FRENETTE GARDENS

SB# 03-22 CU #05-22

STAFF REPORT #2

June 22, 2022

(See May 25, 2022 Report for previous comments)

SITE: 65 Central Street; Map 182 Lot 3

ZONING: Town Residential (TR)

PURPOSE OF PLAN: To show a proposed ten lot subdivision and 705 linear feet of a new dead end roadway.

PLANS UNDER REVIEW:

- Residential Subdivision Plan, Frenette Gardens, Map 182; Lot 3, 65 Central Street, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for: Laura Ripaldi, 46 Bush Hill Road, Hudson, NH 03051 & Kimberly Frenette, 88 Dumont Road, Hudson, NH 03051 & Ricky Frenette, 14 Tate Street, Hudson, NH 03051; consisting of 16 sheets and an additional cover sheet, and general notes 1-22 on Sheet 1; dated April 20, 2022, last revised June 6, 2022.
- Wetland Buffer Impact Plan, Frenette Gardens, Map 182, Lot 3, 65 Central Street, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for: Laura Ripaldi, 46 Bush Hill Road, Hudson, NH 03051 & Kimberly Frenette, 88 Dumont Road, Hudson, NH 03051 & Ricky Frenette, 14 Tate Street, Hudson, NH 03051; consisting of a single sheet and construction notes 1-8, dated April 15, 2022, last revised June 6, 2022

ATTACHMENTS:

A. Applicant's Response to Peer Review, dated June 6, 2022.
B. Conservation Commission recommendation dated June 13, 2022.
C. CAP Fee Worksheet.
D. Stormwater Management Report revised June 6, 2022 (provided digitally only)

APPLICATION TRACKING:

- April 28, 2022 – Application received.
- May 9, 2022 – presentation to Conservation Commission
- May 12, 2022 – Conservation Commission conducted a site walk
- May 25, 2022 – Planning Board public hearing scheduled, application accepted, continued to June 22, 2022. Waiver from § 289-37.A, phased schedule granted.
- June 9, 2022 – Planning Board site walk.

- June 13, 2022 – Second meeting with Conservation Commission, recommendation issued.
- June 22, 2022 – Continuance scheduled.

COMMENTS & RECOMMENDATIONS:

RESPONSE TO PEER REVIEW

See **Attachment A** for the Applicant's revisions in response to peer review. Staff has also reviewed the changes with the Peer Review consultant and the Applicant's engineer and has found the revised plan set adequately addresses all comments.

Comment 8.a of the Peer Review stated that an Alternation of Terrain (AOT) and a Wetlands permit will be required. Staff clarified this with the Peer Reviewer who stated they mean to say "may" require AOT if disturbance exceeded 100,000-sf, which the plan does not. Also, by "Wetlands permit" the Peer Reviewer meant the Conditional Use Permit from the town that is part of this application.

CONDITIONAL USE PERMIT

The proposed development requires a Wetlands Conservation Conditional Use Permit for the proposed sewer connection and for a drainage improvement (level spreader). The Conservaion Commission first heard the application on May 9, 2022 followed by a site walk on May 12, 2022 and issued a recommendation at their June 13, 2022 meeting (**Attachment B**). The Commission concluded that the proposed is a minor impact to the buffer and poses no issues with any wetlands or the Brook, and complies with §334-36.C(2) and §334-36.A(2). The Commission also noted the potential for erosion during post construction stabilization and accordingly made recommendations for erosion control. Recommended conditions of approval by the Commission are provided in the Draft Motions section of this report.

ADDITIONAL COMMENTS

Staff recommends the Board determine the desirability of the street light place midway into the proposed neighborhood. The only street light type currently carried by the town is an LED "cobra" light shown in the image below. While this type might be appropriate along highways and corridors, some might not consider it palatable in a small neighborhood context. A more suitable location for the town light type might be at the intersection created by the proposed street.

Figure 1 - Town Streetlight

Staff has asked the Applicant's engineer to consider the possibility of providing a pedestrian easement off of the end of the proposed cul-de-sac through proposed Lot 3-6 in the vicinity of

the former rail-bed. The Town currently controls the former rail-bed from Merrill Park to Gillis Street. Note that in order to complete the connection an additional easement would be required in the vicinity of the existing sewer easement between Gillis Street and the subject lot. The purpose of this suggestion is to further opportunities to improve pedestrian facilities and recreation, a goal noted in the 2006 Master Plan as well as during public outreach for the ongoing update.

Last, it is recommended that "Active & Substantial Development" be defined between the Applicant and the Board as part of a potential approval.

DRAFT MOTIONS

CONTINUE the public hearing to a date certain:

I move to continue the conditional use permit application, CU #05-22, and the subdivision application, SB #03-22, for Frenette Gardens, 65 Central Street Map, 182 Lot 3, to date certain, _____, 2022.

Motion by: _____Second: _____Carried/Failed: _____

APPROVE the subdivision plan application:

I move to approve the conditional use permit and subdivision plans entitled: Residential Subdivision Plan & Wetland Buffer Impact Plan, Frenette Gardens, Map 182; Lot 3, 65 Central Street, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3B, Bedford, NH 03110; prepared for: Laura Ripaldi, 46 Bush Hill Road, Hudson, NH 03051 & Kimberly Frenette, 88 Dumont Road, Hudson, NH 03051 & Ricky Frenette, 14 Tate Street, Hudson, NH 03051; consisting of 16 sheets and an additional cover sheet, and general notes 1-22 on Sheet 1; and Construction Notes 1-8 on Sheet 1 of the Wetland Buffer Impact Plan; dated April 20, 2022, last revised June 6, 2022; subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Development Agreement, which shall be recorded at the HCRD, together with the Plan.
2. The Planning Board finds that the Stormwater Management Report, last revised June 6, 2022, complies with the requirements of §290 – Stormwater Management.
3. All improvements shown on the Plan, including Notes 1-22 on Sheet 1 of the Subdivision Plan and Construction Notes 1-8 on Sheet 1 of the Wetland Buffer Impact Plan, shall be completed in their entirety and at the expense of the applicant or the applicant's assigns.
4. A cost allocation procedure (CAP) amount of $5,991 per single-family residential unit, shall be paid prior to the issuance of a Certificate of Occupancy.
5. All monumentation shall be set or bonded for prior to Planning Board endorsement of the Plan-of-Record.

6. Approval of this plan shall be subject to administrative review by the Town Planner and Town Engineer.
7. Construction activities involving the proposed undeveloped lots shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall occur on Sundays.
8. A pre-construction meeting shall be scheduled with the Town Engineer prior to construction.
9. Utilities shall be underground.
10. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer. A two layer erosion control barrier should be employed in the construction areas along First Brook.
11. The commission recommends that a stipulation and or note be added to the Erosion and Sediment Control Plan that states "Erosion control blankets shall be used as part of slope stabilization after construction".
12. The Town Engineer or his representative shall be allowed to inspect the boundaries of the wetland and wetland buffer areas during construction and report any finding to the applicant and the Conservation Commission for remediation.
13. The commission recommends that a stipulation and or note be added to the final plan set that states "Stockpiling of construction materials is not allowed in the Wetland Buffer Area".
14. The commission recommends that a stipulation and or note be added to the final plan set that states "The wetland buffer boundary shall be identified and marked prior to the start of construction per Hudson Zoning Ordinance, Article IX §334-35 (E.)
15. The commission recommends that a stipulation and or note be added to the final plan set that states " No Cut/No Disturb" signage shall be installed along the edge of the wetland buffer boundary of Lots 3-7, 3-8 and 3-9 prior to issuing Certificates of Occupancy per Hudson Zoning Ordinance, Article IX §334-35 (E.)
16. This motion is based on the plan(s) submitted by the applicant. It is recommended that if additional impacts are required the plan be returned to the Conservation Commission for further review.
17. For the purposes of this subdivision plan, the term "active and substantial development" shall mean _____.

Motion by: _____Second: _____Carried/Failed: _____.

KNA KEACH-NORDSTROM ASSOCIATES, INC.

June 6, 2022

Mr. Steven W. Reichert, P.E.
Fuss & O'Neill
50 Commercial Street #2S
Manchester, NH 03101

Subject: **Frenette Gardens**
65 Central Street
Hudson, New Hampshire
KNA Project No. 21-0928-1

Dear Mr. Reichert:

We are in receipt of your comments pertaining to the subject project dated May 13, 2022. On behalf of our client, please find attached to this cover revised plan sheets and updated support documents, which we believe serve to address your comments as noted below:

1. Administrative and Subdivision Review Codes (HR 276 & HR 289)

a. Hudson Regulation HR 276-11.1.B.(6). The owner's signature was not provided on the plan set; however, a space was provided for their future signatures.

The owner's signature will be included on the final plans.

b. HR 276-11.1.B.(13). The applicant has not shown any sign locations or details on the plan set other than traffic signs.

No comment.

c. HR 276-11.1.B.(14). The applicant has shown one proposed streetlight on the plan set approximately three feet from the curb line. It is not noted on the plans or in the application documents that the proposed street right-of-way will be public and the responsibility of the Town to maintain. The applicant should confirm that the proposed right-of-way will be public and that the proposed light model is acceptable to the Town for this location and for maintenance responsibilities.

The project does propose to make this a public right-of-way, which is now noted under the street name throughout the set. DPW has reviewed the plans and has not noted any issues with the proposed street light design and layout.

d. HR 276-11.1.B .(14). We note that there are existing street lights on the utility poles on both sides of the proposed street intersection with Central Street, located 80' and 107' from the proposed street centerline. The applicant should confirm that these

lights will provide enough illumination for drivers to see pedestrians at the proposed crosswalk at night.

Central Street is a well-lit existing street, that promotes public safety. Adequate lighting for both the proposed crosswalk and the overall development has been adequately provided.

e. HR 276-11.1.B.(15). The applicant has not shown any buildings within 50 feet of the site.

Buildings within 50 feet are now shown on the plans (see Sheets 1-4).

f. HR 276-11.1.B.(16). The applicant has not included information on driveways and travel ways within 200 feet of the site.

A GIS image, which shows existing features within 2,000 feet of the site has been added to the cover sheet.

g. HR 276-11.1.B.(17). & 289-27.B.(7). The applicant has not provided any benchmark information.

A benchmark using a granite bound has been added to the plan (see Sheet 5).

h. HR 276-11.1.B.(20). The applicant has not noted existing building heights on the plan set.

The highest building on site is the existing barn which, at its peak, is approximately 38 feet high. Please see Note #3 on Sheet 1.

i. HR 276-11.1.B.(20). The applicant has shown an existing sewer easement on the plans. Several utility easements are proposed and shown on the plans. Copies of these easements were not included in the review package.

A copy of the existing sewer easement is attached to this letter. Additionally, draft copies of the proposed easements are being prepared and will be submitted to the town for review shortly.

j. HR 289-15. & 334-83. The applicant had noted that the site is partially located in the flood hazard area. The applicant has delineated this area on the plan set and we note that it is not within the area proposed for development of the road or new lot areas.

No comment.

k. HR 289-17.C. The applicant should review the front eastern corner of proposed lot 3-7 as it appears to intersect the front lot at an angle of less than 45 degrees.

An additional segment has been added to the lot line so that it intersects the front lot line at an angle of 45 degrees. The subdivision plans and lot areas have been updated accordingly.

l. HR 289-22. The applicant has not proposed any specific open spaces on the plan set. Per the Regulation the Planning Board shall review the plan for open space requirements, which shall generally consist of 10% or less of the total area, and if required this open space shall be deeded to the Town of Hudson and be so indicated on the final subdivision plan.

The area to the south of Limit Brook is unsuitable for development and will be left as open space. The landowners are considering options for granting the town a conservation easement over this land. They will continue to work with staff to determine if this is a direction they would like to go.

m. HR 289-26.B.(5). The applicant has not shown the Right-of-Way width of the existing streets on the plan set.

Existing streets ROW width has been added to the plans (see Sheets 1-4).

n. HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.

Information regarding granite bounds can be found on Note #12 on Sheet 1.

o. HR 289-37.A. The applicant has requested a waiver from the Regulation for phasing of subdivision construction to minimize the disturbance to the abutting parcels.

The planning board voted to grant said waiver at the May 25, 2022 hearing. The waiver note has been updated to reflect this.

2. Driveway Review Codes (HR 193-10)

a. HR 193-10.A. & 193-10.E. The applicant has provided sight distance information for the proposed roadway at the Central Street intersection on the plan set.

No comment.

3. **Roadway Design**

a. HR 289-18.B.(3). The applicant has proposed a cul-de-sac curb radius of 64 feet and the Regulation requires a minimum of 65 feet.

The cul-de-sac curb radius has been increased to 65 feet to meet the requirement. Additionally, the alignment and edge of pavement have been revised accordingly (see Sheet 5).

b. HR 289-18.B.(5). The applicant should add a dead-end informational sign to the plan set and a detail for the sign.

A dead-end sign and detail have been added to the plan set (see Sheets 5 & 11).

c. The proposed stop bar at the intersection with Central Street is shown as less than two feet from the crosswalk. A four-foot separation distance is recommended for this location.

The stop bar has been relocated as recommended.

d. The applicant should provide a crosswalk striping detail in the plans.

A crosswalk striping detail has been added to Sheet 11.

e. The applicant should provide a curb ramp construction detail in the plans.

Curb ramp details have been added to Sheet 11.

f. The applicant has proposed a 6.5-foot-wide grass panel between the road and sidewalk. The Town's standard detail requires a five-foot grass panel. The applicant should confirm with the Town that the wider grass panel is acceptable.

The grass panel has been reduced to 5 feet in the typical ROW and 3.5 feet in the cul-de-sac ROW based on similar comments from the town engineer. The typical roadway section detail on Sheet 11 has been updated accordingly.

4. Drainage Design /Stormwater Management (HR 289-20.C. /Chapter 290)

a. HR 289-20.C.3. & 290-5.A.9. The applicant should provide test pits located within the footprint of Proposed Infiltration Trenches #1 and #2. Verification of the infiltration rate, SHWT, and ledge is required to ensure long term functionality of the infiltration practice. We note Infiltration Trenches #1 and #2 do not account for treatment, as it appears was the design intent.

Test pits are currently scheduled for Friday, June 10 to be performed in the vicinity of the proposed trenches. All data will be added to the plans ASAP.

b. HR 290-5.A.1. & 290-5.A.3. The applicant should provide language in the Drainage Analysis Report, stating if and how low impact development (LID) strategies for stormwater runoff were evaluated for this project.

The proposed subsurface stormwater system was designed as the first of its kind as part of a pilot program in Hudson, requested by DPW. The intent is to move away

from intrusive large-scale open detention systems and replace them with less disruptive subsurface systems. This has been noted in the revised drainage report (see attached). Furthermore, all proposed BMPs are considered Low-Impact Development strategies as they utilize infiltration to reduce the volume of stormwater runoff discharged from the site.

c. HR 290-5.A.12. The applicant should provide information on the maintenance of the proposed drainage system and if a homeowner's association is to be created for that purpose. The plans and application documents do not indicate if the proposed right-of- way will be a public way with Town maintenance.

The applicant has proposed drainage and maintenance easements for the benefit of the town of Hudson to maintain the infiltration trenches. Also, the ROW is proposed as public so the town will be able to maintain the underground system.

d. HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer.

No comment.

e. HR 290-7.A.6. The applicant should provide information as to how the stormwater system is designed to account for frozen ground conditions of the infiltration trenches as the subsurface system is below the frost line.

A separate HydroCAD model has been developed to demonstrate how the infiltration trenches will operate under frozen ground conditions (see attached). This model does not include infiltration as an outlet for either pond node, which simulates what could happen when the ground is frozen. As the model indicates, neither trench is overtopped in the 50-year storm event. This information has been added to the Stormwater Management Report as well.

f. HR 290-8.A.4. & 5. We note the requirement of the applicant to coordinate the need for a Bond or Escrow with the Town Engineer.

No comment.

g. HR 290-10.A. We note that disturbance, tree clearing/stumping, and grading greater than 100,000 sf disturbance may require an NHDES AoT permit.

The limit of work was evaluated at the start of this project. It was determined to be under the 100,000-sf threshold, which does not necessitate an AoT permit.

h. Engineering Technical Guideline & Typical Details (ETGTD) 920.3.13. The applicant has proposed storm drains that are below the listed minimum velocity of

2.0 fps. We note that although it is self-cleaning velocity, it does not meet the regulations.

The slope of the 12" HDPE out of DCB#70 has been increased to 2.00% to ensure that a minimum velocity of 2.0 fps is met. The plans and drainage report have been revised accordingly (see attached).

i. The applicant will be required to comply with all provisions of the Town of Hudson's MS4 permit, including but not limited to annual reporting requirements, construction site stormwater runoff control, and record keeping requirements. The applicant has noted that the project meets 2019 MS4 requirements.

No comment.

j. Please note that this review was carried out in accordance with applicable regulations and standards in place in New Hampshire at this time. Note that conditions at the site, including average weather conditions, patterns and trends, and design storm characteristics, may change in the future. In addition, future changes in federal, state or local laws, rules or regulations, or in generally accepted scientific or industry information concerning environmental, atmospheric and geotechnical conditions and developments may affect the information and conclusions set forth in this review. In no way shall Fuss & O'Neill be liable for any of these changed conditions that may impact the review, regardless of the source of or reason for such changed conditions. Other than as described herein, no other investigation or analysis has been requested by the Client or performed by Fuss & O'Neill in preparing this review.

No comment.

5. Zoning (HR 334)

a. HR 334-14 and HR 276-11.1.B.(20). The applicant has not noted the maximum proposed building heights on the plan set. The applicant should note the maximum building height of 38 feet on the plan set.

As the plan is a conventional subdivision plan, it does not propose the construction of any buildings. Regardless, the maximum building height of 38 feet has been added to Note #3 on Sheet 1.

b. HR 334-20. The site is located in the Town Residence (TR) District. The applicant should provide a formal use note confirming that single family homes are the proposed use.

Please see Note #21 on Sheet 1.

c. HR 334-27. We note that the subdivision design appears to meet the lot size requirements for the district. The applicant has included a table with calculations illustrating that each lot meets the contiguous lot requirements excluding wetland areas and slopes greater than 25%.

No comment.

d. HR 334-36.C. The applicant has noted in their application that a Conditional Use Permit has been filed for the drainage and sewer construction within the Wetland Conservation District.

Please see Note #22 on Sheet 1.

6. Sewer/Water Design/Conflicts & Utility Design/Conflicts (HR 276-13.E.)

a. HR 276-13. The applicant has proposed one fire hydrant within the site, and there is an existing hydrant approximately 180 feet from the proposed intersection on Central Street. The applicant should coordinate with the Hudson Fire Department to verify that there is adequate fire protection coverage for the proposed lots.

The Hudson Fire Department has reviewed the plans and has not requested an additional fire hydrant.

b. ETGTD Section 801. The applicant should verify with the Town that the existing water main in Central Street has adequate flow and pressure to meet both domestic and fire hydrant requirements for the proposed subdivision.

Both the Fire Department and Department of Public Works reviewed the plans and did not note the need for a hydrant flow test.

c. The applicant has not provided any typical details for water and sewer connections to the proposed lots.

Service connection details have been added to Sheets 14 and 15 accordingly.

d. The applicant has not shown utility service connections to the two small existing houses located within proposed lot 3, other than adjacent tank covers. The applicant should verify if these are septic tanks, or if these houses are already connected to the Town sewer system with the main house on that lot.

These buildings were not labeled correctly on the original plan. One is an existing chicken coop and the other is an existing greenhouse, neither of which require utility service connections. Labels have been added to the plan set for clarity,

e. The applicant is proposing four new sewer manholes within a space of less than 60 feet, included internal drop SMH #3 which is located within the steep slope down

towards First Brook which will make maintenance difficult.

The town engineer has reviewed and accepted the proposed sewer design as proposed. Furthermore., a Sewer Connection Permit is currently under review by DES.

f. The applicant is proposing a drop over sewer manhole (SMH #1) for the connection to the existing sewer main adjacent to First Brook. The applicant should review this proposed installation with the Town to confirm that this is acceptable. Also, connection of the proposed sewer to the existing sewer manhole 15 feet upstream from SMH #1 would eliminate the need for this drop over manhole.

The town engineer originally requested this drop over manhole be installed in this location rather than coring into the existing manhole further upstream. After recent discussions with the state and town engineer, the sewer design has been revised to now core into said manhole rather than install a drop over manhole. The revised sewer layout can be found on Sheets 5 & 10.

g. ETGTD Detail S-3. The proposed internal drop sewer manhole doesn't quite match the Town of Hudson detail (cross used at inlet instead of Tee).

The previous detail has been replaced by the town detail (see Sheet 14).

h. The SMH#5 to Existing Sewer Main Profile should show the proposed water main that crosses the sewer at approximate station 1+95. The applicant should also include a water/sewer crossing detail in the plans.

The proposed water main has been added to the profile (see Sheet 10). Additionally, a water crossing detail has been added to Sheet 14.

i. ETGTD Detail R-5. The applicant has proposed a pavement repair detail that doesn't quite match the Town of Hudson detail (base courses should step out 12" beyond the trench width, pavement course cutbacks vary from the detail). The applicant should also coordinate with the Town to show the minimum required pavement depth for the patch across Central Street.

The previous detail has been replaced by the town detail (see Sheet 11).

7. Erosion Control/Wetland Impacts

a. HR 290-5.A.10. Due to the close proximity of the onsite wetlands, and as to avoid unwanted additional wetland impacts, we recommend that the applicant add a note stating that orange construction fence will be placed at all wetland buffers within 50-feet of proposed grading. This fence is recommended during build out, and kept up until the site is complete.

Note #11 has been added to Sheet 7 reflecting this recommendation.

b. The Town should reserve the right to require additional erosion control measures.

No comment.

8. State and Local Permits

a. HR 290-10.A. The applicant has noted the need for a NHDES Sewer Connection permit on the plan. The applicant should list all required permits on the plan. We note that an Alteration of Terrain Permit and a Wetlands permit will be required also.

As disturbance is under 100,000 square feet, an AOT Permit is not required. Also, no disturbance to the existing wetlands is proposed therefore, no Wetlands Permit is required either.

b. HR 290-10.B. The applicant has noted the need for a NPDES Notice of Intent. The applicant should expand this to also note the need for a SWPPP on the plan set.

Note #16 on Sheet 1 has been expanded accordingly.

c. Additional local permitting may be required.

No comment.

9. Other

a. The applicant has shown a lot of design elements on the Roadway Plan. There are locations where lines and symbols are overwritten by other notes. We recommend that the applicant review the plan to more clearly show the information for ease of use by the construction contractor.

The plan has been revised to remove as many overlaps as possible.

b. ETGTD Section 565.1.1. The applicant is reminded that the Town of Hudson has specific requirements for the importing of off-site fill materials for use in constructing this project. We recommended that these requirements be stated on the plans for the Contractors attention.

Please see the additional notes on Sheet 5 stating the town requirements for importing off-site materials.

I trust you will find the attached revised plans and documents address all of your concerns as noted above. As always, should you have any additional questions or require further information, please do not hesitate to contact me directly.

Respectfully,

Peter Madsen
Project Engineer
Keach-Nordstrom Associates, Inc.

TOWN OF HUDSON

Conservation Commission

William Collins, Chairman Dave Morin, Selectmen Liaison

12 School Street • Hudson, New Hampshire 03051 • Tel: 603-886-6008 • Fax: 603-816-1291

To: Town Planner, Brian Groth
Planning Board Chairman, Tim Malley

Date: June 13, 2022

Case: Conditional Use Permit for Frenette Gardens, 65 Central St.
Hudson, New Hampshire
Map 182, Lot 003-000
Zone: Town Residential (TR)

Site Walk Observations and Conclusions

On May 12, 2022 members of the Hudson Conservation Commission conducted a site walk of property owned by the following individuals Laura Ripaldi, 46 Bush Hill Road, Kimberly Frenette 88 Dumont Road and Ricky Frenette 14 Tate Street (all of Hudson NH). The purpose of the site walk was to evaluate proposed permanent wetland buffer impacts at two locations that would be required as part of a planned 10 lot residential subdivision. Buffer impact area #1 requires that approximately 790 square feet is disturbed for the purpose of constructing an overflow system for the proposed storm water infiltration system. Buffer impact area #2 requires that approximately 1,450 square feet is disturbed to connect a new sewer line to an existing sewer line running through the property. If built as designed there will be a permanent wetland buffer impact of 2,240 sq.

The commission concludes that this is a minor impact to the wetland buffer area along First Brook and poses no issues with any wetlands or the brook itself and complies with Hudson Zoning Ordinance §334-36 C (2) and §334-37 A (2). The proposed sewer line connection point and proposed storm water management level spreader appurtenances are placed in areas that are already maintained periodically by the town of Hudson as part of an existing sewer line easement running through the property. With that said both impact sites are located in areas that exceed 25% grade and have a potential for extreme erosion during the post construction stabilization period. Redundant erosion control barriers should be employed in the construction areas to prevent silt and other materials from entering First Brook. Lastly, the commission recommends that Erosions Control Blankets be used over exposed soils of the buffer impact areas in place of standard seeding practices to further mitigate the possibility of excess erosion during unforeseen storm events.

HCC Recommendations to the Planning board as part of a Condition of Approval

After review of the actual site conditions and a post site walk meeting with Applicant's Representative on June 13, 2022 the Conservation Commission members ask that the Planning Board take into consideration the following recommendations.

1. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer. A two layer erosion control barrier should be employed in the construction areas along First Brook.

2. The commission recommends that a stipulation and or note be added to the Erosion and Sediment Control Plan that states "Erosion control blankets shall be used as part of slope stabilization after construction".

3. The Town Engineer or his representative shall be allowed to inspect the boundaries of the wetland and wetland buffer areas during construction and report any finding to the applicant and the Conservation Commission for remediation.

4. The commission recommends that a stipulation and or note be added to the final plan set that states "Stockpiling of construction materials is not allowed in the Wetland Buffer Area".

5. The commission recommends that a stipulation and or note be added to the final plan set that states "The wetland buffer boundary shall be identified and marked prior to the start of construction per Hudson Zoning Ordinance, Article IX §334-35 (E.)

6. The commission recommends that a stipulation and or note be added to the final plan set that states " No Cut/No Disturb" signage shall be installed along the edge of the wetland buffer boundary of Lots 3-7, 3-8 and 3-9 prior to issuing Certificates of Occupancy per Hudson Zoning Ordinance, Article IX §334-35 (E.)

7. This motion is based on the plan(s) submitted by the applicant. It is recommended that if additional impacts are required the plan be returned to the Conservation Commission for further review.

Mr. Dickinson moved to forward recommendations 1 through 7 above to the Planning Board for their consideration as Conditions of Approval for the Conditional Use Permit application submitted for Frenette Gardens, 65 Central Street, Hudson.

Motion Second Mr. Pinsonneault Motion carried 4/1/0 Commission member Saundra Rumbaugh voted against the recommendations stating the project pose undue stress on the First Brook watershed

William Collins

_____

William Collins, HCC Chairman

TOWN OF HUDSON

Planning Board

Timothy Malley, Chairman

12 School Street · Hudson, New Hampshire 03051 · Tel: 603-886-6008 · Fax: 603-594-1142

CAP FEE WORKSHEET - 2022

Date: 06-16-22 Zone # 1 Map/Lot: 182/003
65 Central Street
Project Name: Frenette Gardens 10-lot Subdivision SB #03-22

Proposed ITE Use #1: Single Family Residential Lot

Proposed Building Area (square footage): N/A S.F.

CAP FEES: (ONE CHECK NEEDED)

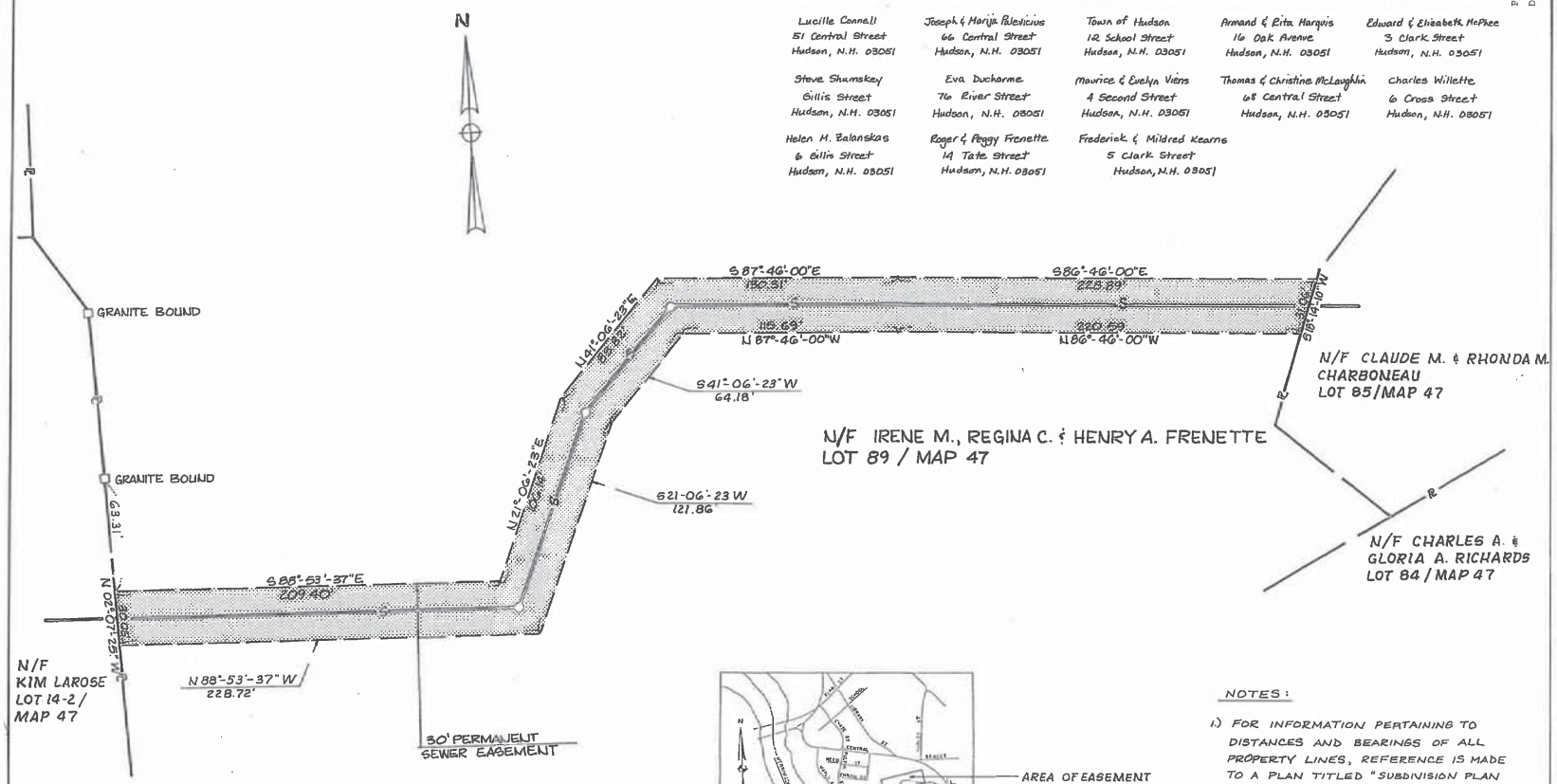
1.	**(Bank 09)**		
	2070-701	**Traffic Improvements**	**$ 2,013.00**
2.	**(Bank 09)**		
	2050-182	**Recreation**	**$ 400.00**
3.	**(Bank 09)**		
	2080-051	**School**	**$ 3,578.00**
		Total CAP Fee	**$ 5,991.00**

Check should be made payable to the Town of Hudson.

OTHER ABUTTERS :

Edward & Barbara Savage 1 Lowell Road Hudson, N.H. 03051	June Champigny 13 Oak Avenue Hudson, N.H. 03051	Lillian J. Rafferty 1 Cross Street Hudson, N.H. 03051	William & Marge Sawicki 7 Clark Street Hudson, N.H. 03051	Agnes & Mary Sklar 10 Gillis Street Hudson, N.H. 03051
Lucille Connell 51 Central Street Hudson, N.H. 03051	Joseph & Marija Palesticius 66 Central Street Hudson, N.H. 03051	Town of Hudson 12 School Street Hudson, N.H. 03051	Armand & Rita Marquis 16 Oak Avenue Hudson, N.H. 03051	Edward & Elizabeth McPhee 3 Clark Street Hudson, N.H. 03051
Steve Shumskey Gillis Street Hudson, N.H. 03051	Eva Ducharme 76 River Street Hudson, N.H. 03051	Maurice & Evelyn Viens 4 Second Street Hudson, N.H. 03051	Thomas & Christine McLaughlin 68 Central Street Hudson, N.H. 03051	Charles Willette 6 Cross Street Hudson, N.H. 03051
Helen M. Zalonskas 6 Gillis Street Hudson, N.H. 03051	Roger & Peggy Frenette 14 Tate Street Hudson, N.H. 03051	Frederick & Mildred Kearns 5 Clark Street Hudson, N.H. 03051		

Pl. #20610 Drwr. 62



LOCATION MAP

NOTES :

1) FOR INFORMATION PERTAINING TO DISTANCES AND BEARINGS OF ALL PROPERTY LINES, REFERENCE IS MADE TO A PLAN TITLED "SUBDIVISION PLAN OF LAND, GILLIS STREET, HUDSON, N.H.", PREPARED BY W. ROBERT NOLTE AND RECORDED IN THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AS PLAN NUMBER 8080.

PERMANENT SEWER EASEMENT AREA = 22,867 S.F. 0.5249 Ac.

EXECUTIVE ADMINISTRATOR TOWN OF HUDSON

"I certify that this survey plat shows the property lines that are the lines of existing ownership and that the lines of streets and ways shown are those of public or private streets or ways already established and that no new lines for division of existing ownership or for new ways are shown."

Date: 10-10-86

Licensed Land Surveyor

REVISIONS		
No.	DATE	BY
1.	3-3-87	JJD
2.	4-21-87	
3.		
4.		
5.		
6.		

TOWN OF HUDSON, NH
EXTENSION OF SEWER SYSTEM
CONTRACT 9

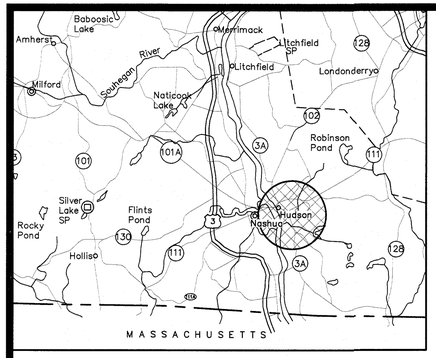
MAP SHOWING EASEMENT ON LAND OF:
IRENE M., REGINA C. & HENRY A. FRENETTE

DRAWN BY	APPD BY	SCALE	DATE
S J K		1" = 40'	SEPT. 1986

MAY 1 1987

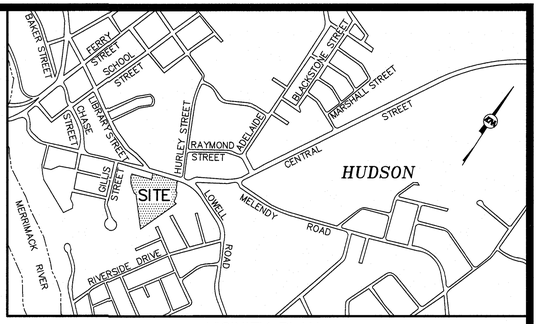
Plan # 20610 Dr. 62

10. HV 86 6 1 AM

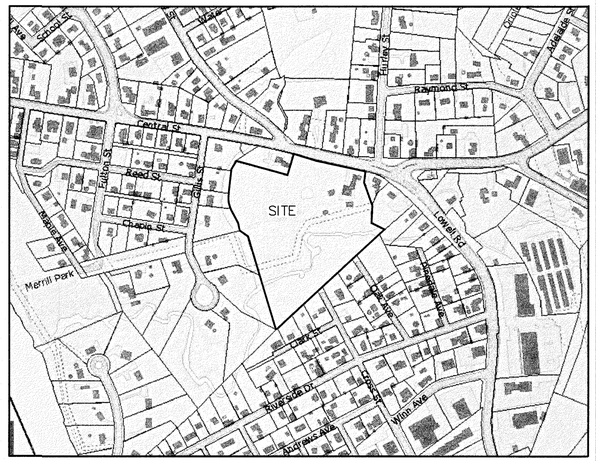


VICINITY PLAN
NOT TO SCALE

RESIDENTIAL SUBDIVISION PLAN
FRENETTE GARDENS
MAP 182; LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE



VICINITY PLAN
SCALE: 1" = 1,000±



EXISTING FEATURES WITHIN 2,000 FT
NOT TO SCALE

OWNERS/APPLICANTS:
LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051

KIMBERLEY FRENETTE
8B DUMONT ROAD
HUDSON, NH 03051

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051

PREPARED BY:
KEACH-NORDSTROM ASSOCIATES, INC.
10 COMMERCE PARK NORTH, SUITE 3B
BEDFORD, NEW HAMPSHIRE 03110
(603) 627-2881

DIG SAFE
1-888-344-7233 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

STATE OF NEW HAMPSHIRE No. 911 CHRISTOPHER J. HICKEY LAND SURVEYOR

STATE OF NEW HAMPSHIRE PAUL CHISHOLM No. 18078 LICENSED PROFESSIONAL ENGINEER

KNA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

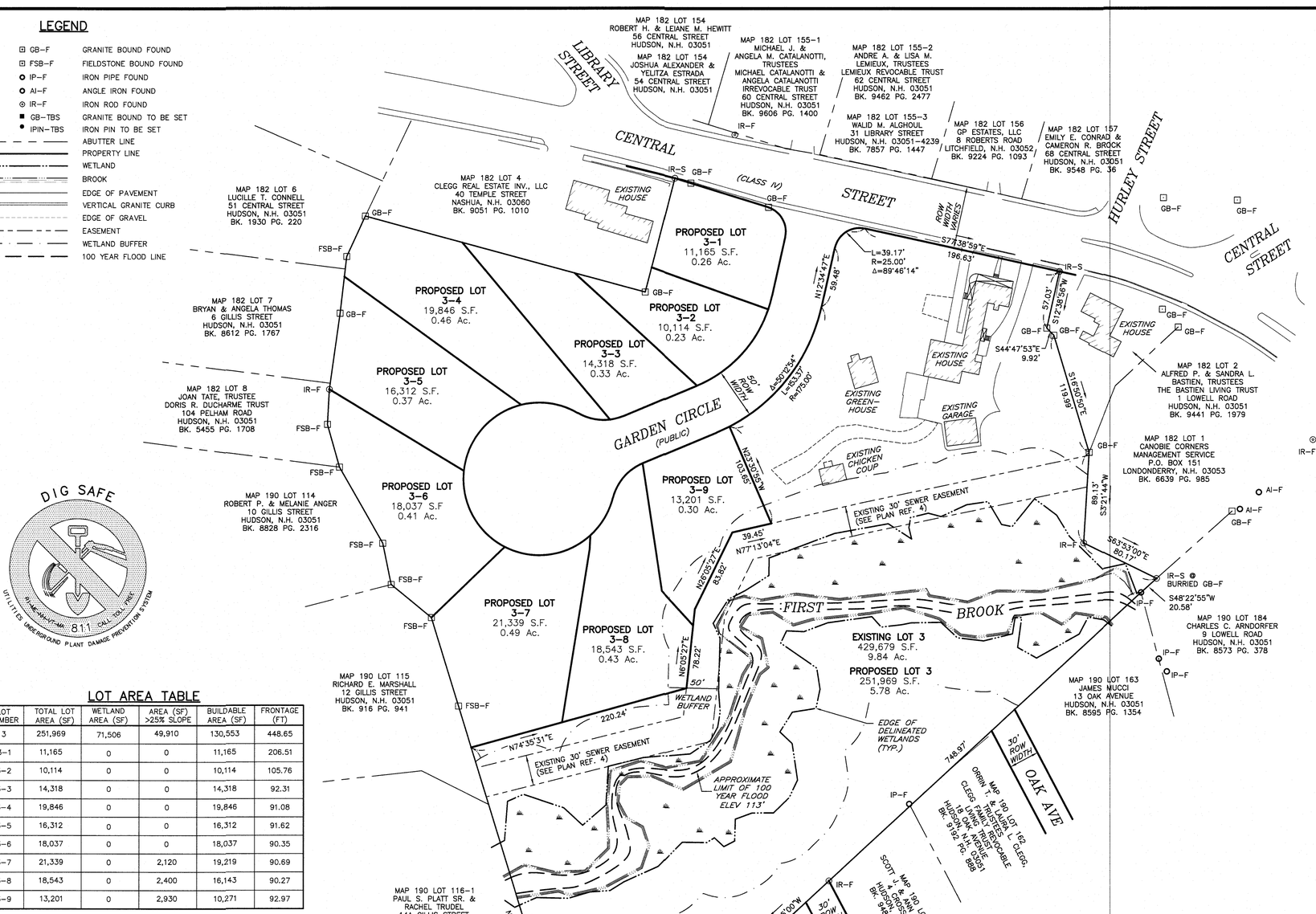
APRIL 20, 2022
LAST REVISED: JUNE 6, 2022
PROJECT NO. 21-0928-1

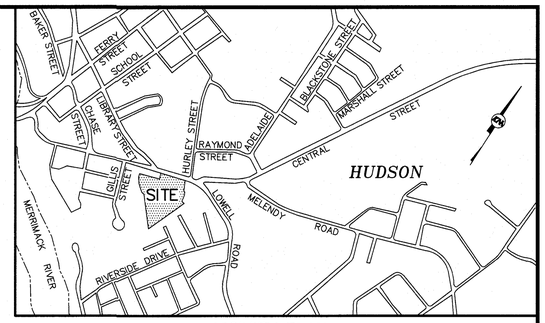
SHEET TITLE	SHEET No.

LEGEND

⊡ GB–F	GRANITE BOUND FOUND
⊡ FSB–F	FIELDSTONE BOUND FOUND
○ IP–F	IRON PIPE FOUND
○ AI–F	ANGLE IRON FOUND
⊙ IR–F	IRON ROD FOUND
■ GB–TBS	GRANITE BOUND TO BE SET
● IPIN–TBS	IRON PIN TO BE SET
	ABUTTER LINE
	PROPERTY LINE
	WETLAND
	BROOK
	EDGE OF PAVEMENT
	VERTICAL GRANITE CURB
	EDGE OF GRAVEL
	EASEMENT
	WETLAND BUFFER
	100 YEAR FLOOD LINE

DIG SAFE
811 CALL TOLL FREE
IT'S NOT ONLY SMART... IT'S THE LAW!
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM





VICINITY PLAN

SCALE: 1" = 1,000±

LOT AREA TABLE

LOT NUMBER	TOTAL LOT AREA (SF)	WETLAND AREA (SF)	AREA (SF) >25% SLOPE	BUILDABLE AREA (SF)	FRONTAGE (FT)
3	251,969	71,506	49,910	130,553	448.65
3–1	11,165	0	0	11,165	206.51
3–2	10,114	0	0	10,114	105.76
3–3	14,318	0	0	14,318	92.31
3–4	19,846	0	0	19,846	91.08
3–5	16,312	0	0	16,312	91.62
3–6	18,037	0	0	18,037	90.35
3–7	21,339	0	2,120	19,219	90.69
3–8	18,543	0	2,400	16,143	90.27
3–9	13,201	0	2,930	10,271	92.97

OWNERS OF MAP 182 LOT 3

SIGNATURE: _____
RICKY FRENETTE
DATE: _____

SIGNATURE: _____
LAURA RIPALDI
DATE: _____

SIGNATURE: _____
KIMBERLEY FRENETTE
DATE: _____

APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE PROPOSED SUBDIVISION OF MAP 182 LOT 3 INTO TEN (10) LOTS WITH MUNICIPAL SEWER AND WATER.
2. EXISTING AREA OF PARCEL IS = 429,679 SF OR 9.84 ACRES
3. THE SUBJECT PARCEL IS SITUATED ENTIRELY WITHIN THE TOWN RESIDENTIAL (TR) ZONING DISTRICT AND IS SUBJECT TO THE FOLLOWING DIMENSIONAL REQUIREMENTS:

	REQUIRED:	EXISTING:	PROPOSED:
– MINIMUM LOT AREA	10,000 SF (WITH WATER & SEWER)	429,679 SF	>10,000 SF
– MINIMUM LOT FRONTAGE	90 FT (LOCAL ROADS)	473.4 FT	>90 FT
MINIMUM BUILDING SETBACKS			
– FRONT	30 FT	26.3 FT	N/A
– REAR	15 FT	217.3 FT	N/A
– SIDE	15 FT	41.2 FT	N/A
– MAXIMUM BUILDING HEIGHT	38 FT	±38 FT (BARN)	N/A

4. BOUNDARY INFORMATION SHOWN HEREON IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE IN FEBRUARY OF 2021.
5. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD88 FROM GPS SURVEY METHODS POST PROCESSED THROUGH NOAA–OPUS.
6. EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR THE TOWN OF HUDSON, NEW HAMPSHIRE, HILLSBOROUGH COUNTY, MAP NUMBER 33011C0518D, PANEL NUMBER 518 OF 701, EFFECTIVE DATE: SEPTEMBER 25, 2009, INDICATES THAT A PORTION OF THE SUBJECT PARCEL IS LOCATED WITHIN A FLOOD HAZARD AREA. THE BASE FLOOD ELEVATION OF 113 FALLS WITHIN THE LIMITS OF FIRST BROOK AND THE APPROXIMATE LOCATION IS SHOWN.
7. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH–NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR OR OWNER SHALL CONTACT DIG SAFE AT 811.
8. THE PLANNING BOARD VOTED TO GRANT THE FOLLOWING WAIVER AT THE MAY 25, 2022 HEARING.
   HTC 289–37(A.) – LOT PHASING
9. A CAP IN THE AMOUNT OF $_____ PER RESIDENTIAL UNIT IN HUDSON, SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
10. A PUBLIC SCHOOL IMPACT FEE IN THE AMOUNT OF $_____ IN HUDSON, PER RESIDENTIAL UNIT, SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
11. A RECREATION CONTRIBUTION IN THE AMOUNT OF $_____ IN HUDSON, PER RESIDENTIAL UNIT, SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
12. STONE BOUNDS (5"x5"x30") TO BE SET AT ALL BOUNDARY INTERSECTIONS AND POINTS OF CURVATURE ON THE RIGHT–OF–WAY AND IRON PINS (5/8" x 30") TO BE SET AT ALL OTHER BOUNDARY CORNERS.
13. THIS PLAN SET CONTAINS A TOTAL OF 16 SHEETS. SHEETS 1 & 3 SHALL BE RECORDED AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AND THE ENTIRE SET IS ON FILE WITH THE TOWN OF HUDSON PLANNING DEPARTMENT.
14. CONSTRUCTION ACTIVITIES INVOLVING THE LOTS SHALL BE LIMITED TO THE HOURS BETWEEN 7:00 A.M. AND 6:00 P.M., MONDAY THROUGH FRIDAY. INTERIOR CONSTRUCTION ACTIVITIES ARE ALLOWED ON SATURDAY 7:00 A.M. AND 6:00 P.M. BOTH INTERIOR AND EXTERIOR CONSTRUCTION ACTIVITIES ARE PROHIBITED ON SUNDAYS.
15. PROPER EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED PRIOR TO CLEARING AND EXCAVATION. THE CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL COMPLETION OF CONSTRUCTION. THE TOWN OF HUDSON RESERVES THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION, IF NECESSARY.
16. PERMITS REQUIRED:

PERMITS REQUIRED:	STATUS	NUMBER
–NHDES SEWER CONNECTION PERMIT	PENDING	N/A
–NPDES NOTICE OF INTENT	REQUIRED PRIOR TO CONSTRUCTION	N/A
–EPA STORMWATER POLLUTION PREVENTION PLAN (SWPPP)	REQUIRED PRIOR TO CONSTRUCTION	N/A

17. THE ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH LOCAL AND NHDES REQUIREMENTS FOR SUCH SYSTEMS.
18. IF LOT DEVELOPMENT INVOLVES BLASTING AND/OR RAMMING OF BEDROCK MATERIALS, SAID ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7:00 A.M. AND 5:00 P.M. MONDAY THROUGH FRIDAY ONLY. SAID BLASTING/RAMMING ACTIVITIES ARE PROHIBITED ON SATURDAY AND SUNDAY.
19. THIS APPROVAL IS SUBJECT TO FINAL ENGINEERING REVIEW.
20. THIS PROJECT MEETS THE 2019 MS4 REQUIREMENTS.
21. SINGLE–FAMILY HOUSES ARE THE PROPOSED USE FOR THE SITE.
22. A CONDITIONAL USE PERMIT FOR DISTURBANCE TO THE WETLAND BUFFER WITHIN THE WETLAND CONSERVATION DISTRICT IS REQUESTED OF THE PLANNING BOARD.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

REFERENCE PLANS:

1. "PLAN OF RIVERSIDE PINES, HUDSON,N.H." SCALE: 1"=80'. DATED: SEPTEMBER, 1915. PREPARED BY: G.P. WIMM H.C.R.D. PLAN #508
2. "PLAN OF G. FRENETTE ET ALS, HUDSON, N.H." SCALE: 1"=20' DATED: SEPTEMBER, 1955 PREPARED BY: SPAULDING, CIVIL ENGINEER H.C.R.D. PLAN #1220
3. "SUBDIVISION PLAN OF LAND, GILLIS STREET, HUDSON, N.H." SCALE: 1"=50'. DATED: NOVEMBER, 1974. PREPARED BY: W. ROBERT NOLTE & ASSOCIATES. H.C.R.D. PLAN #8080
4. "TOWN OF HUDSON, N.H. EXTENSION OF SEWER SYSTEM CONTRACT 9" SCALE: 1"=40' DATED: SEPTEMBER, 1986. PREPARED BY: DAVID W. GATES. H.C.R.D. PLAN #20610
5. "LOTLINE RELOCATION & SUBDIVISION PLAN." SCALE: 1"=50' DATED: AUGUST, 1985. PREPARED BY: MAYNARD & PAQUETTE INC. H.C.R.D. PLAN #20614
6. "BOUNDARY PLAN, 4 CROSS STREET." SCALE: 1"=40'. DATED: MARCH 15, 1996. PREPARED BY: MAYNARD & PAQUETTE, INC. H.C.R.D. PLAN #27934
7. "PLAN OF LAND IN HUDSON, N.H. SHOWING MAP 182, LOT 8." SCALE: 1"=10'. DATED: AUGUST, 2013. PREPARED BY: EDWARD N. HERBERT ASSOC. INC. H.C.R.D. PLAN #37809
8. "STATE OF N.H. D.O.T. PLANS OF PROPOSED FEDERAL AID URBAN SYSTEM PROJECT MG–M–5229(008). MARKUPS" N.H. PROJECT NO. C–2432–G, CENTRAL STREET. SCALE: 1"=20'. PREPARED BY: HOWARD, NEEDLES, TAMMEN & BERGENDOFF.
9. "STATE OF N.H. D.O.T. PLANS OF PROPOSED FEDERAL AID URBAN SYSTEM PROJECT MG–M=5229(008). AS BUILT PLANS" N.H. PROJECT NO. C–2432–G CENTRAL STREET. SCALE: AS SHOWN. PREPARED BY: HOWARD, NEEDLES, TAMMEN & BERGENDOFF.

