ Preliminary Plat ☑ Final Plat             | N/A                 |
| <b>\</b>    | 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<br>Sheet 1 OF 1                                     | ☑ 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<br>Sheet 1 OF 1                                     | ☑ Preliminary Plat ☑ Final Plat             | N/A                 |
| <b>\</b>    | 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)  | Site Plan Sheet<br>C-102<br>Utilities Plan Sheet<br>C-104            | ☑ Preliminary Plat<br>☑ Final Plat          |                     |

|            | Requirements for Preliminary/Final Plat  |  |   |                     |  |  |  |
|------------|--|--|---|---------------------|--|--|--|
| V          | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #)  | Required for<br>Preliminary / Final<br>Plat | Waiver<br>Requested |  |  |  |
| \<br> <br> | 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<br>Plan Sheet 1 OF 1   | ☑ Preliminary Plat ☑ Final Plat             |                     |  |  |  |
| <b>\</b>   | 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   | Existing Conditions<br>Plan Sheet 1 OF 1   | ☑ Preliminary Plat ☑ 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)   | Site Plan Sheet<br>C-102<br>Grading, Drainage, &<br>Erosion Control Plan<br>C-105<br>Utilities Plan Sheet<br>C-104 |   |                     |  |  |  |
| <b>\</b>   | 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             |                     |  |  |  |
| <b>\</b>   | 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) | Existing Conditions<br>Plan Sheet 1 OF 1<br>Grading, Drainage, &<br>Erosion Control Plan<br>C-103                  | ☑ Preliminary Plat ☑ Final Plat             |                     |  |  |  |

| Requirements for Preliminary/Final Plat |  |   |   |                     |
|---|--|---|---|---------------------|
| Ø                                       | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Required for<br>Preliminary / Final<br>Plat | Waiver<br>Requested |
| <b>\</b>                                | 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             |                     |
| <b>\</b>                                | 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             |                     |
| <b>\</b>                                | Location of all permanent monuments. (Section V.12)  | Subdivision Plan<br>Sheet 1 OF 1                          | ☐ Preliminary Plat ☐ Final Plat             |                     |

|  | General Requirements <sup>1</sup>   |   |                     |  |  |  |  |
|--|---|---|---------------------|--|--|--|--|
| Ø                                      | Required Items for Submittal  | Item Location (e.g. Page/line or Plan Sheet/Note #)                                     | Waiver<br>Requested |  |  |  |  |
|  | <ul> <li>1. Basic Requirements: (VI.1)</li> <li>a. Conformity to Official Plan or Map</li> <li>b. Hazards</li> <li>c. Relation to Topography</li> <li>d. Planned Unit Development</li> </ul>  | Subdivision Plan<br>Sheet 1 OF 1<br>PUD not proposed                                    |                     |  |  |  |  |
| \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | <ul><li>2. Lots: (VI.2)</li><li>a. Lot Arrangement</li><li>b. Lot sizes</li><li>c. Commercial and Industrial Lots</li></ul>   | Subdivision Plan<br>Sheet 1 OF 1<br>No commercial or industrial<br>development proposed |                     |  |  |  |  |
|  | 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 | N/A No new streets proposed   |                     |  |  |  |  |
|  | 4. Curbing: (VI.4)  | Site Plan Sheet C-102   |                     |  |  |  |  |
|  | 5. Driveways: (VI.5)  | Site Plan Sheet C-102   |                     |  |  |  |  |
| <b>V</b>                               | 6. Drainage Improvements: (VI.6)  | Sheet C-103   |                     |  |  |  |  |
| <b>✓</b>                               | 7. Municipal Water Service: (VI.7)  | Sheet C-104   |                     |  |  |  |  |
| ✓                                      | 8. Municipal Sewer Service: (VI.8)  | Sheet C-104   |                     |  |  |  |  |
| >>>                                    | <ul><li>9. Installation of Utilities: (VI.9)</li><li>a. All Districts</li><li>b. Indicator Tape</li></ul>   | Sheet C-104   |                     |  |  |  |  |
| <ul><li>✓</li><li>✓</li></ul>          | 10. On-Site Water Supply: (VI.10)   | N/A   |                     |  |  |  |  |
|  | 11. On-Site Sewage Disposal Systems: (VI.11)  | N/A   |                     |  |  |  |  |
| >>>>>                                  | <ul><li>12. Open Space: (VI.12)</li><li>a. Natural Features</li><li>b. Buffer Strips</li><li>c. Parks</li><li>d. Tree Planting</li></ul>  | Site Plan Sheet C-102   |                     |  |  |  |  |
|  | 13. Flood Hazard Areas: (VI.13)  a. Permits b. Minimization of Flood Damage c. Elevation and Flood-Proofing Records d. Alteration of Watercourses  14. Erosion and Sedimentation Control (VI.14)  | N/A   |                     |  |  |  |  |
|  | 14. E1051011 and Sedimentation Control (VI.14)  | Sheet C-103   | <u> </u>            |  |  |  |  |

| V            | Required Items for Submittal   | Item Location<br>(e.g. Page/line or<br>Plan Sheet/Note #) | Waiver<br>Requested |
|--------------|--|---|---------------------|
| \<br>\<br>\  | <ul><li>15. Easements (VI.15)</li><li>a. Utilities</li><li>b. Drainage</li></ul> | Drainage Easement<br>Plan Sheet C-201                     |                     |
| <b>V</b>     | 16. Monuments: (VI.16)   | Subdivision Plan Sheet 1 OF 1                             |                     |
| < >          | 17. Benchmarks: (VI.17)  | Subdivision Plan Sheet 1 OF 1                             |                     |
| $\checkmark$ | 18. House Numbers (VI.18)  | TBD   |                     |

|            |    | Design Standards  |  |                     |
|------------|----|---|--|---------------------|
|            |    | Required Items for Submittal  | Indicate compliance and/or provide explanation as to alternative design  | Waiver<br>Requested |
| \<br>\<br> | 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 | Site Plan Sheet<br>C-102<br>Grading, Drainage, &<br>Erosion Control Plan<br>C-105<br>Utilities Plan Sheet<br>C-104 |                     |
| <b>V</b>   | 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   | Grading, Drainage, &<br>Erosion Control Plan<br>C-105  |                     |
| <b>V</b>   | 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   | Utilities Plan Sheet<br>C-104  |                     |
| <b>V</b>   | 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  | Utilities Plan Sheet<br>C-104  |                     |

| Applicant 3/ Nepresentative 3 Signature | Applicant's/Representative's Signature: | Date: 8/21/2023 |
|---|---|-----------------|
|---|---|-----------------|

 $<sup>^{1}</sup>$  See City of Portsmouth, NH Subdivision Rules and Regulations for details. Subdivision Application Checklist/January 2018

## **Site Plan Review Application Fee**

| Project:       | 0 Shearwater Drive                                    |                        | Map/Lot: Map 2 | 17 Block 2 Lot 1900 |
|----------------|---|------------------------|----------------|---------------------|
| Applicant:     | Chinburg Properties                                   |                        |                |                     |
| All developm   | ent   |                        |                |                     |
| Base fee \$600 | )   |                        |                | \$600.00            |
| Plus \$5.00 pe | r \$1,000 of site costs<br>Site costs                 | \$300,000              |                | + \$1,500.00        |
| Plus \$10.00 p | er 1,000 S.F. of site develo<br>Site development area | pment area<br>97,314 S | S.F.           | + \$973.14          |
|                |   |                        | Fee            | \$3,073.14          |
| Maximum fee    | e: \$20,000.00  |                        |                |                     |
| Fee received   | by:   |                        | Dat            | :e:                 |

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.

## **Subdivision Application Fee**

Map/Lot: Map 217 Block 2 Lot 1900

**Project:** 

0 Shearwater Drive

| Applicant: Chinburg Properties   |                      |
|----------------------------------|----------------------|
| X Residential subdivision        |                      |
| \$600 plus \$200 per lot         |                      |
| Number of lots 9                 | Fee \$2,400.00       |
| ☐ Non-residential subdivision    |                      |
| \$800 plus \$300 per lot         |                      |
| Number of lots                   | Fee \$0.00           |
| ☐ Lot line revision/verification |                      |
| \$250                            | _                    |
|                                  | Fee                  |
| ☐ Filing of condominium site     |                      |
| \$100                            | 5 40.00              |
|                                  | Fee \$0.00           |
| ☐ Lot consolidation              |                      |
| \$175                            | f                    |
|                                  | Fee \$0.00           |
|                                  | Total fee \$2,400.00 |
|                                  |                      |
| Fee received by:                 | Date:                |



August 14, 2023

Matt Assia Chinburg Development 3 Penstock Way Newmarket NH 03857

RE: Natural Gas Availability to Shearwater Dr Portsmouth NH

Dear Matt,

Unitil's natural gas division has reviewed the requested site for natural gas service.

Unitil hereby confirms natural gas service will be available to the Shearwater Dr Portsmouth Project to serve nine new residential single family homes.

