

25 WEBSTER ST. PHASE 2

SB# 06-22

STAFF REPORT

August 24, 2022

SITE: 25 Webster Street, Map 181 Lots 001-000 & 001-001

ZONING: Town Residential (TR)

PURPOSE OF PLAN: To subdivide Map 181 Lot 001-001 into four (4) residential building lots served by a common driveway and to relocate the lot line of Map 181 Lot 001-000.

PLANS UNDER REVIEW:

Subdivision Plan, Map 181 Lots 1 & 1-001, 25 Webster St.; prepared by RJB Engineering, LLC, 2 Glendale Rd. Concord, NH 03301 in association with M.J. Grainger Engineering, Inc., 220 Derry Rd. Hudson, NH 03051; prepared for Tumpney, Hurd, Clegg LLC 39 Trigate Rd. Hudson, NH 03051; consisting of 14 sheets including cover sheet, and general notes 1-14 on Sheet 4; dated June 27, 2022, last revised August 16, 2022.

Note: the hard copy plan sets included in Planning Board packets have a revision date of August 8, 2022. The most recent set dated August 16, 2022 was revised to include the surveyor's error of closure.

ATTACHMENTS:

- A. Peer Review letter, Fuss & O'Neill, dated June 1, 2022
- B. Applicant Response to Peer Review, prepared by RJB Engineering, dated August 8, 2022, received August 11, 2022.
- C. Department Comments
- D. CAP Fee worksheet

APPLICATION TRACKING:

- July 6, 2022 – Application received.
- July 13, 2022 – Planning Board approved SB# 04-22 “25 Webster St. & 20 Baker St. Subdivision”
- July 27, 2022 – deferred to August 24, 2022
- August 24, 2022 – hearing scheduled

COMMENTS & RECOMMENDATIONS:

BACKGROUND

The Planning Board recently approved a subdivision plan for this property creating Map 181 Lot 1-001 which is a 62,596 SF parcel with frontage on Webster Street. It is located in the TR district and abuts residential properties on all sides. A portion of this parcel is within the 250' shoreland setback line of the Merrimack River.

The Applicant now proposes to subdivide Map 181 Lot 1-001 to build a private cul-de-sac with four house lots. In order to accommodate the cul-de-sac entry, the Applicant proposes relocating the lot line of Map 181 Lot 1, which is currently a 10,209 SF parcel with an existing building foundation according to the previously approved subdivision plan SB #04-22. This lot area label should be corrected on the existing conditions plan. Upon lot line relocation, the lot will have 10,018 SF.

PEER REVIEW

Fuss & O'Neill performed a peer review on this submittal when it originally came in under application SB #04-22 where the cul-de-sac was proposed to be public with waivers related to dimensional requirements. While that specific application was revised to eliminate the proposed road, the peer review is applicable to the current application (**Attachment A**), with the exception of items that relate to standards for public roads. The current application proposes a private road. The Applicant subsequently provided a response to the peer review (**Attachment B**).

DEPARTMENT COMMENTS

See **Attachment C** for comments from town departments.

1. Assessing: The nomenclature of the lot numbering system should be revised to match the Town's system.
2. Engineering: Applicant shall provide an easement for the future water utility. Sewer and drainage utilities will be designed and constructed to Town standards and will remain private and the responsibility of the association. No objections to the proposed private road.
3. Fire: The private road will require a street name and formal addressing. Street name shall be approved by the Fire Department, numbering will be generated by the Fire Department (Inspectional Services).
4. Zoning: Lots do not meet frontage requirement because frontage shall be measured along a Class V or better street, known as town roads. A variance would be required to §334-27.1D and §334-6.

STAFF COMMENTS

The Applicant has proposed that the cul-de-sac will be a private road. As noted by the Zoning Administrator, according to §334-27.1D, frontage is measured along Class V or better streets.

The §334-6 definition of Frontage further specifies that frontage shall be measured along a Class V or better **public** Right-of-Way. Class V roads consist of all traveled highways other than Class VI that the town has the duty to maintain regularly. Therefore, a private road would not provide frontage in compliance with the Zoning Ordinance. A Planning Board approval would have to be conditioned upon approval of a variance by the ZBA. Furthermore, the Subdivision regulations §289-14 and §289-17 require general conformance with the Zoning Ordinance and that lot requirements meet the Zoning Ordinance, respectively. Therefore, the applicant has submitted a waiver request for relief from these regulations so that the Planning Board can review their application. Granting a waiver from these regulation does not relieve the requirements of the Zoning Ordinance, but allows the Planning Board to consider an application conditioned on approval of a variance.

Per RSA 676:4.I.i, the planning board may grant conditional approval based on receipt of permits and approvals granted by other boards, and also, may not refuse to process an application solely for lack of said permits.

Considering the proposed private road, the Board may wish to consider an arrangement in place for the maintenance of the private road such as a homeowners association with monthly dues to pay for the cost of regular maintenance and long-term repair. Each deed for the new lots will need to include a fractional ownership interest in the area of the private road.

All utilities on this site are to be private, with the exception of the water main at the request of the Engineering Department. The approximate location of the easement should be 5-feet on either side of the water main. The final location and easement should be recorded prior to Town acceptance of the water main. The water main is suggested to be public in the best interest of the customer and in accord with NH DES preferences that water mains are publicly owned and operated.

DRAFT MOTIONS

ACCEPT the subdivision application:

I move to accept the subdivision application, SB #06-22, for 25 Webster Street, Map 181 Lots 001-000 & 001-001.

CONTINUE the public hearing to a date certain:

I move to continue the subdivision application, SB #06-22, for 25 Webster Street, Map 181 Lots 001-000 & 001-001, to date certain, _____, 2022.

DEFER the public hearing to a date certain:

I move to defer the subdivision application, SB #06-22, for 25 Webster Street, Map 181 Lots 001-000 & 001-001, to date certain, _____, 2022.

To GRANT a waiver:

I move to grant a waiver from §289-14, which requires conformance with Chapter 334 Zoning, based on the Board's discussion, the testimony of the Applicant's representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

To GRANT a waiver:

I move to grant a waiver from §289-17, which requires frontage for new lots to conform to Article VII of the Zoning Ordinance, based on the Board's discussion, the testimony of the Applicant's representative, and in accordance with the language included in the submitted Waiver Request Form for said waiver.

