SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

Remote Meeting Via Zoom Conference Call
to access by web https://zoom.us/join
to access by phone, dial (929) 436 2866
Meeting ID 412761414
Password 010773

Per NH RSA 91-A:2 III (b) the Chair has declared the COVID-19 Outbreak an emergency and has waived the requirement that a quorum be physically present at the meeting.

2:00 PM **APRIL 7, 2020**

AGENDA

I. APPROVAL OF MINUTES

A. Approval of minutes from the March 3, 2020 Site Plan Review Technical Advisory Committee Meeting.

II. OLD BUSINESS

A. The application of the **Maud Hett Revocable Trust, Owner,** for property located on **Banfield Road** requesting Conditional Use Permit approval for an Open Space Planned Unit Development according to the requirements of Section 10.725 of the Zoning Ordinance and Site Plan Review approval for the construction of 22 single-family homes and a new road with related parking, utilities, landscaping, drainage and associated site improvements. Said property is shown on Assessor Map 256 Lot 02 and lies within the Single Residence A (SRA) District.

B. **POSTPONED** The application of **Richard Fusegni, Owner**, for property located at **1574 Woodbury Avenue** requesting a Conditional Use Permit for a drive-through facility in accordance with Section 10.440 (19.40) of the Zoning Ordinance and Site Plan Review Approval for the construction of a new retail bank with parking, utilities, landscaping, lighting, drainage and associated site improvements. Said property is shown on Assessor Map 238 Lot 17 and lies within the Gateway Neighborhood Mixed Use Corridor (G1) District. **POSTPONED**

III. NEW BUSINESS

A. The application of **Bonza Buildings, LLC, Owner**, for property located at **41 Salem Street** requesting Site Plan Review Approval to demolish the existing single-family residence and construct 3 new dwelling units, with related grading, utilities, landscaping, drainage and associated site improvements. Said property is shown on Assessor Map 144 Lot 31 and lies within the General Residence C (GRC) District.

IV. ADJOURNMENT

NOTICE TO MEMBERS OF THE PUBLIC WHO ARE HEARING IMPAIRED
If you wish to attend a Planning Board meeting and need assistance, please contact the Human Resources Office at 610-7270 one week prior to the meeting.

SITE PLAN REVIEW TECHNICAL ADVISORY COMMITTEE
PORTSMOUTH, NEW HAMPSHIRE

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

2:00 PM **MARCH 3, 2020**

MINUTES

MEMBERS PRESENT:	Juliet TH Walker, Chairperson, Planning Director; Peter Britz, Environmental Planner; David Desfosses, Construction Technician Supervisor; Eric Eby, Parking and Transportation Engineer; Patrick Howe, Fire Department; Nicholas Cracknell, Principal Planner and Robert Marsilia, Chief Building Inspector
MEMBERS ABSENT:	
ADDITIONAL STAFF PRESENT:	Jillian Harris, Planner 1

I. APPROVAL OF MINUTES

A. Approval of minutes from the February 4, 2020 Site Plan Review Technical Advisory Committee Meeting.

Mr. Eby moved to approve the minutes from the February 4, 2020 Site Plan Review Technical Advisory Committee Meeting, seconded by Mr. Britz. The motion passed unanimously.

II. OLD BUSINESS

A. The application of **DPF 1600 Woodbury Avenue, LLC, Owner,** for property located at **1600 Woodbury Avenue** requesting Amended Site Plan Review approval to upgrade the existing shopping center with new and additional signage, a new driveway entrance off of Woodbury Avenue, and repurposing of the former supermarket space to separate retail space and new grocery space with accessory café/food court. Said property is shown on Assessor Map 238 Lot 16 and lies within the Gateway Neighborhood Mixed Use Corridor (G1) District.

SPEAKING TO THE APPLICATION

Attorney John Bosen, and Steve Glowacki spoke to the application. Mr. Bosen worked with the Planning Staff to redesign the entrance. The right out has been eliminated and the median was extended. It is safer than what is there today and what was proposed at the last meeting. Mr. Bosen noted that they were in agreement with the comments.

TAC Comments:

- The water service for 1618 Woodbury Avenue needs to be terminated at the main in the road. This is not currently shown on the plans.

  - Mr. Glowacki noted that they agree with all three comments that related to the demolition plan.
- The gas service for 1618 Woodbury Avenue will need to be terminated. This is not shown on the plans. The gas main is located under the existing sidewalk.
- The sewer service to 1618 Woodbury Avenue is shown capped at sewer manhole, please add onto note, 'water tight'.
- The existing ramp at the corner of Durgin Lane and Woodbury is already fully handicapped compliant. It does not need to be replaced.
  - Mr. Glowacki responded that can be removed from the scope.
- The privately owned CB in the north east corner of 1618 Woodbury Avenue is 20" below grade. This basin should be raised up to grade.
  - Mr. Glowacki responded that was easy to include.
- Provide a stay right sign for the island extension on a breakaway post, remove old sign foundation/post.
  - Mr. Glowacki responded that would be included.
- Call out 'bull nose' style curb pieces for the end of the new island.
  - Mr. Glowacki confirmed that would be updated.
- Typical parking lot striping lot detail has an error. 19+24+19=62'
  - Mr. Glowacki responded that would be corrected.
- Do not use welded wire fabric in any sidewalks that are in the ROW.
  - Mr. Glowacki responded that they will omit the welded wire fabric from that detail in the ROW.
- Use thermoplastic markings for crosswalks, lane symbols and stop bars in the ROW.
  - Mr. Glowacki responded that the note would be added.
- Provide easement for signal equipment and tip down at Ruby Tuesday driveway.
  - Mr. Glowacki responded that the applicant does not own that portion of the property. Mr. Desfosses clarified that it was for the other portion of the driveway. Mr. Glowacki confirmed that could be updated on the south side.
- Woodbury Avenue has new pavement. Any pavement impacted by utilities or island construction will be milled and repaved after 12 months to the satisfaction of the Public Works department.
  - Mr. Glowacki agreed.
- Based on the new traffic analysis and the proposed modifications to the GameStop driveway, City staff are satisfied that the revised driveway will operate safely. However, the curbline and sidewalk should stay as true to the existing layout as possible, as pedestrians are not likely to follow the new sidewalk, the sidewalk would require an easement to the City, and the sidewalk snowplow would not be able to follow the new configuration.
  - Mr. Glowacki responded that they provided a taper to bring the pedestrians further into the site. Mr. Eby noted that they should bring it further back to the road.
- The extension of the median island and elimination of the right turn out portion of the driveway are key elements to the safety improvements at this location and will go a long way to improving the operations of this driveway.

- Mr. Desfosses clarified that they prefer it stays in the right of way. Mr. Glowacki confirmed that they could fix that. Mr. Desfosses commented that it should be a straight shot and be handicap accessible.
- Truncated dome panels are not necessary at driveway crossings.
    - Mr. Glowacki agreed.
- The R1-3P sign on the revised driveway is missing.
    - Mr. Glowacki responded that would be updated.
- Recommend the snow removal contractor be "Green Snow-Pro Certified"
    - Mr. Glowacki confirmed that they will coordinate that happens and add a note to the plan.
- Annual stormwater maintenance documentation shall be submitted annually to Portsmouth DPW and Planning Departments.
    - Mr. Glowacki responded that they will add a note.
- Shade trees should be considered within the open lawn area to reduce the heat island effect of the larger site.
    - Mr. Glowacki responded that they considered it and will consider it further. The landscape plan that was included has pockets of landscaping to make it more robust. They will include shade trees.

Mr. Howe commented that any mulch on the site should be fire resistant or non-combustible.

Ms. Walker noted that the changes should be made before the Planning Board Meeting.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to recommend approval of this request to the Planning Board, seconded by Mr. Britz with the following stipulations to be addressed prior to submission of plans for Planning Board:

- The water service for 1618 Woodbury Avenue needs to be terminated at the main in the road;
- The gas service for 1618 Woodbury Avenue will need to be terminated. The gas main is located under the existing sidewalk;
- The sewer service to 1618 Woodbury Avenue is shown capped at sewer manhole, please add onto note, 'water tight';
- The existing ramp at the corner of Durgin Lane and Woodbury is already fully ADA compliant. It does not need to be replaced;
- The privately owned catch basin in the north east corner of 1618 Woodbury Avenue is 20" below grade. This basin should be raised up to grade;
- Provide a stay right sign for the island extension on a breakaway post, remove old sign foundation/post;

- Call out ‘bull nose’ style curb pieces for the end of the new island;
- Correct typical parking lot striping lot detail math error;
- Do not use welded wire fabric in any sidewalks that are in the ROW;
- Use thermoplastic markings for crosswalks, lane symbols and stop bars in the ROW;
- Provide easement for signal equipment and tip down at 1574 Woodbury Avenue driveway.
- Woodbury Avenue has new pavement. Any pavement impacted by utilities or island construction will be milled and repaved after 12 months to the satisfaction of the Public Works department. This shall be noted on the plans.
- The revised driveway curbline and sidewalk should stay as true to the existing layout as possible as discussed at the TAC meeting;
- Truncated dome panels are not necessary at driveway crossings;
- Add the missing R1-3P sign on the revised driveway;
- Add recommended snow removal contractor be “Green Snow-Pro Certified” in the stormwater maintenance plan;
- Note on plans that the annual stormwater maintenance documentation shall be submitted annually to Portsmouth DPW and Planning Departments;
- Shade trees should be considered within the open lawn area to reduce the heat island effect of the larger site.

The motion passed unanimously.

B. **POSTPONED** The application of the **Maud Hett Revocable Trust, Owner,** for property located on **Banfield Road** requesting Conditional Use Permit approval for an Open Space Planned Unit Development according to the requirements of Section 10.725 of the Zoning Ordinance and Site Plan Review approval for the construction of 22 single-family homes and a new road with related parking, utilities, landscaping, drainage and associated site improvements. Said property is shown on Assessor Map 256 Lot 02 and lies within the Single Residence A (SRA) District. **POSTPONED**

DISCUSSION AND DECISION OF THE BOARD

Mr. Britz moved to postpone until the next regularly scheduled TAC meeting, seconded by Mr. Cracknell. The motion passed unanimously.

C. The application of **4 Amigos, LLC, Owner**, for properties located at **1400 Lafayette Road, Peverly Hill Road and 721 Peverly Hill Road** requesting Conditional Use Permit approval for a Development Site according to the requirements of Section 10.5B40 of the Zoning Ordinance and Site Plan Review approval for the construction of a 53-unit Garden and Townhouse Style residential development consisting of 6 structures with a combined total footprint of 37,775 s.f. and 122,000 GFA with associated grading, lighting, utilities, stormwater management, landscape improvements and community space Said properties are shown on Assessor Map 252 Lots 7, 4 & 5 and lie within the Gateway Neighborhood Mixed Use Center (G2) District.

SPEAKING TO THE APPLICATION

Landscape Architect Bob White, Chris Demoula from GPI and Rebecca Brown spoke to the application.

Mr. Demoula commented that they revised the plan and went back to standard crosswalks with accessible ramps. That eliminated the awkward turning movements for cars. An additional egress was added to Building C. The curbing was revised to be slope granite curbing except with the parallel parking. There is a crosswalk connection by the hotel that is aligned to come straight across.

TAC Comments:

- A blanket easement to allow the Portsmouth Water Dept. to access valves, meters and for leak detection will be required for the site.
  - Mr. Demoula confirmed that would be added.
- Instead of tying OCS1 into the existing CB, install a new DMH just downstream from the existing CB and tie OCS#1 into that new DMH.
  - Mr. Demoula responded that they were hesitant to put in an additional structure because they don't think it's needed. It's a straight shot to the catch basin. Mr. Desfosses commented that the additional structure should be there. Mr. Demoula confirmed that it would be added.
- The water service for the front 23 unit building is very long. This may lead to poor water quality. Instead, consider running services under floor slab inside of sleeves from the courtyard side.
  - Mr. Demoula responded that the they did not think it was a long connection, but can discuss this further with the Water Department. Mr. Desfosses agreed that they should discuss it with the Water Department.
- All water lines to be installed to Portsmouth Standards.
- All sewer lines installed to be to State and City standards
  - Mr. Demoula agreed.
- All utilities being installed will be witnessed by a third party inspection company to be determined by the City.
  - Mr. Demoula agreed.
- Confirm from Eversource that both poles proposed to have service drops are able to provide them (i.e. there is nothing else on the poles that they will not allow a service drop)
  - Mr. Demoula responded that they have calls in on the utility connections and will update the plans as needed.
- Wherever possible, the end stalls in a row of parking should be a bit wider.
  - Mr. Demoula requested clarification on the comment. Mr. Desfosses responded that they are tight spots, so if there is room to make them half a foot wider then that would be good.
- Truncated dome panels are <u>not</u> to be used except for street crossings or signalized driveways in the ROW.
  - Mr. Demoula responded that they have no problem with that.

- Number the buildings so they can be referred to.
  - Ms. Walker commented that they are labeled it was just missed in the review. Mr. Howe added that it seems like this should be a Peverly Hill Road address. The buildings should have letters instead of numbers. Mr. White questioned how the townhouses should be addressed. Mr. Howe responded that the building would have a letter and then each unit would be numbered. Ms. Walker added that it would be helpful to include internal signage in the plans before the Planning Board and run it by Mr. Howe for input. It would be good to reach out the DPW to get a sense of what the address would be. Mr. Demoula confirmed they would.
- Easements need to be provided for the sidewalks along Peverly Hill Road.
  - Mr. Demoula confirmed that would be added.
- Follow City of Portsmouth standard planting details available on the City's web page -- https://www.cityofportsmouth.com/sites/default/files/2020-01/Tree%20Planting%20Detail_0.pdf.
  - Mr. White confirmed that they would use the relevant ones.
- The 'Halka' Honey locusts planned for the frontage to Peverly might be too big of a species to fit under the wires. Please revisit this.
  - Mr. White responded that they would look at that for clearance.
- The location of Maple and Elm trees at intersections could block the view of both drivers and pedestrians. Low plantings may be more suitable at these internal intersections.
  - Mr. White responded that they will check the sight distances on them.
  - Mr. Desfosses added that they received a comment from the City Arborist that the Princeton American Elms should be replaced by other trees. The tree planting detail needs to be revised. Mr. White confirmed that they would consult with the arborist.
- The speed table and raised intersection detail can be removed from the plan set if they are not proposed anymore.
  - Mr. Demoula responded that this was resolved already.
- The applicant should provide a pedestrian crossing of Peverly Hill Road at the West Road intersection, along with an RRFB, and design (engineered) plans for a sidewalk along Peverly Hill Road between West Road and the Market Basket driveway.
  - Ms. Brown responded that it was their belief that there was already an accessible path that goes down the easterly side of Peverly Hill Rd. and they can cross at the signalized location to walk back up to the Mark Basket. Ms. Brown looked at the potential crossing area and sight distances. Ms. Brown also looked at the appropriate type of crossing based on the volume and speeds. The work sheet is from the NCHRP article. Many agencies use it determine whether or not to install a signal. Based on the traffic volumes and the travel speeds on this road, they would need to have 15 crossings to warrant a crosswalk and 45 crossings for an RRFB. It doesn't make sense to install a new crossing especially because there is already a signalized crossing close by. The pedestrians using the new crossing will be relatively low. Mr. Eby commented that he thought it was still merited. Ms. Walker agreed this would be a future condition that would prevent a potential issue. The applicant can argue their case at a Planning Board. Ms. Brown noted that there is a very wide shoulder there, so people can walk along the shoulder.

Ms. Walker noted that people will try to walk across and along the shoulder and people won't have the protection.

- Copies of the Stormwater Inspection and Maintenance Log shall be forwarded to DPW and Planning at least annually.
    - Mr. Demoula agreed.
- The so-called "Square" should be relabeled as a pocket park.
    - Mr. Demoula responded that this would be updated.
- The sidewalk adjacent Complex C still needs a connection to the sidewalk along the southern edge of the building. This connection provides access to the sidewalk leading to Peverly Hill Road.
    - Mr. Demoula responded that would be added.
- In building C, is there an exit on the parking level from the vestibule directly to the outside?
    - Mr. Demoula responded that the there was an internal door from the garage out. It's on the architecture plan, but not the site plan. That will be updated. Mr. Howe noted that they could not egress through a trash room. Architect Michael Keen pointed out the main entrance door out of the vestibule and the added egress door. Mr. Howe questioned if that served the second floor as well coming down the south stairs. Mr. Keen confirmed that it serves all three floors. Mr. Howe noted that people are supposed to be able to see the exit when they leave the stair room.
- Waterline extention comment that was left off in error.
    - Mr. Demoula requested a dialogue on the comment. Mr. Desfosses commented that the main should be replaced from the end of the extension that was done in 2001 through West Rd. The only other option would be to connect to Lafayette Rd., but it may not be possible. Mr. Demoula responded that was consistent with what they talked about. Mr. Demoula questioned if the City was willing to do a cost sharing because of the amount of improvements this project includes for the City. The client is willing to do a cost share agreement with the City. Mr. Desfosses responded that they could not speak to that today and could not guarantee that they would be on the same timeline as this project. This will get approved today with the condition that the main will get replaced and the applicant can work with the City. Ms. Walker added that there would be concern if the reliance was on a waterline that needs to be replaced and there was an unknown timeline for the City project. A cost sharing wouldn't be feasible because the City is not ready to do the project. They can consider a proposal before Planning Board to talk about it. Mr. White commented that painting a traditional crosswalk and signage would be fairly straight forward. The concern is about elevating it to the signal. That is a significant order of magnitude and the crossing may not generate that level of pedestrian traffic. Ms. Walker responded that they can suggest something like that. If there is a lot of pedestrian activity and no option to add RRFB, then that may be a problem. Their proposal can include just providing the electrical connection to add a signal later.

Ms. Walker requested clarification on how this sidewalk would link into the proposed Peverly Hill Rd. sidewalk. Mr. Demoula responded that they would do a curb line, 5-10 feet of landscaping, and then a 10-foot sidewalk. Ms. Walker noted that they don't require deeded easements, but this will be a public sidewalk. There should be an easement for the whole sidewalk for the City to maintain it.

Mr. Howe commented that the addresses and signage can be determined outside of TAC. There should be signage at the beginning of the site for the rear buildings.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to recommend approval of this request to the Planning Board, seconded by Mr. Cracknell with the following stipulations:

1) Prior to submission to Planning Board, the plans shall be updated to address the following:

a. Instead of tying OCS1 into the existing CB, install a new DMH just downstream from the existing CB and tie OCS#1 into that new DMH.
b. The water service for the front 23-unit building is very long. This may lead to poor water quality. Instead, consider running services under floor slab inside of sleeves from the courtyard side. Coordinate review of the design with Portsmouth Water Department;
c. All water lines to be installed to Portsmouth Standards;
d. All sewer lines installed to be to State and City standards;
e. All utilities being installed will be witnessed by a third party inspection company to be determined by the City;
f. Confirm from Eversource that both poles proposed to have service drops are able to provide them (i.e. there is nothing else on the poles that they will not allow a service drop);
g. Wherever possible, the end stalls in a row of parking should be a bit wider;
h. Truncated dome panels are not to be used except for street crossings or signalized driveways in the ROW;
i. Coordinate addressing and numbering of the buildings with Portsmouth DPW and Fire Department. Proposed sign locations shall be added to the plan set;
j. Follow City of Portsmouth standard planting details available on the City's web page -- https://www.cityofportsmouth.com/sites/default/files/2020-01/Tree%20Planting%20Detail_0.pdf;
k. The 'Halka' Honey locusts planned for the frontage to Peverly might be too big of a species to fit under the wires. Please consider alternatives;
l. The location of Maple and Elm trees at intersections could block the view of both drivers and pedestrians. Low plantings may be more suitable at these internal intersections;
m. Princeton American Elms are susceptible to Dutch Elm Disease (it's a common

misconception they are not). They should be replaced with native species such as Black Gum, Swamp White Oak, Bald Cypress, or Zelkova (nonnative), or any combination thereof. Avoiding monoculture is generally a good idea;
n. The speed table and raised intersection detail can be removed from the plan set if they are not proposed anymore;
p. Copies of the Stormwater Inspection and Maintenance Log shall be forwarded to DPW and Planning at least annually;
q. The so-called "Square" should be relabeled as a pocket park;
r. The sidewalk adjacent to Complex C still needs a connection to the sidewalk along the southern edge of the building. This connection provides access to the sidewalk leading to Peverly Hill Road;
s. Update Architectural Plans to address egress concerns from the Fire Dept.;

2) A blanket easement to allow the Portsmouth Water Dept. to access valves, meters and for leak detection will be required for the site.

3) Easements shall be provided for the sidewalks along Peverly Hill Road. Plans shall be updated to reflect easement area.

4) The applicant should provide a pedestrian crossing of Peverly Hill Road at the West Road intersection, along with an RRFB, and design (engineered) plans for a sidewalk along Peverly Hill Road between West Road and the Market Basket driveway. Plan shall be reviewed and approved by DPW.

5) The applicant shall replace the water main in Peverly Hill Road is required per Portsmouth DPW requirements.

The motion passed unanimously.

III. NEW BUSINESS

A. The application of **Nickerson Home Improvement Co. Inc**. and the **Linette and James Revocable Trust of 2000, Owners** and **Perley Lane, LLC, Applicant**, for properties located at **95 Brewster and 49 Sudbury Streets** requesting Site Plan Review approval to demolish the existing structures and construct 3 dwelling units in two structures, with related grading, utilities, landscaping, drainage and associated site improvements. Said properties are shown on Assessor's Map 138 Lots 57 and 58 and lie within the General Residence C (GRC) District.

SPEAKING TO THE APPLICATION

John Chagnon from Ambit Engineering and principal owner Joe Calderola spoke to the application. Two corner lots were merged into one lot and right now there is a commercial building and a single-family home. Those structures will be removed. The project will construct a single family and a duplex in their place with driveways off Brewster St. and Sudbury St.

TAC Comments:

- There is not enough clearance on the pole at the corner of Sudbury and Brewster to run conduit up the pole. These homes should have overhead services like the buildings they are replacing, this will require a waiver from the Site Plan review regulations.
  - Mr. Chagnon responded that this plan reflects the onsite meeting with Eversource. They are planning to put the conduit on the east side of the pole that will remain. Then put it underground. Mr. Desfosses commented that there was not enough room on the sidewalk. It will need to be widened. The conduit is on the pole that will be removed. The pole that is staying is the other one. Mr. Chagnon confirmed that they would double check it.
- Show with grading that Unit #3's driveway goes up in grade at 2% in the sidewalk area to conform to the ADA and to keep the storm water from Sudbury St out of the backyard.
  - Mr. Chagnon responded that they will change it to 2%.
- Show a swale along the common borders of Rock St park to bring the stormwater out around units 1 and 2 and out to Brewster St. Grading on the City land may be allowed for the common good if necessary as long as plants are reestablished.
  - Mr. Chagnon responded that the plan would be updated to reflect the swale.
- Show the existing sewer heading to #31 Sudbury to be removed on the demolition plan.
  - Mr. Chagnon confirmed that would be added.
- There are two water services shown going into the existing warehouse building. The one shown nearest the sewer doesn't exist. Please remove from plan for clarity.
  - Mr. Chagnon responded that the extra one will need to be removed.
- The elevation 12 contour behind units 1 and 2 should tie into the 12 contour behind unit 3 and through the infiltration area. A retaining wall should not be needed here. Drain the infiltration overflow into the swale along the property lines out to Brewster.
  - Mr. Chagnon responded that the wall would be taken out.
- Will there be a fence between the park and units 1 and 2?
  - Mr. Chagnon responded that the landscape plan shows the fence. It runs from the corner along Brewster St. to the other corner.
- What is to become of the existing drainage connection to the Nickerson Remick building?
  - Mr. Chagnon responded that it may be reused for an emergency sump pump. There is also a connection for Sudbury St. that will be reused. Mr. Desfosses commented that they should be shown on the plan.
- The City will require street milling and paving in areas damaged by utilities or construction.
  - Mr. Chagnon responded that the note would be added.
- Add note that all invasive species to be removed in accordance with best practices.
  - Mr. Chagnon responded that a note would be added.
- There is a section of curb with very low reveal near the intersection of Brewster and Sudbury. This section should be reset to match the reveal of the rest of the sidewalk, so that it is not used as a driveway to the parcel.
  - Mr. Desfosses clarified that just to the right of the pole was staying. The curb should be raised. Mr. Chagnon questioned if the rest of the curb was fine as it

was. Mr. Desfosses responded that it needs to be that way for handicap access. A handicap ramp should be added to the corner. Mr. Chagnon confirmed that would be updated.

- Install NO PARKING signs along Brewster Street frontage.
  - Mr. Chagnon responded that they would rather not add them because it clutters the space. Mr. Eby noted that it was no parking now. The City will add the signs if they don't.
- The test pit logs completed by S.W. Cole stated that they estimate seasonal high water to be one foot above the noted saturation level. The test pit logs note water is observed at between 3.5 and 4.5 feet so the seasonal high water would be 2.5-3.5 feet. Given the finished floor of the basement is listed at 7.5. How will the basement be protected from impacts of groundwater?
  - Mr. Chagnon responded that the test pit ground elevation is at elevation 9 that is the 2.5 feet to the floor. Mr. Calderola added that they purposely dug in that part of the driveway because it was the low point. That is where they came up with those elevations. Mr. Chagnon commented that test pit 1 had 4 feet. Mr. Desfosses noted that it was fine. Mr. Calderola added that they looked for tidal impacts, but didn't see any.
- A sidewalk should be constructed along the east side of Brewster Street to the gravel walk shown on the plans. Similarly, the sidewalk should be constructed to the east of the driveway on Sudbury Street and include the area in front of the abutting shed.
  - Mr. Chagnon responded that it doesn't show on the plan. The sidewalk on the other side of Brewster St. would be enhanced and the tree area would be enlarged on the other side. The existing conditions plan can be updated to show the sidewalk on the other side of the street. Mr. Eby was fine with the enhanced plantings.
  - Mr. Desfosses noted that the new swamp white oak on the corner of Brewster St. and Sudbury St. needed to be protected per the City Tree Protection Zone standards. The same applies to trees around Rock St. Park. Ms. Walker questioned who would maintain the landscaping in the public right of way. Mr. Desfosses responded that the owners would maintain it. It is no different than having grass all the way out. Ms. Walker noted that it would be good to move it closer to the road. Mr. Calderola commented that they could plant another swamp white oak. Ms. Walker responded that they would need to run it by the Trees and Greenery Committee. Adding a street tree to the front would be good.
- The width of the driveway should be narrowed on the Sudbury Street house.
  - Mr. Chagnon responded that they don't think the driveway is overly wide. It is 25 feet at the street. It can be reduced to 24 feet for the driveway rules. Mr. Cracknell commented that there was 43-45 feet of curb cut between the neighbor and this driveway. Mr. Cracknell suggested creating a short sidewalk. Mr. Desfosses agreed it would be good to add the sidewalk and questioned why one house would have 4 parking spaces but the other house only has 2 spaces. Mr. Calderola responded that the road is stressed for parking. The goal was to give as much parking as possible. That house is a little premium because it is not attached and has guest parking.

- The third floor rear balconies seem unnecessary given there is no door access to the balcony.
    - Mr. Calderola responded that was a resting platform. If the house has finished space in the attic, then it is required. Mr. Marsilia confirmed that was correct.

Mr. Marsilia commented that they will need to advertise the demolition of the buildings. Ms. Walker responded that it was included in this notice because it's in the site plan.

Mr. Howe noted that it was his preferences that the multi-unit keep the Sudbury address. The other should be Brewster St.

PUBLIC HEARING

Peter Happny of 66 Rock St. commented that the area has changed a lot and the park renovation was wonderful. The small house on Sudbury St. is a 1780 house and has historical significance. Mr. Happny questioned why it could not be restored to its original condition. The barn like structure has an interesting shape. It would be difficult to renovate it into a condo. Mr. Happny was concerned about tearing down a house with historical integrity. The land could be parceled out to put up two new structures and still save the historical house.

Ms. Walker responded that it was important to bring up concerns like this during this process because this process works as the demo review as well. Mr. Marsilia added that if they get a written complaint, then it will start the demo delay process. It is not a stop to the project, but it gives the opportunity to review the reasons for the demolition.

The Chair asked if anyone else was present from the public wishing to speak to, for, or against the application. Seeing no one else rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Marsilia noted that this can't go to the Planning Board if there is a demo delay. Ms. Walker responded that it was not official yet.

Mr. Howe moved to recommend approval of this request to the Planning Board, seconded by Mr. Desfosses with the following stipulations:

1) Prior to submission to Planning Board, plans shall be updated to address the following:

a) There is not enough clearance on the pole at the corner of Sudbury and Brewster to run conduit up the pole. Sidewalk will need to be widened to accommodate this design;
b) An ADA accessible ramp shall be added to the sidewalk at the Brewster Street / Sudbury Street intersection;
c) Show with grading that Unit #3's driveway goes up in grade at 2% in the sidewalk area to conform to the ADA and to keep the storm water from Sudbury Street out of the yard;
d) Show a swale along the common borders of Rock Street park to bring the stormwater out

around units 1 and 2 and out to Brewster Street. Grading on the City land may be allowed for the common good if necessary as long as plants are reestablished;
e) Show the existing sewer heading to #31 Sudbury to be removed on the demolition plan;
f) There are two water services shown going into the existing warehouse building. The one shown nearest the sewer does not exist. Please remove from plan;
g) The elevation 12 contour behind units 1 and 2 should tie into the 12 contour behind unit 3 and through the infiltration area. A retaining wall should not be needed here. Drain the infiltration overflow into the swale along the property lines out to Brewster Street;
h) Existing drainage connection to the Nickerson Remick building should be shown on the plans if it is to remain;
i) Add note that the City will require street milling and paving in areas damaged by utilities or construction;
j) Add note that all invasive species to be removed in accordance with best management practices;
k) There is a section of curb with very low reveal near the intersection of Brewster Street and Sudbury Street. This section should be reset to match the reveal of the rest of the sidewalk, so that it is not used as a driveway to the parcel;
l) Install NO PARKING signs along Brewster Street frontage;
m) The sidewalk should be constructed to the east of the driveway on Sudbury Street and include the area in front of the abutting shed;
n) The width of the driveway should be narrowed on the Sudbury Street house to 24 ft;
o) The language found in the Landscaping notes should be consistent with the tree planting detail notes (e.g. planting note 4 calls for all burlap and cages to be pulled open in planting hole--not removed--, while tree planting detail calls for all cage and burlap to be removed);
p) City trees along the property boundaries in in the ROW should be protected during demolition, excavation, and construction via the City's tree protection zone (TPZ) standards. Add a note to the Landscaping plan that replacement of trees is required, at cost to the developer, if they are damaged or destroyed during construction;
q) Add street trees along Brewster Street frontage subject to approval by the Trees and Greenery Committee.

2) Coordinate addressing of proposed units with the Fire Department and DPW.

The motion passed unanimously.

B. The application of **Richard Fusegni, Owner**, for property located at **1574 Woodbury Avenue** requesting Site Plan Review Approval for the construction of a new retail bank with parking, utilities, landscaping, lighting, drainage and associated site improvements. Said property is shown on Assessor Map 238 Lot 17 and lies within the Gateway Neighborhood Mixed Use Corridor (G1) District.

SPEAKING TO THE APPLICATION

Alan Rosco spoke to the application. The proposal is to tear down the Ruby Tuesday to build a full-service Chase Bank. Mr. Rosco met with Planning Staff to discuss the building details and remote ATMs. There will be two remote ATMs. One will be built with the project and another will be added if needed. The project will meet all local codes a CUP is needed for the drive through and ATM. The plan is to reuse existing utilities on the site. There will be a reduction in wastewater and water demand. A good portion of the site will be landscaped to reduce the heat island effect.

TAC Comments:

- Existing utilities (water, fire suppression, storm drain, sewer, gas, power, communications) should all be reused. These will need to be shown in a more complete way on a plan of its own for clarity.
    - Mr. Rosco responded that would be updated on the plan.
- If the fire service is not being used, it will need to be abandoned out in Woodbury Ave and the City will require milling and repaving of the area as the pavement in the road is new.
    - Mr. Desfosses clarified that if there was not going to be fire suppression for the bank, then they would have to abandon the line out to the main road. The City just paved that, so it may cost more to do that than adding fire suppression. Mr. Rosco responded that they would consider that.
- The existing grease trap will need to be cleaned and then filled with sand.
    - Mr. Rosco responded that it would be abandoned in place.
- The parking stall at the end of a row of parking spaces should be made wider if possible to facilitate exiting the vehicle.
    - Mr. Rosco agreed.
- How is stormwater being treated to remove pollutants?
    - Mr. Rosco responded that the two catch basins will remain right near the driveways or in the corner of the parking lot. Mr. Desfosses noted that catch basins take water away, but they don't treat the water.
- <u>Please</u> reduce hatching, it makes plan very difficult to read.
    - Mr. Rosco confirmed that would be cleaned up.
- Is there a lighting plan?
    - Mr. Rosco responded that they were developing a lighting and landscaping plan.
- Storm drainage and sewer pipes not being reused should be either removed or flow-filled.
    - Mr. Rosco responded that they would cut and cap the pipes.
- The drive up ATM should have a full bypass lane for any vehicle that needs to get out of the queue. If a driver mistakenly enters the drive-thru they need to be able to bypass any queued vehicles.
    - Mr. Rosco responded that the second lane would be the bypass. There is one ATM drive through location, then a small raised median, and then the location of the second ATM if it is needed. That is the bypass. Mr. Desfosses commented that would not work if the ATM lane and bypass are one in the same. Mr. Rosco responded that it could be widened. Mr. Desfosses noted that they should not do the island because it will have to be redone if the ATM goes in. Rosco will look at it.

- Parking lot aisles with more than 7 spaces should not be dead-ended. Drivers are not able to see if a space is empty or whether it is occupied by a smaller vehicle. Perhaps an outlet can be provided into the ATM bypass lane.
  - Mr. Eby responded pointed out a spot in the parking lot were cars would get trapped if the lot was full. Mr. Rosco responded that they would look at it.
- A NO PARKING sign should be provided at the head of the HP access aisle, if there is room between the walkway and the ATM drive lane.
  - Mr. Rosco agreed.
- A trip generation memo should be provided, comparing the proposed new bank use to the previous restaurant use.
  - Mr. Rosco responded that this could be provided.
- No stormwater maintenance plan has been provided
  - Mr. Rosco responded that this was being developed.
- A landscape plan shall be provided and shade trees should be included to minimize the heat-island effect of the larger site.
  - Mr. Rosco agreed.
- A statement that lists green building components and systems is required per Section 2.5.3.1A of the Site Plan Regs.
  - Mr. Rosco responded that the building will have the appearance of 2 front faces and an added sidewalk from the entry out to the street sidewalk.
- The required notes shall be added to the Site Plan per Sections 2.5.4.2E, 2.13.3 and 2.13.4 (included on the Site Plan checklist).

Ms. Walker commented that they want to see a complete package at TAC before an application moves to the Planning Board. Mr. Rosco noted that Chase has a 6-month construction time and they don't open new branches in December. The demo is included with the site plan, but Mr. Rosco questioned if they could do it early. Mr. Marsilia responded that it was not likely to generate a complaint within 30 days of the public hearing. Mr. Cracknell added that this was different from the last application. This building would just engage Mr. Marsilia. Mr. Marsilia added that he could issue a demo permit before it goes to the Planning Board. However, if they demo it and don't get approval, then they are doing it at their own risk. Ms. Walker did not think that was a problem. Mr. Marsilia noted that the utility sign offs would be tricky. Mr. Desfosses responded that they would allow a disconnect at the sidewalk temporarily. Mr. Howe noted that the Fire Department would want that in service as long as possible.

Mr. Howe questioned if the rear exit was part of the customer area. Mr. Rosco confirmed that was correct.

PUBLIC HEARING

The Chair asked if anyone was present from the public wishing to speak to, for, or against the application. Seeing no one rise, the Chair closed the public hearing.

DISCUSSION AND DECISION OF THE BOARD

Mr. Desfosses moved to postpone this application until the next regularly scheduled TAC meeting, seconded by Mr. Cracknell. The motion passed unanimously.

IV. ADJOURNMENT

Mr. Eby moved to adjourn the meeting at 3:31 pm, seconded by Mr. Desfosses. The motion passed unanimously.

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Respectfully submitted,

Becky Frey,
Acting Secretary for the Technical Advisory Committee
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Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

TFM Since 1968

NEW HAMPSHIRE 200

March 23, 2020

TFM Project No: 47361.00

Juliet Walker, Planning Director
Portsmouth Planning Department
City Hall, 3rd Floor
1 Junkins Avenue
Portsmouth, NH 03801

Re: Response to Comments from the January TAC Review for Condominium Development, Banfield Road, Tax Map 256, Lot 2

Dear Juliet,

On behalf of our client, Green & Company, TF Moran, Inc. (TFM) respectfully submits the following revised plans and letter in response to the comments made by the Technical Advisory Committee (TAC) at our January meeting.

Based upon discussions held with City Staff and the review engineering firm, changes have been made to the underground stormwater management system and we have submitted revised plans addressing the review engineer's comments, we are anticipating their concurrence that the stormwater management system will provide treatment and storage for the development.
.

Included in this submittal are the following material:

- 9 Copies: 11"x17" Plan Set of the "The Village at Banfield Woods", Banfield Road, Portsmouth, NH, Tax Map 256, Lot 2, Dated September 25, 2019, last revised March 20, 2020.
- 1 Copies: 22"x34" Plan Set of the "The Village at Banfield Woods," Banfield Road, Portsmouth, NH, Tax Map 256, Lot 2, Dated September 25, 2019, last revised March 20, 2020.
- 10 Copies: Impact of "Response to Mark West Review of January 28, 2020 and questions related to Wildlife," by Gove Environmental Services, Inc, Dated February 28, 2020.
- 10 Copies: Impact of "Interpretation of Zoning Ordinances", by John Kuzinevich, Esq., Dated January 15, 2020.
- 10 Copies: "Proposed Stormwater Treatment System Assessment," by Milone and MacBroom, Dated February 28, 2020.
- Electronic Copy: "Drainage Analysis Summary for The Village ay Banfield Woods," By TFMoran, Dated March 23, 2020.

To facilitate your review of the plans, we have provided TAC comments along with our responses, which are shown in ***bold blue***.

Comments from the January TAC Review for Condominium Development:

1. Plans are generally incomplete for this level of review. They are also shown at a scale that is too large to show all the detailing.
   Response: Dave Desfosses (DPW) clarified they wanted more detail on the Stormtech Systems and the ecopassages only. More details for the underground stormwater management system have been provided. Additonally, 2 meetings with CMA, DPW Staff and City Staff have been held to discuss the details of the underground stormwater management systems and the three ecopassages. The revised plan set addresses the concerns on the underground stormwater management systems, and we are in the process of obtaining concurrence with CMA.

2. The utility plans are not showing water lines for fire suppression.
   Response: Additional water services are shown for fire suppression. (See Sheets C-12 through C-15.)

3. Is the proposed common open space designated under a recordable conservation restriction? Additionally, what are the limits of the common open space and how are areas abutting the LCAs behind and beside the proposed houses protected from encroachment over time. How is the common open space proposed to be monumental and/or fenced to prevent unauthorized encroachment into the buffer zone areas?
   Response: The LCAs have been revised to be more square and are shown on the condominium site plan (S-03) as required in the Open Space Planned Unit Development Regulations. The common area behind the LACs will be monumented to prevent unauthorized encroachment into the buffer zone. The common open space will not be designated under a recordable conservation easement, however, it will be part of the recordable condominium documents.

4. The narrow roadways and driveways, together with a lack of visitor parking, will likely result in vehicles parking along the main roadway and causing difficulty for 2-way traffic within the site. Applicant should indicate areas for visitor parking, perhaps around the cul-de-sac.
   Response: At the June work session, visitor parking was provided and TAC recommended removing it. The long-shared drives have been widened to 18' to allow additional visitor parking and emergency access.

5. Confirm that you did not include the proposed LCAs in the calculation of common open space.
   Response: The LCAs are not included in the common opens space calculations.

6. In your summary of zoning requirements, please add a column for "proposed" next to "required"
   Response: This column was added. (See Sheet S-03.)

7. The applicant will need to be prepared to make the case to the Planning Board how the OSPUD goals are satisfied by this proposed development, specifically "preserve natural features" and "create usable open space" and that "the anticipated impacts of the proposed PUD on traffic, market values, stormwater runoff or environmental factors will not be more detrimental to the surrounding area than the impacts of conventional residential development of the site."
Response: Only 7.33 acres of the 44.88 acres is being developed (16%). The total upland on the site (including the buffer area) is 25.54 acres. Only 28% of the upland is being impacted. A large contiguous portion of the lot will remain in its natural vegetated state. We are also creating usable open space contiguous with the conservation land on Map 255, Lot 3. The Stormwater Management Report shows there will be no increases in off-site flows from the new development; the stormwater will be treated in accordance with city and state standards. A conventional subdivision on this property would create the same number of single-family lots as the OSPUD. The impacts on traffic and market values would be similar to that of a conventional subdivision. The OSPUD reduces the impervious area.

8. Sections 10.725.44 and 45 encourage community open space that connects to other public or private open spaces and allows for public access. Has the applicant explored this as staff previously suggested?
Response: The open space and common area abuts land currently under a conservation easement on Map 255, Lot 3. (See Sheet S-03). Access to the open space is available through the abutting conservation easement. Public access to the open space is not viable from this property as it would create additional wetland impact.

9. Did the applicant consider whether two-family or townhomes might be feasible in order to minimize impervious surface and overall site impacts?
Response: We did consider two-family and townhouses for this site. When considering the access, parking, wastewater, utilities and impervious area; impacts are very similar. Given the similarities, the applicant has chosen single-family homes.

10. The report provided by Mr. Gove and the peer review comments provided to the Conservation Commission note there will be significant impacts to habitat and existing natural features. The peer review comments also noted that some of the analysis provided by Mr. Gove was incomplete. How is the applicant proposing to address the outstanding concerns in this regard?
Response: See Gove Environmental' s letter entitled "Response to Mark West Review of January 28, 2020 and questions related to Wildlife corridors as related to the site", submitted to the City on February 28, 2020.

11. If septic systems are proposed than the City will require full designs being submitted for review. This will likely include third party review as well. There is a marginal amount of soil on site and septic systems will need to be designed carefully with contingencies. The applicant should consider installing a force main to Peverley Hill Rd.
Response: Full designs will be submitted upon approval of the project.

Preliminary information was provided to the City's review engineer to demonstrate that systems were feasible in this area. Installing a force main to Peverley Hill Road would incur additional wetland impacts and temporarily impact traffic flow. These impacts are not necessary as the site is suitable for septic systems.

12. The runoff from the site will go to an existing wetland area. There have been concerns by current residents in this area about impacts from runoff along the roadway and flooding of properties in heavy rain events. What is this project doing to reduce the stormwater in this area, so the current impacts seen by residents is not made worse?
Response: The post development flows do not increase from the pre-development flows. Flows for larger storms were decreased. The post development stormwater elevation at the culvert crossing remain the same or slightly lower than pre-development stormwater elevations.

13. The design of the stormwater features is also not complete and is conceptually flawed. The systems should not be placed under the roadways as when they need to be worked on or replaced, there will be no access to homes. These stormwater areas should be placed adjacent to the roadways for access and inspections. TAC requests a third-party peer review of the stormwater analysis.
Response: Two meetings have been held with the City and their review engineer (CMA) to demonstrate the stormwater design is adequate. Additional revisions have been made to eliminate one underground system and split the other system into multiple units to facilitate unforeseen future maintenance. A second underdrain system was provided to ensure that ground water would not flow into the stormwater drainage system.
This stormwater system design was proposed to address the Conservation Commissions comments to reduce buffer impact.

14. An 8" water main will be required for fire flow to hydrants.
Response: An 8" water main has been provided on the plans. (See Sheets C-12 through C-15.)

15. A deceleration lane (or shoulder) may be required for an entrance drive that is so narrow. Typical speeds/traffic load on Banfield Rd require more thought on this driveway. Maybe the driveway should be wider near the road?
Response: Mr. Eby responded that Mr. Pernaw addressed this in the traffic memorandum, it is fine as designed. Further, a deceleration lane or wider roadway entrance would require additional wetland impact.

16. The applicant's plan of three individual crossings seems flawed and overly complex. A small bridge meeting current codes or other another design that is more appropriate and located a little farther from Banfield Road should be considered.
Response: A bridge is not an option as adequate elevation over the wetland does not exist. After discussion with DPW, the requirement of 2% for 20' was reduced allowing us to relocated the ecopassages to increase the height of the tunnels. Two ecopassages are slightly over 24 inches in height, as recommended in the ecopassage documents, and one is 23 inches in height.

17. Curb stops for water shut offs should not be located in paved areas.
Response: These have been relocated.

18. A blanket easement will be required for the entire developed portion so that water department personnel can access valves, hydrants and meters for leak detection and metering. Hydrants will need a maintenance program set up. Main maintenance will be private.
Response: This has been provided, as noted on Sheet S-03.

19. Please add stationing to roadway.
Response: Stationing was added to the Site Layout Plans.

20. There appears to be a very deep ledge cut on the far side of the wetland crossing. It seems like the crossing spot was chosen to minimize wetland disturbance in lieu of constructability and long-term maintenance.
Response: The wetland permit requires us to cross where there is the least disturbance to the wetland. This crossing location is preferred by the Conservation Commission and NHDES; and the road can be constructed where depicted on the plans.

21. There will need to be a tapping saddle and valve on the 20" main in Banfield to supply water. Therefore, the valve shown in the entrance drive is not required.
Response: This has been revised and shown on the plans. (See Sheet C-13.)

We trust the above responses satisfy the concerns expressed at the January meeting of the Technical Advisory Committee. We look forward to discussing these or at the next TAC meeting.

Respectfully,
TFMoran, Inc.

Jack McTigue, PE
Senior Project Manager

JJM/sdr

cc: Rick Green, Michael Green and Jenna Green

THE VILLAGE AT BANFIELD WOODS

BANFIELD ROAD
PORTSMOUTH, NEW HAMPSHIRE

SEPTEMBER 25, 2019
LAST REVISED MARCH 20, 2020

GENERAL INFORMATION

OWNER
MAP 256 LOT 2
MAUD HETT REVOCABLE TRUST
334 HUDSON ROAD
STOWE, MA 01775

APPLICANT/PREPARED FOR
GREEN AND COMPANY REAL ESTATE
11 LAFAYETTE RD, SUITE X
NORTH HAMPTON, NH 03868

RESOURCE LIST

PLANNING/ZONING DEPARTMENT
1 JUNKINS AVE
PORTSMOUTH, NH 03801
603-610-7216
JULIET WALKER, PLANNING DIRECTOR

BUILDING DEPARTMENT
1 JUNKINS AVE
PORTSMOUTH, NH 03801
603-610-7243
ROBERT MARSILIA,
CHIEF BUILDING INSPECTOR

PUBLIC WORKS
600 PEVERLY HILL RD
PORTSMOUTH, NH 03801
603-427-1530
PETER RICE, PUBLIC WORKS DIRECTOR

POLICE DEPARTMENT
3 JUNKINS AVE
PORTSMOUTH, NH 03801
603-427-1510
ROBERT MERNER, CHIEF

FIRE DEPARTMENT
170 COURT STREET
PORTSMOUTH, NH 03801
603-427-1515
TODD GERMAIN, CHIEF

ASSOCIATED PROFESSIONALS

ENVIRONMENTAL SERVICES
GOVE ENVIRONMENTAL SERVICES
8 CONTINENTAL DRIVE
BUILDING 2 - UNIT H
EXETER, NH 03833

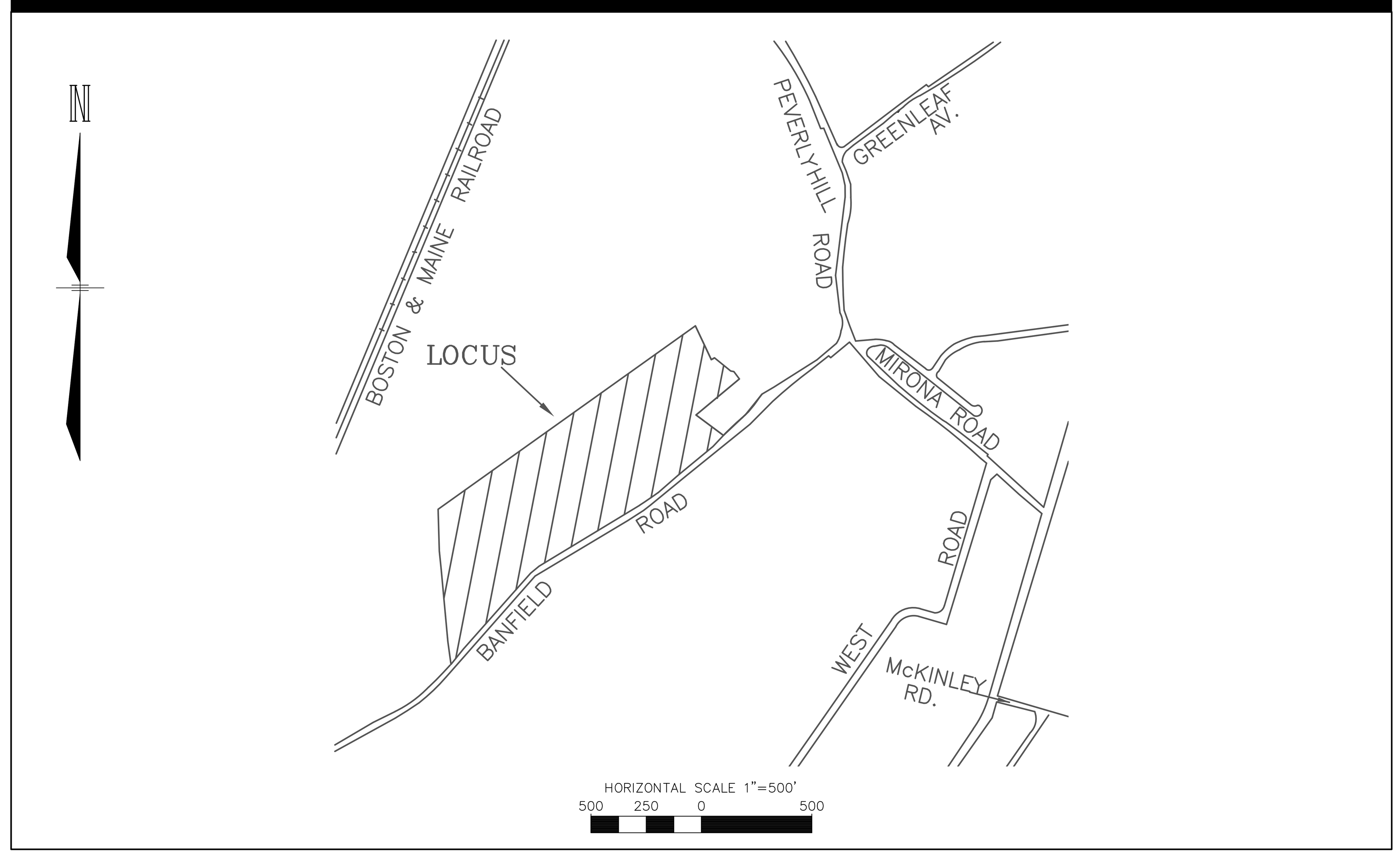
SOIL SCIENTIST
GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE
BUILDING 2 - UNIT H
EXETER, NH 03833
JIM GOVE, CERTIFIED SOIL SCIENTIST

TRAFFIC ENGINEER
STEPHEN G. PERNAW
& COMPANY, INC.
PO BOX 1721
CONCORD, NH 03302
(603) 731-8500
STEPHEN G. PERNAW, PE, PTOE

SURFACE DISPOSAL SYSTEM DESIGNER
G. R. SPAULDING DESIGN
CONSULTANTS LLC.
P.O. BOX 248
CANTERBURY, NH 03224
GARY R. SPAULDING, SSD

INDEX OF SHEETS

VICINITY PLAN



SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2
COVER
THE VILLAGE AT BANFIELD WOODS
PORTSMOUTH, NH
OWNED BY
WALTER D HETT TRUST
PREPARED FOR
GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	REVISED PER REGULATORY COMMENTS	RCK	JJM

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Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	RCK	FB	-	
47361.00	CK	JJM	CADFILE	COVER	C-00

THESE PLANS ARE PERMIT DRAWINGS ONLY AND HAVE NOT BEEN DETAILED FOR CONSTRUCTION OR BIDDING.

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 23, 2020 - 4:39pm
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\Cover.dwg

LEGEND

PROPOSED	
	LARGE DECIDUOUS SHRUBS
	SMALL DECIDUOUS SHRUBS
	LARGE EVERGREEN SHRUBS
	SMALL EVERGREEN SHRUBS
	EVERGREEN TREE
	ORNAMENTAL DECIDUOUS TREE
	MAJOR DECIDUOUS TREE

NOTE:
SELECTED LANDSCAPE PLANT SPECIES TO BE NATIVE OR IMPROVED NATIVE TO NEW ENGLAND.

MAP 266 LOT 3

N/F
ANDREW R. & CAROL ANN CROTEAU
285 BANFIELD ROAD
PORTSMOUTH, NH 03801
RCRD BK. # 1843 PG. # 336

MAP 266 LOT 1

N/F
RICCI CONSTRUCTION CO INC
225 BANFIELD ROAD
PORTSMOUTH, NH 03801
RCRD BK. # 2527 PG. # 0322

MAP 266 LOT 2

N/F
DENISE ARNOLD
261 BANFIELD ROAD
PORTSMOUTH, NH 038
RCRD BK. # 3644 PG. # 1

HORIZONTAL SCALE 1"=50'
50 25 0 50

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

PRELIMINARY LANDSCAPE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: 1"=50' **SEPTEMBER 25, 2019**

TFM

Civil Engineers
Structural Engineers
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Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	RCK	FB	–	
47361.00	CK	JJM	CADFILE	LANDSCAPE	P-01

LEDEND

PROPOSED		PROPOSED	
	PROPERTY LINE		CONCRETE
	ZONING LINE		GRAVEL
	EASEMENT		HEAVY DUTY PAVEMENT
	BASELINE		CONSTRUCTION ENTRANCE
	FLOODPLAIN		SNOW STORAGE
	EDGE OF WATERBODY		RIPRAP
	EDGE OF WETLAND		INLET PROTECTION
	SETBACK (WETLAND)		DRAIN LINE
	SETBACK (STRUCTURE)		DRAINAGE SWALE
	SETBACK (PARKING)		STORMWATER BMP
	SETBACK (LANDSCAPE)	S	SEWER LINE
	GRAVEL ROAD	FM	SEWER FORCE MAIN LINE
EOP	EDGE OF PAVEMENT	W	WATER LINE
VGC	VERTICAL GRANITE CURB	G	GAS LINE
SGC	SLOPED GRANITE CURB	OHE	OVERHEAD UTILITY LINE
CC	CONCRETE CURB	UGE	UNDERGROUND UTILITY LINE
ICC	INTEGRATED CONCRETE CURB		CATCH BASIN
BIT	BUTIMINOUS ASPHALT CURB		DRAIN INLET
CCB	CAPE COD BERM		OUTLET CONTROL STRUCTURE
	SAWCUT		ROOF DRAIN
	BUILDING		DRAIN CLEANOUT
	BUILDING ROOF OVERHANG		DRAIN MANHOLE
	BUILDING FOUNDATION		FLARED END SECTION
	BUILDING ENTRANCE		SEWER CLEAN OUT
	OVERHEAD DOOR		SEWER MANHOLE
	TREE LINE		SEWER VENT
	FENCE (CHAIN LINK)		DRAIN/SEWER/WATER PLUG OR CAP
	FENCE (WIRE)		HYDRANT
	FENCE (STOCKADE)		WATER GATE VALVE
	GUARDRAIL		WATER SHUTOFF
	STONE WALL		THRUST BLOCK
	RETAINING WALL		WATER METER
	SILT FENCE		WATER MANHOLE
SS	SILT SOCK		WELL
	SOIL BOUNDARY		GAS GATE VALVE
	LIMIT OF GRADING		GAS SHUT OFF
	CONTOUR		GAS METER
TC100.50 BC100.00	SPOT GRADE		TELEPHONE MANHOLE
##	PARKING COUNT		ELECTRIC MANHOLE
DSLY	YELLOW DOUBLE SOLID LINE	CC	TRAFFIC CONTROL CABINET
SSLY	YELLOW SINGLE SOLID LINE		ELECTRIC HANDHOLE
SSLW	WHITE SINGLE SOLID LINE		ELECTRIC PULL BOX
SBLW	WHITE SINGLE BROKEN LINE		ELECTRIC METER
STOP	STOP BAR		FLOOD LIGHT
	CROSSWALK		LIGHT POLE
	ACCESSIBLE PARKING SYMBOL		UTILITY POLE
	PAVEMENT ARROW		GUY POLE
	TRAFFIC FLOW ARROW (NOT PAINTED)	T	TRANSFORMER PAD
	SIGN (SINGLE POST)	B-#	BORING LOCATION
	SIGN (DOUBLE POST)	TP-#	TEST PIT LOCATION
	SIGN (PYLON)	IT-#	INFILTRATION TEST LOCATION
	SIGN (MONUMENT)	MW-#	MONITORING WELL
	BOLLARD		
D	DUMPSTER PAD		

ABBREVIATIONS

GENERAL

ABAN	ABANDON	FFE	FINISHED FLOOR ELEVATION	R	RADIUS
AC	ACRES	FND	FOUNDATION	R&D	REMOVE AND DISPOSE
ADJ	ADJUST	HP	HIGH POINT	R&R	REMOVE AND RESET
APPROX	APPROXIMATE	INV	INVERT ELEVATION	REM	REMOVE
BC	BOTTOM OF CURB	IT	INFILTRATION TEST	RET	RETAIN
BIT	BITUMINOUS	L	LENGTH	RIM	RIM ELEVATION
BK/PG	BOOK & PAGE	LF	LINEAR FEET	S	SLOPE
BLDG	BUILDING	LSA	LANDSCAPE AREA	SF	SQUARE FEET
BS	BOTTOM OF SLOPE	MAX	MAXIMUM	SW	SIDEWALK
BW	BOTTOM OF WALL	MIN	MINIMUM	TBM	TEMPORARY BENCHMARK
CONC	CONCRETE	N/F	NOW OR FORMERLY	TC	TOP OF CURB
DIA	DIAMETER	NTS	NOT TO SCALE	TP	TEST PIT
ELEV	ELEVATION	OC	ON CENTER	TW	TOP OF WALL
EP	EDGE OF PAVEMENT	PERF	PERFORATED	TYP	TYPICAL
EXIST	EXISTING	PROP	PROPOSED	UG	UNDERGROUND
				WCR	ACCESSIBLE WHEELCHAIR RAMP
				W/	WITH

UTILITIES

CB	CATCH BASIN
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COND	CONDUIT
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FES	FLARED END SECTION
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
LP	LIGHT POLE
OCS	OUTLET CONTROL STRUCTURE
OWS	OIL WATER SEPARATOR
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE, AND BOX
UP	UTILITY POLE

DIG SAFE
MA ME NH RI VT
811
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

GENERAL NOTES

1. THESE PLANS ARE PERMIT DRAWINGS ONLY AND HAVE NOT BEEN DETAILED FOR CONSTRUCTION OR BIDDING.
2. THESE PLANS WERE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. TFMORAN, INC. ASSUMES NO LIABILITY AS A RESULT OF ANY CHANGES OR NON-CONFORMANCE WITH THESE PLANS EXCEPT UPON THE WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
3. THE CONDOMINIUM SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
4. ALL IMPROVEMENTS SHOWN ON THE SITE PLANS 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 CITY PLANNING DIRECTOR.
5. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE CITY OF PORTSMOUTH, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK TO CONFORM TO CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS. ALL WORK WITHIN THE RIGHT-OF-WAY OF THE CITY AND/OR STATE SHALL COMPLY WITH APPLICABLE STANDARDS. COORDINATE ALL WORK WITHIN THE RIGHT-OF-WAY WITH APPROPRIATE CITY, COUNTY, AND/OR STATE AGENCY.
6. AN ALTERATION OF TERRAIN PERMIT IS REQUIRED PER ENV-WQ 1503.02. THE SITE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF NHDES ENV-WQ 1500 OR AS APPLICABLE.
7. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.
8. CONTACT EASEMENT OWNERS PRIOR TO COMMENCING ANY WORK WITHIN THE EASEMENTS.
9. PRIOR TO COMMENCING ANY SITE WORK, ALL LIMITS OF WORK SHALL BE CLEARLY MARKED IN THE FIELD.
10. SITE WORK SHALL BE CONSTRUCTED FROM A COMPLETE SET OF PLANS, NOT ALL FEATURES ARE DETAILED ON EVERY PLAN. THE ENGINEER IS TO BE NOTIFIED OF ANY CONFLICT WITHIN THIS PLAN SET.
11. TFMORAN, INC. ASSUMES NO LIABILITY FOR WORK PERFORMED WITHOUT AN ACCEPTABLE PROGRAM OF TESTING AND INSPECTION AS APPROVED BY THE ENGINEER OF RECORD.
12. TEMPORARY FENCING SHALL BE PROVIDED AND COVERED WITH A FABRIC MATERIAL TO CONTROL DUST MITIGATION.
13. ALL DEMOLITION SHALL INSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKWAYS, AND ANY OTHER ADJACENT OPERATING FACILITIES. PRIOR WRITTEN PERMISSION FROM THE OWNER/DEVELOPER AND LOCAL PERMITTING AUTHORITY IS REQUIRED IF CLOSURE/OBSTRUCTIONS TO ROADS, STREET, WALKWAYS, AND OTHERS IS DEEMED NECESSARY. CONTRACTOR TO PROVIDE ALTERNATE ROUTES AROUND CLOSURES/OBSTRUCTIONS PER LOCAL/STATE/FEDERAL REGULATIONS.
14. REFER TO ARCHITECTURAL PLANS FOR LAYOUT OF BUILDING FOUNDATIONS AND CONCRETE ELEMENTS WHICH ABUT THE BUILDING SUCH AS STAIRS, SIDEWALKS, LOADING DOCK RAMPS, PADS, AND COMPACTOR PADS. DO NOT USE SITE PLANS FOR LAYOUT OF FOUNDATIONS.
15. IN THE EVENT OF A CONFLICT BETWEEN PLANS, SPECIFICATIONS, AND DETAILS, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATION.
16. IF CONDITIONS AT THE SITE ARE DIFFERENT THAN SHOWN ON THE PLANS, THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
17. CONTRACTOR'S GENERAL RESPONSIBILITIES:
    A. BID AND PERFORM THE WORK IN ACCORDANCE WITH ALL LOCAL, STATE, AND NATIONAL CODES, SPECIFICATIONS, REGULATIONS, AND STANDARDS.
    B. NOTIFY ENGINEER IN WRITING OF ANY DISCREPANCIES OF PROPOSED LAYOUT AND/OR EXISTING FEATURES.
    C. EMPLOY A LICENSED SURVEYOR TO DETERMINE ALL LINES AND GRADES AND LAYOUT OF SITE ELEMENTS AND BUILDINGS.
    D. THE CONTRACTOR SHALL BE RESPONSIBLE TO BECOME FAMILIAR WITH THE SITE AND ALL SURROUNDING CONDITIONS. THE CONTRACTOR SHALL ADVISE THE APPROPRIATE AUTHORITY OF INTENTIONS AT LEAST 48 HOURS IN ADVANCE.
    E. TAKE APPROPRIATE MEASURES TO REDUCE, TO THE FULLEST EXTENT POSSIBLE, NOISE, DUST AND UNSIGHTLY DEBRIS. CONSTRUCTION ACTIVITIES SHALL BE CARRIED OUT BETWEEN THE HOURS OF 7:00 AM AND 9:00 PM, MONDAY THROUGH FRIDAY IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR CONSTRUCTION, PORTSMOUTH, NEW HAMPSHIRE".
    F. MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
    G. IN ACCORDANCE WITH RSA 430:53 AND AGR 3800, THE CONTRACTOR SHALL NOT TRANSPORT INVASIVE SPECIES OFF THE PROPERTY, AND SHALL DISPOSE OF INVASIVE SPECIES ON-SITE IN A LEGAL MANNER.
    H. COORDINATE WITH ALL UTILITY COMPANIES AND CONTACT DIGSAFE (811 OR 888-344-7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
    I. PROTECT NEW AND EXISTING BURIED UTILITIES DURING INSTALLATION OF ALL SITE ELEMENTS. DAMAGED UTILITIES SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER.
    J. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS, PREPARED BY TFMORAN, INC., DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY NOW OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE US OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND/OR LOCAL REGULATIONS.
    K. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWING AND/OR SPECIFICATION, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
    L. VERIFY LAYOUT OF PROPOSED BUILDING FOUNDATIONS WITH ARCHITECT AND THAT PROPOSED FOUNDATION MEETS PROPERTY LINE SETBACKS PRIOR TO COMMENCING ANY FOUNDATION CONSTRUCTION.
    M. PROVIDE AN AS-BUILT PLAN AT THE COMPLETION OF THE PROJECT TO THE PLANNING DIRECTOR AND PER CITY REGULATIONS.
    N. IF ANY DEVIATIONS FROM THE APPROVED PLANS AND SPECIFICATIONS HAVE BEEN MADE, THE SITE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS STAMPED BY A LICENSED SURVEYOR OR QUALIFIED ENGINEER ALONG WITH A LETTER STAMPED BY A QUALIFIED ENGINEER DESCRIBING ALL SUCH DEVIATIONS, AND BEAR ALL COSTS FOR PREPARING AND FILING ANY NEW PERMITS OR PERMIT AMENDMENTS THAT MAY BE REQUIRED.
    O. AT COMPLETION OF CONSTRUCTION, THE SITE CONTRACTOR SHALL PROVIDE A LETTER CERTIFYING THAT THE PROJECT WAS COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND A LETTER STAMPED BY A QUALIFIED ENGINEER THAT THEY HAVE OBSERVED ALL UNDERGROUND DETENTION SYSTEMS, INFILTRATION SYSTEMS, OR FILTERING SYSTEMS PRIOR TO BACKFILL, AND THAT SUCH SYSTEMS CONFORM TO THE APPROVED PLANS AND SPECIFICATIONS.

GRADING NOTES

1. THE CONTRACTOR SHALL ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF NHDES ENV-WQ 1500 AS APPLICABLE.
2. THE CONTRACTOR SHALL PREPARE, MAINTAIN, AND EXECUTE A S.W.P.P.P. IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT.
3. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK THE ACCURACY OF THE TOPOGRAPHY AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY EARTHWORK BEING PERFORMED ON THE SITE. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED FOR PAYMENT AFTER EARTHWORK HAS COMMENCED.
5. THE CONTRACTOR SHALL REFER TO THE GEOTECHNICAL REPORT FOR INFORMATION ABOUT SOIL AND GROUNDWATER CONDITIONS. THE CONTRACTOR SHALL FOLLOW THE GEOTECHNICAL ENGINEERS RECOMMENDED METHODS TO ADDRESS ANY SOIL AND GROUNDWATER ISSUES THAT ARE FOUND ON SITE.
6. COORDINATE WITH GEOTECHNICAL/STRUCTURAL PLANS FOR SITE PREPARATION AND OTHER BUILDING INFORMATION.
7. COORDINATE WITH ARCHITECTURAL PLANS FOR DETAILED GRADING AT BUILDING, AND SIZE AND LOCATION OF ALL BUILDING SERVICES.
8. SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION. VERIFY TBM ELEVATIONS PRIOR TO CONSTRUCTION.
9. LIMITS OF WORK ARE SHOWN AS APPROXIMATE. THE CONTRACTOR SHALL COORDINATE ALL WORK TO PROVIDE SMOOTH TRANSITIONS. THIS INCLUDES GRADING, PAVEMENT, CURBING, SIDEWALKS, AND ALIGNMENTS.
10. THE CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCE, RAMPS AND LOADING AREAS.
11. THE SITE SHALL BE GRADED SO ALL FINISHED PAVEMENT HAS POSITIVE DRAINAGE AND SHALL NOT POND WATER DEEPER THAN 1/4" FOR A PERIOD OF MORE THEN 15 MINUTES AFTER FLOODING.
12. ALL ELEVATIONS SHOWN AT CURB ARE TO THE BOTTOM OF CURB UNLESS OTHERWISE NOTED.
13. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
14. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE PRIOR TO INSTALLATION OF FINISHED PAVEMENT.
15. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS AND SHALL MEET LOCAL STANDARDS AND THE REQUIREMENTS OF THE LATEST NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE CONSTRUCTION AND THE NHDOT STANDARD STRUCTURE DRAWINGS UNLESS OTHERWISE NOTED.
16. STORMWATER DRAINAGE SYSTEM SHALL BE CONSTRUCTED TO LINE AND GRADE AS SHOWN ON THE PLANS. CONSTRUCTION METHODS SHALL CONFORM TO NHDOT STANDARD SPECIFICATIONS, SECTION 603. CATCH BASINS AND DRAIN MANHOLES SHALL CONFORM TO SECTION 604. ALL CATCH BASIN GRATES SHALL BE TYPE B AND CONFORM TO NHDOT STANDARDS AND SPECIFICATIONS UNLESS OTHERWISE NOTED.
17. NO FILL SHALL BE PLACED IN ANY WETLAND AREA, EXCEPT AS SHOWN ON THE WETLAND IMPACT PLAN AND IN ACCORDANCE WITH THE WETLAND PERMIT.
18. ALL EXCAVATIONS SHALL BE THOROUGHLY SECURED ON A DAILY BASIS BY THE CONTRACTOR AT THE COMPLETION OF CONSTRUCTION OPERATIONS IN THE IMMEDIATE AREA.
19. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.
20. DENSITY REQUIREMENTS:

MINIMUM DENSITY*	LOCATION
95%	BELOW PAVED OR CONCRETE AREAS
95%	TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL
90%	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 D-6938.

UTILITY NOTES

1. LENGTH OF PIPE IS FOR CONVENIENCE ONLY. ACTUAL PIPE LENGTH SHALL BE DETERMINED IN THE FIELD.
2. ALL PROPOSED UTILITY WORK, INCLUDING MATERIAL, INSTALLATION, TERMINATION, EXCAVATION, BEDDING, BACKFILL, COMPACTION, TESTING, CONNECTIONS, AND CONSTRUCTION SHALL BE COORDINATED WITH AND COMPLETED IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS, CODES, AND STANDARDS OF ALL CORRESPONDING UTILITY ENTITIES AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR THE CONDITION OF THE SITE. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND REPORT DISCREPANCIES TO THE ENGINEER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE, AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION BE AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT "DIGSAFE" (811) AT LEAST 72 HOURS BEFORE DIGGING.
5. CONFIRM UTILITY PENETRATIONS AND INVERT ELEVATIONS ARE COORDINATED PRIOR TO INSTALLATION.
6. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA AND SHALL COORDINATE AS NECESSARY WITH THE UTILITY COMPANIES OF SAID UTILITIES. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
7. THE EXACT LOCATION OF NEW UTILITY CONNECTIONS SHALL BE DETERMINED BY THE CONTRACTOR IN COORDINATION WITH UTILITY COMPANY, COUNTY AGENCY, AND/OR PRIVATE UTILITY COMPANY.
8. 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 THE UTILITY INSTALLATION COMPLETE AND OPERATIONAL.
9. ALL UTILITY COMPANIES REQUIRE INDIVIDUAL CONDUITS. CONTRACTOR TO COORDINATE WITH TELEPHONE, CABLE, AND ELECTRIC COMPANIES REGARDING NUMBER, SIZE, AND TYPE OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF ANY CONDUIT.
10. ON-SITE WATER DISTRIBUTION SHALL BE TO CITY OF PORTSMOUTH STANDARDS AND SPECIFICATIONS. WATER MAINS SHALL HAVE A MINIMUM OF 5.5' COVER. WHERE WATER PIPES CROSS SEWER LINES A MINIMUM OF 18" VERTICAL SEPARATION BETWEEN THE TWO OUTSIDE PIPE WALLS SHALL BE OBSERVED. HORIZONTAL SEPARATION BETWEEN WATER AND SEWER SHALL BE 10' MINIMUM. WHERE A SANITARY LINE CROSSES A WATER LINE, ENCASE THE SANITARY LINE IN 6" THICK CONCRETE FOR A DISTANCE OF 10' EITHER SIDE OF THE CROSSING, OR SUBSTITUTE RUBBER-GASKETED PRESSURE PIPE FOR THE SAME DISTANCE. WHEN SANITARY LINES PASS BELOW WATER LINES, LAY PIPE SO THAT NO JOINT IN THE SANITARY LINE WILL BE CLOSER THAN 3' HORIZONTALLY TO THE WATER LINE.
11. THRUST BLOCKS SHALL BE PROVIDED AT ALL LOCATIONS WHERE WATER LINE CHANGES DIRECTIONS OR CONNECTS TO ANOTHER WATER LINE.
12. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONDUIT AND WIRING TO ALL SIGNS AND LIGHTS. CONDUIT TO BE A MINIMUM OF 24" BELOW FINISH GRADE.
13. ALL PROPOSED UTILITIES SHALL BE UNDERGROUND. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES.
14. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL INSPECTIONS, TESTING AND RELATED SERVICES AND SUBMIT COPIES OF ACCEPTANCE TO THE OWNER, UNLESS OTHERWISE INDICATED.
15. ALL UTILITY STRUCTURES IN PAVEMENT TO BE SET TO FINISH GRADE REGARDLESS OF ANY ELEVATION SHOWN OTHERWISE.
16. PROVIDE PERMANENT PAVEMENT REPAIR FOR ALL UTILITY TRENCHES IN EXISTING ROAD OR PAVEMENT TO REMAIN. SAW CUT TRENCH, PAVEMENT AND GRANULAR BASE THICKNESS TO MATCH EXISTING PAVEMENT. OBTAIN ALL PERMITS REQUIRED FOR TRENCHING.
17. UNLESS OTHERWISE SPECIFIED, ALL UNDERGROUND STRUCTURES, PIPES, CHAMBERS, ETC. SHALL BE COVERED WITH A MINIMUM OF 18" OF COMPACTED SOIL BEFORE EXPOSURE TO VEHICLE LOADS.
19. THE PROPERTY WILL BE SERVICED BY THE FOLLOWING:

DRAINAGE	PRIVATE
SEWER	SEPTIC SYSTEM
WATER	MUNICIPAL
GAS	UNITIL
ELECTRIC	EVERSOURCE
TELEPHONE	CONSOLIDATED COMMUNICATIONS FKA FAIRPOINT COMMUNICATIONS
CABLE	COMCAST

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

NOTES & LEGEND

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

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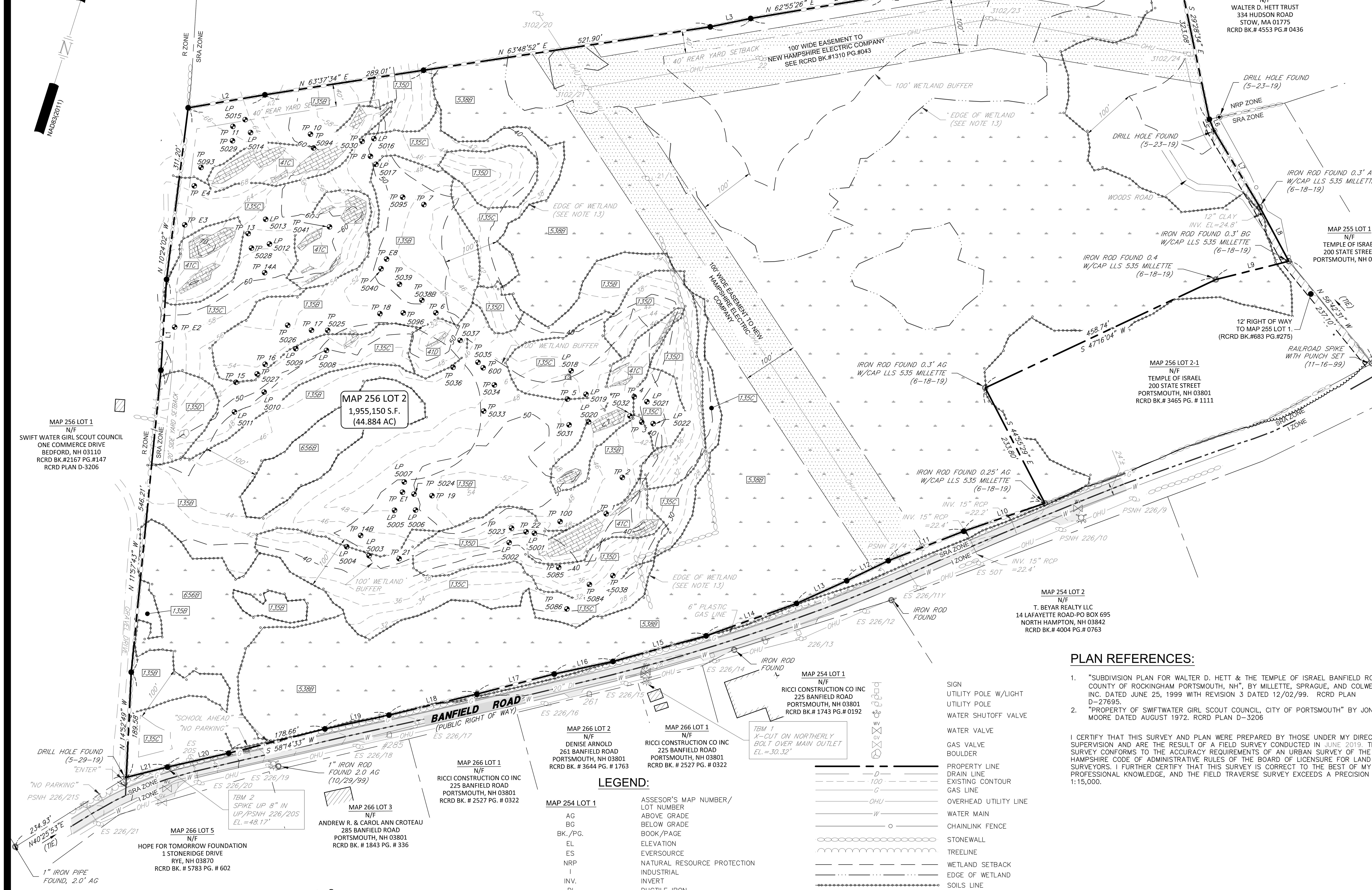
FILE	47361.00	DR	RCK	FB	–	C-01
		CK	JJM	CADFILE	NOTES	

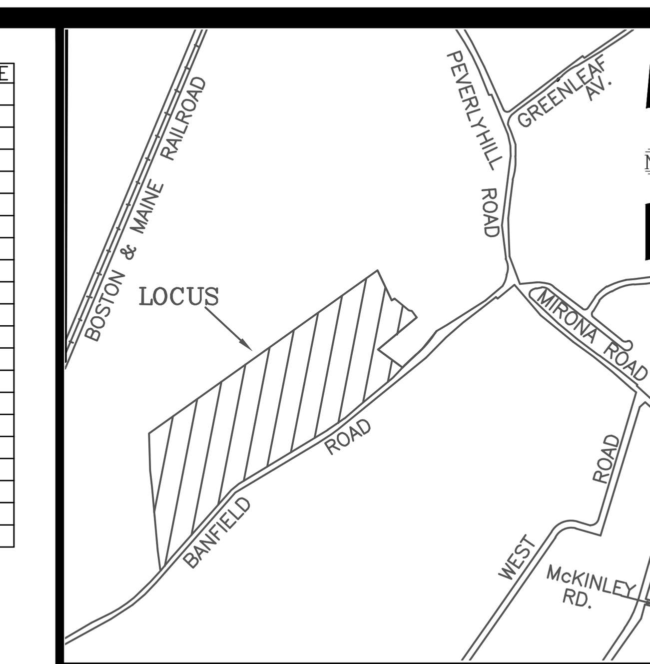
Mar 23, 2020 - 4:39pm
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\Notes.dwg

SOILS LEGEND:		
SSSS SYMBOL	SSSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C

SOILS LEGEND:	
SLOPE PHASE:	ALPHA SLOPE SYMBOL
0–8%	B
8–15%	C
15–25%	D
25%+	E



LINE	BEARING	DISTANCE
L1	N 14°03'49" W	163.61'
L2	N 62°46'56" E	140.17'
L3	N 60°47'10" E	74.31'
L4	N 61°20'44" E	105.56'
L5	N 60°58'42" E	115.75'
L6	S 40°08'01" E	22.98'
L7	S 48°30'23" E	159.80'
L8	S 45°44'06" E	110.28'
L9	S 58°19'16" W	135.27'
L10	S 53°23'55" W	154.49'
L11	S 51°04'17" W	145.81'
L12	S 46°41'16" W	83.08'
L13	S 48°05'39" W	99.00'
L14	S 52°42'36" W	173.00'
L15	S 57°03'44" W	173.81'
L16	S 60°20'11" W	108.27'
L17	S 57°50'14" W	143.89'
L18	S 59°00'53" W	162.66'
L19	S 60°14'59" W	117.96'
L20	S 59°39'51" W	113.08'
L21	S 58°23'21" W	76.30'



LOCATION PLAN

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE A (SRA) ZONING DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 256 AS LOT 2.
3. THE PARCEL IS LOCATED IN ZONE X AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
4. DIMENSIONAL REQUIREMENTS: — REQUIRED:
   MINIMUM LOT SIZE: 1 ACRE
   LOT AREA PER DWELLING UNIT: 1 ACRE
   CONTINUOUS STREET FRONTAGE: 150'
   LOT DEPTH: 200'
   MINIMUM YARD DIMENSIONS:
   FRONT: 30'
   SIDE: 20'
   REAR: 40'
   MAXIMUM STRUCTURE DIMENSIONS:
   STRUCTURE HEIGHT: 35'(SLOPED ROOF) 30'(FLAT ROOF)
   BUILDING COVERAGE: 10%
   MINIMUM OPEN SPACE: 50%
   PER THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTION 10.520.
5. OWNER OF RECORD:
   MAP 256 LOT 2:
   THE WALTER D. HETT TRUST
   WALTER D. HETT, TRUSTEE
   334 HUDSON ROAD
   STOW, MA 01775
   RCRD BK.#4553 PG.#432
6. PARCEL AREA:
   MAP 256 LOT 2:
   1,955,150 S.F.
   (44.884 ACRES)
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO SHOW THE BOUNDARY LINES, TOPOGRAPHY AND CURRENT SITE FEATURES OF MAP 256 LOT 2.
9. FIELD SURVEY COMPLETED BY TCE AND EJS IN MAY & JUNE 2019 USING A TOPCON DS103 AND A TOPCON FC–5000 DATA COLLECTOR.
10. HORIZONTAL DATUM IS NAD83 (2011) PER STATIC GPS OBSERVATIONS. THE VERTICAL DATUM IS NAVD88 (GEOID12B) PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 2 FEET.
11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
12. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.
13. WETLAND DELINEATION WAS COMPLETED BY GOVE ENVIRONMENTAL SERVICES IN MAY, 2019 IN ACCORDANCE WITH THE 1987 ARMY CORP OF ENGINEERS WETLAND MANUAL AND THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. FIELD LOCATED BY TFMORAN, INC.
14. SEE SHEET C–02 FOR TEST PIT & LEDGE PROBE LOGS.
15. SOILS NOTE:
    THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.
    THE SITE SPECIFIC SOIL SURVEY (SSSS) WAS PRODUCED DECEMBER 19, 2019 AND WAS PREPARED BY JAMES P. GOVE, CSS # 004, GOVE ENVIRONMENTAL SERVICES, INC. THE SURVEY AREA IS LOCATED ON BANFIELD ROAD, PORTSMOUTH, NH.
    SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE–WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE # 10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOIL COMPONENTS OF THE COMPLEX.
    HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009.

PLAN REFERENCES:

1. "SUBDIVISION PLAN FOR WALTER D. HETT & THE TEMPLE OF ISRAEL BANFIELD ROAD COUNTY OF ROCKINGHAM PORTSMOUTH, NH", BY MILLETTE, SPRAGUE, AND COLWELL, INC. DATED JUNE 25, 1999 WITH REVISION 3 DATED 12/02/99. RCRD PLAN D–27695.
2. "PROPERTY OF SWIFTWATER GIRL SCOUT COUNCIL, CITY OF PORTSMOUTH" BY JON MOORE DATED AUGUST 1972. RCRD PLAN D–3206

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY THOSE UNDER MY DIRECT SUPERVISION AND ARE THE RESULT OF A FIELD SURVEY CONDUCTED IN JUNE 2019. THIS SURVEY CONFORMS TO THE ACCURACY REQUIREMENTS OF AN URBAN SURVEY OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I FURTHER CERTIFY THAT THIS SURVEY IS CORRECT TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, AND THE FIELD TRAVERSE SURVEY EXCEEDS A PRECISION OF 1:15,000.

LICENSED LAND SURVEYOR

DATE

LEGEND:

MAP 254 LOT 1	ASSESOR'S MAP NUMBER/ LOT NUMBER
AG	ABOVE GRADE
BG	BELOW GRADE
BK./PG.	BOOK/PAGE
EL	ELEVATION
ES	EVERSOURCE
NRP	NATURAL RESOURCE PROTECTION
I	INDUSTRIAL
INV.	INVERT
DI	DUCTILE IRON
LP	LEDGE PROBE
N/F	NOW OR FORMERLY
PSNH	PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
R	RURAL
RCP	REINFORCED CONCRETE PIPE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
SRA	SINGLE RESIDENCE A
S.F.	SQUARE FEET
TBM	TEMPORARY BENCH MARK
TP	TEST PIT
	TEST PIT/LEDGE PROBE
	MAILBOX
	GUY WIRE
	HYDRANT

SIGN
UTILITY POLE W/LIGHT
UTILITY POLE
WATER SHUTOFF VALVE
WATER VALVE
GAS VALVE
BOULDER
PROPERTY LINE
DRAIN LINE
EXISTING CONTOUR
GAS LINE
OVERHEAD UTILITY LINE
WATER MAIN
CHAINLINK FENCE
STONEWALL
TREELINE
WETLAND SETBACK
EDGE OF WETLAND
SOILS LINE

PAVEMENT
12' RIGHT OF WAY
WETLANDS
EXPOSED LEDGE
100' WIDE ELECTRIC EASEMENT

100 0 100
Graphic Scale in Feet

DIG SAFE
MA ME NH RI VT
CALL 811 TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV.	DATE	DESCRIPTION	DR	CK
3	12/23/19	ADDED SOIL MAPPING	MVP	BMK
2	11/11/19	UPDATED WETLAND & BUFFER	MVP	BMK
1	10/2/19	ADDED TEST PIT & LEDGE PROBE LOCATIONS	MVP	BMK

TAX MAP 256 LOT 2
EXISTING CONDITIONS PLAN
BANFIELD ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
THE WALTER D. HETT TRUST
PREPARED FOR
GREEN & COMPANY REAL ESTATE

SCALE: 1" = 100' (22x34)
1" = 200' (11x17)
SEPTEMBER 25, 2019

TFM MSC
A division of TFMoran, Inc.
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
170 Commerce Way, Suite 102
Portsmouth, NH 03801
Phone (603) 431–2222
Fax (603) 431–0910
www.tfmoran.com

FILE	DR	EJS	FB	559	
47361-00	CK	BMK	CADFILE		S-01

Mar 02, 2020 - 1:27pm
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Carlson Survey\Dwgs\47361-00 Survey.dwg

TEST PIT LOG

SITE: BANFIELD RD, PORTSMOUTH
LOGGED BY: JAMES GOVE & BRENDEN WALDEN
DATE: 8/29 & 8/30, 2019

Test Pit #1:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–30 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 30 INCHES REFUSAL: 30 INCHES OBSERVED WATER: N/A

Test Pit #2:
0–9 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
9–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 28 INCHES REFUSAL: 28 INCHES OBSERVED WATER: N/A

Test Pit #3:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–30 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
30–57 INCHES, 2.5Y 5/3, FINE SANDY LOAM, GRANULAR, FRIABLE,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 30 INCHES REFUSAL: 57 INCHES OBSERVED WATER: N/A

Test Pit #4:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–24 INCHES, 10YR 4/6, FINE SANDY LOAM GRANULAR FRIABLE
ESHWT: 24 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #5:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–25 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
25–51 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 25 INCHES REFUSAL: 51 INCHES OBSERVED WATER: N/A

Test Pit #6:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #7:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10– 41 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
41–64 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 41 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #8:
0–7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–53 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 53 INCHES OBSERVED WATER: N/A

Test Pit #10:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–36 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
36–68 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FRIABLE,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 36 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #11:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–64 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCETRATIONS
ESHWT: 28 INCHES REFUSAL: 64 INCHES OBSERVED WATER: N/A

Test Pit #13:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32–61 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 61 INCHES OBSERVED WATER: N/A

Test Pit #14A:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–23 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
23–44 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #14B:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32–57 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 57 INCHES OBSERVED WATER: N/A

TEST PIT LOG

SITE: BANFIELD RD, PORTSMOUTH
LOGGED BY: JAMES GOVE & BRENDEN WALDEN
DATE: 8/29 & 8/30, 2019

Test Pit #15:
0–14 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
14–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FIRM,
WITH 40% REDOX CONCENTRATIONS
ESHWT:28 INCHES REFUSAL: 60 INCHES OBSERVED WATER: N/A

Test pit #16:
0–5 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
5–24 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 24 INCHES REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #17:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–34 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
34–60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FRIABLE,
WITH 10% REDOX CONCENTRATIONS
ESHWT:34 INCHES REFUSAL: 60 INCHES OBSERVED WATER: N/A

Test Pit #18:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–22 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
22–50 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 22 INCHES REFUSAL: 50 INCHES OBSERVED WATER: N/A

Test Pit #19:
0–7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7–24 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 24 INCHES REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #21:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–21 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
21–48 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 21 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #22:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–20 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
20–58 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 20 INCHES REFUSAL: 58 INCHES OBSERVED WATER: N/A

Test Pit #E1:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–22 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
22–51 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 20% REDOX CONCENTRATIONS
ESHWT: 22 INCHES REFUSAL: 51 INCHES OBSERVED WATER: N/A

Test Pit #E2:
0–5 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
5–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 28 INCHES REFUSAL: 28 INCHES OBSERVED WATER: N/A

Test Pit #E3:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32–74 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 74 INCHES OBSERVED WATER: N/A

Test Pit #E4:
0–9 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
9–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–50 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 50 INCHES OBSERVED WATER: N/A

Test Pit #E8:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–27 INCHES, 2.5Y 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
27–62 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 27 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #100:
0–10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10–28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28–54 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 54 INCHES OBSERVED WATER: N/A

Test Pit #600:
0–8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8–21 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
21–47 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM,
WITH 10% REDOX CONCENTRATIONS
47–60 INCHES, 2.5Y 5/2, SILT LOAM, MASSIVE, FIRM,
WITH 30% REDOX CONCENTRATIONS
ESHWT: 21 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT LOG

SITE: BANFIELD RD, PORTSMOUTH
LOGGED BY: BRENDEN WALDEN, LUKE HURLEY & MIKE COUMO
DATE: OCTOBER, 2019

TEST PIT #5023:
0–2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2–24 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
24–36 INCHES, 2.5Y 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
36–44 INCHES, 2.5Y 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 36 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

TEST PIT #5024:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–18 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
18–32 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 32 INCHES OBSERVED WATER: N/A

TEST PIT #5025:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7–32 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 32 INCHES OBSERVED WATER: N/A

TEST PIT #5026:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–22 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 22 INCHES OBSERVED WATER: N/A

TEST PIT #5027:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–20 INCHES, 10YR 5/5, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 20 INCHES OBSERVED WATER: N/A

TEST PIT #5028:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
4–36 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT # 5029:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–8 INCHES, 10YR 4/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
8–24 INCHES, 10YR 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24–40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
40–44 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 40 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

TEST PIT #5030:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–8 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
8–30 INCHES, 2.5Y 7/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
30–40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 30 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5031:
0–5 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
5–12 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12–24 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
24–40 INCHES, 2.5Y 6/4, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5032:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–6 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
6–14 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
14–36 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT #5033:
0–2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2–15 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
15–23 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
23–52 INCHES, 2.5Y 4/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 30% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5034:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–20 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
20–36 INCHES, 2.5Y 5/4, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 20 INCHES REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT #5035:
0–3 INCHES, 10YR 2/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–23 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
23–55 INCHES, 2.5Y 5/2, FINE SANDY LOAM, MASSIVE, FIRM, WITH 25% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5036:
0–2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2–12 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12–26 INCHES, 2.5Y 5/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
26–34 INCHES, 2.5Y 5/5, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 26 INCHES REFUSAL: 34 INCHES OBSERVED WATER: N/A

TEST PIT #5037:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–15 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
15–34 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
34–40 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 34 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5038:
0–4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
4–14 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
14–24 INCHES, 6/4, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM
24–60 INCHES, 2.5Y 5/2, SILT LOAM, BLOCKY, FIRM, WITH 25% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5038B:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–14 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
14–24 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24–29 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM
29–40 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 29 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5039:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–24 INCHES, 2.5Y 4/6, FINE SANDY LOAM, GRANULAR, FRIBALE
ESHWT: N/A REFUSAL: 24 INCHES OBSERVED WATER: N/A

TEST PIT #5040:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–30 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
30–38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM
ESHWT: N/A REFUSAL: 38 INCHES OBSERVED WATER: N/A

TEST PIT #5041:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIBALE
3–20 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIBALE
ESHWT: N/A REFUSAL: 20 INCHES OBSERVED WATER: N/A

TEST PIT #5084:
0–6 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6–24 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24–38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 38 INCHES OBSERVED WATER: N/A

TEST PIT #5085:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–24 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 24 INCHES OBSERVED WATER: N/A

TEST PIT #5086:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6–24 INCHES, 2.5Y 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
24–68 INCHES, 2.5Y 5/2, FINE SANDY LOAM, MASSIVE, FIRM, WITH 50% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5093:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4–12 INCHES, 10YR 4/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
12–22 INCHES, 10YR 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
22–36 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT #5094:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–12 INCHES, 2.5Y 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
12–32 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
32–54 INCHES, 2.5Y 5/4, FINE SANDY LOAM, PLATY, FIRM, WITH 20% REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 54 INCHES OBSERVED WATER: N/A

TEST PIT #5095:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–12 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12–32 INCHES, 2.5Y 7/4, FINE SANDY LOAM, MASSIVE, FIRM WITH 10% REDOX CONCETRATIONS
ESHWT: 12 INCHES REFUSAL: 32 INCHES OBSERVED WATER: N/A

TEST PIT #5096:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–16 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
16–34 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 34 INCHES OBSERVED WATER: N/A

LEDGE PROBES:

NUMBER	DEPTH (IN)	ELEVATION (FT)
5001	47	39.5
5002	52	37.1
5003	32	41.0
5004	36	40.3
5005	32	46.0
5006	36	46.5
5007	36	46.1
5008	24	48.0
5009	30	50.2
5010	34	45.4
5011	22	46.7
5012	42	59.4
5013	24	58.9
5014	30	61.8
5015	24	62.5
5016	32	47.5
5017	48	46.3
5018	46	41.7
5019	32	43.4
5020	46	42.7
5021	41	35.5
5022	66	33.6

TAX MAP 256 LOT 2
TEST PIT LOGS & LEDGE PROBES
BANFIELD ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
THE WALTER D. HETT TRUST
PREPARED FOR
GREEN & COMPANY REAL ESTATE

SCALE: N.T.S.

SEPTEMBER 25, 2019

REV	DATE	DESCRIPTION	DR	CK
3	12/23/19	NO REVISIONS THIS SHEET	MVP	BMK
2	11/11/19	NO REVISIONS THIS SHEET	MVP	BMK
1	10/2/19	ADDED THIS SHEET	MVP	BMK

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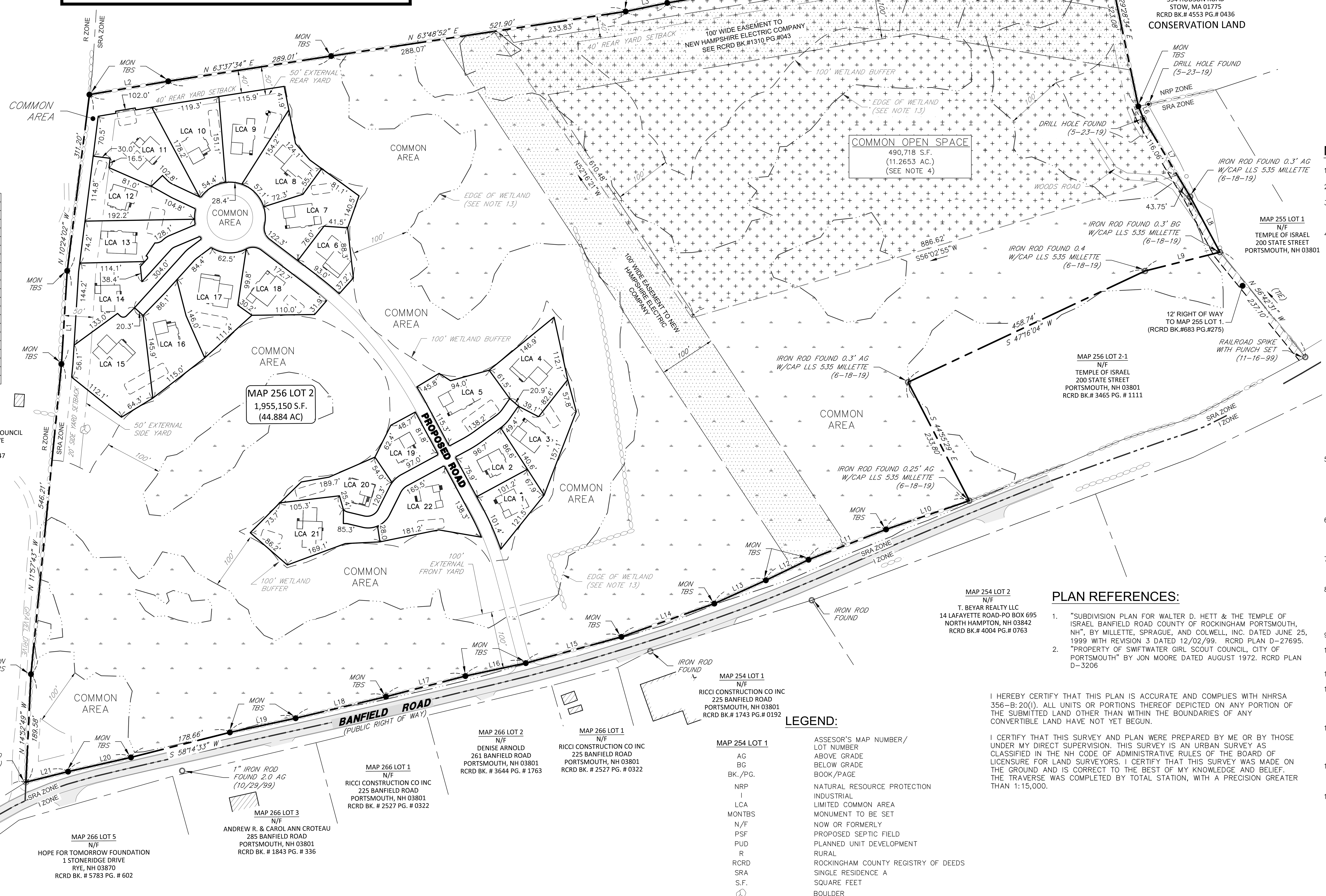
FILE	DR	CK	FB	CADFILE	
47361-00	EJS	BMK	559		S-02

Mar 05, 2020 - 8:26pm
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Carlson Survey\Dwgs\47361-00 Survey.dwg

CITY OF PORTSMOUTH PLANNING BOARD

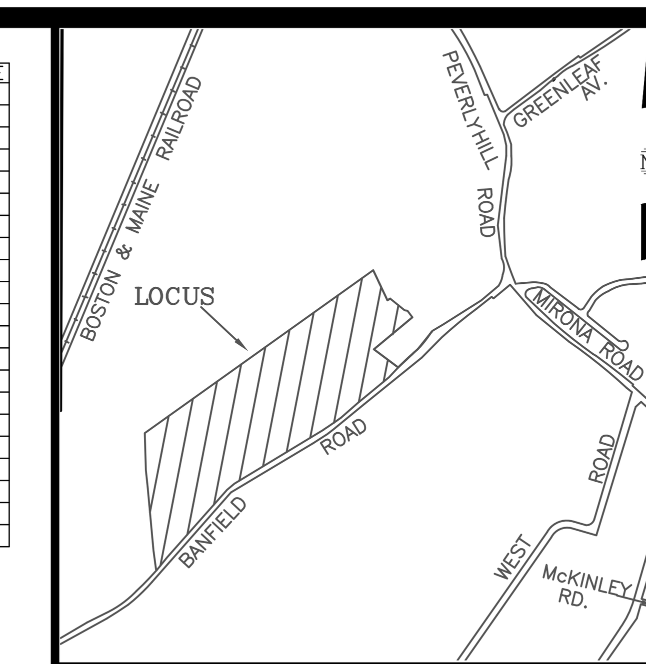
CHAIRPERSON DATE



LIMITED COMMON AREA:

LCA 1	8,071 S.F.
LCA 2	7,950 S.F.
LCA 3	12,048 S.F.
LCA 4	13,016 S.F.
LCA 5	12,587 S.F.
LCA 6	7,108 S.F.
LCA 7	13,804 S.F.
LCA 8	11,038 S.F.
LCA 9	13,443 S.F.
LCA 10	13,550 S.F.
LCA 11	15,500 S.F.
LCA 12	12,483 S.F.
LCA 13	10,714 S.F.
LCA 14	14,387 S.F.
LCA 15	18,120 S.F.
LCA 16	12,304 S.F.
LCA 17	15,553 S.F.
LCA 18	11,591 S.F.
LCA 19	7,470 S.F.
LCA 20	9,677 S.F.
LCA 21	15,268 S.F.
LCA 22	13,160 S.F.

LINE	BEARING	DISTANCE
L1	N 14°03'49" W	163.61'
L2	N 62°46'56" E	140.17'
L3	N 60°47'10" E	74.31'
L4	N 61°20'44" E	105.56'
L5	N 60°58'42" E	115.75'
L6	S 40°08'01" E	22.98'
L7	S 48°30'23" E	159.80'
L8	S 45°44'06" E	110.28'
L9	S 58°19'16" W	135.27'
L10	S 53°23'55" W	154.49'
L11	S 51°04'17" W	145.81'
L12	S 46°41'16" W	83.08'
L13	S 48°05'39" W	99.00'
L14	S 52°42'36" W	173.00'
L15	S 57°03'44" W	173.81'
L16	S 60°20'11" W	108.27'
L17	S 57°50'14" W	143.89'
L18	S 59°00'53" W	162.66'
L19	S 60°14'59" W	117.96'
L20	S 59°39'51" W	113.08'
L21	S 58°23'21" W	76.30'



LOCATION PLAN

PLAN REFERENCES:

1. "SUBDIVISION PLAN FOR WALTER D. HETT & THE TEMPLE OF ISRAEL BANFIELD ROAD COUNTY OF ROCKINGHAM PORTSMOUTH, NH", BY MILLETTE, SPRAGUE, AND COLWELL, INC. DATED JUNE 25, 1999 WITH REVISION 3 DATED 12/02/99. RCRD PLAN D-27695.
2. "PROPERTY OF SWIFTWATER GIRL SCOUT COUNCIL, CITY OF PORTSMOUTH" BY JON MOORE DATED AUGUST 1972. RCRD PLAN D-3206

I HEREBY CERTIFY THAT THIS PLAN IS ACCURATE AND COMPLIES WITH NHRSA 356-B:20(I). ALL UNITS OR PORTIONS THEREOF DEPICTED ON ANY PORTION OF THE SUBMITTED LAND OTHER THAN WITHIN THE BOUNDARIES OF ANY CONVERTIBLE LAND HAVE NOT YET BEGUN.

I CERTIFY THAT THIS SURVEY AND PLAN WERE PREPARED BY ME OR BY THOSE UNDER MY DIRECT SUPERVISION. THIS SURVEY IS AN URBAN SURVEY AS CLASSIFIED IN THE NH CODE OF ADMINISTRATIVE RULES OF THE BOARD OF LICENSURE FOR LAND SURVEYORS. I CERTIFY THAT THIS SURVEY WAS MADE ON THE GROUND AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THE TRAVERSE WAS COMPLETED BY TOTAL STATION, WITH A PRECISION GREATER THAN 1:15,000.

LICENSED LAND SURVEYOR DATE

NOTES:

1. THE PARCEL IS LOCATED IN THE SINGLE RESIDENCE A (SRA) ZONING DISTRICT.
2. THE PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 256 AS LOT 2.
3. THE PARCEL IS LOCATED IN ZONE X AS SHOWN ON NATIONAL FLOOD INSURANCE PROGRAM (NFIP), FLOOD INSURANCE RATE MAP (FIRM) ROCKINGHAM COUNTY, NEW HAMPSHIRE, PANEL 270 OF 681, MAP NUMBER 33015C0270E, WITH AN EFFECTIVE DATE OF MAY 17, 2005.
4.

DIMENSIONAL REQUIREMENTS:	REQUIRED:	PROPOSED:
MINIMUM LOT SIZE:	1 ACRE	44.884 ACRES
LOT AREA PER DWELLING UNIT:	1 ACRE	N/A
CONTINUOUS STREET FRONTAGE:	150'	1,730'
LOT DEPTH:	200'	876'
MINIMUM YARD DIMENSIONS:		
FRONT:	30'	254'
SIDE:	20'	53'
REAR:	40'	89.9'
MAXIMUM STRUCTURE DIMENSIONS:		
STRUCTURE HEIGHT:	35'(SLOPED ROOF) 30'(FLAT ROOF)	
BUILDING COVERAGE:	10%	2.12%
MINIMUM OPEN SPACE:	50%	94.67%

PER THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTION 10.520.

OPEN SPACE RESIDENTIAL PUD (OS-PUD)	REQUIRED:	PROPOSED:
MINIMUM LOT AREA:	10 ACRES	44.884 ACRES
MINIMUM STREET FRONTAGE:	100'	1,730'
MINIMUM EXTERNAL YARDS:		
FRONT:	100'	254'
SIDE & REAR:	50'	53.0'; 89.9'
MINIMUM INTERNAL YARDS:		
FRONT:	20'	20.9'
SIDE & REAR:	25'	53.0'; 89.9'
MINIMUM SEPARATION BETWEEN STRUCTURES:	30'	31.0'
MINIMUM OPEN SPACE:	25%	94.67%

PER THE CITY OF PORTSMOUTH ZONING ORDINANCE SECTION 10.725

5. OWNER OF RECORD:
MAP 256 LOT 2:
THE WALTER D. HETT TRUST
WALTER D. HETT, TRUSTEE
334 HUDSON ROAD
STOW, MA 01775
RCRD BK.#4553 PG.#432
6.

TOTAL PARCEL AREA: MAP 256 LOT 2:	SUBMITTED AREA:	COMMON AREA:
1,955,150 S.F. (44.884 ACRES)	1,955,150 S.F. (44.884 ACRES)	1,955,150 S.F. (44.884 ACRES)

7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE THE EXTENT OF OWNERSHIP OR DEFINE THE LIMITS OF TITLE.
8. THE PURPOSE OF THIS PLAN IS TO DEPICT THE COMMON AREAS AND LIMITED COMMON AREAS ASSOCIATED WITH THE OPEN SPACE PLANNED UNIT DEVELOPMENT OF MAP 256 LOT 2. CONSTRUCTION OF UNITS NOT YET BEGUN. THE FINAL METES AND BOUNDS OF THE UNITS AND THEIR ASSIGNED LIMITED COMMON AREAS SHALL BE DETERMINED BY AS-BUILT PLANS WITH AN AMENDED CONDOMINIUM SITE PLAN TO BE RECORDED UPON COMPLETION OF EACH UNIT.
9. THESE UNITS ARE FOR RESIDENTIAL USE ONLY.
10. FIELD SURVEY COMPLETED BY TCE AND EJS IN MAY & JUNE 2019 USING A TOPCON DS103 AND A TOPCON FC-5000 DATA COLLECTOR.
11. HORIZONTAL DATUM IS NAD83 (2011) PER STATIC GPS OBSERVATIONS.
12. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
13. WETLAND DELINEATION WAS COMPLETED BY GOVE ENVIRONMENTAL SERVICES IN MAY, 2019 IN ACCORDANCE WITH THE 1987 ARMY CORP OF ENGINEERS WETLAND MANUAL AND THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION. FIELD LOCATED BY TFMORAN, INC.
14. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. TFMORAN, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE.
15. AN EASEMENT SHALL BE GRANTED TO THE CITY OF PORTSMOUTH TO ALLOW WATER DEPARTMENT PERSONNEL ACCESS TO VALVES, HYDRANTS AND METERS FOR LEAK DETECTION, METERING AND MAINTENANCE.

LEGEND:

MAP 254 LOT 1	ASSESOR'S MAP NUMBER/ LOT NUMBER
AG	ABOVE GRADE
BG	BELOW GRADE
BK./PG.	BOOK/PAGE
NRP	NATURAL RESOURCE PROTECTION
I	INDUSTRIAL
LCA	LIMITED COMMON AREA
MONTBS	MONUMENT TO BE SET
N/F	NOW OR FORMERLY
PSF	PROPOSED SEPTIC FIELD
PUD	PLANNED UNIT DEVELOPMENT
R	RURAL
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
SRA	SINGLE RESIDENCE A
S.F.	SQUARE FEET
	BOULDER
	PROPERTY LINE
	CHAINLINK FENCE
	STONEWALL
	WETLAND SETBACK
	EDGE OF WETLAND
	PAVEMENT
	100' WIDE ELECTRIC EASEMENT
	WETLANDS
	12' RIGHT OF WAY
	COMMON OPEN SPACE

100 0 100
Graphic Scale in Feet

REV.	DATE	DESCRIPTION	DR	CK
1	3/23/2020	REVISED LCA BOUNDARIES, ADDED NOTE 15	IID	BMK

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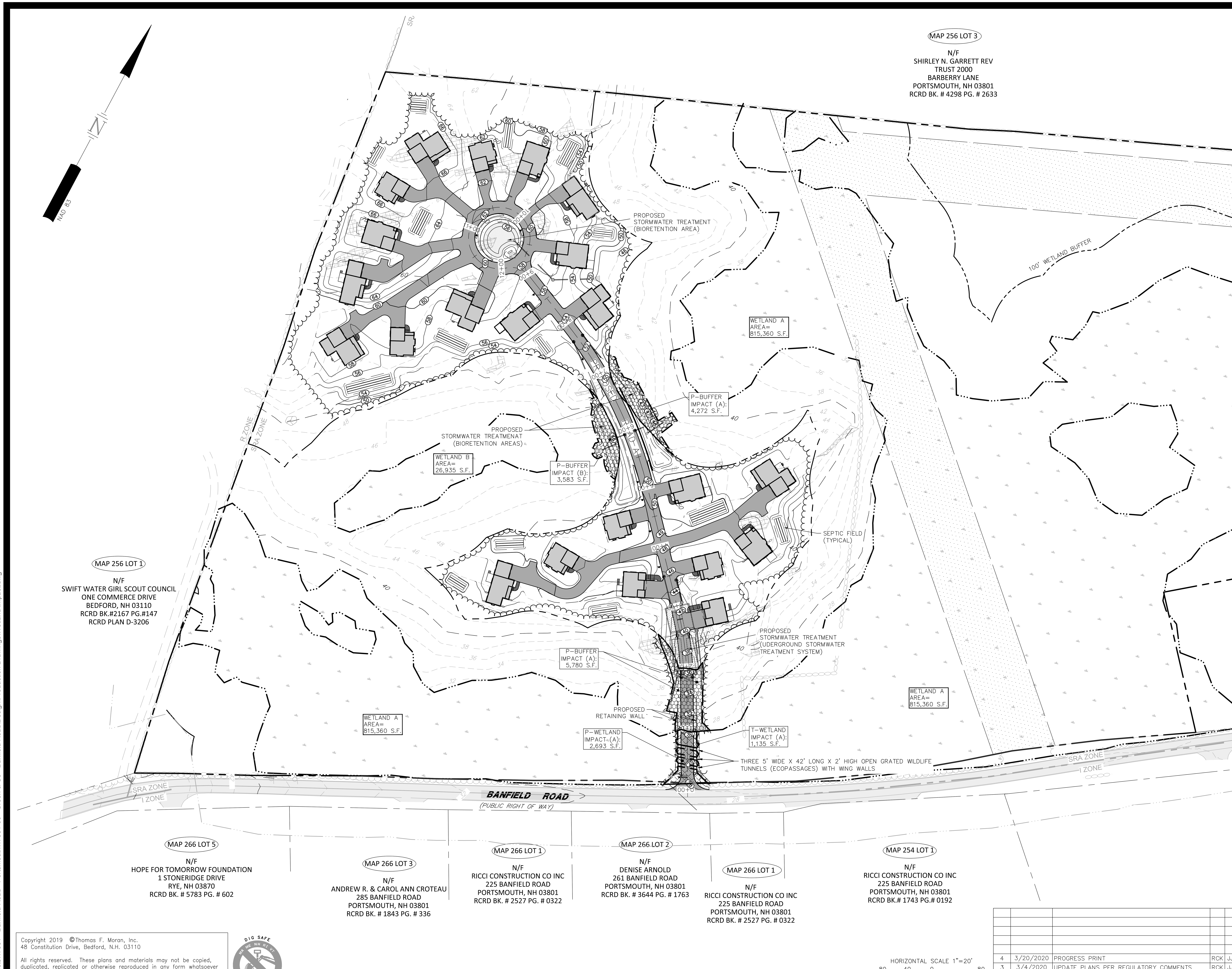
FILE	47361-00	DR	EJS	FB	559	S-03
		CK	BMK	CADFILE		

TAX MAP 256 LOT 2
CONDOMINIUM SITE PLAN
BANFIELD ROAD
PORTSMOUTH, NEW HAMPSHIRE
COUNTY OF ROCKINGHAM
OWNED BY
THE WALTER D. HETT TRUST
PREPARED FOR
GREEN & COMPANY REAL ESTATE

SCALE: 1" = 100' (22x34) 1" = 200' (11x17) **DECEMBER 23, 2019**



NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE WETLAND IMPACTS AND WETLAND BUFFER IMPACTS ASSOCIATED WITH THE CONDOMINIUM DEVELOPMENT OF TAX MAP 256 LOT 2.
2. FIELD SURVEY WAS COMPLETED BY TCE AMD EJS IN MAY & JUNE 2019 USING A TOPCON DS103 AND A TOPCON FC-5000 DATA COLLECTOR.
3. THE PURPOSE OF THE BUILDING FOOTPRINTS SHOWN ON THE PLAN ARE FOR ILLUSTRATIVE PURPOSES ONLY. FOOTPRINTS MAY CHANGE DURING CONSTRUCTION, BUT WILL REMAIN WITHIN REQUIRED SETBACKS. INDIVIDUAL GRADING PLAN ARE REQUIRED FOR EACH AREA OF HOMES TO BE DEVELOPED (PRIOR TO BUILDING PERMIT).
4. DENSITY CALCULATIONS:
   TOTAL LOT AREA: 44.88 ACRES
   WETLAND AREA: 18.97 ACRES
   STEEP SLOPES OVER 15%: 2.20 ACRES
   TOTAL DEVELOPABLE AREA: 23.71 ACRES (REMAINING LAND IS WETLANDS AND STEEP SLOPES OVER 15%)
   MAXIMUM UNITS FOR DEVELOPMENT: 23 SINGLE FAMILY HOUSES
   PROPOSED UNITS FOR OPEN SPACE PLANNED UNIT DEVELOPMENT: 22 UNITS
5. PARKING CALCULATIONS:
   REQUIRED: 1.3 SPACES/UNIT PLUS ONE (1) VISITOR SPACE FOR EVERY 5 DWELLING UNITS.
   TOTAL REQUIRED = 33 SPACES

   PROPOSED: 88 SPACES (2 GARAGED SPACES PER UNIT, PLUS 44 SPACES ON PRIVATE DRIVEWAYS)
6. WETLANDS DELINEATION WAS COMPLETED BY GOVE ENVIRONMENTAL SERVICES IN MAY 2019 AND FIELD LOCATED BY MSC A DIVISION OF TFMORAN, INC.
7. STEEP SLOPE AREAS ARE APPROXIMATE. TOWN REGULATIONS DEFINE SLOPES OF 15% AND GREATER TO BE NON-BUILDABLE.
8. EXAMINATION OF THE FLOOD INSURANCE RATE MAP FOR THE TOWN OF PORTSMOUTH, NEW HAMPSHIRE, ROCKINGHAM COUNTY, COMMUNITY PANEL NUMBER 0270, EFFECTIVE DATE: MAY 17, 2005, INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
9. WETLAND IMPACTS WILL REQUIRE AN APPLICATION TO NHDES WETLANDS BUREAU AND A CONDITIONAL USE PERMIT FROM THE CITY OF PORTSMOUTH. OBTAINING THESE PERMITS WILL DEPEND ON THE WETLAND FUNCTION AND VALUES, AND SENSITIVITY OF THE PROJECT.
10. SITE DEVELOPMENT MAY REQUIRE RETAINING WALLS FOR GRADE CHANGES.
11. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.

WETLAND IMPACTS TABLE

WETLAND	WETLAND AREA	TEMPORARY WETLAND IMPACT	PERMANENT WETLAND IMPACT	BUFFER IMPACT
A	815,360 S.F.	1,135 S.F.	2,693 S.F.	10,052 S.F.
B	26,935 S.F.	0 S.F.	0 S.F.	3,583 S.F.
TOTALS	842,295 S.F.	3,828 S.F.		13,635 S.F.

LEGEND

- PERMANENT WETLAND IMPACT
- TEMPORARY WETLAND IMPACT
- PERMANENT WETLAND BUFFER IMPACT
- P- PERMANENT
- T- TEMPORARY

TAX MAP 256 LOT 2

WETLAND IMPACT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=160' (11"X17")

SCALE: 1"=80' (22"X34") **SEPTEMBER 25, 2019**

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/03/19	Revised Alignnment Per Regulatory Comments	RCK	JJM

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FILE 47361.00 | DR RCK | FB | – | C-02
CK JJM | CADFILE | WETLAND IMPACT

Mar 23, 2020 - 4:40pm
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NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATIONS, SIZE, AND ELEVATIONS OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS PRIOR TO THE START OF ANY DEMOLITION. THE LOCATIONS SHOWN ON THESE PLANS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED DEMOLITION TO DETERMINE APPROPRIATE ACTION TO BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT IS ALSO THE CONTRACTOR'S RESPONSIBILITY TO ANTICIPATE CONFLICTS AND REPAIR EXISTING UTILITIES AS NECESSARY TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
2. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY WORK AT ALL TIMES.
3. EXISTING UTILITY SERVICES TO BE DISCONTINUED ARE TO BE CAPPED AS REQUIRED BY THE RESPECTIVE UTILITY COMPANIES.
4. CONSTRUCTION DEBRIS AND INVASIVE SPECIES SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LEGAL MANNER.
5. PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL PLACE ORANGE CONSTRUCTION FENCING AROUND EACH TREE TO BE RETAINED, OR ADEQUATELY MARK, THROUGHOUT CONSTRUCTION. NO STOCKPILES OF MATERIAL ARE PERMITTED WITHIN THE DRIP LINE OF THE TREES TO BE SAVED.
6. CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY IF ANY TREES ARE DAMAGED DURING CONSTRUCTION.

CONSTRUCTION SEQUENCE NOTES

TO MINIMIZE EROSION AND SEDIMENTATION DUE TO CONSTRUCTION, CONSTRUCTION SHALL FOLLOW THIS GENERAL CONSTRUCTION SEQUENCE.

MODIFICATIONS TO THE SEQUENCE NECESSARY DUE TO THE CONTRACTOR'S SCHEDULE SHALL INCLUDE APPROPRIATE TEMPORARY AND PERMANENT EROSION AND SEDIMENTATION CONTROL MEASURES.

THE CONTRACTOR SHALL SCHEDULE WORK SUCH THAT ANY CONSTRUCTION AREA IS STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE EXCEPT AS NOTED BELOW. NO MORE THAN 5 ACRES OF DISTURBED LAND SHALL BE UNSTABILIZED AT ANY ONE TIME.

THE PROJECT SHALL BE MANAGED SO THAT IT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER ARG 3800 RELATIVE TO INVASIVE SPECIES.

DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION BASIN.

DO NOT PLACE INFILTRATION SYSTEMS/BIORETENTION AREAS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

AFTER THE BASIN IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE THE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.

1. NOTIFY EASEMENT OWNERS PRIOR TO COMMENCEMENT OF WORK WITHIN THE RESPECTIVE EASEMENT.
2. INSTALL ALL PERIMETER EROSION PROTECTION MEASURES AS INDICATED ON THE PLANS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. PONDS AND SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
4. DURING CONSTRUCTION EVERY EFFORT SHALL BE MADE TO MANAGE SURFACE RUNOFF QUALITY.
5. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT BARRIERS, SEDIMENT TRAPS, ETC. MULCH AND SEED AS REQUIRED. (TEMPORARY SEED MIXTURE OF WINTER RYE APPLIED AT A RATE OF 2.5 LBS/1000 SF SHALL BE USED).
6. CONDUCT MAJOR EARTHWORK, INCLUDING CLEARING AND GRUBBING, WITHIN THE LIMITS OF WORK. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
7. ALL STRIPPED TOPSOIL AND OTHER EARTH MATERIALS SHALL BE STOCKPILED OUTSIDE THE IMMEDIATE WORK AND WETLAND AREAS. A SILT BARRIER SHALL BE CONSTRUCTED AROUND THESE PILES IN A MANNER TO PROVIDE ACCESS AND AVOID SEDIMENT OUTSIDE OF THE WORK AREA.
8. CONSTRUCT TEMPORARY CULVERTS AND DIVERSIONS AS REQUIRED.
9. BEGIN PERMANENT AND TEMPORARY INSTALLATION OF SEED AND MULCH.
10. PERFORM EARTHWORK NECESSARY TO ESTABLISH ROUGH GRADING AROUND PROPOSED ROAD AND ACCESS DRIVES. MANAGE EXPOSED SOIL SURFACES TO AVOID TRANSPORTING SEDIMENTS INTO WETLANDS.
11. INSTALL SUBSURFACE UTILITIES (WATER, SEWER, GAS, ELECTRIC, COMMUNICATIONS, DRAINAGE, DRAINAGE FACILITIES, ETC.).
12. CONSTRUCT PROPOSED ROADWAY, RAIN GARDENS, BIORETENTION AREAS AND DRAINAGE SWALES. ALL DITCHES, SWALES SHALL BE FULLY STABILIZED PRIOR TO DIRECTING FLOW TO THEM.
13. COMPLETE BUILDINGS, BIORETENTION AREAS, AND LOAM AND SEED UNSTABLE AREAS .
14. COMPLETE SEEDING AND MULCHING. SEED TO BE APPLIED WITH BROADCAST SPREADER OR BY HYDRO-SEEDING, THEN ROLLED, RAKED OR DRAGGED TO ASSURE SEED/SOIL CONTACT.
15. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDED AREAS HAVE BECOME FIRMLY ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE.
16. DURING THE COURSE OF THE WORK AND UPON COMPLETION, THE CONTRACTOR SHALL REMOVE ALL SEDIMENT DEPOSITS, EITHER ON OR OFF SITE, INCLUDING CATCH BASINS, AND SUMPS, DRAIN PIPES AND DITCHES, CURB LINES, ALONG SILT BARRIERS, ETC. RESULTING FROM SOIL AND/OR CONSTRUCTION OPERATIONS.
17. SEE WINTER CONSTRUCTION SEQUENCE FOR WORK CONDUCTED AFTER OCTOBER 15TH.

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

SITE PREPARATION PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=120' (11"X17")

SCALE: 1"=60' (22"X34") **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

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FILE	DR	RCK	FB	–	
47361.00	CK	JJM	CADFILE	SITEPREP	C-03

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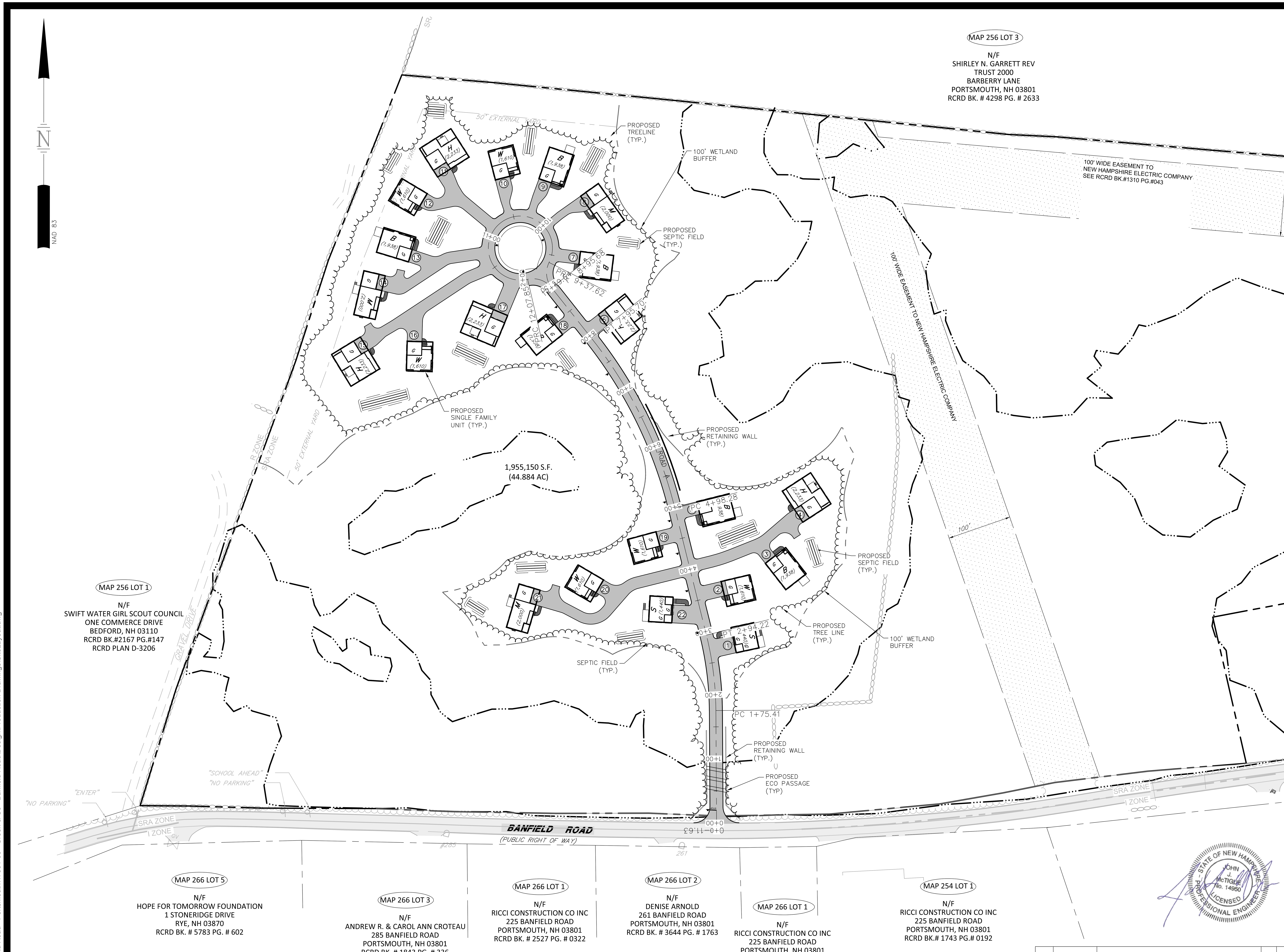
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION



SITE DATA

OWNER OF RECORD OF MAP 256 LOT 02: HETT MAUD REVOCABLE TRUST,
334 HUDSON ROAD, STOW, MA 01775
DEED REFERNCE TO PARCEL IS BK 4553 PG 0432
AREA OF PARCEL = 1,955,150± SF OR 44.88± ACRES

ZONED: SINGLE RESIDENCE A (SRA)
EXISTING USE: N/A
PROPOSED USE: SINGLE FAMILY CONDOMINIUM UNITS

THE PURPOSE OF THIS PLAN IS TO DEPICT A DEVELOPMENT OF 22 SINGLE FAMILY CONDOMINIUM UNITS WITH ASSOCIATED ROADWAY, UTILITIES, AND SITE IMPROVEMENTS.

DENSITY CALCULATIONS:
- TOTAL LOT AREA: 44.88 ACRES
- WETLAND AREA: 18.97 ACRES
- STEEP SLOPES OVER 15%: 2.20 ACRES
- TOTAL DEVELOPABLE AREA: 23.71 ACRES (REMAINING LAND IS WETLANDS AND STEEP SLOPES OVER 15%)
- MAXIMUM UNITS FOR DEVELOPMENT: 23 SINGLE FAMILY HOUSES
- PROPOSED UNITS FOR OPEN SPACE PLANNED UNIT DEVELOPMENT: 22 THREE (3) BEDROOM UNITS

PARKING CALCULATIONS:
- REQUIRED: 1.3 SPACES/UNIT PLUS ONE (1) VISITOR SPACE FOR EVERY 5 DWELLING UNITS.
  TOTAL REQUIRED = 33 SPACES
- PROPOSED: 88 SPACES (2 GARAGED SPACES PER UNIT, PLUS 44 SPACES ON PRIVATE DRIVEWAYS)

EFFECTIVE IMPERVIOUS SURFACE CALCULATIONS:
- IMPERVIOUS AREA/TOTAL LOT AREA = 15,286.5 SF/1,955,150 SF = 0.0539
  TOTAL EFFECTIVE IMPERVIOUS SURFACE = 5.39%

NOTES

1. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS NOTED OTHERWISE.
2. LIGHTING, SIGNAGE, LANDSCAPING, AND SCREENING SHALL MEET THE REQUIREMENTS OF THE CITY ZONING ORDINANCE AND SITE PLAN REGULATIONS.
3. ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

SIGN LEGEND

ID	SIGN	SIZE (INCHES)		DESIGN (COLORING, TEXT SIZE, SPACING, SHAPE, RETROFLECTIVITY, ETC.)	NO. OF SIGNS
		WIDTH	HEIGHT		
R1-1	STOP	30	30	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	1
R713	NO PARKING THIS SIDE OF STREET	12	18	REFER TO THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS	17

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

OVERALL SITE LAYOUT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=160' (11"X17")

SCALE: 1"=80' (22"X34") **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=80'
80 40 0 80

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

SITE LAYOUT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=60' (11"X17")

SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

SITE LAYOUT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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SEPTEMBER 25, 2019

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=30'

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HORIZONTAL SCALE 1"=30'

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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

SITE LAYOUT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

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JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
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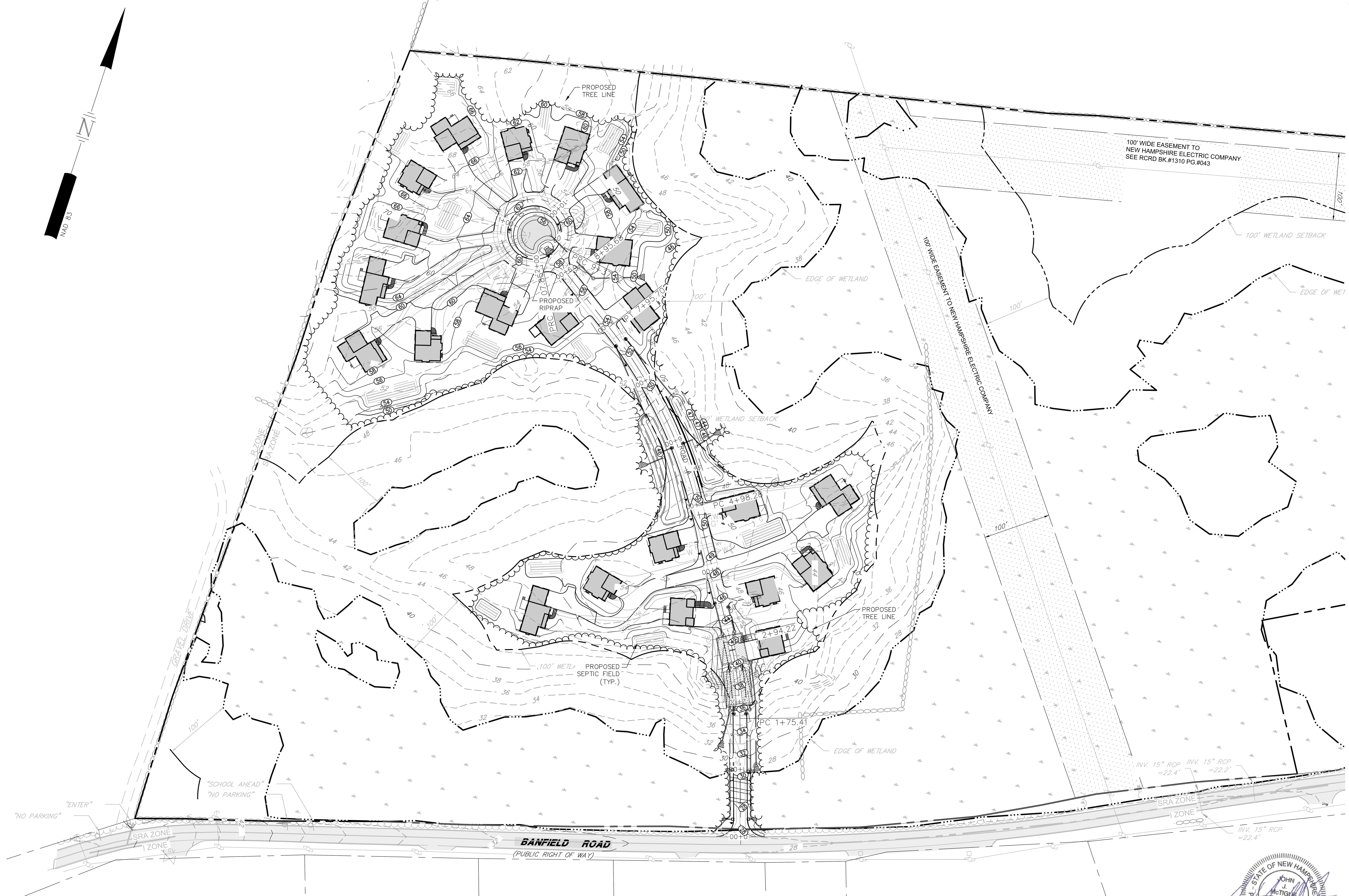

BEST MANAGEMENT PRACTICES FOR BLASTING

1. PURPOSE. THE PURPOSE OF THIS PART IS TO ESTABLISH BEST MANAGEMENT PRACTICES FOR BLASTING TO MINIMIZE THE POTENTIAL FOR GROUNDWATER CONTAMINATION, TO ENSURE THAT THE GROUNDWATER CAN BE USED FOR EXISTING AND FUTURE DRINKING WATER SUPPLY SOURCES. (SEE RN3 AT P. V) #12342, EFF 8-15-17

2. LOADING PRACTICES. THE FOLLOWING BLAST HOLE LOADING PRACTICES SHALL BE IMPLEMENTED:
   - A. THE DRILLER SHALL MAINTAIN DRILLING LOGS TO DOCUMENT:
     - I. THE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED; AND
     - II. GROUNDWATER CONDITIONS;
   - B. THE DRILLER SHALL COMMUNICATE THE CONTENTS OF THE DRILLING LOGS DIRECTLY TO THE BLASTER;
   - C. EXPLOSIVE PRODUCTS SHALL BE MANAGED ON SITE SUCH THAT THEY ARE:
     - I. USED IN THE BOREHOLE;
     - II. RETURNED TO THE DELIVERY VEHICLE; OR
     - III. PLACED IN SECURE CONTAINERS FOR OFF-SITE DISPOSAL;
   - D. SPILLAGE AROUND THE BOREHOLE SHALL BE:
     - I. PLACED IN THE BOREHOLE; OR
     - II. CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF-SITE DISPOSAL;
   - E. LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND NOT LEFT IN THE BLAST HOLES OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED;
   - F. LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT; AND
   - G. EXPLOSIVES SHALL BE LOADED IN ACCORDANCE WITH INDUSTRY STANDARD PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. SOURCE. (SEE RN3 AT P. V) #12342, EFF 8-15-17

3. EXPLOSIVE SELECTION. EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE:
   - A. APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION; AND
   - B. HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT.

4. PREVENTION OF MISFIRES. INDUSTRY-STANDARD PRACTICES SHALL BE IMPLEMENTED TO PREVENT MISFIRES.

5. MUCK AND ROCK MANAGEMENT.
   - A. FOR PURPOSES OF THIS PART, THE FOLLOWING DEFINITIONS APPLY:
     - I. "BLASTED MATERIAL" MEANS ALL OF THE EARTH MATERIAL LOOSENED AS A RESULT OF THE BLASTING;
     - II. "MUCK" MEANS THE BLASTED MATERIAL REMAINING AFTER THE ROCKS HAVE BEEN REMOVED; AND
     - III. "ROCKS" MEANS THE LARGER PIECES OF BLASTED MATERIAL THAT ARE SEPARATED FROM THE MUCK FOR USE ELSEWHERE, INCLUDING FOR FEEDSTOCK OF A ROCK CRUSHING OPERATION.
   - B. MUCK SHALL BE REMOVED FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.
   - C. ROCKS SHALL BE MANAGED SO AS TO PREVENT WATER SUPPLY WELLS OR SURFACE WATERS FROM BEING CONTAMINATED BY RUNOFF.

6. SPILL PREVENTION MEASURES AND SPILL MITIGATION.
   - A. FUEL AND OTHER REGULATED SUBSTANCES SHALL BE MANAGED AS REQUIRED BY ENV-WQ 401.04.
   - B. PERSONNEL WORKING AT THE BLAST SITE SHALL BE TRAINED IN HOW TO RESPOND TO A SPILL OF THE REGULATED SUBSTANCES BEING USED AT THE SITE.

7. FUELING AND MAINTENANCE OF CONSTRUCTION EQUIPMENT.
   - A. IF ANY CONSTRUCTION EQUIPMENT, INCLUDING BUT NOT LIMITED TO EARTHMOVING, EXCAVATION, AND BORING EQUIPMENT, WILL BE FUELED FROM A TANK TRUCK OR OTHER CONTAINER THAT IS MOVED AROUND THE SITE, THE FOLLOWING SHALL APPLY:
     - I. PORTABLE CONTAINMENT EQUIPMENT THAT IS SIZED TO CONTAIN THE MOST LIKELY VOLUME OF FUEL TO BE SPILLED DURING A FUEL TRANSFER SHALL BE USED, WHERE THE MOST LIKELY VOLUME TO BE SPILLED IS DETERMINED BASED ON THE FUEL TRANSFER RATE, THE AMOUNT OF FUEL BEING TRANSFERRED, THE DISTANCE BETWEEN THE HOSE NOZZLE AND PUMP SHUT OFF SWITCH, AND THE RESPONSE TIME OF PERSONNEL AND EQUIPMENT AVAILABLE AT THE FACILITY;
     - II. THE CONTAINMENT EQUIPMENT SHALL BE POSITIONED TO CATCH ANY FUEL SPILLS DUE TO OVERFILLING THE EQUIPMENT AND ANY OTHER SPILLS THAT MIGHT OCCUR AT OR NEAR THE FUEL FILLER PORT TO THAT EQUIPMENT;
     - III. THE TYPE OF CONTAINMENT EQUIPMENT USED AND ITS POSITIONING AND USE SHALL ACCOUNT FOR ALL OF THE DRIP POINTS ASSOCIATED WITH THE FUEL FILLING PORT AND THE HOSE FROM THE FUEL DELIVERY TRUCK; AND
     - IV. PERSONNEL SHALL NOT LEAVE THE IMMEDIATE AREA WHILE FUEL IS BEING TRANSFERRED, TO ENSURE THAT ANY SPILLS WILL BE OF LIMITED VOLUME.
   - B. IF THE SITE WILL HAVE A FIXED LOCATION FOR FUELING CONSTRUCTION EQUIPMENT, THE FOLLOWING SHALL APPLY:
     - I. ALL FUEL CONTAINERS, INCLUDING BUT NOT LIMITED TO SKID-MOUNTED TANKS, DRUMS, AND FIVE GALLON CANS, SHALL HAVE SECONDARY CONTAINMENT THAT:
       1. IS CAPABLE OF CONTAINING 110% OF THE VOLUME OF THE LARGEST FUEL STORAGE CONTAINER; AND
       2. HAS AN IMPERVIOUS FLOOR;
     - II. SECONDARY CONTAINMENT FOR TANKS MAY COMPRISE A METAL, PLASTIC, POLYMER OR PRECAST CONCRETE VAULT PROVIDING 110 PERCENT OF THE VOLUME OF THE LARGEST FUEL STORAGE CONTAINER;
     - III. FOR FUEL CONTAINERS, SECONDARY CONTAINMENT MAY COMPRISE CONTAINMENT PALLETS;
     - IV. THE AREA WHERE FUEL IS TRANSFERRED SHALL BE A FLAT, IMPERVIOUS AREA THAT:
       1. IS ADJACENT TO THE FUEL CONTAINER(S); AND
       2. EXTENDS BEYOND THE FULL REACH, OR LENGTH, OF THE FUEL HOSE; AND
     - V. SECONDARY CONTAINMENT AREAS MAY BE IN THE FORM OF A BASIN THAT IS:
       1. SLOPED DOWN TO A CENTRAL LOW POINT OR BERMED ALONG THE PERIMETER;
       2. LINED WITH A CONTINUOUS SHEET OF 20 MIL OR THICKER POLYMER MATERIAL OR APPROPRIATE GEOMEMBRANE LINER; AND
       3. BACKFILLED WITH AT LEAST 6 INCHES OF SAND.