Installation is pending an authorized installation agreement with Chinburg Development and street opening approval from the City of Portsmouth DPW.

Let me know if you have any questions. You can email me at oliver@unitil.com. My phone number is 603-294-5174.

Sincerely,

Janet Oliver Senior Business Development Representative



# CARBONARA CLASSIC W WING 1027.127 GL

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

Artform Home Plans ("Artform") requires that our Drawings be built substantially as designed. Artform will not be obligated by or liable for use of this design with markups as part of any builder agreement. While we attempt to accommodate where possible and reasonable, and where the changes do not denigrate our design, any and all changes to Drawings must be approved in writing by Artform. It is recommended that you have your Drawing updated by Artform prior to attaching any Drawing to any builder agreement. Artform shall not be responsible for the misuse of or unauthorized alterations to any of its Drawings.

BUILDING SIZE, STYLE, AND LOCATION SHOWN ARE APPROXIMATE AND FOR DEMONSTRATIVE PURPOSES ONLY. FINAL BUILDING LOCATION, SIZE, AND STYLES TO BE DETERMINED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, AND SHALL MEET ALL APPLICABLE CITY AND STATE REGULATIONS.



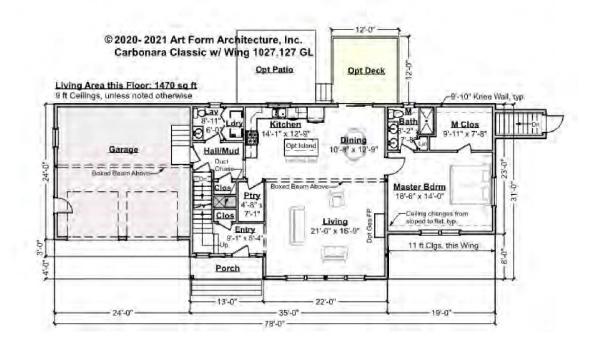
| Width 78.00 FT | Donath 21 00 FT       | Height 26.83 FT |
|----------------|-----------------------|-----------------|
| widin /8.00    | <b>Depth</b> 31.00 F1 | neiani ∠o.83    |

| LIVING AREA          | 2885 <sup>FT</sup> | BEDROOMS             | 5 | BATHROOMS            | 3.5 |
|----------------------|--------------------|----------------------|---|----------------------|-----|
| Main                 | 2885 <sup>FT</sup> | Main                 | 3 | Main                 | 3.5 |
| Future               | 0 FT               | Future               | 2 | Future               | 0   |
| 2 <sup>nd</sup> Unit | 0 FT               | 2 <sup>nd</sup> Unit | 0 | 2 <sup>nd</sup> Unit | 0   |



### CARBONARA CLASSIC W WING - 1<sup>ST</sup> FLOOR 1027,127 GL

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



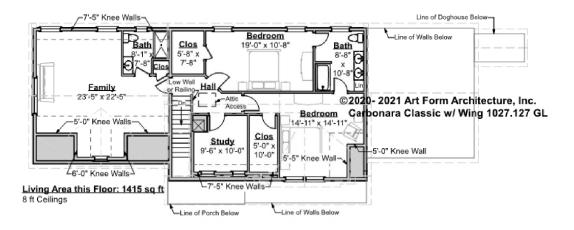
#### CLG HT SHOWN 9'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 1470 <sup>FT</sup>    | F1 BEDROOMS          | 1    | F1 BATHROOMS         | 1.5  |
|----------------------|-----------------------|----------------------|------|----------------------|------|
| Main                 | 1470.00 <sup>FT</sup> | Main                 | 1.00 | Main                 | 1.50 |
| Future               | 0.00 FT               | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 <sup>FT</sup>    | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



# CARBONARA CLASSIC W WING - 2<sup>ND</sup> FLOOR 1027.127 GL

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



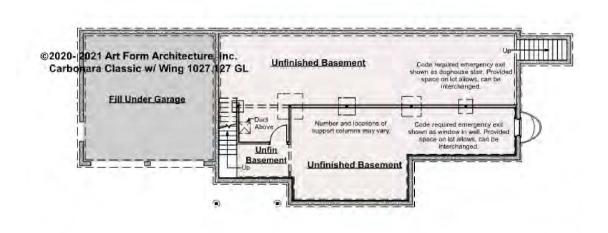
#### CLG HT SHOWN 8'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 1415 <sup>FT</sup> | F1 BEDROOMS          | 4    | F1 BATHROOMS         | 2    |
|----------------------|--------------------|----------------------|------|----------------------|------|
| Main                 | 1415.00 FT         | Main                 | 2.00 | Main                 | 2.00 |
| Future               | 0.00 <sup>FT</sup> | Future               | 2.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 <sup>FT</sup> | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



# CARBONARA CLASSIC W WING - BASEMENT 1027.127 GL

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



#### CLG HT SHOWN 7'-8" CLG HT POSSIBLE 9'-0"

| F1 LIVING AREA       | 0 FT    | F1 BEDROOMS          | 0    | F1 BATHROOMS         | 0    |
|----------------------|---------|----------------------|------|----------------------|------|
| Main                 | 0.00 FT | Main                 | 0.00 | Main                 | 0.00 |
| Future               | 0.00 FT | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



#### CARBONARA CLASSIC W WING -FRONT ELEVATION 1027.127 GL





#### CARBONARA CLASSIC W WING -RIGHT ELEVATION 1027.127 GL





### CARBONARA CLASSIC W WING -REAR ELEVATION 1027.127 GL





# CARBONARA CLASSIC W WING - LEFT ELEVATION 1027.127 GL





# **DAMARA** 861.124 GR

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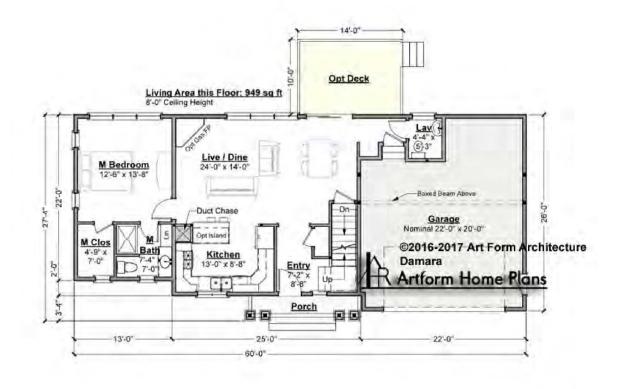


| LIVING AREA          | 2029 FT | BEDROOMS             | 4 | BATHROOMS            | 3.5 |
|----------------------|---------|----------------------|---|----------------------|-----|
| Main                 | 2029 FT | Main                 | 4 | Main                 | 3.5 |
| Future               | 0 FT    | Future               | 0 | Future               | 0   |
| 2 <sup>nd</sup> Unit | 0 FT    | 2 <sup>nd</sup> Unit | 0 | 2 <sup>nd</sup> Unit | 0   |



### DAMARA - 1<sup>ST</sup> FLOOR 861.124 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



#### CLG HT SHOWN 8'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 949 <sup>FT</sup>  | F1 BEDROOMS          | 1    | F1 BATHROOMS         | 1.5  |
|----------------------|--------------------|----------------------|------|----------------------|------|
| Main                 | 949.00 FT          | Main                 | 1.00 | Main                 | 1.50 |
| Future               | 0.00 <sup>FT</sup> | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 <sup>FT</sup> | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



### DAMARA - 2<sup>ND</sup> FLOOR 861.124 GR

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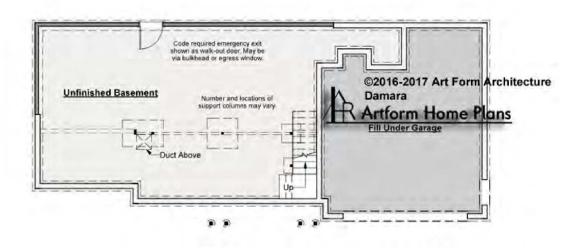
#### CLG HT SHOWN 8'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 1080 <sup>FT</sup> | F1 BEDROOMS          | 3    | F1 BATHROOMS         | 2    |
|----------------------|--------------------|----------------------|------|----------------------|------|
| Main                 | 1080.00 FT         | Main                 | 3.00 | Main                 | 2.00 |
| Future               | 0.00 FT            | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT            | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



#### **DAMARA - BASEMENT** 861.124 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



#### CLG HT SHOWN 7'-8" CLG HT POSSIBLE 9'-0"

| F1 LIVING AREA       | 0 FT    | F1 BEDROOMS          | 0    | F1 BATHROOMS         | 0    |
|----------------------|---------|----------------------|------|----------------------|------|
| Main                 | 0.00 FT | Main                 | 0.00 | Main                 | 0.00 |
| Future               | 0.00 FT | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



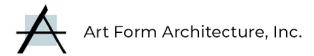
#### **DAMARA - FRONT ELEVATION** 861.124 GR





#### **DAMARA - RIGHT ELEVATION** 861.124 GR





#### **DAMARA - REAR ELEVATION** 861.124 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

D Second floor windows over 8 ft first floors over walkout basements DO qualify as egress without lowering window. If first floor is raised to 9 ft, window will need to be lowered, which triggers other requirements, such as window guards and/or tempering





#### **DAMARA - LEFT ELEVATION** 861.124 GR





# Art Form Architecture, Inc.

#### FIONA 395.124.v5 GR

We have this in reverse as well (Garage on the Left), at no additional charge.