APPROVE the subdivision application:

I move to approve the subdivision plan entitled: Subdivision Plan, Map 181 Lots 1 & 1-001, 25 Webster St.; prepared by RJB Engineering, LLC, 2 Glendale Rd. Concord, NH 03301 in association with M.J. Grainger Engineering, Inc., 220 Derry Rd. Hudson, NH 03051; prepared for Tumpney, Hurd, Clegg LLC 39 Trigate Rd. Hudson, NH 03051; consisting of 14 sheets including cover sheet, and general notes 1-14 on Sheet 4; dated June 27, 2022, last revised August 16, 2022 ; subject to, and revised per, the following stipulations:

1. Satisfaction of conditions of approval and Planning Board endorsement of case SB# 04-22.
2. All stipulations of approval shall be incorporated into the Development Agreement, which shall be recorded at the HCRD, together with the Plan.
3. A cost allocation procedure (CAP) amount of \$5,991.00 shall be paid prior to the issuance of a Certificate of Occupancy for the new house lots.
4. All monumentation shall be set or bonded for prior to Planning Board endorsement of the Plan-of-Record.
5. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
6. Prior to application for a building permit, the Applicant shall schedule a pre-construction meeting with the Town Engineer.
7. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M. No exterior construction activities shall be allowed on Sundays.
8. The easement for the water line shall be reviewed favorably by the Town Engineer and Town Counsel. The easement area shall be shown on the final plan. The easement and final location shall be recorded at time of town acceptance of the water main.
9. Notice of Limits of Municipal Responsibility and Liability: The Town of Hudson neither assumes responsibility for maintenance of the Private Road shown on the

Plan, nor liability for any claim, loss, or damages, including those arising for failure to provide municipal services, including police, fire, or ambulance services, resulting in any way from the use of said Private Road. The Owners shall be responsible for transporting any children residing on the Private Road to the nearest regular school bus stop. The Owners shall be responsible, at the Owners own expense, for maintaining the Private Road in a reasonable and safe condition at all times.

10. A note shall be added to the final plan stating condition #9 above.
11. Deed language related to fractional ownership of the private road to be approved by Town Counsel.
12. Approval of this plan is contingent upon a variance granted by the Zoning Board of Adjustment from §334-27.1D and §334-6 of the Zoning Ordinance, regarding the requirement of lot frontage to be on a Class V or better public way.

Motion by: _____ Second: _____ Carried/Failed: _____



June 1, 2022

Mr. Brian Groth
Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Town of Hudson Planning Board Review
Webster Street Subdivision Plan
Tax Map 174, Lot 15-1 & Map 181 Lot 1; Acct. #1350-511
Reference No. 20030249.2190

Dear Mr. Groth:

Fuss & O'Neill, Inc. has reviewed the first submission of the materials received on May 20, 2022, related to the above-referenced project. Authorization to proceed was received on May 20, 2022. A list of items reviewed is enclosed. The scope of our review is based on the Subdivision Plan Review Codes, Stormwater Codes, Driveway Review Codes, Sewer Use Ordinance 77, Zoning Regulations, and criteria outlined in the CLD Consulting Engineers Proposal approved September 16, 2003, revised September 20, 2004, June 4, 2007, September 3, 2008, and October 2015.

We have included a copy of Fuss & O'Neill's evaluation of the checklist for your reference. We note that several items could not be verified by Fuss & O'Neill and require action by the Town.

The project appears to consist of subdividing the existing 1.92-acre existing lot to create a six (6)-lot subdivision. A new roadway with a cul-de-sac is proposed as part of the subdivision. The new subdivision lots are proposed to be serviced by public water and sewer.

The following items are noted:

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

- a. Hudson Regulation HR 276-11.1.B.(4). & 289-27.A.(3). The applicant should add the approval block to all sheets of the plan set per the Regulations.
- b. 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.
- c. HR 276-11.1.B.(13). The applicant has not shown any sign locations or details on the plan set other than traffic signs.
- d. HR 276-11.1.B.(14). The applicant has not shown any lighting on the plan set. The applicant should confirm if any lighting is proposed and provide locations and details, or add the required note if lighting is not proposed.

The Gateway Building
50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469
www.fando.com

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Mr. Brian Groth

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- e. HR 276-11.1.B.(16). The applicant has not included information on driveways and travel ways within 200 feet of the site. The current plan only shows information approximately between 50 and 150 feet from the site.
- f. HR 276-11.1.B.(17). & 289-27.B.(7). The applicant has not provided any benchmark information.
- g. HR 276-11.1.B.(20). The applicant has not noted existing building heights on the plan set, including the existing home to be relocated.
- h. HR 289-15. & 334-83. The applicant had noted that the site is not located in the flood hazard area.
- i. 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.
- j. HR 289-26.B.(5). The applicant has not shown the Right-of-Way width of the existing streets on the plan set.
- k. HR 289-27.A.(2). The applicant has noted the Subdivision is valid for one year instead of the two noted in the Regulation.
- l. HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.
- m. HR 289-37.A. The applicant has not provided any information on phasing of subdivision construction on the plan set. We note that subdivisions with six or more lots must be developed over two years per the Regulation.

2. Driveway Review Codes (HR 193-10)

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

3. Roadway Design

- a. HR 289-18.A. The applicant has requested a waiver to reduce the required Right-of-Way width from 50 feet to 30 feet. We note that this is a significant reduction that will impact the Towns ability to maintain and repair the water main, curbing, drainage structures and perform snow plowing without impacting private property. We note the this would only allow three feet from the front of the curb to be within the Town Right-of-Way.
- b. HR 289-18.B.(3). The applicant has requested a waiver for the 75 foot minimum Right-of-Way radius and 65 foot outside edge of curb radius of the cul-de-sac. We note that the applicant has proposed a Right-of-Way radius of 55 feet and the curb radius is not shown on the plan set. We estimate the back of curb radius to be less than 53 feet. As noted above this small Right-of-Way area will impact the Towns maintenance and snowplowing abilities. We also note that emergency vehicles may have more difficulty accessing the cul-de-sac since the smaller radius will mean tighter maneuvering and may prohibit emergency vehicle access, particularly if other vehicles are parked on the street.



Mr. Brian Groth

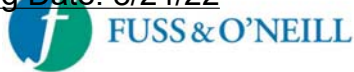
June 1, 2022

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- c. HR 289-18.B.(5). The applicant should add dead-end and stop sign locations to the plan set. Details have been provided.
- d. The applicant should show a stop bar location and detail on the plan set.
- e. HR 289-18.C.(1). The applicant should show horizontal curve information on the plan set.
- f. HR 289-18.R.(b). & 289-28.G. The applicant has requested a waiver from providing sidewalks. We note the applicant should remove the sidewalk from the Typical Individual Lot detail on the plan set.
- g. HR 289-28.F. The applicant has requested a waiver to use vertical granite curbing on the site instead of the sloped granite curbing required by the Regulation. We note that the details on the plan set all show sloped granite curbing and the curbing on the plan and profile is not labeled sloped or vertical.
- h. HR 289-Attachment 3. The applicant has labeled the width of the gravels on the Typical Roadway Section as 22 feet but the roadway is proposed to be paved at 24 foot width. The applicant should review and coordinate these details.
- i. HR 289-Attachment 3. The applicant should review the driveway maximum slope and the slope of the adjacent grassed areas on the Typical Roadway Section detail to match the Regulation.
- j. Hudson Engineering Technical Guidelines & Typical Details (ETGTD) Detail R-1. The Typical Roadway Section on sheet 6 of 12 includes 3 inches of bituminous pavement. The Town standard requires 3.5 inches. The applicant should also correct the 22' measurement call out at the bottom of the detail.
- k. The applicant should label the curb curve radii on the plan set.
- l. The applicant has shown the existing utility pole on the north side of the proposed roadway projecting into the road beyond the proposed curb line. Either the curb line should be adjusted so that the pole is behind the curb or the pole should be relocated. The applicant should consult with the owner of the utility pole to verify the minimum dimension behind curbing that is required to prevent damage from plows, etc.