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

OVERALL GRADING & DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: 1"=160' (11"X17")
1"=80' (22"X34")

SEPTEMBER 25, 2019

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14560 LICENSED PROFESSIONAL ENGINEER

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4	3/20/2020	PROGRESS PRINT	RCK	JJM
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HORIZONTAL SCALE 1"=80'
80 40 0 80

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	CK JJM	CADFILE	GRADINGDRAINAGE		

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

GRADING & DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=60' (11"X17")

SCALE: 1"=30' (22"X34")

SEPTEMBER 25, 2019

STATE OF NEW HAMPSHIRE — JOHN J. McTIGUE — No. 14950 — LICENSED — PROFESSIONAL ENGINEER

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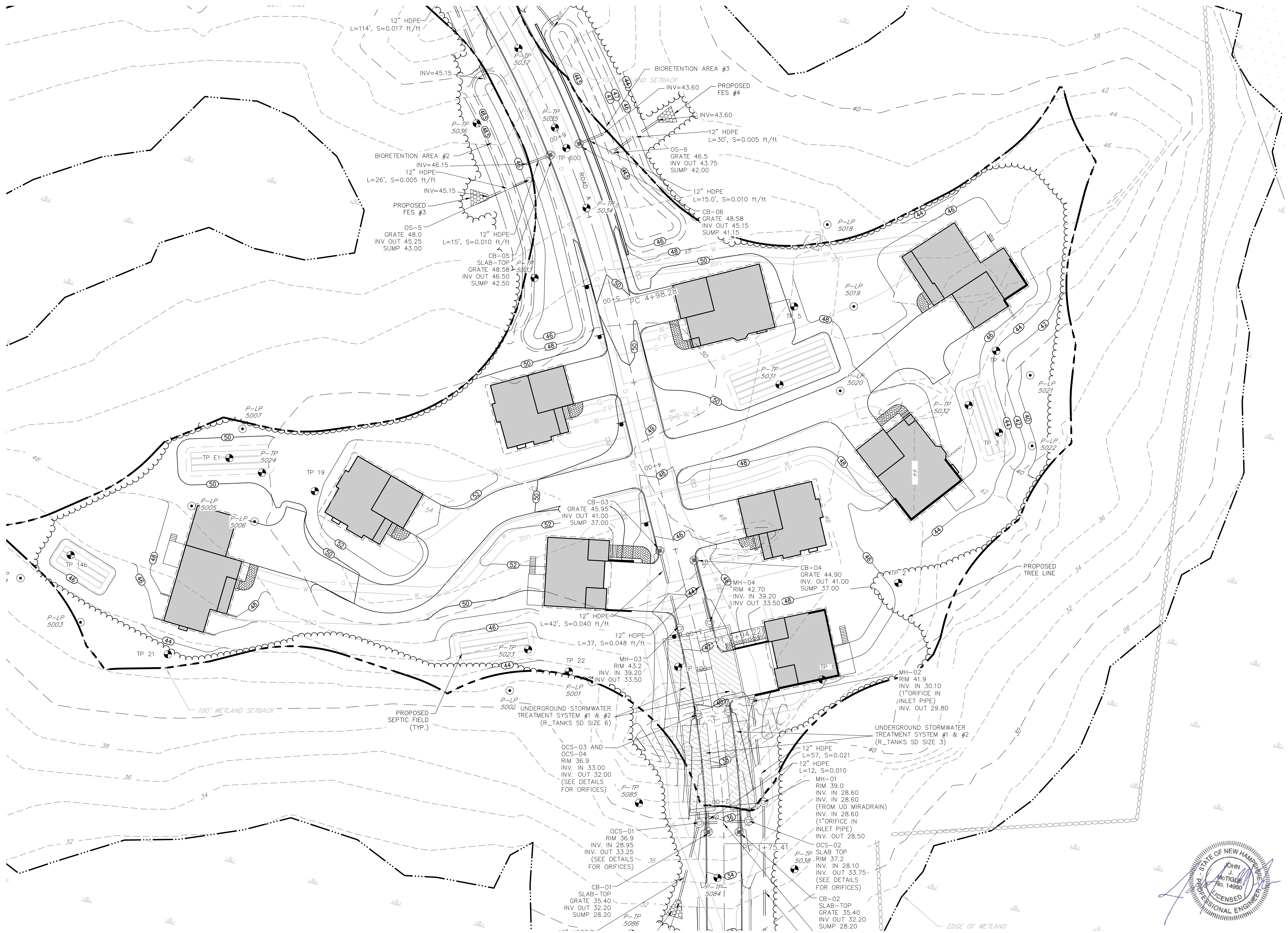

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

GRADING & DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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1"=60' (11"X17")

SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14960 LICENSED PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=30'

30 15 0 30

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	CK JJM	CADFILE	GRADINGDRAINAGE		

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HORIZONTAL SCALE 1"=30'

30 15 0 30

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

GRADING & DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

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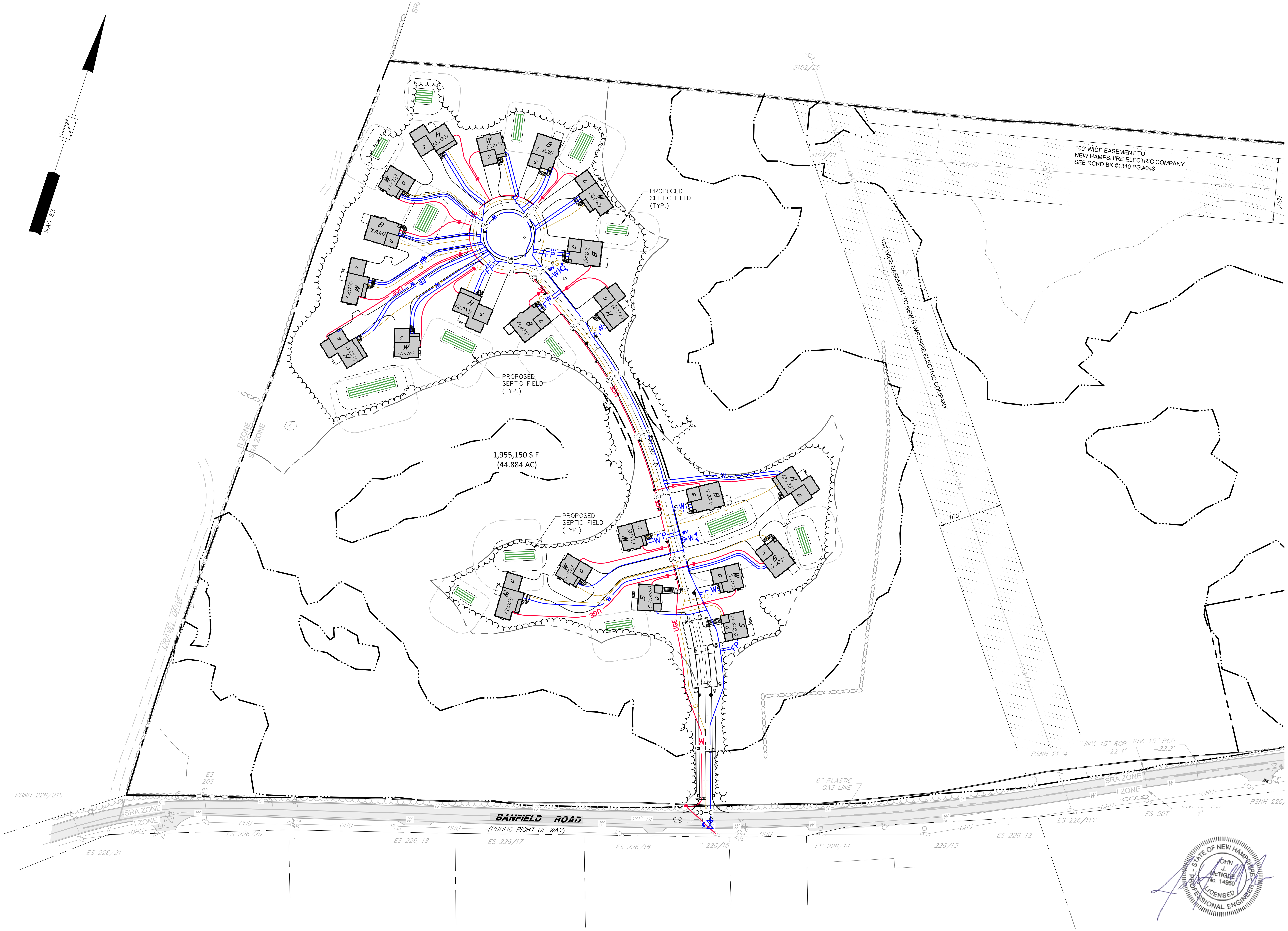

NOTES

1. ALL CONDOMINIUM UNITS SHALL HAVE FIRE SUPPRESSION SPRINKLERS SYSTEMS INSTALLED.
2. SEE UTILITY NOTES ON NOTES AND LEGEND SHEET (C-02)

UTILITY COLOR LEGEND
WATER
SEPTIC
ELECTRIC & COMMUNICATIONS
GAS

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

OVERALL UTILITY PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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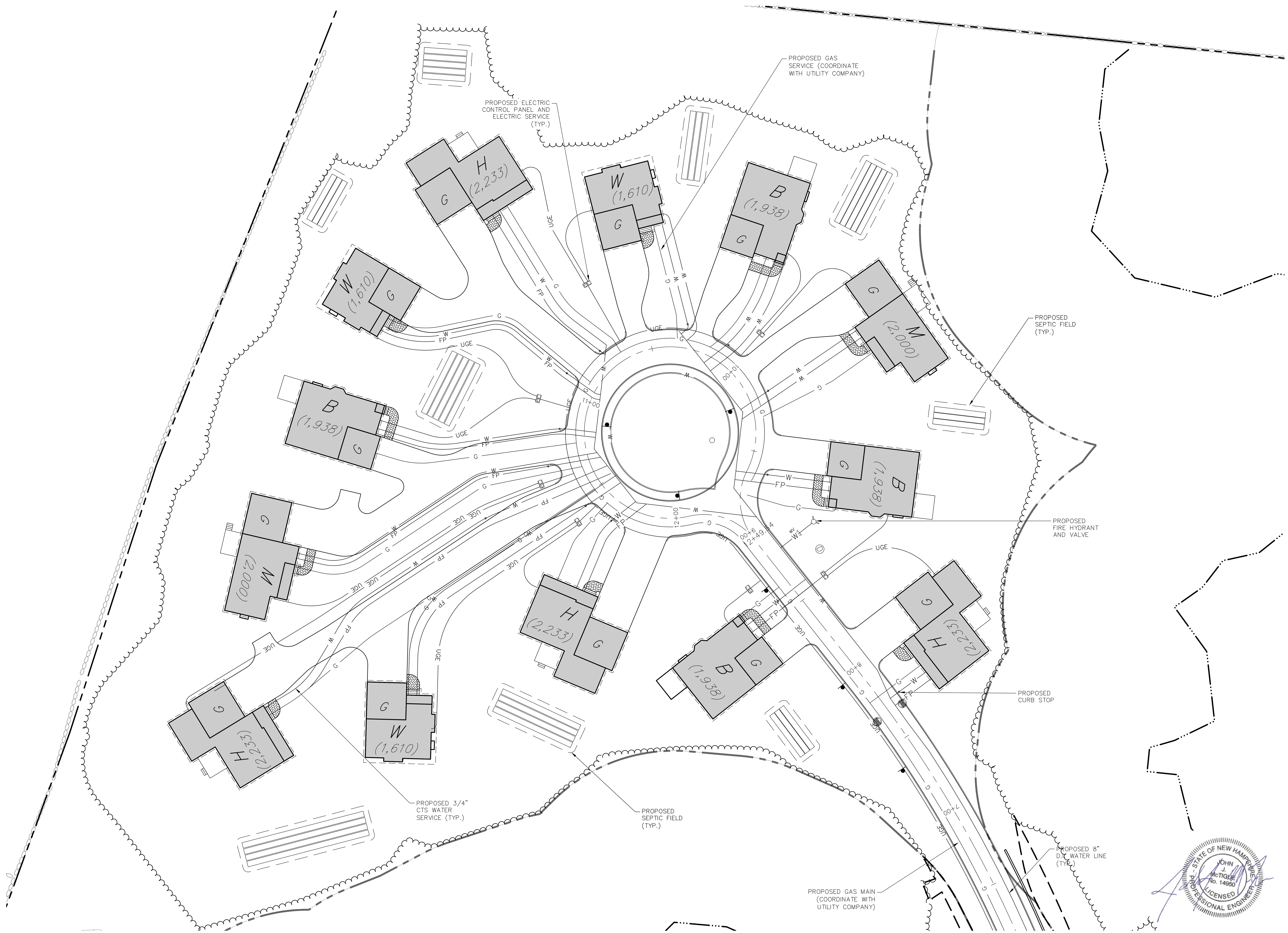

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

UTILITY PLAN

THE VILLAGE AT BANFIELD WOODS

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STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

UTILITY PLAN

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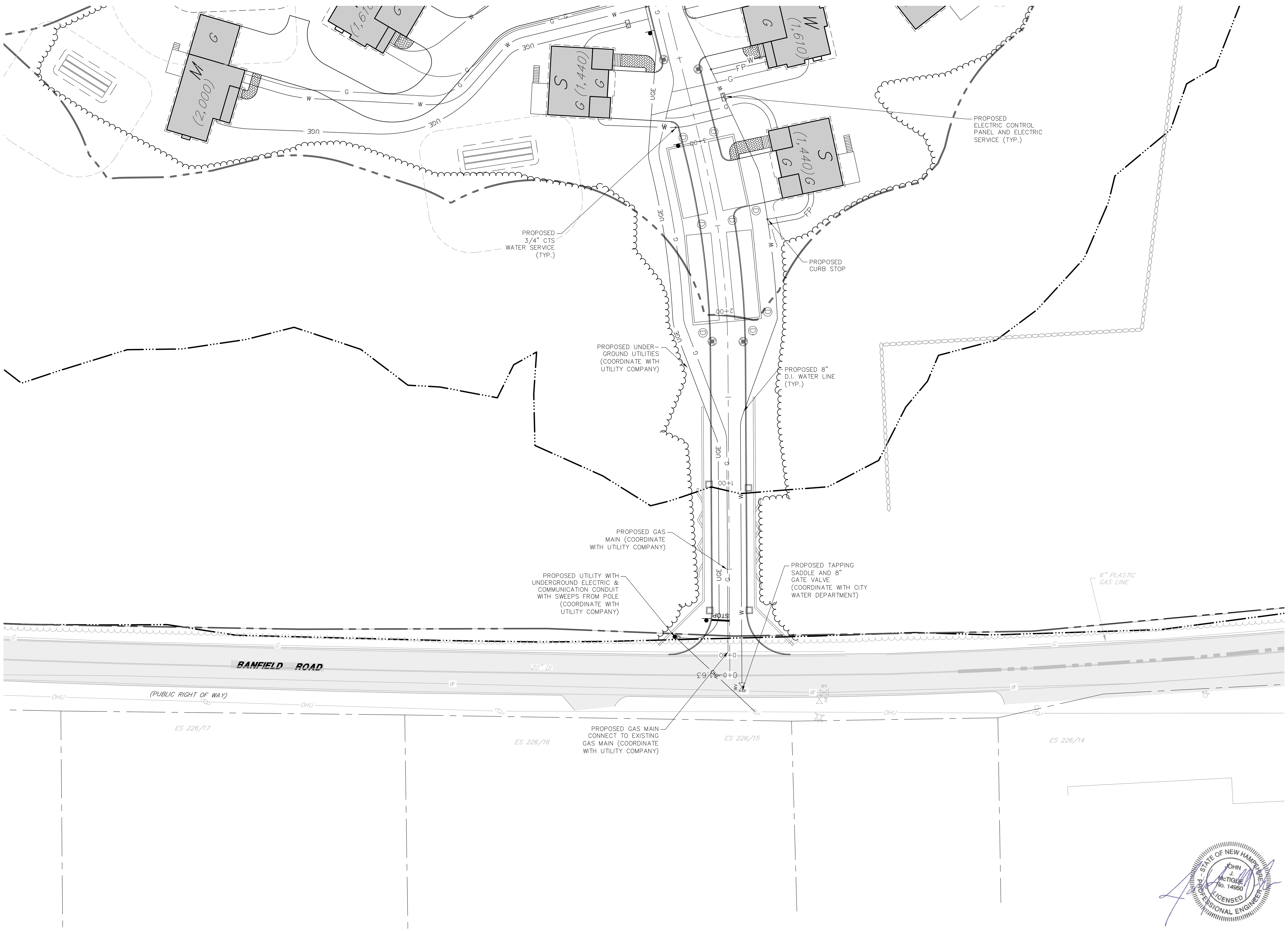

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

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GREEN & COMPANY REAL ESTATE

1"=60' (11"X17")
SCALE: 1"=30' (22"X34")

SEPTEMBER 25, 2019

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

HORIZONTAL SCALE 1"=30'
30 15 0 30

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
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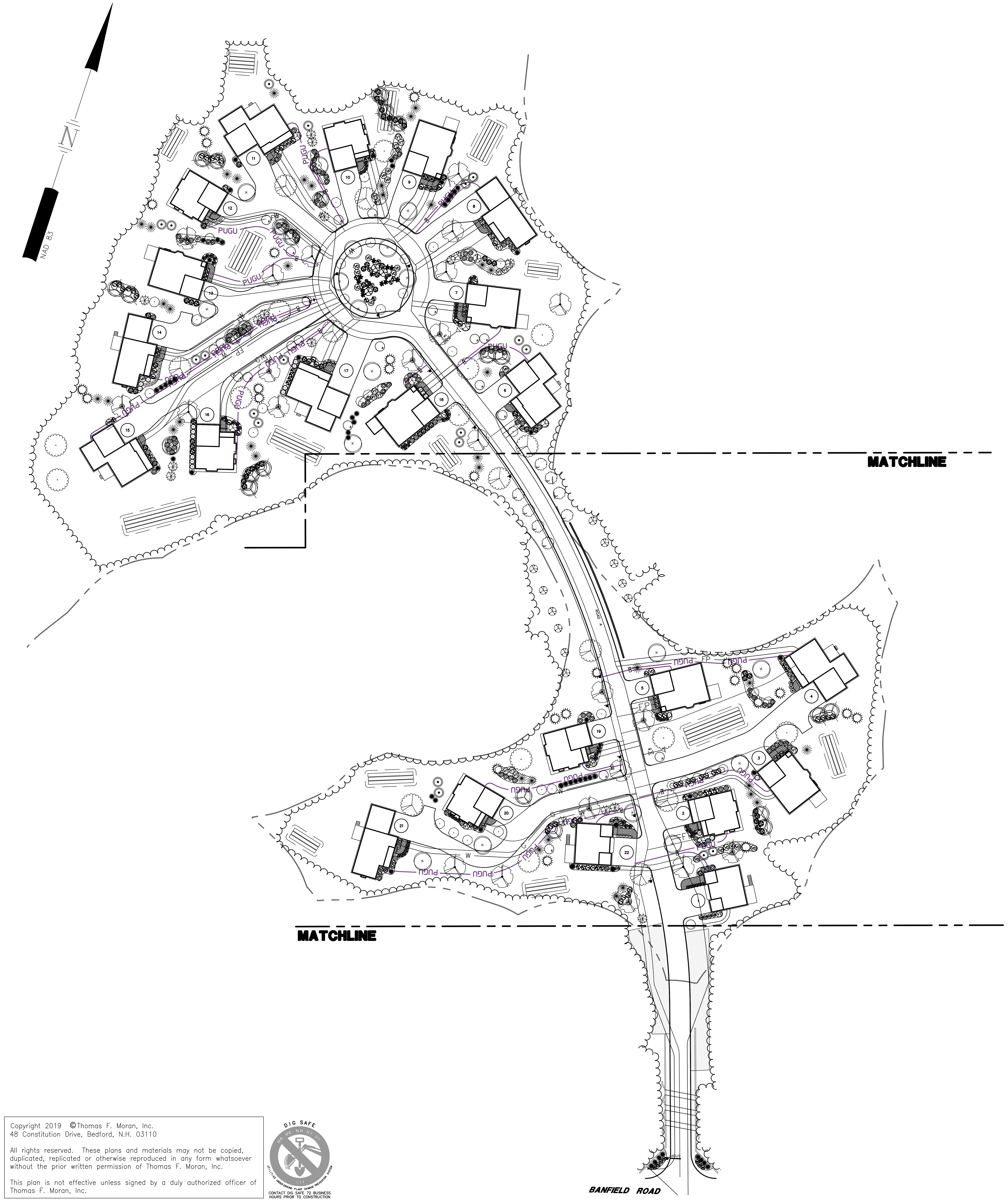

HORIZONTAL SCALE 1"=60'

60 30 0 60

LANDSCAPE NOTES

1. CONTRACTOR WILL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWNWORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES WILL IMMEDIATELY BE REPORTED TO THE LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE, SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
2. CONTRACTOR WILL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. IN CASES OF DISCREPANCY BETWEEN PLAN AND LIST CLARIFY WITH LANDSCAPE ARCHITECT PRIOR TO PLACING PURCHASE ORDER AND AGAIN PRIOR TO PLANTING.
3. SEE PLANTING DETAILS AND IF INCLUDED, SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE THE APPROPRIATE ARRANGEMENTS TO PROVIDE ALL PLANTS AND MATERIALS TO ACCOMMODATE PLANTING WITHIN THE TIME ALLOWED BY THE CONSTRUCTION SCHEDULE.
6. PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 15TH UNLESS OTHERWISE NOTED IN SPECIFICATIONS. THERE WILL BE NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT BY PROVIDING ADDITIONAL WATERING.
7. ALL PLANTS WILL BE NURSERY GROWN.
8. PLANTS WILL BE IN ACCORDANCE, AT A MINIMUM, WITH CURRENT EDITION OF "AMERICAN STANDARDS FOR NURSERY STOCK" AS PUBLISHED BY THE AMERICAN HORTICULTURE INDUSTRY ASSOCIATION.
9. TREES WILL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 PART 1, "TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE STANDARD PRACTICES".
10. PLANTS MATERIAL IS SUBJECT TO APPROVAL / REJECTION BY THE LANDSCAPE ARCHITECT AT THE SITE AND AT THE NURSERY.
11. ALL PLANTS WILL BE MOVED WITH ROOT SYSTEMS AS SOLID UNITS AND WITH BALLS OF EARTH FIRMLY WRAPPED WITH BURLAP. NO PLANT WILL BE ACCEPTED WHEN BALL OF EARTH SURROUNDING ITS ROOTS HAS BEEN BADLY CRACKED OR BROKEN BEFORE PLANTING. ALL PLANTS THAT CANNOT BE PLANTED AT ONCE WILL BE HEELED–IN BY SETTING IN THE GROUND AND COVERING THE BALLS WITH SOIL AND THEN WATERING. DURING TRANSPORT, ALL PLANT MATERIALS WILL BE WRAPPED WITH WIND PROOF COVERING.
12. NEWLY PLANTED MATERIAL WILL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL GRADE OF THE PLANT PRIOR TO DIGGING.
13. PROPOSED TREES OVERHANGING SIDEWALKS, ROADS OR PARKING WILL BEGIN BRANCHING NATURALLY (NOT PRUNED) AT 6' HEIGHT.
14. MULCH FOR PLANTED AREAS (NOT INCLUDING RAIN GARDENS) WILL BE AGED SHREDDED PINE BARK, PARTIALLY DECOMPOSED, DARK BROWN IN COLOR AND FREE OF WOOD CHIPS UNLESS OTHERWISE SHOWN.
15. PLANT MATERIAL WILL BE LOCATED OUTSIDE BUILDING DRIPLINES AND ROOF VALLEY POINTS OF CONCENTRATION TO PREVENT DAMAGE TO PLANTS. CLARIFY DISCREPANCIES WITH LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
16. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, WILL RECEIVE SIX (6) INCH LOAM AND SEED AT THE DIRECTION OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE.
17. TREE STAKES AND WRAP WILL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR. CONTRACTOR WILL REMOVE.
18. ALL PLANT GROUPINGS WILL BE IN MULCH BEDS UNLESS OTHERWISE SPECIFIED OR NOTED ON PLANS. WHERE MULCHED PLANT BED ABUTS LAWN, PROVIDE TURF CUT EDGE.
19. ALL PLANT BEDS WILL INTERSECT WITH PAVEMENT AT 90 DEGREES UNLESS OTHERWISE NOTED ON PLANS.

LANDSCAPE GUARANTEE AND MAINTENANCE NOTES

1. CONTRACTOR WILL BE RESPONSIBLE FOR ALL MEANS, METHODS AND TECHNIQUES OF WATERING.
2. CONTRACTOR WILL BEGIN WATERING IMMEDIATELY AFTER PLANTING. ALL PLANTS WILL BE THOROUGHLY WATERED TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS WILL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON BUT NOT LESS THAN ONE YEAR.
3. WATER ALL LAWNS AS REQUIRED. DO NOT LET NEWLY PLANTED LAWNS DRY OUT DURING THE FIRST FOUR WEEKS MINIMUM.
4. ALL NEW LAWNS WILL BE MAINTAINED AND MOWED A MINIMUM THREE (3) TIMES BEFORE REQUESTING REVIEW BY LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE FOR ACCEPTANCE. MAINTENANCE AND MOWING WILL CONTINUE UNTIL ACCEPTED BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE IS ISSUED IN WRITING.
5. THE CONTRACTOR WILL MAINTAIN AND 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 BY THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE SHOWING LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE (1) YEAR PERIOD WILL BE IMMEDIATELY REPLACED BY THE CONTRACTOR.
6. DECIDUOUS PLANT MATERIAL INSTALLED AFTER SEPTEMBER 30 AND BEFORE APRIL 15 WILL NOT BE REVIEWED THAT SEASON FOR ACCEPTANCE DUE TO STAGE OF LEAF PHYSIOLOGY. THIS PLANT MATERIAL WILL NOT BE REVIEWED UNTIL FOLLOWING GROWING SEASON. GUARANTEE PERIOD WILL BEGIN ONLY AFTER ACCEPTANCE BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE.
7. EVERGREEN PLANT MATERIAL INSTALLED AFTER OCTOBER 30 AND BEFORE APRIL 15 WILL NOT BE REVIEWED THAT SEASON FOR ACCEPTANCE DUE TO END OF GROWTH SEASON. THIS PLANT MATERIAL WILL NOT BE REVIEWED UNTIL FOLLOWING GROWING SEASON. GUARANTEE PERIOD WILL BEGIN ONLY AFTER ACCEPTANCE BY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE.

HYDROSEEDING NOTES

1. HYDROSEEDING MAY BE USED AS AN ALTERNATE METHOD OF SEEDING. THE APPLICATION OF LIMESTONE AS NECESSARY, FERTILIZER AND GRASS SEED MAY BE ACCOMPLISHED IN ONE OPERATION BY THE USE OF A SPRAYING MACHINE APPROVED BY THE LANDSCAPE ARCHITECT OR CIVIL ENGINEER. THE MATERIALS SHALL BE MIXED WITH WATER IN THE MACHINE AND SHALL CONFORM TO RELATIVE REQUIREMENTS OF SECTION 644 OF NH. STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. (FOR MASSACHUSETTS PROJECTS PLUG IN – SECTION 765.65 OF MASS. DPW CURRENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES).

INVASIVE PLANT NOTES

1. EXISTING NON–NATIVE, INVASIVE PLANT SPECIES WILL BE IDENTIFIED, REMOVED, DESTROYED AND LEGALLY DISPOSED OF OFF–SITE IN ACCORDANCE WITH THE LATEST UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION METHODS OF DISPOSING NON–NATIVE INVASIVE PLANTS. SEE "MANAGE AND CONTROL INVASIVES" AND PROPERLY DISPOSE OF INVASIVE PLANTS".

PRICING & CONSTRUCTION DOCUMENT NOTES

1. CONTRACTOR WILL PRICE PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE PLANTINGS GRAPHICALLY SHOWN ON THESE DRAWINGS OR IN PLANT LIST, WHICHEVER IS GREATER. IN CASES OF DISCREPANCY BETWEEN PLAN AND LIST CLARIFY WITH LANDSCAPE ARCHITECT PRIOR TO PLACING PURCHASE ORDER AND AGAIN PRIOR TO PLANTING.
2. CONTRACTOR WILL VERIFY PRIOR TO PRICING IF SITE SOILS ARE VERY POORLY DRAINING OR IF LEDGE IS PRESENT. IF CONTRACTOR ENCOUNTERS VERY POORLY DRAINING SOILS (BATH TUB EFFECT) OR LEDGE THAT IMPACTS PROPOSED PLANTING PLAN, NOTIFY LANDSCAPE ARCHITECT OR OWNERS' REPRESENTATIVE FOR DIRECTION PRIOR TO PRICING AND AGAIN PRIOR TO PERFORMING ANY WORK.
3. CONTRACTOR WILL STAKE OR PLACE ON GROUND ALL PROPOSED PLANT MATERIALS PER PLAN. CONTACT LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
4. COORDINATE WITH LANDSCAPE ARCHITECT'S CONTRACTED NUMBER OF SITE VISITS WHEN PLANNING FOR INSPECTION. NOTIFY LANDSCAPE ARCHITECT 72 HOURS MINIMUM IN ADVANCE OF REQUESTED SITE VISIT.
5. CONTRACTOR WILL DEVELOP A WRITTEN WATERING SCHEDULE AND WILL SUBMIT WATERING SCHEDULE TO OWNERS' REPRESENTATIVE. CONTRACTOR WILL WATER ALL NEW PLANTS INCLUDING LAWNS THAT ARE NOT "IRRIGATED" VIA A PERMANENT IRRIGATION SYSTEM FOR THE FIRST 12 MONTHS.

PORTSMOUTH NOTES

1. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNER'S WILL BE RESPONSIBLE FOR THE MAINTENANCE AND OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS INDICATED ON THESE PLANS.
2.
3. ALL REQUIRED PLANT MATERIAL WILL BE TENDED TO AND KEPT FREE OF REFUSE AND DEBRIS.
4. ALL REQUIRED FENCES AND WALLS WILL BE MAINTAINED IN GOOD REPAIR.
5. THE PROPERTY OWNER WILL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
6. ALL IMPROVEMENTS SHOWN ON THIS PLAN WILL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THIS PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES WILL BE MADE TO THIS PLAN WITHOUT THE WRITTEN APPROVAL OF THE PORTSMOUTH PLANNING BOARD OR PLANNING DIRECTOR.
7. THE LANDSCAPE PLAN WILL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

SEEDING NOTES

1. SLOPES UP TO AND INCLUDING 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA.
2. SLOPES STEEPER THAN 3:1 GRADE, SEED WILL BE NEW ENGLAND EROSION CONTROL & RESTORATION MIX PER NEW ENGLAND WETLANDS PLANTS INC., AMHERST, MA. SEE CIVIL FOR ADDITIONAL EROSION CONTROL MEASURES.
3. GENERAL SEED WILL BE NHDOT SPECIFICATION SECTION 644, TABLE 644–1–PARK SEED TYPE 15, INCLUDING NOTES TO TABLE 1, 2 & 3.

LICENSED LANDSCAPE ARCHITECT
MICHAEL S. KRZEMINSKI
143
STATE OF NEW HAMPSHIRE

Michael S. Krzeminski
3/27/2020

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

OVERALL LANDSCAPE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
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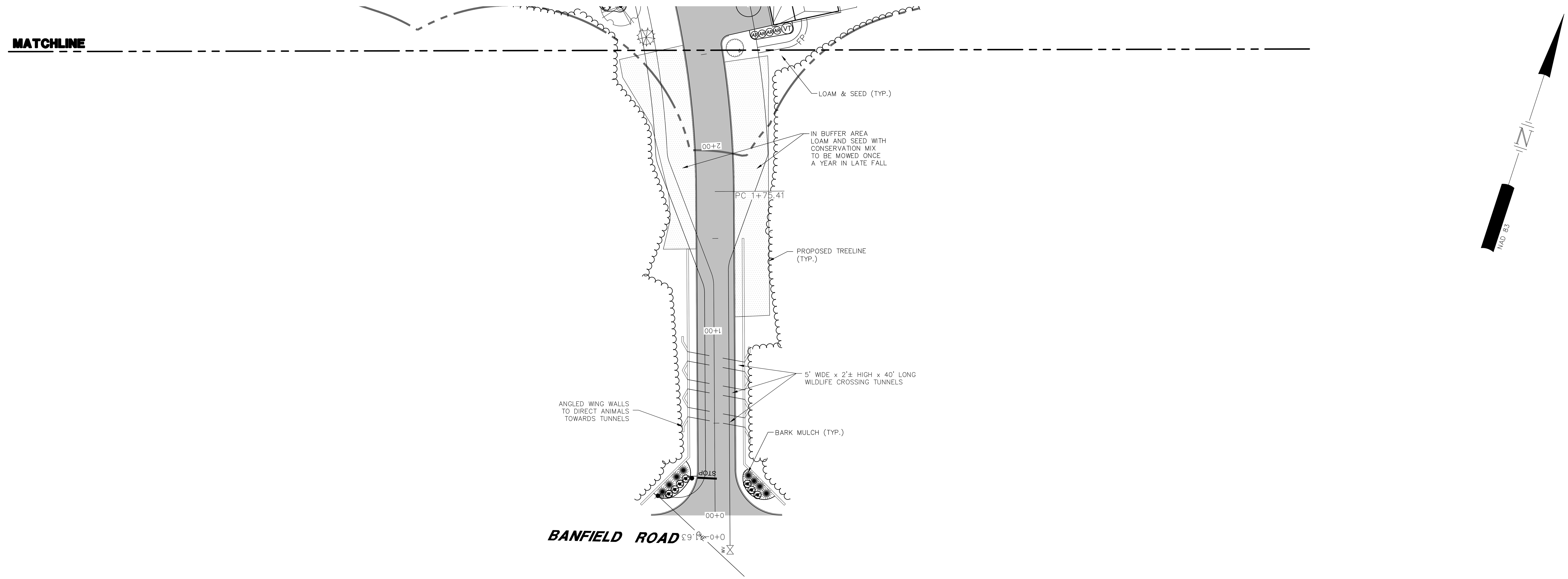

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS
SHADE TREES				
	12	ACER RUBRUM 'OCTOBER GLORY' **OCTOBER GLORY RED MAPLE	3" TO 3 1/2" CAL.	B&B
	10	ACER SACCHARUM 'COMMEMORATION' **COMMEMORATION SUGAR MAPLE	3" TO 3 1/2" CAL.	B&B
	23	BETULA N. 'HERITAGE' *RIVER BIRCH	12' TO 14' CLUMP	B&B
	20	NYSSA SYLVATICA *BLACK GUM	2 1/2 TO 3" CAL.	B&B
	12	QUERCUS ALBA *WHITE OAK	3" TO 3 1/2" CAL.	B&B
	11	QUERCUS RUBRA *RED OAK	3" TO 3 1/2" CAL.	B&B

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS
SMALL/FLOWERING TREES				
	8	CARPINUS CAROLINIANA *AMERICAN HORNBEAM	2' TO 2 1/2" CAL.	B&B
	36	CRATAEGUS CRUSGALLI INERMIS **THORNLESS COCKSPUR HAWTHORN	2 1/2" TO 3" CAL.	B&B
	24	PRUNUS VIRGINIANA 'SCHUBERT' *CANADA RED CHERRY	2 1/2" TO 3" CAL.	B&B
EVERGREEN TREES				
	19	ABIES BALSAMAE *BALSAM FIR	6' TO 7'	B&B
	14	JUNIPERUS VIRGINIANA *EASTERN RED CEDAR	6' TO 7'	B&B
	38	PICEA GLAUCA WHITE SPRUCE	7' TO 8'	B&B
	25	PINUS STROBUS *WHITE PINE	6' TO 7'	B&B

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS
DECIDUOUS SHRUB				
	24	AMELANCHEIR CANADENSIS SHADBLOW SERVICEBERRY	5' TO 6' CLUMP	B&B
	34	CLETHRA ALNIFOLIA 'COMPACTA' **COMPACT SUMMERSWEET	7 GAL.	CONT.
	60	CORNUS SERICEA 'ALLEMAN'S COMPACTA' **ALLEMAN'S COMPACT RED-OSIER DOGWOOD	3' TO 4'	CONT.
	48	PHYSOCARPUS O. 'BURGUNDY CANDY' **BURGUNDY CANDY NINEBARK	2 GAL.	CONT.
VD	14	VIBURNUM DENTATUM *ARROWWOOD VIBURNUM	4' TO 5'	B&B
VT	19	VIBURNUM TRILOBUM *AMERIVAN CRANBERRY VIBURNUM	4' TO 5'	B&B
VP	6	VIBURNUM PRUNIFOLIUM *BLACKHAW VIBURNUM	4' TO 5'	B&B

LANDSCAPE LEGEND

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS
EVERGREEN SHRUB				
	23	ARCTOSTAPHYLOS UVA-URSI *BEARBERRY	1 GAL.	CONT.
AC	26	AZALEA 'GIRARD'S CRIMSON' GIRARD'S CRIMSON AZALEA	3 GAL.	CONT.
AR	26	AZALEA 'GIRARD'S RENEE MICHELE' GIRARD'S RENEE MICHELE AZALEA	3 GAL.	CONT.
	39	RHODODENDRON 'ROSEUM PINK' **ROSEUM PINK CATAWBA RHODODENDRON	7 GAL.	CONT.
	20	ILEX GLABRA 'COMPACTA' **COMPACT INKBERRY	3 GAL.	CONT.
	25	JUNIPERUS H. 'BAR HARBOR' *BAR HARBOR JUNIPER	3 GAL.	CONT.
	126	JUNIPERUS C. 'ANGELICA BLUE' ANGELICA BLUE JUNIPER	5 GAL.	CONT.
	14	PINUS M. 'MOPS' MOPS MUGO PINE	3 GAL.	CONT.
	58	THUJA O. NIGRA DARK AMERICAN ARBORVITAE	5' TO 6'	B&B

*NATIVE
** IMPROVED NATIVE

SYMBOL	QTY	BOTANICAL NAME / COMMON NAME	SIZE	REMARKS
GRASSES AND GRASS MIXES				
	11	PANICUM VIRGATUM 'CLOUD NINE' CLOUD NINE SWITCH GRASS	3 GAL.	CONT.
	3 LBS	NEW ENGLAND CONSERVATION WILDLIFE MIX	25 LBS/ACRE	BULK LBS

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

LANDSCAPE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

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1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

LICENSED LANDSCAPE ARCHITECT
MICHAEL S. KRZEMINSKI
143
STATE OF NEW HAMPSHIRE
3/27/2020

HORIZONTAL SCALE 1"=30'
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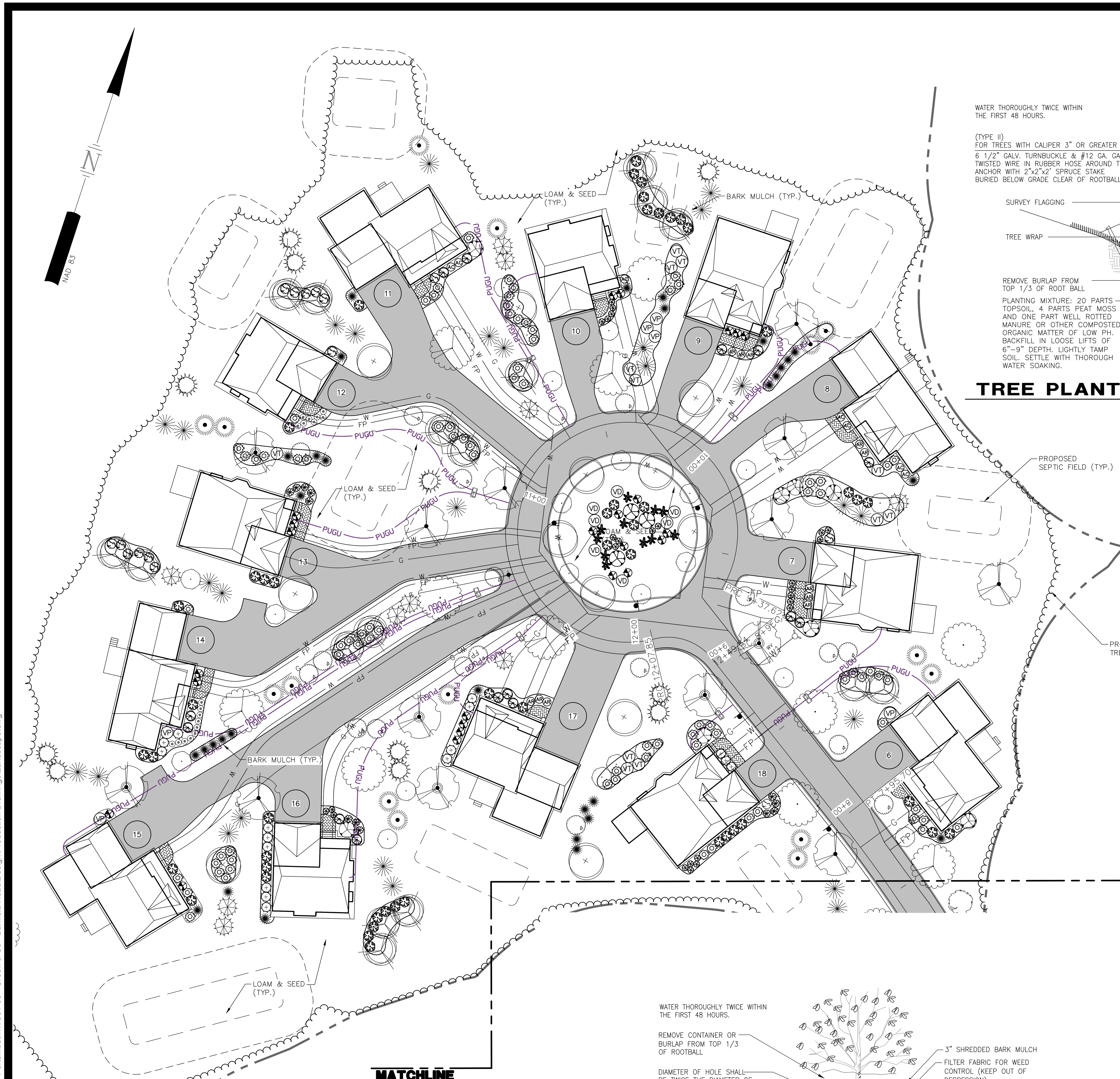
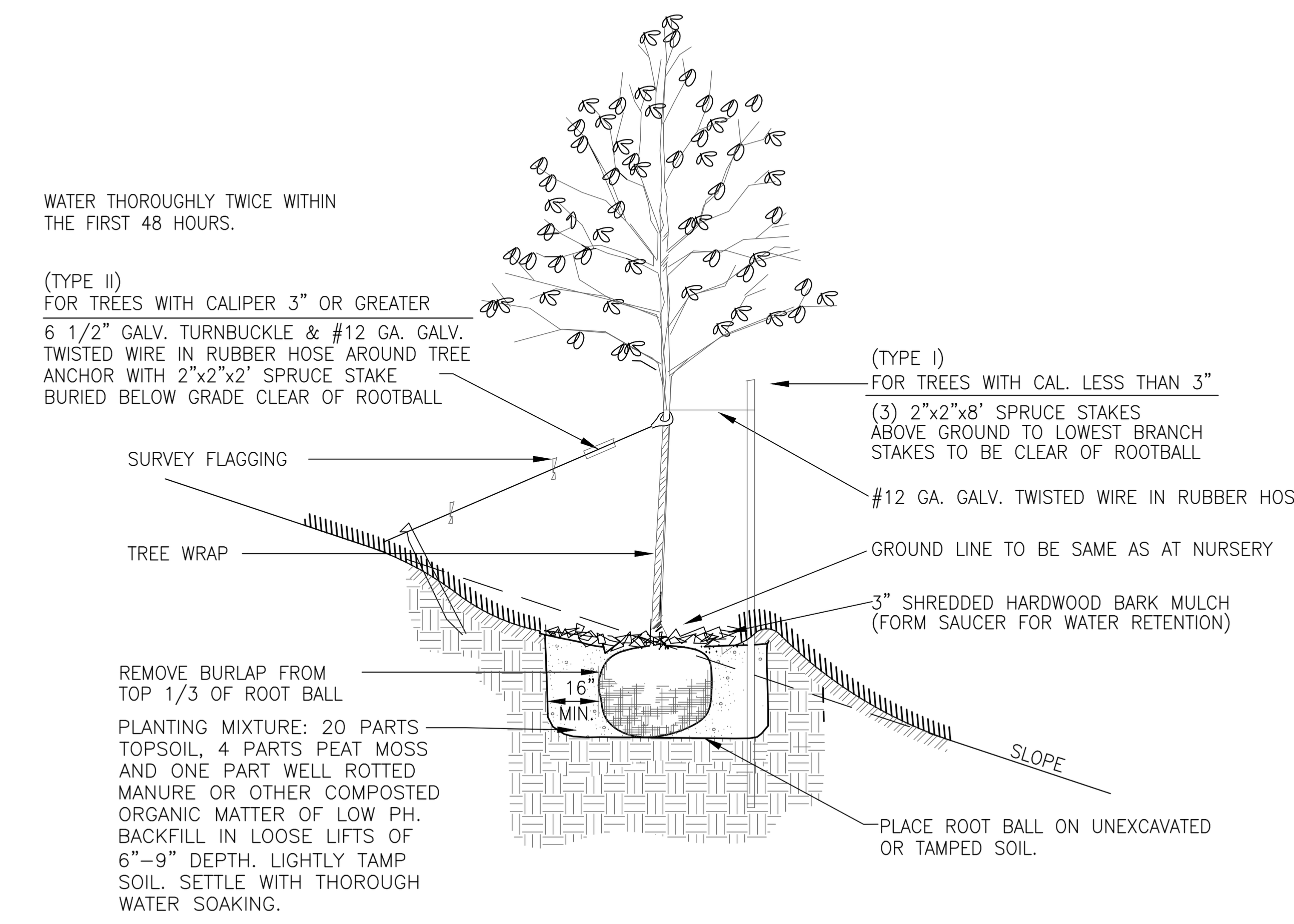
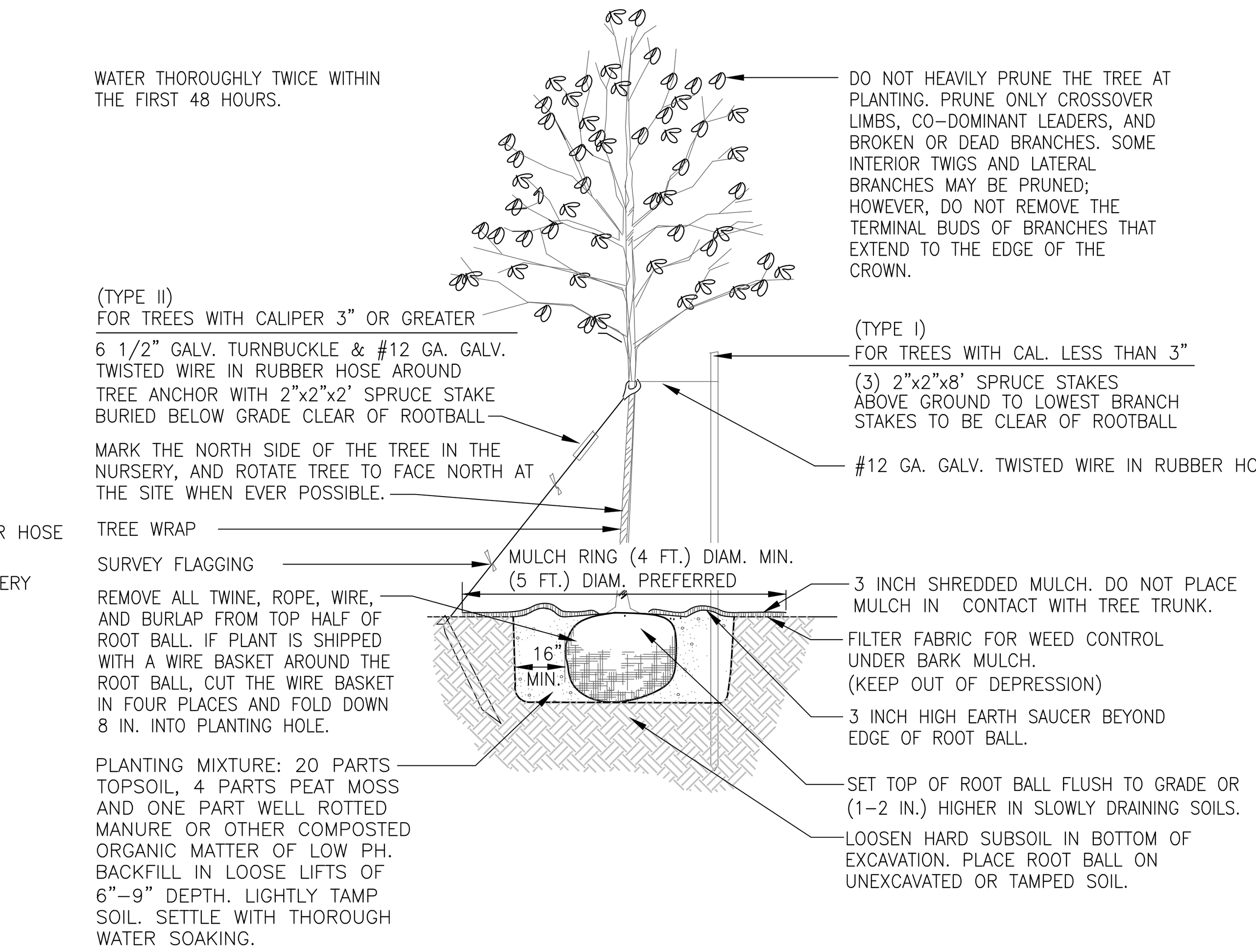




TREE PLANTING ON SLOPE DETAIL

NOT TO SCALE



DECIDUOUS TREE PLANTING

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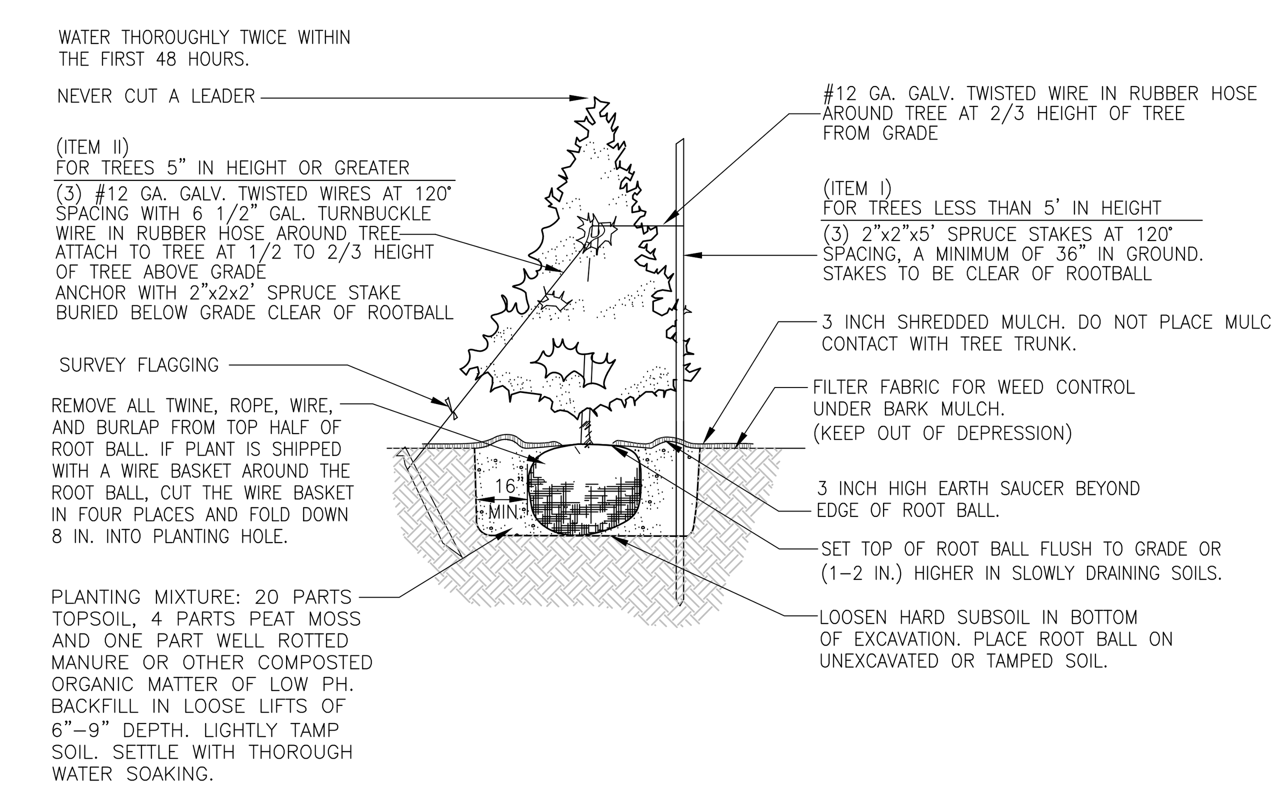

EVERGREEN PLANTING

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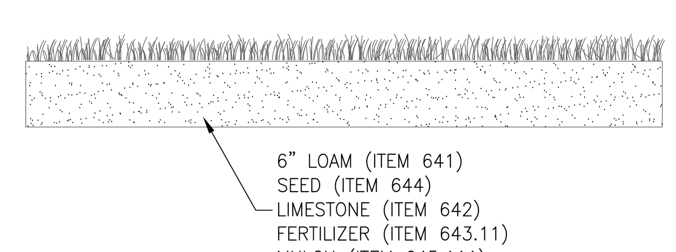

LOAM & SEED

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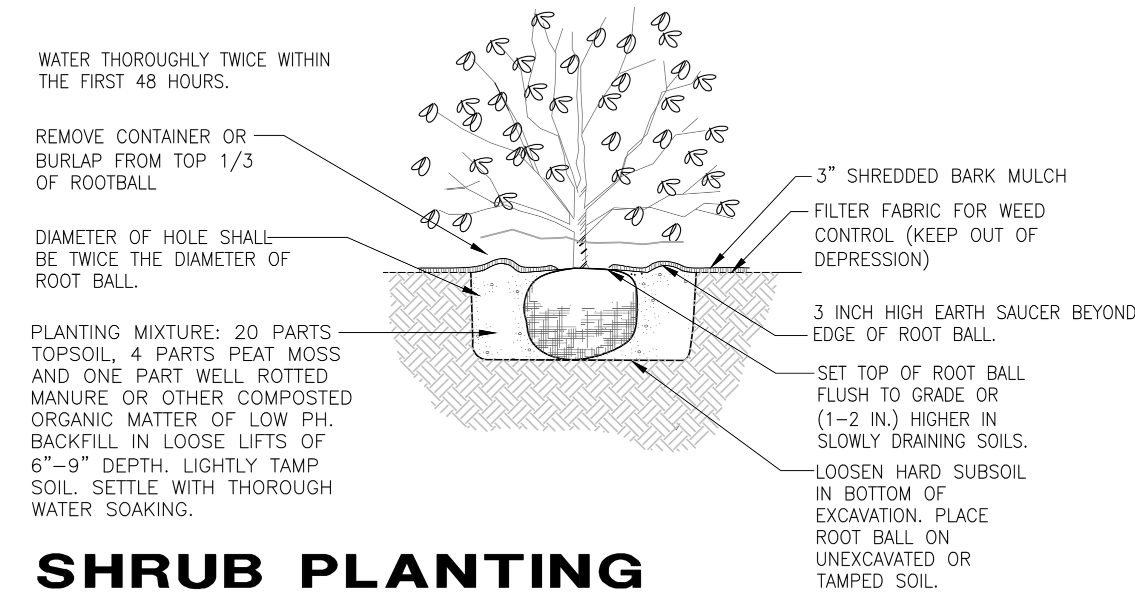

SHRUB PLANTING

NOT TO SCALE

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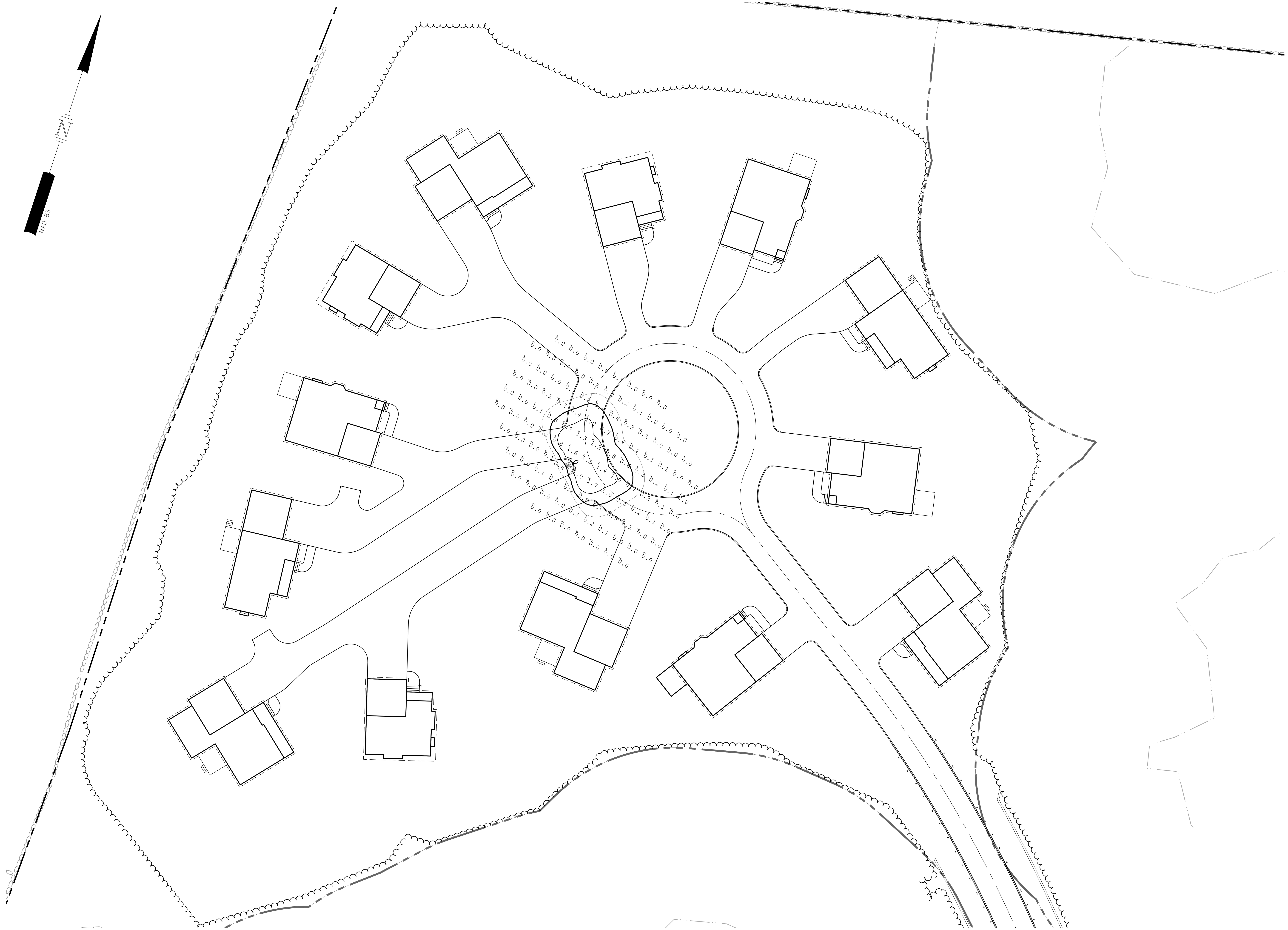

Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
☒	1	P4	SINGLE	COL18-IV-48VLED-NW-350-HS-PT/ MOUNTED ON 12' WOOD POLE PROVIDED BY OTHERS

HORIZONTAL SCALE 1"=30'
30 15 0 30

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

LIGHTING PLAN

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
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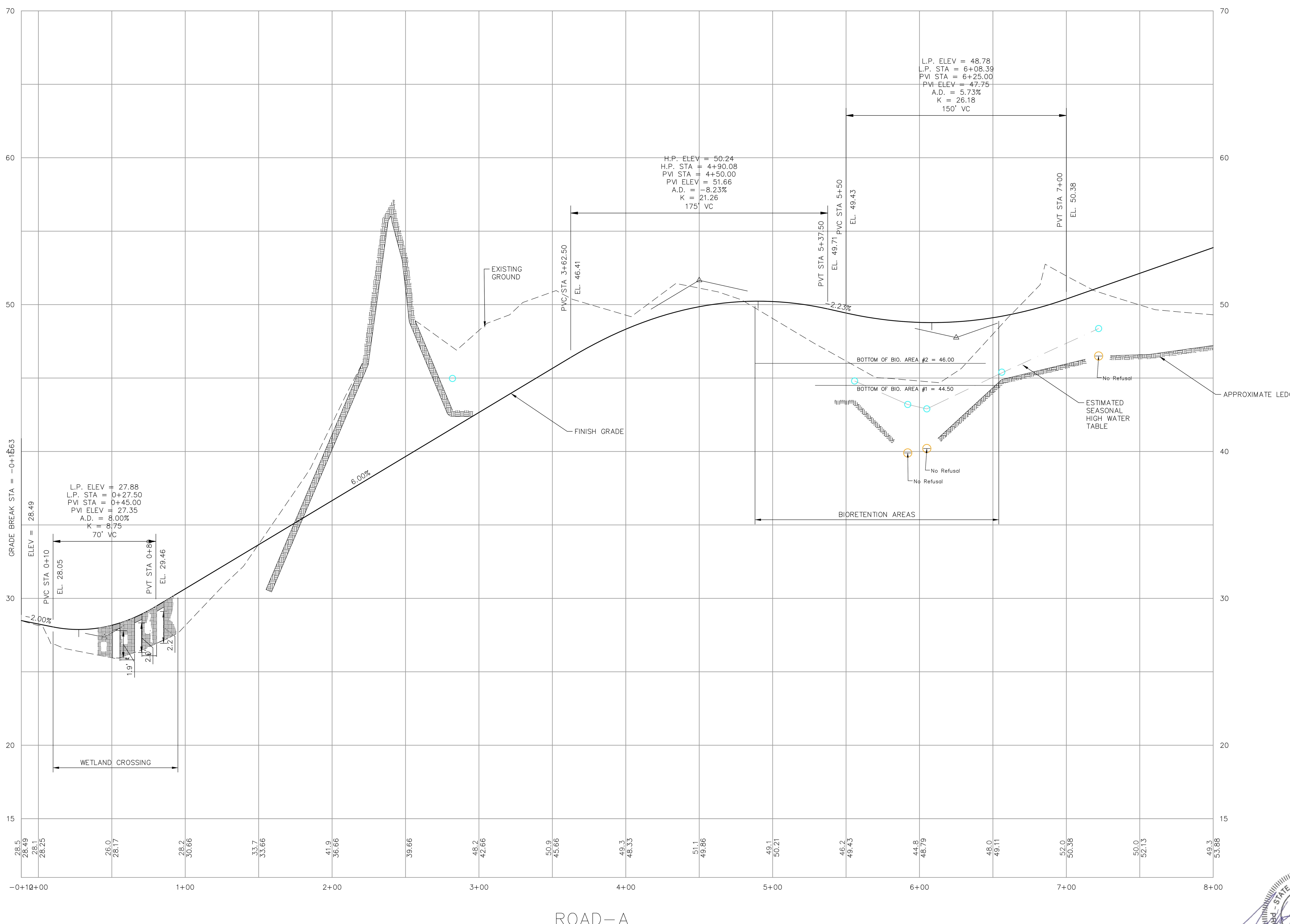

HORIZONTAL SCALE 1"=40'

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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

ROAD-A PROFILE

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=80' (11"X17")
SCALE: 1"=40' (22"X34") **SEPTEMBER 25, 2019**

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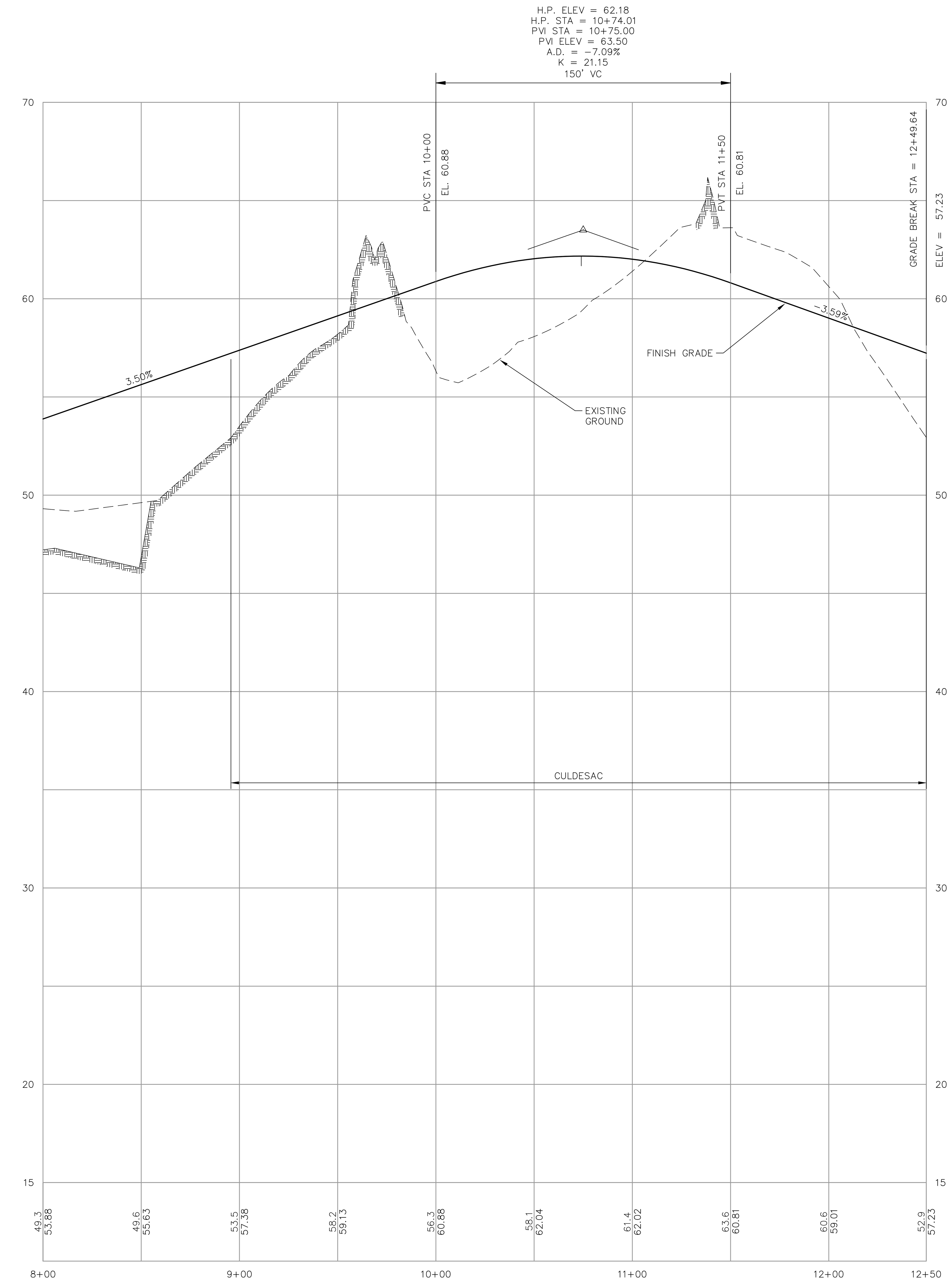

ROAD-A

HORIZONTAL SCALE 1"=40'
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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

ROAD-A PROFILE

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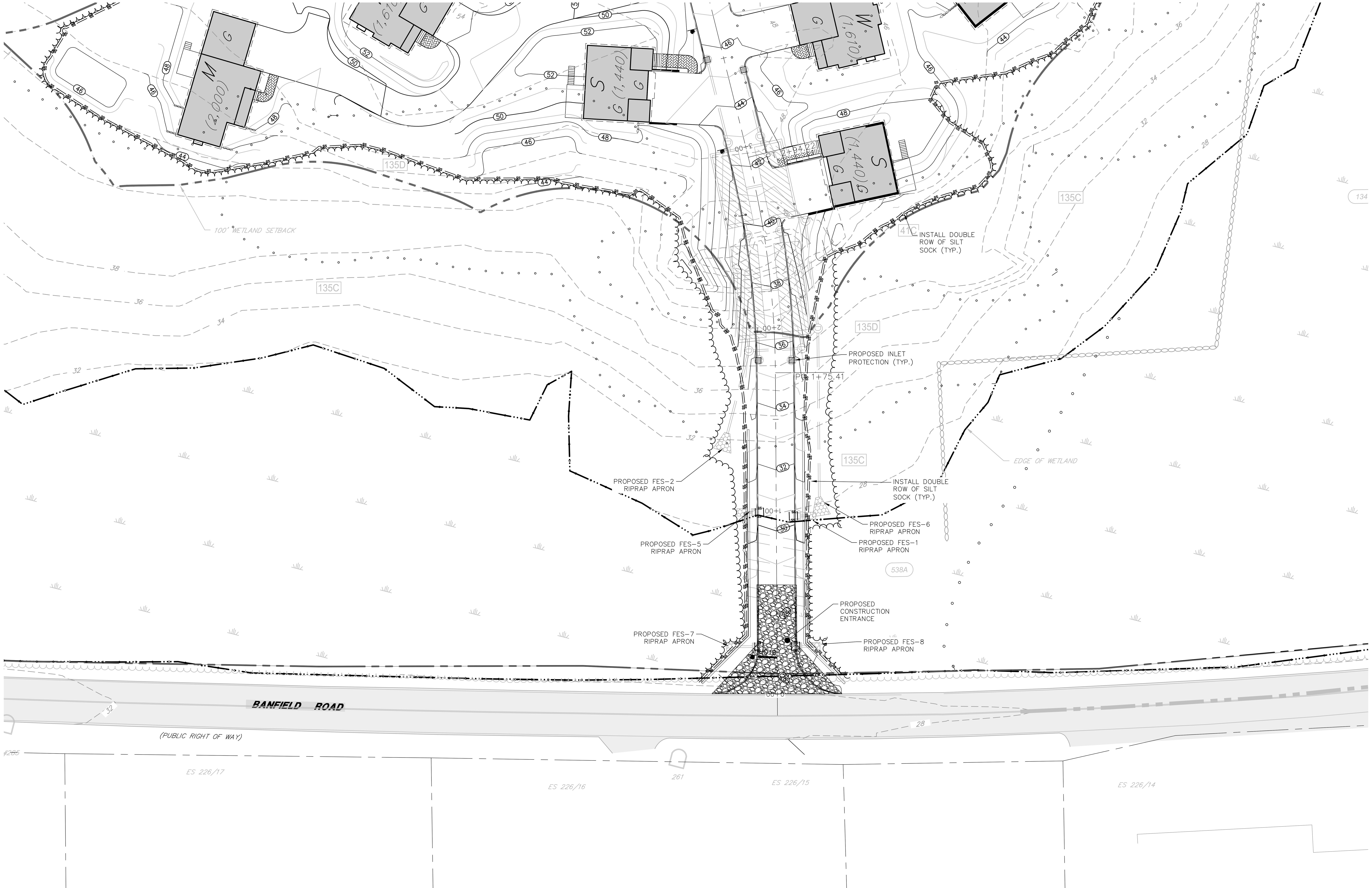

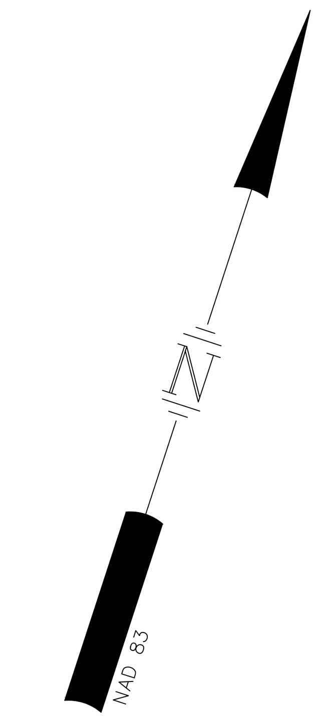

NOTES

1. SEE GENERAL EROSION CONTROL NOTES ON THE EROSION CONTROL DETAIL SHEET AND THE APPROVED SWPPP.
2. INSTALL SILT BARRIER ALONG THE PERIMETER OF THE AREA TO BE DISTURBED AS FIRST ORDER OF WORK.
3. PROVIDE INLET PROTECTION BARRIERS AROUND ALL EXISTING AND PROPOSED STORM DRAINAGE INLETS WITHIN THE WORK LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT UNTIL PAVEMENT HAS BEEN INSTALLED. INLET PROTECTION BARRIERS SHALL BE IN PLACE AT ALL CATCH BASINS PRIOR TO THE DISTURBANCE OF SOIL.
4. DUST CONTROL SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. IT SHALL BE ACCOMPLISHED BY THE UNIFORM APPLICATION OF CALCIUM CHLORIDE AT THE RATE OF 1-1/2 POUNDS PER SQUARE YARD BY MEANS OF A LIME SPREADER OR OTHER APPROVED METHOD. WATER MAY ALSO BE USED FOR DUST CONTROL, AND APPLIED BY SPRINKLING WITH WATER TRUCK DISTRIBUTORS, AS REQUIRED.
5. THE SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE SITE CONSTRUCTION SINCE THE DISTURBANCE EXCEEDS ONE ACRE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH EPA REGULATIONS AND THE CONSTRUCTION GENERAL PERMIT WHICH SHALL REMAIN ON SITE AND MADE ACCESSIBLE TO THE PUBLIC. THE SITE CONTRACTOR SHALL COORDINATE WITH THE OWNER TO SUBMIT AN eNOI AT LEAST 14 DAYS IN ADVANCE OF ANY EARTHWORK ACTIVITIES AT THE SITE. A COMPLETED NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET: FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE FOR, OR ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
6. SILT PROTECTION MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS CONTAINED IN THIS PLAN SET.
7. CONSTRUCT JUTE MATTING ON ALL SLOPES STEEPER THAN 3:1, DISTURBED AREAS SLOPING TOWARDS WETLANDS AND ALL LOCATIONS SHOWN ON PLAN.
8. INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH RAIN STORM OF 0.10" OR GREATER. REPAIR/MODIFY SILT BARRIER AS NECESSARY TO MAXIMIZE FILTER EFFICIENCY. REMOVE SEDIMENT WHEN SEDIMENT IS 1/3 THE STRUCTURE HEIGHT.
9. PROVIDE SILT BARRIERS AT THE BASE OF CUT AND FILL SLOPES UNTIL COMPLETION OF THE PROJECT OR UNTIL VEGETATION BECOMES ESTABLISHED ON SLOPES. EROSION PROTECTION BELOW FILL SLOPES SHALL BE PLACED IMMEDIATELY AFTER CLEARING, PRIOR TO EMBANKMENT CONSTRUCTION.
10. ALL DISTURBED AREAS SHALL BE REVEGETATED AS QUICKLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SEEDED WITHIN 72 HOURS AFTER GRADING.
11. ALL WORK AREAS TO BE STABILIZED AT THE END OF EACH WORK DAY AND PRIOR TO ANY PREDICTED SIGNIFICANT RAIN EVENT.
12. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
A. BASE COURSE GRAVELS ARE 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 RIP RAP HAS BEEN INSTALLED
D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED
13. ALL CATCH BASINS, MANHOLES, AND DRAIN LINES SHALL BE THOROUGHLY CLEANED OF ALL SEDIMENT AND DEBRIS AFTER ALL AREAS HAVE BEEN STABILIZED.
14. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SLOPE STABILITY DURING CONSTRUCTION.
15. THE EROSION CONTROL PRACTICES SHOWN ON THESE PLANS ARE ILLUSTRATIVE ONLY AND SHALL BE SUPPLEMENTED BY THE SITE CONTRACTOR AS NEEDED.
16. EROSION CONTROL BERM MAY BE USED IN PLACE OF ONE LAYER OF SILT SOCK.
17. TURBIDITY CURTAIN TO BE USED IN PLACE OF DOUBLE LAYER OF SILT SOCK WHEN STANDING WATER IS ENCOUNTERED.

SOIL LEGEND

SITE SPECIFIC SOILS	135B
NRCS SOILS	538A

SOIL LEGEND
PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD-HOLLIS-ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT-NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0-8%	B	
8-15%	C	
15-25%	D	
25%+	E	

SOIL LEGEND
PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% - 8% SLOPES	C/D
140B	CHATFIELD-HOLLIS-CANTON COMPLEX, 0% - 8%	B
140C	CHATFIELD-HOLLIS-CANTON COMPLEX, 8% - 15%	B
299	UDORTHENTS	-
538A	SQUAMSCOTT FINE SANDY LOAM, 0% - 5%	C/D

HORIZONTAL SCALE 1"=30'
30 15 0 30

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STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

EROSION CONTROL PLAN

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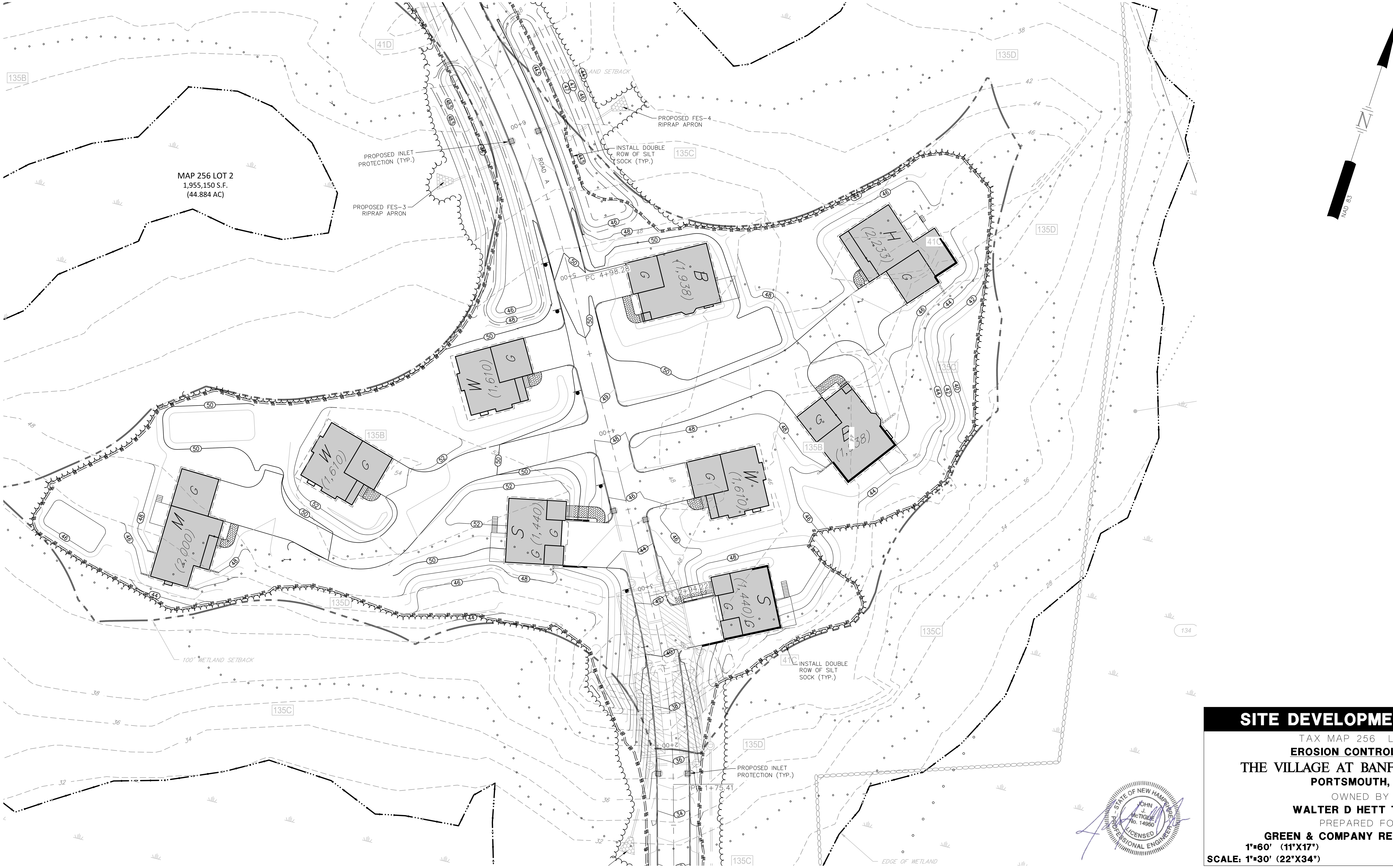

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

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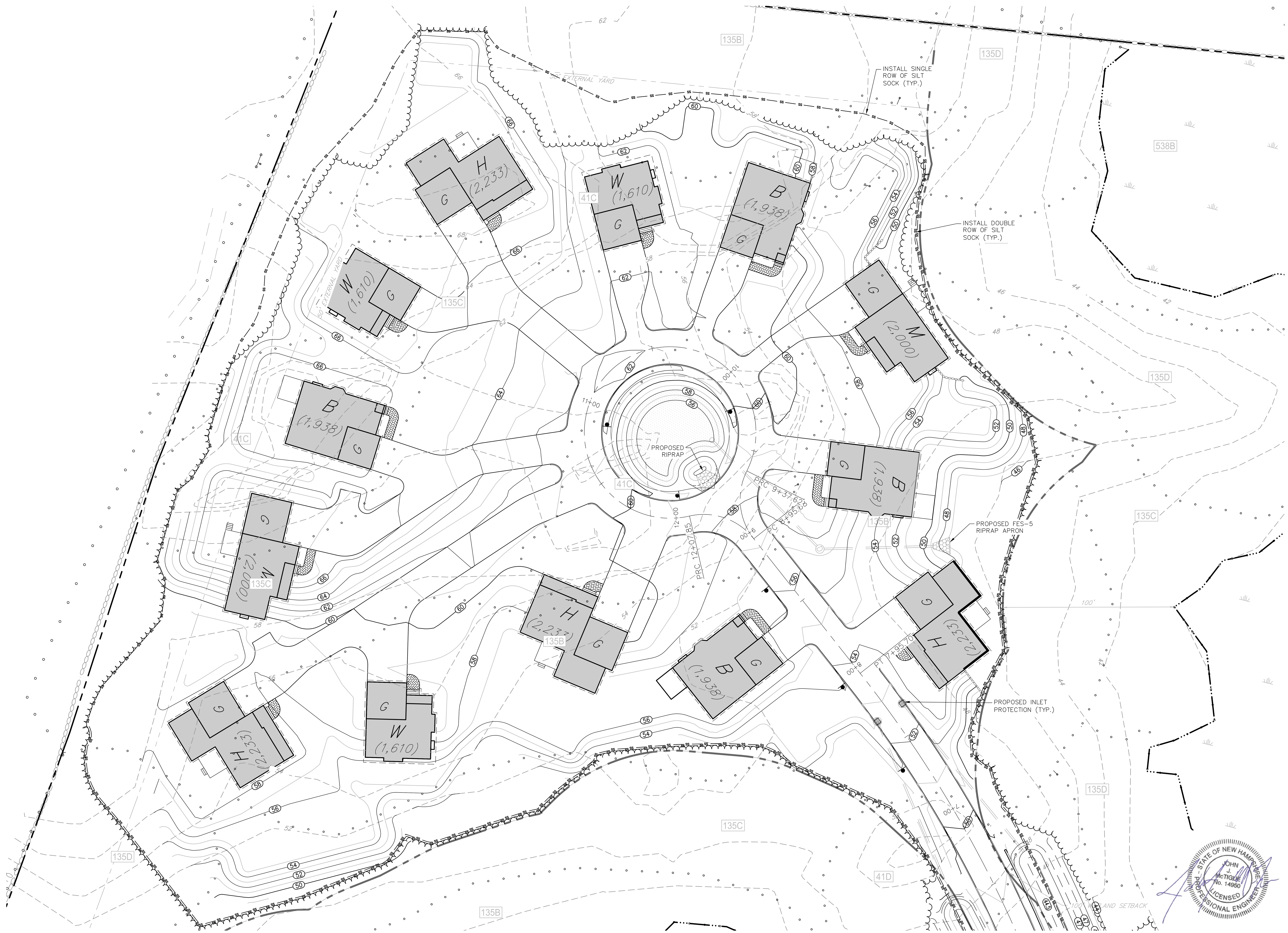

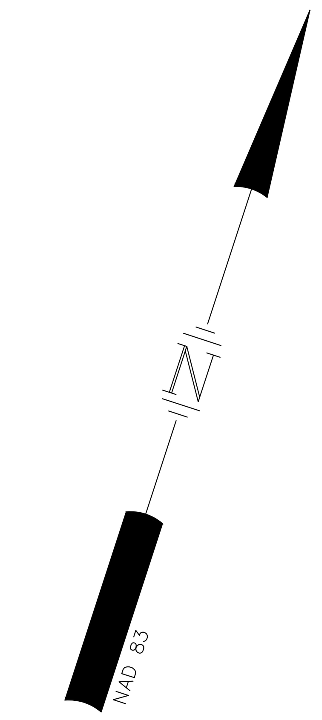

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SOIL CHARACTERISTICS

THE SOIL IN THE VICINITY OF THE SITE CONSISTS OF CHATFIELD–HOLLIS–CANTON AND SQUAMSCOTT FINE SANDY LOAM, THE MAJORITY OF THE SOIL IS HSG TYPE B.

DISTURBED AREA

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 330,672 SQUARE FEET (7.60 ACRES). CONSTRUCTION SHALL BE PHASED TO LIMIT DISTURBED AREAS TO LESS THAN 5 ACRES.

CRITICAL NOTE: THIS DRAWING IS PROVIDED FOR GENERAL GUIDANCE. ALL SPECIAL EROSION CONTROL MEASURES MUST BE EXECUTED IN ACCORDANCE WITH CURRENT STATE AND LOCAL REGULATIONS, APPROVED SWPPP AND PERMIT REQUIREMENTS.

SEQUENCE OF MAJOR ACTIVITIES

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE AND TEMPORARY EROSION CONTROL MEASURES PER APPROVED SWPPP IF REQUIRED.
2. CLEAR TREES DESIGNATED FOR REMOVAL.
3. COMPLETE MAJOR GRADING OF SITE.
4. CONSTRUCT STORMWATER SYSTEM, AND SITE UTILITIES.
5. CONSTRUCT ROAD TO SUBGRADE ELEVATION.
6. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND SITE IS STABILIZED, REMOVE ALL INLET PROTECTION, SILT BARRIERS AND SEDIMENT THAT HAS BEEN TRAPPED BY THESE DEVICES.
7. CONSULT APPROVED SWPPP FOR CONDITIONS RELATED TO NOTICE OF TERMINATION, IF REQUIRED.

EROSION AND SEDIMENT CONTROLS AND STABILIZATION PRACTICES

STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES AND DISTURBED AREAS WHERE CONSTRUCTION ACTIVITY WILL 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. ALL DISTURBED AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

1. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
2. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
3. A MINIMUM OF 3" OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
4. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

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 BARRIERS. ALL STORM DRAIN INLETS SHALL BE PROVIDED WITH BARRIER FILTERS. STONE RIPRAP SHALL BE PROVIDED AT THE OUTLETS OF DRAINAGE PIPES WHERE EROSIVE VELOCITIES ARE ENCOUNTERED.

OFF SITE VEHICLE TRACKING

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED.

INSTALLATION, MAINTENANCE AND INSPECTION OF EROSION AND SEDIMENT CONTROLS

A. GENERAL

THESE ARE THE GENERAL INSPECTION AND MAINTENANCE PRACTICES THAT WILL BE USED TO IMPLEMENT THE PLAN.

1. STABILIZATION OF ALL SWALES, DITCHES AND PONDS IS REQUIRED PRIOR TO DIRECTING FLOW TO THEM.
2. THE SMALLEST PRACTICAL PORTION OF THE SITE WILL BE DENUDED AT ONE TIME. (5 AC MAX)
3. ALL CONTROL MEASURES WILL BE INSPECTED AT LEAST ONCE EACH WEEK AND FOLLOWING ANY STORM EVENT OF 0.10" OR GREATER.
4. ALL MEASURES WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE INITIATED WITHIN 24 HOURS OF REPORT.
5. BUILT UP SEDIMENT WILL BE REMOVED FROM SILT BARRIER WHEN IT HAS REACHED ONE THIRD THE HEIGHT OF THE BARRIER.
6. ALL DIVERSION DIKES WILL BE INSPECTED AND ANY BREACHES PROMPTLY REPAIRED.
7. TEMPORARY SEEDING AND PLANTING WILL BE INSPECTED FOR BARE SPOTS, WASHOUTS, AND UNHEALTHY GROWTH.
8. A MAINTENANCE INSPECTION REPORT WILL BE MADE AFTER EACH INSPECTION.
9. THE CONTRACTOR'S SITE SUPERINTENDENT WILL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES, AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.

B. FILTERS / BARRIERS

1. SILT SOCKS

A. KNOTTED MESH NETTING MATERIAL SHALL BE DELIVERED TO SITE IN A 5 MIL CONTINUOUS, TUBULAR, HDPE 3/8" MATERIAL, FILLED WITH COMPOST CONFORMING TO THE FOLLOWING REQUIREMENTS:

PHYSICAL PROPERTY	TEST	REQUIREMENTS
PH	TMECC 04.11–A	5.0 TO 8.0
PARTICLE SIZE	TMECC 02.02–B	2" SIEVE AND MIN. 60% GREATER THAN THE $\frac{3}{8}$" SIEVE
MOISTURE CONTENT		STND TESTING < 60%

MATERIAL SHALL BE RELATIVELY FREE OF INERT OR FOREIGN MAN–MADE MATERIALS.

MATERIAL SHALL BE WEED FREE AND DERIVED FROM A WELL–DECOMPOSED SOURCE OF ORGANIC MATTER, FREE FROM ANY REFUSE, CONTAMINANTS OR OTHER MATERIALS TOXIC TO PLANT GROWTH.

B. SEDIMENT COLLECTED AT THE BASE OF THE SILT SOCK SHALL BE REMOVED ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE SILT SOCK.

C. SILT BARRIER SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAS BEEN PERMANENTLY STABILIZED.

2. SEQUENCE OF INSTALLATION

SEDIMENT BARRIERS SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTRIBUTING DRAINAGE AREA ABOVE THEM.

3. MAINTENANCE

A. SILT BARRIERS SHALL BE INSPECTED WEEKLY AND IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THEY SHALL BE REPAIRED IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THEM. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THEM, SEDIMENT BARRIERS SHALL BE REPLACED WITH A TEMPORARY CHECK DAM.

B. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

C. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE THIRD (1/3) THE HEIGHT OF THE BARRIER.

D. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFIRM WITH THE EXISTING GRADE, PREPARED AND SEEDED.

C. MULCHING

1. TIMING

IN ORDER FOR MULCH TO BE EFFECTIVE, IT MUST BE IN PLACE PRIOR TO MAJOR STORM EVENTS. THERE ARE TWO (2) TYPES OF STANDARDS WHICH SHALL BE USED TO ASSURE THIS:

A. APPLY MULCH PRIOR TO ANY STORM EVENT.

THIS IS APPLICABLE WHEN WORKING WITHIN 100' OF WETLANDS. IT WILL BE NECESSARY TO CLOSELY MONITOR WEATHER PREDICTIONS, USUALLY BY CONTACTING THE NATIONAL WEATHER SERVICE, TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.

B. REQUIRED MULCHING WITHIN A SPECIFIED TIME PERIOD.

THE TIME PERIOD CAN RANGE FROM 14 TO 21 DAYS OF INACTIVITY ON AN AREA, WHERE THE LENGTH OF TIME VARIES WITH SITE CONDITIONS. PROFESSIONAL JUDGMENT SHALL BE USED TO EVALUATE THE INTERACTION OF SITE CONDITIONS (SOIL ERODIBILITY, SEASON OF YEAR, EXTENT OF DISTURBANCE, PROXIMITY TO SENSITIVE RESOURCES, ETC.) AND THE POTENTIAL IMPACT OF EROSION ON ADJACENT AREAS TO CHOOSE AN APPROPRIATE TIME RESTRICTION.

2. GUIDELINES FOR WINTER MULCH APPLICATION.

WHEN MULCH IS APPLIED TO PROVIDE PROTECTION OVER WINTER (PAST THE GROWING SEASON) IT SHALL BE AT A RATE OF 6,000 POUNDS OF HAY OR STRAW PER ACRE. A TACKIFIER MAY BE ADDED TO THE MULCH.

3. MAINTENANCE

ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. IF LESS THAN 90% OF THE SOIL SURFACE IS COVERED BY MULCH, ADDITIONAL MULCH SHALL BE IMMEDIATELY APPLIED.

D. VEGETATIVE PRACTICE

1. AFTER ROUGH GRADING OF THE SUBGRADE HAS BEEN COMPLETED AND APPROVED, THE SUB GRADE SURFACE SHALL BE SCARIFIED TO A DEPTH OF 4". THEN, FURNISH AND INSTALL A LAYER OF LOAM PROVIDING A ROLLED THICKNESS AS SPECIFIED IN THESE PLANS. ANY DEPRESSIONS WHICH MAY OCCUR DURING ROLLING SHALL BE FILLED WITH ADDITIONAL LOAM, REGRADED AND REROLLED UNTIL THE SURFACE IS TRUE TO THE FINISHED LINES AND GRADES. ALL LOAM NECESSARY TO COMPLETE THE WORK UNDER THIS SECTION SHALL BE SUPPLIED BY THE SITE SUBCONTRACTOR.
2. ALL LARGE STIFF CLODS, LUMPS, BRUSH, ROOTS, DEBRIS, GLASS, STUMPS, LITTER AND OTHER FOREIGN MATERIAL, AS WELL AS STONES OVER 1" IN DIAMETER, SHALL BE REMOVED FROM THE LOAM AND DISPOSED OF OFF SITE. THE LOAM SHALL BE RAKED SMOOTH AND EVEN.
3. THE LOAM SHALL BE PREPARED TO RECEIVE SEED BY REMOVING STONES, FOREIGN OBJECTS AND GRADING TO ELIMINATE WATER POCKETS AND IRREGULARITIES PRIOR TO PLACING SEED. FINISH GRADING SHALL RESULT IN STRAIGHT UNIFORM GRADES AND SMOOTH, EVEN SURFACES WITHOUT IRREGULARITIES TO LOW POINTS.
4. SHAPE THE AREAS TO THE LINES AND GRADES REQUIRED. THE SITE SUBCONTRACTOR'S ATTENTION IS DIRECTED TO THE SCHEDULING OF LOAMING AND SEEDING OF GRADED AREAS TO PERMIT SUFFICIENT TIME FOR THE STABILIZATION OF THESE AREAS. IT SHALL BE THE SITE SUBCONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE AREAS DURING THE CONSTRUCTION PERIOD AND REGRADE, LOAM AND RESEED ANY DAMAGED AREAS.
5. ALL AREAS DISTURBED BY CONSTRUCTION WITHIN THE PROPERTY LINES AND NOT COVERED BY STRUCTURES, PAVEMENT, OR MULCH SHALL BE LOAMED AND SEEDED.
6. LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE IN ORDER TO PROVIDE A PH VALUE OF 5.5 TO 6.5.
7. FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10–20–20 FERTILIZER.
8. 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.
9. 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" AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH.
10. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE. MULCH THAT BLOWS OR WASHES AWAY SHALL BE REPLACED IMMEDIATELY AND ANCHORED USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.
11. 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.
12. THE SITE SUBCONTRACTOR SHALL PROTECT AND MAINTAIN THE SEEDED AREAS UNTIL ACCEPTED, INCLUDING CUTTING, AS SPECIFIED HEREIN AFTER UNDER MAINTENANCE AND PROTECTION.
13. UNLESS OTHERWISE APPROVED, SEEDING SHALL BE DONE DURING THE APPROXIMATE PERIODS OF EARLY SPRING TO SEPTEMBER 30, WHEN SOIL CONDITIONS AND WEATHER ARE SUITABLE FOR SUCH WORK. IN NO CASE SHALL THE WEED CONTENT EXCEED 1 PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH STATE AND FEDERAL SEED LAWS. FOR TEMPORARY PLANTINGS AFTER SEPTEMBER 30, TO EARLY SPRING AND FOR TEMPORARY PROTECTION OF DISTURBED AREAS:

A. FOLLOW ABOVE SLOPE, LOAM DEPTH AND GRADING REQUIREMENTS.
B. FERTILIZER SHALL BE SPREAD AND WORKED INTO THE SURFACE AT A RATE OF 300 POUNDS PER ACRE.

MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:

WINTER RYE (FALL SEEDING)	2.5 LBS/1,000 SF
OATS (SPRING SEEDING)	2.0 LBS/1,000 SF
MULCH	1.5 TONS/ACRE

E. CATCH BASIN INLET PROTECTION

1. INLET BASKET STRUCTURE

A. INLET PROTECTION SHALL BE INSTALLED IMMEDIATELY PRIOR TO DISTURBING PAVEMENT AND SHALL REMAIN IN PLACE AND MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

B. MOLD 6X6, 42 LB. WIRE SUPPORT AROUND INLET FRAME AND GRATE AND EXTEND 6" BEYOND SIDES. SECURE FILTER FABRIC TO WIRE SUPPORT.

C. THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:

GRAB STRENGTH: 45 LB. MINIMUM IN ANY PRINCIPAL DIRECTION (ASTM D1682)
MULLEN BURST STRENGTH: MIN. 60PSI (ASTM D774)

D. THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 GPM.

E. THE INLET PROTECTION SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

F. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

F. WINTER CONSTRUCTION SEQUENCE

1. ALL PROPOSED POST–DEVELOPMENT LANDSCAPED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1 AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT 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 EVENT.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, ALL TRAVEL SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOWFALL AFTER EACH STORM EVENT.

TIMING OF CONTROLS/MEASURES

AS INDICATED IN THE SEQUENCE OF MAJOR ACTIVITIES, SILT BARRIERS SHALL BE INSTALLED PRIOR TO COMMENCING ANY CLEARING OR GRADING OF THE SITE. STRUCTURAL CONTROLS SHALL BE INSTALLED CONCURRENTLY WITH THE APPLICABLE ACTIVITY. AREAS WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR MORE THAN TWENTY ONE (21) DAYS WILL BE STABILIZED WITH A TEMPORARY SEED AND MULCH WITHIN FOURTEEN (14) DAYS OF THE LAST DISTURBANCE. ONCE CONSTRUCTION ACTIVITY CEASES PERMANENTLY IN AN AREA, SILT BARRIERS AND ANY EARTH/DIKES WILL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.

WASTE DISPOSAL

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

SPILL PREVENTION

1. MATERIAL MANAGEMENT PRACTICES
THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT WILL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:

GOOD HOUSEKEEPING:
THE FOLLOWING GOOD HOUSEKEEPING PRACTICES WILL BE FOLLOWED ON SITE DURING THE CONSTRUCTION PROJECT:

A. AN EFFORT WILL BE MADE TO STORE ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB.

B. ALL MATERIALS STORED ON SITE WILL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE.

C. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL WILL BE FOLLOWED.

D. THE SITE SUPERINTENDENT WILL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS.

E. SUBSTANCES WILL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

F. WHENEVER POSSIBLE ALL OF A PRODUCT WILL BE USED UP BEFORE DISPOSING OF THE CONTAINER.

HAZARDOUS PRODUCTS:
THE FOLLOWING PRACTICES WILL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:

A. PRODUCTS WILL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

B. ORIGINAL LABELS AND MATERIAL SAFETY DATA WILL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION.

C. SURPLUS PRODUCT THAT MUST BE DISPOSED OF WILL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.

2. PRODUCT SPECIFICATION PRACTICES
THE FOLLOWING PRODUCT SPECIFIC PRACTICES WILL BE FOLLOWED ON SITE:

PETROLEUM PRODUCTS:
ALL ON SITE VEHICLES WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT BASED SUBSTANCES USED ON SITE WILL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

FERTILIZERS:
FERTILIZERS USED WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS. ONCE APPLIED FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER WILL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.

PAINTS:
ALL CONTAINERS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM BUT WILL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.

CONCRETE TRUCKS:
CONCRETE TRUCKS WILL DISCHARGE AND WASH OUT SURPLUS CONCRETE OR DRUM WASH WATER IN A CONTAINED AREA DESIGNATED ON SITE.

SPILL CONTROL PRACTICES

IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION THE FOLLOWING PRACTICES WILL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:

A. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP WILL BE CLEARLY POSTED AND SITE PERSONNEL WILL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

B. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP WILL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS WILL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE.

C. ALL SPILLS WILL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY.

D. THE SPILL AREA WILL BE KEPT WELL VENTILATED AND PERSONNEL WILL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

E. SPILLS OF TOXIC OR HAZARDOUS MATERIAL WILL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

F. THE SPILL PREVENTION PLAN WILL BE ADJUSTED TO INCLUDE MEASURES TO PREVENT THIS TYPE OF SPILL FROM RECURRING AND HOW TO CLEANUP THE SPILL IF IT RECURS. A DESCRIPTION OF THE SPILL, ITS CAUSE, AND THE CLEANUP MEASURES WILL BE INCLUDED.

G. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY–TO–DAY SITE OPERATIONS WILL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.

DUST CONTROL

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

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

EROSION CONTROL NOTES

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE – JOHN J. McTIGUE No. 14950 – LICENSED – PROFESSIONAL ENGINEER

REV.	DATE	DESCRIPTION	DR	CK
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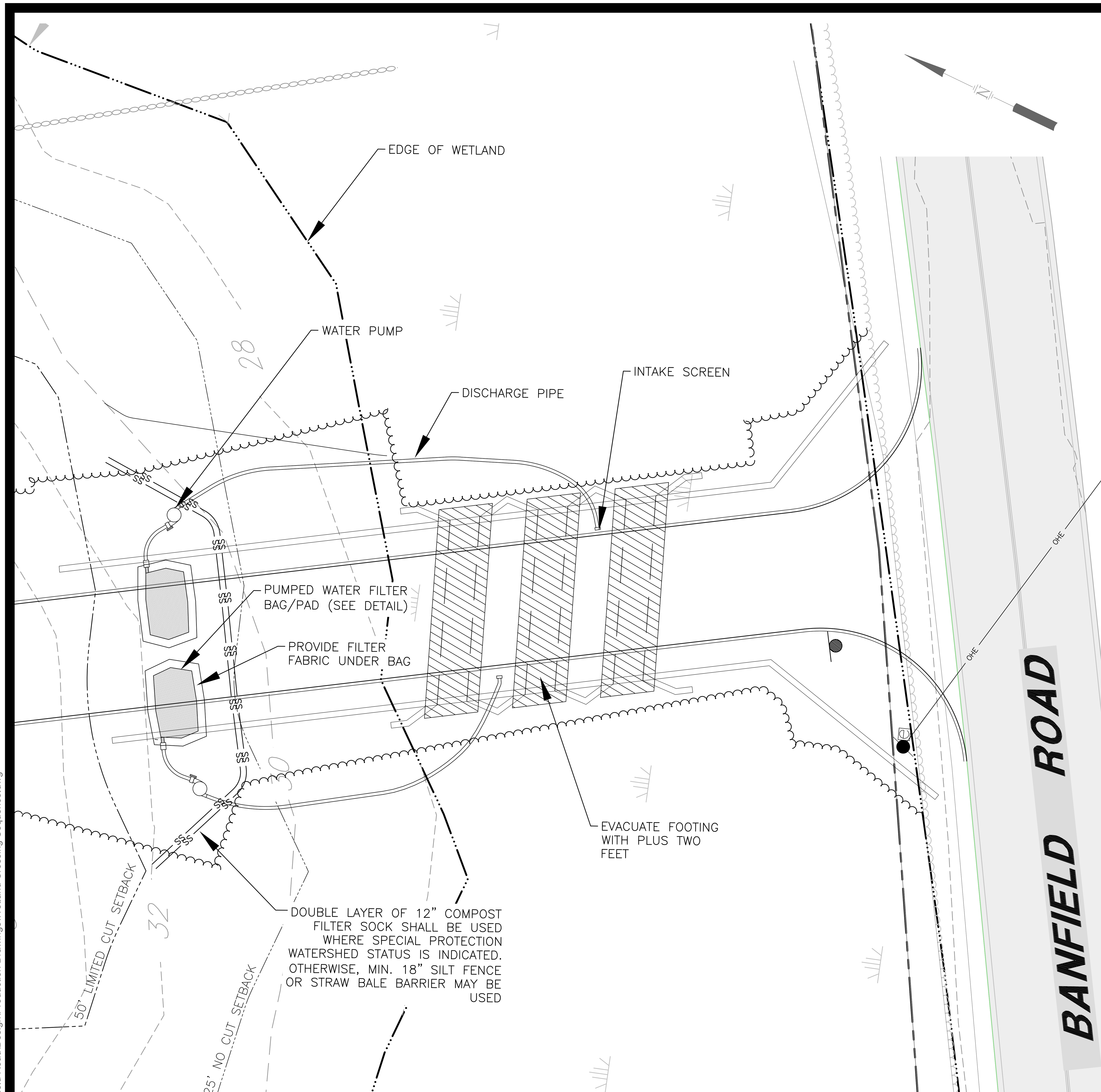
FILE	47361.00	DR	RCK	FB	–	C–26
		CK	JJM	CADFILE	NOTES	

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
811
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

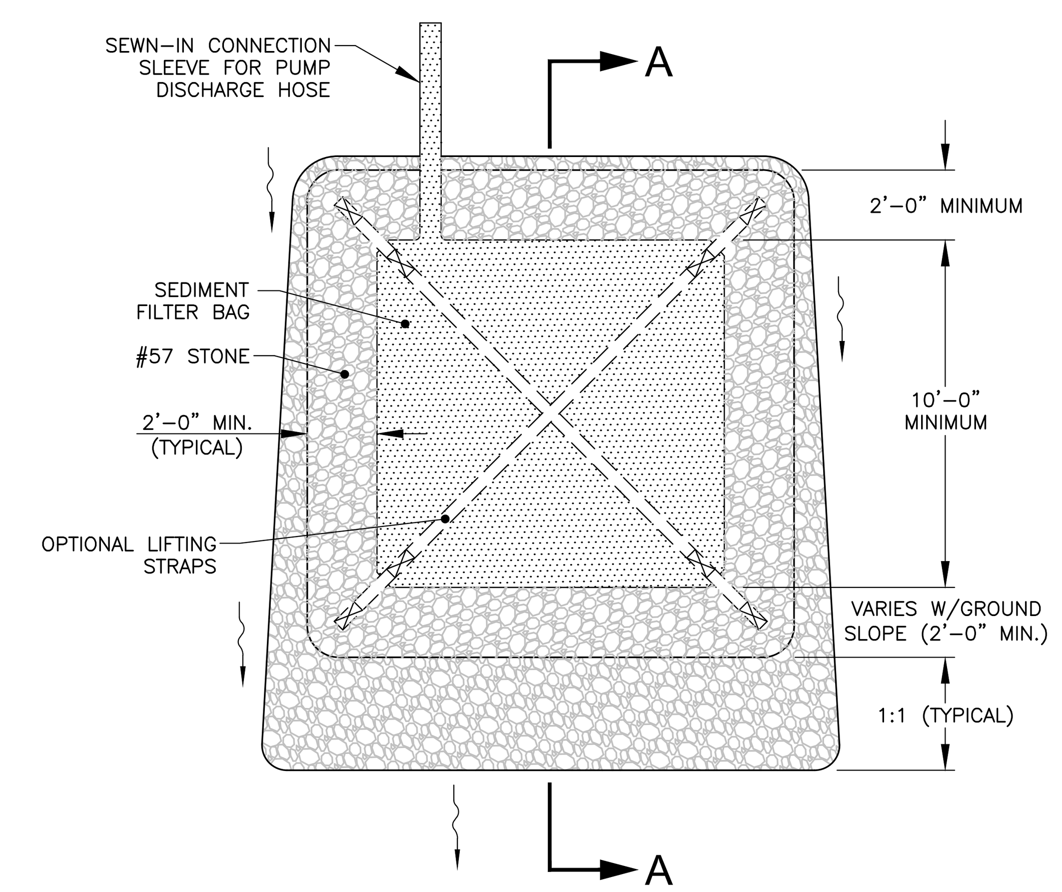


TYPICAL WETLAND CROSSING - OPEN TRENCH

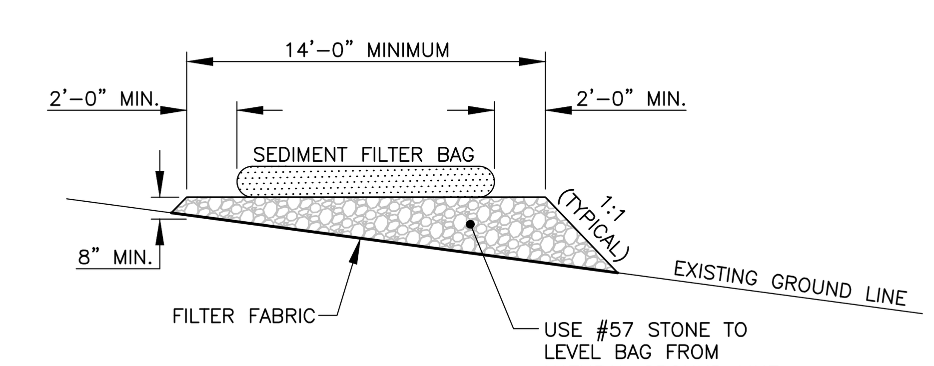
NOT TO SCALE

NOTES:

1. GRUBBING SHALL NOT TAKE PLACE BEYOND THE LIMIT OF WORK AS SHOWN ON THE APPROVED PLANS.
2. WATER ACCUMULATING WITH IN THE WORK AREA SHALL BE PUMPED TO A SEDIMENT BAG OR SEDIMENT TRAP PRIOR TO DISCHARGING.
3. HAZARDOUS OR POLLUTANT MATERIAL STORAGE AREAS AND EQUIPMENT REFUELING AREAS SHALL BE LOCATED AT LEAST 100' BACK FROM THE EDGE OF WETLAND.
4. ALL EXCESS EXCAVATED MATERIAL SHALL BE IMMEDIATELY REMOVED FROM THE EDGE OR WETLAND.
5. ALL DISTURBED AREAS WITHIN 50' OF THE EDGE OF WETLAND SHALL BE BLANKETED OR MATTED WITHIN 24 HOURS OF INITIAL DISTURBANCE UNLESS OTHERWISE AUTHORIZED. APPROPRIATE WETLAND PROTECTION SHALL BE PROVIDED WITHIN THE CHANNEL.
6. PROVIDE SECONDARY CONTAINMENT TO CAPTURE DRIPS, SPILLS, OR LEAKS OF FUEL OR OIL.



PLAN VIEW



SECTION A–A

SEDIMENT FILTER BAG WITH GRAVEL PAD

NOT TO SCALE

WETLAND CROSSING – SEQUENCE OF CONSTRUCTION

THE PLACEMENT OF THESE STRUCTURES WILL BE DONE IN THE ORDER AS NUMBERED BELOW. EACH SEQUENCE

BELOW WILL BE COMPLETED BEFORE THE NEXT STEP IN THE SEQUENCE COMMENCES. NO STEPS WILL BE REMOVED.

THE TIME OF WETLAND DISTURBANCE WILL BE LIMITED AND WILL BE SCHEDULED DURING LOW FLOW OR NO FLOW CONDITIONS.

1. AT WETLAND CROSSING, THE WETLAND BUFFER SHALL BE MAINTAINED TO THE LARGEST EXTENT FEASIBLE. CLEARING, SOD DISTURBANCE, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING CUT LOGS, DISCHARGING RAIN WATER FROM TRENCHES, WELDING PIPE JOINTS, STORING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE OF THESE BUFFERS.
2. INSTALL APPROPRIATE SEDIMENT BARRIER DOWNSLOPE OF ALL SPOIL/EXCAVATION FROM CROSSING AREAS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
   a. NOTE: THE SEDIMENT BARRIER FOR THE SPOIL CROSSING AREAS MUST BE A MINIMUM OF 10' FROM THE EDGE OF WETLAND
3. INSTALL WATER PUMP. IF A LEVEL AREA IS REQUIRED, GRADE THE PUMP AREA, THEN PLACE A 4" LAYER OF #57 STONE OR REINFORCED EROSION CONTROL BLANKET.
4. DURING THE EXCAVATION FOR THE PLACEMENT OF THE WETLAND CROSSING:
   a. ALL WATER THAT NEEDS TO BE PUMPED FROM THE EXCAVATED TRENCH AREA WILL BE REMOVED BY DISCHARGE THROUGH A PUMPED WATER FILTER BAG. SEE FILTER BAG PAD DETAIL.
   b. IF THE AREA THAT THE BAG IS PLACED ON IS GREATER THAN 5% SLOPE, THEN A PUMPED WATER FILTER BAG PAD WILL BE CONSTRUCTED. SEE SEDIMENT FILTER BAG WITH GRAVEL PAD DETAIL.
5. EXCAVATE MATERIAL FOR TRENCH AREA. THE MATERIAL WILL THEN BE PLACED IN A DESIGNATED AREAS FOR LATER USE. KEEP WETLAND TOPSOIL SEPARATE FOR LATER USE.
6. INSTALL CROSSING
   a. INSTALL ECOPASSAGE FOOTING.
   b. INSTALL ECOPASSAGE.
   c. INSTALL CONDUITS FOR UTILITIES.
   d. BACKFILL WILL THEN BE PLACED AROUND AND/OR ON THE ECOPASSAGES. BACK FILL SHALL BE COMPACTED IN A MAXIMUM OF 12" LIFTS.
7. THE WETLAND AND SURROUNDING AREA NOT BEING DEVELOPED WILL BE RESTORED TO ORIGINAL CONTOURS. ALL DISTURBED AREAS WILL BE SEEDED AND MULCHED.
8. THE PUMPING OF WATER TO THE WATER FILTER BAG AS SHOWN IN STEP 4 OF THE INSTALLATION WILL CONTINUE DURING RESTORATION PROCEDURES.
9. THE SPOIL FROM CROSSING PLACEMENT AREAS WILL BE REGRADED, SEEDED AND MULCHED.
   a. THE SILT BARRIER SHALL BE PLACED DOWN GRADIENT OF THE SPOIL STORAGE AREA AND WILL REMAIN IN PLACE AND MAINTAINED UNTIL PERMANENT VEGETATED STABILIZATION IS ACHIEVED.
   b. PERMANENT STABILIZATION WILL BE ACHIEVED WHEN A UNIFORM 85% VEGETATIVE COVER OF THE ENTIRE SEEDED AREA IS ESTABLISHED.
11. REMOVE PUMPED WATER FILTER BAGS. THE AREA UTILIZED FOR THE PUMPED WATER FILTER BAG/PAD WILL BE REGRADED, SEEDED AND MULCHED.
12. THE PUMPING AREA AS SHOWN IN INSTALLATION SEQUENCE 4 WILL BE REGRADED, SEEDED AND MULCHED.
13. ALL AREAS THAT WERE DISTURBED DURING THE CONSTRUCTION OF THE WETLAND CROSSING WILL BE RETURNED TO THEIR ORIGINAL CONTOURS. SILT BARRIERS WILL BE PLACED DOWNSLOPE OF ANY AREAS THAT WILL BE REGRADED. THE AREAS WILL BE SEEDED AND MULCHED AS PER THE EROSION CONTROL NOTES, WILL REMAIN IN PLACE AND MAINTAINED UNTIL PERMANENT VEGETATED STABILIZATION IS ACHIEVED.
14. UPON COMPLETION OF AN EARTH DISTURBANCE ACTIVITY OR ANY STAGE OR PHASE OF AN ACTIVITY, THE SITE SHALL BE IMMEDIATELY SEEDED, MULCHED, OR OTHERWISE PROTECTED FROM ACCELERATED EROSION AND SEDIMENTATION.

SEDIMENT FILTER BAG GENERAL NOTES:

1. CONTRACTOR SHALL EXERCISE CAUTION NOT TO BURST OR DAMAGE THE SEDIMENT FILTER BAG WHEN PUMPING.
2. THE LENGTH AND WIDTH OF THE TEMPORARY SEDIMENT BAG SHOWN ON THIS DRAWING MAY VARY PER VENDOR SPECIFICATIONS. THE MINIMUM "FOOTPRINT" OF THE BAG SHALL BE 10 x 15 FEET.
3. SEDIMENT FILTER BAGS SHALL BE EQUIPPED WTH A SEWN-IN SLEEVE OF SUFFICIENT SIZE TO ACCEPT A MINIMUM 4 INCH DIAMEMTER PUMP DISCHARGE HOSE. THE DISCHARGE HOSE SHOULD BE EXTENDED INTO THIS SLEEVE A MINIMUM OF 6 INCHES AND BE TIGHTLY SECURED WITH A HOSE CLAMP OR OTHER SUITABLE MEANS TO PREVENT LEAKAGE. HOSE CONNECTION THROUGH A SLIT IN THE BAG WILL NOT BE ACCEPTABLE.
4. THE PUMP DISCHARGE HOSE CONNECTION SLEEVE SHALL BE SECURELY TIED OFF DURING DISPOSAL OF THE SEDIMENT FILTER BAG IN ORDER TO PREVENT LEAKAGE OF COLLECTED SEDIMENTS.
5. SEDIMENT FILTER BAG SHALL BE MAINTAINED AND REPLACED WHEN ONE HALF FULL OF SEDIMENT OR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

WETLAND CROSSING PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

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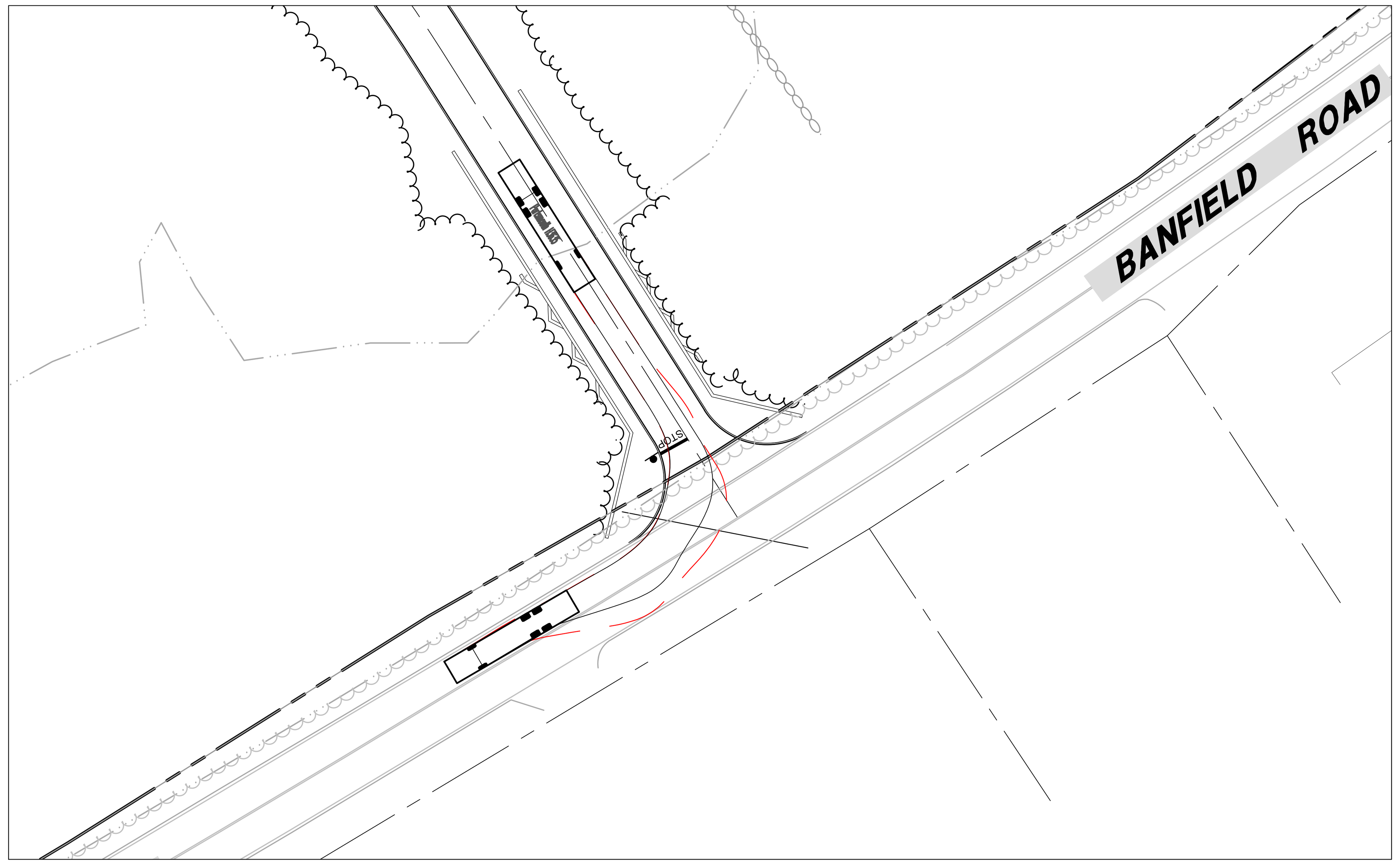
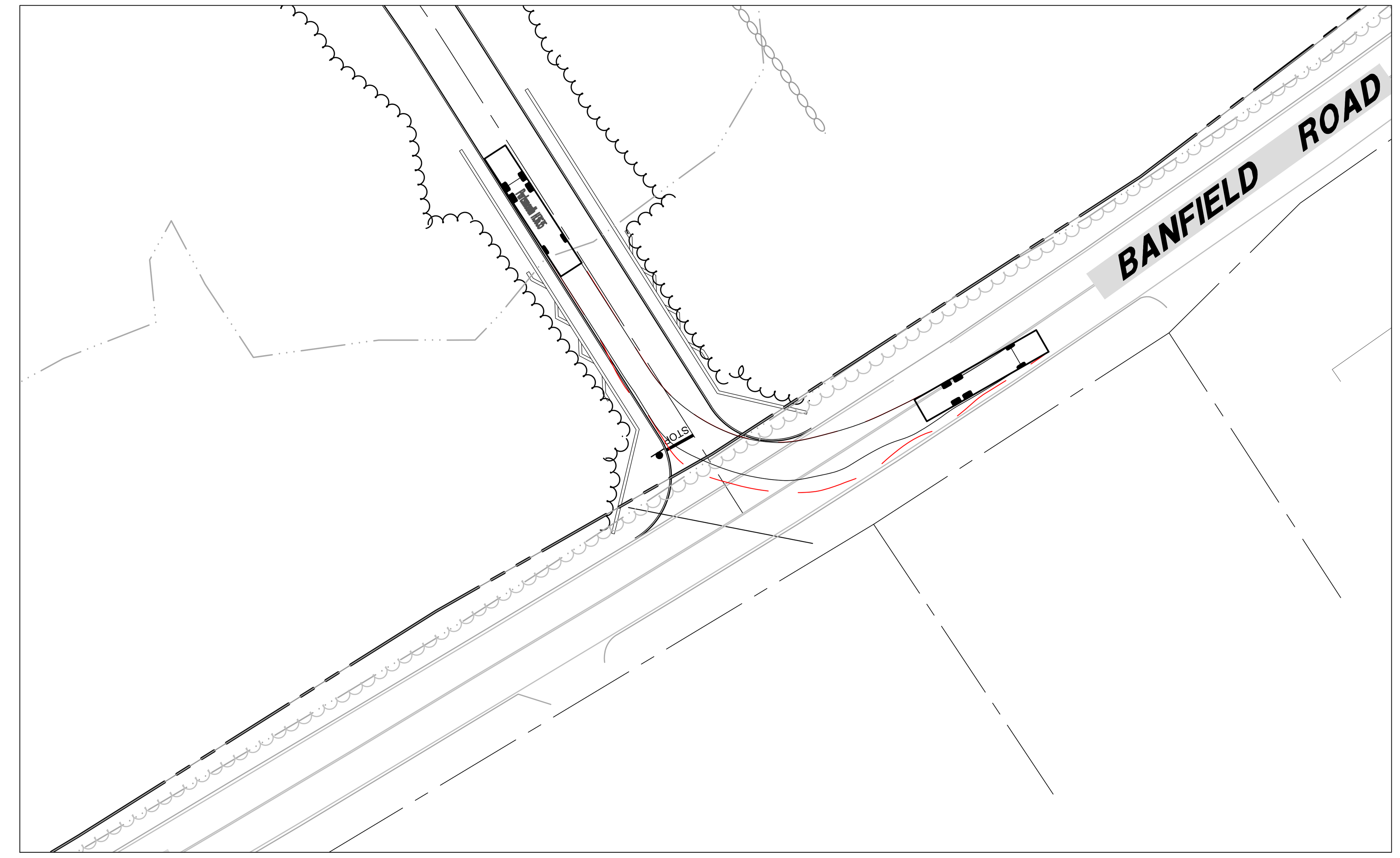
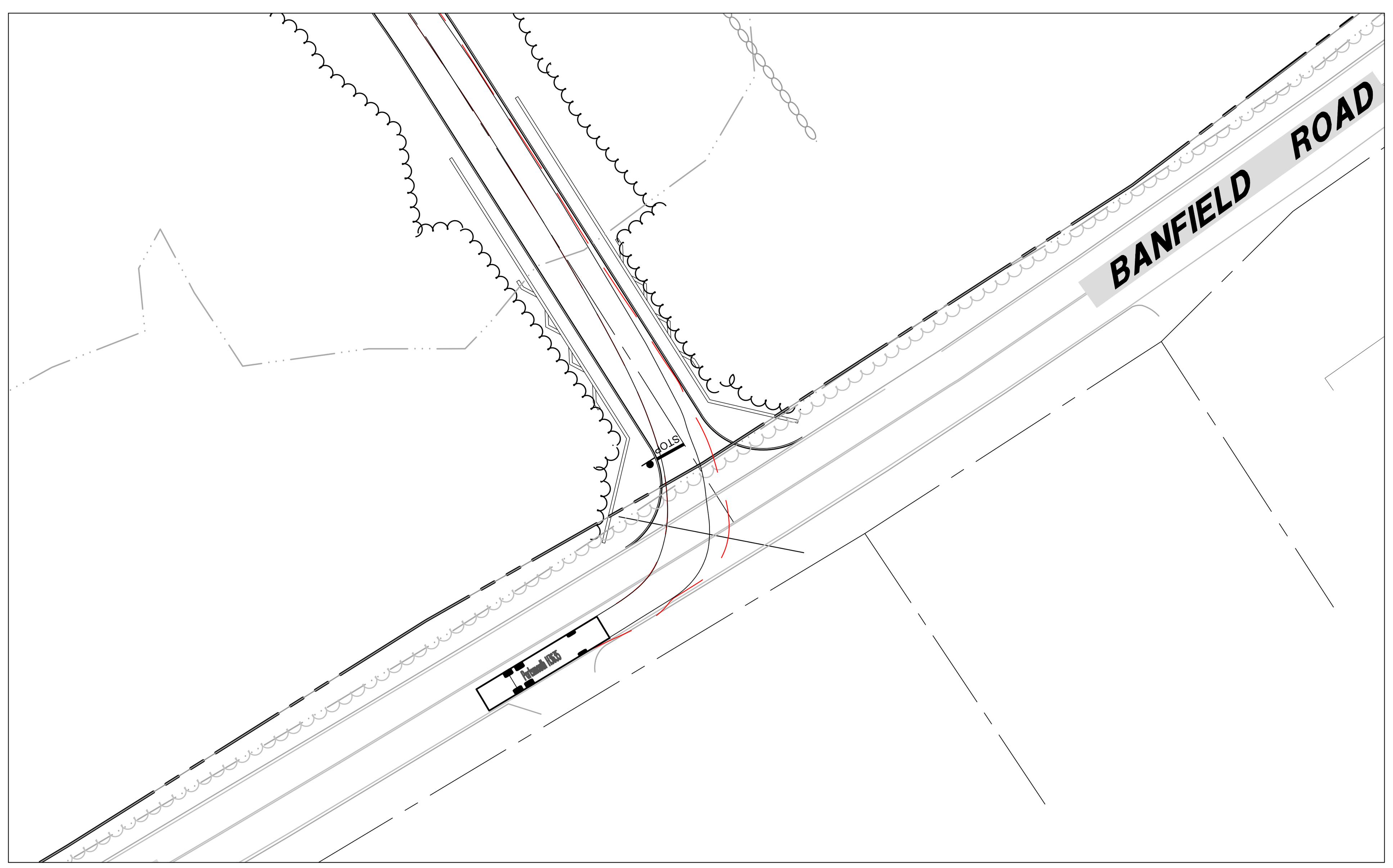
FILE					
47361.00	DR	RCK	FB	–	C-27
	CK	JJM	CADFILE	WETLAND CROSSING SEQUENCE	



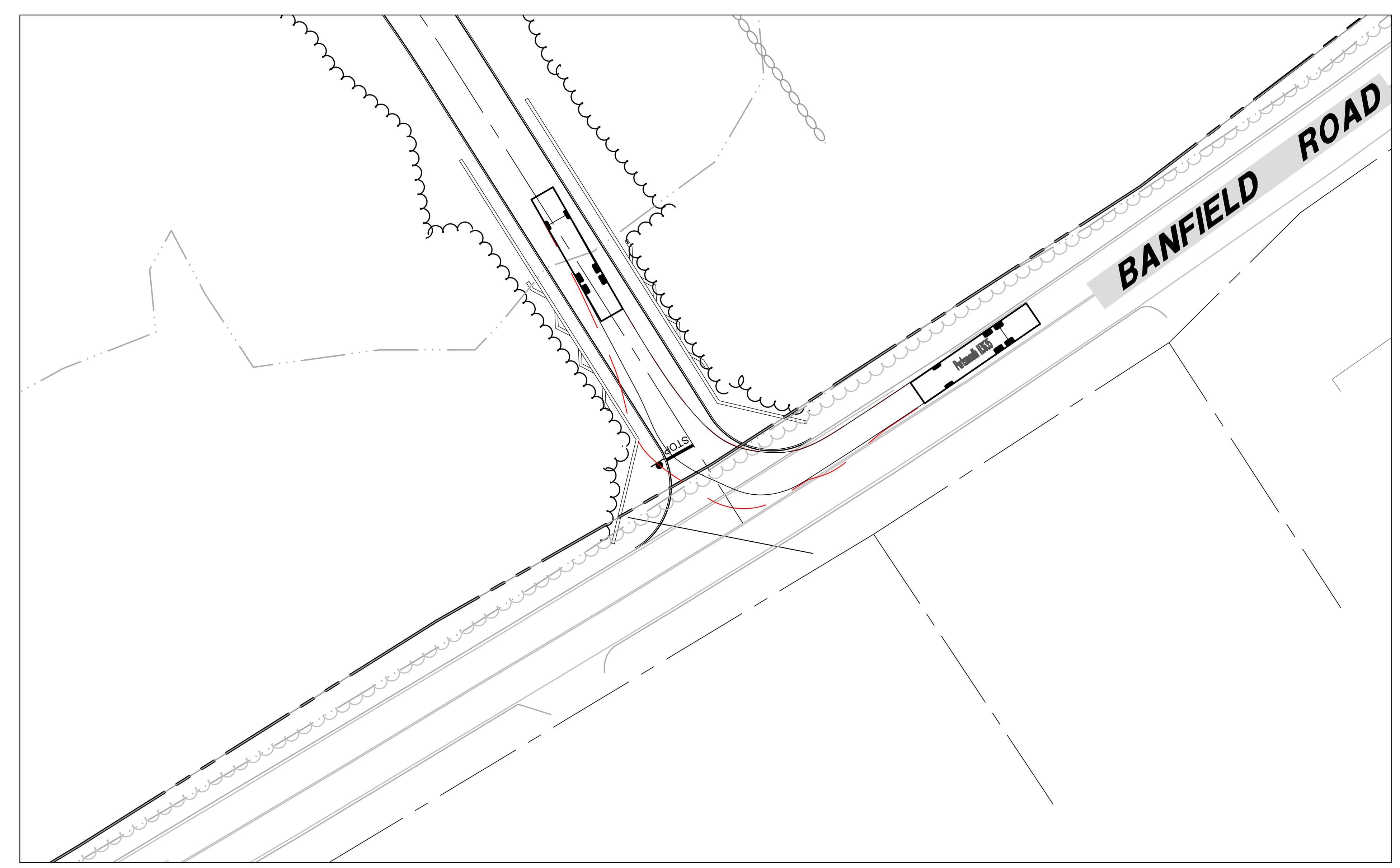
FIRE TRUCK TURNING FROM ROAD-A SOUTHWEST ONTO BANFIELD ROAD



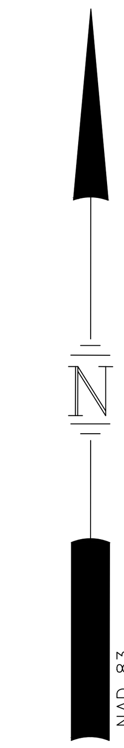
FIRE TRUCK TURNING FROM ROAD-A NORTHEAST ONTO BANFIELD ROAD



FIRE TRUCK DRIVING NORTHEAST TURNING ONTO ROAD-A



FIRE TRUCK DRIVING SOUTHWEST TURNING ONTO ROAD-A



SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

FIRE TRUCK MOVEMENT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

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		CK	JJM	CADFILE	TRUCK MOVEMENT	

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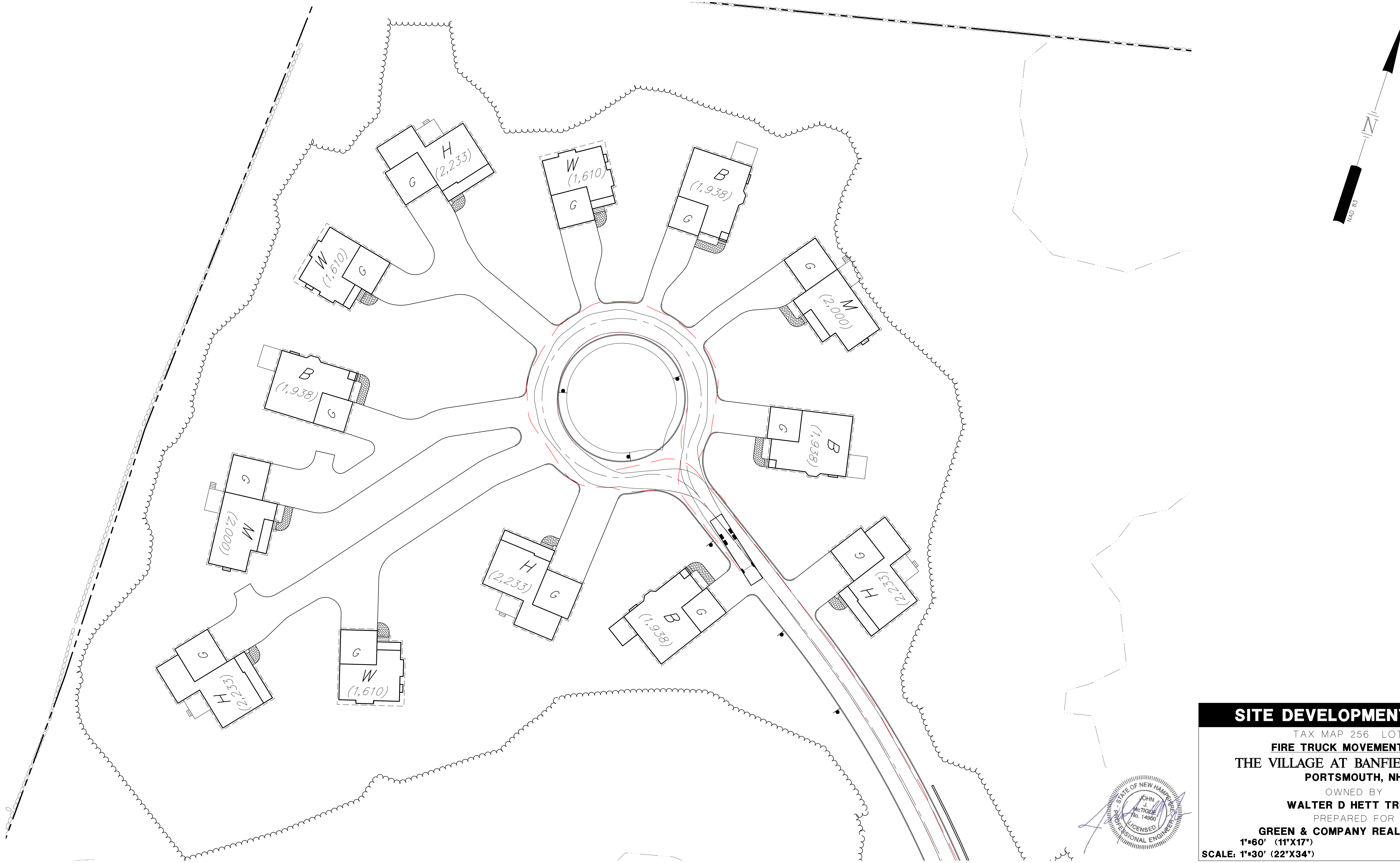

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

FIRE TRUCK MOVEMENT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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1"=60' (11"X17")

SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

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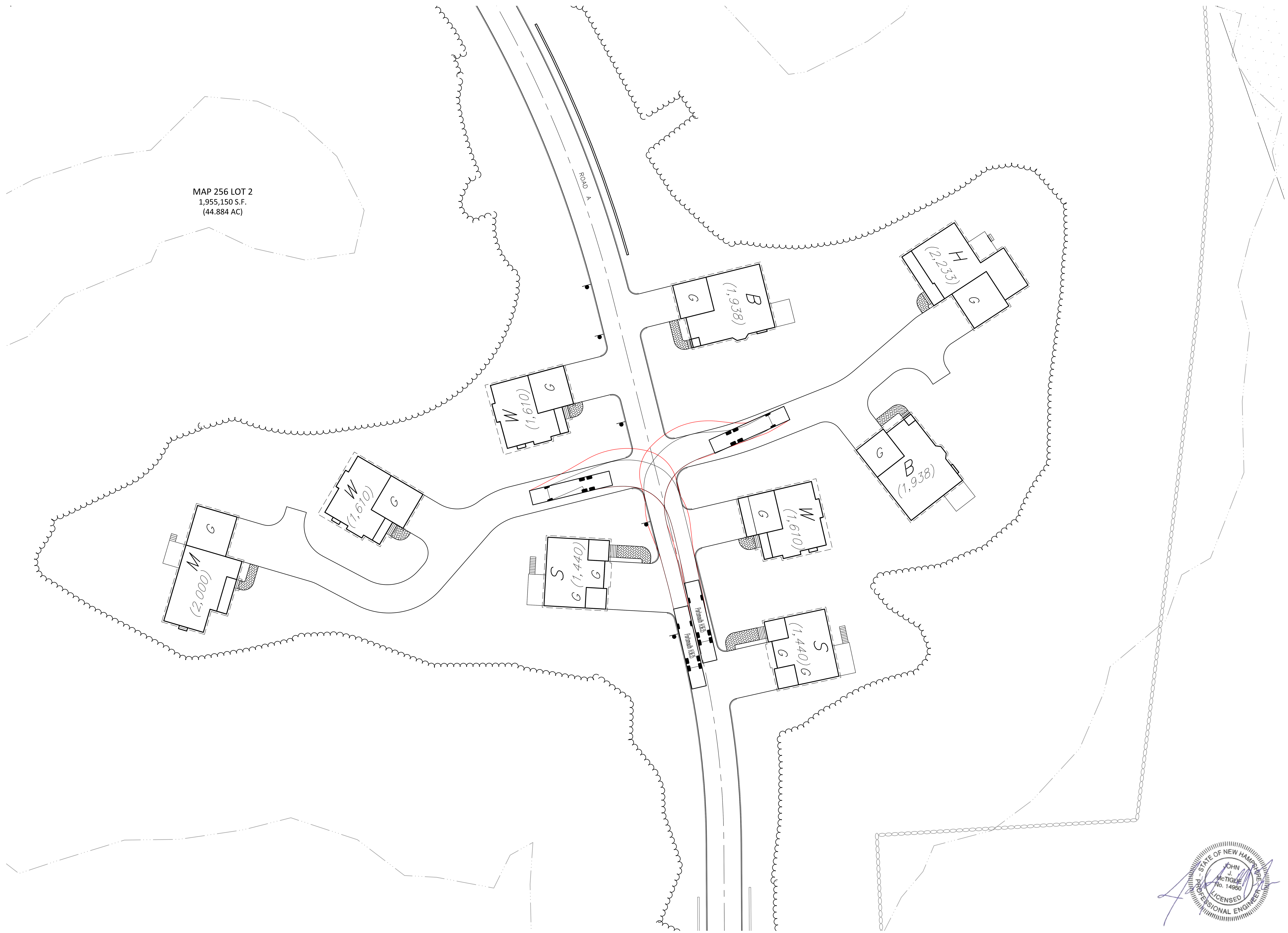
DIG SAFE
MA ME NH RI VT
UTILITIES UNDER GROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION



N
NAD 83

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

FIRE TRUCK MOVEMENT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

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Structural Engineers
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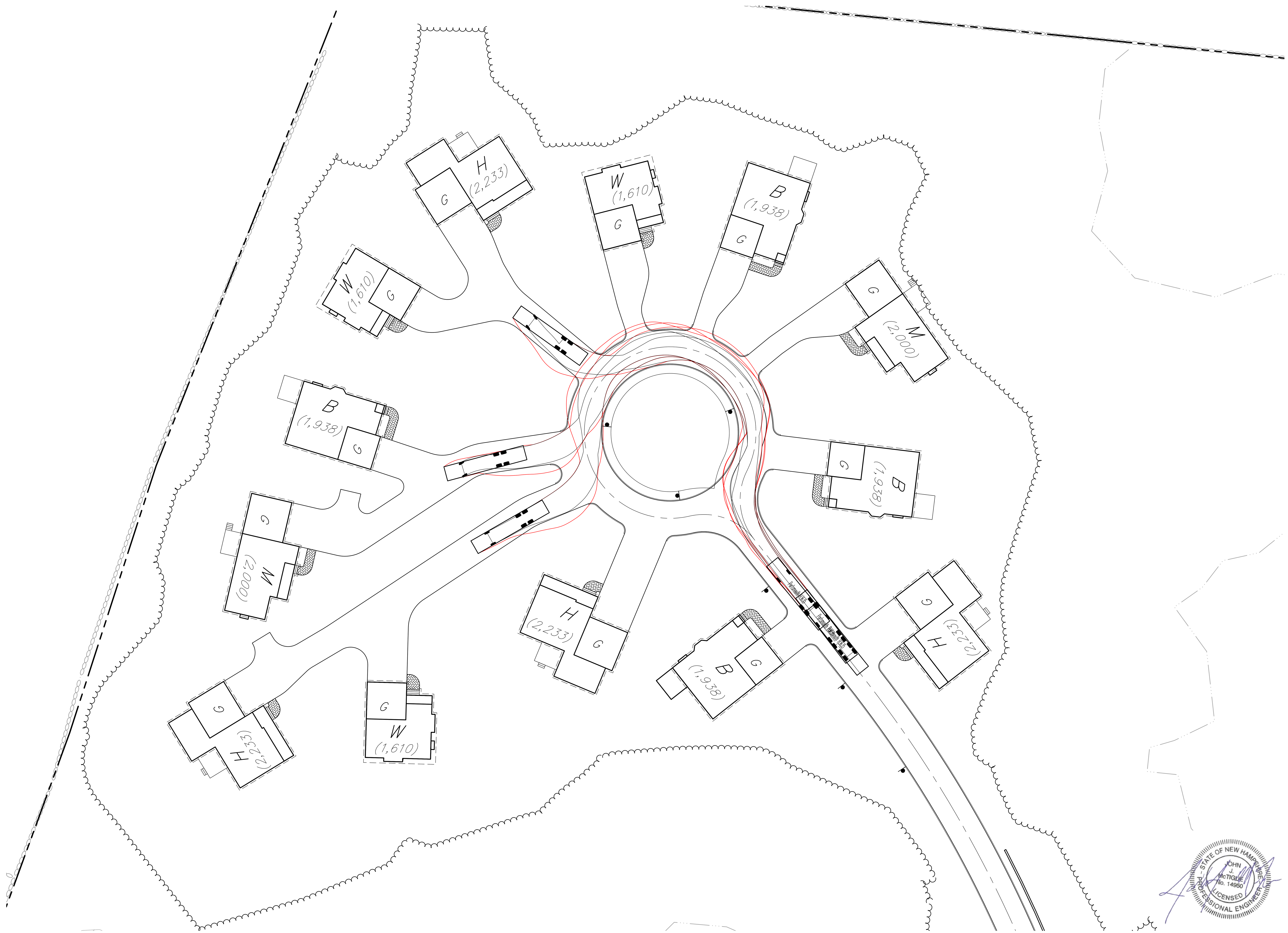
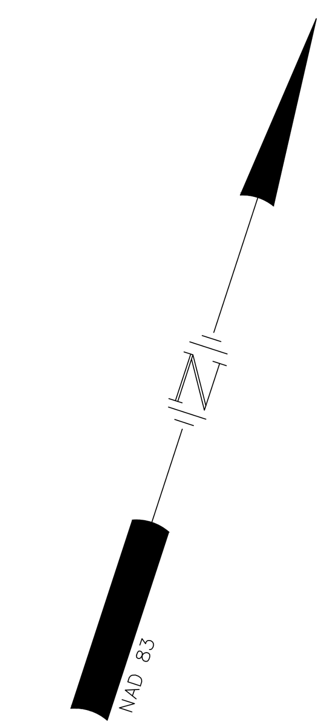
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	DR	RCK	FB	–	
47361.00	CK	JJM	CADFILE	TRUCK MOVEMENT DRIVEWAYS	C-30

Mar 23, 2020 - 4:46pm
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\Truck Movement Driveways.dwg





HORIZONTAL SCALE 1"=30'
30 15 0 30

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

FIRE TRUCK MOVEMENT PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=60' (11"X17")

SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

REV.	DATE	DESCRIPTION	DR	CK
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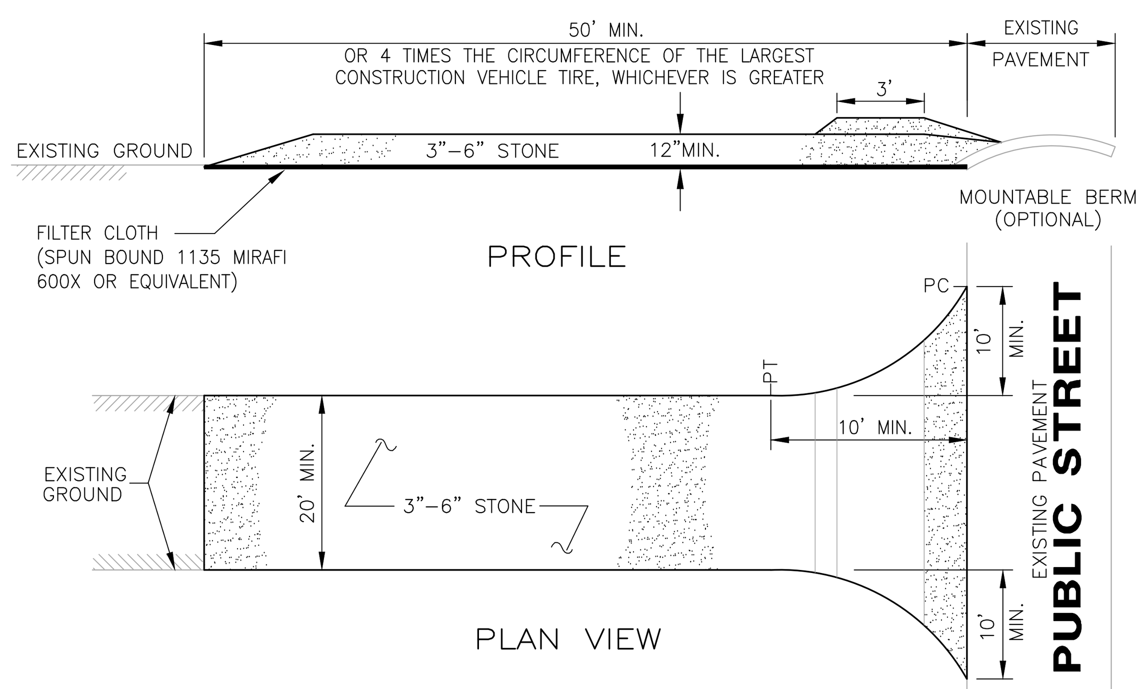
FILE	47361.00	DR	RCK	FB	–	C-31
		CK	JJM	CADFILE	TRUCK MOVEMENT DRIVEWAYS	

DIG SAFE
MA ME NH RI VT
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

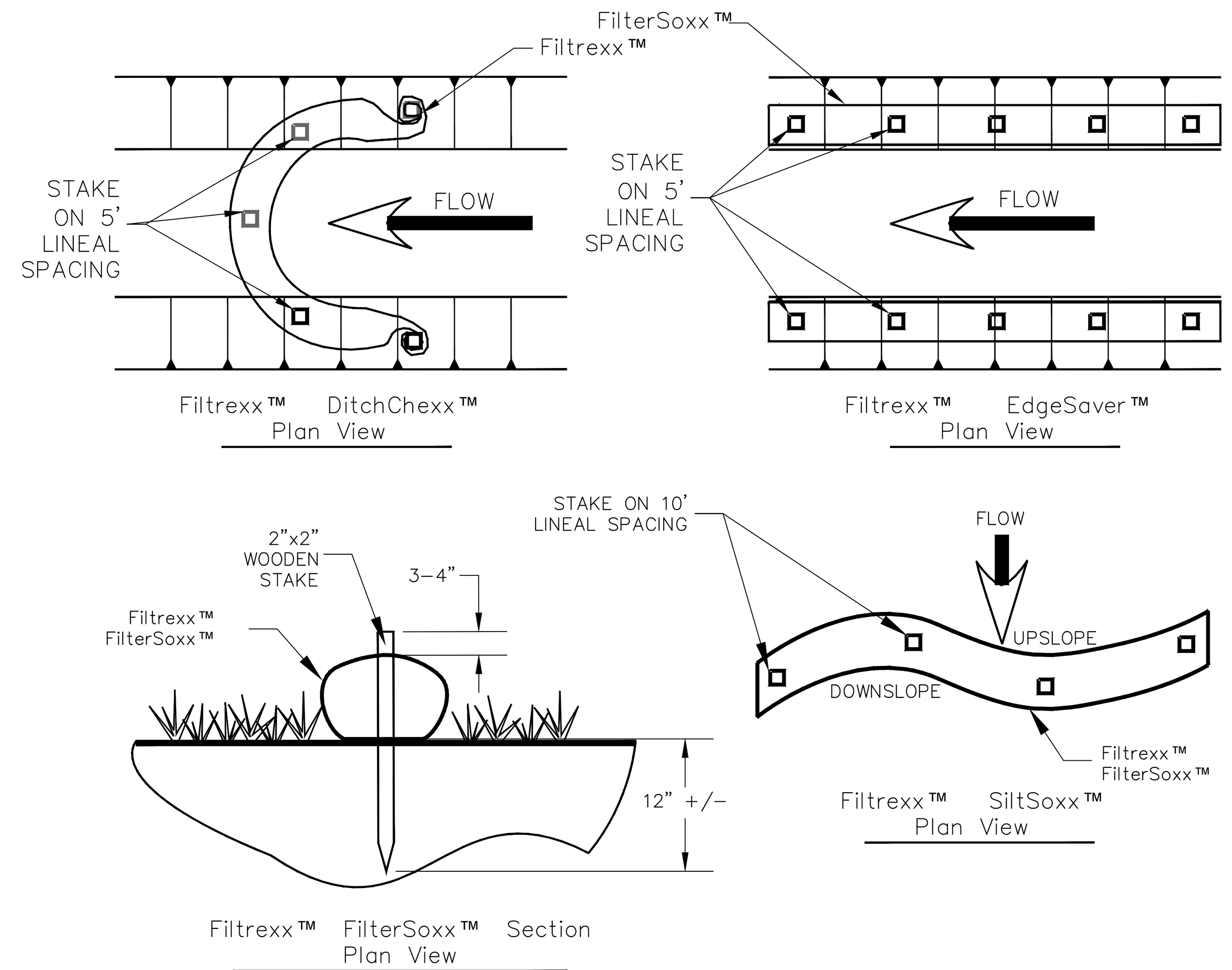


NOTES

1. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE SURFACE.
2. WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
3. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY.
4. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS–OF–WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
5. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN STORM EVENT.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



NOTES:

1. ALL MATERIAL TO MEET Filtrexx™ SPECIFICATIONS
2. FilterSoxx™ COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. SIZE OF SOCK TO BE PER MANUFACTURER'S SPECIFICATIONS

FILTREXX™ FILTERSOXX™ STAKING

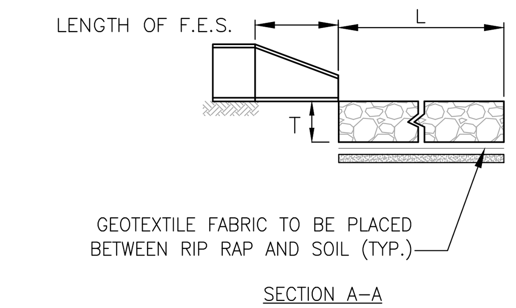
NOT TO SCALE

MAINTENANCE:

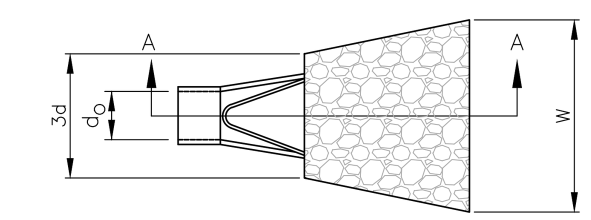
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.

CONSTRUCTION SPECIFICATIONS:

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12".
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. ADD ANIMAL SCREEN TO FLARED END SECTION OUTLET.



% OF WEIGHT SMALLER FOR d50=3" THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	4.50 TO 6.00
85	3.90 TO 5.40
50	3.00 TO 4.50
15	0.90 TO 1.50

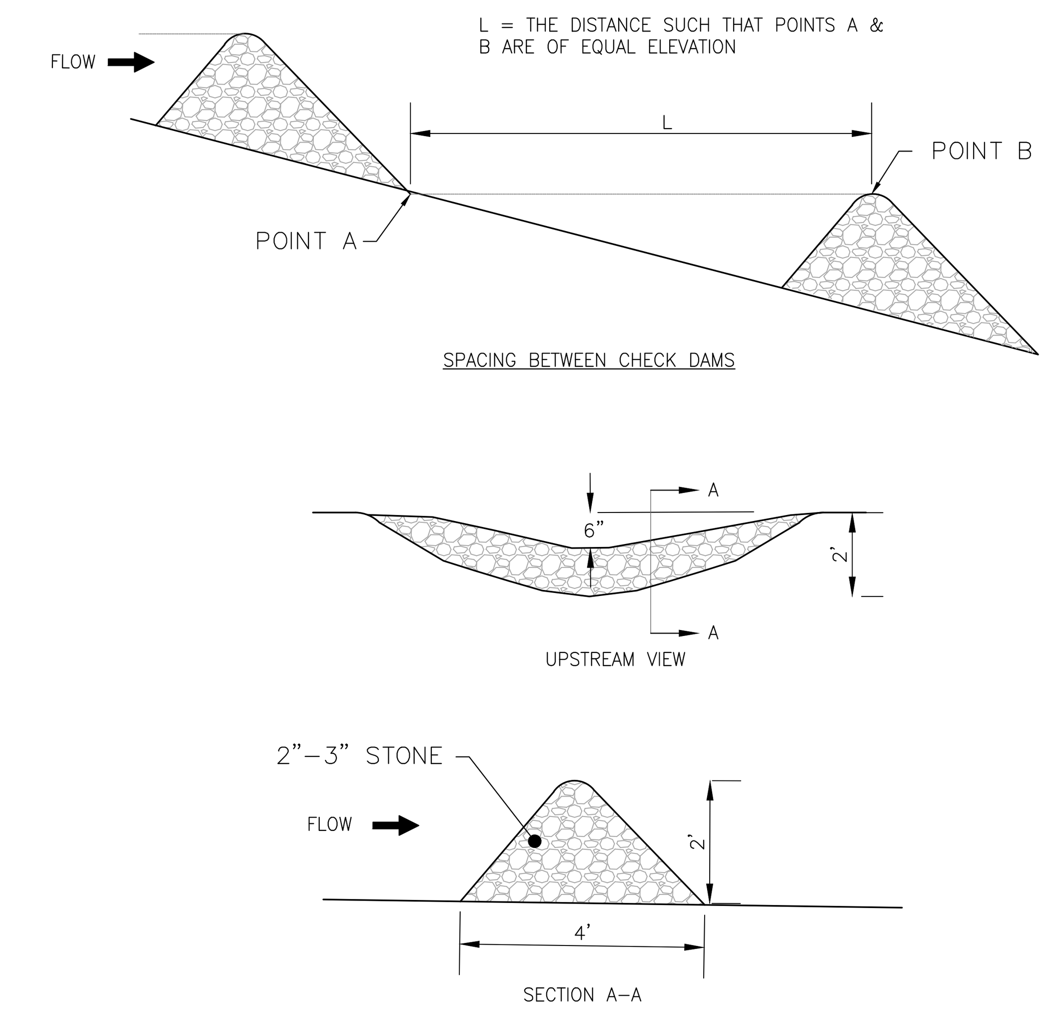


RIPRAP DIMENSIONS

LOCATION	FES01	FES02	FES03	FES04	FES05	FES06	FES07	FES08	FES09
d50 STONE SIZE (IN)	3	3	3	3	3	3	3	3	3
L– LENGTH OF APRON (FT)	7	9	17	12	7	7	7	7	7
W–WIDTH OF APRON (FT)	6	6	10	8	6	7	7	7	7
T–DEPTH OF APRON (IN)	7	7	7	7	7	9	9	9	9

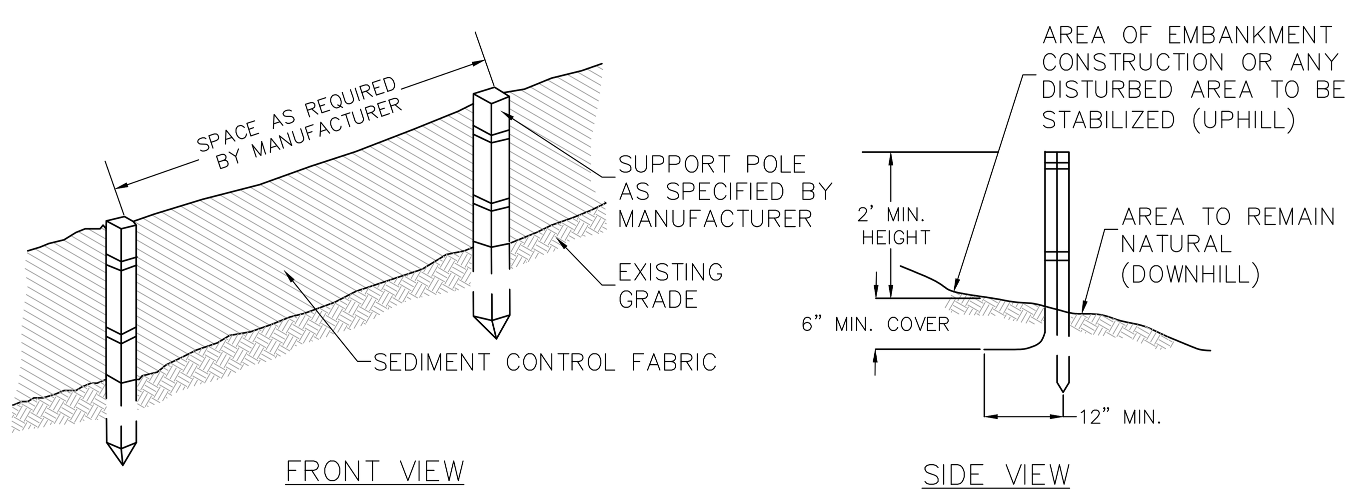
RIP RAP AND FLARED END SECTION WITH OUTLET PROTECTION

NOT TO SCALE



STONE CHECK DAM

NOT TO SCALE

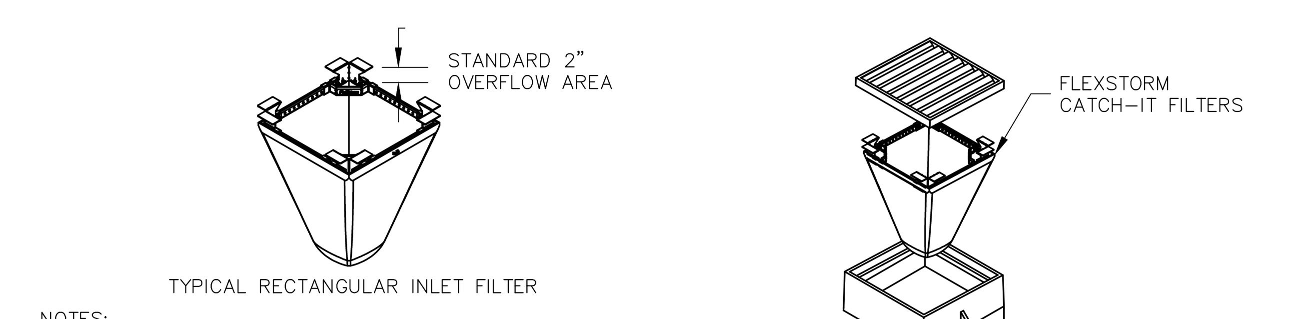


NOTES

1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR BEST MANAGEMENT PRACTICE FOR SILT FENCES, OF THE NEW HAMPSHIRE STORMWATER MANUAL, DECEMBER 2008.
2. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 36 INCHES.
3. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6–INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.
4. POSTS SHALL BE SPACED A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 16 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.
5. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE OF POSTS AND UPSLOPE FROM THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS.
6. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND TO A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED INTO EXISTING TREES.
7. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
8. FILTER BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
9. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL, AND AT LEAST DAILY DURING PROLONGED RAINFALL, ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
10. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
11. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE–THIRD THE HEIGHT OF THE BARRIER.
12. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED, SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.

SILT FENCE

NOT TO SCALE



NOTES:

1. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
2. INSPECTION SHOULD OCCUR FOLLOWING ANY RAIN EVENT > ½".
3. EMPTY THE SEDIMENT BAG PER MANUFACTURER'S SPECIFICATIONS.
4. REMOVED CAKED ON SILT FROM SEDIMENT BAG AND FLUSH WITH MEDIUM SPRAY WITH OPTIMAL FILTRATION.
5. REPLACE BAG IF TORN OR PUNCTURED TO > ½" DIAMETER ON LOWER HALF OF BAG.