STATE OF NEW HAMPSHIRE
CHRISTOPHER K. DANFORTH
No. 077
CERTIFIED WETLAND SCIENTIST

JURISDICTIONAL WETLANDS SHOWN ON THIS PLAN WERE DELINEATED IN APRIL 2022 BY CHRISTOPHER K. DANFORTH CWS #077. THE WETLANDS WERE DELINEATED ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, VERSION 2, JANUARY 2012. DOMINANT HYDRIC SOILS WITHIN THE WETLAND(S) WERE IDENTIFIED USING "FIELD INDICATORS OF HYDRIC SOILS OF THE UNITIED STATES" A GUIDE FOR IDENTIFYING AND DELINEATING HYDRIC SOILS, NRCS, VERSION 8.1, 2017. DOMINANCE OF HYDROPHYTIC VEGETATION WAS DETERMINED USING THE USACE 2020 NATIONAL WETLAND PLANT LIST, NWPL 2020 VERSION 3.5 HTTP://WETLAND–PLANTS.USACE.ARMY.MIL.

CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE DURING FEBRUARY OF 2021. SAID SURVEY HAS A RELATIVE ERROR OF CLOSURE OF ONE PART IN TEN THOUSAND (1:10,000) OR BETTER.

_____ LICENSED LAND SURVEYOR

6/6/22 DATE

MASTER SUBDIVISION PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI	KIMBERLY FRENETTE	RICKY FRENETTE
46 BUSH HILL ROAD	8B DUMONT ROAD	14 TATE STREET
HUDSON, NH 03051	HUDSON, NH 03051	HUDSON, NH 03051
9531/2754	9531/2754	9531/2754

KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

STATE OF NEW HAMPSHIRE
No. 911
CHRISTOPHER J. HICKEY
LICENSED LAND SURVEYOR

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: 1" = 60'
PROJECT NO: 21–0928–1 | SHEET 1 OF 16

LEGEND

- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- BROOK
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB
- EDGE OF GRAVEL
- EASEMENT
- WETLAND BUFFER
- 100 YEAR FLOOD LINE
- 10' CONTOUR
- 2' CONTOUR

SOILS LEGEND

MAP UNIT	SOIL TYPE
WdD	WINDSOR–LOAMY SAND 15 TO 35 PERCENT SLOPES
WnC	WINDSOR–URBAN LAND COMPLEX 3 TO 15 PERCENT SLOPES

SOURCE: USDA–SCS WEB SOIL SURVEY
HILLSBOROUGH COUNTY

MAP 182 LOT 154
ROBERT H. & LEIANE M. HEWITT
56 CENTRAL STREET
HUDSON, N.H. 03051

MAP 182 LOT 154
JOSHUA ALEXANDER & YELITZA ESTRADA
54 CENTRAL STREET
HUDSON, N.H. 03051

MAP 182 LOT 155–1
MICHAEL J. & ANGELA M. CATALANOTTI, TRUSTEES
MICHAEL CATALANOTTI & ANGELA CATALANOTTI IRREVOCABLE TRUST
60 CENTRAL STREET
HUDSON, N.H. 03051
BK. 9606 PG. 1400

MAP 182 LOT 155–2
ANDRE A. & LISA M. LEMIEUX, TRUSTEES
LEMIEUX REVOCABLE TRUST
62 CENTRAL STREET
HUDSON, N.H. 03051
BK. 9462 PG. 2477

MAP 182 LOT 155–3
WALID M. ALGHOUL
31 LIBRARY STREET
HUDSON, N.H. 03051–4239
BK. 7857 PG. 1447

MAP 182 LOT 156
GP ESTATES, LLC
8 ROBERTS ROAD
LITCHFIELD, N.H. 03052
BK. 9224 PG. 1093

MAP 182 LOT 157
EMILY E. CONRAD & CAMERON R. BROOK
68 CENTRAL STREET
HUDSON, N.H. 03051
BK. 9548 PG. 36

LIBRARY STREET

CENTRAL STREET (CLASS IV)

HURLEY STREET

CENTRAL STREET

ROW WIDTH VARIES

MAP 182 LOT 6
LUCILLE T. CONNELL
51 CENTRAL STREET
HUDSON, N.H. 03051
BK. 1930 PG. 220

MAP 182 LOT 4
CLEGG REAL ESTATE INV., LLC
40 TEMPLE STREET
NASHUA, N.H. 03060
BK. 9051 PG. 1010

EXISTING HOUSE

PROPOSED LOT 3–1
11,165 S.F.
0.26 Ac.

PROPOSED LOT 3–2
10,114 S.F.
0.23 Ac.

PROPOSED LOT 3–3
14,318 S.F.
0.33 Ac.

PROPOSED LOT 3–4
19,846 S.F.
0.46 Ac.

PROPOSED LOT 3–5
16,312 S.F.
0.37 Ac.

PROPOSED LOT 3–6
18,037 S.F.
0.41 Ac.

PROPOSED LOT 3–7
21,339 S.F.
0.49 Ac.

PROPOSED LOT 3–8
18,543 S.F.
0.43 Ac.

PROPOSED LOT 3–9
13,201 S.F.
0.30 Ac.

EXISTING LOT 3
429,679 S.F.
9.84 Ac.

PROPOSED LOT 3
251,969 S.F.
5.78 Ac.

50' ROW WIDTH

GARDEN CIRCLE (PUBLIC)

50' WETLAND BUFFER

EDGE OF DELINEATED WETLANDS (TYP.)

APPROXIMATE LIMIT OF 100 YEAR FLOOD ELEV 113'

FIRST BROOK

MAP 182 LOT 7
BRYAN & ANGELA THOMAS
6 GILLIS STREET
HUDSON, N.H. 03051
BK. 8612 PG. 1767

MAP 182 LOT 8
JOAN TATE, TRUSTEE
DORIS R. DUCHARME TRUST
104 PELHAM ROAD
HUDSON, N.H. 03051
BK. 5455 PG. 1708

MAP 190 LOT 114
ROBERT P. & MELANIE ANGER
10 GILLIS STREET
HUDSON, N.H. 03051
BK. 8828 PG. 2316

MAP 190 LOT 115
RICHARD E. MARSHALL
12 GILLIS STREET
HUDSON, N.H. 03051
BK. 916 PG. 941

MAP 190 LOT 116–1
PAUL S. PLATT SR. & RACHEL TRUDEL
14A GILLIS STREET
HUDSON, N.H. 03051
BK. 8626 PG. 1851

MAP 190 LOT 116–2
COREY E. JIMMO
14B GILLIS STREET
HUDSON, N.H. 03051
BK. 8848 PG. 2733

MAP 190 LOT 117–1
CHANTAL MICHAUD
23 LENOX CIRCLE
LAWRENCE, MA. 01843–3415
BK. 9104 PG. 1747

MAP 190 LOT 117–2
LEIGH A. WATERHOUSE & SARA L. WHITNEY
15B GILLIS STREET
HUDSON, N.H. 03051
BK. 9550 PG. 2106

MAP 190 LOT 149
WILLIAM & NICOLE OSTRANDER
7 CLARK STREET
HUDSON, N.H. 03051
BK. 8873 PG. 2334

MAP 190 LOT 150 TRUSTEE
FREDRICK C. KEARNS III FAMILY TRUST OF KEARNS-01
7 CLARK STREET
HUDSON, N.H. 03051
BK. 9499 PG. 2617

MAP 190 LOT 151
EDWARD C. McPHEE
5 CLARK STREET
HUDSON, N.H. 03051
BK. 1726 PG. 218

MAP 190 LOT 152
AMANDA CORBIN & BRIAN D. CROSS JR.
3 CROSS STREET
HUDSON, N.H. 03051
BK. 9383 PG. 2951

MAP 190 LOT 153
SCOTT J. & ANN MARIE MACCORKLE
1 CROSS STREET
HUDSON, N.H. 03051
BK. 9497 PG. 1255

MAP 190 LOT 152
ORRIN T. & LAUREN L. CLEGG, TRUSTEES
CLEGG FAMILY REVOCABLE TRUST
16 OAK AVENUE
HUDSON, N.H. 03051
BK. 9192 PG. 0881

CROSS ST

OAK AVE

50' ROW WIDTH

EXISTING HOUSE

EXISTING GREEN–HOUSE

EXISTING GARAGE

EXISTING CHICKEN COUP

WnC

WdD

MAP 182 LOT 2
ALFRED P. & SANDRA L. BASTIEN, TRUSTEES
THE BASTIEN LIVING TRUST
1 LOWELL ROAD
HUDSON, N.H. 03051
BK. 9441 PG. 1979

MAP 182 LOT 1
CANOBIE CORNERS MANAGEMENT SERVICE
P.O. BOX 151
LONDONDERRY, N.H. 03053
BK. 6639 PG. 985

MAP 190 LOT 184
CHARLES C. ARNDORFER
9 LOWELL ROAD
HUDSON, N.H. 03051
BK. 8573 PG. 378

MAP 190 LOT 163
JAMES MUCCI
13 OAK AVENUE
HUDSON, N.H. 03051
BK. 8595 PG. 1354

NAD 83

SEE SHEET 1 FOR NOTES AND REFERENCE PLANS

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

DIG SAFE
811 CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

TOPOGRAPHIC MASTER SUBDIVISION PLAN

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
8B DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

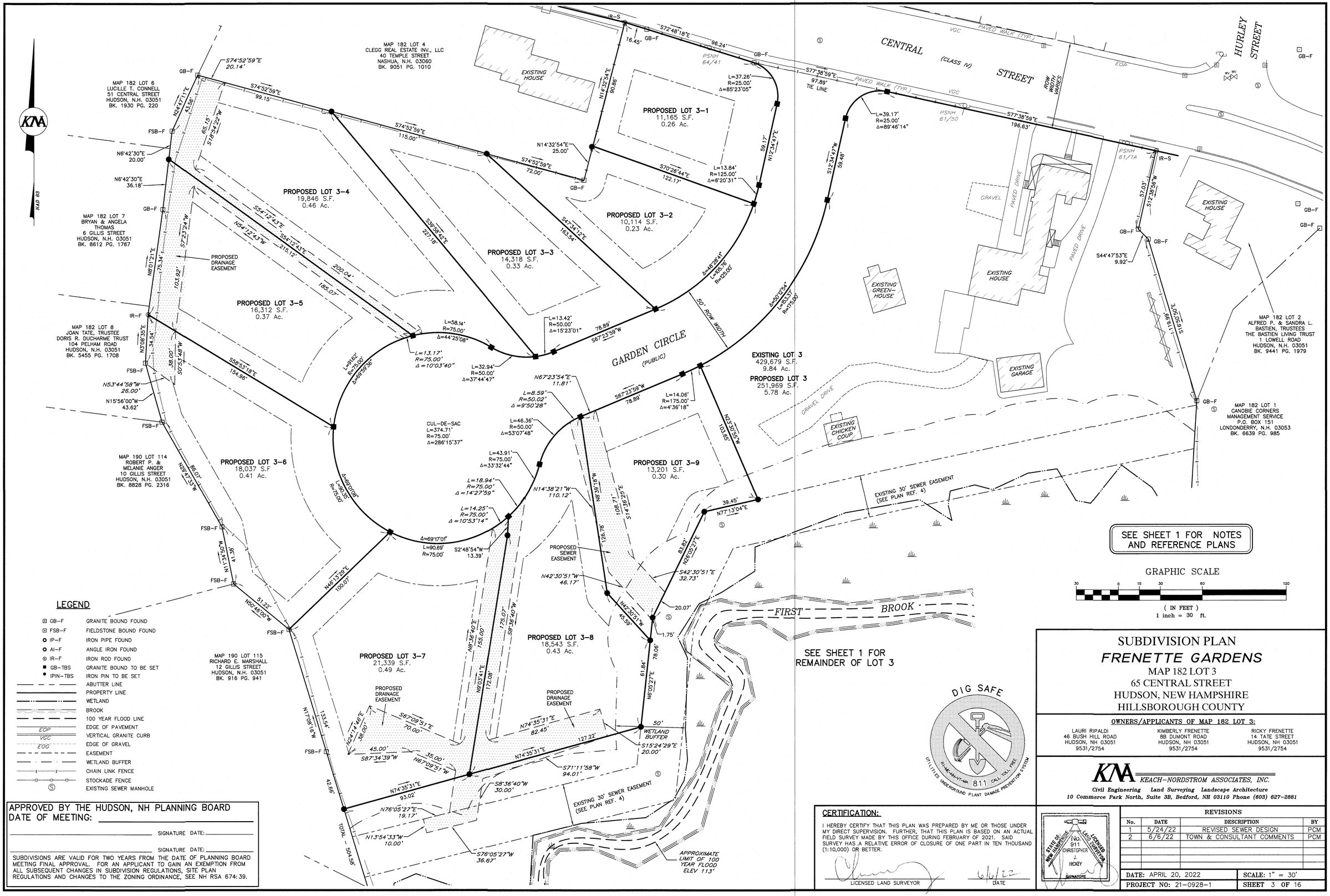
KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

STATE OF NEW HAMPSHIRE — No. 911 CHRISTOPHER J. HICKEY — LICENSED LAND SURVEYOR — SIGNATURE

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 — SCALE: 1" = 60'
PROJECT NO: 21–0928–1 — SHEET 2 OF 16



LEGEND

⊡ GB–F	GRANITE BOUND FOUND
⊡ FSB–F	FIELDSTONE BOUND FOUND
o IP–F	IRON PIPE FOUND
o AI–F	ANGLE IRON FOUND
⊙ IR–F	IRON ROD FOUND
■ GB–TBS	GRANITE BOUND TO BE SET
• IPIN–TBS	IRON PIN TO BE SET
	ABUTTER LINE
	PROPERTY LINE
	WETLAND
	BROOK
	100 YEAR FLOOD LINE
EOP	EDGE OF PAVEMENT
VGC	VERTICAL GRANITE CURB
EOG	EDGE OF GRAVEL
	EASEMENT
	WETLAND BUFFER
	CHAIN LINK FENCE
	STOCKADE FENCE
Ⓢ	EXISTING SEWER MANHOLE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

SUBDIVISION PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
88 DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

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KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR THOSE UNDER MY DIRECT SUPERVISION. FURTHER, THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY MADE BY THIS OFFICE DURING FEBRUARY OF 2021. SAID SURVEY HAS A RELATIVE ERROR OF CLOSURE OF ONE PART IN TEN THOUSAND (1:10,000) OR BETTER.

LICENSED LAND SURVEYOR — DATE 6/6/22

STATE OF NEW HAMPSHIRE — No. 911 CHRISTOPHER J. HICKEY — LICENSED LAND SURVEYOR — SIGNATURE

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DATE: APRIL 20, 2022 — SCALE: 1" = 30'
PROJECT NO: 21–0928–1 — SHEET 3 OF 16

MAP 182 LOT 4
CLEGG REAL ESTATE INV., LLC
40 TEMPLE STREET
NASHUA, N.H. 03060
BK. 9051 PG. 1010

MAP 182 LOT 6
LUCILLE T. CONNELL
51 CENTRAL STREET
HUDSON, N.H. 03051
BK. 1930 PG. 220

MAP 182 LOT 7
BRYAN & ANGELA THOMAS
6 GILLIS STREET
HUDSON, N.H. 03051
BK. 8612 PG. 1767

MAP 182 LOT 8
JOAN TATE, TRUSTEE
DORIS R. DUCHARME TRUST
104 PELHAM ROAD
HUDSON, N.H. 03051
BK. 5455 PG. 1708

MAP 190 LOT 114
ROBERT P. & MELANIE ANGER
10 GILLIS STREET
HUDSON, N.H. 03051
BK. 8828 PG. 2316

MAP 190 LOT 115
RICHARD E. MARSHALL
12 GILLIS STREET
HUDSON, N.H. 03051
BK. 916 PG. 941

MAP 182 LOT 1
CANOBIE CORNERS MANAGEMENT SERVICE
P.O. BOX 151
LONDONDERRY, N.H. 03053
BK. 6639 PG. 985

MAP 182 LOT
ALFRED P. & SAN
BASTIEN, TRUST
THE BASTIEN LIVING
1 LOWELL RO
HUDSON, N.H. 0
BK. 9441 PG. 1

NAD 83

PROPOSED LOT 3-1
11,165 S.F.
0.26 Ac.

PROPOSED LOT 3-2
10,114 S.F.
0.23 Ac.

PROPOSED LOT 3-3
14,318 S.F.
0.33 Ac.

PROPOSED LOT 3-4
19,846 S.F.
0.46 Ac.

PROPOSED LOT 3-5
16,312 S.F.
0.37 Ac.

PROPOSED LOT 3-6
18,037 S.F
0.41 Ac.

PROPOSED LOT 3-7
21,339 S.F.
0.49 Ac.

PROPOSED LOT 3-8
18,543 S.F.
0.43 Ac.

PROPOSED LOT 3-9
13,201 S.F.
0.30 Ac.

EXISTING LOT 3
429,679 S.F.
9.84 Ac.

PROPOSED LOT 3
251,969 S.F.
5.78 Ac.

PROPOSED DRAINAGE EASEMENT

PROPOSED SEWER EASEMENT

EXISTING 30' SEWER EASEMENT (SEE PLAN REF. 4)

EXISTING HOUSE

EXISTING GREEN-HOUSE

EXISTING GARAGE

EXISTING CHICKEN COUP

CENTRAL STREET (CLASS IV)

GARDEN CIRCLE (PUBLIC)

50' ROW WIDTH

APPROXIMATE LOCATION OF EXISTING WATER MAIN

APPROXIMATE LOCATION OF 3/4" COPPER WATER SERVICE

ROW WIDTH VARIES

PAVED WALK (TYP.)

VGC

EOP

PAVED DRIVE

GRAVEL DRIVE

GRAVEL

OHU

CUL-DE-SAC
L=374.71'
R=75.00'
Δ=286°15'37"

WETLAND BUFFER

FIRST BROOK

APPROXIMATE LIMIT OF 100 YEAR FLOOD ELEV 113'

TOTAL = 504.58'

SEE SHEET 1 FOR NOTES AND REFERENCE PLANS

SEE SHEET 2 FOR REMAINDER OF LOT 3

LEGEND

⊡ GB–F	GRANITE BOUND FOUND
⊡ FSB–F	FIELDSTONE BOUND FOUND
⊙ IR–F	IRON ROD FOUND
■ GB–TBS	GRANITE BOUND TO BE SET
• IPIN–TBS	IRON PIN TO BE SET
	ABUTTER LINE
	PROPERTY LINE
	R.O.W. LINE
	STONEWALL
	SOIL LINE
	SETBACK
	EASEMENT
	BROOK
	100 YEAR FLOOD LINE
	10' CONTOUR
	2' CONTOUR
	CHAIN LINK FENCE
	STOCKADE FENCE
VGC	VERTICAL GRANITE CURB
EOP	EDGE OF PAVEMENT
EOG	EDGE OF GRAVEL
OHU	OVERHEAD UTILITIES
G G	GAS LINE
W W	WATER LINE
S S	SEWER LINE
	TREELINE
	DECIDUOUS TREE

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

APPROVED BY THE HUDSON, NH PLANNING BOARD
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SOILS LEGEND

MAP UNIT	SOIL TYPE
WdD	WINDSOR–LOAMY SAND 15 TO 35 PERCENT SLOPES
WnC	WINDSOR–URBAN LAND COMPLEX 3 TO 15 PERCENT SLOPES

SOURCE: USDA–SCS WEB SOIL SURVEY
HILLSBOROUGH COUNTY

TOPOGRAPHIC SUBDIVISION PLAN

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

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STATE OF NEW HAMPSHIRE — No. 911 CHRISTOPHER J. HICKEY — LICENSED LAND SURVEYOR — SIGNATURE

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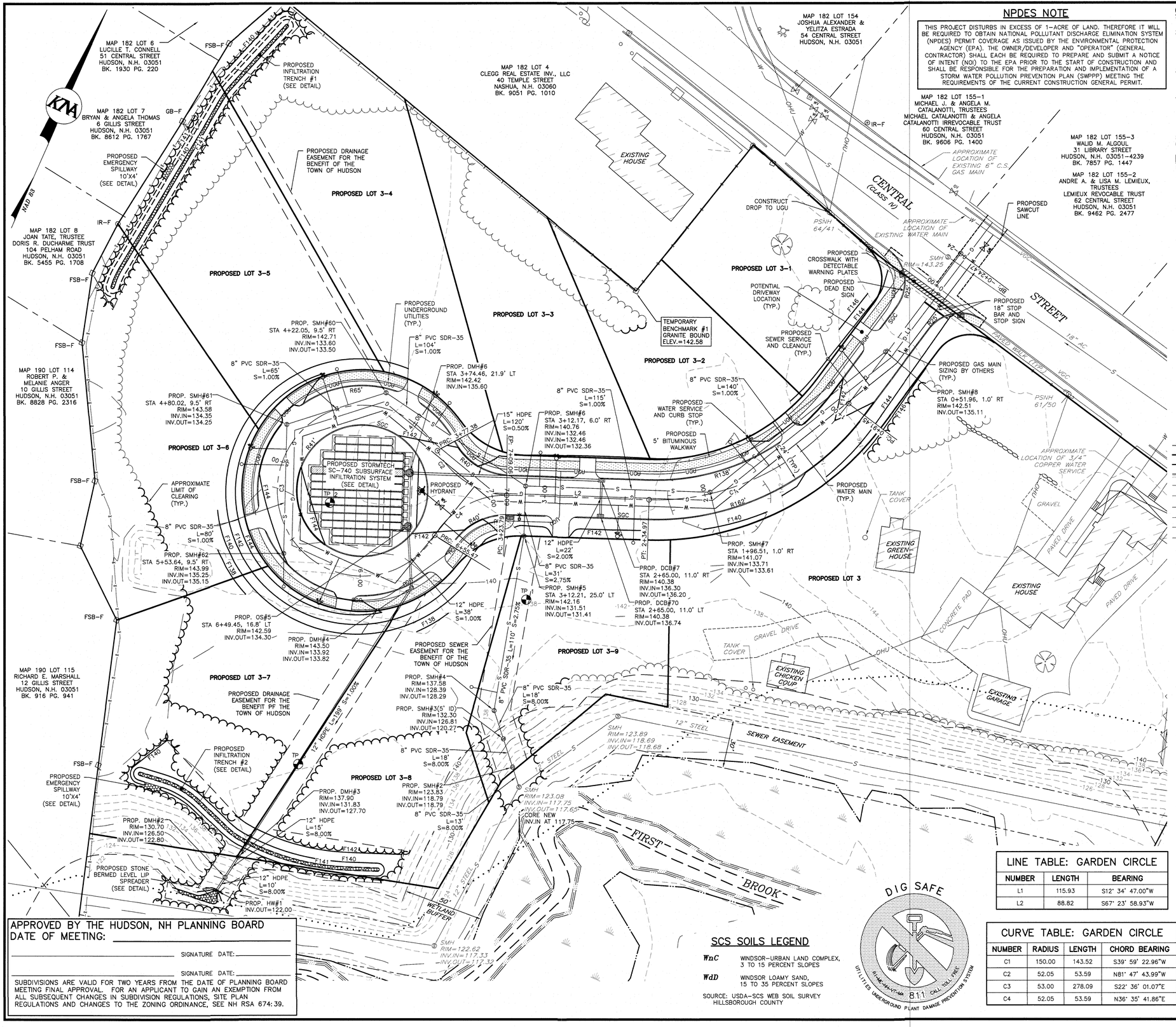

NPDES NOTE

THIS PROJECT DISTURBS IN EXCESS OF 1-ACRE OF LAND. THEREFORE IT WILL BE REQUIRED TO OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE AS ISSUED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE OWNER/DEVELOPER AND "OPERATOR" (GENERAL CONTRACTOR) SHALL EACH BE REQUIRED TO PREPARE AND SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA PRIOR TO THE START OF CONSTRUCTION AND SHALL BE RESPONSIBLE FOR THE PREPARATION AND IMPLEMENTATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MEETING THE REQUIREMENTS OF THE CURRENT CONSTRUCTION GENERAL PERMIT.

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED ROADWAY DESIGN, GRADING, AND UTILITIES FOR THIS SITE.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK PERFORMED IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. ALL DRAINAGE PIPES SHOWN SHALL BE HDPE. CATCH BASINS SHALL BE TYPE B, AND HAVE 3' SUMPS UNLESS OTHERWISE NOTED.
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 TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. ALL DRAINAGE PIPE SHALL BE INSTALLED FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. ALL DRIVEWAY, WATER, AND GAS STUB LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE COORDINATED WITH OWNER & ENGINEER OF RECORD FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

EXCAVATION AND EMBANKMENT NOTES:

1. LEDGE AND BOULDER EXCAVATION AND REMOVAL
   - ALL LEDGE AND BOULDER EXCAVATION AND REMOVAL ACTIVITIES SHALL CONFORM WITH SECTION 203 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS PUBLISHED BY THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION AND TOWN REQUIREMENTS FOR BLASTING PERMITS/SUBMITTALS. NO LEDGE OR BOULDERS SHALL BE BURIED WITHIN THE TOWN OWNED RIGHT-OF-WAY.
2. STUMP REMOVAL AND DISPOSAL
   - STUMPS SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES STANDARDS. PRIOR TOWN APPROVAL IS REQUIRED FOR ANY ON-SITE STUMP BURIALS. STUMPS CANNOT BE BURIED OR OTHERWISE DISPOSED OF WITHIN THE TOWN OWNED RIGHT-OF-WAY.
3. OFF-SITE FILL MATERIAL
   - CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING, CONTAINING, AND DULY REMOVING ALL CONSTITUENTS OF CONCERN BROUGHT TO THE SITE BY CONTRACTOR, SUBCONTRACTORS, SUPPLIERS, OR ANYONE ELSE FOR WHOM CONTRACTOR IS RESPONSIBLE, AND FOR ANY ASSOCIATED COSTS; AND FOR THE COSTS OF REMOVING AND REMEDIATING ANY HAZARDOUS ENVIRONMENTAL CONDITION CREATED BY THE PRESENCE OF ANY SUCH CONSTITUENTS OF CONCERN.
   - CONTRACTOR SHALL NOT IMPORT ANY FILL OVER THE AMOUNT OF TEN CUBIC YARDS CUMULATIVE TOTAL PER SOURCE TO ANY JOB SITE IN THE TOWN OF HUDSON WITHOUT SOILS TESTING VERIFYING THE ABSENCE OF ALL CONSTITUENTS OF CONCERN, AND WITHOUT PRIOR APPROVAL BY ENGINEERING DEPARTMENT STAFF. DOCUMENTATION SUCH AS TEST REPORTS, CERTIFICATIONS AND SIEVE ANALYZES OF FILL SHALL BE PROVIDED TO THE ENGINEERING DEPARTMENT FOR APPROVAL PRIOR TO TRANSPORTING THE MATERIAL TO HUDSON.

LEGEND

GB-F	GRANITE BOUND FOUND
FSB-F	FIELDSTONE BOUND FOUND
IP-F	IRON PIPE FOUND
AI-F	ANGLE IRON FOUND
IR-F	IRON ROD FOUND
	UTILITY POLE
	SIGN
S	SEWER MANHOLE
D	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
	WETLAND
	BROOK
	CHAIN LINK FENCE
	STOCKADE FENCE
OHU	OVERHEAD UTILITIES
G	GAS LINE
W	WATER LINE
S	SEWER LINE
	DRAINAGE LINE
	TREELINE
	EDGE OF PAVEMENT
	VERTICAL GRANITE CURB
	EDGE OF GRAVEL
	10' CONTOUR
	2' CONTOUR
	STONEWALL
	SCS SOIL LINE
	BUILDING SETBACK
	EASEMENT
UGU	PROPOSED UNDERGROUND UTILITIES
G	PROPOSED GAS LINE
W	PROPOSED WATER LINE
S	PROPOSED SEWER LINE
	PROPOSED DRAINAGE LINE
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED SLOPED GRANITE CURB
	PROPOSED 2' CONTOUR

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

SCS SOILS LEGEND

WnC	WINDSOR-URBAN LAND COMPLEX, 3 TO 15 PERCENT SLOPES
WdD	WINDSOR LOAMY SAND, 15 TO 35 PERCENT SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY HILLSBOROUGH COUNTY

DIG SAFE
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LINE TABLE: GARDEN CIRCLE		
NUMBER	LENGTH	BEARING
L1	115.93	S12° 34' 47.00"W
L2	88.82	S67° 23' 58.93"W

CURVE TABLE: GARDEN CIRCLE			
NUMBER	RADIUS	LENGTH	CHORD BEARING
C1	150.00	143.52	S39° 59' 22.96"W
C2	52.05	53.59	N81° 47' 43.99"W
C3	53.00	278.09	S22° 36' 01.07"E
C4	52.05	53.59	N36° 35' 41.86"E

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ROADWAY PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

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PAUL CHISHOLM No. 15073 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

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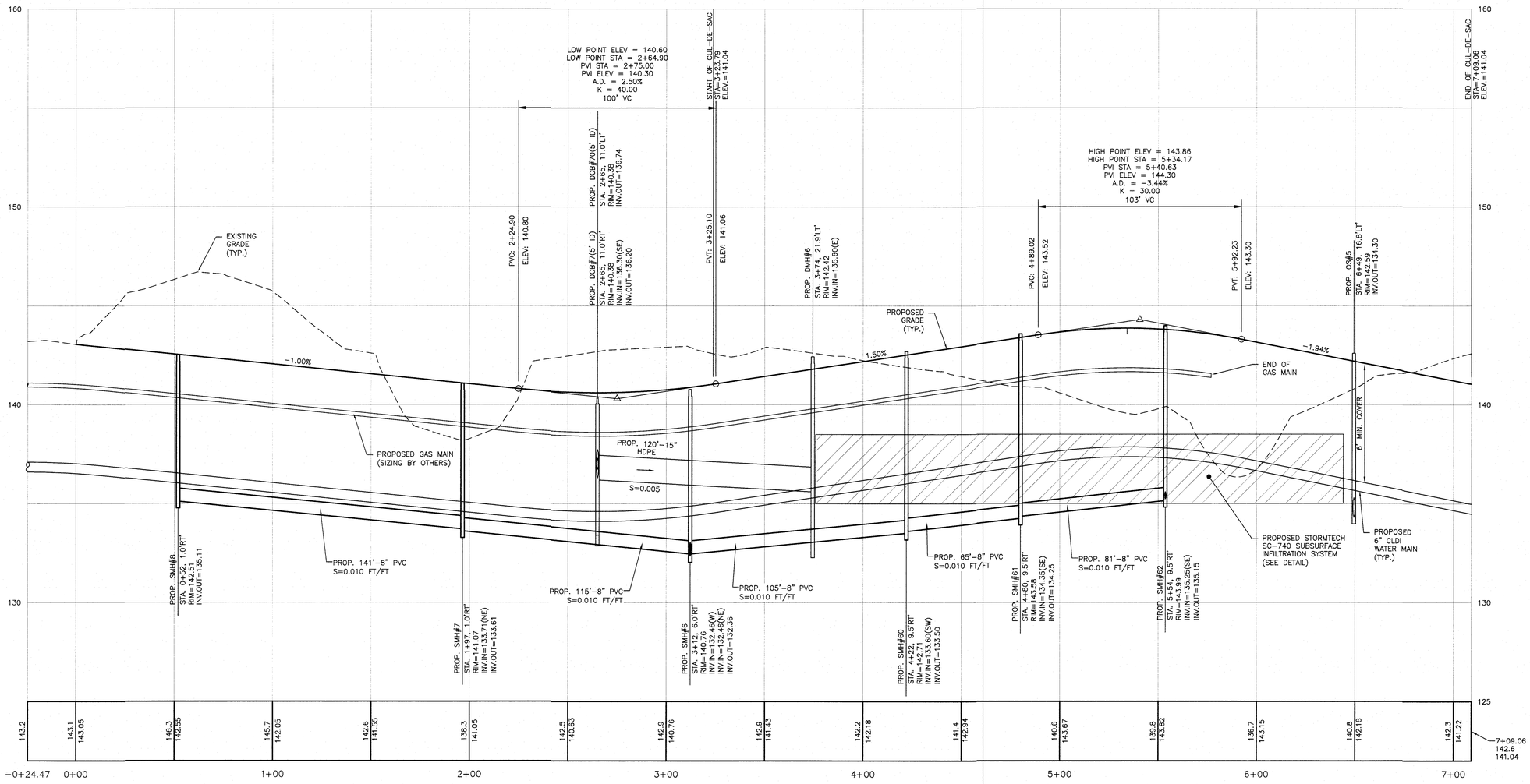

ROADWAY PROFILE
SCALE: 1" = 30'(HORIZ.)
1" = 3'(VERT.)

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GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

ROADWAY PROFILE
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
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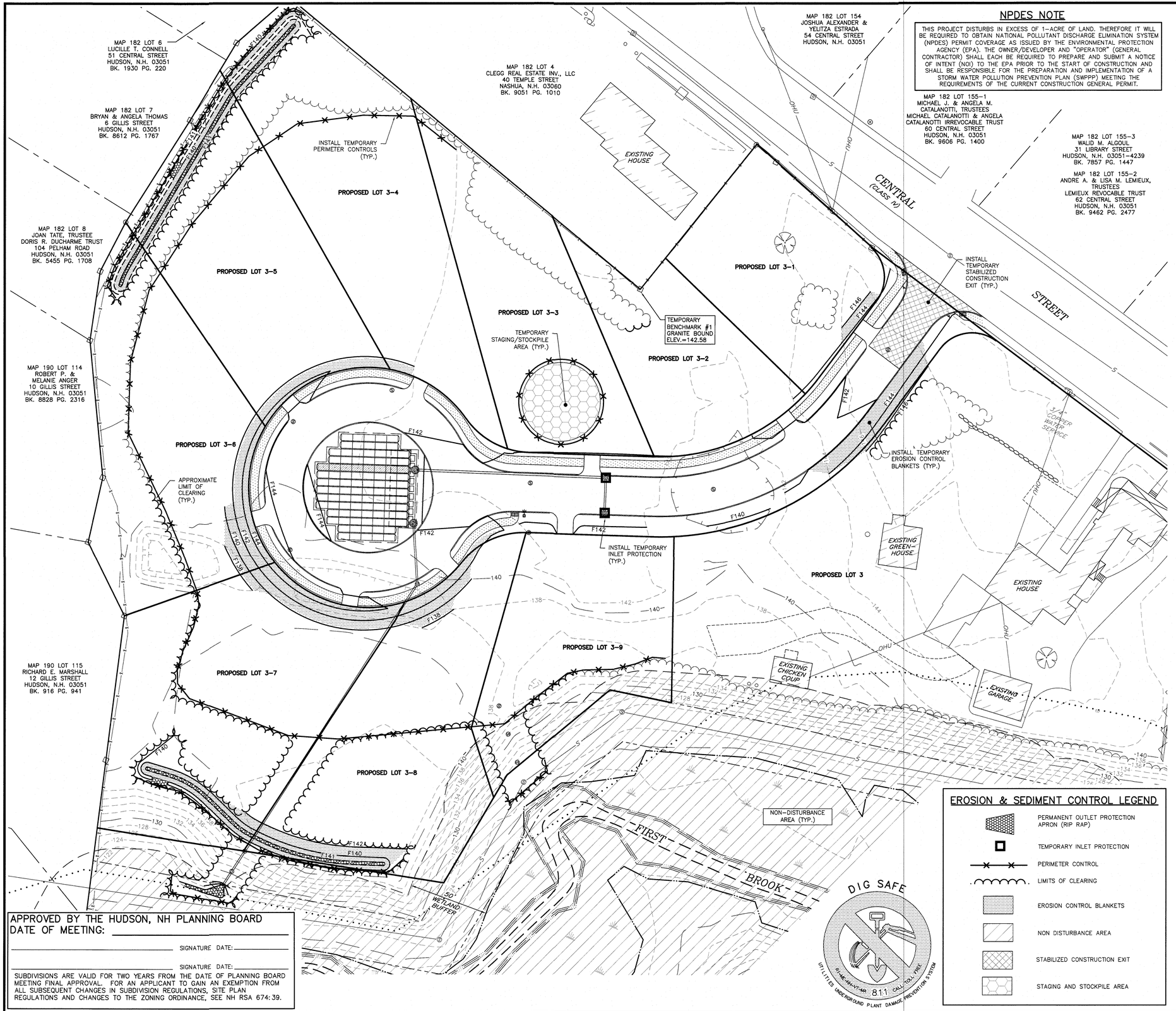

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EROSION CONTROL NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE REQUIRED ONSITE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES AS WELL AS THE PERMANENT EROSION CONTROL MEASURES.
2. ALL MEASURES IN THE PLAN SHALL MEET AS A MINIMUM THE BEST MANAGEMENT PRACTICES SET FORTH IN VOLUME 3 OF THE NEW HAMPSHIRE STORMWATER MANUEL TITLED "EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION," DATED DECEMBER 2010, AS AMENDED FROM TIME TO TIME.
3. WHENEVER PRACTICAL, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED OR SUPPLEMENTED. THE STRIPPING OF VEGETATION SHALL BE DONE IN A MANNER THAT MINIMIZES SOIL EROSION.
4. APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO LAND DISTURBANCE.
5. THE AREA OF DISTURBANCE SHALL BE KEPT TO A MINIMUM. DISTURBED AREAS REMAINING IDLE FOR MORE THAN 30 DAYS SHALL BE STABILIZED.
6. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA USING APPROVED MEASURES. WETLAND AREAS AND SURFACE WATERS SHALL BE PROTECTED FROM SEDIMENT.
7. OFFSITE SURFACE WATER AND RUNOFF FROM UNDISTURBED AREAS SHALL BE DIVERTED AWAY FROM DISTURBED AREAS WHERE FEASIBLE OR CARRIED NON-EROSIVELY THROUGH THE PROJECT AREA. INTEGRITY OF DOWNSTREAM DRAINAGE SYSTEMS SHALL BE MAINTAINED.
8. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL SITE STABILIZATION IS ACCOMPLISHED.
9. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS UNLESS CONDITIONS DICTATE OTHERWISE.
10. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE FURTHER EROSION CONTROL PRACTICES DURING CONSTRUCTION SHOULD THEY FIND IT NECESSARY.
11. ORANGE CONSTRUCTION FENCE WILL BE PLACED AT ALL WETLAND BUFFERS WITHIN 50-FEET OF PROPOSED GRADING. THIS FENCE IS RECOMMENDED DURING BUILD OUT AND KEPT UP UNTIL THE SITE IS COMPLETE.