Reverse plan available.

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

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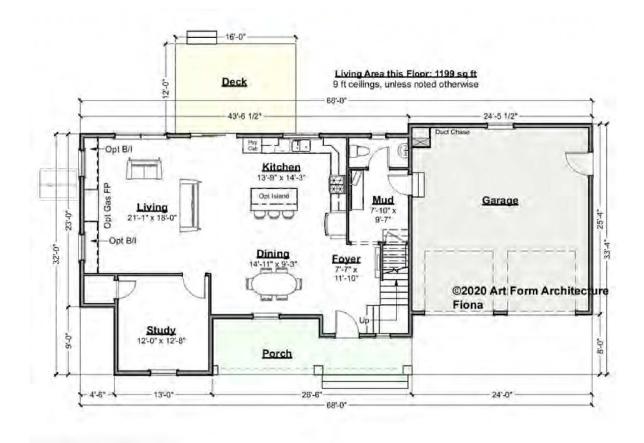
| MILLION OF THE | oo oo FT                         |                       |
|----------------|----------------------------------|-----------------------|
| Width 68.00 FT | <b>Depth</b> 32.00 <sup>F1</sup> | <b>Height</b> 26.16 F |

| LIVING AREA          | 2804 <sup>FT</sup> | BEDROOMS             | 4 | BATHROOMS            | 2.5 |
|----------------------|--------------------|----------------------|---|----------------------|-----|
| Main                 | 2804 FT            | Main                 | 3 | Main                 | 2.5 |
| Future               | 0 FT               | Future               | 1 | Future               | 0   |
| 2 <sup>nd</sup> Unit | 0 FT               | 2 <sup>nd</sup> Unit | 0 | 2 <sup>nd</sup> Unit | 0   |



### FIONA - 1<sup>ST</sup> FLOOR 395.124.v5 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



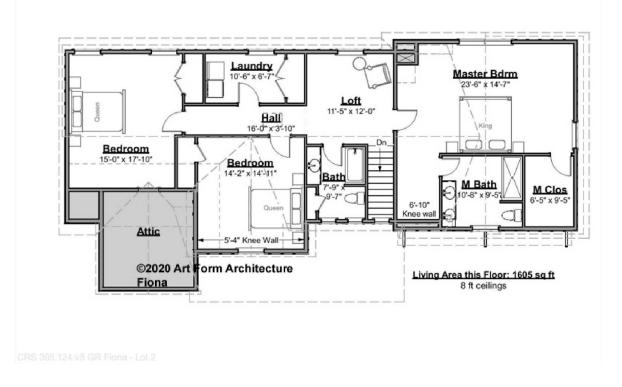
#### CLG HT SHOWN 9'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 1199 <sup>FT</sup>    | F1 BEDROOMS          | 1    | F1 BATHROOMS         | 0.5  |
|----------------------|-----------------------|----------------------|------|----------------------|------|
| Main                 | 1199.00 <sup>FT</sup> | Main                 | 0.00 | Main                 | 0.50 |
| Future               | 0.00 FT               | Future               | 1.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 <sup>FT</sup>    | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



### FIONA - 2<sup>ND</sup> FLOOR 395.124.v5 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



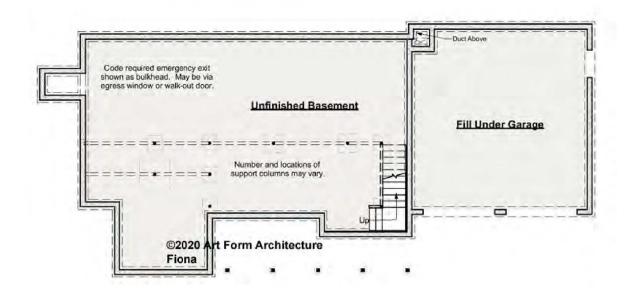
#### CLG HT SHOWN 8'-0" CLG HT POSSIBLE 8'-0"

| F1 LIVING AREA       | 1605 <sup>FT</sup> | F1 BEDROOMS          | 3    | F1 BATHROOMS         | 2    |
|----------------------|--------------------|----------------------|------|----------------------|------|
| Main                 | 1605.00 FT         | Main                 | 3.00 | Main                 | 2.00 |
| Future               | 0.00 FT            | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT            | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



#### FIONA - BASEMENT 395.124.v5 GR

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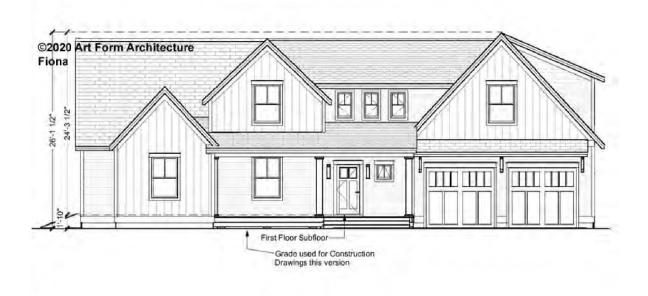


#### CLG HT SHOWN 7'-8" CLG HT POSSIBLE 9'-0"

| F1 LIVING AREA       | 0 FT    | F1 BEDROOMS          | 0    | F1 BATHROOMS         | 0    |
|----------------------|---------|----------------------|------|----------------------|------|
| Main                 | 0.00 FT | Main                 | 0.00 | Main                 | 0.00 |
| Future               | 0.00 FT | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



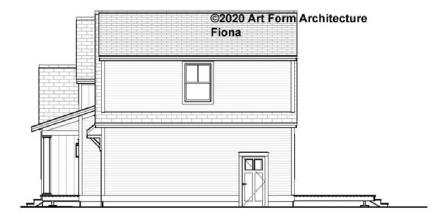
# FIONA - FRONT ELEVATION 395.124.v5 GR





# FIONA - RIGHT ELEVATION 395.124.v5 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

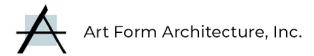


CRS 395 124 v5 GR Fiona - Lot 2



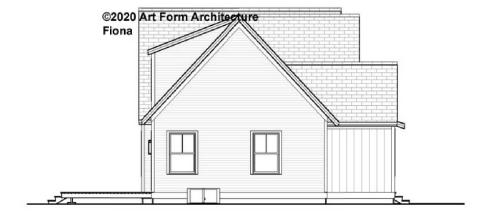
# FIONA - REAR ELEVATION 395.124.v5 GR





# FIONA - LEFT ELEVATION 395.124.v5 GR

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



CRS 395.124.v5 GR Fiona - Lot :



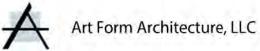
#### FIONA - REAR RENDER 395.124.v5 GR



#### **Garnet Premier**

384.129.v35 GR (8/8/2023)

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#### Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

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#### Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Art Form
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

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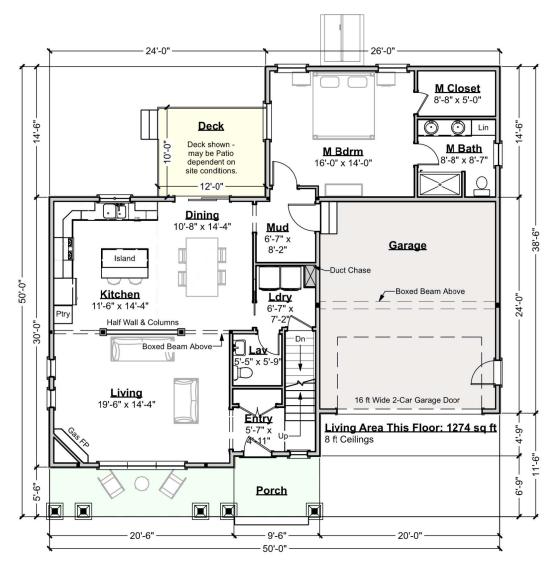
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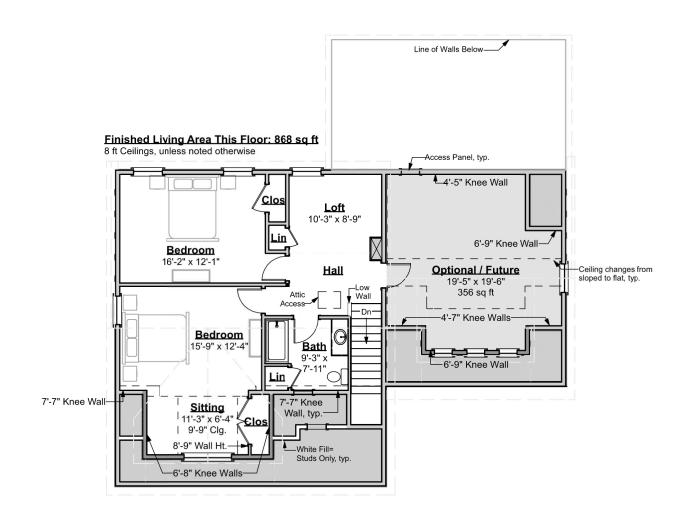
# **First Floor Plan**

Scale: 3/32" = 1'-0"

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### **Second Floor Plan**

Scale: 3/32" = 1'-0"

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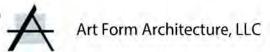
603-431-9559

Code required emergency exit shown as bulkhead. May be via egress window or walk-out door. Duct Above **Unfinished Basement** Fill Under Garage Number and locations of support columns may vary.