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

- a. HR 289-18.A.4. The applicant should review the drainage within the cul-de-sac. Currently the (4P) depression peaks at 117.11' in the 10-year storm event, 117.55' in the 25 year storm event, and 117.91' within the 50-year storm event. The elevation of the roadway is 118.3' in this area, causing the roadway selects to be submerged in storms. This could potentially lead to freeze/thaw issues and heaving within the roadway causing the lifespan of the pavement to be compromised.
- b. HR 289-20.A.2. The project is proposing stormwater to sheet flow across the roadway from the exterior of the cul-de-sac to the center, contrary to the Regulation requirement. The applicant should review this grading/drainage design.
- c. HR 290-5.A.1 & 290.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.
- d. HR 290-5.A.11. The applicant should provide BMP worksheets illustrating treatment is met in all stormwater management areas.
- e. HR 290-5.A.11. The drainage report utilizes an infiltration rate of 15 in/hr on nodes 7P and 8P, while the infiltration feasibility report states a conservative rate of 10 in/hr. The

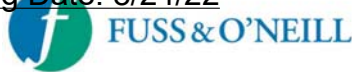


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- applicant should provide additional information on the use of 15 in/hr on these two nodes.
- f. HR 290-5.A.11. We note the Chamber system has a peak elevation in the 50-year storm of 115.58' while the rim of CB2 is 116.52', resulting in a 0.94' "freeboard" from peak elevation to overflow of the nearest inlet. The applicant should review with the Town Engineer if this meets Town typical design methods and criteria.
 - g. HR 290-5.A.11. The applicant should provide additional information on the intended house design in regard to basements. Currently peak elevation of the stormwater system is relatively high which may result in damp/wet basements and the need for waterproofing and/or sump pumps. If sump pumps are utilized, these cannot connect to sewer services and would need to tie into drainage.
 - h. HR 290-5.A.11. We note that nodes 5R and 10P are not illustrated on the pre-development drainage area plan, and it appears that node 6P is listed twice. The applicant should clarify and list all nodes on the drainage area plan.
 - i. HR 290-5.A.12 and 290-8.B.5. The applicant should provide additional information on the intended responsibilities for drainage maintenance, i.e. is a homeowners association to be created? The applicant should review this with the Town Engineer as to who will be responsible for maintenance.
 - j. HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer.
 - k. HR 290-7.A.6. The applicant should provide information as to how the stormwater system is designed to account for frozen ground conditions.
 - l. HR 290-7.B.16., Hudson Engineering Technical Guidelines & Typical Details (ETGTD) 920.4.10, and ETGTD 920.4.11. The applicant should illustrate snow storage areas and methods on the plans. With the proposed reduced roadway widths it may be difficult for snowplows to navigate within the Right-of-Way, and snow storage areas may be limited.
 - m. 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.
 - n. ETGTD 920.3.13. We note the 25-year storm event node listing is provided within the stormwater report. The applicant shall provide the 25-year storm event node summary to ensure all pipes meet the minimum 2 fps velocity required within the drainage system.
 - o. ETGTD 920.4.1 through 920.4.4. The applicant shall illustrate the locations of the requested items upon the plan set.
 - p. ETGTD 930.1. The applicant should review the depth of the drainage within the roadway, it does not meet Town minimum depth of 4' of cover.
 - q. ETGTD 930.4. The applicant shall review the slope of the proposed drainage system with the City Engineer. Slopes within the proposed Right-of-Way are less than the minimum 2% required.
 - r. ETGTD 930.10. We note the requirement for curb inlet drainage structures at all vertical sags. CB2 and CB3 are designed at a vertical sag.
 - s. ETGTD 930.13. The applicant should illustrate the required underdrain within a cut section. Note the limits upon the plan set and where the underdrains ties into the drainage system. We note this may add unintended water to the subsurface drainage system.
 - t. The applicant has shown an underground drainage system on lot one. The applicant has shown an easement for the system. We understand that the Town has requested this type of system within the private lot.



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- u. We note that during winter the catch basin within the cul-de-sac may be covered with snow and not accessible to flows from roadway snow melt and refreeze conditions. We recommend that the applicant review the need to move the drainage structure to the roadway area to allow for use during winter conditions.
- v. 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.
- w. 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.

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.
- 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.
- 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%. These minimum lot areas are achieved with the reduced Right-of-Way widths for which the applicant is requesting waivers through the Planning Board.
- d. HR 334-35. The applicant has noted that no wetlands are located on the site.

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. The applicant should coordinate with the Hudson Fire Department to verify that there is adequate fire protection coverage for the proposed lots.
- b. HR 289-21.A. The Town should review the need for a utility easement for the water main location. We note that when a utility is out of the right-of-way a 15-foot easement is required. The proposed water main is in the right-of-way but is located 1 foot from the edge of the right-of-way. This will make repairs and maintenance within the right-of-way impossible therefore we recommend an appropriately sized easement be required at the edge of the right-of-way.



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- c. HR 289-27.B.(5). The applicant should show proposed water and sewer service connections for each lot, including curb stop and sewer cleanout locations.
- d. ETGTD Section 801. The applicant should verify with the Town that the existing water main in Webster Street has adequate flow and pressure to meet both domestic and fire hydrant requirements for the proposed subdivision.
- e. ETGTD Section 825.2.13. The fire hydrant detail should state the specific Mueller hydrant model required by the Town standard (Mueller Super Centurion A-423).
- f. The applicant has not shown utility service connections to Lot 6. The applicant should verify if this lot is already connected to Town sewer and water and show the service locations on the plan set.
- g. The applicant should show the existing water and sewer connection for the house to be relocated on Lot 1. The applicant should also note how and where the existing connections will be abandoned on the plan set.
- h. The applicant is proposing an outside drop into the existing sewer manhole on Webster Street where the Town typically requires inside drops in manholes. The applicant should review this proposed installation with the Town.
- 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 Webster Street.
- j. ETGTD Detail S-1. The applicant should review the Town of Hudson Sewer Manhole detail for inconsistencies with the details provided.
- k. ETGTD Detail S-5. The applicant should review the Town of Hudson Building Service Connection detail for inconsistencies with the details provided.
- l. HR 276-13.E. The applicant has not shown the proposed means for utility connections (electric/telephone/cable) to the individual lots within the subdivision. The Regulation requires these to be underground.