ALL PRODUCTS MANUFACTURED BY INLET & PIPE PROTECTION, INC.
A DIVISION OF ADS, INC.
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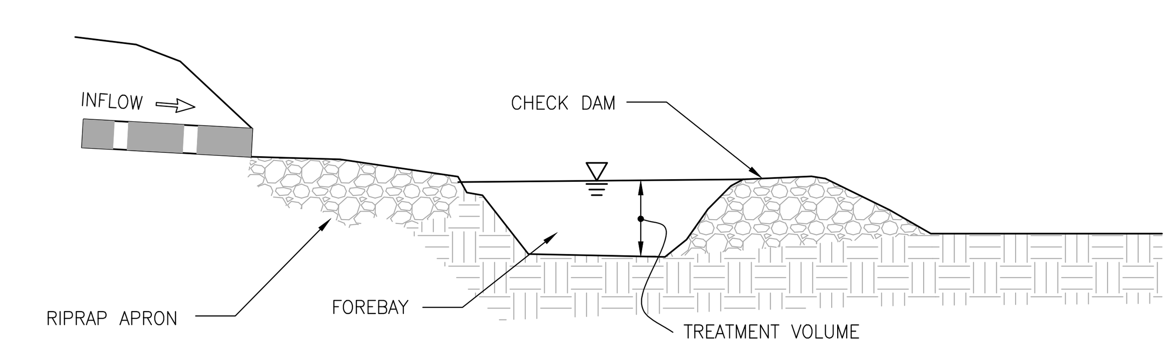
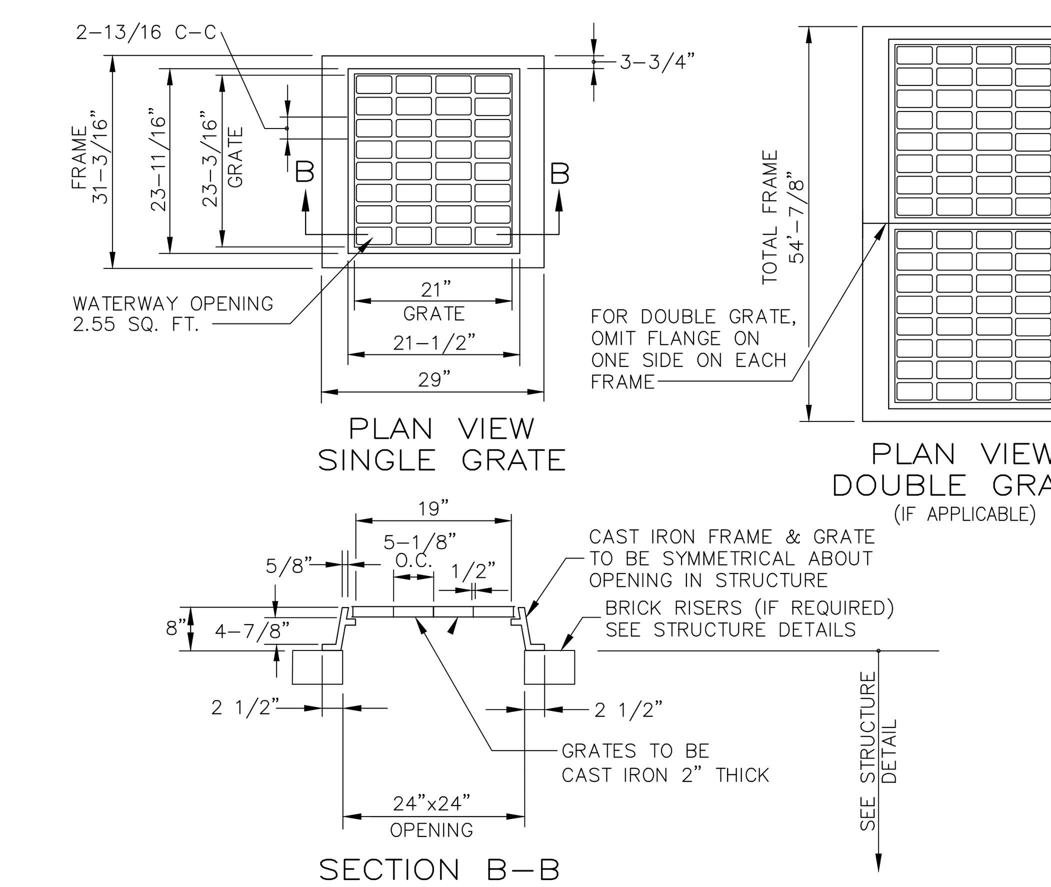
INLET PROTECTION

NOT TO SCALE



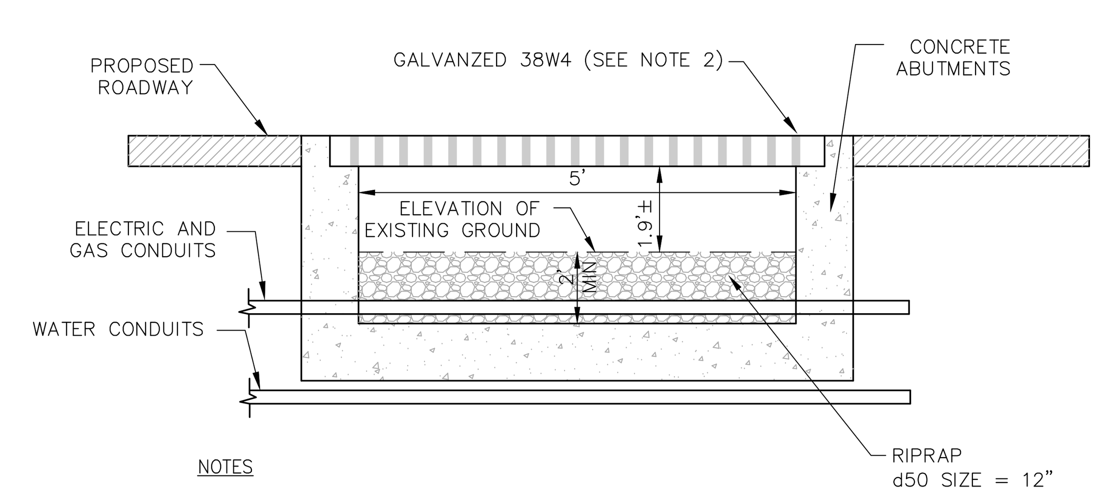
SEDIMENT FOREBAY DETAIL

NOT TO SCALE



FRAME & GRATE (TYPE B)

NOT TO SCALE



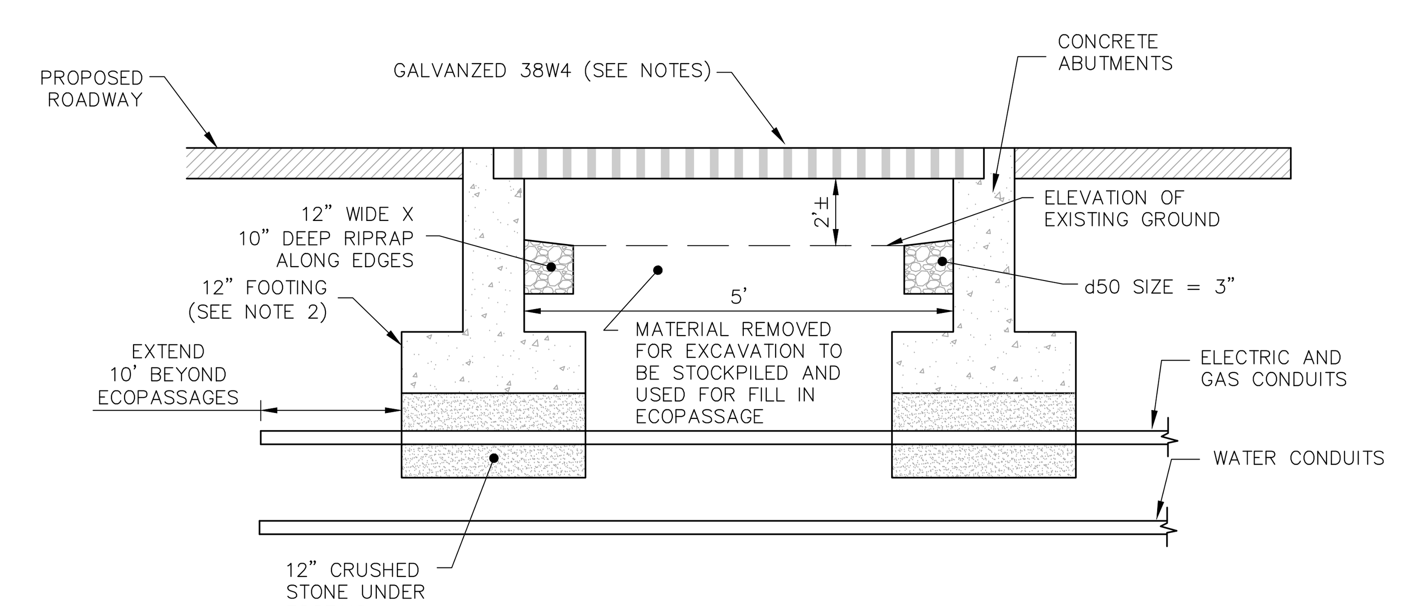
NOTES

1. CONCRETE SHALL BE 5000 PSI.
2. GRATING TO BE EQUIVALENT TO 38W4 (4–1/2" X 3/8") SMOOTH GRATING – GALVANIZED – LOAD BANDING AS PROVIDED BY LAUREL CUSTOM GRATING, LLC.
3. ALL REINFORCEMENT PER ASTM A–615–75.
4. DESIGN LOAD: H–20 LOADING
5. ABUTMENT TO BE DESIGNED BY A STRUCTURAL ENGINEER PRIOR TO INSTALLATION.
6. FOLLOW UTILITY AND GAS LINE TRENCH DETAILS FOR SAND BEDDING.

ECO PASSAGE #1 DETAIL

NOT TO SCALE

% OF WEIGHT SMALLER FOR d50=12" THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	18.00 TO 24.00
85	15.60 TO 21.6
50	12.00 TO 18.00
15	3.60 TO 6.00



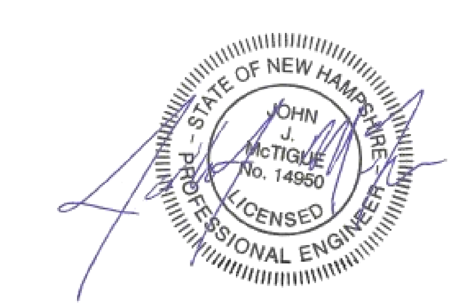
NOTES

1. SEE ECO PASSAGE #1 DETAIL FOR NOTES.

ECO PASSAGE #2 AND #3 DETAIL

NOT TO SCALE

% OF WEIGHT SMALLER FOR d50=3" THAN THE GIVEN SIZE	SIZE OF STONE (INCHES)
100	4.50 TO 6.00
85	3.90 TO 5.40
50	3.00 TO 4.50
15	0.90 TO 1.50



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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

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SCALE: NTS **SEPTEMBER 25, 2019**

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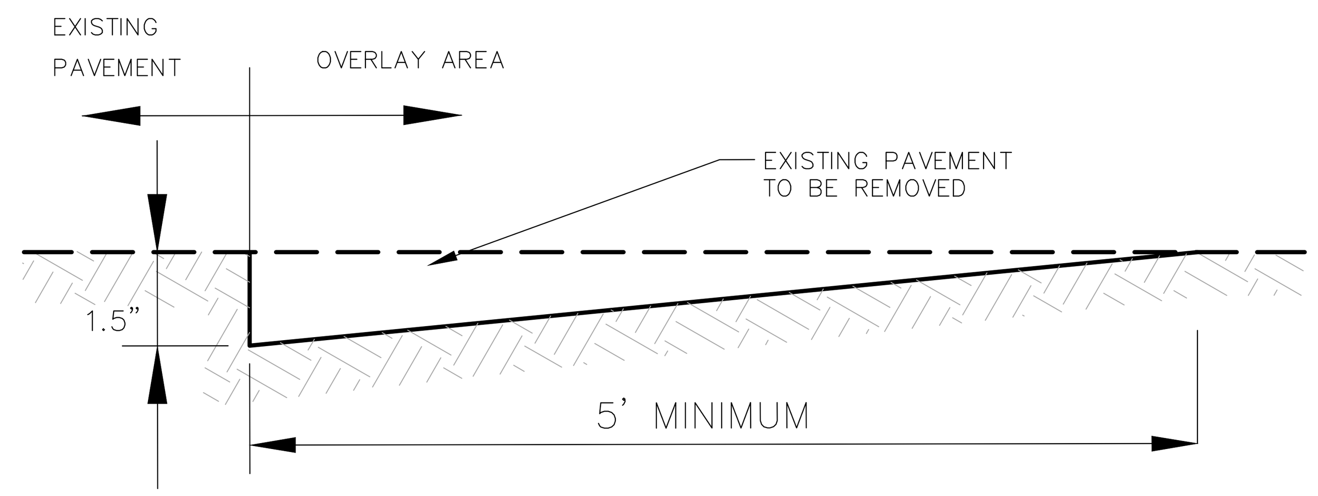
		CK	JJM	CADFILE	DETAILS	

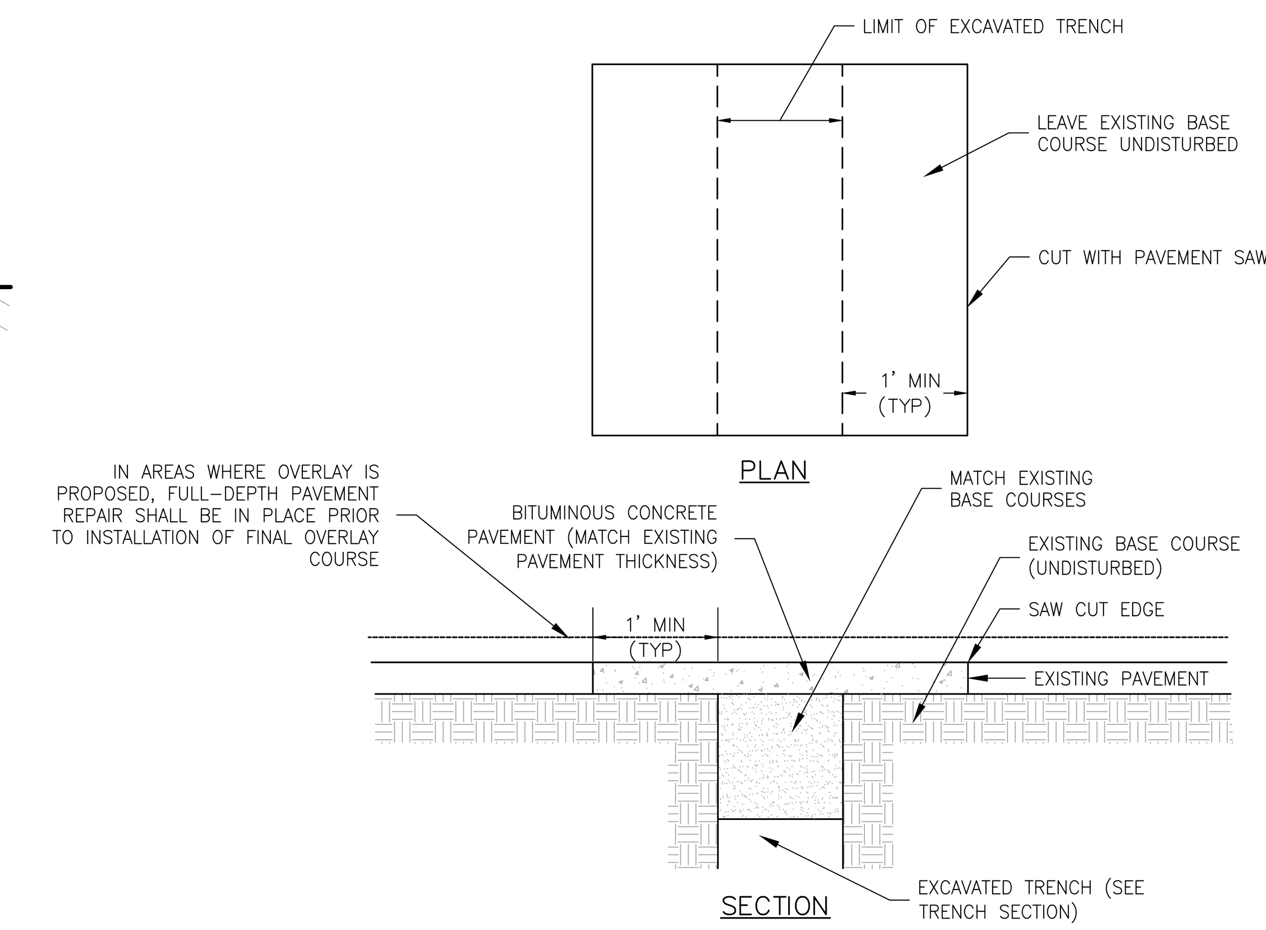


NOTES:

1. USE KEY JOINT AT ALL LOCATIONS WHERE OVERLAY MEETS EXISTING PAVEMENT.
2. NEW PAVEMENT SHALL BE FLUSH WITH EXISTING PAVEMENT AND SHALL MEET OVERLAY GRADE WHERE IT ABUTS EXISTING PAVEMENT TO BE OVERLAYED.

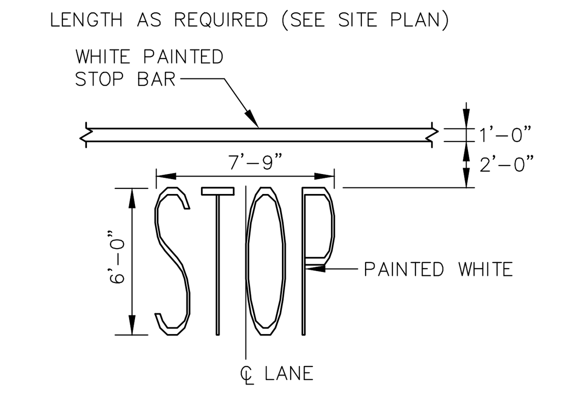
KEY JOINT DETAIL

NOT TO SCALE



TRENCH PATCH

NOT TO SCALE

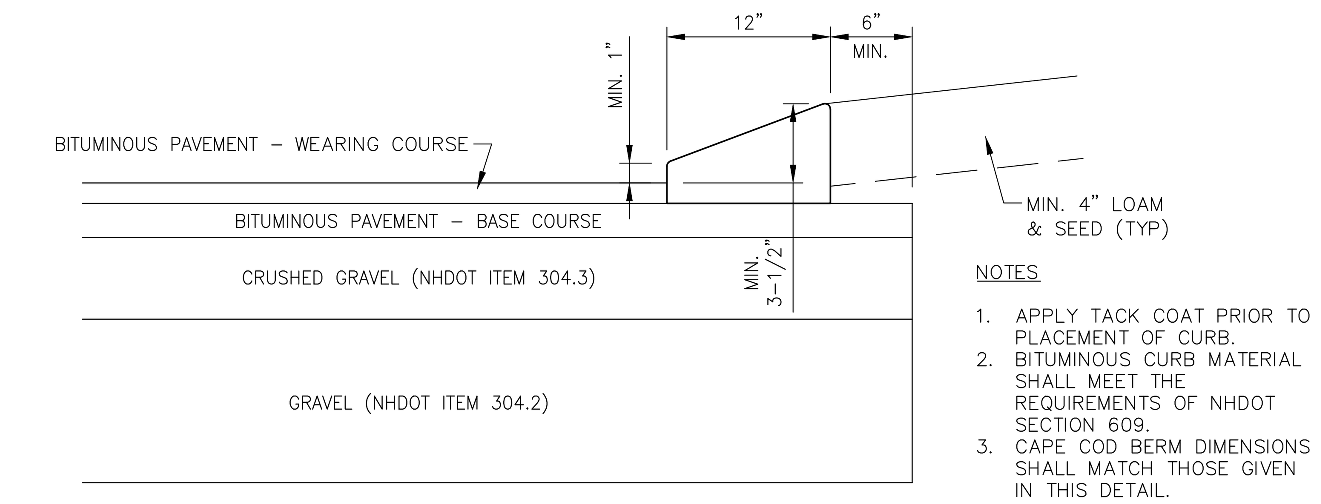


NOTES

1. TRAFFIC PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER AND SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F". APPLY TWO COATS.
2. SYMBOLS AND PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT, LATEST EDITION.

STOP BAR & LEGEND

NOT TO SCALE

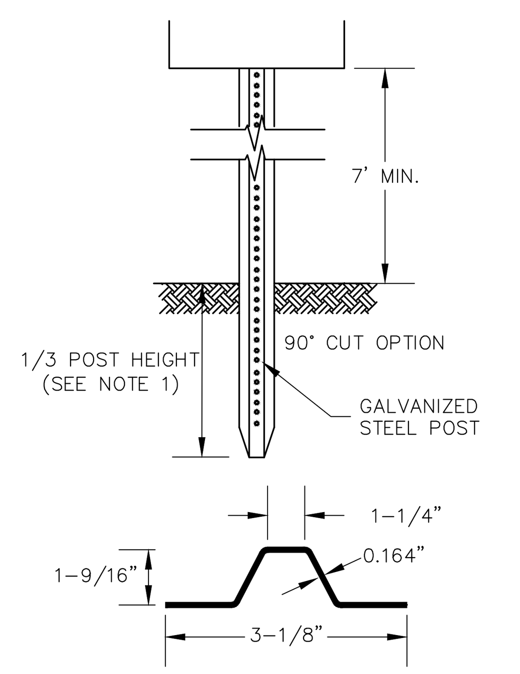


NOTES

1. APPLY TACK COAT PRIOR TO PLACEMENT OF CURB.
2. BITUMINOUS CURB MATERIAL SHALL MEET THE REQUIREMENTS OF NHDOT SECTION 609.
3. CAPE COD BERM DIMENSIONS SHALL MATCH THOSE GIVEN IN THIS DETAIL.

CAPE COD BERM

NOT TO SCALE



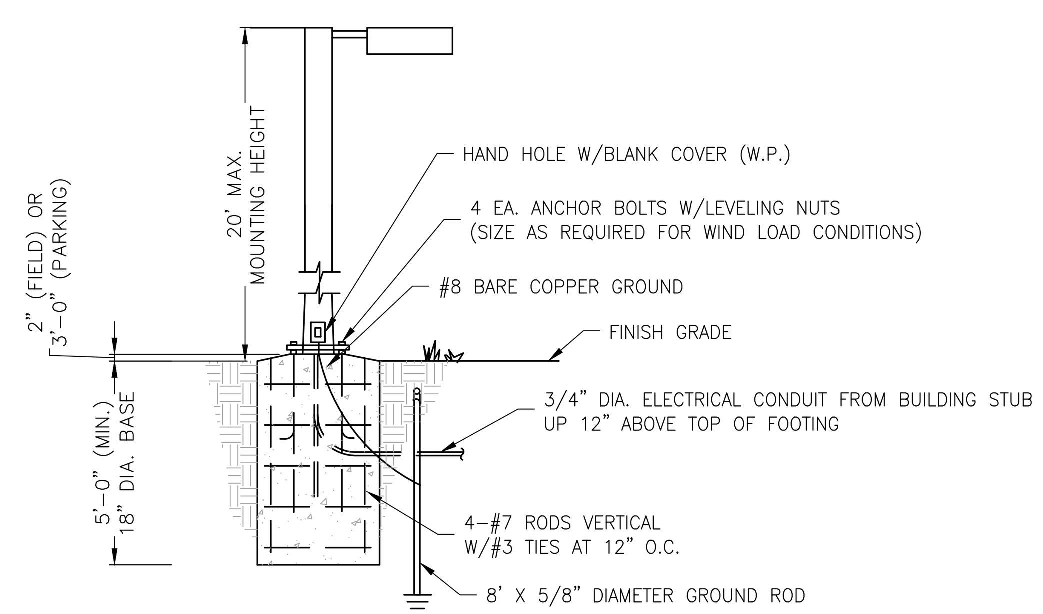
LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN)
HOLES: 3/8" DIAMETER, 1" C-C FULL LENGTH
STEEL: SHALL CONFORM TO ASTM A-499 (GRADE 60) OR ASTM A-576 (GRADE 1070 – 1080)
FINISH: SHALL BE PAINTED WITH 2 COATS OF AN APPROVED MEDIUM GREEN BAKED-ON OR AIR-DRIED PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

NOTE:

1. WHERE LEDGE APPLICATION EXISTS, DRILL & GROUT TO A MINIMUM OF 2'.
2. ALL SIGNAGE SHALL FOLLOW THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES STANDARDS AND NHDOT STANDARDS.
3. SIGN, HARDWARE, AND INSTALLATION SHALL CONFORM TO THE LATEST NHDOT STANDARD SPECIFICATIONS.

SIGN POST

NOT TO SCALE

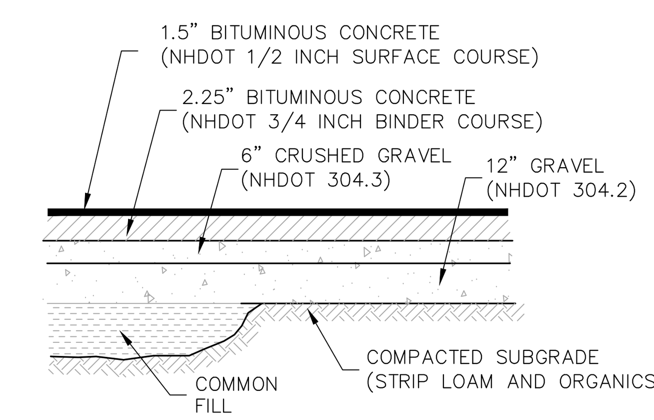


NOTES

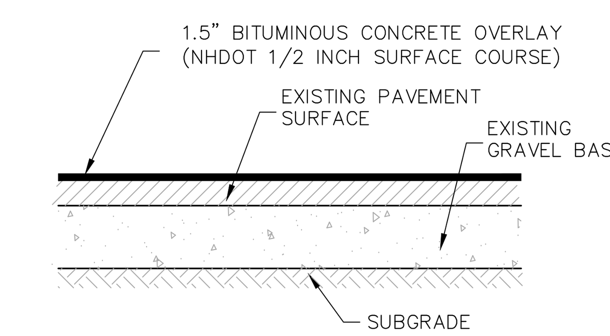
1. BASE SHOWN IS PROTOTYPICAL. VERIFY THAT LIGHT POLE BASE INSTALLED MEETS LIGHT POLE MANUFACTURER'S SPECIFICATIONS. COORDINATE WITH ELECTRICAL CONTRACTOR.
2. WHERE LIGHT POLE BASES ARE PLACED IN AREAS NOT PROTECTED BY CURBING, A 3'-0" REVEAL OF BASE IS REQUIRED WITH REVEAL TO BE PAINTED SAFETY YELLOW. WHERE LIGHT POLE BASES ARE PLACED IN FIELD APPLICATIONS OR PROTECTED BY CURBING, THE BASE IS TO BE PLACED 2" ABOVE FINISHED GRADE.
3. BASE CONCRETE TO BE 4,000 PSI, SMOOTH FINISH.
4. POLES SHALL BE FACTORY CUT TO PROVIDE REQUIRED MOUNTING HEIGHTS.

LIGHT POLE BASE

NOT TO SCALE



STANDARD DUTY PAVEMENT



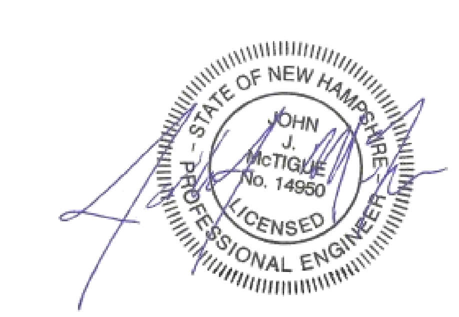
OVERLAY

NOTES

1. SEE GRADING & EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
2. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT– USE TACK COAT. A TACK COAT SHALL ALSO BE PLACED BETWEEN GRAVEL COURSE AND SUCCESSIVE LAYERS OF BITUMINOUS CONCRETE. SPECIFICALLY, A TACK COAT SHALL BE PLACED ATOP THE BINDER COURSE PAVEMENT PRIOR TO PLACING THE WEARING COURSE.
3. REMOVE ALL LOAM AND/OR YIELDING MATERIAL BELOW PAVEMENT.
4. BITUMINOUS MATERIALS SHALL CONFORM TO NHDOT SPECIFICATION SECTION 401.
5. BITUMINOUS CONCRETE SHALL BE COMPACTED TO AT LEAST 92.5% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D2041 OR AASHTO T209. PLACEMENT TEMPERATURES OF BITUMINOUS CONCRETE MIXES, IN GENERAL, RANGE BETWEEN 270 AND 310 DEGREES FAHRENHEIT.
6. PAVEMENT BASE COURSE AGGREGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.3 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.
7. PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOF ROLLED AND COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.
8. THE EXPOSED SOIL SUBGRADE SHOULD BE PROOF ROLLED PRIOR TO THE PLACEMENT OF SUBBASE GRAVEL, AND SOFT AREAS SHOULD BE REPAIRED AND REPLACED.
9. ALL PARKING SPACES SHALL BE STANDARD DUTY. ALL OTHER LOCATIONS SHALL BE HEAVY DUTY.

PAVEMENT SECTIONS

NOT TO SCALE



SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

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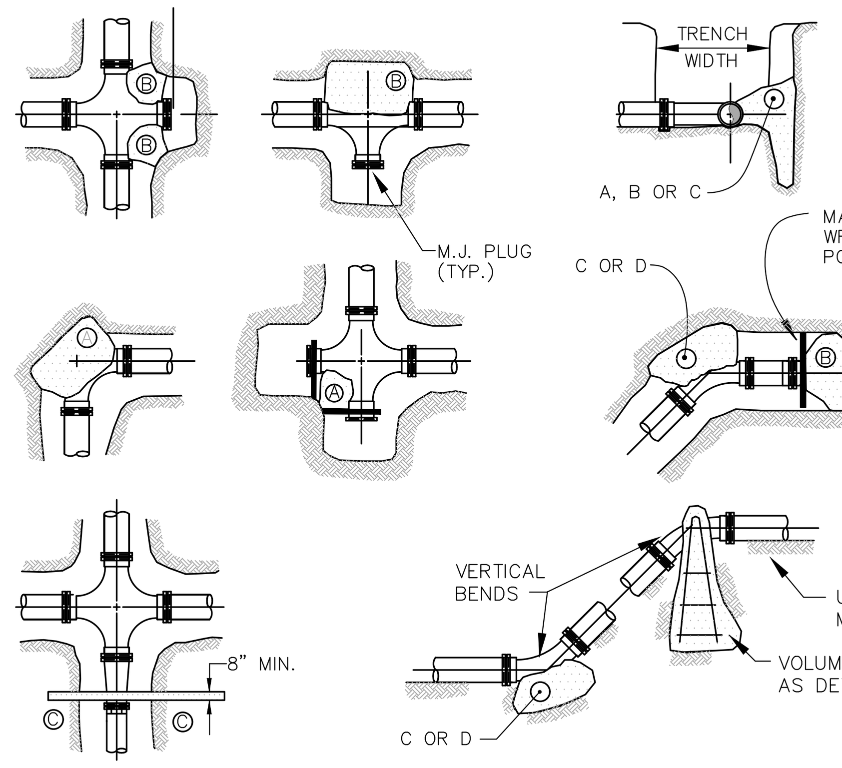


NOTES

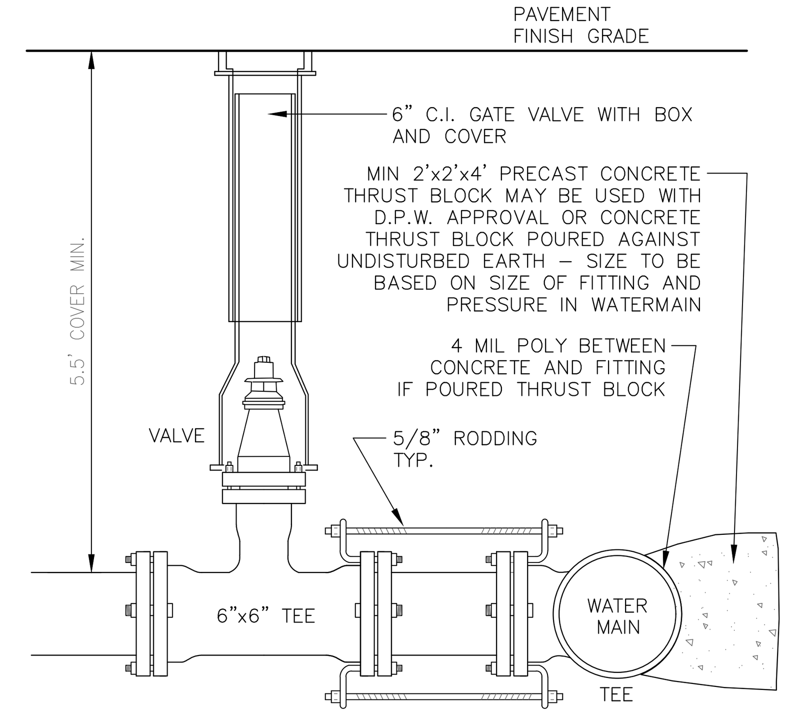
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED. EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO PIPE JOINTS SHALL BE COVERED WITH CONCRETE.
2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
4. WHERE MECHANICAL JOINT PIPE IS USED, MECHANICAL JOINT PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE CITY/TOWN ESTABLISHED RULES AND PROCEDURES.

TEST PRESSURE = 200psi — SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL

REACTION TYPE		PIPE SIZE 4"	6"	8"	10"	12"
A	90°	0.89	2.19	3.82	11.14	17.24
B	180°	0.65	1.55	2.78	8.38	12.00
C	45°	0.48	1.19	2.12	6.02	9.32
D	22-1/2°	0.25	0.60	1.06	3.08	4.74
E	11-1/4°	0.13	0.30	0.54	1.54	2.38

THRUST BLOCKS

NOT TO SCALE

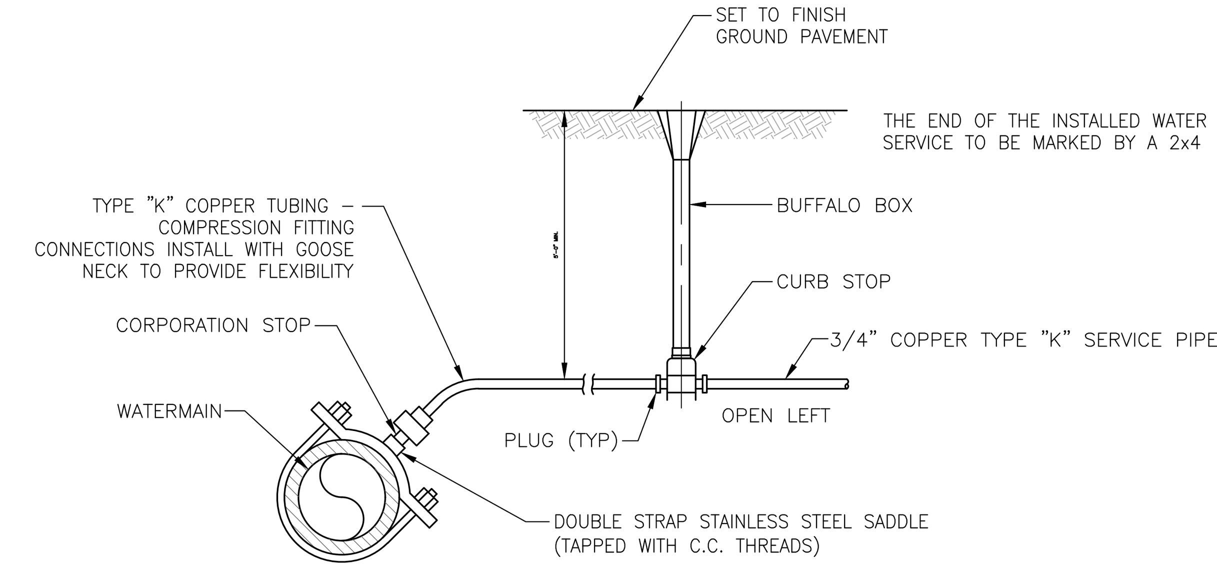


NOTES:

1. POLYETHYLENE PIPE WITH TRACER WIRE MAY BE USED IN LIEU OF TYPE "K" COPPER TUBING.
2. VALVE TO OPEN LEFT.

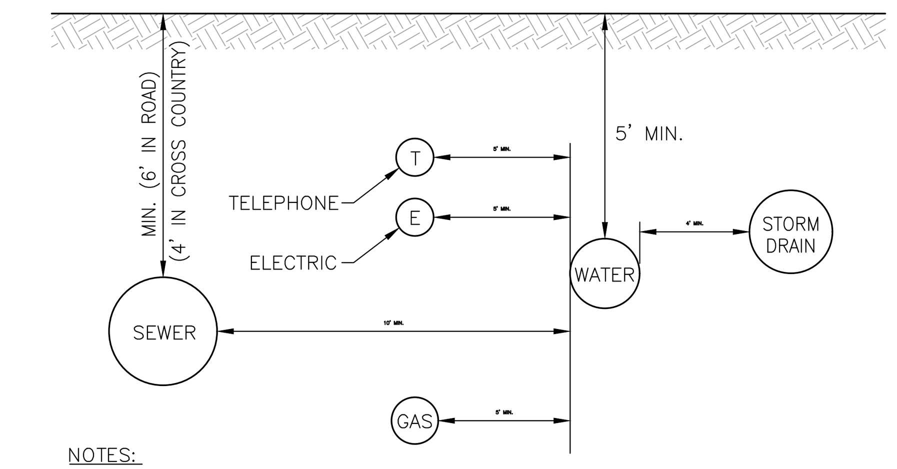
BURIED GATE VALVE

NOT TO SCALE



WATER SERVICE CONNECTION - COPPER PIPE

NOT TO SCALE

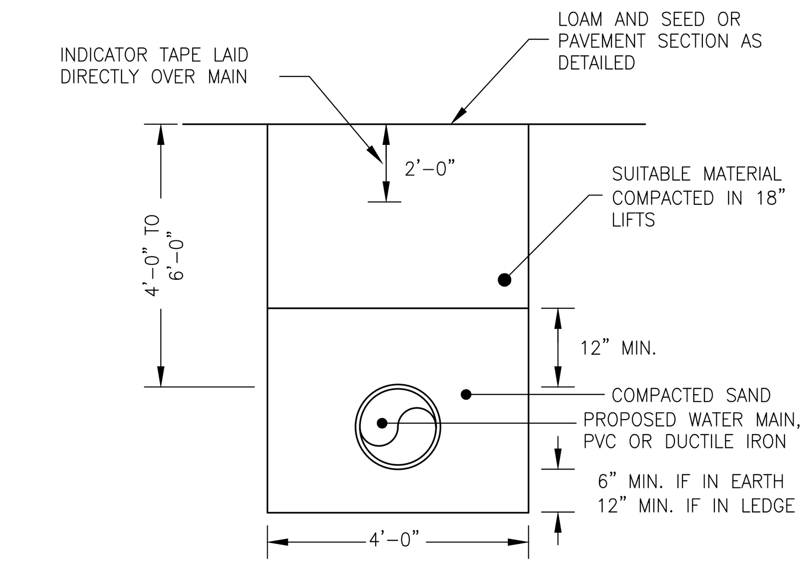


NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO EXETER DPW TECHNICAL SPECIFICATIONS.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

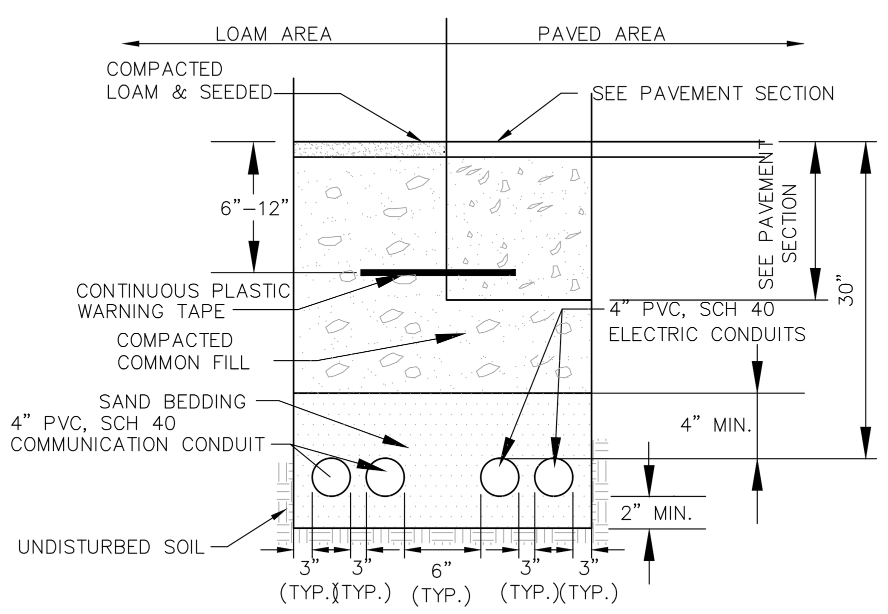
TYPICAL UTILITY SEPARATION

NOT TO SCALE



WATER MAIN TRENCH

NOT TO SCALE

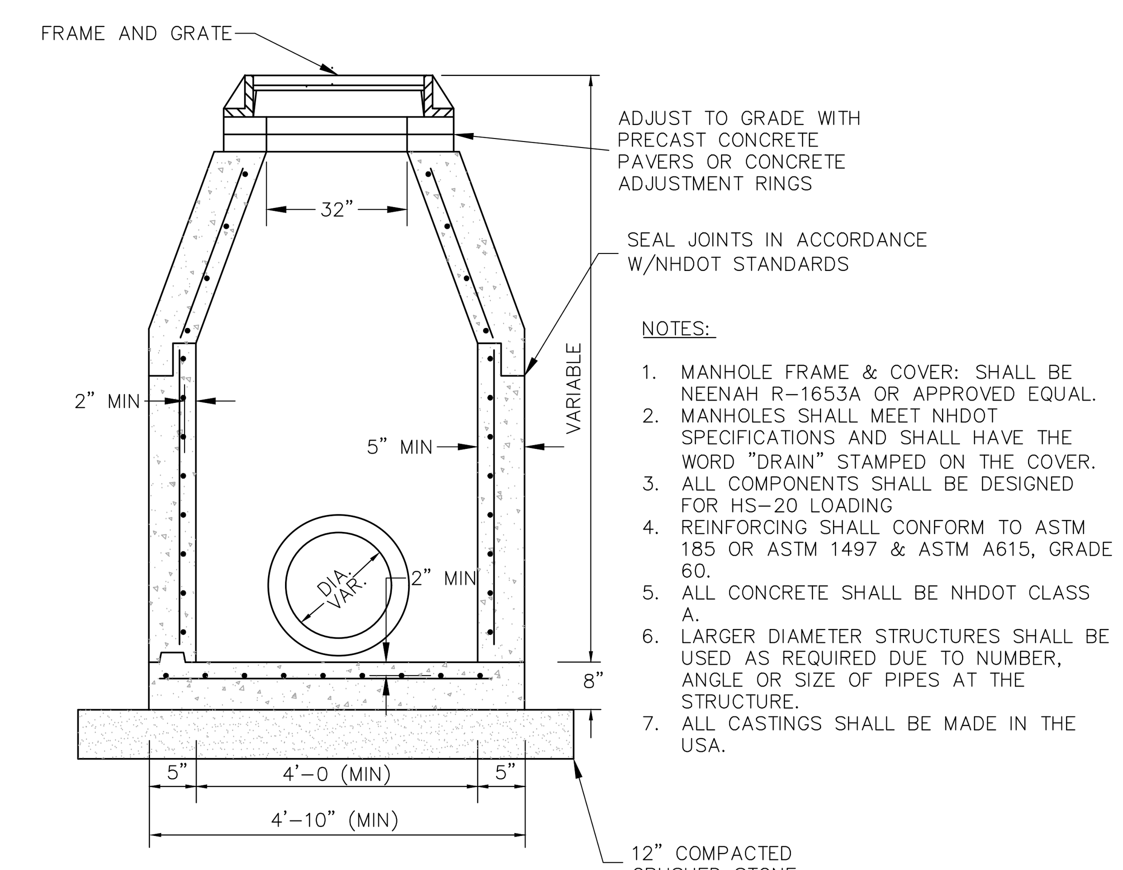


NOTES

1. ELECTRIC SERVICE INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL CODES.
2. COMMUNICATION SERVICE INSTALLATION SHALL MEET ALL CONSTRUCTION REQUIREMENTS.
3. ACTUAL NUMBER OF CONDUITS TO BE DETERMINED BY RESPECTIVE COMPANIES.
4. VERIFY INSTALLATION REQUIREMENTS WITH RESPECTIVE COMPANIES.

ELECTRIC/COMMUNICATIONS CONDUIT

NOT TO SCALE

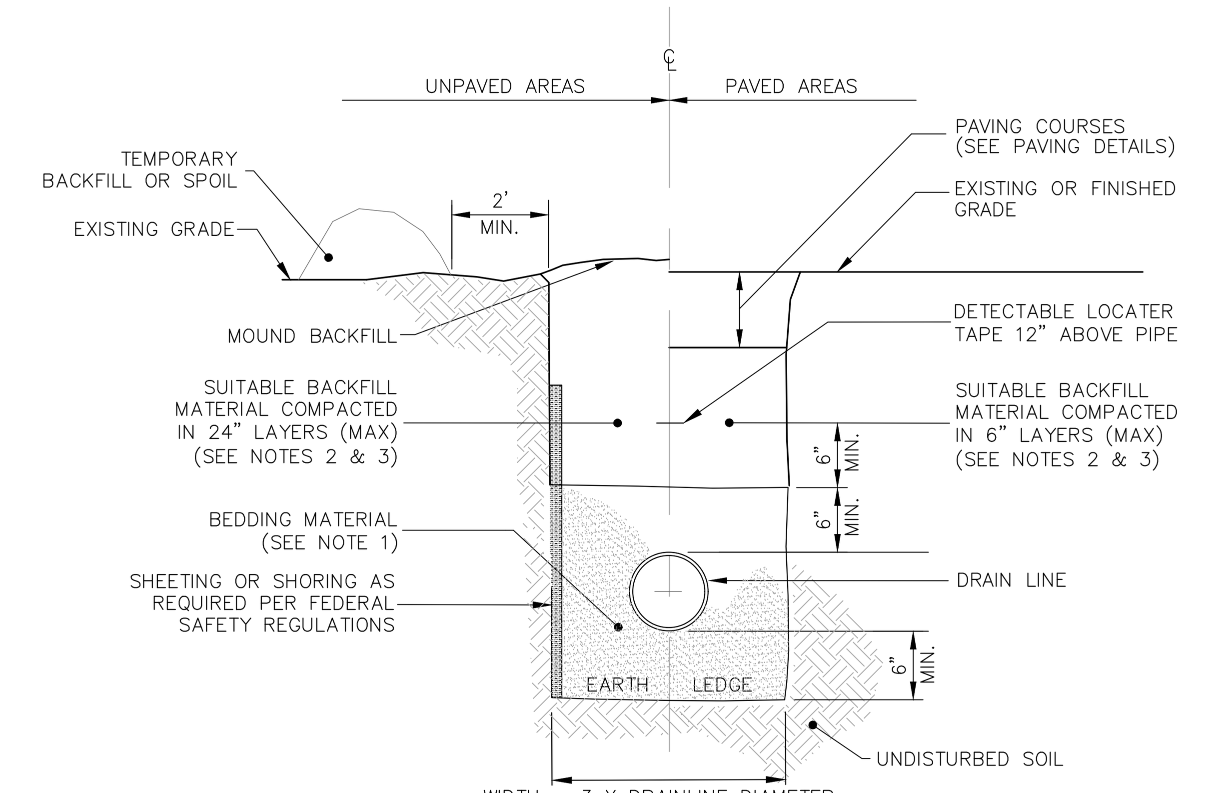


NOTES:

1. MANHOLE FRAME & COVER: SHALL BE NEENAH R-1653A OR APPROVED EQUAL.
2. MANHOLES SHALL MEET NHDOT SPECIFICATIONS AND SHALL HAVE THE WORD "DRAIN" STAMPED ON THE COVER.
3. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING
4. REINFORCING SHALL CONFORM TO ASTM 185 OR ASTM 1497 & ASTM A615, GRADE 60.
5. ALL CONCRETE SHALL BE NHDOT CLASS A.
6. LARGER DIAMETER STRUCTURES SHALL BE USED AS REQUIRED DUE TO NUMBER, ANGLE OR SIZE OF PIPES AT THE STRUCTURE.
7. ALL CASTINGS SHALL BE MADE IN THE USA.

DRAIN MANHOLE

NOT TO SCALE

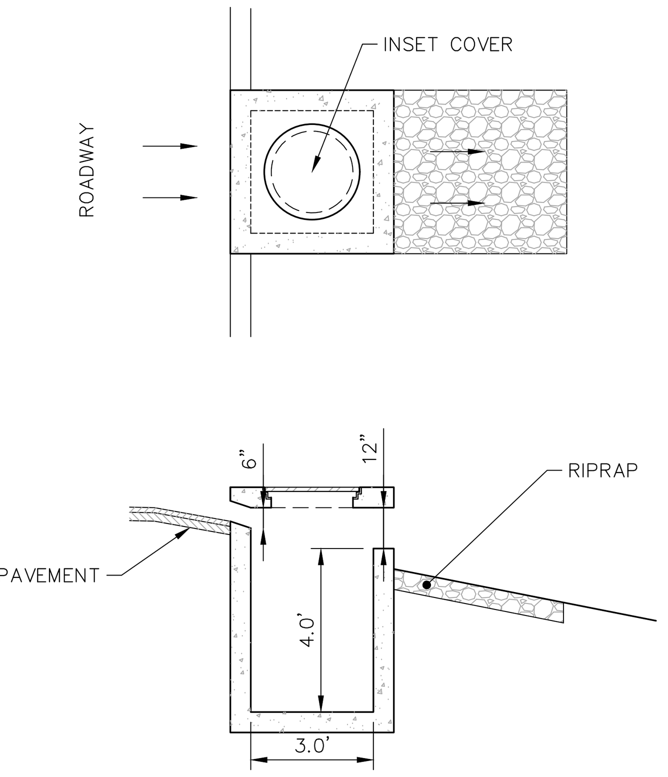


NOTES

1. BEDDING – BEDDING FOR PIPES SHALL CONSIST OF PREPARING THE BOTTOM OF THE TRENCH TO SUPPORT THE ENTIRE LENGTH OF THE PIPE AT A UNIFORM SLOPE AND ALIGNMENT. CRUSHED STONE SHALL BE USED TO BED THE PIPE TO THE ELEVATION SHOWN ON THE DRAWINGS. NORMAL PIPE BEDDING IS CRUSHED STONE TO THE HAUNCH OF THE PIPE AND SAND BEDDING 6" ABOVE THE CROWN. IF THE TOP OF THE PIPE IS LESS THAN 30" FROM FINISH GRADE, BED PIPE COMPLETELY IN STONE UP TO 6" ABOVE PIPE CROWN. UNDERDRAIN TO HAVE 4" MINIMUM OF STONE OVER PIPE OR AS NECESSARY TO BE IN CONTACT WITH GRAVEL LAYER OF SELECTS ABOVE.
2. COMPACTION – ALL BACKFILL SHALL BE COMPACTED AT OR NEAR OPTIMUM MOISTURE CONTENT BY PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. BACKFILL BENEATH PAVED SURFACES SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C.
3. SUITABLE MATERIAL – IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ROCKS OVER 6" IN LARGEST DIMENSION; FROZEN EARTH AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
4. BASE COURSE AND PAVEMENT – SHALL MEET THE REQUIREMENT OF THE NHDOT LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DIVISION 300 AND 400 RESPECTIVELY.

TRENCH FOR DRAIN LINE

NOT TO SCALE

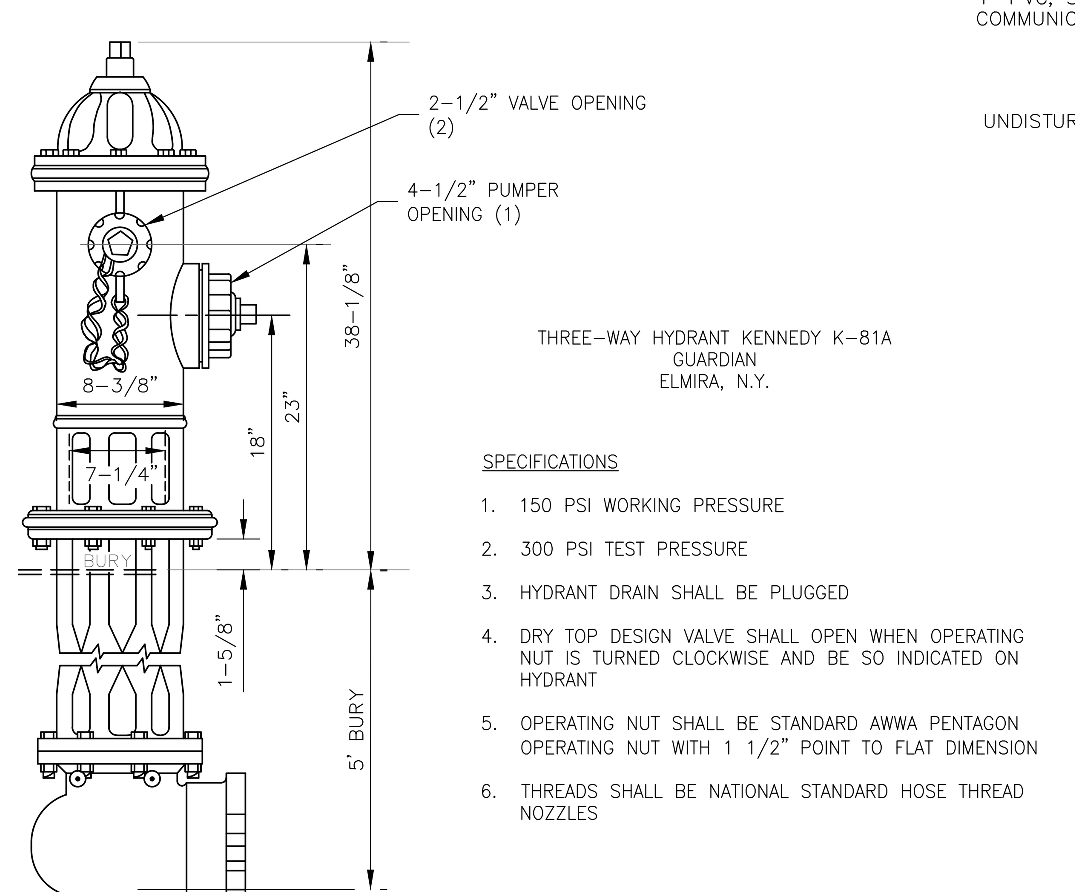


NOTES

1. CLASS III CONCRETE SHALL BE 4,500 PSI AFTER 28 DAYS.
2. DESIGN LOAD: H-20 LOADING
3. GRADE 60 REINFORCED NO. 4 STEEL REBAR TO CONFORM TO ASTM A-615 ON REQUIRED CENTERS OR EQUAL.
4. CAST IRON FRAME AND COVER ARE MANUFACTURED OF GREY CAST IRON CONFORMING TO ASTM A48-76 CLASS 30.

CURB INLET

NOT TO SCALE



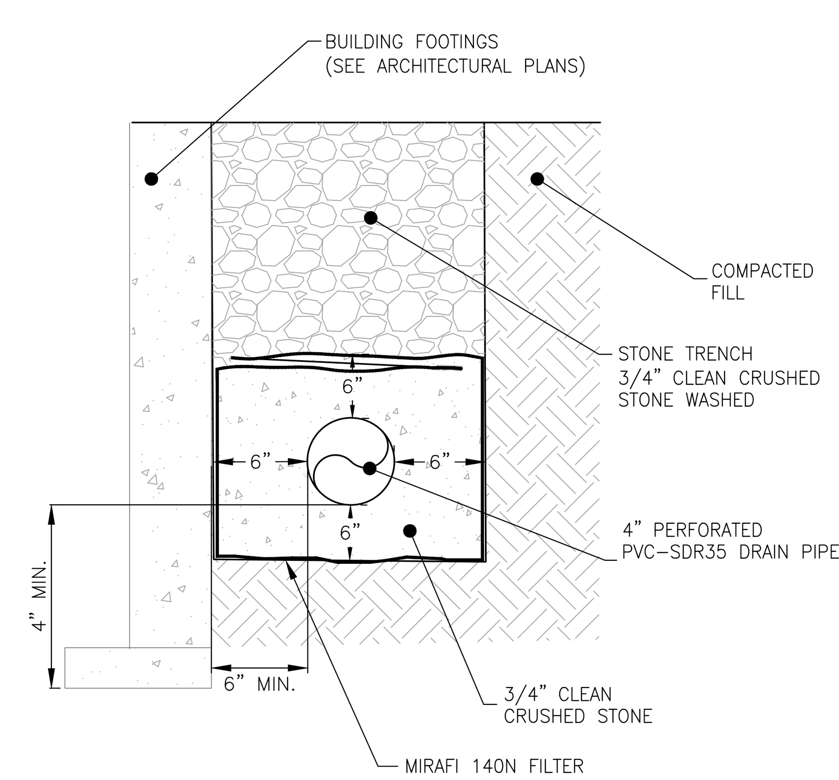
THREE-WAY HYDRANT KENNEDY K-81A GUARDIAN ELMIRA, N.Y.

SPECIFICATIONS

1. 150 PSI WORKING PRESSURE
2. 300 PSI TEST PRESSURE
3. HYDRANT DRAIN SHALL BE PLUGGED
4. DRY TOP DESIGN VALVE SHALL OPEN WHEN OPERATING NUT IS TURNED CLOCKWISE AND BE SO INDICATED ON HYDRANT
5. OPERATING NUT SHALL BE STANDARD AWWA PENTAGON OPERATING NUT WITH 1 1/2" POINT TO FLAT DIMENSION
6. THREADS SHALL BE NATIONAL STANDARD HOSE THREAD NOZZLES

PORTSMOUTH FIRE HYDRANT

NOT TO SCALE

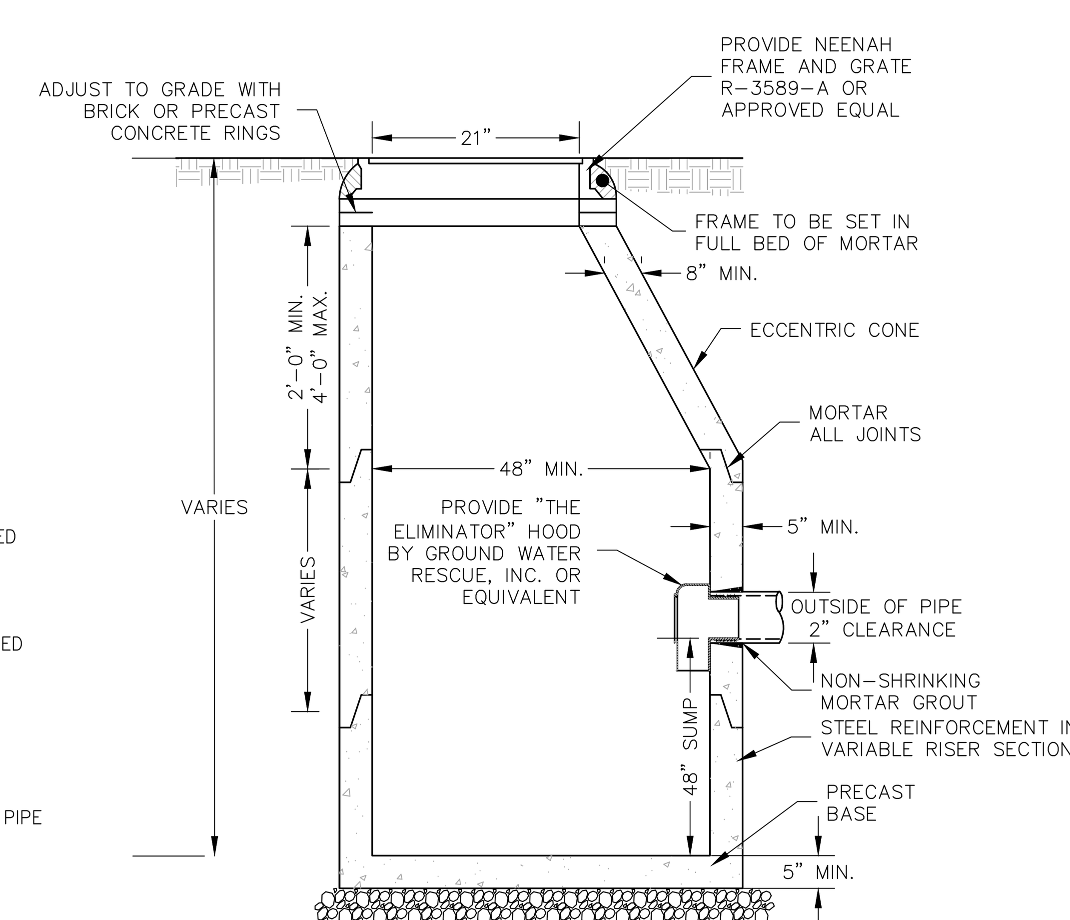


NOTES

1. FOR MINIMUM DIMENSIONAL REQUIREMENT REFER TO THE GEOTECHNICAL REPORT PREPARED BY JOHN TURNER COUNSULTING, INC. ON JULY 3, 2013.

FOUNDATION DRAIN LINES

NOT TO SCALE

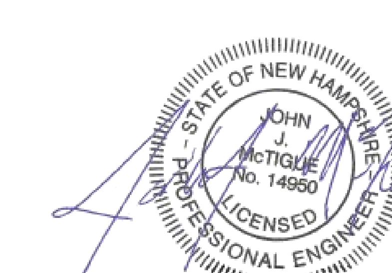


NOTES

1. ALL SECTIONS SHALL BE PRECAST CONCRETE NHDOT CLASS AA, 4,000 PSI.
2. CATCH BASINS SHALL MEET NHDOT SPECIFICATIONS.
3. ALL COMPONENTS SHALL BE DESIGNED FOR HS-20 LOADING.
4. LARGER DIAMETER STRUCTURES SHALL BE USED AS REQUIRED DUE TO NUMBER, ANGLE OR SIZE OF PIPES AT THE STRUCTURE.
5. ALL CASTINGS SHALL BE MADE IN THE USA.

ECCENTRIC CATCH BASIN WITH HOODED OUTLET

NOT TO SCALE



DIG SAFE — CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

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Civil Engineers
Structural Engineers
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Land Surveyors
Landscape Architects
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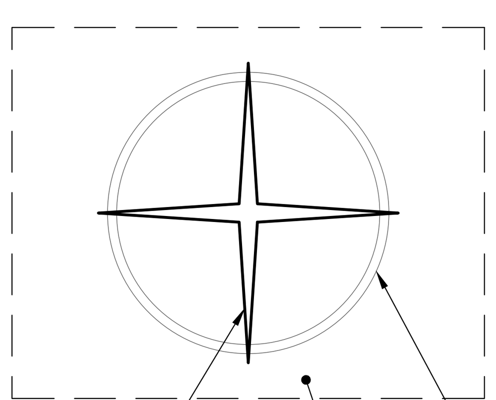
ELEVATIONS		
OUTLET STRUCTURE	#1	#3 AND #4
A	34.50	37.60
B	33.50	NA
C	NA	35.85 (1")
D	33.25	32.50

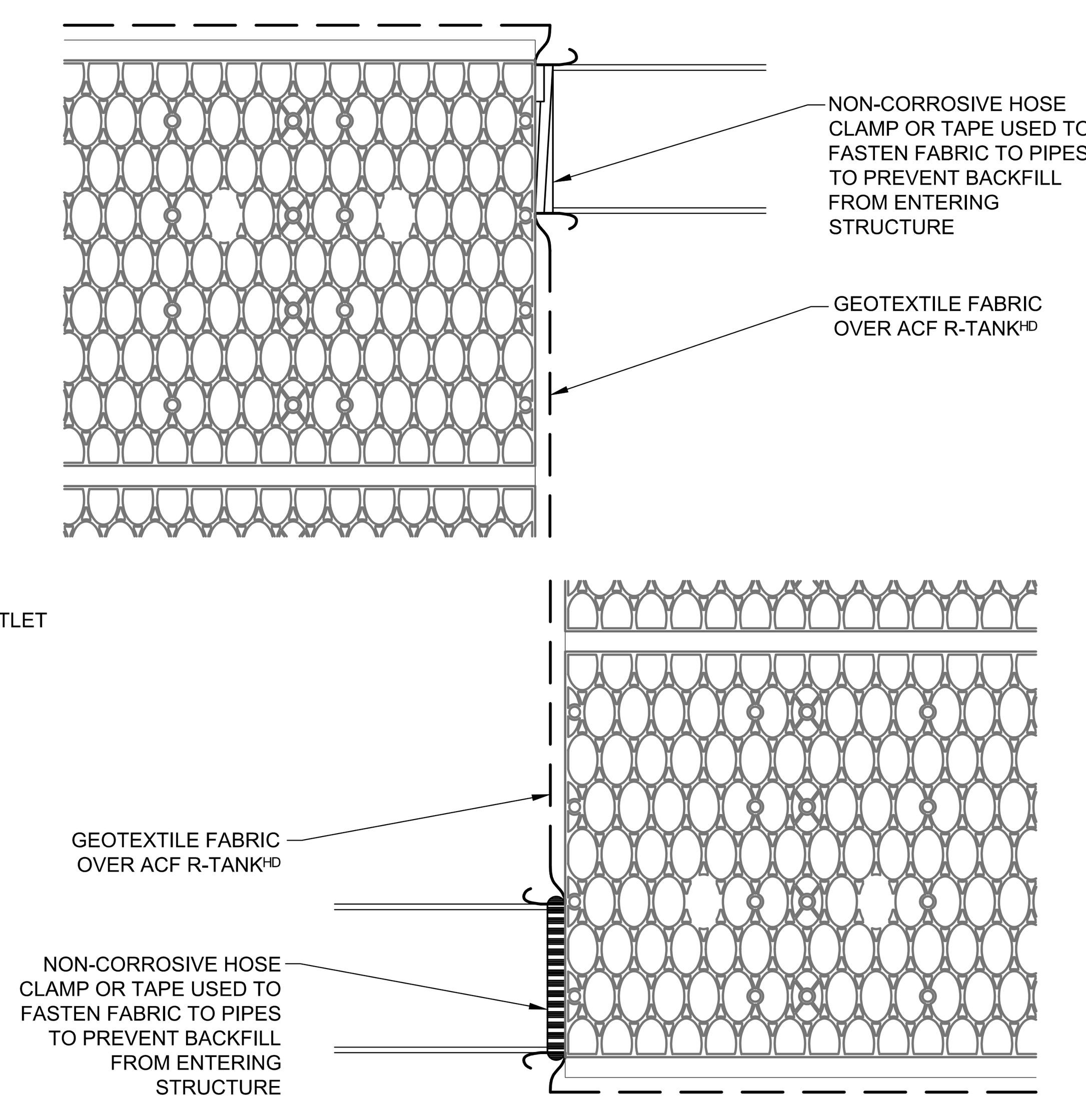
NOTE: SEE GRADING AND DRAINAGE PLAN FOR RIM ELEVATIONS, INVERTS IN AND INVERTS OUT.

HDPE IMPERMEABLE LINER NOTE:

1. HDPE LINER TO BE INSTALLED PER MANUFACTURES SPECIFCATIONS
2. SEAMS SHALL BE FUSION WELDED OR EXTRUSION WELDED.
3. FUSION WELD:
   A. THE SEAM SHALL BE PRODUCED BY SELF PROPELLED WEDGE WELDING APPARATUS. THE MEMBRANE SHALL HAVE AN OVERLAP OF APPROXIMATELY 150MM (6.0 INCHES). THE AREA SHALL BE PREPARED BY WIPING THE AREA WITH A CLEAN DRY CLOTH TO REMOVE ANY FOREIGN MATTER.
3. EXTRUSION WELD:
   A. THE SEAM SHALL BE PRODUCED BY EXTRUDING MOLTEN RESIN AT THE EDGE OF TWO OVERLAPPED SHEETS OF GEOMEMBRANE TO AFFECT A HOMOGENEOUS BOND. THE WELD AREA SHALL BE PREPARED BY SANDING OR GRINDING TO A DEPTH OF LESS THAN .02 MM IN THE SHEET SURFACE TO BE IN CONTACT WITH THE EXTRUDATE. GRINDING REQUIRED ALONG A SEAM SHALL BE DONE CONCURRENT WITH OR WITHIN TWENTY MINUTES OF THE SEAMING OPERATION AND SHALL NOT DAMAGE THE GEOMEMBRANE. MEMBRANE SHALL BE OVERLAPPED A MINIMUM OF 75 MM (3.0 INCHES) PRIOR TO SEAMING. THE WELD AREA SHALL BE KEPT CLEAN AND DRY DURING THIS PROCESS.
4. SEAMS TO BE TESTED IN ACCORDANCE WITH ASTM D6392 STANDARDS

END VIEW OF PIPE/FABRIC CONNECTION. CUT AN "X" IN THE FABRIC SLIGHTLY LARGER THAN PIPE, PULL THE FABRIC AROUND THE PIPE TO CREATE THE "BOOT" AND THEN SECURE WITH A HOSE-CLAMP.



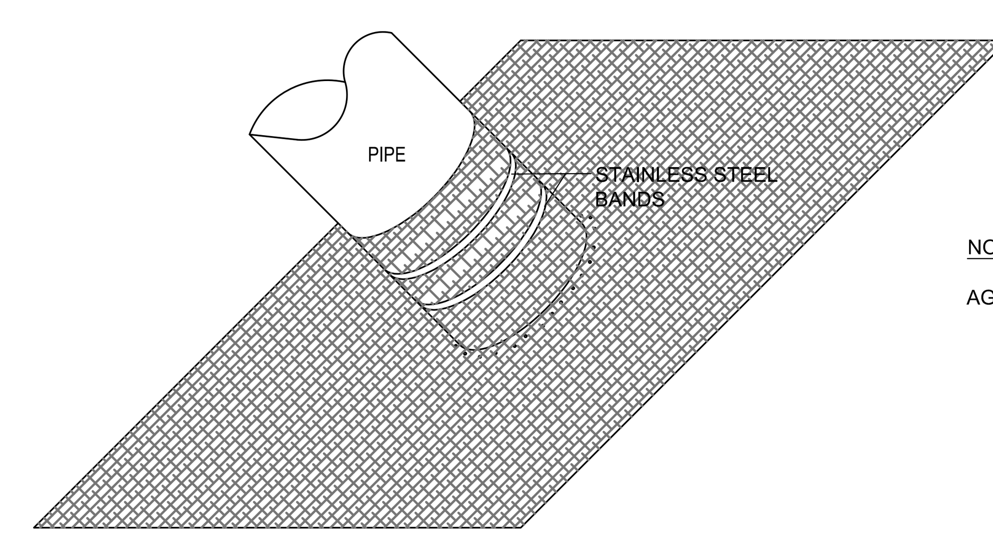


NOTE

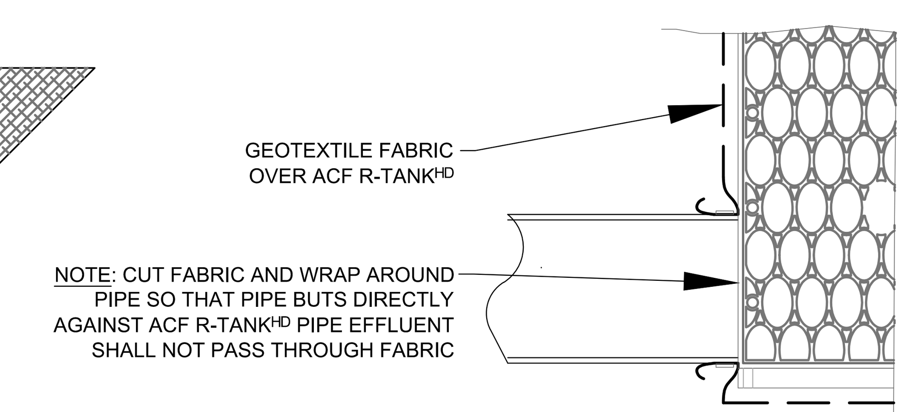
1. SEE DRAINAGE PLAN FOR LOCATIONS AND ELEVATIONS

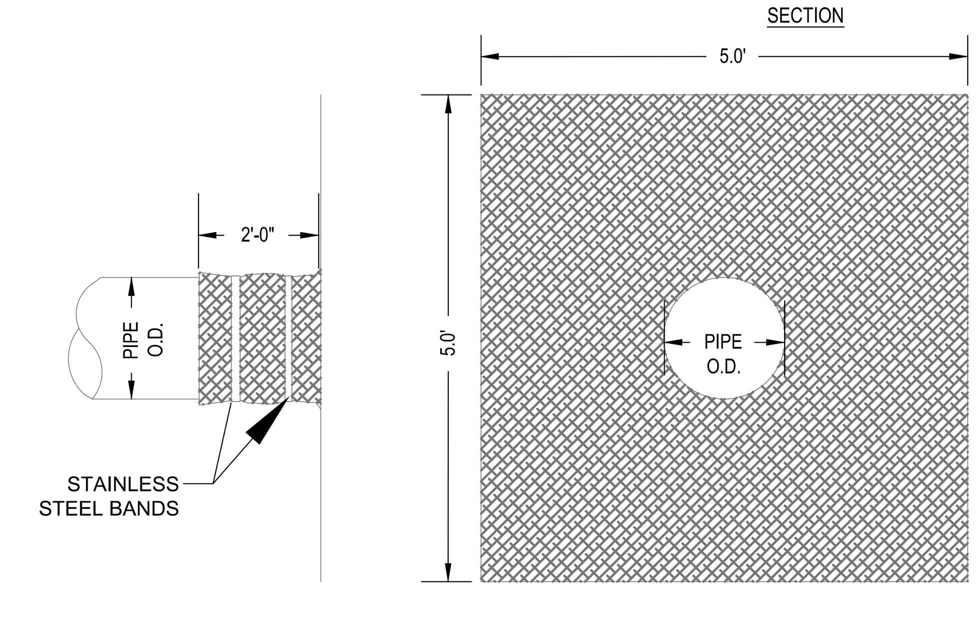
R-TANK^{SD} TYPICAL TANK INLET/OUTLET DETAIL

NOT TO SCALE



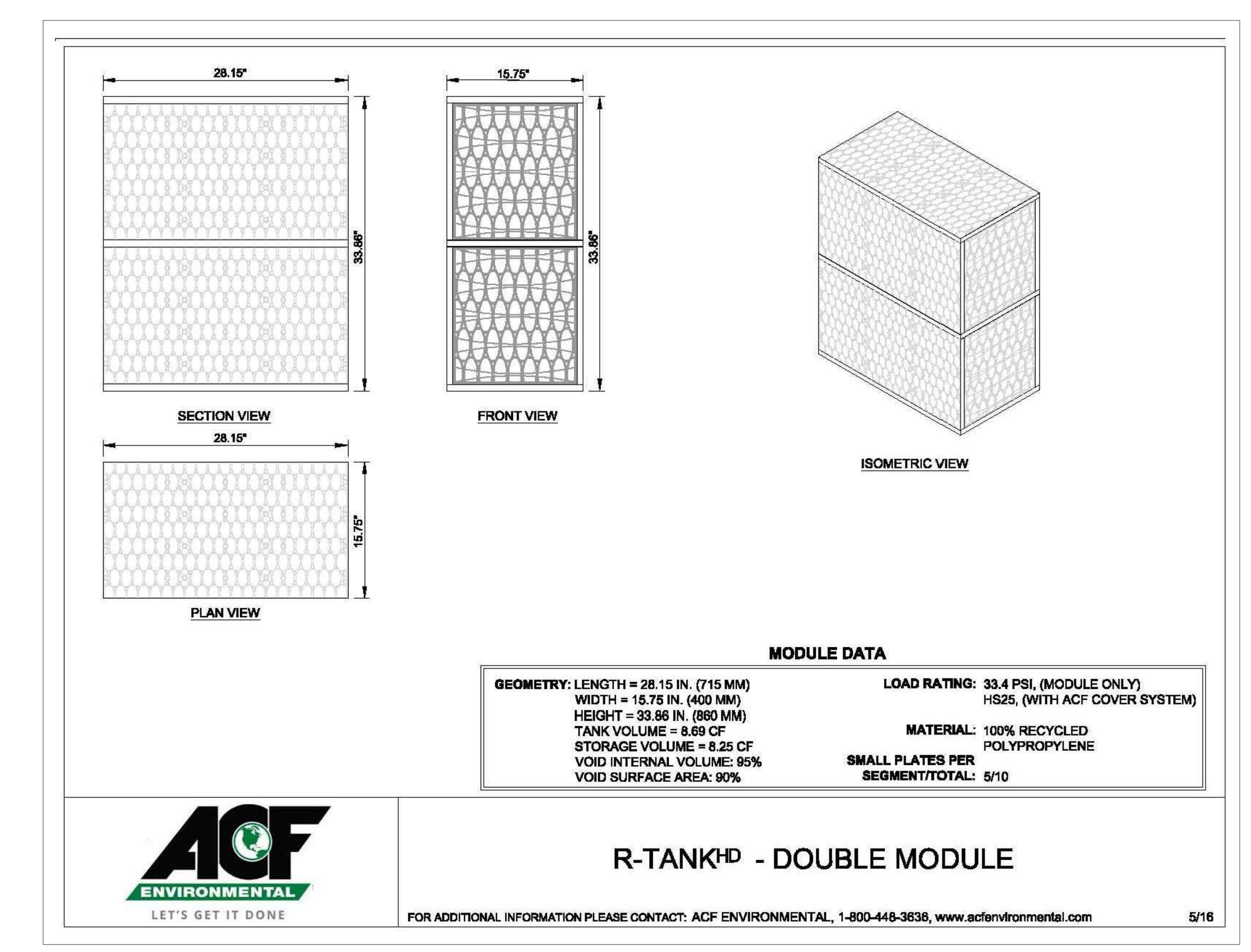
- 12 OZ/SY NONWOVEN GEOTEXTILE
- FABRIC COLLAR TO FIT OUTSIDE DIAMETER OF INLET/OUTLET PIPE





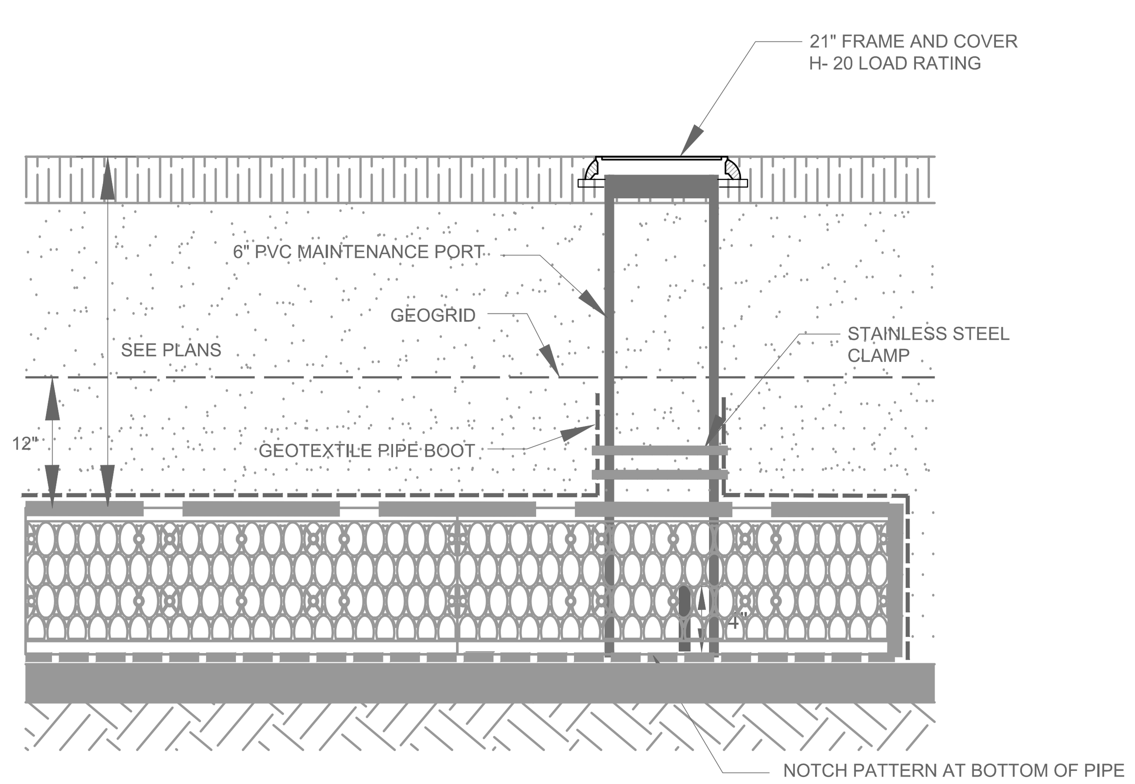
FABRIC PIPE BOOT FOR R-TANK^{HD}

NOT TO SCALE



MAINTENANCE PORT

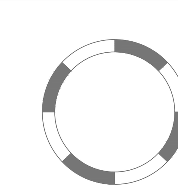
PORT USED FOR INSPECTION PURPOSES AND FOR SYSTEM MAINTENANCE AS REQUIRED. WATER SHALL BE PUMPED INTO THE SYSTEM AND RESUSPEND ACCUMULATED SEDIMENT. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION FOR THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER FLUSH AS NEEDED.



MAINTENANCE PORT

NOT TO SCALE

PIPE NOTCH PATTERN DETAIL



NOTE

1. SEE DRAINAGE PLAN FOR LOCATIONS AND ELEVATIONS

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

SCALE: NTS SEPTEMBER 25, 2019

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14950 LICENSED PROFESSIONAL ENGINEER

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1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

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C-35

DIG SAFE
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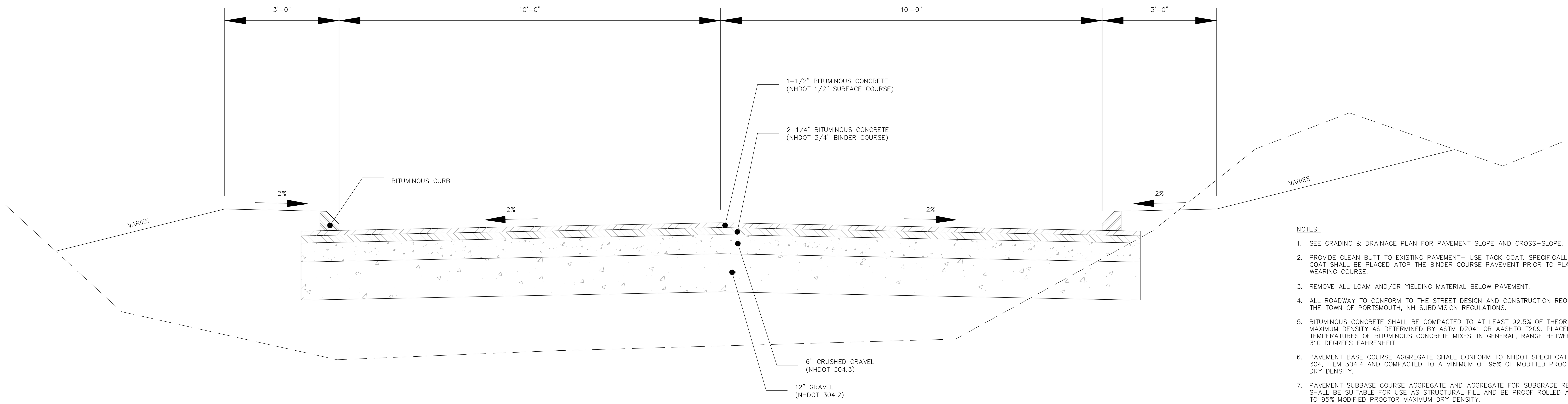
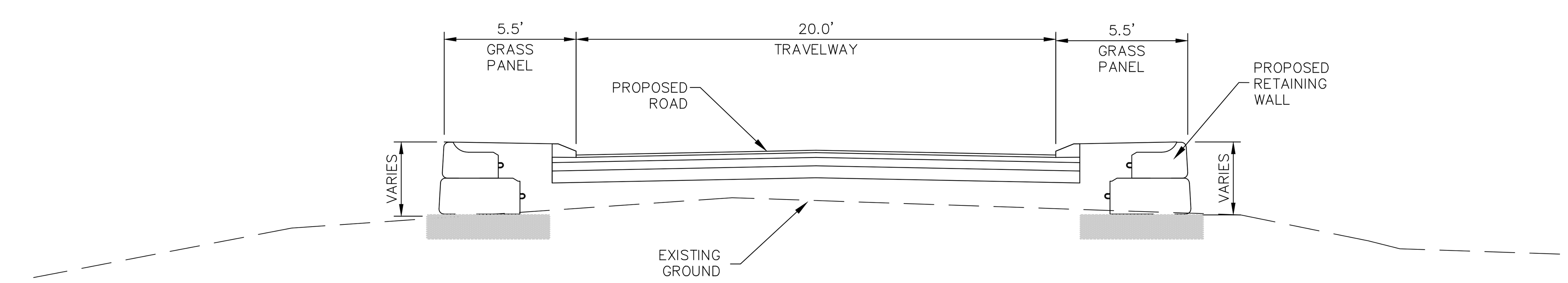


ROADWAY TYPCIAL SECTION

NOT TO SCALE

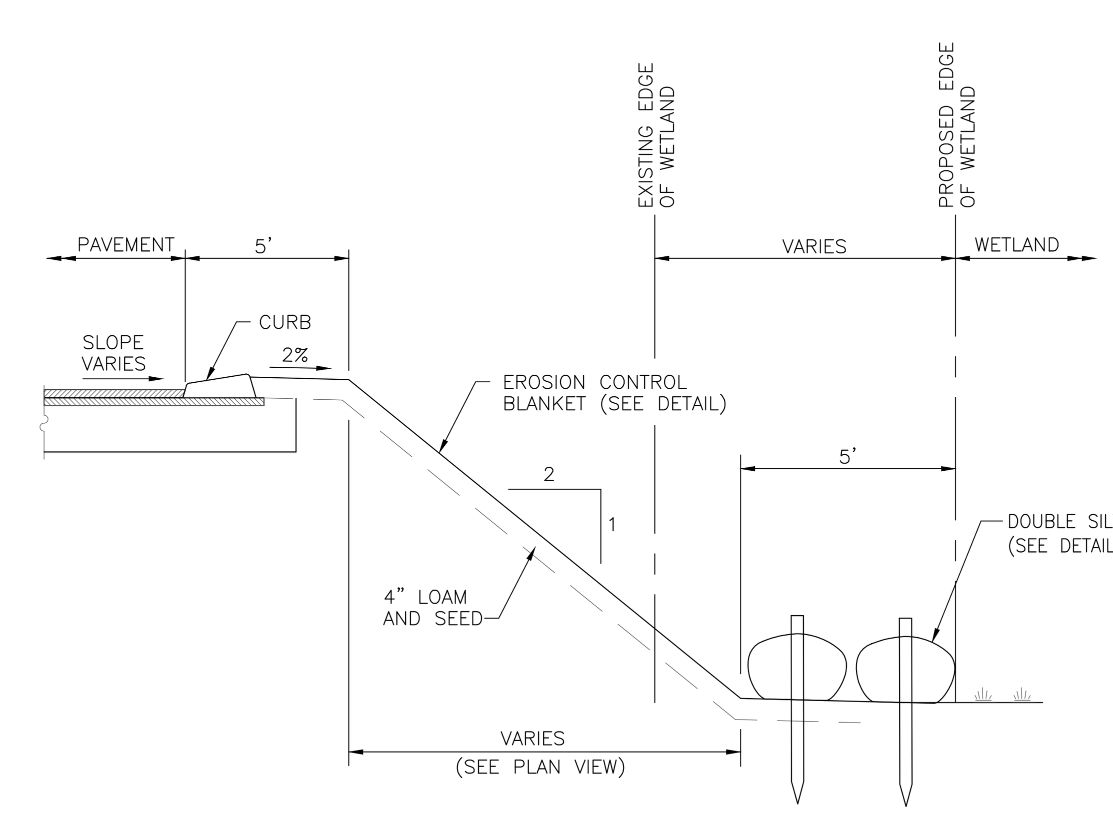
NOTES:

1. SEE GRADING & DRAINAGE PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
2. PROVIDE CLEAN BUTT TO EXISTING PAVEMENT- USE TACK COAT. SPECIFICALLY, A TACK COAT SHALL BE PLACED ATOP THE BINDER COURSE PAVEMENT PRIOR TO PLACING THE WEARING COURSE.
3. REMOVE ALL LOAM AND/OR YIELDING MATERIAL BELOW PAVEMENT.
4. ALL ROADWAY TO CONFORM TO THE STREET DESIGN AND CONSTRUCTION REQUIREMENTS IN THE TOWN OF PORTSMOUTH, NH SUBDIVISION REGULATIONS.
5. BITUMINOUS CONCRETE SHALL BE COMPACTED TO AT LEAST 92.5% OF THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D2041 OR AASHTO T209. PLACEMENT TEMPERATURES OF BITUMINOUS CONCRETE MIXES, IN GENERAL, RANGE BETWEEN 270 AND 310 DEGREES FAHRENHEIT.
6. PAVEMENT BASE COURSE AGGREGATE SHALL CONFORM TO NHDOT SPECIFICATION SECTION 304, ITEM 304.4 AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY.
7. PAVEMENT SUBBASE COURSE AGGREGATE AND AGGREGATE FOR SUBGRADE REPAIR AREAS SHALL BE SUITABLE FOR USE AS STRUCTURAL FILL AND BE PROOF ROLLED AND COMPACTED TO 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY.
8. THE EXPOSED SOIL SUBGRADE SHOULD BE PROOF ROLLED PRIOR TO THE PLACEMENT OF SUBBASE GRAVEL, AND SOFT AREAS SHOULD BE REPAIRED AND REPLACED.



RETAINING WALL TYPICAL SECTION

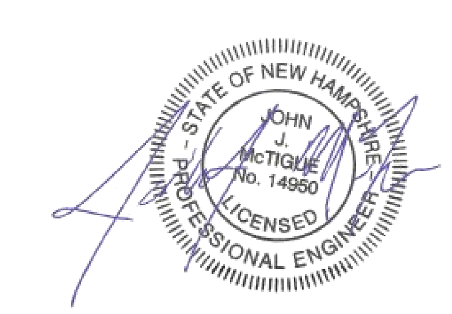
NOT TO SCALE



SLOPE STABILIZATION ADJACENT TO WETLANDS

FOR EROSION CONTROL

NOT TO SCALE



SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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WALTER D HETT TRUST

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SCALE: NTS **SEPTEMBER 25, 2019**

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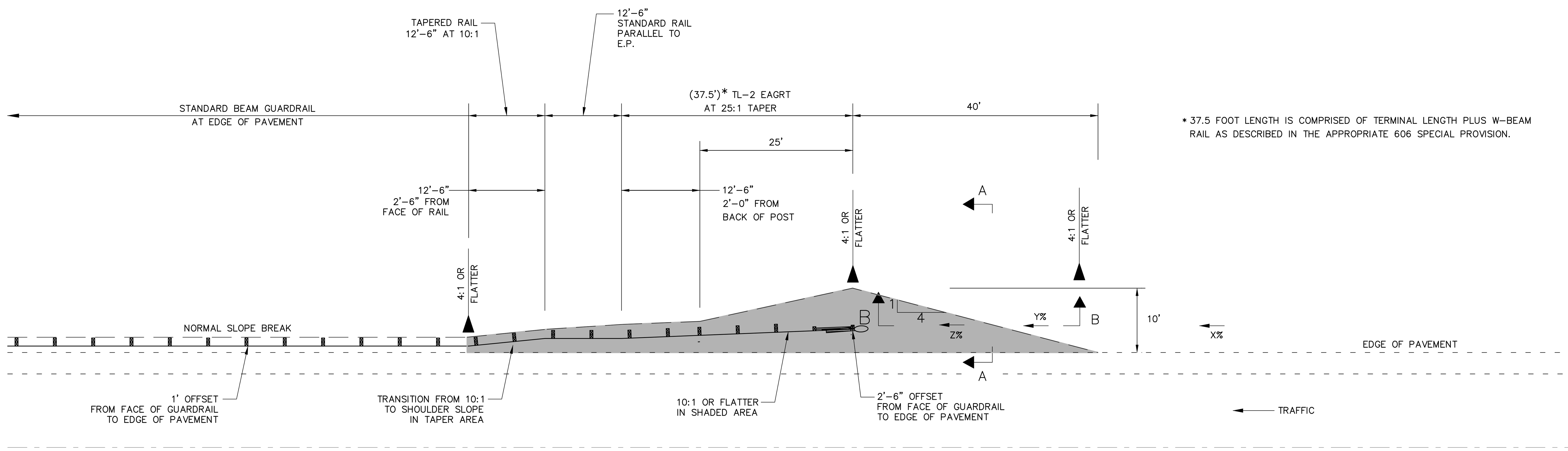
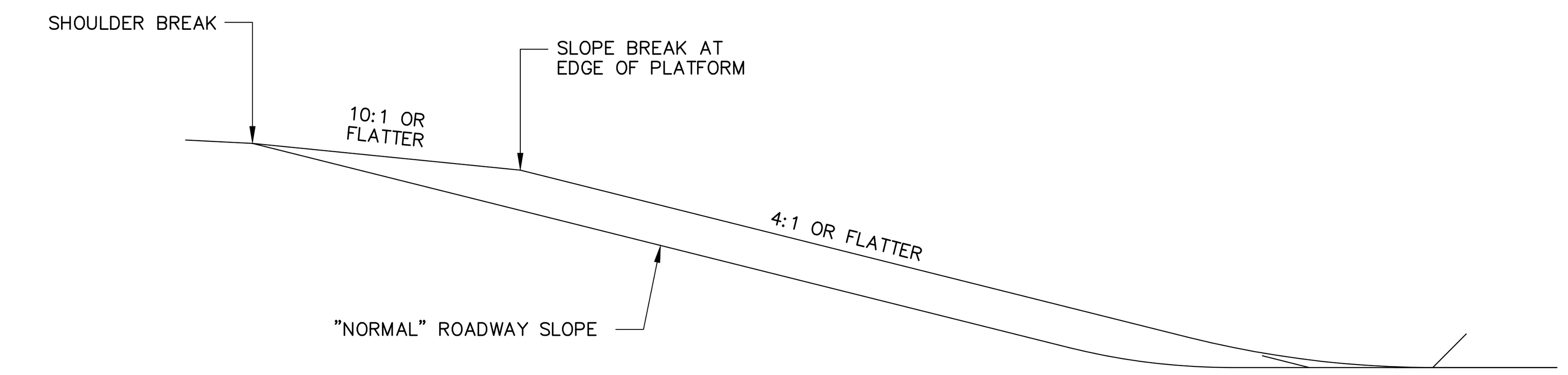


• 37.5 FOOT LENGTH IS COMPRISED OF TERMINAL LENGTH PLUS W-BEAM RAIL AS DESCRIBED IN THE APPROPRIATE 606 SPECIAL PROVISION.

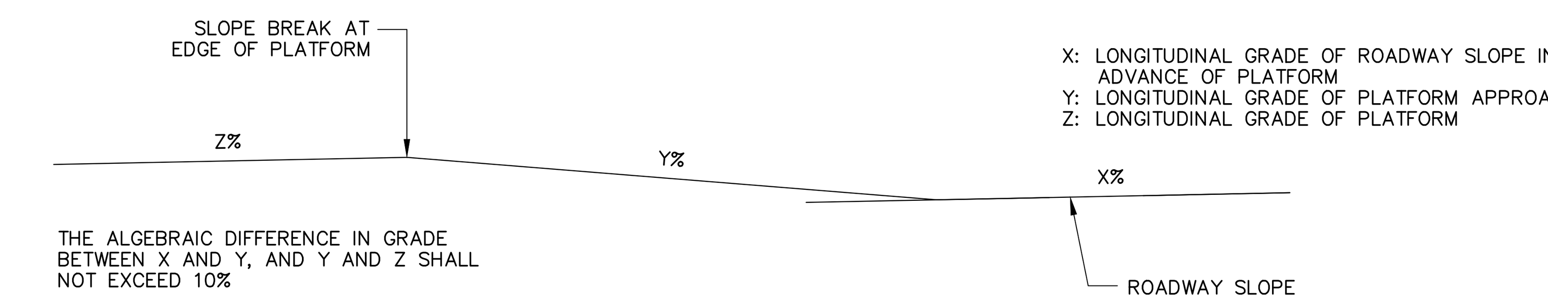
TL-2 EAGRT UNIT

PREFERRED PLATFORM FOR OFFSET ENERGY ABSORBING GUARDRAIL TERMINAL (EAGRT)

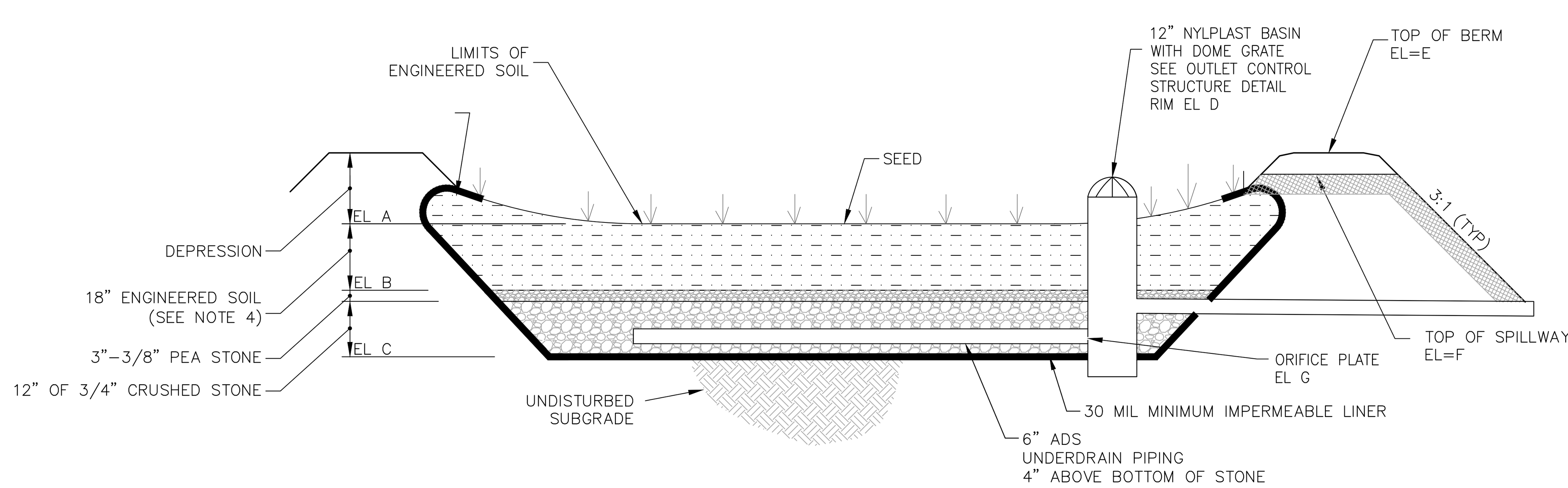
NOT TO SCALE



SECTION A-A
PLATFORM SLOPE GRADING



SECTION B-B
PLATFORM APPROACH GRADING



ELEVATION TABLE	BIORETENTION #1	BIORETENTION #2	BIORETENTION #3
A	56.00	46.00	43.50
B	54.50	44.50	42.00
C	53.17	43.17	41.67
D	57.50	47.75	45.25
E	58.00	48.50	46.00
F	58.10 (Road)	48.00	45.00
G	53.20 (0.2")	43.25 (3")	42.75 (0.5")

BIORETENTION SYSTEM MAINTENANCE

MAINTENANCE SCHEDULE TO BEGIN AFTER CONSTRUCTION IS FINISHED AND BASIN STABILIZATION IS COMPLETE.

1. CONTRACTOR AND LAND OWNERS TO PERFORM SCHEDULED MAINTENANCE ON THE BIORETENTION SYSTEM IN ACCORDANCE WITH THE STORMWATER OPERATION AND MAINTENANCE MANUAL.

BIORETENTION DETAIL

NOT TO SCALE

NOTE: SEE PLANS FOR BED, BERM AND OVERFLOW ELEVATIONS

SEEDING

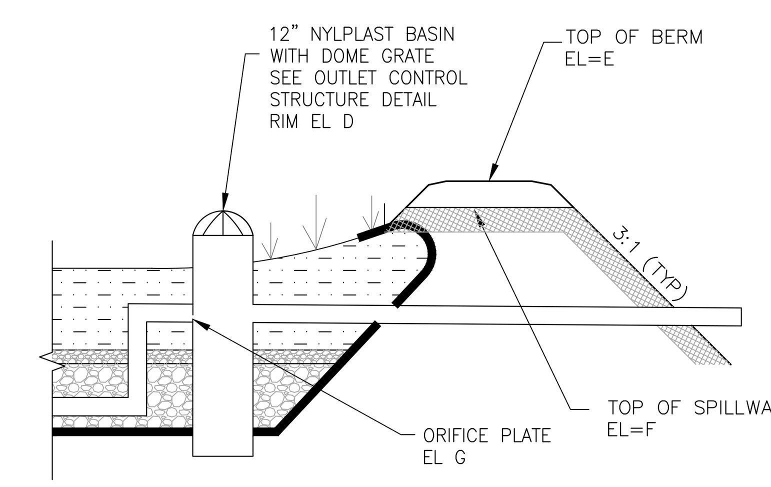
1. USE NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR MOIST SITES BY NEW ENGLAND WETLAND PLANTS, INC. OR EQUIVALENT.
2. SEED AT A RATE OF 1LB/1250SF. APPLY TO BARE SOIL. LIGHTLY MULCH WITH CLEAN WEED FREE STRAW.

BIORETENTION SYSTEM CONSTRUCTION

1. CLEAR AND GRUB THE AREA WHERE THE BIORETENTION SYSTEMS ARE TO BE LOCATED. STOCKPILE LOAM FOR REUSE ON SLOPES.
2. GRADE BIORETENTION SYSTEM ACCORDING TO PLAN AND DETAILS. SIDE SLOPES SHALL HAVE 6" LOAM AND SEED AND A SLOPE NOT TO EXCEED 3:1. BOTTOM OF BIORETENTION SYSTEM AREAS TO BE CONSTRUCTED WITH MANUFACTURED SOIL (SEE BIORETNETION SYSTEM CONSTRUCTION DETAIL).
3. BOTTOM OF THE BIORETENTION SYSTEM TO BE SEEDED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX THAT MEETS NH STATE STANDARDS.
4. SOIL SPECIFICATION TO CONFORM TO THE LATEST UNH STORMWATER CENTER BIORETENTION SOIL SPECIFICATIONS. A COPY OF THE 2017 UNHSC BIORETENTION SPECIFICATION ARE INCLUDED IN THE STORMWATER OPERATION AND MAINTENANCE MANUAL.
5. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT EQUIPMENT & VEHICLE TRAFFIC FROM DRIVING IN THE AREA OF THE PROPOSED BIORETENTION SYSTEM AREA DURING CONSTRUCTION.

BIORETENTION SYSTEM

NOT TO SCALE



HYBRID BIORETENTION SYSTEM STRUCTURE
BIORETETNION SYSTEMS #2 AND #3

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

DETAILS

THE VILLAGE AT BANFIELD WOODS
PORTSMOUTH, NH
OWNED BY
WALTER D HETT TRUST
PREPARED FOR
GREEN & COMPANY REAL ESTATE

SCALE: NTS **SEPTEMBER 25, 2019**

STATE OF NEW HAMPSHIRE JOHN J. McTIGUE No. 14960 LICENSED PROFESSIONAL ENGINEER

REV.	DATE	DESCRIPTION	DR	CK
4	3/20/2020	PROGRESS PRINT	RCK	JJM
3	3/4/2020	UPDATE PLANS PER REGULATORY COMMENTS	RCK	JJM
2	12/27/2019	IN HOUSE REVISIONS	RCK	JJM
1	12/23/19	NO REVISIONS THIS SHEET	RCK	JJM

TFM
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists
48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE 47361.00 DR RCK FB – CK JJM CADFILE DETAILS C-37

GOVE ENVIRONMENTAL SERVICES, INC.

Memorandum

Date: Friday, February 28, 2020

To: Peter Britz, Environmental Planner
Org: Portsmouth Planning Department, 1 Junkins Avenue, Portsmouth, NH 03801
From: Jim Gove

Re: Banfield Road Project for Green and Company
Subject: Response to Mark West Review of January 28, 2020 and questions related to Wildlife corridors as related to the site

The review points out that the Nature Conservancy shows the site in question as part of a prioritized habitat block and wildlife corridor. The GES, Inc. reports have identified the presence of wildlife corridors on the site of which there are many both on and off the site as summarized below.

As noted by the review, GES, Inc. identified the access road to the site as potentially limiting wildlife movement along that specific corridor. What has not been recognized is that numerous wildlife corridors exist over the entire site and the lands beyond. GES, Inc. has attached a plan showing the site and the surrounding areas. The plan is named "Upland/Wetland Habitat Map". The base map is an infrared aerial photo with the wetlands boundaries (outside of the site) being interpreted and the wetlands shown colored in green and the wildlife corridors have been shown as black arrows.

There are numerous wildlife corridors on and off the site. Wildlife movement is not confined to just the areas of the development but are present around the site and in adjacent parcels. Most movement is along drainage ways, valleys, edges of wetlands, and along any streams. Wildlife also moves along man-made corridors, like railroad tracks and electric powerlines. Less movement is over the tops of hills, rock outcrops, and steep areas. The wildlife has many ways to move around the area, and move around the proposed development.

Of the numerous wildlife corridors shown, only two would be limited by the development.

a. The first is at the wetland impact area along Banfield Road. In the West review, there was a concern that the proposed eco-passage was built with less height than recommended. The recommendation for the eco-passages is 2 feet high, with an opening of 2 feet wide. In redesigning this area, the eco-passages have been changed in the design, and are now proposed to have heights of 1.9 feet, 2.0 feet, and 2.2 feet. The openings all have a width of 5 feet which is 2.5 times larger than recommended, allowing for better wildlife passage. Where typically only one eco-passage is used, the project is proposing three eco-passages. The eco-passages now meet or exceed the recommended design. As discussed at the

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Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

Conservation Commission meeting, these eco-passages are to help reptile and amphibian species to continue to move in the wetland. Also, the height of the access road across the wetlands is from 1.4 feet tall to 2.7 feet tall. This height of road will not be an impediment to deer, fox, coyote, raccoon, skunk, weasel, fisher, squirrel and chipmunk. There will continue to be wildlife movement through this corridor.

b. The second is a valley between the two lobes of the development. The West review noted that the large retaining walls connecting the two development areas will permanently impact wildlife movement because the walls were up to 10 feet high and West recommended the elimination of the large retaining walls. In redesigning this area the retaining wall for the road connecting the two development areas is now reduced to 2 feet to 3.2 feet in height. This height will not be an impediment from the movement of mammals crossing along the corridor. As discussed above, deer, fox, coyote, skunk, raccoon, fisher, weasel, squirrel, or chipmunk will not find a 2-foot retaining wall an impediment to crossing through the valley between the two wetland areas. Further, the retaining wall is only on the north side of the proposed road, with the south side having no retaining wall.

   These modifications clearly show that the Applicant has significantly minimized these impacts to these 2 travel corridors.

Another important point to note is that there has been discussion about the development area being the only upland on site, and that it is the only island of upland habitat in the area and is surrounded by wetlands. The Upland/Wetland Habitat Map shows that this is in fact not the case. To the south, west and north of the development site are large areas of uplands. Going west from the development envelope is an uninterrupted continuous tract of upland habitat. To the south, after crossing a wetland, is another tract of upland. To the north, after crossing a wetland, is another tract of uplands.

On the site, of the 44.8 acres making up the subject property, 19.34 acres is wetlands and 25.46 acres of upland, with only 7.3 acres of upland and 0.09 acres of wetland for the crossing being used for the development area. This means that on the site, outside of the development envelope, is 18.2 acres of upland, which means approximately 40% of the 44.88 acre site will remain as undeveloped upland and approximately 83% of the 44.8 acre site will remain undeveloped overall.

In the West review, a recommendation was to provide information as to how the open space area will be managed and protected from future impact. The following is adapted from the Open Space restrictions of a condominium project in Atkinson:

The Open Space as depicted on the plans, is and shall forever be and remain subject to the following deed restrictions:

1) The purpose of the Open Space after completion of the proposed development depicted on the site plan is to retain the area forever in its scenic and open space conditions and to prevent any use of the Open Space that will significantly impair, or interfere with, its conservation value.
2) To protect and conserve the natural biological diversity of the region including exemplary natural communities, wetlands and other significant wildlife habitats on the restricted property.
3) It shall be maintained in perpetuity as open space.
4) No structure of any kind, size or shape shall be constructed on the Open Space.
5) Upon completion of the proposed development, no filling or excavation of soil or other alteration of topography or cutting or removal of standing trees shall be allowed, except those that present an imminent threat to person or property. In addition, trees may be removed in accordance with accepted silvicultural forest practices as outlined in the publication entitled **Good Forestry Practices in the Granite State** by the Society for the Protection of NH Forests. No disturbance of other natural features shall be allowed unless such activities are commonly necessary to maintain the existing natural environment of the open space.
6) There shall be no dumping or depositing of trash, debris, stumps, yard waste, hazardous fluid or materials, vehicle bodies or parts within the Open Space.

There has been discussion that there may be an alternative access to the site via an abutting parcel of land. The abutting parcel is not owned by the project and it –was found not to be available to the project. In addition, the abutting property -- would also require a longer wetland crossing to access uplands. This is not a feasible access because it is not the least impacting alternative and is not owned by the project. Therefore, the proposed access road at the location depicted on Banfield Road is the least impacting alternative.

Copy to:

NH DES Wetlands Bureau Application# 2020-0344.
Amended plans of eco-passages.

Attachments:

1) West Environmental Inc. letter of 01-28-2020
2) Upland/Wetland Habitat Plan
3) Eco-passage cross-section
4) RetainWall cross-section

WEST
ENVIRONMENTAL INC.
48 Stevens Hill Road, Nottingham, NH 03290
603-734-4298 ♦ mark@westenv.net

Peter Britz, Environmental Planner
Portsmouth Planning Department
1 Junkins Avenue
Portsmouth, NH 03801

January 28, 2020

RE: Third Review of Banfield Road Project Green and Company Portsmouth

Dear Peter:
West Environmental, Inc. (WEI) submits this third review report of the above referenced project based on information presented by the applicant at the December 11, 2019. Some of the new information presented addressed issues raised in our report from December 10, 2019 but no formal response to the report was submitted.

2019 Wildlife Habitat Assessment
As discussed in our 12-10-19 report the revised Wildlife Habitat Assessment (WHA) provides more information on wildlife habitat and the species that likely utilize this site. We have attached the Connect the Coast Map prepared by the Nature Conservancy indicating that the Hett parcel to be developed is within a Prioritized Habitat Block. In addition, this map confirms that wildlife movement is in an east-west direction.

WEI agrees with the statement "*The greatest issue with this development is the bisecting of the site with the proposed road, limiting any existing and potential wildlife travel.*" The reports from Gove Environmental indicate that development itself and the large retaining walls in the stretch of road connecting the two development areas **will permanently impact wildlife movement on the site**. The applicant's consultants presented information regarding the retaining walls (up to 10 feet high) and the proposed 4'x4' box culvert. While we understand that this design eliminated impacts to the wetland buffers the road itself now has a greater impact to wildlife movement.

The eco-passage located at the wetland crossing was also presented at the Conservation Commission Meeting to help reptile and amphibian species continue to move through the wetland. It is proposed to be built with less height than is recommended which may reduce its effectiveness to promote passage. WEI recommended consultation with the NH Fish and Game and we have reviewed email correspondence with Kim Tuttle.

She indicated that the design was interesting and had some basic recommendations but did not endorse the design. She also referred the applicant to Sandi Houghton at her office.

It is our understanding that the hydrology and septic designs are being independently reviewed.

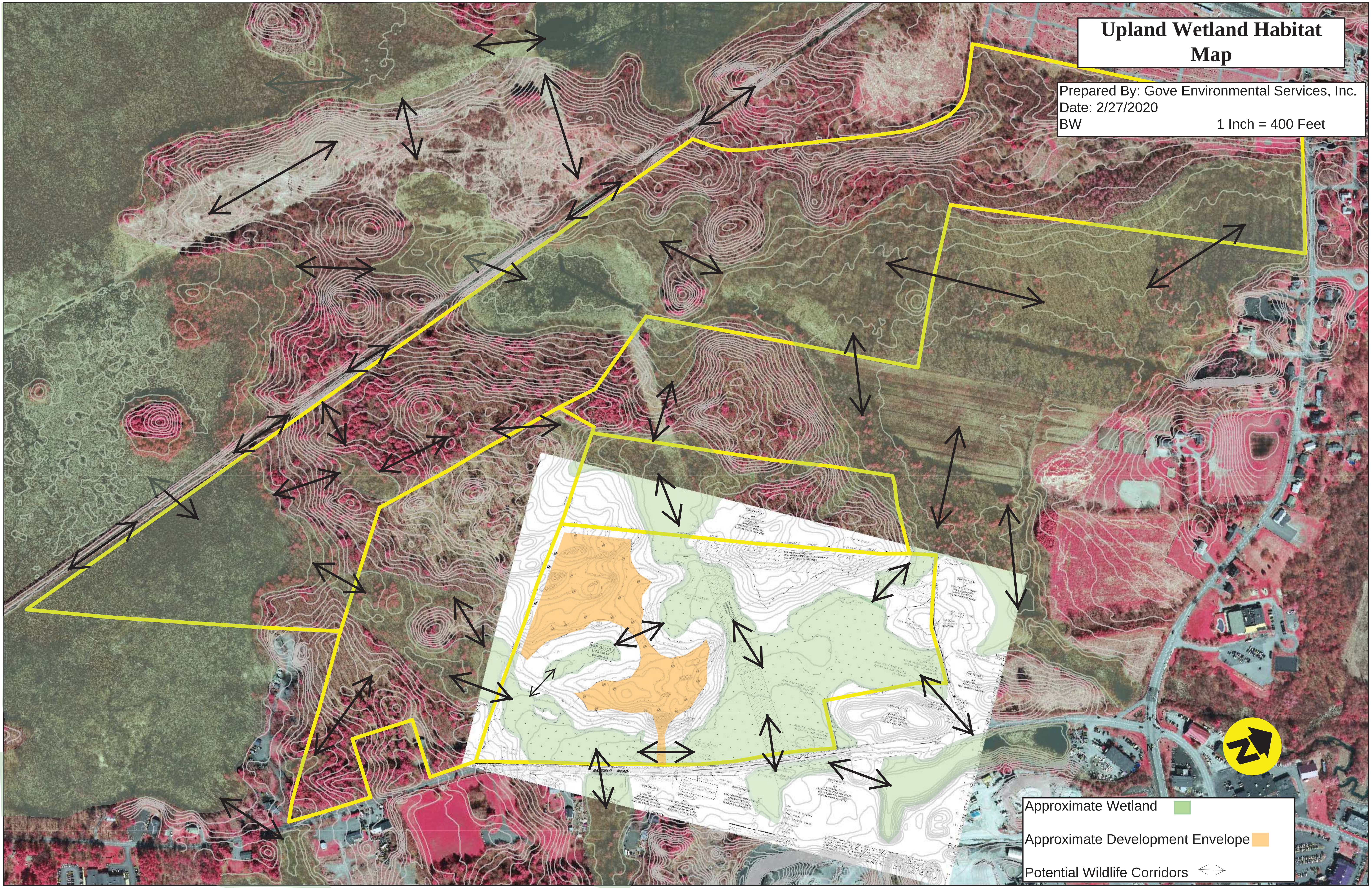
Recommendations:

1. The applicant's consultants should examine alternative stormwater management designs that eliminate the large retaining walls in the under-road detention option and distribute the treatment systems into smaller watersheds. Some impact in the outer 25 feet of the 100-foot wetland buffer for smaller detention/treatment systems would have less impact on wildlife. These areas could also be planted with shrub buffers on their outer slopes to minimize habitat impact. There are also areas outside the 100-foot buffers where rain gardens could be located.
2. The applicant's consultants should continue to research the eco-passages to verify that they will function with an altered design.
3. The applicant should provide information as to how the open space area will be managed and protected from future impact. This element of the project is the most important mitigation for wildlife habitat impacts and it will require signage and other permanent restrictions.

Sincerely,
West Environmental, Inc.

Mark C. West,
NH Certified Wetland Scientist

Cc: Vicky Nelson


Upland Wetland Habitat Map
Prepared By: Gove Environmental Services, Inc.
Date: 2/27/2020
BW
1 Inch = 400 Feet
N
Approximate Wetland
Approximate Development Envelope
Potential Wildlife Corridors

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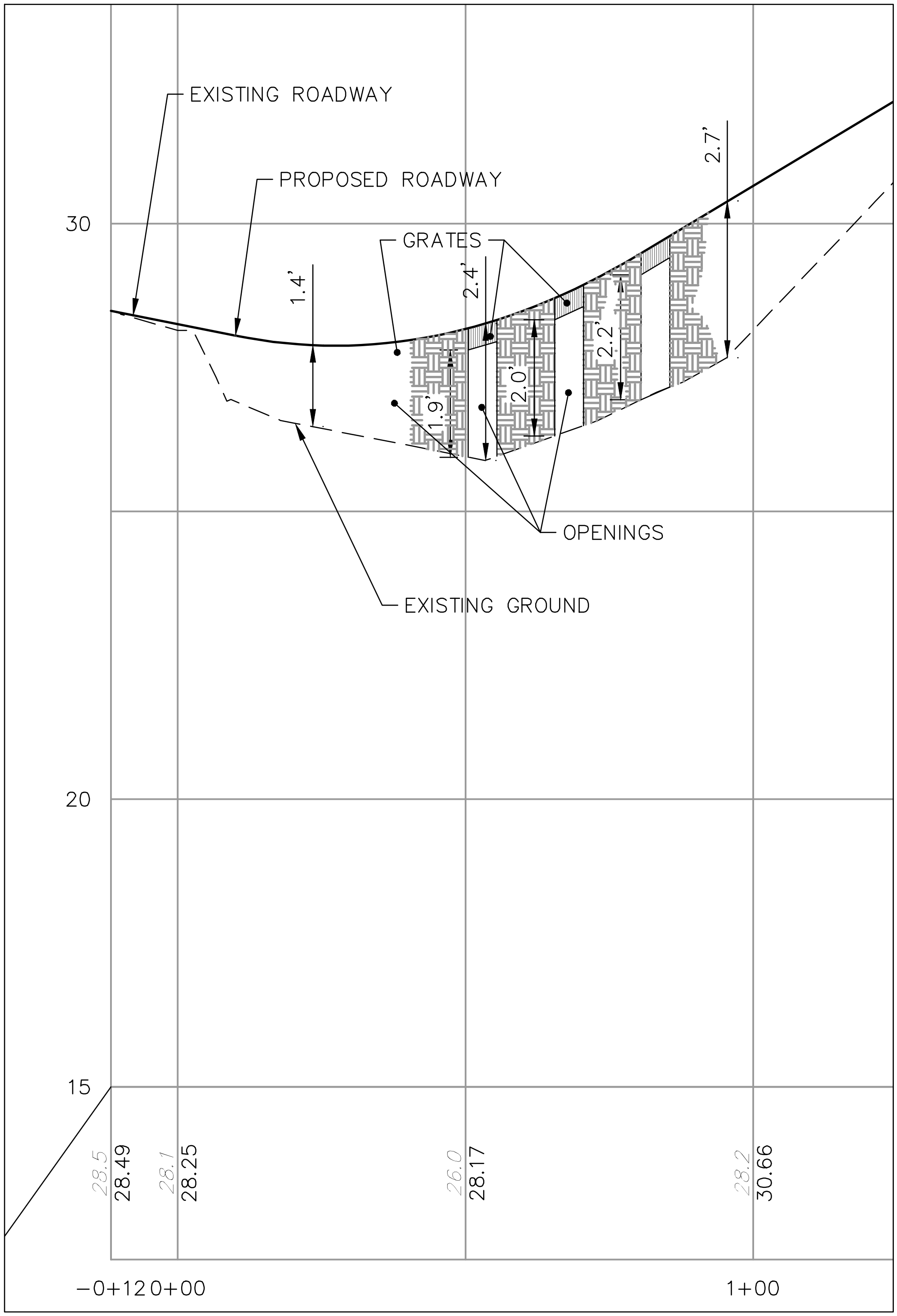

Civil Engineers Structural Engineers Traffic Engineers Land Surveyors Landscape Architects Scientists

170 Commerce Way, Suite 102 Portsmouth, NH 03801
Phone (603) 431-2222
Fax (603) 431-0910
www.TFMoran.com

TAX MAP 256 LOT2

ECOPASSAGES

PROFILE

THE VILLAGE AT BANFIELD WOOODS

PORTSMOUTH, NEW HAMPSHIRE

OWNED BY

GREEN & COMPANY REAL ESTATE

SCALE: H:1"=30' / V:1"=3' **DATE: 2/20/20**

REV.	DATE	

C-1

FILE 47361.00 DR FB CK CADFILE

Feb 27, 2020 - 10:37am
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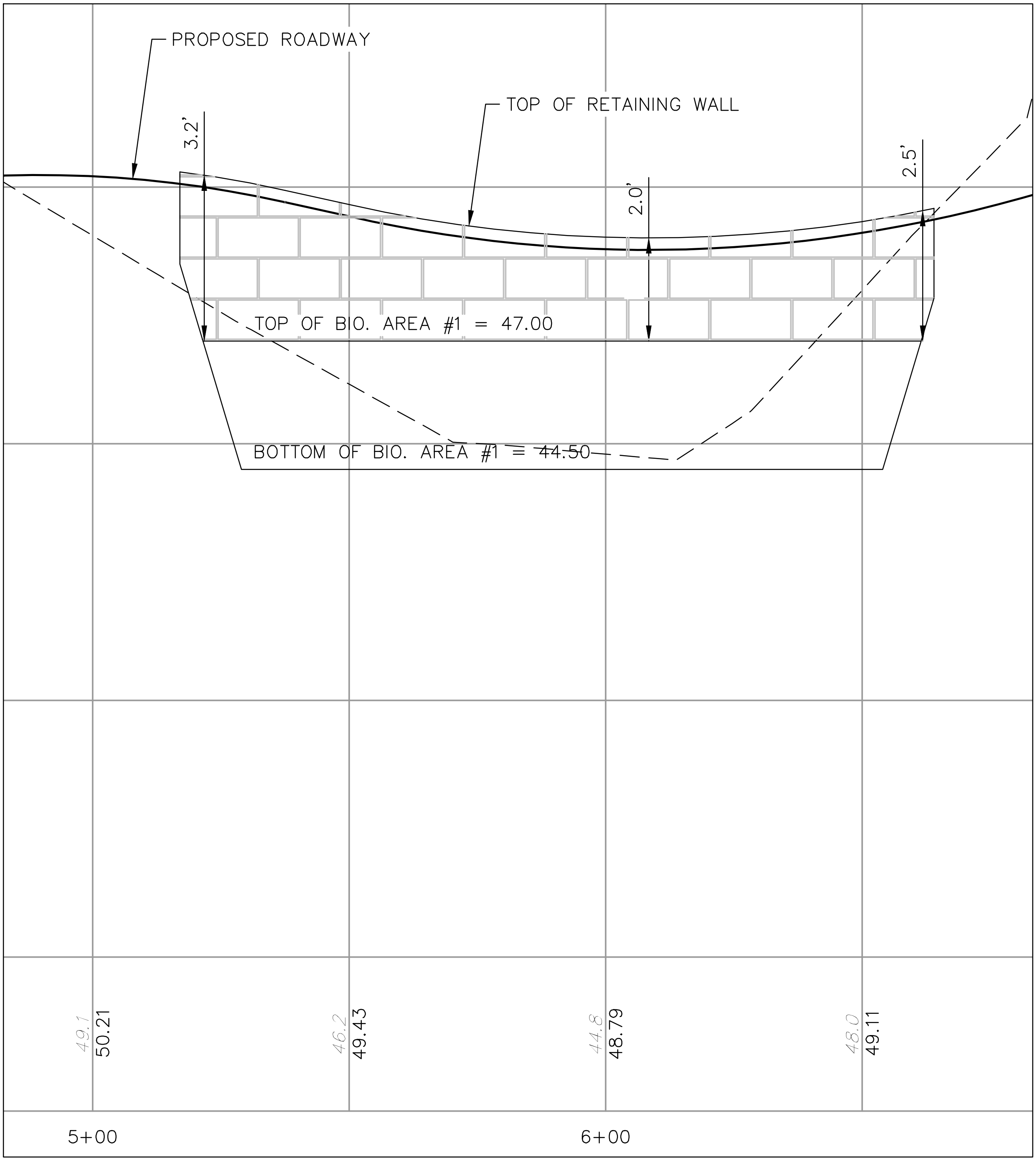

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TAX MAP 256 LOT2

RETAINING WALL AREA

PROFILE

THE VILLAGE AT BANFIELD WOOODS

PORTSMOUTH, NEW HAMPSHIRE

OWNED BY

GREEN & COMPANY REAL ESTATE

SCALE: H:1"=30' / V:1"=3' **DATE: 2/20/20**

REV.	DATE	

C-2

FILE 47361.00 | DR | FB | CK | CADFILE

Feb 27, 2020 - 10:39am
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\XREF\47361-00_3D.dwg

John Kuzinevich, Esq.
Law Office of John Kuzinevich

71 Gurnet Road
Duxbury, Massachusetts 02332

Telephone: 781 536-8835
Cell: 508 245-2105

E-mail: jjkuz@comcast.net

January 15, 2020

Juliet Walker
Planning Director
City Hall
One Junkins Avenue
Portsmouth, NH 03801

Re: Proposed Subdivision, 0 Banfield Road, Portsmouth
Tax Map 256, Lot 2

Interpretation of Zoning Ordinance

Dear Juliet:

As you are aware I represent Green & Company ("Applicant") concerning the Village at Banfield Woods, a proposed subdivision located at 0 Banfield Road, Portsmouth. This letter will address whether or not townhomes may be constructed as a matter of right in the SRA district when a Planned Unit Development is designed. At the formal TAC meeting of January 7, 2020, Corey Colwell, one of the engineers representing the Applicant, stated that townhomes were not considered because they are prohibited in SRA districts. You then indicated he was incorrect and that they were allowed in all PUDs, presumably under authority of 10.722.10 (c). As a matter of law you are incorrect and townhouses are prohibited in the SRA district.

I acknowledge that the Planning Department probably thought townhomes would be available in all PUDs and has interpreted the Ordinance in that manner. However, first and foremost an ordinance is interpreted by its written words; not the interpretation of the enforcing agency. *Appeal of Fournier*, No. 2018-0617 (N.H. Nov. 14, 2019). Ordinances and regulations are construed in the same manner as statutes. *Petition of Parker*, 158 N.H. 499, 502 (2009). Here, application of the statutory rules of construction yields no other conclusion but that townhomes are prohibited in the SRA district. Follows is my analysis.

All words of an ordinance are to be given meaning and reconciled to a meaningful whole. *In re: Portsmouth Regional Hospital, 148 N.H. 55 (2002); Town of Wolfeboro v. Smith*, 131 N.H. 449 (1989). Here, the use table, Section 10.440 (page 4-7) unambiguously shows under line 1.40 that townhouses are prohibited in the SRA district. This must be given meaning. Section 10.712.50 provides "a development authorized…under this Article shall comply with all applicable zoning, site plan and subdivision regulations other than those waived or modified hereunder." Nowhere in Article 7 are the uses established by Section 10.440 waived or modified. Thus, in order to comply with the Ordinance, townhomes must be prohibited. To argue that Article 7 supersedes the uses established by 10.440 means a residential PUD could be placed in any district including GA/MH, GB, WB, OR, I or WI. This would be a nonsensical construction which would vitiate the very concept of zoning. An ordinance cannot be read out of existence by an agency's interpretation. *Appeal of Morrissey*, 165 N.H. 87, 96-97 (2013). Rather, townhomes would be permitted in the 10 districts in which they are already allowed, thus giving effect to the zoning provisions as mandated by 10.712.50. This is the only construction which prevents conflict or ambiguity.

Section 10.722.10 (c) does not alter this. First it does not expressly say that it supersedes the use table. Second, it says a PUD "may" include various uses including townhomes. May is a word of permission indicating discretion to either perform or not preform an act. *Appeal of New Hampshire Division of State Police*, 171 N.H. 262 (2018). Thus, there is no requirement that the specific use be available in all districts. Had that been the intent the ordinance, it would have needed to use the word "shall" and an appropriate modifier such as, if desired. Shall is a mandatory word which would clearly show an intent to modify the established uses, as in shall allow. *City of Rochester v. Corpening*, 153 N.H. 383 (2006). Thus in a SRA district, a PUD would have only single family homes. In other residential districts, there could be townhomes if desired as they are already an allowed use.

This interpretation is confirmed by 10.722.30 which specifically ties accessory uses to those permitted in each specific district. It further goes on to specifically exclude certain accessory uses, clearly evidencing when it is superseding the use table. It did not resort to this type of construction concerning townhouses in the SRA district although the drafters clearly know how to do it if that was the desired outcome. Likewise, in 10.723 density is determined by reference to the density in each specific district. It further shows that the district's are treated separately as when a project is in two districts, the density allowed in each district is calculated separately. This shows that the individual requirements of each district cannot be ignored.

Further, as a rule of construction use of a word in one section and use of a different word in another section indicates a different meaning to each. *State v. Bankunczyk*, 164 N.H. 77 (2012). The word "shall" is used in many sections of the ordinance. This indicates that the drafters meant something different when the word "may" is used. In this case it reinforces the permissive nature of the word and that townhomes do not have to be allowed in all districts.

For all of the above reasons, as a matter of law, townhomes are not permitted in a SRA district. I would be happy to discuss this further with you or City Attorney Sullivan. Thank you.

Sincerely,

John Kuzinevich

Copy to: City Attorney Sullivan
Clients

February 28, 2020
Project No. 6535-20

Green and Company Real Estate
c/o: Mr. Jack McTigue, PE, CPESC
Project Manager
TF Moran, Inc. (TFM)
170 Commerce Way, Suite 102
Portsmouth, New Hampshire 03801

RE: Proposed Stormwater Treatment System Assessment
The Village at Banfield Woods
Banfield Road
Portsmouth, New Hampshire

Dear jack:

As requested, Milone & MacBroom, Inc. (MMI) has reviewed your design drawings and data to evaluate the proposed Stormwater Treatment Systems #1 and #2 (System) to be located under the entrance road to the residential development project off of Banfield Road. As part of this evaluation, we have also reviewed your previous test pit subsurface exploration data in order to develop an approximate hydrogeologic model.

The proposed System is shown on TFM Sheet C-09 with latest revision date of January 28, 2020. The System collectively will consist of four individual systems; the two smaller systems to the south are about 42± feet by 14.5± feet in plan and the larger two systems to the north are about 51± feet by 14.5± feet in plan. In the east-west direction, the systems are separated by about 10± feet and by about 10± feet to 15± feet in the north-south direction as shown on Sheet C-09. A wetland area is located about 100± feet south and east of the proposed System.

MMI understands that the proposed System will consist of modular R-Tank system components that will be directly underlain by a 1 foot filtration layer below which will in turn be underlain by a 1 foot crushed stone layer with perforated piping to collect and convey infiltration from the system to a dedicated catch basin. This combined system will be enveloped on the sides and bottom by high density polyethylene (HDPE) membrane in order to contain the stormwater and force it through the infiltration media below the R-Tank system components. In order to prevent groundwater intrusion from impacting upon the HDPE enveloped R-Tank system, filtration layer and underlying crushed stone, a dedicated subdrainage system below and along the sides of the HDPE will be required.

Subsurface data at test pits TP-1, TP-100, TP-5084 and TP-5085, which are proximate to the proposed System, indicate a seasonal high water table varying from about 24± inches to 30±

inches below ground surface (bgs). Additionally, top of bedrock was identified in these test pits to vary from about 24± inches to 54± inches bgs.

Based on our review of Sheet C-09, the System will be located within a general topographic high of bedrock. The access road over the proposed System will require cuts varying from about 2± feet to 17± feet, and the bottom of the System will be up to about 29± feet bgs. Most of these cuts will be into bedrock that will require drilling and blasting.

Review of available USGS geologic publications indicates that bedrock at the development site is mapped as consisting of a blastomylonitic quartz-feldspar granitic gneiss and pegmatite intruded into the Rye Complex of the Breakfast Hill Granite of Novotny. Groundwater migration will be through existing joint sets and fractures, as well as new fractures caused by blasting operations. We have estimated the average hydraulic conductivity, k, of this fractured igneous rock formation to be on the order of $3x10^{-4}$ meters per second (m/sec) based on review of representative values presented by Domenico and Schwartz 1990 (an excerpt from their work is attached).

We have modeled this system using a partially penetrating "slot". To be conservative, we take this rectangular System footprint and consider the entire System sides as a "slot" drain with ambient groundwater conditions on the system outside and drawdown conditions on the inside (i.e. within the System footprint).

We have used the methodology developed in the combined design manual entitled "Dewatering and Groundwater Control" prepared by the Army, Navy and Air Force. Refer to the attachments for further reference.

Given these parameters, we modeled the proposed system consistent with the gravity flow model (c) as provided by Figure 4-3 of the aforementioned "Dewatering and Groundwater Control" document. Conservatively we calculate the aggregate system "length" as the sum of all four sides of the overall combined system to be a 300± foot "slot" drain with the requirement that the groundwater level inside the system not rise above the bottom of the underlying composite system. Given this restriction and the measured seasonal high water table conditions, a permanent lowering of the water table inside the system footprint of about 8± feet is required.

Our calculations are attached hereto and show that the anticipated steady state outflow from the proposed dedicated subdrainage system to be constructed below the HDPE enveloped R-Tank system, filtration layer and underlying crushed stone could be as much as about 1,350± gallons per hour. The steady state flow rate would be anticipated to be somewhat lower once groundwater levels equilibrate with the future topographic changes.

In order to minimize rock excavation depths and hence costs, we recommend that the dedicated subdrainage system to be constructed below the HDPE enveloped R-Tank system, filtration layer and underlying crushed stone consist of CCW MiraDRAIN 900 composite with a bottom layer of Mirafi 140N or similar filtration geotextile. The attached cross section provides for an illustration of the recommended drainage system. Additionally, we recommend a minimum 1 foot thickness of ¾ inch crushed stone be placed along the System sidewalls to collect and transmit seepage down to the CCW MiraDRAIN 900.

Next we evaluate the ability of the CCW MiraDRAIN 900 to pass the groundwater influx. The CCW MiraDRAIN 900 has a specified maximum hydraulic capacity of 21 gal/min-ft which exceeds the estimated unit influx rate of 4.5 gal/min-ft. Therefor the CCW MiraDRAIN 900 is adequate for this application.

The next aspect of the system is to consider the hydraulic capacity of a single 6 inch diameter perforated HDPE pipe with smooth interior surface laid at a relatively flat slope of 0.005 (i.e. 6 inches per 100 feet) to be placed along the south side of the System. This perforated HDPE pipe will be wrapped in the same Mirafi 140N geotextile as shown on the attached sketch to collect System drainage along the south side and convey it to a dedicated catch basin. Using the "conveyance factor" method as provided by the ADS, Inc. Drainage Handbook (pertinent excerpts are attached hereto), we calculate a "conveyance factor" of 6.1. The resultant volumetric flow rate able to be conveyed by the pipe is then estimated at 0.43 cfs which is much greater than the total system outflow of 1,350± gallons per hour (i.e. 0.05 cfs). These calculations are attached hereto.

Based on these analyses, the proposed HDPE enveloped R-Tank system, filtration layer and underlying crushed stone System will not be impacted by steady state groundwater flow conditions given the recommended subdrainage system as described herein.

Please do not hesitate to contact the undersigned should you have any questions or if we can be of further assistance at this time.

Very truly yours,
MILONE & MACBROOM, INC.

Charles E. Teale

Charles E. Teale, PE, LSP, LEP
New Hampshire Regional Office manager

Attachments: TFM Sheet C-09, Test Pit Logs and Stormwater Treatment System Section
Domenico and Schwartz 1990 Excerpts
"Dewatering and Groundwater Control" excerpts
CCW MiraDRAIN 9000 Information
Proposed Subdrainage Section
ADS Drainage Manual excerpts
MMI Calculations

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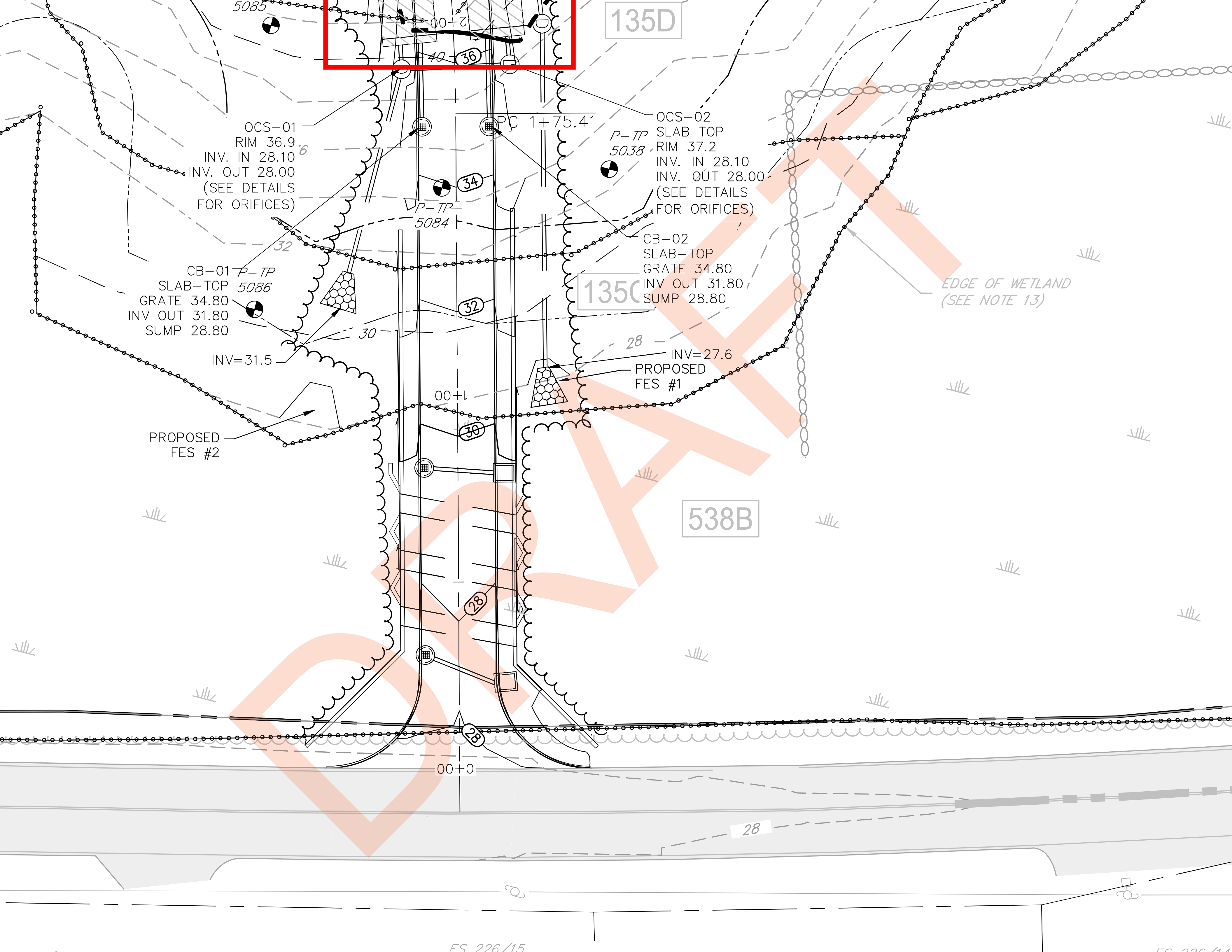
135D
OCS-01
RIM 36.9
INV. IN 28.10
INV. OUT 28.00
(SEE DETAILS
FOR ORIFICES)
PC 1+75.41
OCS-02
SLAB TOP
RIM 37.2
INV. IN 28.10
INV. OUT 28.00
(SEE DETAILS
FOR ORIFICES)
P-TP
5038
P-TP
5084
CB-02
SLAB-TOP
GRATE 34.80
INV OUT 31.80
SUMP 28.80
135C
CB-01
SLAB-TOP
GRATE 34.80
INV OUT 31.80
SUMP 28.80
P-TP
5086
5085
INV=31.5
INV=27.6
PROPOSED
FES #1
PROPOSED
FES #2
EDGE OF WETLAND
(SEE NOTE 13)
538B
1+00
0+00
2+00
DRAFT

GRANULAR, FRIABLE
M, GRANULAR, FRIABLE
OBSERVED WATER: N/A

M, GRANULAR, FRIABLE
M, GRANULAR, FRIABLE
M, PLATY, FIRM,
ATIONS
OBSERVED WATER: N/A

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OBSERVED WATER: N/A

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OBSERVED WATER: N/A

GRANULAR, FRIABLE
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M, PLATY, FIRM,
ATIONS
SERVED WATER: N/A

M, GRANULAR, FRIABLE
M, GRANULAR, FRIABLE

TEST PIT #5027:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–20 INCHES, 10YR 5/5, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 20 INCHES OBSERVED WATER: N/A

TEST PIT #5028:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
4–36 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT # 5029:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2–8 INCHES, 10YR 4/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
8–24 INCHES, 10YR 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24–40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
40–44 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 40 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

TEST PIT #5030:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–8 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
8–30 INCHES, 2.5Y 7/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
30–40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 30 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5031:
0–5 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
5–12 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12–24 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
24–40 INCHES, 2.5Y 6/4, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

TEST PIT #5032:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3–6 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
6–14 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
14–36 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

TEST PIT #5033:
0–2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2–15 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
15–23 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
23–52 INCHES, 2.5Y 4/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 30% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: N/A OBSERVED WATER: N/A

TEST PIT #5038:
0–4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRA
4–14 INCHES, 10YR 4/6, FINE SANDY LOAM, GR
14–24 INCHES, 6/4, GRAVELY FINE SANDY LOA
24–60 INCHES, 2.5Y 5/2, SILT LOAM, BLOCKY,
CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVED

TEST PIT #5038B:
0–2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
2–14 INCHES, 10YR 5/6, FINE SANDY LOAM, GR
14–24 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY
FRIABLE
24–29 INCHES, 2.5Y 6/3, FINE SANDY LOAM, M
29–40 INCHES, 2.5Y 6/3, FINE SANDY LOAM, M
REDOX CONCENTRATIONS
ESHWT: 29 INCHES REFUSAL: 40 INCHES OB

TEST PIT #5039:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
3–24 INCHES, 2.5Y 4/6, FINE SANDY LOAM, GR
ESHWT: N/A REFUSAL: 24 INCHES OBSERVE

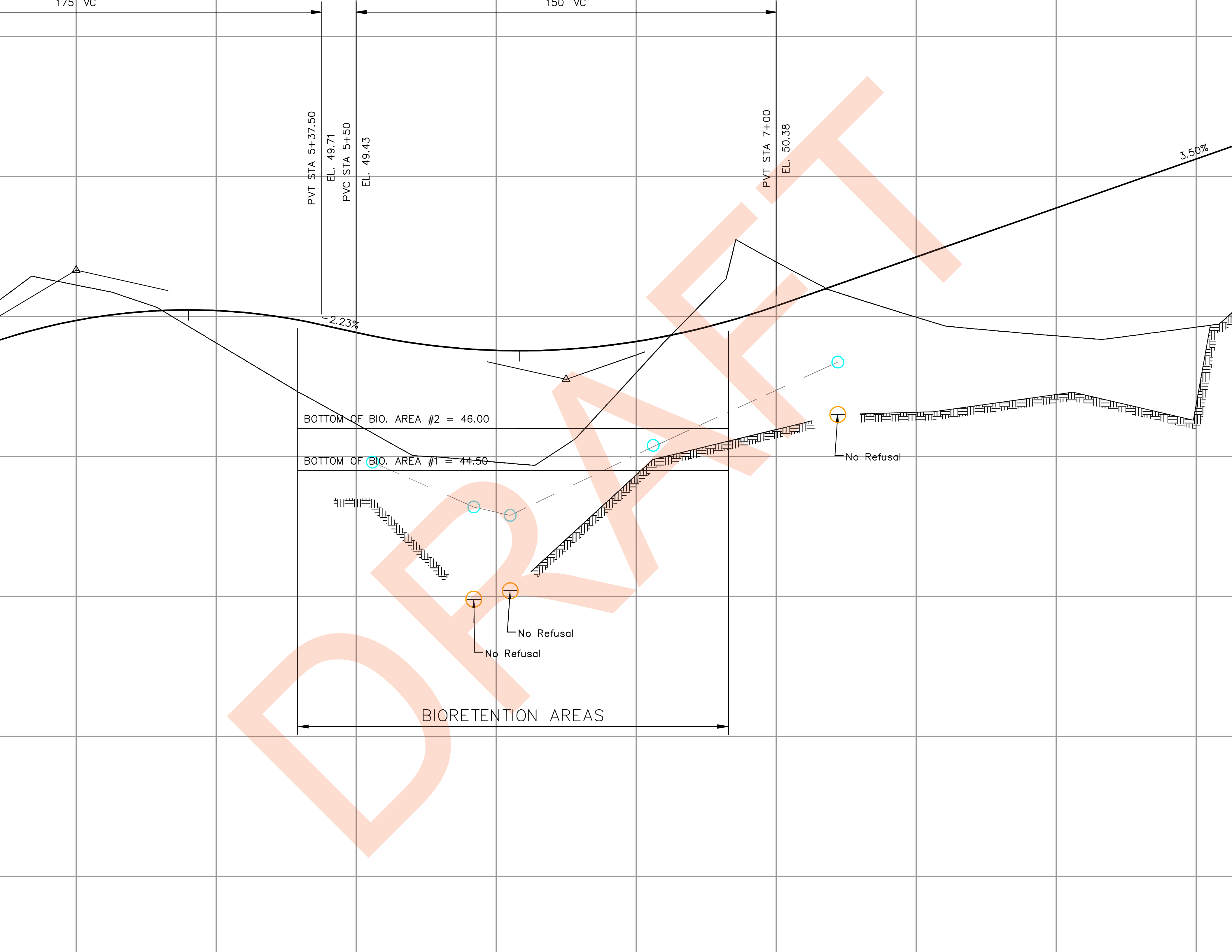
TEST PIT #5040:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
3–30 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GR
30–38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY
ESHWT: N/A REFUSAL: 38 INCHES OBSERVE

TEST PIT #5041:
0–3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
3–20 INCHES, 10YR 4/6, FINE SANDY LOAM, GF
ESHWT: N/A REFUSAL: 20 INCHES OBSERVE

TEST PIT #5084:
0–6 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
6–24 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY
FRIABLE
24–38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY
FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 38 INCHES OB

TEST PIT #5085:
0–4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRA
4–24 INCHES, 10YR 5/6, FINE SANDY LOAM, GF
ESHWT: N/A REFUSAL: 24 INCHES OBSERVE

TEST PIT #5086:
0–6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRA
6–24 INCHES, 2.5Y 5/6, FINE SANDY LOAM, GR
24–68 INCHES, 2.5Y 5/2, FINE SANDY LOAM, M
REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVE


175' VC
150' VC
PVT STA 5+37.50
EL. 49.71
PVC STA 5+50
EL. 49.43
PVT STA 7+00
EL. 50.38
3.50%
-2.23%
BOTTOM OF BIO. AREA #2 = 46.00
BOTTOM OF BIO. AREA #1 = 44.50
No Refusal
No Refusal
No Refusal
BIORETENTION AREAS
DRAFT

Representative Values

The following tables show representative values of hydraulic conductivity for various unconsolidated sedimentary materials, sedimentary rocks and crystalline rocks (from Domenico and Schwartz 1990):

Unconsolidated Sedimentary Materials	
Material	**Hydraulic Conductivity (m/sec)**
Gravel	3×10^{-4} to 3×10^{-2}
Coarse sand	9×10^{-7} to 6×10^{-3}
Medium sand	9×10^{-7} to 5×10^{-4}
Fine sand	2×10^{-7} to 2×10^{-4}
Silt, loess	1×10^{-9} to 2×10^{-5}
Till	1×10^{-12} to 2×10^{-6}
Clay	1×10^{-11} to 4.7×10^{-9}
Unweathered marine clay	8×10^{-13} to 2×10^{-9}

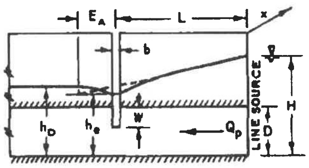
Sedimentary Rocks	
Rock Type	**Hydraulic Conductivity (m/sec)**
Karst and reef limestone	1×10^{-6} to 2×10^{-2}
Limestone, dolomite	1×10^{-9} to 6×10^{-6}
Sandstone	3×10^{-10} to 6×10^{-6}
Siltstone	1×10^{-11} to 1.4×10^{-8}
Salt	1×10^{-12} to 1×10^{-10}
Anhydrite	4×10^{-13} to 2×10^{-8}
Shale	1×10^{-13} to 2×10^{-9}

Crystalline Rocks	
Material	**Hydraulic Conductivity (m/sec)**
Permeable basalt	4×10^{-7} to 2×10^{-2}
Fractured igneous and metamorphic rock	8×10^{-9} to 3×10^{-4}
Weathered granite	3.3×10^{-6} to 5.2×10^{-5}
Weathered gabbro	5.5×10^{-7} to 3.8×10^{-6}
Basalt	2×10^{-11} to 4.2×10^{-7}
Unfractured igneous and metamorphic rock	3×10^{-14} to 2×10^{-10}

ARMY TM 5-818-5
NAVY NAVFAC P-418
AIR FORCE AFM 88-5, Chap 6

DEWATERING
AND
GROUNDWATER CONTROL

DEPARTMENTS OF THE ARMY, THE NAVY, AND THE AIR FORCE
NOVEMBER 1983



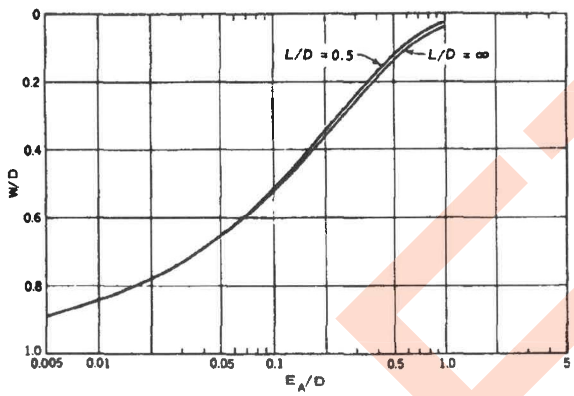
FLOW

$$Q_p = \frac{kDx(H-h_e)}{L+E_A} \qquad (1)$$

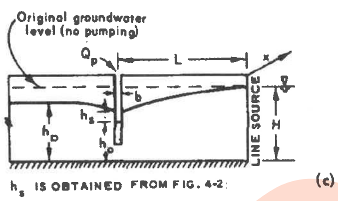
MAX RESIDUAL HEAD DOWNSTREAM OF SLOT

$$h_D = \frac{E_A(H-h_e)}{L+E_A} + h_e \qquad (2)$$

WHERE E_A IS AN ADDITIONAL LENGTH FACTOR OBTAINED FROM THE FIGURE BELOW



ARTESIAN FLOW



FLOW

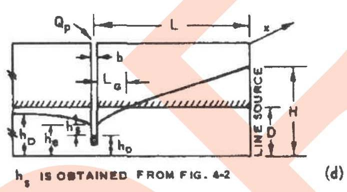
$$Q_p = \left(0.73 + 0.27\frac{H-h_o}{H}\right)\frac{kx}{2L}(H^2-h_o^2) \qquad (3)$$

WHERE $L \geqq 3H$

MAX RESIDUAL HEAD DOWNSTREAM OF SLOT

$$h_D = h_o\left[\frac{1.48}{L}(H-h_o)+1\right] \qquad (4)$$

GRAVITY FLOW



FLOW

$$Q_p = \frac{kDx(H-D)}{L-L_o} \qquad (5)$$

MAX RESIDUAL HEAD DOWNSTREAM OF SLOT†

$$h_D = h_o\left[\frac{1.48}{L_o}(D-h_o)+1\right] \qquad (6)$$

PROVIDED $h_D \leqq D$; $L_o \geqq 3D$

$$\text{WHERE } L_o = \frac{L(D^2-h_o^2)\left(0.73+0.27\frac{D-h_o}{D}\right)}{2D(H-D)+(D^2-h_o^2)\left(0.73+0.27\frac{D-h_o}{D}\right)} \qquad (7)$$

COMBINED ARTESIAN AND GRAVITY FLOWS

(Modified from "Foundation Engineering," G. A. Leonards, ed., 1962. McGraw-Hill Book Company. Used with permission of McGraw-Hill Book Company.)

Figure 4-3. Flow and head for partially penetrating line slot; single-line source; artesian, gravity, and combined flows.

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WATERPROOFING

MiraDRAIN 9000

Description

CCW MiraDRAIN 9000 is a high-performance, high-strength drainage composite consisting of a three-dimensional, high-impact polypropylene core and a woven filter fabric. The filter fabric is bonded to the individual dimples of the molded polypropylene core to minimize fabric intrusion into the flow channels caused by overburden pressure. The fabric serves as a filter medium to prevent the passage of particles into the core, while allowing surface moisture to pass freely. CCW MiraDRAIN 9000's woven, monofilament fabric withstands high abrasion from applied overburden and prevents intrusion into the drainage core due to its low elongation characteristics. The woven fabric is better suited to receive a directly poured concrete topping than nonwoven geotextile fabrics.