## **Foundation Plan**

Scale: 3/32" = 1'-0"

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**Front Elevation** 

Scale: 1/8" = 1'-0"

### **Garnet Premier**

384.129.v35 GR (8/8/2023)

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Right Elevation Scale: 1/8" = 1'-0"

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**Rear Elevation** 

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**Left Elevation** 

370.124.v20 GL (8/8/2023)

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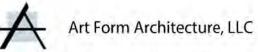
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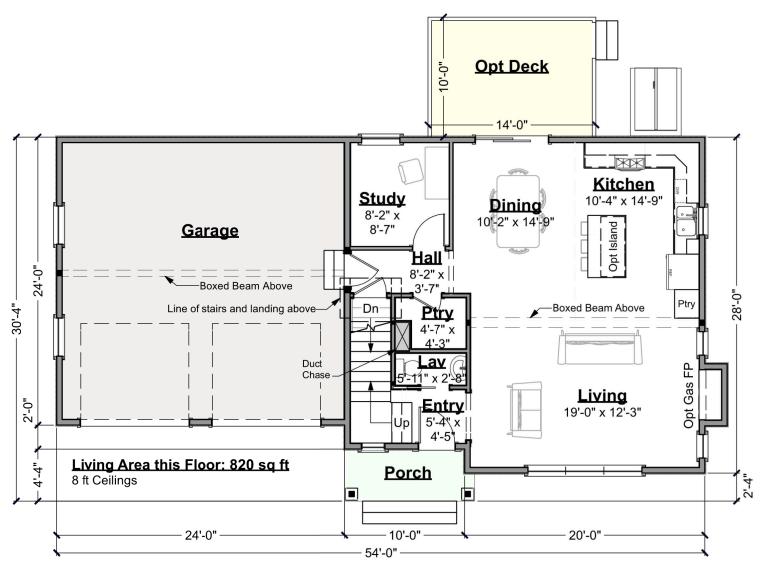
370.124.v20 GL (8/8/2023)

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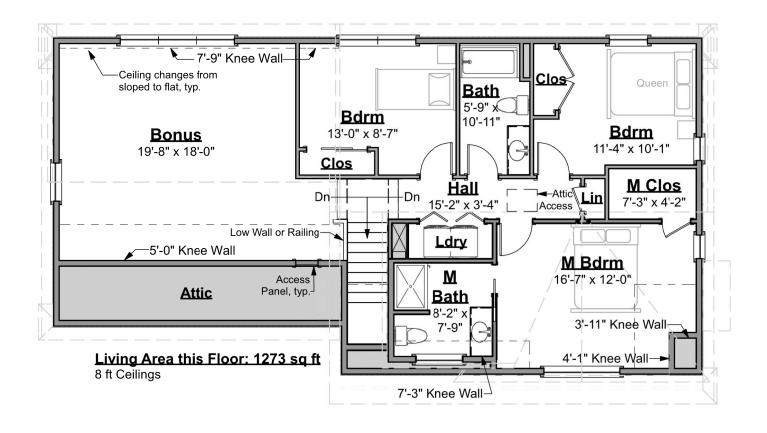


### **First Floor Plan**

370.124.v20 GL (8/8/2023)

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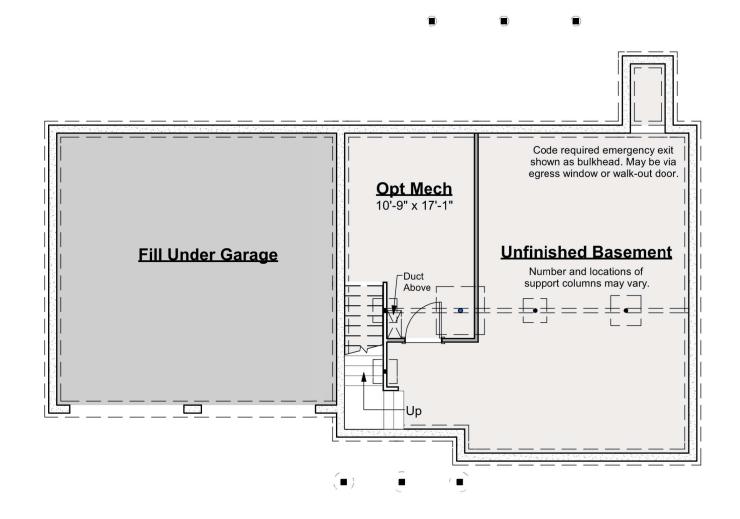
### **Second Floor Plan**

370.124.v20 GL (8/8/2023)

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### **Foundation Plan**

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**Front Elevation** 

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Right Elevation

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**Rear Elevation** 

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**Left Elevation** 



# PEPPERCORN CLASSIC WITH WING 975.127.v3 GL

This plan is Tier 2 because original was for Portland Maine that doesn't allow us to give you the choices we normally give. Tier 2 gives us the time to add that back in.

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

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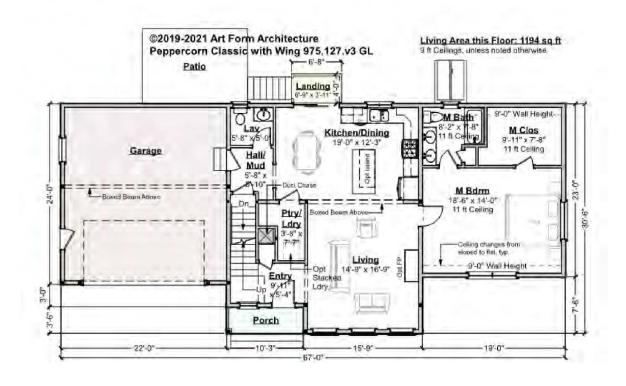
| 144 44 AT AA FT | FT                               | Height 25.66 FT  |
|-----------------|----------------------------------|------------------|
| Width 67.00 FT  | <b>Depth</b> 30.60 <sup>F1</sup> | Height 25 66 ' ' |
|                 |                                  |                  |

| LIVING AREA          | 2294 <sup>FT</sup> | BEDROOMS             | 3 | BATHROOMS            | 2.5 |
|----------------------|--------------------|----------------------|---|----------------------|-----|
| Main                 | 2294 <sup>FT</sup> | Main                 | 3 | Main                 | 2.5 |
| Future               | 0 FT               | Future               | 0 | Future               | 0   |
| 2 <sup>nd</sup> Unit | 0 FT               | 2 <sup>nd</sup> Unit | 0 | 2 <sup>nd</sup> Unit | 0   |



## PEPPERCORN CLASSIC WITH WING - 1<sup>ST</sup> FLOOR 975.127.v3 GL

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



#### CLG HT SHOWN 9'-0" CLG HT POSSIBLE 9'-0"

\* Major Change Fee, see website plan page for cost

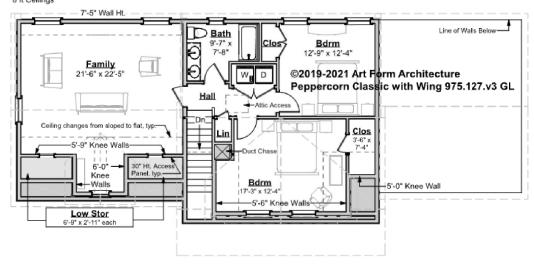
| F1 LIVING AREA       | 1194 <sup>FT</sup>    | F1 BEDROOMS          | 1    | F1 BATHROOMS         | 1.5  |
|----------------------|-----------------------|----------------------|------|----------------------|------|
| Main                 | 1194.00 <sup>FT</sup> | Main                 | 1.00 | Main                 | 1.50 |
| Future               | 0.00 <sup>FT</sup>    | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 <sup>FT</sup>    | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



## PEPPERCORN CLASSIC WITH WING - 2<sup>ND</sup> FLOOR 975.127.v3 GL

Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.