7. Erosion Control/Wetland Impacts

- a. The applicant should show the locations of the proposed check dams and catch basin inlet protection measures on the plan set.
- b. The applicant should revise the silt fence location so that it can be maintained while the homes are built, and the lots are graded. The applicant should also review the need for additional silt fence location on Lot 1 for the underground drainage system and Lot 2 and 4 due to the grading.
- c. The Town should reserve the right to require additional erosion control measures.

8. State and Local Permits

- a. The applicant has noted that a NHDES Shoreland Protection permit may be required on the plan. The applicant should list all required permits on the plan.
- b. HR 290-10.B. The applicant has noted that there is no need for a NPDES Notice of Intent or a SWPPP as the disturbed area is under one acre. When home construction and site work at each lot is taken into account it appears this value would exceed one acre of disturbance.



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- c. Additional local permitting may be required.

9. Other

- a. 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.
- b. The applicant has listed the requested waivers on the plan set under the heading "Waivers Granted".

Please feel free to call if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Steve Reichert', is written over a light blue horizontal line. Below the signature, the name 'Steven W. Reichert, PE' is printed in a black, sans-serif font.

SWR:elc

Enclosure

cc: Town of Hudson Engineering Division – File
MJ Grainger Engineering, Inc.
mjgraingereng@gmail.com

August 8, 2022

Mr. Brian Groth, Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: **25 Webster Street**
Map 181, lot 001-000 & 001-001

Dear Mr. Groth,

Please find enclosed revised plans and supporting documents for the above-referenced project. This information has been revised in response to the technical review comments by Fuss & O'Neill Engineering in their letter dated June 1, 2022. Following are responses to the items as outlined in their letter:

1. Administrative and Subdivision Review Codes (HR 276 & HR 289)
 - a. Hudson Regulation HR 276-11.1.B.(4). & 289-27.A.(3). The applicant should add the approval block to all sheets of the plan set per the Regulations. **Sheets 1 through 7 have been revised accordingly.**
 - b. 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 signature will be provided on the final plans.**
 - c. HR 276-11.1.B.(13). The applicant has not shown any sign locations or details on the plan set other than traffic signs. **Note number 10 has been added to sheet 4.**
 - d. HR 276-11.1.B.(14). The applicant has not shown any lighting on the plan set. The applicant should confirm if any lighting is proposed and provide locations and details, or add the required note if lighting is not proposed. **Note number 11 has been added to sheet 4.**
 - e. HR 276-11.1.B.(16). The applicant has not included information on driveways and travel ways within 200 feet of the site. The current plan only shows information approximately between 50 and 150 feet from the site. **An overview plan, sheet 2, has been added to the plan set depicting Town GIS mapping of the vicinity.**
 - f. HR 276-11.1.B.(17). & 289-27.B.(7). The applicant has not provided any benchmark information. **A bench has been added to sheet 7.**
 - g. HR 276-11.1.B.(20). The applicant has not noted existing building heights on the plan set, including the existing home to be relocated.
 - h. HR 289-15. & 334-83. The applicant had noted that the site is not located in the flood hazard area. **No revision or response needed.**
 - i. 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.
 - j. HR 289-26.B.(5). The applicant has not shown the Right-of-Way width of the existing streets on the plan set. **The right-of-way widths have been added to the plans.**
 - k. HR 289-27.A.(2). The applicant has noted the Subdivision is valid for one year instead of the two noted in the Regulation. **This has been corrected to two years.**
 - l. HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.

This detail has been added to sheet 8.

- m. HR 289-37.A. The applicant has not provided any information on phasing of subdivision construction on the plan set. We note that subdivisions with six or more lots must be developed over two years per the Regulation. **No phasing is proposed for this subdivision.**
2. Driveway Review Codes (HR 193-10)
 - a. HR 193-10.A. & 193-10.E. The applicant should provide sight distance information for the proposed roadway at the Webster Street intersection on the plan set. **Note 12 has been added on sheet 4.**
 3. Roadway Design

The road profile design has been revised to eliminate the sag curve that had been proposed and propose a constant +2% grade for the entire length. While this raises the grade considerably and will require fill in the cul-de-sac, it is intended to improve the drainage in the roadway, raise the proposed house foundations, and should blend better with the higher elevations on Baker Street.

 - a. HR 289-18.A. The applicant has requested a waiver to reduce the required Right-of-Way width from 50 feet to 30 feet. We note that this is a significant reduction that will impact the Towns ability to maintain and repair the water main, curbing, drainage structures and perform snow plowing without impacting private property. We note the this would only allow three feet from the front of the curb to be within the Town Right-of-Way. **The proposed road and utilities would be privately owned and maintained by the homeowners association.**
 - b. HR 289-18.B.(3). The applicant has requested a waiver for the 75 foot minimum Right-of- Way radius and 65 foot outside edge of curb radius of the cul-de-sac. We note that the applicant has proposed a Right-of-Way radius of 55 feet and the curb radius is not shown on the plan set. We estimate the back of curb radius to be less than 53 feet. As noted above this small Right-of-Way area will impact the Towns maintenance and snowplowing abilities. We also note that emergency vehicles may have more difficulty accessing the cul- de-sac since the smaller radius will mean tighter maneuvering and may prohibit emergency vehicle access, particularly if other vehicles are parked on the street. **Again, the proposed road and utilities would be privately owned and maintained by the homeowners association. The turning radius of the cul-de-sac is adequate to accommodate fire trucks.**
 - c. HR 289-18.B.(5). The applicant should add dead-end and stop sign locations to the plan set. Details have been provided. **A general roadway plan, sheet 6, has been added to the set and the sign locations have been added to this sheet.**
 - d. The applicant should show a stop bar location and detail on the plan set. **This has been added to sheet 6.**
 - e. HR 289-18.C.(1). The applicant should show horizontal curve information on the plan set. **This has been added to sheet 6.**
 - f. HR 289-18.R.(b). & 289-28.G. The applicant has requested a waiver from providing sidewalks. We note the applicant should remove the sidewalk from the Typical Individual Lot detail on the plan set. **This detail has been revised accordingly.**
 - g. HR 289-28.F. The applicant has requested a waiver to use vertical granite curbing on the site instead of the sloped granite curbing required by the Regulation. We note that the details on the plan set all show sloped granite curbing and the curbing on the plan and profile is not labeled sloped or vertical. **Slope granite curb is proposed for the project.**
 - h. HR 289-Attachment 3. The applicant has labeled the width of the gravels on the Typical