LEGEND

- GB-F — GRANITE BOUND FOUND
- FSB-F — FIELDSTONE BOUND FOUND
- IP-F — IRON PIPE FOUND
- AI-F — ANGLE IRON FOUND
- IR-F — IRON ROD FOUND
- UTILITY POLE
- SIGN
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- BROOK
- CHAIN LINK FENCE
- STOCKADE FENCE
- OVERHEAD UTILITIES
- DRAINAGE LINE
- TREELINE
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB
- EDGE OF GRAVEL
- 10' CONTOUR
- 2' CONTOUR
- STONEWALL
- BUILDING SETBACK
- PROPOSED DRAINAGE LINE
- PROPOSED TREELINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED VERTICAL GRANITE CURB
- PROPOSED 2' CONTOUR

NAD 83

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

EROSION & SEDIMENT CONTROL LEGEND

- PERMANENT OUTLET PROTECTION APRON (RIP RAP)
- TEMPORARY INLET PROTECTION
- PERIMETER CONTROL
- LIMITS OF CLEARING
- EROSION CONTROL BLANKETS
- NON DISTURBANCE AREA
- STABILIZED CONSTRUCTION EXIT
- STAGING AND STOCKPILE AREA

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EROSION CONTROL PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
88 DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

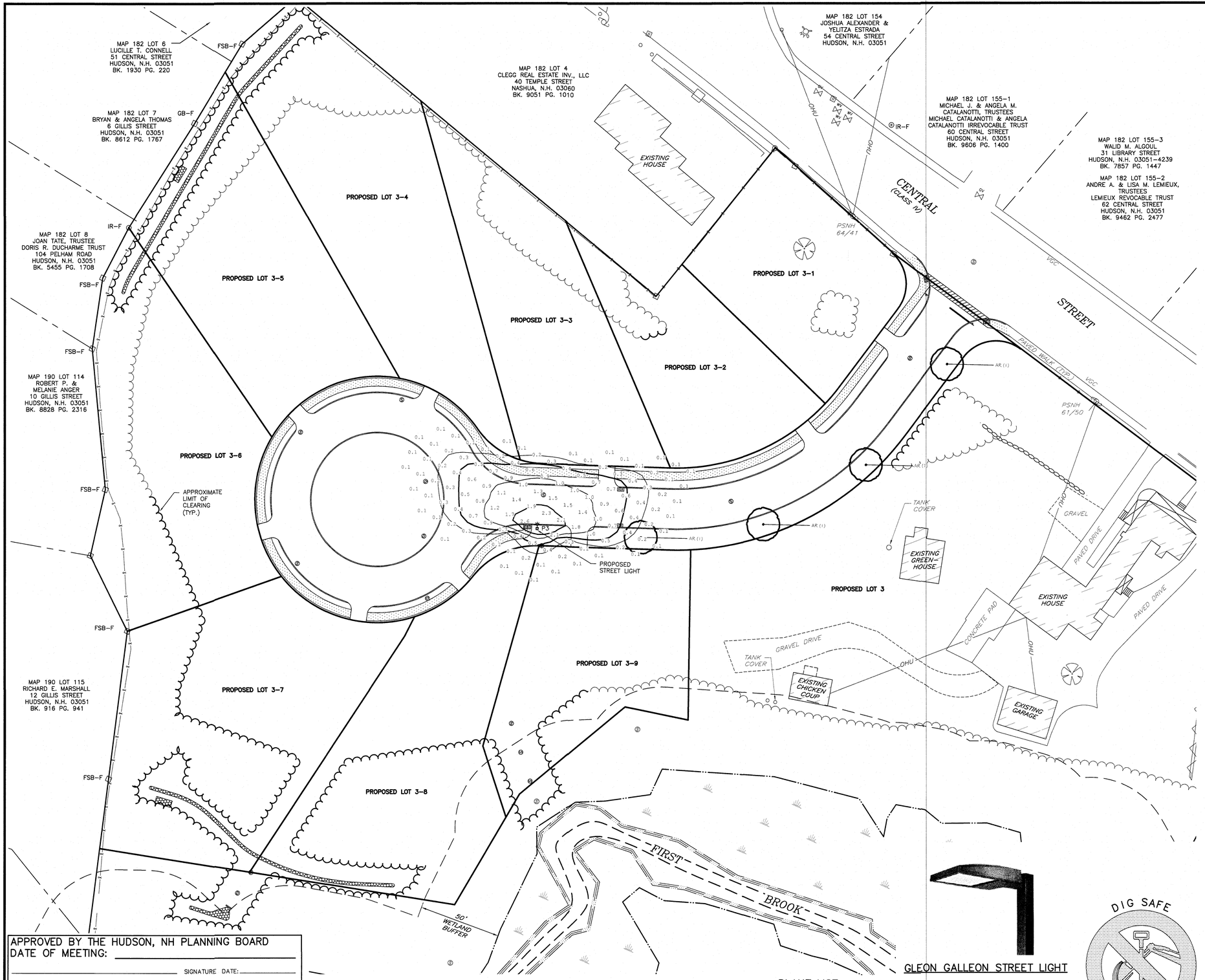
KNA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 15078 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
6/6/22

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | **SCALE:** 1" = 30'
PROJECT NO: 21-0928-1 | **SHEET** 7 **OF** 16



LANDSCAPE NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED SITE LANDSCAPING AND LIGHTING WHICH PROVIDES CLIMATIC RELIEF AND AESTHETIC APPEAL.
2. ALL PLANT MATERIALS USED SHALL BE NURSERY STOCK AND SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF INSTALLATION. ANY MATERIAL WHICH DIES OR DOES NOT SHOWN HEALTHY APPEARANCE WITHIN THIS TIME SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE; WITH SAME WARRANTY REQUIREMENTS AS THE ORIGINAL. WARRANTIES TYPICALLY DO NOT COVER LOSS DUE TO INSECT INFESTATION OR MECHANICAL DAMAGE (I.E. SNOW STORAGE).
3. IF THE SOIL CONDITIONS ARE EXTREMELY SANDY, ALL TREES SHALL HAVE A 6" LAYER OF COMPACTED TOPSOIL PLACED IN THE BASE OF THE PLANT PIT AS A MOISTURE RETENTION LAYER. THE PLANT PIT SIDEWALLS SHALL BE OVER EXCAVATED BY AN ADDITIONAL 12" BEYOND THE NORMAL OUTSIDE RADIUS OF THE HOLE. A TOPSOIL MIXTURE SHALL BE USED TO BACKFILL THE HOLE AS FOLLOWED; ORGANIC TOPSOIL, AMENDED WITH 10% WOOD ASH, 10% MANURE, 30% COMPOST AND A GRANULAR HYDROGEL TO ABSORB AND RETAIN WATER.
4. PLANTING BEDS AND SAUCERS SHALL RECEIVE A FOUR INCH (4") MINIMUM THICKNESS OF PINE/HEMLOCK BARK MULCH OVER A 5 OZ. POLYPROPYLENE WEED CONTROL FABRIC.
5. MINIMUM TOPSOIL DEPTH IN LAWN AREAS AND ALL OTHER DISTURBED AREAS SHALL BE 6".
6. MULCH SHALL BE MINIMUM 3" THICKNESS CONSISTING OF 50% SHREDDED BARK AND 50% WOOD CHIPS, 3/4 TO 2 INCH IN SIZE, UNIFORMLY MIXED AND FREE OF ELM WOOD. MULCH TO BE PLACED UNIFORMLY OVER THE PLANTING BED ALLOWING NO WEED BARRIER TO BE SEEN
7. PAVEMENT AND ROAD BASE MATERIAL ENCOUNTERED IN ANY LAWN OR PLANTING BED SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND SUITABLE AMENDED SOIL INSTALLED AS SPECIFIED IN THE TURF ESTABLISHMENT SCHEDULE.
8. THE APPLICANT OR THEIR SUCCESSORS SHALL BE RESPONSIBLE FOR THE REGULAR MAINTENANCE OF ALL PLANTING AND OTHER LANDSCAPE FEATURES. PLANT MATERIALS SHALL BE MAINTAINED ALIVE, HEALTHY AND FREE FROM PESTS AND DISEASE.
9. ALL LIGHTS/FIXTURES SHALL BE AS SPECIFIED BY CHARRON INCORPORATED.
10. ALL PROPOSED FIXTURES ARE TO BE FULL CUTOFF.
11. ALL FINAL SITE LIGHTING AND CONDUIT LAYOUT SHALL BE COORDINATED WITH LOCAL UTILITY PROVIDER.
12. PRIOR TO CONSTRUCTION, THE SITE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ELECTRICIAN FOR THE EXACT LOCATION, LAYOUT, CONDUIT SIZE AND CIRCUITS ASSOCIATED WITH THE SITE LIGHTING.

LEGEND

⊡	GB-F GRANITE BOUND FOUND
⊡	FSB-F FIELDSTONE BOUND FOUND
○	IP-F IRON PIPE FOUND
○	AI-F ANGLE IRON FOUND
⊙	IR-F IRON ROD FOUND
	UTILITY POLE
	SIGN
Ⓢ	SEWER MANHOLE
Ⓓ	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
	WETLAND
	BROOK
	CHAIN LINK FENCE
	STOCKADE FENCE
OHU	OVERHEAD UTILITIES
	TREELINE
	EDGE OF PAVEMENT
	VERTICAL GRANITE CURB
	EDGE OF GRAVEL
	STONEWALL
	BUILDING SETBACK
	EASEMENT
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED VERTICAL GRANITE CURB
	PROPOSED 2' CONTOUR

NAD 83

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

APPROVED BY THE HUDSON, NH PLANNING BOARD
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Luminaire Schedule				
Symbol	Qty	Label	Arrangement	Description
✱	1	P3	SINGLE	GLEON-SA1C-730-U-SL3/SSS4A20SFN1 (20' AFG)

GLEON GALLEON STREET LIGHT

PLANT LIST

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE	MATURE HEIGHT
TREES					
Ar	4	ACER RUBURM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	2.5-3" CAL.	40-60'

DIG SAFE
811
CALL TOLL FREE
811 APPLY ON-LINE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

IN ASSOCIATION WITH:

CHARRON
BRIGHTER.

P.O. BOX 4550
MANCHESTER, NH 03108
(603) 624-4827
FAX (603) 624-9764
SALES@CHARRONINC.COM

LANDSCAPING & LIGHTING PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

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PAUL CHISHOLM No. 15075 LICENSED PROFESSIONAL ENGINEER
4/20/22

REVISIONS			
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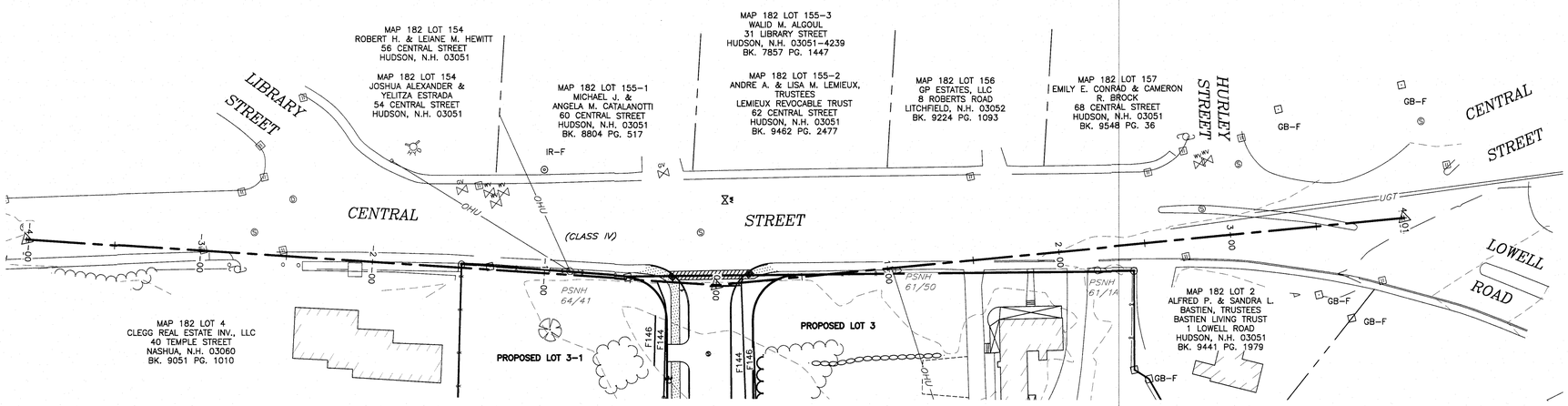
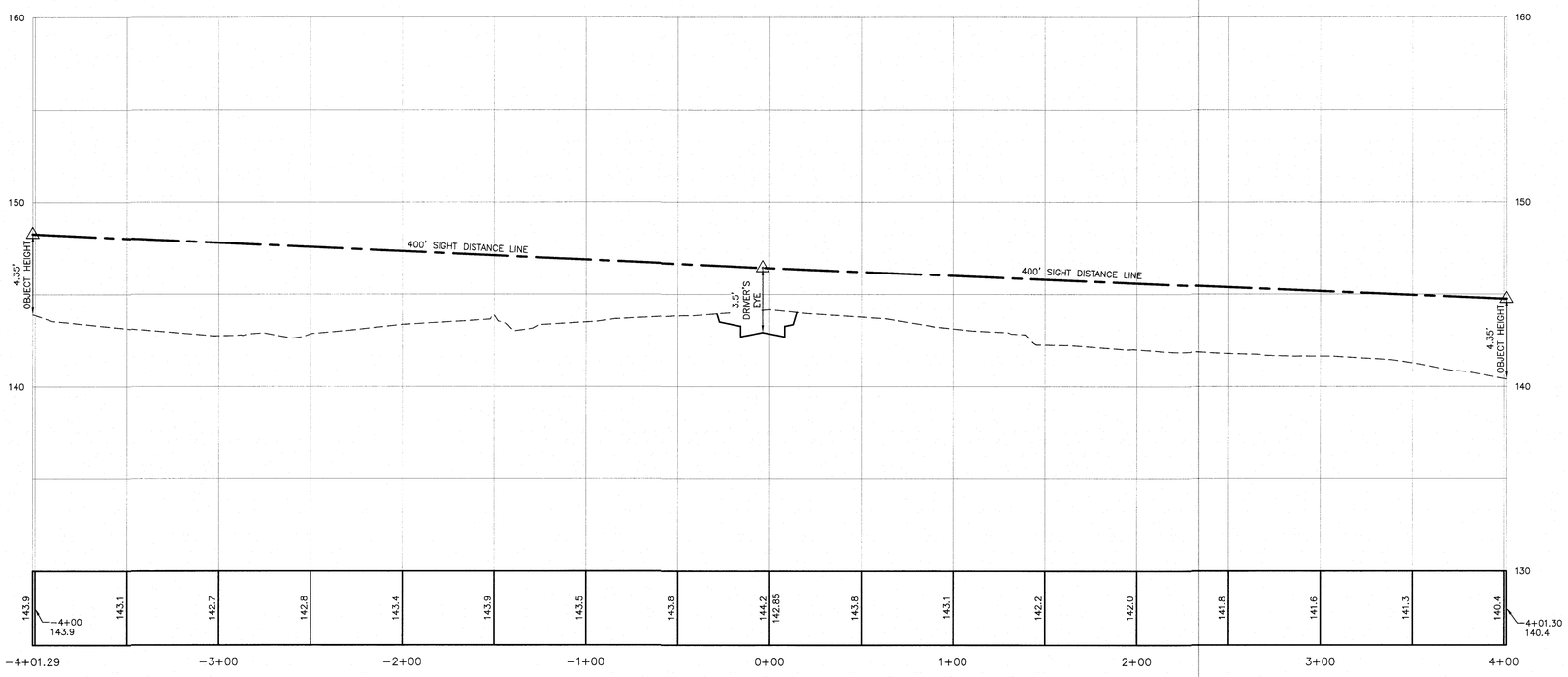
DATE: APRIL 20, 2022 | SCALE: 1" = 30'
PROJECT NO: 21-0928-1 | SHEET 8 OF 16



SIGHT DISTANCE PLAN
SCALE: 1" = 40'(HORIZ.)
1" = 4'(VERT.)



SIGHT DISTANCE PROFILE
SCALE: 1" = 40'(HORIZ.)
1" = 4'(VERT.)

DIG SAFE
811
CALL TOLL FREE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

SIGHT DISTANCE PLAN & PROFILE
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
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STATE OF NEW HAMPSHIRE
PAUL CHISHOLM
No. 15078
LICENSED
PROFESSIONAL ENGINEER
6/6/22

REVISIONS

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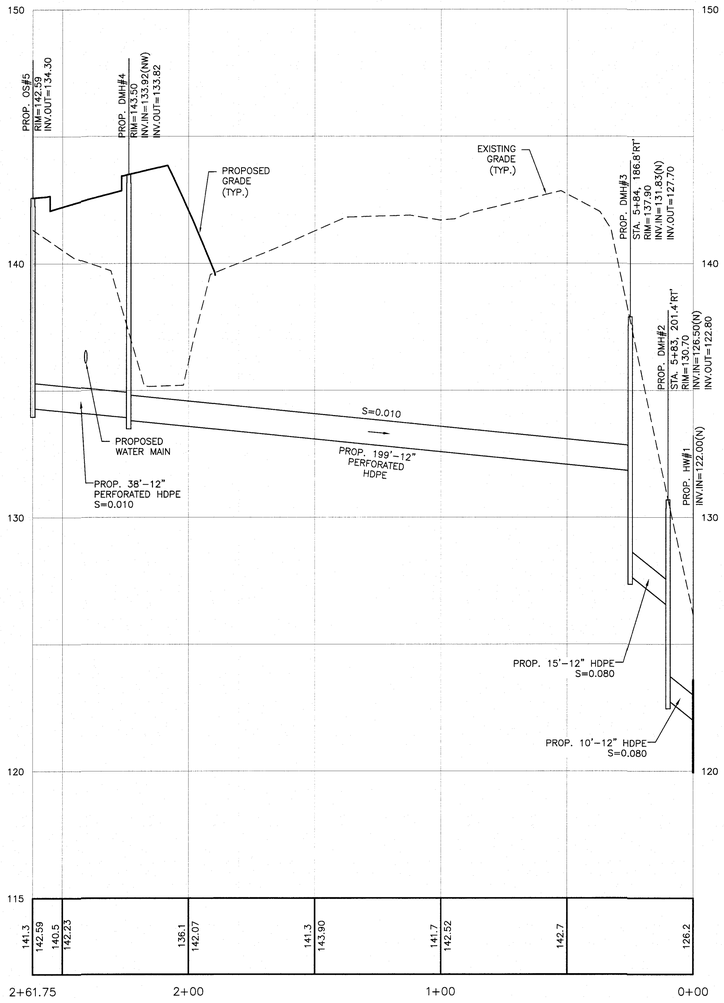
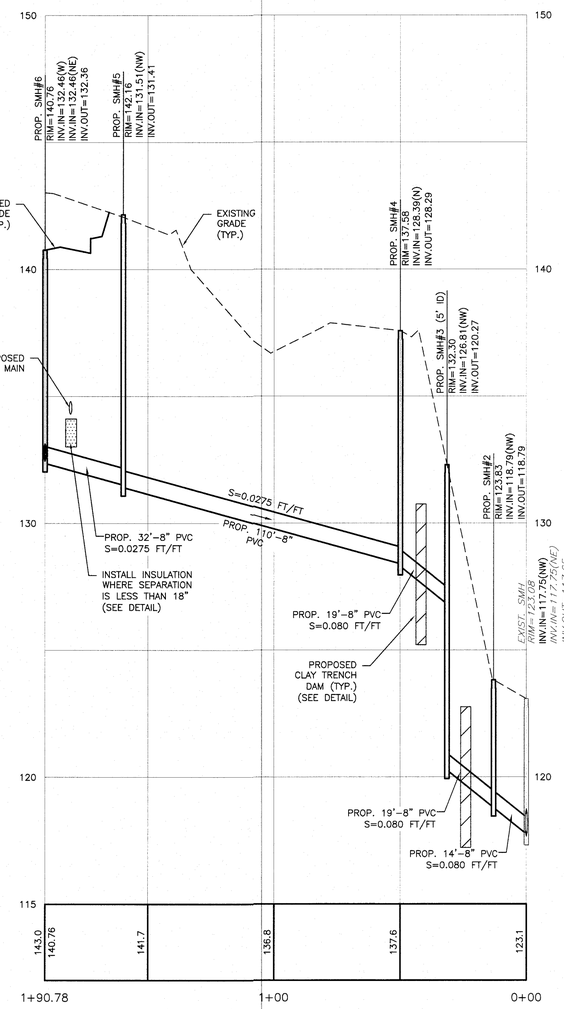
PROJECT NO: 21-0928-1 **SHEET** 9 **OF** 16



OS#5 TO HW#1 PROFILE
SCALE: 1" = 30'(HORIZ.)
1" = 3'(VERT.)



SMH#5 TO EXISTING SEWER MAIN PROFILE
SCALE: 1" = 30'(HORIZ.)
1" = 3'(VERT.)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

SEWER & DRAINAGE PROFILES
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
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HILLSBOROUGH COUNTY

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

PAUL CHISHOLM No. 15073 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE
6/6/22

REVISIONS

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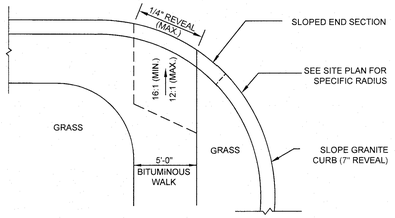
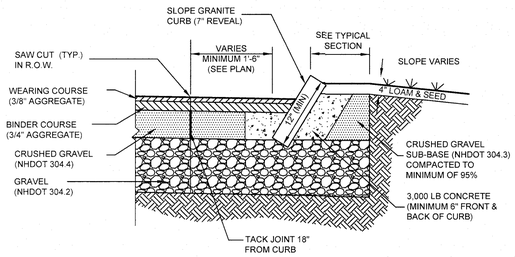


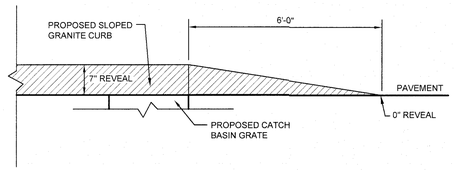
NOTES:

1. SLOPE OF RAMP VARIES WITH SIDEWALK WIDTH AND HEIGHT, WITH A MAXIMUM SLOPE OF 12:1 AND MINIMUM SLOPE 16:1.
2. A BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP SHALL BE USED ON PORTLAND CEMENT CONCRETE RAMPS.
3. MAINTAIN THE NORMAL GUTTER PROFILE THROUGHOUT THE RAMP AREA.
4. INTERCEPT DRAINAGE ALONG THE CURB IN ADVANCE OF THE RAMP.
5. MAINTAIN A MAXIMUM 1/4" OF CURB REVEAL AT THE RAMP, SEE SECTION A-A.

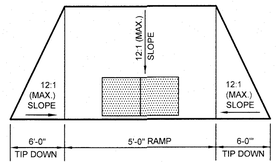
SIDEWALK RAMP
NOT TO SCALE
(MARCH 2008)

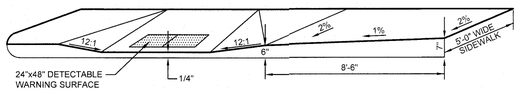


SLOPE GRANITE CURB DETAIL
NOT TO SCALE



SLOPED GRANITE CURB TIP DOWN DETAIL
NOT TO SCALE

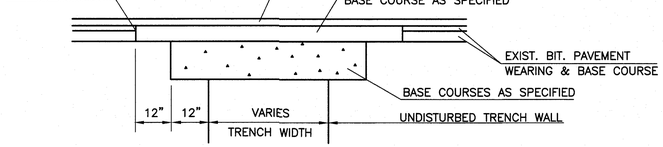




NOTES:

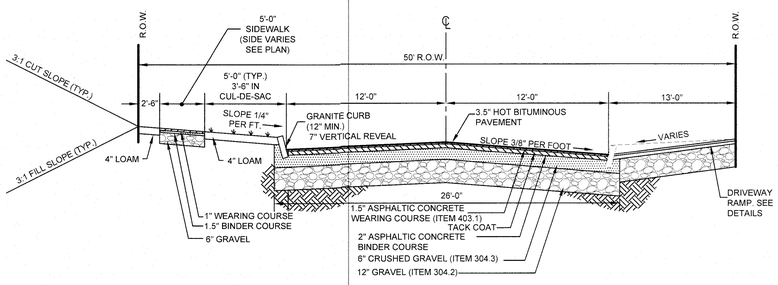
1. TEXTURED WALK SURFACE TO CONSIST OF CAST TRUNCATED DOMES SUPPLIED BY THE NEENAH FOUNDRY COMPANY, OR APPROVED EQUAL.
2. IN ORDER TO OBTAIN A 12:1 MAXIMUM SLOPE ON HANDICAP RAMP, PITCH SIDEWALK DOWN AT A 1% SLOPE FOR APPROXIMATELY 8.5 FEET.

HANDICAP CURB SIDEWALK RAMP WITH DETECTABLE WARNING SURFACE
NOT TO SCALE
(JULY 2010)



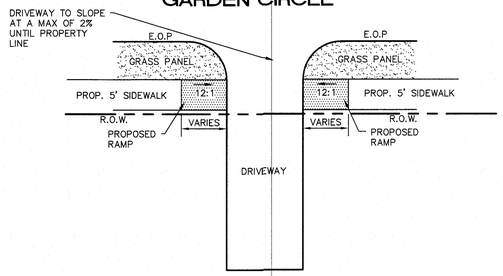
NOTE: AT END OF OVERLAY, SAW CUT AND REMOVE EXISTING PAVEMENT. BUTT PROPOSED OVERLAY TO EXISTING WEARING COURSE.

PAVEMENT PATCH WITH OVERLAY
NOT TO SCALE

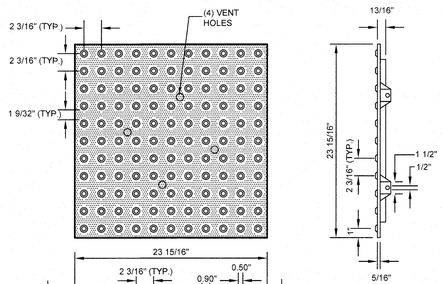


TYPICAL ROADWAY CROSS SECTION
NOT TO SCALE

GARDEN CIRCLE



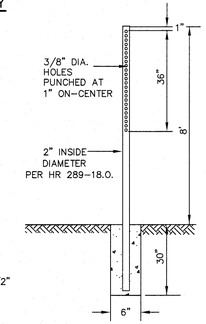
RAMP DETAIL AT DRIVEWAY
NOT TO SCALE



NOTES:

1. DETECTABLE WARNING PLATE SHALL BE NEENAH FOUNDRY OR APPROVED EQUAL.
2. THE PLATE MUST COMPLY WITH ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES) AND ARCHITECTURAL BARRIER ACT GUIDELINES.
3. MATERIAL SHALL BE CAST GRAY IRON
4. FINISH: NO PAINT

24"x24" DETECTABLE WARNING PLATE DETAIL
NOT TO SCALE



POST
TYPICAL SIGN POST DETAIL
NOT TO SCALE

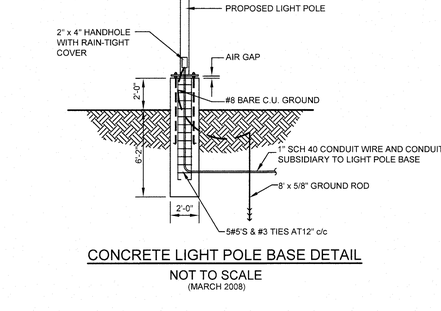
DEAD-END

ROAD NAME 3-1/2"

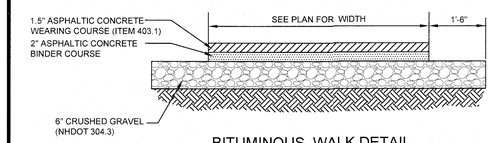
NOTES:

1. STREET NAME SIGNS SHALL BE METAL, IN CONFORMITY WITH NEW SIGNS PURCHASED BY THE TOWN, TWO-FACED AND REFLECTORIZED, SIX INCHES HIGH WITH THREE-AND-ONE-HALF-INCH LETTERS EMBOSSED AND REFLECTORIZED WITH GREEN BACKGROUND AND WHITE LETTERS, OF ALUMINUM METAL.

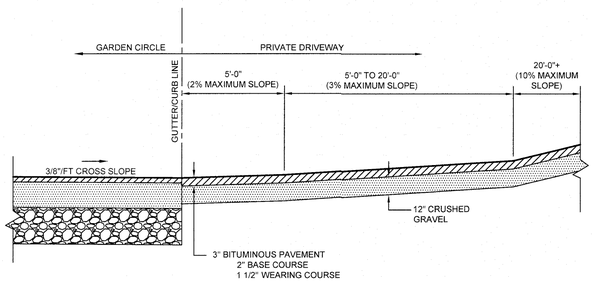
TYPICAL SIGN PLATE DETAILS
NOT TO SCALE



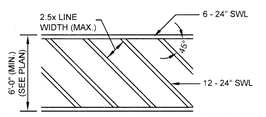
CONCRETE LIGHT POLE BASE DETAIL
NOT TO SCALE
(MARCH 2008)



BITUMINOUS WALK DETAIL
NOT TO SCALE
(MARCH 2008)



DRIVEWAY CROSS SECTION
NOT TO SCALE



PEDESTRIAN WALK & CROSSING STRIPING

STOP
R1-1

VARIES
18" SWL

STOP BAR

STRIPING NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE IN CONFORMANCE WITH THESE STANDARDS AND THE CURRENT EDITION OF MUTCD.
2. WIDTH OF LINES SHALL VARY NO MORE THAN = 1/4 INCH FROM THAT SPECIFIED.
3. THE WET FILM THICKNESS OF A PAINTED LINE SHALL BE A MINIMUM OF 15 MILS THROUGHOUT THE ENTIRE WIDTH AND LENGTH OF LINE SPECIFIED.
4. OVERSPRAY SHALL BE KEPT TO AN ABSOLUTE MINIMUM.
5. ALL PAINT SHALL COMPLY WITH NHDOT SPECIFICATION SECTION 708.

TYPICAL PAVEMENT MARKING DETAIL
NOT TO SCALE

APPROVED BY THE HUDSON, NH PLANNING BOARD
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CONSTRUCTION DETAILS
FRENETTE GARDENS
MAP 182 LOT 3
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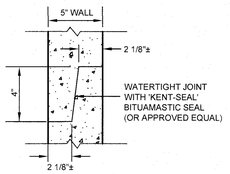
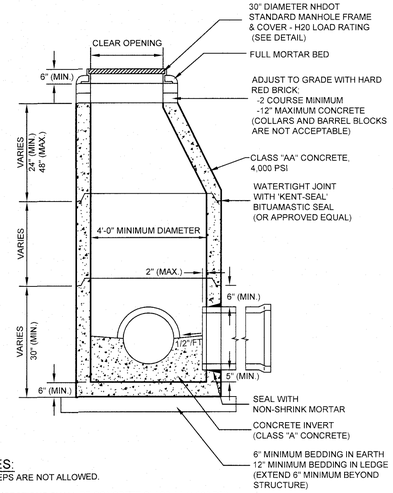
PROJECT NO: 21-0928-1 **SHEET** 11 **OF** 16



DETAIL OF TONGUE AND GROOVE JOINT



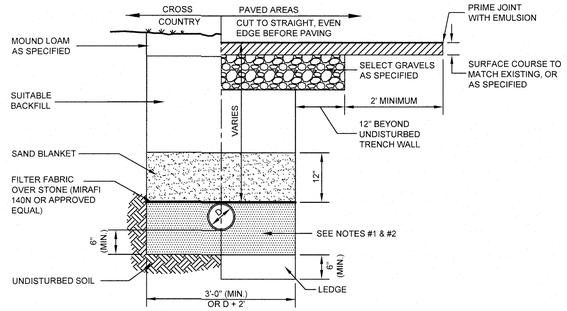
NOTES:

1. STEPS ARE NOT ALLOWED.
2. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4,000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER L.F. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER 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 L.F.
4. MATERIALS AND CONSTRUCTION TO NHDOT STANDARDS.

PRECAST REINFORCED DRAIN MANHOLE DETAIL

NOT TO SCALE

(MARCH 2008)



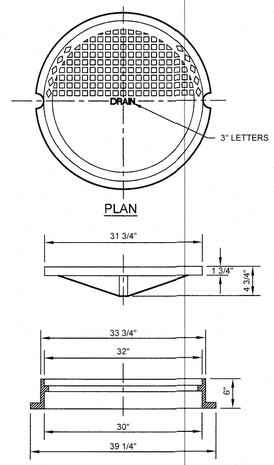
NOTES

1. THOROUGHLY COMPACTED SCREENED GRAVEL FOR RCP PIPE. SCREENED GRAVEL TO EXTEND TO SELECT FILL LINE.
2. FOR HDPE OR PVC PIPE, BEDDING SHALL BE 3/4" STONE TO THE TOP OF THE PIPE.

STORM DRAINAGE TRENCH DETAIL

NOT TO SCALE

(MARCH 2008)



SECTION

NOTES:

NEW HAMPSHIRE MAINTAINS A CLEAR OPENING DESIGNATION OF 30" FOR ITS MANHOLE CASTINGS.

FEATURES:

- 3" LETTERING
- COVERS AVAILABLE PLAIN OR MARKED SEWER, DRAIN OR WATER
- NONROCKING COVER
- DIAMOND SURFACE DESIGN

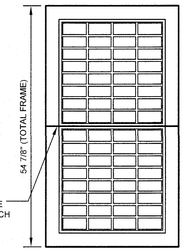
SPECIFICATIONS:

- FULLY MACHINED FRAME AND COVER
- H-20 LOAD RATED
- GRAY CAST IRON MEETS ASTM A48 CLASS 30

DRAIN MANHOLE FRAME AND COVER DETAIL

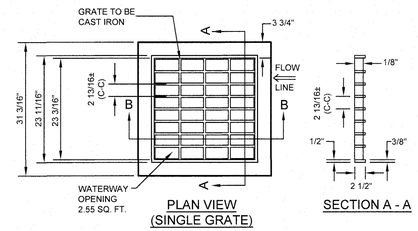
NOT TO SCALE

(MARCH 2008)



NOTE: FOR DOUBLE GRATE, OMIT FLANGE ON ONE SIDE ON EACH FRAME

PLAN VIEW (DOUBLE GRATE)



PLAN VIEW (SINGLE GRATE)

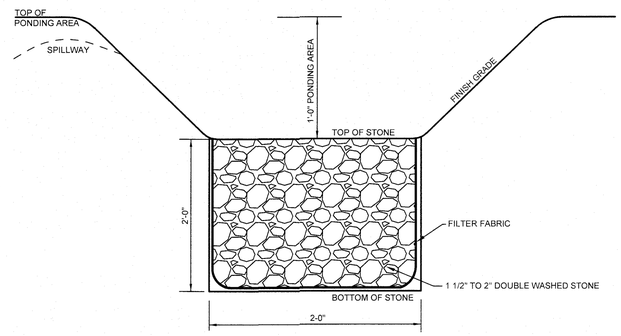
SECTION A - A

SECTION B - B

TYPE B FRAME & GRATE DETAIL

NOT TO SCALE

(MARCH 2008)

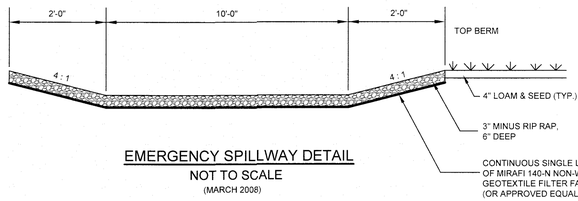


EXFILTRATION TRENCH DETAIL

NOT TO SCALE

(MARCH 2008)

LOCATION	TOP OF PONDING AREA	TOP OF STONE	BOTTOM OF STONE	SPILLWAY ELEVATION
TRENCH #1	141.00	140.00	138.00	140.75
TRENCH #2	140.00	139.00	137.00	138.90



EMERGENCY SPILLWAY DETAIL

NOT TO SCALE

(MARCH 2008)

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

TP #1

LOGGED BY GPC
PERC TEST @ 20"
DATE: 3-3-2022
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE

0"	FOREST MAT
4"	10YR 6/8, GRANULAR, FRIABLE SANDY LOAM, COBBLES, ROOTS
24"	10YR 6/3, GRANULAR, FRIABLE, SAND, FEW ROOTS
54"	10YR 7/3, SAND, SINGLE GRAIN, MASSIVE
72" BOTTOM OF HOLE	

TP #2

LOGGED BY GPC
PERC TEST @ 20"
DATE: 3-3-2022
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE

0"	FOREST MAT
22"	10YR 5/6, GRANULAR, FRIABLE SANDY LOAM, COBBLES, ROOTS
32"	10YR 6/3, GRANULAR, FRIABLE, SAND, FEW ROOTS
42"	10YR 5/4, SAND, SINGLE GRAIN, MASSIVE
72" BOTTOM OF HOLE	

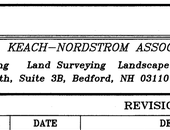
TP #3

LOGGED BY GPC
PERC TEST @ 20"
DATE: 3-3-2022
PERC RATE: 2 MIN./INCH
IMPERVIOUS LAYER: NONE
WATER ENCOUNTERED: NONE

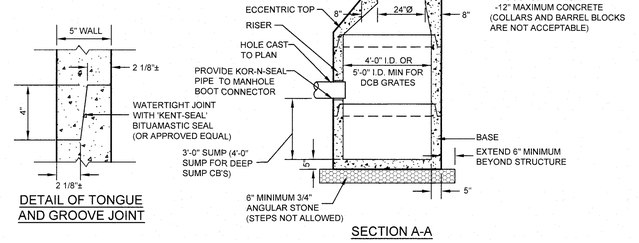
0"	FOREST MAT
5"	10YR 5/4, GRANULAR, FRIABLE SANDY LOAM, COBBLES, ROOTS
24"	10YR 7/4, GRANULAR, FRIABLE, SAND, FEW ROOTS
40"	10YR 6/2, SAND, SINGLE GRAIN, MASSIVE
72" BOTTOM OF HOLE	

NOTES:

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA(4000 PSI). CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCH PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
2. THE TONGUE OR GROVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCH PER LINEAR FOOT.
3. RISER OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
4. EXCAVATION PER FOOT OF DEPTH = 1.358 C.Y.



PLAN



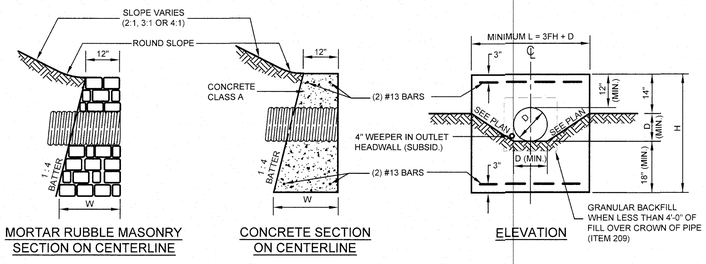
DETAIL OF TONGUE AND GROOVE JOINT

SECTION A-A

PRECAST REINFORCED CATCH BASIN

NOT TO SCALE

(MARCH 2008)



MORTAR RUBBLE MASONRY SECTION ON CENTERLINE

CONCRETE SECTION ON CENTERLINE

ELEVATION

NOTE:

DIMENSIONS SHOWN ARE TO PAYMENT LINES. MORTAR RUBBLE MASONRY TO BE STEPPED OUTSIDE PAYMENT LINES ON SLOPING FACES.

DIAMETER D (INCH)	AREA OF PIPE (SF)	MASONRY PER FOOT OF WALL (CU. YD.)	MASONRY PER HOLE (CU. FT.)	MASONRY PER STANDARD HEADER (CU. YD.)	STEEL PER STANDARD HEADER (LB)	LENGTH OF BARS	PIPE EXC. 1' DEPTH 1' LENGTH (CU. YD.)	HEADER EXC. PER HEADER 1' DEPTH (CU. YD.)	ITEM 209 PER LINEAR FOOT	HEADER LENGTH L	HEADER HEIGHT H	FILL HEIGHT FH	WIDTH AT BOTTOM OF HEADER W	"L" HEADWALL: MASONRY IN CORNER FRUSTRUM (CU. YD)	"L" HEADWALL: HEADER EXC. PER HEADER 1' DEPTH (CU. YD.)
12"	0.79	0.186	1.08	0.61	9	3'-2"	0.111	0.789	0.30	3'-6"	3'-6"	10"	1'-10 1/2"	0.28	1.057

MORTAR RUBBLE MASONRY AND CONCRETE HEADWALLS

NOT TO SCALE

(MARCH 2008)

CONSTRUCTION DETAILS

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
8B DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

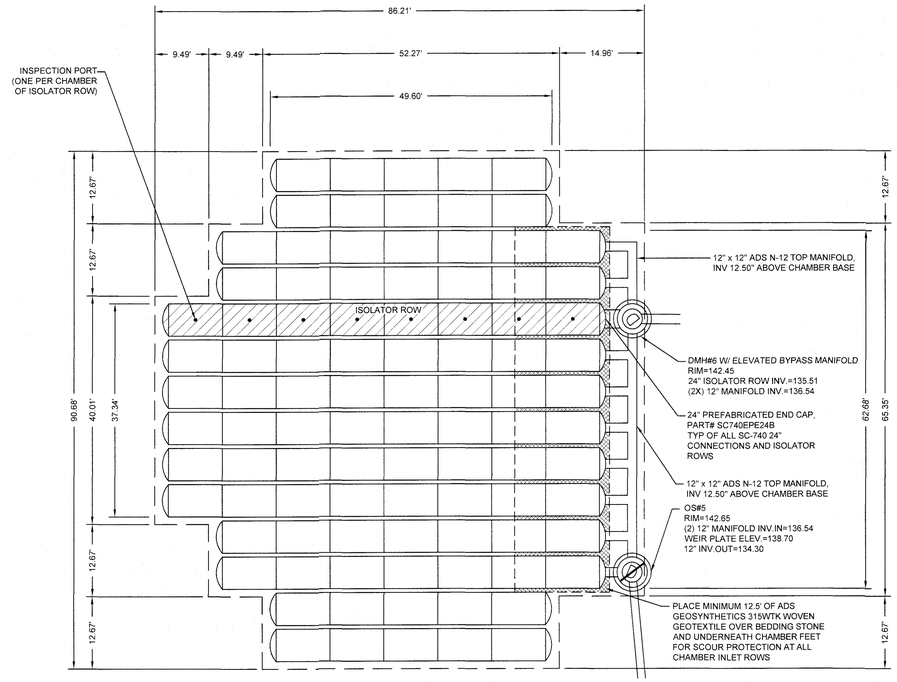
KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHEHOUM No. 10073 STATE OF NEW HAMPSHIRE PROFESSIONAL ENGINEER LICENSED
4/6/22

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 **SCALE:** AS SHOWN
PROJECT NO: 21-0928-1 **SHEET** 12 **OF** 16



STORMTECH SC-740 CHAMBER SYSTEM

SCALE 1' = 10'

STORMTECH CHAMBER SPECIFICATIONS:

1. CHAMBERS SHALL BE STORMTECH SC-740, SC-310, OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.^J
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".^J
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

INFILTRATION SYSTEM NOTES:

1. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE INFILTRATION SYSTEM.
2. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION SYSTEM.
3. AFTER THE AREA IS EXCAVATED TO THE FINAL DESIGN ELEVATION, THE FLOOR SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW TO RESTORE INFILTRATION RATES, FOLLOWED BY A PASS WITH A LEVELING DRAG.
4. DO NOT PLACE INFILTRATION SYSTEMS INTO SERVICE UNTIL THE CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM:

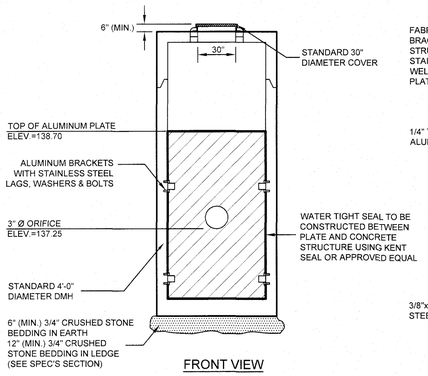
1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.^J
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".^J
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.^J
   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.^J
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.^J
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.^J
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.^J
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).^J
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.^J
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT:^J

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".^J
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".^J
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

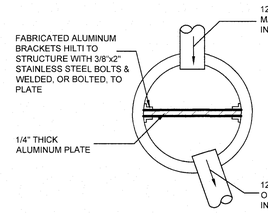


FRONT VIEW

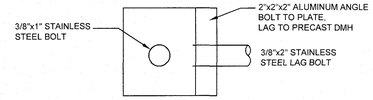
OUTLET STRUCTURE #5 DETAIL

NOT TO SCALE

(MARCH 2008)



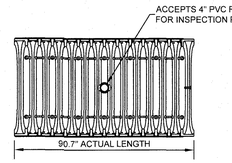
PLAN VIEW

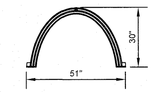


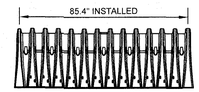
CONNECTION BRACKET DETAIL

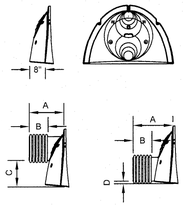
NOT TO SCALE

(MARCH 2008)









NOMINAL CHAMBER SPECIFICATIONS

SIZE (W x H x INSTALLED LENGTH)	*51.0" x 30.0" x 85.4"*
CHAMBER STORAGE	*45.9 CUBIC FEET*
MINIMUM INSTALLED STORAGE	*74.9 CUBIC FEET*
WEIGHT	*75 LBS.*

PIPE SIZE	A	B	C	D
12 in (300 mm)	14.70 in (373 mm)	7.70 in (196 mm)	12.50 in (318 mm)	N/A
12 in (300 mm)	14.70 in (373 mm)	7.70 in (196 mm)	N/A	1.20 in (30 mm)
24 in (600 mm)	18.50 in (470 mm)	9.45 in (240 mm)	N/A	0.10 in (3 mm)

SC-740 TECHNICAL SPECIFICATIONS

NOT TO SCALE

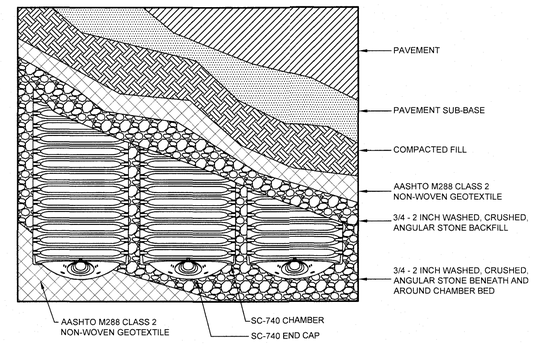
(OCTOBER 2012)

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	146.50
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	140.50
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	140.00
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	140.00
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	140.00
	135.00

CONCEPTUAL LAYOUT

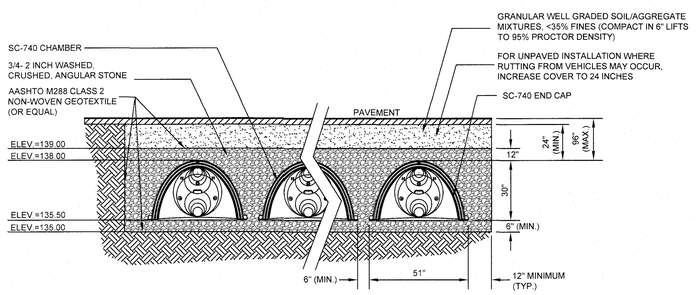
(96) STORMTECH SC-740 CHAMBERS
(28) STORMTECH SC-740 END CAPS
INSTALLED WITH 12" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 8690 CF
AREA OF SYSTEM: 3777 **FT²**
PERIMETER OF SYSTEM: 265 **FT**



SC-740 CHAMBER SYSTEM PLAN VIEW DETAIL

NOT TO SCALE

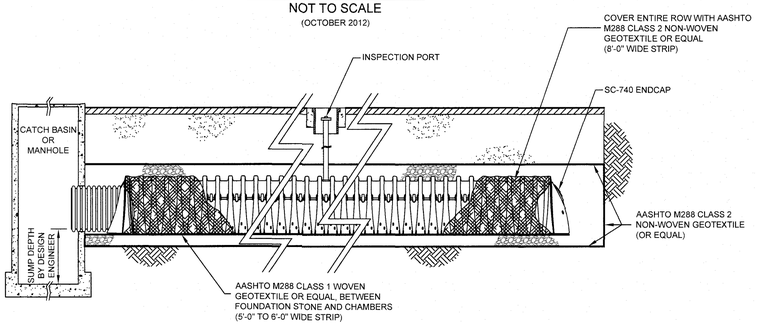
(OCTOBER 2012)



SC-740 CROSS SECTION

NOT TO SCALE

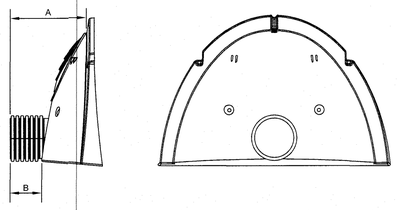
(OCTOBER 2012)



SC-740 ISOLATOR ROW PROFILE

NOT TO SCALE

(OCTOBER 2012)

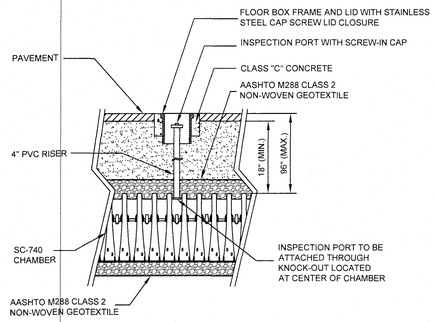


SC-740 CHAMBER END CAPS - BOTTOM

NOT TO SCALE

(OCTOBER 2012)

PIPE SIZE	A	B	C
12" (300 mm)	18.20" (462 mm)	9.20" (234 mm)	1.30" (33 mm)
24" (450 mm)	20.10" (511 mm)	11.00" (279 mm)	1.30" (33 mm)



SC-740 INSPECTION PORT DETAIL

NOT TO SCALE

(OCTOBER 2012)

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

CONSTRUCTION DETAILS

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
8B DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

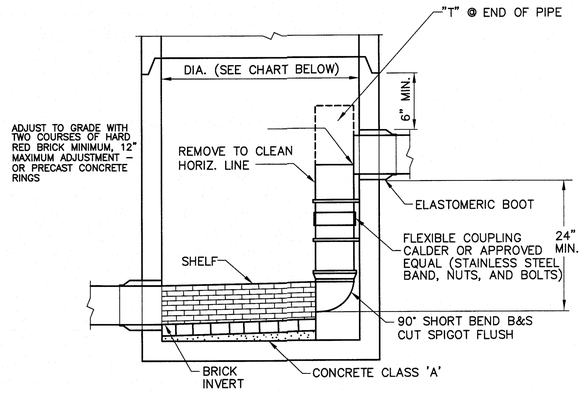
KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 12079 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 6/6/22

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 **SCALE:** AS SHOWN
PROJECT NO: 21-0928-1 **SHEET** 13 **OF** 16

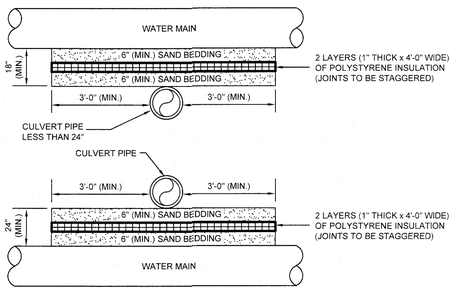


MAN HOLE SIZE CHART

ONE 8" DROP USE 4' DIA.
ONE 10" DROP USE 4' DIA.
TWO 8" DROP USE 5' DIA.
TWO 10" DROP USE 5' DIA.
ONE 12" DROP USE 5' DIA.
ONE 15" DROP USE 5' DIA.
ONE 18" DROP USE 6' DIA.
ONE 24" DROP USE 6' DIA.