#### Living Area this Floor: 1100 sq ft 8 ft Ceilings



#### CLG HT SHOWN 8'-0" CLG HT POSSIBLE 9'-0"

\* Major Change Fee, see website plan page for cost

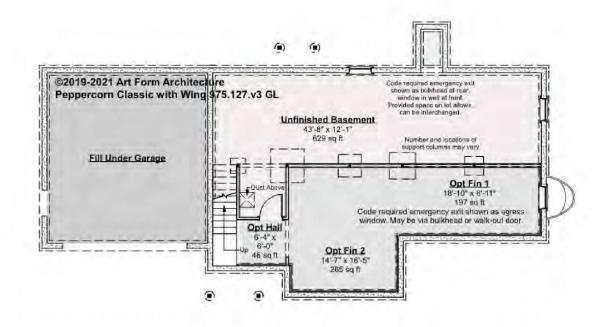
| F1 LIVING AREA       | 1100 <sup>FT</sup> | F1 BEDROOMS          | 2    | F1 BATHROOMS         | 1    |
|----------------------|--------------------|----------------------|------|----------------------|------|
| Main                 | 1100.00 FT         | Main                 | 2.00 | Main                 | 1.00 |
| Future               | 0.00 FT            | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT            | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



### PEPPERCORN CLASSIC WITH WING -BASEMENT 975.127.v3 GL

The construction drawings show this lower level as finished. We don't include that in our data chart so Search isn't misleading. Everybody knows you can finish a basement!

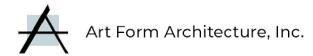
Some features shown are optional. Your Purchase & Sale Agreement governs, whether items are labeled "optional" in this document or not.



#### CLG HT SHOWN 7'-8" CLG HT POSSIBLE 9'-0"

\* Major Change Fee, see website plan page for cost

| F1 LIVING AREA       | 0 FT    | F1 BEDROOMS          | 0    | F1 BATHROOMS         | 0    |
|----------------------|---------|----------------------|------|----------------------|------|
| Main                 | 0.00 FT | Main                 | 0.00 | Main                 | 0.00 |
| Future               | FT      | Future               | 0.00 | Future               | 0.00 |
| 2 <sup>nd</sup> Unit | 0.00 FT | 2 <sup>nd</sup> Unit | 0.00 | 2 <sup>nd</sup> Unit | 0.00 |



### PEPPERCORN CLASSIC WITH WING -FRONT ELEVATION 975.127.v3 GL





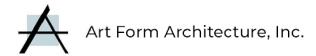
### PEPPERCORN CLASSIC WITH WING -RIGHT ELEVATION 975.127.v3 GL





### PEPPERCORN CLASSIC WITH WING -REAR ELEVATION 975.127.v3 GL





### PEPPERCORN CLASSIC WITH WING -LEFT ELEVATION 975.127.v3 GL



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BUILDING SIZE, STYLE, AND LOCATION SHOWN ARE APPROXIMATE AND FOR DEMONSTRATIVE PURPOSES ONLY. FINAL BUILDING LOCATION, SIZE, AND STYLES TO BE DETERMINED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT, AND SHALL MEET ALL APPLICABLE CITY AND STATE REGULATIONS.

#### Dear Builders and Home Buyers,

In addition to our Terms and Conditions (the "Terms"), please be aware of the following:

This design may not yet have Construction Drawings (as defined in the Terms), and is, therefore, only available as a Design Drawing (as defined in the Terms and together with Construction Drawings, "Drawings'). It is possible that during the conversion of a Design Drawing to a final Construction Drawing, changes may be necessary including, but not limited to, dimensional changes. Please see Plan Data Explained on www.artform.us to understand room sizes, dimensions and other data provided. We are not responsible for typographical errors.

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#### Facade Changes:

- To maintain design integrity, we pay particular attention to features on the front facade, including but not limited to door surrounds, window casings, finished porch column sizes, and roof friezes. While we may allow builders to add their own flare to aesthetic elements, we don't allow our designs to be stripped of critical details. Any such alterations require the express written consent of Art Form.
- Increasing ceiling heights usually requires adjustments to window sizes and other exterior elements.

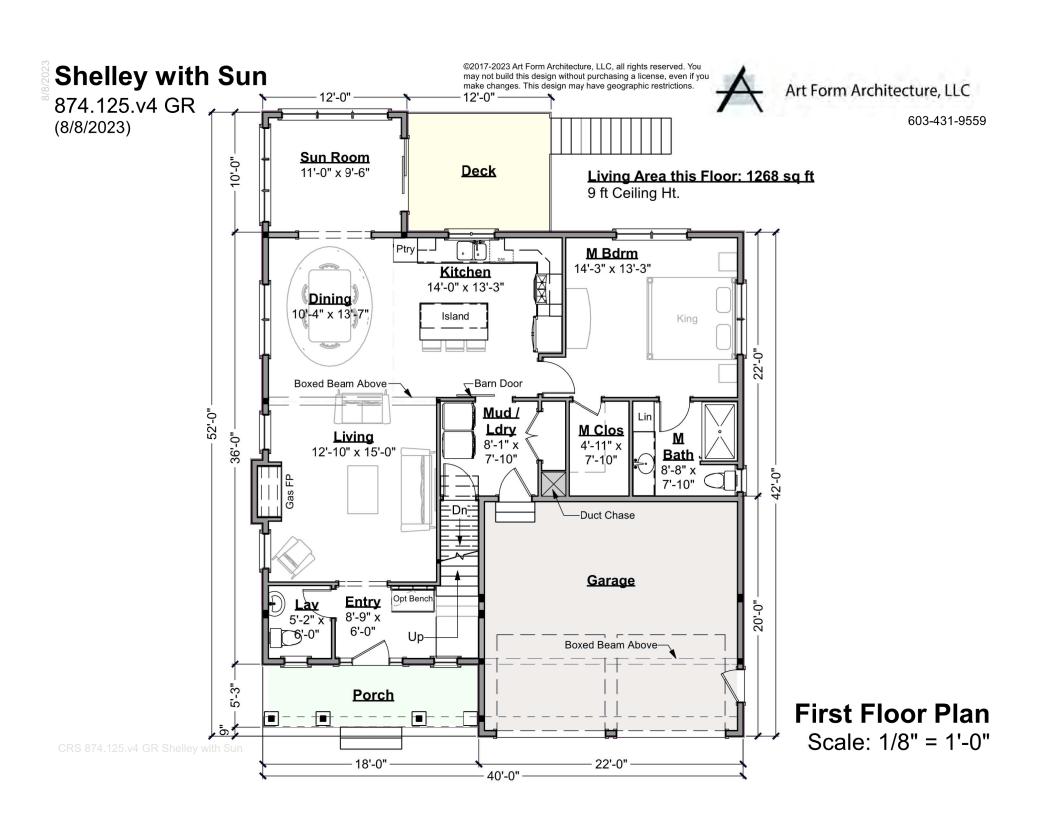
Floor plan layout and/or Structural Changes:

- Structural changes always require the express written consent of Art Form
- If you wish to move or remove walls or structural elements (such as removal of posts, increases in house size, ceiling height changes, addition of dormers, etc), please do not assume it can be done without other additional changes (even if the builder or lumber yard says you can).

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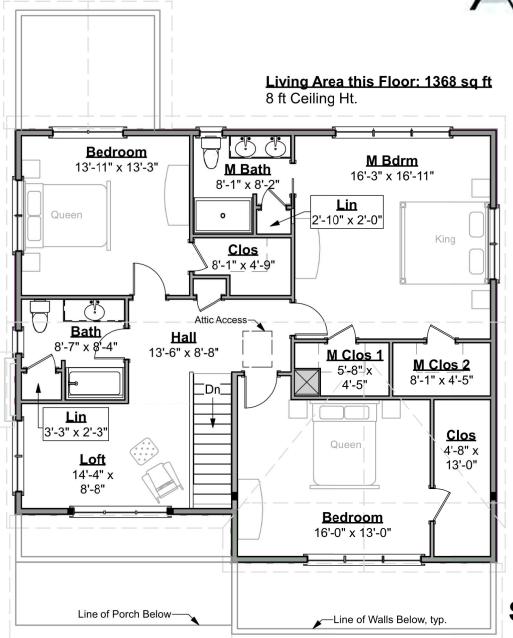
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**Second Floor Plan** 

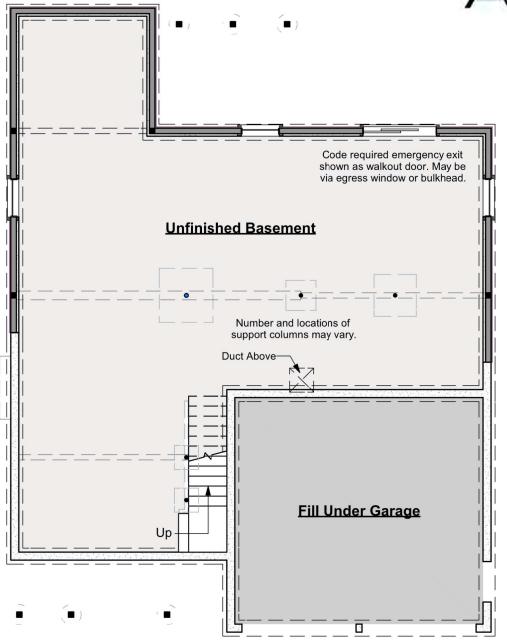
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**Foundation Plan** 