- Roadway Section as 22 feet but the roadway is proposed to be paved at 24 foot width. The applicant should review and coordinate these details. **This detail has been revised accordingly.**
- i. HR 289-Attachment 3. The applicant should review the driveway maximum slope and the slope of the adjacent grassed areas on the Typical Roadway Section detail to match the Regulation. **This detail has been revised accordingly.**
 - j. Hudson Engineering Technical Guidelines & Typical Details (ETGTD) Detail R-1. The Typical Roadway Section on sheet 6 of 12 includes 3 inches of bituminous pavement. The Town standard requires 3.5 inches. The applicant should also correct the 22' measurement call out at the bottom of the detail. **This detail has been revised accordingly.**
 - k. The applicant should label the curb curve radii on the plan set. **The radii has been added to the general roadway plan, sheet 6.**
 - l. The applicant has shown the existing utility pole on the north side of the proposed roadway projecting into the road beyond the proposed curb line. Either the curb line should be adjusted so that the pole is behind the curb or the pole should be relocated. The applicant should consult with the owner of the utility pole to verify the minimum dimension behind curbing that is required to prevent damage from plows, etc. **A note has been added to the plan to relocate the pole.**
4. Drainage Design /Stormwater Management (HR 289-20.C. /Chapter 290)
- a. HR 289-18.A.4. The applicant should review the drainage within the cul-de-sac. Currently the (4P) depression peaks at 117.11' in the 10-year storm event, 117.55' in the 25 year storm event, and 117.91' within the 50-year storm event. The elevation of the roadway is 118.3' in this area, causing the roadway selects to be submerged in storms. This could potentially lead to freeze/thaw issues and heaving within the roadway causing the lifespan of the pavement to be compromised. **The drainage design has been revised and the proposed depression inside the cul-de-sac removed. The roadway is superelevated to the outside curb line and catch basins have been added at the throat of the cul-de-sac and routed to the chamber system.**
 - b. HR 289-20.A.2. The project is proposing stormwater to sheet flow across the roadway from the exterior of the cul-de-sac to the center, contrary to the Regulation requirement. The applicant should review this grading/drainage design. **This has been revised as noted in 4a above.**
 - c. HR 290-5.A.1 & 290.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. ???
 - d. HR 290-5.A.11. The applicant should provide BMP worksheets illustrating treatment is met in all stormwater management areas. **A BMP worksheet has been added in the Drainage Report.**
 - e. HR 290-5.A.11. The drainage report utilizes an infiltration rate of 15 in/hr on nodes 7P and 8P, while the infiltration feasibility report states a conservative rate of 10 in/hr. The applicant should provide additional information on the use of 15 in/hr on these two nodes. **The 15 in/hr is estimated for the upper soil horizon, while the 10 in/hr is estimated for the deeper soil horizon. A statement was added in the Drain Report narrative.**
 - f. HR 290-5.A.11. We note the Chamber system has a peak elevation in the 50-year storm of 115.58' while the rim of CB2 is 116.52', resulting in a 0.94' "freeboard" from peak elevation to overflow of the nearest inlet. The applicant should review with the Town Engineer if this meets Town typical design methods and criteria. **Since the road and drainage system was raised, the freeboard has increased. Note that the chamber system is designed with sufficient capacity to accomodate the 50-year storm.**
 - g. HR 290-5.A.11. The applicant should provide additional information on the intended house design in regard to basements. Currently peak elevation of the stormwater system is relatively

high which may result in damp/wet basements and the need for waterproofing and/or sump pumps. If sump pumps are utilized, these cannot connect to sewer services and would need to tie into drainage. **As previously noted, the house foundation elevations have been raised. This should minimize water in the basement concerns. Should a sump pump be required in any of the houses, they will be tied into the drainage system.**

- h. HR 290-5.A.11. We note that nodes 5R and 10P are not illustrated on the pre-development drainage area plan, and it appears that node 6P is listed twice. The applicant should clarify and list all nodes on the drainage area plan. **This has been added to the plan accordingly.**
- i. HR 290-5.A.12 and 290-8.B.5. The applicant should provide additional information on the intended responsibilities for drainage maintenance, i.e. is a homeowners association to be created? The applicant should review this with the Town Engineer as to who will be responsible for maintenance. **The road, utilities, and drainage system will be maintained by the homeowners association.**
- j. HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer. **Note 8 has been added to sheet 7.**
- k. HR 290-7.A.6. The applicant should provide information as to how the stormwater system is designed to account for frozen ground conditions. **The chamber system should not freeze, or at least not to any significant degree. A statement was added in the Drain Report narrative.**
- l. HR 290-7.B.16., Hudson Engineering Technical Guidelines & Typical Details (ETGTD) 920.4.10, and ETGTD 920.4.11. The applicant should illustrate snow storage areas and methods on the plans. With the proposed reduced roadway widths it may be difficult for snowplows to navigate within the Right-of-Way, and snow storage areas may be limited. **There should be adequate room to store snow along the roadway grass panels. Excess snow in peak years may need to be trucked off site. This will be a homeowner association responsibility.**
- m. 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. **Note 17 has been added to sheet 4.**
- n. ETGTD 920.3.13. We note the 25-year storm event node listing is provided within the stormwater report. The applicant shall provide the 25-year storm event node summary to ensure all pipes meet the minimum 2 fps velocity required within the drainage system. **The 25-year storm node summary has been included in the report. The velocities meet the required 2 fps.**
- o. ETGTD 920.4.1 through 920.4.4. The applicant shall illustrate the locations of the requested items upon the plan set. **These items have been added to sheet 7 accordingly.**
- p. ETGTD 930.1. The applicant should review the depth of the drainage within the roadway, it does not meet Town minimum depth of 4' of cover. **Most pipes have the 4' of cover except at CB#3 and #4, and these have over 3'. This will be reviewed with the Town Engineer and a waiver will be requested if necessary.**
- q. ETGTD 930.4. The applicant shall review the slope of the proposed drainage system with the City Engineer. Slopes within the proposed Right-of-Way are less than the minimum 2% required. **Due to the flat nature of the site, the closed drainage system is less than 2% but is more than 1% for all pipes. This will also be reviewed with the Town Engineer and a waiver will be requested if necessary.**
- r. ETGTD 930.10. We note the requirement for curb inlet drainage structures at all vertical sags. CB2 and CB3 are designed at a vertical sag. **The sag vertical curve was eliminated from the profile design.**
- s. ETGTD 930.13. The applicant should illustrate the required underdrain within a cut section. Note the limits upon the plan set and where the underdrains ties into the drainage system. We note this

may add unintended water to the subsurface drainage system. **Underdrain should not be needed since the water table is below the chamber system and the road design has been raised.**