INTERNAL DROP SEWER MANHOLE

NOT TO SCALE



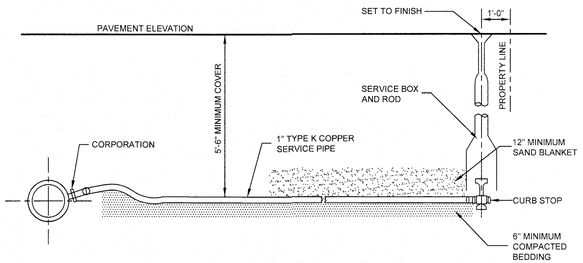
NOTES:

1. INSULATION TO BE USED WHERE PIPE SEPARATION IS 24" OR LESS.

WATER PIPE CROSSING INSULATION DETAIL

NOT TO SCALE

(JUNE 2012)



WATER SERVICE CONNECTION

NOT TO SCALE

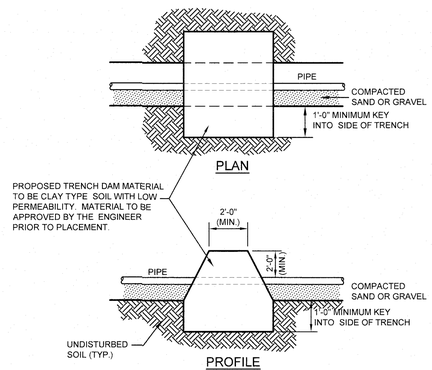
(MARCH 2008)

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

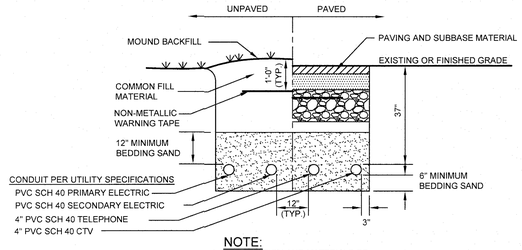
SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674: 39.



CLAY TRENCH DAM DETAIL

NOT TO SCALE

(MARCH 2008)



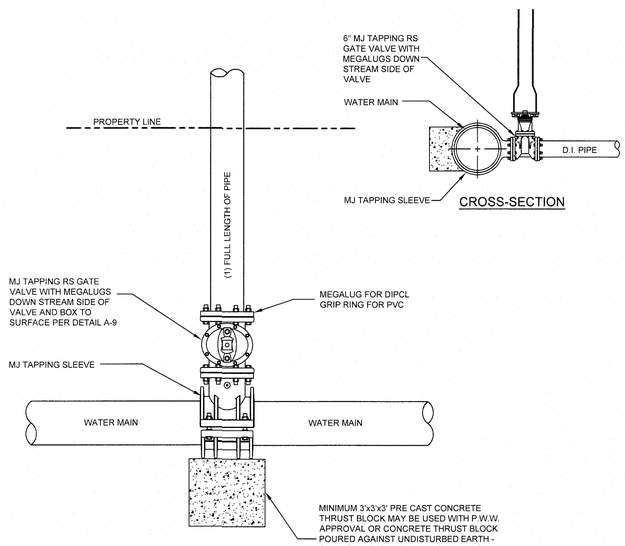
NOTE:

INSTALLATION AND MATERIALS OF UNDERGROUND UTILITIES SHALL CONFORM TO LOCAL UTILITY COMPANY SPECIFICATIONS.

UTILITY TRENCH DETAIL

NOT TO SCALE

(MARCH 2008)



CROSS-SECTION

NOTES:

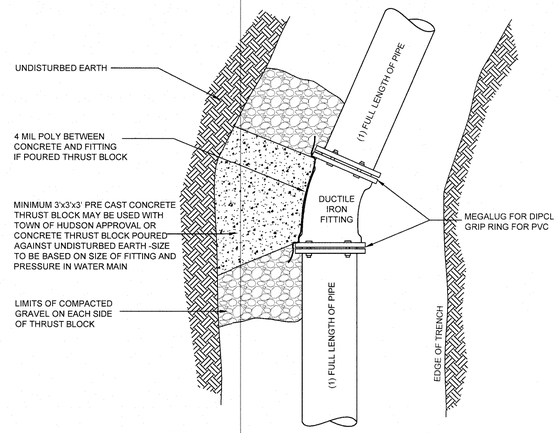
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.

LARGE SERVICE AND/OR TAPPING SLEEVE DETAIL

(A-21)

NOT TO SCALE

(MARCH 2008)



NOTES:

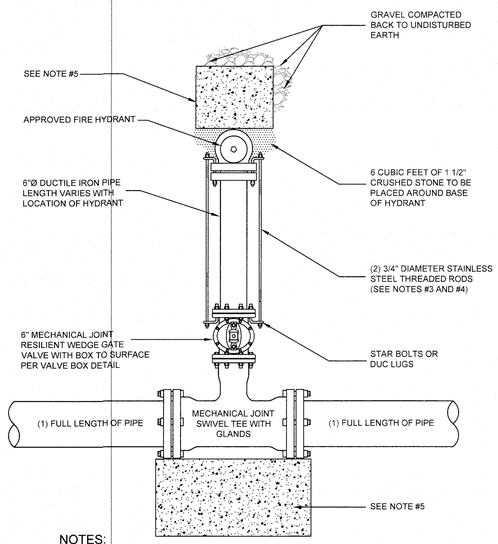
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. 3/4"Ø S.S. RODS SHALL BE USED IN CONJUNCTION WITH REQUIRED S.S. NUTS. RODS ARE TO BE ATTACHED TO FITTINGS WITH EITHER STAR BOLTS OR DUC LUGS.
   10" FITTING OR SMALLER = (2) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
   12" FITTING OR LARGER = (4) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
4. MIN 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH TOWN OF HUDSON APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN.

THRUST BLOCK BEHIND FITTINGS INSTALLATION

(A-07)

NOT TO SCALE

(MARCH 2008)



NOTES:

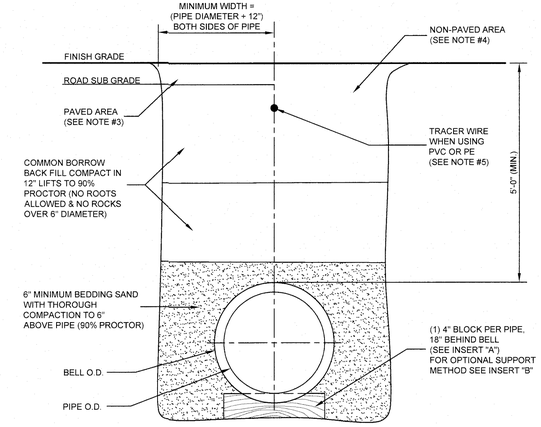
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO THE TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. 3/4"Ø S.S. RODS SHALL BE USED IN CONJUNCTION WITH REQUIRED S.S. NUTS. RODS ARE TO BE ATTACHED TO FITTINGS WITH EITHER STAR BOLTS OR DUC LUGS.
   10" FITTING OR SMALLER = (2) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
   12" FITTING OR LARGER = (4) 3/4"Ø S.S. RODS & ASSOCIATED HARDWARE.
4. WHEN DISTANCE FROM WATER MAIN TO HYDRANT IS MORE THAN 10'-0" SUBSTITUTE MEGALUGS (OR GRIP RINGS) IN LIEU OF THREADED RODS.
5. MINIMUM 3'x3'x3' PRE CAST CONCRETE THRUST BLOCK MAY BE USED WITH TOWN OF HUDSON APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATER MAIN. SEE THRUST BLOCK BEHIND FITTINGS DETAIL.

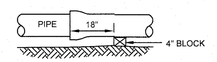
HYDRANT INSTALLATION

(A-10)

NOT TO SCALE

(MARCH 2008)

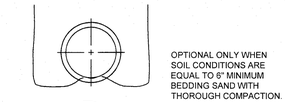




INSERT "A"

NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN PAVED AREAS.
4. REQUIREMENTS FOR GRAVEL, LOAM AND/OR SEED ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY HAVING LOCAL JURISDICTION IN NON-PAVED AREAS.
5. 10 GAUGE TRACER WIRE AS MANUFACTURED BY BMS, DIVISION OF ALBESTAR CORP., AVON, MA OR EQUIVALENT.



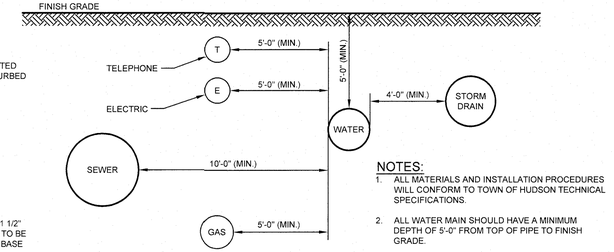
INSERT "B"

TRENCH DETAIL

(A-02)

NOT TO SCALE

(MARCH 2008)



NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
2. ALL WATER MAIN SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
3. SEE DETAIL FOR TRENCH SPECIFICATIONS.
4. SEE DETAIL FOR OUTSIDE SERVICE ENTRANCE SPECIFICATIONS.

UTILITY SEPARATION (MAIN) DETAIL

(A-01)

NOT TO SCALE

(MARCH 2008)

CONSTRUCTION DETAILS

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
88 DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

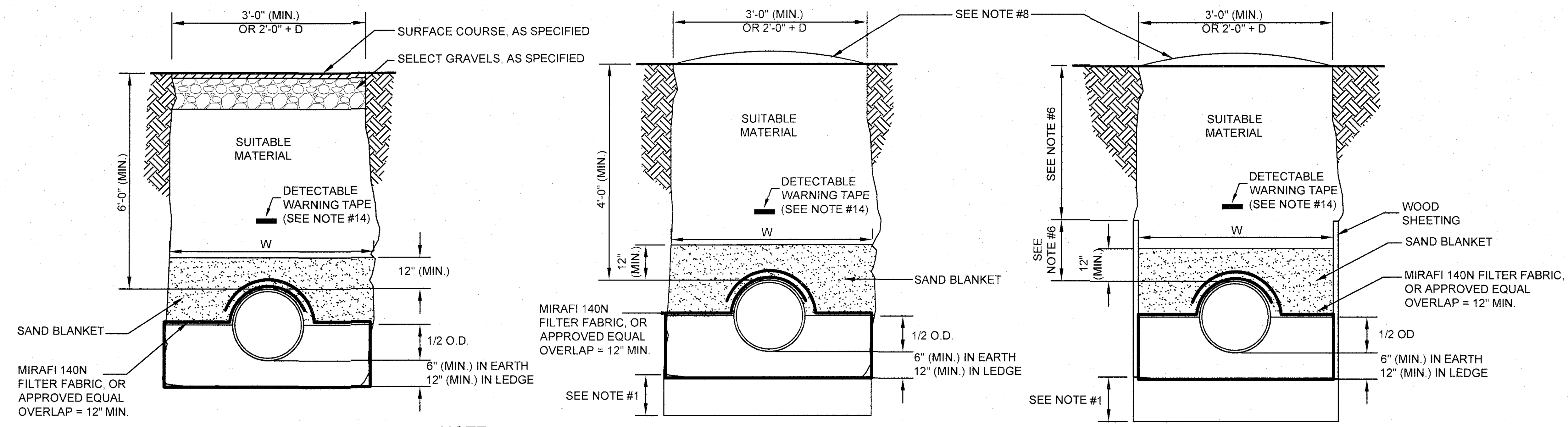
KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 15073 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE 6/16/22

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: AS SHOWN
PROJECT NO: 21-0928-1 | SHEET 14 OF 16



FOR CONSTRUCTION IN ROADS, ROAD SHOULDER AND WALKWAYS

NOTE:
MINIMUM BEDDING DEPTH AND MAXIMUM PAYMENT DEPTH FOR LEDGE EXCAVATION: 1/4 O.D. (6" MIN.)

CROSS COUNTRY EARTH CONSTRUCTION

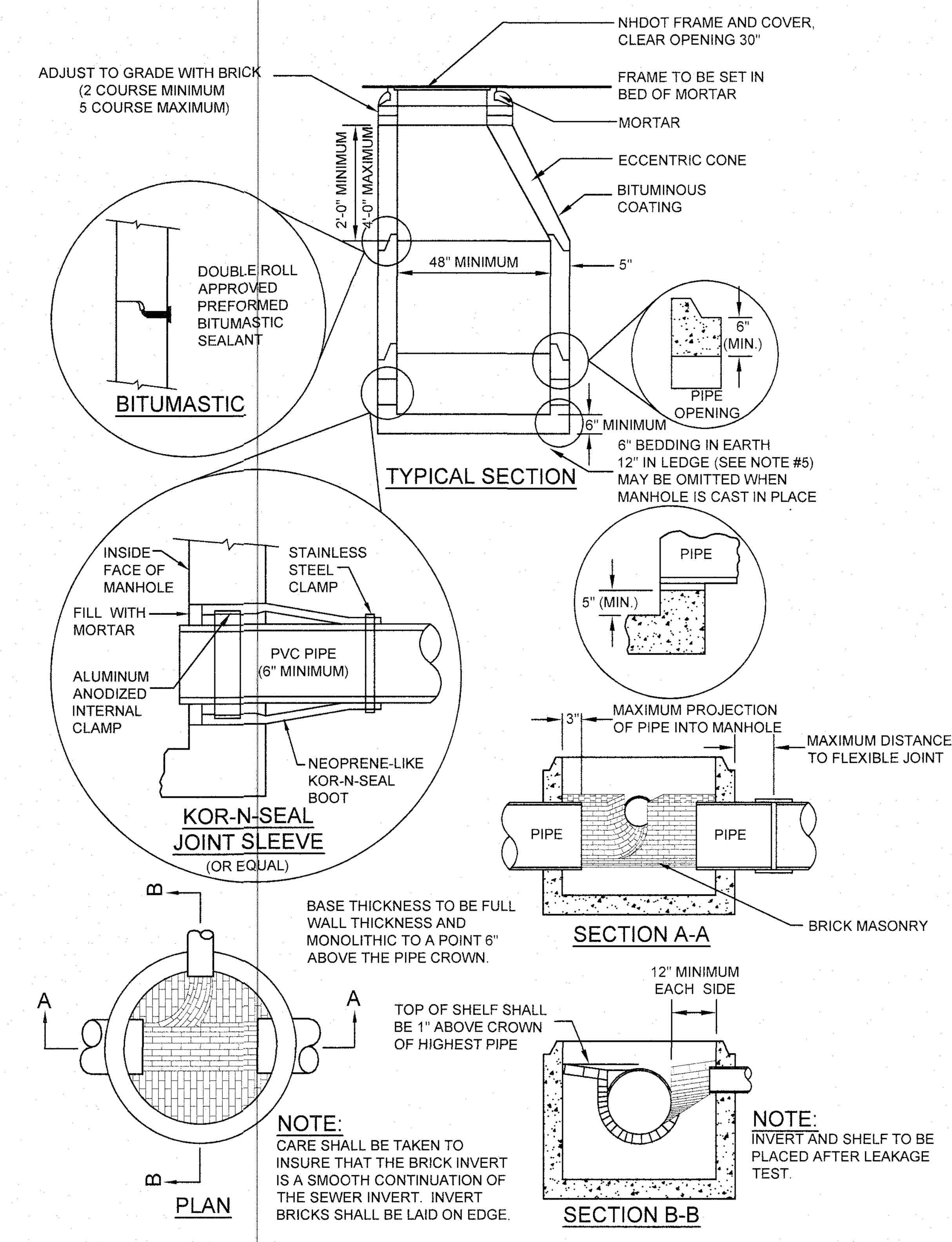
CROSS COUNTRY EARTH CONSTRUCTION WITH SHEETING

SANITARY SEWER TRENCH DETAIL

NOT TO SCALE
(NOVEMBER 2016)

NOTES:

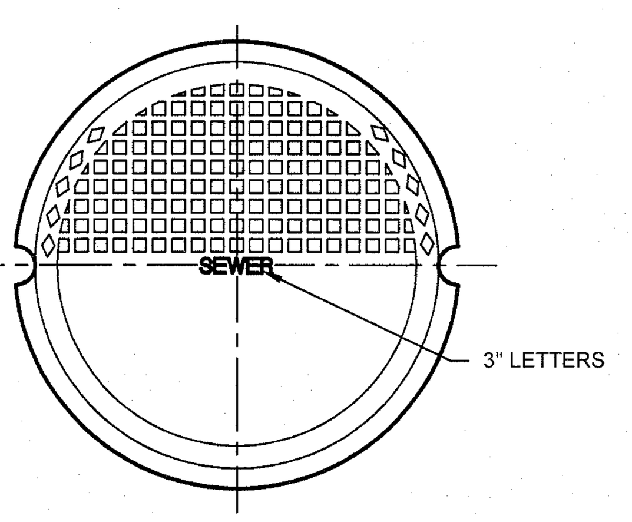
1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE. REFILL WITH BEDDING MATERIAL, ALSO SEE NOTE #7.
   BEDDING: CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33/C33M STONE SIZE NO. 67.
   100% PASSING 1 INCH SCREEN
   90 - 100% PASSING 3/4 INCH SCREEN
   20 - 55% PASSING 3/8 INCH SCREEN
   0 - 10% PASSING # 4 SIEVE
   0 - 5% PASSING # 8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, GRADED CRUSHED STONE 1/2 INCH TO 1-1/2 INCHES SHALL BE USED.
2. SAND BLANKET: GRADED CLEAN SAND FREE FROM ORGANIC MATTER, SO THAT 100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A # 200 SIEVE. BLANKET MAY BE OMITTED FOR CAST IRON, DUCTILE IRON AND REINFORCED CONCRETE PIPE PROVIDED, HOWEVER, THAT NO STONE LARGER THAN 2 INCHES IS IN CONTACT WITH THE PIPE.
3. MIRAFI 140 N FILTER FABRIC, OR APPROVED EQUAL, SHALL BE INSTALLED ABOVE PIPE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL AND ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
   IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT IF HE/SHE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER WILL BE PRESERVED FOR MAINTENANCE AND POSSIBLY RECONSTRUCTION, WHEN NECESSARY.
5. BASE COURSE, IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS."
6. WOOD SHEETING, IF REQUIRED, WHERE PLACED ALONGSIDE THE PIPE AND EXTENDING BELOW MID-DIAMETER, 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.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE 10 FEET OF SEPARATION BETWEEN WATER AND SEWER. HOWEVER, SHOULD CONSTRUCTION REVEAL OR EXPOSE A WATERLINE (MAIN OR SERVICE) RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FEET HORIZONTALLY FROM THE PROPOSED SEWER INSTALLATION AND WHERE IT IS NOT PRACTICAL TO RELOCATE THE SEWER, A DEVIATION MAY BE GRANTED PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENT SPECIFIED BELOW:
   A. FORCE MAINS SHALL BE CONSTRUCTED FROM DUCTILE IRON, HIGH DENSITY POLYETHYLENE, OR PVC PER ENV-WQ 704.06(a).
      PVC SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05
      HDPE SHALL CONFORM TO ASTM D3035-03a
      D.I. SHALL BE CORROSION PROTECTED IN CORROSIVE ENVIRONMENTS
10. WHERE WATER LINES AND SEWER LINES CROSS, THEY SHOULD CROSS AS PERPENDICULAR AS POSSIBLE AND THE WATER MAIN SHALL CROSS AT LEAST 18" INCHES ABOVE THE SEWER. FURTHER, THE SEWER JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.
11. ALL SEWERS AT 8 PERCENT SLOPE, OR GREATER, SHALL HAVE IMPERVIOUS TRENCH DAMS CONSTRUCTED EVERY 300 FEET.
12. UNLESS OTHERWISE NOTED, ALL GRANULAR MATERIAL SHALL BE PLACED IN 12" LIFTS AND COMPACTED TO 95% OF THE MODIFIED PROCTOR TEST.
13. WHERE WATER MAINS CROSS UNDER SEWER MAINS, BOTH THE SEWER AND WATER MAINS SHALL BE PRESSURE RATED PIPE PER ENV-WQ 704.06 AND TESTED PER AWWA C600-05 AT 1.5 TIMES DESIGN PRESSURE OR 100 PSI, WHICHEVER IS GREATER, WITH NO JOINTS WITHIN 9 FEET OF THE CROSSING POINT AND 18" MINIMUM VERTICAL SEPARATION.
14. ALL SEWERS SHALL BE MARKED USING METAL IMPREGNATED MARKING TAPE OR TRACER WIRE THAT CAN BE LOCATED USING METAL DETECTION EQUIPMENT.
15. GRAVITY PIPE SEWER TESTING:
   A. ALL NEW GRAVITY SEWERS SHALL BE TESTED FOR WATER TIGHTNESS BY THE USE OF LOW-PRESSURE AIR TESTS.
   B. LOW-PRESSURE AIR TESTING SHALL BE IN CONFORMANCE WITH:
      1. ASTM F1417-92(2005) "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR;" OR
      2. UNI-BELL PVC PIPE ASSOCIATION UNI-B-6, "LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE" (1998).
   C. ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED USING A LAMP TEST AND BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER AND SHALL BE TRUE TO LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE.
   D. ALL PLASTIC SEWER PIPE SHALL BE DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION.
   E. THE MAXIMUM ALLOWABLE DEFLECTION OF FLEXIBLE SEWER PIPE SHALL BE 5 PERCENT OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95 PERCENT OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.



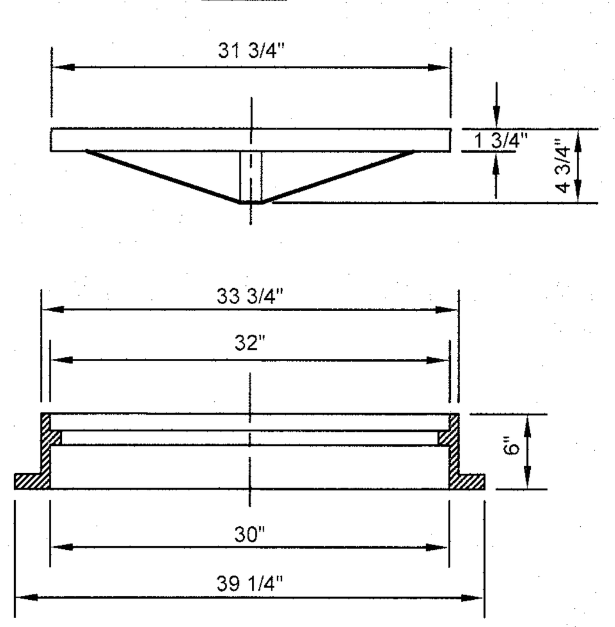
SANITARY SEWER MANHOLE

NOT TO SCALE
(MARCH 2011)

1. ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE AND SPACE NECESSARY FOR THE INTENDED SERVICE.
2. MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY OF AT LEAST 25 YEARS.
3. MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND HS-20 LOADING AND SHALL NOT LEAK IN EXCESS OF ONE GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
4. BARRELS, CONE SECTIONS, AND CONCRETE GRADE RINGS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE.
5. BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 6 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
6. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
7. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
   A. ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
   B. CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
   C. ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
   D. NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
9. MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
10. ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
11. ALL PRECAST SECTIONS AND BASES SHALL BE COATED ON THE EXTERIOR WITH A BITUMINOUS DAMP-PROOFING COATING.
12. MANHOLES THAT ARE NOT REPLACING EXISTING MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
13. REPLACEMENT MANHOLES WHERE THERE IS AN ESTABLISHED LINE AND GRADE THROUGH WHICH THE SEWER ENTERS AND EXITS THE MANHOLE SHALL HAVE:
   A. A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AS REQUIRED IN (12) ABOVE.
   B. A PRECAST CONCRETE SHELF AND INVERT WITH THE SHELF CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL; OR
   C. A FIBERGLASS INSERT WITH THE SHELF CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL.
14. WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECTION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND BE CAPABLE OF SUPPORTING HS-20 LOADS.
15. THE MINIMUM INTERNAL DIAMETER OF MANHOLES SHALL BE 48 INCHES
16. MATERIALS OF CONSTRUCTION FOR MANHOLES SHALL BE AS FOLLOWS.
   A. CONCRETE FOR CAST-IN-PLACE BASES OR COMPLETE MANHOLES SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
   B. REINFORCING FOR CAST-IN-PLACE CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
   C. PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478-06;
   D. THE MANHOLE FRAME AND COVER SHALL PROVIDE A 30-INCH DIAMETER CLEAR OPENING;
   E. THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
   F. THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
   G. CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
   H. CASTINGS SHALL BE EQUAL TO CLASS 30, CONFORMING TO ASTM A48/48M-03;
   I. BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK;
   J. MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
   K. PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
      1. 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      2. 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PARTS HYDRATED LIME;
   L. CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
   M. HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 "STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES";
   N. SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
   O. CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
   P. SUBJECT TO (Q) BELOW, A FLEXIBLE PIPE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION:
      1. WITHIN 48-INCHES FOR REINFORCED CONCRETE (RC) PIPE; AND
      2. WITHIN 60-INCHES FOR PVC PIPE LARGER THAN 15-INCH DIAMETER;
   Q. NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DI PIPE OR FOR PVC PIPE UP THROUGH 15-INCH DIAMETER; AND
   R. WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECTION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND IS CAPABLE OF SUPPORTING H-20 LOADS.
17. MANHOLE STEPS ARE NOT PERMITTED BY THE TOWN.
18. MANHOLE TESTING:
   A. MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.
   B. THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
      1. THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg: AND
      2. THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 9 INCH Hg SHALL BE:
         a. NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;
         b. NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
         c. NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP.
   C. THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (B) ABOVE.
   D. FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENTS TO GRADE.



PLAN



SECTION

NOTES:
NEW HAMPSHIRE MAINTAINS A CLEAR OPENING DESIGNATION OF 30" FOR ITS MANHOLE CASTINGS.

FEATURES:
- 3" LETTERING
- COVERS MARKED SEWER
- NONROCKING COVER
- DIAMOND SURFACE DESIGN

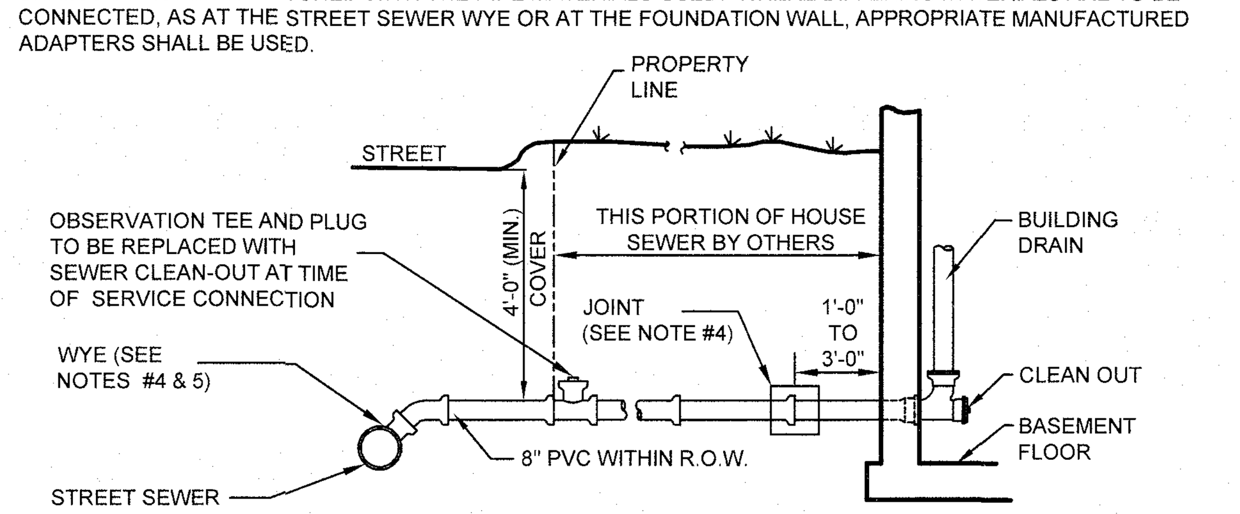
SPECIFICATIONS:
- FULLY MACHINED FRAME AND COVER
- H-20 LOAD RATED
- GRAY CAST IRON MEETS ASTM A48 CLASS 30

SEWER MANHOLE FRAME AND COVER DETAIL

NOT TO SCALE
(MARCH 2008)

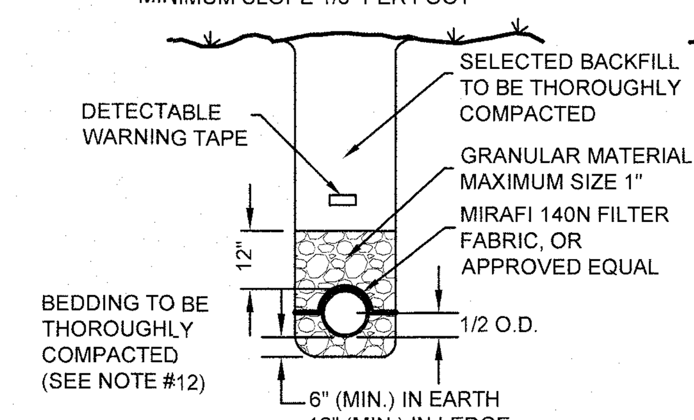
NOTES:

1. MINIMUM SIZE PIPE FOR HOUSE SERVICE SHALL BE 4 INCHES. MINIMUM SIZE FOR STREET SEWER LINES SHALL BE 8 INCHES.
2. PIPE AND JOINT MATERIALS:
   A. DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION (AWWA):
      1. AWWA C151/A21.51-02 - FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL OR SAND-LINED MOLDS, FOR WATER OR OTHER LIQUIDS;
      2. AWWA C150/A21.50-02 - FOR THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A536-84 (2004) DUCTILE IRON CASTINGS;
      3. JOINTS SHALL BE MECHANICAL, PUSH-ON OR BALL-AND-SOCKET TYPE.
   B. PLASTIC GRAVITY SEWER PIPE AND FITTINGS SHALL COMPLY WITH THE FOLLOWING STANDARDS:
      1. ASTM D3034-04A - PVC, SOLID WALL;
      2. AT LEAST 46 PSI AT 5% PIPE DIAMETER DEFLECTION, AS MEASURED IN ACCORDANCE WITH ASTM D2414-02 DURING MANUFACTURING; AND
      3. JOINT SEALS FOR PVC PIPE SHALL BE OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212-96A(2003)E1 AND SHALL BE PUSH-ON OR BELL-AND-SPIGOT TYPE.
3. DAMAGED PIPE SHALL BE REJECTED AND REMOVED FROM THE JOB SITE.
4. JOINTS SHALL BE DEPENDENT UPON PROPER MATERIALS (SEE NOTE #2) FOR WATER TIGHTNESS, AND ALL JOINTS SHALL BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED. WHERE DIFFERING MATERIALS ARE TO BE CONNECTED, AS AT THE STREET SEWER WYE OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.
5. SERVICE CONNECTIONS SHALL USE SANITARY TEE OR WYE FITTINGS FOR ALL NEW CONSTRUCTION. THE CENTERLINE OF ALL BUILDING CONNECTIONS SHALL ENTER THE TOP HALF OF THE SEWER. ANY SERVICE CONNECTION WITH A VERTICAL RISE UP TO 4 FEET MAY HAVE THE SEWER FITTING SET VERTICALLY. ANY SERVICE CONNECTION WITH A VERTICAL RISE UP TO 12 FEET SHALL EMPLOY NON-ENCASED RISERS THAT PROTECT AGAINST PIPE PENETRATION OR FAILURE AT THE FITTING BY THE USE OF BELL-ON-BELL CONNECTIONS. FOR EXISTING SEWER WHERE FITTINGS CANNOT BE INSTALLED, SADDLE CONNECTIONS SHALL BE USED. PRESSURE SEWERAGE SHALL HAVE AN ISOLATION VALVE OR CURB STOP VALVE INSTALLED AT THE PROPERTY LINE. IF A CHECK VALVE IS USED AT THE PROPERTY LINE, THE VALVE SHALL BE INSTALLED WITHIN A VAULT TO FACILITATE MAINTENANCE. ROOF DOWNSPOUTS, EXTERIOR OR INTERIOR FOUNDATION DRAINS, SUMP PUMPS OR OTHER SOURCE OF SURFACE WATER RUN-OFF OR GROUND WATER SHALL NOT BE DIRECTLY OR INDIRECTLY CONNECTED TO A PUBLIC SEWER.
6. PIPE INSTALLATION:
   A. THE PIPE SHALL BE HANDLED, PLACED AND JOINTED IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER.
   B. PIPES SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND/OR GRAVEL.
   C. BEDDING AND RE-FILL, FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE, SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH THE APPROPRIATE MECHANICAL DEVICES.
   D. THE PIPE SHALL BE LAID AT A CONTINUOUS AND CONSTANT GRADE FROM THE STREET SEWER CONNECTION TO THE HOUSE FOUNDATION AT A GRADE OF NOT LESS THAN 1/8 INCH PER FOOT.
   E. PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.
7. TESTING: THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)
   A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR PLUG SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM ABOVE THE PLUG TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.
   B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER TO SIMULATE, AS NEARLY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTIONS FOR LEAKS SHALL BE MADE THROUGH THE CLEAN OUT WITH A FLASHLIGHT.
   C. DRY FLUORESCENCE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER, OR IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. OBSERVATION FOR LEAKS SHALL BE MADE IN THE FIRST DOWNSTREAM MANHOLE.
   D. LEAKAGE OBSERVED IN ANY OF THE ABOVE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG-UP, IF NECESSARY, AND RE-LAID SO AS TO ASSURE WATER-TIGHTNESS.
8. ILLEGAL CONNECTIONS: NOTHING BUT SANITARY WASTE FLOW FROM TOILETS, SINKS, LAUNDRY, ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE OR GROUND WATER, SHALL NOT BE PERMITTED.
9. WATER SERVICE SHALL NOT BE LAID IN THE SAME TRENCH AS THE SEWER SERVICE, UNLESS NECESSARY AND APPROVED BY THE AHJ. WHEN NECESSARY, THE WATER SERVICE SHALL BE PLACED ABOVE AND TO ONE SIDE OF THE SEWER SERVICE, AS SHOWN.
10. LOCATION: THE LOCATION OF THE WYE SHALL BE RECORDED AND FILED IN THE MUNICIPAL RECORDS. IN ADDITION, A FERROUS MATERIAL, ROD OR PIPE SHALL BE PLACED OVER THE WYE TO AID IN LOCATING THE BURIED PIPE WITH A DIP NEEDLE OR PIPE FINDER.
11. CHIMNEY CONNECTIONS ARE ONLY PERMITTED IF ALLOWED BY THE AHJ. ANY VERTICAL RISE GREATER THAN 4 FEET SHALL BE PROVIDED WITH ADDED SUPPORT BY ENCASING THE FITTING AND RISER IN A PRECAST CONCRETE CHIMNEY. UP TO 12 FEET OF VERTICAL RISE CAN ALSO BE SECURED BY PROPER MEANS AS LONG AS IT CONSISTS OF A BELL-ON-BELL CONNECTION PROPERLY PROTECTED AGAINST PIPE PENETRATION AND IF IT IS ALLOWED BY THE AHJ.
12. UNLESS OTHERWISE NOTED, ALL GRANULAR MATERIAL SHALL BE PLACED IN 12" MAXIMUM LIFTS AND COMPACTED TO 95% OF THE MODIFIED PROCTOR TEST DENSITY.

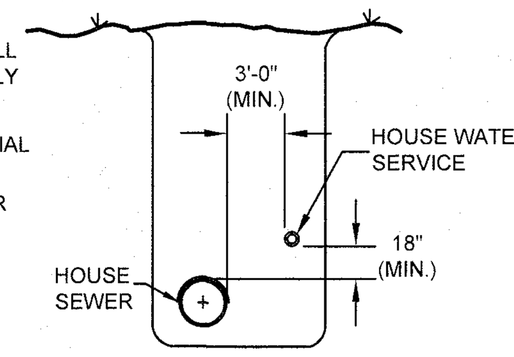


APPROVED BACKFLOW PREVENTER TO BE INSTALLED WERE DIRECTED.
HOUSE SEWER: 4" (OR 6") PVC SDR 35, MINIMUM SLOPE 1/8" PER FOOT

NOTE: HOUSE SEWER MAY ALSO BE LOCATED BELOW BASEMENT FLOOR WHEN REQUIRED.



TRENCH CROSS-SECTION



WATER AND SEWER IN SAME TRENCH

SANITARY SEWER SERVICE DETAIL

NOT TO SCALE
(JUNE 2015)

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: ____________

____________ SIGNATURE DATE: ____________

____________ SIGNATURE DATE: ____________

SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.

CONSTRUCTION DETAILS
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI	KIMBERLY FRENETTE	RICKY FRENETTE
46 BUSH HILL ROAD	8B DUMONT ROAD	14 TATE STREET
HUDSON, NH 03051	HUDSON, NH 03051	HUDSON, NH 03051
9531/2754	9531/2754	9531/2754

KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

STATE OF NEW HAMPSHIRE – PAUL CHISHOLM No. 15076 – LICENSED PROFESSIONAL ENGINEER
6/6/22

REVISIONS

No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022	SCALE: AS SHOWN
PROJECT NO: 21-0928-1	SHEET 15 OF 16

TURF ESTABLISHMENT SCHEDULE

PURPOSE:

TO ESTABLISH AND MAINTAIN PERMANENT AND TEMPORARY TURF AREAS, RESTORE GROWTH TO EXISTING TURF AREAS DISTURBED DURING CONSTRUCTION AND CONTROL SOIL EROSION.

PREPARATION AND EXECUTION:

1. RAKE THE SUBGRADE OF ALL AREAS TO BE LOAMED AND SEEDED TO REMOVE RUBBISH, STICKS, ROOTS AND STONES LARGER THAN 1 INCH.
2. PLACE LOAM OVER AREAS TO BE SEEDED AND SPREAD.
3. FINE GRADE SURFACE AND SUPPLEMENT WITH SUITABLE LOAM WHERE NEEDED TO CREATE A UNIFORM SURFACE ACCORDING TO THE FINISH GRADES INDICATED; TOP AND BOTTOM OF SLOPES SHALL BE ROUNDED. NO LOAM SHALL BE SPREAD IF THE SUBGRADE IS EXCESSIVELY WET OR FROZEN.
4. APPLY LIME EVENLY OVER LOAM SURFACE AND THOROUGHLY INCORPORATE LIME INTO THE LOAM BY HEAVY RAKING TO AT LEAST ONE-HALF THE DEPTH OF THE LOAM.
5. APPLY NO PHOSPHATE, SLOW RELEASE FERTILIZER AND MIX WITH THE UPPER 2 INCHES OF LOAM.
6. DETERMINE APPROPRIATE MIXTURE FOR AREA TO BE SEEDED BASED ON EXAMINATION OF PROJECT PLANS. UNIFORMLY SPREAD THE SEED BY BROADCASTING OR HYDROSEEDING. IF BROADCASTING, LIGHTLY RAKE INTO THE PREPARED SURFACE AND ROLL. IF, HYDROSEEDING, USE 4 TIMES THE RECOMMENDED RATE OF INOCULANT. AFTER SEED IS SPREAD, WATER THOROUGHLY WITH A FINE SPRAY.
7. SEEDING FOR PERMANENT COVER SHALL OCCUR BETWEEN SEPTEMBER 15 AND OCTOBER 15 AND BETWEEN APRIL 15 AND JUNE 15. SEEDING SHALL NOT BE DONE DURING WINDY WEATHER, WHEN THE GROUND IS FROZEN OR EXCESSIVELY WET OR OTHERWISE UNTILLABLE.
8. WITHIN 24 HOURS AFTER SEEDING OPERATION, UNIFORMLY MULCH THE AREA WITH STRAW. ANCHOR MULCH ON ALL SLOPES EXCEEDING 3 : 1 USING MULCH NETTING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER.
9. PROTECT AND PREVENT AGAINST WASHOUTS, ANY WASHOUTS WHICH OCCUR SHALL BE PROMPTLY REGRADED AND RESEEDED.
10. WHEN IT IS IMPRACTICAL TO ESTABLISH PERMANENT GROWTH ON DISTURBED EARTH BY OCTOBER 15, A TEMPORARY SEED MIXTURE SHALL BE USED. WHEN TEMPORARY SEEDING CANNOT ESTABLISH VISIBLE GROWTH, THE DISTURBED AREA SHALL BE COVERED WITH SIX INCHES OF MULCH FOR THE WINTER.

MAINTENANCE:

ALL SEEDED AREAS SHALL BE KEPT WATERED AND IN GOOD CONDITION. RESEED AS NECESSARY TO ESTABLISH HEALTHY UNIFORM GROWTH OVER THE ENTIRE SEEDED AREA. MAINTAIN SEEDED AREAS IN AN APPROVED CONDITION UNTIL FINAL ACCEPTANCE. MAINTENANCE SHALL INCLUDE REPAIRS FOR DAMAGE CAUSED BY EROSION.

APPLICATION RATES:

1. LOAM SHALL BE APPLIED AT A MINIMUM COMPACTED THICKNESS OF 4 INCHES.
2. LIME SHALL BE APPLIED AT A RATE OF 75 TO 100 POUNDS PER 1,000 S.F.
3. FERTILIZER SHALL BE APPLIED AT A RATE OF 30 POUNDS PER 1,000 S.F. IT IS RECOMMENDED THAT THE SOIL BE TESTED PRIOR TO APPLYING ANY FERTILIZERS TO DETERMINE WHAT LEVELS AND RATES ARE NECESSARY.
4. SEED MIXTURE FOR LAWN AREAS SHALL BE APPLIED AT A RATE OF AT LEAST 80 POUNDS PER ACRE OR 2 POUNDS PER 1,000 S.F.
5. TEMPORARY SEED MIXTURE SHALL BE APPLIED AT A RATE OF 2 POUNDS PER 1,000 S.F.
6. SEED MIXTURE FOR SLOPE AREAS SHALL BE APPLIED AT A RATE OF 80 POUNDS PER ACRE OR 2 POUNDS PER 1,000 S.F.
7. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS SHALL BE APPLIED AT A RATE OF 70 POUNDS PER ACRE OR 1.6 POUNDS PER 1,000 S.F.
8. MULCH SHALL BE APPLIED AT A RATE OF 90 POUNDS PER 1,000 S.F.

MATERIALS:

1. LOAM USED FOR TOPSOIL SHALL BE FRIABLE, FERTILE, NATURAL FREE-DRAINING LOAM; FREE OF ROOTS, GRASS, STICKS, WEEDS, CLAY, SOD LUMPS, DEBRIS AND STONES LARGER THAN 1 INCH IN ANY DIMENSION. SOIL SHALL NOT BE EXCESSIVELY ACID OR ALKALINE AND CONTAIN NO TOXIC MATERIALS.
2. LIME SHALL BE GROUND LIMESTONE CONTAINING NO LESS THAN 95% CALCIUM AND MAGNESIUM CARBONATES.
3. FERTILIZER SHALL BE NO PHOSPHORUS, SLOW RELEASE.
4. SEED MIXTURE FOR LAWN AREAS SHALL BE 99% PURE LIVE SEED AND CONSIST OF THE FOLLOWING:
   - 25% CREEPING RED FESCUE
   - 25% KENTUCKY BLUEGRASS
   - 25% REDTOP
   - 25% MANHATTAN PERENNIAL RYEGRASS
5. TEMPORARY SEEDING MIXTURE SHALL BE AN APPROVED CONSERVATION MIX OR CONSIST OF THE FOLLOWING:
   - 15% BLACKWELL OR SHELTER SWITCHGRASS
   - 30% NIAGRA OR KAW BIG BLUESTEM
   - 30% CAMPER OR BLAZE LITTLESTEM
   - 15% NE-27 OR BLAZE SAND LOVEGRASS
   - 10% VIKING BIRDSFOOT TREFOIL
   - INOCULUM SPECIFIC TO BIRDSFOOT TREFOIL MUST BE USED WITH THIS MIXTURE. IF SEEDING BY HAND, A STICKING AGENT SHALL BE USED. IF SEEDING WITH A HYDROSEEDER, USE FOUR TIMES THE RECOMMENDED AMOUNT OF INOCULUM.
6. SEED MIXTURE FOR SLOPE AREAS SHALL BE 99% PURE LIVE SEED AND SHALL CONSIST OF THE FOLLOWING:
   - 30% CREEPING RED FESCUE
   - 40% PERENNIAL RYE GRASS
   - 15% REDTOP
   - 15% BIRDSFOOT TREFOIL
   - *IN ADDITION TO THE MIX SPECIFIED ABOVE, CROWN VETCH SHALL BE USED ON ALL SLOPES STEEPER THAN 3 : 1. CROWN VETCH SHALL BE APPLIED AT A RATE OF 10 POUNDS PER ACRE AND INOCULUM SPECIFIC TO CROWN VETCH MUST BE USED.
7. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS, INCLUDING DETENTION BASINS AND VEGETATED TREATMENT SWALES SHALL CONSIST OF THE FOLLOWING:
   - 25% CREEPING RED FESCUE
   - 15% SWITCH GRASS
   - 15% FOX SEDGE
   - 15% CREEPING BENTGRASS
   - 10% FLATPEA
   - 20% WILDFLOWER VARIETY
8. STRAW USED FOR MULCH SHALL CONSIST OF MOWED AND PROPERLY CURED GRASS OR LEGUME MOWINGS, FREE FROM WEEDS, TWIGS, DEBRIS OR OTHER DELETERIOUS MATERIAL AND ROT OR MOLD.
9. NATIVE PLANTINGS SHOULD BE USED FOR ALL NEW GREENSCAPES.
10. ALL WILDFLOWER SEEDING MIXES SHOULD BE FREE OF INVASIVE SPECIES.