CCW MiraDRAIN 9000 is designed for use in horizontal plaza, roof deck and between-slab drainage applications where single-sided subsurface drainage is required. CCW MiraDRAIN 9000 also serves as a protection course when used in conjunction with CCW Waterproofing Membranes.

Features and Benefits

- Relieves hydrostatic pressure buildup
- Consistent and proven long-term performance due to a multi-directional core configuration providing a uniform flow path for water to escape
- High-flow drainage capacity ensuring effective drainage for virtually any horizontal application
- No-clogging drainage performance
- High-compressive-strength system withstands overburden stresses
- Enhances waterproofing system by channeling water away and providing a secondary water retention layer
- Cost-saving, lightweight, easy-to-install panels eliminate the need for bringing aggregate to the construction site

Installation

CCW MiraDRAIN prefabricated drainage panels may be installed in a variety of construction applications. They may be installed in split slabs, plaza decks and planter applications. CCW MiraDRAIN can be cut with a utility knife or scissors. Concrete may be placed directly onto either side of the panels. The panels can terminate at the top of the footing and are flexible enough to form right angles to cover the top of the footing. CCW MiraDRAIN eliminates the need for a protection course over waterproofing systems. Native soils can be used over CCW MiraDRAIN. (Contact your local CCW representative for specific guidelines). The CCW MiraDRAIN should be attached with CCW CAV-GRIP, CCW Contact Adhesive or SecurTAPE™. Apply CCW CAV-GRIP or CCW Contact Adhesive over entire surface of waterproofing membrane and back side of MiraDRAIN and mate the two surfaces together.

For standard installation details, follow the CCW MiraDRAIN detail drawings. For non-standard installation instructions contact your local Carlisle Coatings & Waterproofing representative.

Underslab / Horizontal Applications

Floor Slabs and Concrete-Lined Channels

Proper preparation of the subgrade will require grading to a 2% minimum slope. The area of installation should be clear of rubble, rock, large soil clods, etc. Place CCW MiraDRAIN with the fabric side toward the soil. The flange of the second and subsequent panels should be placed over the back side of the preceding dimpled core and butted as close as possible to the preceding panel. The panel joints, longitudinal and transverse on the CCW MiraDRAIN core, should be sealed with a strip of CCW-705, CCW-701 or duct tape. This will aid in preventing concrete or soil from intruding into the CCW MiraDRAIN core during subsequent construction phases. Construction traffic should be minimized over the installed CCW MiraDRAIN. Sand and/or concrete may be poured directly over the CCW MiraDRAIN core.

Planters

Place the CCW MiraDRAIN in the planter so that the fabric on the vertical and horizontal surfaces faces the soil. Utilize the installation procedures and attachment method appropriate for the type of substrate. Overlap the fabric of the vertical panel onto the horizontal panel at the transition point. If cutting of the panels is required, exposed cuts must be covered with supplemental pieces of filter fabric to prevent soil intrusion. A minimum overlap of 6" (15 cm) will be required to cover cut sections.

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WATERPROOFING

MiraDRAIN 9000

Plaza Decks

Place fabric side up over a properly waterproofed substrate. The panels should be placed so that water runs with the overlap not against it. Secure CCW MiraDRAIN to the substrate with ballast or CCW CAV-GRIP, CCW Contact Adhesive or SecurTAPE to hold it in place. The first panels should be placed with the flanged edge uphill. Cut the fabric along the flange edge and strip off this fabric exposing the edge of the core and the flange. Place the dimpled edge over the preceding flanged edge to join the next panel. Secure the remaining fabric flap with CCW CAV-GRIP, CCW Contact Adhesive, CCW-704 Mastic, CCW LM800-XL, Aluma-Grip 701 or duct tape. Terminal edges that have been cut will require a supplemental piece of filter fabric to seal the panel from soil intrusion and if there is insufficient fabric, the core shall be cut out from the fabric by a depth of 3 dimples to provide excess fabric for wrapping behind the core.

Drainage Collector/Discharge System

Collector Pipe

Place collector pipe as required in design details. For installations where a collector pipe is specified, encapsulate the collector pipe in a gravel bed with a supplemental section of filter fabric as a separator/filter.

Limitations

- Limit ultraviolet exposure by backfilling within 30 days of installation. Any panels damaged during installation should be replaced by the installer.
- CCW MiraDRAIN is resistant to chemicals in normal soil environments. However, some reagents may affect its performance. Consult CCW representatives concerning the suitability of CCW MiraDRAIN in unusual soil environments.

Packaging

4' x 50' (1.22 m x 15.24 m) rolls

CCW MiraDRAIN 9000 is made in the USA and is sold through a highly qualified sales representative network.

Typical Properties

Property	Method	Unit	Typical Value
CORE			
Thickness	ASTM D1777	in (mm)	0.40 (10.16)
Compressive Strength	ASTM D1621 (mod)	psf (kPa)	21,000 psi
Maximum Flow Rate	ASTM D4716	gpm/ft (l/min/m)	23 gpm/ft
FABRIC			
Apparent Opening Size	ASTM D4751	US Std Sieve (mm)	40 (0.43)
Water Flow Rate	ASTM D4491	gpm/ft2 (l/min/m)	145 (5,907)
Grab Tensile Strength	ASTM D4632	lbs (N)	365 (1624)
Grab Longation	ASTM D4632	%	24
CBR Puncture Strength	ASTM D6241	lbs (N)	675 (3004)

Limited Warranty

Carlisle Coatings & Waterproofing Incorporated (Carlisle) warrants this product to be free of defects in workmanship and materials only at the time of shipment from our factory. If any Carlisle materials prove to contain manufacturing defects that substantially affect their performance, Carlisle will, at its option, replace the materials or refund its purchase price. This limited warranty is the only warranty extended by Carlisle with respect to its materials. There are no other warranties, including the implied warranties of merchantability and fitness for a particular purpose. Carlisle specifically disclaims liability for any incidental, consequential, or other damages, including but not limited to, loss of profits or damages to a structure or its contents, arising under any theory of law whatsoever. The dollar value of Carlisle's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the Carlisle material in question.

Carlisle Coatings & Waterproofing
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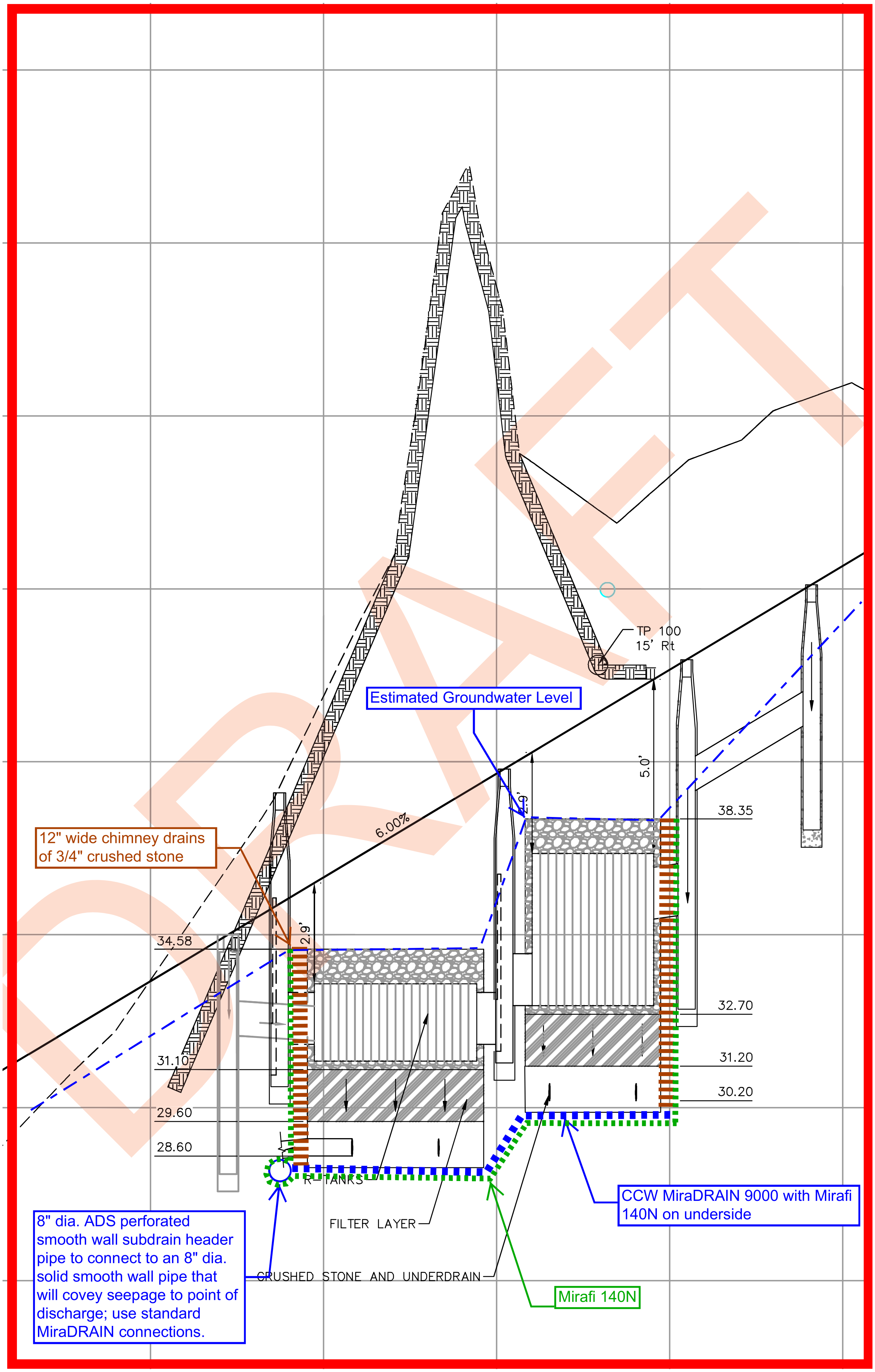

DRAFT
TP 100
15' Rt
Estimated Groundwater Level
5.0'
2.9'
6.00%
38.35
12" wide chimney drains
of 3/4" crushed stone
2.9'
34.58
32.70
31.10
31.20
30.20
29.60
28.60
R-TANKS
FILTER LAYER
CCW MiraDRAIN 9000 with Mirafi
140N on underside
8" dia. ADS perforated
smooth wall subdrain header
pipe to connect to an 8" dia.
solid smooth wall pipe that
will covey seepage to point of
discharge; use standard
MiraDRAIN connections.
CRUSHED STONE AND UNDERDRAIN
Mirafi 140N

3-3 THE CONVEYANCE METHOD

Conveyance provides a convenient means of selecting a variety of pipe options that will satisfy a project's flow requirements. Conveyance factors are based on a greatly simplified version of the Manning's equation shown in Equation 3-1 and 3-1 (a). In the following discussion, example problems and subsequent sections, the pipe is assumed to be flowing full. This assumption typically allows for a simplified, yet accurate analysis of the given conditions. Each project should be evaluated on a case-by-case basis to determine the best, most-representative design method.

$$Q = \frac{(1.486)(A)(R^{2/3})(S^{1/2})}{n}$$ Equation 3-1

Where:

Q = pipe capacity, (cfs)
n = Manning's "n"
A = cross-sectional flow area of the pipe (ft.^{2})
R = hydraulic radius (ft.):

$$R = \frac{A}{P}$$

P = Wetted perimeter (ft); Pipe inside circumference, or (π)(inside diameter) for full flowing pipe conditions

S = pipe slope (feet/foot)

Or, in metric units:

$$Q = \frac{(A)(R^{2/3})(S^{1/2})}{n}$$ Equation 3-1(a)

Where:

Q = pipe capacity, m^3/s
n = Manning's "n"
A = cross-sectional flow-area of the pipe (m^2)
P = Wetted perimeter (ft); Pipe circumference, or (π)(diameter) for full flowing pipe conditions

R = hydraulic radius (m),

$$R = \frac{A}{P}$$

S = pipe slope (m/m)

For a specific full-flowing pipe installation, the parameters n, A, and R are easily defined constants. The flow-carrying ability, or conveyance factor, of the pipe can then be defined as shown in Equation 3-2 or 3-2(a).

$$k = \frac{(1.486)(A)(R^{2/3})}{n}$$ Equation 3-2

Or, in metric units:

$$k = \frac{(A)(R^{2/3})}{n}$$ Equation 3-2(a)

By substitution, the Manning's formula can then be reduced to the following equation.

$$Q = kS^{1/2}$$ Equation 3-3

Equation 3-3 can also be written as shown in Equation 3-4.

$$k = \frac{Q}{S^{1/2}}$$ Equation 3-4

Direct substitution of design conditions into Equation 3-4 will determine the minimum conveyance factor allowed. Table 3-2 or 3-2 is then used as a guide to select a pipe having a conveyance factor of at least that calculated.

Table 3-1 and 3-2 require knowledge of the Manning's "n" value. These tables can also be used for any materials if the specific Manning's "n" is known.

The Manning's "n" is a critical value in the conveyance concept. Among pipes of the same diameter and slope, Manning's "n" will be the only factor that will have an effect on conveyance, and therefore capacity. When comparing identical field conditions, conveyance has a direct relationship to capacity. That is, if the slope is held constant, tripling conveyance will triple the capacity; halving conveyance will halve the capacity.

Example problems involving conveyance factors are explained in a subsequent section.

Table 3-1
Conveyance Factors (Standard Units)

Design Manning's Values for ADS Thermoplastic Pipe *		
Product	**Diameter**	**Design Manning's "n"**
N-12, MEGA GREEN, N-12 STIB, N-12 WTIB, HP STORM, SaniTite, SaniTite HP, N-12 Low Head	4" - 60"	"n" = 0.012
Single Wall Highway and Heavy Duty *	18" - 24" 12" - 15" 10" 8" 3" - 6"	"n" = 0.020 "n" = 0.018 "n" = 0.017 "n" = 0.016 "n" = 0.015
TripleWall and Smoothwall Sewer & Drain	3" - 6"	"n" = 0.009 **
Conveyance Equations: k = Q/(s^0.5) Q = k s^0.5		

Conveyance Factors for Circular Pipe Flowing Full																		
		Manning's "n" Values																
Dia. (in.)	Area (sq. ft.)	0.009	0.010	0.011	0.012	0.013	0.014	0.015	0.016	0.017	0.018	0.019	0.020	0.021	0.022	0.023	0.024	0.025
3	0.05	1.3	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
4	0.09	2.7	2.5	2.2	2.1	1.9	1.8	1.6	1.5	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.0	1.0
6	0.20	8.1	7.3	6.6	6.1	5.6	5.2	4.9	4.6	4.3	4.1	3.8	3.6	3.5	3.3	3.2	3.0	2.9
8	0.35	17.5	15.7	14.3	13.1	12.1	11.2	10.5	9.8	9.2	8.7	8.3	7.9	7.5	7.1	6.8	6.5	6.3
10	0.55	31.6	28.5	25.9	23.7	21.9	20.3	19.0	17.8	16.8	15.8	15.0	14.2	13.6	12.9	12.4	11.9	11.4
12	0.79	51.5	46.3	42.1	38.6	35.6	33.1	30.9	28.9	27.2	25.7	24.4	23.2	22.1	21.1	20.1	19.3	18.5
15	1.23	93.3	84.0	76.3	70.0	64.6	60.0	56.0	52.5	49.4	46.7	44.2	42.0	40.0	38.2	36.5	35.0	33.6
18	1.77	151.7	136.6	124.1	113.8	105.0	97.5	91.0	85.3	80.3	75.9	71.9	68.3	65.0	62.1	59.4	56.9	54.6
21	2.41	228.9	206.0	187.3	171.6	158.4	147.1	137.3	128.7	121.2	114.4	108.4	103.0	98.1	93.6	89.6	85.8	82.4
24	3.14	326.8	294.1	267.3	245.1	226.2	210.1	196.1	183.8	173.0	163.4	154.8	147.0	140.0	133.7	127.9	122.5	117.6
27	3.98	447.3	402.6	366.0	335.5	309.7	287.6	268.4	251.6	236.8	223.7	211.9	201.3	191.7	183.0	175.0	167.8	161.0
30	4.91	592.5	533.2	484.7	444.3	410.2	380.9	355.5	333.3	313.7	296.2	280.6	266.6	253.9	242.4	231.8	222.2	213.3
33	5.94	763.9	687.5	625.0	572.9	528.9	491.1	458.3	429.7	404.4	382.0	361.9	343.8	327.4	312.5	298.9	286.5	275.0
36	7.07	963.4	867.1	788.2	722.6	667.0	619.3	578.0	541.9	510.0	481.7	456.4	433.5	412.9	394.1	377.0	361.3	346.8
42	9.62	1453.2	1307.9	1189.0	1089.9	1006.1	934.2	871.9	817.5	769.4	726.6	688.4	654.0	622.8	594.5	568.7	545.0	523.2
45	11.04	1746.8	1572.1	1429.2	1310.1	1209.3	1122.9	1048.1	982.6	924.8	873.4	827.4	786.1	748.6	714.6	683.5	655.0	628.8
48	12.57	2074.8	1867.4	1697.6	1556.1	1436.4	1333.8	1244.9	1167.1	1098.4	1037.4	982.8	933.7	889.2	848.8	811.9	778.1	746.9
54	15.90	2840.5	2556.4	2324.0	2130.4	1966.5	1826.0	1704.3	1597.8	1503.8	1420.2	1345.5	1278.2	1217.4	1162.0	1111.5	1065.2	1022.6
60	19.63	3762.0	3385.8	3078.0	2821.5	2604.4	2418.4	2257.2	2116.1	1991.6	1881.0	1782.0	1692.9	1612.3	1539.0	1472.1	1410.7	1354.3
72	28.27	6117.3	5505.6	5005.1	4588.0	4235.1	3932.6	3670.4	3441.0	3238.6	3058.7	2897.7	2752.8	2621.7	2502.5	2393.7	2294.0	2202.2

* Corrugated Polyethylene Pipe Association (2000) "Hydraulic Considerations for Corrugated Polyethylene Pipe"
** "Lingedburg, Michael, "Civil Engineer Reference Manual"[4]

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JOB THE VILLAGE AT BANFIELD WOODS
SHEET NO. 1 OF
SCALE NTS
CALCULATED BY [initials]
DATE 2/26/20
CHECKED BY
DATE

ESTIMATE FLOW INTO THE COMBINED STORMWATER TREATMENT SYSTEM #1 AND #2 COLLECTIVELY. REFER TO TFM SITE DEVELOPMENT PLANS FOR "THE VILLAGE AT BANFIELD WOODS" DATED SEPTEMBER 25, 2019.

ASSUMPTIONS USED IN THIS ASSESSMENT:

1) GROUNDWATER @ 2'± ABOVE TOP OF SYSTEMS #1 AND #2 OR ABOUT 2'± BELOW TOP OF PAVEMENT.
2) BOTTOM AND SIDES OF BOTH SYSTEMS TO BE ENVELOPED WITH IMPERVIOUS BARRIER RESULTING IN NO LEAKAGE.
3) BOTH SYSTEMS WILL BE UNDERLAIN WITH A SYNTHETIC DRAINAGE MEDIUM, CCW MIRADRAIN 9000, THAT HAS A MAX DRAINAGE CAPACITY OF 21 $\frac{GAL}{MIN/FT}$
4) A 6" Ø PERFORATED SUBDRAIN WILL BE PLACED ALONG THE SOUTH SIDE OF THE SYSTEM PROXIMATE TO STA 1+95± THAT WILL CONVEY COLLECTED SEEPAGE BY GRAVITY AWAY FROM THE SYSTEM.
5) A 12" THICK CRUSHED STONE LAYER WILL ALSO BE PLACED BETWEEN THE VERTICAL ROCK CUTS AND THE IMPERVIOUS SIDE WALLS OF THE SYSTEMS.
6) BEDROCK AT THE SITE IS MAPPED AS THE "RYE COMPLEX, BREAKFAST HILL GRANITE OF NOVOTNY".
7) ROCK REMOVAL WILL REQUIRE DRILLING + BLASTING.
8) GROUNDWATER WILL MIGRATE THROUGH BEDROCK JOINTS + FRACTURES + ZONES OF OVERBLAST ROCK.
9) FROM DOMENICO + SCHWARTZ 1990, WE USE A HYDRAULIC CONDUCTIVITY OF 3×10^{-4} m/SEC FOR FRACTURED IGNEOUS ROCK.
10) USE FIG 4-3 OF THE COMBINED ARMY (TM5-818-5), NAVY (P-418) + AIR FORCE (AFM 88-5, CHPT 6) DATED NOV. 1983 FOR A PARTIALLY PENETRATING LINE SLOT DRAINAGE SYSTEM.
11) CONSERVATIVELY ASSUME INFILTRATION ON ALL SIDES OF THE COMBINED BASINS EQUALING ABOUT 300'± LF.

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SHEET NO. 2 OF
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DATE 2/26/20
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DATE

12) REFER TO FIG 4.3 FOR DIMENSION DETAILS FOR GRAVITY FLOW MODEL.

FROM FIG 4.3 – GRAVITY FLOW

$$Q_p = \left(0.73 + 0.27\left(\frac{H - h_o}{H}\right)\right)\frac{K}{2L}\left(H^2 - h_o^2\right)$$

$H = 8'\pm$ TO $10'\pm$; USE $10'\pm$

h_o = THICKNESS OF DRAINAGE LAYER $\approx 0.5''\pm \approx 0.04'\pm$ (CCW MIRADRAIN 9000)

$L = 100'\pm$ (ASSUMED)

$K = 3\times10^{-4}$ m/sec = 3.6 FT/HR

$$Q_{p(1\,FT)} = \left(0.73 + 0.27\left(\frac{10 - 0.04}{10}\right)\right)\frac{3.6}{2(100)}\left(10^2 - 0.04^2\right) = 0.60\ \frac{FT^3}{HR/FT}$$

$$= 4.5\ \frac{GAL}{HR/FT}$$

ASSUME INFILTRATION OVER ALL FOUR SIDES – CONTRIBUTING LENGTH $\approx$ 42' WIDE BY 44' LONG (COMBINED FOOTPRINT)

TOTAL PERIMETER LENGTH $\approx 300'\pm$ LF

$$Q_{p(300\,FT)} = 4.5(300) = 1{,}350\ \frac{GAL}{HR}$$

NOW CHECK PERMEABILITY OF CCW MIRADRAIN 9000 TO ABSORB AND TRANSMIT 1,350 GAL/HR. MAX FLOW RATE THROUGH CCW MIRADRAIN 9000 IS 21 $\frac{GAL}{MIN/FT}$ OR 1,260 $\frac{GAL}{HR/FT}$. SINCE ALL DRAINAGE WILL

BE CONVEYED TO THE SOUTH PERIMETER WITH A LENGTH OF 42 FT, EACH FT OF THE DRAIN MUST PASS AT LEAST 4.5 GAL/HR/FT

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JOB THE VILLAGE AT BANFIELD WOODS
SHEET NO. 3 OF 3 SCALE NTS
CALCULATED BY [initials] DATE 2/26/20
CHECKED BY DATE

SINCE THE DRAIN CAN PASS 1,260 $\frac{GAL}{HR/FT}$ >> 4.5 $\frac{GAL}{HR/FT}$

THE CCW MIRADRAIN 9000 IS HYDRAULICALLY ADEQUATE TO ABSORB AND CONVEY THE GROUNDWATER SEEPAGE.

NOW CHECK HYDRAULIC CONDUCTIVITY OF THE 6" HDPE SUBDRAIN TO BE LOCATED ALONG SOUTH SIDE OF SYSTEM.

TO ESTIMATE THE CAPACITY OF A 6" HDPE SMOOTH WALL PERFORATED PIPE, REFER TO THE "CONVEYANCE FACTOR" AS TABULATED ON TABLE 3.1 OF THE ADS DRAINAGE HANDBOOK FOR A MANNINGS "n" VALUE OF 0.012. THE CONVEYENCE FACTOR "K" IS SHOWN AS 6.1.

FROM ADS EQUATION 3-3:

$$Q = K\left(S^{0.5}\right)$$ WHERE S IS THE SLOPE OF THE PIPE

FOR A RELATIVELY FLAT SLOPE OF 6" PER 100'

$$Q = 6.1\left(0.005^{1/2}\right) = 0.43 \ \frac{FT^3}{S}$$

SINCE THE SUBDRAIN MUST PASS A COMBINED FLOW OF AT LEAST 1,350 $\frac{GAL}{HR}$ OR 0.05 $\frac{FT^3}{S}$, THE 6"Ø ADS PERFORATED SMOOTH BORE PIPE IS ADEQUATE.

Job #47361.00

DRAINAGE ANALYSIS

F O R

The Village at Banfield Woods

0 Banfield Road
County of Rockingham
Portsmouth, New Hampshire

Tax Map 256, Lot 2

STATE OF NEW HAMPSHIRE
JOHN J. McTIGUE
No. 14950
LICENSED
PROFESSIONAL ENGINEER

December 27, 2019
Last Revised March 23, 2020

Prepared By:

TFM MSC
A division of TFMoran, Inc.
Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

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1.0 SUMMARY

This drainage study was completed to assess the pre- and post-development runoff rates for the proposed subdivision for the 2-year, 10-year, 25-year, and the 50-year storm events. There is no increase in drainage flows in the post development study.

In addition, Best Management Practices were developed to formulate a plan that assures stormwater quality both during and after construction. The following summarizes the findings from the study.

1.1 - Pre- and Post-Development Flow Comparison

The pre- and post-development watershed areas have been analyzed for each of the six lots. Table 1 compares pre- and post-development peak runoff rates during all storm events analyzed for each Point of Interest.

The drainage flows in post development remain the same of show a slight decrease for the Pre-Development Flows.

Area Number	2-Year (Flow - cfs)		2-Year (Volume - cf)		10-Year (Flow - cfs)		25-Year (Flow - cfs)		50-Year (Flow - cfs)	
	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.	Pre-Dev.	Post Dev.
POI-1	0.3	0.3	3,189	3,189	1.1	1.1	1.8	1.8	2.5	2.5
POI-2	11.5	10.1	176,319	182,572	21.8	21.6	42.7	41.4	70.4	68.5
Total Volume			179,508	185,761						

Table 1 - Pre and Post Flows

1.2 – Best Management Practices

Best Management Practices have been incorporated into the drainage design which provide for temporary erosion control measures during the construction process and permanent erosion control measures after construction is complete. Temporary measures include construction sequencing, silt barriers and provisions for stabilization of inactive areas. Permanent erosion control measures include turf establishment on all disturbed areas that have not been paved, one bioretention area, two hybrid bioretention areas and on underground stormwater treatment area consisting of 4 sets of tanks using R-tank chambers and engineered soil filtration.

2.0 - PROJECT DESCRIPTION

The existing lot is a 44.884 acre. The proposed development will only effect 17% of the lot with a 5% impervious cover.

The proposal is for a multi-family condominium site comprising of 22 single-family dwelling units. This project has been before the Technical Advisory Committee in work sessions and one review meeting and the Conservation Commission. This site has a significant amount of upland, surrounded by wetlands. We have worked on solutions to minimize impacts to the wetlands and their 100' buffers.

The disturbance on the lot is limited to the western section of the lot. This is the area focused on for the drainage report. The calculations show that the proposed drainage flows remain the same or slightly less than the existing drainage flows.

3.0 - CALCULATION METHODS

The design storms analyzed in this study are the 2-year, 10-year, 25-year and the 50-year, 24-hour storm events. The software program, HydroCAD version 10.00[1] was utilized to calculate the peak runoff rates from these storm events. The program estimates the peak rates using the TR-20 method. A Type III storm pattern was used in the model. Rainfall frequencies for the analyzed region were also incorporated into the model. Rainfall frequencies from the Northeast Regional Climate Center were used to determine the storm-event intensities, see Table 2. Design standards were taken from the New Hampshire Stormwater Manual, December 2008[2].

PRECIPITATION ESTIMATES	
Storm-Event (yr)	Rainfall (in)
2	3.24
10	4.91
25	6.23
50	7.46

Table 2 - Precipitation Estimates

Time of Concentration is the time it takes for water to flow from the most hydraulically remote point to the watershed outlet following the route that takes the longest watercourse length. This time is determined by calculating the time it takes runoff to travel this route under one of three hydrologic conditions: sheet flow, shallow concentrated flow or channel flow. Because the Intensity-Duration-Frequency (IDF) curve is steep with short T_C's, estimating the actual intensity is subject to error and

[1] HydroCAD version 10.00, HydroCAD Software Solutions LLC, Chocorua, NH, 2013.
[2] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

overestimates actual runoff. Due to this, the T_C's are adjusted to a minimum of 5 minutes.

The National Resources Conservation Service (NRCS) Web Soil shows that approximately half the soil in the area to be (140) Chatfield-Hollis-Canton complex, 0 to 15 percent slopes and rocky. Chatfield soil is well drained soil with high runoff potential. It is grouped as a Hydrologic Soil Group B soil. Hollis soil is somewhat-excessively-drained with a very high runoff potential and grouped as a Hydrologic Soil Group D soil. Canton soil is a well-drained soil with a low runoff potential. It is grouped as a Hydrologic Soil Group B soil.

The next major soil group in the study area is (538) Squamscott fine sandy loam, 0 to 5 % slopes. It is a poorly-drained with a medium runoff potential and grouped as a Hydrologic Soil Group C/D soil.

The remainder of the soil is classed as (134) Maybid silt loam, 0 to 5 % slopes, and (38) Edlridge fine sandy loam, 3 to 8 % slopes. Neither of these are in the area being developed, both are grouped as a Hydrologic Soil Group C/D soil. See Appendix G for more detail.

Curve number are based on the soil's hydrologic properties, ranging from 30 to 100. The lower numbers indicate the soils have less runoff potential (amount of rainwater that is not retained) and higher curve numbers indicate high runoff potential. Several curve numbers were used in the analysis of this property. For areas in the buffer that were going to be mowed, at most, once a year, a curve number was used that was more than the original undisturbed woods and less than well maintained lawns.

Existing Woods - Woods Good	55	70
Powerlines – Powerlines - Brush, Good	48	65
Wetlands – Brush, Good	48	65
Lawns - >75% Grass Cover, Good	61	74
Restored Buffer Areas – Woods Grass Combo, Good	58	72
(Areas that would be mowed one or less times a year)		
Roads and Driveways – Paved Parking	98	98
Houses – Roofs	98	98

4.0 – PRE-DEVELOPMENT CONDITION

There are nine watershed areas that have been used to identify the pre-development conditions. The pre-development watersheds are depicted on the attached plan entitled “Pre-Development Drainage Plan,” Appendix I - Sheet D-1.

Except for a small portion in the northeast corner of the lot, stormwater from offsite and onsite drain to two ‘valleys’ in the property. The first of these areas is orientated in a north/south direction near the middle of the property. The second area is orientated in the east/west direction, just north of Banfield Road. Wetlands exists in both of these areas.

The two low areas direct the water to two culverts near the middle of the property that direct water under Banfield road to the property to the south of Banfield Road.

See Table 1 for Pre-development Stormwater Flows Offsite. Appendix A in this Drainage Study documents the peak runoff rates. Appendix B and C in this Drainage Study documents the computations for these peak stormwater flows.

5.0 – POST-DEVELOPMENT CONDITION

There are 22 drainage areas that have been used to define identify the post development conditions. Post-development watershed areas are depicted on the attached plan entitled “Post-Development Drainage Plan,” Appendix I - Sheet D-2.

Table 1 summarizes the Post-Development Stormwater Flows Offsite for the 2-year, 10-year, 25-year and 50-year Type III storm events for the watershed areas. Appendix A in this Drainage Study documents the peak runoff rates. Appendix D and E in this Drainage Study documents the computations for these peak stormwater flows.

Four deep sump curb inlets are used at the entrance to the site to capture water and provide some pretreatment. Because of the topography and the locations of the wetlands and buffers, additional treatment to the stormwater is not feasible.

One underground detentions area is used to capture runoff form the roadway, drives, and buildings from approximately 175’ to 500’ into the site. The underground stormwater management system captures the water through 4 deep-sump catch basins, providing the pretreatment to the stormwater before it enters the system. Four sets of R-Tanks hold and detain the stormwater as it filters a layer of engineered soil, removing most of the contaminants. Outlet structures meter the release of larger storms.

Two Hybrid bioretention areas treat the stormwater from 500’ to the cul-de-sac, including some of the houses and drives along the outer edge of the cul-de-sac. The stormwater enters through four catchbasins for pretreatment prior to in entering the ponding areas. Stormwater is held in the pond area as it filters through an engineered soil, filtering out contaminants. In addition, the hybrid design offers and anaerobic area (absence of free oxygen) that further aids in the denitrification process.

One conventional bioretention area is used to treat the stormwater for a portion of the cul-de-sac and the grassed area in the center of the cul-de-sac. A forebay near the front of the island in the cul-de-sac provides pretreatment prior to the water entering the Bioretention Area 1. Engineered soil will filter the soil before being captured by underdrains and flowing back into the undisturbed woods. An outlet control structure is used to meter the flow of the water to keep storm flows to minimum.

The remainder of the roof runoff not captured by these systems will be treated by overland flow through the wetland buffers.

For channel protection, the state DES uses the 2-year volume. The site remains in the 0.1 acre-ft allowed.

For all the storm events analyzed, the runoff from site remains the same or a slight decrease than the existing runoff. The proposed storm flows will have no adverse effects on the abutting properties.

6.0 – BMP EFFICIENCIES

Appendix B of Volume 2 of the New Hampshire Stormwater [3] list the pollutant removal efficiencies of various BMP's. The bioretention area and filtration practices are listed as having a 90% efficiency for removing Total Suspended Solids (TSS) and 65% efficiencies in removing Total Nitrogen (TN) and Total Phosphorous (TP). Based on UNHSC data, the Hybrid bioretention systems offer further denitrification of the stormwater, showing approximately a 30% increase in removal of TP and an additional 20% removal for TN.

7.0 – LOW IMPACT DESIGN

Low Impact Design (LID) is utilized in the design and implementation of this project. This site is laid out to provide the maximum greenspace for the proposed development. The total area of the lot is 44.884 acre (1,955,150 sf). The total proposed disturbed area is 7.591 acres (330,672 sf) or 17% of the lot. The total impervious area on the lot, including roofs, is 2.228 acres (97,030 sf). This is only 5% impervious cover on the lot.

The original lot had 28' wide roadway (two 12' lanes and a 4' walkway) and a cul-de-sac was reduced from having and exterior 90' arc to an exterior 60' arc. This totaled approximately 16,400 sf or 35% reduction in impervious roadway.

[3] New Hampshire Stormwater Manual: Volume One - Stormwater and Antidegradation, December 2008; Volume Two - Post-Construction Best Management Practices Selection and Design, December 2008; Volume Three - Erosion and Sediment Controls During Construction, December 2008.

The impervious roadway is being captured and treated using the Bioretention Area #1 which is using soil and plant-based media to filter and treat the stormwater. Bioretention Areas #2 and #3 add an anaerobic zone on top of the filtration that the conventional bioretention area offers. The Underground Detention System uses engineered soil to treat and attenuate stormwater flows, similar to the bioretention system. Refer to section 6 for the pollutant efficiency removal rates.

In the April 2009 article titled “Managing Stormwater with Low Impact Development Practices: Addressing Barriers to LID” it speaks of LID’s as “practices that manage stormwater by minimizing impervious cover and by using natural or man-made systems to filter and recharge stormwater into the ground. Roads, parking lots, and other types of impervious cover are the most significant contributors to stormwater runoff”.

The project has minimized the impervious cover and provided treatment in several disperse systems. It is a Low Impact Design.

8.0 – BEST MANAGEMENT PRACTICES

All soil erosion and sediment control measures shall be in accordance with regulations and principles as outlined in the *New Hampshire Stormwater Manual, Volumes Two and Three, December 2008*. The intent of the outlined measures is to minimize erosion and sedimentation during construction, stabilize and protect the site from erosion after construction is complete and mitigate any adverse impacts to stormwater quality resulting from development. Best Management Practices for this project include:

- Temporary practices to be implemented during construction.

- Permanent practices to be implemented after construction.

8.1 – Temporary Practices:

1. Erosion, sediment, and stormwater detention measures must be installed as directed by the engineer.

2. All disturbed areas, as well as loam stockpiles, shall be seeded and contained by a silt barrier.

3. Silt barriers must be installed prior to any construction commencing. All erosion control devices including silt barriers and storm drain inlet filters shall be inspected at least once per week and following any rainfall. All necessary maintenance shall be completed within twenty-four (24) hours.

4. Any silt barriers found to be failing must be replaced immediately. Sediment is to be removed from behind the silt fence if found to be one-third the height of the silt barrier or greater.

5. Any area of the site, which has been disturbed and where construction activity will not occur for more than twenty-one (21) days, shall be temporarily stabilized by mulching and seeding.

6. No construction materials shall be buried on-site.

7. After all areas have been stabilized, temporary practices are to be removed, and the area they are removed from must be smoothed and revegetated.

8. Areas must be temporarily stabilized within 14 days of disturbance or seeded and mulched within 3 days of final stabilization.

9. After November 15th, incomplete driveways or parking areas must be protected with a minimum of 3" of crushed gravel, meeting the standards of NHDOT item 304.3.

10. An area is considered stabilized if it has met one of the following:

    a) A minimum of 85% vegetative growth has been established.
    b) Base course gravel has been installed in areas to be paved.
    c) Stone, rip rap, or any other non-erosive material has been installed with a minimum thickness of 3".
    d) Erosion control blankets have been installed.

8.2 – Permanent Practices:

The objectives for developing permanent Best Management Practices for this site include the following:

1. Maintain existing runoff flow characteristics.
    a) Drainage is structured to minimize any offsite increase in runoff

2. Treatment BMP's are established to ensure the water quality.

3. Maintenance schedules are set to safeguard the long term working of the stormwater BMP's.

8.0 – CONCLUSION

The proposed development of the lot located at 0 Banfield Road, Portsmouth, NH shows slight decreases in the stormwater flows for the storm events analyzed and will have no adverse effects on surrounding properties. There will be little to not change stormwater runoff characteristics for the lot. Appropriate erosion and sediment control practices will be implemented to reduce possible erosion and siltation. Best Management Practices will be developed in accordance with the *New Hampshire Stormwater Manual, Volumes Two and Three, December 2008* to formulate a plan that assures stormwater quality both during and after construction.

Submitted by,

MSC a division of TFMoran, Inc.

Jack McTigue, PE

Project Manager

APPENDIX A
EXTREME PRECIPITATION TABLE

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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.793 degrees West
Latitude	43.041 degrees North
Elevation	0 feet
Date/Time	Tue, 22 Oct 2019 08:54:52 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.71	0.98	1.22	1.57	2.04	2.68	2.95	**1yr**	2.37	2.83	3.25	3.97	4.59	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.95	2.50	3.24	3.60	**2yr**	2.86	3.46	3.97	4.71	5.36	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.16	4.10	4.62	**5yr**	3.63	4.44	5.08	5.98	6.76	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.90	**10yr**	1.25	1.73	2.24	2.91	3.77	4.91	5.58	**10yr**	4.35	5.36	6.14	7.17	8.05	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.77	6.23	7.16	**25yr**	5.51	6.89	7.88	9.12	10.15	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.77	**50yr**	1.79	2.53	3.30	4.35	5.71	7.46	8.67	**50yr**	6.61	8.33	9.53	10.93	12.10	**50yr**
100yr	0.60	0.97	1.25	1.78	2.43	3.27	**100yr**	2.09	2.99	3.92	5.19	6.82	8.95	10.48	**100yr**	7.92	10.08	11.52	13.11	14.43	**100yr**
200yr	0.68	1.11	1.43	2.05	2.84	3.85	**200yr**	2.45	3.53	4.64	6.17	8.15	10.72	12.68	**200yr**	9.49	12.19	13.94	15.74	17.21	**200yr**
500yr	0.80	1.32	1.72	2.50	3.49	4.79	**500yr**	3.01	4.40	5.80	7.76	10.31	13.63	16.31	**500yr**	12.07	15.69	17.92	20.04	21.75	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.89	**1yr**	0.63	0.87	0.92	1.32	1.67	2.25	2.57	**1yr**	1.99	2.47	2.88	3.16	3.92	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.08	3.49	**2yr**	2.73	3.36	3.86	4.59	5.11	**2yr**
5yr	0.35	0.54	0.67	0.92	1.18	1.41	**5yr**	1.01	1.38	1.61	2.12	2.73	3.83	4.26	**5yr**	3.39	4.09	4.77	5.61	6.32	**5yr**
10yr	0.39	0.60	0.74	1.03	1.33	1.61	**10yr**	1.15	1.57	1.81	2.39	3.06	4.43	4.96	**10yr**	3.92	4.77	5.55	6.52	7.31	**10yr**
25yr	0.44	0.67	0.84	1.20	1.58	1.91	**25yr**	1.36	1.87	2.10	2.76	3.54	4.76	6.03	**25yr**	4.21	5.80	6.82	7.97	8.84	**25yr**
50yr	0.49	0.74	0.92	1.33	1.79	2.18	**50yr**	1.54	2.13	2.35	3.07	3.94	5.38	6.99	**50yr**	4.76	6.73	7.97	9.28	10.23	**50yr**
100yr	0.54	0.82	1.03	1.49	2.04	2.49	**100yr**	1.76	2.43	2.63	3.42	4.36	6.05	8.11	**100yr**	5.36	7.79	9.33	10.81	11.82	**100yr**
200yr	0.60	0.91	1.15	1.66	2.32	2.84	**200yr**	2.00	2.77	2.94	3.78	4.82	6.79	9.40	**200yr**	6.01	9.03	10.92	12.62	13.69	**200yr**
500yr	0.70	1.04	1.34	1.95	2.78	3.39	**500yr**	2.40	3.32	3.42	4.32	5.50	7.92	11.42	**500yr**	7.01	10.98	13.45	15.51	16.59	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	**1yr**	0.77	1.06	1.26	1.74	2.20	3.02	3.16	**1yr**	2.67	3.04	3.61	4.40	5.09	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.45	3.71	**2yr**	3.06	3.57	4.10	4.86	5.68	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.15	1.59	1.88	2.53	3.24	4.37	4.97	**5yr**	3.87	4.78	5.41	6.39	7.17	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.10	3.93	5.38	6.19	**10yr**	4.76	5.96	6.79	7.85	8.76	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.51	2.95	4.06	5.12	7.86	8.30	**25yr**	6.95	7.98	9.07	10.33	11.41	**25yr**
50yr	0.67	1.02	1.27	1.83	2.46	3.13	**50yr**	2.12	3.06	3.59	4.98	6.27	9.84	10.38	**50yr**	8.71	9.98	11.30	12.71	13.95	**50yr**
100yr	0.79	1.19	1.49	2.16	2.96	3.81	**100yr**	2.55	3.73	4.36	6.13	7.69	12.31	12.97	**100yr**	10.90	12.47	14.07	15.65	17.05	**100yr**
200yr	0.92	1.39	1.76	2.55	3.55	4.65	**200yr**	3.07	4.55	5.32	7.55	9.44	15.45	16.23	**200yr**	13.67	15.61	17.54	19.27	20.86	**200yr**
500yr	1.14	1.70	2.19	3.18	4.52	6.04	**500yr**	3.90	5.90	6.90	9.97	12.40	20.87	21.84	**500yr**	18.47	21.00	23.47	25.36	27.25	**500yr**

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APPENDIX B
PRE-DRAINAGE

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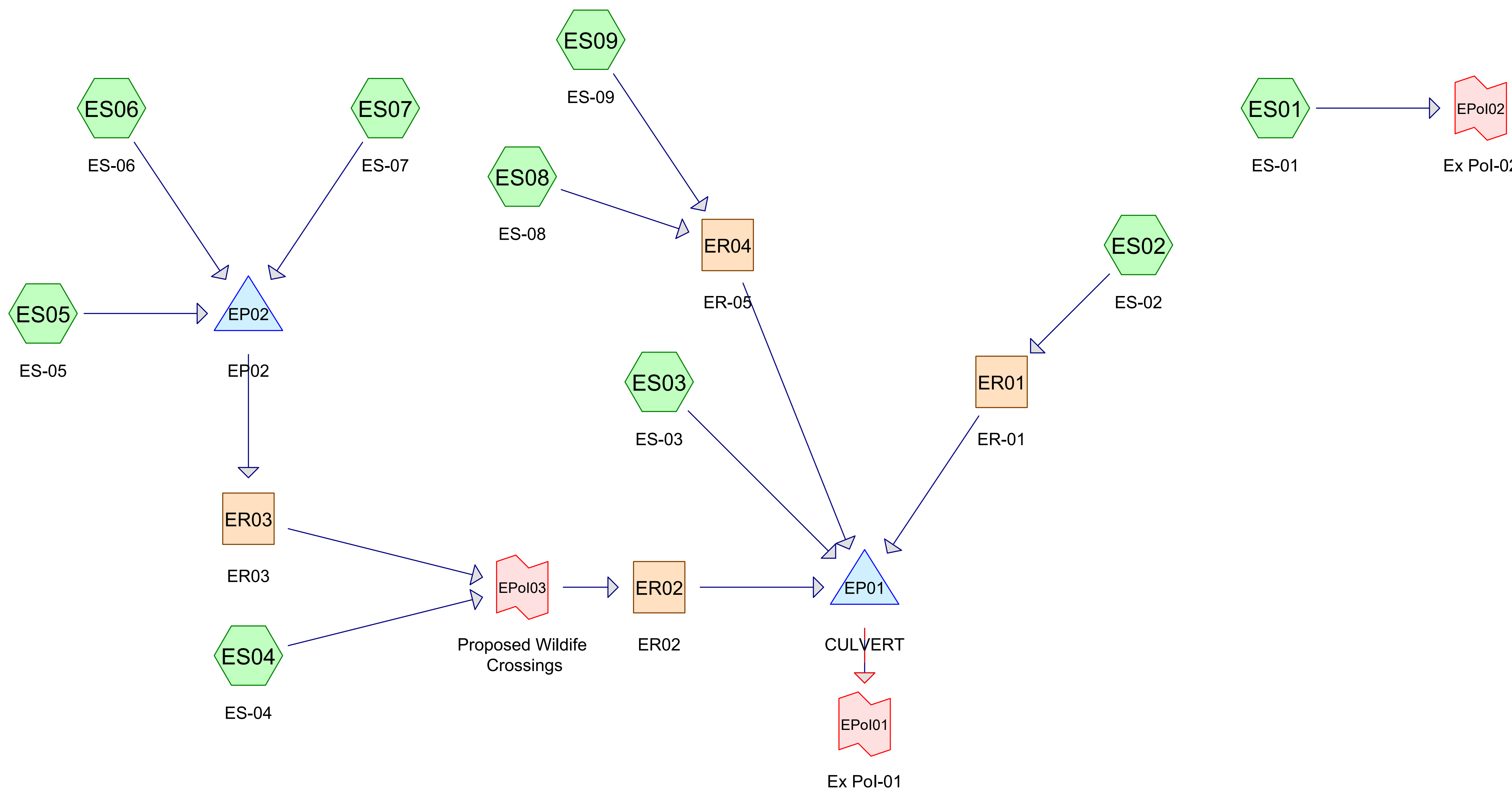
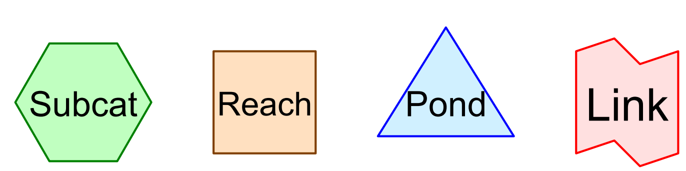
PRE-DEVELOPMENT DRAINAGE





Routing Diagram for 477361-00_PRE-&-POST_2020-03-02
Prepared by {enter your company name here}, Printed 3/4/2020
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
101,486	48	Brush, Good, HSG B (ES01, ES02, ES03, ES08, ES09)
393,326	65	Brush, Good, HSG C (ES01, ES02, ES04, ES05, ES06, ES07, ES08, ES09)
18,932	98	Paved parking, HSG C (ES03, ES04)
138,635	48	Power Line - Brush, Good, HSG B (ES01, ES02, ES03, ES09)
135,237	65	Power Line - Brush, Good, HSG C (ES01, ES02, ES03, ES08, ES09)
920,956	55	Woods, Good, HSG B (ES01, ES02, ES03, ES04, ES05, ES06, ES08, ES09)
1,288,885	70	Woods, Good, HSG C (ES01, ES02, ES03, ES04, ES05, ES06, ES07, ES08, ES09)
2,997,457	**63**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
1,161,077	HSG B	ES01, ES02, ES03, ES04, ES05, ES06, ES08, ES09
1,836,380	HSG C	ES01, ES02, ES03, ES04, ES05, ES06, ES07, ES08, ES09
0	HSG D	
0	Other	
2,997,457		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>0.67"
Flow Length=415' Tc=53.2 min CN=61 Runoff=0.3 cfs 3,189 cf

Subcatchment ES02: ES-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>0.45"
Flow Length=740' Tc=95.8 min CN=56 Runoff=1.2 cfs 18,634 cf

Subcatchment ES03: ES-03 Runoff Area=502,327 sf 1.43% Impervious Runoff Depth>0.97"
Flow Length=800' Tc=40.5 min CN=67 Runoff=5.8 cfs 40,633 cf

Subcatchment ES04: ES-04 Runoff Area=477,519 sf 2.46% Impervious Runoff Depth>1.02"
Flow Length=1,231' Tc=53.0 min CN=68 Runoff=5.1 cfs 40,654 cf

Subcatchment ES05: ES-05 Runoff Area=117,705 sf 0.00% Impervious Runoff Depth>1.02"
Flow Length=350' Slope=0.0200 '/' Tc=43.1 min CN=68 Runoff=1.4 cfs 10,053 cf

Subcatchment ES06: ES-06 Runoff Area=57,841 sf 0.00% Impervious Runoff Depth>0.97"
Flow Length=374' Tc=29.7 min CN=67 Runoff=0.8 cfs 4,695 cf

Subcatchment ES07: ES-07 Runoff Area=42,503 sf 0.00% Impervious Runoff Depth>1.09"
Flow Length=250' Tc=27.5 min CN=69 Runoff=0.7 cfs 3,848 cf

Subcatchment ES08: ES-08 Runoff Area=202,428 sf 0.00% Impervious Runoff Depth>1.03"
Flow Length=695' Tc=34.9 min CN=68 Runoff=2.7 cfs 17,334 cf

Subcatchment ES09: ES-09 Runoff Area=1,037,949 sf 0.00% Impervious Runoff Depth>0.62"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=4.6 cfs 53,255 cf

Reach ER01: ER-01 Avg. Flow Depth=0.03' Max Vel=0.25 fps Inflow=1.2 cfs 18,634 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=1.0 cfs 18,085 cf

Reach ER02: ER02 Avg. Flow Depth=0.11' Max Vel=0.31 fps Inflow=5.1 cfs 50,841 cf
n=0.080 L=635.0' S=0.0058 '/' Capacity=703.8 cfs Outflow=3.8 cfs 49,004 cf

Reach ER03: ER03 Avg. Flow Depth=0.02' Max Vel=0.20 fps Inflow=0.8 cfs 10,875 cf
n=0.080 L=981.0' S=0.0180 '/' Capacity=1,122.7 cfs Outflow=0.5 cfs 10,186 cf

Reach ER04: ER-05 Avg. Flow Depth=0.08' Max Vel=0.44 fps Inflow=5.7 cfs 70,588 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=5.2 cfs 68,974 cf

Pond EP01: CULVERT Peak Elev=24.20' Storage=5,119 cf Inflow=12.0 cfs 176,696 cf
Primary=11.5 cfs 176,319 cf Secondary=0.0 cfs 0 cf Outflow=11.5 cfs 176,319 cf

Pond EP02: EP02 Peak Elev=43.58' Storage=8,453 cf Inflow=2.7 cfs 18,596 cf
Outflow=0.8 cfs 10,875 cf

Link EPol01: Ex Pol-01 Inflow=11.5 cfs 176,319 cf
Primary=11.5 cfs 176,319 cf

Link EPol02: Ex Pol-02

Inflow=0.3 cfs 3,189 cf
Primary=0.3 cfs 3,189 cf

Link EPol03: Proposed Wildife Crossings

Inflow=5.1 cfs 50,841 cf
Primary=5.1 cfs 50,841 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 192,296 cf Average Runoff Depth = 0.77"
99.37% Pervious = 2,978,525 sf 0.63% Impervious = 18,932 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>1.75"
Flow Length=415' Tc=53.2 min CN=61 Runoff=1.1 cfs 8,366 cf

Subcatchment ES02: ES-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>1.35"
Flow Length=740' Tc=95.8 min CN=56 Runoff=4.8 cfs 56,442 cf

Subcatchment ES03: ES-03 Runoff Area=502,327 sf 1.43% Impervious Runoff Depth>2.25"
Flow Length=800' Tc=40.5 min CN=67 Runoff=14.6 cfs 94,062 cf

Subcatchment ES04: ES-04 Runoff Area=477,519 sf 2.46% Impervious Runoff Depth>2.32"
Flow Length=1,231' Tc=53.0 min CN=68 Runoff=12.5 cfs 92,516 cf

Subcatchment ES05: ES-05 Runoff Area=117,705 sf 0.00% Impervious Runoff Depth>2.33"
Flow Length=350' Slope=0.0200 '/' Tc=43.1 min CN=68 Runoff=3.5 cfs 22,865 cf

Subcatchment ES06: ES-06 Runoff Area=57,841 sf 0.00% Impervious Runoff Depth>2.25"
Flow Length=374' Tc=29.7 min CN=67 Runoff=2.0 cfs 10,862 cf

Subcatchment ES07: ES-07 Runoff Area=42,503 sf 0.00% Impervious Runoff Depth>2.43"
Flow Length=250' Tc=27.5 min CN=69 Runoff=1.6 cfs 8,597 cf

Subcatchment ES08: ES-08 Runoff Area=202,428 sf 0.00% Impervious Runoff Depth>2.34"
Flow Length=695' Tc=34.9 min CN=68 Runoff=6.6 cfs 39,407 cf

Subcatchment ES09: ES-09 Runoff Area=1,037,949 sf 0.00% Impervious Runoff Depth>1.66"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=14.8 cfs 143,476 cf

Reach ER01: ER-01 Avg. Flow Depth=0.08' Max Vel=0.42 fps Inflow=4.8 cfs 56,442 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=4.5 cfs 55,208 cf

Reach ER02: ER02 Avg. Flow Depth=0.22' Max Vel=0.49 fps Inflow=13.9 cfs 125,703 cf
n=0.080 L=635.0' S=0.0058 '/' Capacity=703.8 cfs Outflow=12.2 cfs 122,960 cf

Reach ER03: ER03 Avg. Flow Depth=0.07' Max Vel=0.42 fps Inflow=5.3 cfs 34,464 cf
n=0.080 L=981.0' S=0.0180 '/' Capacity=1,122.7 cfs Outflow=3.0 cfs 33,187 cf

Reach ER04: ER-05 Avg. Flow Depth=0.16' Max Vel=0.70 fps Inflow=17.7 cfs 182,883 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=17.1 cfs 179,807 cf

Pond EP01: CULVERT Peak Elev=25.76' Storage=83,762 cf Inflow=39.3 cfs 452,036 cf
Primary=21.8 cfs 451,376 cf Secondary=0.0 cfs 0 cf Outflow=21.8 cfs 451,376 cf

Pond EP02: EP02 Peak Elev=43.72' Storage=11,287 cf Inflow=6.7 cfs 42,324 cf
Outflow=5.3 cfs 34,464 cf

Link EPol01: Ex Pol-01 Inflow=21.8 cfs 451,376 cf
Primary=21.8 cfs 451,376 cf

Link EPol02: Ex Pol-02 Inflow=1.1 cfs 8,366 cf
Primary=1.1 cfs 8,366 cf

Link EPol03: Proposed Wildife Crossings Inflow=13.9 cfs 125,703 cf
Primary=13.9 cfs 125,703 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 476,593 cf Average Runoff Depth = 1.91"
99.37% Pervious = 2,978,525 sf 0.63% Impervious = 18,932 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>2.78"
Flow Length=415' Tc=53.2 min CN=61 Runoff=1.8 cfs 13,302 cf

Subcatchment ES02: ES-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>2.26"
Flow Length=740' Tc=95.8 min CN=56 Runoff=8.5 cfs 94,422 cf

Subcatchment ES03: ES-03 Runoff Area=502,327 sf 1.43% Impervious Runoff Depth>3.40"
Flow Length=800' Tc=40.5 min CN=67 Runoff=22.5 cfs 142,514 cf

Subcatchment ES04: ES-04 Runoff Area=477,519 sf 2.46% Impervious Runoff Depth>3.50"
Flow Length=1,231' Tc=53.0 min CN=68 Runoff=19.1 cfs 139,214 cf

Subcatchment ES05: ES-05 Runoff Area=117,705 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=350' Slope=0.0200 '/' Tc=43.1 min CN=68 Runoff=5.3 cfs 34,398 cf

Subcatchment ES06: ES-06 Runoff Area=57,841 sf 0.00% Impervious Runoff Depth>3.41"
Flow Length=374' Tc=29.7 min CN=67 Runoff=3.0 cfs 16,452 cf

Subcatchment ES07: ES-07 Runoff Area=42,503 sf 0.00% Impervious Runoff Depth>3.63"
Flow Length=250' Tc=27.5 min CN=69 Runoff=2.4 cfs 12,840 cf

Subcatchment ES08: ES-08 Runoff Area=202,428 sf 0.00% Impervious Runoff Depth>3.51"
Flow Length=695' Tc=34.9 min CN=68 Runoff=10.1 cfs 59,273 cf

Subcatchment ES09: ES-09 Runoff Area=1,037,949 sf 0.00% Impervious Runoff Depth>2.66"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=24.9 cfs 230,355 cf

Reach ER01: ER-01 Avg. Flow Depth=0.11' Max Vel=0.54 fps Inflow=8.5 cfs 94,422 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=8.2 cfs 92,827 cf

Reach ER02: ER02 Avg. Flow Depth=0.31' Max Vel=0.59 fps Inflow=24.1 cfs 193,227 cf
n=0.080 L=635.0' S=0.0058 '/' Capacity=703.8 cfs Outflow=21.7 cfs 189,947 cf

Reach ER03: ER03 Avg. Flow Depth=0.11' Max Vel=0.55 fps Inflow=9.1 cfs 55,735 cf
n=0.080 L=981.0' S=0.0180 '/' Capacity=1,122.7 cfs Outflow=6.2 cfs 54,013 cf

Reach ER04: ER-05 Avg. Flow Depth=0.22' Max Vel=0.86 fps Inflow=29.3 cfs 289,628 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=28.6 cfs 285,926 cf

Pond EP01: CULVERT Peak Elev=26.20' Storage=163,831 cf Inflow=67.9 cfs 711,214 cf
Primary=23.9 cfs 618,854 cf Secondary=18.8 cfs 91,441 cf Outflow=42.7 cfs 710,295 cf

Pond EP02: EP02 Peak Elev=43.81' Storage=13,224 cf Inflow=10.2 cfs 63,690 cf
Outflow=9.1 cfs 55,735 cf

Link EPol01: Ex Pol-01 Inflow=42.7 cfs 710,295 cf
Primary=42.7 cfs 710,295 cf

Link EPol02: Ex Pol-02
Inflow=1.8 cfs 13,302 cf
Primary=1.8 cfs 13,302 cf

Link EPol03: Proposed Wildife Crossings
Inflow=24.1 cfs 193,227 cf
Primary=24.1 cfs 193,227 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 742,770 cf Average Runoff Depth = 2.97"
99.37% Pervious = 2,978,525 sf 0.63% Impervious = 18,932 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES01: ES-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>3.84"
Flow Length=415' Tc=53.2 min CN=61 Runoff=2.5 cfs 18,392 cf

Subcatchment ES02: ES-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=740' Tc=95.8 min CN=56 Runoff=12.6 cfs 134,614 cf

Subcatchment ES03: ES-03 Runoff Area=502,327 sf 1.43% Impervious Runoff Depth>4.57"
Flow Length=800' Tc=40.5 min CN=67 Runoff=30.4 cfs 191,246 cf

Subcatchment ES04: ES-04 Runoff Area=477,519 sf 2.46% Impervious Runoff Depth>4.67"
Flow Length=1,231' Tc=53.0 min CN=68 Runoff=25.6 cfs 186,014 cf

Subcatchment ES05: ES-05 Runoff Area=117,705 sf 0.00% Impervious Runoff Depth>4.69"
Flow Length=350' Slope=0.0200 '/' Tc=43.1 min CN=68 Runoff=7.1 cfs 45,955 cf

Subcatchment ES06: ES-06 Runoff Area=57,841 sf 0.00% Impervious Runoff Depth>4.58"
Flow Length=374' Tc=29.7 min CN=67 Runoff=4.1 cfs 22,075 cf

Subcatchment ES07: ES-07 Runoff Area=42,503 sf 0.00% Impervious Runoff Depth>4.82"
Flow Length=250' Tc=27.5 min CN=69 Runoff=3.3 cfs 17,076 cf

Subcatchment ES08: ES-08 Runoff Area=202,428 sf 0.00% Impervious Runoff Depth>4.69"
Flow Length=695' Tc=34.9 min CN=68 Runoff=13.5 cfs 79,179 cf

Subcatchment ES09: ES-09 Runoff Area=1,037,949 sf 0.00% Impervious Runoff Depth>3.70"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=35.3 cfs 320,406 cf

Reach ER01: ER-01 Avg. Flow Depth=0.14' Max Vel=0.62 fps Inflow=12.6 cfs 134,614 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=12.2 cfs 132,764 cf

Reach ER02: ER02 Avg. Flow Depth=0.38' Max Vel=0.67 fps Inflow=34.4 cfs 261,044 cf
n=0.080 L=635.0' S=0.0058 '/' Capacity=703.8 cfs Outflow=31.4 cfs 257,296 cf

Reach ER03: ER03 Avg. Flow Depth=0.14' Max Vel=0.64 fps Inflow=12.5 cfs 77,068 cf
n=0.080 L=981.0' S=0.0180 '/' Capacity=1,122.7 cfs Outflow=9.6 cfs 75,030 cf

Reach ER04: ER-05 Avg. Flow Depth=0.28' Max Vel=0.98 fps Inflow=41.3 cfs 399,585 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=40.5 cfs 395,285 cf

Pond EP01: CULVERT Peak Elev=26.41' Storage=209,760 cf Inflow=97.6 cfs 976,590 cf
Primary=24.9 cfs 717,300 cf Secondary=45.5 cfs 258,096 cf Outflow=70.4 cfs 975,396 cf

Pond EP02: EP02 Peak Elev=43.88' Storage=14,875 cf Inflow=13.7 cfs 85,106 cf
Outflow=12.5 cfs 77,068 cf

Link EPol01: Ex Pol-01 Inflow=70.4 cfs 975,396 cf
Primary=70.4 cfs 975,396 cf

Link EPol02: Ex Pol-02 Inflow=2.5 cfs 18,392 cf
Primary=2.5 cfs 18,392 cf

Link EPol03: Proposed Wildife Crossings Inflow=34.4 cfs 261,044 cf
Primary=34.4 cfs 261,044 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 1,014,957 cf Average Runoff Depth = 4.06"
99.37% Pervious = 2,978,525 sf 0.63% Impervious = 18,932 sf

APPENDIX C
PRE-DRAINAGE
(10 Yr Storm Event)

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Summary for Subcatchment ES01: ES-01

Runoff = 1.1 cfs @ 12.78 hrs, Volume= 8,366 cf, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

	Area (sf)	CN	Description
	9,442	55	Woods, Good, HSG B
	122	48	Brush, Good, HSG B
*	13,602	48	Power Line - Brush, Good, HSG B
	16,200	70	Woods, Good, HSG C
	7,778	65	Brush, Good, HSG C
	10,261	65	Power Line - Brush, Good, HSG C
	57,405	61	Weighted Average
	57,405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.1	100	0.0100	0.03		**Sheet Flow, Sheet-Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
3.4	205	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
0.7	110	0.0100	2.68	374.84	**Channel Flow, Channel Flow** Area= 140.0 sf Perim= 80.9' r= 1.73' n= 0.080 Earth, long dense weeds
53.2	415	Total			

Summary for Subcatchment ES02: ES-02

Runoff = 4.8 cfs @ 13.43 hrs, Volume= 56,442 cf, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
209,453	55	Woods, Good, HSG B
82,831	48	Brush, Good, HSG B
53,777	48	Power Line - Brush, Good, HSG B
21,794	70	Woods, Good, HSG C
126,184	65	Brush, Good, HSG C
7,741	65	Power Line - Brush, Good, HSG C
501,780	56	Weighted Average
501,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Shallow** Woods: Dense underbrush n= 0.800 P2= 3.23"
58.0	550	0.0010	0.16		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
0.6	90	0.0100	2.41	714.05	**Channel Flow, Concentrated** Area= 296.0 sf Perim= 200.0' r= 1.48' n= 0.080 Earth, long dense weeds
95.8	740	Total			

Summary for Subcatchment ES03: ES-03

Runoff = 14.6 cfs @ 12.59 hrs, Volume= 94,062 cf, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
66,527	55	Woods, Good, HSG B
16,804	48	Brush, Good, HSG B
844	48	Power Line - Brush, Good, HSG B
7,176	98	Paved parking, HSG C
109,654	70	Woods, Good, HSG C
229,477	70	Woods, Good, HSG C
71,845	65	Power Line - Brush, Good, HSG C
502,327	67	Weighted Average
495,151		98.57% Pervious Area
7,176		1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	100	0.0400	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
12.3	700	0.0360	0.95		**Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps
40.5	800	Total			

Summary for Subcatchment ES04: ES-04

Runoff = 12.5 cfs @ 12.76 hrs, Volume= 92,516 cf, Depth> 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
19,701	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
11,756	98	Paved parking, HSG C
284,228	70	Woods, Good, HSG C
161,834	65	Brush, Good, HSG C
477,519	68	Weighted Average
465,763		97.54% Pervious Area
11,756		2.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
9.7	421	0.0210	0.72		**Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps
6.1	710	0.0070	1.95	699.40	**Channel Flow, Channel Flow** Area= 358.0 sf Perim= 254.0' r= 1.41' n= 0.080 Earth, long dense weeds
53.0	1,231	Total			

Summary for Subcatchment ES05: ES-05

Runoff = 3.5 cfs @ 12.62 hrs, Volume= 22,865 cf, Depth> 2.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
9,092	55	Woods, Good, HSG B
91,250	70	Woods, Good, HSG C
17,363	65	Brush, Good, HSG C
117,705	68	Weighted Average
117,705		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
5.9	250	0.0200	0.71		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
43.1	350	Total			

Summary for Subcatchment ES06: ES-06

Runoff = 2.0 cfs @ 12.44 hrs, Volume= 10,862 cf, Depth> 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
8,412	55	Woods, Good, HSG B
44,689	70	Woods, Good, HSG C
4,740	65	Brush, Good, HSG C
57,841	67	Weighted Average
57,841		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	100	0.0500	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
3.9	274	0.0550	1.17		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
29.7	374	Total			

Summary for Subcatchment ES07: ES-07

Runoff = 1.6 cfs @ 12.40 hrs, Volume= 8,597 cf, Depth> 2.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
37,671	70	Woods, Good, HSG C
4,832	65	Brush, Good, HSG C
42,503	69	Weighted Average
42,503		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	100	0.0600	0.07		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
3.5	150	0.0200	0.71		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
27.5	250	Total			

Summary for Subcatchment ES08: ES-08

Runoff = 6.6 cfs @ 12.51 hrs, Volume= 39,407 cf, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
15,357	55	Woods, Good, HSG B
3	48	Brush, Good, HSG B
137,613	70	Woods, Good, HSG C
43,258	65	Brush, Good, HSG C
6,197	65	Power Line - Brush, Good, HSG C
202,428	68	Weighted Average
202,428		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	100	0.0500	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
8.7	505	0.0378	0.97		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
0.4	90	0.0156	3.35	1,072.87	**Channel Flow, Channel Flow** Area= 320.0 sf Perim= 184.2' r= 1.74' n= 0.080 Earth, long dense weeds
34.9	695	Total			

Summary for Subcatchment ES09: ES-09

Runoff = 14.8 cfs @ 13.10 hrs, Volume= 143,476 cf, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
582,972	55	Woods, Good, HSG B
1,726	48	Brush, Good, HSG B
70,412	48	Power Line - Brush, Good, HSG B
316,309	70	Woods, Good, HSG C
27,337	65	Brush, Good, HSG C
39,193	65	Power Line - Brush, Good, HSG C
1,037,949	60	Weighted Average
1,037,949		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.6	100	0.0300	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
15.1	808	0.0320	0.89		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
27.1	515	0.0040	0.32		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
2.1	412	0.0170	3.28	594.29	**Channel Flow, Channel Flow** Area= 181.4 sf Perim= 115.3' r= 1.57' n= 0.080 Earth, long dense weeds
75.9	1,835	Total			

Summary for Reach ER01: ER-01

Inflow Area = 501,780 sf, 0.00% Impervious, Inflow Depth > 1.35" for 10-YR event
Inflow = 4.8 cfs @ 13.43 hrs, Volume= 56,442 cf
Outflow = 4.5 cfs @ 13.70 hrs, Volume= 55,208 cf, Atten= 6%, Lag= 15.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.42 fps, Min. Travel Time= 21.1 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 36.7 min

Peak Storage= 5,651 cf @ 13.70 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 142.58'
Bank-Full Depth= 2.00' Flow Area= 470.0 sf, Capacity= 1,413.2 cfs

135.00' x 2.00' deep channel, n= 0.050 Scattered brush, heavy weeds
Side Slope Z-value= 50.0 '/' Top Width= 335.00'
Length= 537.0' Slope= 0.0065 '/'
Inlet Invert= 26.50', Outlet Invert= 23.00'

‡

Summary for Reach ER02: ER02

Inflow Area = 695,568 sf, 1.69% Impervious, Inflow Depth > 2.17" for 10-YR event
Inflow = 13.9 cfs @ 12.85 hrs, Volume= 125,703 cf
Outflow = 12.2 cfs @ 13.10 hrs, Volume= 122,960 cf, Atten= 12%, Lag= 15.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.49 fps, Min. Travel Time= 21.8 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 45.6 min

Peak Storage= 16,021 cf @ 13.10 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 125.94'
Bank-Full Depth= 2.00' Flow Area= 408.0 sf, Capacity= 703.8 cfs

104.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 50.0 '/' Top Width= 304.00'
Length= 635.0' Slope= 0.0058 '/'
Inlet Invert= 25.70', Outlet Invert= 22.00'

‡

Summary for Reach ER03: ER03

Inflow Area = 218,049 sf, 0.00% Impervious, Inflow Depth > 1.90" for 10-YR event
Inflow = 5.3 cfs @ 12.77 hrs, Volume= 34,464 cf
Outflow = 3.0 cfs @ 13.26 hrs, Volume= 33,187 cf, Atten= 42%, Lag= 29.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.42 fps, Min. Travel Time= 39.3 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 69.4 min

Peak Storage= 7,178 cf @ 13.26 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 109.15'
Bank-Full Depth= 2.00' Flow Area= 358.0 sf, Capacity= 1,122.7 cfs

104.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 50.0 25.0 '/' Top Width= 254.00'
Length= 981.0' Slope= 0.0180 '/'
Inlet Invert= 43.50', Outlet Invert= 25.80'

Summary for Reach ER04: ER-05

Inflow Area = 1,240,377 sf, 0.00% Impervious, Inflow Depth > 1.77" for 10-YR event
Inflow = 17.7 cfs @ 12.99 hrs, Volume= 182,883 cf
Outflow = 17.1 cfs @ 13.17 hrs, Volume= 179,807 cf, Atten= 4%, Lag= 11.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.70 fps, Min. Travel Time= 16.2 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 32.8 min

Peak Storage= 16,575 cf @ 13.17 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 150.78'
Bank-Full Depth= 3.00' Flow Area= 569.4 sf, Capacity= 2,431.4 cfs

146.00' x 3.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 17.0 12.2 '/' Top Width= 233.60'
Length= 682.0' Slope= 0.0161 '/'
Inlet Invert= 33.00', Outlet Invert= 22.00'

Summary for Pond EP01: CULVERT

[62] Hint: Exceeded Reach ER01 OUTLET depth by 2.69' @ 14.22 hrs
[62] Hint: Exceeded Reach ER02 OUTLET depth by 3.62' @ 14.34 hrs
[62] Hint: Exceeded Reach ER04 OUTLET depth by 3.65' @ 14.28 hrs

Inflow Area = 2,940,052 sf, 0.64% Impervious, Inflow Depth > 1.85" for 10-YR event
Inflow = 39.3 cfs @ 13.05 hrs, Volume= 452,036 cf
Outflow = 21.8 cfs @ 14.17 hrs, Volume= 451,376 cf, Atten= 44%, Lag= 67.3 min
Primary = 21.8 cfs @ 14.17 hrs, Volume= 451,376 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 25.76' @ 14.17 hrs Surf.Area= 144,280 sf Storage= 83,762 cf

Plug-Flow detention time= 32.9 min calculated for 450,251 cf (100% of inflow)
Center-of-Mass det. time= 32.1 min (950.8 - 918.7)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	349,966 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.00	10	40.0	0	0	10
24.00	5,297	274.3	3,691	3,691	5,879
25.00	33,326	789.9	17,303	20,995	49,546
26.00	194,732	2,359.1	102,872	123,867	442,774
27.00	258,992	2,650.0	226,100	349,966	558,757

Device	Routing	Invert	Outlet Devices
#1	Primary	22.40'	**15.0" Round RCP_Round 15"** L= 33.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 22.40' / 22.35' S= 0.0015 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	22.40'	**15.0" Round RCP_Round 15"** L= 33.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 22.40' / 22.35' S= 0.0015 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Secondary	25.93'	**50.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.8 cfs @ 14.17 hrs HW=25.76' TW=0.00' (Dynamic Tailwater)
1=RCP_Round 15" (Barrel Controls 10.9 cfs @ 8.90 fps)
2=RCP_Round 15" (Barrel Controls 10.9 cfs @ 8.90 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=22.00' TW=0.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Pond EP02: EP02

Inflow Area = 218,049 sf, 0.00% Impervious, Inflow Depth > 2.33" for 10-YR event
Inflow = 6.7 cfs @ 12.50 hrs, Volume= 42,324 cf
Outflow = 5.3 cfs @ 12.77 hrs, Volume= 34,464 cf, Atten= 21%, Lag= 16.1 min
Primary = 5.3 cfs @ 12.77 hrs, Volume= 34,464 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 43.72' @ 12.78 hrs Surf.Area= 21,559 sf Storage= 11,287 cf

Plug-Flow detention time= 117.4 min calculated for 34,464 cf (81% of inflow)
Center-of-Mass det. time= 44.3 min (913.8 - 869.5)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	17,987 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	10,339	760.4	0	0	10,339
44.00	26,935	899.1	17,987	17,987	28,674

Device	Routing	Invert	Outlet Devices
#1	Primary	43.53'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=5.2 cfs @ 12.77 hrs HW=43.72' TW=43.54' (Dynamic Tailwater)
└─**1=Broad-Crested Rectangular Weir** (Weir Controls 5.2 cfs @ 1.09 fps)

Summary for Link EPol01: Ex Pol-01

Inflow Area = 2,940,052 sf, 0.64% Impervious, Inflow Depth > 1.84" for 10-YR event
Inflow = 21.8 cfs @ 14.17 hrs, Volume= 451,376 cf
Primary = 21.8 cfs @ 14.17 hrs, Volume= 451,376 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

Summary for Link EPol02: Ex Pol-02

Inflow Area = 57,405 sf, 0.00% Impervious, Inflow Depth > 1.75" for 10-YR event
Inflow = 1.1 cfs @ 12.78 hrs, Volume= 8,366 cf
Primary = 1.1 cfs @ 12.78 hrs, Volume= 8,366 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

Summary for Link EPoI03: Proposed Wildife Crossings

Inflow Area = 695,568 sf, 1.69% Impervious, Inflow Depth > 2.17" for 10-YR event
Inflow = 13.9 cfs @ 12.85 hrs, Volume= 125,703 cf
Primary = 13.9 cfs @ 12.85 hrs, Volume= 125,703 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

APPENDIX D
POST DRAINAGE

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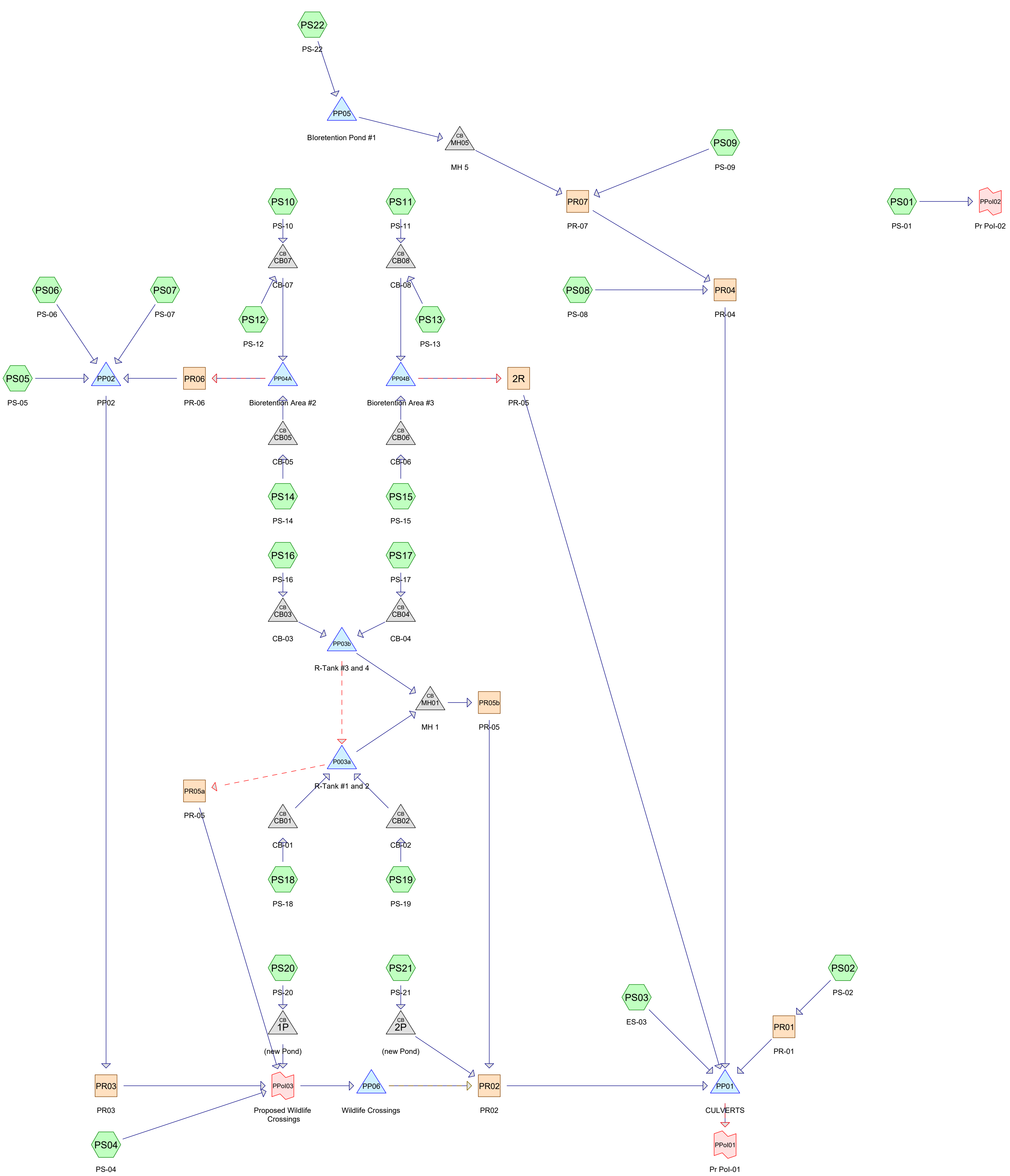
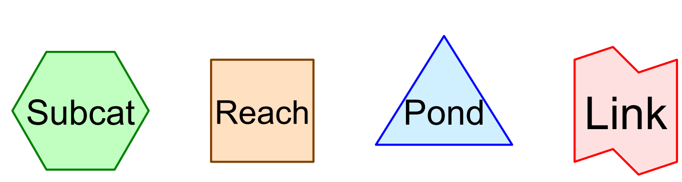
POST DEVELOPMENT DRAINAGE





Routing Diagram for 477361-00_PRE-&-POST_2020-03-02
Prepared by {enter your company name here}, Printed 3/4/2020
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
41,015	61	>75% Grass cover, Good, HSG B (PS03, PS05, PS06, PS08, PS09, PS10, PS11, PS12, PS13, PS17, PS18, PS19, PS22)
167,029	74	>75% Grass cover, Good, HSG C (PS03, PS04, PS05, PS06, PS07, PS08, PS09, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22)
101,365	48	Brush, Good, HSG B (PS01, PS02, PS03, PS09)
618,870	65	Brush, Good, HSG C (PS01, PS02, PS03, PS04, PS05, PS06, PS07, PS08, PS09)
16,298	98	Paved parking, HSG B (PS03, PS09, PS10, PS11, PS12, PS13, PS17, PS18, PS19, PS20, PS21, PS22)
60,995	98	Paved parking, HSG C (PS03, PS04, PS05, PS06, PS08, PS09, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22)
138,638	48	Power Line - Brush, Good, HSG B (PS01, PS02, PS03, PS08, PS09)
135,237	65	Power Line - Brush, Good, HSG C (PS01, PS02, PS03, PS08, PS09)
12,388	98	Roofs, HSG B (PS03, PS05, PS06, PS08, PS09, PS10, PS11, PS17, PS19)
28,996	98	Roofs, HSG C (PS03, PS04, PS05, PS06, PS07, PS08, PS09, PS10, PS11, PS14, PS16, PS17, PS18, PS19)
847,317	55	Woods, Good, HSG B (PS01, PS02, PS03, PS04, PS05, PS06, PS08, PS09)
806,253	70	Woods, Good, HSG C (PS01, PS02, PS03, PS04, PS05, PS06, PS07, PS08, PS09)
4,054	58	Woods/grass comb., Good, HSG B (PS06, PS12, PS13, PS18, PS19)
19,002	72	Woods/grass comb., Good, HSG C (PS03, PS04, PS06, PS07, PS08, PS12, PS13, PS14, PS15, PS18, PS19, PS20, PS21)
2,997,457	**64**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
1,161,075	HSG B	PS01, PS02, PS03, PS04, PS05, PS06, PS08, PS09, PS10, PS11, PS12, PS13, PS17, PS18, PS19, PS20, PS21, PS22
1,836,382	HSG C	PS01, PS02, PS03, PS04, PS05, PS06, PS07, PS08, PS09, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22
0	HSG D	
0	Other	
2,997,457		**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS01: PS-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>0.67"
Flow Length=415' Tc=53.2 min CN=61 Runoff=0.3 cfs 3,189 cf

Subcatchment PS02: PS-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>0.45"
Flow Length=740' Tc=95.8 min CN=56 Runoff=1.2 cfs 18,634 cf

Subcatchment PS03: ES-03 Runoff Area=483,638 sf 3.20% Impervious Runoff Depth>0.86"
Flow Length=800' Tc=40.5 min CN=65 Runoff=4.8 cfs 34,855 cf

Subcatchment PS04: PS-04 Runoff Area=460,441 sf 3.70% Impervious Runoff Depth>1.08"
Flow Length=1,231' Tc=52.0 min CN=69 Runoff=5.3 cfs 41,377 cf

Subcatchment PS05: PS-05 Runoff Area=117,283 sf 8.10% Impervious Runoff Depth>1.26"
Flow Length=375' Tc=41.3 min CN=72 Runoff=1.9 cfs 12,318 cf

Subcatchment PS06: PS-06 Runoff Area=63,674 sf 8.10% Impervious Runoff Depth>1.27"
Flow Length=337' Tc=16.9 min CN=72 Runoff=1.5 cfs 6,733 cf

Subcatchment PS07: PS-07 Runoff Area=32,586 sf 5.06% Impervious Runoff Depth>1.20"
Flow Length=316' Tc=28.1 min CN=71 Runoff=0.6 cfs 3,269 cf

Subcatchment PS08: PS-08 Runoff Area=155,960 sf 3.58% Impervious Runoff Depth>1.15"
Flow Length=599' Tc=13.3 min CN=70 Runoff=3.5 cfs 14,937 cf

Subcatchment PS09: PS-09 Runoff Area=1,008,725 sf 0.85% Impervious Runoff Depth>0.62"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=4.4 cfs 51,755 cf

Subcatchment PS10: PS-10 Runoff Area=32,468 sf 52.74% Impervious Runoff Depth>2.21"
Flow Length=483' Tc=13.2 min CN=85 Runoff=1.5 cfs 5,988 cf

Subcatchment PS11: PS-11 Runoff Area=12,159 sf 58.76% Impervious Runoff Depth>2.22"
Flow Length=452' Tc=7.5 min CN=85 Runoff=0.7 cfs 2,245 cf

Subcatchment PS12: PS-12 Runoff Area=4,911 sf 36.61% Impervious Runoff Depth>1.60"
Flow Length=139' Tc=5.0 min CN=77 Runoff=0.2 cfs 656 cf

Subcatchment PS13: PS-13 Runoff Area=4,559 sf 39.96% Impervious Runoff Depth>1.97"
Flow Length=139' Tc=5.0 min CN=82 Runoff=0.2 cfs 750 cf

Subcatchment PS14: PS-14 Runoff Area=5,051 sf 20.97% Impervious Runoff Depth>1.67"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.2 cfs 704 cf

Subcatchment PS15: PS-15 Runoff Area=4,235 sf 19.50% Impervious Runoff Depth>1.67"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.2 cfs 590 cf

Subcatchment PS16: PS-16 Runoff Area=8,958 sf 58.47% Impervious Runoff Depth>2.48"
Flow Length=117' Tc=5.6 min CN=88 Runoff=0.6 cfs 1,850 cf

Subcatchment PS17: PS-17
Runoff Area=12,705 sf 47.10% Impervious Runoff Depth>2.13"
Flow Length=166' Tc=7.3 min CN=84 Runoff=0.7 cfs 2,258 cf

Subcatchment PS18: PS-18
Runoff Area=7,913 sf 43.27% Impervious Runoff Depth>1.90"
Flow Length=124' Tc=5.0 min CN=81 Runoff=0.4 cfs 1,250 cf

Subcatchment PS19: PS-19
Runoff Area=7,620 sf 43.87% Impervious Runoff Depth>1.90"
Flow Length=164' Tc=5.0 min CN=81 Runoff=0.4 cfs 1,204 cf

Subcatchment PS20: PS-20
Runoff Area=3,773 sf 66.10% Impervious Runoff Depth>2.57"
Flow Length=128' Tc=5.0 min CN=89 Runoff=0.3 cfs 808 cf

Subcatchment PS21: PS-21
Runoff Area=3,612 sf 69.10% Impervious Runoff Depth>2.66"
Flow Length=124' Tc=5.0 min CN=90 Runoff=0.3 cfs 801 cf

Subcatchment PS22: PS-22
Runoff Area=8,001 sf 37.17% Impervious Runoff Depth>1.47"
Flow Length=128' Slope=0.0250 '/' Tc=5.0 min CN=75 Runoff=0.3 cfs 977 cf

Reach 2R: PR-05
Avg. Flow Depth=0.01' Max Vel=0.05 fps Inflow=0.0 cfs 444 cf
n=0.100 L=1,100.0' S=0.0050 '/' Capacity=60.8 cfs Outflow=0.0 cfs 246 cf

Reach PR01: PR-01
Avg. Flow Depth=0.03' Max Vel=0.25 fps Inflow=1.2 cfs 18,634 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=1.0 cfs 18,085 cf

Reach PR02: PR02
Avg. Flow Depth=0.10' Max Vel=0.45 fps Inflow=5.6 cfs 67,739 cf
n=0.050 L=668.0' S=0.0055 '/' Capacity=1,097.9 cfs Outflow=4.7 cfs 66,004 cf

Reach PR03: PR03
Avg. Flow Depth=0.04' Max Vel=0.29 fps Inflow=2.0 cfs 21,412 cf
n=0.080 L=894.0' S=0.0187 '/' Capacity=1,142.3 cfs Outflow=1.2 cfs 20,585 cf

Reach PR04: PR-04
Avg. Flow Depth=0.07' Max Vel=0.40 fps Inflow=4.4 cfs 65,359 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=4.0 cfs 63,780 cf

Reach PR05a: PR-05
Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.0 cfs 0 cf
n=0.100 L=46.0' S=0.0152 '/' Capacity=106.1 cfs Outflow=0.0 cfs 0 cf

Reach PR05b: PR-05
Avg. Flow Depth=0.02' Max Vel=0.18 fps Inflow=0.1 cfs 4,207 cf
n=0.100 L=46.0' S=0.0326 '/' Capacity=155.3 cfs Outflow=0.1 cfs 4,186 cf

Reach PR06: PR-06
Avg. Flow Depth=0.06' Max Vel=0.15 fps Inflow=0.3 cfs 6,962 cf
n=0.100 L=193.0' S=0.0047 '/' Capacity=58.7 cfs Outflow=0.3 cfs 6,874 cf

Reach PR07: PR-07
Avg. Flow Depth=0.09' Max Vel=0.47 fps Inflow=4.4 cfs 51,822 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=992.5 cfs Outflow=3.9 cfs 50,421 cf

Pond 1P: (new Pond)
Peak Elev=26.57' Inflow=0.3 cfs 808 cf
Outflow=0.3 cfs 808 cf

Pond 2P: (new Pond)
Peak Elev=26.57' Inflow=0.3 cfs 801 cf
Outflow=0.3 cfs 801 cf

Pond CB01: CB-01 Peak Elev=32.54' Inflow=0.4 cfs 1,250 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=0.4 cfs 1,250 cf

Pond CB02: CB-02 Peak Elev=32.47' Inflow=0.4 cfs 1,204 cf
22.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=0.4 cfs 1,204 cf

Pond CB03: CB-03 Peak Elev=41.38' Inflow=0.6 cfs 1,850 cf
12.0" Round Culvert n=0.013 L=42.0' S=0.0429 '/' Outflow=0.6 cfs 1,850 cf

Pond CB04: CB-04 Peak Elev=41.42' Inflow=0.7 cfs 2,258 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0486 '/' Outflow=0.7 cfs 2,258 cf

Pond CB05: CB-05 Peak Elev=47.33' Inflow=0.2 cfs 704 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.2 cfs 704 cf

Pond CB06: CB-06 Peak Elev=45.45' Inflow=0.2 cfs 590 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.2 cfs 590 cf

Pond CB07: CB-07 Peak Elev=50.20' Inflow=1.7 cfs 6,644 cf
12.0" Round Culvert n=0.013 L=114.0' S=0.0175 '/' Outflow=1.7 cfs 6,644 cf

Pond CB08: CB-08 Peak Elev=49.99' Inflow=0.9 cfs 2,994 cf
12.0" Round Culvert n=0.013 L=110.0' S=0.0318 '/' Outflow=0.9 cfs 2,994 cf

Pond MH01: MH 1 Peak Elev=28.66' Inflow=0.1 cfs 4,207 cf
12.0" Round Culvert n=0.012 L=91.0' S=0.0082 '/' Outflow=0.1 cfs 4,207 cf

Pond MH05: MH 5 Peak Elev=51.32' Inflow=0.0 cfs 66 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0523 '/' Outflow=0.0 cfs 66 cf

Pond P003a: R-Tank #1 and 2 Peak Elev=31.83' Storage=1,359 cf Inflow=0.8 cfs 2,453 cf
Primary=0.0 cfs 1,781 cf Secondary=0.0 cfs 0 cf Outflow=0.0 cfs 1,781 cf

Pond PP01: CULVERTS Peak Elev=24.00' Storage=3,674 cf Inflow=10.2 cfs 182,969 cf
Primary=10.1 cfs 182,572 cf Secondary=0.0 cfs 0 cf Outflow=10.1 cfs 182,572 cf

Pond PP02: PP02 Peak Elev=43.63' Storage=9,353 cf Inflow=3.6 cfs 29,195 cf
Outflow=2.0 cfs 21,412 cf

Pond PP03b: R-Tank #3 and 4 Peak Elev=34.58' Storage=2,509 cf Inflow=1.2 cfs 4,107 cf
Primary=0.1 cfs 2,426 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 2,426 cf

Pond PP04A: Bioretention Area #2 Peak Elev=47.33' Storage=2,873 cf Inflow=1.8 cfs 7,348 cf
Primary=0.3 cfs 6,962 cf Secondary=0.0 cfs 0 cf Outflow=0.3 cfs 6,962 cf

Pond PP04B: Bioretention Area #3 Peak Elev=45.25' Storage=3,140 cf Inflow=1.1 cfs 3,585 cf
Primary=0.0 cfs 444 cf Secondary=0.0 cfs 0 cf Outflow=0.0 cfs 444 cf

Pond PP05: BIoretention Pond #1 Peak Elev=56.04' Storage=911 cf Inflow=0.3 cfs 977 cf
Outflow=0.0 cfs 66 cf

Pond PP06: Wildlife Crossings Peak Elev=26.32' Storage=130 cf Inflow=5.4 cfs 62,770 cf
Primary=5.4 cfs 62,721 cf Secondary=0.0 cfs 31 cf Tertiary=0.0 cfs 0 cf Outflow=5.4 cfs 62,752 cf

Link PPol01: Pr Pol-01 Inflow=10.1 cfs 182,572 cf
Primary=10.1 cfs 182,572 cf

Link PPol02: Pr Pol-02 Inflow=0.3 cfs 3,189 cf
Primary=0.3 cfs 3,189 cf

Link PPol03: Proposed Wildlife Crossings Inflow=5.4 cfs 62,770 cf
Primary=5.4 cfs 62,770 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 207,149 cf Average Runoff Depth = 0.83"
96.04% Pervious = 2,878,780 sf 3.96% Impervious = 118,677 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS01: PS-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>1.75"
Flow Length=415' Tc=53.2 min CN=61 Runoff=1.1 cfs 8,366 cf

Subcatchment PS02: PS-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>1.35"
Flow Length=740' Tc=95.8 min CN=56 Runoff=4.8 cfs 56,442 cf

Subcatchment PS03: ES-03 Runoff Area=483,638 sf 3.20% Impervious Runoff Depth>2.08"
Flow Length=800' Tc=40.5 min CN=65 Runoff=12.9 cfs 83,789 cf

Subcatchment PS04: PS-04 Runoff Area=460,441 sf 3.70% Impervious Runoff Depth>2.41"
Flow Length=1,231' Tc=52.0 min CN=69 Runoff=12.7 cfs 92,551 cf

Subcatchment PS05: PS-05 Runoff Area=117,283 sf 8.10% Impervious Runoff Depth>2.68"
Flow Length=375' Tc=41.3 min CN=72 Runoff=4.1 cfs 26,241 cf

Subcatchment PS06: PS-06 Runoff Area=63,674 sf 8.10% Impervious Runoff Depth>2.70"
Flow Length=337' Tc=16.9 min CN=72 Runoff=3.3 cfs 14,329 cf

Subcatchment PS07: PS-07 Runoff Area=32,586 sf 5.06% Impervious Runoff Depth>2.60"
Flow Length=316' Tc=28.1 min CN=71 Runoff=1.3 cfs 7,070 cf

Subcatchment PS08: PS-08 Runoff Area=155,960 sf 3.58% Impervious Runoff Depth>2.52"
Flow Length=599' Tc=13.3 min CN=70 Runoff=8.3 cfs 32,799 cf

Subcatchment PS09: PS-09 Runoff Area=1,008,725 sf 0.85% Impervious Runoff Depth>1.66"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=14.4 cfs 139,436 cf

Subcatchment PS10: PS-10 Runoff Area=32,468 sf 52.74% Impervious Runoff Depth>3.97"
Flow Length=483' Tc=13.2 min CN=85 Runoff=2.7 cfs 10,729 cf

Subcatchment PS11: PS-11 Runoff Area=12,159 sf 58.76% Impervious Runoff Depth>3.97"
Flow Length=452' Tc=7.5 min CN=85 Runoff=1.2 cfs 4,022 cf

Subcatchment PS12: PS-12 Runoff Area=4,911 sf 36.61% Impervious Runoff Depth>3.17"
Flow Length=139' Tc=5.0 min CN=77 Runoff=0.4 cfs 1,299 cf

Subcatchment PS13: PS-13 Runoff Area=4,559 sf 39.96% Impervious Runoff Depth>3.66"
Flow Length=139' Tc=5.0 min CN=82 Runoff=0.4 cfs 1,392 cf

Subcatchment PS14: PS-14 Runoff Area=5,051 sf 20.97% Impervious Runoff Depth>3.27"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.4 cfs 1,376 cf

Subcatchment PS15: PS-15 Runoff Area=4,235 sf 19.50% Impervious Runoff Depth>3.27"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.4 cfs 1,154 cf

Subcatchment PS16: PS-16 Runoff Area=8,958 sf 58.47% Impervious Runoff Depth>4.29"
Flow Length=117' Tc=5.6 min CN=88 Runoff=1.0 cfs 3,200 cf

Subcatchment PS17: PS-17 Runoff Area=12,705 sf 47.10% Impervious Runoff Depth>3.87"
Flow Length=166' Tc=7.3 min CN=84 Runoff=1.2 cfs 4,093 cf

Subcatchment PS18: PS-18 Runoff Area=7,913 sf 43.27% Impervious Runoff Depth>3.56"
Flow Length=124' Tc=5.0 min CN=81 Runoff=0.8 cfs 2,350 cf

Subcatchment PS19: PS-19 Runoff Area=7,620 sf 43.87% Impervious Runoff Depth>3.56"
Flow Length=164' Tc=5.0 min CN=81 Runoff=0.7 cfs 2,263 cf

Subcatchment PS20: PS-20 Runoff Area=3,773 sf 66.10% Impervious Runoff Depth>4.39"
Flow Length=128' Tc=5.0 min CN=89 Runoff=0.4 cfs 1,382 cf

Subcatchment PS21: PS-21 Runoff Area=3,612 sf 69.10% Impervious Runoff Depth>4.50"
Flow Length=124' Tc=5.0 min CN=90 Runoff=0.4 cfs 1,355 cf

Subcatchment PS22: PS-22 Runoff Area=8,001 sf 37.17% Impervious Runoff Depth>2.98"
Flow Length=128' Slope=0.0250 '/' Tc=5.0 min CN=75 Runoff=0.6 cfs 1,990 cf

Reach 2R: PR-05 Avg. Flow Depth=0.03' Max Vel=0.11 fps Inflow=0.5 cfs 3,393 cf
n=0.100 L=1,100.0' S=0.0050 '/' Capacity=60.8 cfs Outflow=0.1 cfs 2,861 cf

Reach PR01: PR-01 Avg. Flow Depth=0.08' Max Vel=0.42 fps Inflow=4.8 cfs 56,442 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=4.5 cfs 55,208 cf

Reach PR02: PR02 Avg. Flow Depth=0.20' Max Vel=0.71 fps Inflow=17.3 cfs 152,048 cf
n=0.050 L=668.0' S=0.0055 '/' Capacity=1,097.9 cfs Outflow=15.9 cfs 149,571 cf

Reach PR03: PR03 Avg. Flow Depth=0.09' Max Vel=0.52 fps Inflow=7.3 cfs 52,606 cf
n=0.080 L=894.0' S=0.0187 '/' Capacity=1,142.3 cfs Outflow=5.2 cfs 51,160 cf

Reach PR04: PR-04 Avg. Flow Depth=0.15' Max Vel=0.65 fps Inflow=14.7 cfs 170,095 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=14.0 cfs 167,052 cf

Reach PR05a: PR-05 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.0 cfs 0 cf
n=0.100 L=46.0' S=0.0152 '/' Capacity=106.1 cfs Outflow=0.0 cfs 0 cf

Reach PR05b: PR-05 Avg. Flow Depth=0.02' Max Vel=0.20 fps Inflow=0.1 cfs 5,650 cf
n=0.100 L=46.0' S=0.0326 '/' Capacity=155.3 cfs Outflow=0.1 cfs 5,623 cf

Reach PR06: PR-06 Avg. Flow Depth=0.13' Max Vel=0.24 fps Inflow=1.4 cfs 13,019 cf
n=0.100 L=193.0' S=0.0047 '/' Capacity=58.7 cfs Outflow=1.2 cfs 12,897 cf

Reach PR07: PR-07 Avg. Flow Depth=0.19' Max Vel=0.74 fps Inflow=14.4 cfs 139,519 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=992.5 cfs Outflow=13.7 cfs 137,296 cf

Pond 1P: (new Pond) Peak Elev=26.60' Inflow=0.4 cfs 1,382 cf
Outflow=0.4 cfs 1,382 cf

Pond 2P: (new Pond) Peak Elev=26.60' Inflow=0.4 cfs 1,355 cf
Outflow=0.4 cfs 1,355 cf

Pond CB01: CB-01 Peak Elev=33.79' Inflow=0.8 cfs 2,350 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=0.8 cfs 2,350 cf

Pond CB02: CB-02 Peak Elev=33.98' Inflow=0.7 cfs 2,263 cf
22.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=0.7 cfs 2,259 cf

Pond CB03: CB-03 Peak Elev=41.51' Inflow=1.0 cfs 3,200 cf
12.0" Round Culvert n=0.013 L=42.0' S=0.0429 '/' Outflow=1.0 cfs 3,200 cf

Pond CB04: CB-04 Peak Elev=41.58' Inflow=1.2 cfs 4,093 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0486 '/' Outflow=1.2 cfs 4,093 cf

Pond CB05: CB-05 Peak Elev=47.98' Inflow=0.4 cfs 1,376 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.4 cfs 1,376 cf

Pond CB06: CB-06 Peak Elev=45.60' Inflow=0.4 cfs 1,154 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.4 cfs 1,154 cf

Pond CB07: CB-07 Peak Elev=50.61' Inflow=3.0 cfs 12,028 cf
12.0" Round Culvert n=0.013 L=114.0' S=0.0175 '/' Outflow=3.0 cfs 12,028 cf

Pond CB08: CB-08 Peak Elev=50.18' Inflow=1.6 cfs 5,414 cf
12.0" Round Culvert n=0.013 L=110.0' S=0.0318 '/' Outflow=1.6 cfs 5,414 cf

Pond MH01: MH 1 Peak Elev=28.67' Inflow=0.1 cfs 5,650 cf
12.0" Round Culvert n=0.012 L=91.0' S=0.0082 '/' Outflow=0.1 cfs 5,650 cf

Pond MH05: MH 5 Peak Elev=51.32' Inflow=0.0 cfs 83 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0523 '/' Outflow=0.0 cfs 83 cf

Pond P003a: R-Tank #1 and 2 Peak Elev=33.79' Storage=3,609 cf Inflow=1.5 cfs 5,570 cf
Primary=0.1 cfs 2,569 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 2,569 cf

Pond PP01: CULVERTS Peak Elev=25.72' Storage=78,114 cf Inflow=36.2 cfs 458,481 cf
Primary=21.6 cfs 457,784 cf Secondary=0.0 cfs 0 cf Outflow=21.6 cfs 457,784 cf

Pond PP02: PP02 Peak Elev=43.77' Storage=12,394 cf Inflow=8.2 cfs 60,537 cf
Outflow=7.3 cfs 52,606 cf

Pond PP03b: R-Tank #3 and 4 Peak Elev=36.69' Storage=4,461 cf Inflow=2.2 cfs 7,294 cf
Primary=0.1 cfs 3,081 cf Secondary=0.0 cfs 961 cf Outflow=0.1 cfs 4,041 cf

Pond PP04A: Bioretention Area #2 Peak Elev=47.97' Storage=4,724 cf Inflow=3.3 cfs 13,404 cf
Primary=1.4 cfs 13,019 cf Secondary=0.0 cfs 0 cf Outflow=1.4 cfs 13,019 cf

Pond PP04B: Bioretention Area #3 Peak Elev=45.38' Storage=3,476 cf Inflow=1.9 cfs 6,568 cf
Primary=0.5 cfs 3,393 cf Secondary=0.0 cfs 0 cf Outflow=0.5 cfs 3,393 cf

Pond PP05: BIoretention Pond #1 Peak Elev=56.75' Storage=1,906 cf Inflow=0.6 cfs 1,990 cf
Outflow=0.0 cfs 83 cf

Pond PP06: Wildlife Crossings Peak Elev=26.76' Storage=520 cf Inflow=17.1 cfs 145,093 cf
Primary=12.7 cfs 131,716 cf Secondary=4.4 cfs 13,354 cf Tertiary=0.0 cfs 0 cf Outflow=17.1 cfs 145,070 cf

Link PPoI01: Pr PoI-01 Inflow=21.6 cfs 457,784 cf
Primary=21.6 cfs 457,784 cf

Link PPoI02: Pr PoI-02 Inflow=1.1 cfs 8,366 cf
Primary=1.1 cfs 8,366 cf

Link PPoI03: Proposed Wildlife Crossings Inflow=17.1 cfs 145,093 cf
Primary=17.1 cfs 145,093 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 497,631 cf Average Runoff Depth = 1.99"
96.04% Pervious = 2,878,780 sf 3.96% Impervious = 118,677 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS01: PS-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>2.78"
Flow Length=415' Tc=53.2 min CN=61 Runoff=1.8 cfs 13,302 cf

Subcatchment PS02: PS-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>2.26"
Flow Length=740' Tc=95.8 min CN=56 Runoff=8.5 cfs 94,422 cf

Subcatchment PS03: ES-03 Runoff Area=483,638 sf 3.20% Impervious Runoff Depth>3.20"
Flow Length=800' Tc=40.5 min CN=65 Runoff=20.3 cfs 128,855 cf

Subcatchment PS04: PS-04 Runoff Area=460,441 sf 3.70% Impervious Runoff Depth>3.60"
Flow Length=1,231' Tc=52.0 min CN=69 Runoff=19.2 cfs 138,298 cf

Subcatchment PS05: PS-05 Runoff Area=117,283 sf 8.10% Impervious Runoff Depth>3.93"
Flow Length=375' Tc=41.3 min CN=72 Runoff=6.1 cfs 38,434 cf

Subcatchment PS06: PS-06 Runoff Area=63,674 sf 8.10% Impervious Runoff Depth>3.95"
Flow Length=337' Tc=16.9 min CN=72 Runoff=4.9 cfs 20,978 cf

Subcatchment PS07: PS-07 Runoff Area=32,586 sf 5.06% Impervious Runoff Depth>3.84"
Flow Length=316' Tc=28.1 min CN=71 Runoff=2.0 cfs 10,419 cf

Subcatchment PS08: PS-08 Runoff Area=155,960 sf 3.58% Impervious Runoff Depth>3.74"
Flow Length=599' Tc=13.3 min CN=70 Runoff=12.4 cfs 48,643 cf

Subcatchment PS09: PS-09 Runoff Area=1,008,725 sf 0.85% Impervious Runoff Depth>2.66"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=24.2 cfs 223,869 cf

Subcatchment PS10: PS-10 Runoff Area=32,468 sf 52.74% Impervious Runoff Depth>5.40"
Flow Length=483' Tc=13.2 min CN=85 Runoff=3.6 cfs 14,598 cf

Subcatchment PS11: PS-11 Runoff Area=12,159 sf 58.76% Impervious Runoff Depth>5.40"
Flow Length=452' Tc=7.5 min CN=85 Runoff=1.6 cfs 5,472 cf

Subcatchment PS12: PS-12 Runoff Area=4,911 sf 36.61% Impervious Runoff Depth>4.51"
Flow Length=139' Tc=5.0 min CN=77 Runoff=0.6 cfs 1,845 cf

Subcatchment PS13: PS-13 Runoff Area=4,559 sf 39.96% Impervious Runoff Depth>5.06"
Flow Length=139' Tc=5.0 min CN=82 Runoff=0.6 cfs 1,924 cf

Subcatchment PS14: PS-14 Runoff Area=5,051 sf 20.97% Impervious Runoff Depth>4.62"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.6 cfs 1,944 cf

Subcatchment PS15: PS-15 Runoff Area=4,235 sf 19.50% Impervious Runoff Depth>4.62"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.5 cfs 1,630 cf

Subcatchment PS16: PS-16 Runoff Area=8,958 sf 58.47% Impervious Runoff Depth>5.75"
Flow Length=117' Tc=5.6 min CN=88 Runoff=1.3 cfs 4,289 cf

Subcatchment PS17: PS-17 Runoff Area=12,705 sf 47.10% Impervious Runoff Depth>5.29"
Flow Length=166' Tc=7.3 min CN=84 Runoff=1.6 cfs 5,598 cf

Subcatchment PS18: PS-18 Runoff Area=7,913 sf 43.27% Impervious Runoff Depth>4.95"
Flow Length=124' Tc=5.0 min CN=81 Runoff=1.0 cfs 3,265 cf

Subcatchment PS19: PS-19 Runoff Area=7,620 sf 43.87% Impervious Runoff Depth>4.95"
Flow Length=164' Tc=5.0 min CN=81 Runoff=1.0 cfs 3,144 cf

Subcatchment PS20: PS-20 Runoff Area=3,773 sf 66.10% Impervious Runoff Depth>5.86"
Flow Length=128' Tc=5.0 min CN=89 Runoff=0.6 cfs 1,843 cf

Subcatchment PS21: PS-21 Runoff Area=3,612 sf 69.10% Impervious Runoff Depth>5.98"
Flow Length=124' Tc=5.0 min CN=90 Runoff=0.6 cfs 1,799 cf

Subcatchment PS22: PS-22 Runoff Area=8,001 sf 37.17% Impervious Runoff Depth>4.29"
Flow Length=128' Slope=0.0250 '/' Tc=5.0 min CN=75 Runoff=0.9 cfs 2,859 cf

Reach 2R: PR-05 Avg. Flow Depth=0.06' Max Vel=0.15 fps Inflow=1.5 cfs 5,841 cf
n=0.100 L=1,100.0' S=0.0050 '/' Capacity=60.8 cfs Outflow=0.3 cfs 5,220 cf

Reach PR01: PR-01 Avg. Flow Depth=0.11' Max Vel=0.54 fps Inflow=8.5 cfs 94,422 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=8.2 cfs 92,827 cf

Reach PR02: PR02 Avg. Flow Depth=0.27' Max Vel=0.86 fps Inflow=29.1 cfs 228,626 cf
n=0.050 L=668.0' S=0.0055 '/' Capacity=1,097.9 cfs Outflow=27.3 cfs 225,708 cf

Reach PR03: PR03 Avg. Flow Depth=0.14' Max Vel=0.65 fps Inflow=12.1 cfs 79,656 cf
n=0.080 L=894.0' S=0.0187 '/' Capacity=1,142.3 cfs Outflow=9.6 cfs 77,821 cf

Reach PR04: PR-04 Avg. Flow Depth=0.20' Max Vel=0.80 fps Inflow=24.8 cfs 269,844 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=24.0 cfs 266,209 cf

Reach PR05a: PR-05 Avg. Flow Depth=0.05' Max Vel=0.25 fps Inflow=0.5 cfs 2,665 cf
n=0.100 L=46.0' S=0.0152 '/' Capacity=106.1 cfs Outflow=0.5 cfs 2,665 cf

Reach PR05b: PR-05 Avg. Flow Depth=0.02' Max Vel=0.20 fps Inflow=0.1 cfs 6,254 cf
n=0.100 L=46.0' S=0.0326 '/' Capacity=155.3 cfs Outflow=0.1 cfs 6,225 cf

Reach PR06: PR-06 Avg. Flow Depth=0.20' Max Vel=0.30 fps Inflow=3.4 cfs 18,001 cf
n=0.100 L=193.0' S=0.0047 '/' Capacity=58.7 cfs Outflow=2.5 cfs 17,859 cf

Reach PR07: PR-07 Avg. Flow Depth=0.26' Max Vel=0.90 fps Inflow=24.2 cfs 223,961 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=992.5 cfs Outflow=23.3 cfs 221,202 cf

Pond 1P: (new Pond) Peak Elev=26.63' Inflow=0.6 cfs 1,843 cf
Outflow=0.6 cfs 1,843 cf

Pond 2P: (new Pond) Peak Elev=26.62' Inflow=0.6 cfs 1,799 cf
Outflow=0.6 cfs 1,799 cf

Pond CB01: CB-01 Peak Elev=34.48' Inflow=1.0 cfs 3,265 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=1.0 cfs 3,266 cf

Pond CB02: CB-02 Peak Elev=34.48' Inflow=1.0 cfs 3,144 cf
22.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=1.0 cfs 3,138 cf

Pond CB03: CB-03 Peak Elev=41.60' Inflow=1.3 cfs 4,289 cf
12.0" Round Culvert n=0.013 L=42.0' S=0.0429 '/' Outflow=1.3 cfs 4,289 cf

Pond CB04: CB-04 Peak Elev=41.69' Inflow=1.6 cfs 5,598 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0486 '/' Outflow=1.6 cfs 5,598 cf

Pond CB05: CB-05 Peak Elev=48.18' Inflow=0.6 cfs 1,944 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.6 cfs 1,944 cf

Pond CB06: CB-06 Peak Elev=45.75' Inflow=0.5 cfs 1,630 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.5 cfs 1,630 cf

Pond CB07: CB-07 Peak Elev=51.11' Inflow=4.0 cfs 16,443 cf
12.0" Round Culvert n=0.013 L=114.0' S=0.0175 '/' Outflow=4.0 cfs 16,443 cf

Pond CB08: CB-08 Peak Elev=50.33' Inflow=2.2 cfs 7,396 cf
12.0" Round Culvert n=0.013 L=110.0' S=0.0318 '/' Outflow=2.2 cfs 7,396 cf

Pond MH01: MH 1 Peak Elev=28.68' Inflow=0.1 cfs 6,254 cf
12.0" Round Culvert n=0.012 L=91.0' S=0.0082 '/' Outflow=0.1 cfs 6,254 cf

Pond MH05: MH 5 Peak Elev=51.32' Inflow=0.0 cfs 92 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0523 '/' Outflow=0.0 cfs 92 cf

Pond P003a: R-Tank #1 and 2 Peak Elev=34.48' Storage=4,100 cf Inflow=2.1 cfs 9,304 cf
Primary=0.1 cfs 2,868 cf Secondary=0.5 cfs 2,665 cf Outflow=0.5 cfs 5,533 cf

Pond PP01: CULVERTS Peak Elev=26.19' Storage=161,217 cf Inflow=63.3 cfs 718,821 cf
Primary=23.9 cfs 631,236 cf Secondary=17.5 cfs 86,635 cf Outflow=41.4 cfs 717,871 cf

Pond PP02: PP02 Peak Elev=43.87' Storage=14,715 cf Inflow=13.3 cfs 87,691 cf
Outflow=12.1 cfs 79,656 cf

Pond PP03b: R-Tank #3 and 4 Peak Elev=37.77' Storage=5,263 cf Inflow=2.9 cfs 9,887 cf
Primary=0.1 cfs 3,386 cf Secondary=0.7 cfs 2,900 cf Outflow=0.8 cfs 6,286 cf

Pond PP04A: Bioretention Area #2 Peak Elev=48.10' Storage=5,178 cf Inflow=4.4 cfs 18,386 cf
Primary=2.6 cfs 17,436 cf Secondary=0.8 cfs 565 cf Outflow=3.4 cfs 18,001 cf

Pond PP04B: Bioretention Area #3 Peak Elev=45.52' Storage=3,838 cf Inflow=2.6 cfs 9,026 cf
Primary=1.4 cfs 5,826 cf Secondary=0.0 cfs 15 cf Outflow=1.5 cfs 5,841 cf

Pond PP05: BIoretention Pond #1 Peak Elev=57.27' Storage=2,767 cf Inflow=0.9 cfs 2,859 cf
Outflow=0.0 cfs 92 cf

Pond PP06: Wildlife Crossings Peak Elev=27.04' Storage=1,017 cf Inflow=29.0 cfs 220,627 cf
Primary=18.4 cfs 186,193 cf Secondary=8.8 cfs 31,627 cf Tertiary=1.8 cfs 2,781 cf Outflow=29.0 cfs 220,601 cf

Link PPol01: Pr Pol-01 Inflow=41.4 cfs 717,871 cf
Primary=41.4 cfs 717,871 cf

Link PPol02: Pr Pol-02 Inflow=1.8 cfs 13,302 cf
Primary=1.8 cfs 13,302 cf

Link PPol03: Proposed Wildlife Crossings Inflow=29.0 cfs 220,627 cf
Primary=29.0 cfs 220,627 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 767,430 cf Average Runoff Depth = 3.07"
96.04% Pervious = 2,878,780 sf 3.96% Impervious = 118,677 sf

Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PS01: PS-01 Runoff Area=57,405 sf 0.00% Impervious Runoff Depth>3.84"
Flow Length=415' Tc=53.2 min CN=61 Runoff=2.5 cfs 18,392 cf

Subcatchment PS02: PS-02 Runoff Area=501,780 sf 0.00% Impervious Runoff Depth>3.22"
Flow Length=740' Tc=95.8 min CN=56 Runoff=12.6 cfs 134,614 cf

Subcatchment PS03: ES-03 Runoff Area=483,638 sf 3.20% Impervious Runoff Depth>4.33"
Flow Length=800' Tc=40.5 min CN=65 Runoff=27.7 cfs 174,537 cf

Subcatchment PS04: PS-04 Runoff Area=460,441 sf 3.70% Impervious Runoff Depth>4.79"
Flow Length=1,231' Tc=52.0 min CN=69 Runoff=25.6 cfs 183,980 cf

Subcatchment PS05: PS-05 Runoff Area=117,283 sf 8.10% Impervious Runoff Depth>5.17"
Flow Length=375' Tc=41.3 min CN=72 Runoff=8.0 cfs 50,485 cf

Subcatchment PS06: PS-06 Runoff Area=63,674 sf 8.10% Impervious Runoff Depth>5.19"
Flow Length=337' Tc=16.9 min CN=72 Runoff=6.4 cfs 27,548 cf

Subcatchment PS07: PS-07 Runoff Area=32,586 sf 5.06% Impervious Runoff Depth>5.06"
Flow Length=316' Tc=28.1 min CN=71 Runoff=2.6 cfs 13,740 cf

Subcatchment PS08: PS-08 Runoff Area=155,960 sf 3.58% Impervious Runoff Depth>4.96"
Flow Length=599' Tc=13.3 min CN=70 Runoff=16.4 cfs 64,403 cf

Subcatchment PS09: PS-09 Runoff Area=1,008,725 sf 0.85% Impervious Runoff Depth>3.70"
Flow Length=1,835' Tc=75.9 min CN=60 Runoff=34.3 cfs 311,385 cf

Subcatchment PS10: PS-10 Runoff Area=32,468 sf 52.74% Impervious Runoff Depth>6.76"
Flow Length=483' Tc=13.2 min CN=85 Runoff=4.5 cfs 18,294 cf

Subcatchment PS11: PS-11 Runoff Area=12,159 sf 58.76% Impervious Runoff Depth>6.77"
Flow Length=452' Tc=7.5 min CN=85 Runoff=2.0 cfs 6,858 cf

Subcatchment PS12: PS-12 Runoff Area=4,911 sf 36.61% Impervious Runoff Depth>5.81"
Flow Length=139' Tc=5.0 min CN=77 Runoff=0.8 cfs 2,376 cf

Subcatchment PS13: PS-13 Runoff Area=4,559 sf 39.96% Impervious Runoff Depth>6.41"
Flow Length=139' Tc=5.0 min CN=82 Runoff=0.8 cfs 2,435 cf

Subcatchment PS14: PS-14 Runoff Area=5,051 sf 20.97% Impervious Runoff Depth>5.93"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.8 cfs 2,494 cf

Subcatchment PS15: PS-15 Runoff Area=4,235 sf 19.50% Impervious Runoff Depth>5.93"
Flow Length=96' Tc=5.0 min CN=78 Runoff=0.7 cfs 2,091 cf

Subcatchment PS16: PS-16 Runoff Area=8,958 sf 58.47% Impervious Runoff Depth>7.13"
Flow Length=117' Tc=5.6 min CN=88 Runoff=1.6 cfs 5,324 cf

Subcatchment PS17: PS-17 Runoff Area=12,705 sf 47.10% Impervious Runoff Depth>6.65"
Flow Length=166' Tc=7.3 min CN=84 Runoff=2.0 cfs 7,038 cf

Subcatchment PS18: PS-18 Runoff Area=7,913 sf 43.27% Impervious Runoff Depth>6.29"
Flow Length=124' Tc=5.0 min CN=81 Runoff=1.3 cfs 4,146 cf

Subcatchment PS19: PS-19 Runoff Area=7,620 sf 43.87% Impervious Runoff Depth>6.29"
Flow Length=164' Tc=5.0 min CN=81 Runoff=1.3 cfs 3,993 cf

Subcatchment PS20: PS-20 Runoff Area=3,773 sf 66.10% Impervious Runoff Depth>7.25"
Flow Length=128' Tc=5.0 min CN=89 Runoff=0.7 cfs 2,280 cf

Subcatchment PS21: PS-21 Runoff Area=3,612 sf 69.10% Impervious Runoff Depth>7.37"
Flow Length=124' Tc=5.0 min CN=90 Runoff=0.7 cfs 2,219 cf

Subcatchment PS22: PS-22 Runoff Area=8,001 sf 37.17% Impervious Runoff Depth>5.56"
Flow Length=128' Slope=0.0250 '/' Tc=5.0 min CN=75 Runoff=1.2 cfs 3,710 cf

Reach 2R: PR-05 Avg. Flow Depth=0.08' Max Vel=0.18 fps Inflow=2.8 cfs 8,192 cf
n=0.100 L=1,100.0' S=0.0050 '/' Capacity=60.8 cfs Outflow=0.5 cfs 7,503 cf

Reach PR01: PR-01 Avg. Flow Depth=0.14' Max Vel=0.62 fps Inflow=12.6 cfs 134,614 cf
n=0.050 L=537.0' S=0.0065 '/' Capacity=1,413.2 cfs Outflow=12.2 cfs 132,764 cf

Reach PR02: PR02 Avg. Flow Depth=0.33' Max Vel=0.97 fps Inflow=40.4 cfs 305,470 cf
n=0.050 L=668.0' S=0.0055 '/' Capacity=1,097.9 cfs Outflow=38.5 cfs 302,179 cf

Reach PR03: PR03 Avg. Flow Depth=0.17' Max Vel=0.75 fps Inflow=16.6 cfs 106,267 cf
n=0.080 L=894.0' S=0.0187 '/' Capacity=1,142.3 cfs Outflow=13.9 cfs 104,209 cf

Reach PR04: PR-04 Avg. Flow Depth=0.25' Max Vel=0.92 fps Inflow=35.2 cfs 373,031 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=2,431.4 cfs Outflow=34.3 cfs 368,799 cf

Reach PR05a: PR-05 Avg. Flow Depth=0.16' Max Vel=0.47 fps Inflow=2.9 cfs 6,313 cf
n=0.100 L=46.0' S=0.0152 '/' Capacity=106.1 cfs Outflow=2.9 cfs 6,313 cf

Reach PR05b: PR-05 Avg. Flow Depth=0.02' Max Vel=0.21 fps Inflow=0.1 cfs 6,526 cf
n=0.100 L=46.0' S=0.0326 '/' Capacity=155.3 cfs Outflow=0.1 cfs 6,497 cf

Reach PR06: PR-06 Avg. Flow Depth=0.26' Max Vel=0.35 fps Inflow=4.9 cfs 22,784 cf
n=0.100 L=193.0' S=0.0047 '/' Capacity=58.7 cfs Outflow=3.9 cfs 22,619 cf

Reach PR07: PR-07 Avg. Flow Depth=0.32' Max Vel=1.02 fps Inflow=34.3 cfs 311,871 cf
n=0.080 L=682.0' S=0.0161 '/' Capacity=992.5 cfs Outflow=33.3 cfs 308,628 cf

Pond 1P: (new Pond) Peak Elev=26.64' Inflow=0.7 cfs 2,280 cf
Outflow=0.7 cfs 2,280 cf

Pond 2P: (new Pond) Peak Elev=26.64' Inflow=0.7 cfs 2,219 cf
Outflow=0.7 cfs 2,219 cf

Pond CB01: CB-01 Peak Elev=34.89' Inflow=1.3 cfs 4,146 cf
12.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=1.3 cfs 4,146 cf

Pond CB02: CB-02 Peak Elev=34.88' Inflow=1.3 cfs 3,993 cf
22.0" Round Culvert n=0.013 L=12.0' S=0.0125 '/' Outflow=1.3 cfs 3,983 cf

Pond CB03: CB-03 Peak Elev=41.68' Inflow=1.6 cfs 5,324 cf
12.0" Round Culvert n=0.013 L=42.0' S=0.0429 '/' Outflow=1.6 cfs 5,324 cf

Pond CB04: CB-04 Peak Elev=41.80' Inflow=2.0 cfs 7,038 cf
12.0" Round Culvert n=0.013 L=37.0' S=0.0486 '/' Outflow=2.0 cfs 7,038 cf

Pond CB05: CB-05 Peak Elev=48.58' Inflow=0.8 cfs 2,494 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.8 cfs 2,494 cf

Pond CB06: CB-06 Peak Elev=46.01' Inflow=0.7 cfs 2,091 cf
6.0" Round Culvert n=0.013 L=15.0' S=0.0100 '/' Outflow=0.7 cfs 2,091 cf

Pond CB07: CB-07 Peak Elev=51.72' Inflow=5.0 cfs 20,670 cf
12.0" Round Culvert n=0.013 L=114.0' S=0.0175 '/' Outflow=5.0 cfs 20,670 cf

Pond CB08: CB-08 Peak Elev=50.49' Inflow=2.7 cfs 9,292 cf
12.0" Round Culvert n=0.013 L=110.0' S=0.0318 '/' Outflow=2.7 cfs 9,292 cf

Pond MH01: MH 1 Peak Elev=28.68' Inflow=0.1 cfs 6,526 cf
12.0" Round Culvert n=0.012 L=91.0' S=0.0082 '/' Outflow=0.1 cfs 6,526 cf

Pond MH05: MH 5 Peak Elev=51.37' Inflow=0.0 cfs 486 cf
12.0" Round Culvert n=0.013 L=65.0' S=0.0523 '/' Outflow=0.0 cfs 486 cf

Pond P003a: R-Tank #1 and 2 Peak Elev=34.88' Storage=4,337 cf Inflow=2.8 cfs 13,216 cf
Primary=0.1 cfs 2,978 cf Secondary=2.9 cfs 6,313 cf Outflow=3.0 cfs 9,290 cf

Pond PP01: CULVERTS Peak Elev=26.40' Storage=206,422 cf Inflow=91.1 cfs 985,781 cf
Primary=24.9 cfs 728,667 cf Secondary=43.7 cfs 255,873 cf Outflow=68.5 cfs 984,541 cf

Pond PP02: PP02 Peak Elev=43.95' Storage=16,719 cf Inflow=18.1 cfs 114,392 cf
Outflow=16.6 cfs 106,267 cf

Pond PP03b: R-Tank #3 and 4 Peak Elev=38.27' Storage=5,503 cf Inflow=3.6 cfs 12,362 cf
Primary=0.1 cfs 3,548 cf Secondary=1.6 cfs 5,087 cf Outflow=1.7 cfs 8,635 cf

Pond PP04A: Bioretention Area #2 Peak Elev=48.19' Storage=5,486 cf Inflow=5.5 cfs 23,165 cf
Primary=2.9 cfs 20,980 cf Secondary=2.0 cfs 1,804 cf Outflow=4.9 cfs 22,784 cf

Pond PP04B: Bioretention Area #3 Peak Elev=45.60' Storage=4,053 cf Inflow=3.3 cfs 11,384 cf
Primary=2.1 cfs 7,782 cf Secondary=0.7 cfs 410 cf Outflow=2.8 cfs 8,192 cf

Pond PP05: BIoretention Pond #1 Peak Elev=57.52' Storage=3,235 cf Inflow=1.2 cfs 3,710 cf
Outflow=0.0 cfs 486 cf

Pond PP06: Wildlife Crossings Peak Elev=27.25' Storage=1,660 cf Inflow=40.2 cfs 296,783 cf
Primary=23.1 cfs 236,192 cf Secondary=12.6 cfs 50,841 cf Tertiary=4.4 cfs 9,720 cf Outflow=40.2 cfs 296,753 cf

Link PPoI01: Pr PoI-01 Inflow=68.5 cfs 984,541 cf
Primary=68.5 cfs 984,541 cf

Link PPoI02: Pr PoI-02 Inflow=2.5 cfs 18,392 cf
Primary=2.5 cfs 18,392 cf

Link PPoI03: Proposed Wildlife Crossings Inflow=40.2 cfs 296,783 cf
Primary=40.2 cfs 296,783 cf

Total Runoff Area = 2,997,457 sf Runoff Volume = 1,042,344 cf Average Runoff Depth = 4.17"
96.04% Pervious = 2,878,780 sf 3.96% Impervious = 118,677 sf

APPENDIX E
POST DRAINAGE
(10 Yr Storm Event)

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Summary for Subcatchment PS01: PS-01

Runoff = 1.1 cfs @ 12.78 hrs, Volume= 8,366 cf, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
9,442	55	Woods, Good, HSG B
122	48	Brush, Good, HSG B
13,602	48	Power Line - Brush, Good, HSG B
16,200	70	Woods, Good, HSG C
7,778	65	Brush, Good, HSG C
10,261	65	Power Line - Brush, Good, HSG C
57,405	61	Weighted Average
57,405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
49.1	100	0.0100	0.03		**Sheet Flow, Sheet-Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
3.4	205	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
0.7	110	0.0100	2.68	374.84	**Channel Flow, Channel Flow** Area= 140.0 sf Perim= 80.9' r= 1.73' n= 0.080 Earth, long dense weeds
53.2	415	Total			

Summary for Subcatchment PS02: PS-02

Runoff = 4.8 cfs @ 13.43 hrs, Volume= 56,442 cf, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
209,453	55	Woods, Good, HSG B
82,831	48	Brush, Good, HSG B
53,777	48	Power Line - Brush, Good, HSG B
21,794	70	Woods, Good, HSG C
126,184	65	Brush, Good, HSG C
7,741	65	Power Line - Brush, Good, HSG C
501,780	56	Weighted Average
501,780		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Shallow** Woods: Dense underbrush n= 0.800 P2= 3.23"
58.0	550	0.0010	0.16		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
0.6	90	0.0100	2.41	714.05	**Channel Flow, Concentrated** Area= 296.0 sf Perim= 200.0' r= 1.48' n= 0.080 Earth, long dense weeds
95.8	740	Total			

Summary for Subcatchment PS03: ES-03

Runoff = 12.9 cfs @ 12.59 hrs, Volume= 83,789 cf, Depth> 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
2,148	98	Paved parking, HSG B
2,609	98	Roofs, HSG B
6,992	61	>75% Grass cover, Good, HSG B
47,744	55	Woods, Good, HSG B
16,804	48	Brush, Good, HSG B
844	48	Power Line - Brush, Good, HSG B
8,479	98	Paved parking, HSG C
2,230	98	Roofs, HSG C
14,892	74	>75% Grass cover, Good, HSG C
75,358	70	Woods, Good, HSG C
232,548	65	Brush, Good, HSG C
71,845	65	Power Line - Brush, Good, HSG C
1,145	72	Woods/grass comb., Good, HSG C
483,638	65	Weighted Average
468,172		96.80% Pervious Area
15,466		3.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.2	100	0.0400	0.06		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
12.3	700	0.0360	0.95		**Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps
40.5	800	Total			

Summary for Subcatchment PS04: PS-04

Runoff = 12.7 cfs @ 12.74 hrs, Volume= 92,551 cf, Depth> 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
0	98	Roofs, HSG B
0	61	>75% Grass cover, Good, HSG B
18,261	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
0	48	Power Line - Brush, Good, HSG B
13,586	98	Paved parking, HSG C
3,431	98	Roofs, HSG C
19,621	74	>75% Grass cover, Good, HSG C
248,714	70	Woods, Good, HSG C
154,834	65	Brush, Good, HSG C
1,994	72	Woods/grass comb., Good, HSG C
460,441	69	Weighted Average
443,424		96.30% Pervious Area
17,017		3.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
9.7	421	0.0210	0.72		**Shallow Concentrated Flow, Shallow Flow** Woodland Kv= 5.0 fps
5.1	710	0.0100	2.34	835.95	**Channel Flow, Channel Flow** Area= 358.0 sf Perim= 254.0' r= 1.41' n= 0.080 Earth, long dense weeds
52.0	1,231	Total			

Summary for Subcatchment PS05: PS-05

Runoff = 4.1 cfs @ 12.58 hrs, Volume= 26,241 cf, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
1,372	98	Roofs, HSG B
6,689	61	>75% Grass cover, Good, HSG B
1,161	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
2,910	98	Paved parking, HSG C
5,221	98	Roofs, HSG C
31,592	74	>75% Grass cover, Good, HSG C
50,975	70	Woods, Good, HSG C
17,363	65	Brush, Good, HSG C
117,283	72	Weighted Average
107,780		91.90% Pervious Area
9,503		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
37.2	100	0.0200	0.04		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
4.1	275	0.0500	1.12		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
41.3	375	Total			

Summary for Subcatchment PS06: PS-06

Runoff = 3.3 cfs @ 12.24 hrs, Volume= 14,329 cf, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
244	98	Roofs, HSG B
3,297	61	>75% Grass cover, Good, HSG B
4,211	55	Woods, Good, HSG B
539	58	Woods/grass comb., Good, HSG B
1,904	98	Paved parking, HSG C
3,008	98	Roofs, HSG C
20,224	74	>75% Grass cover, Good, HSG C
22,797	70	Woods, Good, HSG C
4,735	65	Brush, Good, HSG C
2,715	72	Woods/grass comb., Good, HSG C
63,674	72	Weighted Average
58,518		91.90% Pervious Area
5,156		8.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0100	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
3.9	237	0.0400	1.00		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
16.9	337	Total			

Summary for Subcatchment PS07: PS-07

Runoff = 1.3 cfs @ 12.40 hrs, Volume= 7,070 cf, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved roads w/curbs & sewers, HSG C
1,648	98	Roofs, HSG C
6,087	74	>75% Grass cover, Good, HSG C
18,941	70	Woods, Good, HSG C
4,832	65	Brush, Good, HSG C
1,078	72	Woods/grass comb., Good, HSG C
32,586	71	Weighted Average
30,938		94.94% Pervious Area
1,648		5.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	50	0.0300	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
18.2	50	0.0300	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
5.1	216	0.0200	0.71		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
28.1	316	Total			

Summary for Subcatchment PS08: PS-08

Runoff = 8.3 cfs @ 12.19 hrs, Volume= 32,799 cf, Depth> 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
0	98	Paved parking, HSG B
154	98	Roofs, HSG B
772	61	>75% Grass cover, Good, HSG B
97	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
3	48	Power Line - Brush, Good, HSG B
574	98	Paved parking, HSG C
4,850	98	Roofs, HSG C
21,977	74	>75% Grass cover, Good, HSG C
75,234	70	Woods, Good, HSG C
43,259	65	Brush, Good, HSG C
6,197	65	Power Line - Brush, Good, HSG C
2,843	72	Woods/grass comb., Good, HSG C
155,960	70	Weighted Average
150,382		96.42% Pervious Area
5,578		3.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	100	0.0700	0.28		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
7.0	409	0.0378	0.97		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
0.4	90	0.0156	3.35	1,072.87	**Channel Flow, Channel Flow** Area= 320.0 sf Perim= 184.2' r= 1.74' n= 0.080 Earth, long dense weeds
13.3	599	Total			

Summary for Subcatchment PS09: PS-09

Runoff = 14.4 cfs @ 13.10 hrs, Volume= 139,436 cf, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
1,512	98	Paved parking, HSG B
3,924	98	Roofs, HSG B
8,482	61	>75% Grass cover, Good, HSG B
556,948	55	Woods, Good, HSG B
1,608	48	Brush, Good, HSG B
70,412	48	Power Line - Brush, Good, HSG B
332	98	Paved parking, HSG C
2,813	98	Roofs, HSG C
19,924	74	>75% Grass cover, Good, HSG C
276,240	70	Woods, Good, HSG C
27,337	65	Brush, Good, HSG C
39,193	65	Power Line - Brush, Good, HSG C
1,008,725	60	Weighted Average
1,000,144		99.15% Pervious Area
8,581		0.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
31.6	100	0.0300	0.05		**Sheet Flow, Sheet Flow** Woods: Dense underbrush n= 0.800 P2= 3.23"
15.1	808	0.0320	0.89		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
27.1	515	0.0040	0.32		**Shallow Concentrated Flow, Shallow Channel** Woodland Kv= 5.0 fps
2.1	412	0.0170	3.28	594.29	**Channel Flow, Channel Flow** Area= 181.4 sf Perim= 115.3' r= 1.57' n= 0.080 Earth, long dense weeds
75.9	1,835	Total			

Summary for Subcatchment PS10: PS-10

Runoff = 2.7 cfs @ 12.18 hrs, Volume= 10,729 cf, Depth> 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
4,190	98	Paved parking, HSG B
2,107	98	Roofs, HSG B
3,848	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
8,981	98	Paved parking, HSG C
1,847	98	Roofs, HSG C
11,495	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
32,468	85	Weighted Average
15,343		47.26% Pervious Area
17,125		52.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.9	100	0.0100	0.13		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.3	383	0.0150	21.93	438.64	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
13.2	483	Total			

Summary for Subcatchment PS11: PS-11

Runoff = 1.2 cfs @ 12.11 hrs, Volume= 4,022 cf, Depth> 3.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
2,472	98	Paved parking, HSG B
911	98	Roofs, HSG B
2,470	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
2,828	98	Paved parking, HSG C
934	98	Roofs, HSG C
2,544	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
12,159	85	Weighted Average
5,014		41.24% Pervious Area
7,145		58.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	69	0.0200	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.3	383	0.0150	21.93	438.64	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
7.5	452	Total			

Summary for Subcatchment PS12: PS-12

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.08 hrs, Volume= 1,299 cf, Depth> 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
791	98	Paved parking, HSG B
0	98	Roofs, HSG B
248	61	>75% Grass cover, Good, HSG B
1,545	58	Woods/grass comb., Good, HSG B
1,007	98	Paved parking, HSG C
0	98	Roofs, HSG C
269	74	>75% Grass cover, Good, HSG C
1,051	72	Woods/grass comb., Good, HSG C
4,911	77	Weighted Average
3,113		63.39% Pervious Area
1,798		36.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.08		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	136	0.0100	17.91	358.14	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.3					**Direct Entry, Min Tc of 5 Min**
5.0	139	Total			

Summary for Subcatchment PS13: PS-13

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.07 hrs, Volume= 1,392 cf, Depth> 3.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
565	98	Paved parking, HSG B
0	98	Roofs, HSG B
130	61	>75% Grass cover, Good, HSG B
133	58	Woods/grass comb., Good, HSG B
1,257	98	Paved parking, HSG C
0	98	Roofs, HSG C
518	74	>75% Grass cover, Good, HSG C
1,956	72	Woods/grass comb., Good, HSG C
4,559	82	Weighted Average
2,737		60.04% Pervious Area
1,822		39.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.08		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	136	0.0100	17.91	358.14	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.3					**Direct Entry, Min Tc of 5 Min**
5.0	139	Total			

Summary for Subcatchment PS14: PS-14

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.08 hrs, Volume= 1,376 cf, Depth> 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
813	98	Paved parking, HSG C
246	98	Roofs, HSG C
1,636	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
2,356	72	Woods/grass comb., Good, HSG C
5,051	78	Weighted Average
3,992		79.03% Pervious Area
1,059		20.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.08		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	93	0.0100	17.91	358.14	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.3					**Direct Entry, Min Tc of 5 Min**
5.0	96	Total			

Summary for Subcatchment PS15: PS-15

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.08 hrs, Volume= 1,154 cf, Depth> 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
826	98	Paved parking, HSG C
0	98	Roofs, HSG C
1,548	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
1,861	72	Woods/grass comb., Good, HSG C
4,235	78	Weighted Average
3,409		80.50% Pervious Area
826		19.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	3	0.0200	0.08		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	93	0.0100	17.91	358.14	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.3					**Direct Entry, Min Tc of 5 Min**
5.0	96	Total			

Summary for Subcatchment PS16: PS-16

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.0 cfs @ 12.08 hrs, Volume= 3,200 cf, Depth> 4.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
4,626	98	Paved parking, HSG C
612	98	Roofs, HSG C
3,720	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
8,958	88	Weighted Average
3,720		41.53% Pervious Area
5,238		58.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.0	67	0.0400	35.81	716.29	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
5.6	117	Total			

Summary for Subcatchment PS17: PS-17

Runoff = 1.2 cfs @ 12.11 hrs, Volume= 4,093 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
782	98	Paved parking, HSG B
754	98	Roofs, HSG B
1,392	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
3,514	98	Paved parking, HSG C
934	98	Roofs, HSG C
5,329	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
12,705	84	Weighted Average
6,721		52.90% Pervious Area
5,984		47.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	68	0.0200	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	98	0.0300	31.02	620.33	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
7.3	166	Total			

Summary for Subcatchment PS18: PS-18

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.8 cfs @ 12.07 hrs, Volume= 2,350 cf, Depth> 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
611	98	Paved parking, HSG B
0	98	Roofs, HSG B
182	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
1,535	58	Woods/grass comb., Good, HSG B
2,125	98	Paved parking, HSG C
688	98	Roofs, HSG C
2,348	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
424	72	Woods/grass comb., Good, HSG C
7,913	81	Weighted Average
4,489		56.73% Pervious Area
3,424		43.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	22	0.2500	0.35		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	102	0.0300	31.02	620.33	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
3.8					**Direct Entry, Min Tc of 5 Min**
5.0	124	Total			

Summary for Subcatchment PS19: PS-19

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.7 cfs @ 12.07 hrs, Volume= 2,263 cf, Depth> 3.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
865	98	Paved parking, HSG B
313	98	Roofs, HSG B
1,705	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
302	58	Woods/grass comb., Good, HSG B
1,631	98	Paved parking, HSG C
534	98	Roofs, HSG C
1,922	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
348	72	Woods/grass comb., Good, HSG C
7,620	81	Weighted Average
4,277		56.13% Pervious Area
3,343		43.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	44	0.0600	0.23		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.1	120	0.0300	31.02	620.33	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
1.6					**Direct Entry, Min Tc of 5 Min**
5.0	164	Total			

Summary for Subcatchment PS20: PS-20

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.07 hrs, Volume= 1,382 cf, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
14	98	Paved parking, HSG B
0	48	Brush, Good, HSG B
2,480	98	Paved parking, HSG C
0	98	Roofs, HSG C
584	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
695	72	Woods/grass comb., Good, HSG C
3,773	89	Weighted Average
1,279		33.90% Pervious Area
2,494		66.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.3300	0.39		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.0	106	0.0600	43.86	877.27	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.1					**Direct Entry, Min Tc of 5 Min**
5.0	128	Total			

Summary for Subcatchment PS21: PS-21

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.4 cfs @ 12.07 hrs, Volume= 1,355 cf, Depth> 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
10	98	Paved parking, HSG B
2,486	98	Paved parking, HSG C
0	98	Roofs, HSG C
580	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
536	72	Woods/grass comb., Good, HSG C
3,612	90	Weighted Average
1,116		30.90% Pervious Area
2,496		69.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	22	0.3300	0.39		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.23"
0.0	102	0.0600	43.86	877.27	**Channel Flow, Channel Flow** Area= 20.0 sf Perim= 10.2' r= 1.96' n= 0.013 Asphalt, smooth
4.1					**Direct Entry, Min Tc of 5 Min**
5.0	124	Total			

Summary for Subcatchment PS22: PS-22

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.6 cfs @ 12.08 hrs, Volume= 1,990 cf, Depth> 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs
Type III 24-hr 10-YR Rainfall=5.65"

Area (sf)	CN	Description
2,338	98	Paved parking, HSG B
0	98	Roofs, HSG B
4,808	61	>75% Grass cover, Good, HSG B
0	55	Woods, Good, HSG B
0	48	Brush, Good, HSG B
636	98	Paved parking, HSG C
0	98	Roofs, HSG C
219	74	>75% Grass cover, Good, HSG C
0	70	Woods, Good, HSG C
0	65	Brush, Good, HSG C
8,001	75	Weighted Average
5,027		62.83% Pervious Area
2,974		37.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	128	0.0250	3.87	7.74	**Channel Flow, Channel Flow** Area= 2.0 sf Perim= 20.2' r= 0.10' n= 0.013 Asphalt, smooth
4.4					**Direct Entry, Min Tc of 5 Min**
5.0	128	Total			

Summary for Reach 2R: PR-05

Inflow Area = 20,953 sf, 46.74% Impervious, Inflow Depth > 1.94" for 10-YR event
Inflow = 0.5 cfs @ 12.50 hrs, Volume= 3,393 cf
Outflow = 0.1 cfs @ 14.59 hrs, Volume= 2,861 cf, Atten= 77%, Lag= 125.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.11 fps, Min. Travel Time= 172.5 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 228.8 min

Peak Storage= 1,162 cf @ 14.59 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 33.33'
Bank-Full Depth= 1.00' Flow Area= 80.0 sf, Capacity= 60.8 cfs

30.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 50.0 '/' Top Width= 130.00'
Length= 1,100.0' Slope= 0.0050 '/'
Inlet Invert= 27.50', Outlet Invert= 22.00'

‡

Summary for Reach PR01: PR-01

Inflow Area = 501,780 sf, 0.00% Impervious, Inflow Depth > 1.35" for 10-YR event
Inflow = 4.8 cfs @ 13.43 hrs, Volume= 56,442 cf
Outflow = 4.5 cfs @ 13.70 hrs, Volume= 55,208 cf, Atten= 6%, Lag= 15.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.42 fps, Min. Travel Time= 21.1 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 36.7 min

Peak Storage= 5,651 cf @ 13.70 hrs
Average Depth at Peak Storage= 0.08' , Surface Width= 142.58'
Bank-Full Depth= 2.00' Flow Area= 470.0 sf, Capacity= 1,413.2 cfs

135.00' x 2.00' deep channel, n= 0.050 Scattered brush, heavy weeds
Side Slope Z-value= 50.0 '/' Top Width= 335.00'
Length= 537.0' Slope= 0.0065 '/'
Inlet Invert= 26.50', Outlet Invert= 23.00'

Summary for Reach PR02: PR02

Inflow Area = 760,995 sf, 10.02% Impervious, Inflow Depth > 2.40" for 10-YR event
Inflow = 17.3 cfs @ 12.84 hrs, Volume= 152,048 cf
Outflow = 15.9 cfs @ 13.02 hrs, Volume= 149,571 cf, Atten= 8%, Lag= 10.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.71 fps, Min. Travel Time= 15.7 min
Avg. Velocity = 0.28 fps, Avg. Travel Time= 39.2 min

Peak Storage= 14,957 cf @ 13.02 hrs
Average Depth at Peak Storage= 0.20' , Surface Width= 123.67'
Bank-Full Depth= 2.00' Flow Area= 408.0 sf, Capacity= 1,097.9 cfs

104.00' x 2.00' deep channel, n= 0.050 Scattered brush, heavy weeds
Side Slope Z-value= 50.0 '/' Top Width= 304.00'
Length= 668.0' Slope= 0.0055 '/'
Inlet Invert= 25.70', Outlet Invert= 22.00'

Summary for Reach PR03: PR03

Inflow Area = 255,973 sf, 14.18% Impervious, Inflow Depth > 2.47" for 10-YR event
Inflow = 7.3 cfs @ 12.65 hrs, Volume= 52,606 cf
Outflow = 5.2 cfs @ 13.02 hrs, Volume= 51,160 cf, Atten= 29%, Lag= 22.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.52 fps, Min. Travel Time= 28.9 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 54.8 min

Peak Storage= 9,004 cf @ 13.02 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 111.02'
Bank-Full Depth= 2.00' Flow Area= 358.0 sf, Capacity= 1,142.3 cfs

104.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 50.0 25.0 '/' Top Width= 254.00'
Length= 894.0' Slope= 0.0187 '/'
Inlet Invert= 43.50', Outlet Invert= 26.80'

Summary for Reach PR04: PR-04

[63] Warning: Exceeded Reach PR07 INLET depth by 0.05' @ 12.30 hrs

Inflow Area = 1,172,686 sf, 1.46% Impervious, Inflow Depth > 1.74" for 10-YR event
Inflow = 14.7 cfs @ 13.28 hrs, Volume= 170,095 cf
Outflow = 14.0 cfs @ 13.48 hrs, Volume= 167,052 cf, Atten= 5%, Lag= 11.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.65 fps, Min. Travel Time= 17.5 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 33.7 min

Peak Storage= 14,689 cf @ 13.48 hrs
Average Depth at Peak Storage= 0.15' , Surface Width= 150.25'
Bank-Full Depth= 3.00' Flow Area= 569.4 sf, Capacity= 2,431.4 cfs

146.00' x 3.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 17.0 12.2 '/' Top Width= 233.60'
Length= 682.0' Slope= 0.0161 '/'
Inlet Invert= 33.00', Outlet Invert= 22.00'

‡

Summary for Reach PR05a: PR-05

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 80.0 sf, Capacity= 106.1 cfs

30.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 50.0 '/' Top Width= 130.00'
Length= 46.0' Slope= 0.0152 '/'
Inlet Invert= 27.50', Outlet Invert= 26.80'

‡

Summary for Reach PR05b: PR-05

Inflow Area =		37,196 sf, 48.36% Impervious,	Inflow Depth > 1.82"	for 10-YR event
Inflow	=	0.1 cfs @	15.89 hrs, Volume=	5,650 cf
Outflow	=	0.1 cfs @	15.93 hrs, Volume=	5,623 cf, Atten= 0%, Lag= 2.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.20 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 4.5 min

Peak Storage= 29 cf @ 15.93 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 32.03'
Bank-Full Depth= 1.00' Flow Area= 80.0 sf, Capacity= 155.3 cfs

30.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 50.0 '/' Top Width= 130.00'
Length= 46.0' Slope= 0.0326 '/'
Inlet Invert= 27.50', Outlet Invert= 26.00'

‡


Summary for Reach PR06: PR-06

Inflow Area = 42,430 sf, 47.09% Impervious, Inflow Depth > 3.68" for 10-YR event
Inflow = 1.4 cfs @ 12.49 hrs, Volume= 13,019 cf
Outflow = 1.2 cfs @ 12.65 hrs, Volume= 12,897 cf, Atten= 20%, Lag= 9.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.24 fps, Min. Travel Time= 13.6 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 25.1 min

Peak Storage= 939 cf @ 12.65 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 43.28'
Bank-Full Depth= 1.00' Flow Area= 80.0 sf, Capacity= 58.7 cfs

30.00' x 1.00' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 50.0 '/' Top Width= 130.00'
Length= 193.0' Slope= 0.0047 '/'
Inlet Invert= 44.90', Outlet Invert= 44.00'

‡

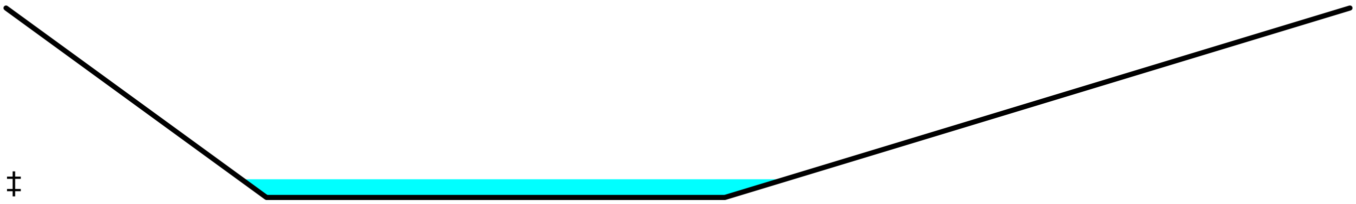

Summary for Reach PR07: PR-07

Inflow Area = 1,016,726 sf, 1.14% Impervious, Inflow Depth > 1.65" for 10-YR event
Inflow = 14.4 cfs @ 13.10 hrs, Volume= 139,519 cf
Outflow = 13.7 cfs @ 13.29 hrs, Volume= 137,296 cf, Atten= 5%, Lag= 11.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Max. Velocity= 0.74 fps, Min. Travel Time= 15.3 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 32.5 min

Peak Storage= 12,544 cf @ 13.29 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 104.26'
Bank-Full Depth= 2.00' Flow Area= 346.0 sf, Capacity= 992.5 cfs

88.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds
Side Slope Z-value= 25.0 60.0 '/' Top Width= 258.00'
Length= 682.0' Slope= 0.0161 '/'
Inlet Invert= 33.00', Outlet Invert= 22.00'



Summary for Pond 1P: (new Pond)

[57] Hint: Peaked at 26.60' (Flood elevation advised)