- t. The applicant has shown an underground drainage system on lot one. The applicant has shown an easement for the system. We understand that the Town has requested this type of system within the private lot. **No revision or response needed.**
 - u. We note that during winter the catch basin within the cul-de-sac may be covered with snow and not accessible to flows from roadway snow melt and refreeze conditions. We recommend that the applicant review the need to move the drainage structure to the roadway area to allow for use during winter conditions. **This basin has been eliminated from the design.**
 - v. 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 revision or response needed.**
 - w. 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.
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. **Note 13 has been added to sheet 4.**
 - 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. **Note 1 on sheet 4 has been revised to specify that the lots are intended for single-family homes.**
 - 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%. These minimum lot areas are achieved with the reduced Right-of-Way widths for which the applicant is requesting waivers through the Planning Board. **No revision or response needed.**
 - d. HR 334-35. The applicant has noted that no wetlands are located on the site. **No revision or response needed.**
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. The applicant should coordinate with the Hudson Fire Department to verify that there is adequate fire protection coverage for the proposed lots.
 - b. HR 289-21.A. The Town should review the need for a utility easement for the water main location. We note that when a utility is out of the right-of-way a 15-foot easement is required. The proposed water main is in the right-of-way but is located 1 foot from the edge of the right-of-

way. This will make repairs and maintenance within the right-of-way impossible therefore we recommend an appropriately sized easement be required at the edge of the right-of-way. **The water main will be maintained by the homeowners association. Provisions will be made for access to the main in the association documents.**

- c. HR 289-27.B.(5). The applicant should show proposed water and sewer service connections for each lot, including curb stop and sewer cleanout locations. **Connections have been added to the plan sheet 7.**
 - d. ETGTD Section 801. The applicant should verify with the Town that the existing water main in Webster Street has adequate flow and pressure to meet both domestic and fire hydrant requirements for the proposed subdivision.
 - e. ETGTD Section 825.2.13. The fire hydrant detail should state the specific Mueller hydrant model required by the Town standard (Mueller Super Centurion A-423). **The model number has been added as note 6 in the detail.**
 - f. The applicant has not shown utility service connections to Lot 6. The applicant should verify if this lot is already connected to Town sewer and water and show the service locations on the plan set. **Lot 6 is no longer part of this application.**
 - g. The applicant should show the existing water and sewer connection for the house to be relocated on Lot 1. The applicant should also note how and where the existing connections will be abandoned on the plan set. **The new service connections have been added to the plans.**
 - h. The applicant is proposing an outside drop into the existing sewer manhole on Webster Street where the Town typically requires inside drops in manholes. The applicant should review this proposed installation with the Town. **The Town requested an outside drop.**
 - 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 Webster Street. **The detail has been revised.**
 - j. ETGTD Detail S-1. The applicant should review the Town of Hudson Sewer Manhole detail for inconsistencies with the details provided. **The detail has been revised.**
 - k. ETGTD Detail S-5. The applicant should review the Town of Hudson Building Service Connection detail for inconsistencies with the details provided. **The detail has been revised.**
 - l. HR 276-13.E. The applicant has not shown the proposed means for utility connections (electric/telephone/cable) to the individual lots within the subdivision. The Regulation requires these to be underground. **The underground utility main has been added to sheet 7.**
7. Erosion Control/Wetland Impacts
- a. The applicant should show the locations of the proposed check dams and catch basin inlet protection measures on the plan set. **A note has been added at CB#2 and noted as "Typical".**
 - b. The applicant should revise the silt fence location so that it can be maintained while the homes are built, and the lots are graded. The applicant should also review the need for additional silt fence location on Lot 1 for the underground drainage system and Lot 2 and 4 due to the grading. **Additional silt fence was added to the plan.**
 - c. The Town should reserve the right to require additional erosion control measures. **This is noted on the plan sheet 7.**
8. State and Local Permits
- a. The applicant has noted that a NHDES Shoreland Protection permit may be required on the plan.

The applicant should list all required permits on the plan. **Permit requirements are noted on the cover sheet.**

- b. HR 290-10.B. The applicant has noted that there is no need for a NPDES Notice of Intent or a SWPPP as the disturbed area is under one acre. When home construction and site work at each lot is taken into account it appears this value would exceed one acre of disturbance. **It is implied in the note #6 on sheet 7 that the contractor must file an NOI and prepare a SWPPP if more than one acre is disturbed.**
 - c. Additional local permitting may be required. **So noted.**
9. Other
- a. 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. **These notes have been added to sheet 7.**
 - b. The applicant has listed the requested waivers on the plan set under the heading “Waivers Granted” **No revision or response needed.**

We are hopeful that this revised and updated information adequately addresses all of the concerns and comments. Please feel free to call should you have any questions or concerns.

Sincerely,



Jeffrey Burd, PE



TOWN OF HUDSON

Office of the Chief Assessor



Jim Michaud
Chief Assessor, CAE
email: jmichaud@hudsonnh.gov
www.hudsonnh.gov

12 School Street · Hudson, New Hampshire 03051 · Tel: 603-886-6009 · Fax: 603-598-6481

To: Brian Groth, Town Planner

July 11, 2022

From: Jim Michaud, Chief Assessor

Re: **NEWLY RE-PROPOSED** - Subdivision Plan 20 Baker St and 25 Webster St

In reviewing the proposed subdivision plan I would offer the following map/lot/sublot numbers to be utilized, if the proposed layout of the lots does not change after Planning Board consideration. The location on the plan shows that the Subject parcels are located on four tax maps, which requires a renumbering of the suggested map/lots that were presented on the initial Plan, as per below.

CURRENT-From Plan	Assigned Map/Lot to be used on plan
Map 181 Lot 1	Map 181 Lot 001 Sublot 000
Map 181 Lot 1-001	Map 181 Lot 001 Sublot 001
Map 181 Lot 1-002	Map 173 Lot 057 Sublot 000
Map 181 Lot 1-003	Map 174 Lot 015 Sublot 002
Map 181 Lot 1-004	Map 181 Lot 001 Sublot 002

From: Dhima, Elvis
Sent: Tuesday, July 12, 2022 2:15 PM
To: Groth, Brian
Cc: Forrence, Jess
Subject: RE: 25 Webster St Phase 2

Brian

Please see below

1. Applicant shall provide an easement for the future water utility serving this development.
2. The sewer utility will be designed and constructed to Town standards and will remain private and responsibility of the association.
3. The drainage utility will be designed and constructed to Town standards and will remain private and responsibility of the association.
4. Engineering Department has no objections to the proposed private road

E

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Mobile: (603) 318-8286



SUBDIVISION APPLICATION

Date of Application: June 29, 2022 Tax Map #: 181 Lot #: 1-001

Site Address: 25 Webster St., Hudson, New Hampshire 03051

Name of Project: Proposed Residential Subdivision Plan Map 181 Lot 1 & 1-001 25 Webster St.

Zoning District: TR General SB#: SB #06-22
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:

Name: Tumpney Hurd Clegg, LLC

Address: 39 Trigate Rd., Hudson, NH 03051

Address: _____

Telephone # 603-718-2932

Email: george@hurdandson.com

DEVELOPER:

Tumpney Hurd Clegg, LLC

39 Trigate Rd., Hudson, NH 03051

603-718-2932

george@hurdandson.com

PROJECT ENGINEER:

Name: RBJ Engineering, LLC

Address: 2 Glendale Rd., Concord, NH 03301

Address: _____

Telephone # 603-219-0194

Email: _____

SURVEYOR:

M.J. Grainger Engineering, Inc.