CONSTRUCTION SEQUENCE

1. THE CONTRACTOR WILL ENSURE THAT NO MORE THAN 5 ACRES IS DISTURBED AT ANY ONE TIME.
2. FIRST CUT AND CLEAR TREES AND BRUSH ONLY WITHIN DESIGNATED LIMITS OF CLEARING AS NECESSARY TO FACILITATE PROPOSED CONSTRUCTION. ALL TREES, BRANCHES AND OTHER VEGETATIVE MATERIALS SHALL BE PROPERLY DISPOSED OF OFF SITE BY THE CONTRACTOR. THIS PROJECT IS MANAGED TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
3. PRIOR TO COMMENCEMENT OF ANY EARTHMOVING OPERATIONS, ALL APPLICABLE TEMPORARY EROSION CONTROL MEASURES, INCLUDING SPECIFIED PERIMETER SILTATION FENCING AND STABILIZED CONSTRUCTION EXIT SHALL BE IN PLACE AS SHOWN ON THE PROJECT PLANS.
4. COMPLETE GRUBBING OPERATIONS. ALL STUMPS AND SIMILAR ORGANIC DEBRIS SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR. NATIVE ORGANIC SOIL MATERIALS SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED WITHIN AREAS OUT OF THE WAY OF OTHER CONSTRUCTIONS ACTIVITIES AND DRAINAGE FLOW. STOCKPILES SHALL BE TEMPORARILY SEEDED WITH WINTER RYE AND BE SURROUNDED WITH STRAW BALES AND/OR FABRIC SILTATION FENCE IN ORDER TO PREVENT LOSS DUE TO EROSION.
5. BEGIN EARTHMOVING OPERATIONS, COMMENCING WITH WORK NEEDED TO BALANCE SITE AND FACILITATE BUILDING FOUNDATION AND RETAINING WALL CONSTRUCTION. PERMANENT DOWNSLOPE WORK SHALL BE PROTECTED FROM UPGRADIENT STORMWATER FLOW BY THE CONSTRUCTION OF TEMPORARY EARTHEN DIKES OR EXCAVATED SWALES.
6. ONCE BUILDING FOUNDATION WORK IS UNDERWAY, CONTINUE EARTHMOVING OPERATIONS UNTIL DESIGN SUBGRADE IS ACHIEVED.
7. DETENTION BASINS/SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
8. DITCHES/SWALES/BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
9. TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC.) MUST BE USED AS NECESSARY UNTIL SOILS ARE STABILIZED.
10. INSTALL DRAINAGE SWALE SYSTEMS AND OTHER UTILITIES WORKING FROM LOW TO HIGH. INCOMPLETE WORK SHALL BE PROTECTED FROM SILTATION BY THE USE OF SILTATION BARRIERS AROUND SWALES UNTIL THE SITE HAS BECOME FULLY STABILIZED.
11. DEEPLY TILL THE BASE OF THE INFILTRATION BASIN TO RESTORE INFILTRATION RATES FOLLOWED BY A PASS WITH A LEVELING DRAG. STORMWATER FLOWS ARE NOT TO BE DIRECTED TO THE INFILTRATION AREA UNTIL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
12. PLACE GRAVEL AND CRUSHED GRAVEL OVER PROPOSED DRIVEWAY, WALKS AND PARKING AREAS AND COMPACT IN SPECIFIED LIFT THICKNESS.
13. COMPLETE EXCAVATION/STABILIZATION GRADING ACTIVITIES. WHEN COMPLETE, IMMEDIATELY BEGIN TOPSOILING PROPOSED TURF AREAS USING STOCKPILED LOAM SUPPLEMENTED WITH BORROW LOAM, IF NECESSARY, TO LEAVE A THICKNESS OF 4 INCHES OF FRIABLE LOAM.
14. FINE GRADE ALL FUTURE TURF AREAS AND HYDROSEED WITH THE SPECIFIED SEED MIXTURE IMMEDIATELY AFTER FINE GRADING IS COMPLETED. ALL AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
15. INSTALL THE BINDER COURSE OF PAVEMENT OVER ALL DESIGNATED AREAS.
16. CONTINUE TO MONITOR AND RECTIFY MINOR SITE AND SLOPE EROSION UNTIL ENTIRE SITE APPEARS TO BE COMPLETELY STABILIZED AND VEGETATED WITH A HEALTHY STAND OF TURF OR GROUND COVER. MAINTAIN SPECIFIED SILTATION/EROSION CONTROL MEASURES THROUGH ONE WINTER.
17. INSTALL THE SPECIFIED WEARING COURSE OF PAVEMENT OVER THE BINDER COURSE.
18. COMPLETE INSTALLATION OF LANDSCAPING, SIGNAGE AND OTHER SITE AMENITIES.

CERTIFICATE OF OCCUPANCY PHASING PLAN AGREEMENT:

1. THE FOLLOWING SITE IMPROVEMENTS ARE REQUIRED FOR INDIVIDUAL CERTIFICATES OF OCCUPANCY AS CONSTRUCTION PROGRESSES:
   - A. ROAD BASE COAT;
   - B. STOP SIGNS AND TEMPORARY STRIPING OF STOP BARS;
   - C. GRADING AND DRAINAGE;
   - D. LOAM AND SEED THAT SUPPORTS THE SUBJECT UNIT OF THE CERTIFICATE OF OCCUPANCY;
   - E. TEMPORARY STRIPING OF VISITOR PARKING; AND
   - F. UTILITIES.

EROSION CONTROL NOTES

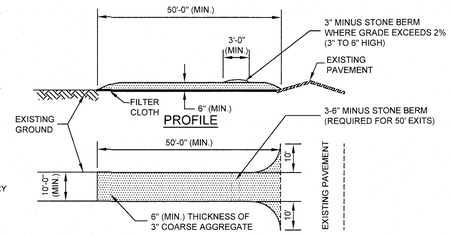
1. EXPOSED EARTHWORK SHALL BE CONFINED TO AS LIMITED AN AREA AS IS PRACTICAL AT ANY GIVEN TIME THROUGHOUT THE CONSTRUCTION SEQUENCE. AT NO TIME SHALL MORE THAN FIVE (5) ACRES OF SITE AREA BE IN AN UNSTABLE CONDITION UNLESS AN ENVIRONMENTAL MONITOR IS EMPLOYED THROUGH THE DURATION OF CONSTRUCTION. NO GIVEN AREA OF THE SITE SHALL BE LEFT IN AN UNSTABILIZED CONDITION FOR A PERIOD OF TIME EXCEEDING FORTY-FIVE (45) CALENDAR DAYS.
2. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH PROJECT PLANS. IN ADDITION, SIMILAR MEASURES SHALL BE INSTALLED WHERE AND WHEN THE FIELD CONDITION, OR FIELD OPERATION OF THE INDIVIDUAL SITE CONTRACTOR, MAY WARRANT. ALL TEMPORARY EROSION CONTROL MEASURES USED SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OF RAINFALL OR MORE. THEY SHALL BE CLEANED AND MAINTAINED AND OTHERWISE KEPT IN AN EFFECTIVE OPERATING MANNER THROUGHOUT THE CONSTRUCTION PERIOD.
3. ALL DISTURBED AREAS DESIGNATED TO BE TURF, SHALL RECEIVE A MINIMUM APPLICATION OF 4 INCHES OF LOAM (COMPACTED THICKNESS), PRIOR TO FINAL SEEDING AND MULCHING.
4. EROSION CONTROL AND STABILIZATION SHALL BE IN ACCORDANCE WITH HILLSBOROUGH COUNTY CONSERVATION DISTRICT-VEGETATIVE STANDARD AND SPECIFICATIONS FOR SEEDING GRASSES AND LEGUMES FOR LONG-TERM COVER ON EXCAVATED AREAS.
5. ALL SWALES AND DITCHLINES SHALL BE PERIODICALLY CLEANED OF DEPOSITED SEDIMENT SO AS TO MAINTAIN AN EFFECTIVE GRADE AND CROSS SECTION. ALL SWALES AND DITCHLINES SHALL BE FULLY STABILIZED PRIOR TO HAVING STORMWATER DIRECTED TOWARDS THEM.
6. IN THE EVENT THAT, DURING CONSTRUCTION OF ANY PORTION OF THIS PROJECT, A WINTER SHUTDOWN IS NECESSARY, THE CONTRACTOR SHALL STABILIZE ALL INCOMPLETE WORK AND PROVIDE FOR SUITABLE METHODS OF DIVERTING RUNOFF IN ORDER TO ELIMINATE SHEET FLOW ACROSS FROZEN SURFACES.
7. 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; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
8. DUST SHALL BE CONTROLLED BY THE USE OF WATER AS NECESSARY THROUGHOUT THE CONSTRUCTION PERIOD. IN ACCORDANCE WITH ENV-A 1000.
9. IN NO WAY ARE THOSE TEMPORARY EROSION CONTROL MEASURES INDICATED ON THESE PLANS TO BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR SHALL USE JUDGEMENT IN INSTALLING SUPPLEMENTARY EROSION CONTROL MEASURES WHERE AND WHEN SPECIFIC SITE CONDITIONS AND/OR CONSTRUCTION METHODOLOGIES MAY WARRANT.
10. THE TOWN RESERVES THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION.
11. AREAS HAVING FINISH GRADE SLOPES OF 3 : 1 OR STEEPER, SHALL BE STABILIZED WITH JUTE MATTING WHEN AND IF FIELD CONDITIONS WARRANT, OR IF SO ORDERED. JUTE MATTING INSTALLED TO CONFORM WITH THE RECOMMENDED BEST MANAGEMENT PRACTICE OUTLINED IN VOLUME 3 OF THE NEW HAMPSHIRE STORMWATER MANUAL "EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION."
12. DETENTION BASINS/SWALES SHALL BE INSTALLED BEFORE ROUGH GRADING THE SITE.
13. DITCHES/SWALES/BASINS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
14. TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC.) MUST BE USED AS NECESSARY UNTIL SOILS ARE STABILIZED.
15. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
16. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

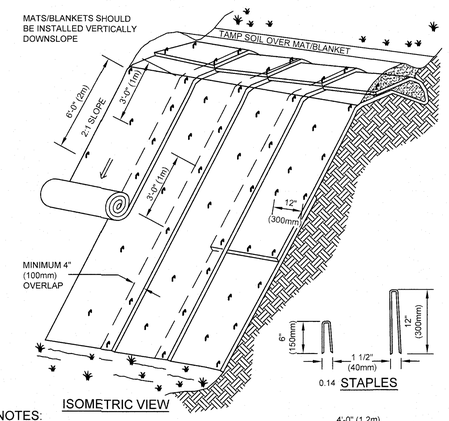
SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39.



PLAN VIEW

STABILIZED CONSTRUCTION EXIT DETAIL

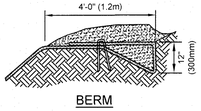
NOT TO SCALE



ISOMETRIC VIEW

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. EROSION BLANKETS TO BE A BCN150 OR AN APPROVED ALTERNATIVE WHICH MUST CONSIST OF ALL NATURAL FIBERS.



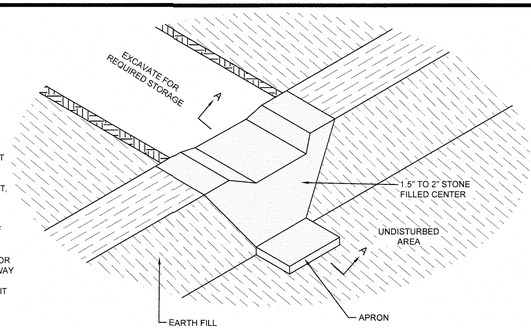
BERM

MAINTENANCE:

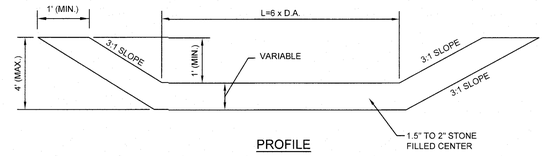
1. MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE CRUSHED STONE AND THE EFFECTIVENESS OF THE CRUSHED STONE PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOPDRESSED WITH NEW CRUSHED STONE OR COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY 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:

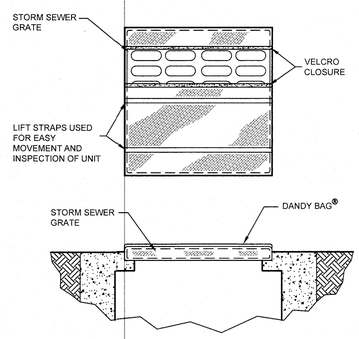
1. STONE FOR A STABILIZED CONSTRUCTION EXIT SHALL BE 3 INCH MINIMUM STONE. RECLAIMED STONE OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED EXIT SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED EXIT SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE EXIT SHALL NOT BE LESS THAN THE FULL WIDTH OF THE AREA 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 EXIT SHALL BE PIPED BENEATH THE EXIT. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE EXIT SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOPDRESSING 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 RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. THE MOUNTABLE BERM IS REQUIRED FOR 50' LONG EXITS.



ISOMETRIC VIEW

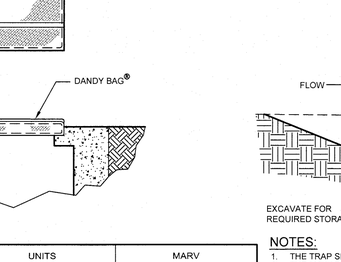


PROFILE



HI-FLOW DANDY BAG® (SAFETY ORANGE)

MECHANICAL PROPERTIES	TEST METHOD	UNITS	MARV
GRAB TENSILE STRENGTH	ASTM D 4632	kN (lbs)	1.62 (365) x 0.89 (200)
GRAB TENSILE ELONGATION	ASTM D 4632	%	24 x 10
PUNCTURE STRENGTH	ASTM D 4833	kN (lbs)	0.40 (90)
MULLEN BURST STRENGTH	ASTM D 3786	kPa (psi)	3097 (450)
TRAPEZOID TEAR STRENGTH	ASTM D 4533	kN (lbs)	0.51 (115) x 0.33 (75)
UV RESISTANCE	ASTM D 4355	%	90
APPARENT OPENING SIZE	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
FLOW RATE	ASTM D 4491	l/min/m^2 (gal/min/ft^2)	5907 (145)
PERMITTIVITY	ASTM D 4491	Sec^{-1}	2.1



SECTION A-A

NOTES:

1. THE TRAP SHALL BE INSTALLED AS CLOSE TO THE DISTURBED AREA OR SOURCE OF SEDIMENT AS POSSIBLE.
2. THE MAXIMUM CONTRIBUTING DRAINAGE AREA TO THE TRAP SHALL BE LESS THAN 5 ACRES.
3. THE MINIMUM VOLUME OF THE TRAP SHALL BE 3,600 CUBIC FEET OF STORAGE FOR EACH ACRE OF DRAINAGE AREA.
4. THE SIDE SLOPES OF THE TRAP SHALL BE 3:1 OR FLATTER, AND SHALL BE STABILIZED IMMEDIATELY AFTER THEIR CONSTRUCTION.
5. THE OUTLET OF THE TRAP SHALL BE A MINIMUM OF ONE FOOT BELOW THE CREST OF THE TRAP AND SHALL DISCHARGE TO A STABILIZED AREA.
6. THE TRAP SHALL BE CLEANED WHEN 50 PERCENT OF THE ORIGINAL VOLUME IS FILLED.
7. THE MATERIALS REMOVED FROM THE TRAP SHALL BE PROPERLY DISPOSED OF AND STABILIZED.
8. SEDIMENT TRAPS AND/OR BASINS SHOULD BE USED AS NECESSARY TO CONTAIN RUNOFF UNTIL BASINS/PONDS ARE STABILIZED.

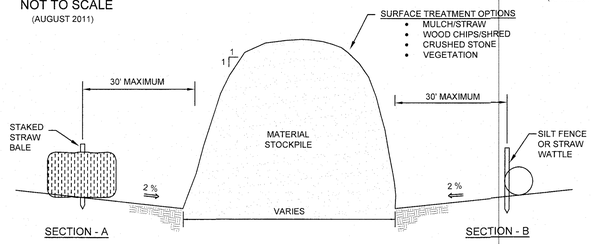
TEMPORARY SEDIMENT TRAP DETAIL

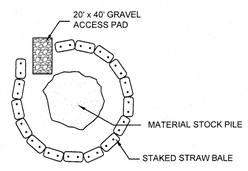
NOT TO SCALE

EROSION CONTROL BLANKETS - SLOPE INSTALLATION

NOT TO SCALE

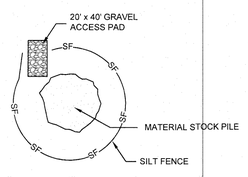
(AUGUST 2011)





PLAN - A

STOCK PILE STABILIZATION MEASURE A:
TEMPORARY STRAW BALE PERIMETER



PLAN - B

STOCK PILE STABILIZATION MEASURE B:
TEMPORARY SILT FENCE PERIMETER

GENERAL NOTES:

1. THIS PROJECT DOES ANTICIPATE THE NEED OR USE OF STANDING STOCKPILES FOR GREATER THAN 24 HOURS. ALL MATERIALS WILL EITHER BE IMMEDIATELY REMOVED OR PLACED WITHIN THE ACTIVE PROJECT LIMITS.
2. ALL MATERIAL STOCK PILES LEFT STANDING GREATER THAN 72 HOURS WILL REQUIRE PERIMETER MEASURES (A OR B), AS NOTED ABOVE.
3. NO TEMPORARY OR PERMANENT MATERIAL STOCKPILES WILL BE PERMITTED WITHIN THE PROJECT LIMITS FOLLOWING PROJECT SUBSTANTIAL COMPLETION.

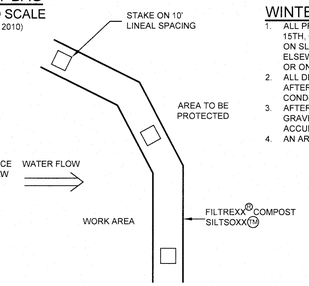
STOCK PILE STABILIZATION

NOT TO SCALE

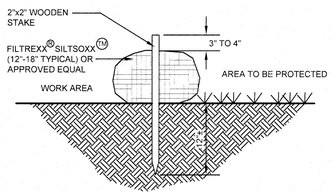
DANDY BAG®

NOT TO SCALE

(APRIL 2010)



PLAN VIEW



SECTION VIEW

NOTES:

1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. SILTSOXX™ COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS.
3. SILTSOXX™ DEPICTED IS FOR MINIMUM SLOPES. GREAT SLOPES MAY REQUIRE LARGER SOCKS PER THE ENGINEER.
4. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

FILTREXX® SILTSOXX™ DETAIL

NOT TO SCALE

(AUGUST 2011)

WINTER CONSTRUCTION NOTES:

1. ALL PROPOSED POST-DEVELOPMENT 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 4:1, 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 EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3 OR, IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON, BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT.
4. 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; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

CONSTRUCTION DETAILS

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
8B DUMONT ROAD
HUDSON, NH 03051
9531/2754

RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 15079 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE
6/6/22

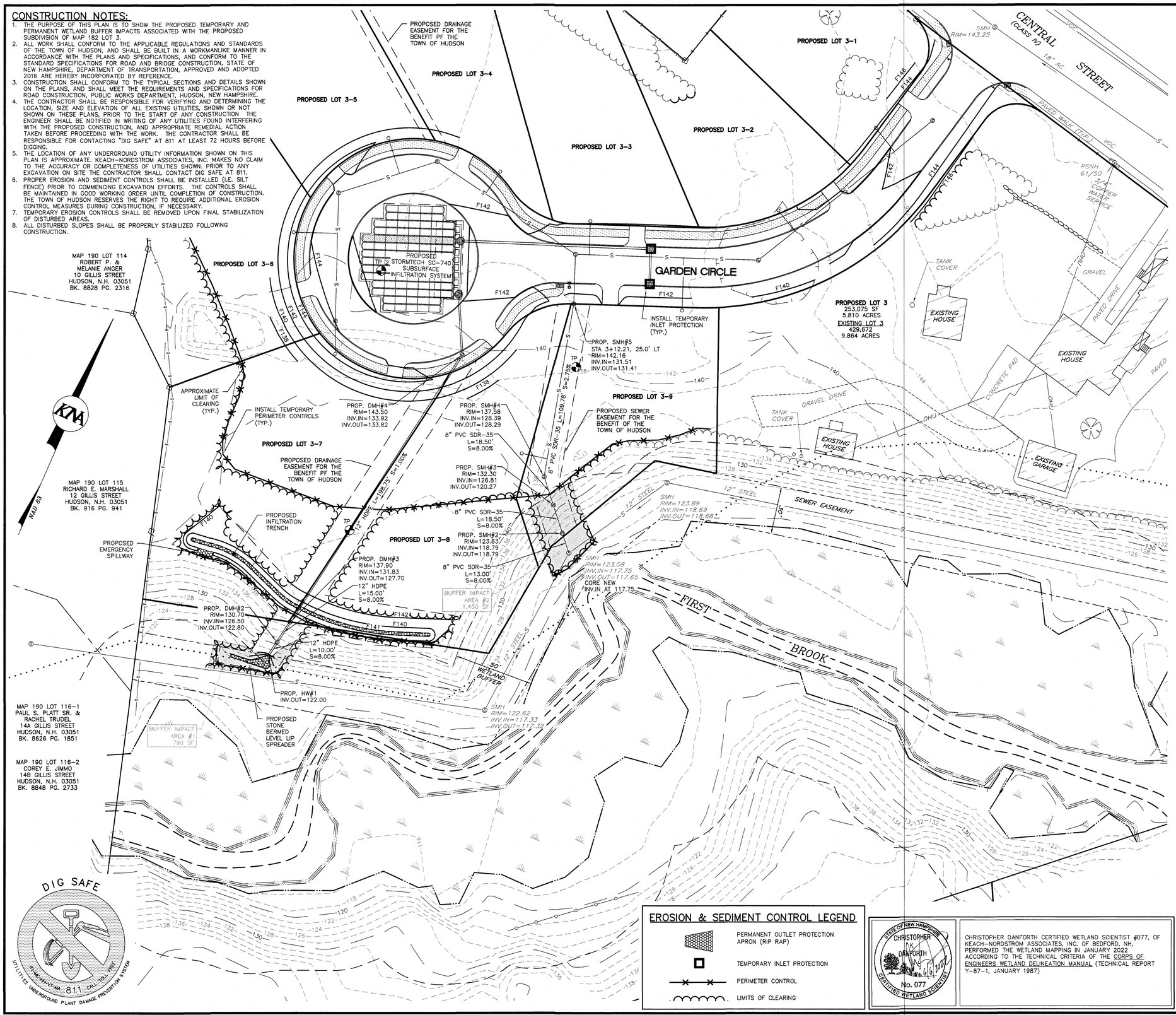
REVISIONS

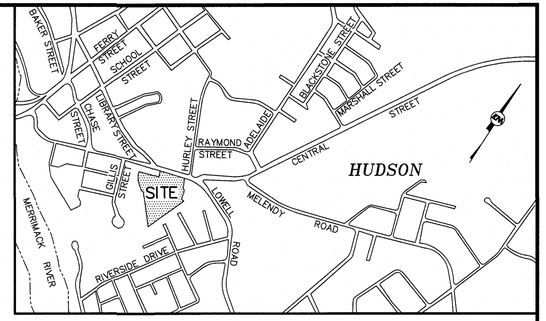
No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: AS SHOWN
PROJECT NO: 21-0928-1 | SHEET 16 OF 16

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED TEMPORARY AND PERMANENT WETLAND BUFFER IMPACTS ASSOCIATED WITH THE PROPOSED SUBDIVISION OF MAP 182 LOT 3.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, AND CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE.
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 TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
6. PROPER EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED (I.E. SILT FENCE) PRIOR TO COMMENCING EXCAVATION EFFORTS. THE CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL COMPLETION OF CONSTRUCTION. THE TOWN OF HUDSON RESERVES THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION, IF NECESSARY.
7. TEMPORARY EROSION CONTROLS SHALL BE REMOVED UPON FINAL STABILIZATION OF DISTURBED AREAS.
8. ALL DISTURBED SLOPES SHALL BE PROPERLY STABILIZED FOLLOWING CONSTRUCTION.





VICINITY PLAN

SCALE: 1" = 1,000±

LEGEND

- UTILITY POLE
- SIGN
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- BROOK
- CHAIN LINK FENCE
- STOCKADE FENCE
- OVERHEAD UTILITIES
- SEWER LINE
- DRAINAGE LINE
- TREELINE
- EDGE OF PAVEMENT
- VERTICAL GRANITE CURB
- EDGE OF GRAVEL
- 10' CONTOUR
- 2' CONTOUR
- STONEWALL
- EASEMENT
- PROPOSED SEWER LINE
- PROPOSED DRAINAGE LINE
- PROPOSED TREELINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED VERTICAL GRANITE CURB
- PROPOSED 2' CONTOUR
- WETLAND BUFFER IMPACT

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

EROSION & SEDIMENT CONTROL LEGEND

- PERMANENT OUTLET PROTECTION APRON (RIP RAP)
- TEMPORARY INLET PROTECTION
- PERIMETER CONTROL
- LIMITS OF CLEARING

DIG SAFE — UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM — 811 CALL TOLL FREE

STATE OF NEW HAMPSHIRE — CHRISTOPHER K. DANFORTH — No. 077 — CERTIFIED WETLAND SCIENTIST

CHRISTOPHER DANFORTH CERTIFIED WETLAND SCIENTIST #077, OF KEACH-NORDSTROM ASSOCIATES, INC. OF BEDFORD, NH, PERFORMED THE WETLAND MAPPING IN JANUARY 2022 ACCORDING TO THE TECHNICAL CRITERIA OF THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (TECHNICAL REPORT Y-87-1, JANUARY 1987)

WETLAND BUFFER IMPACT PLAN

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS OF MAP 182 LOT 3:

LAURA RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
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STATE OF NEW HAMPSHIRE — PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER

REVISIONS

No.	DATE	DESCRIPTION	BY
1	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 15, 2022	SCALE: 1" = 30'
PROJECT NO: 21-0928-1	SHEET 1 OF 1

Stormwater Management Report

Frenette Gardens

Map 182; Lot 3
65 Central Street
Hudson, New Hampshire

April 20, 2022

Revised: June 6, 2022

KNA Project No. 21-0928-1

Prepared For: Laura Ripaldi
46 Bush Hill Road
Hudson, NH 03051

Kimberley Frenette
88 Dumont Road
Hudson, NH 03051

Ricky Frenette
14 Tate Street
Hudson, NH 03051

Prepared By: Keach-Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, New Hampshire 03110
(603) 627-2881
(603) 627-2915 (fax)

KNA KEACH-NORDSTROM ASSOCIATES, INC.

Table of Contents

I. INTRODUCTION

A. Project Description

The project proposes to subdivide the existing parcel, located at 65 Central Street, into ten (10) new residential lots and construct approximately 700 feet of new roadway, culminating in a cul-de-sac. Roadway construction also entails the installation of public utilities, including water, sewer, drainage, gas, underground electric, and telecommunications services. The proposed stormwater management system includes a subsurface infiltration system, consisting of Stormtech SC-740 chambers, and two stone bottomed infiltration trenches as well as a closed drainage system which directs runoff into said subsurface infiltration system.

B. Existing Site Conditions

The subject property, prior to the subdivision, is approximately 9.88 acres in total area, and is located at 65 Central Street in Hudson's Town Residential (TR) Zoning District. The lot is currently developed with a single-family house in the northeast corner. It is bisected by First Brook to the south of the existing house. The parcel is bordered by Central Street to the north and several single-family houses to the east, south, and west. The lot currently has access from Central Street.

According to the Natural Resources Conservation Service (NRCS) web soil survey, the predominant soil types onsite are Windsor-Urban Land Complex with slopes ranging from 3-15% and Windsor Loamy Sand, with slopes ranging from 15-35%. Both soils are classified as Hydrologic Soil Group (HSG) 'A'.

II. STORM DRAINAGE ANALYSIS & DESIGN

A. Methodology

In accordance with the provisions of the Town of Hudson, and generally accepted engineering practice, the 2-year, 10-year, 25-year, and 50-year frequency storms have each been used in the various aspects of analysis and design of stormwater management considerations for the subject site. All proposed stormwater measures have been designed to not overtop in the 50-year frequency storm.

KNA utilizes HydroCAD version 10.0 to analyze both pre and post-development watershed characteristics. This computer software system is based largely on hydrology techniques (TR-20) developed by the Soil Conservation Service (now the Natural Resources Conservation Service). In addition, the software derives Time of Concentration values using the methodology contained within USDA-S.C.S. publication Urban Hydrology for Small Watersheds Technical Release No. 55 (TR 55).

All design and analysis calculations performed using the referenced methodologies are attached to this report. The minimum time of concentrations used for the analysis is 6 minutes. These calculations document each catchment area, a breakdown of surface type, time of concentration, rainfall intensity, peak discharge volume, Manning's "n" value, peak velocity, and other descriptive design data for each watershed and pipe segment evaluated. In addition, the "Pre/Post Development Drainage Area Plans" graphically define and illustrate the extent of each watershed or catchment area investigated.

B. Pre-Development Drainage Conditions

In the pre-development scenario, three (3) point of analysis (POA) have been identified as the appropriate points to compare pre vs. post development rates of stormwater discharge. These points of analysis reflect the main discharge point of the site and were analyzed to show the impact from the proposed improvements.

The pre-development drainage model's POA's are further described as follows:

- Link A — Central Street
- Link B — First Brook Tributary
- Link C — First Brook

In general, the site slopes from a central high point in the existing field downward to the three points of analysis. Runoff from a small portion of the front of the lot along Central Street and half the roof of the existing house flows to the roadway and is collected in the existing drainage network (Link A). Runoff from the western portion of the lot flows over the property line and into a small brook on the abutting lots (Link B), which eventually feeds into First Brook. Finally, runoff from most of the site is conveyed to First Brook (Link C) by overland flow. There are two existing depressions on site, which are currently used as gardens by the property owner. These depressions are included in the drainage analysis. For a more visual description of the information presented in this section, please refer to the attached "Pre-Development Drainage Areas Plan" attached in the appendix of this report.

C. Post-Development Drainage Conditions:

The same POA's that were identified in the pre-development scenario have been analyzed in the post-development scenario.

The proposed stormwater management system utilizes both open and closed practices for the collection, detention, treatment, and recharge of runoff. Stormwater runoff generated from the proposed roadway and most of the developed lots, will be collected by two catch basins and piped to a subsurface infiltration system located under the grass panel at the center of the cul-de-sac. This BMP was selected for the site as part of a pilot program proposed by the Town of Hudson to move away from open detention basins and shift towards less intrusive subsurface stormwater solutions. It is designed to mitigate peak rates and provide the required treatment and recharge volumes per town regulations. Outfall from the system will be piped to the toe of slope along the embankment leading down to the brook, where it will be diffused by a stone bermed level lip spreader before discharging to the wetland. The bottom of this system will lie below the frost line and ensure that this BMP will continue to operate as intended during frozen ground conditions.

It is important to note that a typical 2,000 square foot lot development envelope of impervious area was assumed for the drainage calculations, to properly size the stormwater BMP's. This approximate area was determined by assuming each lot will be developed with a 1,500-sf house and a 500-sf driveway. This means that the nine proposed lots contribute an additional 18,000-sf of impervious area. The subsurface infiltration system was designed with the intent of having 14,000-sf of impervious lot area (and the roadway) drain to the BMP based on assumed lot grading. The 4,000-sf of remaining impervious lot area (back half of roofs) is accounted for by the construction of two proposed infiltration trenches to be located along the rear property lines of Lots 3-4, 3-5, 3-6, 3-7, and 3-8. These trenches include two feet of washed, crushed stone wrapped in fabric and one foot ponding area with a ten-foot overflow spillway in the berm. Outfall from these trenches will flow overland to First Brook and its tributary. Additionally, both trenches have been designed to not overtop in the 50-

year storm event under frozen ground conditions by removing infiltration from the drainage analysis.

The peak stormwater runoff rate and the channel protection requirements for the specific storm frequencies are presented and analyzed in the subsequent summary section of this report (Tables 1 & 2). For a more visual description of the information presented in this section, please refer to the attached "Post-Development Drainage Areas Plan" attached in the appendix of this report.

D. Summary:

The subject site complies with the Town of Hudson regulations regarding stormwater treatment and groundwater recharge volume. Proposed stormwater best management practices (BMP) are designed in accordance with the New Hampshire Stormwater Manual Volume 2: Post-Construction Best Management Practices Selection and Design and BMP worksheets provided by the New Hampshire Department of Environmental Services. In addition, stormwater discharges, in terms of peak rate of runoff and total volume, are consistent with the Town of Hudson Stormwater Regulations. The results are reported below in Table 1 and 2.

Table 1: Peak Flow Discharge Rate

Site Pre-Development vs. Post-Development (cfs)								
Description	**2-Year**		**10-Year**		**25-Year**		**50-Year**	
24-hr Rainfall	2.95 in/hr		4.45 in/hr		5.62 in/hr		6.72 in/hr	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
A	0.20	0.20	0.30	0.30	0.38	0.38	0.52	0.50
B	0.22	0.21	0.33	0.33	0.43	0.42	0.71	0.55
C	0.89	0.88	1.36	1.35	1.77	1.74	2.49	2.48

Table 2: Stormwater Runoff Volume

Site Pre-Development vs. Post Development (Storm Volume in Acre-Feet)		
Description	**2-Year**	
24-hr Rainfall	2.95 in/hr	
	Pre	Post
A	**0.02**	0.02
B	**0.02**	0.02
C	**0.11**	0.11

III. EROSION & SEDIMENTATION CONTROL PROVISIONS

A. Temporary Erosion Control Measures

As an integral part of the engineering design of this site, an erosion and sedimentation control plan has been developed with the intent of limiting the potential for soil loss and associated receiving water quality degradation, both during and after the construction period. As the project plans indicate, traditional temporary erosion and sedimentation control devices and practices, such as siltation fencing and temporary block and sediment barriers at. In preparation of these provisions, reference was made to the New Hampshire Stormwater Manual: Volume 3: Erosion and Sediment Temporary Controls During Construction. Construction details for each temporary erosion control measure and practice specified have been added to the project plans. These plans also contain a number of

erosion control notes, which are offered to the selected contractor in order to supplement the specified measures and practices to the extent practical.

B. Construction Sequence

A site-specific construction sequence sensitive to limiting soil loss due to erosion and associated water quality degradation was prepared specifically for this project and is shown on the project plans. As pointed out in the erosion control notes, it is important for the contractor to recognize that proper judgment in the implementation of work will be essential if erosion is to be limited and protection of completed work is to be realized. Moreover, any specific changes in sequence and/or field conditions affecting the ability of specific erosion control measures to adequately serve their intended purpose should be reported to this office by the contractor. Further, the contractor is encouraged to supplement specified erosion control measures during the construction period where and when in his/ her best judgment additional protection is warranted.

C. Permanent Erosion Control Measures

In the design of this site, consideration was given to limiting the potential for long-term erosion of completed improvements. As a result, several permanent erosion control measures were incorporated into the site design. These provisions include:

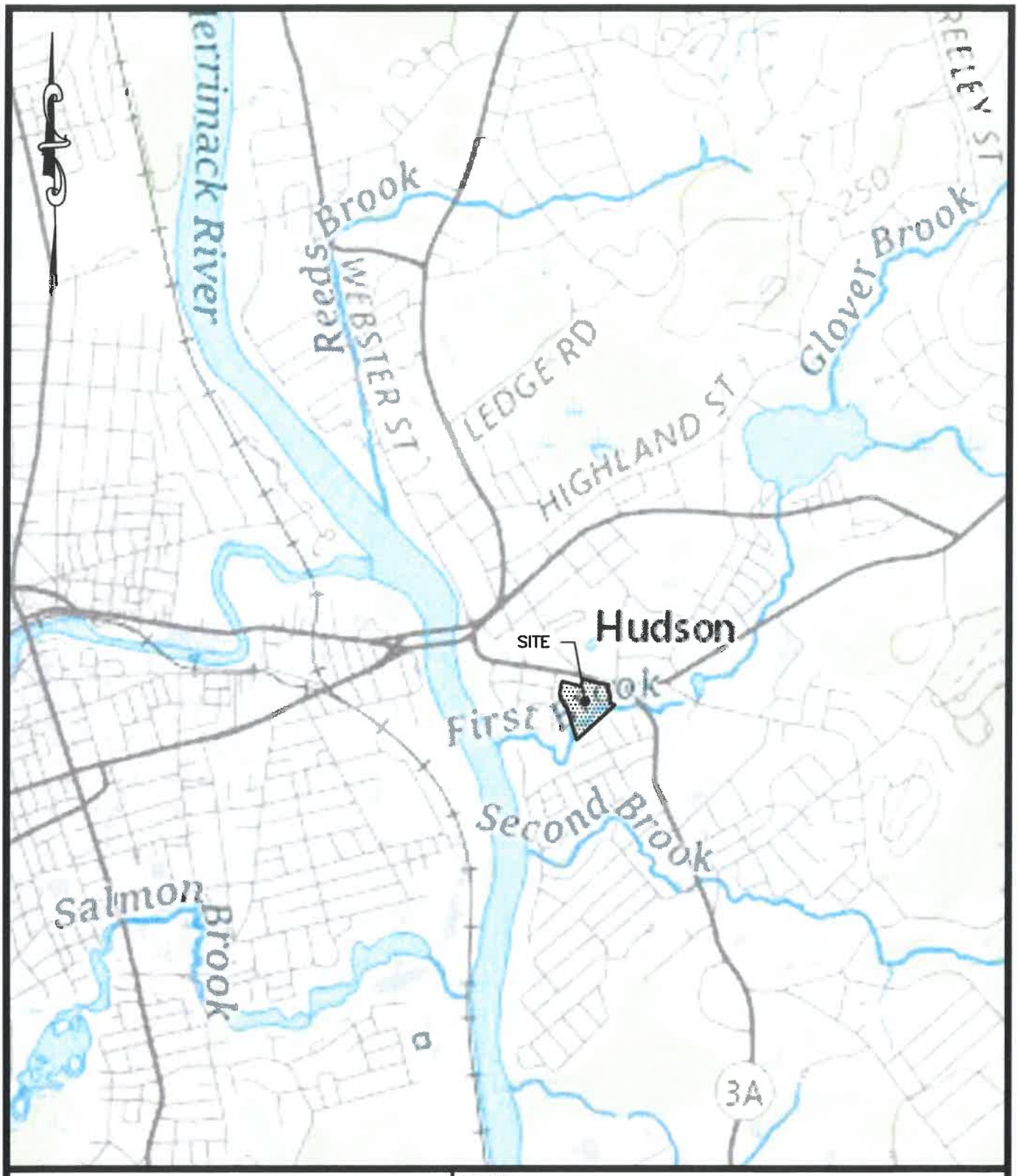
1) Specification of a turf establishment schedule and seed mixture, utilizing materials and workmanship recognized as appropriate for the site conditions at hand; and

2) The design has provided catch basins with sumps to capture runoff and reduce the overland flow, thereby reducing erosion.

3) Multiple infiltration practices were designed to reduce runoff and volume.

FIGURES AND SPREADSHEETS

FIGURE NO. 1 – AERIAL IMAGE
FIGURE NO. 2 – USGS IMAGE
FIGURE NO. 3 – SCS SOILS MAP
FIGURE NO. 4 – EXTREME PRECIPITATION TABLES
FIGURE NO. 5 – GROUNDWATER RECHARGE VOLUME CALCULATION
FIGURE NO. 6 – BMP WORKSHEETS



KEACH-NORDSTROM ASSOCIATES, INC.

Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110
Phone (603) 627-2881

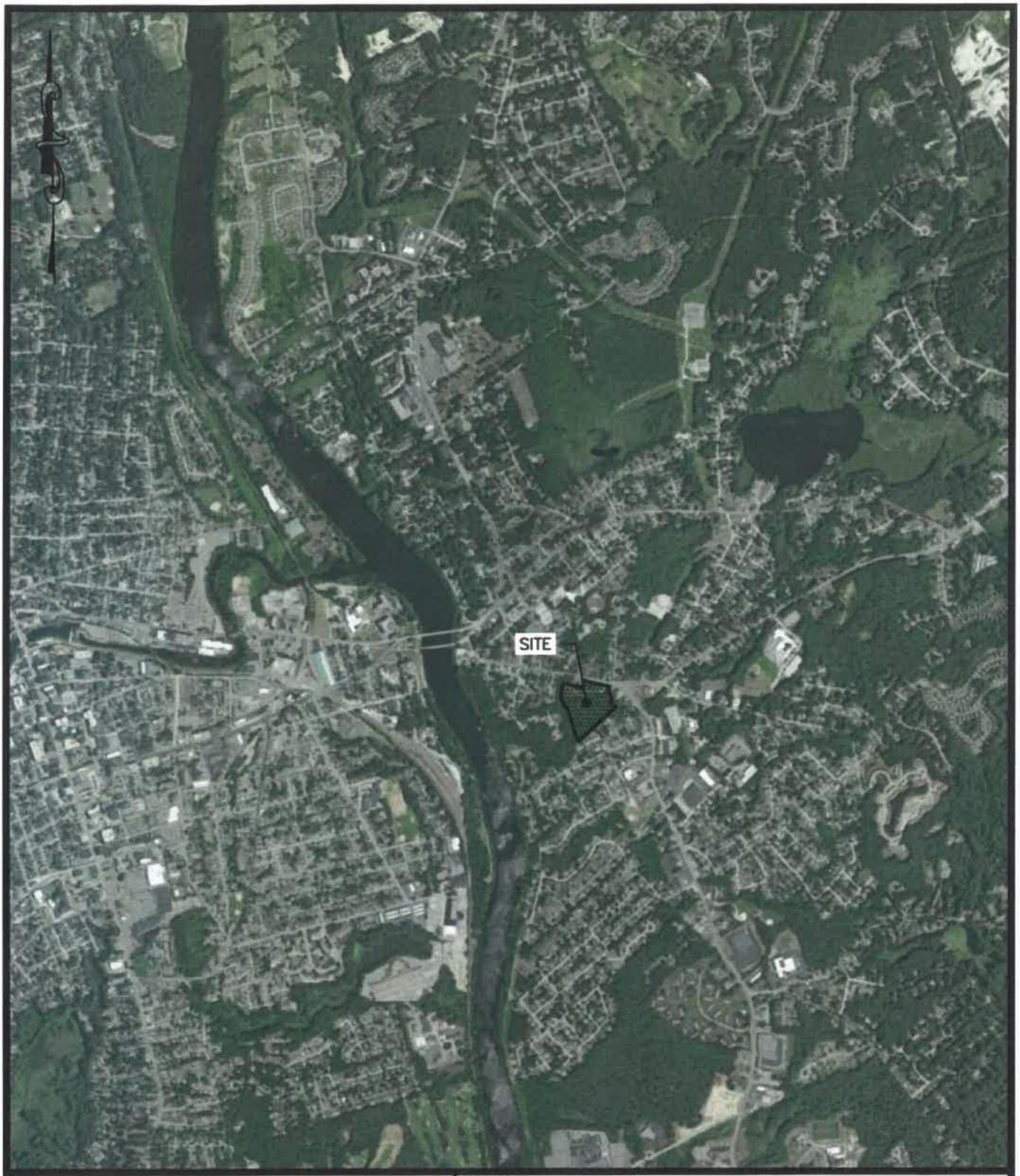
TITLE:

USGS EXHIBIT PREPARED FOR:

FRENETTE GARDENS

MAP 182; LOT 3 - 65 CENTRAL STREET, HUDSON, NEW HAMPSHIRE

DATE: 4/20/2022	JOB. NO. 21-0928-1
SCALE: 1" = 2000'	SHEET 1 OF 1



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TITLE:

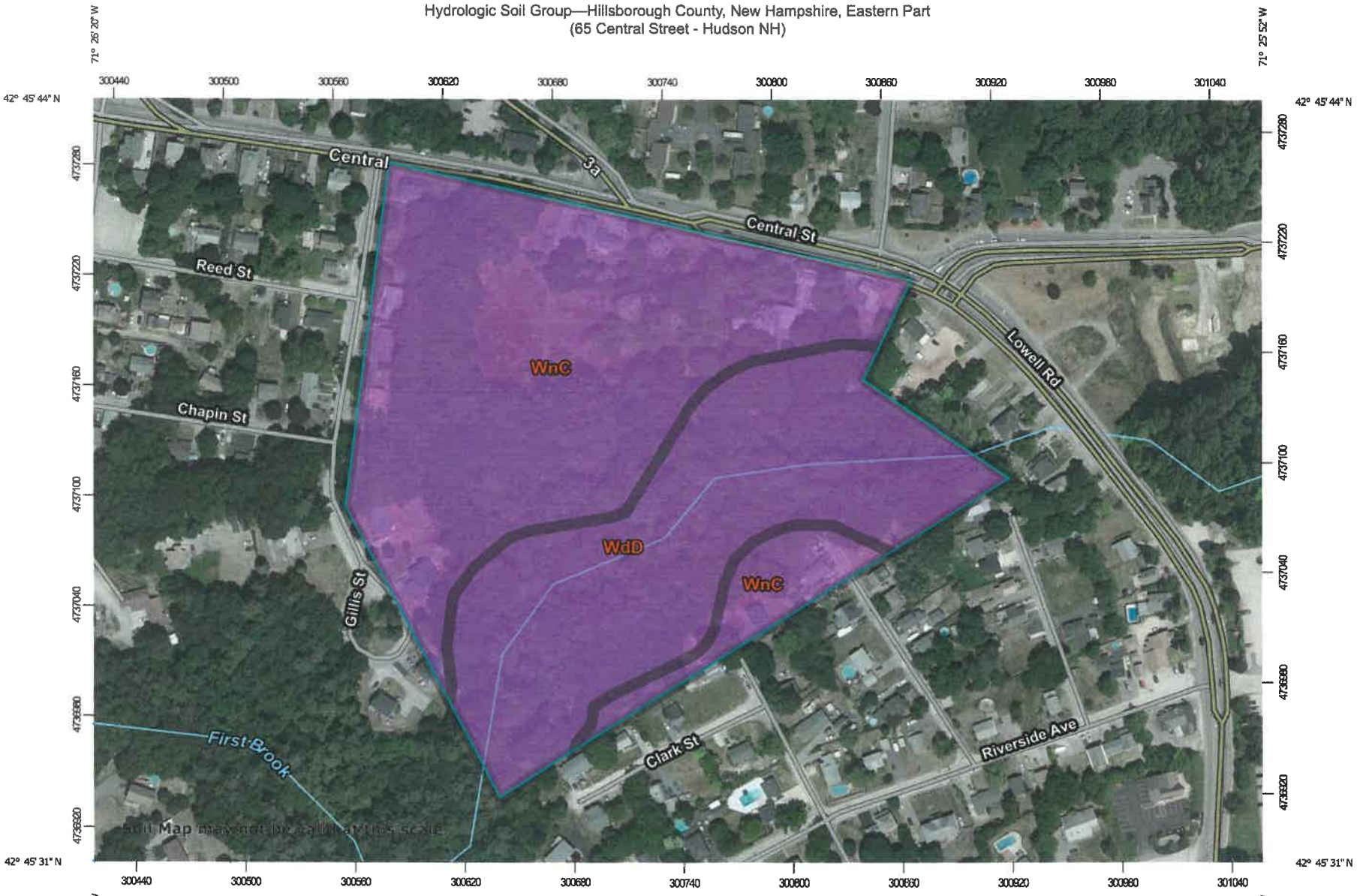
AERIAL EXHIBIT PREPARED FOR:

FRENETTE GARDENS

MAP 182; LOT 3 - 65 CENTRAL STREET, HUDSON, NEW HAMPSHIRE

DATE: 4/20/2022	JOB. NO. 21-0928-1
SCALE: 1" = 2000'	SHEET 1 OF 1

Hydrologic Soil Group—Hillsborough County, New Hampshire, Eastern Part
(65 Central Street - Hudson NH)



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 1:20,000.