Inflow Area = 3,773 sf, 66.10% Impervious, Inflow Depth > 4.39" for 10-YR event
Inflow = 0.4 cfs @ 12.07 hrs, Volume= 1,382 cf
Outflow = 0.4 cfs @ 12.07 hrs, Volume= 1,382 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.07 hrs, Volume= 1,382 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 26.60' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.50'	**48.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.4 cfs @ 12.07 hrs HW=26.60' TW=0.00' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 0.4 cfs @ 1.02 fps)

Summary for Pond 2P: (new Pond)

[57] Hint: Peaked at 26.60' (Flood elevation advised)

Inflow Area = 3,612 sf, 69.10% Impervious, Inflow Depth > 4.50" for 10-YR event
Inflow = 0.4 cfs @ 12.07 hrs, Volume= 1,355 cf
Outflow = 0.4 cfs @ 12.07 hrs, Volume= 1,355 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.07 hrs, Volume= 1,355 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 26.60' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	26.50'	**48.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.4 cfs @ 12.07 hrs HW=26.60' TW=25.74' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 0.4 cfs @ 1.02 fps)

Summary for Pond CB01: CB-01

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=44)

Inflow Area =	7,913 sf, 43.27% Impervious,	Inflow Depth > 3.56"	for 10-YR event	
Inflow =	0.8 cfs @	12.07 hrs, Volume=	2,350 cf	
Outflow =	0.8 cfs @	12.07 hrs, Volume=	2,350 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.8 cfs @	12.07 hrs, Volume=	2,350 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 33.79' @ 18.12 hrs
Flood Elev= 35.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.20' / 32.05' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.7 cfs @ 12.07 hrs HW=32.67' TW=31.81' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.7 cfs @ 2.92 fps)

Summary for Pond CB02: CB-02

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=68)

Inflow Area =	7,620 sf, 43.87% Impervious,	Inflow Depth > 3.56"	for 10-YR event	
Inflow =	0.7 cfs @	12.07 hrs, Volume=	2,263 cf	
Outflow =	0.7 cfs @	12.07 hrs, Volume=	2,259 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.7 cfs @	12.07 hrs, Volume=	2,259 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 33.98' @ 17.61 hrs
Flood Elev= 35.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	32.20'	**22.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.20' / 32.05' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.64 sf

Primary OutFlow Max=0.7 cfs @ 12.07 hrs HW=32.58' TW=31.81' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 0.7 cfs @ 2.73 fps)

Summary for Pond CB03: CB-03

Inflow Area =	8,958 sf, 58.47% Impervious,	Inflow Depth > 4.29"	for 10-YR event	
Inflow =	1.0 cfs @	12.08 hrs, Volume=	3,200 cf	
Outflow =	1.0 cfs @	12.08 hrs, Volume=	3,200 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.0 cfs @	12.08 hrs, Volume=	3,200 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 41.51' @ 12.08 hrs
Flood Elev= 45.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.00'	**12.0" Round Culvert** L= 42.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.00' / 39.20' S= 0.0429 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.9 cfs @ 12.08 hrs HW=41.50' TW=34.26' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.9 cfs @ 2.40 fps)

Summary for Pond CB04: CB-04

Inflow Area = 12,705 sf, 47.10% Impervious, Inflow Depth > 3.87" for 10-YR event
Inflow = 1.2 cfs @ 12.11 hrs, Volume= 4,093 cf
Outflow = 1.2 cfs @ 12.11 hrs, Volume= 4,093 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.2 cfs @ 12.11 hrs, Volume= 4,093 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 41.58' @ 12.11 hrs
Flood Elev= 44.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	41.00'	**12.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.00' / 39.20' S= 0.0486 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.2 cfs @ 12.11 hrs HW=41.57' TW=34.48' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 1.2 cfs @ 2.57 fps)

Summary for Pond CB05: CB-05

Inflow Area = 5,051 sf, 20.97% Impervious, Inflow Depth > 3.27" for 10-YR event
Inflow = 0.4 cfs @ 12.08 hrs, Volume= 1,376 cf
Outflow = 0.4 cfs @ 12.08 hrs, Volume= 1,376 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.4 cfs @ 12.08 hrs, Volume= 1,376 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 47.98' @ 12.47 hrs
Flood Elev= 48.58'

Device	Routing	Invert	Outlet Devices
#1	Primary	46.30'	**6.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 46.30' / 46.15' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.4 cfs @ 12.08 hrs HW=47.22' TW=47.02' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.4 cfs @ 2.18 fps)

Summary for Pond CB06: CB-06

Inflow Area =	4,235 sf, 19.50% Impervious,	Inflow Depth > 3.27" for 10-YR event		
Inflow =	0.4 cfs @	12.08 hrs, Volume=	1,154 cf	
Outflow =	0.4 cfs @	12.08 hrs, Volume=	1,154 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.4 cfs @	12.08 hrs, Volume=	1,154 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 45.60' @ 12.08 hrs
Flood Elev= 48.58'

Device	Routing	Invert	Outlet Devices
#1	Primary	45.15'	**6.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.15' / 45.00' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.4 cfs @ 12.08 hrs HW=45.59' TW=44.77' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 0.4 cfs @ 2.60 fps)

Summary for Pond CB07: CB-07

Inflow Area =	37,379 sf, 50.62% Impervious,	Inflow Depth > 3.86" for 10-YR event		
Inflow =	3.0 cfs @	12.17 hrs, Volume=	12,028 cf	
Outflow =	3.0 cfs @	12.17 hrs, Volume=	12,028 cf,	Atten= 0%, Lag= 0.0 min
Primary =	3.0 cfs @	12.17 hrs, Volume=	12,028 cf	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 50.61' @ 12.17 hrs
Flood Elev= 52.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**12.0" Round Culvert** L= 114.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 47.50' S= 0.0175 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.9 cfs @ 12.17 hrs HW=50.60' TW=47.41' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.9 cfs @ 3.73 fps)

Summary for Pond CB08: CB-08

Inflow Area =	16,718 sf,	53.64% Impervious,	Inflow Depth > 3.89"	for 10-YR event	
Inflow =	1.6 cfs @	12.10 hrs, Volume=	5,414 cf		
Outflow =	1.6 cfs @	12.10 hrs, Volume=	5,414 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	1.6 cfs @	12.10 hrs, Volume=	5,414 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 50.18' @ 12.10 hrs
Flood Elev= 52.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	49.50'	**12.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 49.50' / 46.00' S= 0.0318 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.5 cfs @ 12.10 hrs HW=50.17' TW=44.85' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.5 cfs @ 2.78 fps)

Summary for Pond MH01: MH 1

[57] Hint: Peaked at 28.67' (Flood elevation advised)

Inflow Area =	37,196 sf,	48.36% Impervious,	Inflow Depth > 1.82"	for 10-YR event	
Inflow =	0.1 cfs @	15.89 hrs, Volume=	5,650 cf		
Outflow =	0.1 cfs @	15.89 hrs, Volume=	5,650 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	0.1 cfs @	15.89 hrs, Volume=	5,650 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 28.67' @ 15.89 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	28.50'	**12.0" Round Culvert** L= 91.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 28.50' / 27.75' S= 0.0082 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.1 cfs @ 15.89 hrs HW=28.67' TW=27.52' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.1 cfs @ 2.04 fps)

Summary for Pond MH05: MH 5

[57] Hint: Peaked at 51.32' (Flood elevation advised)

Inflow Area =	8,001 sf,	37.17% Impervious,	Inflow Depth > 0.12"	for 10-YR event	
Inflow =	0.0 cfs @	24.00 hrs, Volume=	83 cf		
Outflow =	0.0 cfs @	24.00 hrs, Volume=	83 cf,	Atten= 0%,	Lag= 0.0 min
Primary =	0.0 cfs @	24.00 hrs, Volume=	83 cf		

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 51.32' @ 24.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	51.30'	**12.0" Round Culvert** L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 51.30' / 47.90' S= 0.0523 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.0 cfs @ 24.00 hrs HW=51.32' TW=33.04' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.0 cfs @ 0.49 fps)

Summary for Pond P003a: R-Tank #1 and 2

[80] Warning: Exceeded Pond CB01 by 1.32' @ 21.78 hrs (3.2 cfs 13,781 cf)
[80] Warning: Exceeded Pond CB02 by 1.58' @ 17.52 hrs (8.4 cfs 43,523 cf)

Inflow Area = 15,533 sf, 43.57% Impervious, Inflow Depth > 4.30" for 10-YR event
Inflow = 1.5 cfs @ 12.07 hrs, Volume= 5,570 cf
Outflow = 0.1 cfs @ 18.15 hrs, Volume= 2,569 cf, Atten= 96%, Lag= 364.7 min
Primary = 0.1 cfs @ 18.15 hrs, Volume= 2,569 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 33.79' @ 18.15 hrs Surf.Area= 2,953 sf Storage= 3,609 cf
Flood Elev= 36.68' Surf.Area= 2,953 sf Storage= 4,369 cf

Plug-Flow detention time= 352.9 min calculated for 2,569 cf (46% of inflow)
Center-of-Mass det. time= 222.1 min (1,056.9 - 834.8)

Volume	Invert	Avail.Storage	Storage Description
#1	28.95'	295 cf	**14.50'W x 50.90'L x 1.00'H StoneL** 738 cf Overall x 40.0% Voids
#2	29.95'	221 cf	**14.50'W x 50.90'L x 1.50'H Filter SoilL**-Impervious 1,107 cf Overall x 20.0% Voids
#3B	31.45'	588 cf	**14.50'W x 50.92'L x 3.48'H Field B** 2,570 cf Overall - 1,099 cf Embedded = 1,471 cf x 40.0% Voids
#4B	31.70'	1,044 cf	**ACF R-Tank SD 3** x 160 Inside #3 Inside= 15.7"W x 26.8"H => 2.78 sf x 2.35'L = 6.5 cf Outside= 15.7"W x 26.8"H => 2.93 sf x 2.35'L = 6.9 cf 160 Chambers in 8 Rows
#5	28.95'	295 cf	**14.50'W x 50.90'L x 1.00'H StoneR** 738 cf Overall x 40.0% Voids
#6	29.95'	221 cf	**14.50'W x 50.90'L x 1.50'H Filter SoilR**-Impervious 1,107 cf Overall x 20.0% Voids
#7C	31.45'	588 cf	**14.50'W x 50.92'L x 3.48'H Field C** 2,570 cf Overall - 1,099 cf Embedded = 1,471 cf x 40.0% Voids
#8C	31.70'	1,044 cf	**ACF R-Tank SD 3** x 160 Inside #7 Inside= 15.7"W x 26.8"H => 2.78 sf x 2.35'L = 6.5 cf Outside= 15.7"W x 26.8"H => 2.93 sf x 2.35'L = 6.9 cf 160 Chambers in 8 Rows

#9	28.95'	72 cf	**4.00'D x 5.70'H Vertical Cone/Cylinder**-Impervious
		4,369 cf	Total Available Storage

Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	28.95'	**12.0" Round UD-Culvert** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 28.95' / 28.10' S= 0.0425 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 0.79 sf
#2	Device 1	28.95'	**1.0" Vert. UD-Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	28.95'	**10.000 in/hr Exfiltration over Surface area**
#4	Secondary	33.25'	**18.0" Round Culvert** L= 53.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 33.25' / 32.45' S= 0.0151 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 4	34.35'	**12.0" Horiz. Top of Stand Pipe** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.1 cfs @ 18.15 hrs HW=33.79' TW=28.67' (Dynamic Tailwater)
└─**1=UD-Culvert** (Passes 0.1 cfs of 7.9 cfs potential flow)
  └─**2=UD-Orifice** (Orifice Controls 0.1 cfs @ 10.55 fps)
    └─**3=Exfiltration** (Passes 0.1 cfs of 0.7 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=28.95' TW=27.50' (Dynamic Tailwater)
└─**4=Culvert** (Controls 0.0 cfs)
  └─**5=Top of Stand Pipe** (Controls 0.0 cfs)

Summary for Pond PP01: CULVERTS

[62] Hint: Exceeded Reach 2R OUTLET depth by 3.69' @ 14.22 hrs
[62] Hint: Exceeded Reach PR01 OUTLET depth by 2.66' @ 14.34 hrs
[62] Hint: Exceeded Reach PR02 OUTLET depth by 3.61' @ 14.34 hrs
[62] Hint: Exceeded Reach PR04 OUTLET depth by 3.61' @ 14.40 hrs

Inflow Area = 2,940,052 sf, 4.04% Impervious, Inflow Depth > 1.87" for 10-YR event
Inflow = 36.2 cfs @ 13.18 hrs, Volume= 458,481 cf
Outflow = 21.6 cfs @ 14.25 hrs, Volume= 457,784 cf, Atten= 40%, Lag= 64.6 min
Primary = 21.6 cfs @ 14.25 hrs, Volume= 457,784 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 25.72' @ 14.25 hrs Surf.Area= 136,388 sf Storage= 78,114 cf

Plug-Flow detention time= 30.5 min calculated for 456,643 cf (100% of inflow)
Center-of-Mass det. time= 29.7 min (954.1 - 924.3)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	347,907 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
22.00	10	40.0	0	0	10
24.00	5,297	274.3	3,691	3,691	5,879
25.00	33,326	789.9	17,303	20,995	49,546
26.00	194,474	2,151.9	102,768	123,763	368,395
27.00	255,187	2,316.1	224,144	347,907	426,819

Device	Routing	Invert	Outlet Devices
#1	Primary	22.40'	**15.0" Round RCP_Round 15"** L= 33.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 22.40' / 22.35' S= 0.0015 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#2	Primary	22.40'	**15.0" Round RCP_Round 15"** L= 33.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 22.40' / 22.35' S= 0.0015 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf
#3	Secondary	25.93'	**50.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.6 cfs @ 14.25 hrs HW=25.72' TW=0.00' (Dynamic Tailwater)
1=RCP_Round 15" (Barrel Controls 10.8 cfs @ 8.81 fps)
2=RCP_Round 15" (Barrel Controls 10.8 cfs @ 8.81 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=22.00' TW=0.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Pond PP02: PP02

Inflow Area = 255,973 sf, 14.18% Impervious, Inflow Depth > 2.84" for 10-YR event
Inflow = 8.2 cfs @ 12.49 hrs, Volume= 60,537 cf
Outflow = 7.3 cfs @ 12.65 hrs, Volume= 52,606 cf, Atten= 10%, Lag= 9.1 min
Primary = 7.3 cfs @ 12.65 hrs, Volume= 52,606 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 43.77' @ 12.67 hrs Surf.Area= 22,491 sf Storage= 12,394 cf

Plug-Flow detention time= 92.8 min calculated for 52,606 cf (87% of inflow)
Center-of-Mass det. time= 36.8 min (907.2 - 870.4)

Volume	Invert	Avail.Storage	Storage Description
#1	43.00'	17,987 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.00	10,339	760.4	0	0	10,339
44.00	26,935	899.1	17,987	17,987	28,674

Device	Routing	Invert	Outlet Devices
#1	Primary	43.53'	**25.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=7.3 cfs @ 12.65 hrs HW=43.77' TW=43.57' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 7.3 cfs @ 1.21 fps)

Summary for Pond PP03b: R-Tank #3 and 4

Inflow Area = 21,663 sf, 51.80% Impervious, Inflow Depth > 4.04" for 10-YR event
Inflow = 2.2 cfs @ 12.10 hrs, Volume= 7,294 cf
Outflow = 0.1 cfs @ 14.58 hrs, Volume= 4,041 cf, Atten= 95%, Lag= 148.9 min
Primary = 0.1 cfs @ 14.58 hrs, Volume= 3,081 cf
Secondary = 0.0 cfs @ 14.58 hrs, Volume= 961 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 36.69' @ 14.58 hrs Surf.Area= 2,409 sf Storage= 4,461 cf
Flood Elev= 39.85' Surf.Area= 2,409 sf Storage= 5,540 cf

Plug-Flow detention time= 312.2 min calculated for 4,031 cf (55% of inflow)
Center-of-Mass det. time= 205.8 min (1,006.2 - 800.4)

Volume	Invert	Avail.Storage	Storage Description
#1	30.20'	241 cf	**14.50'W x 41.53'L x 1.00'H StoneL** 602 cf Overall x 40.0% Voids
#2	31.20'	181 cf	**14.50'W x 41.53'L x 1.50'H Filter SoilL**-Impervious 903 cf Overall x 20.0% Voids
#3B	32.70'	667 cf	**14.50'W x 41.53'L x 5.65'H Field B** 3,400 cf Overall - 1,732 cf Embedded = 1,668 cf x 40.0% Voids
#4B	32.95'	1,646 cf	**ACF R-Tank SD 6** x 128 Inside #3 Inside= 15.7"W x 52.8"H => 5.48 sf x 2.35'L = 12.9 cf Outside= 15.7"W x 52.8"H => 5.77 sf x 2.35'L = 13.5 cf 128 Chambers in 8 Rows
#5	30.20'	241 cf	**14.50'W x 41.53'L x 1.00'H StoneR** 602 cf Overall x 40.0% Voids
#6	31.20'	181 cf	**14.50'W x 41.53'L x 1.50'H Filter SoilR**-Impervious 903 cf Overall x 20.0% Voids
#7C	32.70'	667 cf	**14.50'W x 41.53'L x 5.65'H Field C** 3,400 cf Overall - 1,732 cf Embedded = 1,668 cf x 40.0% Voids
#8C	32.95'	1,646 cf	**ACF R-Tank SD 6** x 128 Inside #7 Inside= 15.7"W x 52.8"H => 5.48 sf x 2.35'L = 12.9 cf Outside= 15.7"W x 52.8"H => 5.77 sf x 2.35'L = 13.5 cf 128 Chambers in 8 Rows
#9	30.20'	72 cf	**4.00'D x 5.70'H Vertical Cone/Cylinder**-Impervious
		5,540 cf	Total Available Storage

Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	29.80'	**18.0" Round UD-Culvert** L= 57.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 29.80' / 28.60' S= 0.0211 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	30.20'	**1.0" Vert. UD-Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	30.20'	**10.000 in/hr UD-Exfiltration over Surface area**
#4	Secondary	32.50'	**18.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 32.50' / 32.00' S= 0.0500 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#5	Device 4	35.85'	**1.0" Vert. Orifice X 2.00** C= 0.600 Limited to weir flow at low heads
#6	Device 4	37.60'	**6.0" Horiz. Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.1 cfs @ 14.58 hrs HW=36.69' TW=28.67' (Dynamic Tailwater)
└─**1=UD-Culvert** (Passes 0.1 cfs of 21.1 cfs potential flow)
  └─**2=UD-Orifice** (Orifice Controls 0.1 cfs @ 12.23 fps)
    └─**3=UD-Exfiltration** (Passes 0.1 cfs of 0.6 cfs potential flow)

Secondary OutFlow Max=0.0 cfs @ 14.58 hrs HW=36.69' TW=33.44' (Dynamic Tailwater)
└─**4=Culvert** (Passes 0.0 cfs of 15.3 cfs potential flow)
  ├─**5=Orifice** (Orifice Controls 0.0 cfs @ 4.31 fps)
  └─**6=Grate** (Controls 0.0 cfs)

Summary for Pond PP04A: Bioretention Area #2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=41)

Inflow Area = 42,430 sf, 47.09% Impervious, Inflow Depth > 3.79" for 10-YR event
Inflow = 3.3 cfs @ 12.16 hrs, Volume= 13,404 cf
Outflow = 1.4 cfs @ 12.49 hrs, Volume= 13,019 cf, Atten= 56%, Lag= 19.8 min
Primary = 1.4 cfs @ 12.49 hrs, Volume= 13,019 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 47.97' @ 12.49 hrs Surf.Area= 3,269 sf Storage= 4,724 cf
Flood Elev= 49.00' Surf.Area= 4,729 sf Storage= 7,722 cf

Plug-Flow detention time= 109.7 min calculated for 13,019 cf (97% of inflow)
Center-of-Mass det. time= 93.2 min (904.2 - 810.9)

Volume	Invert	Avail.Storage	Storage Description
#1	45.25'	386 cf	**Engineered Soil Above Invert (Irregular)**Listed below (Recalc) -Impervious 965 cf Overall x 40.0% Voids
#2	46.00'	7,336 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)
		7,722 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
45.25	1,287	332.5	0	0	1,287
46.00	1,287	332.5	965	965	1,536

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
46.00	1,287	332.5	0	0	1,287
48.50	3,958	379.6	6,252	6,252	4,101
48.75	4,729	392.2	1,084	7,336	4,880

Device	Routing	Invert	Outlet Devices
#1	Primary	45.25'	**12.0" Round Culvert** L= 24.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.25' / 45.00' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	45.25'	**3.0" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	46.00'	**10.000 in/hr Exfiltration Filter Soil over Surface area**
#4	Device 1	47.75'	**12.0" Horiz. Top of Stand Pipe** C= 0.600 Limited to weir flow at low heads
#5	Secondary	48.00'	**10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=1.4 cfs @ 12.49 hrs HW=47.97' TW=45.01' (Dynamic Tailwater)
1=Culvert (Passes 1.4 cfs of 5.6 cfs potential flow)
2=Orifice (Orifice Controls 0.4 cfs @ 7.75 fps)
3=Exfiltration Filter Soil (Passes 0.4 cfs of 0.8 cfs potential flow)
4=Top of Stand Pipe (Weir Controls 1.1 cfs @ 1.53 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=45.25' TW=44.90' (Dynamic Tailwater)
5=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

Summary for Pond PP04B: Bioretention Area #3

Inflow Area = 20,953 sf, 46.74% Impervious, Inflow Depth > 3.76" for 10-YR event
Inflow = 1.9 cfs @ 12.09 hrs, Volume= 6,568 cf
Outflow = 0.5 cfs @ 12.50 hrs, Volume= 3,393 cf, Atten= 74%, Lag= 24.4 min
Primary = 0.5 cfs @ 12.50 hrs, Volume= 3,393 cf
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 45.38' @ 12.50 hrs Surf.Area= 2,575 sf Storage= 3,476 cf
Flood Elev= 46.50' Surf.Area= 3,665 sf Storage= 6,152 cf

Plug-Flow detention time= 226.1 min calculated for 3,385 cf (52% of inflow)
Center-of-Mass det. time= 116.3 min (924.2 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1	42.75'	285 cf	**Engineered Soil Above Invert (Irregular)** Listed below (Recalc) -Impervious 713 cf Overall x 40.0% Voids
#2	43.50'	5,867 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)
		6,152 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
42.75	950	287.5	0	0	950
43.50	950	287.5	713	713	1,166

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
43.50	950	287.5	0	0	950
46.00	3,283	334.6	4,999	4,999	3,408
46.25	3,665	347.1	868	5,867	4,091

Device	Routing	Invert	Outlet Devices
#1	Primary	42.75'	**15.0" Round Culvert** L= 24.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 42.75' / 42.50' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	42.75'	**0.5" Vert. Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	43.50'	**10.000 in/hr Exfiltration over Surface area**
#4	Device 1	45.25'	**12.0" Horiz. Top of Stand Pipe** C= 0.600 Limited to weir flow at low heads
#5	Secondary	45.50'	**10.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.5 cfs @ 12.50 hrs HW=45.38' TW=27.51' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.5 cfs of 8.4 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.0 cfs @ 7.78 fps)
  │ └─**3=Exfiltration** (Passes 0.0 cfs of 0.6 cfs potential flow)
  └─**4=Top of Stand Pipe** (Weir Controls 0.5 cfs @ 1.18 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=42.75' TW=27.50' (Dynamic Tailwater)
└─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond PP05: BIoretention Pond #1

Inflow Area = 8,001 sf, 37.17% Impervious, Inflow Depth > 2.98" for 10-YR event
Inflow = 0.6 cfs @ 12.08 hrs, Volume= 1,990 cf
Outflow = 0.0 cfs @ 24.00 hrs, Volume= 83 cf, Atten= 100%, Lag= 715.4 min
Primary = 0.0 cfs @ 24.00 hrs, Volume= 83 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2

Peak Elev= 56.75' @ 24.00 hrs Surf.Area= 1,559 sf Storage= 1,906 cf
Flood Elev= 58.50' Surf.Area= 2,696 sf Storage= 5,552 cf

Plug-Flow detention time= 454.2 min calculated for 83 cf (4% of inflow)
Center-of-Mass det. time= 240.7 min (1,068.5 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	53.33'	5,552 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
53.33	1,227	140.7	0.0	0	0	1,227
53.50	1,227	140.7	0.0	0	0	1,251
54.50	1,227	140.7	40.0	491	491	1,392
56.00	1,227	140.1	20.0	368	859	1,603
57.00	1,677	159.6	100.0	1,446	2,305	2,091
58.00	2,184	178.4	100.0	1,925	4,230	2,624
58.10	2,696	205.8	100.0	244	4,474	3,462
58.50	2,696	205.8	100.0	1,078	5,552	3,545

Device	Routing	Invert	Outlet Devices
#1	Primary	53.20'	**12.0" Round Culvert** L= 87.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 53.20' / 52.30' S= 0.0103 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	53.50'	**0.2" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	57.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.0 cfs @ 24.00 hrs HW=56.75' TW=51.32' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.0 cfs of 5.7 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.0 cfs @ 8.67 fps)
  └─**3=Orifice/Grate** (Controls 0.0 cfs)

Summary for Pond PP06: Wildlife Crossings

Inflow Area = 720,187 sf, 7.75% Impervious, Inflow Depth > 2.42" for 10-YR event
Inflow = 17.1 cfs @ 12.82 hrs, Volume= 145,093 cf
Outflow = 17.1 cfs @ 12.84 hrs, Volume= 145,070 cf, Atten= 0%, Lag= 0.8 min
Primary = 12.7 cfs @ 12.84 hrs, Volume= 131,716 cf
Secondary = 4.4 cfs @ 12.84 hrs, Volume= 13,354 cf
Tertiary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs / 2
Peak Elev= 26.76' @ 12.84 hrs Surf.Area= 1,361 sf Storage= 520 cf

Plug-Flow detention time= 0.4 min calculated for 144,708 cf (100% of inflow)
Center-of-Mass det. time= 0.4 min (899.4 - 899.0)

Volume	Invert	Avail.Storage	Storage Description
#1	25.50'	7,358 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
25.50	10	40.0	0	0	10
26.00	141	144.3	31	31	1,540
27.00	2,025	318.1	900	932	7,940
28.00	12,270	467.3	6,427	7,358	17,273

Device	Routing	Invert	Outlet Devices
#1	Primary	25.80'	**60.0" W x 23.0" H Box Culvert** L= 31.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.80' / 25.70' S= 0.0032 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 9.58 sf
#2	Secondary	26.30'	**60.0" W x 24.0" H Box Culvert** L= 31.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.30' / 26.20' S= 0.0032 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 10.00 sf
#3	Tertiary	26.80'	**60.0" W x 26.0" H Box Culvert** L= 31.5' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.80' / 26.70' S= 0.0032 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 10.83 sf
#4	Tertiary	27.70'	**50.0' long x 35.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=12.7 cfs @ 12.84 hrs HW=26.76' TW=25.89' (Dynamic Tailwater)
└─**1=Culvert** (Barrel Controls 12.7 cfs @ 3.54 fps)

Secondary OutFlow Max=4.4 cfs @ 12.84 hrs HW=26.76' TW=25.89' (Dynamic Tailwater)
└─**2=Culvert** (Barrel Controls 4.4 cfs @ 2.59 fps)

Tertiary OutFlow Max=0.0 cfs @ 0.00 hrs HW=25.50' TW=25.70' (Dynamic Tailwater)
├─**3=Culvert** (Controls 0.0 cfs)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link PPol01: Pr Pol-01

Inflow Area = 2,940,052 sf, 4.04% Impervious, Inflow Depth > 1.87" for 10-YR event
Inflow = 21.6 cfs @ 14.25 hrs, Volume= 457,784 cf
Primary = 21.6 cfs @ 14.25 hrs, Volume= 457,784 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

Summary for Link PPol02: Pr Pol-02

Inflow Area =	57,405 sf,	0.00% Impervious,	Inflow Depth > 1.75"	for 10-YR event
Inflow =	1.1 cfs @	12.78 hrs, Volume=	8,366 cf	
Primary =	1.1 cfs @	12.78 hrs, Volume=	8,366 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

Summary for Link PPol03: Proposed Wildlife Crossings

Inflow Area =	720,187 sf,	7.75% Impervious,	Inflow Depth > 2.42"	for 10-YR event
Inflow =	17.1 cfs @	12.82 hrs, Volume=	145,093 cf	
Primary =	17.1 cfs @	12.82 hrs, Volume=	145,093 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.06 hrs

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APPENDIX F
BMP WORKSHEETS

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FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PP03a R-Tanks 1 and 2**

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

		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.36	ac	A = Area draining to the practice	
0.16	ac	A_I = Impervious area draining to the practice	
0.44	decimal	I = percent impervious area draining to the practice, in decimal form	
0.44	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.16	ac-in	WQV= 1" x Rv x A	
572	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
143	cf	25% x WQV (check calc for sediment forebay volume)	
429	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CB		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← **≥ 25%WQV**
1,476	sf	A_{SA} = surface area of the practice	
NA	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← **≤ 72-hrs**
29.95	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
28.95	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
NA	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
NA	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	← **≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	← **≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	← **≥ 1'**
34.88	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
34.93	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← **yes**

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	← **< 10 ac**
	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ 75%WQV**
	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← **yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
3,204	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

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

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

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

Designer's Notes:

R-Tanks with filter layer and Underdrain

2019

Stage-Area-Storage for Pond P003a: R-Tank #1 and 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
29.20	1,476	0	34.50	2,953	3,962
29.30	1,476	60	34.60	2,953	4,023
29.40	1,476	121	34.70	2,953	4,083
29.50	1,476	181	34.80	2,953	4,143
29.60	1,476	241	34.90	2,953	4,203
29.70	1,476	302	35.00	2,953	4,263
29.80	1,476	362	35.10	2,953	4,322
29.90	1,476	422	35.20	2,953	**4,369**
30.00	1,476	482	35.30	2,953	4,369
30.10	1,476	543	35.40	2,953	4,369
30.20	1,476	603	35.50	2,953	4,369
30.30	1,476	634	35.60	2,953	4,369
30.40	1,476	665	35.70	2,953	4,369
30.50	1,476	695	35.80	2,953	4,369
30.60	1,476	726	35.90	2,953	4,369
30.70	1,476	757	36.00	2,953	4,369
30.80	1,476	788	36.10	2,953	4,369
30.90	1,476	818	36.20	2,953	4,369
31.00	1,476	849	36.30	2,953	4,369
31.10	1,476	880	36.40	2,953	4,369
31.20	1,476	911	36.50	2,953	4,369
31.30	1,476	942	36.60	2,953	4,369
31.40	1,476	972	36.70	2,953	4,369
31.50	1,476	1,003	36.80	2,953	4,369
31.60	1,476	1,034	36.90	2,953	4,369
31.70	**2,953**	1,065			
31.80	2,953	1,125			
31.90	2,953	1,185			
32.00	2,953	1,273			
32.10	2,953	1,387			
32.20	2,953	1,502			
32.30	2,953	1,616			
32.40	2,953	1,731			
32.50	2,953	1,845			
32.60	2,953	1,960			
32.70	2,953	2,074			
32.80	2,953	2,189			
32.90	2,953	2,303			
33.00	2,953	2,418			
33.10	2,953	2,532			
33.20	2,953	2,647			
33.30	2,953	2,761			
33.40	2,953	2,876			
33.50	2,953	2,990			
33.60	2,953	3,105			
33.70	2,953	3,219			
33.80	2,953	3,334			
33.90	2,953	3,448			
34.00	2,953	3,563			
34.10	2,953	3,677			
34.20	2,953	3,781			
34.30	2,953	3,842			
34.40	2,953	3,902			

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FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Type/Node Name: **PP03b R-Tanks 3 and 4**

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

		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.50	ac	A = Area draining to the practice	
0.26	ac	A_I = Impervious area draining to the practice	
0.52	decimal	I = percent impervious area draining to the practice, in decimal form	
0.52	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.26	ac-in	WQV= 1" x Rv x A	
932	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
233	cf	25% x WQV (check calc for sediment forebay volume)	
699	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CB		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = sediment forebay volume, if used for pretreatment	**← ≥ 25%WQV**
1,204	sf	A_{SA} = surface area of the practice	
NA	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	**← ≤ 72-hrs**
31.20	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
30.20	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
NA	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
NA	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	**← ≥ 1'**
38.27	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
38.35	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	**← < 10 ac**
	cf	V = volume of storage[3] (attach a stage-storage table)	**← ≥ 75%WQV**
	inches	D_{FC} = filter course thickness	**← 18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
3,688	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

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

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

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

Designer's Notes:

R-Tanks with filter layer and Underdrain

2019

Stage-Area-Storage for Pond PP03b: R-Tank #3 and 4

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
30.20	1,204	0	31.26	1,204	510
30.22	1,204	10	31.28	1,204	515
30.24	1,204	20	31.30	1,204	520
30.26	1,204	30	31.32	1,204	525
30.28	1,204	40	31.34	1,204	530
30.30	1,204	49	31.36	1,204	535
30.32	1,204	59	31.38	1,204	540
30.34	1,204	69	31.40	1,204	545
30.36	1,204	79	31.42	1,204	550
30.38	1,204	89	31.44	1,204	555
30.40	1,204	99	31.46	1,204	560
30.42	1,204	109	31.48	1,204	565
30.44	1,204	119	31.50	1,204	570
30.46	1,204	129	31.52	1,204	575
30.48	1,204	138	31.54	1,204	580
30.50	1,204	148	31.56	1,204	586
30.52	1,204	158	31.58	1,204	591
30.54	1,204	168	31.60	1,204	596
30.56	1,204	178	31.62	1,204	601
30.58	1,204	188	31.64	1,204	606
30.60	1,204	198	31.66	1,204	611
30.62	1,204	208	31.68	1,204	616
30.64	1,204	217	31.70	1,204	621
30.66	1,204	227	31.72	1,204	626
30.68	1,204	237	31.74	1,204	631
30.70	1,204	247	31.76	1,204	636
30.72	1,204	257	31.78	1,204	641
30.74	1,204	267	31.80	1,204	646
30.76	1,204	277	31.82	1,204	651
30.78	1,204	287	31.84	1,204	657
30.80	1,204	297	31.86	1,204	662
30.82	1,204	306	31.88	1,204	667
30.84	1,204	316	31.90	1,204	672
30.86	1,204	326	31.92	1,204	677
30.88	1,204	336	31.94	1,204	682
30.90	1,204	346	31.96	1,204	687
30.92	1,204	356	31.98	1,204	692
30.94	1,204	366	32.00	1,204	697
30.96	1,204	376	32.02	1,204	702
30.98	1,204	386	32.04	1,204	707
31.00	1,204	395	32.06	1,204	712
31.02	1,204	405	32.08	1,204	717
31.04	1,204	415	32.10	1,204	722
31.06	1,204	425	32.12	1,204	727
31.08	1,204	435	32.14	1,204	733
31.10	1,204	445	32.16	1,204	738
31.12	1,204	455	32.18	1,204	743
31.14	1,204	465	32.20	1,204	748
31.16	1,204	475	32.22	1,204	753
31.18	1,204	484	32.24	1,204	758
31.20	1,204	494	32.26	1,204	763
31.22	1,204	499	32.28	1,204	768
31.24	1,204	504	32.30	1,204	773

Stage-Area-Storage for Pond PP03b: R-Tank #3 and 4 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
32.32	1,204	778	33.38	2,409	1,397
32.34	1,204	783	33.40	2,409	1,416
32.36	1,204	788	33.42	2,409	1,434
32.38	1,204	793	33.44	2,409	1,453
32.40	1,204	798	33.46	2,409	1,471
32.42	1,204	804	33.48	2,409	1,490
32.44	1,204	809	33.50	2,409	1,508
32.46	1,204	814	33.52	2,409	1,527
32.48	1,204	819	33.54	2,409	1,545
32.50	1,204	824	33.56	2,409	1,564
32.52	1,204	829	33.58	2,409	1,583
32.54	1,204	834	33.60	2,409	1,601
32.56	1,204	839	33.62	2,409	1,620
32.58	1,204	844	33.64	2,409	1,638
32.60	1,204	849	33.66	2,409	1,657
32.62	1,204	854	33.68	2,409	1,675
32.64	1,204	859	33.70	2,409	1,694
32.66	1,204	864	33.72	2,409	1,712
32.68	1,204	869	33.74	2,409	1,731
32.70	**2,409**	874	33.76	2,409	1,750
32.72	2,409	884	33.78	2,409	1,768
32.74	2,409	894	33.80	2,409	1,787
32.76	2,409	904	33.82	2,409	1,805
32.78	2,409	914	33.84	2,409	1,824
32.80	2,409	924	33.86	2,409	1,842
32.82	2,409	934	33.88	2,409	1,861
32.84	2,409	944	33.90	2,409	1,879
32.86	2,409	954	33.92	2,409	1,898
32.88	2,409	963	33.94	2,409	1,917
32.90	2,409	973	33.96	2,409	1,935
32.92	2,409	983	33.98	2,409	1,954
32.94	2,409	993	34.00	2,409	1,972
32.96	2,409	1,007	34.02	2,409	1,991
32.98	2,409	1,026	34.04	2,409	2,009
33.00	2,409	1,044	34.06	2,409	2,028
33.02	2,409	1,063	34.08	2,409	2,046
33.04	2,409	1,082	34.10	2,409	2,065
33.06	2,409	1,100	34.12	2,409	2,084
33.08	2,409	1,119	34.14	2,409	2,102
33.10	2,409	1,137	34.16	2,409	2,121
33.12	2,409	1,156	34.18	2,409	2,139
33.14	2,409	1,174	34.20	2,409	2,158
33.16	2,409	1,193	34.22	2,409	2,176
33.18	2,409	1,211	34.24	2,409	2,195
33.20	2,409	1,230	34.26	2,409	2,213
33.22	2,409	1,249	34.28	2,409	2,232
33.24	2,409	1,267	34.30	2,409	2,251
33.26	2,409	1,286	34.32	2,409	2,269
33.28	2,409	1,304	34.34	2,409	2,288
33.30	2,409	1,323	34.36	2,409	2,306
33.32	2,409	1,341	34.38	2,409	2,325
33.34	2,409	1,360	34.40	2,409	2,343
33.36	2,409	1,378	34.42	2,409	2,362

Stage-Area-Storage for Pond PP03b: R-Tank #3 and 4 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
34.44	2,409	2,380	35.50	2,409	3,364
34.46	2,409	2,399	35.52	2,409	3,382
34.48	2,409	2,418	35.54	2,409	3,401
34.50	2,409	2,436	35.56	2,409	3,419
34.52	2,409	2,455	35.58	2,409	3,438
34.54	2,409	2,473	35.60	2,409	3,457
34.56	2,409	2,492	35.62	2,409	3,475
34.58	2,409	2,510	35.64	2,409	3,494
34.60	2,409	2,529	35.66	2,409	3,512
34.62	2,409	2,547	35.68	2,409	3,531
34.64	2,409	2,566	35.70	2,409	3,549
34.66	2,409	2,585	35.72	2,409	3,568
34.68	2,409	2,603	35.74	2,409	3,586
34.70	2,409	2,622	35.76	2,409	3,605
34.72	2,409	2,640	35.78	2,409	3,624
34.74	2,409	2,659	35.80	2,409	3,642
34.76	2,409	2,677	35.82	2,409	3,661
34.78	2,409	2,696	35.84	2,409	3,679
34.80	2,409	2,714	35.86	2,409	3,698
34.82	2,409	2,733	35.88	2,409	3,716
34.84	2,409	2,752	35.90	2,409	3,735
34.86	2,409	2,770	35.92	2,409	3,753
34.88	2,409	2,789	35.94	2,409	3,772
34.90	2,409	2,807	35.96	2,409	3,790
34.92	2,409	2,826	35.98	2,409	3,808
34.94	2,409	2,844	36.00	2,409	3,826
34.96	2,409	2,863	36.02	2,409	3,845
34.98	2,409	2,881	36.04	2,409	3,863
35.00	2,409	2,900	36.06	2,409	3,881
35.02	2,409	2,918	36.08	2,409	3,900
35.04	2,409	2,937	36.10	2,409	3,918
35.06	2,409	2,956	36.12	2,409	3,936
35.08	2,409	2,974	36.14	2,409	3,955
35.10	2,409	2,993	36.16	2,409	3,973
35.12	2,409	3,011	36.18	2,409	3,991
35.14	2,409	3,030	36.20	2,409	4,009
35.16	2,409	3,048	36.22	2,409	4,028
35.18	2,409	3,067	36.24	2,409	4,046
35.20	2,409	3,085	36.26	2,409	4,064
35.22	2,409	3,104	36.28	2,409	4,083
35.24	2,409	3,123	36.30	2,409	4,101
35.26	2,409	3,141	36.32	2,409	4,119
35.28	2,409	3,160	36.34	2,409	4,138
35.30	2,409	3,178	36.36	2,409	4,156
35.32	2,409	3,197	36.38	2,409	4,174
35.34	2,409	3,215	36.40	2,409	4,193
35.36	2,409	3,234	36.42	2,409	4,211
35.38	2,409	3,252	36.44	2,409	4,229
35.40	2,409	3,271	36.46	2,409	4,247
35.42	2,409	3,290	36.48	2,409	4,266
35.44	2,409	3,308	36.50	2,409	4,284
35.46	2,409	3,327	36.52	2,409	4,302
35.48	2,409	3,345	36.54	2,409	4,321

Stage-Area-Storage for Pond PP03b: R-Tank #3 and 4 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
36.56	2,409	4,339	37.62	2,409	5,190
36.58	2,409	4,357	37.64	2,409	5,200
36.60	2,409	4,376	37.66	2,409	5,210
36.62	2,409	4,394	37.68	2,409	5,219
36.64	2,409	4,412	37.70	2,409	5,229
36.66	2,409	4,430	37.72	2,409	5,239
36.68	2,409	4,449	37.74	2,409	5,248
36.70	2,409	4,467	37.76	2,409	5,258
36.72	2,409	4,485	37.78	2,409	5,267
36.74	2,409	4,504	37.80	2,409	5,277
36.76	2,409	4,522	37.82	2,409	5,287
36.78	2,409	4,540	37.84	2,409	5,296
36.80	2,409	4,559	37.86	2,409	5,306
36.82	2,409	4,577	37.88	2,409	5,316
36.84	2,409	4,595	37.90	2,409	5,325
36.86	2,409	4,614	37.92	2,409	5,335
36.88	2,409	4,632	37.94	2,409	5,345
36.90	2,409	4,650	37.96	2,409	5,354
36.92	2,409	4,668	37.98	2,409	5,364
36.94	2,409	4,687	38.00	2,409	5,373
36.96	2,409	4,705	38.02	2,409	5,383
36.98	2,409	4,723	38.04	2,409	5,393
37.00	2,409	4,742	38.06	2,409	5,402
37.02	2,409	4,760	38.08	2,409	5,412
37.04	2,409	4,778	38.10	2,409	5,422
37.06	2,409	4,797	38.12	2,409	5,431
37.08	2,409	4,815	38.14	2,409	5,441
37.10	2,409	4,833	38.16	2,409	5,451
37.12	2,409	4,851	38.18	2,409	5,460
37.14	2,409	4,870	38.20	2,409	5,470
37.16	2,409	4,888	38.22	2,409	5,479
37.18	2,409	4,906	38.24	2,409	5,489
37.20	2,409	4,925	38.26	2,409	5,499
37.22	2,409	4,943	38.28	2,409	5,508
37.24	2,409	4,961	38.30	2,409	5,518
37.26	2,409	4,980	38.32	2,409	5,528
37.28	2,409	4,998	38.34	2,409	5,537
37.30	2,409	5,016	38.36	2,409	**5,540**
37.32	2,409	5,034	38.38	2,409	5,540
37.34	2,409	5,053	38.40	2,409	5,540
37.36	2,409	5,065	38.42	2,409	5,540
37.38	2,409	5,075	38.44	2,409	5,540
37.40	2,409	5,084	38.46	2,409	5,540
37.42	2,409	5,094	38.48	2,409	5,540
37.44	2,409	5,104	38.50	2,409	5,540
37.46	2,409	5,113	38.52	2,409	5,540
37.48	2,409	5,123	38.54	2,409	5,540
37.50	2,409	5,133	38.56	2,409	5,540
37.52	2,409	5,142	38.58	2,409	5,540
37.54	2,409	5,152	38.60	2,409	5,540
37.56	2,409	5,162	38.62	2,409	5,540
37.58	2,409	5,171	38.64	2,409	5,540
37.60	2,409	5,181	38.66	2,409	5,540

Stage-Area-Storage for Pond PP03b: R-Tank #3 and 4 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
38.68	2,409	5,540	39.74	2,409	5,540
38.70	2,409	5,540	39.76	2,409	5,540
38.72	2,409	5,540	39.78	2,409	5,540
38.74	2,409	5,540	39.80	2,409	5,540
38.76	2,409	5,540	39.82	2,409	5,540
38.78	2,409	5,540	39.84	2,409	5,540
38.80	2,409	5,540			
38.82	2,409	5,540			
38.84	2,409	5,540			
38.86	2,409	5,540			
38.88	2,409	5,540			
38.90	2,409	5,540			
38.92	2,409	5,540			
38.94	2,409	5,540			
38.96	2,409	5,540			
38.98	2,409	5,540			
39.00	2,409	5,540			
39.02	2,409	5,540			
39.04	2,409	5,540			
39.06	2,409	5,540			
39.08	2,409	5,540			
39.10	2,409	5,540			
39.12	2,409	5,540			
39.14	2,409	5,540			
39.16	2,409	5,540			
39.18	2,409	5,540			
39.20	2,409	5,540			
39.22	2,409	5,540			
39.24	2,409	5,540			
39.26	2,409	5,540			
39.28	2,409	5,540			
39.30	2,409	5,540			
39.32	2,409	5,540			
39.34	2,409	5,540			
39.36	2,409	5,540			
39.38	2,409	5,540			
39.40	2,409	5,540			
39.42	2,409	5,540			
39.44	2,409	5,540			
39.46	2,409	5,540			
39.48	2,409	5,540			
39.50	2,409	5,540			
39.52	2,409	5,540			
39.54	2,409	5,540			
39.56	2,409	5,540			
39.58	2,409	5,540			
39.60	2,409	5,540			
39.62	2,409	5,540			
39.64	2,409	5,540			
39.66	2,409	5,540			
39.68	2,409	5,540			
39.70	2,409	5,540			
39.72	2,409	5,540			

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FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PP-04a BIORETENTION AREA #2**

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

		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.97	ac	A = Area draining to the practice	
0.46	ac	A_I = Impervious area draining to the practice	
0.47	decimal	I = percent impervious area draining to the practice, in decimal form	
0.47	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.46	ac-in	WQV= 1" x Rv x A	
1,675	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
419	cf	25% x WQV (check calc for sediment forebay volume)	
1,256	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump		Method of Pretreatment? (not required for clean or roof runoff)	
-	cf	V_{SED} = sediment forebay volume, if used for pretreatment	**← ≥ 25%WQV**
1,287	sf	A_{SA} = surface area of the practice	
NA	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	**← ≤ 72-hrs**
44.50	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
43.50	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
NA	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
NA	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	**← ≥ 1'**
48.19	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
48.75	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	**← < 10 ac**
	cf	V = volume of storage[3] (attach a stage-storage table)	**← ≥ 75%WQV**
	inches	D_{FC} = filter course thickness	**← 18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
4,036	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

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

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

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

Designer's Notes:

This is a Hybrid Bioretention Area with a Anaerobic Area Beneath the Engeineered Soil

2019

Stage-Area-Storage for Pond PP04A: Bioretention Area #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
45.25	0	0
45.30	0	26
45.35	0	51
45.40	0	77
45.45	0	103
45.50	0	129
45.55	0	154
45.60	0	180
45.65	0	206
45.70	0	232
45.75	0	257
45.80	0	283
45.85	0	309
45.90	0	335
45.95	0	360
46.00	1,287	386
46.05	1,326	451
46.10	1,366	519
46.15	1,406	588
46.20	1,447	659
46.25	1,488	733
46.30	1,530	808
46.35	1,573	886
46.40	1,616	965
46.45	1,660	1,047
46.50	1,704	1,131
46.55	1,749	1,218
46.60	1,795	1,306
46.65	1,841	1,397
46.70	1,888	1,490
46.75	1,935	1,586
46.80	1,983	1,684
46.85	2,031	1,784
46.90	2,080	1,887
46.95	2,130	1,992
47.00	2,180	2,100
47.05	2,231	2,210
47.10	2,282	2,323
47.15	2,334	2,439
47.20	2,387	2,557
47.25	2,440	2,677
47.30	2,493	2,801
47.35	2,548	2,927
47.40	2,603	3,055
47.45	2,658	3,187
47.50	2,714	3,321
47.55	2,771	3,458
47.60	2,828	3,598
47.65	2,886	3,741
47.70	2,944	3,887
47.75	3,003	4,036
47.80	3,063	4,187
47.85	3,123	4,342
47.90	3,184	4,499
47.95	3,245	4,660
48.00	3,307	4,824
48.05	3,369	4,991
48.10	3,432	5,161
48.15	3,496	5,334
48.20	3,560	5,511
48.25	3,625	5,690
48.30	3,691	5,873
48.35	3,757	6,059
48.40	3,823	6,249
48.45	3,890	6,442
48.50	3,958	6,638
48.55	4,107	6,839
48.60	4,258	7,048
48.65	4,412	7,265
48.70	4,569	7,490
48.75	**4,729**	**7,722**
48.80	4,729	7,722
48.85	4,729	7,722
48.90	4,729	7,722
48.95	4,729	7,722
49.00	4,729	7,722

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FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PP-04b BIORETENTION AREA #3**

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

		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.48	ac	A = Area draining to the practice	
0.22	ac	A_I = Impervious area draining to the practice	
0.47	decimal	I = percent impervious area draining to the practice, in decimal form	
0.47	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.23	ac-in	WQV= 1" x Rv x A	
822	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
205	cf	25% x WQV (check calc for sediment forebay volume)	
616	cf	75% x WQV (check calc for surface sand filter volume)	
Deep Sump CB		Method of Pretreatment? (not required for clean or roof runoff)	
NA	cf	V_{SED} = sediment forebay volume, if used for pretreatment	← **≥ 25%WQV**
950	sf	A_{SA} = surface area of the practice	
NA	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	← **≤ 72-hrs**
42.00	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
41.00	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
NA	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
NA	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	← **≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	← **≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	← **≥ 1'**
45.60	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
46.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	← **yes**

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	← **< 10 ac**
	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ 75%WQV**
	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	← **yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← **yes**
3,147	cf	V = volume of storage[3] (attach a stage-storage table)	← **≥ WQV**
18.0	inches	D_{FC} = filter course thickness	← **18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← **≥3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← **≤ 5:1**
	inches	D_{FC} = filter course thickness	← **12", or 18" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course spec.	← **304.1 sand**

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

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

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

Designer's Notes:

This is a Hybrid Bioretention Area with a Anaerobic Area Beneath the Engeineered Soil

2019

Stage-Area-Storage for Pond PP04B: Bioretention Area #3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
42.75	0	0	45.40	2,595	3,525
42.80	0	19	45.45	2,649	3,656
42.85	0	38	45.50	2,704	3,790
42.90	0	57	45.55	2,760	3,926
42.95	0	76	45.60	2,816	4,066
43.00	0	95	45.65	2,872	4,208
43.05	0	114	45.70	2,929	4,353
43.10	0	133	45.75	2,987	4,501
43.15	0	152	45.80	3,045	4,652
43.20	0	171	45.85	3,103	4,805
43.25	0	190	45.90	3,163	4,962
43.30	0	209	45.95	3,223	5,122
43.35	0	228	46.00	3,283	5,284
43.40	0	247	46.05	3,358	5,450
43.45	0	266	46.10	3,433	5,620
43.50	950	285	46.15	3,510	5,794
43.55	983	333	46.20	3,587	5,971
43.60	1,016	383	46.25	**3,665**	**6,152**
43.65	1,050	435	46.30	3,665	6,152
43.70	1,085	488	46.35	3,665	6,152
43.75	1,120	543	46.40	3,665	6,152
43.80	1,156	600	46.45	3,665	6,152
43.85	1,192	659	46.50	3,665	6,152
43.90	1,229	720			
43.95	1,266	782			
44.00	1,304	846			
44.05	1,343	912			
44.10	1,382	981			
44.15	1,422	1,051			
44.20	1,462	1,123			
44.25	1,503	1,197			
44.30	1,544	1,273			
44.35	1,586	1,351			
44.40	1,628	1,432			
44.45	1,671	1,514			
44.50	1,715	1,599			
44.55	1,759	1,686			
44.60	1,804	1,775			
44.65	1,849	1,866			
44.70	1,895	1,960			
44.75	1,941	2,056			
44.80	1,988	2,154			
44.85	2,036	2,254			
44.90	2,084	2,357			
44.95	2,132	2,463			
45.00	2,182	2,571			
45.05	2,231	2,681			
45.10	2,282	2,794			
45.15	2,332	2,909			
45.20	2,384	3,027			
45.25	2,436	3,147			
45.30	2,488	3,271			
45.35	2,542	3,396			

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FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.07)

Type/Node Name: **PP-05 BIORETENTION AREA #1**

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

		Have you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a)?	
0.18	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.37	decimal	I = percent impervious area draining to the practice, in decimal form	
0.38	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
256	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
64	cf	25% x WQV (check calc for sediment forebay volume)	
192	cf	75% x WQV (check calc for surface sand filter volume)	
Forbay		Method of Pretreatment? (not required for clean or roof runoff)	
140	cf	V_{SED} = sediment forebay volume, if used for pretreatment	**← ≥ 25%WQV**
1,227	sf	A_{SA} = surface area of the practice	
NA	iph	$Ksat_{DESIGN}$ = design infiltration rate[1]	
Yes	Yes/No	If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	hours	T_{DRAIN} = drain time = V / (A_{SA} * I_{DESIGN})	**← ≤ 72-hrs**
54.50	feet	E_{FC} = elevation of the bottom of the filter course material[2]	
53.50	feet	E_{UD} = invert elevation of the underdrain (UD), if applicable	
NA	feet	E_{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
NA	feet	E_{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = depth to UD from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ ROCK}$ = depth to bedrock from the bottom of the filter course	**← ≥ 1'**
#VALUE!	feet	$D_{FC\ to\ SHWT}$ = depth to SHWT from the bottom of the filter course	**← ≥ 1'**
57.52	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
58.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**

If a surface sand filter or underground sand filter is proposed:

YES	ac	Drainage Area check.	**← < 10 ac**
	cf	V = volume of storage[3] (attach a stage-storage table)	**← ≥ 75%WQV**
	inches	D_{FC} = filter course thickness	**← 18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:

YES	ac	Drainage Area no larger than 5 ac?	← yes
3,204	cf	V = volume of storage[3] (attach a stage-storage table)	← ≥ WQV
18.0	inches	D_{FC} = filter course thickness	← 18", or 24" if within GPA
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	← ≥3:1
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	

If porous pavement is proposed:

		Type of pavement proposed (concrete? Asphalt? Pavers? Etc)	
	acres	A_{SA} = surface area of the pervious pavement	
	:1	ratio of the contributing area to the pervious surface area	← ≤ 5:1
	inches	D_{FC} = filter course thickness	← 12", or 18" if within GPA
Sheet		Note what sheet in the plan set contains the filter course spec.	← 304.1 sand

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

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

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

Designer's Notes:

2019

Stage-Area-Storage for Pond PP05: Bloretention Pond #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
53.33	1,227	0	54.39	1,227	437
53.35	1,227	0	54.41	1,227	447
53.37	1,227	0	54.43	1,227	456
53.39	1,227	0	54.45	1,227	466
53.41	1,227	0	54.47	1,227	476
53.43	1,227	0	54.49	1,227	486
53.45	1,227	0	54.51	1,227	493
53.47	1,227	0	54.53	1,227	498
53.49	1,227	0	54.55	1,227	503
53.51	1,227	5	54.57	1,227	508
53.53	1,227	15	54.59	1,227	513
53.55	1,227	25	54.61	1,227	518
53.57	1,227	34	54.63	1,227	523
53.59	1,227	44	54.65	1,227	528
53.61	1,227	54	54.67	1,227	533
53.63	1,227	64	54.69	1,227	537
53.65	1,227	74	54.71	1,227	542
53.67	1,227	83	54.73	1,227	547
53.69	1,227	93	54.75	1,227	552
53.71	1,227	103	54.77	1,227	557
53.73	1,227	113	54.79	1,227	562
53.75	1,227	123	54.81	1,227	567
53.77	1,227	133	54.83	1,227	572
53.79	1,227	142	54.85	1,227	577
53.81	1,227	152	54.87	1,227	582
53.83	1,227	162	54.89	1,227	587
53.85	1,227	172	54.91	1,227	591
53.87	1,227	182	54.93	1,227	596
53.89	1,227	191	54.95	1,227	601
53.91	1,227	201	54.97	1,227	606
53.93	1,227	211	54.99	1,227	611
53.95	1,227	221	55.01	1,227	616
53.97	1,227	231	55.03	1,227	621
53.99	1,227	240	55.05	1,227	626
54.01	1,227	250	55.07	1,227	631
54.03	1,227	260	55.09	1,227	636
54.05	1,227	270	55.11	1,227	640
54.07	1,227	280	55.13	1,227	645
54.09	1,227	290	55.15	1,227	650
54.11	1,227	299	55.17	1,227	655
54.13	1,227	309	55.19	1,227	660
54.15	1,227	319	55.21	1,227	665
54.17	1,227	329	55.23	1,227	670
54.19	1,227	339	55.25	1,227	675
54.21	1,227	348	55.27	1,227	680
54.23	1,227	358	55.29	1,227	685
54.25	1,227	368	55.31	1,227	690
54.27	1,227	378	55.33	1,227	694
54.29	1,227	388	55.35	1,227	699
54.31	1,227	398	55.37	1,227	704
54.33	1,227	407	55.39	1,227	709
54.35	1,227	417	55.41	1,227	714
54.37	1,227	427	55.43	1,227	719

Stage-Area-Storage for Pond PP05: Bloretention Pond #1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
55.45	1,227	724	56.51	1,448	1,540
55.47	1,227	729	56.53	1,457	1,569
55.49	1,227	734	56.55	1,466	1,598
55.51	1,227	739	56.57	1,475	1,628
55.53	1,227	744	56.59	1,484	1,657
55.55	1,227	748	56.61	1,493	1,687
55.57	1,227	753	56.63	1,502	1,717
55.59	1,227	758	56.65	1,512	1,747
55.61	1,227	763	56.67	1,521	1,778
55.63	1,227	768	56.69	1,530	1,808
55.65	1,227	773	56.71	1,539	1,839
55.67	1,227	778	56.73	1,549	1,870
55.69	1,227	783	56.75	1,558	1,901
55.71	1,227	788	56.77	1,567	1,932
55.73	1,227	793	56.79	1,577	1,963
55.75	1,227	798	56.81	1,586	1,995
55.77	1,227	802	56.83	1,596	2,027
55.79	1,227	807	56.85	1,605	2,059
55.81	1,227	812	56.87	1,615	2,091
55.83	1,227	817	56.89	1,624	2,124
55.85	1,227	822	56.91	1,634	2,156
55.87	1,227	827	56.93	1,643	2,189
55.89	1,227	832	56.95	1,653	2,222
55.91	1,227	837	56.97	1,662	2,255
55.93	1,227	842	56.99	1,672	2,288
55.95	1,227	847	57.01	1,682	2,322
55.97	1,227	852	57.03	1,691	2,356
55.99	1,227	856	57.05	1,701	2,389
56.01	1,231	871	57.07	1,710	2,424
56.03	1,239	896	57.09	1,720	2,458
56.05	1,248	921	57.11	1,729	2,492
56.07	1,256	946	57.13	1,739	2,527
56.09	1,265	971	57.15	1,749	2,562
56.11	1,273	996	57.17	1,758	2,597
56.13	1,282	1,022	57.19	1,768	2,632
56.15	1,290	1,048	57.21	1,778	2,668
56.17	1,299	1,074	57.23	1,788	2,703
56.19	1,307	1,100	57.25	1,797	2,739
56.21	1,316	1,126	57.27	1,807	2,775
56.23	1,324	1,152	57.29	1,817	2,812
56.25	1,333	1,179	57.31	1,827	2,848
56.27	1,342	1,206	57.33	1,837	2,885
56.29	1,350	1,232	57.35	1,847	2,921
56.31	1,359	1,260	57.37	1,857	2,959
56.33	1,368	1,287	57.39	1,867	2,996
56.35	1,377	1,314	57.41	1,877	3,033
56.37	1,385	1,342	57.43	1,887	3,071
56.39	1,394	1,370	57.45	1,897	3,109
56.41	1,403	1,398	57.47	1,907	3,147
56.43	1,412	1,426	57.49	1,917	3,185
56.45	1,421	1,454	57.51	1,927	3,223
56.47	1,430	1,483	57.53	1,937	3,262
56.49	1,439	1,511	57.55	1,948	3,301

Stage-Area-Storage for Pond PP05: Bloretention Pond #1 (continued)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
57.57	1,958	3,340
57.59	1,968	3,379
57.61	1,978	3,419
57.63	1,989	3,458
57.65	1,999	3,498
57.67	2,009	3,538
57.69	2,020	3,579
57.71	2,030	3,619
57.73	2,041	3,660
57.75	2,051	3,701
57.77	2,061	3,742
57.79	2,072	3,783
57.81	2,083	3,825
57.83	2,093	3,866
57.85	2,104	3,908
57.87	2,114	3,951
57.89	2,125	3,993
57.91	2,136	4,036
57.93	2,146	4,078
57.95	2,157	4,121
57.97	2,168	4,165
57.99	2,179	4,208
58.01	2,233	4,252
58.03	2,332	4,298
58.05	2,433	4,345
58.07	2,537	4,395
58.09	2,642	4,447
58.11	**2,696**	4,500
58.13	2,696	4,554
58.15	2,696	4,608
58.17	2,696	4,662
58.19	2,696	4,716
58.21	2,696	4,770
58.23	2,696	4,824
58.25	2,696	4,878
58.27	2,696	4,932
58.29	2,696	4,986
58.31	2,696	5,040
58.33	2,696	5,094
58.35	2,696	5,148
58.37	2,696	5,201
58.39	2,696	5,255
58.41	2,696	5,309
58.43	2,696	5,363
58.45	2,696	5,417
58.47	2,696	5,471
58.49	2,696	**5,525**

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APPENDIX G
RIPRAP CALCULATIONS

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The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES #1- (MH01) Outlet of Underdrain for R-Tanks

Design Flow =	Q =	0.1	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **7** feet

W_1 = Width = 3Do+(0.4)(La)= **6** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.		Size of stone (inches)		
100	(See Last Page of Calculations for 25-Year Flows)	4.50	-	6.00
85		3.90	-	5.40
50		3.00	-	4.50
15		0.90	-	1.50

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES#2 - (P003A) Outlet from Overflow of R-Tanks

Design Flow =	Q =	0.5	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **9** feet

W = Width = 3Do+(0.4)(La)= **6** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.	Size of stone (inches)		
100	4.50	-	6.00
85	3.90	-	5.40
50	3.00	-	4.50
15	0.90	-	1.50

(See Last Page of Calculations
for 25-Year Flows)

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES#3 - (PP04a)From Bioretention Area #3

Design Flow =	Q =	3.4	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **17** feet

W = Width = 3Do+(0.4)(La)= **10** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.	Size of stone (inches)		
100	4.50	-	6.00
85	3.90	-	5.40
50	3.00	-	4.50
15	0.90	-	1.50

(See Last Page of Calculations
for 25-Year Flows)

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES#4 - (PP04b)From Bioretention Area #4

Design Flow =	Q =	1.5	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **12** feet

W = Width = 3Do+(0.4)(La)= **8** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.	Size of stone (inches)		
100	4.50	-	6.00
85	3.90	-	5.40
50	3.00	-	4.50
15	0.90	-	1.50

(See Last Page of Calculations
for 25-Year Flows)

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES#5 - (PP05) From Bioretention Area #1

Design Flow =	Q =	0	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **7** feet

W = Width = 3Do+(0.4)(La)= **6** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.		Size of stone (inches)		
100	(See Last Page of Calculations for 25-Year Flows)	4.50	-	6.00
85		3.90	-	5.40
50		3.00	-	4.50
15		0.90	-	1.50

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES #6 - (Ci01) Curb Inlet 01

Design Flow =	Q =	0.6	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **9** feet

W = Width = 3Do+(0.4)(La)= **7** feet **(or Width of Channel)**

W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.	Size of stone (inches)		
100	4.50	-	6.00
85	3.90	-	5.40
50	3.00	-	4.50
15	0.90	-	1.50

(See Last Page of Calculations
for 25-Year Flows)

The Village at Banfield Woods
Portsmouth, NH
3/4/2020

RIPRAP OUTLET PROTECTION

Location: FES #7 - (Ci02) Curb Inlet 02

Design Flow =	Q =	0.6	cfs
Tailwater =	Tw =	0.666667	feet
Pipe Dia.=	Do =	1	feet

La = Length = $3Q/Do^{(3/2)} + 7Do$ = **9** feet

W = Width = 3Do+(0.4)(La)= **7** feet **(or Width of Channel)**
W_2 = Width = 3Do= 3 feet

D = Depth = (1.5)(1.5d50)= **7** inches **(or Min. 6")**

d50 = $(.02)(Q)^{(4/3)}/(Tw*Do)$= **3.00** inches **(or Min. 3")**

Rock Riprap Gradation

% of weight smaller than the given size.	Size of stone (inches)		
100	4.50	-	6.00
85	3.90	-	5.40
50	3.00	-	4.50
15	0.90	-	1.50

(See Last Page of Calculations for 25-Year Flows)

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Time span=0.00-24.00 hrs, dt=0.06 hrs, 401 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond Ci01: CURB INLET 1 Peak Elev=26.63' Inflow=0.6 cfs 1,843 cf
Outflow=0.6 cfs 1,843 cf

Pond Ci02: CURB INLET 2 Peak Elev=26.62' Inflow=0.6 cfs 1,799 cf
Outflow=0.6 cfs 1,799 cf

Pond MH01: MH 1 Peak Elev=28.68' Inflow=0.1 cfs 6,254 cf
UNDERDRAIN FROM R-TANKS 12.0" Round Culvert n=0.012 L=91.0' S=0.0082 '/' Outflow=0.1 cfs 6,254 cf

Pond MH05: MH 5 Peak Elev=51.30' Inflow=0.0 cfs 0 cf
UNDERDRAIN FROM BIORETENTION AREA 1 12.0" Round Culvert n=0.013 L=65.0' S=0.0523 '/' Outflow=0.0 cfs 0 cf

Pond P003a: R-Tank #1 and 2 Peak Elev=34.48' Storage=4,100 cf Inflow=2.1 cfs 9,304 cf
OVERFLOW FROM RITANKS Primary=0.1 cfs 2,868 cf Secondary=0.5 cfs 2,665 cf Outflow=0.5 cfs 5,533 cf

Pond PP04A: Bioretention Area #2 Peak Elev=48.10' Storage=5,178 cf Inflow=4.4 cfs 18,386 cf
Primary=2.6 cfs 17,436 cf Secondary=0.8 cfs 565 cf Outflow=3.4 cfs 18,001 cf

Pond PP04B: Bioretention Area #3 Peak Elev=45.52' Storage=3,838 cf Inflow=2.6 cfs 9,026 cf
Primary=1.4 cfs 5,826 cf Secondary=0.0 cfs 15 cf Outflow=1.5 cfs 5,841 cf

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APPENDIX H
INLET CAPACITY CALCULATIONS

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Assumes Steady Flow

K	Constant for Imperial Units (unitless)	1.49
K_u	Constant Gutter	0.09
n	Coefficient of Roughness	0.016 For Asphalt
W	Width of Gutter (ft)	2
L	Length of Gutter (ft)	Given
S	Longintudinal Slope (ft/ft)	Given
S_x	Cross Slope (ft/ft)	Given
S_w	Cross Slope in Depression (ft/ft)	$S_w = a/W+S_x$
A	Area (sf)	A = 1/2 Ty
A_2	Area Based on Gutter (sf)	A_2 = 0.5 T2Sx + 0.5 a W
P	Wetted Perimeter	P = (y/SINΦ)+y
R	Hydraulic Radius (ft)	R = A/P
R_f	Frontal Grate Efficiency	if $V<V_o$ then $R_f=1$
R_s	The ratio of side flow interc. total side flow (cfs)	$R_s = 1/[1+ (K_u V^{1.8}) / (S_x L^{2.3})]$
V	Velocity (fps)	$V = K/n R\text{^}^{2/3}S^{1/2}$
V_O	Splash Over Velocity (fps) (Rectilinear)	V_o=0.03+2.278L-0.179L^2+0.01L^3
y	Depth of Flow (ft)	$y=((2QnS_x(S_x+2)^{2/3}) / (K*D31\text{^}^{1/2}))^{3/8}$
T	Width of Flow (ft)	$T=y/S_x$
Q_{10}	10 year, 24 hr storm Flow (cfs)	Given
Q_S	Flow capacity at Gutter Section Above the Dep.(cfs)	$Q_s=K_u/n\ S_x^{1.67}S^{1/2}T_s^{2.67}$ K_u = 0.56 (Constant for Imperial Units)
Q_w	Flow at Depression (cfs)	$Q_w = Q-Q_s$
Q_g	Flow at Gutter (cfs)	$Q_g = Q_s/(1-E_o)$
Q_i	Flow at Gutter (cfs)	$Q_i = Q[R_f E_o + R_s (1 - E_o)]$
E_o	Ratio of Flow in A Chosed Width to Gutter Flow	E_O= 1/[1+((S_w/S_x)/(1+(S_w/S_x)/(T/W-1))^2.67-1))]
a	Inet Depression (2 inches)	0.167 (Given)

	Q_{10} (CFS)	L (ft)	S (ft/ft	S_x (ft/ft)	S_w (ft/ft)	y (ft)	Φ of Slope	T (ft)	A (ft^2)	P (ft)	R (ft)	V (fps)	A_2 (ft^2)	V_G (fps)	V_O (fps)	R_f	R_S	E_f	Q_i (CFS)	R_S	S_W (ft/ft)	E_o	T_s (ft)	Q_s (cfs)
																					(4-6)b	(4-4)		(4-2)
CB-01	0.8	2.00	0.06	0.02	0.10	0.10	0.02	5.07	0.26	5.2	0.0497	3.0854	0.4246	1.8843	3.9500	1.000	0.080	0.758	0.6067	0.1735	0.10	0.91	3.07	0.25
CB-02	0.7	2.00	0.06	0.02	0.10	0.10	0.02	4.83	0.23	4.9	0.0473	2.9841	0.2330	3.0041	3.9500	1.000	0.084	0.084	0.0588	0.0831	0.10	0.92	2.83	0.20
CB-03	1.0	2.00	0.06	0.02	0.10	0.11	0.02	5.52	0.30	5.6	0.0541	3.2624	0.3045	3.2843	3.9500	1.000	0.072	0.072	0.0725	0.0717	0.10	0.88	3.52	0.36
CB-04	1.2	2.00	0.06	0.02	0.10	0.12	0.02	5.91	0.35	6.0	0.0579	3.4145	0.3491	3.4375	3.9500	1.000	0.067	0.067	0.0806	0.0664	0.10	0.86	3.91	0.47
CB-05	0.4	2.00	0.00	0.02	0.10	0.17	0.02	8.43	0.71	8.6	0.0827	0.5588	0.7111	0.5625	3.9500	1.000	0.652	0.652	0.2607	0.649	0.10	0.70	6.43	0.23
CB-06	0.4	2.00	0.00	0.02	0.10	0.17	0.02	8.43	0.71	8.6	0.0827	0.5588	0.7111	0.5625	3.9500	1.000	0.652	0.652	0.2607	0.649	0.10	0.70	6.43	0.23
CB-07	3.0	4.00	0.04	0.02	0.10	0.18	0.02	9.22	0.85	9.4	0.0903	3.5078	0.8495	3.5314	6.9180	1.000	0.252	0.252	0.7575	0.2502	0.10	0.65	7.22	1.86
CB-08	1.6	4.00	0.04	0.02	0.10	0.15	0.02	7.28	0.53	7.4	0.0714	2.9977	0.5302	3.0178	6.9180	1.000	0.309	0.309	0.4952	0.3069	0.10	0.77	5.28	0.81

All CB Gutter Velocity is below Jump Velocity, therefore double grate not required

CB -07 Flow is greater than the allowable 2 cfs, therefore, calling for double grate catchbasin for this and CB-8

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APPENDIX I
NRCS WEB SOILS SURVEY

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United States Department of Agriculture

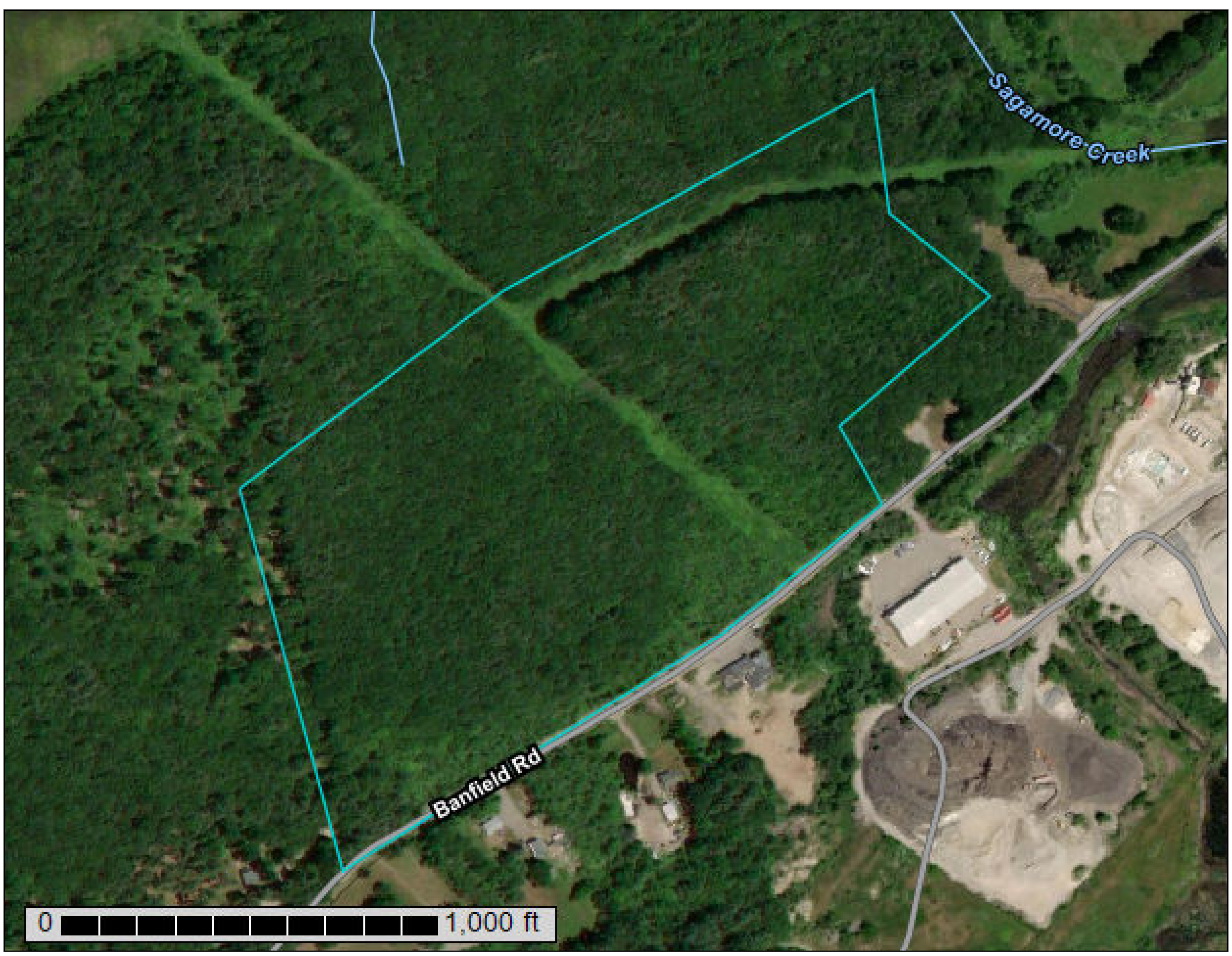
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for
Rockingham County, New Hampshire

Banfield - Portsmouth, NH



September 13, 2019

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

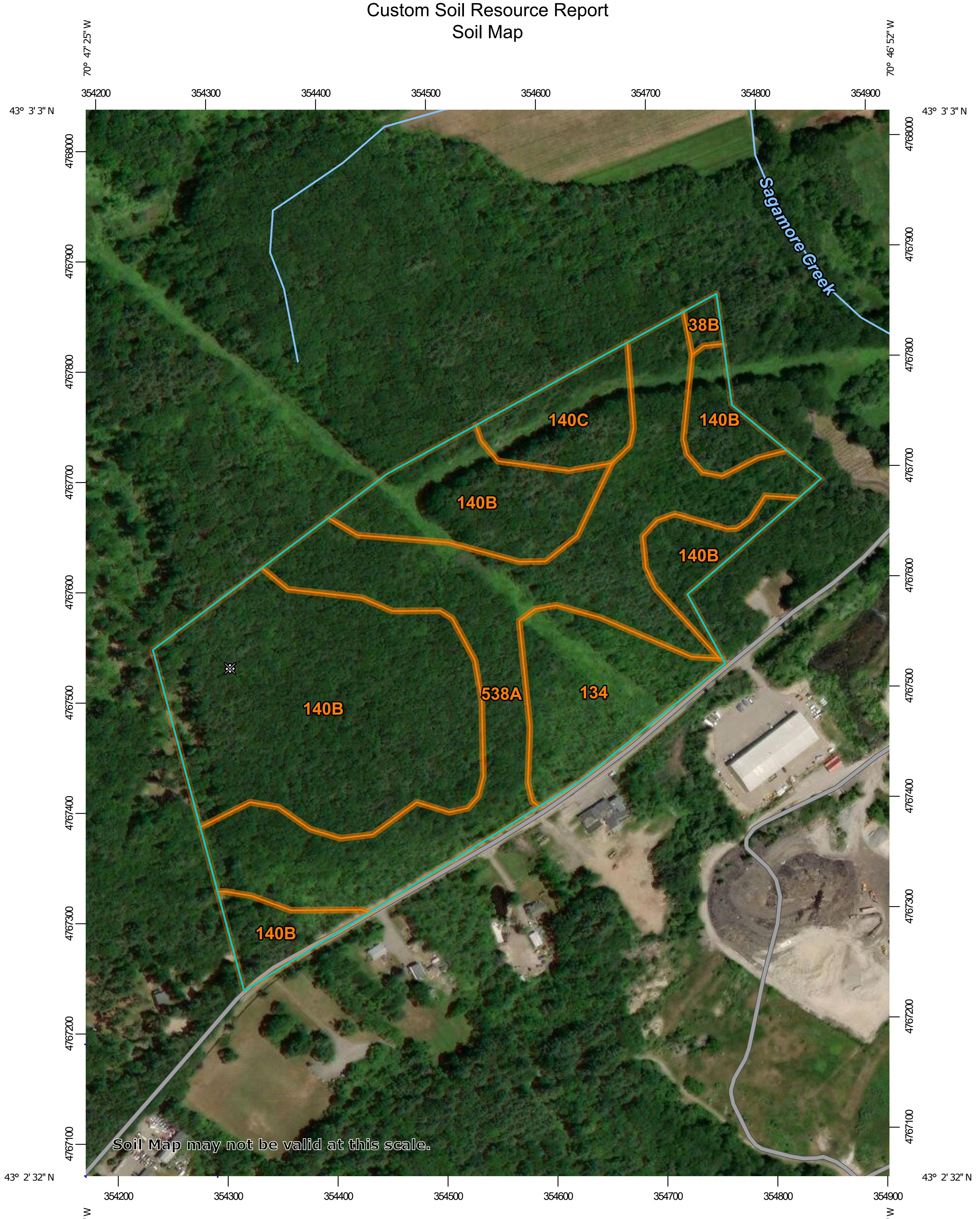
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map



Map Scale: 1:4,710 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 50, 100, 200, 300

Feet: 0, 200, 400, 800, 1200

N

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 20, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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
38B	Eldridge fine sandy loam, 3 to 8 percent slopes	0.3	0.7%
134	Maybid silt loam	4.5	10.0%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	22.1	48.5%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	2.5	5.5%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	16.1	35.4%
Totals for Area of Interest		**45.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

38B—Eldridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9cnb
Elevation: 90 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Eldridge and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Eldridge

Setting

Parent material: Outwash over glaciolacustrine

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 23 inches: loamy fine sand
H3 - 23 to 62 inches: loamy very fine sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Squamscott

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Boxford

Percent of map unit: 5 percent
Hydric soil rating: No

Well drained inclusion

Percent of map unit: 5 percent
Hydric soil rating: No

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

134—Maybid silt loam

Map Unit Composition

Maybid and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Maybid

Setting

Landform: Marine terraces
Parent material: Silty and clayey marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 26 inches: silty clay loam
H3 - 26 to 63 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Ossipee

Percent of map unit: 10 percent
Landform: Swamps
Hydric soil rating: Yes

Scitico

Percent of map unit: 10 percent
Landform: Marine terraces
Hydric soil rating: Yes

Not named wet

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Hollis, very stony, and similar soils: 25 percent
Canton, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Hills, moraines, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 5 percent
Landform: Moraines, hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Freetown

Percent of map unit: 5 percent
Landform: Depressions, marshes, swamps, kettles, bogs
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole, very stony

Percent of map unit: 3 percent
Landform: Depressions, outwash plains, depressions, deltas, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82s
Elevation: 0 to 980 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Canton, very stony, and similar soils: 25 percent
Hollis, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Hills, moraines, ridges
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex

Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent
Landform: Marshes, swamps, kettles, bogs, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scarboro, very stony

Percent of map unit: 3 percent
Landform: Outwash deltas, drainageways, outwash terraces, depressions
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Hills, ridges
Hydric soil rating: Unranked

538A—Squamscott fine sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9cp9
Elevation: 90 to 1,000 feet
Mean annual precipitation: 30 to 55 inches
Mean annual air temperature: 45 to 54 degrees F
Frost-free period: 120 to 180 days
Farmland classification: Farmland of local importance

Map Unit Composition

Squamscott and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Squamscott

Setting

Landform: Marine terraces

Typical profile

H1 - 0 to 4 inches: fine sandy loam
H2 - 4 to 12 inches: loamy sand
H3 - 12 to 19 inches: fine sand
H4 - 19 to 65 inches: silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Hydric soil rating: Yes

Minor Components

Maybid

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scitico

Percent of map unit: 5 percent
Landform: Marine terraces
Hydric soil rating: Yes

Eldridge

Percent of map unit: 5 percent
Hydric soil rating: No

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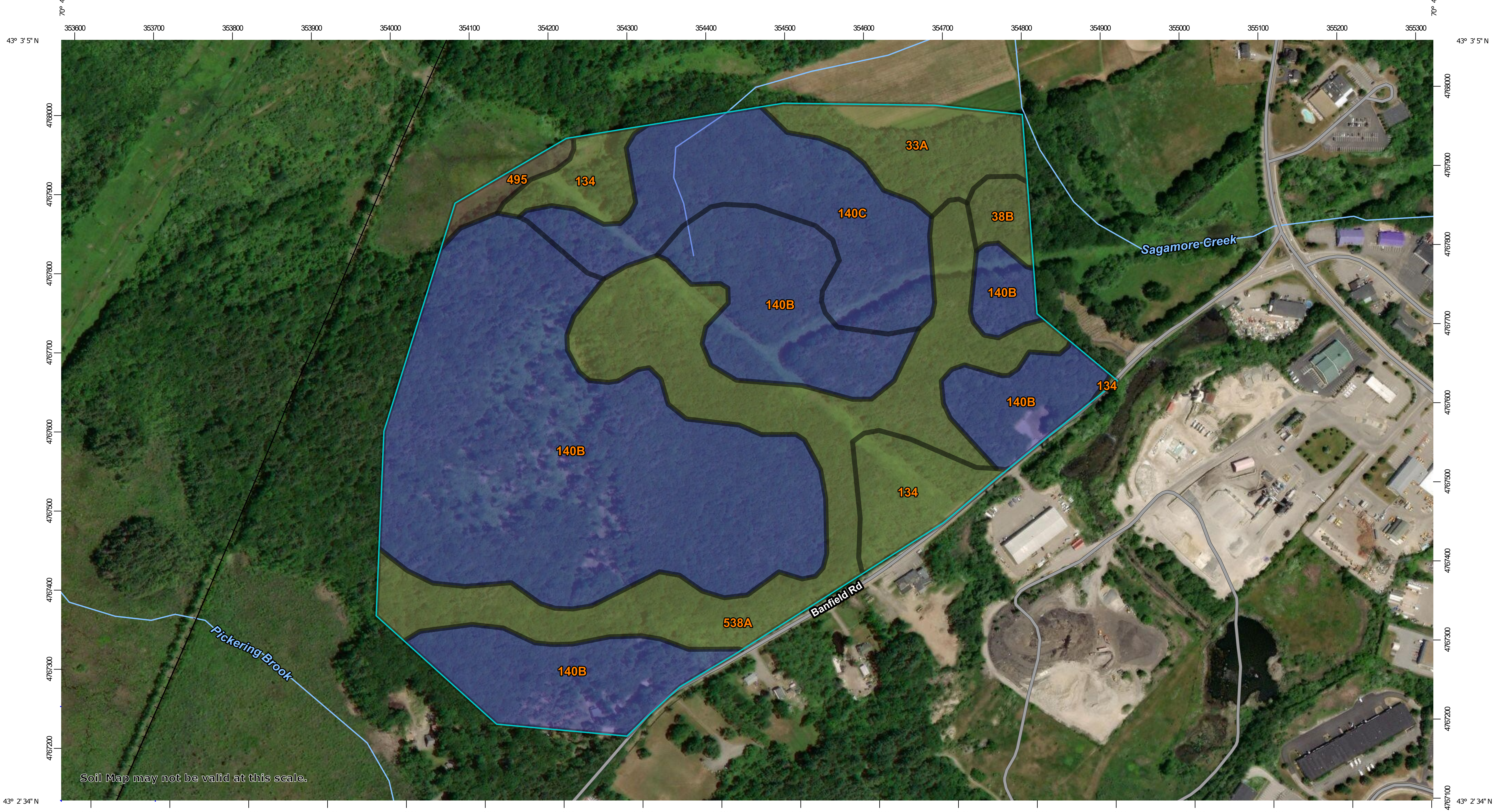
Hydrologic Soil Group—Rockingham County, New Hampshire
(BANFIELD - HSG)



Map Scale: 1:4,680 if printed on B landscape (17" x 11") sheet.

N

0 50 100 200 300 Meters

0 200 400 800 1200 Feet

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

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MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 21, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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.

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Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
33A	Scitico silt loam, 0 to 5 percent slopes	C/D	6.7	5.2%
38B	Eldridge fine sandy loam, 3 to 8 percent slopes	C/D	1.7	1.3%
134	Maybid silt loam	C/D	7.6	5.9%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	68.4	53.3%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	15.9	12.4%
495	Natchaug mucky peat, 0 to 2 percent slopes	B/D	1.3	1.0%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	26.8	20.9%
Totals for Area of Interest			**128.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX J
TEST PIT LOGS

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SITE-SPECIFIC SOIL SURVEY REPORT
THE VILLAGES AT BANFIELD ROAD
PORTSMOUTH, NH
GES # 2017071

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 5.0, December 2017. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the submission to NH DES Alteration of Terrain. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

2. DATE SOIL MAP PRODUCED
December 19, 2019

3. GEOGRAPHIC LOCATION AND SIZE OF SITE

Approximately 23 acres of the 44.8 acre lot was soil mapped. Tax map 256, Lot 2. The site is located in the City of Portsmouth, NH.

4. PURPOSE OF THE SOIL MAP

The preparation of this map was requested by TFM. The purpose was to meet the requirements of NH Alteration of Terrain.

5. SOIL IDENTIFICATION LEGEND

SSSS SYM.	SSSS MAP NAME	HYDROLOGIC SOIL GRP.
41	Chatfield-Hollis-Rock Outcrop Complex	B
135	Chatfield Variant-Newfields Complex	C
538	Squamscott fine sandy loam	C
656	Ridgebury fine sandy loam	C

SLOPE PHASE:

0-8%	B	8-15%	C	15-25%	D
25%+	E				

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

6. SOIL MAP UNIT DESCRIPTIONS

41 – Chatfield-Hollis-Rock Outcrop Complex is located in bedrock-controlled landscapes. A soil complex is a mix of soil types that are too interwoven to be able to separate at the scale of the soil map. Chatfield is the largest component of the complex at 50%. Hollis is the next component at 30%. The last component is Rock Outcrop at 20%. Chatfield is a loamy glacial till soil that is 20 to 40 inches deep to bedrock. The Hollis has a depth of 10 to 20 inches to bedrock. Rock Outcrop is exposed ledge. The hydrologic group for Chatfield is B. The hydrologic group for Hollis is C/D. There is no hydrologic group for Rock Outcrop, as it is impervious surface. The hydrologic group for this complex was assigned as B, as that represents the largest component of the complex.

135 – Chatfield Variant-Newfields Complex is located in bedrock-controlled landscapes. This is a case where the state-wide soil legend is not adequate to classify the soil types that are intermixed in the soil complex. While Newfields is present in the soil complex map unit, it is not one of the major components. Woodbridge is more dominant than Newfields. Newfields is a moderately well drained loose glacial till soil that has a hydrologic group of B. Woodbridge is a moderately will drained soil on dense glacial till and has a hydrologic group of C. Numerous test pits were conducted on site. At the end of the investigations, 37 Woodbridge soils, 32 Chatfield soil, and 6 Newfields were recorded on the site. So, Woodbridge is the largest component of this soil complex. The Chatfield Variant is a moderately well drained soil that is 20 to 40 inches deep. In this case, there were Chatfield Variant soils that had a dense till layer above the bedrock, which would make the hydrologic soil group for these pits more appropriately identified as C. Based upon the major component of this soil complex and based upon the Chatfield Variant soil profiles, this soil complex map unit was assigned a hydrologic group of C.

538 – Squamscott fine sandy loam is a poorly drained sand over marine silts soil that is commonly found along the Seacoast of New Hampshire. In this case, this soil represents the largest wetland on site. Inclusions would be Scitico silt loam and Ridgebury fine sandy loam.

656 – Ridgebury fine sandy loam is a poorly drained loamy soil that developed on dense glacial tills. These areas commonly have a perched water table. Inclusions would be Walpole fine sandy loam.

7. RESPONSIBLE SOIL SCIENTIST

James P. Gove, C.S.S. #004

8. OTHER DISTINGUISHING FEATURES OF SITE

This site has numerous rock outcrops at the higher elevations.

9. MAXIMUM SIZE OF LIMITING INCLUSIONS

15%

10. SPECIAL FEATURE SYMBOLS

None used.

STATE OF NEW HAMPSHIRE
JAMES
P.
GOVE 12/19/2019
No. 004
CERTIFIED SOIL SCIENTIST

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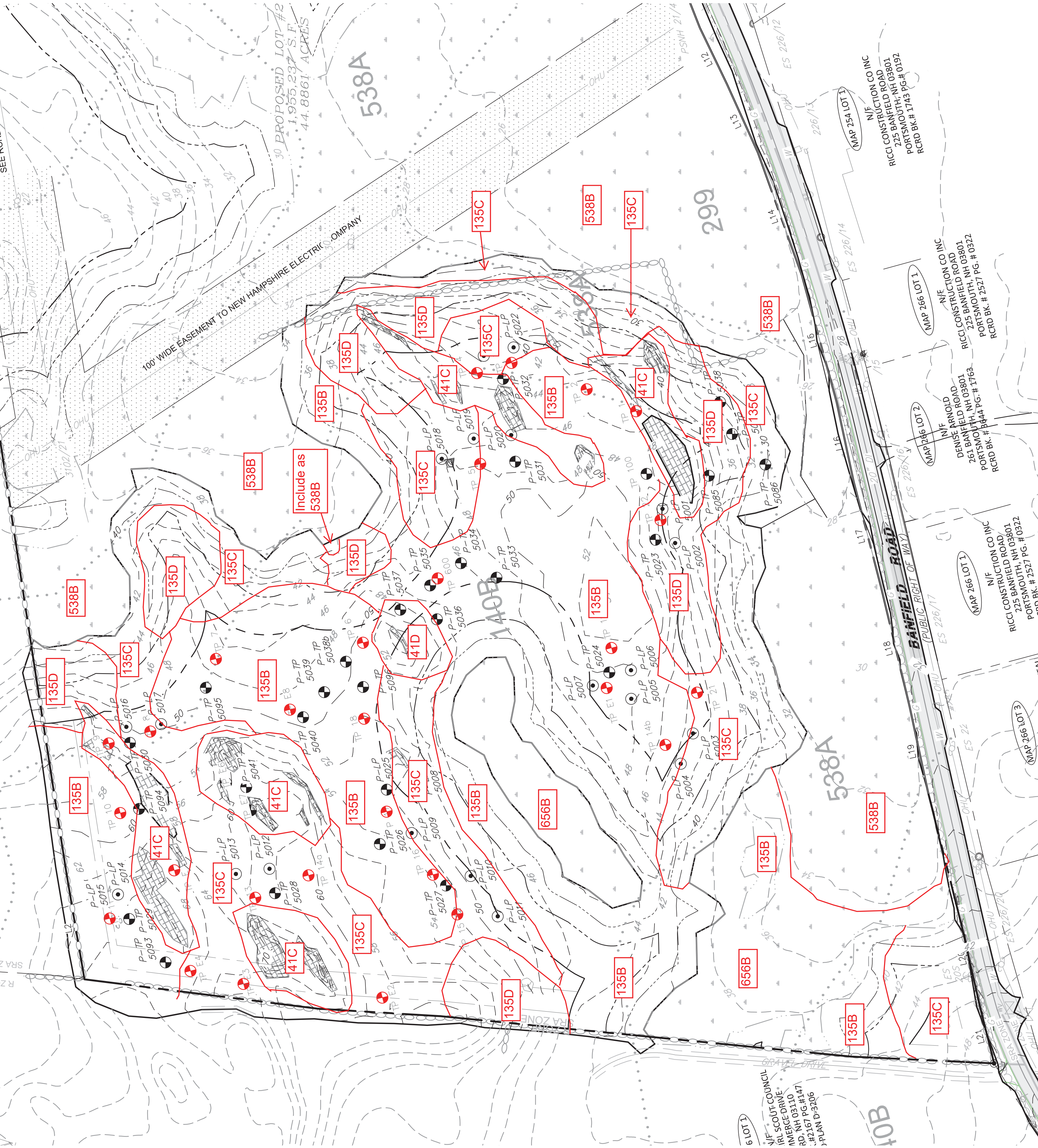
100' WIDE EASEMENT TO NEW HAMPSHIRE ELECTRIC COMPANY
PROPOSED LOT #2
538A
299
140B
656B
538B
135B
135C
135D
41C
41D
Include as 538B
BANFIELD ROAD
(PUBLIC RIGHT OF WAY)
MAP 254 LOT 1
N/F
RICCI CONSTRUCTION CO INC
225 BANFIELD ROAD
PORTSMOUTH, NH 03801
RCRD BK.# 1743 PG.# 0192
MAP 266 LOT 1
N/F
RICCI CONSTRUCTION CO INC
225 BANFIELD ROAD
PORTSMOUTH, NH 03801
RCRD BK. # 2527 PG. # 0322
MAP 266 LOT 2
N/F
DENISE ARNOLD
261 BANFIELD ROAD
PORTSMOUTH, NH 03801
RCRD BK. # 3944 PG. # 1763
GRAVEL DRIVE
SRA ZONE

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Test Pit Log
Banfield Rd, Portsmouth
Logged By: Brenden Walden & James Gove
Date: 8/29 & 8/30, 2019

Test Pit #1:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-30 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 30 INCHES REFUSAL: 30 INCHES OBSERVED WATER: N/A

Test Pit #2:
0-9 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
9-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 28 INCHES REFUSAL: 28 INCHES OBSERVED WATER: N/A

Test Pit #3:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-30 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
30-57 INCHES, 2.5Y 5/3, FINE SANDY LOAM, GRANULAR, FRIABLE, WITH 20% REDOX CONCENTRATIONS
ESHWT: 30 INCHES REFUSAL: 57 INCHES OBSERVED WATER: N/A

Test Pit #4:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-24 INCHES, 10YR 4/6, FINE SANDY LOAM GRANULAR, FRIABLE
ESHWT: 24 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #5:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-25 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
25-51 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX, CONCENTRATIONS
ESHWT: 25 INCHES REFUSAL: 51 INCHES OBSERVED WATER: N/A

Test Pit #6:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 20% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #7:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10- 41 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
41-64 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT:41 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #8:
0-7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-53 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 20% REDOX CONCENTRATIONS
ESHWT:28 INCHES REFUSAL: 53 INCHES OBSERVED WATER: N/A

Test Pit #10:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-36 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
36-68 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FRIABLE, WITH 20% REDOX CONCENTRATIONS
ESHWT: 36 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #11:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-64 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCETRATIONS
ESHWT:28 INCHES REFUSAL: 64 INCHES OBSERVED WATER: N/A

Test Pit #13:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32-61 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 61 INCHES OBSERVED WATER: N/A

Test Pit #14A:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-23 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
23-44 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 20% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #14B:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32-57 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10 % REDOX CONCENTRATIONS
ESHWT: 32 INCHES REFUSAL: 57 INCHES OBSERVED WATER: N/A

Test Pit #15:
0-14 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
14-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 40% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 60 INCHES OBSERVED WATER: N/A

Test pit #16:
0-5 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
5-24 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 24 INCHES REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #17:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-34 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
34-60 INCHES, 2.5Y 5/3, FINE SANDY LOAM, MASSIVE, FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 34 INCHES REFUSAL: 60 INCHES OBSERVED WATER: N/A

Test Pit #18:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-22 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
22-50 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 22 INCHES REFUSAL: 50 INCHES OBSERVED WATER: N/A

Test Pit #19:
0-7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7-24 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 24 INCHES REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #21:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-21 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
21-48 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 21 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #22:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-20 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
20-58 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 20 INCHES REFUSAL: 58 INCHES OBSERVED WATER: N/A

Test Pit #E1:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-22 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
22-51 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, 20% REDOX CONCENTRATIONS
ESHWT: 22 INCHES REFUSAL: 51 INCHES OBSERVED WATER: N/A

Test Pit #E2:
0-5 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
5-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: 28 INCHES REFUSAL: 28 INCHES OBSERVED WATER: N/A

Test Pit #E3:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-32 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
32-74 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT:32 INCHES REFUSAL: 74 INCHES OBSERVED WATER: N/A

Test Pit #E4:
0-9 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
9-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-50 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 50 INCHES OBSERVED WATER: N/A

Test Pit #E8:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-27 INCHES, 2.5Y 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
27-62 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT:27 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #100:
0-10 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
10-28 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
28-54 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 28 INCHES REFUSAL: 54 INCHES OBSERVED WATER: N/A

Test Pit #600:
0-8 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
8-21 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
21-47 INCHES, 2.5Y 5/3, FINE SANDY LOAM, PLATY, FIRM, WITH 10% REDOX CONCENTRATIONS
47-60 INCHES, 2.5Y 5/2, SILT LOAM, MASSIVE, FIRM, WITH 305 REDOX CONCENTRATIONS
ESHWT: 21 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit Log
Banfield Rd
Date:
Logged By: Brenden Walden, Luke Hurley & Mike Coumo

Test Pit #5027:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-20 INCHES, 10YR 5/5, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 20 INCHES OBSERVED WATER: N/A

Test Pit #5026:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-22 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 22 INCHES OBSERVED WATER: N/A

Test Pit #5028:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
4-36 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

Test Pit #5093:
0-4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4-12 INCHES, 10YR 4/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
12-22 INCHES, 10YR 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
22-36 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

Test Pit # 5029:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-8 INCHES, 10YR 4/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
8-24 INCHES, 10YR 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24-40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
40-44 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 40 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #5094:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-12 INCHES, 2.5Y 5/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
12-32 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
32-54 INCHES, 2.5Y 5/4, FINE SANDY LOAM, PLATY, FIRM, WITH 20% REDOX CONCENTRATIONS

ESHWT: 32 INCHES REFUSAL: 54 INCHES OBSERVED WATER: N/A

Test Pit #5038:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-8 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
8-30 INCHES, 2.5Y 7/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
30-40 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 30 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #5095:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-12 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12-32 INCHES, 2.5Y 7/4, FINE SANDY LOAM, MASSIVE, FIRMWITH 10% REDOX CONCETRATIONS
ESHWT: 12 INCHES REFUSAL: 32 INCHES OBSERVED WATER: N/A

Test Pit #5040/62
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-30 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
30-38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM
ESHWT: N/A REFUSAL: 38 INCHES OBSERVED WATER: N/A

Test Pit #5041/63:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIBALE
3-20 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIBALE
ESHWT: N/A REFUSAL: 20 INCHES OBSERVED WATER: N/A

Test Pit #5039/61:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-24 INCHES, 2.5Y 4/6, FINE SANDY LOAM, GRANULAR, FRIBALE
ESHWT: N/A REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #5096:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-16 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
16-34 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 34 INCHES OBSERVED WATER: N/A

Test Pit #5038B:
0-2 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
2-14 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
14-24 INCHES, 2.5Y 6/4, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24-29 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM
29-40 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS

ESHWT: 29 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #5037/59:
0-4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4-15 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
15-34 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
34-40 INCHES, 2.5Y 6/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 34 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #5036/57:
0-2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2-12 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12-26 INCHES, 2.5Y 5/3, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
26-34 INCHES, 2.5Y 5/5, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 26 INCHES REFUSAL: 34 INCHES OBSERVED WATER: N/A

Test Pit #5035/58:
0-3 INCHES, 10YR 2/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-23 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
23-55 INCHES, 2.5Y 5/2, FINE SANDY LOAM, MASSIVE, FIRM, WITH 25% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #5034/56:
0-4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4-20 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
20-36 INCHES, 2.5Y 5/4, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 20 INCHES REFUSAL: 36 INCHES OBSERVED WATER: N/A

Test Pit #5033:
0-2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2-15 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
15-23 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
23-52 INCHES, 2.5Y 4/3, FINE SANDY LOAM, MASSIVE, FIRM, WITH 30% REDOX CONCENTRATIONS
ESHWT: 23 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #5031:
0-5 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
5-12 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
12-24 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
24-40 INCHES, 2.5Y 6/4, FINE SANDY LOAM, MASSIVE, FIRM, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 40 INCHES OBSERVED WATER: N/A

Test Pit #5032:

0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-6 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
6-14 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
14-36 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 36 INCHES OBSERVED WATER: N/A

Test Pit #5084/52:
0-6 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
6-24 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE
24-38 INCHES, 2.5Y 5/6, GRAVELY FINE SANDY LOAM, GRANULAR, FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: 38 INCHES OBSERVED WATER: N/A

Test Pit #5038/51:
0-4 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
4-14 INCHES, 10YR 4/6, FINE SANDY LOAM, GRANULAR, FRIABLE
14-24 INCHES, 6/4, GRAVELY FINE SANDY LOAM, MASSIVE, FIRM
24-60 INCHES, 2.5Y 5/2, SILT LOAM, BLOCKY, FIRM, WITH 25% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #5086/53:
0-6 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
6-24 INCHES, 2.5Y 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
24-68 INCHES, 2.5Y 5/2, FINE SANDY LOAM, MASSIVE, FIRM, WITH 50% REDOX CONCENTRATIONS
ESHWT: 24 INCHES REFUSAL: N/A OBSERVED WATER: N/A

Test Pit #5085/54:
0-4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4-24 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 24 INCHES OBSERVED WATER: N/A

Test Pit #5023:
0-2 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
2-24 INCHES, 10YR 5/6, FINE SANDY LOAM, GRANULAR, FRIABLE
24-36 INCHES, 2.5Y 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
36-44 INCHES, 2.5Y 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE, WITH 10% REDOX CONCENTRATIONS
ESHWT: 36 INCHES REFUSAL: 44 INCHES OBSERVED WATER: N/A

Test Pit #5024:
0-4 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
4-18 INCHES, 2.5Y 6/4, FINE SANDY LOAM, GRANULAR, FRIABLE
18-32 INCHES, 2.5Y 5/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 32 INCHES OBSERVED WATER: N/A

Test Pit #5025:
0-3 INCHES, 10YR 3/2, FINE SANDY LOAM, GRANULAR, FRIABLE
3-7 INCHES, 10YR 3/3, FINE SANDY LOAM, GRANULAR, FRIABLE
7-32 INCHES, 10YR 4/4, FINE SANDY LOAM, GRANULAR, FRIABLE
ESHWT: N/A REFUSAL: 32 INCHES OBSERVED WATER: N/A

Number	**ESHWT**	**REFUSAL**	**DEPTH**
LEDGE PROBES			
5001	N/A	47	47
5002	N/A	N/A	52
5003	N/A	32	32
5004	N/A	36	36
5005	N/A	32	32
5006	N/A	36	36
5007	N/A	36	36
5008	N/A	24	24
5009	N/A	30	30
5010	N/A	34	34
5011	N/A	22	22
5012	N/A	42	42
5013	N/A	24	24
5014	N/A	30	30
5015	N/A	24	24
5016	N/A	32	32
5017	N/A	48	48
5018	N/A	N/A	46
5019	N/A	32	32
5020	N/A	46	46
5021	N/A	N/A	41
5022	N/A	N/A	66

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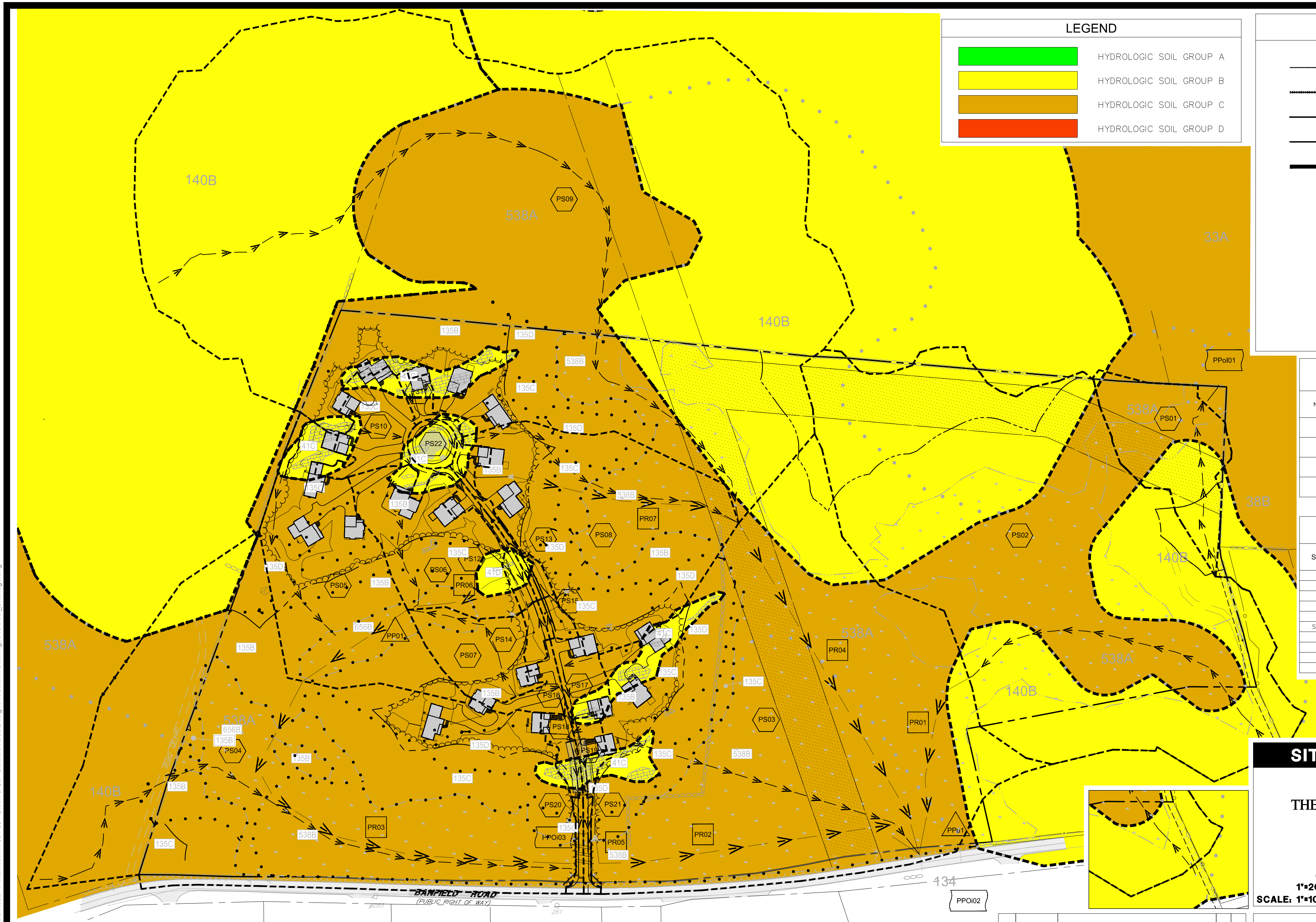

LEGEND

HYDROLOGIC SOIL GROUP A
HYDROLOGIC SOIL GROUP B
HYDROLOGIC SOIL GROUP C
HYDROLOGIC SOIL GROUP D

LEGEND

FLOW PATH (Tc LINE)
REACH
SOIL GROUP BREAK LINE
EXISTING LOT LINE
LIMITS OF SUBCATCHMENT
PS4 PROPOSED SUBCATCHMENT NODE
PR1 PROPOSED REACH
PC1 PROPOSED POND AREA AND CULVERT NODE
PPOi3 POINT OF INTEREST

SOIL LEGEND PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% – 8% SLOPES	C/D
140B	CHATFIELD–HOLLIS–CANTON COMPLEX, 0% – 8%	B
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, 8% – 15%	B
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5%	C/D

SOIL LEGEND PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0–8%	B	
8–15%	C	
15–25%	D	
25%+	E	

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

HYDROLOGIC SOIL GROUPS

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=200' (11"X17")

SCALE: 1"=100' (22"X34") **SEPTEMBER 25, 2019**

HORIZONTAL SCALE 1"=100'
100 50 0 100

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		CK	JJM	CADFILE	PRE-POST_DRAINAGE	

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APPENDIX K
NHDES ONE STOP DATA MAPPER

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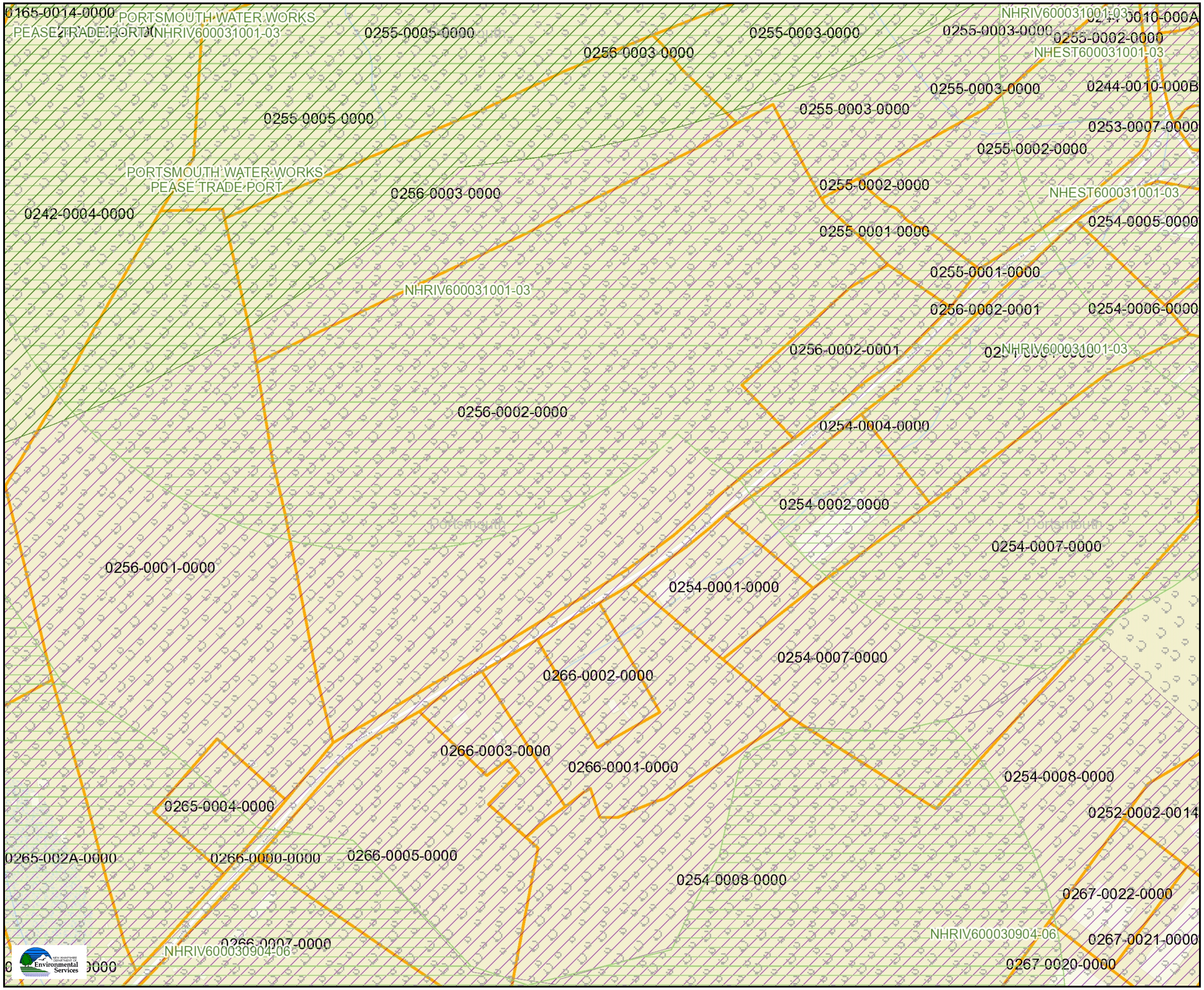
Banfield Road - Portsmouth, NH



Legend

- Coastal and Great Bay Regi Communities
- Designated Rivers Quarterm Buffer
- Public Water Supply Wells
- Groundwater Classification / GA1
- Groundwater Classification / GA2
- Water Supply Intake Protect Areas
- Wellhead Protection Areas
- Lakes with a Quarter Mile Bu
- All Features
- All Lakes, with a Quarter Mil Buffer
- Outstanding Resource Wate Watersheds
- Surface Waters with Impairn 2016 with Quarter Mile Buffe
- Watersheds with Chloride Impairments 2016
- Parcels - polygons

Map Scale

1: 5,000

Map Generated: 10/3/2019

Notes

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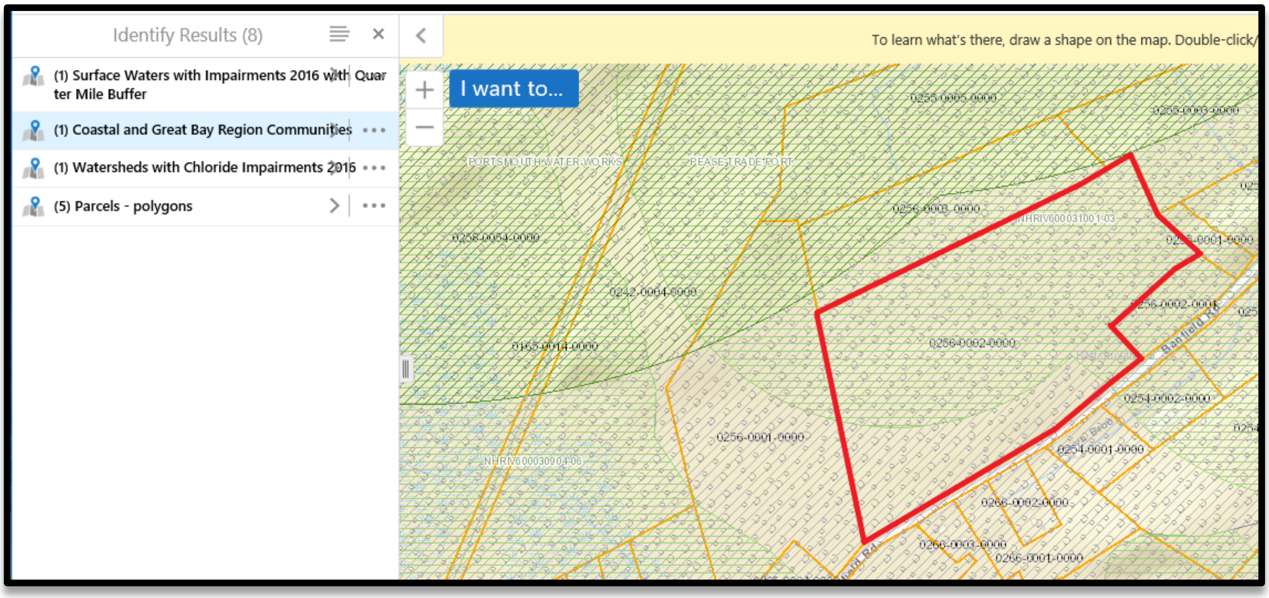

Description

Assessment Unit ID (AUID): NHRIV600031001-03
Assessment Unit Name: SAGAMORE CREEK

Beach (Y/N?): N

Impairments related to stormwater: Chloride, Escherichia coli

Metadata

Details

- AUID

  NHRIV600031001-03 NHRIV600031001-03 N/A

- FID

  387 387 N/A

- Waterbodyi

  NHRIV600031001-03 NHRIV600031001-03 N/A

- Waterbodyn

  SAGAMORE CREEK SAGAMORE CREEK N/A

- Impairment

  Chloride, Escherichia coli

Details

- FID

  8 8 N/A

- OBJECTID_1

  3282 3282 N/A

- AUID

  NHRIV600031001-03 NHRIV600031001-03 N/A

- Shape_Leng

  17891.5112 17891.5112 N/A

- QAQC

  Good Good N/A

- Method

  10m DEM, 24k NHHD Burned and Catchment Walled 10m DEM, 24k NHHD Burned and Catchment Walled N/A

- Mod_Date

  Apr 8, 2013 8:00 PM Apr 8, 2013 8:00 PM N/A

- CYCLE

  2014 2014 N/A

- USE_ID

  952 952 N/A

- IMPAIRMENT

  138 138 N/A

- IMPAIRMEN2

  Chloride Chloride N/A

- DESCATEGOR

  5-M

APPENDIX L

CURVE NUMBER MAP

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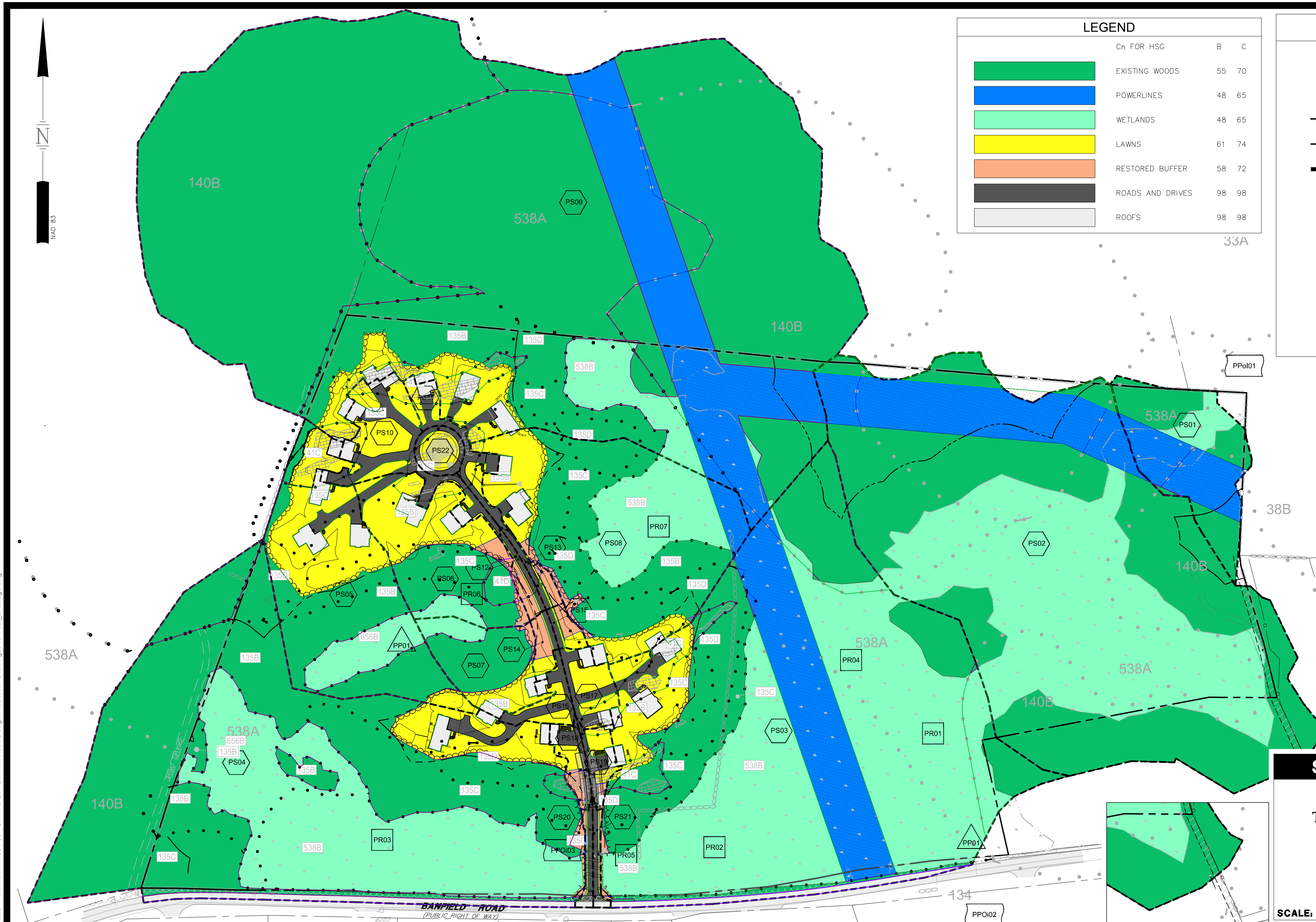

LEGEND

	Cn FOR HSG	B	C
	EXISTING WOODS	55	70
	POWERLINES	48	65
	WETLANDS	48	65
	LAWNS	61	74
	RESTORED BUFFER	58	72
	ROADS AND DRIVES	98	98
	ROOFS	98	98

LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% – 8% SLOPES	C/D
140B	CHATFIELD–HOLLIS–CANTON COMPLEX, 0% – 8%	B
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, 8% – 15%	B
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5%	C/D

SOIL LEGEND PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0–8%	B	
8–15%	C	
15–25%	D	
25%+	E	

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

CURVE NUMBER PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

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1"=200' (11"X17")

SCALE: 1"=100' (22"X34") **SEPTEMBER 25, 2019**

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		CK	JJM	CADFILE	PRE-POST_DRAINAGE	

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APPENDIX M

PRE AND POST DRAINAGE PLANS

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LEGEND

FLOW PATH (Tc LINE)

REACH

SOIL GROUP BREAK LINE

EXISTING LOT LINE

LIMITS OF SUBCATCHMENT

ES4 — EXISTING SUBCATCHMENT NODE

ER1 — EXISTING REACH

EC1 — EXISTING POND AREA AND CULVERT NODE

EPOi3 — POINT OF INTEREST

SOIL LEGEND PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% – 8% SLOPES	C/D
140B	CHATFIELD–HOLLIS–CANTON COMPLEX, 0% – 8%	B
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, 8% – 15%	B
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5%	C/D

SOIL LEGEND PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0–8%	B	
8–15%	C	
15–25%	D	
25%+	E	

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

PRE-DRAINAGE PLAN OVERALL

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

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1"=200' (11"X17")

SCALE: 1"=100' (22"X34") **SEPTEMBER 25, 2019**

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		CK	JJM	CADFILE	PRE-POST_DRAINAGE	

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LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
PS4	PROPOSED SUBCATCHMENT NODE
PR1	PROPOSED REACH
PC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% – 8% SLOPES	C/D
140B	CHATFIELD–HOLLIS–CANTON COMPLEX, 0% – 8%	B
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, 8% – 15%	B
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5%	C/D

SOIL LEGEND PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0–8%	B	
8–15%	C	
15–25%	D	
25%+	E	

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

POST-DRAINAGE PLAN OVERALL

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

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GREEN & COMPANY REAL ESTATE

1"=200' (11"X17")

SCALE: 1"=100' (22"X34") **SEPTEMBER 25, 2019**

HORIZONTAL SCALE 1"=100'

100 50 0 100

TFM

Civil Engineers
Structural Engineers
Traffic Engineers
Land Surveyors
Landscape Architects
Scientists

48 Constitution Drive
Bedford, NH 03110
Phone (603) 472-4488
Fax (603) 472-9747
www.tfmoran.com

FILE	47361.00	DR	RCK	FB	–	D-02
		CK	JJM	CADFILE	PRE-POST_DRAINAGE	

Mar 05, 2020 - 10:56am
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\Pre-Post_Drainage.dwg

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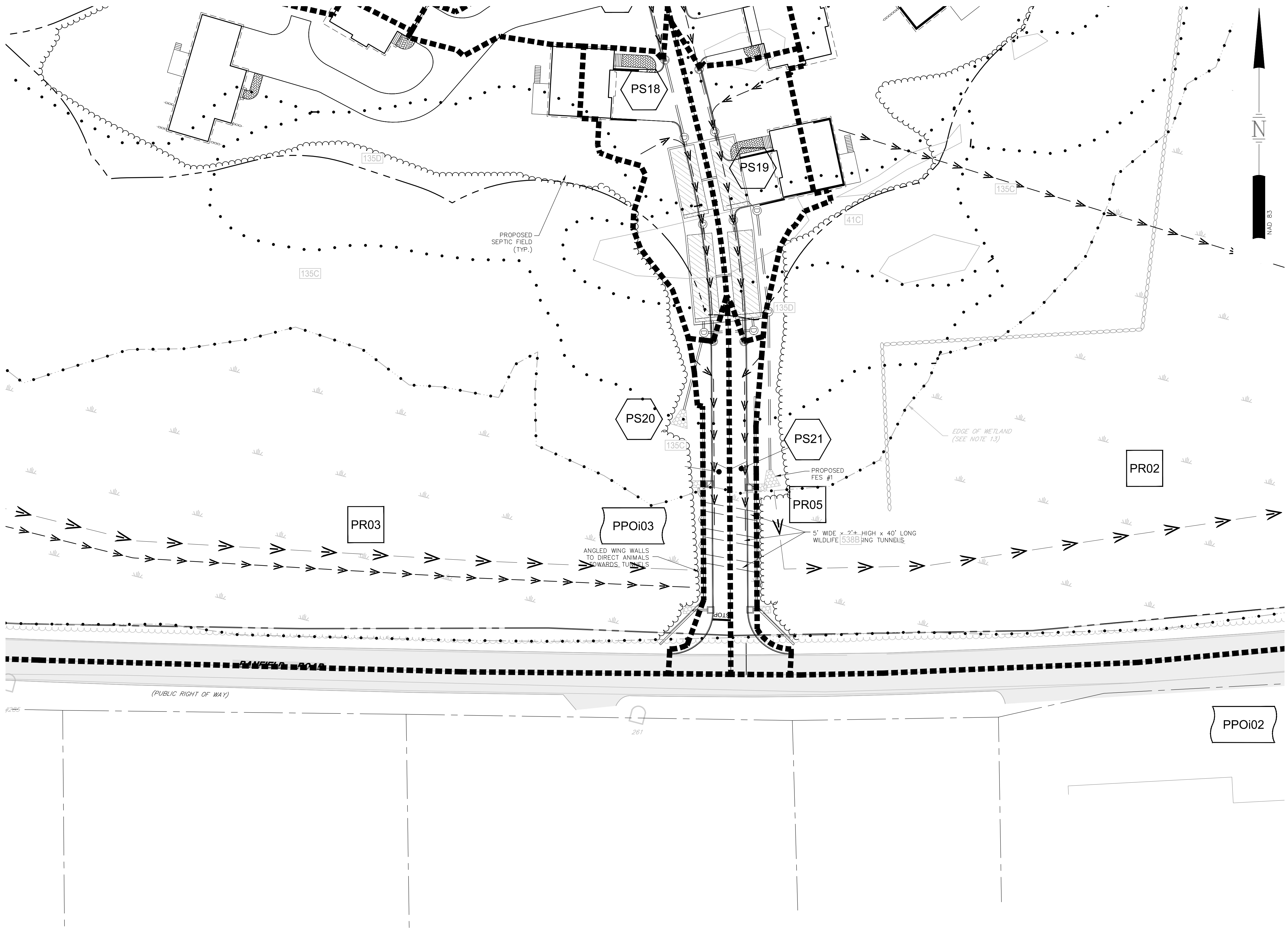

LEGEND

	FLOW PATH (Tc LINE)
	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
	LIMITS OF SUBCATCHMENT
ES4	PROPOSED SUBCATCHMENT NODE
ER1	PROPOSED REACH
EC1	PROPOSED POND AREA AND CULVERT NODE
PPOi3	POINT OF INTEREST

SOIL LEGEND
PER USDA NRCS WEB SOIL SURVEY

NRCS SYMBOL	NRCS DESCRIPTION	HYDROLOGIC SOIL GROUP
38B	ELDRIDGE FINE SANDY LOAM, 3% – 8% SLOPES	C/D
140B	CHATFIELD–HOLLIS–CANTON COMPLEX, 0% – 8%	B
140C	CHATFIELD–HOLLIS–CANTON COMPLEX, 8% – 15%	B
538A	SQUAMSCOTT FINE SANDY LOAM, 0% – 5%	C/D

SOIL LEGEND
PER SITE SPECIFIC SOIL SURVEY (SSS):

SSS SYMBOL	SSS MAP NAME	HYDROLOGIC SOIL GROUP
41	CHATFIELD–HOLLIS–ROCK OUTCROP COMPLEX	B
135	CHATFIELD VARIANT–NEWFIELDS COMPLEX	C
538	SQUAMSCOTT FINE SANDY LOAM	C
656	RIDGEBURY FINE SANDY LOAM	C
SLOPE PHASE:		
0–8%	B	
8–15%	C	
15–25%	D	
25%+	E	

SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

POST DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

PREPARED FOR

GREEN & COMPANY REAL ESTATE

1"=60' (11"X17")
SCALE: 1"=30' (22"X34") **SEPTEMBER 25, 2019**

1	12/23/19	REVISED PER REGULATORY COMMENTS	RCK	JJM

HORIZONTAL SCALE 1"=30'
30 15 0 30

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FILE	DR	RCK	FB	–	
47361.00	CK	JJM	CADFILE	PRE–POST_DRAINAGE	D–03

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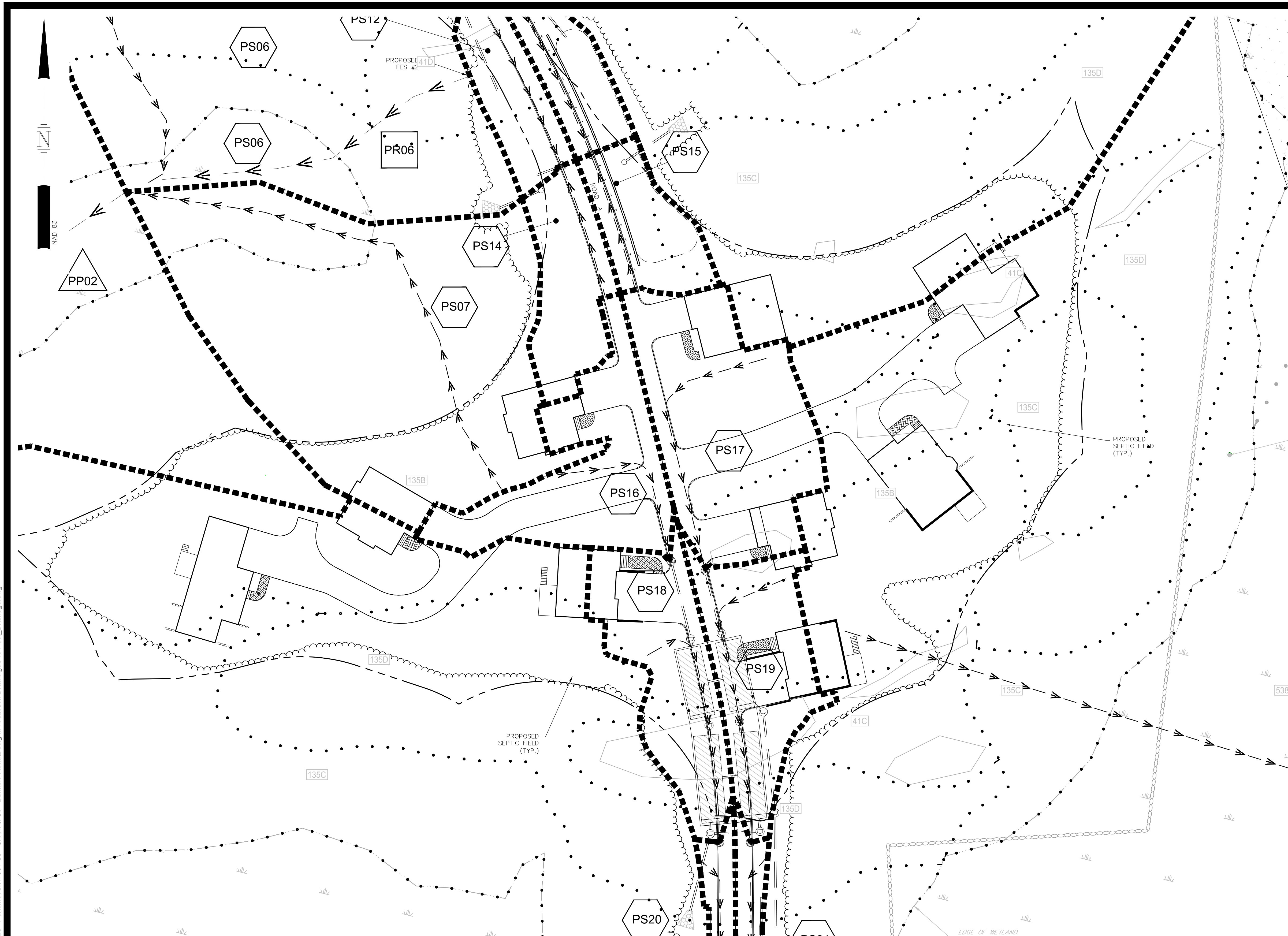

LEGEND

- FLOW PATH (Tc LINE)
- REACH
- SOIL GROUP BREAK LINE
- EXISTING LOT LINE
- LIMITS OF SUBCATCHMENT
- PS4 — PROPOSED SUBCATCHMENT NODE
- PR1 — PROPOSED REACH
- PC1 — PROPOSED POND AREA AND CULVERT NODE
- PPOi3 — POINT OF INTEREST

SOIL LEGEND PER USDA NRCS WEB SOIL SURVEY

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8–15%	C	
15–25%	D	
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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

POST DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

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HORIZONTAL SCALE 1"=30'

30 15 0 30

1	12/23/19	REVISED PER REGULATORY COMMENTS	RCK	JJM

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FILE	DR	RCK	FB	–	
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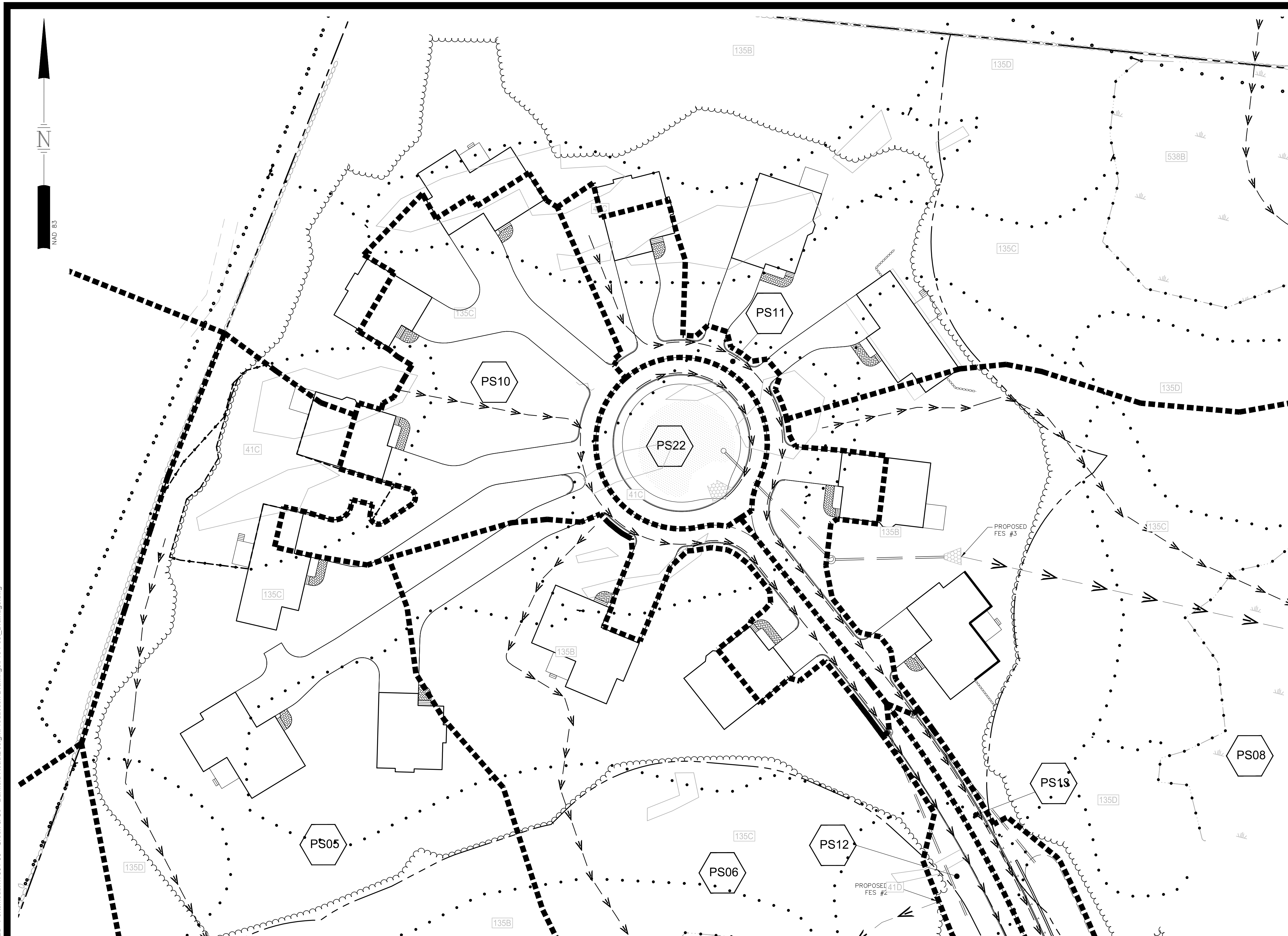

LEGEND

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	REACH
	SOIL GROUP BREAK LINE
	EXISTING LOT LINE
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SITE DEVELOPMENT PLANS

TAX MAP 256 LOT 2

POST DRAINAGE PLAN

THE VILLAGE AT BANFIELD WOODS

PORTSMOUTH, NH

OWNED BY

WALTER D HETT TRUST

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FILE	DR	RCK	FB	–	
47361.00	CK	JJM	CADFILE	PRE-POST_DRAINAGE	D-05

DIG SAFE
CONTACT DIG SAFE 72 BUSINESS HOURS PRIOR TO CONSTRUCTION

Mar 05, 2020 - 10:57am
F:\MSC Projects\47361 - Banfield Road - Portsmouth\47361-00 - Green & Co - Banfield Road\Design\Production Drawings\Pre-Post_Drainage.dwg

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PROPOSED RESIDENTIAL DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, NEW HAMPSHIRE
PERMIT PLANS

OWNER:

BONZA BUILDERS, LLC.
79 EXETER ROAD
NORTH HAMPTON, N.H. 03862
TEL. (603) 770–5630

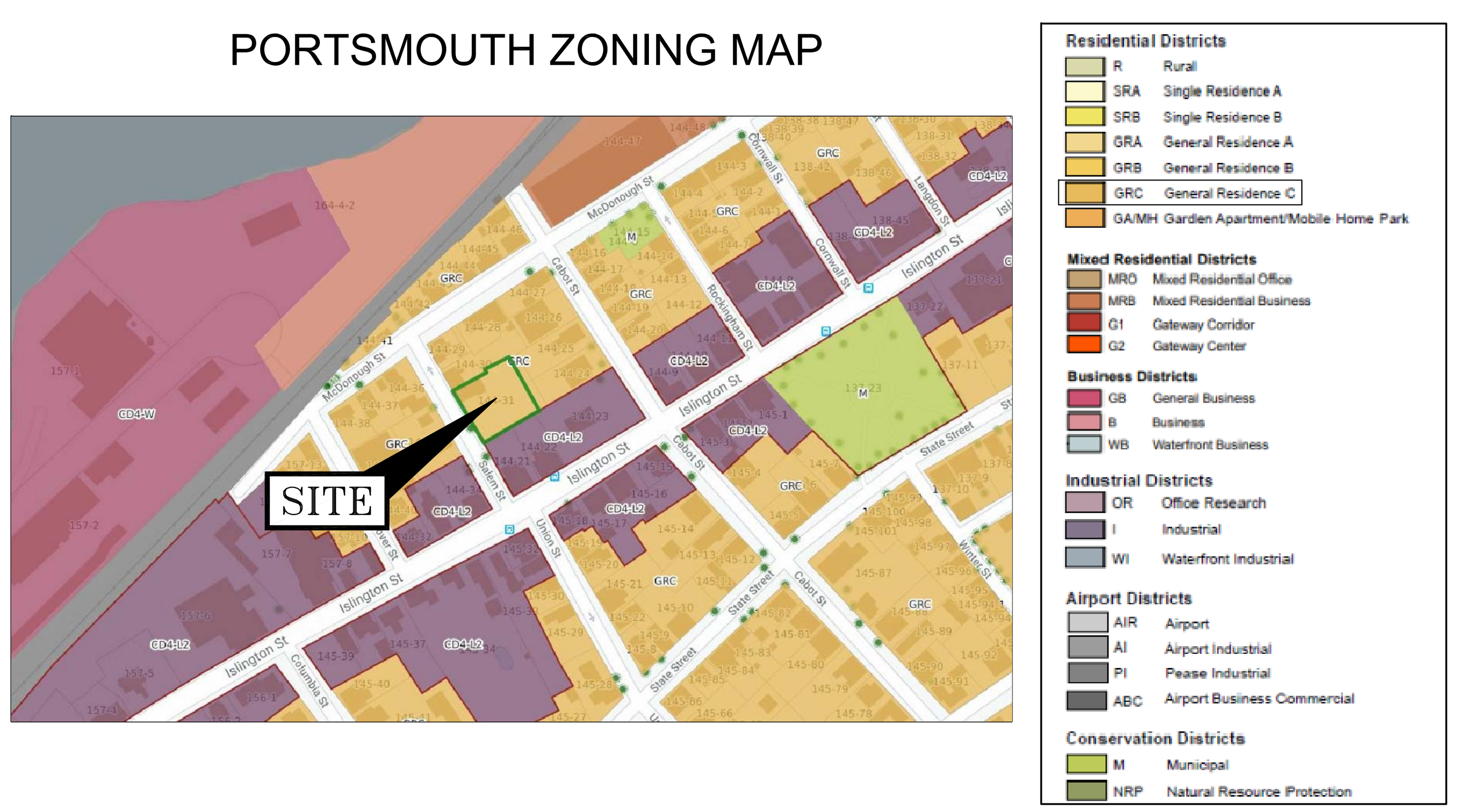
CIVIL ENGINEER & LAND SURVEYOR:

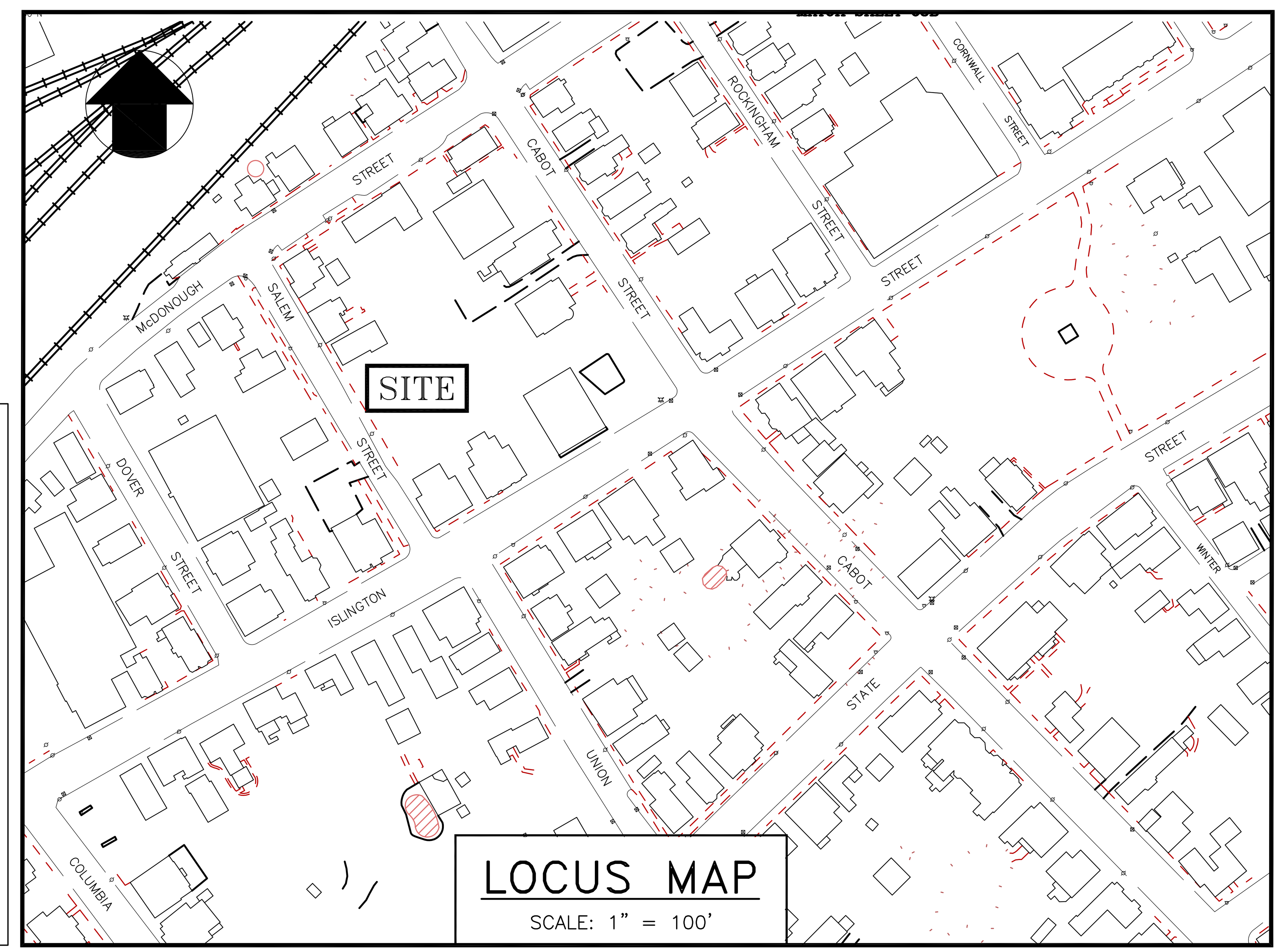
AMBIT ENGINEERING, INC.
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, N.H. 03801
TEL. (603) 430–9282
FAX (603) 436–2315

ARCHITECT:

ART FORM ARCHITECTURE
44 LAFAYETTE ROAD
NORTH HAMPTON, N.H. 03862
TEL. (603) 431–9559

PORTSMOUTH ZONING MAP





DIG SAFE
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1–888–344–7233
CALL TOLL FREE

LEGEND:

EXISTING	PROPOSED	
		PROPERTY LINE
		SETBACK
S	S	SEWER PIPE
SL	SL	SEWER LATERAL
G	G	GAS LINE
D	D	STORM DRAIN
W	W	WATER LINE
WS	WS	WATER SERVICE
UGE	UGE	UNDERGROUND ELECTRIC
OHW	OHW	OVERHEAD ELECTRIC/WIRES
	UD	FOUNDATION DRAIN
		EDGE OF PAVEMENT (EP)
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		UTILITY POLE
		WALL MOUNTED EXTERIOR LIGHTS
		TRANSFORMER ON CONCRETE PAD
		ELECTRIC HANDHOLD
WSO GSO	WSO GSO	SHUT OFFS (WATER/GAS)
	GV	GATE VALVE
	HYD	HYDRANT
CB	CB	CATCH BASIN
S	SMH	SEWER MANHOLE
D	DMH	DRAIN MANHOLE
T	TMH	TELEPHONE MANHOLE
14	14	PARKING SPACE COUNT
PM		PARKING METER
LSA		LANDSCAPED AREA
TBD	TBD	TO BE DETERMINED
CI	CI	CAST IRON PIPE
COP	COP	COPPER PIPE
DI	DI	DUCTILE IRON PIPE
PVC	PVC	POLYVINYL CHLORIDE PIPE
RCP	RCP	REINFORCED CONCRETE PIPE
AC	–	ASBESTOS CEMENT PIPE
VC	VC	VITRIFIED CLAY PIPE
EP	EP	EDGE OF PAVEMENT
EL.	EL.	ELEVATION
FF	FF	FINISHED FLOOR
INV	INV	INVERT
S =	S =	SLOPE FT/FT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL
W.W.	W.W	WINDOW WELL

INDEX OF SHEETS

UTILITY CONTACTS

ELECTRIC:
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 436–7708, Ext. 555.5678
ATTN: MICHAEL BUSBY, P.E. (MANAGER)

NATURAL GAS:
UNITIL
325 WEST ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 294–5144
ATTN: DAVE BEAULIEU

CABLE:
COMCAST
155 COMMERCE WAY
PORTSMOUTH, N.H. 03801
Tel. (603) 679–5695 (X1037)
ATTN: MIKE COLLINS

SEWER & WATER:
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 427–1530
ATTN: JIM TOW

COMMUNICATIONS:
CONSOLIDATED COMMUNICATIONS
JOE CONSIDINE
1575 GREENLAND ROAD
GREENLAND, N.H. 03840
Tel. (603) 427–5525

PORTSMOUTH APPROVAL CONDITIONS NOTE:
ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

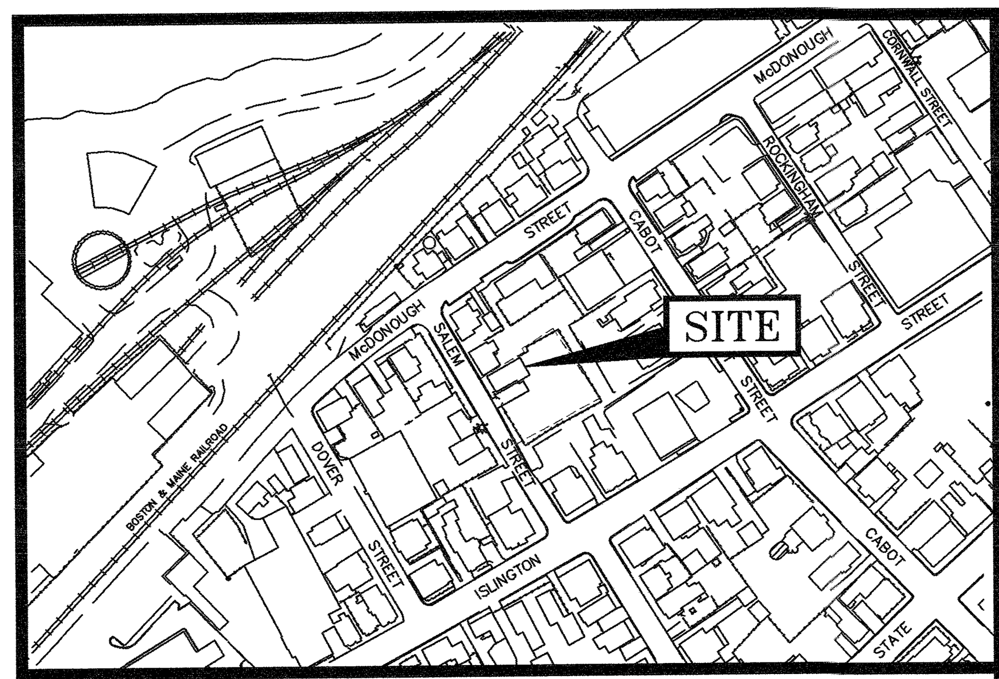
CHAIRMAN DATE

PROPOSED RESIDENTIAL DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

PLAN SET SUBMITTAL DATE: 18 MARCH 2020

3082.01



LOCATION MAP SCALE 1"=200'

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
RR SPK	RAILROAD SPIKE
11/21	MAP 11/LOT 21
IR FND	IRON ROD FOUND
IP FND	IRON PIPE FOUND
IR SET	IRON ROD SET
DH FND	DRILL HOLE FOUND
DH SET	DRILL HOLE SET
NHHB	NHDOT BOUND FOUND
TB	TOWN BOUND
BND w/DH	BOUND WITH DRILL HOLE
ST BND w/DH	STONE BOUND WITH DRILL HOLE
LSA	LANDSCAPED AREA

PLAN REFERENCES:

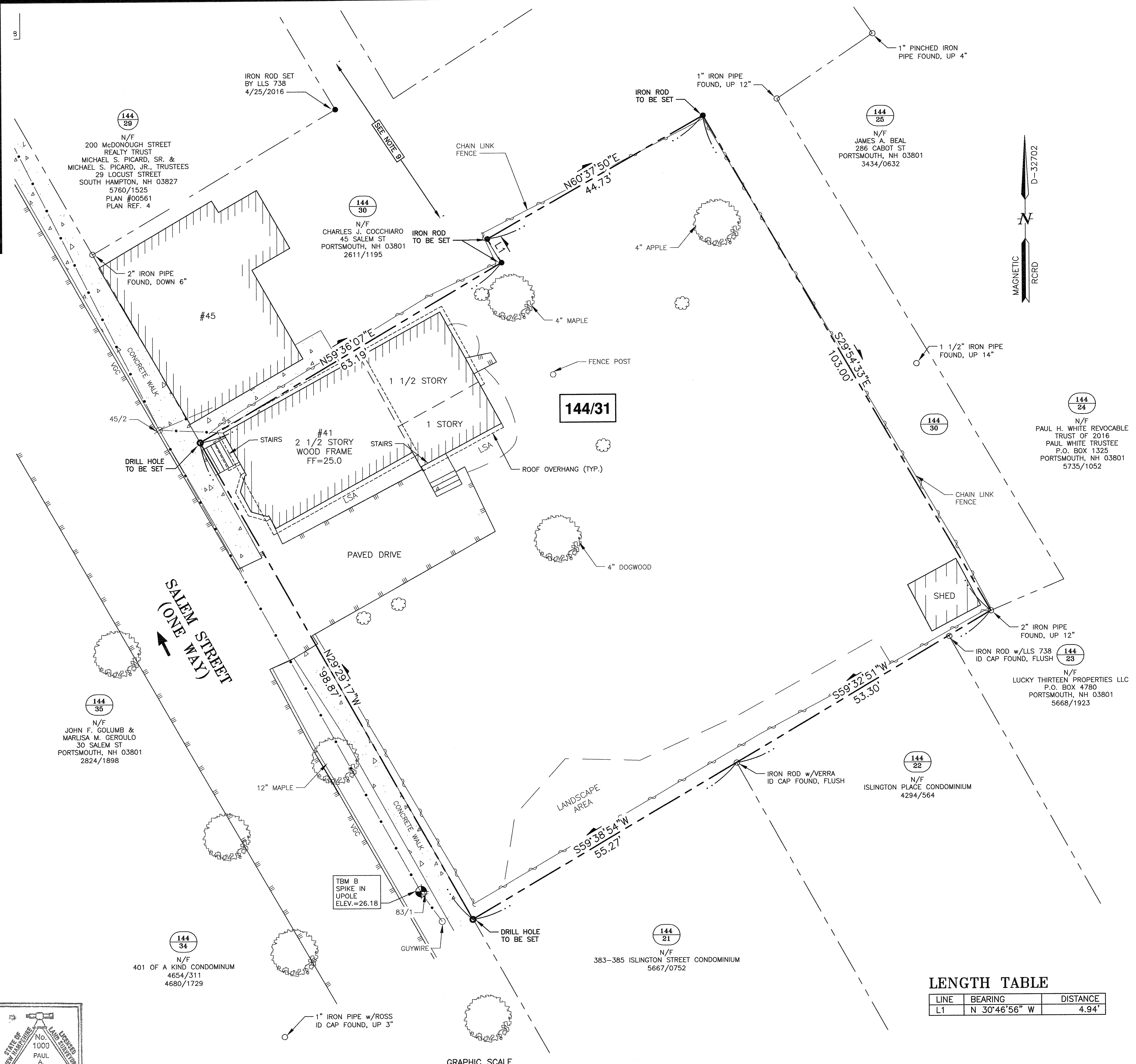
1) PLAN OF TRACT OF LAND IN THE TOWN OF PORTSMOUTH; BELONGING TO A.W. HAVEN G.W. HAVEN & BENJ. CHEEVER ESQ.S AS LAID OUT INTO HOUSE LOTS. PREPARED BY BENJAMIN AKERMAN. DATED JULY 1846. R.C.R.D. PLAN #00561.