220 Derry Rd, Hudson, NH 03051

603-882-4359

PURPOSE OF PLAN:

The purpose of this Plan/Application is to show the subdivision of Map 181- Lot 1-001 and Lot Line Relocation of Map 181 - Lot 1 and then to construct four (4) four single family residences serviced by a common driveway. All lots meet required area and set back requirements. See Attachment to Application appended hereto.

(For Town Use Only)

Routing Date: 7/8/22 Deadline Date: 7/15/22 Meeting Date: 7/27/22

_____ I have no comments I have comments (attach to form)

RMC Title: Fire Chief Date: 08/09/2022
(Initials)

The private road will require a street name and formal addressing.
Department: Street name shall be approved by the Fire Department. Numbering will be generated by the Fire Department (Inspectional Services).
Zoning: Engineering: Assessor: Police: Fire: DPW: Consultant:



TOWN OF HUDSON

Land Use Division



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

Subdivision application #06-22 Zoning Review/Comments

July 7, 2022

Re: Map 181, Lot 1 & 1-001
Address: 25 Webster Street
Zoning district: Town Residential (TR)
Proposal: 5 lot subdivision w/associated new roadway.
Based on submitted plan: 3 of 12 dated June 27, 2022.

I note the following non-compliance of the Zoning Ordinance:

1) Article VII Dimensional Requirements, §334-27.1 General Requirements, item D:

*“Frontage shall be measured in a continuous line along the sideline of a **Class V** or better street between the points of intersection of the side lot lines with the street.”*

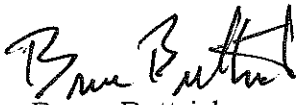
2) §334-6 Definitions.

FRONTAGE:

The distance measured along the FRONT LOT LINE between points of intersection with the SIDE LOT LINES. FRONTAGE along cul-de-sac roadways (HIGHWAYS) shall be measured at the appropriate yard building SETBACK depth from the FRONT LOT LINE between the points of intersection with the SIDE LOT LINES. "FRONTAGE" shall be contiguous and measured along the joining boundary of the FRONT LOT LINE and a **Class V** or better **public** RIGHT-OF-WAY. Lot lines bordering limited access roads cannot be considered "FRONTAGE." FRONTAGE shall be capable of providing ACCESS.

From State of NH RSA 229:5 – *Class V highways shall consist of all other traveled highways which the town has the duty to maintain regularly and shall be known as town roads.*

There would need to be variance required to 334-27.1D and 334-6, for this subdivision to proceed as presented.



Bruce Buttrick

Zoning Administrator/Code Enforcement Officer

(603) 816-1275

bbuttrick@hudsonnh.gov

cc: B. Groth - Town Planner
file



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: 08-18-22 Zone # 2 Map/Lot: 181/001001-000 & 001-001-001
25 Webster St

Project Name: SB #06-22 25 Webster St Phase 2

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	\$ <u>2,013.00</u>
2.	(Bank 09) 2050-182	Recreation	\$ <u>400.00</u>
3.	(Bank 09) 2080-051	School	\$ <u>3,578.00</u>
		Total CAP Fee	\$ <u>5,991.00</u>

Check should be made payable to the Town of Hudson.

GEORGE HURD, MEMBER, TUMPNEY HURD CLEGG LLC – APPLICANT

TUMPNEY HURD CLEGG, LLC – OWNER

(25 webster Street; Map 181, Lot & 1-001)

ATTACHMENT TO NARRATIVE: CONSOLIDATION / SUBDIVISION PLAN

Property Summary

Tumpney Hurd Clegg, LLC is the titled owner of the approximately 62,596 square foot (1.437 acre) parcel of land (Map 181 – Lot 1-001), located in a Town (TR) Zoning District. This particular parcel is located with frontage on Webster Street The property abuts other residential properties on all borders.

Project Overview

It is the intention of Tumpney Hurd Clegg LLC (Applicant & Owner) to subdivide the property into four lots, inclusive of a lot line adjustment (Map 181 – Lot 1), and construct four single family residences, along with the construction of a private driveway ending in a cul-de-sac with access from the Webster Street frontage. The site plan for the development is entitled “Proposed Residential Subdivision Plan Map 181 Lot 1 & 1-001 25 Webster St.” Dated June 27, 2022. A copy of which is appended to this application.

The proposed four (4) single family residences would each have individual private driveways from the existing and proposed private way. The residences would each be serviced by municipal water and private sewer, and usual utilities. The utilities will be sub-surface/underground.

Lot Line Relocation

As delineated on the attached Plan, the lot line of pre-existing Map 181 Lot 1 will be adjusted so as to accommodate the necessary flair at the junction of the private drive and public way. This negligible 191 square foot lot line adjustment does not affect any set back, area, or frontage requirement for the subject Lot 1.

The nature and character of the general vicinity include single family homes. The proposed residences are consistent with and in character with the existing neighborhood.

All Requirements Met

The Subdivision Plan as submitted ensures that all density, setback, frontage, and applicable regulations are and will be met.

Proposed Lot 1-001:	Driveway entrance on proposed new private way. 10,007 sq. ft. All frontage & set back requirements met
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Proposed Lot 1 -002:	Driveway entrance on proposed new private way. 10,011 sq. ft. All frontage & set back requirements met
Proposed Lot 1-003:	Driveway entrance on proposed new private way. 11,802 sq. ft. All frontage & set back requirements met
Proposed Lot 1-004:	Driveway entrance on proposed new private way. 15,645 sq. ft. All frontage and set back requirements met

Proposed New Private Way

The construction of the new private way will adequately service the four residences it is intended to provide access for. It is proposed that the new private way be 24 feet in pavement width. The proposed driveway will have a 30-foot right-of-way. Consistent with the general area there are no proposed sidewalks. The Applicant/ Owner will record all necessary documentation indemnifying and relieving the Town of Hudson from any and all liability with respect to the private way maintenance and future usage.

Special Considerations

The Applicant / Owner believes that the Planning Board ruled within its delegated authority in the Application for a "Derry Street 4-Lot Subdivision – Map 174 / Lot 79 – SB# 07-17 (Lee Way), wherein identical conditions as those included in this application were approved by the Board.

The proposal presently before the Board was patterned on the above cited Application, and will fully comply with all the notes and specifications.

Additionally, the Applicant will record at the Hillsborough County Registry of Deeds documentation that all private driveway connections, including structures like culverts, pipes, drainage, sewer remain the continuing responsibility of the landowner. Further, if any driveway connection threatens the integrity of the public way due to plugged culverts, erosion, siltation, etc., the planning board or its designee can require the owner to repair it. If the owner fails to make the repair, the town may perform the work and assess the costs to the owner.

Waiver Request

Please see Waiver Request seeking relief from sec. 289-14 & 289-17 appended to the Application.