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: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Aug 6, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WdD	Windsor loamy sand, 15 to 35 percent slopes	A	7.2	39.4%
WnC	Windsor-Urban land complex, 3 to 15 percent slopes	A	11.1	60.6%
Totals for Area of Interest			**18.4**	**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

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	71.434 degrees West
Latitude	42.761 degrees North
Elevation	0 feet
Date/Time	Mon, 14 Feb 2022 16:02:56 -0500

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.74	1.01	1.24	1.56	1.96	2.48	2.72	**1yr**	2.19	2.61	3.04	3.73	4.34	**1yr**
2yr	0.33	0.51	0.64	0.84	1.05	1.32	**2yr**	0.91	1.21	1.53	1.91	2.37	2.95	3.28	**2yr**	2.61	3.15	3.66	4.38	4.98	**2yr**
5yr	0.39	0.61	0.77	1.03	1.32	1.67	**5yr**	1.14	1.52	1.93	2.42	3.00	3.73	4.17	**5yr**	3.30	4.01	4.64	5.51	6.22	**5yr**
10yr	0.44	0.70	0.88	1.20	1.56	1.99	**10yr**	1.34	1.80	2.32	2.90	3.60	4.45	5.00	**10yr**	3.94	4.81	5.55	6.54	7.37	**10yr**
25yr	0.53	0.83	1.06	1.46	1.94	2.51	**25yr**	1.68	2.25	2.93	3.67	4.56	5.62	6.37	**25yr**	4.97	6.13	7.05	8.22	9.21	**25yr**
50yr	0.59	0.95	1.21	1.70	2.30	3.00	**50yr**	1.99	2.66	3.51	4.42	5.48	6.72	7.66	**50yr**	5.94	7.36	8.45	9.78	10.92	**50yr**
100yr	0.68	1.10	1.42	2.01	2.73	3.58	**100yr**	2.36	3.16	4.20	5.28	6.55	8.03	9.20	**100yr**	7.10	8.85	10.13	11.63	12.94	**100yr**
200yr	0.77	1.26	1.63	2.35	3.24	4.28	**200yr**	2.80	3.75	5.03	6.34	7.85	9.60	11.06	**200yr**	8.49	10.64	12.14	13.84	15.34	**200yr**
500yr	0.93	1.53	2.00	2.90	4.07	5.41	**500yr**	3.51	4.70	6.38	8.05	9.96	12.17	14.13	**500yr**	10.77	13.58	15.44	17.43	19.22	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.22	0.35	0.42	0.57	0.70	0.80	**1yr**	0.60	0.78	1.06	1.32	1.67	2.28	2.56	**1yr**	2.01	2.46	2.71	3.01	3.71	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.20	**2yr**	0.86	1.17	1.37	1.79	2.30	2.89	3.20	**2yr**	2.56	3.08	3.57	4.27	4.87	**2yr**
5yr	0.36	0.55	0.69	0.94	1.20	1.42	**5yr**	1.04	1.39	1.63	2.11	2.69	3.50	3.88	**5yr**	3.10	3.73	4.27	5.14	5.81	**5yr**
10yr	0.39	0.61	0.75	1.05	1.36	1.60	**10yr**	1.17	1.57	1.82	2.39	3.04	4.04	4.49	**10yr**	3.58	4.32	4.91	5.88	6.64	**10yr**
25yr	0.45	0.68	0.85	1.21	1.59	1.88	**25yr**	1.38	1.83	2.13	2.81	3.54	4.88	5.48	**25yr**	4.32	5.27	5.89	7.04	7.89	**25yr**
50yr	0.49	0.74	0.92	1.33	1.79	2.13	**50yr**	1.54	2.08	2.41	3.20	3.99	5.66	6.38	**50yr**	5.01	6.13	6.78	8.07	9.00	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.40	**100yr**	1.73	2.35	2.73	3.50	4.49	6.47	7.45	**100yr**	5.72	7.17	7.81	9.27	10.22	**100yr**
200yr	0.59	0.88	1.12	1.62	2.26	2.73	**200yr**	1.95	2.66	3.07	3.95	5.09	7.48	8.73	**200yr**	6.62	8.39	9.00	10.64	11.65	**200yr**
500yr	0.67	0.99	1.27	1.85	2.63	3.23	**500yr**	2.27	3.16	3.61	4.66	6.02	9.10	10.81	**500yr**	8.05	10.39	10.85	12.78	13.84	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.58	0.78	0.96	1.12	**1yr**	0.83	1.10	1.27	1.66	2.10	2.63	2.87	**1yr**	2.33	2.76	3.44	4.23	4.78	**1yr**
2yr	0.35	0.54	0.67	0.91	1.12	1.31	**2yr**	0.97	1.28	1.49	1.93	2.47	3.05	3.39	**2yr**	2.70	3.26	3.78	4.50	5.14	**2yr**
5yr	0.44	0.67	0.83	1.14	1.46	1.67	**5yr**	1.26	1.63	1.90	2.43	3.05	4.02	4.53	**5yr**	3.55	4.36	5.00	5.92	6.64	**5yr**
10yr	0.52	0.81	1.00	1.40	1.80	2.04	**10yr**	1.56	1.99	2.31	2.91	3.62	4.97	5.64	**10yr**	4.40	5.42	6.21	7.27	8.11	**10yr**
25yr	0.68	1.03	1.28	1.83	2.41	2.65	**25yr**	2.08	2.59	2.98	3.68	4.51	6.59	7.54	**25yr**	5.83	7.25	8.27	9.56	10.59	**25yr**
50yr	0.82	1.25	1.55	2.23	3.00	3.23	**50yr**	2.59	3.16	3.63	4.41	5.34	8.17	9.39	**50yr**	7.23	9.03	10.26	11.76	12.96	**50yr**
100yr	1.00	1.51	1.89	2.73	3.75	3.94	**100yr**	3.23	3.85	4.42	5.45	6.32	10.24	11.67	**100yr**	9.06	11.22	12.75	14.49	15.88	**100yr**
200yr	1.21	1.83	2.32	3.35	4.68	4.81	**200yr**	4.04	4.70	5.36	6.55	7.49	12.71	14.51	**200yr**	11.25	13.95	15.83	17.86	19.47	**200yr**
500yr	1.58	2.36	3.03	4.41	6.27	6.24	**500yr**	5.41	6.10	6.96	8.37	9.37	16.91	19.30	**500yr**	14.96	18.56	21.09	23.54	25.50	**500yr**

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Northeast Regional Climate Center

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

0.87	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.40	inches	Rd = Weighted groundwater recharge depth	
0.3472	ac-in	GRV = AI * Rd	
1,260	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12")	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Subsurface Infiltration System provides 5,676 cf of recharge volume where 1,260 cf is required

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: Stormtech SC-740 System (1P)

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
2.74	ac	A = Area draining to the practice	
0.79	ac	A_I = Impervious area draining to the practice	
0.29	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.31	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.85	ac-in	WQV= 1" x Rv x A	
3,079	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
770	cf	25% x WQV (check calc for sediment forebay volume)	
Isolator Row		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
5,676	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
3,777	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
3.3	hours	I_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
135.00	feet	E_{BTM} = Elevation of the bottom of the basin	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
135.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
135.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
N/A	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
Yes	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
N/A		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
N/A	:1	If a basin is proposed, pond side slopes.	≥3:1
136.78	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
138.77	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
139.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Infiltration Trench #1**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.54	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.13	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.16	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.09	ac-in	WQV= 1" x Rv x A	
323	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
81	cf	25% x WQV (check calc for sediment forebay volume)	
N/A		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
929	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
384	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
3.4	hours	I_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
138.00	feet	E_{BTM} = Elevation of the bottom of the basin	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
138.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
138.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
2.00	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
No	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
Yes		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
N/A	:1	If a basin is proposed, pond side slopes.	≥3:1
140.10	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
140.60	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
141.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Infiltration Trench #2**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable.

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	← yes
0.39	ac	A = Area draining to the practice	
0.02	ac	A_I = Impervious area draining to the practice	
0.06	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.10	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.04	ac-in	WQV= 1" x Rv x A	
145	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
36	cf	25% x WQV (check calc for sediment forebay volume)	
N/A		Method of pretreatment? (not required for clean or roof runoff)	
N/A	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
986	cf	V = Volume[1] (attach a stage-storage table)	≥ WQV
333	sf	A_{SA} = Surface area of the bottom of the pond	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[2]	
1.7	hours	I_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	≤ 72-hrs
137.00	feet	E_{BTM} = Elevation of the bottom of the basin	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
137.00	feet	D_{SHWT} = Separation from SHWT	≥ *[3]
137.0	feet	D_{ROCK} = Separation from bedrock	≥ *[3]
N/A	ft	D_{amend} = Depth of amended soil, if applicable due high infiltation rate	≥ 24"
2.00	ft	D_T = Depth of trench, if trench proposed	4 - 10 ft
No	Yes/No	If a trench or underground system is proposed, has observation well been provided?	←yes
Yes		If a trench is proposed, does materialmeet Env-Wq 1508.06(k)(2) requirements.[4]	← yes
N/A	Yes/No	If a basin is proposed, Is the perimeter curvilinear, and basin floor flat?	← yes
N/A	:1	If a basin is proposed, pond side slopes.	≥3:1
137.52	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
138.91	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
140.00	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench?[5]	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. $Ksat_{DESIGN}$ includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

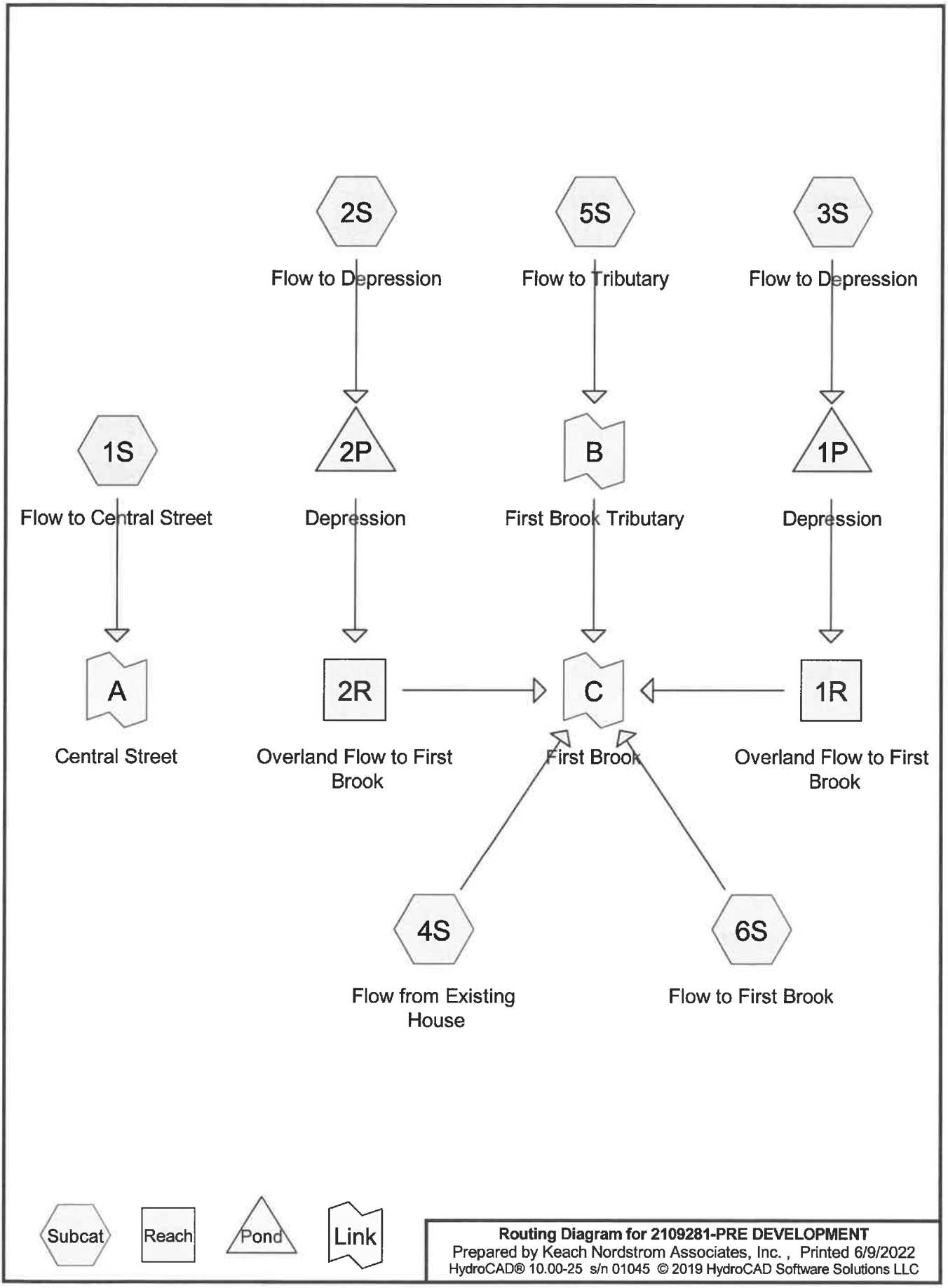
Designer's Notes:

HYDROCAD DRAINAGE ANALYSIS

I. 2-YR, PRE-DEVELOPMENT
II. 10-YR, PRE-DEVELOPMENT
III. 25-YR, PRE-DEVELOPMENT
IV. 50-YR, PRE-DEVELOPMENT

V. 2-YR, POST-DEVELOPMENT
VI. 10-YR, POST-DEVELOPMENT
VII. 25-YR, POST-DEVELOPMENT
VIII. 50-YR, POST-DEVELOPMENT

IX. FROZEN GROUND CONDITIONS POND NODES



Routing Diagram for 2109281-PRE DEVELOPMENT
Prepared by Keach Nordstrom Associates, Inc. , Printed 6/9/2022
HydroCAD® 10.00-25 s/n 01045 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow to Central Street Runoff Area=21,075 sf 15.46% Impervious Runoff Depth>0.49"
Flow Length=125' Tc=13.9 min CN=WQ Runoff=0.20 cfs 0.02 af

Subcatchment 2S: Flow to Depression Runoff Area=43,218 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=144' Tc=13.9 min CN=WQ Runoff=0.00 cfs 0.00 af

Subcatchment 3S: Flow to Depression Runoff Area=37,017 sf 1.72% Impervious Runoff Depth>0.05"
Flow Length=163' Tc=19.0 min CN=WQ Runoff=0.03 cfs 0.00 af

Subcatchment 4S: Flow from Existing Runoff Area=84,645 sf 16.53% Impervious Runoff Depth>0.52"
Flow Length=162' Tc=23.8 min CN=WQ Runoff=0.68 cfs 0.08 af

Subcatchment 5S: Flow to Tributary Runoff Area=98,684 sf 4.88% Impervious Runoff Depth>0.13"
Flow Length=747' Tc=19.9 min CN=WQ Runoff=0.22 cfs 0.02 af

Subcatchment 6S: Flow to First Brook Runoff Area=73,668 sf 0.00% Impervious Runoff Depth>0.00"
Flow Length=247' Tc=15.1 min CN=WQ Runoff=0.00 cfs 0.00 af

Reach 1R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=150.0' S=0.1520 '/' Capacity=282.79 cfs Outflow=0.00 cfs 0.00 af

Reach 2R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=170.0' S=0.1194 '/' Capacity=250.65 cfs Outflow=0.00 cfs 0.00 af

Pond 1P: Depression Peak Elev=140.07' Storage=144 cf Inflow=0.03 cfs 0.00 af
Outflow=0.00 cfs 0.00 af

Pond 2P: Depression Peak Elev=135.00' Storage=0 cf Inflow=0.00 cfs 0.00 af
Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.20 cfs 0.02 af
Primary=0.20 cfs 0.02 af

Link B: First Brook Tributary Inflow=0.22 cfs 0.02 af
Primary=0.22 cfs 0.02 af

Link C: First Brook Inflow=0.89 cfs 0.11 af
Primary=0.89 cfs 0.11 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.13 af Average Runoff Depth = 0.19"
93.66% Pervious = 7.704 ac 6.34% Impervious = 0.521 ac

Summary for Subcatchment 1S: Flow to Central Street

Runoff = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af, Depth> 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
1,998	98.0	Paved parking, HSG A
1,260	98.0	Roofs, HSG A
1,466	30.0	Woods, Good, HSG A
15,781	39.0	>75% Grass cover, Good, HSG A
570	96.0	Gravel surface, HSG A
21,075		Weighted Average
17,817	40.1	84.54% Pervious Area
3,258	98.0	15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	125	Total			

Summary for Subcatchment 2S: Flow to Depression

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
22,970	30.0	Woods, Good, HSG A
20,248	39.0	>75% Grass cover, Good, HSG A
43,218		Weighted Average
43,218	34.2	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.0	94	0.0957	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	144	Total			

Summary for Subcatchment 3S: Flow to Depression

Runoff = 0.03 cfs @ 12.25 hrs, Volume= 0.00 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
18,978	30.0	Woods, Good, HSG A
17,402	39.0	>75% Grass cover, Good, HSG A
637	98.0	Roofs, HSG A
37,017		Weighted Average
36,380	34.3	98.28% Pervious Area
637	98.0	1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.0	163	Total			

Summary for Subcatchment 4S: Flow from Existing House

Runoff = 0.68 cfs @ 12.31 hrs, Volume= 0.08 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,838	30.0	Woods, Good, HSG A
39,430	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
84,645		Weighted Average
70,651	37.2	83.47% Pervious Area
13,994	98.0	16.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.8	162	Total			

Summary for Subcatchment 5S: Flow to Tributary

Runoff = 0.22 cfs @ 12.26 hrs, Volume= 0.02 af, Depth> 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
46,962	30.0	Woods, Good, HSG A
46,908	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
98,684		Weighted Average
93,870	34.5	95.12% Pervious Area
4,814	98.0	4.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
19.9	747	Total			

Summary for Subcatchment 6S: Flow to First Brook

Runoff = 0.00 cfs @ 12.20 hrs, Volume= 0.00 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
65,603	30.0	Woods, Good, HSG A
7,986	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
73,668		Weighted Average
73,668	31.0	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	90	0.0444	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	57	0.0614	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	50	0.3200	2.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	247	Total			

Summary for Reach 1R: Overland Flow to First Brook

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 282.79 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 150.0' Slope= 0.1520 '/'
Inlet Invert= 141.80', Outlet Invert= 119.00'

‡

Summary for Reach 2R: Overland Flow to First Brook

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 250.65 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 170.0' Slope= 0.1194 '/'
Inlet Invert= 137.80', Outlet Invert= 117.50'

‡

Summary for Pond 1P: Depression

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth > 0.05" for 2-YEAR event
Inflow = 0.03 cfs @ 12.25 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.07' @ 24.00 hrs Surf.Area= 2,060 sf Storage= 144 cf
Flood Elev= 142.00' Surf.Area= 3,991 sf Storage= 5,980 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	5,980 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,989	0	0
142.00	3,991	5,980	5,980

Device	Routing	Invert	Outlet Devices
#1	Primary	141.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.00' TW=141.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 135.00' @ 0.00 hrs Surf.Area= 250 sf Storage= 0 cf
Flood Elev= 139.00' Surf.Area= 6,715 sf Storage= 15,895 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	15,895 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
135.00	250	0	0
136.00	2,787	1,519	1,519
138.00	5,488	8,275	9,794
139.00	6,715	6,102	15,895

Device	Routing	Invert	Outlet Devices
#1	Primary	137.90'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=137.80' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.484 ac, 15.46% Impervious, Inflow Depth > 0.49" for 2-YEAR event
Inflow = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af
Primary = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 2.265 ac, 4.88% Impervious, Inflow Depth > 0.13" for 2-YEAR event
Inflow = 0.22 cfs @ 12.26 hrs, Volume= 0.02 af
Primary = 0.22 cfs @ 12.26 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.742 ac, 5.77% Impervious, Inflow Depth > 0.17" for 2-YEAR event
Inflow = 0.89 cfs @ 12.30 hrs, Volume= 0.11 af
Primary = 0.89 cfs @ 12.30 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow to Central Street Runoff Area=21,075 sf 15.46% Impervious Runoff Depth>0.83"
Flow Length=125' Tc=13.9 min CN=WQ Runoff=0.30 cfs 0.03 af

Subcatchment 2S: Flow to Depression Runoff Area=43,218 sf 0.00% Impervious Runoff Depth>0.05"
Flow Length=144' Tc=13.9 min CN=WQ Runoff=0.01 cfs 0.00 af

Subcatchment 3S: Flow to Depression Runoff Area=37,017 sf 1.72% Impervious Runoff Depth>0.12"
Flow Length=163' Tc=19.0 min CN=WQ Runoff=0.04 cfs 0.01 af

Subcatchment 4S: Flow from Existing Runoff Area=84,645 sf 16.53% Impervious Runoff Depth>0.85"
Flow Length=162' Tc=23.8 min CN=WQ Runoff=1.03 cfs 0.14 af

Subcatchment 5S: Flow to Tributary Runoff Area=98,684 sf 4.88% Impervious Runoff Depth>0.25"
Flow Length=747' Tc=19.9 min CN=WQ Runoff=0.33 cfs 0.05 af

Subcatchment 6S: Flow to First Brook Runoff Area=73,668 sf 0.00% Impervious Runoff Depth>0.02"
Flow Length=247' Tc=15.1 min CN=WQ Runoff=0.01 cfs 0.00 af

Reach 1R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=150.0' S=0.1520 '/' Capacity=282.79 cfs Outflow=0.00 cfs 0.00 af

Reach 2R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=170.0' S=0.1194 '/' Capacity=250.65 cfs Outflow=0.00 cfs 0.00 af

Pond 1P: Depression Peak Elev=140.18' Storage=370 cf Inflow=0.04 cfs 0.01 af
Outflow=0.00 cfs 0.00 af

Pond 2P: Depression Peak Elev=135.28' Storage=172 cf Inflow=0.01 cfs 0.00 af
Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.30 cfs 0.03 af
Primary=0.30 cfs 0.03 af

Link B: First Brook Tributary Inflow=0.33 cfs 0.05 af
Primary=0.33 cfs 0.05 af

Link C: First Brook Inflow=1.36 cfs 0.19 af
Primary=1.36 cfs 0.19 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.23 af Average Runoff Depth = 0.34"
93.66% Pervious = 7.704 ac 6.34% Impervious = 0.521 ac

Summary for Subcatchment 1S: Flow to Central Street

Runoff = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af, Depth> 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
1,998	98.0	Paved parking, HSG A
1,260	98.0	Roofs, HSG A
1,466	30.0	Woods, Good, HSG A
15,781	39.0	>75% Grass cover, Good, HSG A
570	96.0	Gravel surface, HSG A
21,075		Weighted Average
17,817	40.1	84.54% Pervious Area
3,258	98.0	15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	125	Total			

Summary for Subcatchment 2S: Flow to Depression

Runoff = 0.01 cfs @ 14.90 hrs, Volume= 0.00 af, Depth> 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
22,970	30.0	Woods, Good, HSG A
20,248	39.0	>75% Grass cover, Good, HSG A
43,218		Weighted Average
43,218	34.2	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.0	94	0.0957	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	144	Total			

Summary for Subcatchment 3S: Flow to Depression

Runoff = 0.04 cfs @ 12.25 hrs, Volume= 0.01 af, Depth> 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
18,978	30.0	Woods, Good, HSG A
17,402	39.0	>75% Grass cover, Good, HSG A
637	98.0	Roofs, HSG A
37,017		Weighted Average
36,380	34.3	98.28% Pervious Area
637	98.0	1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.0	163	Total			

Summary for Subcatchment 4S: Flow from Existing House

Runoff = 1.03 cfs @ 12.31 hrs, Volume= 0.14 af, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,838	30.0	Woods, Good, HSG A
39,430	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
84,645		Weighted Average
70,651	37.2	83.47% Pervious Area
13,994	98.0	16.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.8	162	Total			

Summary for Subcatchment 5S: Flow to Tributary

Runoff = 0.33 cfs @ 12.26 hrs, Volume= 0.05 af, Depth> 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
46,962	30.0	Woods, Good, HSG A
46,908	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
98,684		Weighted Average
93,870	34.5	95.12% Pervious Area
4,814	98.0	4.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
19.9	747	Total			

Summary for Subcatchment 6S: Flow to First Brook

Runoff = 0.01 cfs @ 12.20 hrs, Volume= 0.00 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
65,603	30.0	Woods, Good, HSG A
7,986	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
73,668		Weighted Average
73,668	31.0	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	90	0.0444	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	57	0.0614	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	50	0.3200	2.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	247	Total			

Summary for Reach 1R: Overland Flow to First Brook

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 282.79 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 150.0' Slope= 0.1520 '/'
Inlet Invert= 141.80', Outlet Invert= 119.00'

‡

Summary for Reach 2R: Overland Flow to First Brook

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 250.65 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 170.0' Slope= 0.1194 '/'
Inlet Invert= 137.80', Outlet Invert= 117.50'

‡

Summary for Pond 1P: Depression

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth > 0.12" for 10-YEAR event
Inflow = 0.04 cfs @ 12.25 hrs, Volume= 0.01 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.18' @ 24.00 hrs Surf.Area= 2,167 sf Storage= 370 cf
Flood Elev= 142.00' Surf.Area= 3,991 sf Storage= 5,980 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	5,980 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,989	0	0
142.00	3,991	5,980	5,980

Device	Routing	Invert	Outlet Devices
#1	Primary	141.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.00' TW=141.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth > 0.05" for 10-YEAR event
Inflow = 0.01 cfs @ 14.90 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 135.28' @ 24.00 hrs Surf.Area= 966 sf Storage= 172 cf
Flood Elev= 139.00' Surf.Area= 6,715 sf Storage= 15,895 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	15,895 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
135.00	250	0	0
136.00	2,787	1,519	1,519
138.00	5,488	8,275	9,794
139.00	6,715	6,102	15,895

Device	Routing	Invert	Outlet Devices
#1	Primary	137.90'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=137.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.484 ac, 15.46% Impervious, Inflow Depth > 0.83" for 10-YEAR event
Inflow = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af
Primary = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 2.265 ac, 4.88% Impervious, Inflow Depth > 0.25" for 10-YEAR event
Inflow = 0.33 cfs @ 12.26 hrs, Volume= 0.05 af
Primary = 0.33 cfs @ 12.26 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.742 ac, 5.77% Impervious, Inflow Depth > 0.29" for 10-YEAR event
Inflow = 1.36 cfs @ 12.29 hrs, Volume= 0.19 af
Primary = 1.36 cfs @ 12.29 hrs, Volume= 0.19 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow to Central Street Runoff Area=21,075 sf 15.46% Impervious Runoff Depth>1.23"
Flow Length=125' Tc=13.9 min CN=WQ Runoff=0.38 cfs 0.05 af

Subcatchment 2S: Flow to Depression Runoff Area=43,218 sf 0.00% Impervious Runoff Depth>0.18"
Flow Length=144' Tc=13.9 min CN=WQ Runoff=0.05 cfs 0.01 af

Subcatchment 3S: Flow to Depression Runoff Area=37,017 sf 1.72% Impervious Runoff Depth>0.27"
Flow Length=163' Tc=19.0 min CN=WQ Runoff=0.07 cfs 0.02 af

Subcatchment 4S: Flow from Existing Runoff Area=84,645 sf 16.53% Impervious Runoff Depth>1.20"
Flow Length=162' Tc=23.8 min CN=WQ Runoff=1.33 cfs 0.19 af

Subcatchment 5S: Flow to Tributary Runoff Area=98,684 sf 4.88% Impervious Runoff Depth>0.44"
Flow Length=747' Tc=19.9 min CN=WQ Runoff=0.43 cfs 0.08 af

Subcatchment 6S: Flow to First Brook Runoff Area=73,668 sf 0.00% Impervious Runoff Depth>0.07"
Flow Length=247' Tc=15.1 min CN=WQ Runoff=0.02 cfs 0.01 af

Reach 1R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=150.0' S=0.1520 '/' Capacity=282.79 cfs Outflow=0.00 cfs 0.00 af

Reach 2R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=170.0' S=0.1194 '/' Capacity=250.65 cfs Outflow=0.00 cfs 0.00 af

Pond 1P: Depression Peak Elev=140.38' Storage=834 cf Inflow=0.07 cfs 0.02 af
Outflow=0.00 cfs 0.00 af

Pond 2P: Depression Peak Elev=135.62' Storage=643 cf Inflow=0.05 cfs 0.01 af
Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.38 cfs 0.05 af
Primary=0.38 cfs 0.05 af

Link B: First Brook Tributary Inflow=0.43 cfs 0.08 af
Primary=0.43 cfs 0.08 af

Link C: First Brook Inflow=1.77 cfs 0.29 af
Primary=1.77 cfs 0.29 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.37 af Average Runoff Depth = 0.54"
93.66% Pervious = 7.704 ac 6.34% Impervious = 0.521 ac

Summary for Subcatchment 1S: Flow to Central Street

Runoff = 0.38 cfs @ 12.19 hrs, Volume= 0.05 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
1,998	98.0	Paved parking, HSG A
1,260	98.0	Roofs, HSG A
1,466	30.0	Woods, Good, HSG A
15,781	39.0	>75% Grass cover, Good, HSG A
570	96.0	Gravel surface, HSG A
21,075		Weighted Average
17,817	40.1	84.54% Pervious Area
3,258	98.0	15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	125	Total			

Summary for Subcatchment 2S: Flow to Depression

Runoff = 0.05 cfs @ 12.51 hrs, Volume= 0.01 af, Depth> 0.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
22,970	30.0	Woods, Good, HSG A
20,248	39.0	>75% Grass cover, Good, HSG A
43,218		Weighted Average
43,218	34.2	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.0	94	0.0957	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	144	Total			

Summary for Subcatchment 3S: Flow to Depression

Runoff = 0.07 cfs @ 12.47 hrs, Volume= 0.02 af, Depth> 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
18,978	30.0	Woods, Good, HSG A
17,402	39.0	>75% Grass cover, Good, HSG A
637	98.0	Roofs, HSG A
37,017		Weighted Average
36,380	34.3	98.28% Pervious Area
637	98.0	1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.0	163	Total			

Summary for Subcatchment 4S: Flow from Existing House

Runoff = 1.33 cfs @ 12.32 hrs, Volume= 0.19 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,838	30.0	Woods, Good, HSG A
39,430	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
84,645		Weighted Average
70,651	37.2	83.47% Pervious Area
13,994	98.0	16.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.8	162	Total			

Summary for Subcatchment 5S: Flow to Tributary

Runoff = 0.43 cfs @ 12.28 hrs, Volume= 0.08 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
46,962	30.0	Woods, Good, HSG A
46,908	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
98,684		Weighted Average
93,870	34.5	95.12% Pervious Area
4,814	98.0	4.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
19.9	747	Total			

Summary for Subcatchment 6S: Flow to First Brook

Runoff = 0.02 cfs @ 12.50 hrs, Volume= 0.01 af, Depth> 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
65,603	30.0	Woods, Good, HSG A
7,986	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
73,668		Weighted Average
73,668	31.0	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	90	0.0444	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	57	0.0614	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	50	0.3200	2.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	247	Total			

Summary for Reach 1R: Overland Flow to First Brook

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth = 0.00" for 25-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 282.79 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 150.0' Slope= 0.1520 '/'
Inlet Invert= 141.80', Outlet Invert= 119.00'

‡

Summary for Reach 2R: Overland Flow to First Brook

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth = 0.00" for 25-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 250.65 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 170.0' Slope= 0.1194 '/'
Inlet Invert= 137.80', Outlet Invert= 117.50'

‡

Summary for Pond 1P: Depression

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth > 0.27" for 25-YEAR event
Inflow = 0.07 cfs @ 12.47 hrs, Volume= 0.02 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.38' @ 24.00 hrs Surf.Area= 2,372 sf Storage= 834 cf
Flood Elev= 142.00' Surf.Area= 3,991 sf Storage= 5,980 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	5,980 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,989	0	0
142.00	3,991	5,980	5,980

Device	Routing	Invert	Outlet Devices
#1	Primary	141.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.00' TW=141.80' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 2P: Depression

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth > 0.18" for 25-YEAR event
Inflow = 0.05 cfs @ 12.51 hrs, Volume= 0.01 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 135.62' @ 24.00 hrs Surf.Area= 1,824 sf Storage= 643 cf
Flood Elev= 139.00' Surf.Area= 6,715 sf Storage= 15,895 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	15,895 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
135.00	250	0	0
136.00	2,787	1,519	1,519
138.00	5,488	8,275	9,794
139.00	6,715	6,102	15,895

Device	Routing	Invert	Outlet Devices
#1	Primary	137.90'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=137.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.484 ac, 15.46% Impervious, Inflow Depth > 1.23" for 25-YEAR event
Inflow = 0.38 cfs @ 12.19 hrs, Volume= 0.05 af
Primary = 0.38 cfs @ 12.19 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 2.265 ac, 4.88% Impervious, Inflow Depth > 0.44" for 25-YEAR event
Inflow = 0.43 cfs @ 12.28 hrs, Volume= 0.08 af
Primary = 0.43 cfs @ 12.28 hrs, Volume= 0.08 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.742 ac, 5.77% Impervious, Inflow Depth > 0.45" for 25-YEAR event
Inflow = 1.77 cfs @ 12.31 hrs, Volume= 0.29 af
Primary = 1.77 cfs @ 12.31 hrs, Volume= 0.29 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow to Central Street Runoff Area=21,075 sf 15.46% Impervious Runoff Depth>1.68"
Flow Length=125' Tc=13.9 min CN=WQ Runoff=0.52 cfs 0.07 af

Subcatchment 2S: Flow to Depression Runoff Area=43,218 sf 0.00% Impervious Runoff Depth>0.40"
Flow Length=144' Tc=13.9 min CN=WQ Runoff=0.14 cfs 0.03 af

Subcatchment 3S: Flow to Depression Runoff Area=37,017 sf 1.72% Impervious Runoff Depth>0.51"
Flow Length=163' Tc=19.0 min CN=WQ Runoff=0.16 cfs 0.04 af

Subcatchment 4S: Flow from Existing Runoff Area=84,645 sf 16.53% Impervious Runoff Depth>1.61"
Flow Length=162' Tc=23.8 min CN=WQ Runoff=1.72 cfs 0.26 af

Subcatchment 5S: Flow to Tributary Runoff Area=98,684 sf 4.88% Impervious Runoff Depth>0.71"
Flow Length=747' Tc=19.9 min CN=WQ Runoff=0.71 cfs 0.13 af

Subcatchment 6S: Flow to First Brook Runoff Area=73,668 sf 0.00% Impervious Runoff Depth>0.23"
Flow Length=247' Tc=15.1 min CN=WQ Runoff=0.06 cfs 0.03 af

Reach 1R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=150.0' S=0.1520 '/' Capacity=282.79 cfs Outflow=0.00 cfs 0.00 af

Reach 2R: Overland Flow to First Brook Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.00 af
n=0.013 L=170.0' S=0.1194 '/' Capacity=250.65 cfs Outflow=0.00 cfs 0.00 af

Pond 1P: Depression Peak Elev=140.67' Storage=1,566 cf Inflow=0.16 cfs 0.04 af
Outflow=0.00 cfs 0.00 af

Pond 2P: Depression Peak Elev=135.97' Storage=1,439 cf Inflow=0.14 cfs 0.03 af
Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.52 cfs 0.07 af
Primary=0.52 cfs 0.07 af

Link B: First Brook Tributary Inflow=0.71 cfs 0.13 af
Primary=0.71 cfs 0.13 af

Link C: First Brook Inflow=2.49 cfs 0.43 af
Primary=2.49 cfs 0.43 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.56 af Average Runoff Depth = 0.82"
93.66% Pervious = 7.704 ac 6.34% Impervious = 0.521 ac

Summary for Subcatchment 1S: Flow to Central Street

Runoff = 0.52 cfs @ 12.20 hrs, Volume= 0.07 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
1,998	98.0	Paved parking, HSG A
1,260	98.0	Roofs, HSG A
1,466	30.0	Woods, Good, HSG A
15,781	39.0	>75% Grass cover, Good, HSG A
570	96.0	Gravel surface, HSG A
21,075		Weighted Average
17,817	40.1	84.54% Pervious Area
3,258	98.0	15.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.9	125	Total			

Summary for Subcatchment 2S: Flow to Depression

Runoff = 0.14 cfs @ 12.40 hrs, Volume= 0.03 af, Depth> 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
22,970	30.0	Woods, Good, HSG A
20,248	39.0	>75% Grass cover, Good, HSG A
43,218		Weighted Average
43,218	34.2	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.0	94	0.0957	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.9	144	Total			

Summary for Subcatchment 3S: Flow to Depression

Runoff = 0.16 cfs @ 12.39 hrs, Volume= 0.04 af, Depth> 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
18,978	30.0	Woods, Good, HSG A
17,402	39.0	>75% Grass cover, Good, HSG A
637	98.0	Roofs, HSG A
37,017		Weighted Average
36,380	34.3	98.28% Pervious Area
637	98.0	1.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
19.0	163	Total			

Summary for Subcatchment 4S: Flow from Existing House

Runoff = 1.72 cfs @ 12.33 hrs, Volume= 0.26 af, Depth> 1.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,838	30.0	Woods, Good, HSG A
39,430	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
84,645		Weighted Average
70,651	37.2	83.47% Pervious Area
13,994	98.0	16.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.4	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
23.8	162	Total			

Summary for Subcatchment 5S: Flow to Tributary

Runoff = 0.71 cfs @ 12.33 hrs, Volume= 0.13 af, Depth> 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
46,962	30.0	Woods, Good, HSG A
46,908	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
98,684		Weighted Average
93,870	34.5	95.12% Pervious Area
4,814	98.0	4.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
19.9	747	Total			

Summary for Subcatchment 6S: Flow to First Brook

Runoff = 0.06 cfs @ 12.40 hrs, Volume= 0.03 af, Depth> 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
65,603	30.0	Woods, Good, HSG A
7,986	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
73,668		Weighted Average
73,668	31.0	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.8	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
1.4	90	0.0444	1.05		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.5	57	0.0614	1.73		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.3	50	0.3200	2.83		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
15.1	247	Total			

Summary for Reach 1R: Overland Flow to First Brook

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth = 0.00" for 50-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 282.79 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 150.0' Slope= 0.1520 '/'
Inlet Invert= 141.80', Outlet Invert= 119.00'

‡

Summary for Reach 2R: Overland Flow to First Brook

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth = 0.00" for 50-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
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= 8.0 sf, Capacity= 250.65 cfs

5.00' x 1.00' deep channel, n= 0.013 Corrugated PE, smooth interior
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 170.0' Slope= 0.1194 '/'
Inlet Invert= 137.80', Outlet Invert= 117.50'

‡

Summary for Pond 1P: Depression

Inflow Area = 0.850 ac, 1.72% Impervious, Inflow Depth > 0.51" for 50-YEAR event
Inflow = 0.16 cfs @ 12.39 hrs, Volume= 0.04 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.67' @ 24.00 hrs Surf.Area= 2,663 sf Storage= 1,566 cf
Flood Elev= 142.00' Surf.Area= 3,991 sf Storage= 5,980 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	140.00'	5,980 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
140.00	1,989	0	0
142.00	3,991	5,980	5,980

Device	Routing	Invert	Outlet Devices
#1	Primary	141.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=140.00' TW=141.80' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: Depression

Inflow Area = 0.992 ac, 0.00% Impervious, Inflow Depth > 0.40" for 50-YEAR event
Inflow = 0.14 cfs @ 12.40 hrs, Volume= 0.03 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 135.97' @ 24.00 hrs Surf.Area= 2,714 sf Storage= 1,439 cf
Flood Elev= 139.00' Surf.Area= 6,715 sf Storage= 15,895 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	135.00'	15,895 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
135.00	250	0	0
136.00	2,787	1,519	1,519
138.00	5,488	8,275	9,794
139.00	6,715	6,102	15,895

Device	Routing	Invert	Outlet Devices
#1	Primary	137.90'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=137.80' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.484 ac, 15.46% Impervious, Inflow Depth > 1.68" for 50-YEAR event
Inflow = 0.52 cfs @ 12.20 hrs, Volume= 0.07 af
Primary = 0.52 cfs @ 12.20 hrs, Volume= 0.07 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

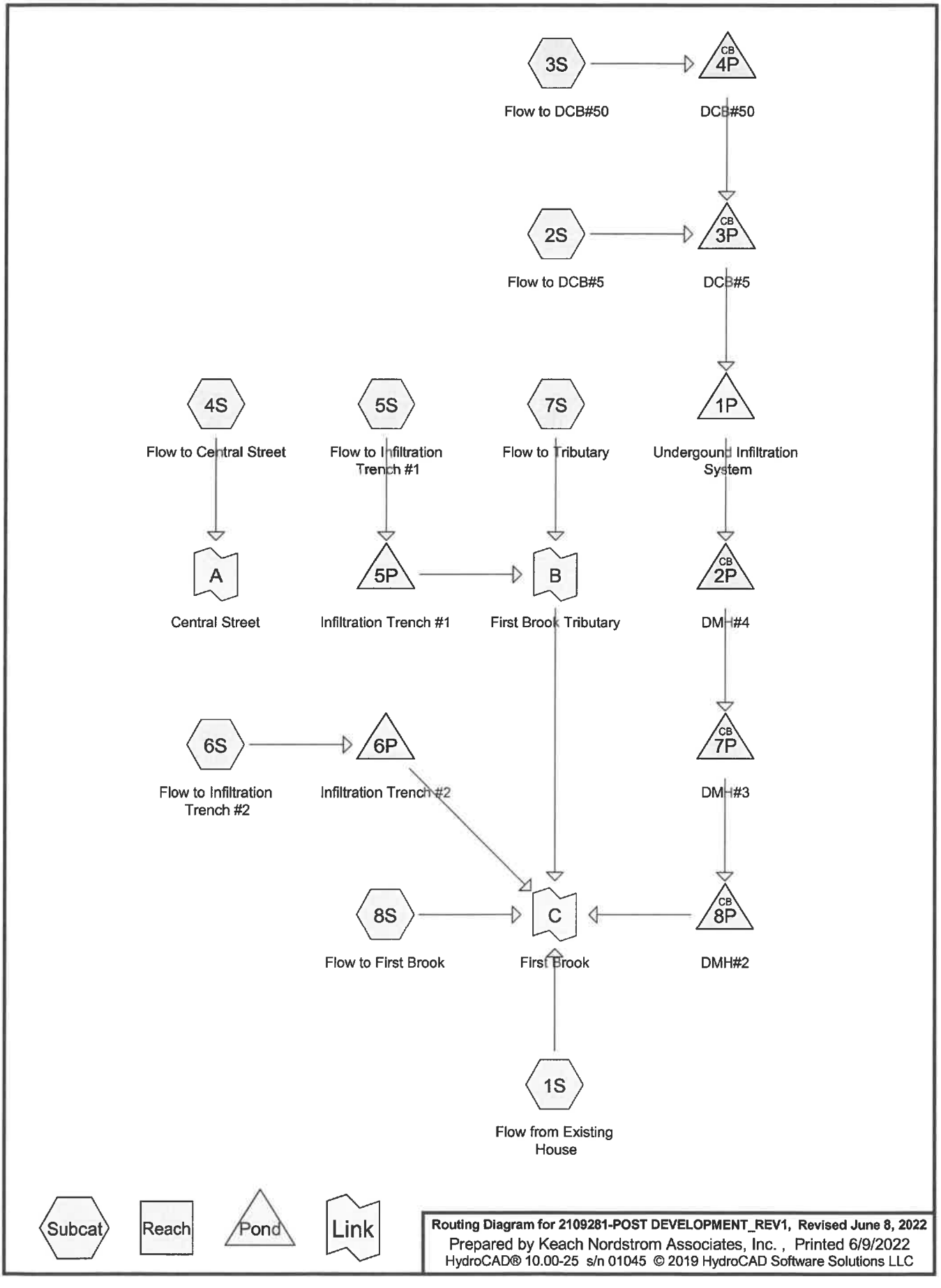
Inflow Area = 2.265 ac, 4.88% Impervious, Inflow Depth > 0.71" for 50-YEAR event
Inflow = 0.71 cfs @ 12.33 hrs, Volume= 0.13 af
Primary = 0.71 cfs @ 12.33 hrs, Volume= 0.13 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.742 ac, 5.77% Impervious, Inflow Depth > 0.66" for 50-YEAR event
Inflow = 2.49 cfs @ 12.33 hrs, Volume= 0.43 af
Primary = 2.49 cfs @ 12.33 hrs, Volume= 0.43 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs



Routing Diagram for 2109281-POST DEVELOPMENT_REV1, Revised June 8, 2022

Prepared by Keach Nordstrom Associates, Inc. , Printed 6/9/2022

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow from Existing Runoff Area=86,036 sf 16.27% Impervious Runoff Depth>0.51"
Flow Length=162' Tc=24.2 min CN=WQ Runoff=0.67 cfs 0.08 af