2) PLAN OF LAND CONVEYED TO ALFRED W. HAVEN AND GEORGE W. HAVEN BY SAMUEL HALE JUNE 1, 1846. R.C.R.D. 323/81.

3) AMENDED CONDOMINIUM SITE PLAN 383–385 ISLINGTON STREET CONDOMINIUM TAX SHEET & LOT 141–021–000 PORTSMOUTH, NH OWNER: GREENWAY MANAGEMENT NORTH, LLC. PREPARED BY JAMES VERRA AND ASSOCIATES, INC. DATED NOVEMBER 30, 2005. R.C.R.D. PLAN D–33370.

4) VARIANCE APPLICATION PLAN 200 MCDONOUGH STREET PORTSMOUTH, N.H. PREPARED BY AMBIT ENGINEERING, INC. DATED APRIL 2016, FINAL REVISION DATE JUNE 1, 2016. NOT RECORDED.

5) LOT 45 SALEM ST. PORTSMOUTH, N.H. PREPARED BY JOHN W. DURGIN. DATED DECEMBER 1938. R.C.R.D. PLAN #0889.



LENGTH TABLE

LINE	BEARING	DISTANCE
L1	N 30°46'56" W	4.94'

GRAPHIC SCALE

10 5 0 10 20 30 40 FEET
3 0 5 10 METERS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

I CERTIFY THAT THIS SURVEY PLAT IS NOT A SUBDIVISION PURSUANT TO THIS TITLE AND THAT THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED AND THAT NO NEW WAYS ARE SHOWN.

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 1000 PAUL A. DOBBERSTEIN SIGNATURE

PAUL A. DOBBERSTEIN, LLS #1000

3/18/2020
DATE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 144 AS LOT 31.

2) OWNER OF RECORD:
BONZA BUILDERS, LLC
79 EXETER ROAD
NORTH HAMPTON, NH 03862
6056/205
R.C.R.D. PLAN #0889

3) PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259E. EFFECTIVE DATE MAY 17, 2005.

4) EXISTING LOT AREA:
10,903 S.F.
0.2503 ACRES

5) PARCEL IS LOCATED IN THE GENERAL RESIDENCE C (GRC) ZONING DISTRICT.

6) DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:		3,500 S.F.
FRONTAGE:		70 FEET
DEPTH:	50 FEET	
SETBACKS:	FRONT	5 FEET
	SIDE	10 FEET
	REAR	20 FEET
MAXIMUM STRUCTURE HEIGHT:		35 FEET
MAXIMUM BUILDING COVERAGE:		35%
MINIMUM OPEN SPACE:		20%

7) THE PURPOSE OF THIS PLAN IS TO SHOW THE RESULT OF A STANDARD BOUNDARY SURVEY OF TAX MAP 144 LOT 31 IN THE CITY OF PORTSMOUTH.

8) VERTICAL DATUM IS MEAN SEA LEVEL NAVD88. BASIS OF VERTICAL DATUM IS REDUNDANT RTN GPS OBSERVATIONS.

9) PARCEL BENEFITS FROM A RIGHT–OF–WAY OVER ASSESSOR'S MAP 144 LOT 30 FROM McDONOUGH STREET TO "THE GARAGES ON THE PREMISES HEREIN CONVEYED". SAID GARAGES ARE NO LONGER PRESENT ON THE SUBJECT PARCEL.

NO.	DESCRIPTION	DATE
1	ISSUED FOR TAC SUBMISSION	3/18/20
0	ISSUED FOR COMMENT	12/2/19

REVISIONS

STANDARD BOUNDARY SURVEY TAX MAP 144 – LOT 31

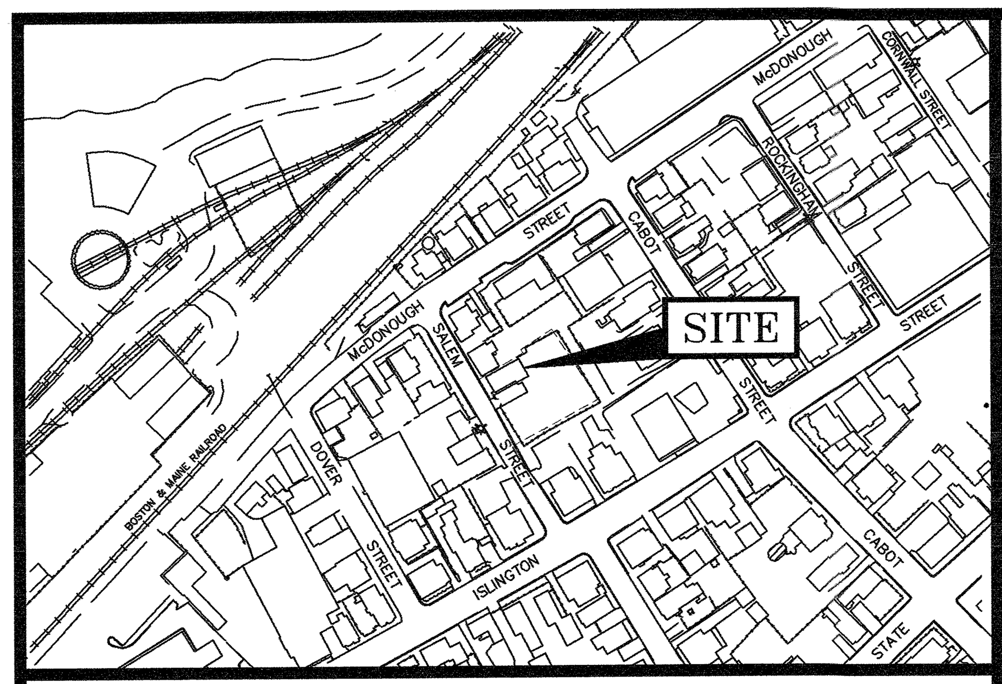
OWNER

BONZA BUILDERS, LLC

41 SALEM STREET
CITY OF PORTSMOUTH
COUNTY OF ROCKINGHAM
STATE OF NEW HAMPSHIRE

SCALE 1"=10' DECEMBER 2019

FB 330 PG 41 3082.01



LOCATION MAP SCALE 1"=200'

LEGEND:

N/F	NOW OR FORMERLY
RP	RECORD OF PROBATE
RCRD	ROCKINGHAM COUNTY REGISTRY OF DEEDS
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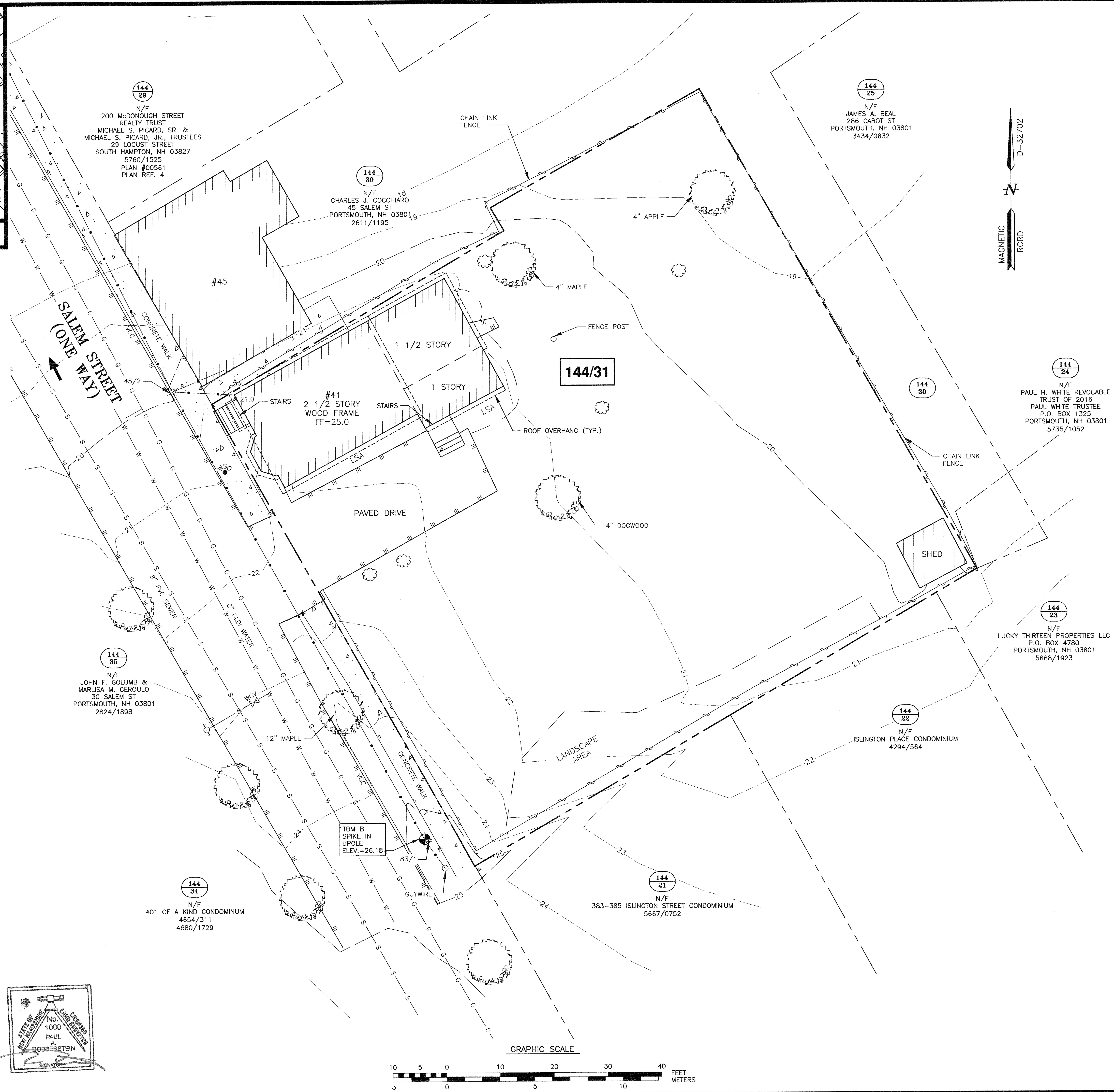
2) PLAN OF LAND CONVEYED TO ALFRED W. HAVEN AND GEORGE W. HAVEN BY SAMUEL HALE JUNE 1, 1846. R.C.R.D. 323/81.

3) STATION MAP-LANDS BOSTON AND MAINE R.R. OPERATED BY THE BOSTON AND MAINE R.R. STATION 2966+20 TO STATION 3019+0. PREPARED BY OFFICE OF THE VALUATION ENGINEER BOSTON, MASS. DATED JUNE 30, 1914, REVISED THROUGH AUGUST 2004. NOT RECORDED.

4) VARIANCE APPLICATION PLAN 200 MCDONOUGH STREET PORTSMOUTH, N.H. PREPARED BY AMBIT ENGINEERING, INC. DATED APRIL 2016, FINAL REVISION DATE JUNE 1, 2016. NOT RECORDED.



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STATE OF NEW HAMPSHIRE
LICENSED LAND SURVEYOR
No. 1000
PAUL A. DOBBERSTEIN

PAUL A. DOBBERSTEIN, LLS #1000

3/18/2020
DATE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
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Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

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2) OWNER OF RECORD:
BONZA BUILDERS, LLC
79 EXETER ROAD
NORTH HAMPTON, NH 03862
6056/205

3) PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259E. EFFECTIVE DATE MAY 17, 2005.

4) EXISTING LOT AREA:
10,903 S.F.
0.2503 ACRES

5) PARCEL IS LOCATED IN THE GENERAL RESIDENCE C (GRC) ZONING DISTRICT.

6) DIMENSIONAL REQUIREMENTS:

MIN. LOT AREA:		3,500 S.F.
FRONTAGE:		70 FEET
DEPTH:		50 FEET
SETBACKS:	FRONT	5 FEET
	SIDE	10 FEET
	REAR	20 FEET
MAXIMUM STRUCTURE HEIGHT:		35 FEET
MAXIMUM BUILDING COVERAGE:		35%
MINIMUM OPEN SPACE:		20%

7) THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS ON TAX MAP 144 LOT 31 IN THE CITY OF PORTSMOUTH.

8) THERE ARE NO WETLANDS ON THE SUBJECT PROPERTY.

SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED FOR TAC	3/18/20
0	ISSUED FOR COMMENT	11/18/19

REVISIONS

SCALE: 1"=10' NOVEMBER 2019

EXISTING CONDITIONS PLAN

C1

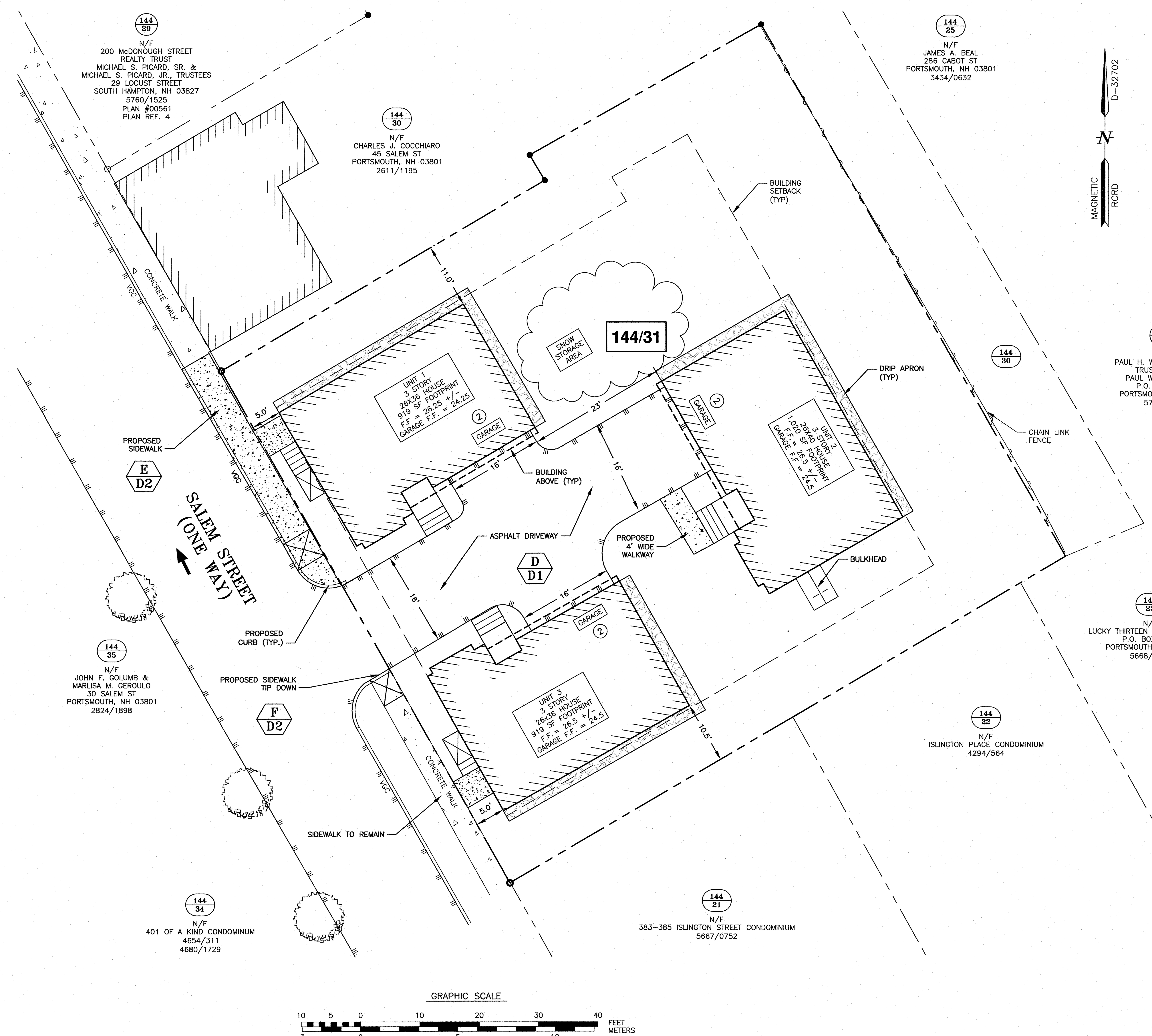
FB 330 PG 41

3082.01

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

IMPERVIOUS SURFACE AREAS
(TO PROPERTY LINE)

STRUCTURE	PRE-CONSTRUCTION IMPERVIOUS (S.F.)	POST-CONSTRUCTION IMPERVIOUS (S.F.)
MAIN STRUCTURE	1,134	2,858
BULKHEAD	0	28
CONCRETE	14	68
STAIRS/PORCH	47	146
PAVEMENT	650	1,207
TOTAL	1,845	4,307
LOT SIZE	10,903	10,903
% LOT COVERAGE	16.9%	39.5%



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BONZA BUILDERS, LLC
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NORTH HAMPTON, NH 03862
6056/205

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	REAR	20 FEET
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MAXIMUM BUILDING COVERAGE:		35%
MINIMUM OPEN SPACE:		20%

7) THE PURPOSE OF THIS PLAN IS TO SHOW PROPOSED DEVELOPMENT ON TAX MAP 144 LOT 31 IN THE CITY OF PORTSMOUTH.

8) PROPOSED BUILDING COVERAGE:
STRUCTURES: 2,858 SF
STAIRS/STOOP: 117 SF
TOTAL: 2,975 SF

2,975 SF / 10,903 SF = 27%

9) REQUIRED PARKING:
3 UNITS x 1.3 SPACES PER UNIT = 4 SPACES
PROVIDED PARKING: 6 SPACES (ALL IN GARAGES)

10) ARCHITECTURAL PLANS BY ART FORM ARCHITECTURE "CLARA"

SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED TO TAC	3/18/20
0	ISSUED FOR COMMENT	12/30/19

REVISIONS

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 738 JOHN R. CHAGNON

SCALE: 1" = 10'   DECEMBER 2019

SITE LAYOUT PLAN   C2

PORTSMOUTH APPROVAL CONDITIONS NOTE:

ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

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.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

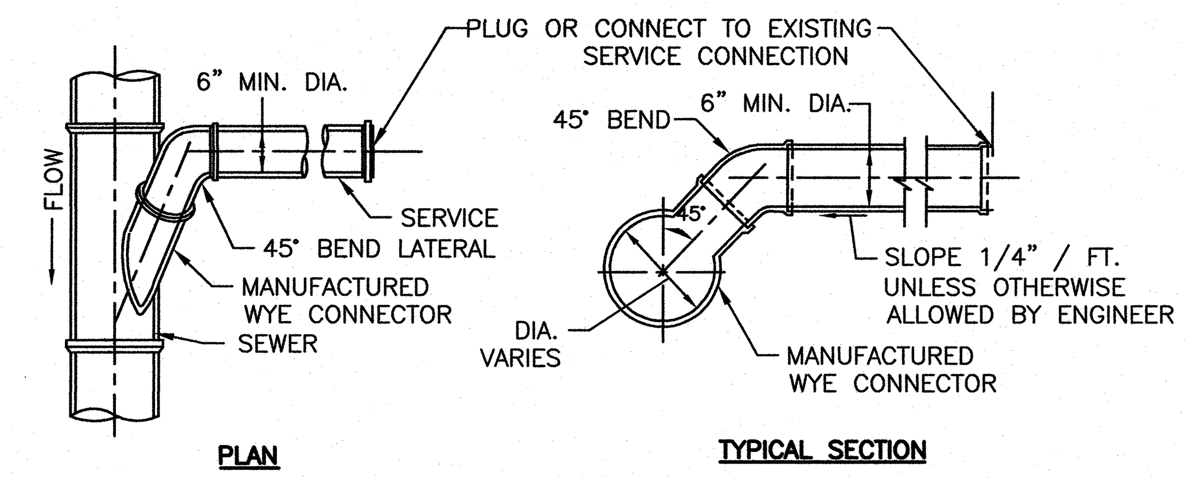
CHAIRMAN   DATE

FB. 330, PG 41   3082.01

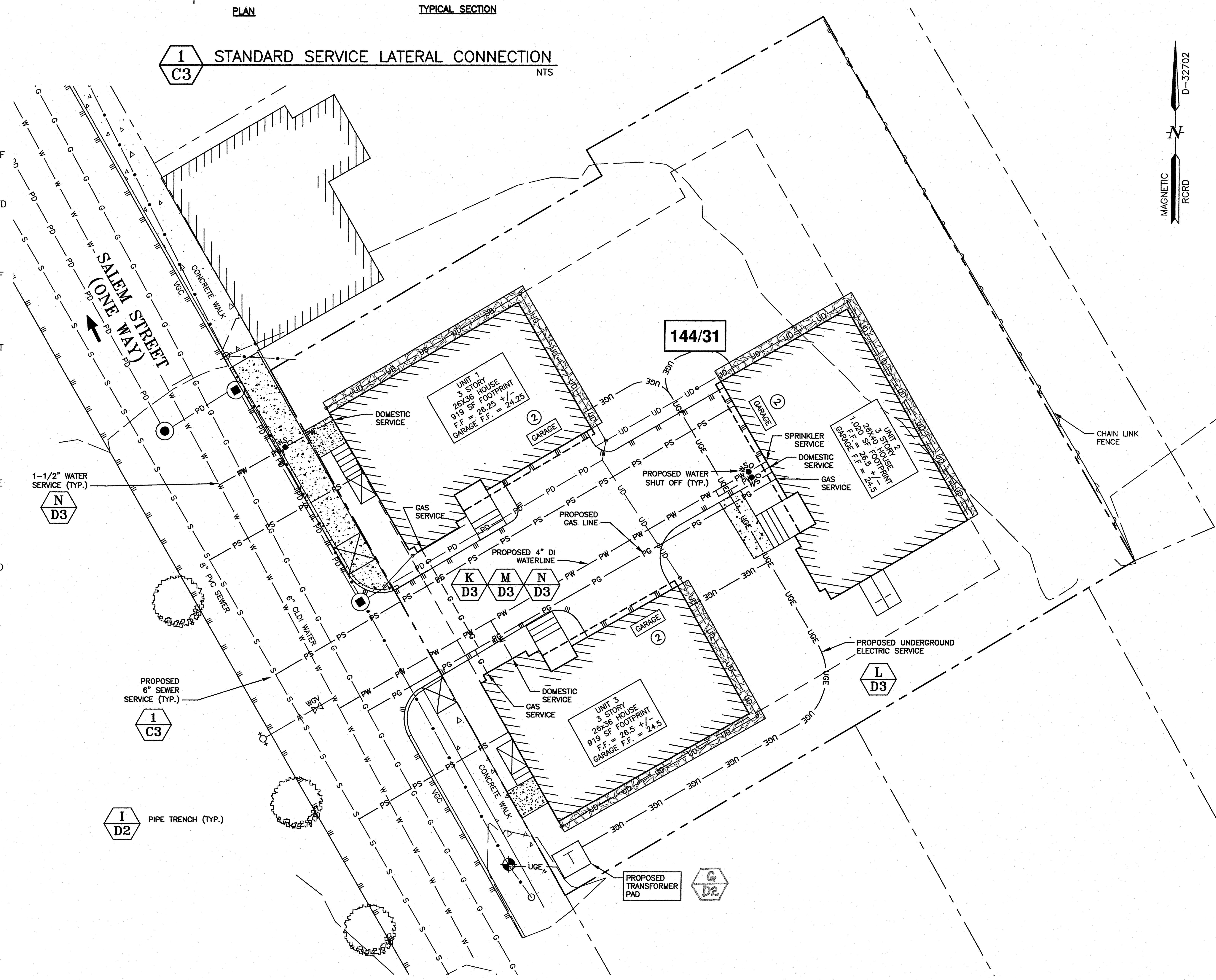
J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 SITE 2019.dwg, C2 (SITE LAYOUT)

UTILITY NOTES:

1) SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
2) COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY.
3) SEE GRADING AND DRAINAGE PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4) ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, POLYWRAPPED, CEMENT LINED DUCTILE IRON PIPE.
5) ALL WATERMAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION AND BEFORE ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE WITH THE CITY OF PORTSMOUTH.
6) ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
7) ALL WORK WITHIN CITY R.O.W. SHALL BE COORDINATED WITH CITY OF PORTSMOUTH
8) CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
9) ANY CONNECTION TO EXISTING WATERMAIN SHALL BE CONSTRUCTED BY THE CITY OF PORTSMOUTH.
10) 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.
11) ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
12) THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH BUILDING DRAWINGS AND UTILITY COMPANIES.
13) ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
14) ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
15) THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATED TO THE OWNER PRIOR TO THE COMPLETION OF PROJECT.
16) THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED IN THESE DRAWING TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
17) CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
18) A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS WATER ABOVE SEWER.
19) SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
20) GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
21) COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
22) ALL SEWER PIPES WITH LESS THAN 6' COVER SHALL BE INSULATED.
23) CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
24) CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH UTILITY COMPANY AND AFFECTED ABUTTER.
25) ALL WORK PERFORMED IN THE PUBLIC RIGHT-OF-WAY SHALL BE BUILD TO DEPARTMENT OF PUBLIC WORKS STANDARDS.
26) WATER, SEWER, AND DRAIN LINES SHALL BE PRIVATE. CONDOMINIUM DOCUMENTS SHALL REFLECT MAINTENANCE OF PRIVATE UTILITIES.
27) THIRD PARTY UTILITY INSTALLATION INSPECTIONS SHALL BE REQUIRED ON WATER MAIN, SEWER, AND DRAINAGE SYSTEM.
28) A WATER UTILITY ACCESS EASEMENT SHALL BE PROVIDED TO THE CITY OF PORTSMOUTH FOR ACCESS TO WATER METERS, SHUT OFF VALVES & PIPING.



1 / C3 STANDARD SERVICE LATERAL CONNECTION
NTS



APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008)".

4) INSTALL CATCH BASIN INLET PROTECTION ON ALL EXISTING AND INSTALLED CATCH BASINS UNTIL CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

5) ALL WATER MAIN AND SANITARY SEWER WORK SHALL MEET THE STANDARDS OF THE NEW HAMPSHIRE STATE PLUMBING CODE AND CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

6) UTILITY AS-BUILTS SHALL BE SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS UPON COMPLETION OF THE PROJECT.

7) PROPOSED SEWER FLOW
3 UNITS X 2.33 RESIDENTS/UNIT = 7 RESIDENTS
7 RESIDENTS X 70 GPD/RESIDENT = 490 GPD
TOTAL PROPOSED FLOW = 490 GPD
NHDES SEWER DISCHARGE PERMIT NOT REQUIRED.

SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
2	TAC SUBMISSION	3/18/20
1	TAC WORKSHOP	12/2/19
0	ISSUED FOR COMMENT	11/18/19

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER

SCALE: 1" = 10' NOVEMBER 2019

UTILITY PLAN

C3

FB. 330, PG 41 3082.01

J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 SITE 2019.dwg, C3 (UTILITY)

TEST PIT #1, ELEV.

Date: 11/7/19
Logged by: JOE MULLEDY
ESHWT: –
Observed Water: 64"
REFUSAL: NONE
Roots: 12"

DEPTH	DESCRIPTION
0" – 12"	10YR 3/3 DARK BROWN, FINE SANDY LOAM
12" – 18"	10YR 4/3 BROWN, LOAMY FINE SAND
18" – 64"	2.5Y 6/4 GRAY, SILTY FINE SAND

TEST PIT #2, ELEV.

Date: 11/7/19
Logged by: JOE MULLEDY
ESHWT: –
Observed Water: 66"
REFUSAL: NONE
Roots: 14" MANY FINE

DEPTH	DESCRIPTION
0" – 14"	10YR 3/3 DARK BROWN, FINE SANDY LOAM
14" – 20"	10YR 4/3 BROWN, LOAMY FINE SAND
20" – 66"	2.5Y 5/2 GRAY, SILTY FINE SAND

TEST PIT #3, ELEV.

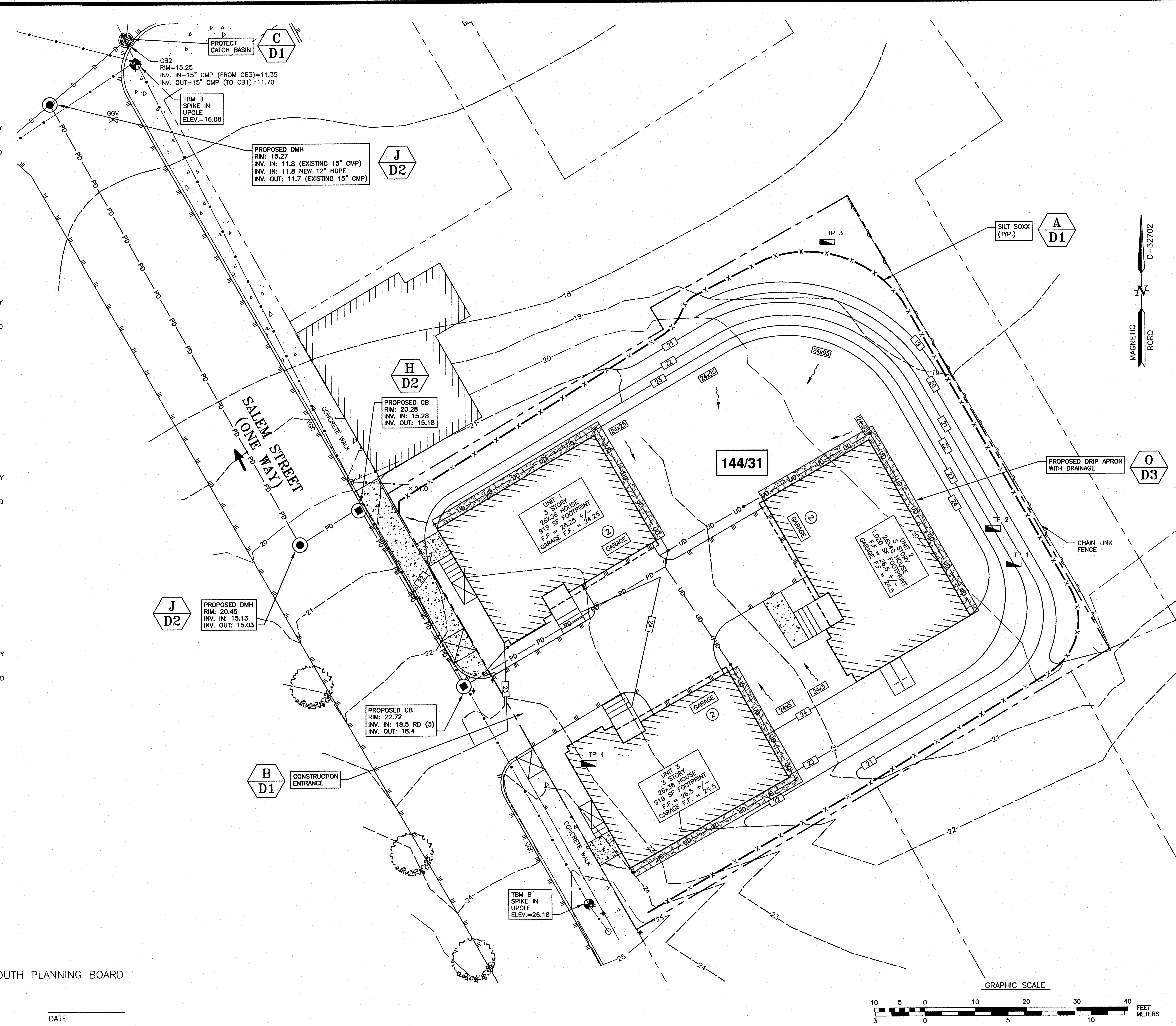
Date: 11/7/19
Logged by: JOE MULLEDY
ESHWT: –
Observed Water: 62"
REFUSAL: NONE
Roots: 16"

DEPTH	DESCRIPTION
0" – 16"	10YR 3/3 DARK BROWN, FINE SANDY LOAM
16" – 40"	10YR 4/3 BROWN, LOAMY FINE SAND
40" – 62"	2.5Y 4/2 GRAY, CLAYEY FINE SAND

TEST PIT #4, ELEV.

Date: 11/7/19
Logged by: JOE MULLEDY
ESHWT: –
Observed Water: 62"
REFUSAL: NONE
Roots: 6"

DEPTH	DESCRIPTION
0" – 8"	10YR 3/3 DARK BROWN, FINE SANDY LOAM
8" – 24"	10YR 4/3 BROWN, LOAMY FINE SAND
24" – 34"	2.5Y 4/4 GRAY, LOAMY FINE SAND



NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

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Tel (603) 430-9282
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SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
2	TAC SUBMISSION	3/18/19
1	TAC WORKSHOP	12/2/19
0	ISSUED FOR COMMENT	11/18/19

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER

SCALE: 1" = 10'
NOVEMBER 2019

GRADING, DRAINAGE AND EROSION CONTROL PLAN

C4

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN
DATE

FB.330, PG 41
3082.01

J:\J0853\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 SITE 2019.dwg, C4 (DRAINAGE)

GENERAL NOTES

1. The Contractor shall contact DigSafe prior to the installation of plant materials.

2. Planting methods and overall care and maintenance of all planting stock shall meet the standards contained in The American National Institute A300 (Part 6) - 2012.

3. All plant materials grown in containers shall have the containers removed prior to installation.

4. All balled and burlapped ("b&b") plant materials shall have the burlapp (and twine or rope) cut and pulled open to expose the full plant ball prior to backfilling the planting hole.

5. All deciduous tres shall be staked and guyed with two (2) upright metal or wood stakes and flexible ties upon planting. Stakes and guys shall remain in place and be maintained for the duration of the first year after planting.

6. All disturbed areas shall be treated with 3" topsoil and seed unless otherwise indicated.
7. Finish grade of all lawn areas shall be a minimum of one (1) inch below adjacent curb or pavement.

8. The surface of all planting beds shall be treated with three (3) inch (minimum) of bark mulch.

9. All plant materials are selected for hardiness to the temperature zone of the proposed project.

~~10. This Site Plan shall be recorded in the Rockingham Registry of Deeds.~~

11. All improvements shown on this Site Plan shal be constructed and maintained in accordance with the plan by the Property Owners and all future property owners. No changes shall be made to this Site Plan without the expressed approval of the Portsmouth Planning Board.

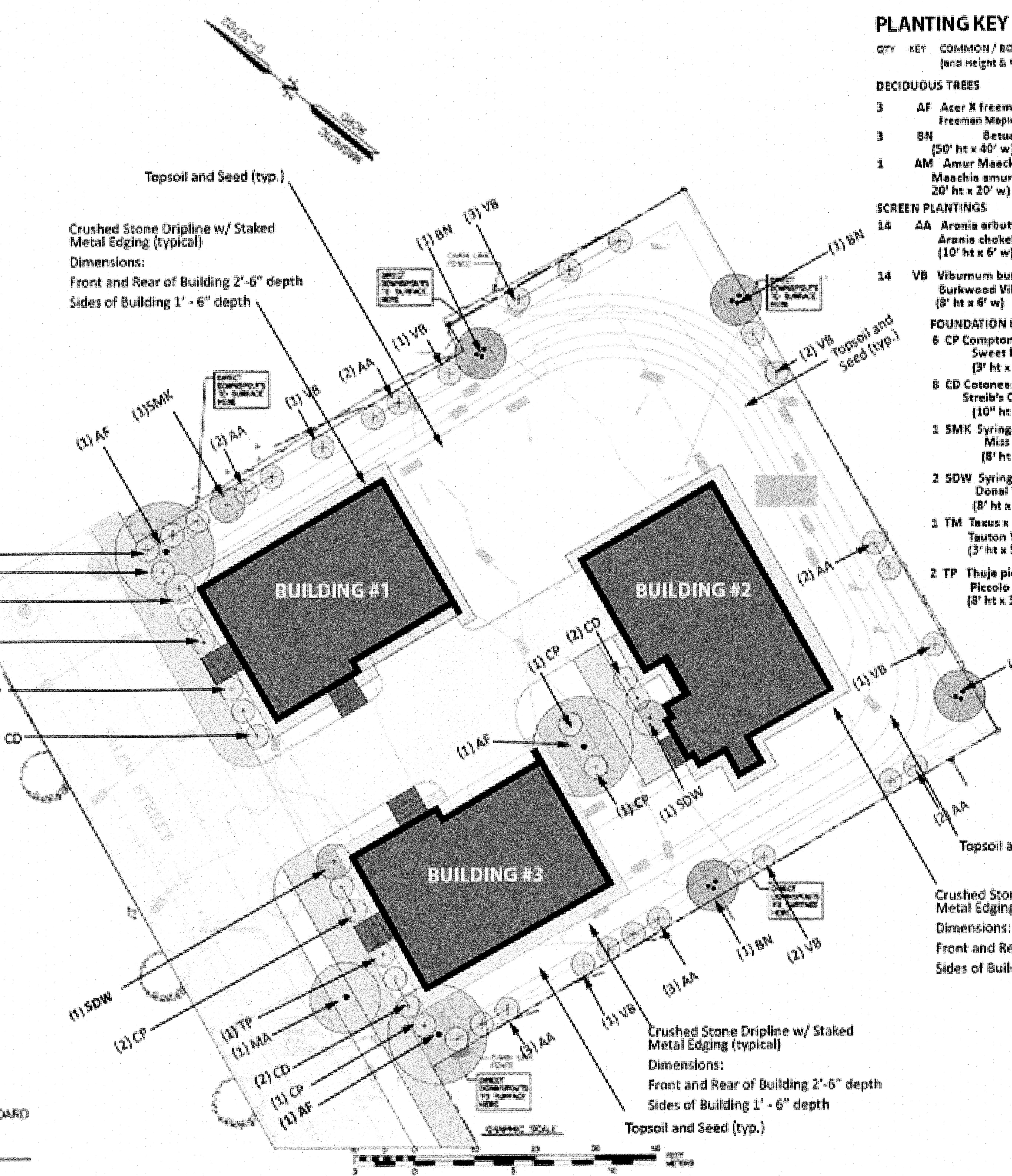
12. The Property Owner and all future property owners shall be responsible for the maintenance,repair and replacement of all required screening and landscape materials.

13. All plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris.

14. The Propery Owner shall be responsible for the removal and repalcement of all dead plant material immediately with the same type, size, and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN ______________ DATE ______________



PLANTING KEY & SCHEDULE

QTY	KEY	COMMON / BOTANICAL NAME (and Height & Width at Maturity)	HARDINESS ZONE	DESCRIPTION
DECIDUOUS TREES				
3	AF	Acer X freemanii / Freeman Maple (45' ht x 25' w)	Z4	2" caliper (min) b&b
3	BN	Betual nigra /River Birch) (50' ht x 40' w)	Z4	8' - 10' ht., b7b, clump
1	AM	Amur Maackia / Maachia amurensis "Starburst" 20' ht x 20' w)	Z4	6' - 8' ht. b&b
SCREEN PLANTINGS				
14	AA	Aronia arbutifolia 'brilliantissima' / Aronia chokeberry (10' ht x 6' w)	Z3	3' - 4' ht., #3 container (min.), Plant 5' o.c. (typ.)
14	VB	Viburnum burkwoodii / Burkwood Viburnum (8' ht x 6' w)	Z4	3' - 4' ht., #3 container (min.), Plant 5' o.c. (typ.)
FOUNDATION PLANTINGS				
6	CP	Comptonia perengrina Sweet Fern (3' ht x 4' w)	Z2	#2 cont, Plant 3' o.c. (typ.)
8	CD	Cotoneaster dammerii 'Strieb's Findling' / Streib's Cotoneaster (10" ht x 3' w)	Z2	#2 cont, Plant 3' o.c. (typ.)
1	SMK	Syringa patula 'Miss Kim' / Miss Kim Lilac (8' ht x 6' w)	Z3	2.5' - 3' ht., b&b or #3 cont(min.)
2	SDW	Syringa x prestonia / Donal Wyman Lilac (8' ht x 6' w)	Z2	4' - 5' ht., b&b
1	TM	Taxus x media "Tautonii" / Tauton Yew (3' ht x 5'w)	Z4	18" - 24" spread, b&b
2	TP	Thuja piccolo / Piccolo Arborvitae (8' ht x 3'w)	Z3	2' - 3' ht., #3 cont.

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors

NOTES:

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2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

Landscape Plan prepared by
Scott N Collard MLLA

Scott N Collard Landscape Architecture LLC
P O Box 356
Parsonsfield, Maine 04047

scott@snodesignpresence.com
207.756.3636

SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	TAC WORKSHOP	12/2/19
0	ISSUED FOR COMMENT	11/18/19

REVISIONS

SCALE: 1" = 10'   February 27, 2020

LANDSCAPE PLAN   C5

FB 228, PG 45   3082.01

DEMOLITION NOTES

a) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE DESIGNER. IT IS THE CONTRACTORS' RESPONSIBILITY TO LOCATE UTILITIES AND ANTICIPATE CONFLICTS. CONTRACTOR SHALL REPAIR EXISTING UTILITIES DAMAGED BY THEIR WORK AND RELOCATE EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED PRIOR TO COMMENCING ANY WORK IN THE IMPACTED AREA OF THE PROJECT.

b) ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTORS UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.

c) ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO THE ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

d) THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.

e) SAWCUT AND REMOVE PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.

f) IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL THE PERMIT APPROVALS.

g) THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL CONSTRUCTION PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR ANY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK.

h) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE, UTILITIES, VEGETATION, PAVEMENT, AND CONTAMINATED SOIL WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ANY EXISTING DOMESTIC / IRRIGATION SERVICE WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR PROPER CAPPING / RE-USE. ANY EXISTING MONITORING WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER TO COORDINATE MONITORING WELL REMOVAL AND/OR RELOCATION WITH NHDES AND OTHER AUTHORITY WITH JURISDICTION PRIOR TO CONSTRUCTION.

i) ALL WORK WITHIN THE CITY OF PORTSMOUTH RIGHT OF WAY SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS (DPW).

j) REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL SLUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

k) CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED, THE CONTRACTOR SHALL EMPLOY A NH LICENSED LAND SURVEYOR TO REPLACE THEM.

l) PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS WITHIN CONSTRUCTION LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE HIGH FLOW SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF WARRANTED OR FABRIC BECOMES CLOGGED. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.

m) THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFELY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.

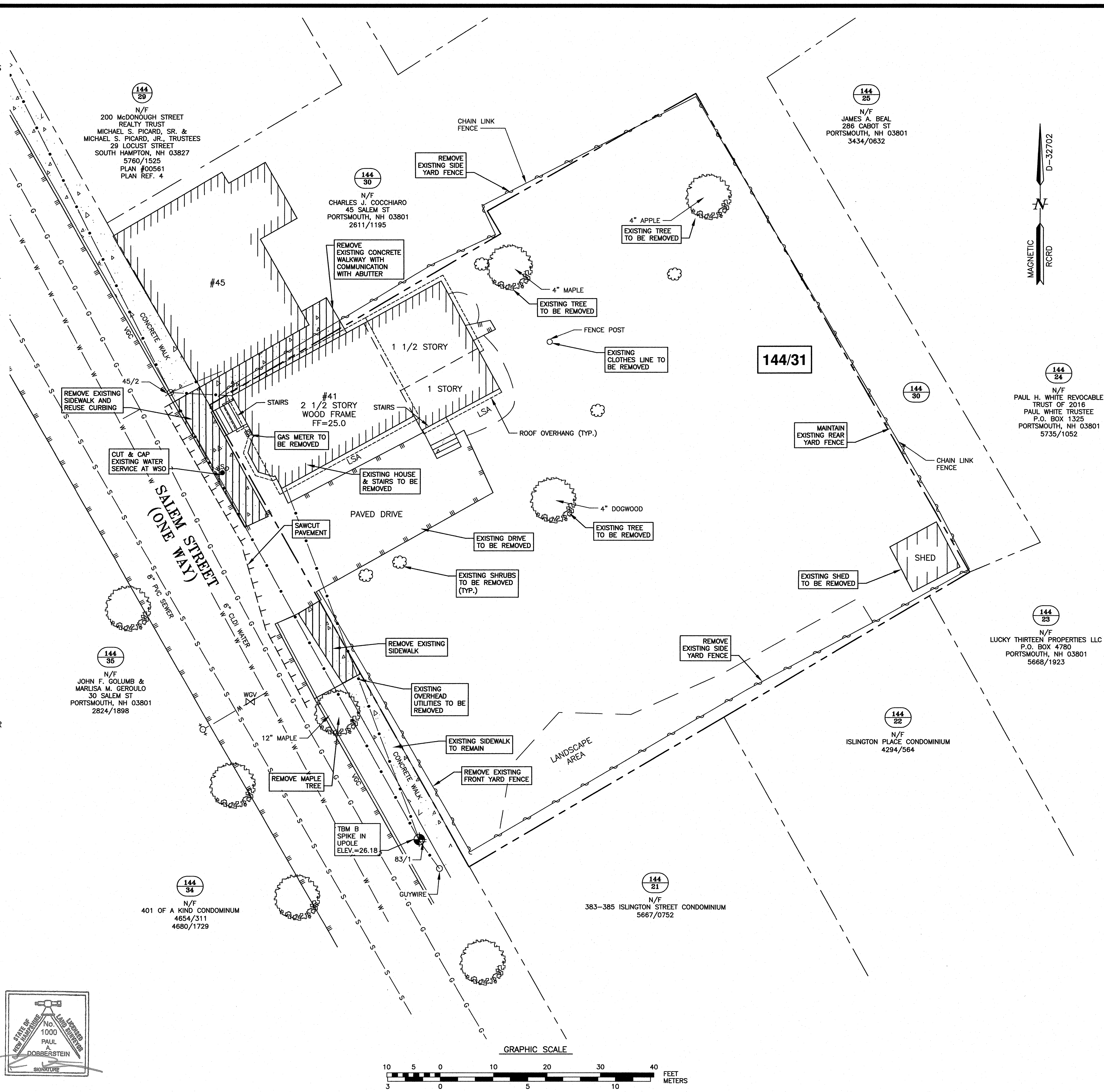
n) ANY CONTAMINATED MATERIAL REMOVED DURING THE COURSE OF THE WORK WILL REQUIRE HANDLING IN ACCORDANCE WITH NHDES REGULATIONS. CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN IN PLACE, AND COMPLY WITH ALL APPLICABLE PERMITS, APPROVALS, AUTHORIZATIONS, AND REGULATIONS

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN ACCURACY OF THE CLOSED TRAVERSE THAT EXCEEDS THE PRECISION OF 1:15,000.

PAUL A. DOBBERSTEIN, LLS #1000

3/18/2020
DATE

STATE OF NEW HAMPSHIRE LICENSED LAND SURVEYOR No. 1000 PAUL A. DOBBERSTEIN SIGNATURE



AMBIT ENGINEERING, INC.
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NOTES:

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) EXISTING UTILITY CONNECTIONS SHALL BE ABANDONED IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS. UTILITIES THAT ARE TO BE REUSED SHALL BE CUT & CAPPED.

5) CONTRACTOR WILL COORDINATE STREET CLOSINGS, IF ANY, WITH CITY OF PORTSMOUTH.

6) DURING CONSTRUCTION, TEMPORARY FENCING SHALL BE INSTALLED, AS REQUIRED, TO PROTECT THE SITE FROM THE PUBLIC.

7) COORDINATE DEMOLITION WITH CITY OF PORTSMOUTH, PERMITS REQUIRED. PROVIDE TEMPORARY DRAINAGE STRUCTURES, AS REQUIRED, TO KEEP SITE FROM FLOODING DURING CONSTRUCTION.

8) REMOVAL OF MAPLE TREE IN SALEM STREET RIGHT OF WAY APPROVED BY THE TREES AND GREENERY COMMITTEE 2/12/2020.

SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
2	TAC SUBMISSION	3/18/20
1	TAC WORKSHOP	12/2/19
0	ISSUED FOR COMMENT	11/18/19

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER

SCALE: 1"=10' NOVEMBER 2019

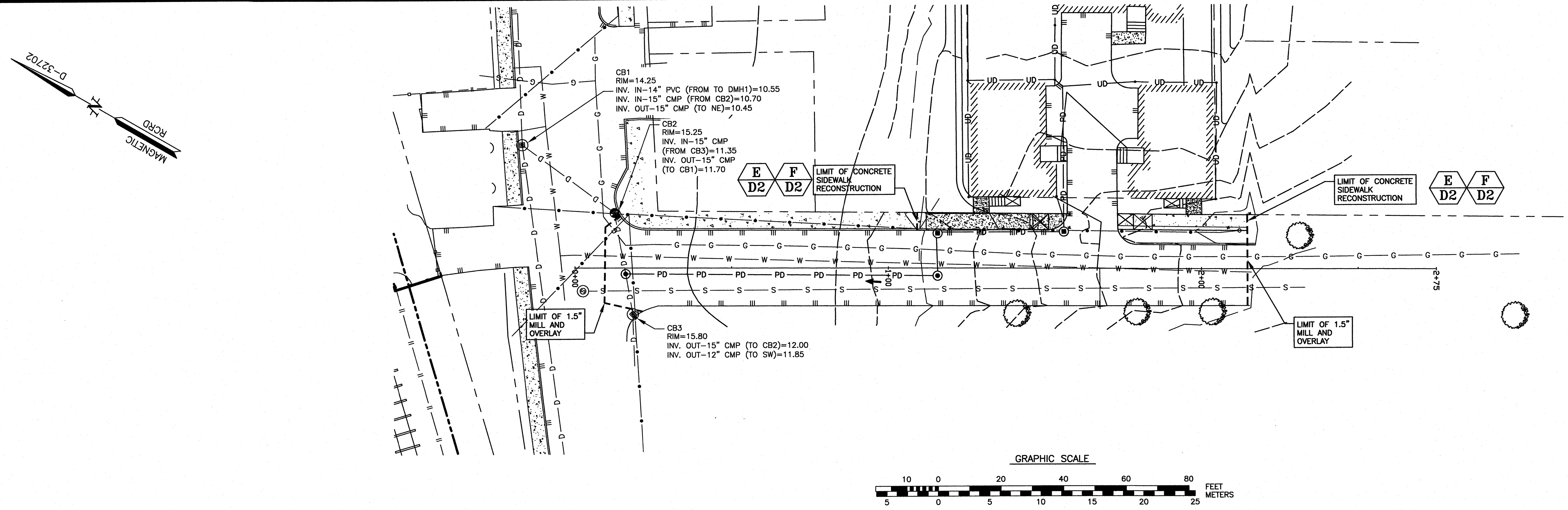
DEMOLITION PLAN

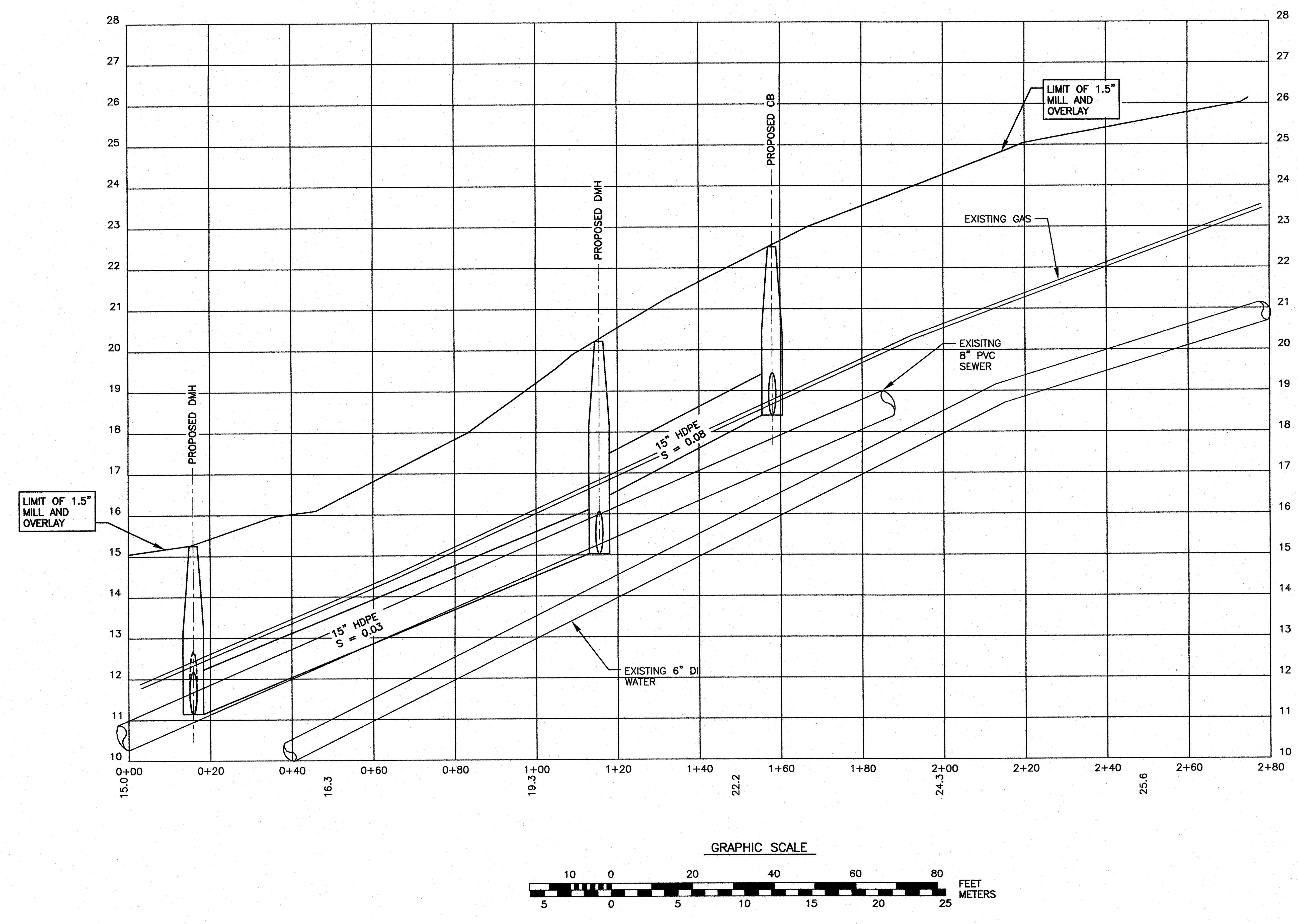
C6

FB 330 PG 41

3082.01

J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 SITE 2019.dwg, C6 DEMOLITION





APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN

DATE

J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 SITE 2019.dwg, P1(SALEM ST PROFILE)

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

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SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS

STATE OF NEW HAMPSHIRE JOHN R. CHAGNON No. 8651 LICENSED PROFESSIONAL ENGINEER

SCALE: 1" = 20' NOVEMBER 2019

SALEM STREET
PLAN AND PROFILE

P1

FB. 229, PG 45

3082.01

EROSION CONTROL NOTES

CONSTRUCTION SEQUENCE

DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

INSTALL PERIMETER CONTROLS AROUND THE LIMITS OF DISTURBANCE BEFORE ANY EARTH MOVING OPERATIONS. THE USE OF HAYBALES IS NOT ALLOWED.

CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.

PERFORM DEMOLITION.

CUT AND GRUB ALL TREES, SHRUBS, SAPLINGS, BRUSH, VINES AND REMOVE OTHER DEBRIS AND RUBBISH AS REQUIRED.

BULLDOZE TOPSOIL INTO STOCKPILES, AND CIRCLE WITH SILT FENCING OR SILTSOXX. IF EROSION IS EXCESSIVE, THEN COVER WITH MULCH.

CONSTRUCT FOUNDATIONS.

LAYOUT AND INSTALL ALL BURIED UTILITIES AND SERVICES TO THE PROPOSED BUILDING FOUNDATIONS. CAP AND MARK TERMINATIONS OR LOG SWING TIES.

FINISH GRADE SITE, BACKFILL DRIVEWAY SUBBASE GRAVEL IN TWO, COMPACTED LIFTS. PROVIDE TEMPORARY EROSION PROTECTION TO SITE IN THE FORM OF MULCHING, JUTE MESH OR DITCH DAMS.

PLACE BINDER LAYER OF PAVEMENT

PLANT LANDSCAPING IN AREAS OUT OF WAY OF BUILDING CONSTRUCTION. PREPARE AND STABILIZE FINAL SITE GRADING BY ADDING TOPSOIL, SEED, MULCH AND FERTILIZER.

AFTER BUILDINGS ARE COMPLETED, FINISH ALL REMAINING LANDSCAPED WORK.

CONSTRUCT ASPHALT WEARING COURSE.

REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES UPON COMPLETION OF FINAL STABILIZATION OF THE SITE.

GENERAL CONSTRUCTION NOTES

THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.

ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.

DUST CONTROL: IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.

SILT FENCES AND SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILT FENCES AND SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.

AVOID THE USE OF FUTURE OPEN SPACES (LOAM AND SEED AREAS) WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL USE THE ROADBEDS OF FUTURE ACCESS DRIVES AND PARKING AREAS.

ADDITIONAL TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNTS NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS--CONSTRUCT SILT FENCE OR SILTSOXX AROUND TOPSOIL STOCKPILE.

AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL. STUMPS SHALL BE DISPOSED OF IN AN APPROVED FACILITY.

ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.

ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.

FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.

FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.

DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.

THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.

ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
- EROSION CONTROL BLANKETS HAVE BEEN INSTALLED

VEGETATIVE PRACTICE

FOR PERMANENT MEASURES AND PLANTINGS:

LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE.

FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10-20-20 FERTILIZER.

SEED SHALL BE SOWN AT THE RATES SHOWN IN THE TABLE BELOW. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE, AND SHALL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.

THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL, UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED.

A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE:

GENERAL COVER	PROPORTION	SEEDING RATE
CREEPING RED FESCUE	50%	100 LBS/ACRE
KENTUCKY BLUEGRASS	50%	
SLOPE SEED (USED ON ALL SLOPES GREATER THAN OR EQUAL TO 3:1)		
CREEPING RED FESCUE	42%	
TALL FESCUE	42%	48 LBS/ACRE
BIRDSFOOT TREFOIL	16%	

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH APPLICABLE STATE AND FEDERAL SEED LAWS.

FOR TEMPORARY PROTECTION OF DISTURBED AREAS:
MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:
PERENNIAL RYE: 0.7 LBS/1,000 S.F.
MULCH: 1.5 TONS/ACRE

MAINTENANCE AND PROTECTION

THE CONTRACTOR SHALL MAINTAIN ALL LOAM & SEED AREAS UNTIL FINAL ACCEPTANCE AT THE COMPLETION OF THE CONTRACT. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, REMOVAL OF STONES AND OTHER FOREIGN OBJECTS OVER 1/2 INCHES IN DIAMETER WHICH MAY APPEAR AND THE FIRST TWO (2) CUTTINGS OF GRASS NO CLOSER THEN TEN (10) DAYS APART. THE FIRST CUTTING SHALL BE ACCOMPLISHED WHEN THE GRASS IS FROM 2 1/2 TO 3 INCHES HIGH. ALL BARE AND DEAD SPOTS WHICH BECOME APPARENT SHALL BE PROPERLY PREPARED, LIMED AND FERTILIZED, AND RESEEDED BY THE CONTRACTOR AT HIS EXPENSE AS MANY TIMES AS NECESSARY TO SECURE GOOD GROWTH. THE ENTIRE AREA SHALL BE MAINTAINED, WATERED AND CUT UNTIL ACCEPTANCE OF THE LAWN BY THE OWNER'S REPRESENTATIVE.

THE CONTRACTOR SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO PROTECT THE GRASS WHILE IT IS DEVELOPING.

TO BE ACCEPTABLE, SEEDED AREAS SHALL CONSIST OF A UNIFORM STAND OF AT LEAST 90 PERCENT ESTABLISHED PERMANENT GRASS SPECIES, WITH UNIFORM COUNT OF AT LEAST 100 PLANTS PER SQUARE FOOT.

SEEDED AREAS WILL BE FERTILIZED AND RESEEDED AS NECESSARY TO INSURE VEGETATIVE ESTABLISHMENT.

THE SWALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY UNTIL ADEQUATE VEGETATION IS ESTABLISHED.

THE SILT FENCE OR SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.

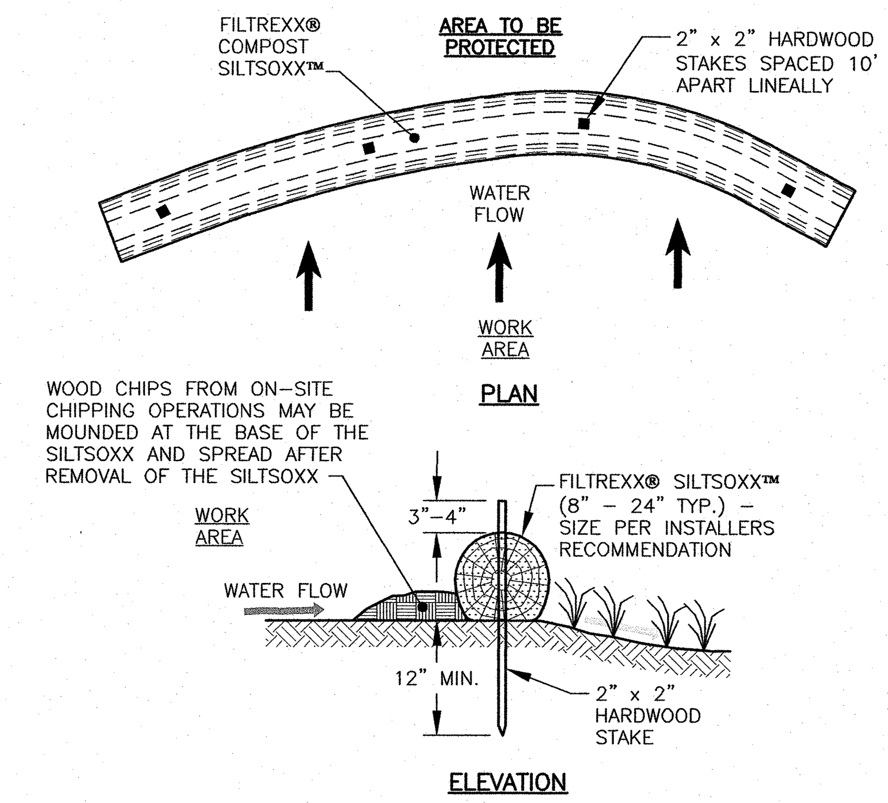
SILT FENCING AND SILTSOXX SHALL BE REMOVED ONCE VEGETATION IS ESTABLISHED, AND DISTURBED AREAS RESULTING FROM SILT FENCE AND SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.

WINTER NOTES

ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

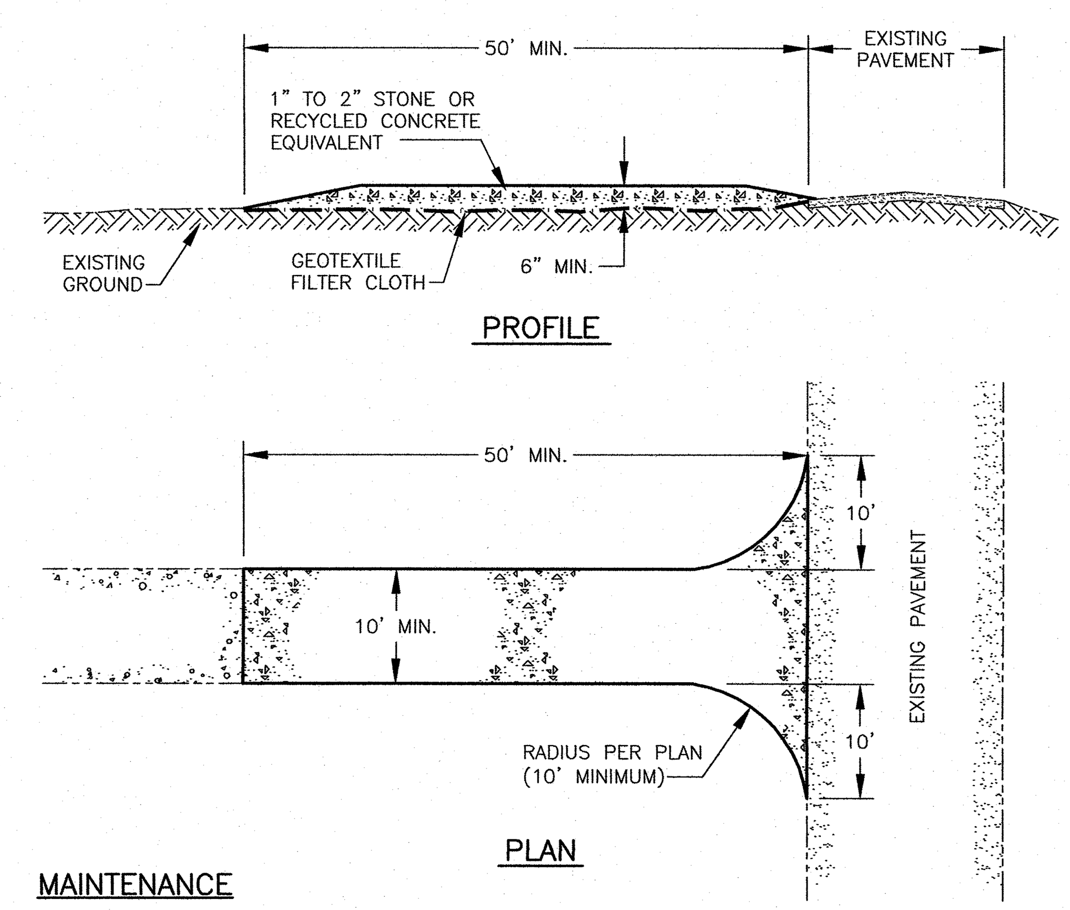
ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.



NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

A/C4 FILTREXX® SILTSOXX™ FILTRATION SYSTEM
NTS



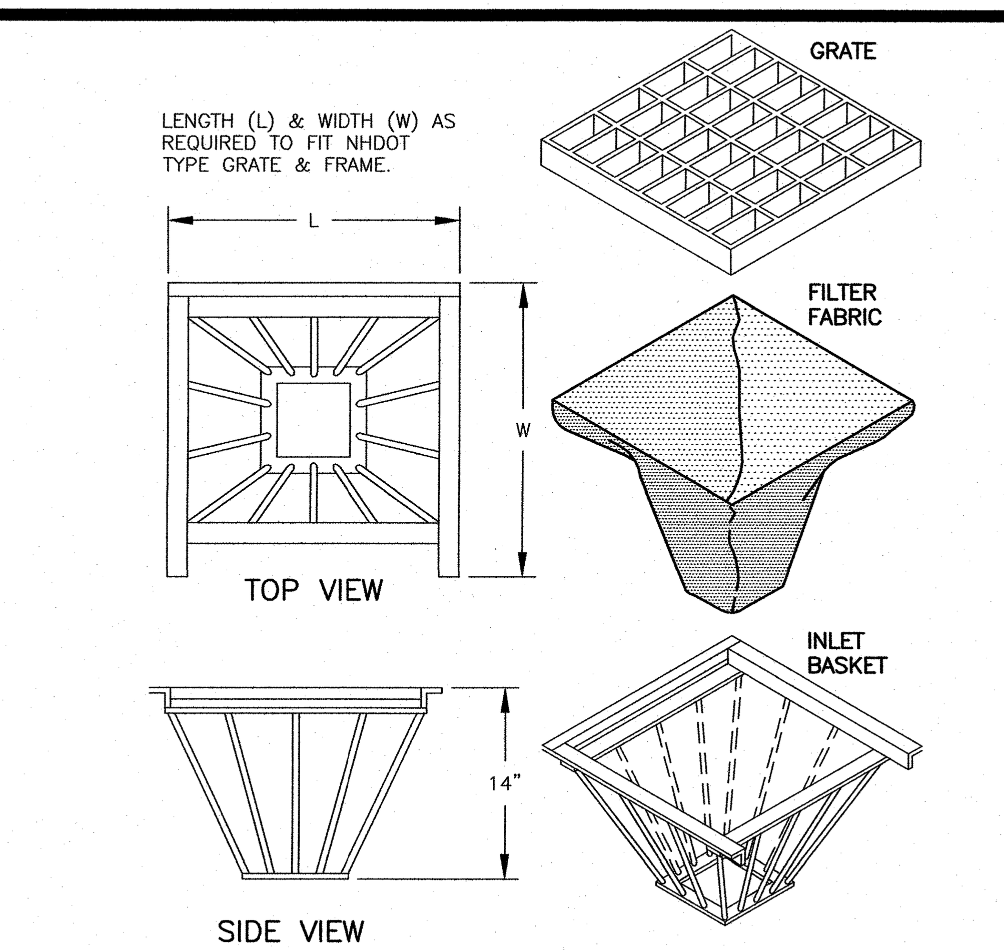
MAINTENANCE

1) MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE GRAVEL AND THE EFFECTIVENESS OF THE GRAVEL PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOP DRESSED WITH NEW STONE. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
2) IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS

1) STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2) THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3) THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4) THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5) GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6) ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8) WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

B/C4 STABILIZED CONSTRUCTION ENTRANCE
SUBSTITUTE FODS IF DESIRED
NTS



1) INLET BASKETS SHALL BE INSTALLED IMMEDIATELY AFTER CATCH BASIN CONSTRUCTION IS COMPLETE AND SHALL REMAIN IN PLACE AND BE MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

2) FILTER FABRIC SHALL BE PUSHED DOWN AND FORMED TO THE SHAPE OF THE BASKET. THE SHEET OF FABRIC SHALL BE LARGE ENOUGH TO BE SUPPORTED BY THE BASKET FRAME WHEN HOLDING SEDIMENT AND, SHALL EXTEND AT LEAST 6" PAST THE FRAME. THE INLET GRATE SHALL BE PLACED OVER THE BASKET/FRAME AND WILL SERVE AS THE FABRIC ANCHOR.

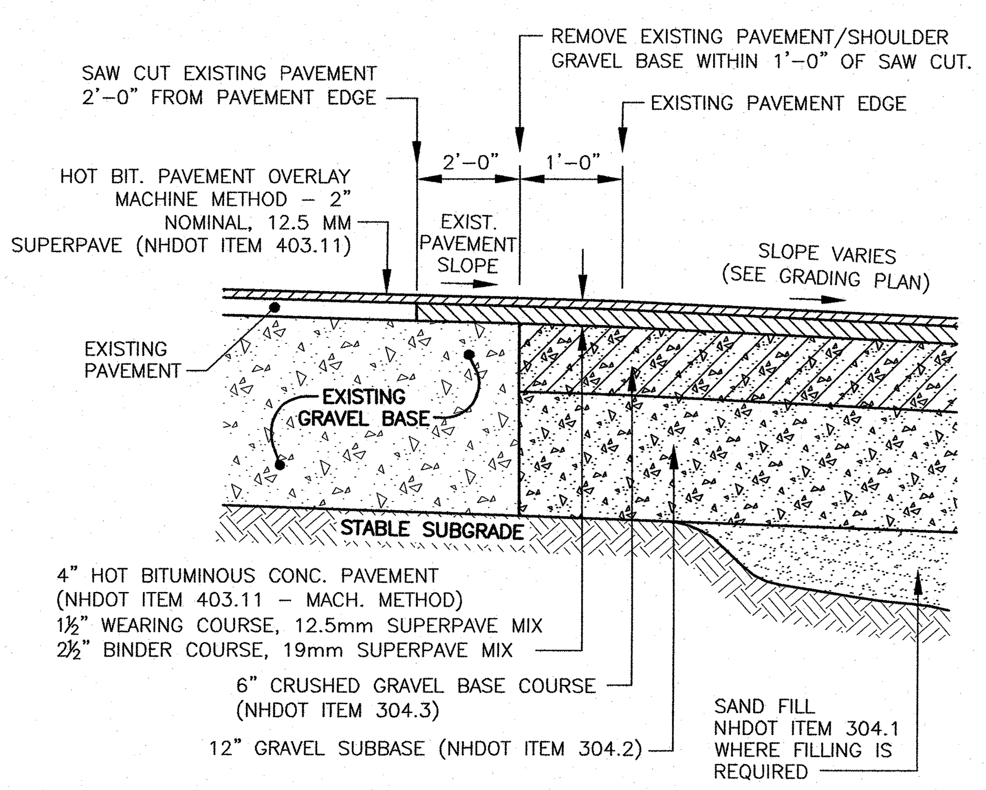
3) THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE, OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:
-RAB STRENGTH: 45 LB. MIN. IN ANY PRINCIPAL DIRECTION (ASTM D1682)
-MULLEN BURST STRENGTH: MIN. 60 psi (ASTM D774)

4) THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 gpm/s.f. (MULTIPLY THE PERMITTIVITY IN SEC.-1 FROM ASTM 54491-85 CONSTANT HEAD TEST USING THE CONVERSION FACTOR OF 74.)

5) THE INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

6) SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

C/C4 CATCH BASIN INLET BASKET
NTS



D/C2 FULL DEPTH PAVEMENT SECTION AND PAVEMENT JOINT DETAIL
NTS

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SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
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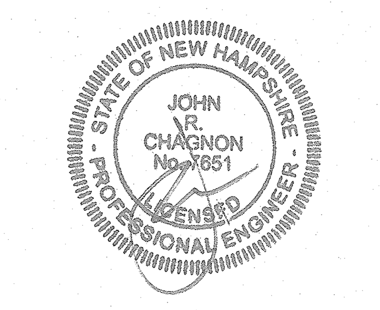
REVISIONS



AS NOTED | MARCH 2020

EROSION CONTROL NOTES & DETAILS

D1

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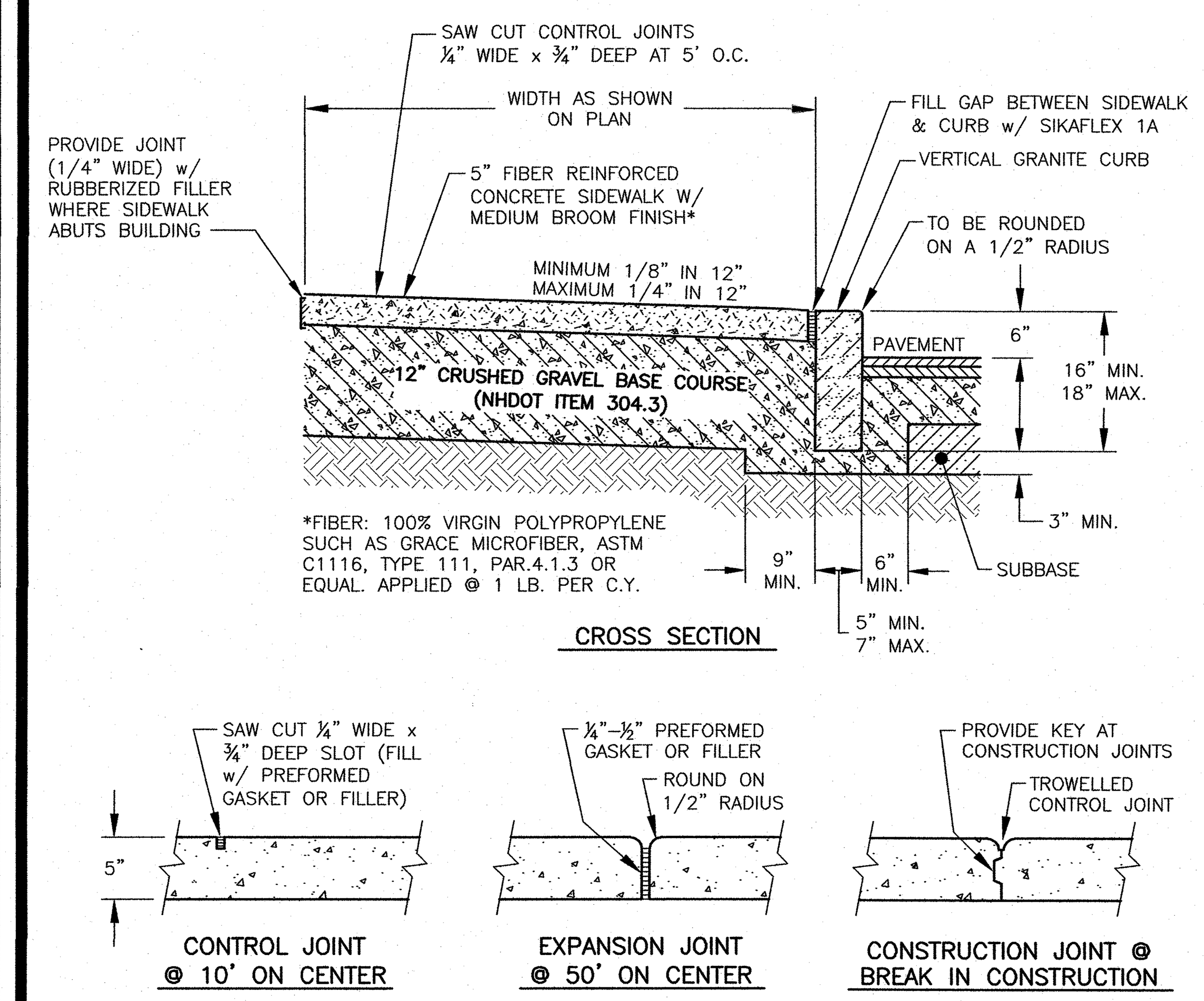
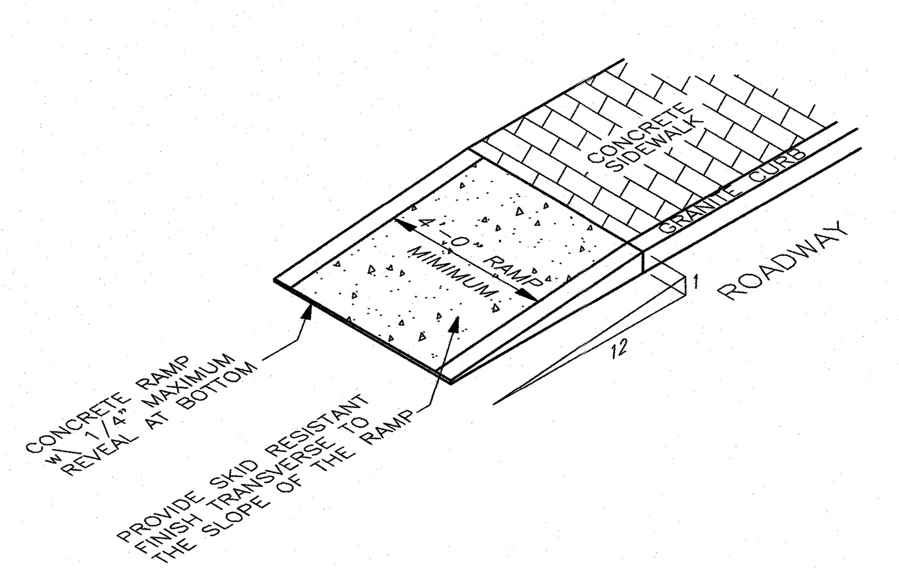
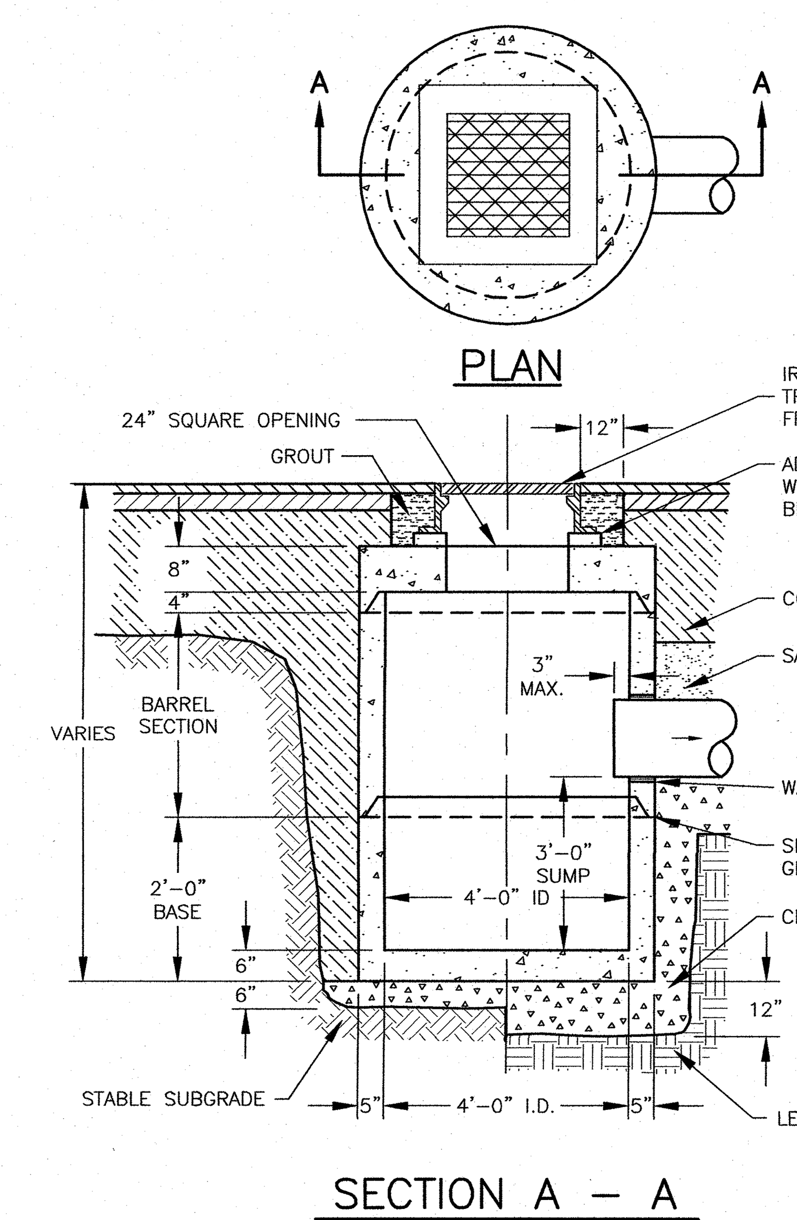
J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 DETAILS 2019.dwg, D1 EROSION

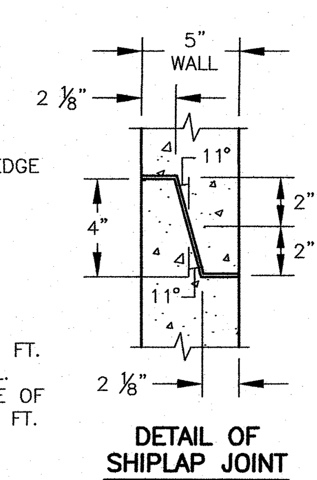


E / C2 PORTLAND CEMENT CONCRETE SIDEWALK
(WITH VERTICAL GRANITE CURB) NTS



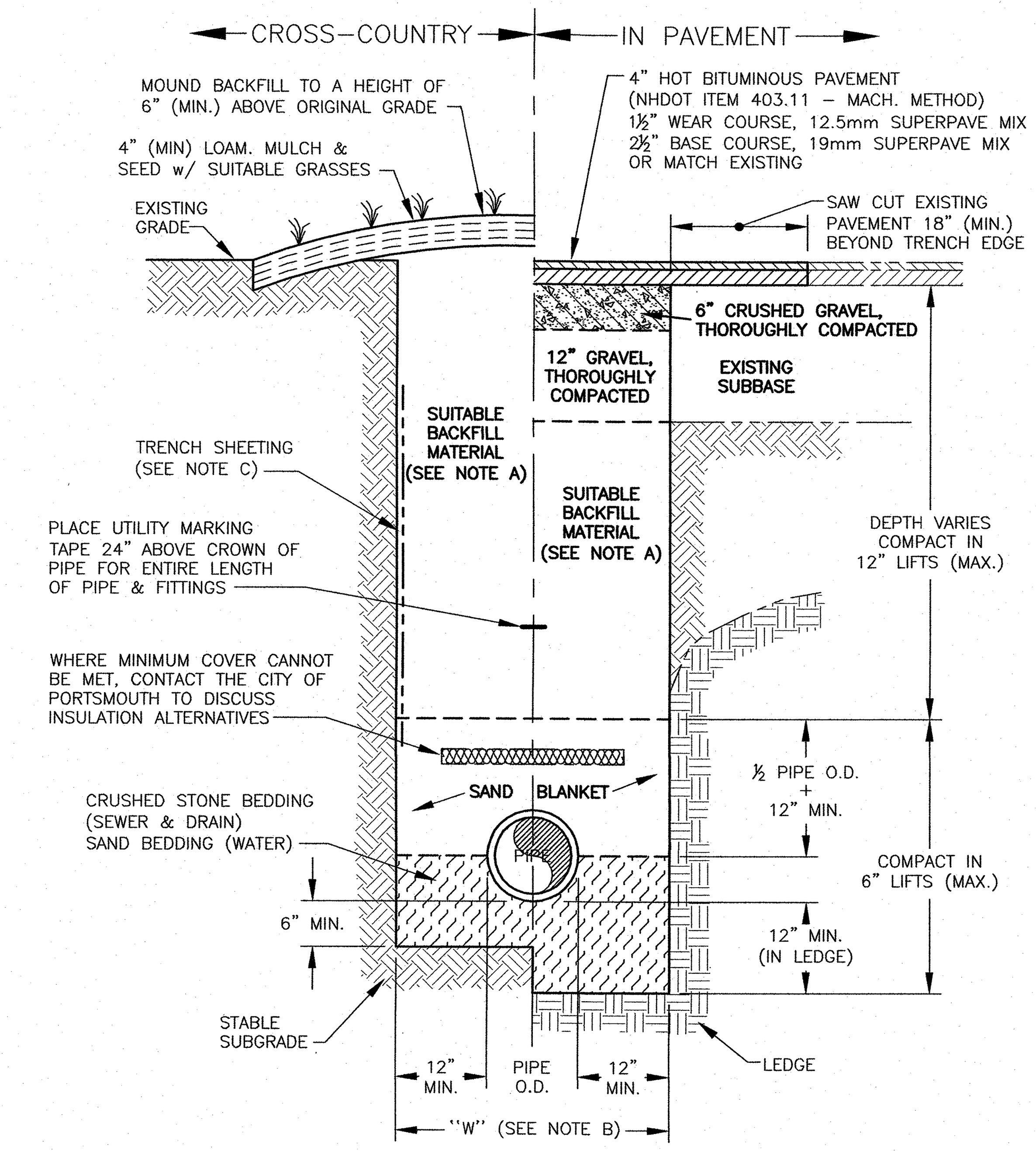
F / C2 SIDEWALK TIP DOWN
NTS





NOTES:
1. CONCRETE SHALL BE 4,000 P.S.I. AFTER 28 DAYS.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FT. IN ALL SECTIONS & SHALL BE PLACED IN THE CENTER THIRD OF WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. EACH CASTING TO HAVE LIFTING HOLES CAST IN.

H / C4 CATCH BASIN
NTS



TRENCH NOTES:

A) TRENCH BACKFILL:
– IN PAVED AREAS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIALS DEEMED TO BE UNACCEPTABLE BY THE ENGINEER.

– IN CROSS–COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE.

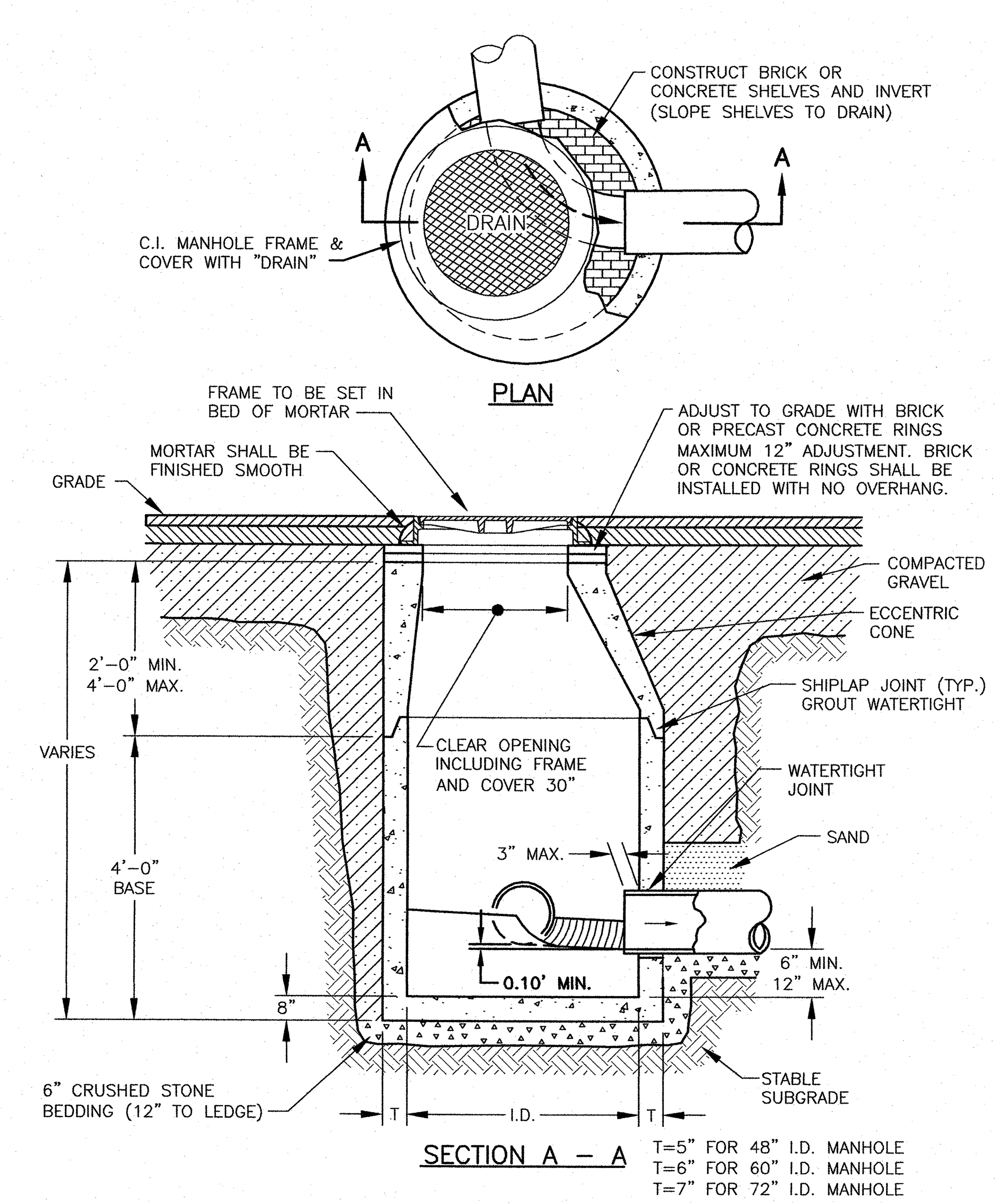
B) "W" = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D..

C) TRENCH SHEETING:
IF REQUIRED. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

D) MINIMUM PIPE COVER FOR UTILITY MAINS (UNLESS GOVERNED BY OTHER CODES):
6' MINIMUM FOR SEWER (IN PAVEMENT)
4' MINIMUM FOR SEWER (CROSS COUNTRY)
3' MINIMUM FOR STORMWATER DRAINS
5' MINIMUM FOR WATER MAINS

E) ALL PAVEMENT CUTS SHALL BE REPAIRED BY THE INFRARED HEAT METHOD.

I / C3 TYPICAL PIPE TRENCH
NTS



NOTES:
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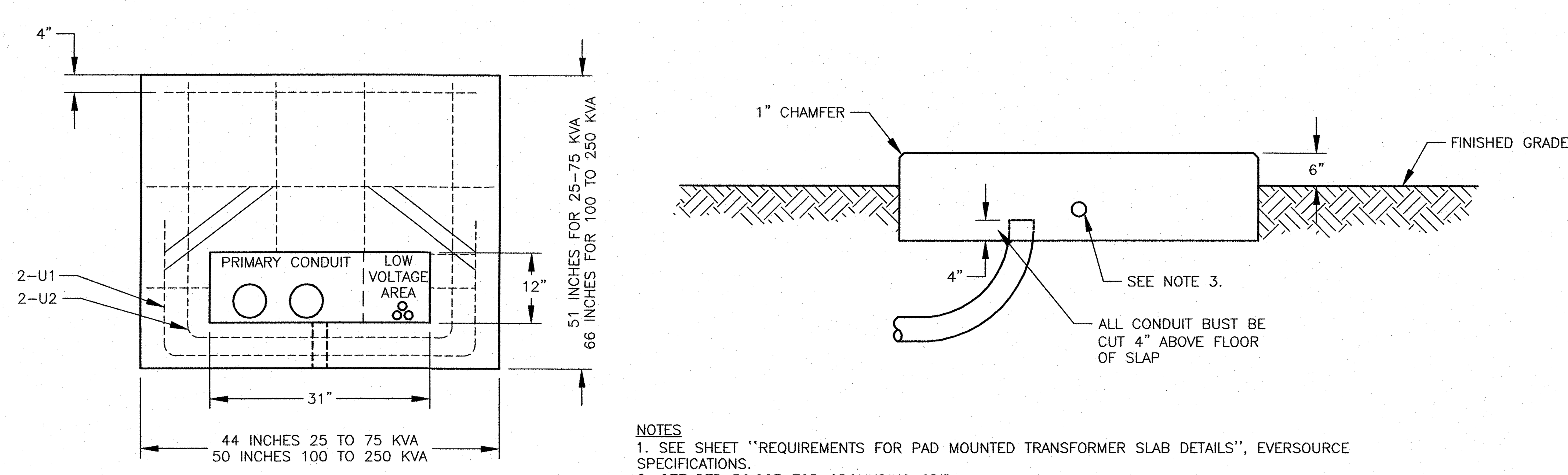
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FOOT.
4. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
5. ALL MANHOLES SHALL BE 48" I.D. UNLESS SPECIFIED OTHERWISE ON THE PLANS.
6. MANHOLE SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND H–20 LOADING.

J / C4 DRAIN MANHOLE DETAIL
NTS



NOTES
1. SEE SHEET "REQUIREMENTS FOR PAD MOUNTED TRANSFORMER SLAB DETAILS", EVERSOURCE SPECIFICATIONS.
2. SEE DTR 56.223 FOR GROUNDING GRID.
3. 1" PVC CONDUIT SLEEVE FOR GROUND GRID LEADS.
4. ALL REBAR TO BE #6.
5. CONDUITS CUT 4" ABOVE SLAB BASE.

G / C3 TRANSFORMER FOUNDATION SINGLE PHASE
EVERSOURCE NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

NOTES:

1) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

2) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1–888–DIG–SAFE (1–888–344–7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS

AS NOTED MARCH 2020

DETAILS

D2

3082.01

J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 DETAILS 2019.dwg, D2 DETAILS

HORIZONTAL ANCHOR DIMENSIONS FOR PIPE INSTALLATION IN ROCK

UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	TEE OR TAP SLEEVE H	TEE OR TAP SLEEVE L	90° BEND H	90° BEND L	45° BEND H	45° BEND L	22 1/2° BEND H	22 1/2° BEND L	11 1/4° BEND H	11 1/4° BEND L
* 4"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
6"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
8"	1'-2"	1'-2"	1'-2"	1'-2"	1'-0"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
10"	1'-4"	1'-4"	1'-4"	1'-4"	1'-0"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0'
12"	1'-8"	1'-8"	1'-8"	1'-8"	1'-3"	1'-3"	1'-0"	1'-0"	0'-9"	1'-0"

* – FOR 3" AND SMALLER PIPES

HORIZONTAL ANCHOR DIMENSIONS FOR AVERAGE SOIL CONDITIONS

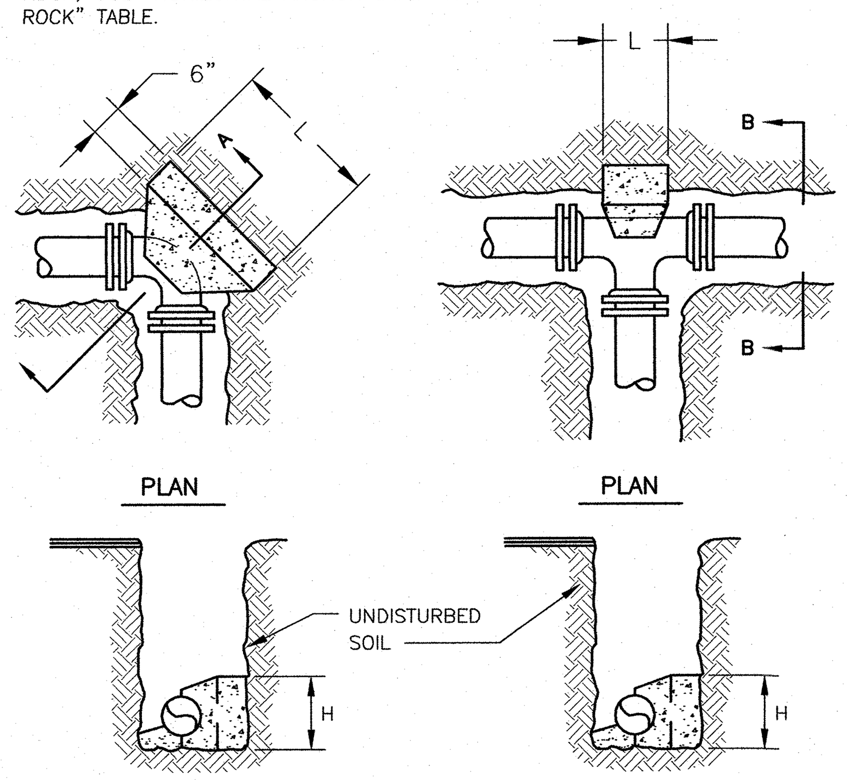
UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	TEE OR TAP SLEEVE H	TEE OR TAP SLEEVE L	90° BEND H	90° BEND L	45° BEND H	45° BEND L	22 1/2° BEND H	22 1/2° BEND L	11 1/4° BEND H	11 1/4° BEND L
* 4"	1'-0"	2'-0"	1'-0"	2'-0"	1'-0"	1'-4"	0'-9"	1'-0"	0'-6"	1'-0"
6"	1'-0"	2'-0"	1'-0"	2'-0"	1'-0"	1'-4"	0'-9"	1'-0"	0'-6"	1'-0"
8"	1'-4"	2'-8"	1'-4"	2'-8"	1'-4"	1'-6"	1'-0"	1'-0"	0'-9"	1'-0"
10"	1'-8"	3'-4"	1'-8"	3'-4"	1'-8"	2'-0"	1'-3"	1'-3"	1'-0"	1'-0'
12"	2'-0"	4'-0"	2'-0"	4'-0"	2'-0"	2'-2"	1'-6"	1'-6"	1'-3"	1'-3"

* – FOR 3" AND SMALLER PIPES

NOTES:
1) TABLES ARE BASED ON AN ALLOWABLE SOIL PRESSURE OF 3000 PSF ON UNDISTURBED EARTH BEHIND THE ANCHOR BLOCK. WHERE SOIL HAS BEEN DISTURBED BY ADJACENT EXCAVATIONS OR WHERE SOIL CANNOT WITHSTAND SUCH A PRESSURE, THE TABLE DOES NOT APPLY.

2) WHERE ENTIRE DEPTH OF PIPE IS BELOW THE TOP SURFACE OF SOUND ROCK, USE "HORIZONTAL ANCHOR DIMENSIONS FOR PIPE INSTALLATION IN ROCK" TABLE.

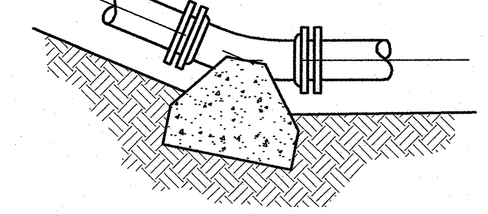


HORIZONTAL ANCHORING

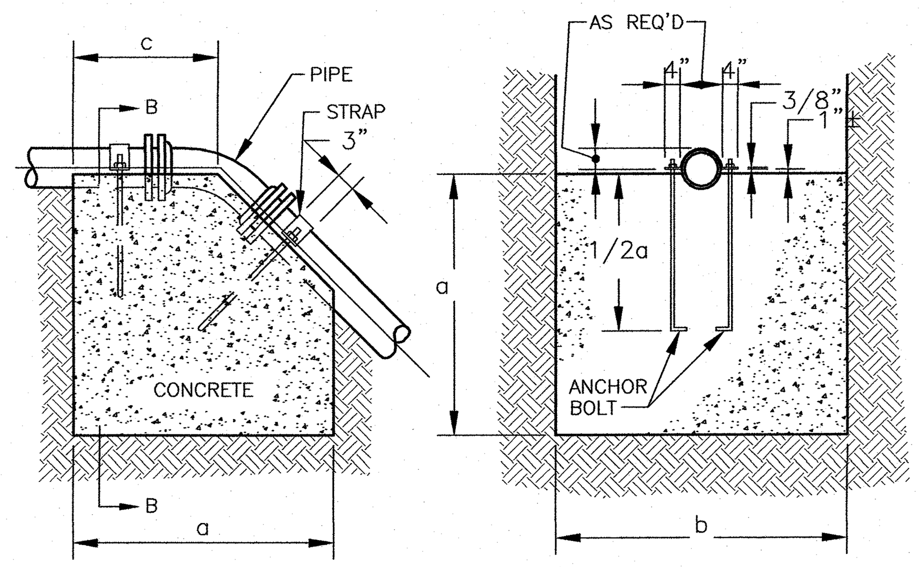
VERTICAL ANCHOR DIMENSIONS

UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	45° BEND DIMENSION a	45° BEND DIMENSION b	45° BEND DIMENSION c	45° BEND ROD DIA.	22 1/2° BEND DIMENSION a	22 1/2° BEND DIMENSION b	22 1/2° BEND DIMENSION c	22 1/2° BEND ROD DIA.	11 1/4° BEND DIMENSION a	11 1/4° BEND DIMENSION b	11 1/4° BEND DIMENSION c	11 1/4° BEND ROD DIA.
4"	3'-0"	3'-0"	2'-0"	3/4"	2'-6"	2'-3"	1'-6"	3/4"	2'-0"	2'-0"	1'-6"	3/4"
6"	3'-0"	3'-0"	2'-0"	3/4"	2'-6"	2'-3"	1'-6"	3/4"	2'-0"	2'-0"	1'-6"	3/4"
8"	3'-6"	3'-6"	2'-6"	3/4"	3'-0"	3'-0"	1'-9"	3/4"	2'-6"	2'-6"	1'-3"	3/4"
10"	4'-3"	4'-0"	3'-0"	3/4"	3'-6"	3'-3"	2'-0"	3/4"	2'-9"	2'-9"	1'-6"	3/4"
12"	4'-9"	4'-6"	3'-3"	3/4"	4'-0"	3'-9"	2'-6"	3/4"	3'-3"	3'-3"	1'-9"	3/4"

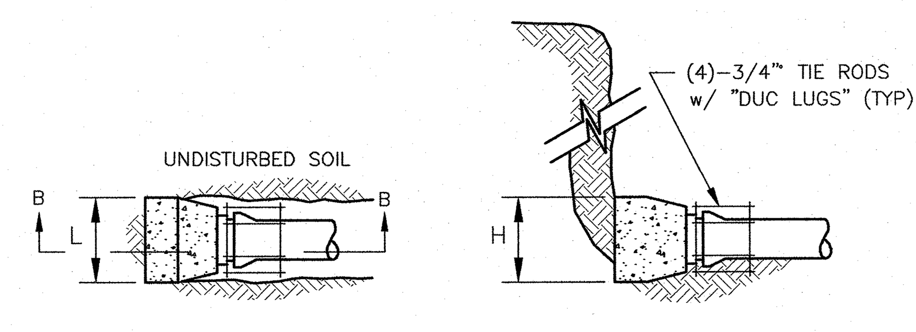


USE SAME DIMENSIONS AS FOR HORIZONTAL BEND ANCHORS



VERTICAL BEND

ALL EXPOSED PORTIONS OF ANCHOR STRAPS TO RECEIVE TWO FIELD COATS (MIN.) OF BITUMASTIC MATERIAL

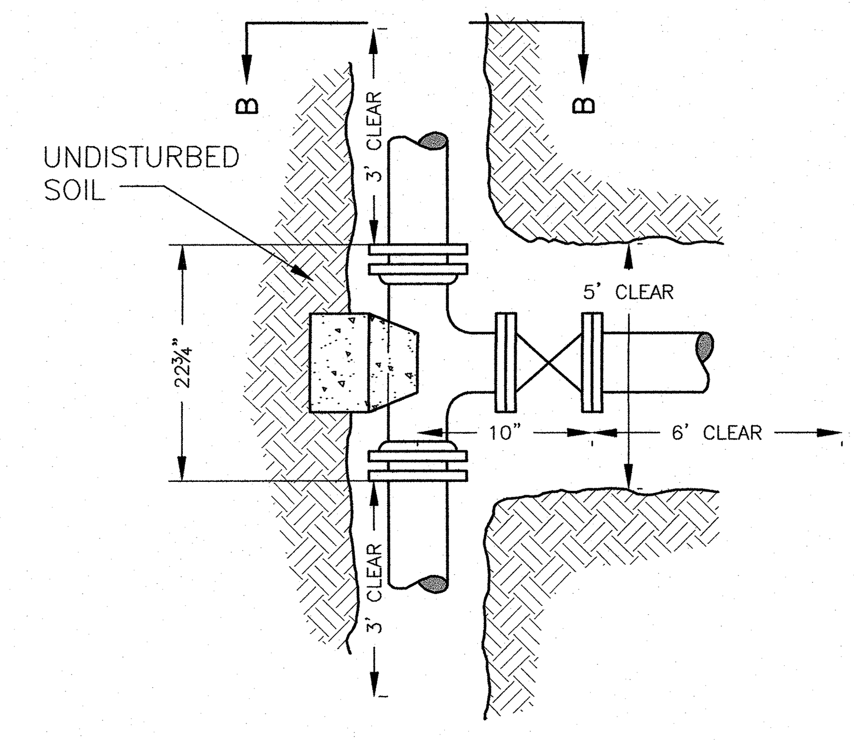


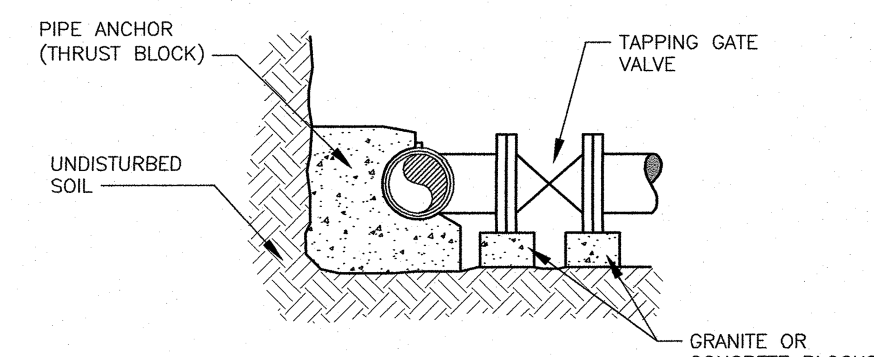
RESTRAINED PLUG OR CAP

NOTE: SEE CHART "HORIZONTAL ANCHOR DIMENSIONS" TIE RODS TO BE PROVIDED IN LIEU OF THRUST BLOCK

VERTICAL ANCHORING

K / C3 PRESSURE PIPE ANCHORING DETAILS
INSTALL PER PORTSMOUTH REQUIREMENTS NTS





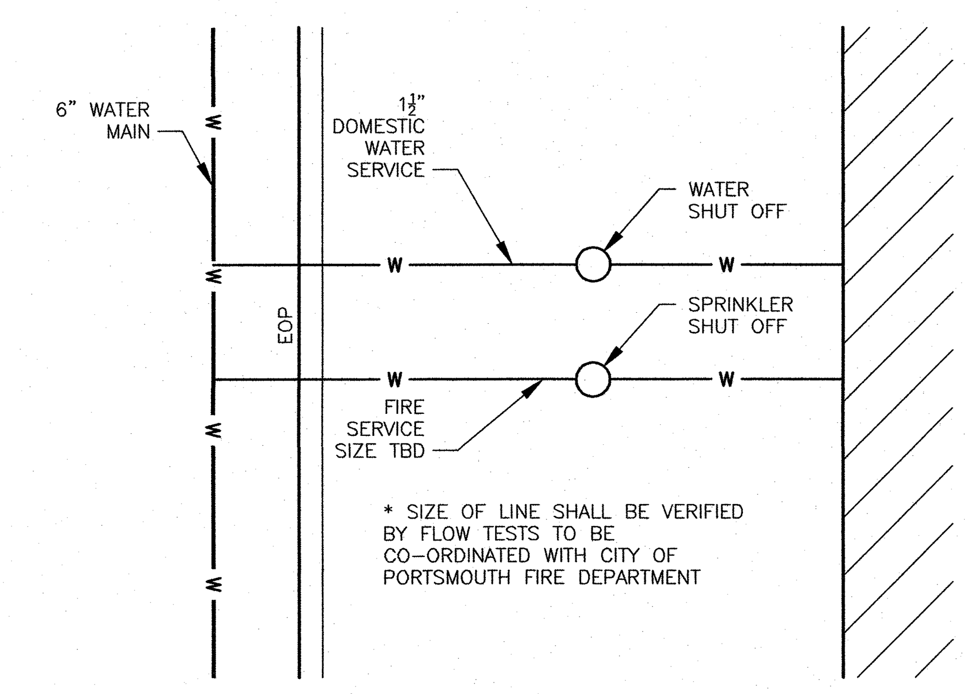
NOTES:
1) ALL MATERIALS SHALL BE APPROVED BY THE PORTSMOUTH WATER DEPARTMENT PRIOR TO INSTALLATION AND USE.

2) ALL JOINTS SHALL BE MECHANICAL.

3) "CLEAR" DIMENSIONS SHOWN ATE REQUIRED FOR WORKSPACE. NO JOINTS ON PIPE BEING TAPPED WITHIN "CLEAR" AREA.

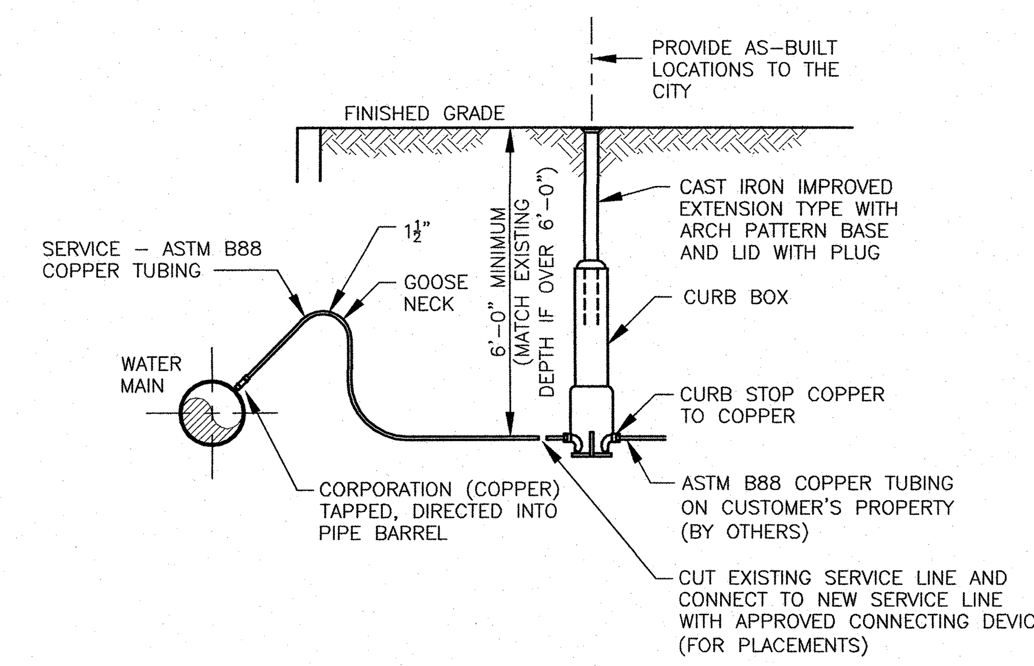
4) FORD TYPE STAINLESS STEEL TAPPING SADDLES OR APPROVED EQUAL ARE ALSO ACCEPTABLE.

M / C3 TAPPING SLEEVE AND GATE
INSTALL PER PORTSMOUTH REQUIREMENTS NTS

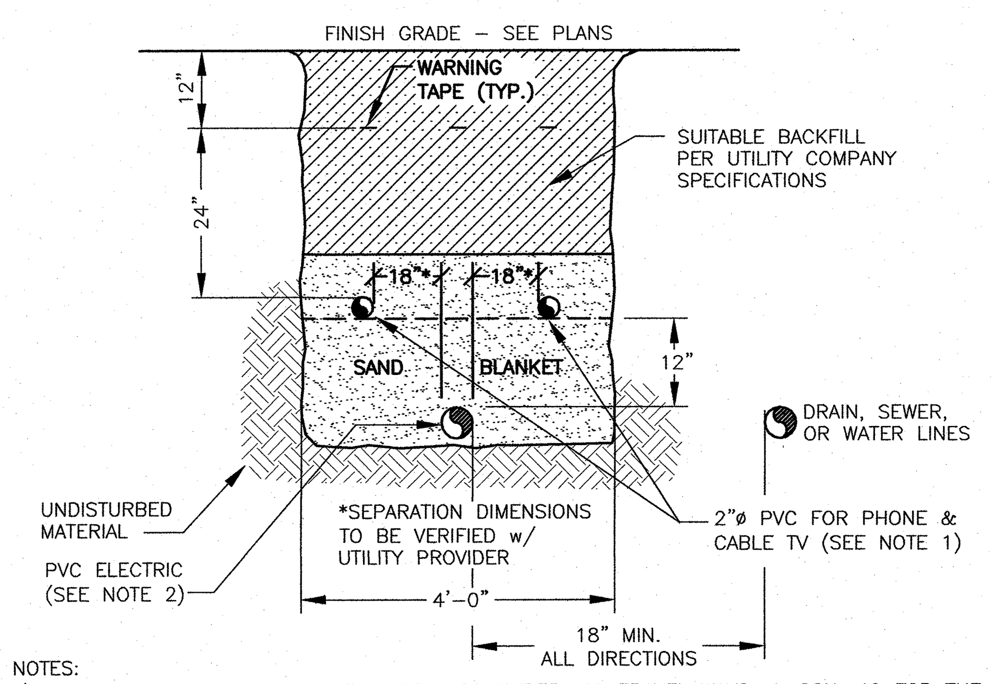


NOTES:
1) SIZE OF SPRINKLER LINE SHALL BE VERIFIED BY FLOW TESTS TO BE CO-ORDINATED WITH CITY OF PORTSMOUTH FIRE DEPARTMENT.

2) SPRINKLER SERVICE REQUIRED FOR UNIT 2 ONLY.

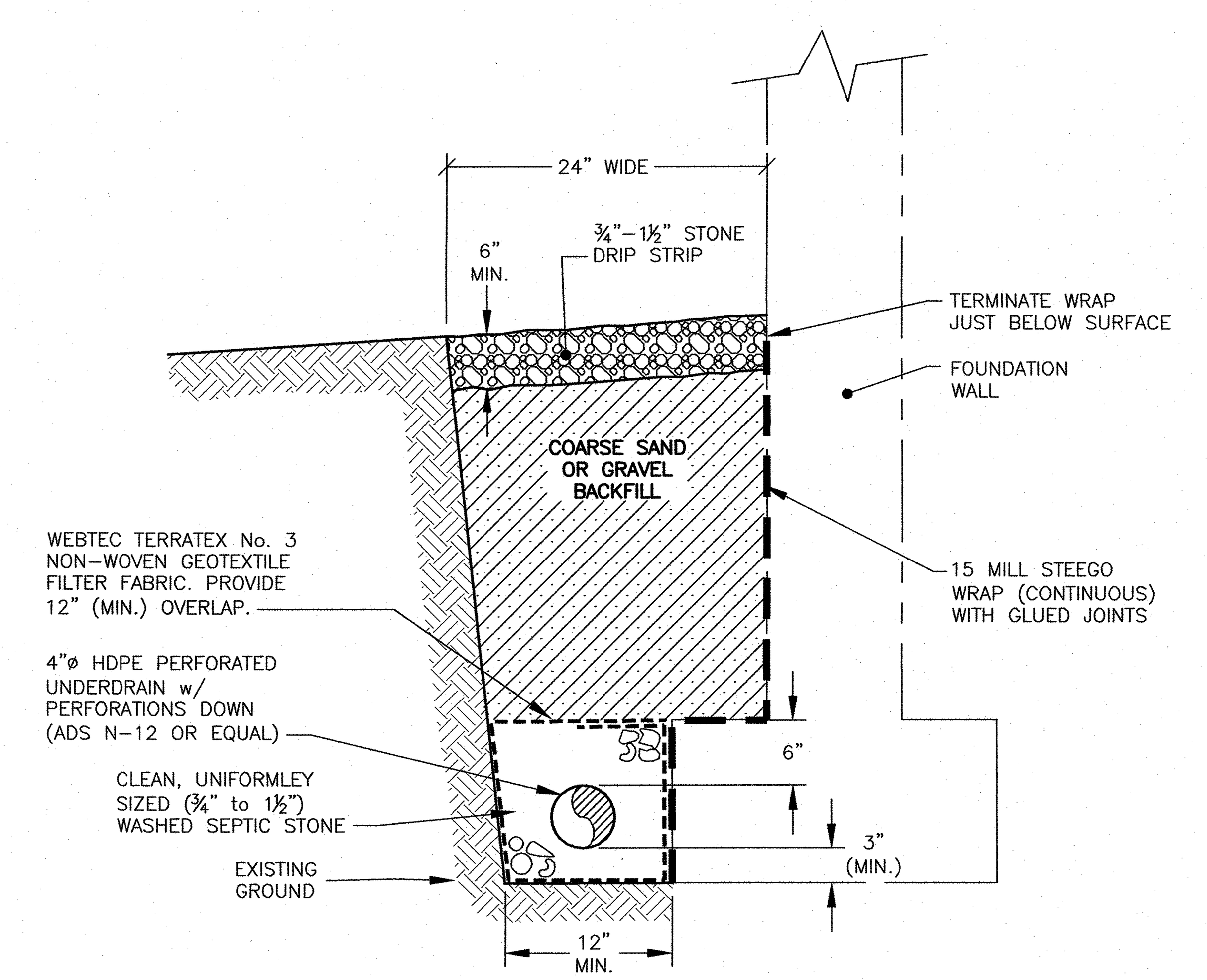


N / C3 TYPICAL WATER SERVICE CONNECTION
NTS



NOTES:
1) ALL CONDUIT TO BE U.L. LISTED, SCH. 80 UNDER ALL TRAVEL WAYS, & SCH. 40 FOR THE REMAINDER.
2) NORMAL CONDUIT SIZES FOR PSNH ARE 3 INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4 INCH FOR THREE PHASE SECONDARY, AND 5 INCH FOR THREE PHASE PRIMARY.
3) ALL WORK TO CONFORM TO THE NATIONAL ELECTRICAL CODE (LATEST REVISION)
4) INSTALL A 200# PULL ROPE FOR EACH CONDUIT
5) VERIFY ALL CONDUIT SPECIFICATIONS WITH UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION.

L / C3 UTILITY TRENCH
ELECTRIC/PHONE/CABLE NTS



O / C4 STONE DRIP APRON
(UNDER BUILDING DRIP LINE) NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

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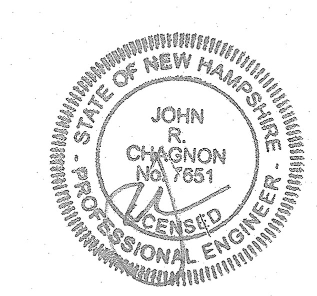
4) ALL WATER LINE INSTALLATION WORK SHALL BE TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS. DETAILS MAY OR MAY NOT BE UP-TO-DATE.

SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS



AS NOTED MARCH 2020

DETAILS D3

3082.01

J:\JOBS3\JN 3000's\JN 3080's\JN 3082\2019 Site Development\Plans & Specs\Site\3082 DETAILS 2019.dwg, D3 DETAILS

AMBIT ENGINEERING, INC. CIVIL ENGINEERS AND LAND SURVEYORS

200 Griffin Road, Unit 3, Portsmouth, NH 03801
Phone (603) 430-9282 Fax 436-2315

18 March 2020

Juliet Walker, Planning Director
City of Portsmouth
1 Junkins Avenue
Portsmouth, NH 03801

RE: Request for TAC Site Plan Approval at 41 Salem Street, Tax Map 144 / Lot 31

Dear Ms. Walker:

On behalf of Bonza Builders, LLC we hereby submit the attached and enclosed Site Plans for TAC Approval for a Residential Development at 41 Salem Street. The project proposes the construction of three new single family homes with the associated and required site improvements. The site is currently a single family home which will be demolished.

The following plans are included in our submission:

- Cover Sheet – This shows the Development Team, Legend, Site Location, and Site Zoning.
- Standard Boundary Survey – This plans show the property boundary lines and areas.
- Existing Conditions Plan C1 – This plan shows the existing features on the property.
- Site Layout Plan C2 – This plan shows the proposed site layout.
- Utility Plan C3 – This plan shows the proposed utilities including individual service connections.
- Grading and Erosion Control Plan C4 – This plan shows the proposed grading and erosion control. The project proposes off-site drainage improvements as project mitigation.
- Landscape Plan C5 – This plan shows the proposed landscaping at the site.
- Demolition Plan C6 – This plan shows site demolition. The existing single family residence will be removed from the property.
- Detail Sheets D1 to D3 – These plans show the associated construction details.

Also included herewith is the following Supplemental Information to assist in the review of the project: Site Plan Application Checklist, Site Cost Estimate, Trip Generation, and Architectural Plans. We look forward to the TAC Committee's review of this submission. If there are any questions or comments please feel free to reach out to me.

Sincerely,

John Chagnon

John R. Chagnon, PE
CC: Bonza Builders, LLC

Construction Cost Estimate

Bonza Builders, Inc.

Date: March 18, 2020

Project: Residential Development   Job No: 3082.01

Location: 41 Salem Street, Portsmouth, NH

Scope: **Site Cost Estimate**

ITEM NO	DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL
1	6" PVC Sewer	LF	145	$80.00	$11,600.00
2	15" HDPE Drainage Pipe	LF	146	$120.00	$17,520.00
3	Underdrains	LF	290	$38.00	$11,020.00
4	Catch basin	EA	2	$4,000.00	$8,000.00
5	4' DMH	EA	2	$4,000.00	$8,000.00
6	Crushed Gravel / Base Preparation	CY	88	$50.00	$4,400.00
7	Sidewalk	SY	38	$96.00	$3,648.00
8	Landscape Plantings	LS	1	$15,000.00	$15,000.00
9	Re-Set Curb	LF	65	$45.00	$2,925.00
10	Underground Electric / Conduit	LF	130	$55.00	$7,150.00
11	Transformer	EA	1	$10,000.00	$10,000.00
12	Water Services	LF	100	$80.00	$8,000.00
13	Erosion Control	LS	1	$1,000.00	$1,000.00
14	Paving	TON	22	$210.00	$4,620.00
15	Gas Service	LF	110	$85.00	$9,350.00
16	Demolition	LS	1	$5,000.00	$5,000.00
17	Drip Apron	LF	180	$35.00	$6,300.00
	TOTAL				**$133,533**

Note: This is an estimate of construction costs based upon various sources

APPLICATION FEE:

$500 + ($ 133533/1000 x $5) + (10,000 / 1,000 x $10)= $ 1,267.67

AMBIT ENGINEERING, INC. CIVIL ENGINEERS AND LAND SURVEYORS

200 Griffin Road, Unit 3, Portsmouth, NH 03801
Phone (603) 430-9282 Fax 436-2315

18 March, 2020

Trip Generation Calculation
Site Redevelopment
41 Salem Street
Portsmouth, NH

The purpose of this calculation is to identify the net change in vehicle trips expected to be generated by the site development at 41 Salem Street. Currently the lot has a single family residence. The plan is to remove the existing single family residence and construct three residential units on the lot.

In developing the expected trips Ambit Engineering considered the standard trip generation rates and equations published in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition (2012). The land use category that best correlates with the existing use is Single Family Home (ITE Land Use Code 220). The land use category that best correlates with the proposed use is "Residential Condominium / Townhouse" (ITE Land Use Code 230). The trip rates, based upon the number of dwelling units in the buildings are summarized below for the **Weekday AM and PM Peak Hour**:

Trip Generation Summary

Existing – AM Peak Hour

Single Family Home (0.75 trips per dwelling unit)	0.75 x 1 units = 1 trip
Total	1 trip

Proposed – AM Peak Hour

Condominium/Townhouse (0.44 trips per dwelling unit)	0.44 x 3 units = 2 trips
Total	2 trips

Existing – PM Peak Hour

Single Family Home (0.75 trips per dwelling unit)	0.75 x 1 units = 1 trip
Total	1 trip

Proposed – PM Peak Hour

Condominium/Townhouse (0.52trips per dwelling unit)	0.52 x 3 units = 2 trips
Total	2 trips

Trip Generation Impact

The increase anticipated with this project is 1 additional trip in the AM and 1 additional trip in the PM peak hours. The anticipated increase in traffic is negligible and does not substantially alter the traffic conditions. Salem Street is designed for uses such as the proposed project.

Please feel free to call if you have any questions or comments.

Sincerely,

John Chagnon

John R. Chagnon, PE

11/25/2019

Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

Prelim / Work in Progress 603-431-9559

11/25/2019

Clara

1011.500.v2 - 41 Salem St

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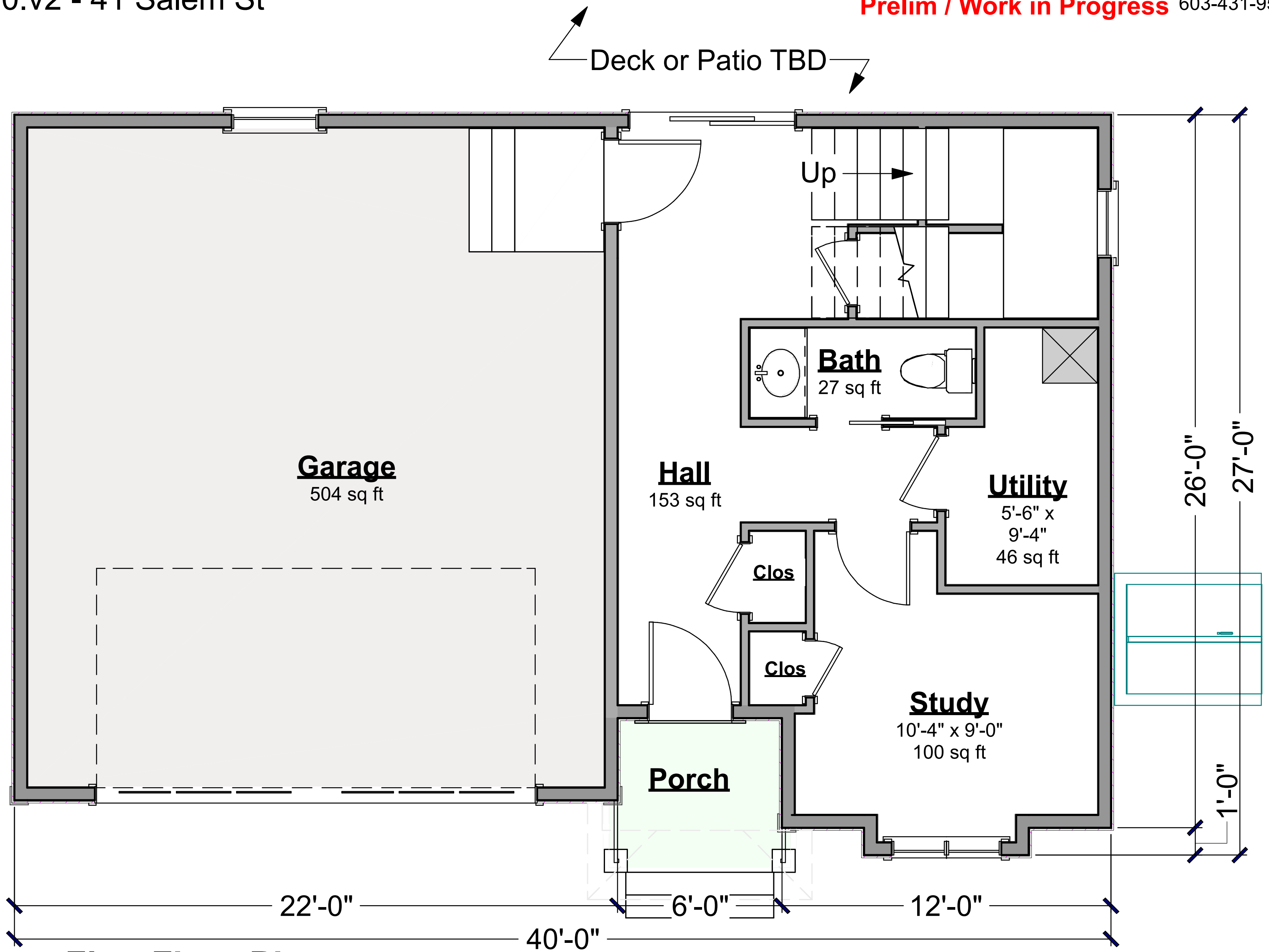


First Floor Plan

Scale: 1/8" = 1'-0"

Living Area this Floor: 460 sq ft
8ft Finished Ceiling Height

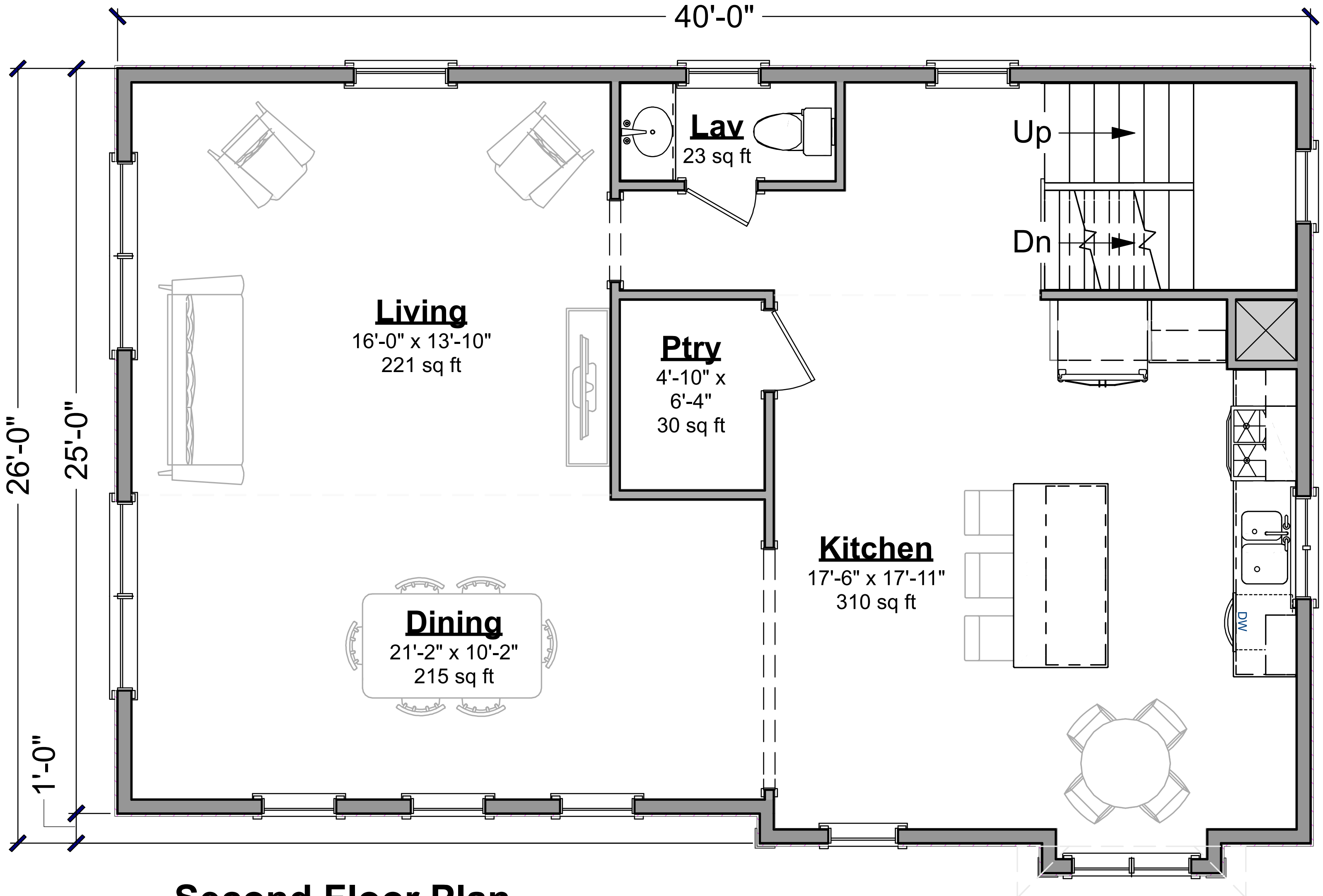
Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

Prelim / Work in Progress 603-431-9559

NOTE; Front Buildings are 36 feet wide



Second Floor Plan

Scale: 1/8" = 1'-0"

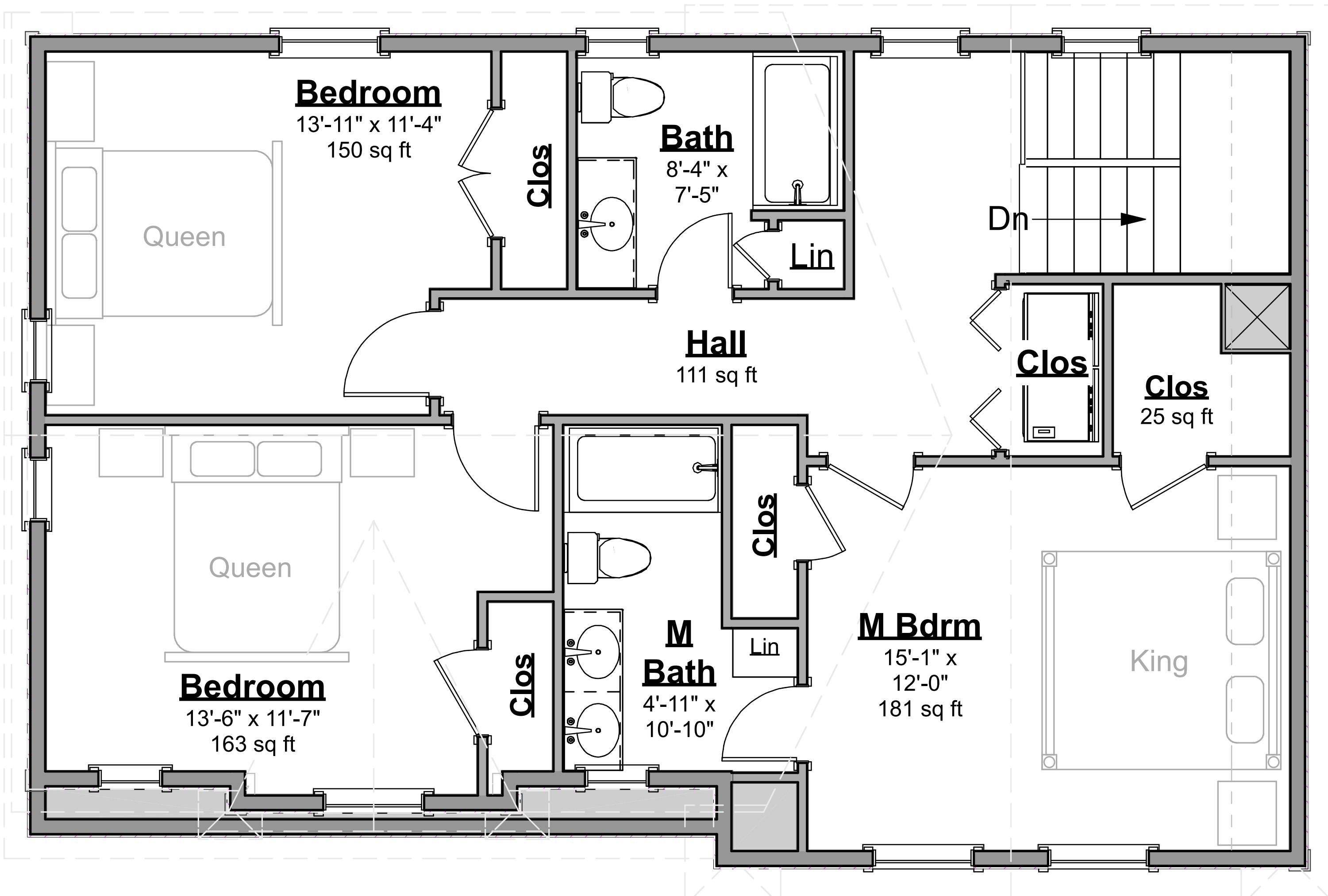
Living Area this Floor: 1024 sq ft
8ft Finished Ceiling Height

Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

Prelim / Work in Progress 603-431-9559



Third Floor Plan

Scale: 1/8" = 1'-0"

Living Area this Floor: 986 sq ft
8ft Finished Ceiling Height

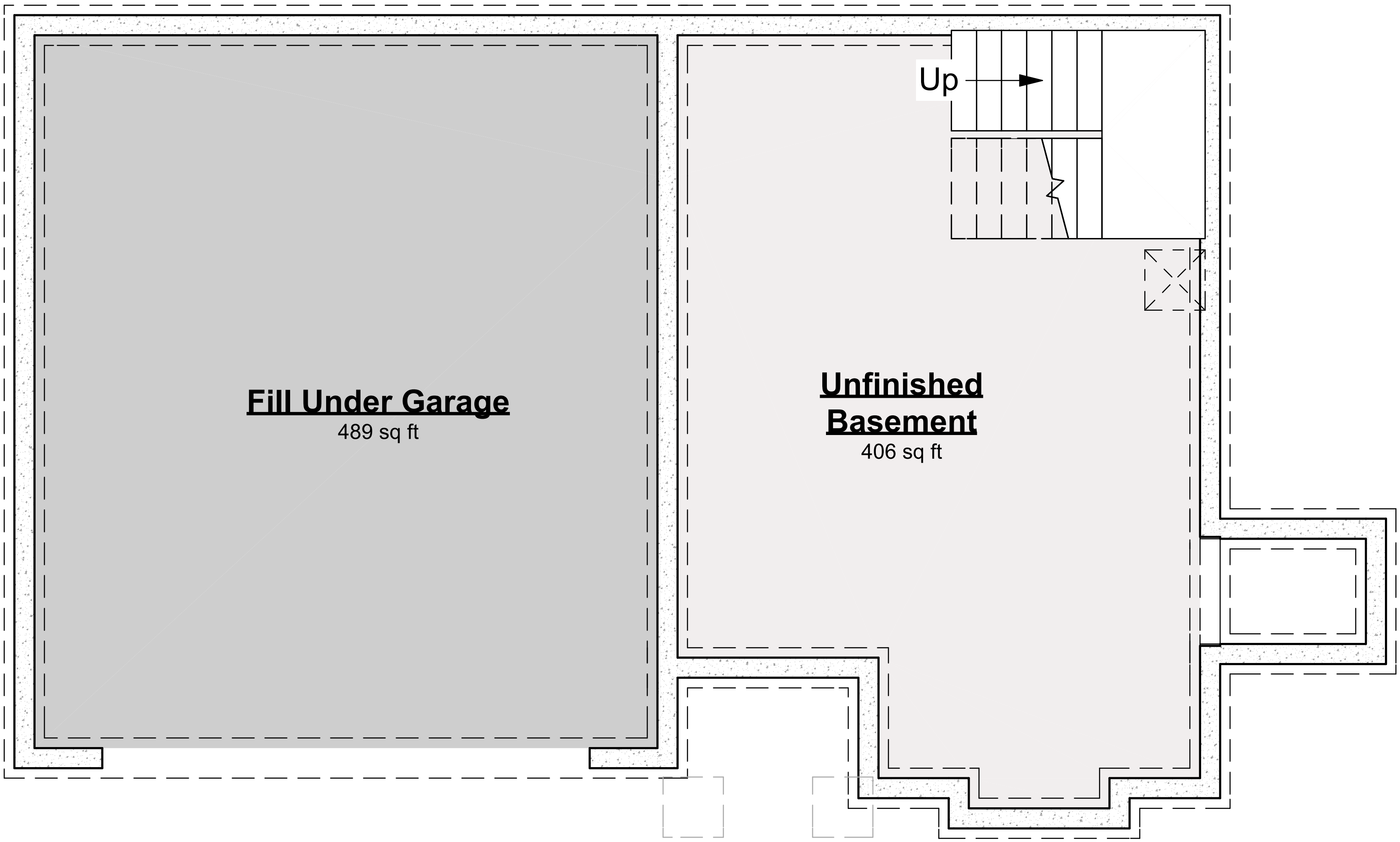
Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

603-431-9559

Prelim / Work in Progress



IMPORTANT:

- Unless an area is specifically designed as "no posts", additional posts may be required.
- Unless specifically noted otherwise, basement beams will be framed below the floor joists.
- Basement spaces accommodate utilities, mechanical equipment and the horizontal movement of plumbing pipes, electrical wires and heating ducts. Both as part of any Construction Drawings produced based on this design and as future decisions made by the builder, changes to accommodate these items must be expected.
- Basement window locations are dependent on site conditions and utility locations. Clarify number and location with your builder.

Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

Prelim / Work in Progress 603-431-9559

Front Elevation

Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

Prelim / Work in Progress 603-431-9559

Rear Elevation

Clara

1011.500.v2 - 41 Salem St

Art Form Architecture, Inc.

603-431-9559

Prelim / Work in Progress

Right Elevation

Left Elevation

DRAINAGE ANALYSIS

PROPOSED RESIDENTIAL REDEVELOPMENT

41 Salem Street
PORTSMOUTH, NH

March 18, 2020

STATE OF NEW HAMPSHIRE
JOSEPH
L.
MULLEDY
No. 11502
LICENSED
PROFESSIONAL ENGINEER

3/16/20

Ambit Engineering, Inc.

Civil Engineers and Land Surveyors
200 Griffin Road, Unit 3
Portsmouth, NH 03801
Phone: 603.430.9282; Fax: 603.436.2315
E-mail: jlm@ambitengineering.com

(Ambit Job Number3082.01)

TABLE OF CONTENTS

REPORT

EXECUTIVE SUMMARY

The hydrologic modeling for this project considers the "Extreme Precipitation" values from The Northeast Regional Climate Center (Cornell University). For modeling purposes, these values have been used and are included in this report.

This drainage analysis examines the pre-development (existing) and post-development (proposed) stormwater drainage patterns for the proposed redevelopment of a residential lot with an existing single family home and construction of three single family homes and associated site improvements at 41 Salem Street in Portsmouth, NH. The site is shown on the City of Portsmouth Assessor's Tax Map 144 as Lot 31. The total lot size is 10,903 square-feet (0.2503 acres).

The new buildings will be serviced by public water and sewer. The development has the potential to increase stormwater runoff to adjacent properties, and therefore must be designed in a manner to prevent that occurrence. This will be done primarily by capturing stormwater runoff and routing it through appropriate stormwater facilities, designed to ensure that there will be no increase in peak runoff from the site as a result of this project.

PROPOSED RESIDENTIAL

REDEVELOPMENT

41 Salem Street

PORTSMOUTH, NH

INTRODUCTION / PROJECT DESCRIPTION

This drainage report is designed to assist the owner, planning board, contractor, regulatory reviewer, and others in understanding the impact of the proposed development project on local surface water runoff and quality. The project site is shown on the City of Portsmouth, NH Assessor's Tax Map 144 as Lot 31.

Bounding the site to the east, south and west are single and multi-family residential properties. Bounding the site to the west is Salem Street and beyond are residential properties. The property is situated in the General Residence C (GRC) Zoning District. A vicinity map is included in the Appendix to this report.

The proposed development will demolish an existing residential structure and construct three new single family units, new driveway and other associated improvements such as a utilities and landscaping. The project is anticipated to begin construction in the spring of 2020 and be substantially completed by the fall of 2020.

This report includes information about the existing site and the proposed development necessary to analyze stormwater runoff and to design any required mitigation. The report includes maps of pre-development and post-development watersheds, sub-catchment areas and calculations of runoff. The report will provide a narrative of the stormwater runoff and describe numerically and graphically the surface water runoff patterns for this site. Proposed stormwater management and treatment structures and methods will also be described, as well as erosion and sediment control practices. To fully understand the proposed site development the reader should also review a complete site plan set in addition to this report.

METHODOLOGY

This report uses the US Soil Conservation Service (SCS) Method for estimating stormwater runoff. The SCS method is published in The National Engineering Handbook (NEH), Section 4 "Hydrology" and includes the Technical Release No. 20, (TR-20) "Computer Program for Project Formulation Hydrology", and Technical Release No. 55 (TR-55) "Urban Hydrology for

Small Watersheds” methods. This report uses the HydroCAD version 10.0 program, written by HydroCAD Software Solutions LLC, Chocorua, N.H., to apply these methods for the calculation of runoff and for pond modeling. The hydrologic modeling considers the “Extreme Precipitation” values from The Northeast Regional Climate Center (Cornell University).These values have been used and are included in this report.

Time of Concentration (Tc) is calculated by entering measured flow path data such as flow path type, length, slope and surface characteristics into the HydroCAD program. For the purposes of this report, a minimum time of concentration of 5 minutes is used.

The storm events used for the calculations in this report are the 10-year and 50-year (24-hour) storms. Watershed basin boundaries have been delineated using topographic maps prepared by Ambit Engineering and field observations to confirm.

SITE SPECIFIC INFORMATION

Based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Soil Survey of Rockingham County, New Hampshire, and confirmed by field exploration conducted by Ambit Engineering, Inc., the site is made up of one soil type:

699 – Urban land – This soil does not have a Hydrologic Soil Group (HSG) classification. Four test pits were conducted to a depth of about 60” and found to have fairly consistent soil types across all four. Soils were found to be generally fine sandy loam over fine loamy sand and silty or clayey soils to greater depths. The test pit locations and logs can be reviewed on Sheet C4.

The physical characteristics of the site consist of (1-5%) grades that generally slope downward from the west (front along Salem Street) to the east (back). Elevations on the site range from 24 to 19 feet above sea level. The existing site is partially developed and includes an existing building located at the front of the lot, with an asphalt driveway. Vegetation around the developed portion of the lot consists of established grasses, shrubs and trees.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) number 33015C0259E (effective date May 17, 2005), the project site is located in Zone X and is determined to be outside of the 0.2% annual chance floodplain. A copy of the FIRM map is included in the Appendix.

PRE-DEVELOPMENT DRAINAGE

The existing site drains via overland flow from the front of the lot at Salem Street towards the rear of the site. There is no existing stormwater detention or treatment on the site.

In the pre-development condition, the site has been analyzed as one single watershed basin (ES1) based on localized topography and discharge location. Additionally, there is runoff entering the lot from Off Site. This off site area has been analyzed as a singl watershed basin (OS1). ES1 and OS1 flow overland directly to the northeast corner of the lot to Discharge Point 1 (DP1) and further at Discharge Point 2 (DP2) which is a catch basin located at the corner of McDonough and Cabot Street. The majority of the lot is previously developed consisting of a single family home, paved driveway and grassed / landscaped yard. The runoff curve number (CN) for Subcatchment ES1 is calculated to be 67 with impervious coverage of 15.13%. The CN value for Subcatchment OS1 is calculated to be 89 with 74.45% impervious coverage. The Time of Concentration in all subcatchments accounts for the flow paths that are not modeled as ponds (catch basins). This produces an accurate analysis of the timing of the peak at Discharge Point 2.