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**Front Elevation** 

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**Right Elevation** 

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**Rear Elevation** 

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**Left Elevation** 

### **Sweet Cherry Peekaboo**

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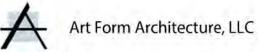
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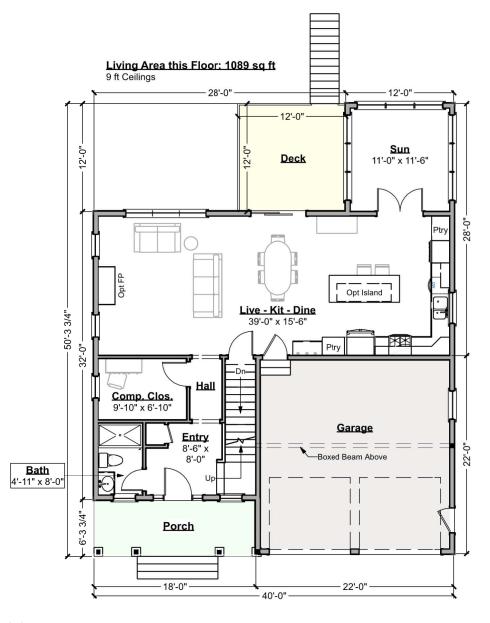
### **Sweet Cherry Peekaboo**

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**First Floor Plan** 

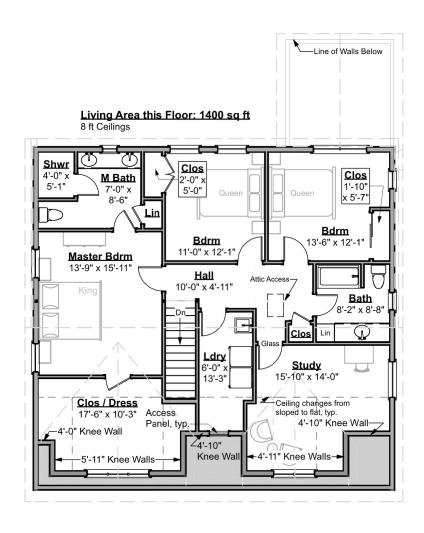
Scale: 3/32" = 1'-0"

### **Sweet Cherry Peekaboo**

1020.124.v4 GR (8/8/2023)

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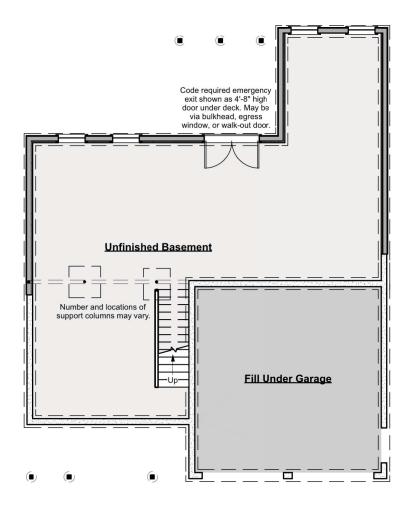
**Second Floor Plan** 

Scale: 3/32" = 1'-0"

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**Foundation Plan** 

Scale: 3/32" = 1'-0"

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**Front Elevation** 

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Right Elevation

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**Rear Elevation** 

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**Left Elevation** 



200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

21 August 2023

Rick Chellman, Planning Board Chair City of Portsmouth 1 Junkins Avenue Portsmouth, NH 03801

RE: Application for Parking CUP Approval, Tax Map 107, Lot 50, 111 State Street

Dear Chair Chellman and Planning Board members:

On behalf of Coventry Realty, LLC, we hereby apply for a **Parking Conditional Use Permit** at the site to convert some of the restaurant use to residential use. Please find the following information in support thereof. The site was granted a Parking CUP on October 20, 2022, to provide Zero (0) parking spaces where 35 spaces are required. This revision to the project adds one dwelling unit to the site and eliminates 2,827 square feet of restaurant use. The Parking Demand will decrease under this revision. The required parking under the Portsmouth Ordinance will increase from 35 spaces to 43 spaces. Since no parking is being provided on site, this request is to provide Zero (0) parking spaces where 43 spaces are required. The request, however, is similar in nature to the previously granted approval.

We submit that the application conforms to the Portsmouth Ordinance Sections, repeated below with comments in **bold** text, as follows:

Section 10.1112.141: An application for a conditional use permit under this section shall include a parking demand analysis demonstrating that the proposed number of off-street parking spaces is sufficient for the proposed use. The attached Parking Demand Analysis shows that the proposed improvements will decrease the parking demand at the property.

Section 10.1112.142: An application for a conditional use permit under this section shall identify permanent evidence-based measures to reduce parking demand, including but not limited to provision of rideshare/micro transit services or bike share station(s) servicing the property, proximity to public transit, car/van-pool incentives, alternative transit subsidies, provisions for teleworking, and shared parking on a separate lot subject to the requirements of 10.1112.62. The attached Parking Demand Analysis shows that the proposed improvements will decrease the parking demand at the property.

<u>Section 10.1112.143</u>: The Planning Board may grant a conditional use permit only if it finds that the number of off-street parking spaces required or allowed by the permit

will be adequate and appropriate for the proposed use of the property. In making this determination, the Board may accept, modify or reject the findings of the applicant's parking demand analysis. Since parking supply is currently sufficient for the existing use, and the proposed improvements will decrease the parking demand at the property, we submit that the available parking is adequate.

Section 10.1112.144: At its discretion, the Planning Board may require more offstreet parking spaces than the minimum number requested by the applicant or may allow fewer spaces than the maximum number requested by the applicant. **Due to the nature of this particular request, where no parking is provided, this section is not applicable to this project.** 

The renovation will reduce the intensity of the required parking for the property with the now total removal of the restaurant dining use on the second floor. The change to residential units, pursuant to the parking metric, reduces the demand for parking spaces for the proposed building renovation revision.

The proposed renovation will result in a decreased demand for parking over the current building use and configuration. Denial of the Parking CUP would present a distinct hardship to the applicant, since the use revision reduces parking demand, a stated goal of the Ordinance requirements. Therefore, we ask that the Planning Board grant the Parking Conditional Use Permit finding that the reduction in the parking demand conforms to the intent of the Ordinance provisions.

Thank you for your time and attention to this proposal.

Sincerely,

John R. Chagnon, PE

CC: 111 State Street Team



#### CITY OF PORTSMOUTH

Planning Department 1 Junkins Avenue Portsmouth, New Hampshire 03801 (603) 610-7216

#### **PLANNING BOARD**

October 27, 2022

Coventry Realty, LLC 3 Pleasant St. 4th Floor Portsmouth, NH 03801

RE: Conditional Use Permit Approval for property located at 111 State Street (LU-22-125)

#### Dear Owners:

The Planning Board, at its regularly scheduled meeting of Thursday, October 20, 2022, considered your application for Conditional Use Permit approval in accordance with section 10.1112.14 of the Zoning Ordinance to allow zero (0) parking spaces where 35 are required. Said property is shown on Assessor Map 107 Lot 50 and lies within the Character District 4 (CD4) and Historic Districts. 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 10.1112.1 and to adopt the findings of fact as presented, and 2) to find that the number of off-street parking spaces provided will be adequate and appropriate for the proposed use of the property and to **grant** the conditional use permit as presented.

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.

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. All stipulations of approval must be completed prior to issuance of a building permit unless otherwise indicated above.

This approval shall expire unless a building permit is obtained within a period of one year from the date granted, unless otherwise stated in the conditions of approval. The Planning Board may, for good cause shown, extend such period by as much as one year if such extension is requested and acted upon prior to the expiration date. No other extensions may be requested.

The Findings of Fact associated with this decision are available: attached here <u>or</u> as an attachment in the Viewpoint project record associated with this application <u>and</u> on the Planning Board Meeting website:

 $\underline{https://www.cityofportsmouth.com/planportsmouth/planning-board/planning-board-archived-meetings-and-material}$ 

The minutes and audio recording of this meeting are available by contacting the Planning Department.

Very truly yours,

Rick Chellman, Chairman of the Planning Board

cc: Shanti Wolph, Chief Building Inspector Rosann Maurice-Lentz, City Assessor

John Chagnon, Ambit Engineering



200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

21 August, 2023

Proposed Parking Demand Building Revision 111 State Street Portsmouth, NH

The purpose of this calculation is to identify the existing and proposed parking demand expected to be generated by the proposed building revision at 111 State Street. Currently the lot had a three-story building which has restaurant use with proposed added residential units. Recently, approval was obtained to convert some of the restaurant use to residential use, creating less restaurant space and five proposed residential units. This proposed building revision will further reduce the restaurant space and add one more dwelling unit for a total of six. This results in a decreased parking demand.