Subcatchment 2S: Flow to DCB#5 Runoff Area=75,925 sf 24.53% Impervious Runoff Depth>0.67"
Tc=6.0 min CN=WQ Runoff=1.21 cfs 0.10 af

Subcatchment 3S: Flow to DCB#50 Runoff Area=43,243 sf 36.54% Impervious Runoff Depth>0.99"
Tc=6.0 min CN=WQ Runoff=1.03 cfs 0.08 af

Subcatchment 4S: Flow to Central Street Runoff Area=15,941 sf 20.44% Impervious Runoff Depth>0.64"
Flow Length=125' Tc=13.7 min CN=WQ Runoff=0.20 cfs 0.02 af

Subcatchment 5S: Flow to Infiltration Runoff Area=23,530 sf 12.75% Impervious Runoff Depth>0.35"
Flow Length=269' Tc=16.8 min CN=WQ Runoff=0.14 cfs 0.02 af

Subcatchment 6S: Flow to Infiltration Runoff Area=16,816 sf 5.95% Impervious Runoff Depth>0.16"
Tc=6.0 min CN=WQ Runoff=0.07 cfs 0.01 af

Subcatchment 7S: Flow to Tributary Runoff Area=58,458 sf 8.23% Impervious Runoff Depth>0.22"
Flow Length=747' Tc=20.2 min CN=WQ Runoff=0.21 cfs 0.02 af

Subcatchment 8S: Flow to First Brook Runoff Area=38,360 sf 0.00% Impervious Runoff Depth>0.01"
Flow Length=200' Tc=14.3 min CN=WQ Runoff=0.00 cfs 0.00 af

Pond 1P: Undergound Infiltration System Peak Elev=136.05' Storage=2,415 cf Inflow=2.24 cfs 0.18 af
Discarded=0.26 cfs 0.18 af Primary=0.00 cfs 0.00 af Outflow=0.26 cfs 0.18 af

Pond 2P: DMH#4 Peak Elev=133.82' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=198.7' S=0.0100 '/' Outflow=0.00 cfs 0.00 af

Pond 3P: DCB#5 Peak Elev=137.06' Inflow=2.24 cfs 0.18 af
15.0" Round Culvert n=0.013 L=119.6' S=0.0050 '/' Outflow=2.24 cfs 0.18 af

Pond 4P: DCB#50 Peak Elev=137.35' Inflow=1.03 cfs 0.08 af
12.0" Round Culvert n=0.013 L=22.0' S=0.0200 '/' Outflow=1.03 cfs 0.08 af

Pond 5P: Infiltration Trench #1 Peak Elev=139.25' Storage=192 cf Inflow=0.14 cfs 0.02 af
Discarded=0.03 cfs 0.02 af Primary=0.00 cfs 0.00 af Outflow=0.03 cfs 0.02 af

Pond 6P: Infiltration Trench #2 Peak Elev=137.21' Storage=28 cf Inflow=0.07 cfs 0.01 af
Discarded=0.02 cfs 0.01 af Primary=0.00 cfs 0.00 af Outflow=0.02 cfs 0.01 af

Pond 7P: DMH#3 Peak Elev=127.70' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.00 cfs 0.00 af

Pond 8P: DMH#2 Peak Elev=122.80' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=10.0' S=0.0800 '/' Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.20 cfs 0.02 af
Primary=0.20 cfs 0.02 af

Link B: First Brook Tributary Inflow=0.21 cfs 0.02 af
Primary=0.21 cfs 0.02 af

Link C: First Brook Inflow=0.88 cfs 0.11 af
Primary=0.88 cfs 0.11 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.33 af Average Runoff Depth = 0.48"
83.12% Pervious = 6.837 ac 16.88% Impervious = 1.389 ac

Summary for Subcatchment 1S: Flow from Existing House

Runoff = 0.67 cfs @ 12.32 hrs, Volume= 0.08 af, Depth> 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,793	30.0	Woods, Good, HSG A
40,866	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
86,036		Weighted Average
72,042	37.3	83.73% Pervious Area
13,994	98.0	16.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.2	162	Total			

Summary for Subcatchment 2S: Flow to DCB#5

Runoff = 1.21 cfs @ 12.08 hrs, Volume= 0.10 af, Depth> 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	8,986	98.0	Paved parking, HSG A
	56,071	39.0	>75% Grass cover, Good, HSG A
	637	98.0	Roofs, HSG A
	1,231	30.0	Woods, Good, HSG A
*	9,000	98.0	Lots, HSG A
	75,925		Weighted Average
	57,302	38.8	75.47% Pervious Area
	18,623	98.0	24.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Flow to DCB#50

Runoff = 1.03 cfs @ 12.08 hrs, Volume= 0.08 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	27,440	39.0	>75% Grass cover, Good, HSG A
	10,803	98.0	Paved parking, HSG A
*	5,000	98.0	Lots, HSG A
	43,243		Weighted Average
	27,440	39.0	63.46% Pervious Area
	15,803	98.0	36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 4S: Flow to Central Street

Runoff = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af, Depth> 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
11,163	39.0	>75% Grass cover, Good, HSG A
1,260	98.0	Roofs, HSG A
1,998	98.0	Paved parking, HSG A
570	96.0	Gravel surface, HSG A
950	30.0	Woods, Good, HSG A
15,941		Weighted Average
12,683	40.9	79.56% Pervious Area
3,258	98.0	20.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.6	10	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	125	Total			

Summary for Subcatchment 5S: Flow to Infiltration Trench #1

Runoff = 0.14 cfs @ 12.22 hrs, Volume= 0.02 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
*	3,000	98.0	Lots, HSG A
	14,196	39.0	>75% Grass cover, Good, HSG A
	6,334	30.0	Woods, Good, HSG A
	23,530		Weighted Average
	20,530	36.2	87.25% Pervious Area
	3,000	98.0	12.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.1	185	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	22	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	12	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.8	269	Total			

Summary for Subcatchment 6S: Flow to Infiltration Trench #2

Runoff = 0.07 cfs @ 12.08 hrs, Volume= 0.01 af, Depth> 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	6,548	30.0	Woods, Good, HSG A
	9,268	39.0	>75% Grass cover, Good, HSG A
*	1,000	98.0	Lots, HSG A
	16,816		Weighted Average
	15,816	35.3	94.05% Pervious Area
	1,000	98.0	5.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Flow to Tributary

Runoff = 0.21 cfs @ 12.26 hrs, Volume= 0.02 af, Depth> 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
38,714	30.0	Woods, Good, HSG A
14,930	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
58,458		Weighted Average
53,644	32.5	91.77% Pervious Area
4,814	98.0	8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
20.2	747	Total			

Summary for Subcatchment 8S: Flow to First Brook

Runoff = 0.00 cfs @ 12.19 hrs, Volume= 0.00 af, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
32,083	30.0	Woods, Good, HSG A
6,198	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
38,360		Weighted Average
38,360	31.6	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.2	150	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	200	Total			

Summary for Pond 1P: Undergound Infiltration System

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 0.78" for 2-YEAR event
Inflow = 2.24 cfs @ 12.08 hrs, Volume= 0.18 af
Outflow = 0.26 cfs @ 11.73 hrs, Volume= 0.18 af, Atten= 88%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.73 hrs, Volume= 0.18 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 136.05' @ 12.68 hrs Surf.Area= 3,776 sf Storage= 2,415 cf
Flood Elev= 139.00' Surf.Area= 3,776 sf Storage= 8,688 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 57.9 min (815.5 - 757.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	135.00'	4,277 cf	**32.13'W x 117.54'L x 4.00'H Field A** 15,103 cf Overall - 4,410 cf Embedded = 10,693 cf x 40.0% Voids
#2A	135.50'	4,410 cf	**ADS_StormTech SC-740 +Cap** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 6 Rows
		8,688 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	134.30'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.30' / 133.92' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	137.25'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	138.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	135.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.26 cfs @ 11.73 hrs HW=135.05' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=133.82' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 1.54 cfs potential flow)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: DMH#4

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 133.82' @ 0.00 hrs
Flood Elev= 143.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.82'	**12.0" Round Culvert** L= 198.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.82' / 131.83' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.82' TW=127.70' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 3P: DCB#5

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 0.78" for 2-YEAR event
Inflow = 2.24 cfs @ 12.08 hrs, Volume= 0.18 af
Outflow = 2.24 cfs @ 12.08 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.0 min
Primary = 2.24 cfs @ 12.08 hrs, Volume= 0.18 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.06' @ 12.08 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.20'	**15.0" Round Culvert** L= 119.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.20' / 135.60' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=2.22 cfs @ 12.08 hrs HW=137.05' TW=135.63' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.22 cfs @ 3.52 fps)

Summary for Pond 4P: DCB#50

Inflow Area = 0.993 ac, 36.54% Impervious, Inflow Depth > 0.99" for 2-YEAR event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.08 af
Outflow = 1.03 cfs @ 12.08 hrs, Volume= 0.08 af, Atten= 0%, Lag= 0.0 min
Primary = 1.03 cfs @ 12.08 hrs, Volume= 0.08 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.35' @ 12.10 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.74'	**12.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.74' / 136.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.97 cfs @ 12.08 hrs HW=137.34' TW=137.05' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 0.97 cfs @ 2.84 fps)

Summary for Pond 5P: Infiltration Trench #1

Inflow Area = 0.540 ac, 12.75% Impervious, Inflow Depth > 0.35" for 2-YEAR event
Inflow = 0.14 cfs @ 12.22 hrs, Volume= 0.02 af
Outflow = 0.03 cfs @ 11.88 hrs, Volume= 0.02 af, Atten= 81%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.88 hrs, Volume= 0.02 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 139.25' @ 12.84 hrs Surf.Area= 384 sf Storage= 192 cf
Flood Elev= 141.00' Surf.Area= 1,572 sf Storage= 1,285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 42.5 min (809.0 - 766.6)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	1,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	384	0.0	0	0
140.00	384	40.0	307	307
141.00	1,572	100.0	978	1,285

Device	Routing	Invert	Outlet Devices
#1	Primary	140.75'	**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
#2	Discarded	138.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 11.88 hrs HW=138.04' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench #2

Inflow Area = 0.386 ac, 5.95% Impervious, Inflow Depth > 0.16" for 2-YEAR event
Inflow = 0.07 cfs @ 12.08 hrs, Volume= 0.01 af
Outflow = 0.02 cfs @ 12.03 hrs, Volume= 0.01 af, Atten= 65%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.03 hrs, Volume= 0.01 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.21' @ 12.34 hrs Surf.Area= 333 sf Storage= 28 cf
Flood Elev= 140.00' Surf.Area= 1,369 sf Storage= 1,117 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 4.9 min (762.6 - 757.6)

Volume	Invert	Avail.Storage	Storage Description
#1	137.00'	1,117 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.00	333	0.0	0	0
139.00	333	40.0	266	266
140.00	1,369	100.0	851	1,117

Device	Routing	Invert	Outlet Devices
#1	Primary	138.90'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	137.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.03 hrs HW=137.04' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: DMH#3

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 127.70' @ 0.00 hrs
Flood Elev= 137.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	127.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.70' / 126.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.70' TW=122.80' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 8P: DMH#2

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 122.80' @ 0.00 hrs
Flood Elev= 130.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	122.80'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.80' / 122.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.80' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.366 ac, 20.44% Impervious, Inflow Depth > 0.64" for 2-YEAR event
Inflow = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af
Primary = 0.20 cfs @ 12.18 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 1.882 ac, 9.53% Impervious, Inflow Depth > 0.16" for 2-YEAR event
Inflow = 0.21 cfs @ 12.26 hrs, Volume= 0.02 af
Primary = 0.21 cfs @ 12.26 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.860 ac, 16.72% Impervious, Inflow Depth > 0.17" for 2-YEAR event
Inflow = 0.88 cfs @ 12.30 hrs, Volume= 0.11 af
Primary = 0.88 cfs @ 12.30 hrs, Volume= 0.11 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow from Existing Runoff Area=86,036 sf 16.27% Impervious Runoff Depth>0.84"
Flow Length=162' Tc=24.2 min CN=WQ Runoff=1.03 cfs 0.14 af

Subcatchment 2S: Flow to DCB#5 Runoff Area=75,925 sf 24.53% Impervious Runoff Depth>1.11"
Tc=6.0 min CN=WQ Runoff=1.85 cfs 0.16 af

Subcatchment 3S: Flow to DCB#50 Runoff Area=43,243 sf 36.54% Impervious Runoff Depth>1.60"
Tc=6.0 min CN=WQ Runoff=1.57 cfs 0.13 af

Subcatchment 4S: Flow to Central Street Runoff Area=15,941 sf 20.44% Impervious Runoff Depth>1.07"
Flow Length=125' Tc=13.7 min CN=WQ Runoff=0.30 cfs 0.03 af

Subcatchment 5S: Flow to Infiltration Runoff Area=23,530 sf 12.75% Impervious Runoff Depth>0.60"
Flow Length=269' Tc=16.8 min CN=WQ Runoff=0.22 cfs 0.03 af

Subcatchment 6S: Flow to Infiltration Runoff Area=16,816 sf 5.95% Impervious Runoff Depth>0.31"
Tc=6.0 min CN=WQ Runoff=0.10 cfs 0.01 af

Subcatchment 7S: Flow to Tributary Runoff Area=58,458 sf 8.23% Impervious Runoff Depth>0.37"
Flow Length=747' Tc=20.2 min CN=WQ Runoff=0.33 cfs 0.04 af

Subcatchment 8S: Flow to First Brook Runoff Area=38,360 sf 0.00% Impervious Runoff Depth>0.02"
Flow Length=200' Tc=14.3 min CN=WQ Runoff=0.01 cfs 0.00 af

Pond 1P: Undergound Infiltration System Peak Elev=136.78' Storage=4,459 cf Inflow=3.41 cfs 0.29 af
Discarded=0.26 cfs 0.29 af Primary=0.00 cfs 0.00 af Outflow=0.26 cfs 0.29 af

Pond 2P: DMH#4 Peak Elev=133.82' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=198.7' S=0.0100 '/' Outflow=0.00 cfs 0.00 af

Pond 3P: DCB#5 Peak Elev=137.32' Inflow=3.41 cfs 0.29 af
15.0" Round Culvert n=0.013 L=119.6' S=0.0050 '/' Outflow=3.41 cfs 0.29 af

Pond 4P: DCB#50 Peak Elev=137.59' Inflow=1.57 cfs 0.13 af
12.0" Round Culvert n=0.013 L=22.0' S=0.0200 '/' Outflow=1.57 cfs 0.13 af

Pond 5P: Infiltration Trench #1 Peak Elev=140.10' Storage=350 cf Inflow=0.22 cfs 0.03 af
Discarded=0.03 cfs 0.03 af Primary=0.00 cfs 0.00 af Outflow=0.03 cfs 0.03 af

Pond 6P: Infiltration Trench #2 Peak Elev=137.52' Storage=70 cf Inflow=0.10 cfs 0.01 af
Discarded=0.02 cfs 0.01 af Primary=0.00 cfs 0.00 af Outflow=0.02 cfs 0.01 af

Pond 7P: DMH#3 Peak Elev=127.70' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.00 cfs 0.00 af

Pond 8P: DMH#2 Peak Elev=122.80' Inflow=0.00 cfs 0.00 af
12.0" Round Culvert n=0.013 L=10.0' S=0.0800 '/' Outflow=0.00 cfs 0.00 af

Link A: Central Street Inflow=0.30 cfs 0.03 af
Primary=0.30 cfs 0.03 af

Link B: First Brook Tributary Inflow=0.33 cfs 0.04 af
Primary=0.33 cfs 0.04 af

Link C: First Brook Inflow=1.35 cfs 0.18 af
Primary=1.35 cfs 0.18 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.55 af Average Runoff Depth = 0.80"
83.12% Pervious = 6.837 ac 16.88% Impervious = 1.389 ac

Summary for Subcatchment 1S: Flow from Existing House

Runoff = 1.03 cfs @ 12.32 hrs, Volume= 0.14 af, Depth> 0.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,793	30.0	Woods, Good, HSG A
40,866	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
86,036		Weighted Average
72,042	37.3	83.73% Pervious Area
13,994	98.0	16.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.2	162	Total			

Summary for Subcatchment 2S: Flow to DCB#5

Runoff = 1.85 cfs @ 12.08 hrs, Volume= 0.16 af, Depth> 1.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

	Area (sf)	CN	Description
	8,986	98.0	Paved parking, HSG A
	56,071	39.0	>75% Grass cover, Good, HSG A
	637	98.0	Roofs, HSG A
	1,231	30.0	Woods, Good, HSG A
*	9,000	98.0	Lots, HSG A
	75,925		Weighted Average
	57,302	38.8	75.47% Pervious Area
	18,623	98.0	24.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Flow to DCB#50

Runoff = 1.57 cfs @ 12.08 hrs, Volume= 0.13 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

	Area (sf)	CN	Description
	27,440	39.0	>75% Grass cover, Good, HSG A
	10,803	98.0	Paved parking, HSG A
*	5,000	98.0	Lots, HSG A
	43,243		Weighted Average
	27,440	39.0	63.46% Pervious Area
	15,803	98.0	36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 4S: Flow to Central Street

Runoff = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
11,163	39.0	>75% Grass cover, Good, HSG A
1,260	98.0	Roofs, HSG A
1,998	98.0	Paved parking, HSG A
570	96.0	Gravel surface, HSG A
950	30.0	Woods, Good, HSG A
15,941		Weighted Average
12,683	40.9	79.56% Pervious Area
3,258	98.0	20.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.6	10	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	125	Total			

Summary for Subcatchment 5S: Flow to Infiltration Trench #1

Runoff = 0.22 cfs @ 12.22 hrs, Volume= 0.03 af, Depth> 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

	Area (sf)	CN	Description
*	3,000	98.0	Lots, HSG A
	14,196	39.0	>75% Grass cover, Good, HSG A
	6,334	30.0	Woods, Good, HSG A
	23,530		Weighted Average
	20,530	36.2	87.25% Pervious Area
	3,000	98.0	12.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.1	185	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	22	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	12	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.8	269	Total			

Summary for Subcatchment 6S: Flow to Infiltration Trench #2

Runoff = 0.10 cfs @ 12.08 hrs, Volume= 0.01 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

	Area (sf)	CN	Description
	6,548	30.0	Woods, Good, HSG A
	9,268	39.0	>75% Grass cover, Good, HSG A
*	1,000	98.0	Lots, HSG A
	16,816		Weighted Average
	15,816	35.3	94.05% Pervious Area
	1,000	98.0	5.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Flow to Tributary

Runoff = 0.33 cfs @ 12.26 hrs, Volume= 0.04 af, Depth> 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
38,714	30.0	Woods, Good, HSG A
14,930	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
58,458		Weighted Average
53,644	32.5	91.77% Pervious Area
4,814	98.0	8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
20.2	747	Total			

Summary for Subcatchment 8S: Flow to First Brook

Runoff = 0.01 cfs @ 12.19 hrs, Volume= 0.00 af, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 10-YEAR Rainfall=4.45"

Area (sf)	CN	Description
32,083	30.0	Woods, Good, HSG A
6,198	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
38,360		Weighted Average
38,360	31.6	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.2	150	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	200	Total			

Summary for Pond 1P: Undergound Infiltration System

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 1.29" for 10-YEAR event
Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.29 af
Outflow = 0.26 cfs @ 11.46 hrs, Volume= 0.29 af, Atten= 92%, Lag= 0.0 min
Discarded = 0.26 cfs @ 11.46 hrs, Volume= 0.29 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 136.78' @ 13.27 hrs Surf.Area= 3,776 sf Storage= 4,459 cf
Flood Elev= 139.00' Surf.Area= 3,776 sf Storage= 8,688 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 127.1 min (893.8 - 766.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	135.00'	4,277 cf	**32.13'W x 117.54'L x 4.00'H Field A** 15,103 cf Overall - 4,410 cf Embedded = 10,693 cf x 40.0% Voids
#2A	135.50'	4,410 cf	**ADS_StormTech SC-740 +Cap** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 6 Rows
		8,688 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	134.30'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.30' / 133.92' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	137.25'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	138.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	135.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.26 cfs @ 11.46 hrs HW=135.04' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=135.00' TW=133.82' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.00 cfs of 1.54 cfs potential flow)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: DMH#4

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 133.82' @ 0.00 hrs
Flood Elev= 143.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.82'	**12.0" Round Culvert** L= 198.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.82' / 131.83' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=133.82' TW=127.70' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 3P: DCB#5

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 1.29" for 10-YEAR event
Inflow = 3.41 cfs @ 12.08 hrs, Volume= 0.29 af
Outflow = 3.41 cfs @ 12.08 hrs, Volume= 0.29 af, Atten= 0%, Lag= 0.0 min
Primary = 3.41 cfs @ 12.08 hrs, Volume= 0.29 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.32' @ 12.08 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.20'	**15.0" Round Culvert** L= 119.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.20' / 135.60' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=3.38 cfs @ 12.08 hrs HW=137.32' TW=135.96' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.38 cfs @ 3.87 fps)

Summary for Pond 4P: DCB#50

Inflow Area = 0.993 ac, 36.54% Impervious, Inflow Depth > 1.60" for 10-YEAR event
Inflow = 1.57 cfs @ 12.08 hrs, Volume= 0.13 af
Outflow = 1.57 cfs @ 12.08 hrs, Volume= 0.13 af, Atten= 0%, Lag= 0.0 min
Primary = 1.57 cfs @ 12.08 hrs, Volume= 0.13 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.59' @ 12.10 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.74'	**12.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.74' / 136.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.43 cfs @ 12.08 hrs HW=137.57' TW=137.32' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 1.43 cfs @ 2.79 fps)

Summary for Pond 5P: Infiltration Trench #1

Inflow Area = 0.540 ac, 12.75% Impervious, Inflow Depth > 0.60" for 10-YEAR event
Inflow = 0.22 cfs @ 12.22 hrs, Volume= 0.03 af
Outflow = 0.03 cfs @ 12.96 hrs, Volume= 0.03 af, Atten= 84%, Lag= 44.4 min
Discarded = 0.03 cfs @ 12.96 hrs, Volume= 0.03 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.10' @ 12.96 hrs Surf.Area= 498 sf Storage= 350 cf
Flood Elev= 141.00' Surf.Area= 1,572 sf Storage= 1,285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 86.7 min (876.5 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	1,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	384	0.0	0	0
140.00	384	40.0	307	307
141.00	1,572	100.0	978	1,285

Device	Routing	Invert	Outlet Devices
#1	Primary	140.75'	**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
#2	Discarded	138.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.03 cfs @ 12.96 hrs HW=140.10' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench #2

Inflow Area = 0.386 ac, 5.95% Impervious, Inflow Depth > 0.31" for 10-YEAR event
Inflow = 0.10 cfs @ 12.08 hrs, Volume= 0.01 af
Outflow = 0.02 cfs @ 11.88 hrs, Volume= 0.01 af, Atten= 77%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.88 hrs, Volume= 0.01 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.52' @ 12.47 hrs Surf.Area= 333 sf Storage= 70 cf
Flood Elev= 140.00' Surf.Area= 1,369 sf Storage= 1,117 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 12.0 min (818.3 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	137.00'	1,117 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.00	333	0.0	0	0
139.00	333	40.0	266	266
140.00	1,369	100.0	851	1,117

Device	Routing	Invert	Outlet Devices
#1	Primary	138.90'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	137.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.88 hrs HW=137.03' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: DMH#3

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 127.70' @ 0.00 hrs
Flood Elev= 137.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	127.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.70' / 126.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=127.70' TW=122.80' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Summary for Pond 8P: DMH#2

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.00" for 10-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 122.80' @ 0.00 hrs
Flood Elev= 130.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	122.80'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.80' / 122.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=122.80' TW=0.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Link A: Central Street

Inflow Area = 0.366 ac, 20.44% Impervious, Inflow Depth > 1.07" for 10-YEAR event
Inflow = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af
Primary = 0.30 cfs @ 12.18 hrs, Volume= 0.03 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 1.882 ac, 9.53% Impervious, Inflow Depth > 0.27" for 10-YEAR event
Inflow = 0.33 cfs @ 12.26 hrs, Volume= 0.04 af
Primary = 0.33 cfs @ 12.26 hrs, Volume= 0.04 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.860 ac, 16.72% Impervious, Inflow Depth > 0.28" for 10-YEAR event
Inflow = 1.35 cfs @ 12.30 hrs, Volume= 0.18 af
Primary = 1.35 cfs @ 12.30 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow from Existing Runoff Area=86,036 sf 16.27% Impervious Runoff Depth>1.19"
Flow Length=162' Tc=24.2 min CN=WQ Runoff=1.32 cfs 0.20 af

Subcatchment 2S: Flow to DCB#5 Runoff Area=75,925 sf 24.53% Impervious Runoff Depth>1.57"
Tc=6.0 min CN=WQ Runoff=2.34 cfs 0.23 af

Subcatchment 3S: Flow to DCB#50 Runoff Area=43,243 sf 36.54% Impervious Runoff Depth>2.18"
Tc=6.0 min CN=WQ Runoff=1.99 cfs 0.18 af

Subcatchment 4S: Flow to Central Street Runoff Area=15,941 sf 20.44% Impervious Runoff Depth>1.52"
Flow Length=125' Tc=13.7 min CN=WQ Runoff=0.38 cfs 0.05 af

Subcatchment 5S: Flow to Infiltration Runoff Area=23,530 sf 12.75% Impervious Runoff Depth>0.90"
Flow Length=269' Tc=16.8 min CN=WQ Runoff=0.28 cfs 0.04 af

Subcatchment 6S: Flow to Infiltration Runoff Area=16,816 sf 5.95% Impervious Runoff Depth>0.52"
Tc=6.0 min CN=WQ Runoff=0.13 cfs 0.02 af

Subcatchment 7S: Flow to Tributary Runoff Area=58,458 sf 8.23% Impervious Runoff Depth>0.55"
Flow Length=747' Tc=20.2 min CN=WQ Runoff=0.42 cfs 0.06 af

Subcatchment 8S: Flow to First Brook Runoff Area=38,360 sf 0.00% Impervious Runoff Depth>0.10"
Flow Length=200' Tc=14.3 min CN=WQ Runoff=0.02 cfs 0.01 af

Pond 1P: Undergound Infiltration System Peak Elev=137.62' Storage=6,520 cf Inflow=4.32 cfs 0.41 af
Discarded=0.26 cfs 0.36 af Primary=0.12 cfs 0.02 af Outflow=0.38 cfs 0.38 af

Pond 2P: DMH#4 Peak Elev=133.99' Inflow=0.12 cfs 0.02 af
12.0" Round Culvert n=0.013 L=198.7' S=0.0100 '/' Outflow=0.12 cfs 0.02 af

Pond 3P: DCB#5 Peak Elev=137.63' Inflow=4.32 cfs 0.41 af
15.0" Round Culvert n=0.013 L=119.6' S=0.0050 '/' Outflow=4.32 cfs 0.41 af

Pond 4P: DCB#50 Peak Elev=137.80' Inflow=1.99 cfs 0.18 af
12.0" Round Culvert n=0.013 L=22.0' S=0.0200 '/' Outflow=1.99 cfs 0.18 af

Pond 5P: Infiltration Trench #1 Peak Elev=140.35' Storage=511 cf Inflow=0.28 cfs 0.04 af
Discarded=0.06 cfs 0.04 af Primary=0.00 cfs 0.00 af Outflow=0.06 cfs 0.04 af

Pond 6P: Infiltration Trench #2 Peak Elev=138.06' Storage=141 cf Inflow=0.13 cfs 0.02 af
Discarded=0.02 cfs 0.02 af Primary=0.00 cfs 0.00 af Outflow=0.02 cfs 0.02 af

Pond 7P: DMH#3 Peak Elev=127.87' Inflow=0.12 cfs 0.02 af
12.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.12 cfs 0.02 af

Pond 8P: DMH#2 Peak Elev=122.97' Inflow=0.12 cfs 0.02 af
12.0" Round Culvert n=0.013 L=10.0' S=0.0800 '/' Outflow=0.12 cfs 0.02 af

Link A: Central Street Inflow=0.38 cfs 0.05 af
Primary=0.38 cfs 0.05 af

Link B: First Brook Tributary Inflow=0.42 cfs 0.06 af
Primary=0.42 cfs 0.06 af

Link C: First Brook Inflow=1.74 cfs 0.29 af
Primary=1.74 cfs 0.29 af

Total Runoff Area = 8.226 ac Runoff Volume = 0.78 af Average Runoff Depth = 1.13"
83.12% Pervious = 6.837 ac 16.88% Impervious = 1.389 ac

Summary for Subcatchment 1S: Flow from Existing House

Runoff = 1.32 cfs @ 12.32 hrs, Volume= 0.20 af, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,793	30.0	Woods, Good, HSG A
40,866	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
86,036		Weighted Average
72,042	37.3	83.73% Pervious Area
13,994	98.0	16.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.2	162	Total			

Summary for Subcatchment 2S: Flow to DCB#5

Runoff = 2.34 cfs @ 12.08 hrs, Volume= 0.23 af, Depth> 1.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

	Area (sf)	CN	Description
	8,986	98.0	Paved parking, HSG A
	56,071	39.0	>75% Grass cover, Good, HSG A
	637	98.0	Roofs, HSG A
	1,231	30.0	Woods, Good, HSG A
*	9,000	98.0	Lots, HSG A
	75,925		Weighted Average
	57,302	38.8	75.47% Pervious Area
	18,623	98.0	24.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Flow to DCB#50

Runoff = 1.99 cfs @ 12.08 hrs, Volume= 0.18 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

	Area (sf)	CN	Description
	27,440	39.0	>75% Grass cover, Good, HSG A
	10,803	98.0	Paved parking, HSG A
*	5,000	98.0	Lots, HSG A
	43,243		Weighted Average
	27,440	39.0	63.46% Pervious Area
	15,803	98.0	36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 4S: Flow to Central Street

Runoff = 0.38 cfs @ 12.18 hrs, Volume= 0.05 af, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
11,163	39.0	>75% Grass cover, Good, HSG A
1,260	98.0	Roofs, HSG A
1,998	98.0	Paved parking, HSG A
570	96.0	Gravel surface, HSG A
950	30.0	Woods, Good, HSG A
15,941		Weighted Average
12,683	40.9	79.56% Pervious Area
3,258	98.0	20.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.6	10	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	125	Total			

Summary for Subcatchment 5S: Flow to Infiltration Trench #1

Runoff = 0.28 cfs @ 12.22 hrs, Volume= 0.04 af, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

	Area (sf)	CN	Description
*	3,000	98.0	Lots, HSG A
	14,196	39.0	>75% Grass cover, Good, HSG A
	6,334	30.0	Woods, Good, HSG A
	23,530		Weighted Average
	20,530	36.2	87.25% Pervious Area
	3,000	98.0	12.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.1	185	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	22	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	12	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.8	269	Total			

Summary for Subcatchment 6S: Flow to Infiltration Trench #2

Runoff = 0.13 cfs @ 12.09 hrs, Volume= 0.02 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

	Area (sf)	CN	Description
	6,548	30.0	Woods, Good, HSG A
	9,268	39.0	>75% Grass cover, Good, HSG A
*	1,000	98.0	Lots, HSG A
	16,816		Weighted Average
	15,816	35.3	94.05% Pervious Area
	1,000	98.0	5.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Flow to Tributary

Runoff = 0.42 cfs @ 12.27 hrs, Volume= 0.06 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
38,714	30.0	Woods, Good, HSG A
14,930	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
58,458		Weighted Average
53,644	32.5	91.77% Pervious Area
4,814	98.0	8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
20.2	747	Total			

Summary for Subcatchment 8S: Flow to First Brook

Runoff = 0.02 cfs @ 12.48 hrs, Volume= 0.01 af, Depth> 0.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 25-YEAR Rainfall=5.62"

Area (sf)	CN	Description
32,083	30.0	Woods, Good, HSG A
6,198	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
38,360		Weighted Average
38,360	31.6	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.2	150	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	200	Total			

Summary for Pond 1P: Undergound Infiltration System

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 1.79" for 25-YEAR event
Inflow = 4.32 cfs @ 12.08 hrs, Volume= 0.41 af
Outflow = 0.38 cfs @ 13.50 hrs, Volume= 0.38 af, Atten= 91%, Lag= 85.0 min
Discarded = 0.26 cfs @ 11.10 hrs, Volume= 0.36 af
Primary = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.62' @ 13.50 hrs Surf.Area= 3,776 sf Storage= 6,520 cf
Flood Elev= 139.00' Surf.Area= 3,776 sf Storage= 8,688 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 150.4 min (926.6 - 776.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	135.00'	4,277 cf	**32.13'W x 117.54'L x 4.00'H Field A** 15,103 cf Overall - 4,410 cf Embedded = 10,693 cf x 40.0% Voids
#2A	135.50'	4,410 cf	**ADS_StormTech SC-740 +Cap** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 6 Rows
		8,688 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	134.30'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.30' / 133.92' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	137.25'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	138.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	135.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.26 cfs @ 11.10 hrs HW=135.04' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.12 cfs @ 13.50 hrs HW=137.62' TW=133.99' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.12 cfs of 6.31 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.12 cfs @ 2.40 fps)
  └**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 2P: DMH#4

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.11" for 25-YEAR event
Inflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af
Outflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 133.99' @ 13.50 hrs
Flood Elev= 143.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.82'	**12.0" Round Culvert** L= 198.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.82' / 131.83' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 13.50 hrs HW=133.99' TW=127.87' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.12 cfs @ 2.07 fps)

Summary for Pond 3P: DCB#5

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 1.79" for 25-YEAR event
Inflow = 4.32 cfs @ 12.08 hrs, Volume= 0.41 af
Outflow = 4.32 cfs @ 12.08 hrs, Volume= 0.41 af, Atten= 0%, Lag= 0.0 min
Primary = 4.32 cfs @ 12.08 hrs, Volume= 0.41 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.63' @ 13.51 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.20'	**15.0" Round Culvert** L= 119.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.20' / 135.60' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.29 cfs @ 12.08 hrs HW=137.54' TW=136.26' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 4.29 cfs @ 4.06 fps)

Summary for Pond 4P: DCB#50

Inflow Area = 0.993 ac, 36.54% Impervious, Inflow Depth > 2.18" for 25-YEAR event
Inflow = 1.99 cfs @ 12.08 hrs, Volume= 0.18 af
Outflow = 1.99 cfs @ 12.08 hrs, Volume= 0.18 af, Atten= 0%, Lag= 0.0 min
Primary = 1.99 cfs @ 12.08 hrs, Volume= 0.18 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 137.80' @ 12.10 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.74'	**12.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.74' / 136.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.74 cfs @ 12.08 hrs HW=137.76' TW=137.54' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 1.74 cfs @ 2.68 fps)

Summary for Pond 5P: Infiltration Trench #1

Inflow Area = 0.540 ac, 12.75% Impervious, Inflow Depth > 0.90" for 25-YEAR event
Inflow = 0.28 cfs @ 12.22 hrs, Volume= 0.04 af
Outflow = 0.06 cfs @ 13.08 hrs, Volume= 0.04 af, Atten= 80%, Lag= 51.0 min
Discarded = 0.06 cfs @ 13.08 hrs, Volume= 0.04 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.35' @ 13.08 hrs Surf.Area= 795 sf Storage= 511 cf
Flood Elev= 141.00' Surf.Area= 1,572 sf Storage= 1,285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 105.9 min (916.6 - 810.7)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	1,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	384	0.0	0	0
140.00	384	40.0	307	307
141.00	1,572	100.0	978	1,285

Device	Routing	Invert	Outlet Devices
#1	Primary	140.75'	**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
#2	Discarded	138.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 13.08 hrs HW=140.35' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench #2

Inflow Area = 0.386 ac, 5.95% Impervious, Inflow Depth > 0.52" for 25-YEAR event
Inflow = 0.13 cfs @ 12.09 hrs, Volume= 0.02 af
Outflow = 0.02 cfs @ 11.82 hrs, Volume= 0.02 af, Atten= 82%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.82 hrs, Volume= 0.02 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.06' @ 12.97 hrs Surf.Area= 333 sf Storage= 141 cf
Flood Elev= 140.00' Surf.Area= 1,369 sf Storage= 1,117 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 39.1 min (878.7 - 839.6)

Volume	Invert	Avail.Storage	Storage Description
#1	137.00'	1,117 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.00	333	0.0	0	0
139.00	333	40.0	266	266
140.00	1,369	100.0	851	1,117

Device	Routing	Invert	Outlet Devices
#1	Primary	138.90'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	137.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.82 hrs HW=137.04' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=137.00' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 7P: DMH#3

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.11" for 25-YEAR event
Inflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af
Outflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 127.87' @ 13.50 hrs
Flood Elev= 137.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	127.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.70' / 126.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 13.50 hrs HW=127.87' TW=122.97' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.12 cfs @ 1.38 fps)

Summary for Pond 8P: DMH#2

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.11" for 25-YEAR event
Inflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af
Outflow = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 13.50 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 122.97' @ 13.50 hrs
Flood Elev= 130.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	122.80'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.80' / 122.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 13.50 hrs HW=122.97' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.12 cfs @ 1.38 fps)

Summary for Link A: Central Street

Inflow Area = 0.366 ac, 20.44% Impervious, Inflow Depth > 1.52" for 25-YEAR event
Inflow = 0.38 cfs @ 12.18 hrs, Volume= 0.05 af
Primary = 0.38 cfs @ 12.18 hrs, Volume= 0.05 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 1.882 ac, 9.53% Impervious, Inflow Depth > 0.39" for 25-YEAR event
Inflow = 0.42 cfs @ 12.27 hrs, Volume= 0.06 af
Primary = 0.42 cfs @ 12.27 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.860 ac, 16.72% Impervious, Inflow Depth > 0.44" for 25-YEAR event
Inflow = 1.74 cfs @ 12.31 hrs, Volume= 0.29 af
Primary = 1.74 cfs @ 12.31 hrs, Volume= 0.29 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Flow from Existing Runoff Area=86,036 sf 16.27% Impervious Runoff Depth>1.59"
Flow Length=162' Tc=24.2 min CN=WQ Runoff=1.72 cfs 0.26 af

Subcatchment 2S: Flow to DCB#5 Runoff Area=75,925 sf 24.53% Impervious Runoff Depth>2.09"
Tc=6.0 min CN=WQ Runoff=3.08 cfs 0.30 af

Subcatchment 3S: Flow to DCB#50 Runoff Area=43,243 sf 36.54% Impervious Runoff Depth>2.79"
Tc=6.0 min CN=WQ Runoff=2.51 cfs 0.23 af

Subcatchment 4S: Flow to Central Street Runoff Area=15,941 sf 20.44% Impervious Runoff Depth>2.02"
Flow Length=125' Tc=13.7 min CN=WQ Runoff=0.50 cfs 0.06 af

Subcatchment 5S: Flow to Infiltration Runoff Area=23,530 sf 12.75% Impervious Runoff Depth>1.27"
Flow Length=269' Tc=16.8 min CN=WQ Runoff=0.39 cfs 0.06 af

Subcatchment 6S: Flow to Infiltration Runoff Area=16,816 sf 5.95% Impervious Runoff Depth>0.82"
Tc=6.0 min CN=WQ Runoff=0.20 cfs 0.03 af

Subcatchment 7S: Flow to Tributary Runoff Area=58,458 sf 8.23% Impervious Runoff Depth>0.81"
Flow Length=747' Tc=20.2 min CN=WQ Runoff=0.55 cfs 0.09 af

Subcatchment 8S: Flow to First Brook Runoff Area=38,360 sf 0.00% Impervious Runoff Depth>0.26"
Flow Length=200' Tc=14.3 min CN=WQ Runoff=0.05 cfs 0.02 af

Pond 1P: Undergound Infiltration System Peak Elev=138.77' Storage=8,340 cf Inflow=5.59 cfs 0.53 af
Discarded=0.26 cfs 0.37 af Primary=0.52 cfs 0.10 af Outflow=0.78 cfs 0.47 af

Pond 2P: DMH#4 Peak Elev=134.18' Inflow=0.52 cfs 0.10 af
12.0" Round Culvert n=0.013 L=198.7' S=0.0100 '/' Outflow=0.52 cfs 0.10 af

Pond 3P: DCB#5 Peak Elev=138.80' Inflow=5.59 cfs 0.53 af
15.0" Round Culvert n=0.013 L=119.6' S=0.0050 '/' Outflow=5.59 cfs 0.53 af

Pond 4P: DCB#50 Peak Elev=138.80' Inflow=2.51 cfs 0.23 af
12.0" Round Culvert n=0.013 L=22.0' S=0.0200 '/' Outflow=2.51 cfs 0.23 af

Pond 5P: Infiltration Trench #1 Peak Elev=140.60' Storage=749 cf Inflow=0.39 cfs 0.06 af
Discarded=0.08 cfs 0.05 af Primary=0.00 cfs 0.00 af Outflow=0.08 cfs 0.05 af

Pond 6P: Infiltration Trench #2 Peak Elev=138.91' Storage=255 cf Inflow=0.20 cfs 0.03 af
Discarded=0.02 cfs 0.02 af Primary=0.03 cfs 0.00 af Outflow=0.05 cfs 0.03 af

Pond 7P: DMH#3 Peak Elev=128.06' Inflow=0.52 cfs 0.10 af
12.0" Round Culvert n=0.013 L=15.0' S=0.0800 '/' Outflow=0.52 cfs 0.10 af

Pond 8P: DMH#2 Peak Elev=123.16' Inflow=0.52 cfs 0.10 af
12.0" Round Culvert n=0.013 L=10.0' S=0.0800 '/' Outflow=0.52 cfs 0.10 af

Link A: Central Street Inflow=0.50 cfs 0.06 af
Primary=0.50 cfs 0.06 af

Link B: First Brook Tributary Inflow=0.55 cfs 0.09 af
Primary=0.55 cfs 0.09 af

Link C: First Brook Inflow=2.48 cfs 0.47 af
Primary=2.48 cfs 0.47 af

Total Runoff Area = 8.226 ac Runoff Volume = 1.05 af Average Runoff Depth = 1.53"
83.12% Pervious = 6.837 ac 16.88% Impervious = 1.389 ac

Summary for Subcatchment 1S: Flow from Existing House

Runoff = 1.72 cfs @ 12.34 hrs, Volume= 0.26 af, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
8,242	98.0	Paved parking, HSG A
5,752	98.0	Roofs, HSG A
28,793	30.0	Woods, Good, HSG A
40,866	39.0	>75% Grass cover, Good, HSG A
2,383	96.0	Gravel surface, HSG A
86,036		Weighted Average
72,042	37.3	83.73% Pervious Area
13,994	98.0	16.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.8	50	0.0050	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.4	112	0.0714	1.34		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.2	162	Total			

Summary for Subcatchment 2S: Flow to DCB#5

Runoff = 3.08 cfs @ 12.09 hrs, Volume= 0.30 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

	Area (sf)	CN	Description
	8,986	98.0	Paved parking, HSG A
	56,071	39.0	>75% Grass cover, Good, HSG A
	637	98.0	Roofs, HSG A
	1,231	30.0	Woods, Good, HSG A
*	9,000	98.0	Lots, HSG A
	75,925		Weighted Average
	57,302	38.8	75.47% Pervious Area
	18,623	98.0	24.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 3S: Flow to DCB#50

Runoff = 2.51 cfs @ 12.09 hrs, Volume= 0.23 af, Depth> 2.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

	Area (sf)	CN	Description
	27,440	39.0	>75% Grass cover, Good, HSG A
	10,803	98.0	Paved parking, HSG A
*	5,000	98.0	Lots, HSG A
	43,243		Weighted Average
	27,440	39.0	63.46% Pervious Area
	15,803	98.0	36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 4S: Flow to Central Street

Runoff = 0.50 cfs @ 12.19 hrs, Volume= 0.06 af, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
11,163	39.0	>75% Grass cover, Good, HSG A
1,260	98.0	Roofs, HSG A
1,998	98.0	Paved parking, HSG A
570	96.0	Gravel surface, HSG A
950	30.0	Woods, Good, HSG A
15,941		Weighted Average
12,683	40.9	79.56% Pervious Area
3,258	98.0	20.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	40	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.6	10	0.0200	0.10		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.84"
1.1	75	0.0285	1.18		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	125	Total			

Summary for Subcatchment 5S: Flow to Infiltration Trench #1

Runoff = 0.39 cfs @ 12.25 hrs, Volume= 0.06 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

	Area (sf)	CN	Description
*	3,000	98.0	Lots, HSG A
	14,196	39.0	>75% Grass cover, Good, HSG A
	6,334	30.0	Woods, Good, HSG A
	23,530		Weighted Average
	20,530	36.2	87.25% Pervious Area
	3,000	98.0	12.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
3.1	185	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	22	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.0	12	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.8	269	Total			

Summary for Subcatchment 6S: Flow to Infiltration Trench #2

Runoff = 0.20 cfs @ 12.11 hrs, Volume= 0.03 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

	Area (sf)	CN	Description
	6,548	30.0	Woods, Good, HSG A
	9,268	39.0	>75% Grass cover, Good, HSG A
*	1,000	98.0	Lots, HSG A
	16,816		Weighted Average
	15,816	35.3	94.05% Pervious Area
	1,000	98.0	5.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 7S: Flow to Tributary

Runoff = 0.55 cfs @ 12.29 hrs, Volume= 0.09 af, Depth> 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
1,636	98.0	Roofs, HSG A
38,714	30.0	Woods, Good, HSG A
14,930	39.0	>75% Grass cover, Good, HSG A
3,178	98.0	Paved parking, HSG A
58,458		Weighted Average
53,644	32.5	91.77% Pervious Area
4,814	98.0	8.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.3	50	0.0100	0.05		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
0.9	72	0.0694	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	625	0.0100	5.11	66.39	**Trap/Vee/Rect Channel Flow,** Bot.W=10.00' D=1.00' Z= 3.0 '/' Top.W=16.00' n= 0.025 Earth, clean & winding
20.2	747	Total			

Summary for Subcatchment 8S: Flow to First Brook

Runoff = 0.05 cfs @ 12.38 hrs, Volume= 0.02 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Type III 24-hr 50-YEAR Rainfall=6.72"

Area (sf)	CN	Description
32,083	30.0	Woods, Good, HSG A
6,198	39.0	>75% Grass cover, Good, HSG A
79	96.0	Gravel surface, HSG A
38,360		Weighted Average
38,360	31.6	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.1	50	0.0200	0.06		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.84"
1.2	150	0.1700	2.06		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
14.3	200	Total			