Table 1: Pre-Development Watershed Basin Summary

Watershed Basin ID	Basin Area (SF)	Tc (MIN)	CN	10-Year Runoff (CFS)	50-Year Runoff (CFS)	Design Point
ES1	10.903	5.5	67	0.63	1.31	DP1/DP2
OS1	18,588	10.6	89	1.78	2.86	DP1/DP2

POST-DEVELOPMENT DRAINAGE

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. In the post-development condition, the site has been analyzed as five separate watersheds (PS1, PS1a, PS2, PS3 and OS 1) based on localized topography and discharge locations. Subcatchments PS1 and PS2 are primarily site runoff (grass and asphalt driveway pavement) that flow overland to a proposed catch basin located on site near the driveway entrance along Salem Street and further down Salem Street within a proposed closed drainage system which will tie into the existing closed drainage in McDonough Street. Subcatchment PS1a is runoff from the roofs of all three homes that is filtered through Drip Edge Filter Strips located at each home. This treated runoff discharges to the catch basin located at the corner of the driveway entrance along Salem Street. Subcathment PS3 is the remainder of the lot which is not directed to Salem Street. This runoff flows via a grassed pathway through adjacent lots to McDonough Street. Subcatchment OS 1 is the same area of off site runoff as in the existing conditions which combines with the runoff from PS3 and discharges via the same grassed pathway to McDonough Street and further to the catch basin located at the corner of McDonough and Cabot Streets. This allows for a detailed review of Design Points to show the comparison of runoff from the site in the pre-development and post-development conditions as well as off site points of interest. The Time of Concentration in all subcatchments accounts for the flow paths that are not modeled as ponds (catch basins). This produces an accurate analysis of the timing of the peak at Discharge Point 2.

The runoff curve number (CN) for basin PS1 is calculated to be 79 with impervious coverage of 48.83%. The runoff curve number (CN) for basin PS1a is calculated to be 98 with impervious coverage of 100.00%. The runoff curve number (CN) for basin PS2 is calculated to be 79 with impervious coverage of 47.84%. The runoff curve number (CN) for basin PS3 is calculated to be 61 with impervious coverage of 0.00%. The runoff curve number (CN) for basin OS 1 is unchanged compared to the existing conditions.

Table 2: Post-Development Watershed Basin Summary

Watershed Basin ID	Basin Area (SF)	Tc (MIN)	CN	10-Year Runoff (CFS)	50-Year Runoff (CFS)	Design Point
PS1	2,893	0.8	79	0.29	0.51	DP1/DP2
PS1a	2,717	10.0	98	0.30	0.45	DP1/DP2
PS2	1,411	1.1	79	0.14	0.24	DP1/DP2
PS3	3,882	6.3	61	0.16	0.38	DP1/DP2
OS 1	18,588	10.6	89	1.78	2.86	DP1/DP2

The overall impervious coverage of the area analyzed in this report for all basins **increases** from 15,489 square feet (52.52%) in the pre-development condition to 18,641 square feet (63.21%) in the post-development condition. Since the site represents an increase in impervious area, the project proposes the construction of Drip Edge Soil Filters along the rooflines of each home to filter and slow the rate of runoff from the site. Since no treatment systems currently exist for the site, providing this proposed treatment is a vast improvement on the water quality of the runoff.

Table 3 shows a summary of the comparison between pre-developed flows and post-developed flows for the design point.

Table 3: Pre-Development to Post-Development Peak Flow Comparison

	Q2 (CFS)		Q10 (CFS)		Q25 (CFS)		Q50 (CFS)	
Design Point	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP 1	1.29	1.12	2.34	1.94	3.20	2.61	4.02	3.23
DP 2	1.29	1.41	2.34	2.44	3.20	3.25	4.02	4.02

Table 4 shows a summary of the comparison between the timing of pre-developed flows and the timing of post-developed flows for the design point. The goal here was to match those peaks as close as possible.

Table 3: Pre-Development to Post-Development Timing of Peak Flow Comparison

	Q2 (hrs)		Q10 (hrs)		Q25 (hrs)		Q50 (hrs)	
Design Point	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP 1	12.15	12.14	12.14	12.14	12.13	12.14	12.12	12.14
DP 2	12.14	12.14	12.14	12.13	12.13	12.13	12.12	12.13

EROSION AND SEDIMENT CONTROL PRACTICES

The erosion potential for this site as it exists is low due to the existing vegetation and the built-up nature of the surrounding sites. During construction, the major potential for erosion is wind and stormwater runoff. The contractor will be required to inspect and maintain all necessary erosion control measures, as well as installing any additional measures as required. All erosion control practices shall conform to "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire." Some examples of erosion and sediment control measures to be utilized for this project during construction may include:

- Silt Soxx (or approved alternative) located at the toe of disturbed slopes
- Stabilized construction entrance at access point to the site
- Temporary mulching and seeding for disturbed areas
- Spraying water over disturbed areas to minimize wind erosion

After construction, permanent stabilization will be accomplished by permanent seeding, landscaping and surfacing the access drives and parking areas with either compacted gravel or asphalt paving.

CONCLUSION

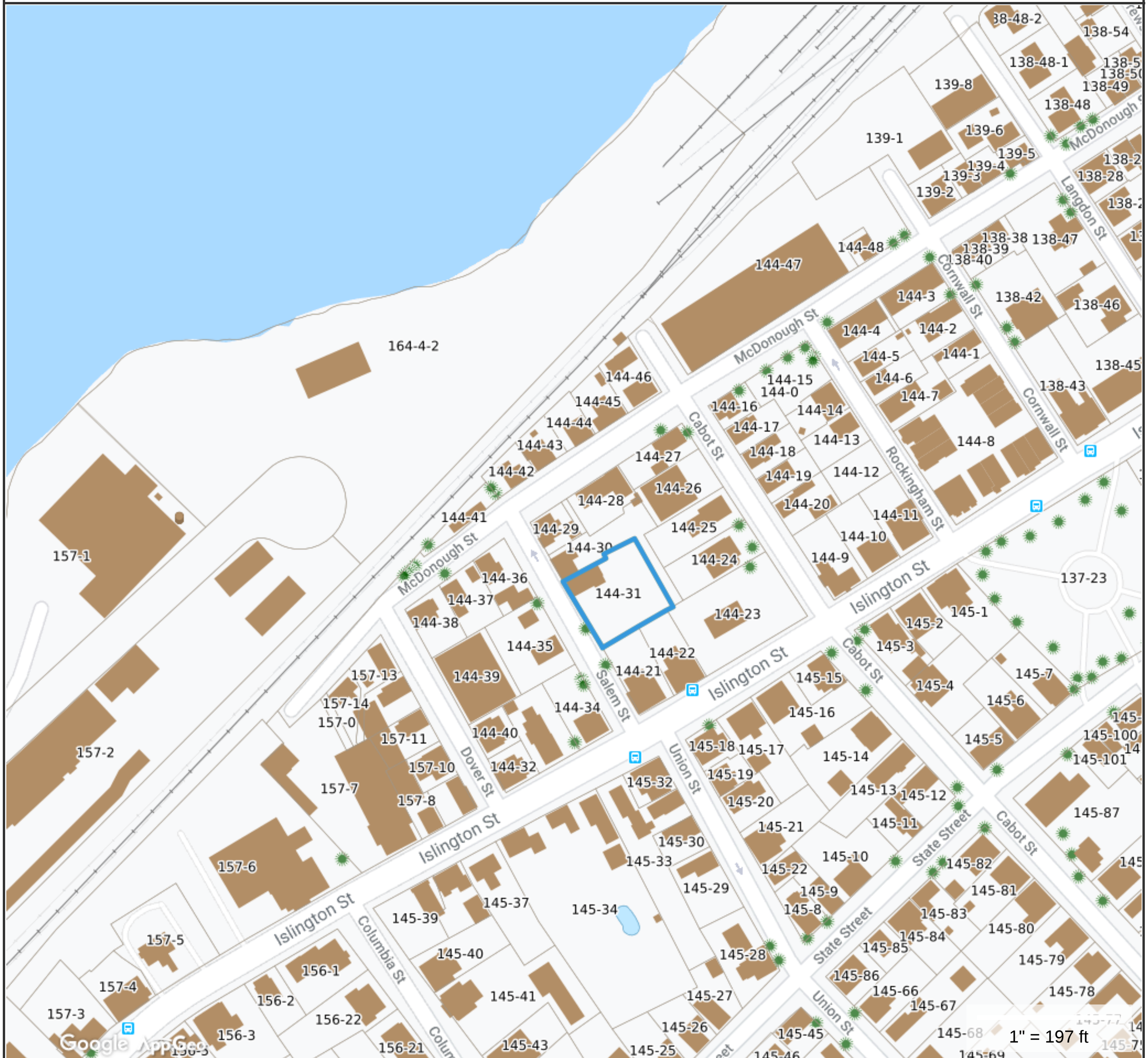
The proposed development has been designed to be low impact in terms of stormwater quality and quantity. With the design of a much needed closed drainage system within Salem Street and on Site Stormwater Controls such as the Drip Edge Soil Filters, Stormwater runoff is managed to mitigate impacts to neighboring properties. Erosion and sediment control practices will be implemented for both the temporary condition during construction and for final stabilization after construction. Therefore, there are no negative impacts to downstream receptors or adjacent properties anticipated as a result of this project. There is also no negative impact to the City of Portsmouth storm drainage system.

REFERENCES

1. City of Portsmouth, NH. Site Plan Review Regulations amended December 18, 2014.
2. Comprehensive Environmental Inc. and New Hampshire Department of Environmental Services. *New Hampshire Stormwater Manual (Volumes 1, 2 and 3)*, December 2008 (Revision 1.0).
3. Minnick, E.L. and H.T. Marshall. *Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire*, prepared by Rockingham County Conservation District, prepared for New Hampshire Department of Environmental Services, in cooperation with USDA Soil Conservation Service, August 1992.
4. HydroCAD Software Solution, LLC. *HydroCAD Stormwater Modeling System Version 10.0* copyright 2013.

APPENDIX A

VICINITY (TAX) MAP



Property Information

Property ID	0144-0031-0000
Location	41 SALEM ST
Owner	BONZA BUILDERS LLC

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Geometry updated 4/1/2019
Data updated 7/17/2019

APPENDIX B

TABLES, CHARTS, ETC.

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	No
State	New Hampshire
Location	
Longitude	70.770 degrees West
Latitude	43.069 degrees North
Elevation	0 feet
Date/Time	Tue, 17 Apr 2018 15:07:43 -0400

Inches of Rain - 24 HR Event

2 YR = 3.21 x 15% = 3.69

10 YR = 4.87 x 15% = 5.60

25 YR = 6.17 x 15% = 7.10

50 Yr = 7.39 x 15% = 8.50

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.66	0.81	1.00	**1yr**	0.70	0.98	1.14	1.57	2.01	2.66	2.92	**1yr**	2.35	2.81	3.22	3.94	4.55	**1yr**
2yr	0.32	0.50	0.61	0.83	1.02	1.21	**2yr**	0.88	1.18	1.40	1.87	2.40	3.21	3.57	**2yr**	2.84	3.43	3.94	4.68	5.33	**2yr**
5yr	0.37	0.58	0.71	0.98	1.25	1.50	**5yr**	1.08	1.47	1.73	2.32	2.96	4.07	4.58	**5yr**	3.60	4.40	5.04	5.94	6.70	**5yr**
10yr	0.42	0.65	0.80	1.12	1.45	1.76	**10yr**	1.25	1.72	2.04	2.72	3.47	4.87	5.53	**10yr**	4.31	5.32	6.08	7.11	7.98	**10yr**
25yr	0.50	0.76	0.94	1.35	1.77	2.19	**25yr**	1.53	2.14	2.53	3.38	4.28	6.17	7.10	**25yr**	5.46	6.83	7.80	9.02	10.05	**25yr**
50yr	0.56	0.86	1.07	1.54	2.07	2.58	**50yr**	1.78	2.52	2.98	3.99	5.02	7.39	8.58	**50yr**	6.54	8.25	9.42	10.81	11.98	**50yr**
100yr	0.64	0.97	1.22	1.76	2.41	3.04	**100yr**	2.08	2.97	3.51	4.70	5.89	8.85	10.38	**100yr**	7.84	9.98	11.38	12.96	14.28	**100yr**
200yr	0.73	1.10	1.40	2.02	2.82	3.59	**200yr**	2.43	3.51	4.14	5.55	6.91	10.61	12.55	**200yr**	9.39	12.07	13.75	15.55	17.03	**200yr**
500yr	0.88	1.30	1.68	2.44	3.47	4.47	**500yr**	2.99	4.37	5.14	6.90	8.55	13.49	16.15	**500yr**	11.93	15.53	17.67	19.78	21.50	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.86	0.92	1.33	1.68	2.23	2.50	**1yr**	1.98	2.40	2.86	3.17	3.89	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.06	3.45	**2yr**	2.71	3.32	3.82	4.55	5.08	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.79	4.19	**5yr**	3.35	4.03	4.72	5.54	6.24	**5yr**
10yr	0.39	0.59	0.73	1.03	1.32	1.60	**10yr**	1.14	1.56	1.81	2.39	3.06	4.37	4.87	**10yr**	3.87	4.68	5.45	6.42	7.20	**10yr**
25yr	0.44	0.67	0.83	1.19	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.71	5.90	**25yr**	4.17	5.68	6.66	7.80	8.69	**25yr**
50yr	0.48	0.73	0.91	1.31	1.77	2.17	**50yr**	1.52	2.12	2.35	3.08	3.94	5.32	6.82	**50yr**	4.71	6.56	7.74	9.06	10.03	**50yr**
100yr	0.54	0.81	1.01	1.47	2.01	2.47	**100yr**	1.74	2.41	2.63	3.42	4.36	5.98	7.87	**100yr**	5.29	7.57	9.00	10.53	11.58	**100yr**
200yr	0.59	0.89	1.13	1.63	2.28	2.82	**200yr**	1.97	2.75	2.93	3.79	4.80	6.70	9.09	**200yr**	5.93	8.74	10.46	12.25	13.39	**200yr**
500yr	0.69	1.02	1.31	1.91	2.71	3.37	**500yr**	2.34	3.29	3.41	4.33	5.47	7.79	10.98	**500yr**	6.89	10.56	12.75	14.99	16.21	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.99	3.16	**1yr**	2.64	3.04	3.58	4.38	5.05	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.43	3.70	**2yr**	3.03	3.56	4.09	4.84	5.63	**2yr**
5yr	0.40	0.62	0.76	1.05	1.34	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.34	4.96	**5yr**	3.84	4.77	5.38	6.37	7.15	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.95	5.34	6.19	**10yr**	4.72	5.96	6.81	7.83	8.74	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.56	**25yr**	1.76	2.51	2.95	4.07	5.14	7.79	8.33	**25yr**	6.90	8.01	9.13	10.33	11.40	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.12	3.05	3.59	4.99	6.30	9.76	10.44	**50yr**	8.64	10.03	11.41	12.71	13.95	**50yr**
100yr	0.79	1.19	1.49	2.15	2.95	3.80	**100yr**	2.55	3.72	4.37	6.15	7.74	12.22	13.07	**100yr**	10.81	12.57	14.25	15.67	17.07	**100yr**
200yr	0.92	1.39	1.76	2.54	3.55	4.64	**200yr**	3.06	4.54	5.33	7.57	9.50	15.33	16.40	**200yr**	13.57	15.77	17.84	19.31	20.90	**200yr**
500yr	1.14	1.70	2.19	3.18	4.52	6.02	**500yr**	3.90	5.88	6.91	10.00	12.50	20.72	22.13	**500yr**	18.34	21.28	24.00	25.46	27.31	**500yr**

SCS METHODS

Technical Release - 55 Urban Hydrology for Small Watersheds

TR-55 presents simplified procedures to calculate storm runoff volume, peak rate of discharge, partial hydrographs and storage volumes for water control structures. The procedures are applicable to small watersheds, especially urbanizing watersheds with time of concentration between 0.1 hours and 10.0 hours. TR-55 is an approximation of the more detailed TR-20 method and does not have TR-20's capability to flood route. The user should examine the sensitivity of the analysis being conducted to ensure that the degree of error is tolerable. TR-55 contains two methods, the Tabular Hydrograph method and the Graphical Peak Discharge method. The accuracy of both methods is comparable; they differ only in their output. Both methods are based on open and unconfined flow over land and in channels.

The TR-55 Tabular Method can develop partial composite flood hydrographs at any point in a watershed by dividing the watershed into homogeneous subareas. By doing this, the method can estimate runoff from a larger nonhomogeneous watershed. The method is especially applicable for estimating the effects of land use change in a portion of a watershed. It can also be used to estimate the effects of proposed structures. The TR-55 Graphical Peak Discharge method calculates peak discharge using an assumed unit hydrograph and a thorough, but rapid, evaluation of the soils, slope, and surface cover characteristics of the watershed. This method is recommended for use in the design of all erosion and sediment control measures and simple stormwater management practices. When more detail and accuracy are required or when an accurate simulation of natural conditions is required, one of the other appropriate methods should be used. The TR-55 Graphical Peak Discharge method is the method that is discussed in this manual.

SCS TR-55 Graphical Peak Discharge Method

The peak discharge equation used in this method is:

$$q_p = q_u A_m Q F_p$$

where:

q_p is the peak discharge in cubic feet per second (cfs).

q_u is the unit peak discharge in cubic feet per second per square mile per inch of runoff (csm/in).

A_m is the drainage area in square miles.

Q is the runoff from the watershed in inches.

F_p is a pond and swamp adjustment factor that can be applied for ponds or swamps that are spread throughout the watershed and not in the time of concentration flow path.

Technical Release-20 Computer Program for Project Formulation Hydrology

The TR-20 computer program assists the engineer in hydrologic evaluation of flood events for use in analysis of water resource projects. The program is a single event model which computes direct runoff resulting from any natural or synthetic rainstorm. It develops flood hydrographs from runoff and routes the flow through stream channels and reservoirs. It combines the routed hydrograph with those from tributaries and computes the peak discharges, their times of occurrence and the water surface elevations at any desired cross section or structure. The program provides for the analysis of up to nine different rainstorm distributions over a watershed under various combinations of land treatment. The analysis can be performed on as many as 200 reaches and 99 structures in any one continuous run. The procedure should probably not be used for subarea drainage areas less than 5 acres nor more than 20 square miles.

Input Data Required

The following information is required to use TR-20:

Drainage Area - The drainage area of each subwatershed in square miles.

Runoff Curve Number - A factor that relates mass rainfall to mass runoff. It is based on soil characteristics, cover type, and land treatment. Tables 6-4.1 - 6-4.3 provides runoff curve numbers for urban areas and agricultural areas.

Time of Concentration - The time which would be required for the surface runoff from the hydraulically most remote part of the drainage area to reach the point being evaluated. A more detailed discussion of time of concentration is found later in this chapter.

Reach Length - The length of the stream or valley in feet selected for generally constant hydraulic characteristics for use in the study. A watershed may have several reaches in the flow path.

Cross Section Information - This information consists of either surveyed valley and channel sections with appropriate Manning's "n" values or "x" and "m" discharge coefficient values obtained from nomographs in the TR-20 documentation for the valley and channel reach.

Rainfall Data - The average depth, in inches, of rainfall occurring over a watershed or subwatershed for a given design frequency and duration storm event.

Structural Data - Information on any culverts, bridges, or reservoirs in the watershed that includes elevations, discharges, and storage behind the structures.

Output Data

The type and amount of output can be controlled by options within the program. In general the output data will provide estimates of peak flow, hydrographs, peak times, runoff volumes, and water surface elevations at any location within the watershed.

Runoff Curve Number (RCN)

The runoff curve number is a factor that relates mass rainfall to mass runoff. It is based on soil characteristics, cover type, hydrologic condition, and land treatment. Tables 6-4.1 through 6-4.3 provide runoff curve numbers for urban areas, cultivated agricultural areas, and other agricultural areas for various hydrologic conditions

Cover type relates to the kind of cover found on the soil such as vegetation, bare soil, and impervious surfaces such as parking areas, roofs, streets, and roads.

Hydrologic condition indicates the effects of cover type and treatment on infiltration and runoff rates. It is generally estimated from the density of plant and crop residue on the area. Good hydrologic condition indicates that the soil usually has low runoff potential for that specific hydrologic soil group, cover type and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are: canopy or density of leaves, amount of year-round cover, amount of grass or close-seeded legumes in a rotation, percent of residue cover, and the degree of surface roughness.

Treatment is a cover type modifier used to describe the management of cultivated agricultural lands. It includes mechanical practices such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.

TABLE 6-4.1 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION Cover type and hydrologic condition	Average percent impervious area[2]	CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP A	B	C	D
FULLY DEVELOPED URBAN AREAS[1] (Vegetation Established)					
Lawns, open spaces, parks, golf courses, cemeteries, etc.					
good condition; grass cover on 75% or more of the area		39	61	74	80
fair condition; grass cover on 50% to 75% of the area		49	69	79	84
poor condition; grass cover on 50% or less of the area		68	79	86	89
Paved parking lots, roofs, driveways, etc.		98	98	98	98
Streets and roads;					
paved with curbs and storm sewers		98	98	98	98
gravel		76	85	89	91
dirt		72	82	87	89
paved with open ditches		83	89	92	93
Commercial and business areas	85	89	92	94	95
Industrial districts	72	81	88	91	93
Row houses, town houses, and residential with lot sizes 1/8 acre or less	65	77	85	90	92
Residential					
Average lot size					
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acre	12	46	65	77	82
DEVELOPING URBAN AREAS[3] (No vegetation Established)					
Newly graded area		77	86	91	94

1. For land uses with impervious areas, curve numbers are computed assuming that 100% of runoff from impervious areas is directly connected to the drainage system. Pervious areas (lawn) are considered to be equivalent to lawns in good condition and the impervious areas have an RCN of 98.

2. Includes paved streets.

3. Use for the design of temporary measures during grading and construction. Impervious area percent for urban areas under development vary considerably. The user will determine the percent impervious. Then using the newly graded area RCN and Table 6-4, the composite RCN can be computed for any degree of development.

Source: USDA Soil Conservation Service

TABLE 6-4.2 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION Cover type and hydrologic condition		Hydrologic condition[4]	CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP A	B	C	D
CULTIVATED AGRICULTURAL LAND						
Fallow	Bare soil		77	86	91	94
	Crop residue cover (CR)	poor	76	85	90	93
	CR	good	74	83	88	90
Row crops	Straight row (SR)	poor	72	81	88	91
	SR	good	67	78	85	89
	SR & CR	poor	71	80	87	90
	SR & CR	good	64	75	82	85
	Contoured (C)	poor	70	79	84	88
	C	good	65	75	82	86
	C & CR	poor	69	78	83	87
	C & CR	good	64	74	81	85
	Contoured & Terraces (C&T)	poor	66	74	80	82
	C&T	good	62	71	78	81
	C&T & CR	poor	65	73	79	81
	C&T & CR	good	61	70	77	80
Small grain	SR	poor	65	76	84	88
	SR	good	63	75	83	87
	SR & CR	poor	64	75	83	86
	SR & CR	good	60	72	80	84
	C	poor	63	74	82	85
	C	good	61	73	81	84
	C & CR	poor	62	73	81	84
	C & CR	good	60	72	80	83
	C&T	poor	61	72	79	82
	C&T	good	59	70	78	81
	C&T & CR	poor	60	71	78	81
	C&T & CR	good	58	69	77	80
Close-seeded Legumes or Rotation Meadow[5]	SR	poor	66	77	85	89
	SR	good	58	72	81	85
	C	poor	64	75	83	85
	C	good	55	69	78	83
	C&T	poor	63	73	80	83
	C&T	good	51	67	76	80

4. For conservation tillage poor hydrologic condition, 5 to 20 percent of the surface is covered with residue (less than 750 #/acre row crops or 300#/acre small grain).
   For conservation tillage good hydrologic condition, more than 20 percent of the surface is covered with residue (greater than 750 #/acre row crops or 300 #/acre small grain).
5. Close-drilled or broadcast.

Source: USDA Soil Conservation Service

TABLE 6-4.3 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION Cover type and hydrologic condition	Hydrologic condition[6]	CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP A	B	C	D
NON-CULTIVATED AGRICULTURAL LAND					
Pasture, grassland, or range - continuous forage for grazing	poor	68	79	86	89
	fair	49	69	79	84
	good	39	61	74	80
Meadow - continuous grass, protected from grazing and generally mowed for hay	---	30	58	71	78
Woods-grass combination (orchard or tree farm)	poor	57	73	82	86
	fair	43	65	76	82
	good	32	58	72	79
Brush - brush-weed-grass mixture with brush the major element	poor	48	67	77	83
	fair	35	56	70	77
	good	30	48	65	73
Woods	poor	45	66	77	83
	fair	36	60	73	79
	good	30	55	70	77
Farmsteads - buildings, lanes, driveways, and surrounding lots	---	59	74	82	86

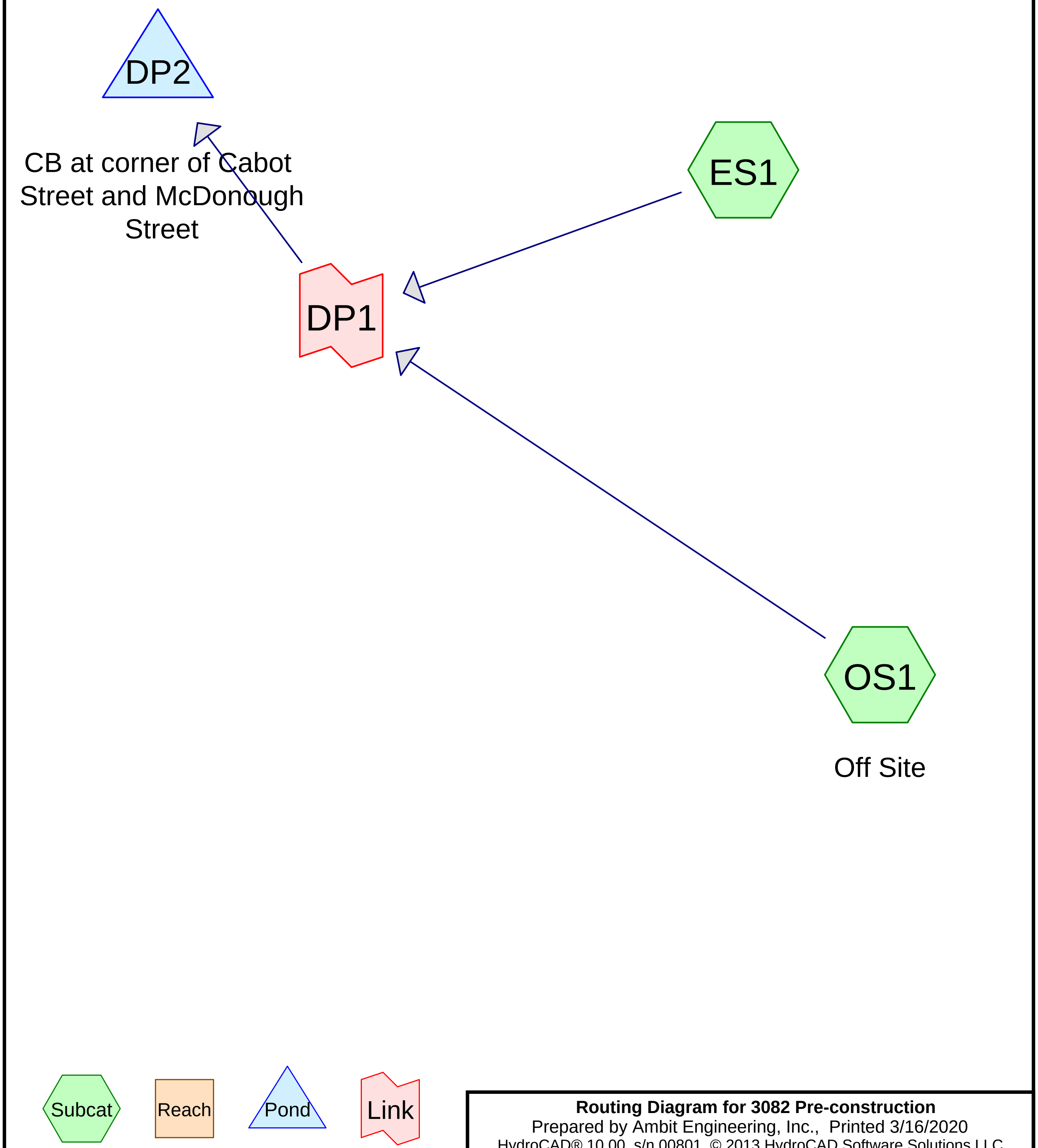
6. Poor hydrologic condition has less than 50 percent ground cover density.
Fair hydrologic condition has between 50 and 75 percent ground cover density.
Good hydrologic condition has more than 75 percent ground cover density.

Source: USDA Soil Conservation Service

APPENDIX C

HYDROCAD DRAINAGE

ANALYSIS CALCULATIONS



Routing Diagram for 3082 Pre-construction
Prepared by Ambit Engineering, Inc., Printed 3/16/2020
HydroCAD® 10.00 s/n 00801 © 2013 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
14,003	61	>75% Grass cover, Good, HSG B (ES1, OS1)
650	98	Paved parking, HSG B (ES1)
1,000	98	Roofs, HSG B (ES1)
13,838	98	Unconnected roofs, HSG B (OS1)
29,491	**80**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
29,491	HSG B	ES1, OS1
0	HSG C	
0	HSG D	
0	Other	
29,491		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	14,003	0	0	0	14,003	>75% Grass cover, Good	
0	650	0	0	0	650	Paved parking	
0	1,000	0	0	0	1,000	Roofs	
0	13,838	0	0	0	13,838	Unconnected roofs	
0	**29,491**	**0**	**0**	**0**	**29,491**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.06 hrs, 501 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Runoff Area=10,903 sf 15.13% Impervious Runoff Depth=0.96"
Flow Length=515' Tc=5.5 min CN=67 Runoff=0.24 cfs 871 cf

Subcatchment OS1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=2.53"
Flow Length=722' Tc=10.6 min CN=89 Runoff=1.06 cfs 3,924 cf

Pond DP2: CB at corner of Cabot Street and McDonough Street Inflow=1.29 cfs 4,795 cf
Primary=1.29 cfs 4,795 cf

Link DP1: Inflow=1.29 cfs 4,795 cf
Primary=1.29 cfs 4,795 cf

Total Runoff Area = 29,491 sf Runoff Volume = 4,795 cf Average Runoff Depth = 1.95"
47.48% Pervious = 14,003 sf 52.52% Impervious = 15,488 sf

Summary for Subcatchment ES1:

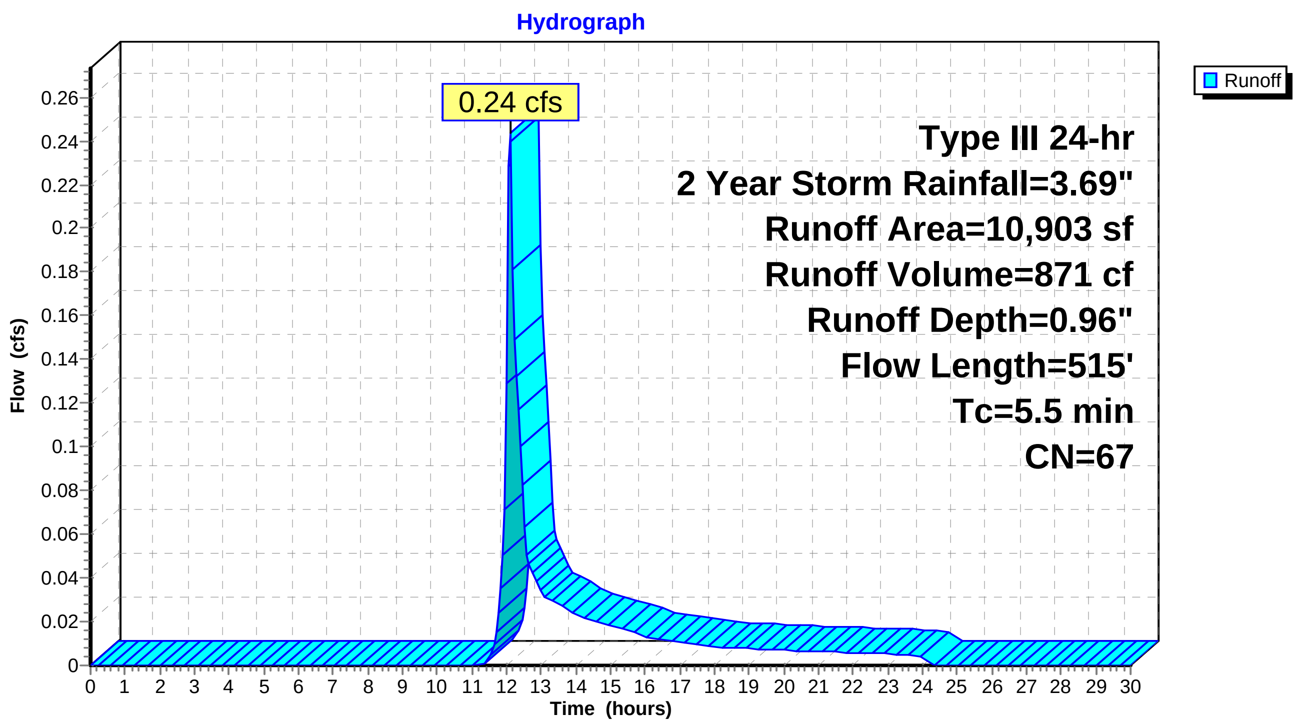
Runoff = 0.24 cfs @ 12.10 hrs, Volume= 871 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
9,253	61	>75% Grass cover, Good, HSG B
1,000	98	Roofs, HSG B
650	98	Paved parking, HSG B
10,903	67	Weighted Average
9,253	61	84.87% Pervious Area
1,650	98	15.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	515	Total			

Subcatchment ES1:



Summary for Subcatchment OS1: Off Site

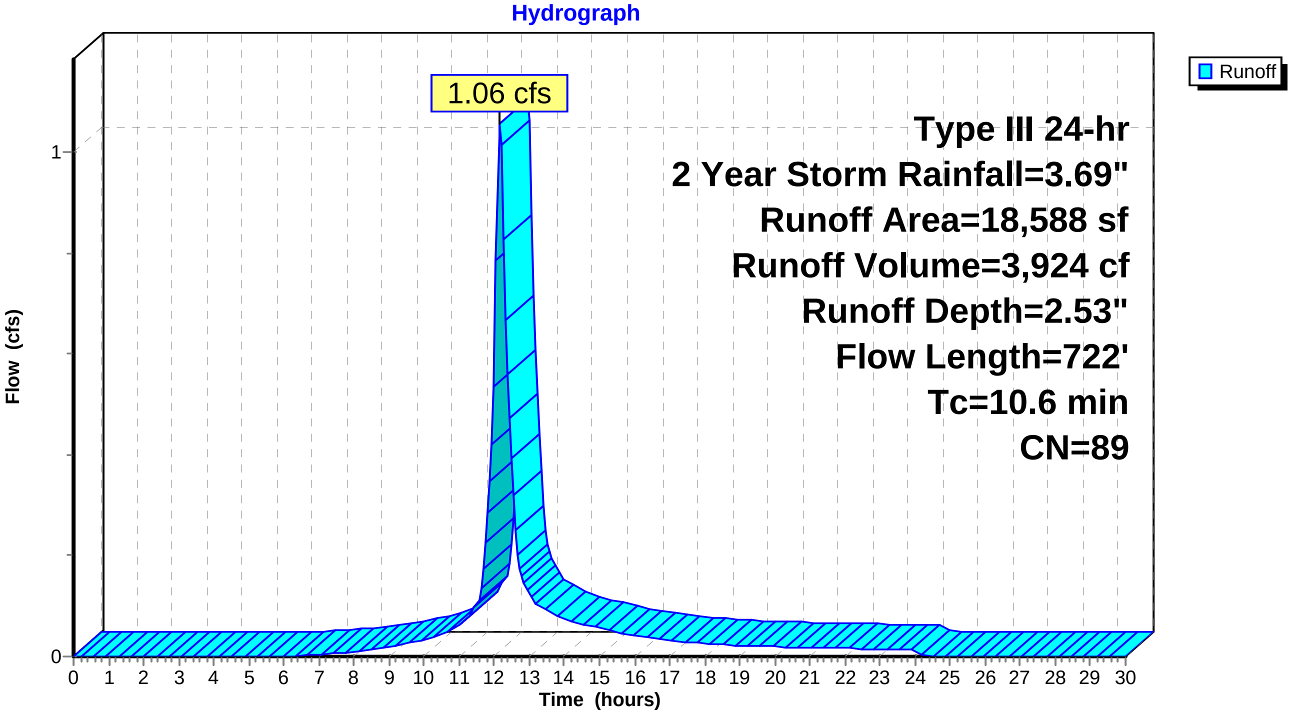
Runoff = 1.06 cfs @ 12.15 hrs, Volume= 3,924 cf, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750	61	25.55% Pervious Area
13,838	98	74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	46	0.0326	1.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	722	Total			

Subcatchment OS1: Off Site

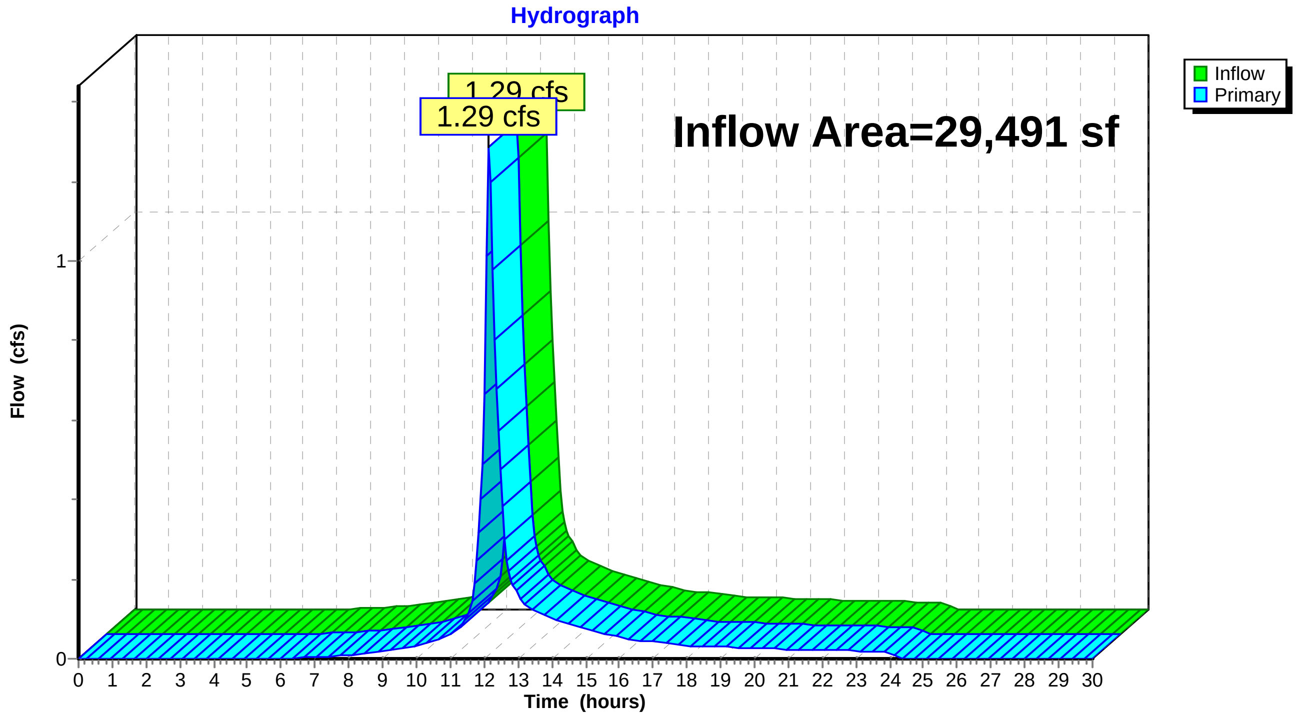


Summary for Pond DP2: CB at corner of Cabot Street and McDonough Street

Inflow Area =	29,491 sf,	52.52% Impervious,	Inflow Depth = 1.95"	for 2 Year Storm event
Inflow =	1.29 cfs @	12.14 hrs, Volume=	4,795 cf	
Primary =	1.29 cfs @	12.14 hrs, Volume=	4,795 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs / 5

Pond DP2: CB at corner of Cabot Street and McDonough Street

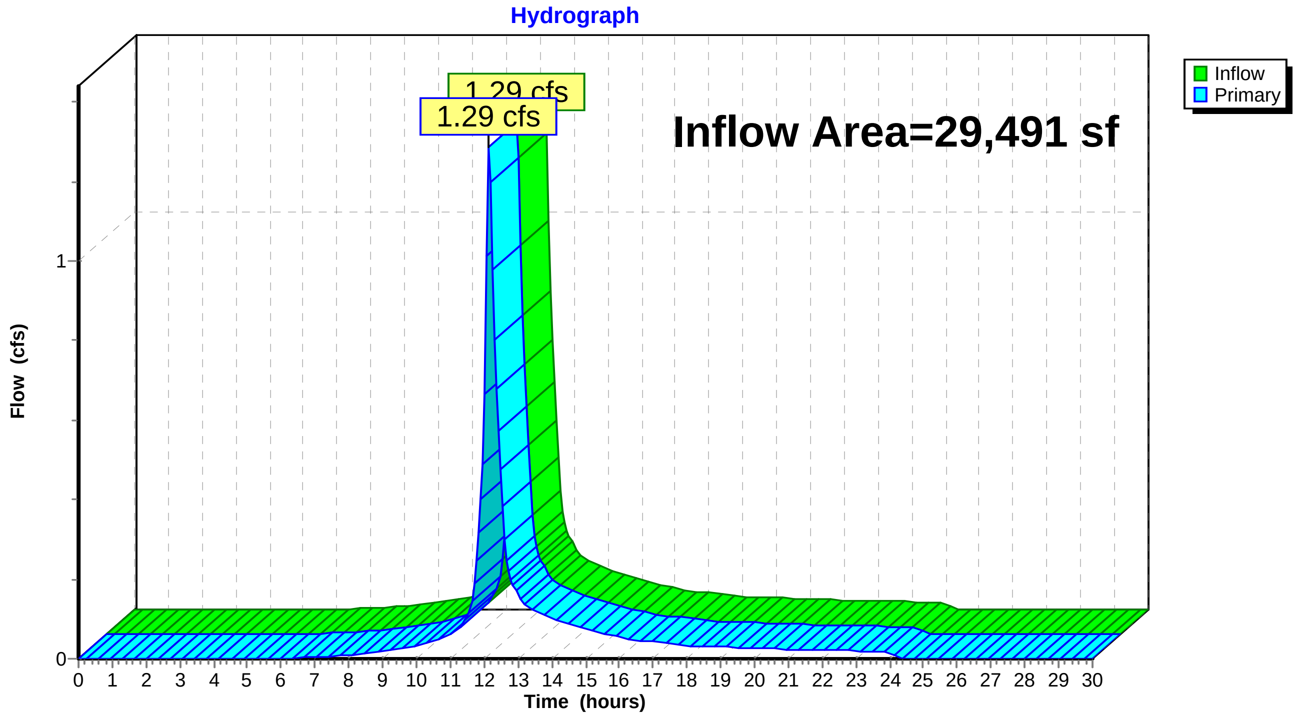


Summary for Link DP1:

Inflow Area =	29,491 sf,	52.52% Impervious,	Inflow Depth = 1.95"	for 2 Year Storm event	
Inflow =	1.29 cfs @	12.14 hrs,	Volume=	4,795 cf	
Primary =	1.29 cfs @	12.14 hrs,	Volume=	4,795 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs

Link DP1:



Time span=0.00-30.00 hrs, dt=0.06 hrs, 501 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Runoff Area=10,903 sf 15.13% Impervious Runoff Depth=2.23"
Flow Length=515' Tc=5.5 min CN=67 Runoff=0.63 cfs 2,028 cf

Subcatchment OS1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=4.35"
Flow Length=722' Tc=10.6 min CN=89 Runoff=1.78 cfs 6,736 cf

Pond DP2: CB at corner of Cabot Street and McDonough Street Inflow=2.34 cfs 8,764 cf
Primary=2.34 cfs 8,764 cf

Link DP1: Inflow=2.34 cfs 8,764 cf
Primary=2.34 cfs 8,764 cf

Total Runoff Area = 29,491 sf Runoff Volume = 8,764 cf Average Runoff Depth = 3.57"
47.48% Pervious = 14,003 sf 52.52% Impervious = 15,488 sf

Summary for Subcatchment ES1:

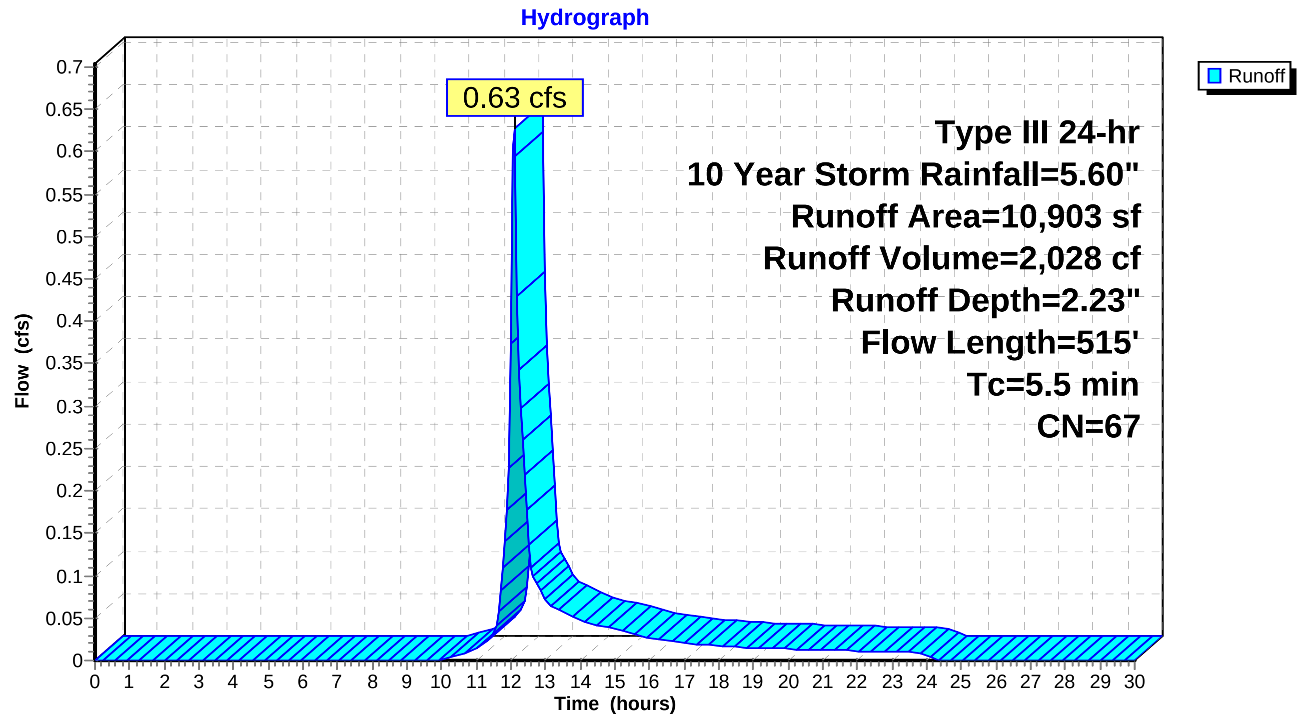
Runoff = 0.63 cfs @ 12.09 hrs, Volume= 2,028 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
9,253	61	>75% Grass cover, Good, HSG B
1,000	98	Roofs, HSG B
650	98	Paved parking, HSG B
10,903	67	Weighted Average
9,253	61	84.87% Pervious Area
1,650	98	15.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	515	Total			

Subcatchment ES1:



Summary for Subcatchment OS1: Off Site

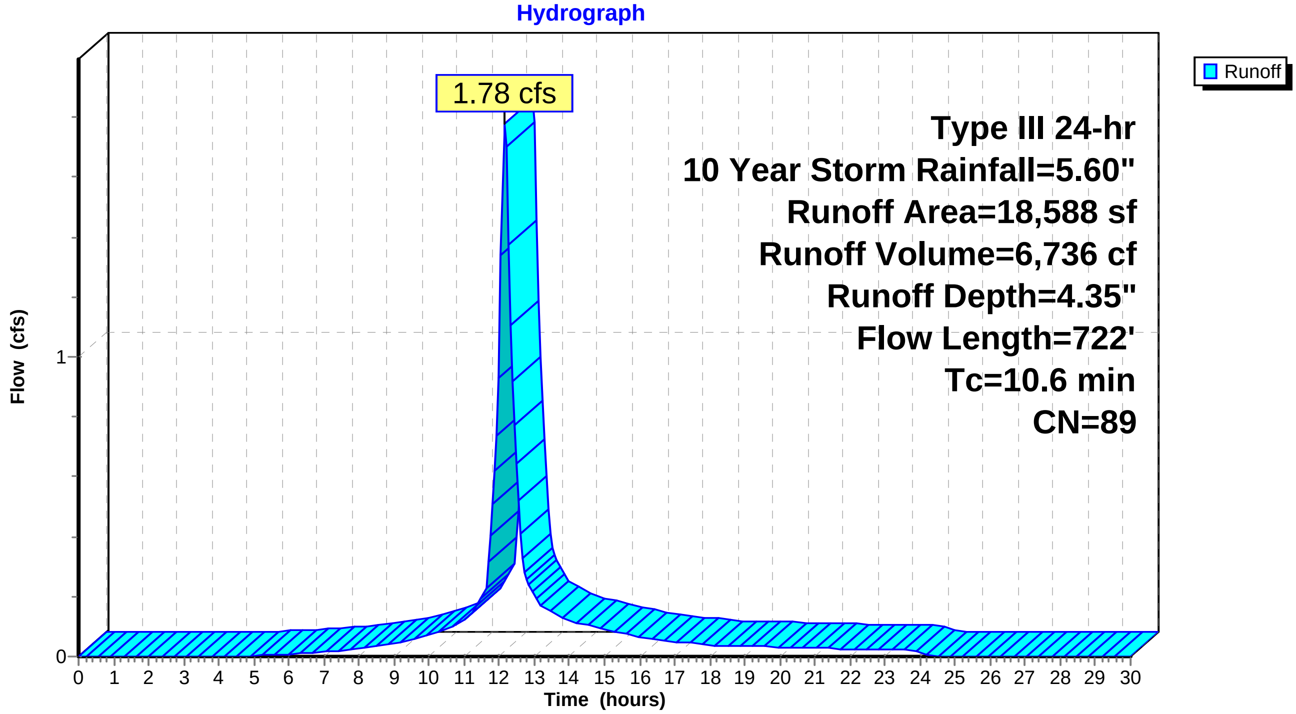
Runoff = 1.78 cfs @ 12.14 hrs, Volume= 6,736 cf, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750	61	25.55% Pervious Area
13,838	98	74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	46	0.0326	1.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	722	Total			

Subcatchment OS1: Off Site

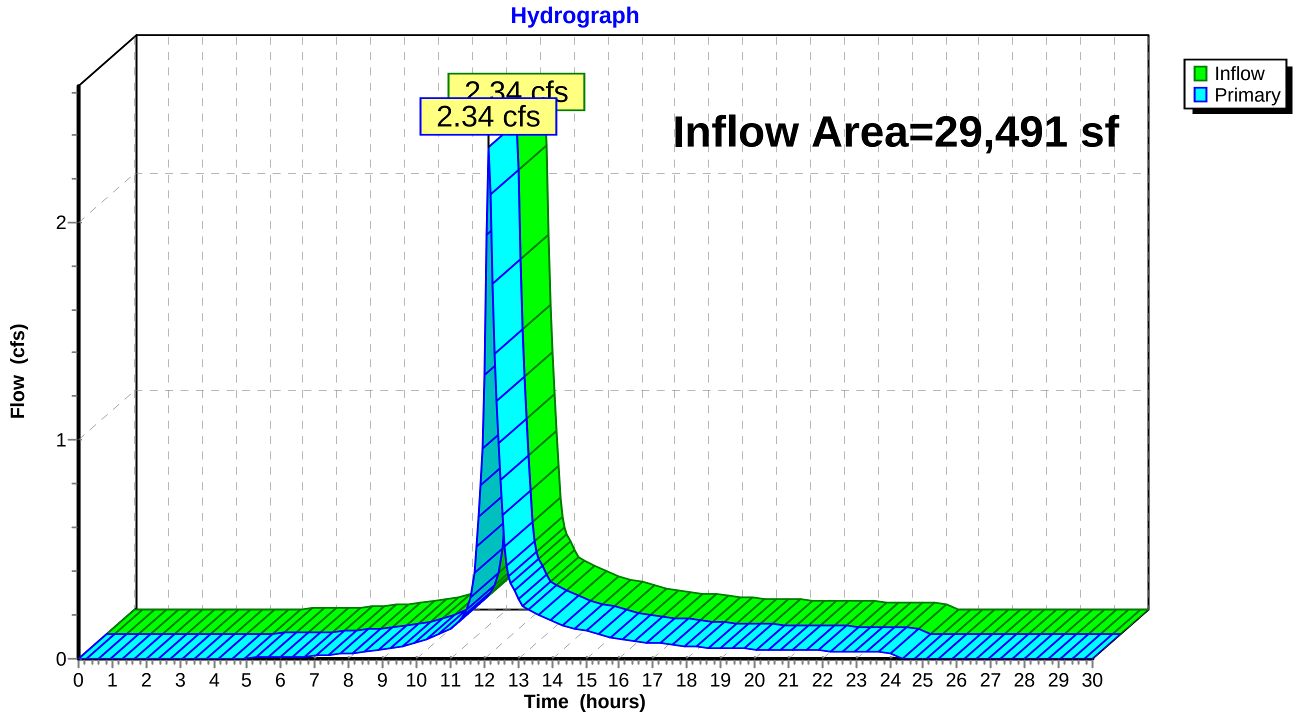


Summary for Pond DP2: CB at corner of Cabot Street and McDonough Street

Inflow Area =	29,491 sf,	52.52% Impervious,	Inflow Depth = 3.57"	for 10 Year Storm event	
Inflow =	2.34 cfs @	12.13 hrs,	Volume=	8,764 cf	
Primary =	2.34 cfs @	12.13 hrs,	Volume=	8,764 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs / 5

Pond DP2: CB at corner of Cabot Street and McDonough Street

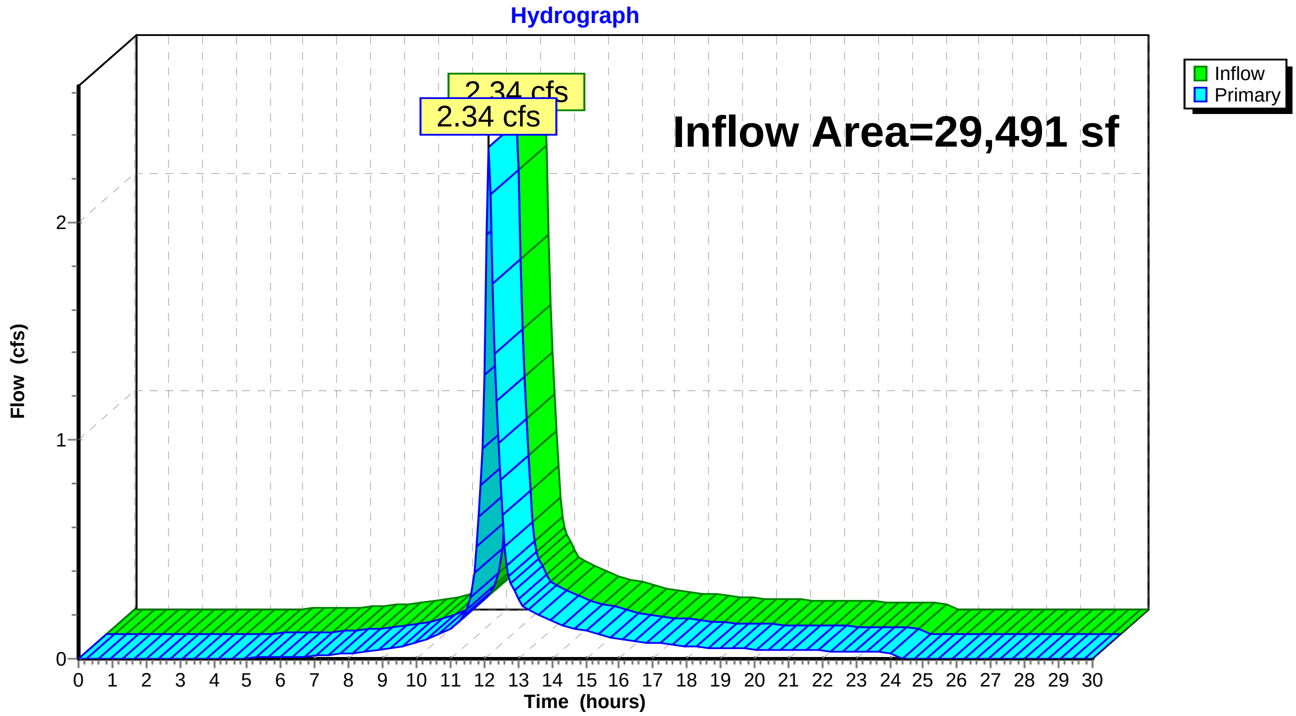


Summary for Link DP1:

Inflow Area =	29,491 sf,	52.52% Impervious,	Inflow Depth = 3.57"	for 10 Year Storm event
Inflow =	2.34 cfs @	12.13 hrs, Volume=	8,764 cf	
Primary =	2.34 cfs @	12.13 hrs, Volume=	8,764 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs

Link DP1:



Time span=0.00-30.00 hrs, dt=0.06 hrs, 501 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Runoff Area=10,903 sf 15.13% Impervious Runoff Depth=3.39"
Flow Length=515' Tc=5.5 min CN=67 Runoff=0.97 cfs 3,077 cf

Subcatchment OS1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=5.81"
Flow Length=722' Tc=10.6 min CN=89 Runoff=2.34 cfs 8,993 cf

Pond DP2: CB at corner of Cabot Street and McDonough Street Inflow=3.20 cfs 12,070 cf
Primary=3.20 cfs 12,070 cf

Link DP1: Inflow=3.20 cfs 12,070 cf
Primary=3.20 cfs 12,070 cf

Total Runoff Area = 29,491 sf Runoff Volume = 12,070 cf Average Runoff Depth = 4.91"
47.48% Pervious = 14,003 sf 52.52% Impervious = 15,488 sf

Summary for Subcatchment ES1:

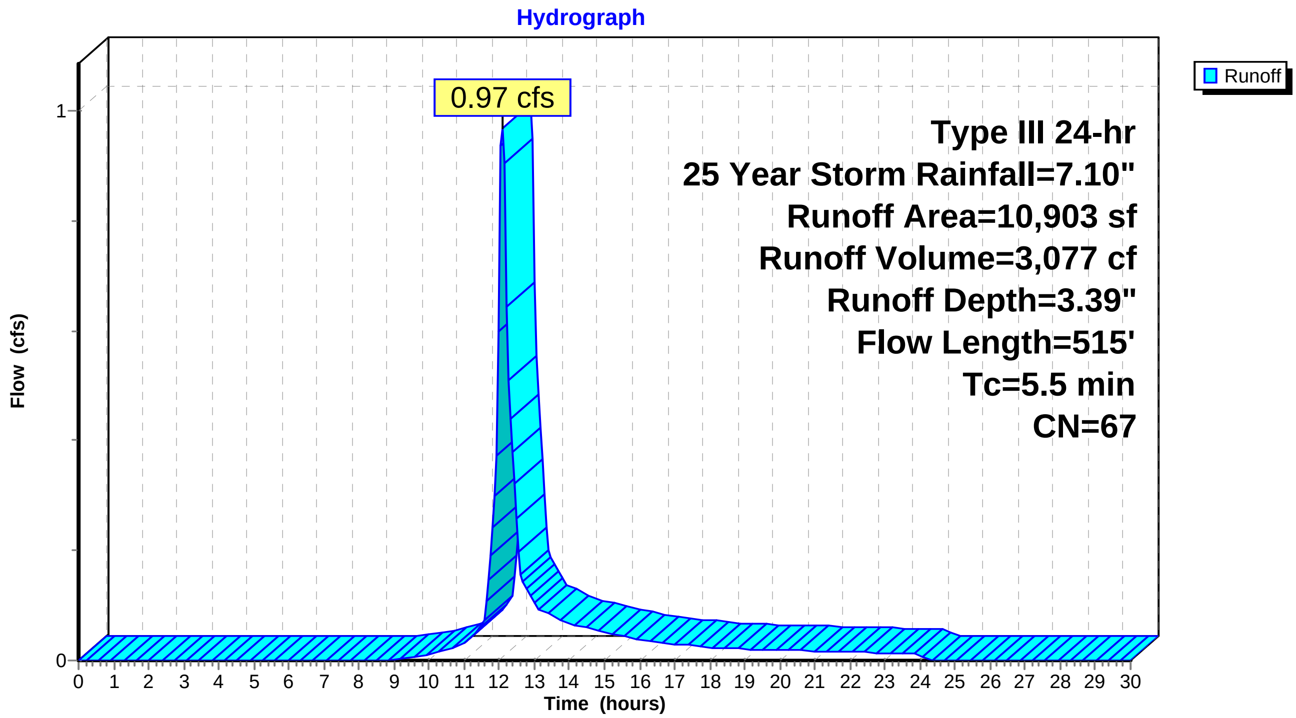
Runoff = 0.97 cfs @ 12.08 hrs, Volume= 3,077 cf, Depth= 3.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
9,253	61	>75% Grass cover, Good, HSG B
1,000	98	Roofs, HSG B
650	98	Paved parking, HSG B
10,903	67	Weighted Average
9,253	61	84.87% Pervious Area
1,650	98	15.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	515	Total			

Subcatchment ES1:



Summary for Subcatchment OS1: Off Site

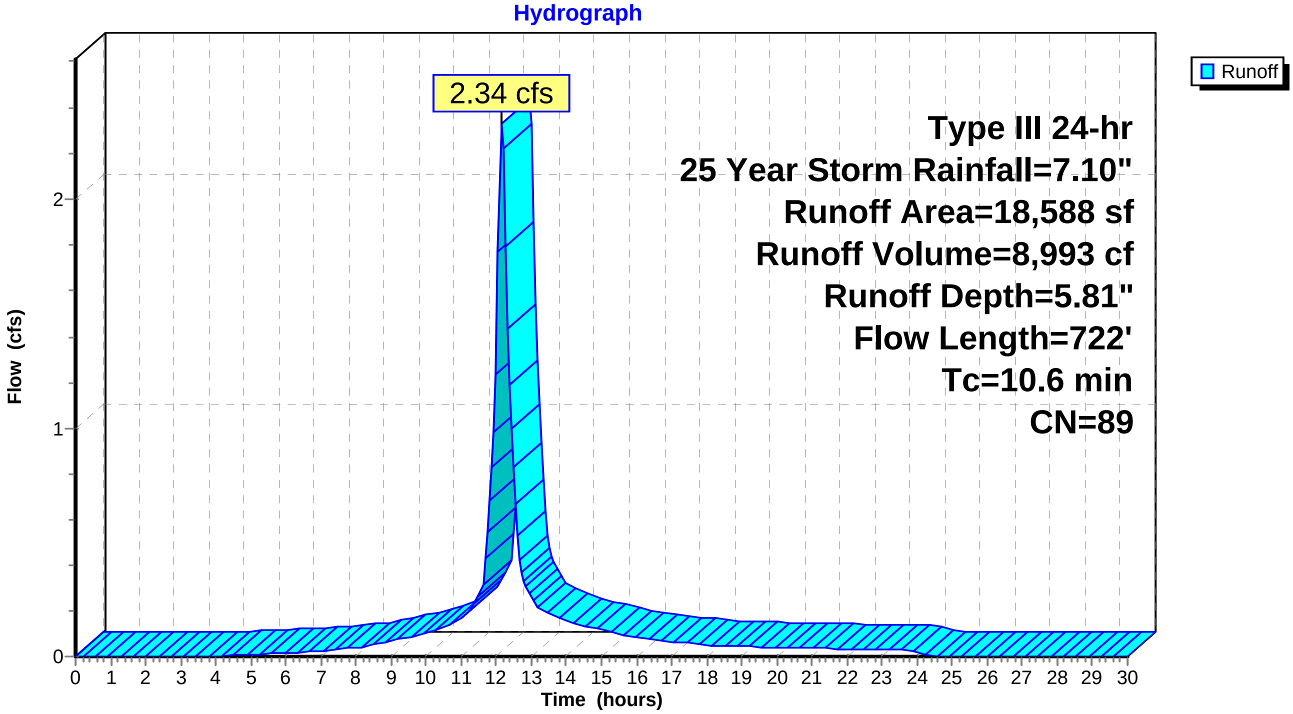
Runoff = 2.34 cfs @ 12.14 hrs, Volume= 8,993 cf, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750	61	25.55% Pervious Area
13,838	98	74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	46	0.0326	1.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	722	Total			

Subcatchment OS1: Off Site

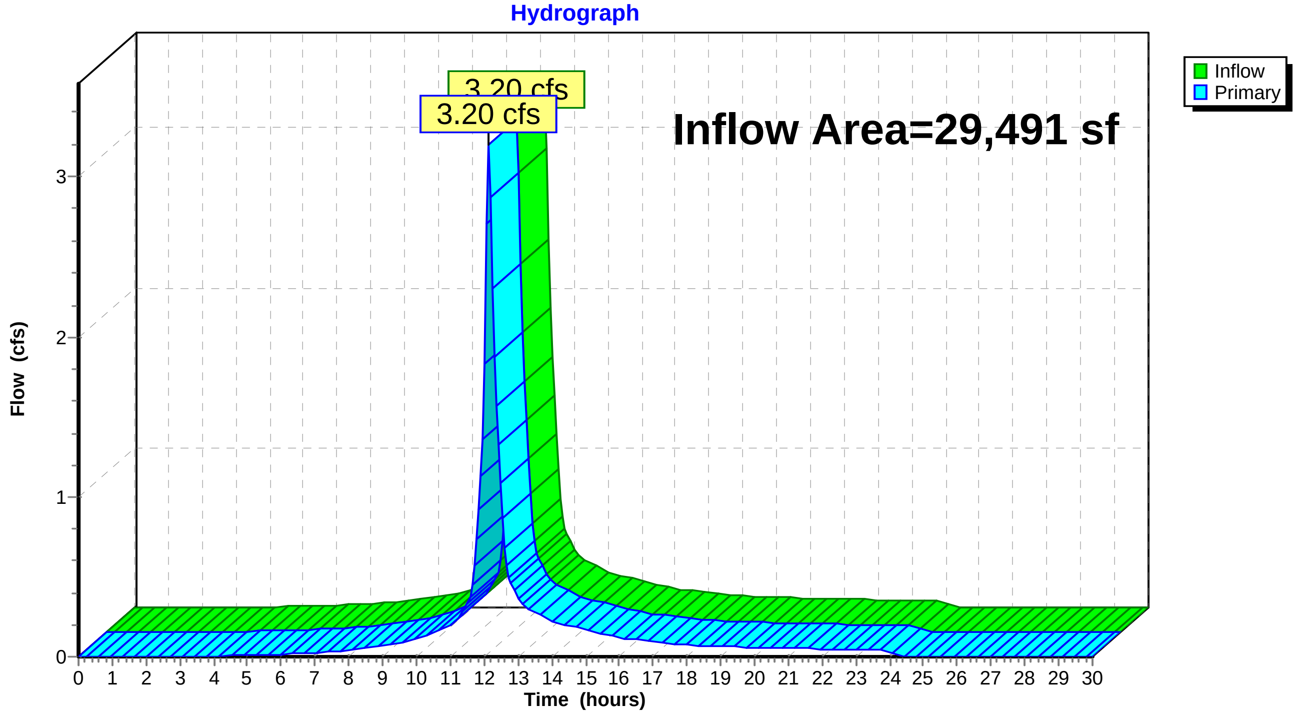


Summary for Pond DP2: CB at corner of Cabot Street and McDonough Street

Inflow Area = 29,491 sf, 52.52% Impervious, Inflow Depth = 4.91" for 25 Year Storm event
Inflow = 3.20 cfs @ 12.13 hrs, Volume= 12,070 cf
Primary = 3.20 cfs @ 12.13 hrs, Volume= 12,070 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs / 5

Pond DP2: CB at corner of Cabot Street and McDonough Street

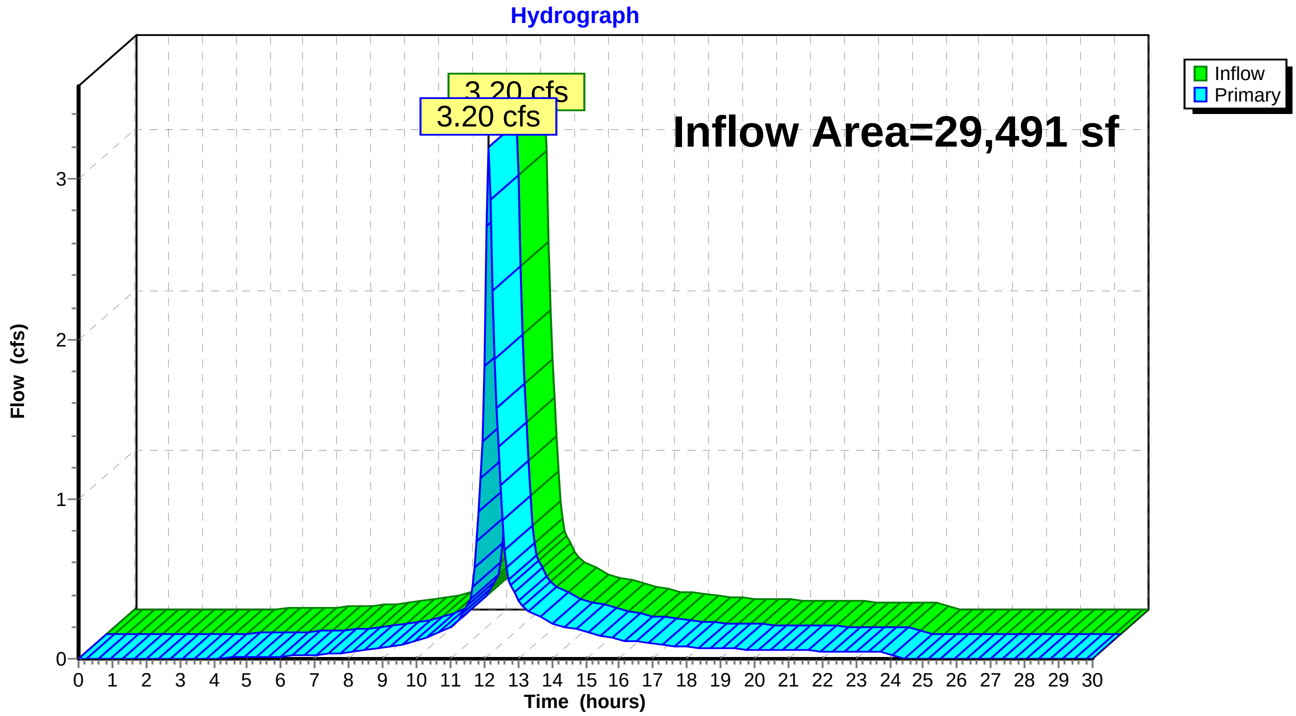


Summary for Link DP1:

Inflow Area = 29,491 sf, 52.52% Impervious, Inflow Depth = 4.91" for 25 Year Storm event
Inflow = 3.20 cfs @ 12.13 hrs, Volume= 12,070 cf
Primary = 3.20 cfs @ 12.13 hrs, Volume= 12,070 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs

Link DP1:



Time span=0.00-30.00 hrs, dt=0.06 hrs, 501 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment ES1: Runoff Area=10,903 sf 15.13% Impervious Runoff Depth=4.54"
Flow Length=515' Tc=5.5 min CN=67 Runoff=1.31 cfs 4,125 cf

Subcatchment OS1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=7.18"
Flow Length=722' Tc=10.6 min CN=89 Runoff=2.86 cfs 11,118 cf

Pond DP2: CB at corner of Cabot Street and McDonough Street Inflow=4.02 cfs 15,243 cf
Primary=4.02 cfs 15,243 cf

Link DP1: Inflow=4.02 cfs 15,243 cf
Primary=4.02 cfs 15,243 cf

Total Runoff Area = 29,491 sf Runoff Volume = 15,243 cf Average Runoff Depth = 6.20"
47.48% Pervious = 14,003 sf 52.52% Impervious = 15,488 sf

Summary for Subcatchment ES1:

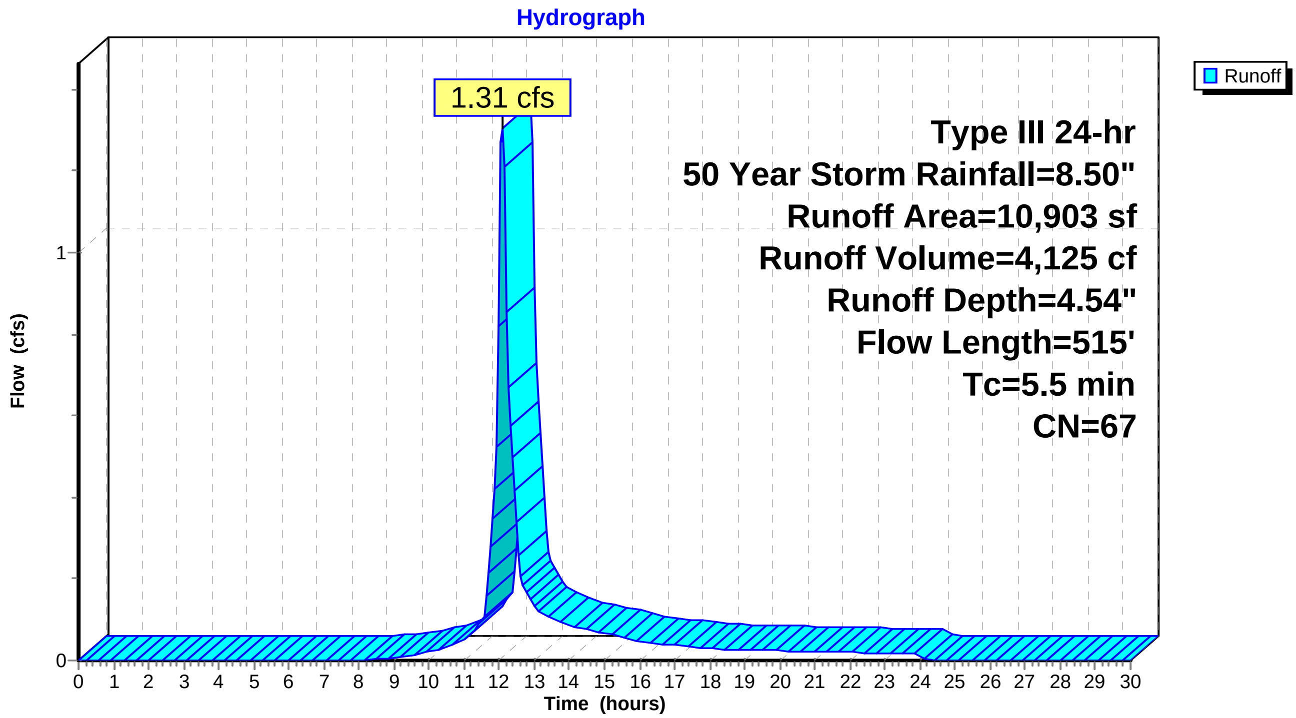
Runoff = 1.31 cfs @ 12.08 hrs, Volume= 4,125 cf, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
9,253	61	>75% Grass cover, Good, HSG B
1,000	98	Roofs, HSG B
650	98	Paved parking, HSG B
10,903	67	Weighted Average
9,253	61	84.87% Pervious Area
1,650	98	15.13% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.5	515	Total			

Subcatchment ES1:



Summary for Subcatchment OS1: Off Site

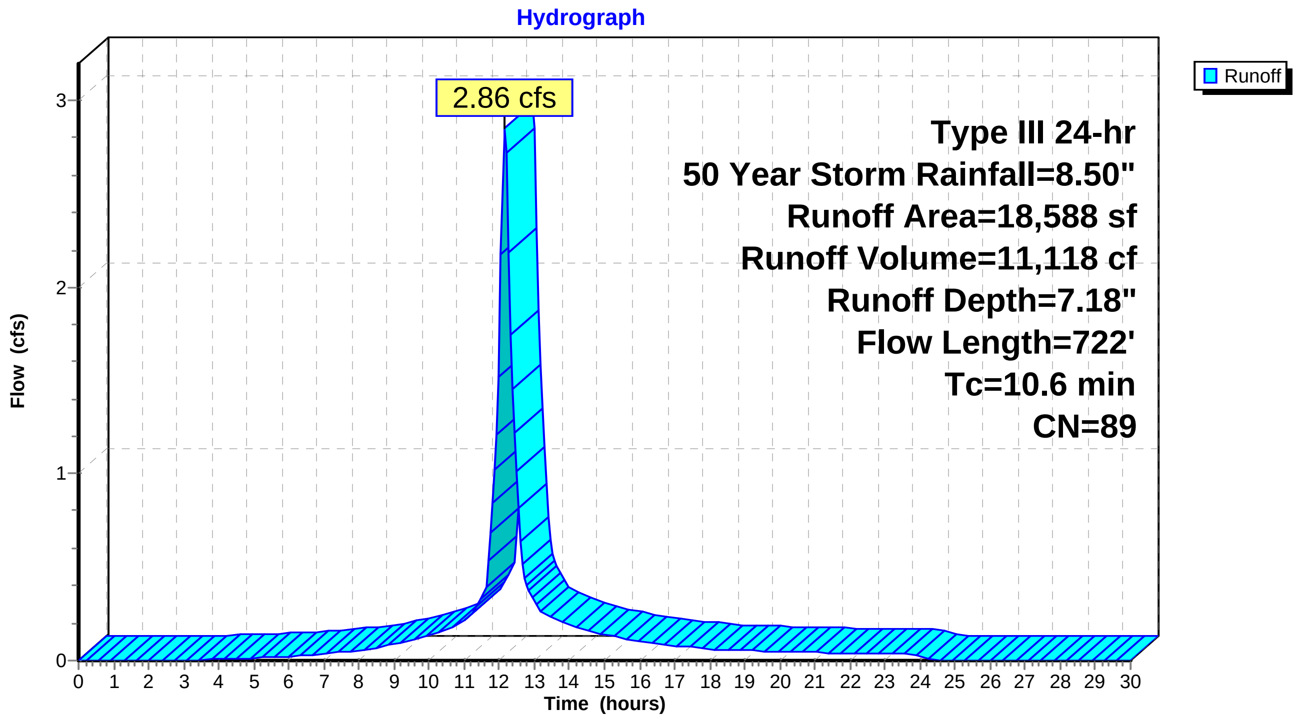
Runoff = 2.86 cfs @ 12.14 hrs, Volume= 11,118 cf, Depth= 7.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750	61	25.55% Pervious Area
13,838	98	74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.8	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.21"
0.5	46	0.0326	1.43		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.21"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.6	722	Total			

Subcatchment OS1: Off Site

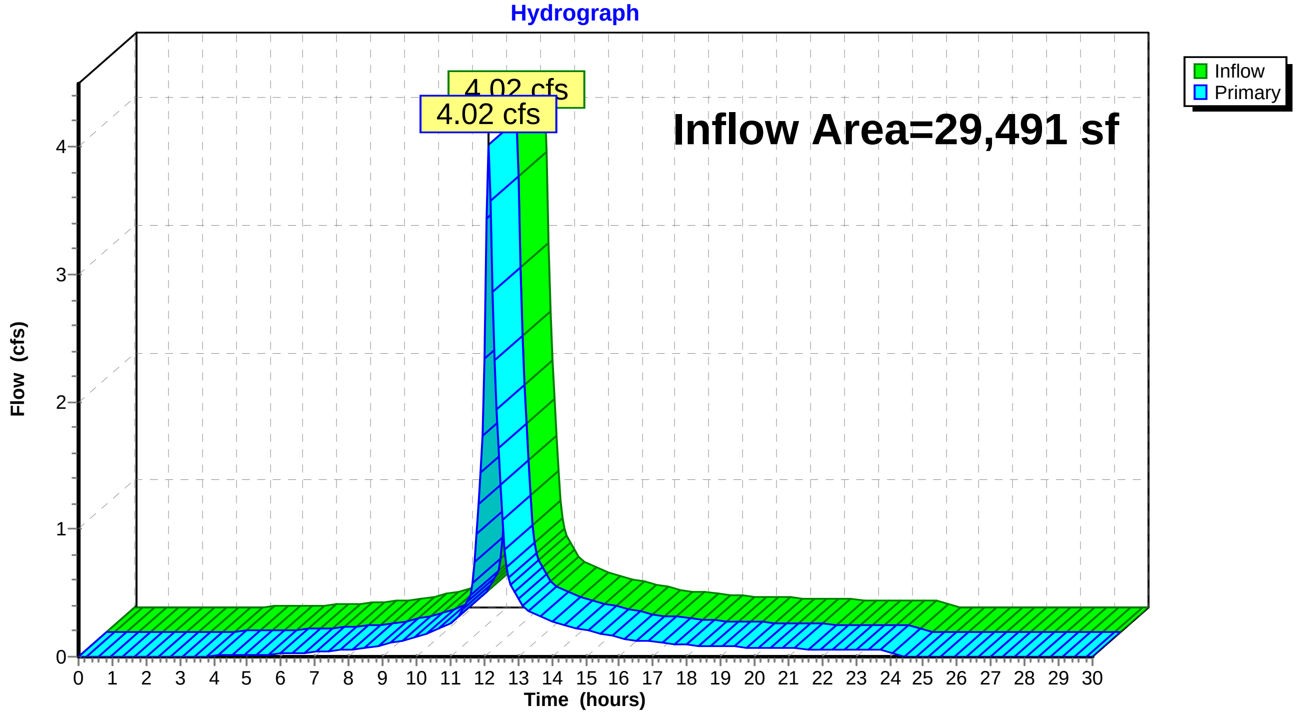


Summary for Pond DP2: CB at corner of Cabot Street and McDonough Street

Inflow Area =	29,491 sf,	52.52% Impervious,	Inflow Depth = 6.20"	for 50 Year Storm event	
Inflow =	4.02 cfs @	12.12 hrs,	Volume=	15,243 cf	
Primary =	4.02 cfs @	12.12 hrs,	Volume=	15,243 cf,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs / 5

Pond DP2: CB at corner of Cabot Street and McDonough Street

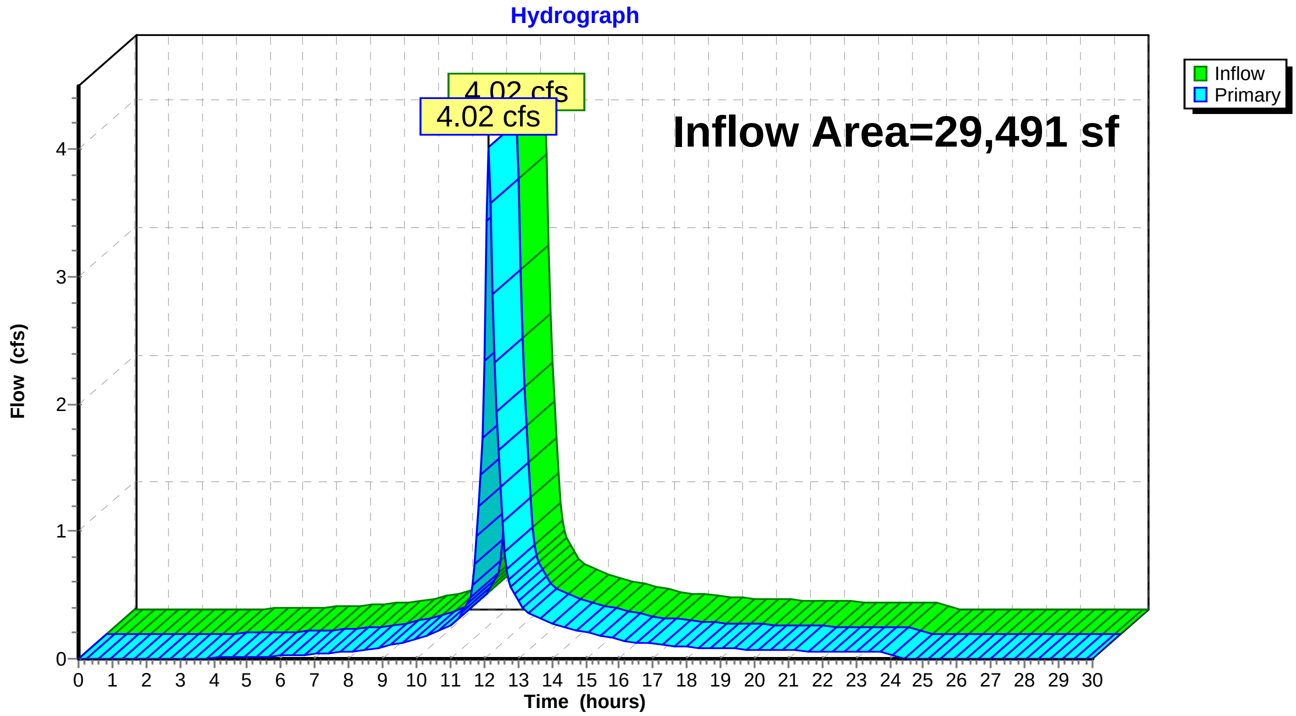


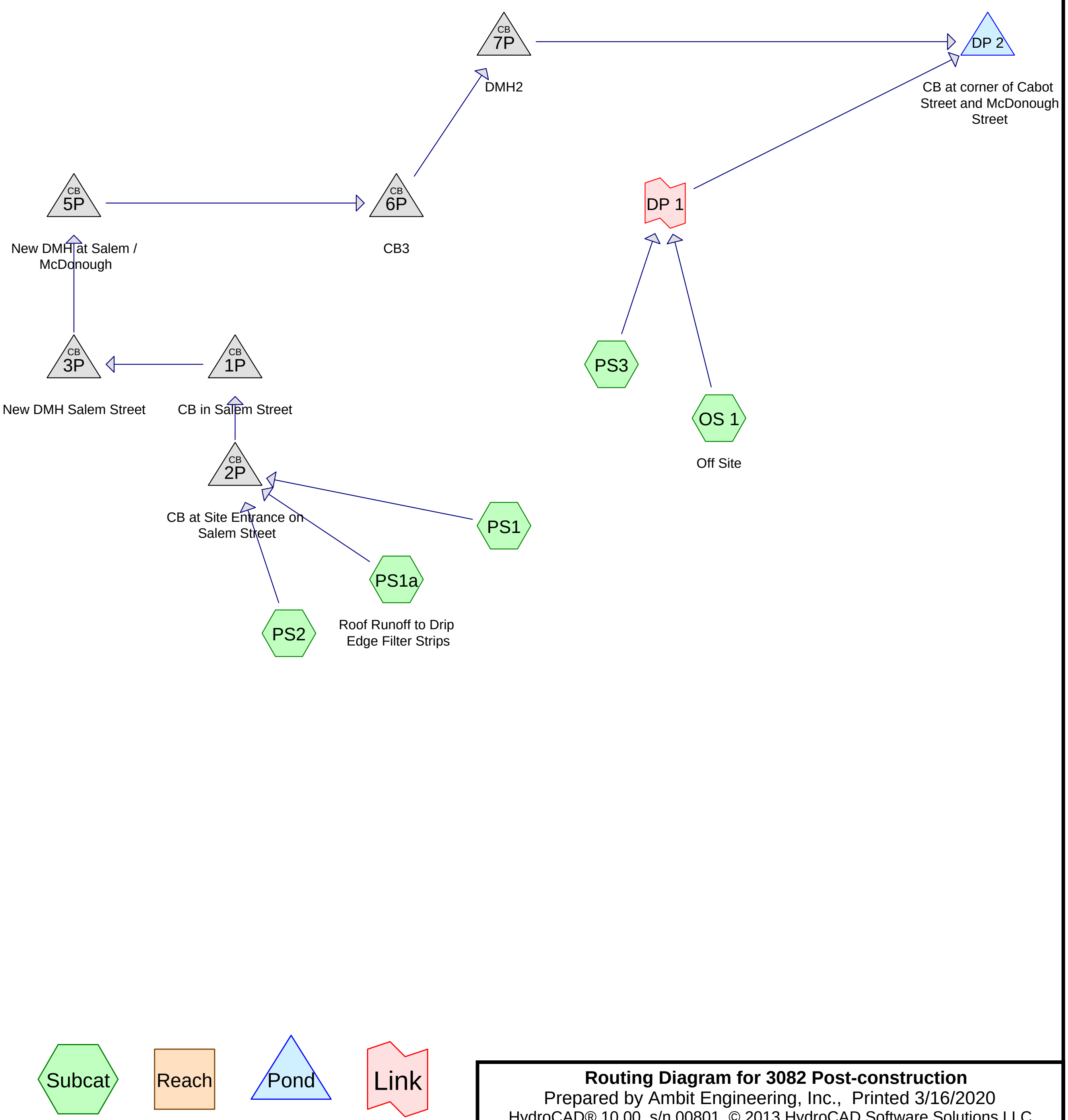
Summary for Link DP1:

Inflow Area = 29,491 sf, 52.52% Impervious, Inflow Depth = 6.20" for 50 Year Storm event
Inflow = 4.02 cfs @ 12.12 hrs, Volume= 15,243 cf
Primary = 4.02 cfs @ 12.12 hrs, Volume= 15,243 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.06 hrs

Link DP1:





Routing Diagram for 3082 Post-construction
Prepared by Ambit Engineering, Inc., Printed 3/16/2020
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
10,849	61	>75% Grass cover, Good, HSG B (OS 1, PS1, PS2, PS3)
1,794	98	Paved parking, HSG B (PS1, PS2)
3,010	98	Roofs, HSG B (PS1a, PS2)
13,838	98	Unconnected roofs, HSG B (OS 1)
29,491	**84**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
29,491	HSG B	OS 1, PS1, PS1a, PS2, PS3
0	HSG C	
0	HSG D	
0	Other	
29,491		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	10,849	0	0	0	10,849	>75% Grass cover, Good	
0	1,794	0	0	0	1,794	Paved parking	
0	3,010	0	0	0	3,010	Roofs	
0	13,838	0	0	0	13,838	Unconnected roofs	
0	**29,491**	**0**	**0**	**0**	**29,491**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	15.18	15.13	9.0	0.0056	0.013	15.0	0.0	0.0
2	2P	18.40	15.28	36.0	0.0867	0.013	15.0	0.0	0.0
3	3P	15.03	11.80	97.0	0.0333	0.013	15.0	0.0	0.0
4	5P	11.78	11.50	15.0	0.0187	0.013	15.0	0.0	0.0
5	6P	11.82	10.56	32.0	0.0394	0.013	15.0	0.0	0.0
6	7P	10.57	0.00	200.0	0.0529	0.013	18.0	0.0	0.0

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 OS 1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=2.53"
Flow Length=722' Tc=10.8 min CN=89 Runoff=1.07 cfs 3,924 cf

Subcatchment PS1: Runoff Area=2,893 sf 48.81% Impervious Runoff Depth=1.71"
Flow Length=143' Slope=0.0200 '/' Tc=0.8 min CN=79 Runoff=0.16 cfs 413 cf

Subcatchment PS1a: Roof Runoff to Drip Runoff Area=2,717 sf 100.00% Impervious Runoff Depth=3.46"
Tc=10.0 min CN=98 Runoff=0.20 cfs 782 cf

Subcatchment PS2: Runoff Area=1,411 sf 47.84% Impervious Runoff Depth=1.71"
Flow Length=89' Slope=0.0200 '/' Tc=1.1 min CN=79 Runoff=0.08 cfs 202 cf

Subcatchment PS3: Runoff Area=3,882 sf 0.00% Impervious Runoff Depth=0.66"
Flow Length=552' Tc=6.3 min CN=61 Runoff=0.05 cfs 214 cf

Pond 1P: CB in Salem Street Peak Elev=15.53' Inflow=0.35 cfs 1,398 cf
15.0" Round Culvert n=0.013 L=9.0' S=0.0056 '/' Outflow=0.35 cfs 1,398 cf

Pond 2P: CB at Site Entrance on Salem Street Peak Elev=18.71' Inflow=0.35 cfs 1,398 cf
15.0" Round Culvert n=0.013 L=36.0' S=0.0867 '/' Outflow=0.35 cfs 1,398 cf

Pond 3P: New DMH Salem Street Peak Elev=15.34' Inflow=0.35 cfs 1,398 cf
15.0" Round Culvert n=0.013 L=97.0' S=0.0333 '/' Outflow=0.35 cfs 1,398 cf

Pond 5P: New DMH at Salem / McDonough Peak Elev=12.09' Inflow=0.35 cfs 1,398 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0187 '/' Outflow=0.35 cfs 1,398 cf

Pond 6P: CB3 Peak Elev=12.13' Inflow=0.35 cfs 1,398 cf
15.0" Round Culvert n=0.013 L=32.0' S=0.0394 '/' Outflow=0.35 cfs 1,398 cf

Pond 7P: DMH2 Peak Elev=10.86' Inflow=0.35 cfs 1,398 cf
18.0" Round Culvert n=0.013 L=200.0' S=0.0529 '/' Outflow=0.35 cfs 1,398 cf

Pond DP 2: CB at corner of Cabot Street and McDonough Street Inflow=1.41 cfs 5,535 cf
Primary=1.41 cfs 5,535 cf

Link DP 1: Inflow=1.12 cfs 4,138 cf
Primary=1.12 cfs 4,138 cf

Total Runoff Area = 29,491 sf Runoff Volume = 5,535 cf Average Runoff Depth = 2.25"
36.79% Pervious = 10,849 sf 63.21% Impervious = 18,642 sf

Summary for Subcatchment OS 1: Off Site

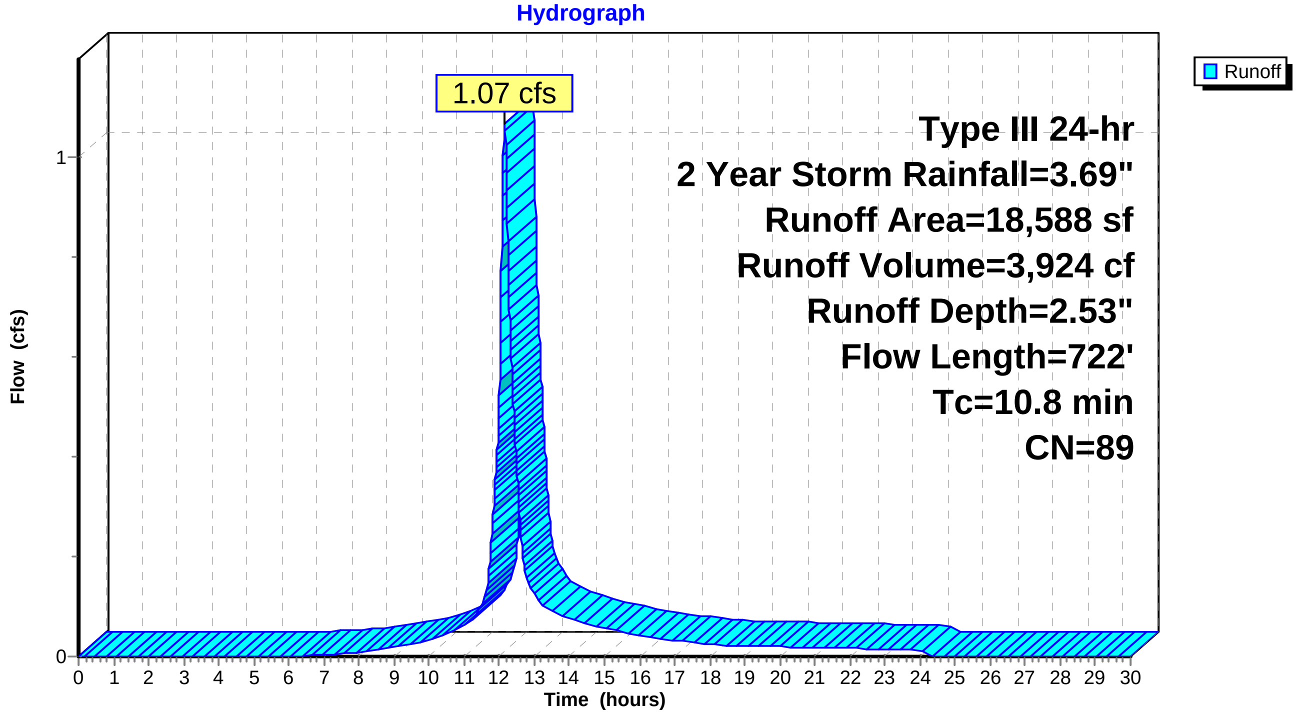
Runoff = 1.07 cfs @ 12.15 hrs, Volume= 3,924 cf, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750		25.55% Pervious Area
13,838		74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	46	0.0326	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
2.9	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.8	722	Total			

Subcatchment OS 1: Off Site



Summary for Subcatchment PS1:

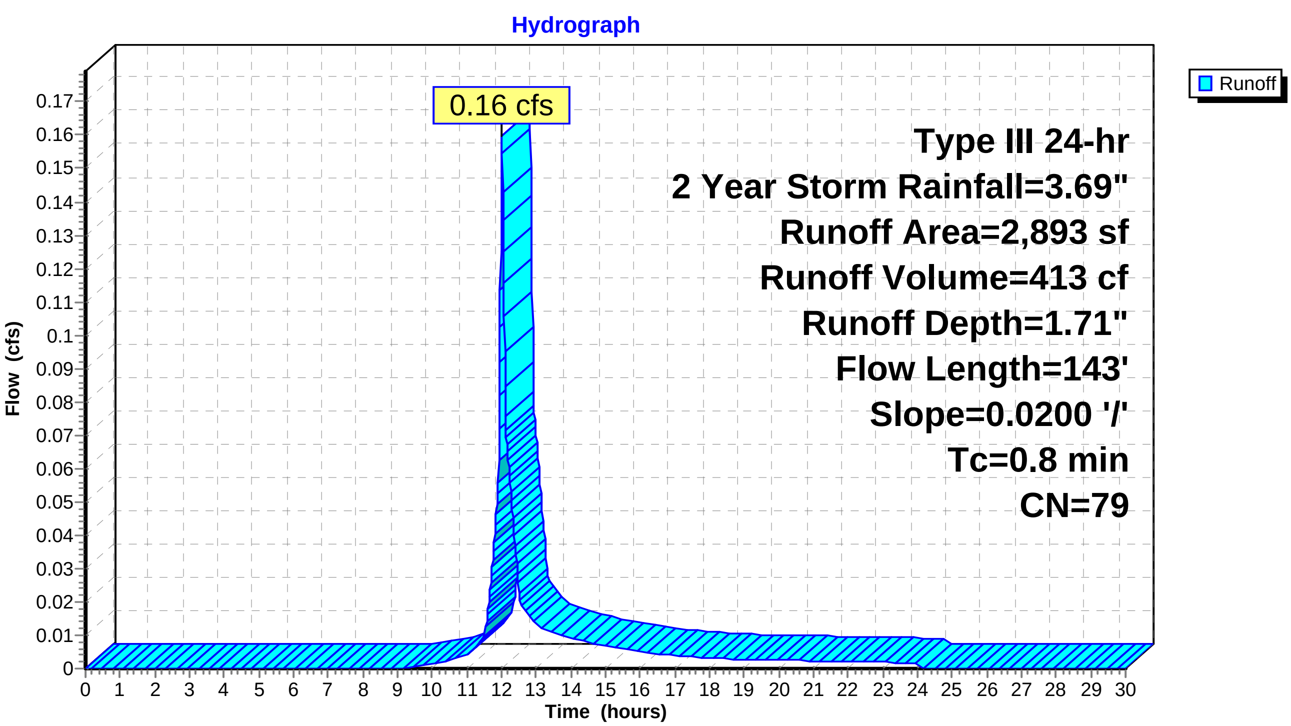
Runoff = 0.16 cfs @ 12.01 hrs, Volume= 413 cf, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
1,481	61	>75% Grass cover, Good, HSG B
1,412	98	Paved parking, HSG B
2,893	79	Weighted Average
1,481		51.19% Pervious Area
1,412		48.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	143	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps

Subcatchment PS1:



Summary for Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips

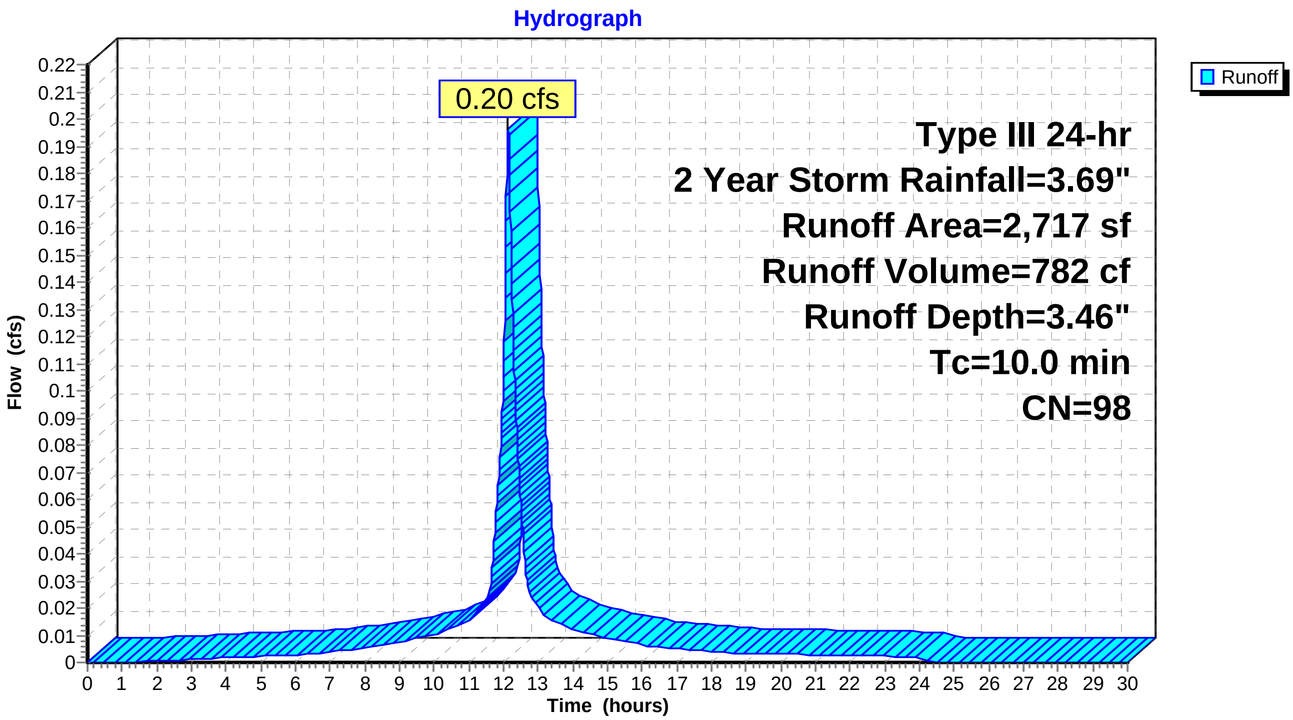
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 782 cf, Depth= 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
2,717	98	Roofs, HSG B
2,717		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Travel Time Through Filter Media**

Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips



Summary for Subcatchment PS2:

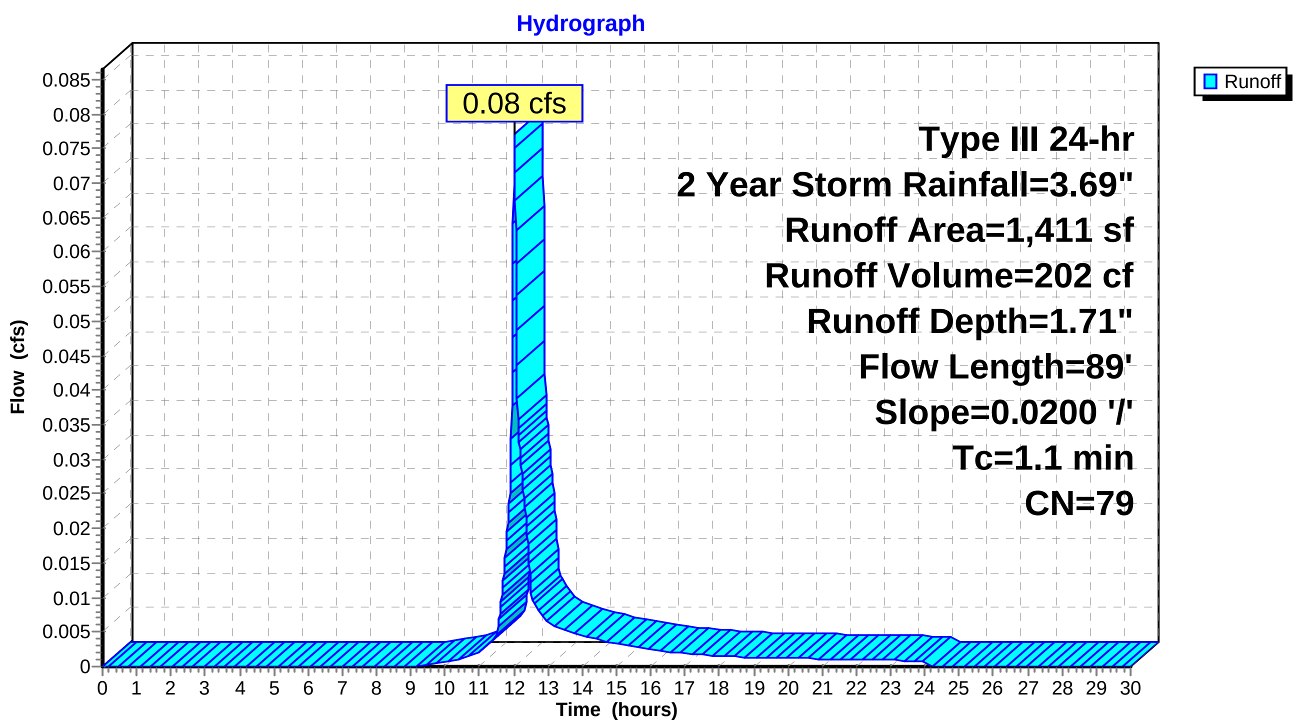
Runoff = 0.08 cfs @ 12.02 hrs, Volume= 202 cf, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
382	98	Paved parking, HSG B
293	98	Roofs, HSG B
736	61	>75% Grass cover, Good, HSG B
1,411	79	Weighted Average
736		52.16% Pervious Area
675		47.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	89	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment PS2:



Summary for Subcatchment PS3:

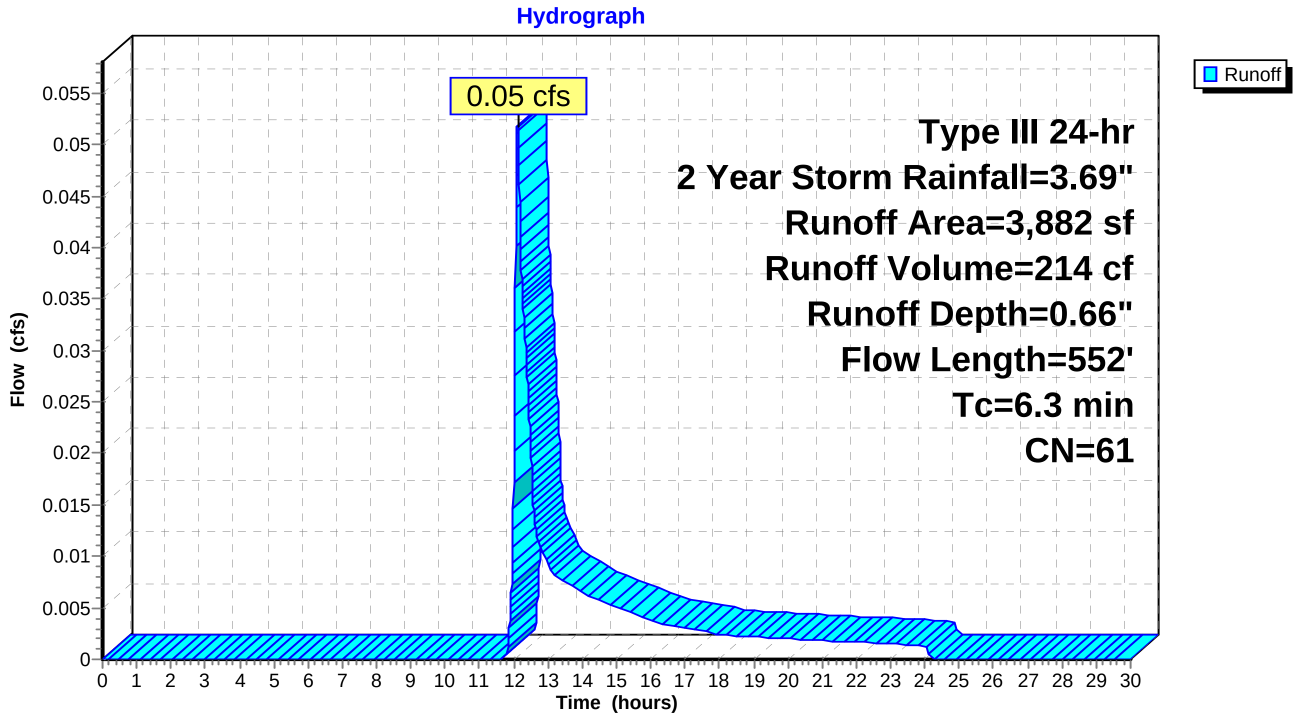
Runoff = 0.05 cfs @ 12.11 hrs, Volume= 214 cf, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 Year Storm Rainfall=3.69"

Area (sf)	CN	Description
3,882	61	>75% Grass cover, Good, HSG B
3,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	342	0.0292	1.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.3	552	Total			

Subcatchment PS3:



Summary for Pond 1P: CB in Salem Street

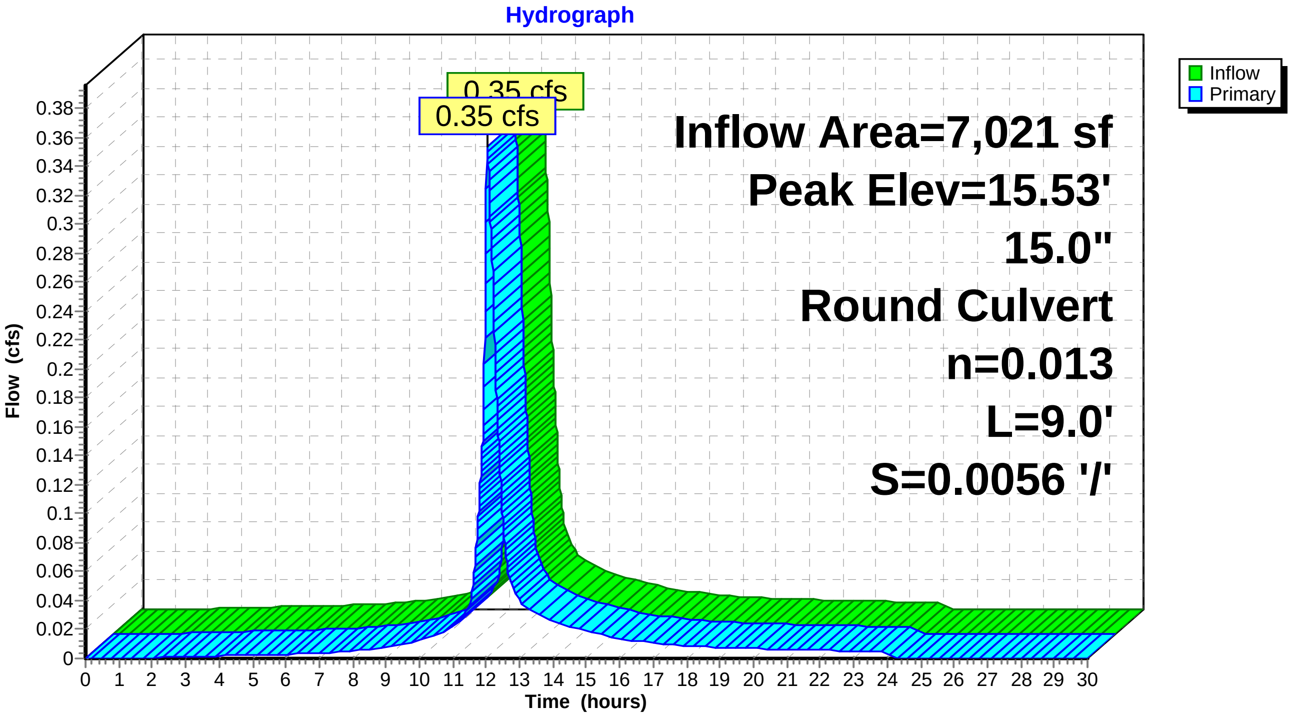
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event	
Inflow =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf	
Outflow =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.53' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.18'	**15.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.18' / 15.13' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=15.53' (Free Discharge)
1=Culvert (Barrel Controls 0.35 cfs @ 1.90 fps)

Pond 1P: CB in Salem Street



Summary for Pond 2P: CB at Site Entrance on Salem Street

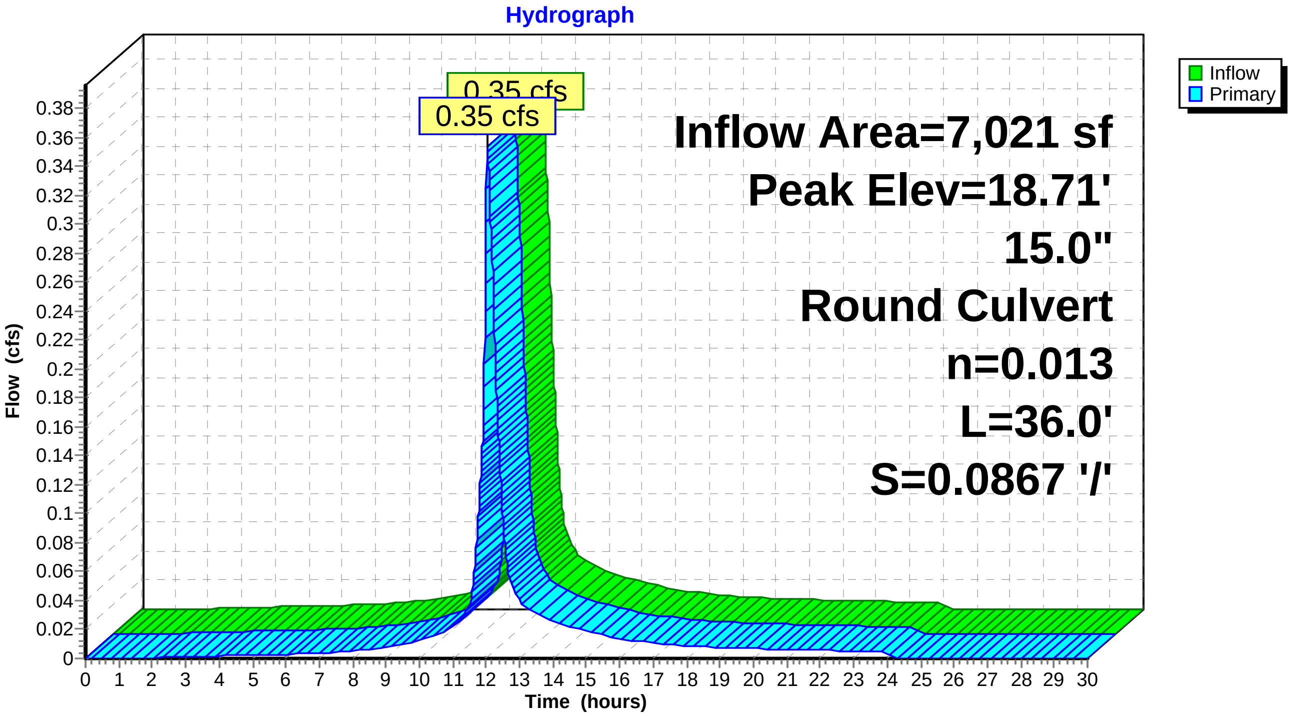
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event
Inflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	
Outflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 18.71' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.40' / 15.28' S= 0.0867 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=18.71' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.35 cfs @ 1.49 fps)

Pond 2P: CB at Site Entrance on Salem Street



Summary for Pond 3P: New DMH Salem Street

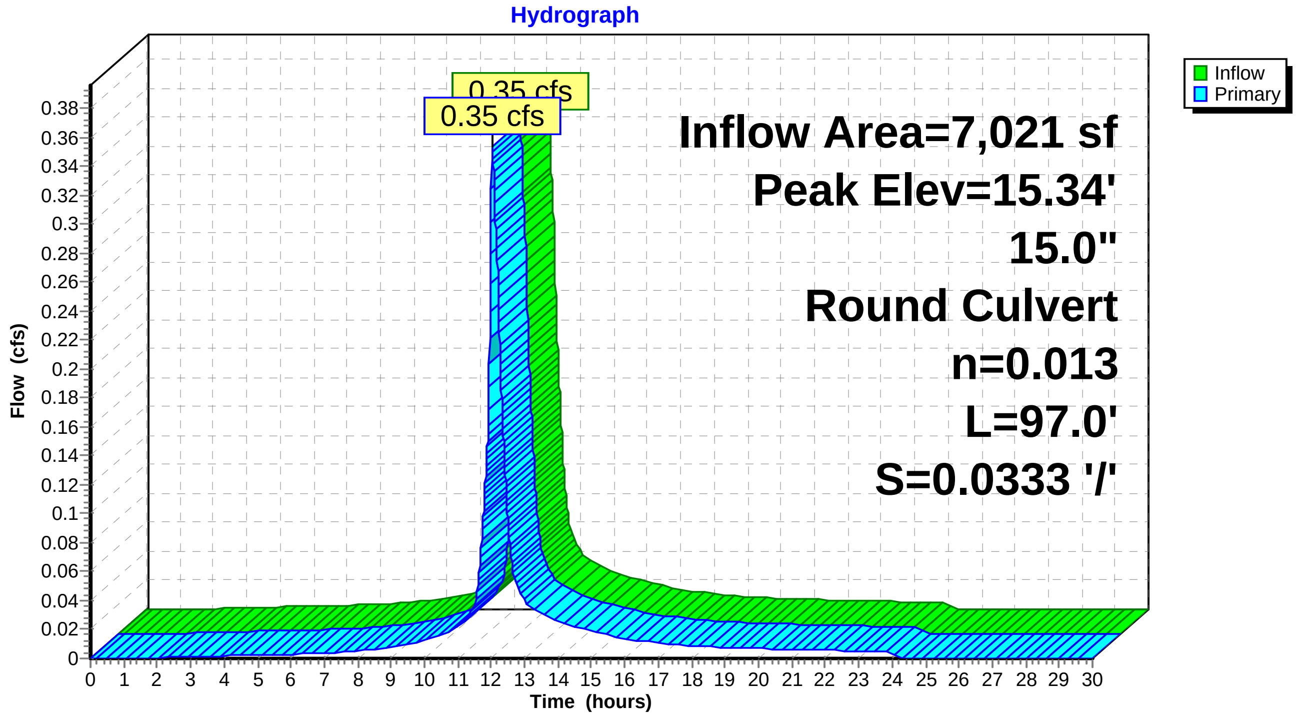
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event
Inflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	
Outflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.34' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.03'	**15.0" Round Culvert** L= 97.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.03' / 11.80' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=15.34' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.35 cfs @ 1.49 fps)

Pond 3P: New DMH Salem Street



Summary for Pond 5P: New DMH at Salem / McDonough

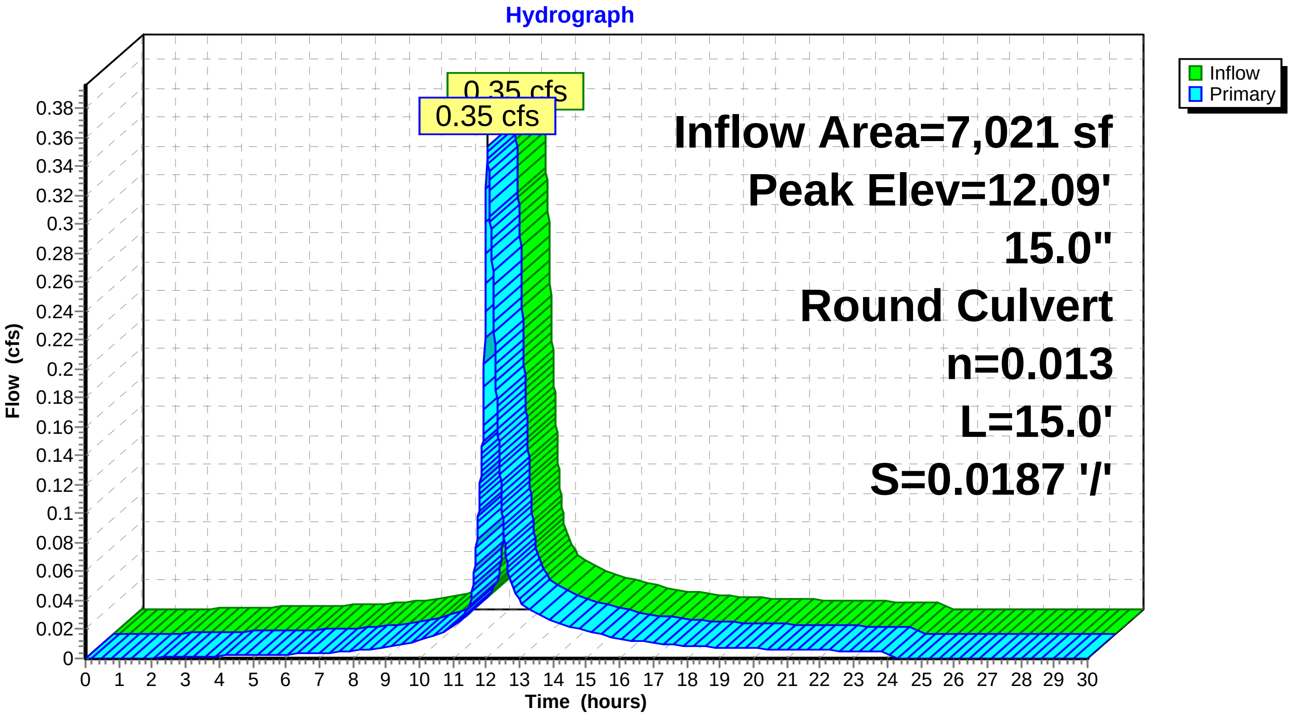
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event	
Inflow =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf	
Outflow =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.35 cfs @	12.02 hrs,	Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.09' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.78'	**15.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.78' / 11.50' S= 0.0187 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=12.09' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.35 cfs @ 1.49 fps)

Pond 5P: New DMH at Salem / McDonough



Summary for Pond 6P: CB3

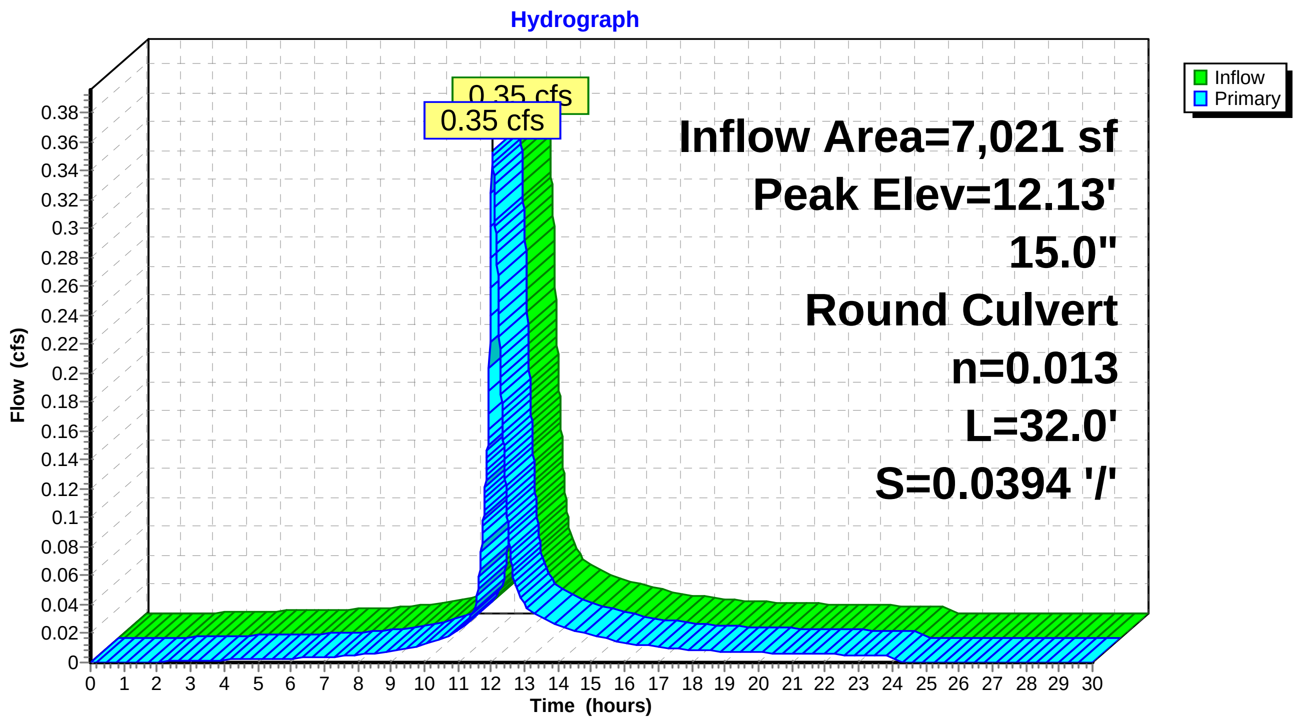
Inflow Area =	7,021 sf, 68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event
Inflow =	0.35 cfs @ 12.02 hrs, Volume=	1,398 cf	
Outflow =	0.35 cfs @ 12.02 hrs, Volume=	1,398 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.35 cfs @ 12.02 hrs, Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.13' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.82'	**15.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.82' / 10.56' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=12.13' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.35 cfs @ 1.49 fps)

Pond 6P: CB3



Summary for Pond 7P: DMH2

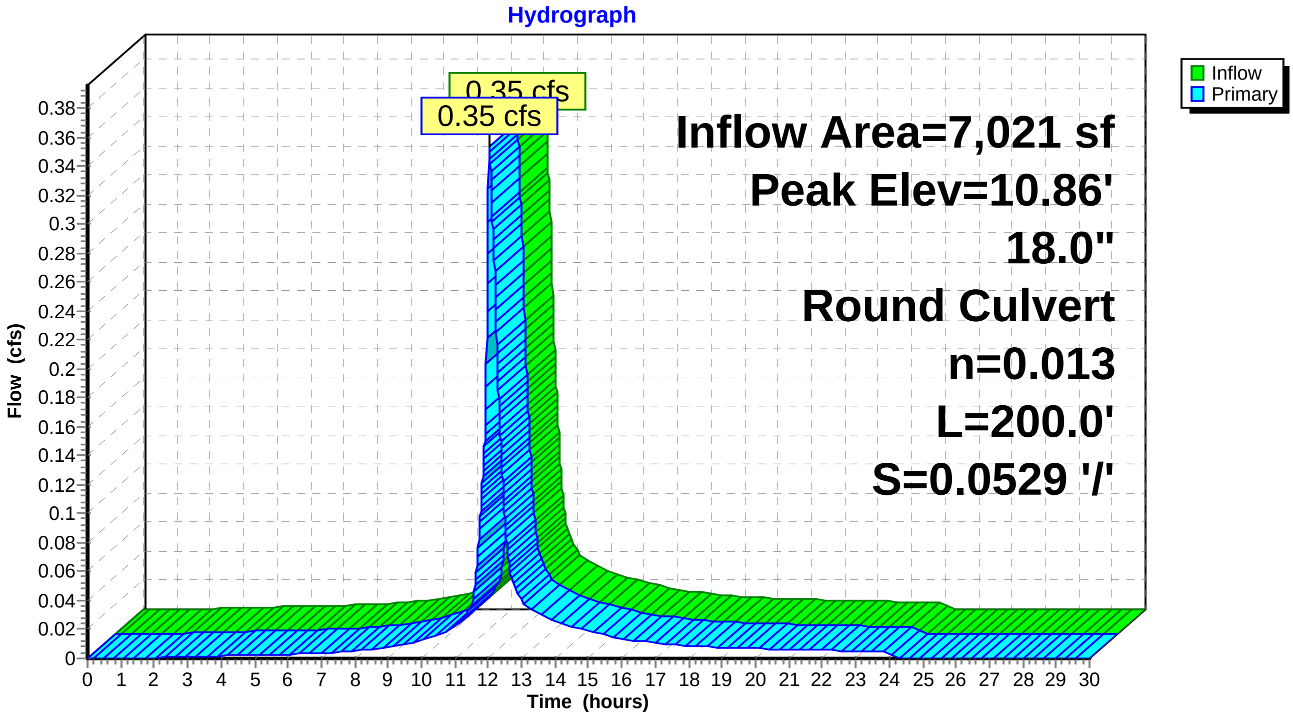
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 2.39"	for 2 Year Storm event
Inflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	
Outflow =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.35 cfs @	12.02 hrs, Volume=	1,398 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 10.86' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	10.57'	**18.0" Round Culvert** L= 200.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 10.57' / 0.00' S= 0.0529 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.35 cfs @ 12.02 hrs HW=10.86' (Free Discharge)
1=Culvert (Inlet Controls 0.35 cfs @ 1.45 fps)

Pond 7P: DMH2

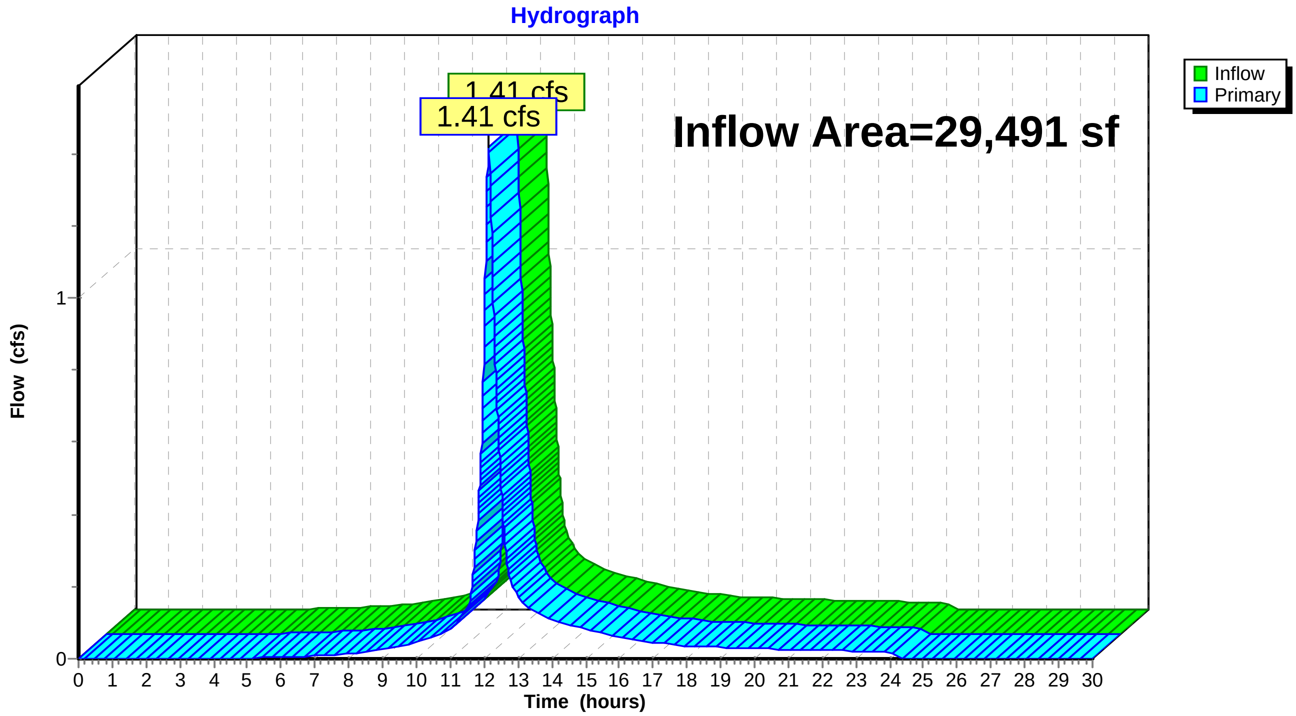


Summary for Pond DP 2: CB at corner of Cabot Street and McDonough Street

Inflow Area =	29,491 sf,	63.21% Impervious,	Inflow Depth = 2.25"	for 2 Year Storm event	
Inflow =	1.41 cfs @	12.14 hrs,	Volume=	5,535 cf	
Primary =	1.41 cfs @	12.14 hrs,	Volume=	5,535 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP 2: CB at corner of Cabot Street and McDonough Street

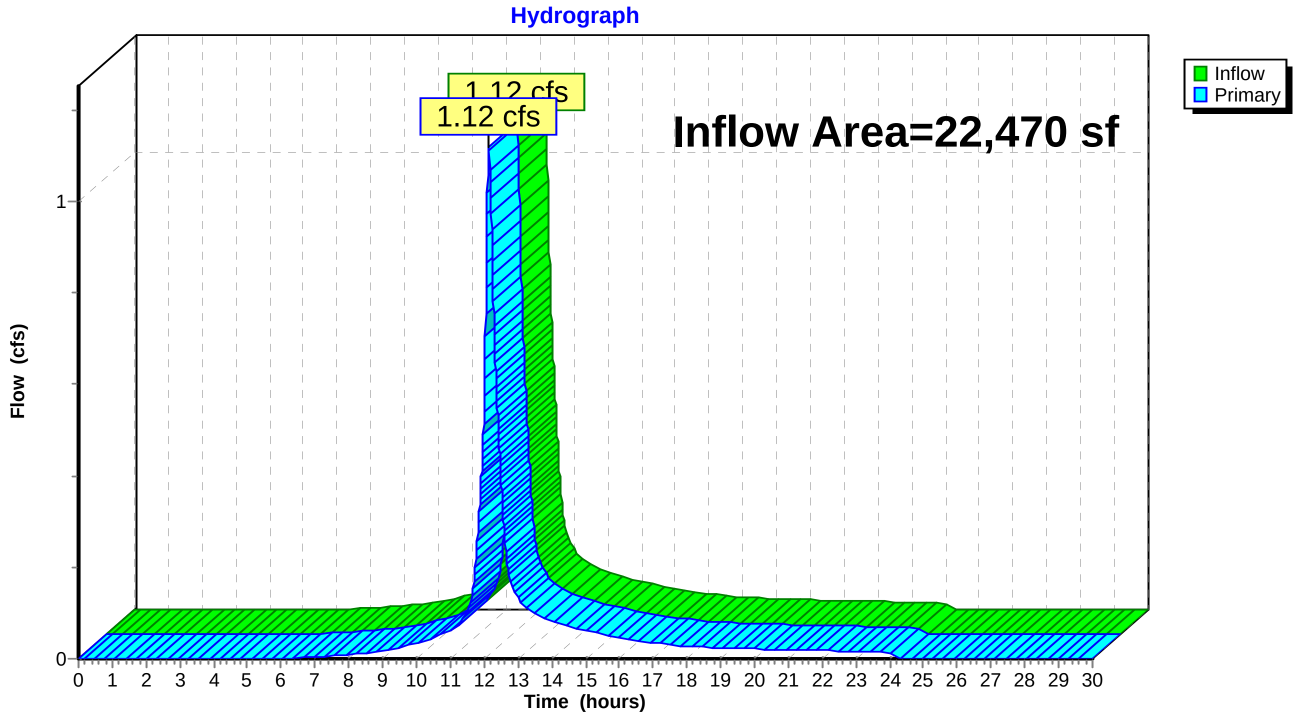


Summary for Link DP 1:

Inflow Area = 22,470 sf, 61.58% Impervious, Inflow Depth = 2.21" for 2 Year Storm event
Inflow = 1.12 cfs @ 12.15 hrs, Volume= 4,138 cf
Primary = 1.12 cfs @ 12.15 hrs, Volume= 4,138 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link DP 1:



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 OS 1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=4.35"
Flow Length=722' Tc=10.8 min CN=89 Runoff=1.79 cfs 6,736 cf

Subcatchment PS1: Runoff Area=2,893 sf 48.81% Impervious Runoff Depth=3.32"
Flow Length=143' Slope=0.0200 '/' Tc=0.8 min CN=79 Runoff=0.31 cfs 802 cf

Subcatchment PS1a: Roof Runoff to Drip Runoff Area=2,717 sf 100.00% Impervious Runoff Depth=5.36"
Tc=10.0 min CN=98 Runoff=0.30 cfs 1,214 cf

Subcatchment PS2: Runoff Area=1,411 sf 47.84% Impervious Runoff Depth=3.32"
Flow Length=89' Slope=0.0200 '/' Tc=1.1 min CN=79 Runoff=0.15 cfs 391 cf

Subcatchment PS3: Runoff Area=3,882 sf 0.00% Impervious Runoff Depth=1.74"
Flow Length=552' Tc=6.3 min CN=61 Runoff=0.17 cfs 564 cf

Pond 1P: CB in Salem Street Peak Elev=15.66' Inflow=0.64 cfs 2,407 cf
15.0" Round Culvert n=0.013 L=9.0' S=0.0056 '/' Outflow=0.64 cfs 2,407 cf

Pond 2P: CB at Site Entrance on Salem Street Peak Elev=18.82' Inflow=0.64 cfs 2,407 cf
15.0" Round Culvert n=0.013 L=36.0' S=0.0867 '/' Outflow=0.64 cfs 2,407 cf

Pond 3P: New DMH Salem Street Peak Elev=15.45' Inflow=0.64 cfs 2,407 cf
15.0" Round Culvert n=0.013 L=97.0' S=0.0333 '/' Outflow=0.64 cfs 2,407 cf

Pond 5P: New DMH at Salem / McDonough Peak Elev=12.20' Inflow=0.64 cfs 2,407 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0187 '/' Outflow=0.64 cfs 2,407 cf

Pond 6P: CB3 Peak Elev=12.24' Inflow=0.64 cfs 2,407 cf
15.0" Round Culvert n=0.013 L=32.0' S=0.0394 '/' Outflow=0.64 cfs 2,407 cf

Pond 7P: DMH2 Peak Elev=10.97' Inflow=0.64 cfs 2,407 cf
18.0" Round Culvert n=0.013 L=200.0' S=0.0529 '/' Outflow=0.64 cfs 2,407 cf

Pond DP 2: CB at corner of Cabot Street and McDonough Street Inflow=2.44 cfs 9,706 cf
Primary=2.44 cfs 9,706 cf

Link DP 1: Inflow=1.94 cfs 7,300 cf
Primary=1.94 cfs 7,300 cf

Total Runoff Area = 29,491 sf Runoff Volume = 9,706 cf Average Runoff Depth = 3.95"
36.79% Pervious = 10,849 sf 63.21% Impervious = 18,642 sf

Summary for Subcatchment OS 1: Off Site

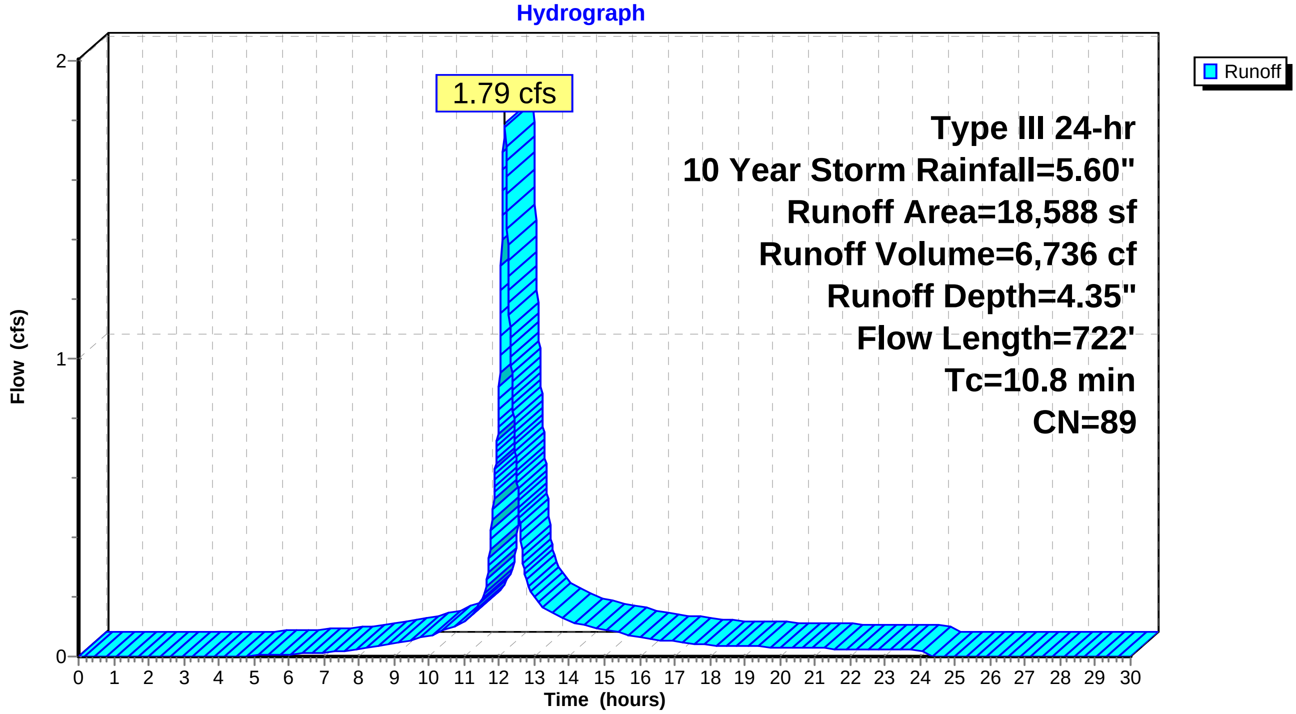
Runoff = 1.79 cfs @ 12.15 hrs, Volume= 6,736 cf, Depth= 4.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750		25.55% Pervious Area
13,838		74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	46	0.0326	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
2.9	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.8	722	Total			

Subcatchment OS 1: Off Site



Summary for Subcatchment PS1:

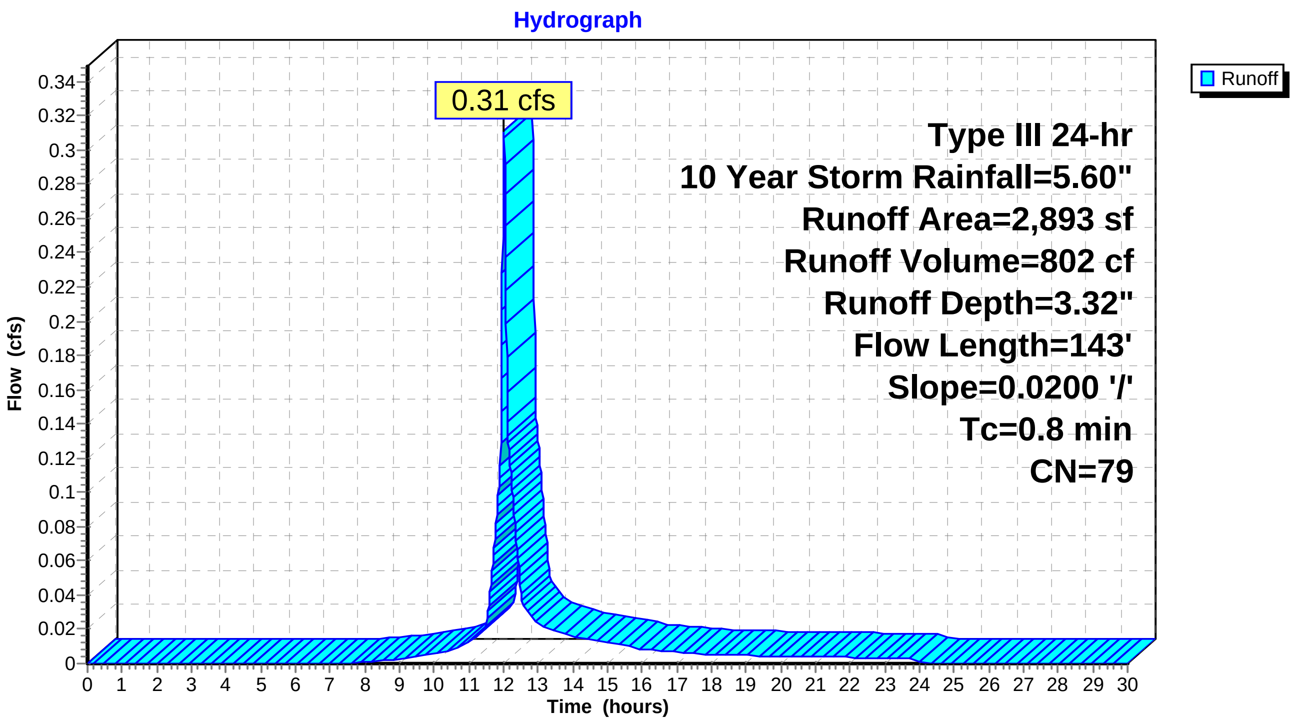
Runoff = 0.31 cfs @ 12.01 hrs, Volume= 802 cf, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
1,481	61	>75% Grass cover, Good, HSG B
1,412	98	Paved parking, HSG B
2,893	79	Weighted Average
1,481		51.19% Pervious Area
1,412		48.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	143	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps

Subcatchment PS1:



Summary for Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips

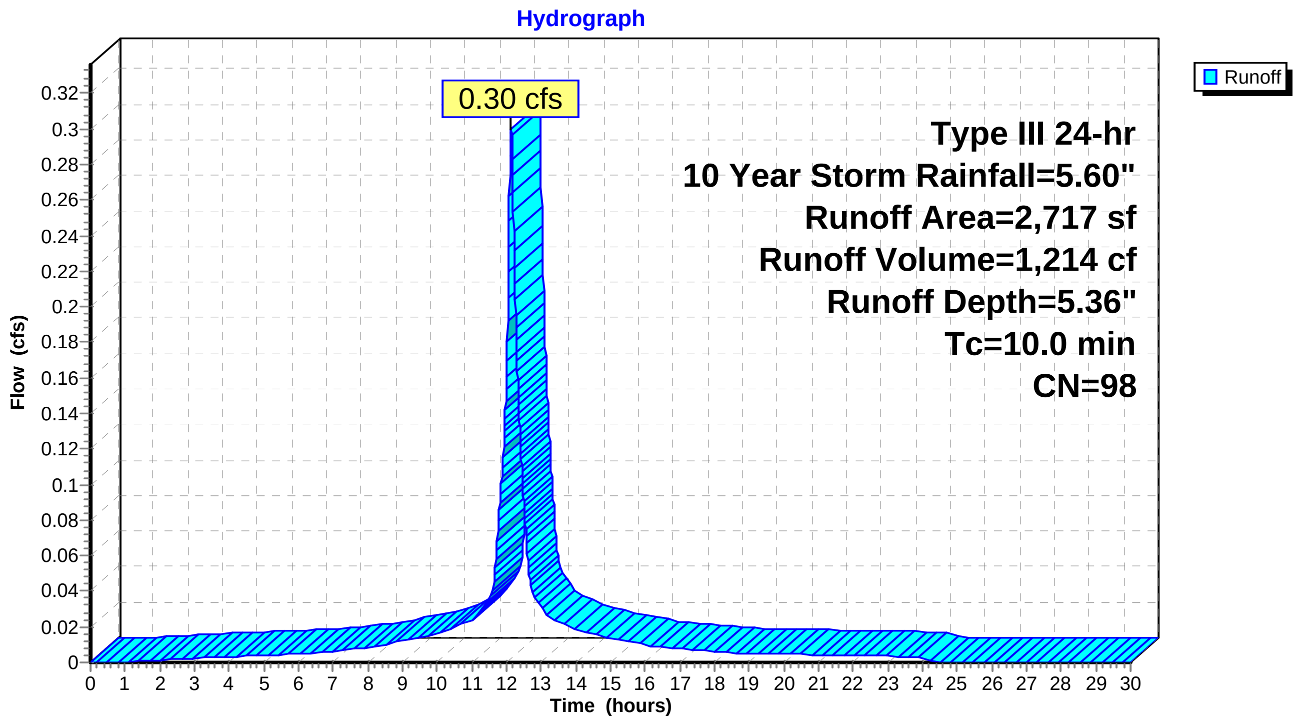
Runoff = 0.30 cfs @ 12.13 hrs, Volume= 1,214 cf, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
2,717	98	Roofs, HSG B
2,717		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Travel Time Through Filter Media**

Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips



Summary for Subcatchment PS2:

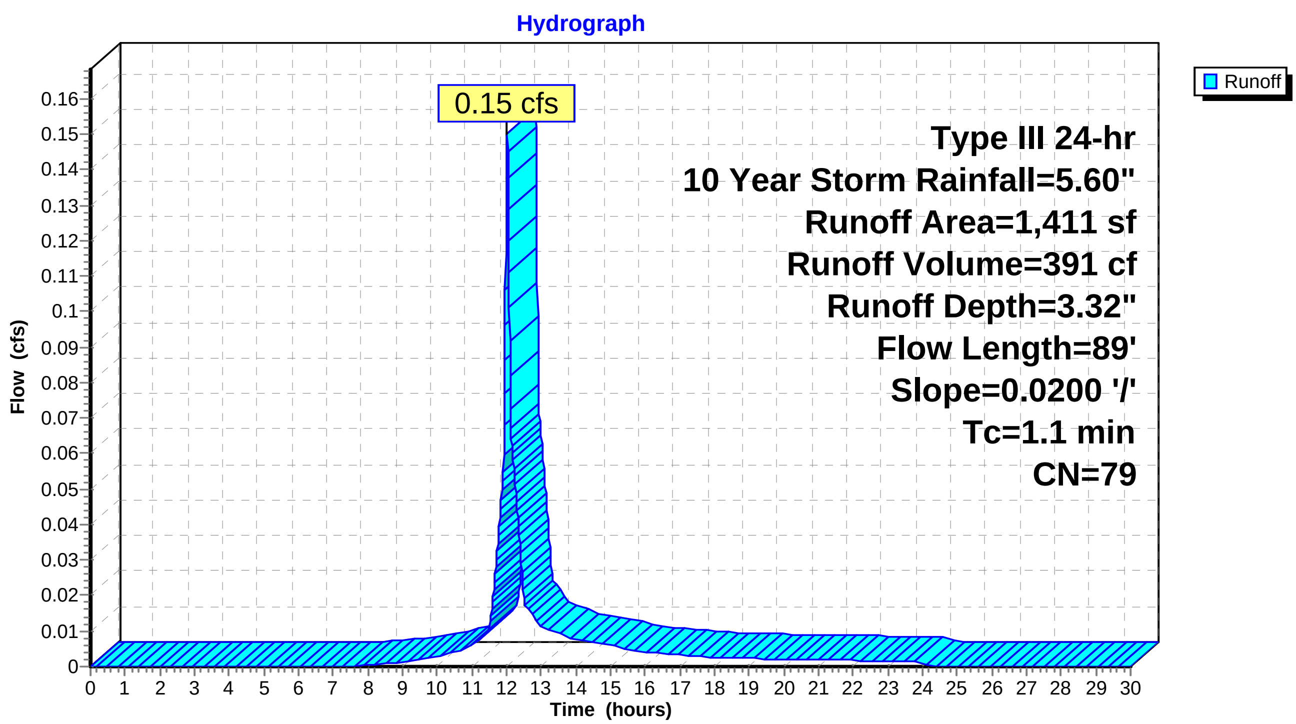
Runoff = 0.15 cfs @ 12.02 hrs, Volume= 391 cf, Depth= 3.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
382	98	Paved parking, HSG B
293	98	Roofs, HSG B
736	61	>75% Grass cover, Good, HSG B
1,411	79	Weighted Average
736		52.16% Pervious Area
675		47.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	89	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment PS2:



Summary for Subcatchment PS3:

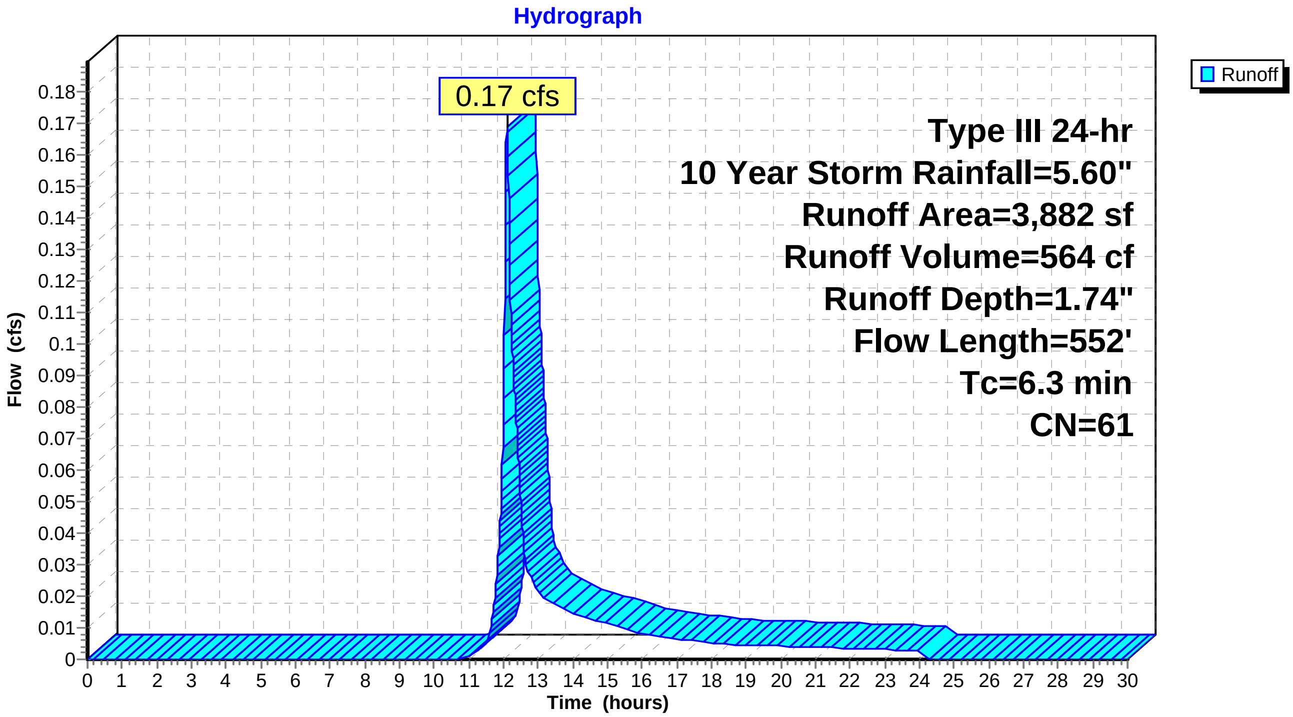
Runoff = 0.17 cfs @ 12.10 hrs, Volume= 564 cf, Depth= 1.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 Year Storm Rainfall=5.60"

Area (sf)	CN	Description
3,882	61	>75% Grass cover, Good, HSG B
3,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	342	0.0292	1.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.3	552	Total			

Subcatchment PS3:



Summary for Pond 1P: CB in Salem Street

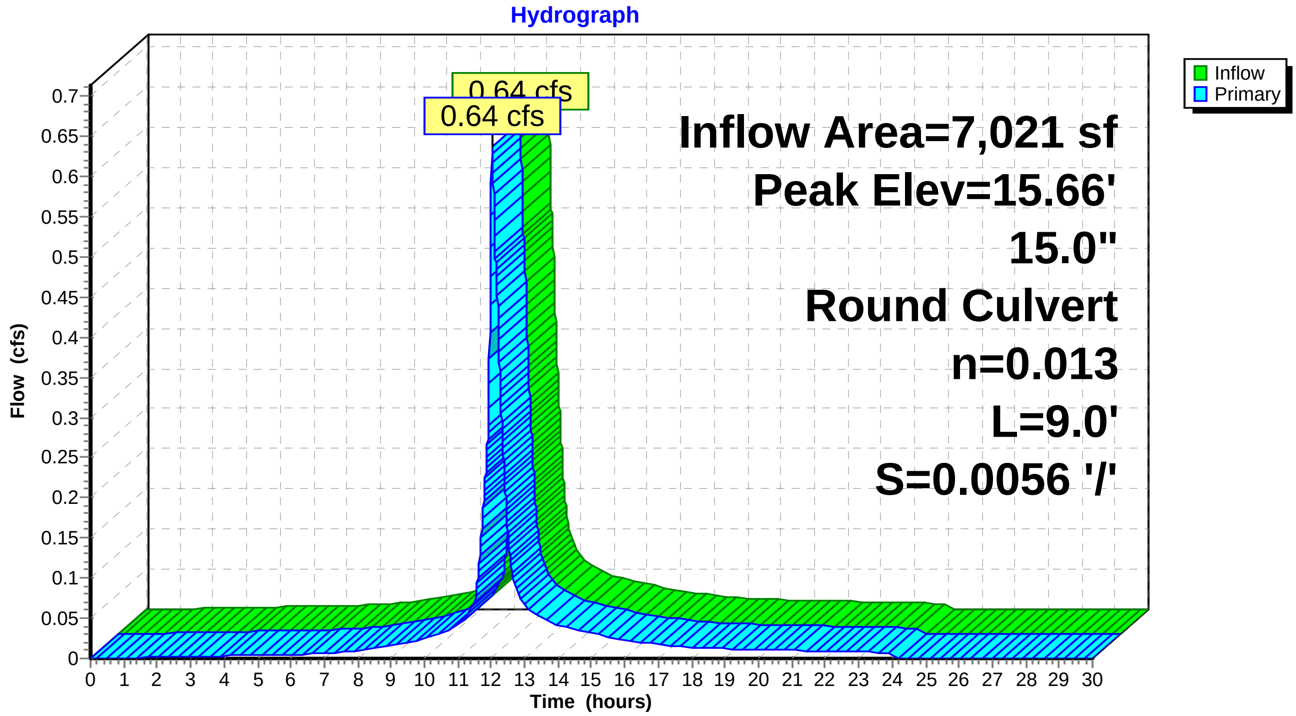
Inflow Area = 7,021 sf, 68.42% Impervious, Inflow Depth = 4.11" for 10 Year Storm event
Inflow = 0.64 cfs @ 12.02 hrs, Volume= 2,407 cf
Outflow = 0.64 cfs @ 12.02 hrs, Volume= 2,407 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.02 hrs, Volume= 2,407 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.66' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.18'	**15.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.18' / 15.13' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=15.66' (Free Discharge)
1=Culvert (Barrel Controls 0.64 cfs @ 2.19 fps)

Pond 1P: CB in Salem Street



Summary for Pond 2P: CB at Site Entrance on Salem Street

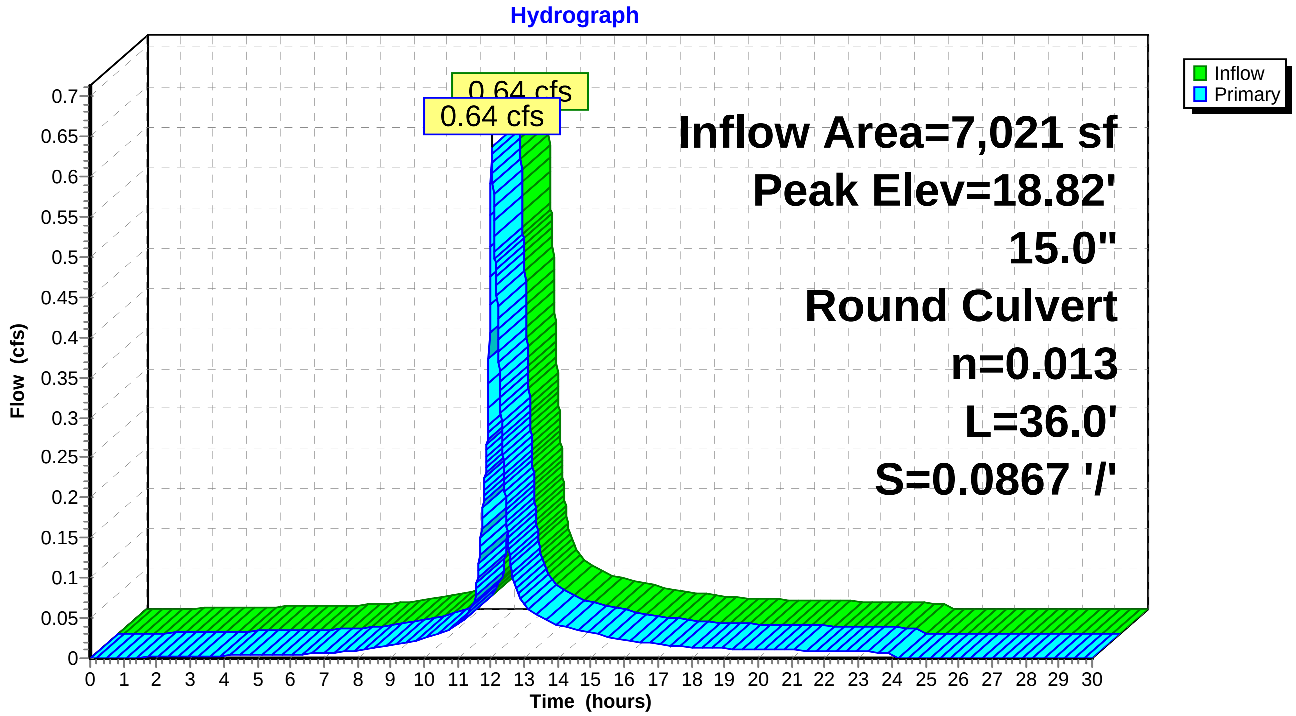
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 4.11"	for 10 Year Storm event	
Inflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	
Outflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 18.82' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.40' / 15.28' S= 0.0867 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=18.82' (Free Discharge)
1=Culvert (Inlet Controls 0.64 cfs @ 1.75 fps)

Pond 2P: CB at Site Entrance on Salem Street



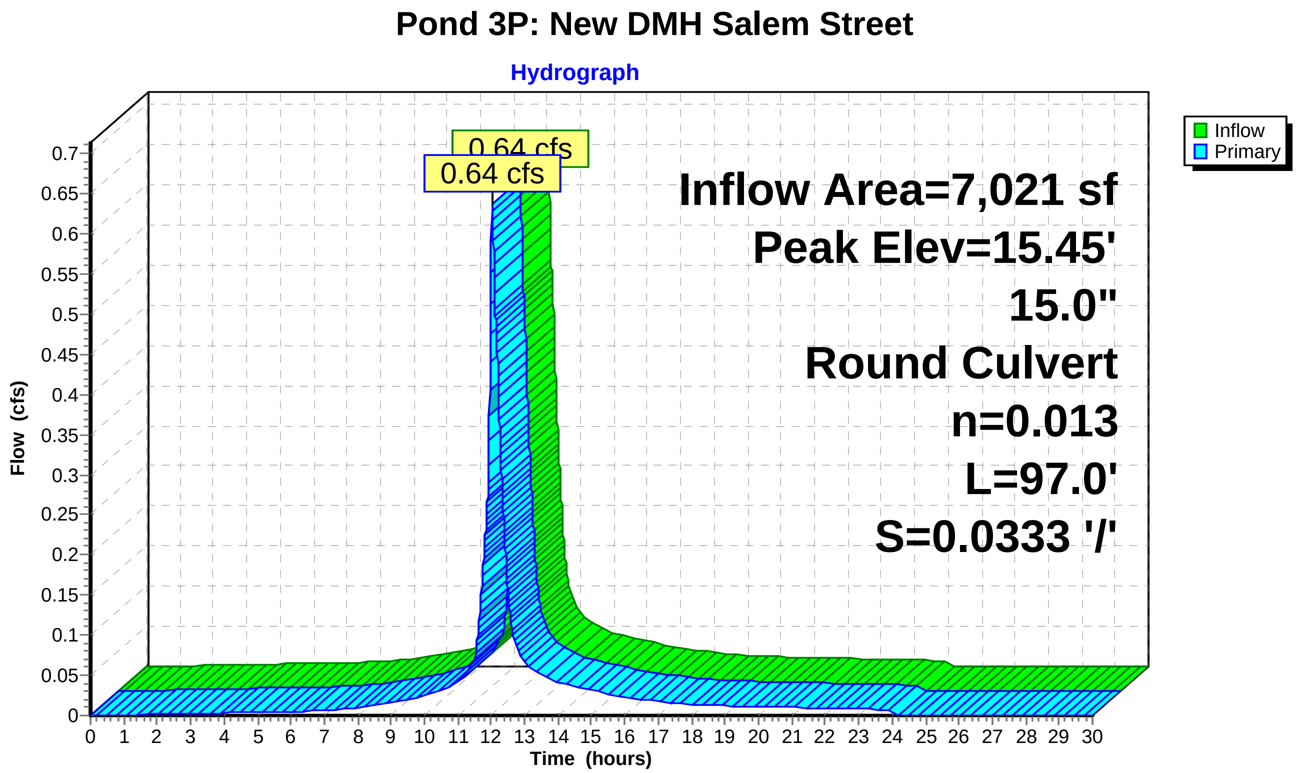
Summary for Pond 3P: New DMH Salem Street

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 4.11"	for 10 Year Storm event
Inflow =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf	
Outflow =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.45' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.03'	**15.0" Round Culvert** L= 97.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.03' / 11.80' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=15.45' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.64 cfs @ 1.75 fps)



Summary for Pond 5P: New DMH at Salem / McDonough

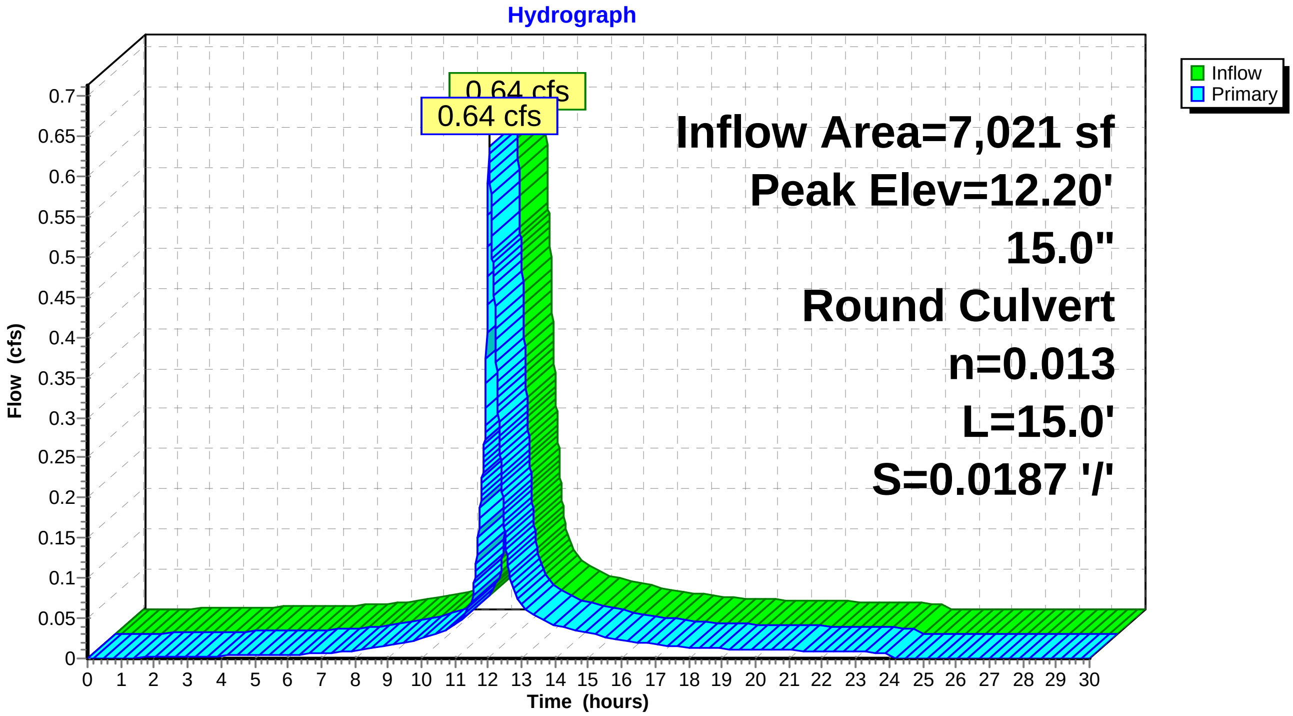
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 4.11"	for 10 Year Storm event	
Inflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	
Outflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.20' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.78'	**15.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.78' / 11.50' S= 0.0187 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=12.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.64 cfs @ 1.75 fps)

Pond 5P: New DMH at Salem / McDonough



Summary for Pond 6P: CB3

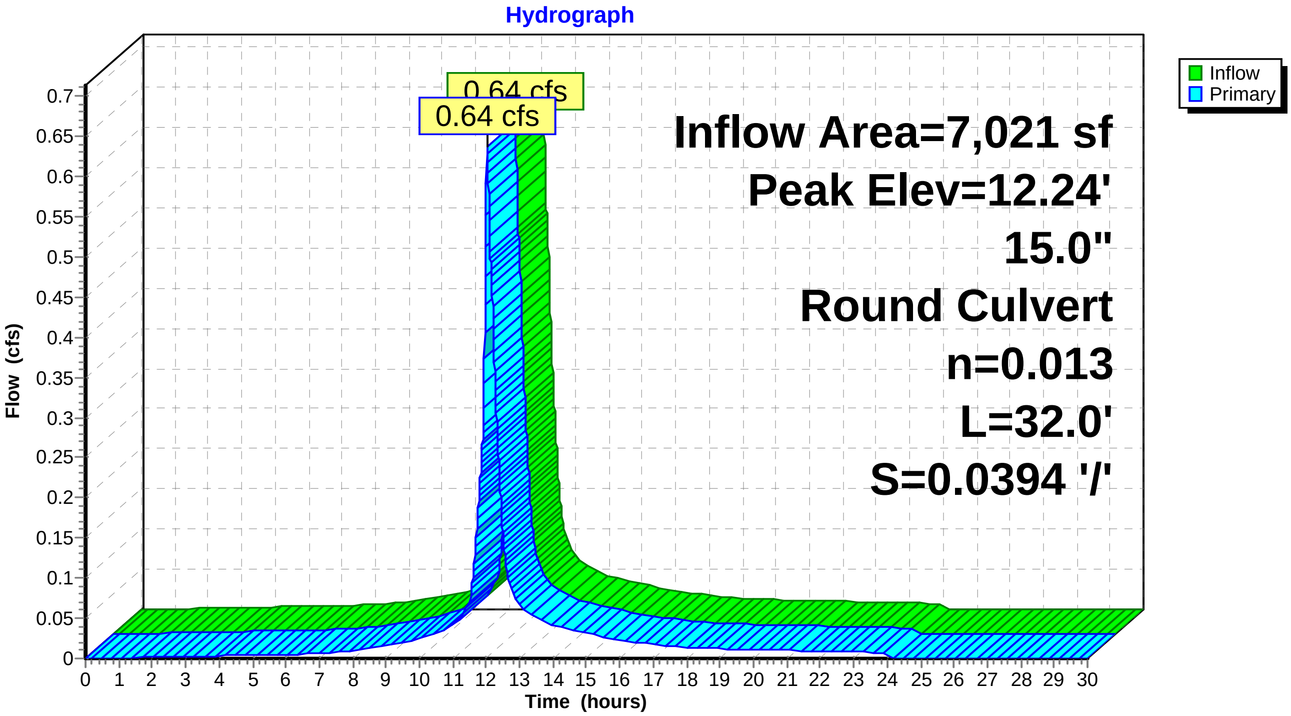
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 4.11"	for 10 Year Storm event	
Inflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	
Outflow =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.02 hrs,	Volume=	2,407 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.24' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.82'	**15.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.82' / 10.56' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=12.24' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.64 cfs @ 1.75 fps)

Pond 6P: CB3



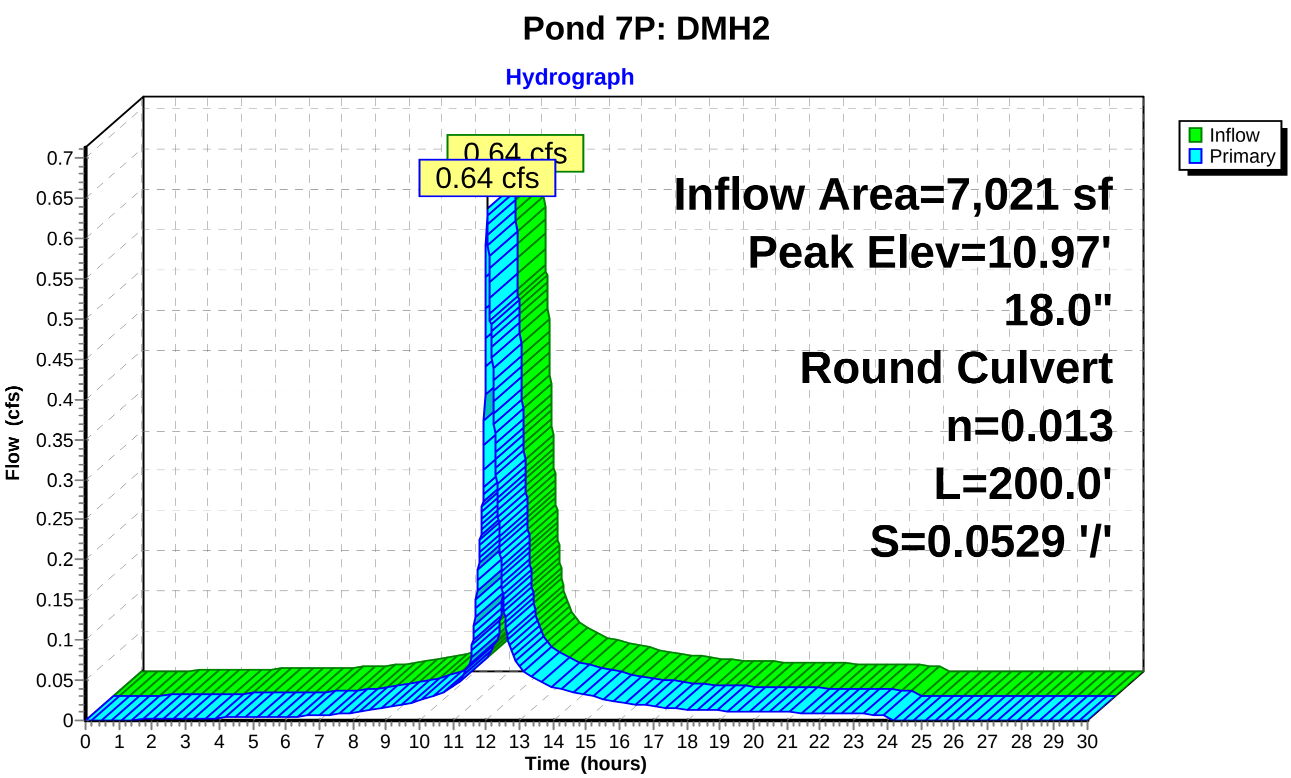
Summary for Pond 7P: DMH2

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 4.11"	for 10 Year Storm event
Inflow =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf	
Outflow =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.64 cfs @	12.02 hrs, Volume=	2,407 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 10.97' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	10.57'	**18.0" Round Culvert** L= 200.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 10.57' / 0.00' S= 0.0529 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

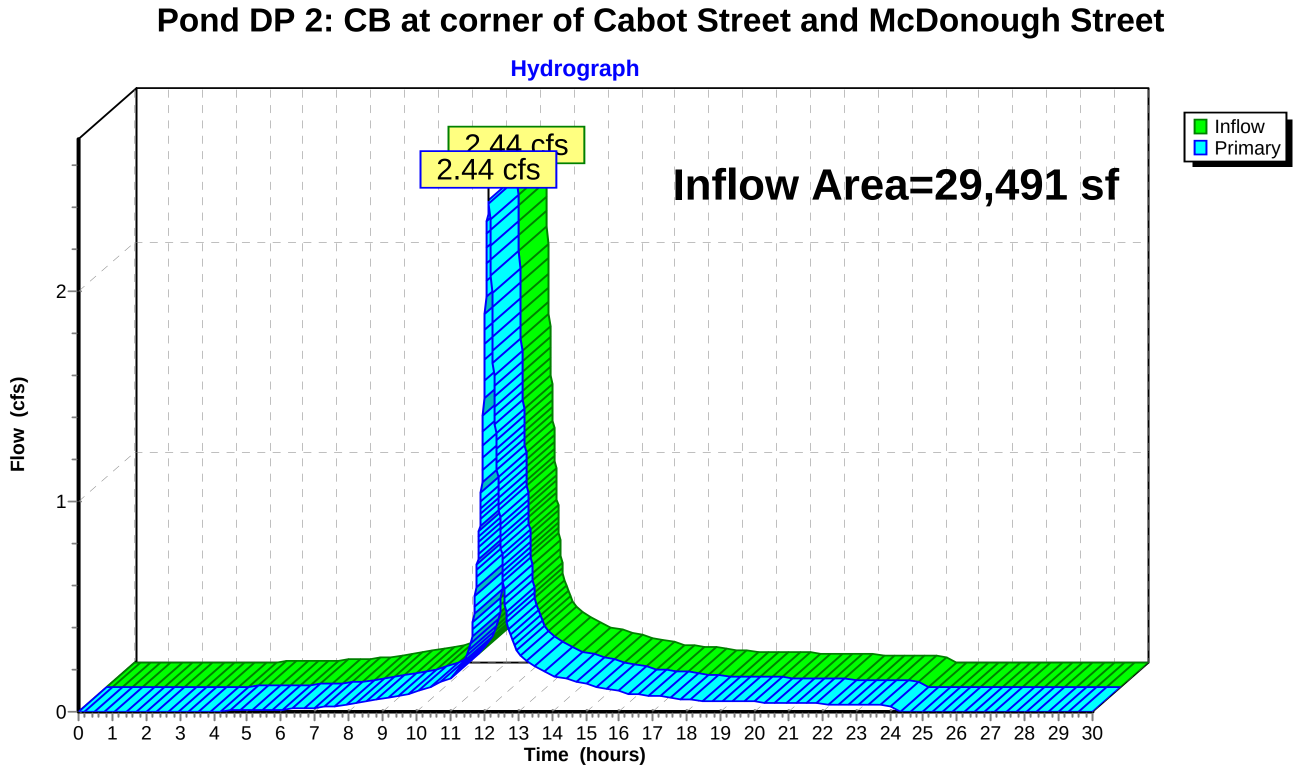
Primary OutFlow Max=0.64 cfs @ 12.02 hrs HW=10.97' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.64 cfs @ 1.70 fps)



Summary for Pond DP 2: CB at corner of Cabot Street and McDonough Street

Inflow Area = 29,491 sf, 63.21% Impervious, Inflow Depth = 3.95" for 10 Year Storm event
Inflow = 2.44 cfs @ 12.14 hrs, Volume= 9,706 cf
Primary = 2.44 cfs @ 12.14 hrs, Volume= 9,706 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

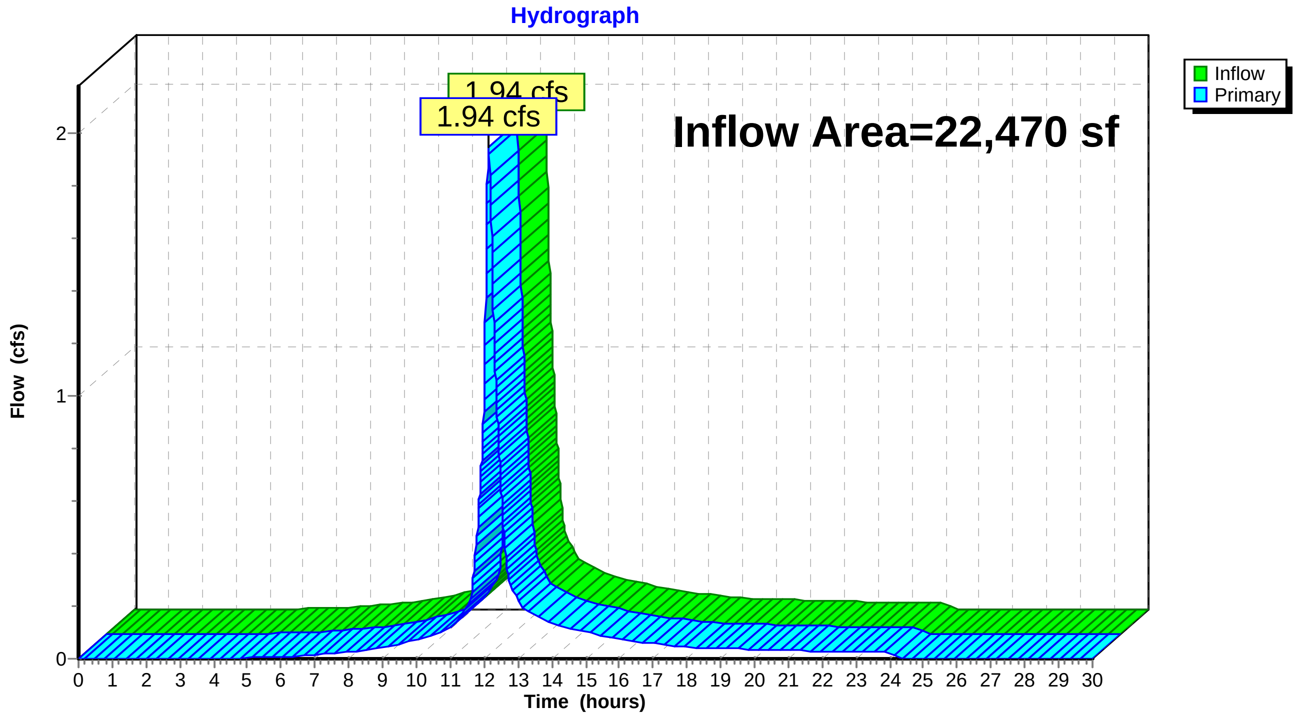


Summary for Link DP 1:

Inflow Area =	22,470 sf,	61.58% Impervious,	Inflow Depth = 3.90"	for 10 Year Storm event	
Inflow =	1.94 cfs @	12.14 hrs,	Volume=	7,300 cf	
Primary =	1.94 cfs @	12.14 hrs,	Volume=	7,300 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link DP 1:



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 OS 1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=5.81"
Flow Length=722' Tc=10.8 min CN=89 Runoff=2.36 cfs 8,993 cf

Subcatchment PS1: Runoff Area=2,893 sf 48.81% Impervious Runoff Depth=4.68"
Flow Length=143' Slope=0.0200 '/' Tc=0.8 min CN=79 Runoff=0.43 cfs 1,127 cf

Subcatchment PS1a: Roof Runoff to Drip Runoff Area=2,717 sf 100.00% Impervious Runoff Depth=6.86"
Tc=10.0 min CN=98 Runoff=0.38 cfs 1,553 cf

Subcatchment PS2: Runoff Area=1,411 sf 47.84% Impervious Runoff Depth=4.68"
Flow Length=89' Slope=0.0200 '/' Tc=1.1 min CN=79 Runoff=0.21 cfs 550 cf

Subcatchment PS3: Runoff Area=3,882 sf 0.00% Impervious Runoff Depth=2.77"
Flow Length=552' Tc=6.3 min CN=61 Runoff=0.28 cfs 897 cf

Pond 1P: CB in Salem Street Peak Elev=15.75' Inflow=0.87 cfs 3,231 cf
15.0" Round Culvert n=0.013 L=9.0' S=0.0056 '/' Outflow=0.87 cfs 3,231 cf

Pond 2P: CB at Site Entrance on Salem Street Peak Elev=18.90' Inflow=0.87 cfs 3,231 cf
15.0" Round Culvert n=0.013 L=36.0' S=0.0867 '/' Outflow=0.87 cfs 3,231 cf

Pond 3P: New DMH Salem Street Peak Elev=15.53' Inflow=0.87 cfs 3,231 cf
15.0" Round Culvert n=0.013 L=97.0' S=0.0333 '/' Outflow=0.87 cfs 3,231 cf

Pond 5P: New DMH at Salem / McDonough Peak Elev=12.28' Inflow=0.87 cfs 3,231 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0187 '/' Outflow=0.87 cfs 3,231 cf

Pond 6P: CB3 Peak Elev=12.32' Inflow=0.87 cfs 3,231 cf
15.0" Round Culvert n=0.013 L=32.0' S=0.0394 '/' Outflow=0.87 cfs 3,231 cf

Pond 7P: DMH2 Peak Elev=11.04' Inflow=0.87 cfs 3,231 cf
18.0" Round Culvert n=0.013 L=200.0' S=0.0529 '/' Outflow=0.87 cfs 3,231 cf

Pond DP 2: CB at corner of Cabot Street and McDonough Street Inflow=3.25 cfs 13,121 cf
Primary=3.25 cfs 13,121 cf

Link DP 1: Inflow=2.61 cfs 9,891 cf
Primary=2.61 cfs 9,891 cf

Total Runoff Area = 29,491 sf Runoff Volume = 13,121 cf Average Runoff Depth = 5.34"
36.79% Pervious = 10,849 sf 63.21% Impervious = 18,642 sf

Summary for Subcatchment OS 1: Off Site

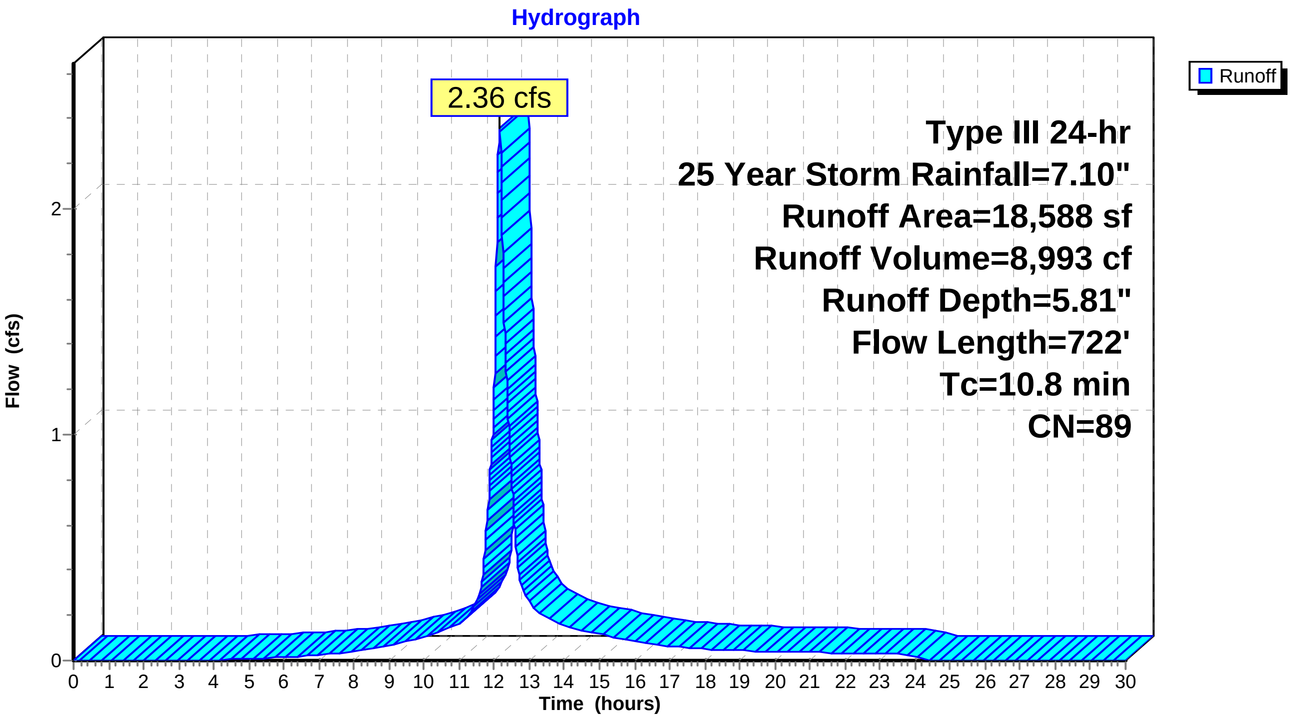
Runoff = 2.36 cfs @ 12.14 hrs, Volume= 8,993 cf, Depth= 5.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750		25.55% Pervious Area
13,838		74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	46	0.0326	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
2.9	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.8	722	Total			

Subcatchment OS 1: Off Site



Summary for Subcatchment PS1:

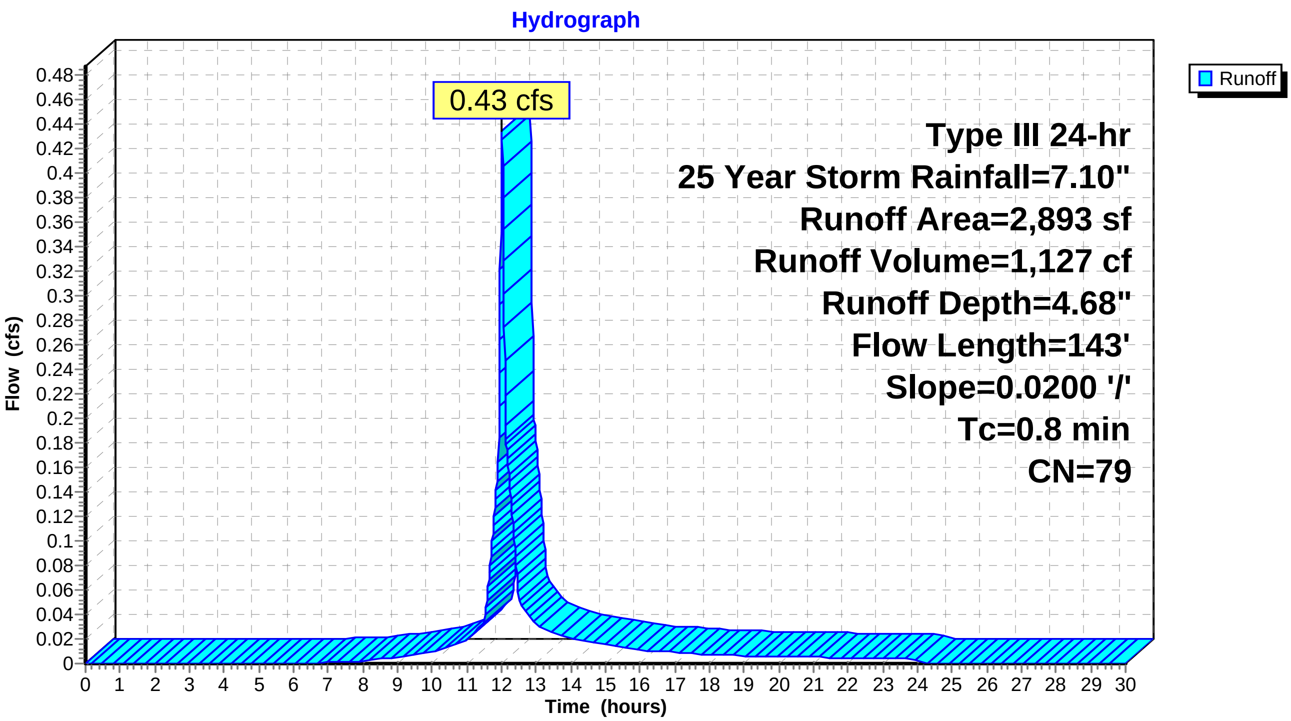
Runoff = 0.43 cfs @ 12.01 hrs, Volume= 1,127 cf, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
1,481	61	>75% Grass cover, Good, HSG B
1,412	98	Paved parking, HSG B
2,893	79	Weighted Average
1,481		51.19% Pervious Area
1,412		48.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	143	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps

Subcatchment PS1:



Summary for Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips

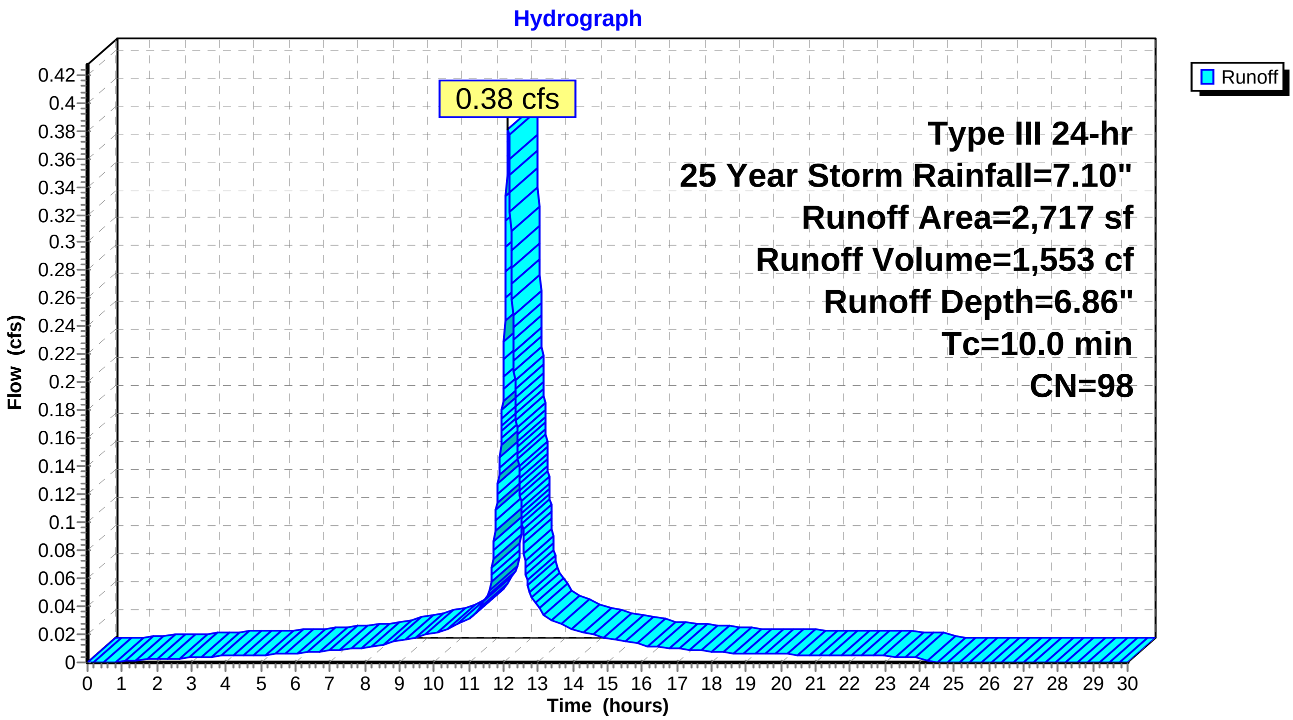
Runoff = 0.38 cfs @ 12.13 hrs, Volume= 1,553 cf, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
2,717	98	Roofs, HSG B
2,717		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Travel Time Through Filter Media**

Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips



Summary for Subcatchment PS2:

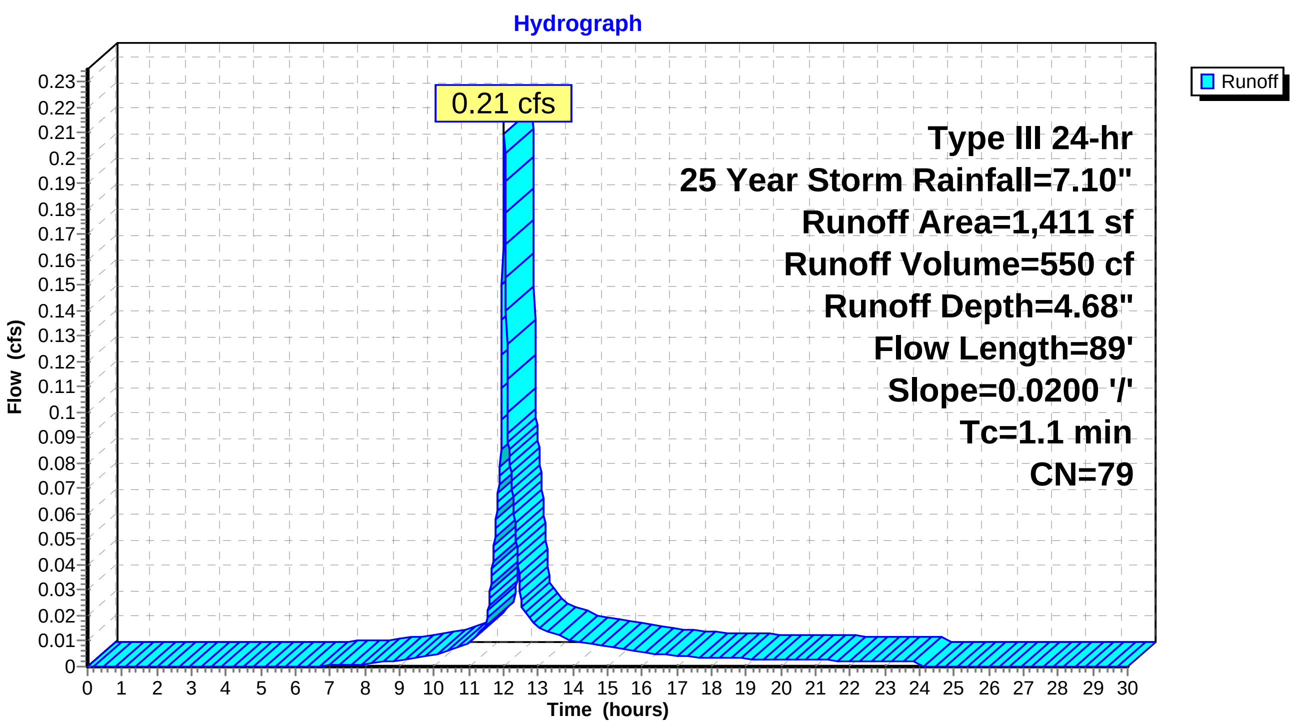
Runoff = 0.21 cfs @ 12.02 hrs, Volume= 550 cf, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
382	98	Paved parking, HSG B
293	98	Roofs, HSG B
736	61	>75% Grass cover, Good, HSG B
1,411	79	Weighted Average
736		52.16% Pervious Area
675		47.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	89	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment PS2:



Summary for Subcatchment PS3:

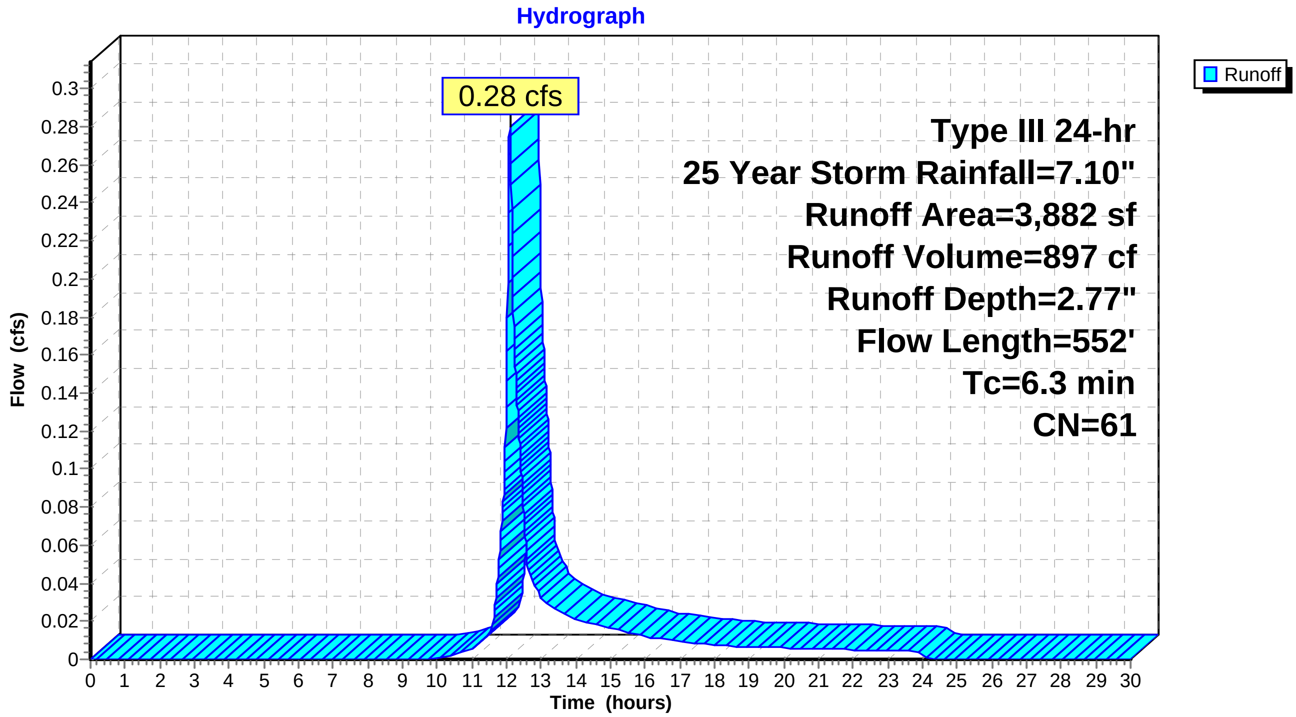
Runoff = 0.28 cfs @ 12.10 hrs, Volume= 897 cf, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 Year Storm Rainfall=7.10"

Area (sf)	CN	Description
3,882	61	>75% Grass cover, Good, HSG B
3,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	342	0.0292	1.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.3	552	Total			

Subcatchment PS3:



Summary for Pond 1P: CB in Salem Street

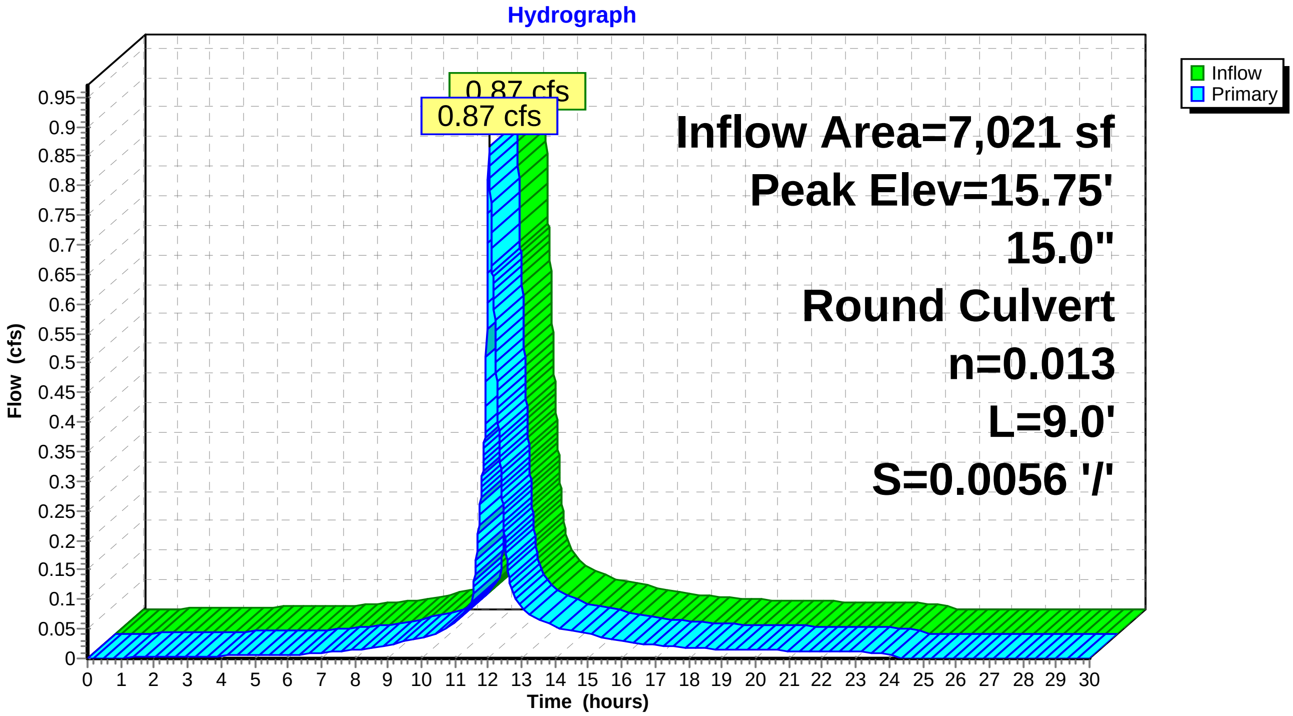
Inflow Area = 7,021 sf, 68.42% Impervious, Inflow Depth = 5.52" for 25 Year Storm event
Inflow = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf
Outflow = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.75' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.18'	**15.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.18' / 15.13' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=15.74' (Free Discharge)
1=Culvert (Barrel Controls 0.86 cfs @ 2.36 fps)

Pond 1P: CB in Salem Street



Summary for Pond 2P: CB at Site Entrance on Salem Street

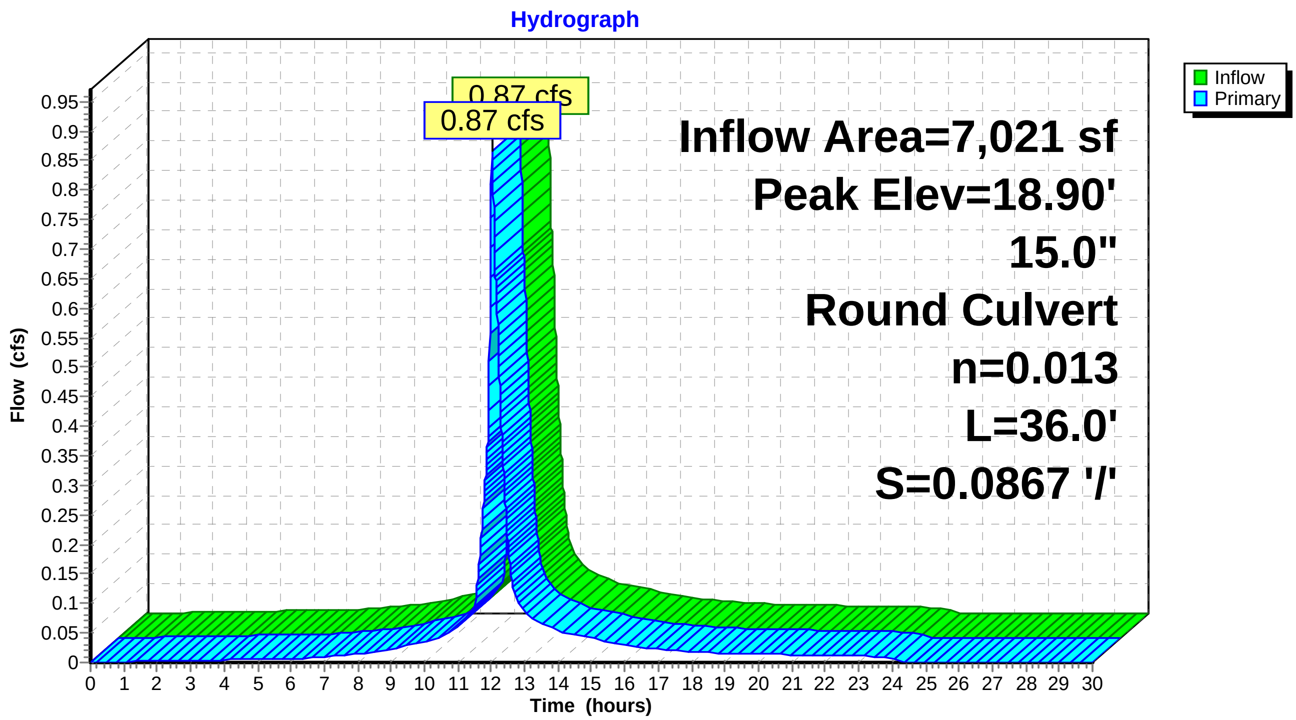
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 5.52"	for 25 Year Storm event	
Inflow =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf	
Outflow =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 18.90' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.40' / 15.28' S= 0.0867 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=18.90' (Free Discharge)
1=Culvert (Inlet Controls 0.86 cfs @ 1.90 fps)

Pond 2P: CB at Site Entrance on Salem Street



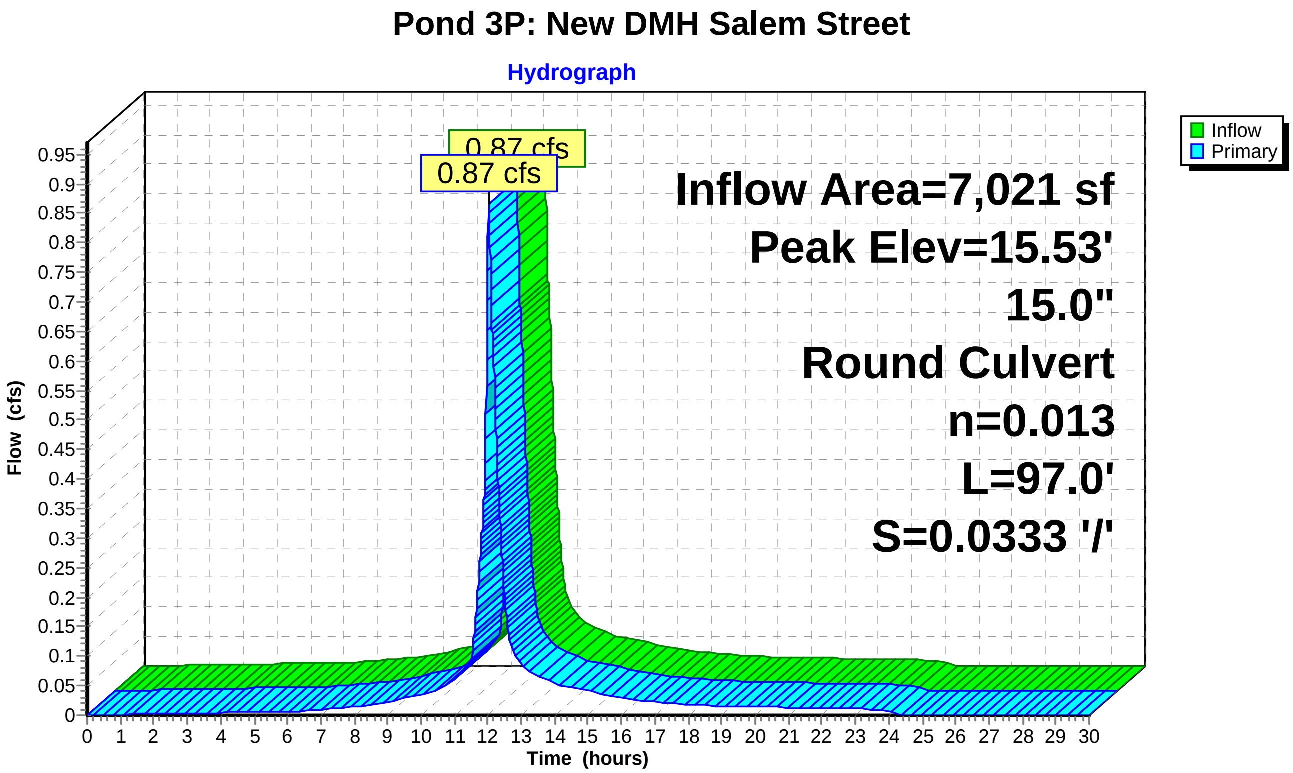
Summary for Pond 3P: New DMH Salem Street

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 5.52"	for 25 Year Storm event	
Inflow =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf	
Outflow =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.87 cfs @	12.02 hrs,	Volume=	3,231 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.53' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.03'	**15.0" Round Culvert** L= 97.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.03' / 11.80' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=15.53' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.86 cfs @ 1.90 fps)



Summary for Pond 5P: New DMH at Salem / McDonough

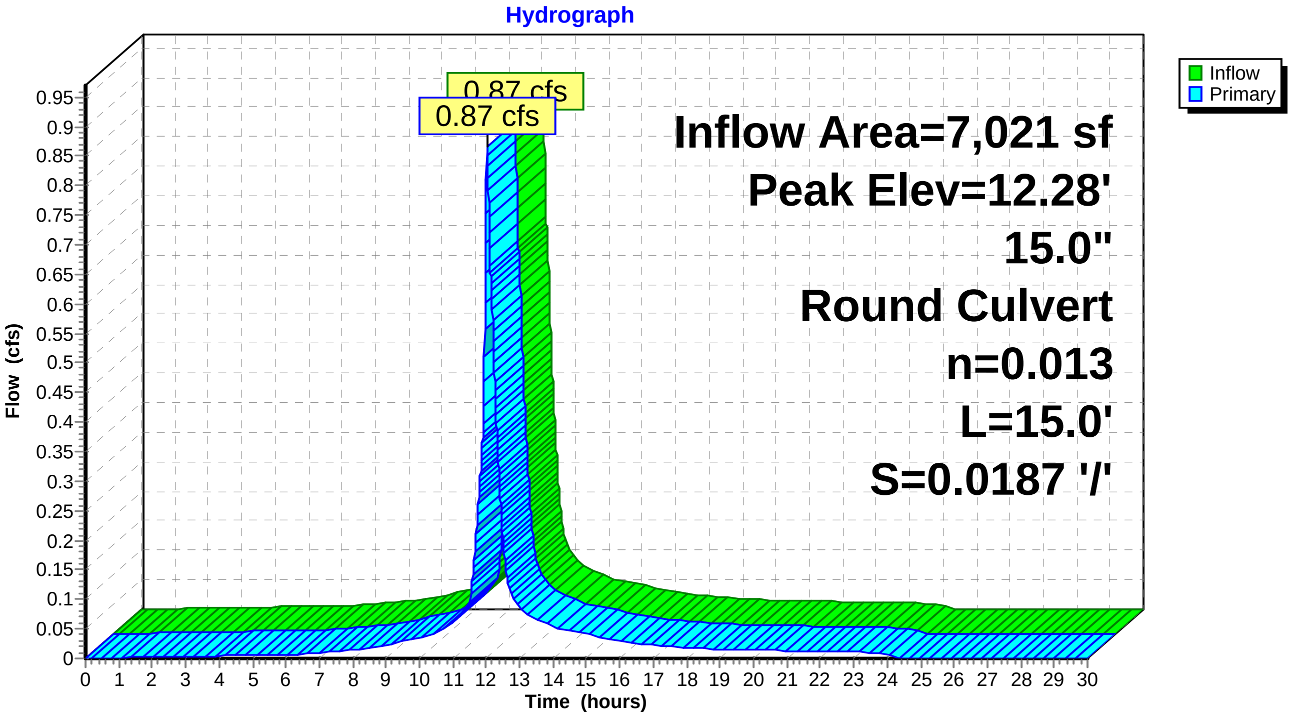
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 5.52"	for 25 Year Storm event
Inflow =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf	
Outflow =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf, Atten= 0%, Lag= 0.0 min	
Primary =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.28' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.78'	**15.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.78' / 11.50' S= 0.0187 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=12.28' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.86 cfs @ 1.90 fps)

Pond 5P: New DMH at Salem / McDonough



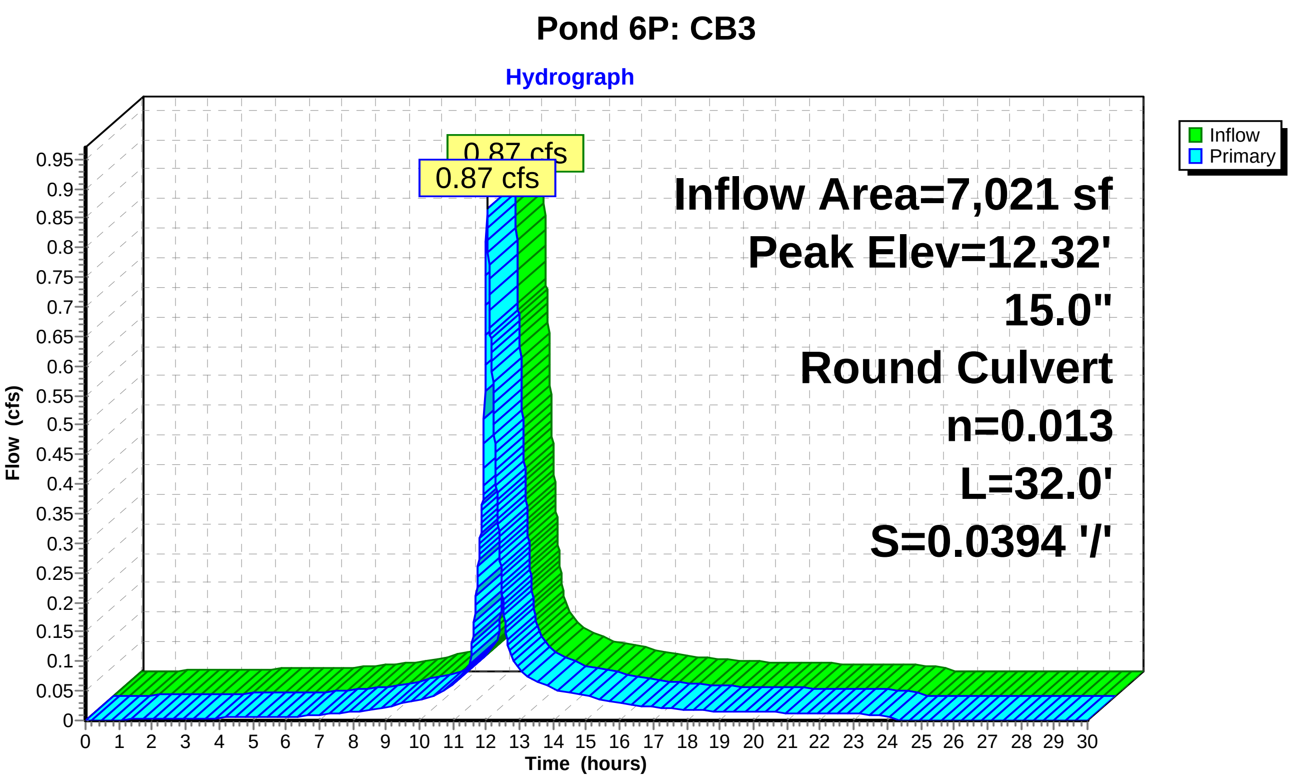
Summary for Pond 6P: CB3

Inflow Area = 7,021 sf, 68.42% Impervious, Inflow Depth = 5.52" for 25 Year Storm event
Inflow = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf
Outflow = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.87 cfs @ 12.02 hrs, Volume= 3,231 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.32' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.82'	**15.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.82' / 10.56' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=12.32' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.86 cfs @ 1.90 fps)



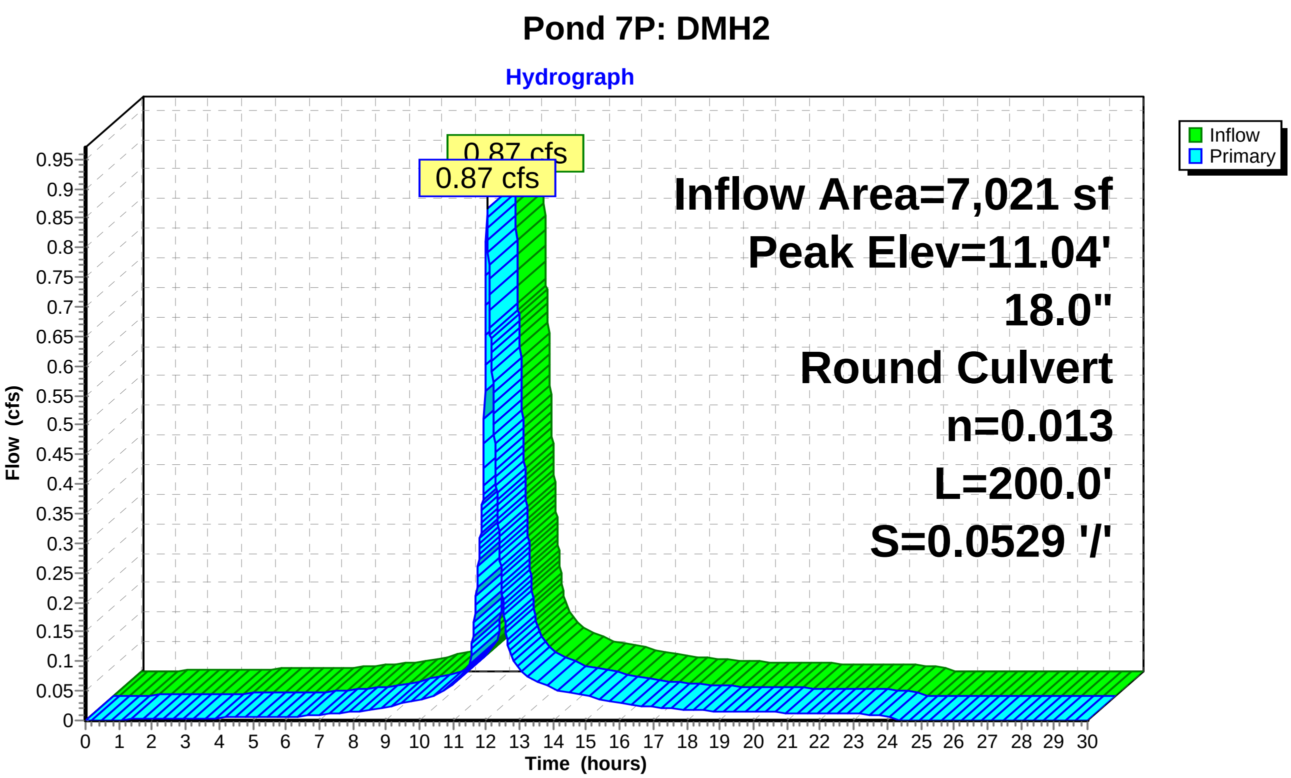
Summary for Pond 7P: DMH2

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 5.52"	for 25 Year Storm event
Inflow =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf	
Outflow =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf,	Atten= 0%, Lag= 0.0 min
Primary =	0.87 cfs @	12.02 hrs, Volume=	3,231 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 11.04' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	10.57'	**18.0" Round Culvert** L= 200.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 10.57' / 0.00' S= 0.0529 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.86 cfs @ 12.02 hrs HW=11.04' (Free Discharge)
└─**1=Culvert** (Inlet Controls 0.86 cfs @ 1.84 fps)

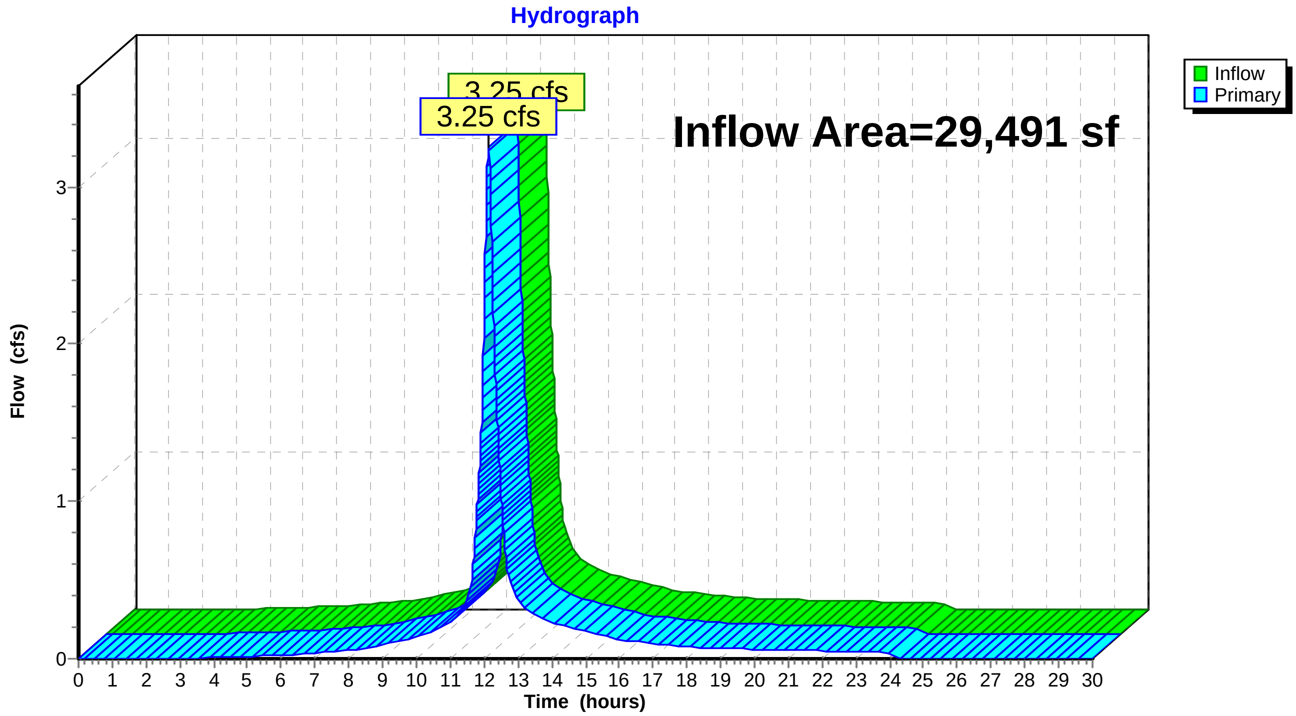


Summary for Pond DP 2: CB at corner of Cabot Street and McDonough Street

Inflow Area = 29,491 sf, 63.21% Impervious, Inflow Depth = 5.34" for 25 Year Storm event
Inflow = 3.25 cfs @ 12.13 hrs, Volume= 13,121 cf
Primary = 3.25 cfs @ 12.13 hrs, Volume= 13,121 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP 2: CB at corner of Cabot Street and McDonough Street

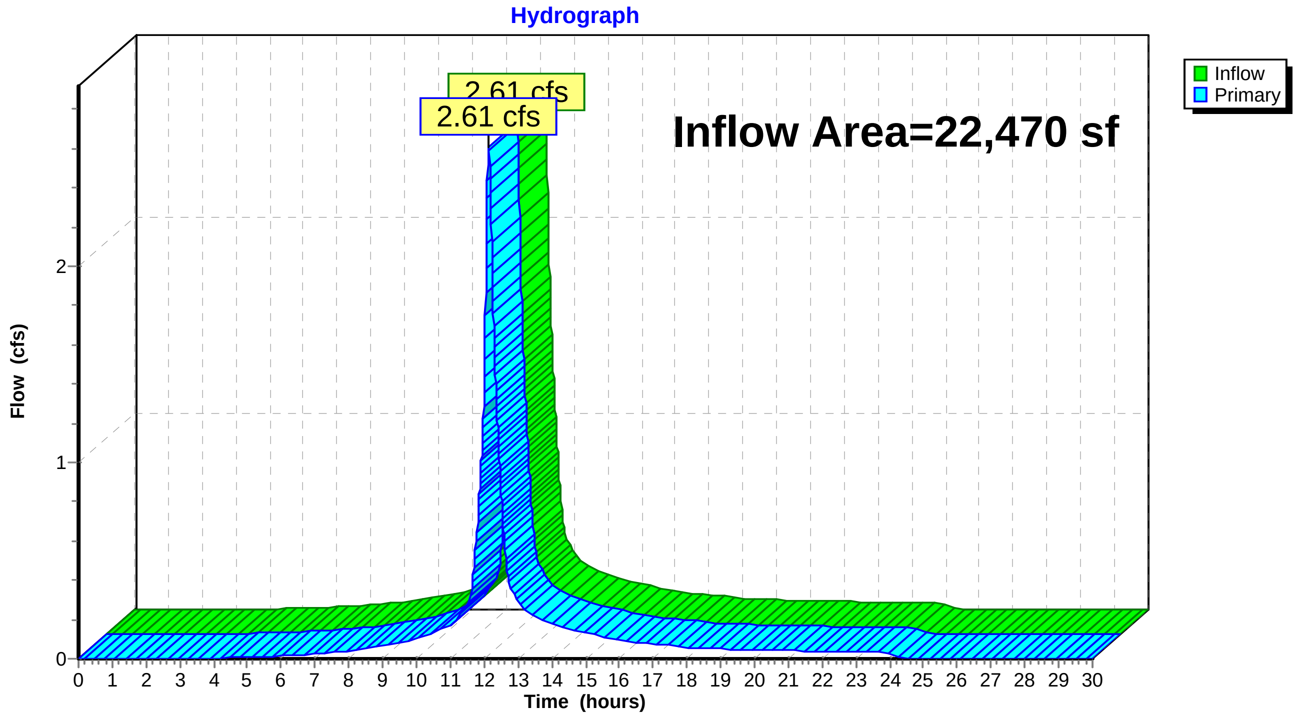


Summary for Link DP 1:

Inflow Area = 22,470 sf, 61.58% Impervious, Inflow Depth = 5.28" for 25 Year Storm event
Inflow = 2.61 cfs @ 12.14 hrs, Volume= 9,891 cf
Primary = 2.61 cfs @ 12.14 hrs, Volume= 9,891 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link DP 1:



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 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 OS 1: Off Site Runoff Area=18,588 sf 74.45% Impervious Runoff Depth=7.18"
Flow Length=722' Tc=10.8 min CN=89 Runoff=2.88 cfs 11,118 cf

Subcatchment PS1: Runoff Area=2,893 sf 48.81% Impervious Runoff Depth=5.98"
Flow Length=143' Slope=0.0200 '/' Tc=0.8 min CN=79 Runoff=0.55 cfs 1,440 cf

Subcatchment PS1a: Roof Runoff to Drip Runoff Area=2,717 sf 100.00% Impervious Runoff Depth=8.26"
Tc=10.0 min CN=98 Runoff=0.46 cfs 1,870 cf

Subcatchment PS2: Runoff Area=1,411 sf 47.84% Impervious Runoff Depth=5.98"
Flow Length=89' Slope=0.0200 '/' Tc=1.1 min CN=79 Runoff=0.27 cfs 703 cf

Subcatchment PS3: Runoff Area=3,882 sf 0.00% Impervious Runoff Depth=3.83"
Flow Length=552' Tc=6.3 min CN=61 Runoff=0.39 cfs 1,239 cf

Pond 1P: CB in Salem Street Peak Elev=15.82' Inflow=1.08 cfs 4,013 cf
15.0" Round Culvert n=0.013 L=9.0' S=0.0056 '/' Outflow=1.08 cfs 4,013 cf

Pond 2P: CB at Site Entrance on Salem Street Peak Elev=18.96' Inflow=1.08 cfs 4,013 cf
15.0" Round Culvert n=0.013 L=36.0' S=0.0867 '/' Outflow=1.08 cfs 4,013 cf

Pond 3P: New DMH Salem Street Peak Elev=15.59' Inflow=1.08 cfs 4,013 cf
15.0" Round Culvert n=0.013 L=97.0' S=0.0333 '/' Outflow=1.08 cfs 4,013 cf

Pond 5P: New DMH at Salem / McDonough Peak Elev=12.34' Inflow=1.08 cfs 4,013 cf
15.0" Round Culvert n=0.013 L=15.0' S=0.0187 '/' Outflow=1.08 cfs 4,013 cf

Pond 6P: CB3 Peak Elev=12.38' Inflow=1.08 cfs 4,013 cf
15.0" Round Culvert n=0.013 L=32.0' S=0.0394 '/' Outflow=1.08 cfs 4,013 cf

Pond 7P: DMH2 Peak Elev=11.10' Inflow=1.08 cfs 4,013 cf
18.0" Round Culvert n=0.013 L=200.0' S=0.0529 '/' Outflow=1.08 cfs 4,013 cf

Pond DP 2: CB at corner of Cabot Street and McDonough Street Inflow=4.02 cfs 16,371 cf
Primary=4.02 cfs 16,371 cf

Link DP 1: Inflow=3.23 cfs 12,358 cf
Primary=3.23 cfs 12,358 cf

Total Runoff Area = 29,491 sf Runoff Volume = 16,371 cf Average Runoff Depth = 6.66"
36.79% Pervious = 10,849 sf 63.21% Impervious = 18,642 sf

Summary for Subcatchment OS 1: Off Site

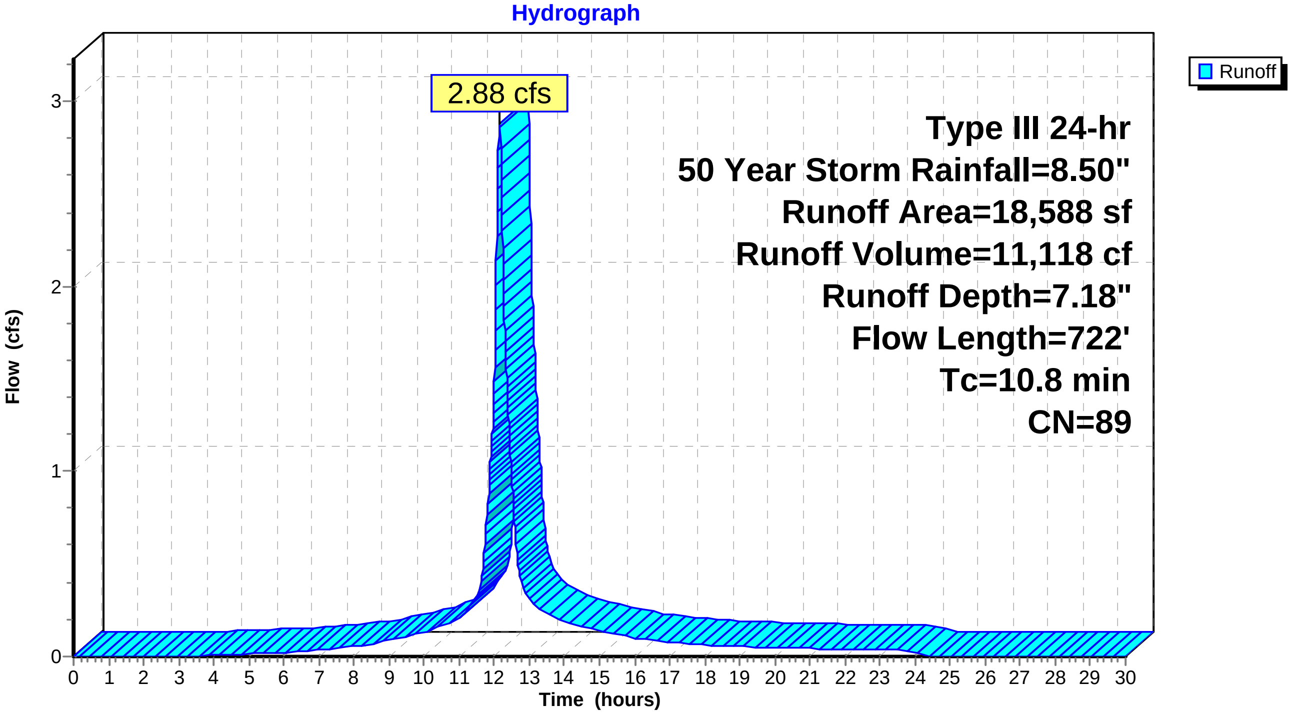
Runoff = 2.88 cfs @ 12.14 hrs, Volume= 11,118 cf, Depth= 7.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
13,838	98	Unconnected roofs, HSG B
4,750	61	>75% Grass cover, Good, HSG B
18,588	89	Weighted Average
4,750		25.55% Pervious Area
13,838		74.45% Impervious Area
13,838		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	119	0.0252	1.11		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	46	0.0326	1.39		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"
2.9	42	0.0833	0.25		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.00"
4.0	305	0.0328	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.8	722	Total			

Subcatchment OS 1: Off Site



Summary for Subcatchment PS1:

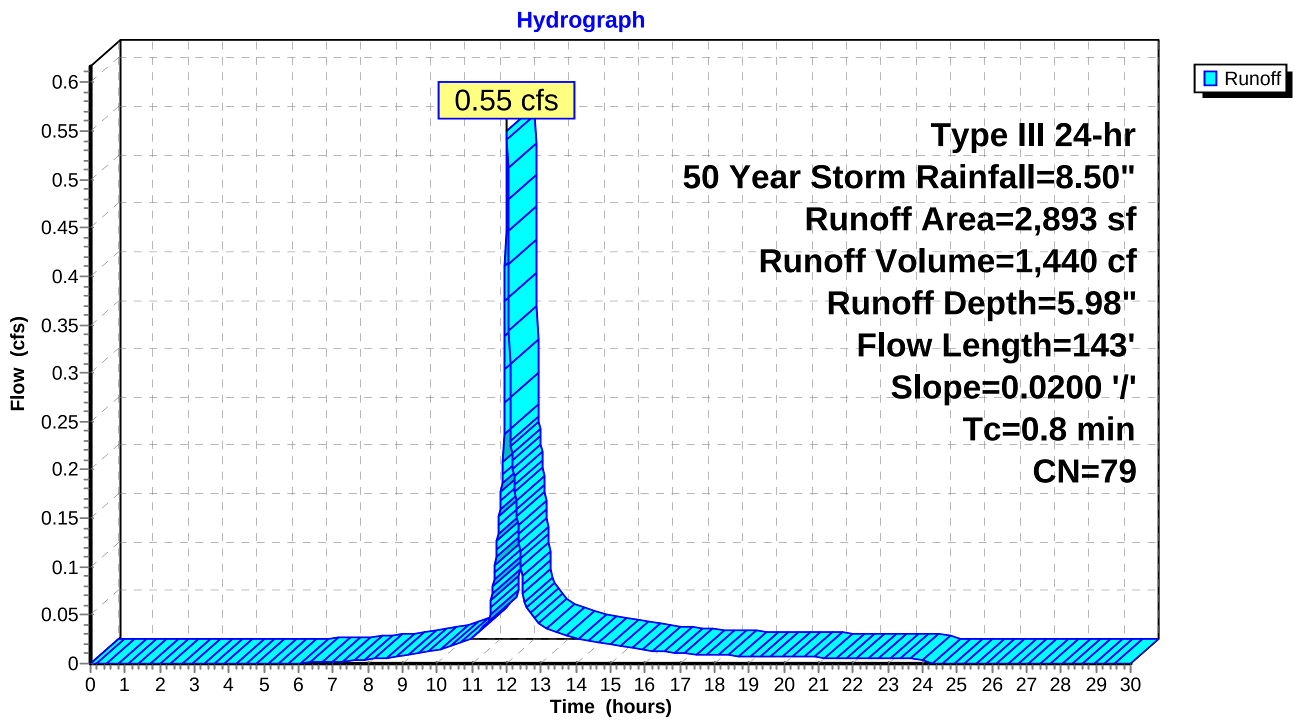
Runoff = 0.55 cfs @ 12.01 hrs, Volume= 1,440 cf, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
1,481	61	>75% Grass cover, Good, HSG B
1,412	98	Paved parking, HSG B
2,893	79	Weighted Average
1,481		51.19% Pervious Area
1,412		48.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	143	0.0200	2.87		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps

Subcatchment PS1:



Summary for Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips

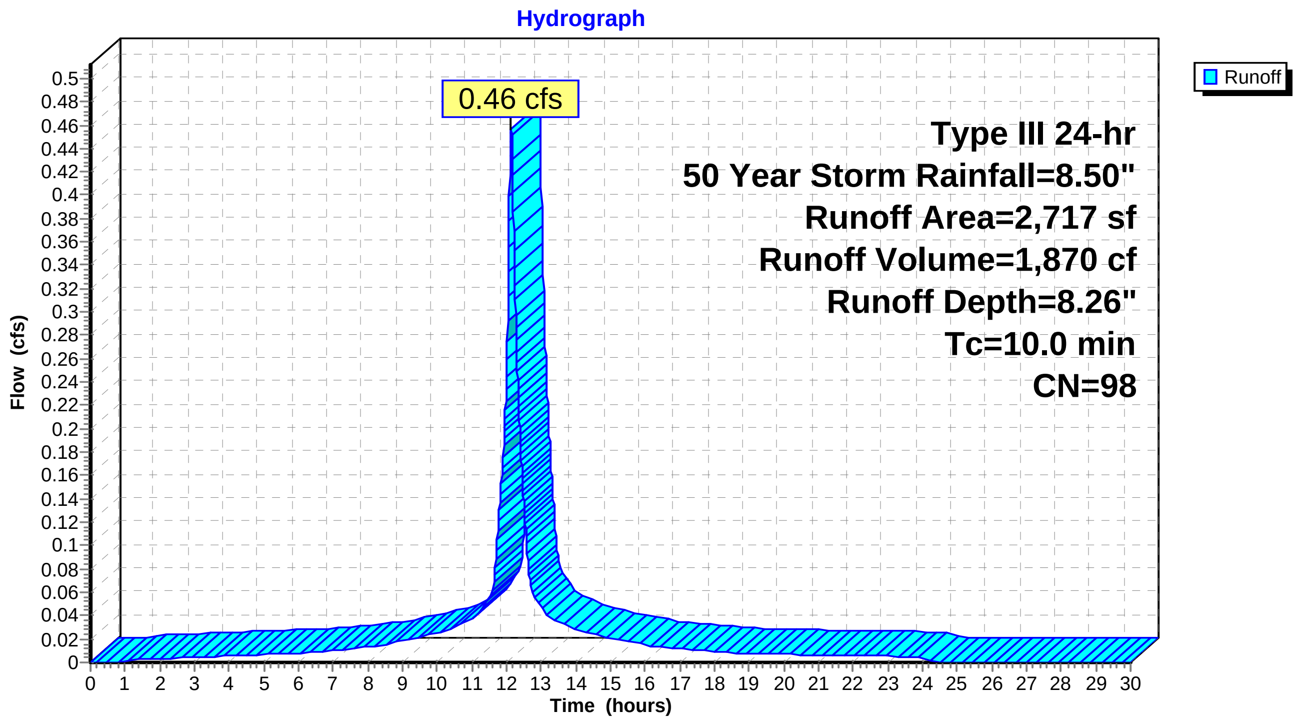
Runoff = 0.46 cfs @ 12.13 hrs, Volume= 1,870 cf, Depth= 8.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
2,717	98	Roofs, HSG B
2,717		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Travel Time Through Filter Media**

Subcatchment PS1a: Roof Runoff to Drip Edge Filter Strips



Summary for Subcatchment PS2:

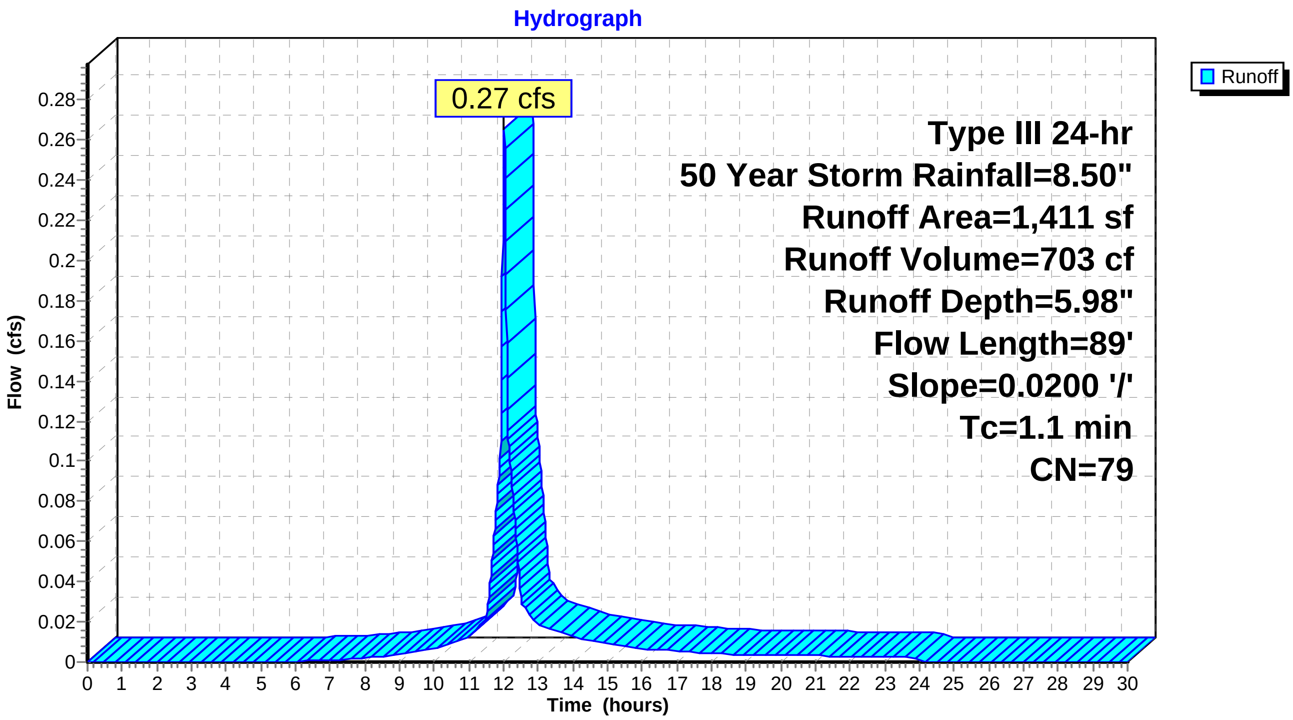
Runoff = 0.27 cfs @ 12.02 hrs, Volume= 703 cf, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
382	98	Paved parking, HSG B
293	98	Roofs, HSG B
736	61	>75% Grass cover, Good, HSG B
1,411	79	Weighted Average
736		52.16% Pervious Area
675		47.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	89	0.0200	1.30		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.00"

Subcatchment PS2:



Summary for Subcatchment PS3:

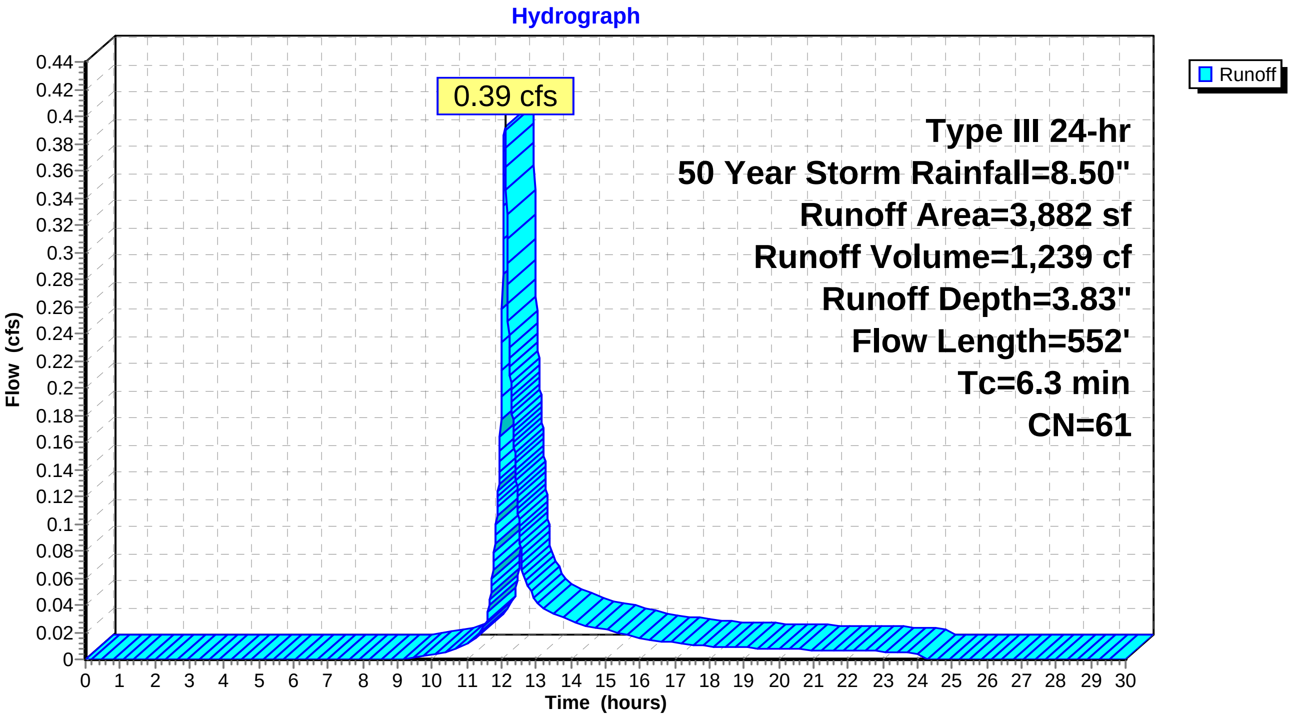
Runoff = 0.39 cfs @ 12.10 hrs, Volume= 1,239 cf, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 Year Storm Rainfall=8.50"

Area (sf)	CN	Description
3,882	61	>75% Grass cover, Good, HSG B
3,882		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	342	0.0292	1.20		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	210	0.0130	2.31		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.3	552	Total			

Subcatchment PS3:



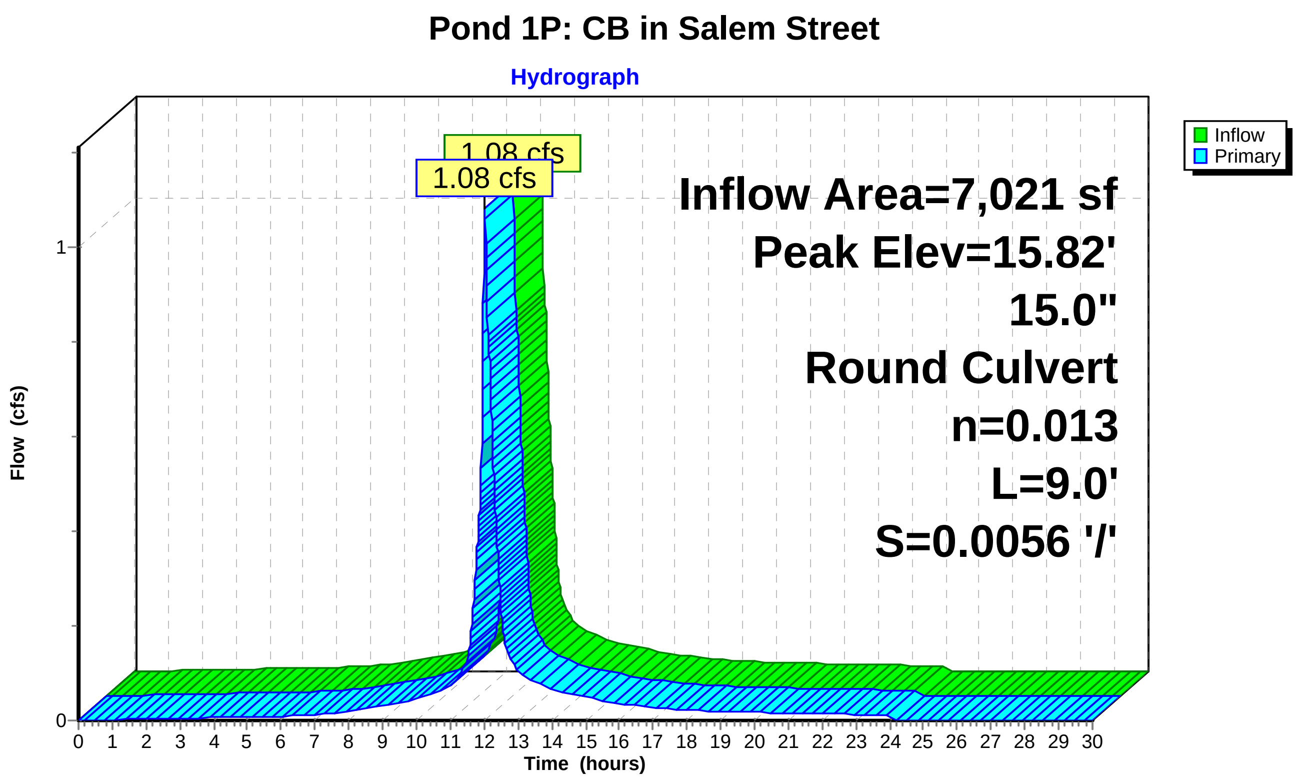
Summary for Pond 1P: CB in Salem Street

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 6.86"	for 50 Year Storm event	
Inflow =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf	
Outflow =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.82' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.18'	**15.0" Round Culvert** L= 9.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.18' / 15.13' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=15.82' (Free Discharge)
└─**1=Culvert** (Barrel Controls 1.08 cfs @ 2.49 fps)



Summary for Pond 2P: CB at Site Entrance on Salem Street

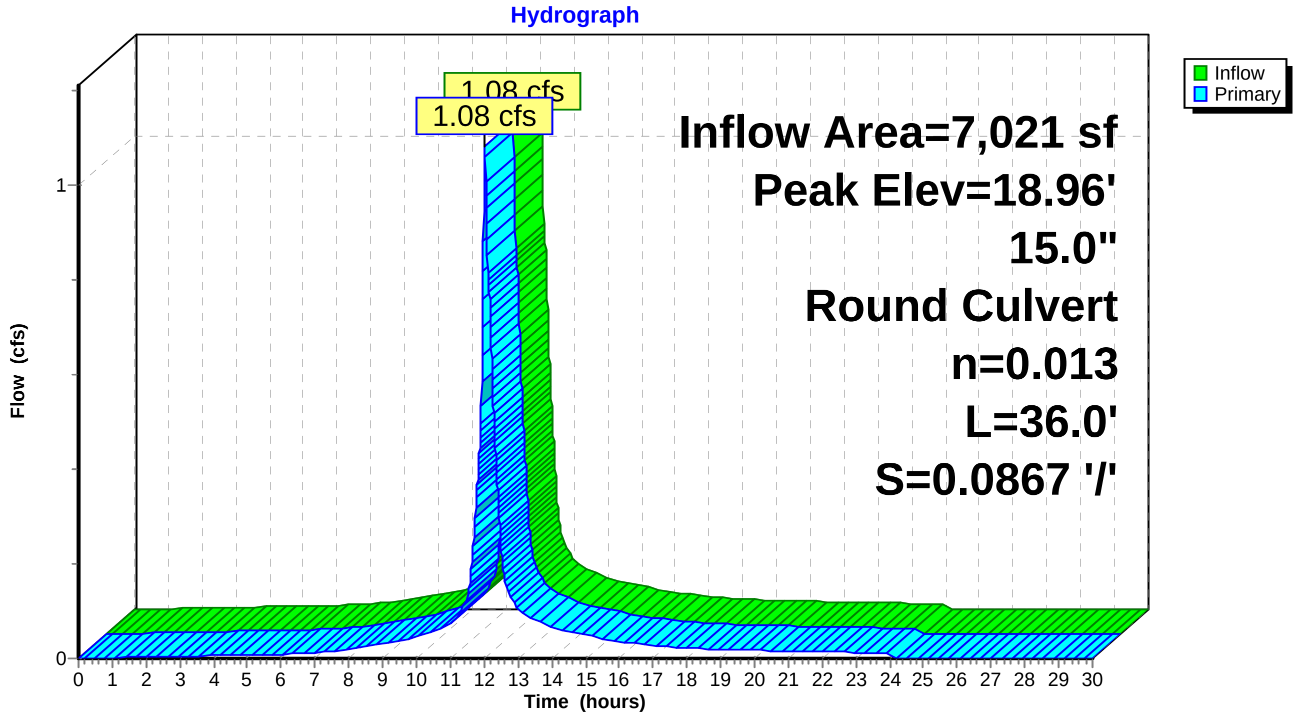
Inflow Area = 7,021 sf, 68.42% Impervious, Inflow Depth = 6.86" for 50 Year Storm event
Inflow = 1.08 cfs @ 12.02 hrs, Volume= 4,013 cf
Outflow = 1.08 cfs @ 12.02 hrs, Volume= 4,013 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.08 cfs @ 12.02 hrs, Volume= 4,013 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 18.96' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	18.40'	**15.0" Round Culvert** L= 36.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 18.40' / 15.28' S= 0.0867 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=18.96' (Free Discharge)
1=Culvert (Inlet Controls 1.08 cfs @ 2.02 fps)

Pond 2P: CB at Site Entrance on Salem Street



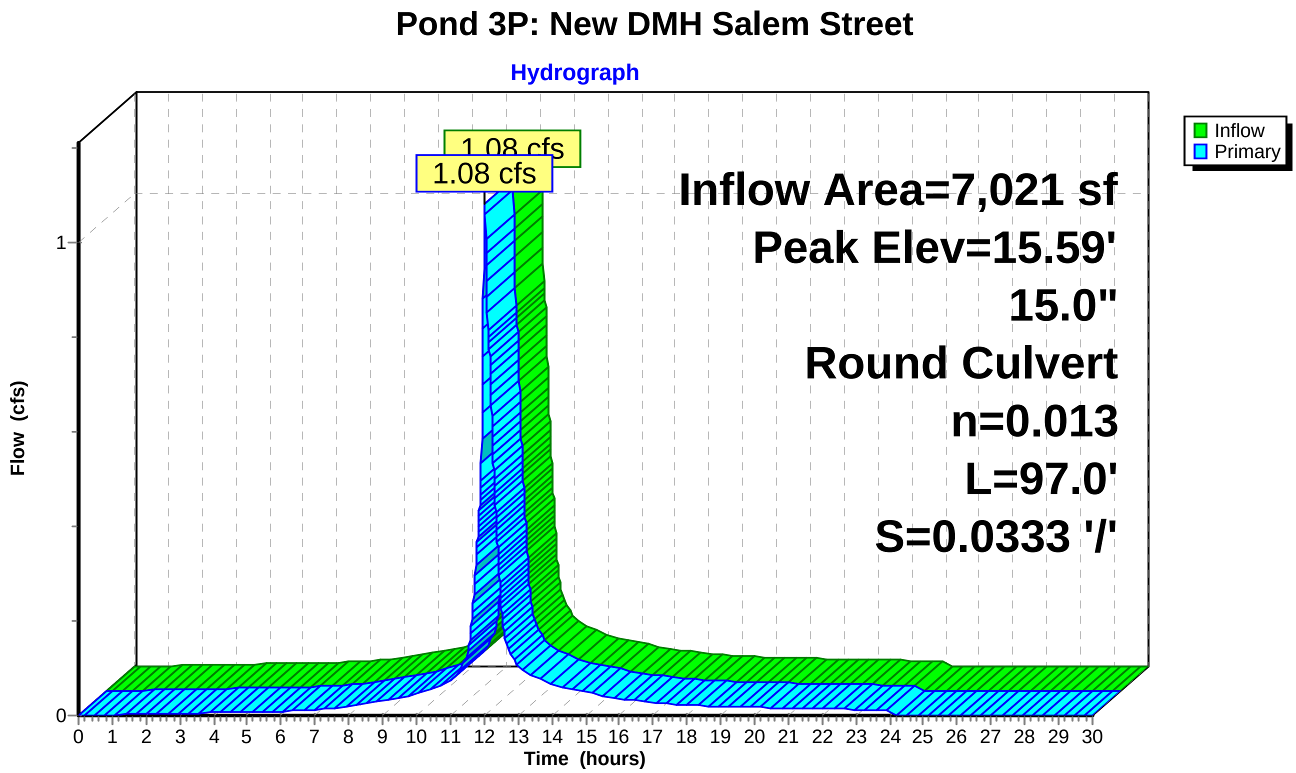
Summary for Pond 3P: New DMH Salem Street

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 6.86"	for 50 Year Storm event
Inflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	
Outflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 15.59' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	15.03'	**15.0" Round Culvert** L= 97.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 15.03' / 11.80' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=15.59' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.08 cfs @ 2.02 fps)



Summary for Pond 5P: New DMH at Salem / McDonough

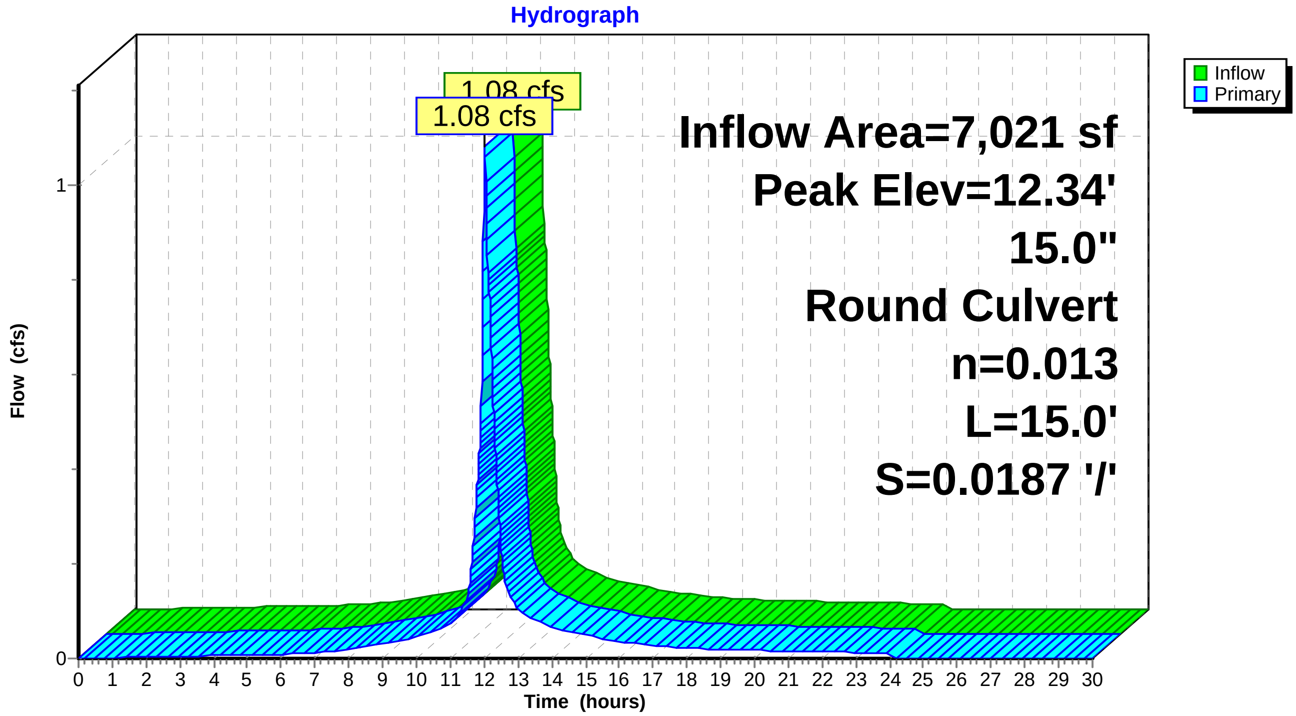
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 6.86"	for 50 Year Storm event
Inflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	
Outflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf, Atten= 0%, Lag= 0.0 min	
Primary =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.34' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.78'	**15.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.78' / 11.50' S= 0.0187 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=12.34' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.08 cfs @ 2.02 fps)

Pond 5P: New DMH at Salem / McDonough



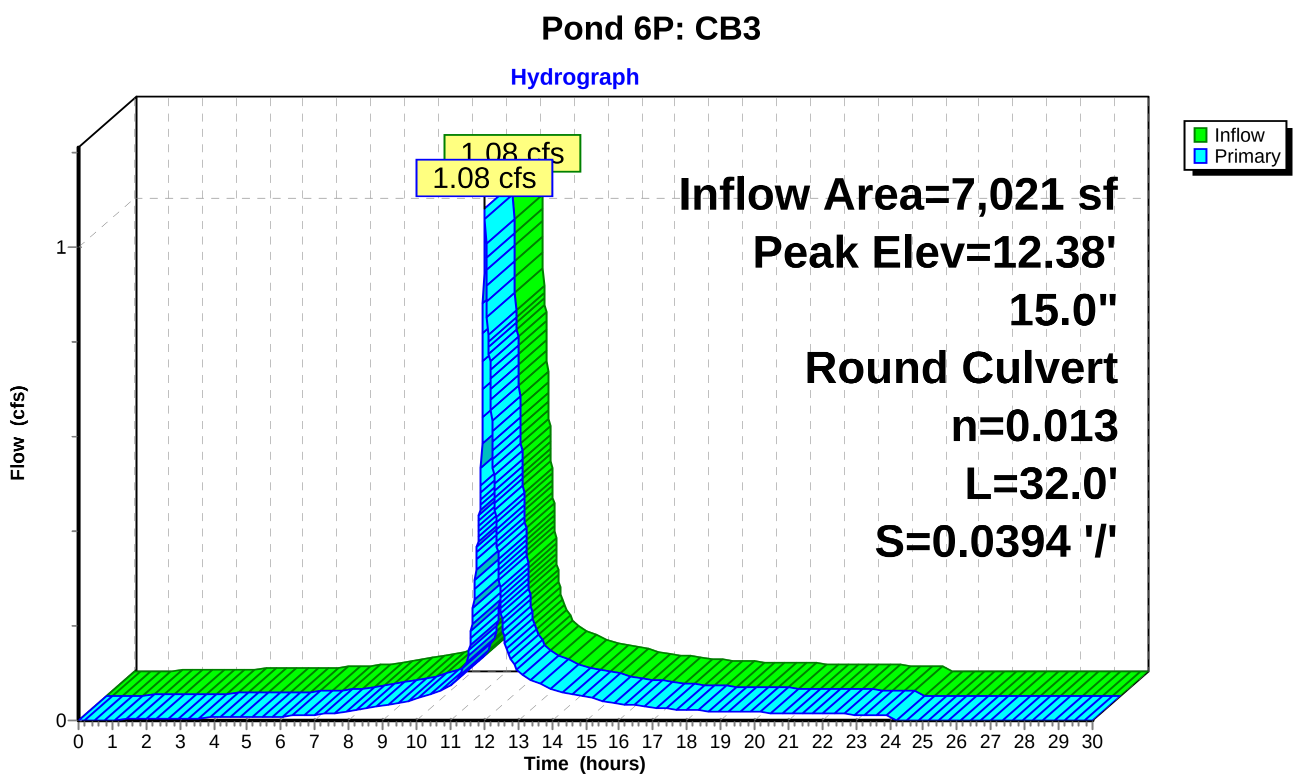
Summary for Pond 6P: CB3

Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 6.86"	for 50 Year Storm event
Inflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	
Outflow =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.08 cfs @	12.02 hrs, Volume=	4,013 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 12.38' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	11.82'	**15.0" Round Culvert** L= 32.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.82' / 10.56' S= 0.0394 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=12.38' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.08 cfs @ 2.02 fps)



Summary for Pond 7P: DMH2

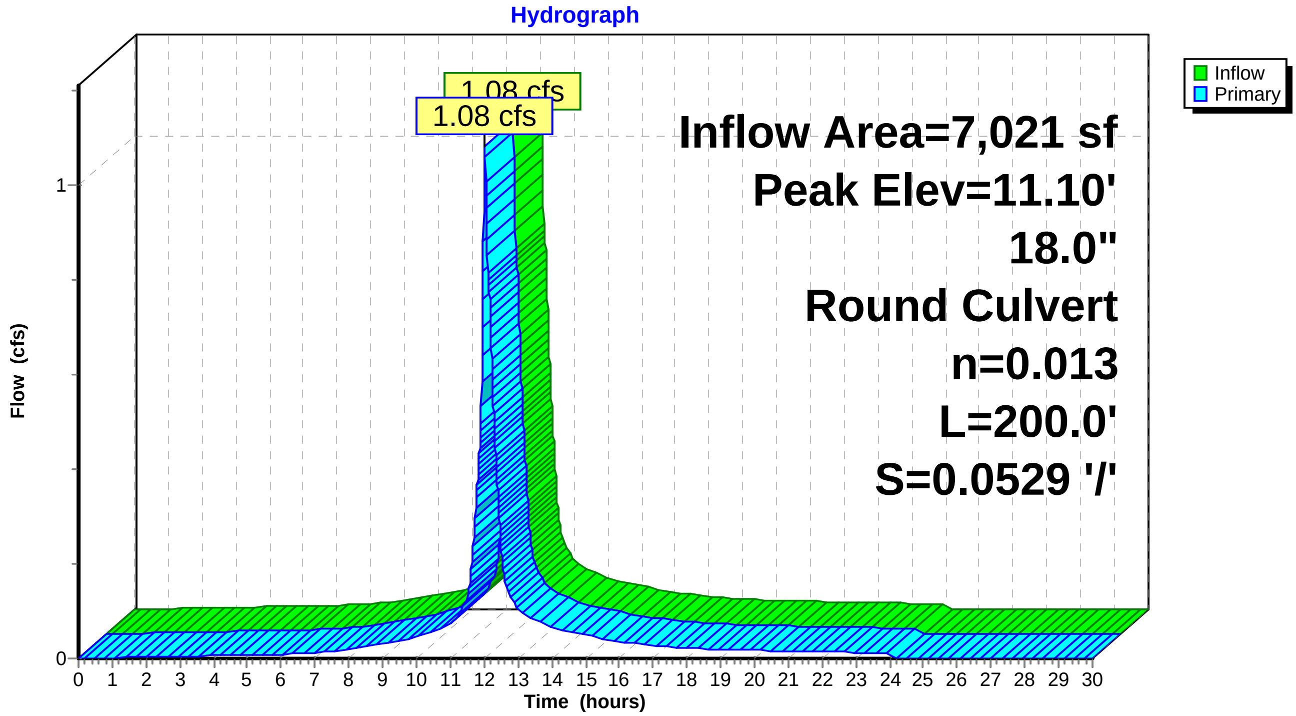
Inflow Area =	7,021 sf,	68.42% Impervious,	Inflow Depth = 6.86"	for 50 Year Storm event	
Inflow =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf	
Outflow =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf,	Atten= 0%, Lag= 0.0 min
Primary =	1.08 cfs @	12.02 hrs,	Volume=	4,013 cf	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 11.10' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	10.57'	**18.0" Round Culvert** L= 200.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 10.57' / 0.00' S= 0.0529 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.08 cfs @ 12.02 hrs HW=11.10' (Free Discharge)
└─**1=Culvert** (Inlet Controls 1.08 cfs @ 1.95 fps)

Pond 7P: DMH2

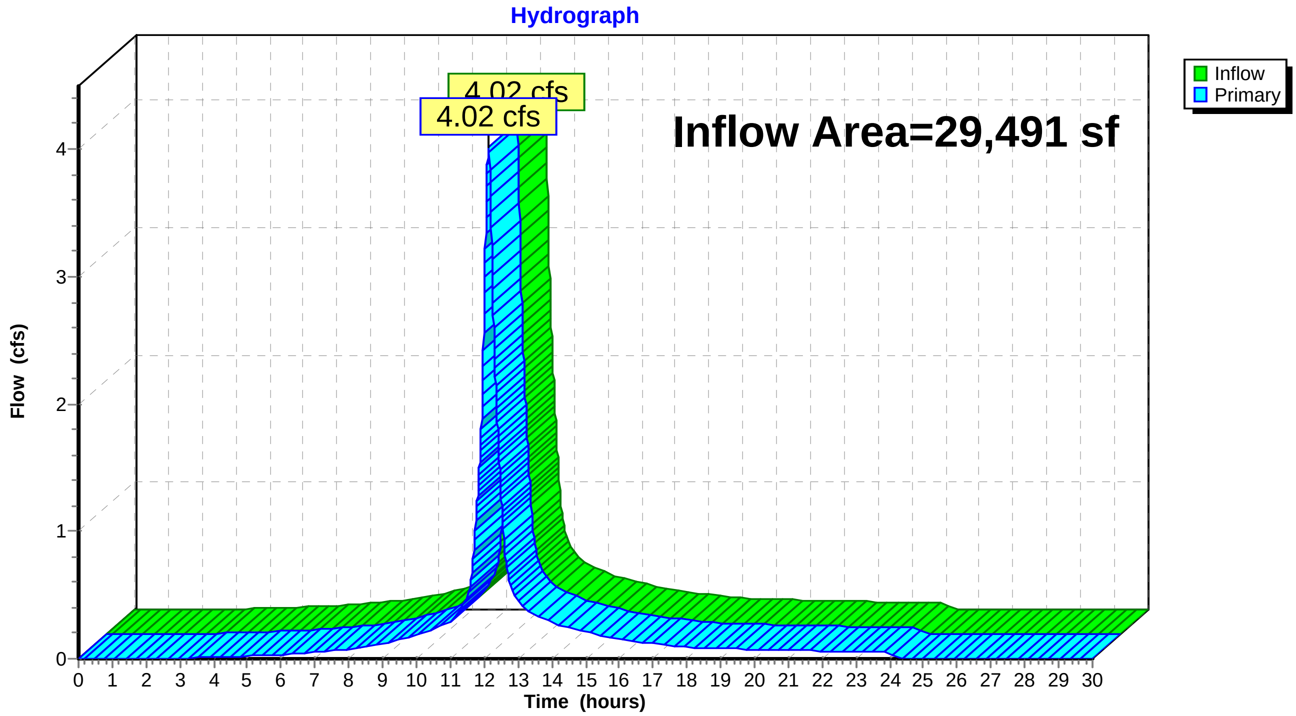


Summary for Pond DP 2: CB at corner of Cabot Street and McDonough Street

Inflow Area =	29,491 sf,	63.21% Impervious,	Inflow Depth = 6.66"	for 50 Year Storm event
Inflow =	4.02 cfs @	12.13 hrs, Volume=	16,371 cf	
Primary =	4.02 cfs @	12.13 hrs, Volume=	16,371 cf,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Pond DP 2: CB at corner of Cabot Street and McDonough Street

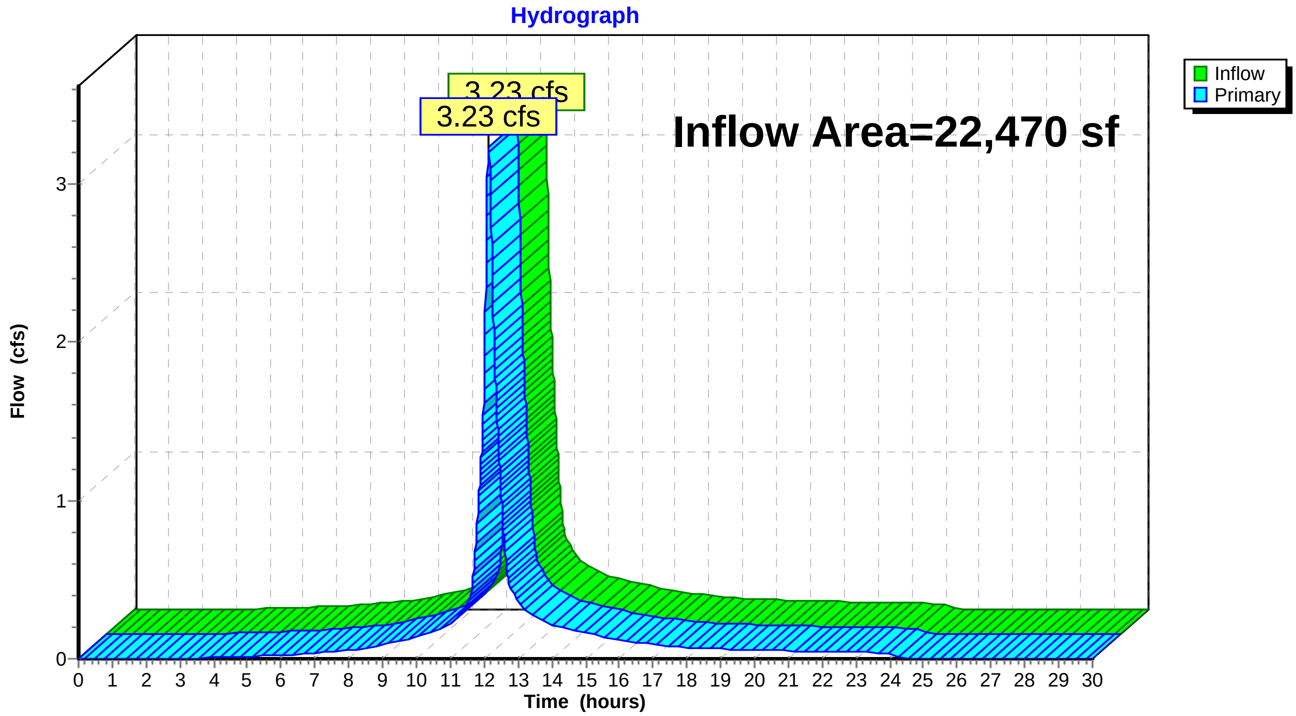


Summary for Link DP 1:

Inflow Area =	22,470 sf,	61.58% Impervious,	Inflow Depth = 6.60"	for 50 Year Storm event
Inflow =	3.23 cfs @	12.14 hrs, Volume=	12,358 cf	
Primary =	3.23 cfs @	12.14 hrs, Volume=	12,358 cf,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link DP 1:



APPENDIX D

SOIL SURVEY INFORMATION

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire

November 12, 2019

Preface

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

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

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

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Soil Map

Map Scale: 1:1,090 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 15, 30, 60, 90

Feet: 0, 50, 100, 200, 300

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 21, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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
699	Urban land	2.2	99.7%
799	Urban land-Canton complex, 3 to 15 percent slopes	0.0	0.3%
Totals for Area of Interest		**2.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

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APPENDIX E

FEMA FIRM MAP

consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles, Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Hampshire State Plane, FIPSZONE 2800. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles (DOQs) produced at a scale of 1:12,000 from photography dated 1998 or later.

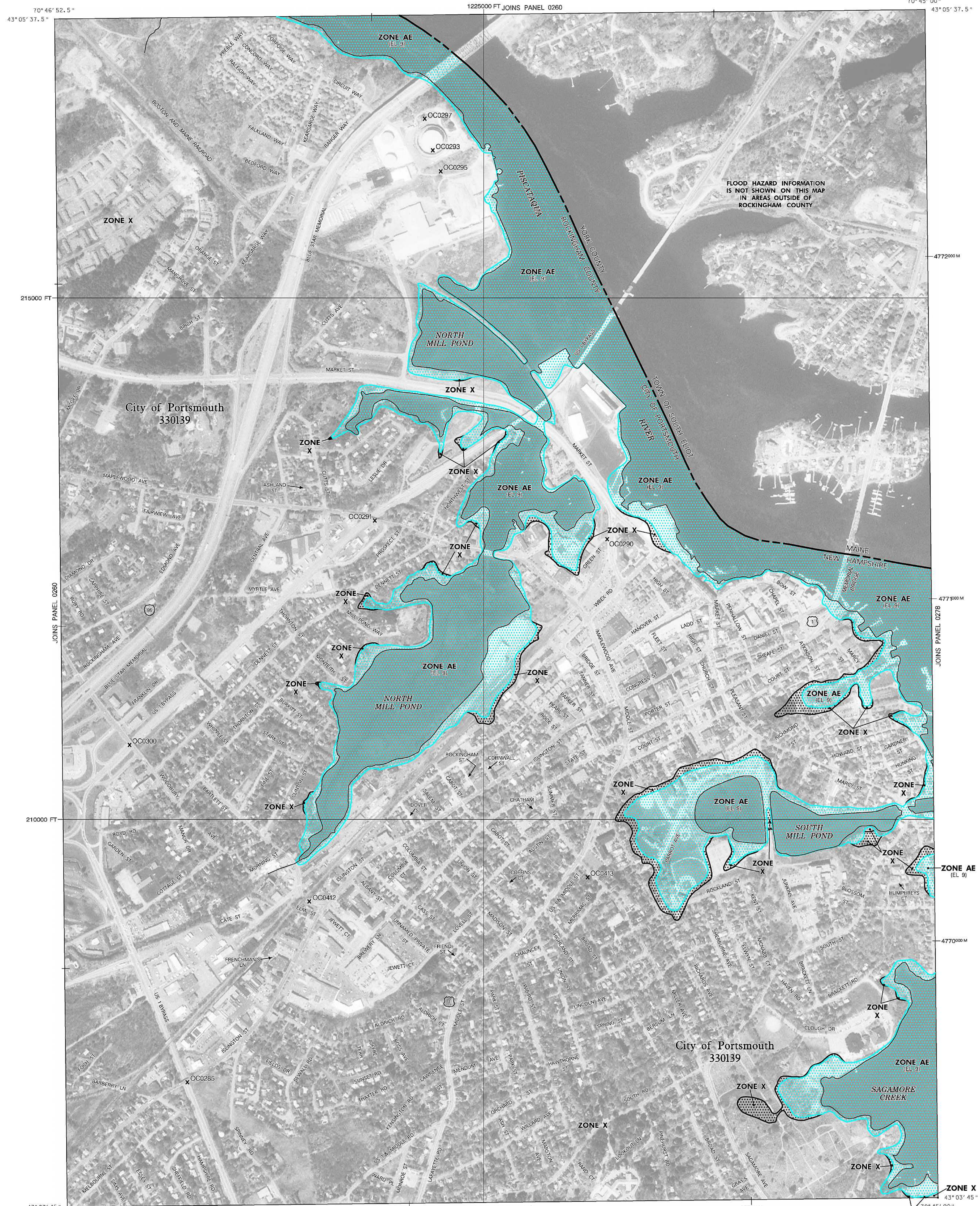
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at www.fema.gov/msc.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.



The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

A — A	Cross section line
23 - - - 23	Transect line
97° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4276000 M	1000-meter Universal Transverse Mercator grid tick values, zone 19
600000 FT	5000-foot grid: New Hampshire State Plane coordinate system, (FIPSZONE 2800), Transverse Mercator projection.
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MAY 17, 2005

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0259E

FIRM
FLOOD INSURANCE RATE MAP
ROCKINGHAM COUNTY,
NEW HAMPSHIRE
(ALL JURISDICTIONS)

PANEL 259 OF 681

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
PORTSMOUTH, CITY OF	330139	0259	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
33015C0259E

EFFECTIVE DATE

APPENDIX F

INSPECTION & MAINTENANCE PLAN

STORMWATER INSPECTION & MAINTENANCE PLAN

FOR

BONZA BUILDERS, LLC

Proposed Residential Redevelopment

41 Salem Street

Portsmouth, NH

Introduction

The intent of this plan is to provide Bonz Builders, LLC (herein referred to as “owner”) with a list of procedures that document the inspection and maintenance requirements of the stormwater management system for this development. Specifically, the drip edge soil filters and associated structures on the project site (collectively referred to as the “Stormwater Management System”).

The following inspection and maintenance program is necessary to keep the stormwater management system functioning properly. These measures will also help minimize potential environmental impacts. By following the enclosed procedures, the owner will be able to maintain the functional design of the stormwater management system and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Annual Report

The owner shall prepare an annual Inspection & Maintenance Report. The report shall include a summary of the system’s maintenance and repair by transmission of the Inspection & Maintenance Log and other information as required. A copy of the report shall be delivered annually to the City of Portsmouth Code Enforcement Officer.

Inspection & Maintenance Checklist/Log

The following pages contain a Stormwater Management System Inspection & Maintenance Checklist and a blank copy of the Stormwater Management System Inspection & Maintenance Log. These forms are provided to the owner as a guideline for performing the inspection and maintenance of the Stormwater Management System. This is a guideline and should be periodically reviewed for conformance with current practice and standards.

STORMWATER MANAGEMENT SYSTEM COMPONENTS

The Stormwater Management System is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, the design includes the following elements:

Non-Structural BMP's

Non-Structural best management practices (BMP's) include temporary and permanent measures that typically require less labor and capital inputs and are intended to provide protection against erosion of soils. Examples of non-structural BMP's on this project include but are not limited to: temporary and permanent mulching, temporary and permanent grass cover, trees, shrubs and ground covers, miscellaneous landscape plantings, dust control, tree protection, topsoiling, sediment barriers, and a stabilized construction entrance.

Structural BMP's

Structural BMP's are more labor and capital-intensive structures or installations that require more specialized personnel to install. Examples on this project include but are not limited to: storm drains, the drip edge soil filters and associated structures, and the infiltration trench system.

Inspection and Maintenance Requirements

The following summarizes the inspection and maintenance requirements for the various BMP's that may be found on this project.

1. **Grassed areas:** After each rain event of 0.5" or more during a 24-hour period, inspect grassed areas for signs of disturbance, such as erosion. If damaged areas are discovered, immediately repair the damage. Repairs may include adding new topsoil, lime, seed, fertilizer and mulch.
2. **Plantings**: Planting and landscaping (trees, shrubs) shall be monitored bi-monthly during the first year to insure viability and vigorous growth. Replace dead or dying vegetation with new stock and make adjustments to the conditions that caused the dead or dying vegetation. During dryer times of the year, provide weekly watering or irrigation during the establishment period of the first year. Make the necessary adjustments to ensure long-term health of the vegetated covers, i.e. provide more permanent mulch or compost or other means of protection.
3. **Catch Basins and Storm Drains:** Monitor drain inlets for excessive accumulation of sediments or missing stone/riprap. Remove sediments as required.
4. **Roofline Drip Edge Filter Strip:** After acceptance of the Filter, perform the following inspections on a semi-annual basis or after significant rainfall events (10-year, 24 hour storms, or back to back 2 year, 24 hour storms):
   a. Monitor Filter for 72 hours following a rain storm. If the Filter fails to fully drain within this period time, the engineered soil may have become plugged. Inspect for other causes of blockage. If it's determined that the soil has become plugged and is no longer functioning as engineered, then replacement of soils shall be required. Contractor shall use care in removing soil around foundations.
   b. Monitor for excessive or concentrated accumulations of debris, or excessive erosion. Remove debris as required.

Invasive Species

The site should be monitored during construction for the presence of any invasive species. Such growth should be removed and disposed properly.

Stormwater Management System

Inspection & Maintenance Checklist for Post Construction Condition—for Bonza Builders, LLC, 41 Salem Street, Portsmouth, NH

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Closed Drainage System			
Drainage Pipes	Yearly	*Check for sediment clogging, or soiled runoff.*	Clean entire drainage system and remove all sediments if discovered in piping.
Roofline Drip Edge Soil Filter	2 X Annually	*Keep filter surface clean*	Remove any weeds, trash, debris and accumulated sediment. If filter does not drain within 72 hours following a rain event, a qualified professional should assess the condition of the facility to determine restoration measures.
Annual Report	Yearly	*Prepare Annual Report, including all Inspection & Maintenance Logs. Provide to Town (if required).*	N/A

Stormwater Management System Maintenance Summary

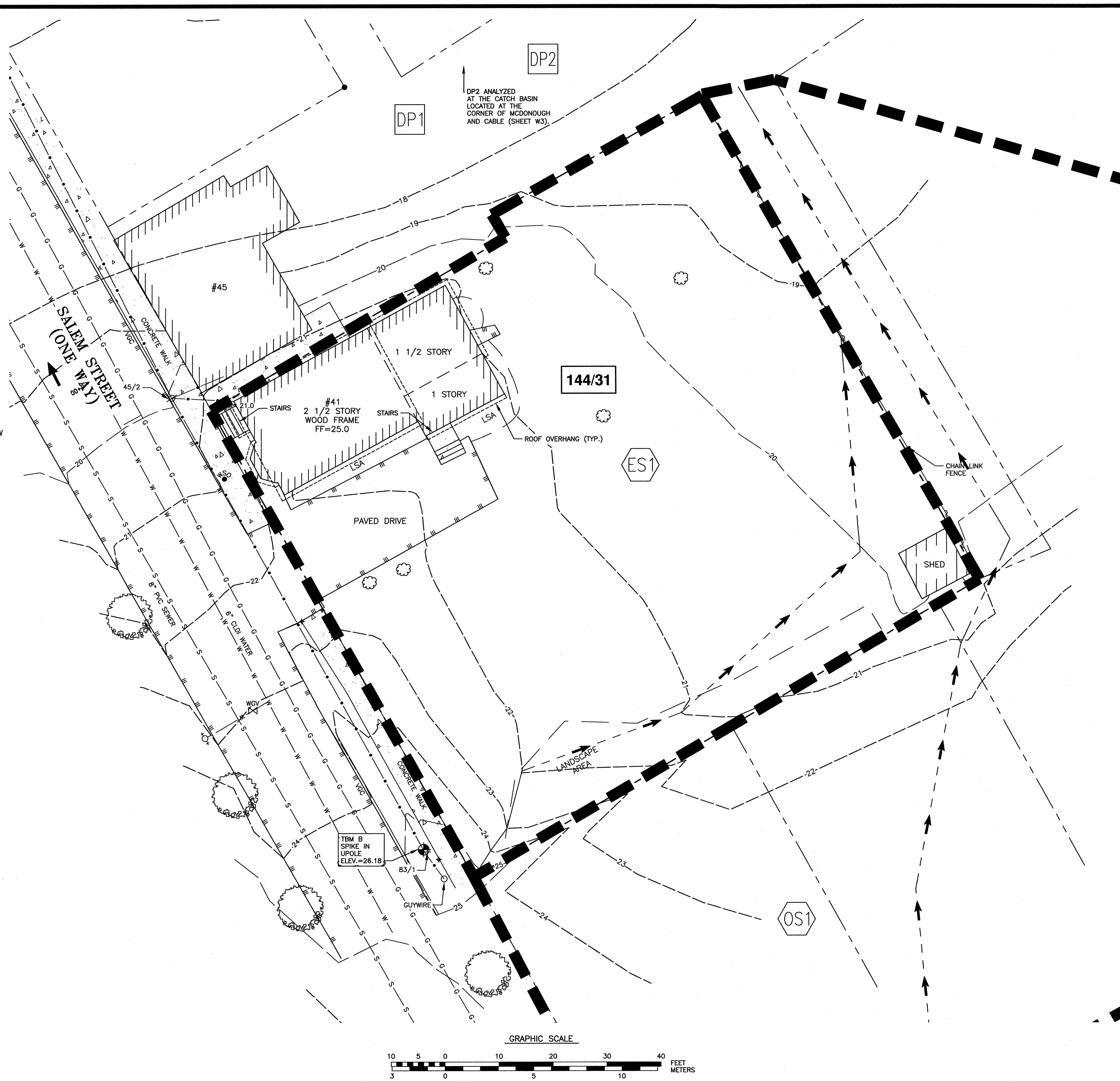
Inspection & Maintenance Log—for Bonza Builders, LLC, 41 Salem Street, Portsmouth, NH

BMP/System Component	Date Inspected	Inspector	Problems Noted, Required Maintenance *(List Items/Comments)*	Date of Maintenance	Performed By

Data Sheets

LEGEND

EXISTING	PROPOSED	
D	D	STORM DRAIN
X X	X X	SILT FENCE
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		EDGE OF PAVEMENT (EP)
		SUBCATCHMENT LINE
6	600	SUBCATCHMENT NUMBER
1234 WOODS	1234 WOODS	AREA IN SQUARE FEET DESCRIPTION OF COVER
6	600	POND (DESIGN MODEL)
6	600	REACH (DESIGN MODEL)
		DRAINAGE VECTOR
		EDGE OF WOODS / TREES
CB	CB	CATCH BASIN
DMH	DMH	DRAIN MANHOLE
W	W	WELL
EL.	EL.	ELEVATION
EP	EP	EDGE OF PAVEMENT
FF	FF	FINISHED FLOOR
INV	INV	INVERT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL
		Tc PATH
HSG	HSG	HYDROLGIC SOIL GROUP
SF	SF	SHEET FLOW
SCF	SCF	SHALLOW CONCENTRATED FLOW
CHANNEL	CHANNEL	CHANNEL FLOW



AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) PARCEL IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 144 AS LOT 31.

2) OWNER OF RECORD:
BONZA BUILDERS, LLC
79 EXETER ROAD
NORTH HAMPTON, NH 03862
6056/205

3) PARCEL IS LOCATED IN THE GENERAL RESIDENCE C (GRC) ZONING DISTRICT.

NOTES:

1) THIS PLAN IS INTENDED FOR RUNOFF ANALYSIS ONLY AND SHALL NOT BE USED FOR CONSTRUCTION.

2) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

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SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS

STATE OF NEW HAMPSHIRE
JOSEPH L. MULLEDY
No. 11802
LICENSED
PROFESSIONAL ENGINEER

3/18/20

SCALE: 1" = 10'

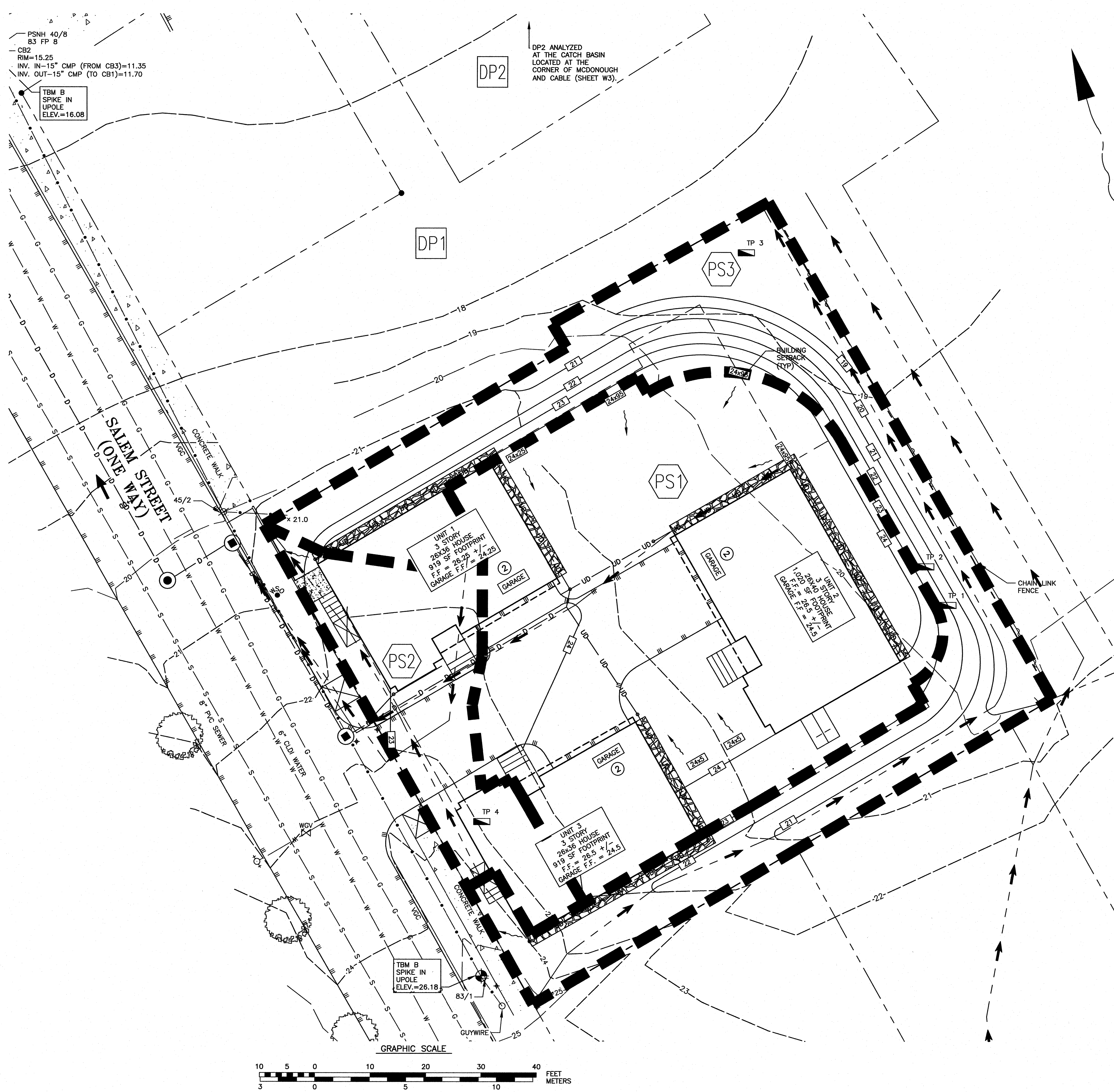
MARCH 2020

PLAN OF EXISTING SUBCATCHMENTS

W1

LEGEND

EXISTING	PROPOSED	
——D——	——D——	STORM DRAIN
—x—x—	—x—x—	SILT FENCE
—100—	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		EDGE OF PAVEMENT (EP)
		SUBCATCHMENT LINE
6	600	SUBCATCHMENT NUMBER
1234 WOODS	1234 WOODS	AREA IN SQUARE FEET DESCRIPTION OF COVER
6	600	POND (DESIGN MODEL)
6	600	REACH (DESIGN MODEL)
		DRAINAGE VECTOR
		EDGE OF WOODS / TREES
CB	CB	CATCH BASIN
DMH	DMH	DRAIN MANHOLE
W	W	WELL
EL.	EL.	ELEVATION
EP	EP	EDGE OF PAVEMENT
FF	FF	FINISHED FLOOR
INV	INV	INVERT
TBM	TBM	TEMPORARY BENCH MARK



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SITE DEVELOPMENT
41 SALEM STREET
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS

JOSEPH L. MULLEDY No. 11502 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
3/18/20

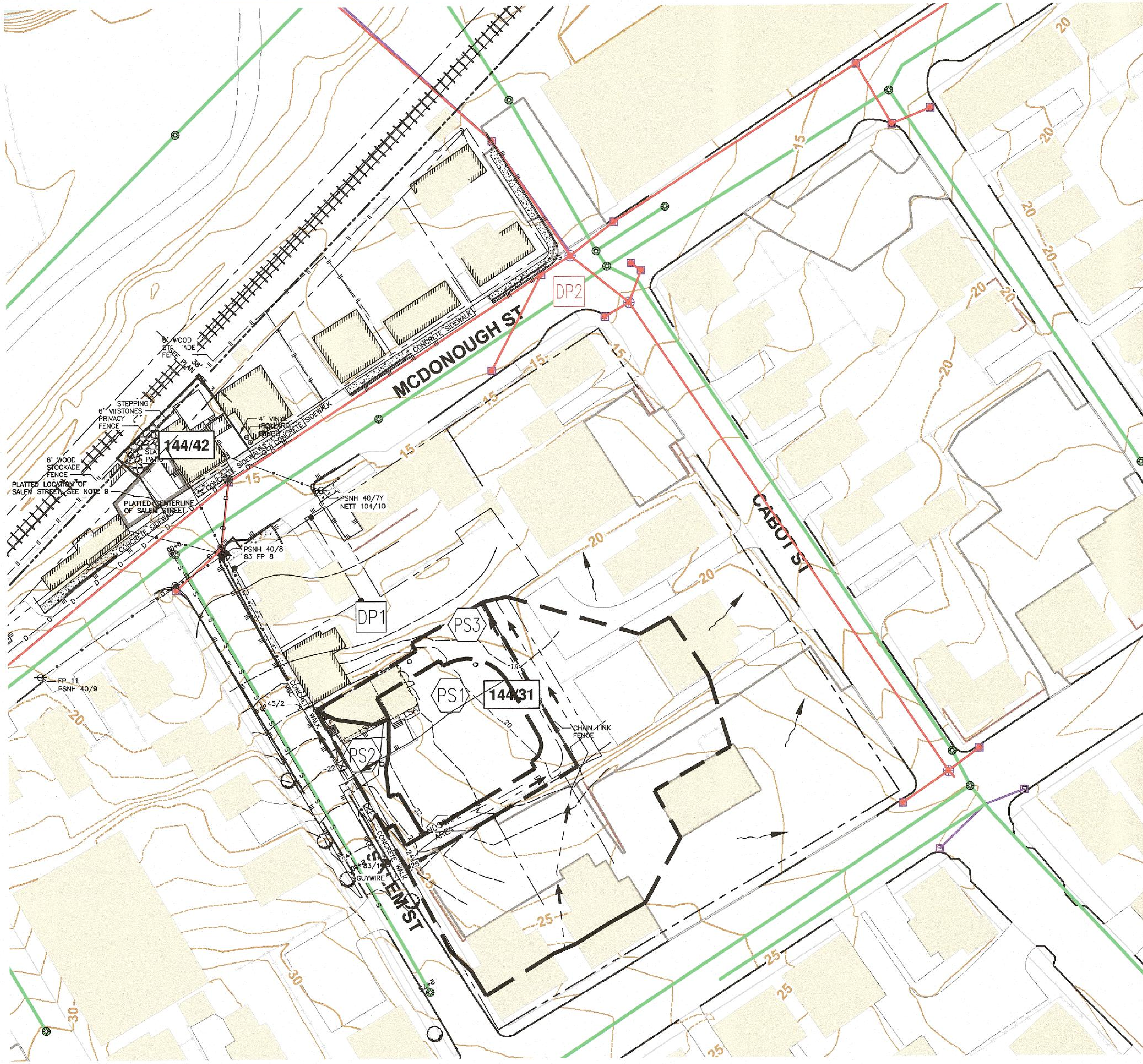
SCALE: 1" = 10'   MARCH 2020

PLAN OF PROPOSED SUBCATCHMENTS

W2

LEGEND

EXISTING	PROPOSED	
D	D	STORM DRAIN
X X	X X	SILT FENCE
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		EDGE OF PAVEMENT (EP)
		SUBCATCHMENT LINE
6	600	SUBCATCHMENT NUMBER
1234	1234	AREA IN SQUARE FEET
WOODS	WOODS	DESCRIPTION OF COVER
6	600	POND (DESIGN MODEL)
6	600	REACH (DESIGN MODEL)
		DRAINAGE VECTOR
		EDGE OF WOODS / TREES
CB	CB	CATCH BASIN
DMH	DMH	DRAIN MANHOLE
W	W	WELL
EL.	EL.	ELEVATION
EP	EP	EDGE OF PAVEMENT
FF	FF	FINISHED FLOOR
INV	INV	INVERT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL
		Tc PATH
HSG	HSG	HYDROLGIC SOIL GROUP
SF	SF	SHEET FLOW
SCF	SCF	SHALLOW CONCENTRATED FLOW
CHANNEL	CHANNEL	CHANNEL FLOW



GRAPHIC SCALE

30 0 50 100 120 FEET
10 5 0 10 20 30 METERS

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6056/205

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SITE DEVELOPMENT 41 SALEM STREET PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	3/18/20

REVISIONS

STATE OF NEW HAMPSHIRE
JOSEPH L. MULLEDY
No. 11502
LICENSED
PROFESSIONAL ENGINEER

3/18/20

SCALE: 1" = 30'   MARCH 2020

PLAN OF OFFSITE SUBCATCHMENTS

W3

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. 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 Owner/Applicant: BONZA BUILDERS LLC. Date Submitted: 3-18-20

Phone Number: 603-770-5636 E-mail: ____________

Site Address: 41 SALEM STREET Map: 144 Lot: 31

Zoning District: GENERAL RESIDENCE C Lot area: 10,903 sq. ft.

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Fully executed and signed Application form. **(2.5.2.3)**	ONLINE	N/A
☒	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). **(2.5.2.8)**	ONLINE	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**	SUBMITTED MATERIAL	
☒	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	ARCHITECTURAL PLANS	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	STANDARD BOUNDARY SURVEY	N/A
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	COVER SHEET	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	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. **(2.5.3.1E)**	COVER SHEET & STANDARD BOUNDARY SURVEY	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	COVER SHEET	N/A
☒	List of reference plans. **(2.5.3.1G)**	STANDARD BOUNDARY SURVEY	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	COVER SHEET	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. **(2.5.4.1A)**	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	TO BE SUBMITTED	N/A
☒	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	YES	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	N/A	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	COVER SHEET	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	YES	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. **(2.5.4.2D)**	STANDARD BOUNDARY SURVEY & EXISTING CONDITIONS PLAN	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	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)**	SHEET C2	N/A
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this Site Plan shall be constructed and maintained in accordance with the Plan by the property owner and all future property owners. No changes shall be made to this Site Plan without the express approval of the Portsmouth Planning Director." **(2.13.3)**	SHEET C2	N/A
☒	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**	SHEET C5	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
☒	a. Surveyed plan of site showing existing natural and built features;	STANDARD BOUNDARY SURVEY	
☒	b. Zoning boundaries;	COVER SHEET	
☒	c. Dimensional Regulations;	SHEET C2	
☒	d. Wetland delineation, wetland function and value assessment;	N/A	
☒	e. SFHA, 100-year flood elevation line and BFE data.	N/A	
	2. Buildings and Structures: (2.5.4.3B)		
☒	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	ARCHITECTS PLAN	
☒	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	ARCHITECTS PLAN	
☒	c. Total Floor Area;	ARCHITECTS PLAN	
☒	d. Number of Usable Floors;	ARCHITECTS PLAN	
☒	e. Gross floor area by floor and use.	ARCHITECTS PLAN	
	3. Access and Circulation: (2.5.4.3C)		
☒	a. Location/width of access ways within site;	SHEET C2	
☒	b. Location of curbing, right of ways, edge of pavement and sidewalks;	SHEET C2	
☒	c. Location, type, size and design of traffic signing (pavement markings);	N/A	
☒	d. Names/layout of existing abutting streets;	STANDARD BOUNDARY SURVEY	
☒	e. Driveway curb cuts for abutting prop. and public roads;	SHEET C2	
☒	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	
☒	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	N/A	
	4. Parking and Loading: (2.5.4.3D)		
☒	a. Location of off street parking/loading areas, landscaped areas/buffers;	SHEET C2	
☒	b. Parking Calculations (# required and the # provided).	SHEET C2	
	5. Water Infrastructure: (2.5.4.3E)		
☒	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	SHEET C3	
☒	b. Location of wells and monitoring wells (include protective radii).	N/A	
	6. Sewer Infrastructure: (2.5.4.3F)		
☒	a. Size, type and location of sanitary sewage facilities & Engineering data.	SHEET C3	
	7. Utilities: (2.5.4.3G)		
☒	a. The size, type and location of all above & below ground utilities;	SHEET C3	
☒	b. Size type and location of generator pads, transformers and other fixtures.	SHEET C3	

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☐	**8. Solid Waste Facilities: (2.5.4.3H)**		
☒	a. The size, type and location of solid waste facilities.	N/A	
	9. Storm water Management: (2.5.4.3I)		
☒	a. The location, elevation and layout of all storm-water drainage.	SHEET C4	
	10. Outdoor Lighting: (2.5.4.3J)		
☒	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	N/A	
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	N/A	
	12. Landscaping: (2.5.4.3K)		
☒	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	SHEET C5	
☒	**b.** Location of any irrigation system and water source.	N/A	
	13. Contours and Elevation: (2.5.4.3L)		
☒	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	SHEET C4	
	14. Open Space: (2.5.4.3M)		
☒	a. Type, extent and location of all existing/proposed open space.	SHEET C2	
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	
☒	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	SHEET C2	
☒	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	N/A	
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	SUBMITTED MATERIAL	
☒	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	SUBMITTED MATERIAL	
☒	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	
☒	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	SHEET C4	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	SEE DRAINAGE ANALYSIS	
☒	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	DRAINAGE ANALYSIS	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. **(2.5.3.2A)**	COVER SHEET	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	SITE PLANS	

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	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)**	SUBMITTED MATERIAL	
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	N/A	

Applicant's Signature: John Chagnon **Date:** 3-18-20