In developing the expected Parking Demand Ambit Engineering considered the standard Parking Demand rates and equations published in the Institute of Transportation Engineers (ITE) Parking Generation Manual, 5<sup>th</sup> Edition. The land use category that best correlates with the proposed uses are Multifamily Housing (Low Rise) (ITE Land Use Code 220) and Quality Restaurant (ITE Land Use Code 931). Please note that the ITE Rates are for non-overlapping peak periods of demand; the residential being 10:00 PM to 6:00 AM and the restaurant 7:00 to 8:00 PM. This makes the total numbers more conservative. The parking demand, based upon the number of dwelling units in the building and GFA of the restaurant is summarized below for the **Average Peak Period of Parking Demand**:

#### Parking Demand Summary - EXISTING

#### Peak Period of Demand

Multifamily Housing (Low Rise) (1.21 vehicles per unit)

Quality Restaurant (16.41 vehicles per 1,000 SF GFA)  $\frac{1.21 \times 5 \text{ units} = 6.0 \text{ vehicles}}{16.41 \times 6.567 \text{ KSF} = 107.8 \text{ vehicles}}$ 

Total Parking Spaces required

114 vehicles

#### Parking Demand Summary - PROPOSED

#### Peak Period of Demand

Multifamily Housing (Low Rise) (1.21 vehicles per unit)

Quality Restaurant (16.41 vehicles per 1,000 SF GFA)  $\frac{1.21 \times 6 \text{ units} = 7.3 \text{ vehicles}}{16.41 \times 3.740 \text{ KSF} = 46.4 \text{ vehicles}}$ 

Total Parking Spaces required

54 vehicles

### Based on the calculation there is an anticipated decrease in parking demand with the renovation project.

Please feel free to call if you have any questions or comments.

Sincerely,

John R. Chagnon, Project Manager

#### Land Use: 220 Multifamily Housing (Low-Rise)

#### Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and with one or two levels (floors) of residence. Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and affordable housing (Land Use 223) are related land uses.

#### Time of Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand (1) on a weekday (10 study sites) and a Saturday (11 study sites) in a general urban/suburban setting and (2) on a weekday (three study sites) and a Saturday (three study sites) in a dense multi-use urban setting.

|                 | Percent of Peak Parking Demand |             |            |             |  |
|-----------------|--------------------------------|-------------|------------|-------------|--|
|                 | General Urb                    | an/Suburban | Dense Mult | i-Use Urban |  |
| Hour Beginning  | Weekday                        | Saturday    | Weekday    | Saturday    |  |
| 12:00–4:00 a.m. | 100                            | 93          | 86         | 100         |  |
| 5:00 a.m.       | 97                             | 100         | 100        | 94          |  |
| 6:00 a.m.       | 90                             | 98          | 94         | 91          |  |
| 7:00 a.m.       | 77                             | 96          | 81         | 85          |  |
| 8:00 a.m.       | 56                             | 92          | 58         | 79          |  |
| 9:00 a.m.       | 45                             | 80          | 56         | 76          |  |
| 10:00 a.m.      | 40                             | 78          | 53         | 71          |  |
| 11:00 a.m.      | 37                             | 71          | 58         | 74          |  |
| 12:00 p.m.      | 36                             | 68          | 56         | 68          |  |
| 1:00 p.m.       | 36                             | 66          | 53         | 68          |  |
| 2:00 p.m.       | 37                             | 65          | 47         | 68          |  |
| 3:00 p.m.       | 43                             | 68          | 56         | 56          |  |
| 4:00 p.m.       | 45                             | 70          | 53         | 59          |  |
| 5:00 p.m.       | 55                             | 73          | 61         | 53          |  |
| 6:00 p.m.       | 66                             | 77          | 81         | 50          |  |
| 7:00 p.m.       | 73                             | 81          | 67         | 56          |  |
| 8:00 p.m.       | 77                             | 82          | 61         | 65          |  |
| 9:00 p.m.       | 86                             | 86          | 64         | 74          |  |
| 10:00 p.m.      | 92                             | 87          | 75         | 85          |  |
| 11:00 p.m.      | 97                             | 92          | 86         | 91          |  |

# Multifamily Housing (Low-Rise) (220)

Peak Period Parking Demand vs: Dwelling Units

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban (no nearby rail transit)

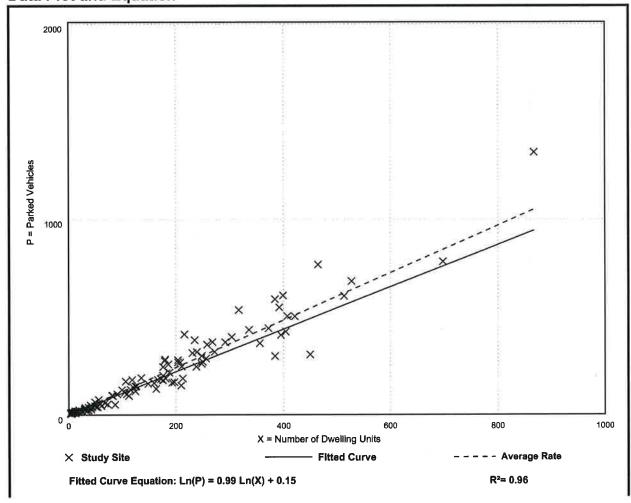
Peak Period of Parking Demand: 11:00 p.m. - 6:00 a.m.

Number of Studies: 119 Avg. Num. of Dwelling Units: 156

#### **Peak Period Parking Demand per Dwelling Unit**

| Average Rate | Range of Rates | 33rd / 85th Percentile | 95% Confidence<br>Interval | Standard Deviation (Coeff. of Variation) |
|--------------|----------------|------------------------|----------------------------|--|
| 1.21         | 0.58 - 2.50    | 1.03 / 1.52            | 1.16 - 1.26                | 0.27 ( 22% )                             |

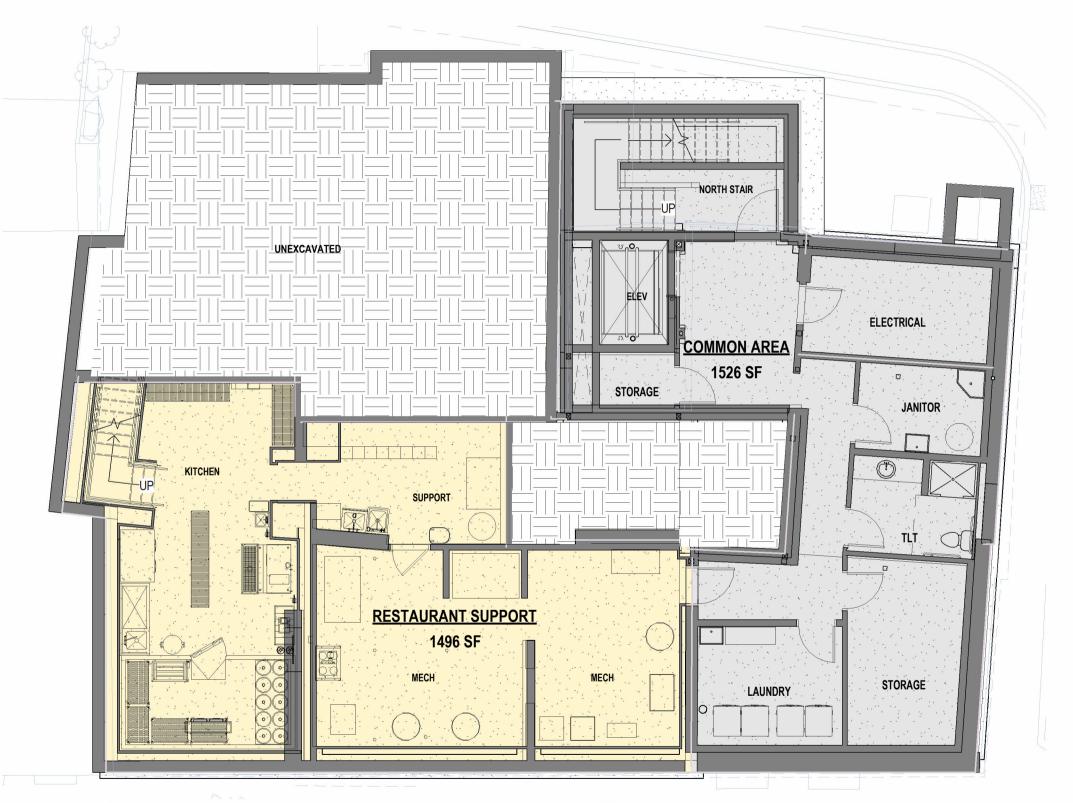
**Data Plot and Equation** 



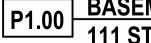
| Existing - | sting - Previously Approved |                             |                             |           |  |      |                                 |
|------------|-----------------------------|-----------------------------|-----------------------------|-----------|--|------|---------------------------------|
| Level      | Occupancy                   | Occupied<br>Floor Area (sf) | Qty<br>Residential<br>Units | Unit size | Parking<br>spaces per<br>area or<br>unit | U    | total area<br>per floor<br>(sf) |
| 3          | Apartment 303               | 757                         | 1                           | 757       | 1.3                                      | 1.3  |                                 |
| 3          | Apartment 302               | 532                         | 1                           | 532       | 1.0                                      | 1.0  |                                 |
| 3          | Apartment 301               | 444                         | 1                           | 444       | 0.5                                      | 0.5  | 1,733                           |
| 2          | Restaurant                  | 2,827                       | 0                           | 0         | 100.0                                    | 28.3 |                                 |
| 2          | R2 - Apartment 202          | 491                         | 1                           | 491       | 0.5                                      | 0.5  |                                 |
| 2          | R2 - Apartment 201          | 535                         | 1                           | 535       | 1.0                                      | 1.0  | 3,853                           |
| 1          | Restaurant                  | 3,626                       | 0                           | 0         | 100.0                                    | 36.3 | 3,626                           |
| TOTAL pro  | oposed                      | 9,212                       |                             |           | •  | 68.8 |                                 |
|            |                             |                             |                             |           |  | 69.0 | 9,212                           |