Summary for Pond 1P: Undergound Infiltration System

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 2.34" for 50-YEAR event
Inflow = 5.59 cfs @ 12.09 hrs, Volume= 0.53 af
Outflow = 0.78 cfs @ 12.80 hrs, Volume= 0.47 af, Atten= 86%, Lag= 42.7 min
Discarded = 0.26 cfs @ 10.65 hrs, Volume= 0.37 af
Primary = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.77' @ 12.80 hrs Surf.Area= 3,776 sf Storage= 8,340 cf
Flood Elev= 139.00' Surf.Area= 3,776 sf Storage= 8,688 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 120.3 min (902.3 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	135.00'	4,277 cf	**32.13'W x 117.54'L x 4.00'H Field A** 15,103 cf Overall - 4,410 cf Embedded = 10,693 cf x 40.0% Voids
#2A	135.50'	4,410 cf	**ADS_StormTech SC-740 +Cap** x 96 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 6 Rows
		8,688 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	134.30'	**12.0" Round Culvert** L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.30' / 133.92' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	137.25'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	138.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Discarded	135.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.26 cfs @ 10.65 hrs HW=135.04' (Free Discharge)
└**4=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.52 cfs @ 12.80 hrs HW=138.77' TW=134.18' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.52 cfs of 7.53 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 5.69 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 0.86 fps)

Summary for Pond 2P: DMH#4

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.44" for 50-YEAR event
Inflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af
Outflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 134.18' @ 12.80 hrs
Flood Elev= 143.59'

Device	Routing	Invert	Outlet Devices
#1	Primary	133.82'	**12.0" Round Culvert** L= 198.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 133.82' / 131.83' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.80 hrs HW=134.18' TW=128.06' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.52 cfs @ 2.04 fps)

Summary for Pond 3P: DCB#5

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth > 2.34" for 50-YEAR event
Inflow = 5.59 cfs @ 12.09 hrs, Volume= 0.53 af
Outflow = 5.59 cfs @ 12.09 hrs, Volume= 0.53 af, Atten= 0%, Lag= 0.0 min
Primary = 5.59 cfs @ 12.09 hrs, Volume= 0.53 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.80' @ 12.81 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.20'	**15.0" Round Culvert** L= 119.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.20' / 135.60' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=5.56 cfs @ 12.09 hrs HW=138.22' TW=136.66' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.56 cfs @ 4.53 fps)

Summary for Pond 4P: DCB#50

Inflow Area = 0.993 ac, 36.54% Impervious, Inflow Depth > 2.79" for 50-YEAR event
Inflow = 2.51 cfs @ 12.09 hrs, Volume= 0.23 af
Outflow = 2.51 cfs @ 12.09 hrs, Volume= 0.23 af, Atten= 0%, Lag= 0.0 min
Primary = 2.51 cfs @ 12.09 hrs, Volume= 0.23 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.80' @ 12.83 hrs
Flood Elev= 140.38'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.74'	**12.0" Round Culvert** L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.74' / 136.30' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=1.89 cfs @ 12.09 hrs HW=138.48' TW=138.23' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.89 cfs @ 2.40 fps)

Summary for Pond 5P: Infiltration Trench #1

Inflow Area = 0.540 ac, 12.75% Impervious, Inflow Depth > 1.27" for 50-YEAR event
Inflow = 0.39 cfs @ 12.25 hrs, Volume= 0.06 af
Outflow = 0.08 cfs @ 13.19 hrs, Volume= 0.05 af, Atten= 81%, Lag= 56.4 min
Discarded = 0.08 cfs @ 13.19 hrs, Volume= 0.05 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.60' @ 13.19 hrs Surf.Area= 1,094 sf Storage= 749 cf
Flood Elev= 141.00' Surf.Area= 1,572 sf Storage= 1,285 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 96.2 min (919.5 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	1,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	384	0.0	0	0
140.00	384	40.0	307	307
141.00	1,572	100.0	978	1,285

Device	Routing	Invert	Outlet Devices
#1	Primary	140.75'	**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
#2	Discarded	138.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.08 cfs @ 13.19 hrs HW=140.60' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=138.00' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: Infiltration Trench #2

Inflow Area = 0.386 ac, 5.95% Impervious, Inflow Depth > 0.82" for 50-YEAR event
Inflow = 0.20 cfs @ 12.11 hrs, Volume= 0.03 af
Outflow = 0.05 cfs @ 12.64 hrs, Volume= 0.03 af, Atten= 73%, Lag= 31.5 min
Discarded = 0.02 cfs @ 11.76 hrs, Volume= 0.02 af
Primary = 0.03 cfs @ 12.64 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.91' @ 12.64 hrs Surf.Area= 333 sf Storage= 255 cf
Flood Elev= 140.00' Surf.Area= 1,369 sf Storage= 1,117 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 93.2 min (947.6 - 854.5)

Volume	Invert	Avail.Storage	Storage Description
#1	137.00'	1,117 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.00	333	0.0	0	0
139.00	333	40.0	266	266
140.00	1,369	100.0	851	1,117

Device	Routing	Invert	Outlet Devices
#1	Primary	138.90'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	137.00'	**3.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 11.76 hrs HW=137.03' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.03 cfs @ 12.64 hrs HW=138.91' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.26 fps)

Summary for Pond 7P: DMH#3

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.44" for 50-YEAR event
Inflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af
Outflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 128.06' @ 12.80 hrs
Flood Elev= 137.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	127.70'	**12.0" Round Culvert** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 127.70' / 126.50' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.80 hrs HW=128.06' TW=123.16' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.52 cfs @ 2.04 fps)

Summary for Pond 8P: DMH#2

Inflow Area = 2.736 ac, 28.89% Impervious, Inflow Depth = 0.44" for 50-YEAR event
Inflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af
Outflow = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af, Atten= 0%, Lag= 0.0 min
Primary = 0.52 cfs @ 12.80 hrs, Volume= 0.10 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Peak Elev= 123.16' @ 12.80 hrs
Flood Elev= 130.70'

Device	Routing	Invert	Outlet Devices
#1	Primary	122.80'	**12.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 122.80' / 122.00' S= 0.0800 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.80 hrs HW=123.16' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 0.52 cfs @ 2.04 fps)

Summary for Link A: Central Street

Inflow Area = 0.366 ac, 20.44% Impervious, Inflow Depth > 2.02" for 50-YEAR event
Inflow = 0.50 cfs @ 12.19 hrs, Volume= 0.06 af
Primary = 0.50 cfs @ 12.19 hrs, Volume= 0.06 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link B: First Brook Tributary

Inflow Area = 1.882 ac, 9.53% Impervious, Inflow Depth > 0.58" for 50-YEAR event
Inflow = 0.55 cfs @ 12.29 hrs, Volume= 0.09 af
Primary = 0.55 cfs @ 12.29 hrs, Volume= 0.09 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Link C: First Brook

Inflow Area = 7.860 ac, 16.72% Impervious, Inflow Depth > 0.72" for 50-YEAR event
Inflow = 2.48 cfs @ 12.34 hrs, Volume= 0.47 af
Primary = 2.48 cfs @ 12.34 hrs, Volume= 0.47 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs

Summary for Pond 5P: Infiltration Trench #1

Inflow Area = 0.540 ac, 12.75% Impervious, Inflow Depth > 1.27" for 50-YEAR event
Inflow = 0.39 cfs @ 12.25 hrs, Volume= 0.06 af
Outflow = 0.27 cfs @ 12.49 hrs, Volume= 0.04 af, Atten= 30%, Lag= 14.5 min
Primary = 0.27 cfs @ 12.49 hrs, Volume= 0.04 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 140.80' @ 12.49 hrs Surf.Area= 1,335 sf Storage= 996 cf
Flood Elev= 141.00' Surf.Area= 1,572 sf Storage= 1,285 cf

Plug-Flow detention time= 250.4 min calculated for 0.04 af (62% of inflow)
Center-of-Mass det. time= 116.3 min (939.6 - 823.3)

Volume	Invert	Avail.Storage	Storage Description
#1	138.00'	1,285 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.00	384	0.0	0	0
140.00	384	40.0	307	307
141.00	1,572	100.0	978	1,285

Device	Routing	Invert	Outlet Devices
#1	Primary	140.75'	**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=0.27 cfs @ 12.49 hrs HW=140.80' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.54 fps)

Summary for Pond 6P: Infiltration Trench #2

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 0.386 ac, 5.95% Impervious, Inflow Depth > 0.82" for 50-YEAR event
Inflow = 0.20 cfs @ 12.11 hrs, Volume= 0.03 af
Outflow = 0.22 cfs @ 12.12 hrs, Volume= 0.02 af, Atten= 0%, Lag= 0.8 min
Primary = 0.22 cfs @ 12.12 hrs, Volume= 0.02 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
Peak Elev= 138.94' @ 12.12 hrs Surf.Area= 333 sf Storage= 259 cf
Flood Elev= 140.00' Surf.Area= 1,369 sf Storage= 1,117 cf

Plug-Flow detention time= 170.0 min calculated for 0.02 af (78% of inflow)
Center-of-Mass det. time= 71.6 min (926.1 - 854.5)

Volume	Invert	Avail.Storage	Storage Description
#1	137.00'	1,117 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
137.00	333	0.0	0	0
139.00	333	40.0	266	266
140.00	1,369	100.0	851	1,117

Device	Routing	Invert	Outlet Devices
#1	Primary	138.90'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.22 cfs @ 12.12 hrs HW=138.94' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.51 fps)

APPENDIX

*OPERATION AND MAINTENANCE MANUAL
*PRE-DEVELOPMENT DRAINAGE AREA PLAN
*POST DEVELOPMENT DRAINAGE AREA PLAN

STORMWATER

OPERATION & MAINTENANCE PLAN

Frenette Gardens

Map 182; Lot 3
65 Central Street
Hudson, New Hampshire

April 22, 2022

KNA KEACH-NORDSTROM ASSOCIATES, INC.

TABLE OF CONTENTS:

I. General

Introduction

The project owners or their assigned heirs will maintain the stormwater treatment facilities after construction is completed. The owners of the project are Laura Ripaldi of 46 Bush Hill Road, Hudson, NH 03051, Kimberley Frenette of 8B Dumont Road, Hudson, NH 03051, and Ricky Frenette of 14 Tate Street, Hudson, NH 03051. Peter Ripaldi will be responsible for the reporting, inspection, and maintenance activities identified in this report. He can be reached at (603) 557-6510.

The subject property is referenced on Hudson's Tax Map 182 as Lot 3. Any transfer of responsibility for inspection and maintenance activities or transfer of ownership shall be documented to the Town of Hudson in writing. The contract documents will require the contractor to designate a person responsible for maintenance of the sedimentation control features during construction. Long-term operation and maintenance for the stormwater management facilities are presented below.

Maintenance will be performed as described and required in this document unless and until the system is formally accepted by a municipality or quasi-municipal district or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system.

Post Construction:

The following standards will be met after construction is complete:

Documentation:

A maintenance log will be kept summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department and/or Town staff and a copy provided upon request.

Maintenance Requirements

Subsurface Systems:

- Removal of accumulated sediment.
- Systems should be inspected at least twice annually with maintenance or rehabilitation conducted as warranted by such inspection.
- Trash and debris should be removed at each inspection.
- At least once annually, the system should be inspected for drawdown time. If the pond does not drain within 72-hours following a rainfall event, a qualified professional should assess the condition of the facility to determine measures required to restore filtration function or infiltration function (as applicable), including but not limited to the removal of accumulated sediments or reconstruction of the filter media.
- **For more specific maintenance requirement for the Stormtech system follow all the manufactures requirements.**

Isolator Rows:

- Inspect Isolator Row for Sediment
  - A) Inspection ports (if present)
    - i. Remove lid from floor box frame.
    - ii. Remove cap from inspection riser.
    - iii. Using a flashlight and stadia rod, measure the depth of sediment and record results on maintenance log.
    - iv. If sediment is at, or above, 3 inch depth, clean out Isolator Row using the JetVac Process.
  - B) All Isolator Rows
    - i. Remove cover from manhole at upstream end of Isolator Row.
    - ii. Using a flashlight, inspect down Isolator Row through outlet pipe. (Mirrors on poles or cameras may be used to avoid confined space entry). Follow OSHA regulations for confined space entry if entering manhole.
    - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches) clean out Isolator Row using the JetVac Process.
- Clean out Isolator Row using the JetVac Process
  - A) A fixed culvert cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
  - B) Apply multiple passes of JetVac until backflush water is clean
  - C) Vacuum manhole sump as required
- Replace all caps, lids and covers, record observations and actions
- Inspect & clean catch basins and manholes upstream of the StormTech system

Infiltration Trenches:

- Systems should be inspected at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24-hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Trash and debris should be removed at each inspection.

- Inspection of pre-treatment measures at least twice annually and removal of accumulated sediment as warranted by inspection, but no less than once annually.
- At least once annually, the system should be inspected for drawdown time. If the pond does not drain within 72-hours following a rainfall event, a qualified professional should assess the condition of the facility to determine measures required to restore filtration function or infiltration function (as applicable), including but not limited to the removal of accumulated sediments or reconstruction of the basin bottom.

Catch Basins and Closed Drainage Network:

- Catch basins may require frequent maintenance. This may require several cleanings of the sumps each year. At a minimum, it is recommended that catch basins be inspected at least twice annually.
- Sediment should be removed when it approaches half of the sump depth.
- If floating hydrocarbons are observed during an inspection, the material should be removed immediately by skimming, absorbent materials, or other methods and disposed in conformance with the applicable state and federal regulations.

Level Spreaders:

- Systems should be inspected at least annually with maintenance or rehabilitation conducted as warranted by such inspection.
- Remove debris and accumulated sediment when exceeds 25% of spreader depth. Disposal of sediment to be done properly.
- Repair eroded areas; remove invasive species and dead vegetation.
- Perform periodic mowing.
- Snow should not be stored within or down-slope of the level spreader.
- Repair any erosion and re-grade was warranted by inspection.
- Reconstruct the spreader if down-slope channelization indicates that the spreader is not level or that discharge has become concentrated, and corrections cannot be made through minor re-grading.

General:

- If any invasive species begin to grow in the stormwater management practices the species shall be disposed of in an appropriate manner that will not allow the pest to survive or spread. The disposal of such species shall be witnessed or approved by a state inspector. Methods for disposal may include, but not be limited to:
    - Encapsulating the plant(s) in plastic bags and disposing of the plant material in one of the following ways:
        - Trash pickup;
        - Discarding;
        - Open burning;
        - Incineration; or
        - Burial of infested nursery.

II. Supporting Documents

Annual Inspection and Maintenance Reporting Form
for
Frenette Gardens
Hudson, New Hampshire

Date: _____

To: Project Owner

Re: Certification of Inspection and Maintenance; Submittal of Forms

Property Name: _____

Property Address: _____

Contact Name: _____

Contact Phone #: _____

Contact Email Address: _____

I verify that the required stormwater facility inspections and required maintenance have been completed in accordance with the Operation & Maintenance Plan associated with the above referenced property.

The required Long-Term Inspection & Maintenance Plan Checklist is attached to this form.

_____ _____
Name of Party Responsible for Inspection & Maintenance — Property Owner

_____ _____
Authorized Signature — Signature

Long-Term Inspection & Maintenance Plan Checklist
Frenette Gardens – Hudson, NH

Current Owner Name:	Date:
Business Address:	Inspector:
Weather:	
Date of Last Rainfall:	Amount: Inches:
Best Management Practice	

Subsurface Infiltration System	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Visual inspection of drawdown time? Yes ☐ No ☐
Drawdown time less than 72 hours? Yes ☐ No ☐
(if no, call a qualified professional for inspection)

Isolator Rows	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Stadia Rod Readings: Fixed Point to Chamber Bottom _____
Fixed Point to Top of Sediment - _____
Sediment Depth = _____

Observations/Actions:

Infiltration Trench #1	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐

Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Visual Inspection of vegetation? Yes ☐ No ☐
Maintenance Required? Yes ☐ No ☐
Corrective Action Needed & Notes:

Visual inspection of drawdown time? Yes ☐ No ☐
Drawdown time less than 72 hours? Yes ☐ No ☐
(if no, call a qualified professional for inspection)

Infiltration Trench #2	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐
Maintenance Required? Yes ☐ No ☐ Corrective Action Needed & Notes:			
Visual Inspection of vegetation? Yes ☐ No ☐ Maintenance Required? Yes ☐ No ☐ Corrective Action Needed & Notes:			
Visual inspection of drawdown time? Yes ☐ No ☐ Drawdown time less than 72 hours? Yes ☐ No ☐ (if no, call a qualified professional for inspection)			
Catch Basins & Closed Drainage Network			
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐
Maintenance Required? Yes ☐ No ☐ Corrective Action Needed & Notes:			
Level Spreaders	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐
Maintenance Required? Yes ☐ No ☐ Corrective Action Needed & Notes:			
Need Repairs? Yes ☐ No ☐			
General	Reason for Inspection		
	Spring ☐	Fall/Yearly ☐	After Major Storm ☐
Maintenance Required? Yes ☐ No ☐ Corrective Action Needed & Notes:			

Long-Term Inspection & Maintenance Log
Frenette Gardens – Hudson, NH

Date	Inspection (Yes or No)	Maintenance (Yes or No)	List BMPs Inspected and/or Provide Comments	Inspected By:

Anti-icing Route Data Form
Frenette Gardens – Hudson, NH

Truck Station:				
Date:				
Temperature:	Pavement Temperature:	Relative Humidity:	Dew Point:	Sky:
Reason For Applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

III. Control of Invasive Plants

Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some Exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

During maintenance activities, check for the presence of invasive plants and suitably remove according to the methods provided in the table below. The following table, based on the "Control of Invasive Plants" published by the New Hampshire Department of Agriculture, describes the most common invasive plants in this region and proper methods of disposal.

Name	Description	Invasive Qualities	Control Methods
Invasive Trees			
Norway Maple	- Large leaves - Will exude milky white sap when leaves are broken - Leaves turn color in Late October (fall foliage is yellow)	- Suppresses growth of grass, garden plants, and forest understory -Wind-borne seeds can germinate and grow in deep shade	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out plants, including the root systems. Use a forked spade or weed wrench. - Cut down the tree. Grind out the stump, or clip off re-growth. - Girdle[1] - Frill[2] - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray with glyphosate [3]* (mid-October to early November).
Tree of Heaven	- Long compound leaves with 11-25 lance shaped leaflets - Smell like peanut butter or burnt coffee when crushed	- Tough, can grow in poor conditions - Produces large quantities of wind-borne seeds - Grows rapidly - Secretes a toxin that kills other plants - Cannot be removed by mechanical means alone	- Pull seedlings when soil is moist. - Frill[2] (no more than 1" gap between cuts). Use Garlon 3a herbicide. - Cut stem/ cut stump with Garlon 3a. Follow label directions for cut stump application. Clip off sucker sprouts or paint with Garlon 3a.* - Foliar spray[3]* (on regrowth) - Paint bottom 12" of bark with Garlon 4 Ultra (February/March). Use maximum strength specified on label for all herbicide applications.
Invasive Shrubs			
Autumn Olive	- Formerly recommended for erosion control and wildlife value	- Highly invasive, diminishes the overall quality of wildlife habitat	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs (up to 4" diameter trunks). - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Bury stump - Do not mow

Invasive Shrubs (continued)			
Multiflora Rose	- Formerly recommended for erosion control, hedges, and wildlife habitat - Covered in white flowers in June - Very hard, curved thorns - Fringed edge to leaf stalk	- Huge shrub that chokes out all other vegetation - Too dense for most birds to nest in - Grows up trees like a vine in Shade	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems (at least 6" from the crown and 6" down). Use a forked spade or weed wrench for trees or shrubs. - Controlled burning[4] (on extensive infestations) - Cut stem/ cut stump with glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* (mix Rodeo with extra sticker-spreader, or use Roundup Sure Shot Foam on small plants) - Herbicide may be applied in winter when other plants are dormant.
Bush Honeysuckles	- Includes Belle, Amur, Morrow's, and Tatarian Honeysuckle	- Creates dense shade reducing plant diversity and eliminating nest sites in forest interior spaces	- Deadhead to prevent spread of seeds (on ornamentals). Cut off seeds or fruits before they ripen. Bag and burn, or send to a landfill. - Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year (on shady sites only, brush cut in early spring and fall). - Controlled burning[4] (during growing season) - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate (late in the growing season). Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.*

Invasive Shrubs (continued)			
Blunt-Leaved Privet	- Medium sized shrub - Simple, oblong, dark green leaves 1-2" in length - Fragrant white flowers (spring) - Blackish-purple fruit (late summer)	- Toxic to mammals - Loss of valuable habitat	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers - Do not cut back or mow
Burning Bush, Winged Euonymus	- Wide, corky wings on the Branches - Brilliant red autumn leaves - Fruit	- High seed production	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers
Japanese Barberry	- Spiny deciduous shrub - Small leaves	- Very dense, displaces native plants - Can change chemistry of soil	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Cut down the tree. Grind out the stump, or clip off re-growth. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Trim off all flowers

Invasive Woody Vines			
Japanese Honeysuckle	- Gold and White flowers - Heavy scent and sweet nectar in June	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Rampant grower - Spirals around trees, often strangling them	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* (fall or early spring when native vegetation is dormant) Plan to re-treat repeatedly
Oriental Bittersweet	- Bright orange seed capsules in clusters all along the stem - Flowers	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle	- Pull seedlings and small or shallow-rooted plants when soil is moist. Dig out larger plants, including the root systems. Use a forked spade or weed wrench for trees or shrubs. - Keep ornamental plants cut back, remove all fruits as soon as they open, and bag or burn fruits. - Cut stem/ cut stump with Garlon 3a. Follow label directions for cut stump application. Clip off sucker sprouts or paint with Garlon 3a.*
Japanese Knotweed, Mexican Bamboo	- The stems have knotty joints, similar to bamboo - Grows 6-10' tall - Large, pointed oval or triangular leaves	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Can grow in shade	- Cut stem/ cut stump with Glyphosate (at least 3 times each during growing season). Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]* - Treat with Rodeo - In gardens, heavy mulch or dense shade may kill it.

Invasive Herbaceous Plants			
Garlic Mustard	- White-flowered biennial - Rough scalloped leaves (kidney, heart, or arrow shaped) - Garlic smell, mustard taste when its leaves are crushed	- Shade shrubs and young trees of the forest understory, eventually killing them, and changing the open structure of the forest into a dense tangle - Rampant grower - Spirals around trees, often strangling them	- Pull seedlings and small or shallow-rooted plants when soil is moist (before it flowers in spring). Dig out larger plants, including the crown and root systems. Use a forked spade or weed wrench for trees or shrubs. Tamp down soil afterwards. - Deadhead to prevent spread of seeds. Cut off seeds or fruits before they ripen. Bag and burn or send to a landfill. - Foliar spray[3]* (may be appropriate in some settings)
Japanese Stilt Grass	- Lime green color - Line of silvery hairs down the middle of the 2-3" long blade	- Tolerates sun or dense shade -Quickly invades areas left bare or disturbed by tilling or flooding - Builds a large seed bank in the soil	- Pull seedlings and small or shallow-rooted plants when soil is moist (pulled easily in early to mid-summer).Dig out larger plants, including root systems. Use a forked spade or weed wrench for trees or shrubs. Be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to a landfill. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. Mowing weekly or when it has just begun to flower may prevent it from setting seed. - Foliar spray[3]* (use glyphosate or herbicidal soap on large infestations. - Use a corn-based pre-emergence herbicide on annual weeds (spring). This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.

Invasive Herbaceous Plants (continued)			
Mile-A-Minute Vine, Devil's Tail Tearthumb	- Triangular leaves - Barbed stems - Turquoise berries	- Rapid growth - Quickly covers and shades out herbaceous plants	- Pull seedlings and small or shallow-rooted plants when soil is moist (pulled easily in early to mid-summer).Dig out larger plants, including root systems. Use a forked spade or weed wrench for trees or shrubs. Be sure to pull before it goes to seed. If seeds have formed, bag and burn or send to a landfill. - Mow or cutting at least 4 times a season to deplete plants' store of nutrients and carbohydrates, reduce seed formation, and kill or minimize spread of plants. If necessary, repeat each year. Mowing weekly or when it has just begun to flower may prevent it from setting seed. - Foliar spray[3]* (use glyphosate or herbicidal soap on large infestations. - Use a corn-based pre-emergence herbicide on annual weeds (spring). This product is also an organic fertilizer, i.e., it can stimulate growth of existing plants, including weeds, so it is appropriate for lawns and gardens but may not be appropriate in woodlands.
Spotted Knapweed	- Thistle-like flowers	- Dense, crowds out native species	- Do not pull unless the plant is young and the ground is very soft. The root will break and produce several new plants. - Wear sturdy gloves - Deadhead to prevent spread of seeds. Cut off seeds or fruits before they ripen. Bag and burn, or send to a landfill. - In lawns, spot treat with broad-leaf weed killer. Good lawn care practices (test soil; use lime and fertilizer only when soil test shows a need; mow high and frequently; leave clippings on lawn) reduce weed infestations. - Cut stem/ cut stump with Glyphosate. Follow label directions for cut stump application. Clip off sucker sprouts or paint with glyphosate.* - Foliar spray[3]*

[1]Girdle: Cut through the bark and growing layer all around the trunk, about 6" above the ground. Girdling is most effective in spring (when the sap is rising) & middle-late summer (when the tree is sending food to the roots). Clip off sucker sprouts.

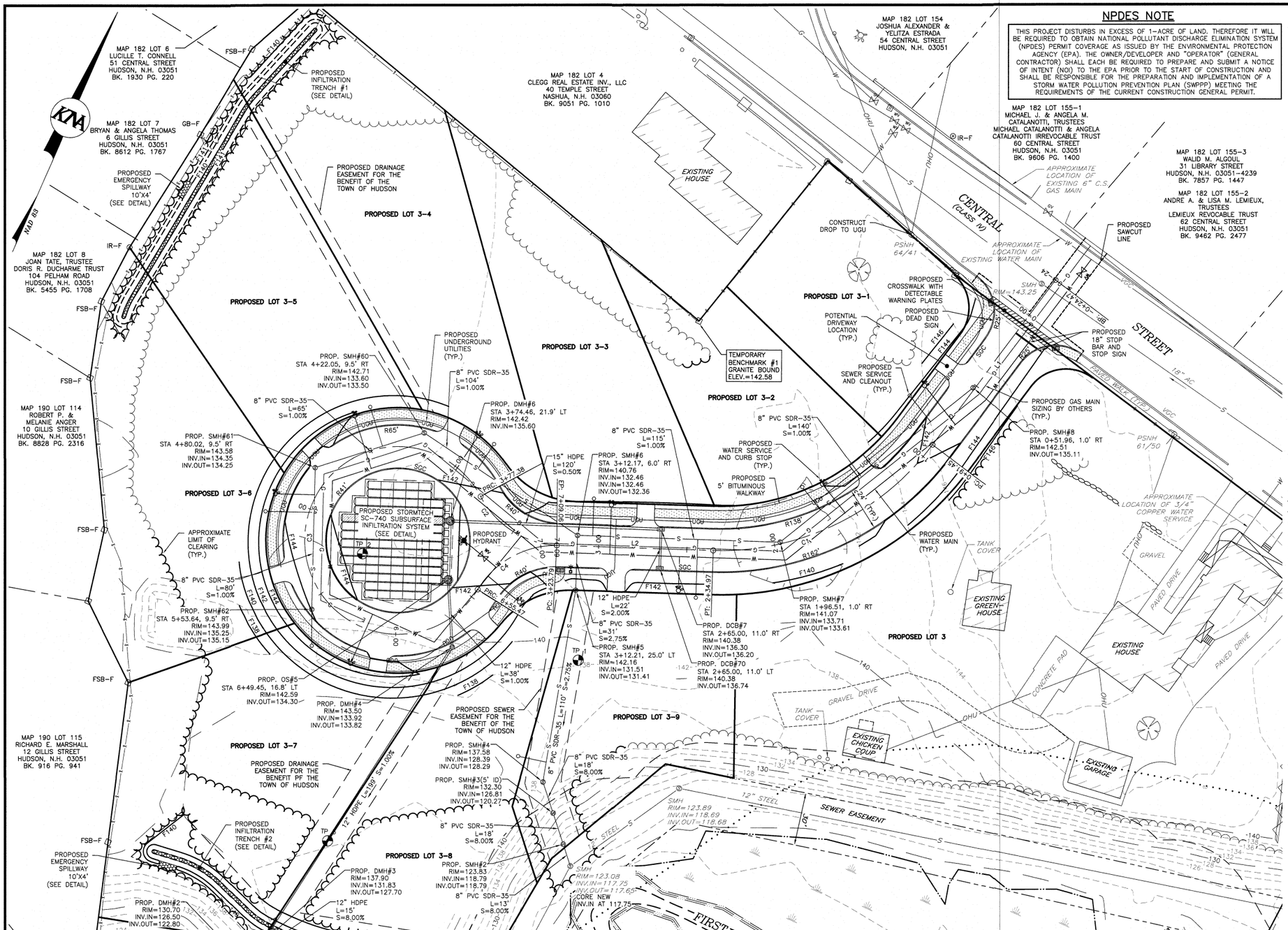
[2]Frill: Using a machete, hatchet, or similar device, hack scars (several holes in larger trees) downward into the growing layer, and squirt in glyphosate (or triclopyr if specified in table). Follow label directions for injection and frill applications. This is most effective from middle to late summer. Clip off any sucker sprouts or treat with glyphosate.

[3]Foliar Spray: Use a backpack or garden sprayer or mist blower, following label directions. Avoid overspray and/or dripping onto non-target plants, because glyphosate kills most plants except moss. If it rolls off waxy or grass-like foliage, use additional sticker-spreader. Deciduous trees, shrubs, and perennials move nutrients down to the roots in late summer. Glyphosate is particularly effective at this time and when plants have just gone out of flowering. Several invasive species retain their foliage after native plants have lost theirs, and resume growth earlier in spring than most natives. This allows you to treat them without harming the natives. However, the plant must be actively growing for the herbicide to work. Retreatments may be necessary the following year if suckering occurs or the plant hasn't been entirely killed.

[4]Controlled Burning: Burning during the spring (repeated over several years) will allow native vegetation to compete more effectively with the invasive species. This requires a permit. Spot treatment with glyphosate in late fall can be used to make this method more effective

*Herbicides: It is highly recommended that small populations try to be controlled using non-chemical methods where feasible. However, for large infestations, and for a few plants herbicide use is essential. Apply herbicides carefully to avoid non-target plants, glyphosate is the least environmentally damaging herbicide in most cases. Add food coloring for visibility, and a soap-based sticker such as Cide-Kick. Glyphosate is ineffective on some plants; for these, triclopyr or Garlon 3a may be indicated. When using herbicides read the entire label and observe all precautions listed, including proper disposal. If in doubt, call your local Cooperative Extension Service.

IV. Stormwater Practice Location Plan



NPDES NOTE

THIS PROJECT DISTURBS IN EXCESS OF 1-ACRE OF LAND. THEREFORE IT WILL BE REQUIRED TO OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE AS ISSUED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE OWNER/DEVELOPER AND "OPERATOR" (GENERAL CONTRACTOR) SHALL EACH BE REQUIRED TO PREPARE AND SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA PRIOR TO THE START OF CONSTRUCTION AND SHALL BE RESPONSIBLE FOR THE PREPARATION AND IMPLEMENTATION OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MEETING THE REQUIREMENTS OF THE CURRENT CONSTRUCTION GENERAL PERMIT.

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED ROADWAY DESIGN, GRADING, AND UTILITIES FOR THIS SITE.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK PERFORMED IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. ALL DRAINAGE PIPES SHOWN SHALL BE HDPE. CATCH BASINS SHALL BE TYPE B, AND HAVE 3' SUMPS UNLESS OTHERWISE NOTED.
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 TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. ALL DRAINAGE PIPE SHALL BE INSTALLED FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. ALL DRIVEWAY, WATER, AND GAS STUB LOCATIONS SHOWN ARE APPROXIMATE AND SHALL BE COORDINATED WITH OWNER & ENGINEER OF RECORD FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

EXCAVATION AND EMBANKMENT NOTES:

1. LEDGE AND BOULDER EXCAVATION AND REMOVAL
   - ALL LEDGE AND BOULDER EXCAVATION AND REMOVAL ACTIVITIES SHALL CONFORM WITH SECTION 203 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION; AS PUBLISHED BY THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION AND TOWN REQUIREMENTS FOR BLASTING PERMITS/SUBMITTALS. NO LEDGE OR BOULDERS SHALL BE BURIED WITHIN THE TOWN OWNED RIGHT-OF-WAY.
2. STUMP REMOVAL AND DISPOSAL
   - STUMPS SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES STANDARDS. PRIOR TOWN APPROVAL IS REQUIRED FOR ANY ON-SITE STUMP BURIALS. STUMPS CANNOT BE BURIED OR OTHERWISE DISPOSED OF WITHIN THE TOWN OWNED RIGHT-OF-WAY.
3. OFF-SITE FILL MATERIAL
   - CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING, CONTAINING, AND DULY REMOVING ALL CONSTITUENTS OF CONCERN BROUGHT TO THE SITE BY CONTRACTOR, SUBCONTRACTORS, SUPPLIERS, OR ANYONE ELSE FOR WHOM CONTRACTOR IS RESPONSIBLE, AND FOR ANY ASSOCIATED COSTS; AND FOR THE COSTS OF REMOVING AND REMEDIATING ANY HAZARDOUS ENVIRONMENTAL CONDITION CREATED BY THE PRESENCE OF ANY SUCH CONSTITUENTS OF CONCERN.
   - CONTRACTOR SHALL NOT IMPORT ANY FILL OVER THE AMOUNT OF TEN CUBIC YARDS CUMULATIVE TOTAL PER SOURCE TO ANY JOB SITE IN THE TOWN OF HUDSON WITHOUT SOILS TESTING VERIFYING THE ABSENCE OF ALL CONSTITUENTS OF CONCERN, AND WITHOUT PRIOR APPROVAL BY ENGINEERING DEPARTMENT STAFF. DOCUMENTATION SUCH AS TEST REPORTS, CERTIFICATIONS AND SIEVE ANALYZES OF FILL SHALL BE PROVIDED TO THE ENGINEERING DEPARTMENT FOR APPROVAL PRIOR TO TRANSPORTING THE MATERIAL TO HUDSON.

LEGEND

⊡ GB-F	GRANITE BOUND FOUND	═══	DRAINAGE LINE
⊡ FSB-F	FIELDSTONE BOUND FOUND	⌒⌒⌒	TREELINE
O IP-F	IRON PIPE FOUND	———	EDGE OF PAVEMENT
O AI-F	ANGLE IRON FOUND	———	VERTICAL GRANITE CURB
⊗ IR-F	IRON ROD FOUND	- - - -	EDGE OF GRAVEL
	UTILITY POLE	———	10' CONTOUR
	SIGN	———	2' CONTOUR
Ⓢ	SEWER MANHOLE	○○○○○	STONEWALL
Ⓓ	DRAINAGE MANHOLE	• • • • •	SCS SOIL LINE
⊞	CATCH BASIN	———	BUILDING SETBACK
— — —	ABUTTER LINE	- - -	EASEMENT
———	PROPERTY LINE	———	PROPOSED UNDERGROUND UTILITIES
-·-·-	WETLAND	—G— G—	PROPOSED GAS LINE
≈≈≈	BROOK	—W— W—	PROPOSED WATER LINE
—x—x—	CHAIN LINK FENCE	—S— S—	PROPOSED SEWER LINE
—o—o—o—	STOCKADE FENCE	═══	PROPOSED DRAINAGE LINE
—OHU—	OVERHEAD UTILITIES	⌒⌒⌒	PROPOSED TREELINE
—G— G—	GAS LINE	———	PROPOSED EDGE OF PAVEMENT
—W— W—	WATER LINE	———	PROPOSED SLOPED GRANITE CURB
—S— S—	SEWER LINE	———	PROPOSED 2' CONTOUR

LOAM & SEED ALL DISTURBED AREAS (TYP.)

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

LINE TABLE: GARDEN CIRCLE		
NUMBER	LENGTH	BEARING
L1	115.93	S12° 34' 47.00"W
L2	88.82	S67° 23' 58.93"W

CURVE TABLE: GARDEN CIRCLE			
NUMBER	RADIUS	LENGTH	CHORD BEARING
C1	150.00	143.52	S39° 59' 22.96"W
C2	52.05	53.59	N81° 47' 43.99"W
C3	53.00	278.09	S22° 36' 01.07"E
C4	52.05	53.59	N36° 35' 41.86"E

SCS SOILS LEGEND

WnC WINDSOR-URBAN LAND COMPLEX, 3 TO 15 PERCENT SLOPES

WdD WINDSOR LOAMY SAND, 15 TO 35 PERCENT SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY HILLSBOROUGH COUNTY

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

ROADWAY PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS/APPLICANTS OF MAP 182 LOT 3:

LAURI RIPALDI
46 BUSH HILL ROAD
HUDSON, NH 03051
9531/2754

KIMBERLY FRENETTE
88 DUMONT ROAD
HUDSON, NH 03051
9531/2754

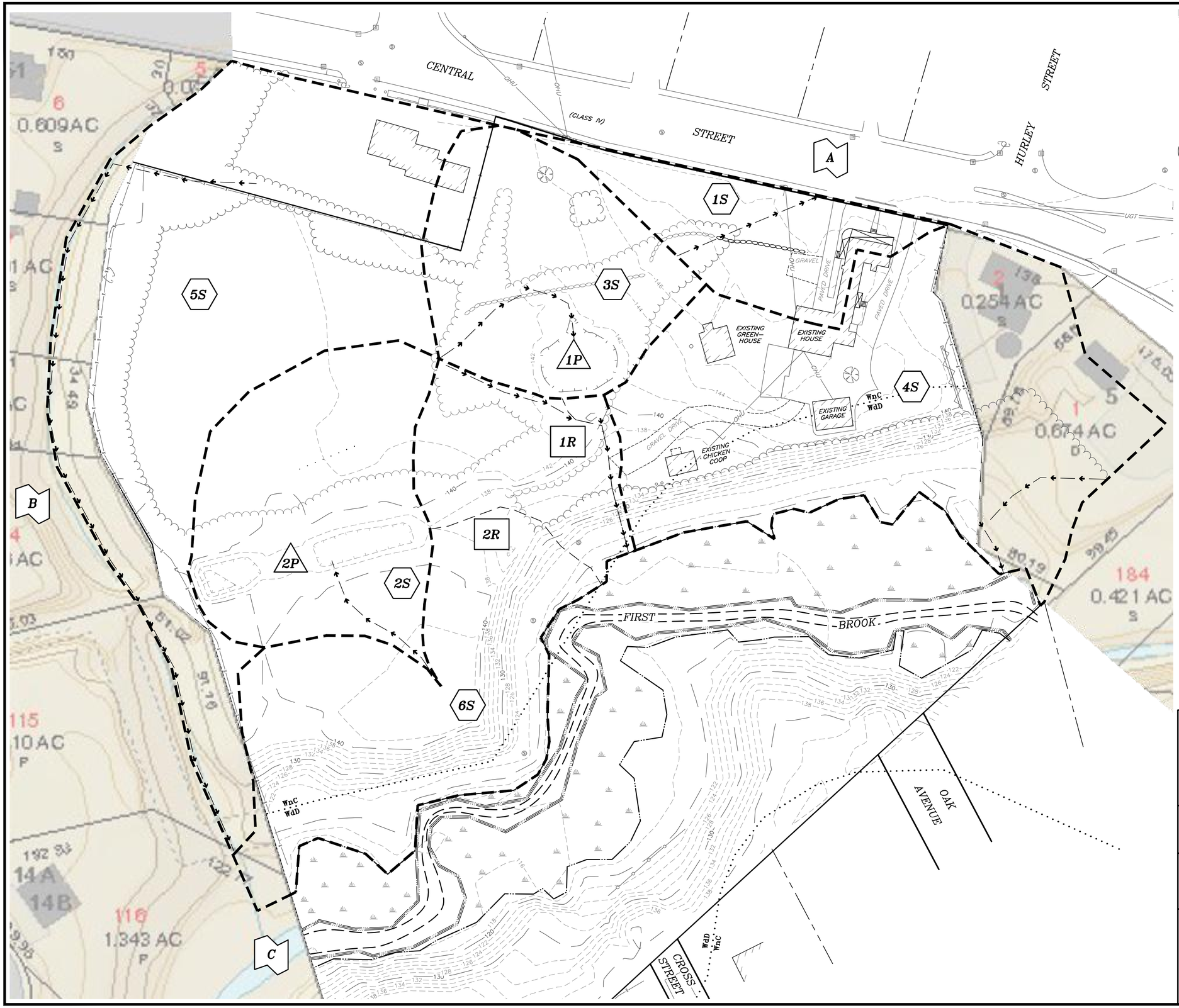
RICKY FRENETTE
14 TATE STREET
HUDSON, NH 03051
9531/2754

KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

PAUL CHISHOLM No. 15078 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	5/24/22	REVISED SEWER DESIGN	PCM
2	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: 1" = 30'
PROJECT NO: 21-0928-1 | SHEET 5 OF 16



NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL PRIOR TO DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "TOPOGRAPHIC SUBDIVISION PLAN, FRENETTE GARDENS, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED APRIL 20, 2022" AND TOWN GIS DATA.

DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

- SCS SOIL LINES
- WnC — DENOTES SOIL TYPE
- P — DENOTES POND
- S — DENOTES SUBCATCHMENT AREA
- L — DENOTES POINT OF INTEREST
- R — DENOTES REACH
- LIMIT OF SUBCATCHMENT AREA
- TIME OF CONCENTRATION
- REACH

SCS SOILS LEGEND

WnC	WINDSOR-URBAN LAND COMPLEX, 3 TO 15 PERCENT SLOPES
WdD	WINDSOR LOAMY SAND, 15 TO 35 PERCENT SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY HILLSBOROUGH COUNTY

DIG SAFE
811
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PRE DEVELOPMENT DRAINAGE AREA PLAN
FRENETTE GARDENS
MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNERS OF MAP 182 LOT 3:

LAURA RIPALDI
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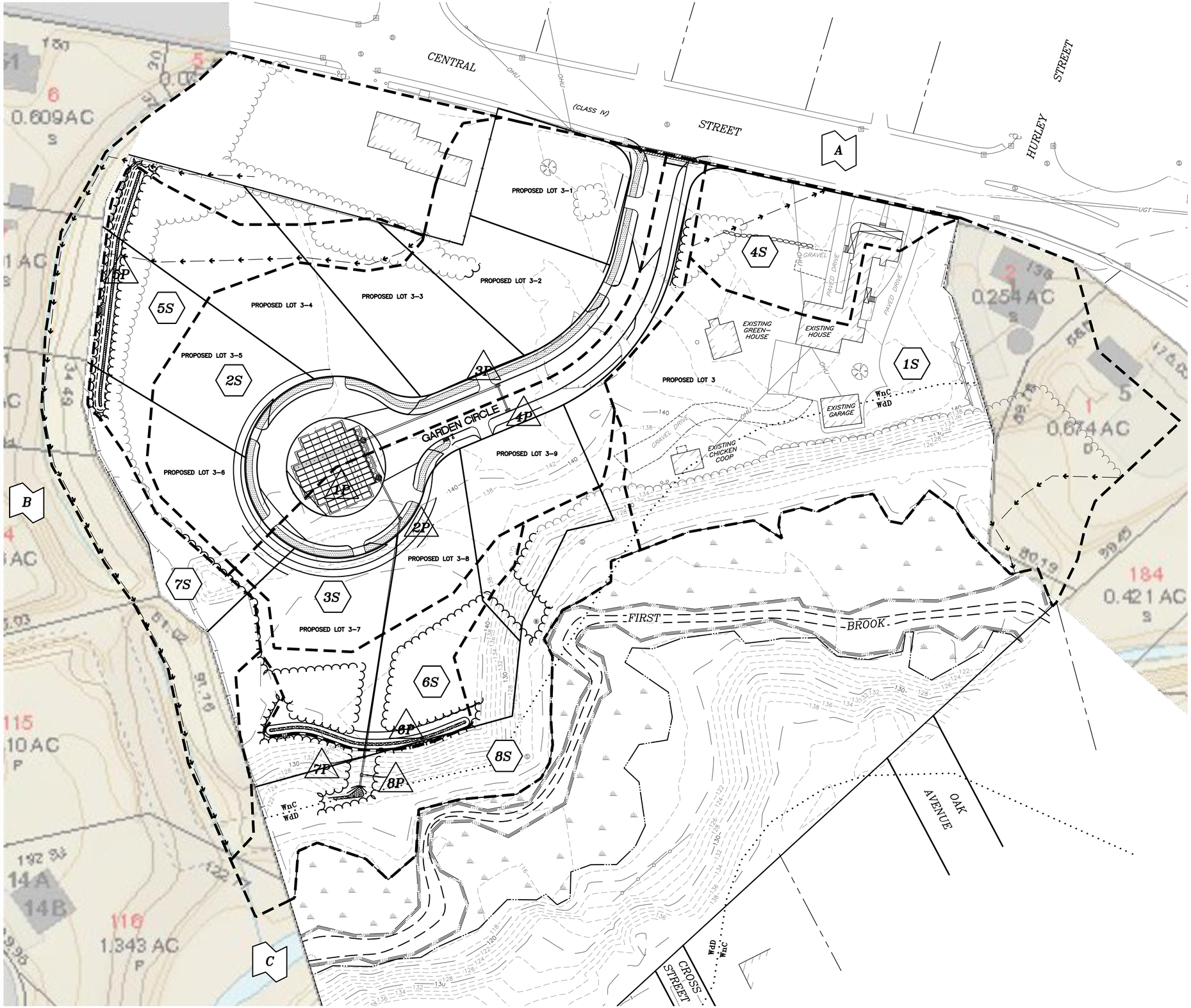
REVISIONS

No.	DATE	DESCRIPTION	BY
1	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: 1" = 40'
PROJECT NO: 21-0928-1 | SHEET 1 OF 2



NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL AFTER DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "TOPOGRAPHIC SUBDIVISION PLAN, FRENETTE GARDENS, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED APRIL 20, 2022" AND TOWN GIS DATA.
3. PROPOSED FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "ROADWAY PLAN, FRENETTE GARDENS, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED APRIL 20, 2022".

DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

- SCS SOIL LINES
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- LIMIT OF SUBCATCHMENT AREA
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- REACH

SCS SOILS LEGEND

WnC	WINDSOR-URBAN LAND COMPLEX, 3 TO 15 PERCENT SLOPES
WdD	WINDSOR LOAMY SAND, 15 TO 35 PERCENT SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY HILLSBOROUGH COUNTY

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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

POST DEVELOPMENT DRAINAGE AREA PLAN

FRENETTE GARDENS

MAP 182 LOT 3
65 CENTRAL STREET
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

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REVISIONS

No.	DATE	DESCRIPTION	BY
1	6/6/22	TOWN & CONSULTANT COMMENTS	PCM

DATE: APRIL 20, 2022 | SCALE: 1" = 40'
PROJECT NO: 21-0928-1 | SHEET 2 OF 2