| Proposed  | Proposed           |                             |                             |           |  |                               |                                 |                       |
|-----------|--------------------|-----------------------------|-----------------------------|-----------|--|-------------------------------|---------------------------------|-----------------------|
| Level     | Occupancy          | Occupied<br>Floor Area (sf) | Qty<br>Residential<br>Units | Unit size | Parking<br>spaces per<br>area or<br>unit | Parking<br>spaces<br>required | total area<br>per floor<br>(sf) | delta - old<br>to new |
| 3         | Apartment 303      | 750                         | 1                           | 750       | 1.0                                      | 1.0                           |                                 |                       |
| 3         | Apartment 302      | 456                         | 1                           | 456       | 0.5                                      | 0.5                           |                                 |                       |
| 3         | Apartment 301      | 385                         | 1                           | 385       | 0.5                                      | 0.5                           | 1,591                           | (142)                 |
| 2         | R2 - Apartment 203 | 2,612                       | 0                           | 2612      | 1.3                                      | 0.0                           |                                 |                       |
| 2         | R2 - Apartment 202 | 476                         | 1                           | 476       | 0.5                                      | 0.5                           |                                 |                       |
| 2         | R2 - Apartment 201 | 526                         | 1                           | 526       | 1.0                                      | 1.0                           | 3,614                           | (239)                 |
| 1         | Restaurant         | 3,740                       | 0                           | 0         | 100.0                                    | 37.4                          | 3,740                           | 114                   |
| TOTAL pro | pposed             | 8,945                       |                             | •         |  | 40.9                          |                                 |                       |
|           |                    |                             |                             |           |  | 41.0                          | 8,945                           | (267)                 |

| Parking Calculation                            | Spaces Required |          |
|--|-----------------|----------|
| Revised spaces needed for proposed floor plans | actual          | round up |
| 6 Dwelling Units                               | 3.5             |          |
| Visitor: 1 space per 5 units                   | 1.2             |          |
| Restaurant                                     | 37.4            |          |
| Total  | 42.1            | 43.0     |



| BUILDING SUMMARY           | GSF    | % BUILDING | RSF   |
|----------------------------|--------|------------|-------|
| TOTAL BUILDING AREA        | 13,423 |            |       |
| TOTAL BUILDING TENANT AREA | 10,439 | 77.8%      |       |
| TOTAL BUILDING COMMON AREA | 2,984  | 22.2%      |       |
| COMMON AREA                | 1,526  | 11.4%      |       |
| Restaurant                 | 1,496  | 14.3%      | 1,924 |



# BASEMENT PLAN 111 STATE STREET





#### First

| 11130                      |        |            |       |
|----------------------------|--------|------------|-------|
| BUILDING SUMMARY           | GSF    | % BUILDING | RSF   |
| TOTAL BUILDING AREA        | 13,423 |            |       |
| TOTAL BUILDING TENANT AREA | 10,439 | 77.8%      |       |
| TOTAL BUILDING COMMON AREA | 2,984  | 22.2%      |       |
| COMMON AREA                | 389    | 2.9%       |       |
| Restaurant                 | 3,740  | 27.9%      | 4,809 |





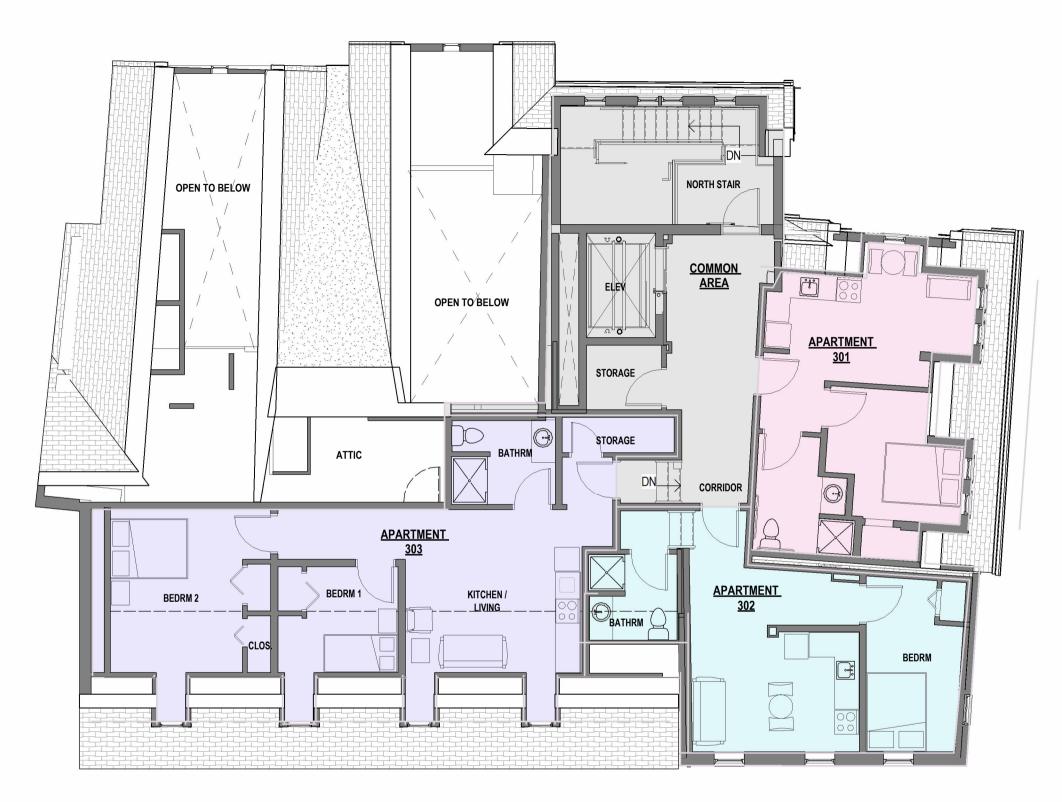


#### Second

| BUILDING SUMMARY           | GSF    | % BUILDING | RSF   |
|----------------------------|--------|------------|-------|
| TOTAL BUILDING AREA        | 13,423 |            |       |
| TOTAL BUILDING TENANT AREA | 10,439 | 77.8%      |       |
| TOTAL BUILDING COMMON AREA | 2,984  | 22.2%      |       |
| 2nd floor COMMON AREA      | 494    | 3.7%       |       |
| Apartment 201              | 525    | 5.0%       | 675   |
| Apartment 202              | 475    | 4.55%      | 611   |
| Apartment 203              | 2,612  | 19.5%      | 3,359 |

# P1.02 SECOND FLOOR PLAN 111 STATE STREET





#### **Third**

| BUILDING SUMMARY           | GSF    | % BUILDING | RSF |
|----------------------------|--------|------------|-----|
| TOTAL BUILDING AREA        | 13,423 |            |     |
| TOTAL BUILDING TENANT AREA | 10,439 | 77.8%      |     |
| TOTAL BUILDING COMMON AREA | 2,984  | 22.2%      |     |
| 3rd Floor COMMON AREA      | 575    | 4.3%       |     |
| Apartment 301              | 385    | 3.7%       | 495 |
| Apartment 302              | 456    | 4.4%       | 586 |
| Apartment 303              | 750    | 7.2%       | 964 |

## P1.03 THIRD FLOOR PLAN 111 STATE STREET





## P2.1 SOUTH EXTERIOR ELEVATION

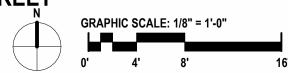
111 STATE STREET





## P2.2 EAST EXTERIOR ELEVATION

111 STATE STREET



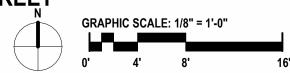




## P2.3 NORTH EXTERIOR ELEVATION

111 STATE STREET

SCALE: 1/8" = 1'-0" 9/27/22







# P3.1 SOUTHEAST VIEW 111 STATE STREET SCALE: 9/27/22



# P3.2 NORTHEAST VIEW 111 STATE STREET SCALE: 9/27/22