SUBDIVISION APPLICATION

Date of Application: June 29, 2022 Tax Map #: 181 Lot #: 1-001

Site Address: 25 Webster St., Hudson, New Hampshire 03051

Name of Project: Proposed Residential Subdivision Plan Map 181 Lot 1 & 1-001 25 Webster St.

Zoning District: TR General SB#: _____
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:

Name: Tumpney Hurd Clegg, LLC

Address: 39 Trigate Rd., Hudson, NH 03051

Address: _____

Telephone # 603-718-2932

Email: george@hurdandson.com

DEVELOPER:

Tumpney Hurd Clegg, LLC

39 Trigate Rd., Hudson, NH 03051

603-718-2932

george@hurdandson.com

PROJECT ENGINEER:

Name: RBJ Engineering, LLC

Address: 2 Glendale Rd., Concord, NH 03301

Address: _____

Telephone # 603-219-0194

Email: _____

SURVEYOR:

M.J. Grainger Engineering, Inc.

220 Derry Rd, Hudson, NH 03051

603-882-4359

PURPOSE OF PLAN:

The purpose of this Plan/Application is to show the subdivision of Map 181- Lot 1-001 and Lot Line Relocation of Map 181 - Lot 1 and then to construct four (4) four single family residences serviced by a common driveway. All lots meet required area and set back requirements. See Attachment to Application appended hereto.

(For Town Use Only)

Routing Date: _____ Deadline Date: _____ Meeting Date: _____

_____ I have no comments _____ I have comments (attach to form)

_____ Title: _____ Date: _____
(Initials)

Department: _____

Zoning: ___ Engineering: ___ Assessor: ___ Police: ___ Fire: ___ DPW: ___ Consultant: ___

SUBDIVISION PLAN DATA SHEET

PLAN NAME: Proposed Residential Subdivision Plan Map 181 Lot 1 & 1-001 25 Webster St.

PLAN TYPE: Conventional Subdivision Plan or Open Space Development (Circle One)

LEGAL DESCRIPTION: MAP 181 LOT 1-001

DATE: June 27, 2022

Address: 25 Webster Street, Hudson, NH 03051

Total Area: S.F. 62,596 Acres: 1.437

Zoning: TR - Town Residence

Required Lot Area: 10,000 sf

Required Lot Frontage: 90 ft

Number of Lots Proposed: 4

Water and Waste System Proposed: Municipal water and private sewer

Area in Wetlands: None

Existing Buildings To Be Removed: None

Flood Zone Reference: FIRM - Community Map Number 33011 C 0514E

Proposed Linear Feet Of New Roadway: None

SUBDIVISION PLAN DATA SHEET

Dates/Case #/Description/
Stipulations of ZBA,
Conservation Commission,
NH Wetlands Board Action:

(Attach Stipulations on
Separate Sheet)

List Permits Required:

<u>*Waivers Requested:</u>	<u>Hudson Town Code Reference</u>	<u>Regulation Description</u>
	1. 289-17	Frontage Requirement
	2. 289-14	Conformity
	3.	
	4.	
	5.	
	6.	
	7.	

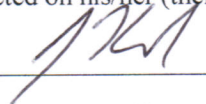
**(Left Column for Town Use)*

(For Town Use Only)	
Data Sheets Checked By: _____	Date: _____

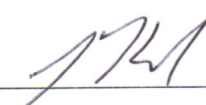
SUBDIVISION PLAN APPLICATION AUTHORIZATION

I hereby apply for *Subdivision Plan* Review and acknowledge I will comply with all of the Ordinances of the Town of Hudson, New Hampshire State Laws, as well as any stipulations of the Planning Board, in development and construction of this project. I understand that if any of the items listed under the *Subdivision Plan* specifications or application form are incomplete, the application will be considered rejected.

Pursuant to RSA 674:1-IV, the owner(s) by the filing of this application as indicated above, hereby given permission for any member of the Hudson Planning Board, the Town Planner, the Town Engineer, and such agents or employees of the Town or other persons as the Planning Board may authorize, to enter upon the property which is the subject of this application at all reasonable times for the purpose of such examinations, surveys, tests and inspections as may be appropriate. The owner(s) release(s) any claim to or right he/she (they) may now or hereafter possess against any of the above individuals as a result of any examinations, surveys, tests and/or inspections conducted on his/her (their) property in connection with this applications.

Signature of Owner: _____  _____ Date: 6-27-22
Print Name of Owner: George Hurd, Manager - Tumpney Hurd Clegg, LLC

- ❖ If other than an individual, indicate name of organization and its principal owner, partners, or corporate officers.

Signature of Developer: _____  _____ Date: 6-27-22
Print Name of Developer: George Hurd, Manager - Tumpney Hurd Clegg, LLC

- ❖ The developer/individual in charge must have control over all project work and be available to the Code Enforcement Officer/Building Inspector during the construction phase of the project. The individual in charge of the project must notify the Code Enforcement Officer/Building Inspector within two (2) working days of any change.

WAIVER REQUEST FORM

Name of Subdivision/Site Plan: Proposed Residential Subdivision Plan Map 181 Lot 1&1-001 Webster St.

Street Address: 25 Webster St., Hudson, New Hampshire 03051

I George Hurd, Manager - Tumpney Hurd Clegg, LLC hereby request that the Planning Board waive the requirements of item sec. 289-14 & sec. 289-17 of the Hudson Land Use Regulations in reference to a plan presented by M.J. Grainger Engineering, Inc. & RBJ Engineering, LLC (name of surveyor and engineer) dated June 27, 2022 for property tax map(s) 181 and lot(s) 1& 1-001 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n), i.e., without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant), and the granting of this waiver would not be contrary to the spirit and intent of the Land Use Regulations.


Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

Please see attached documenting why applicant believes failure to grant requested waiver would pose an unnecessary hardship, and the granting of the requested waiver would not be contrary to the spirit and intent of the Land Use Regulations.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations: (if additional space is needed please attach the appropriate documentation hereto):

Please see attached explaining reasons why the requested waiver is not contrary to the spirit and intent of the Land Use Regulations with reasons why it is not contrary to its spirit and intent.

Signed:



Applicant or Authorized Agent

ATTACHMENT TO WAIVER REQUEST

25 WEBSTER STREET, HUDSON

(Section 289-14 & 289-17)

HARDSHIP REASONS.

It is the intent of the Owner/Applicant to construct a private way which would afford each of the four (4) planned residences the necessary frontage and all necessary set back requirements. Failure to grant the requested Waiver would cause the Owner/Applicant significant hardship, as it would render the 1.437-acre parcel economically unviable for the practical and intended use. The relief sought from the requested Waiver would allow the development of the property in much the same manner as has been previously granted to similar projects in the past.

The hardship imposed by the frontage requirement from a public way would unreasonably and unfairly impose restrictions which the subject ordinance was not designed to prohibit. The granting of the Waiver would provide equitable relief from the consequences associated with restricting the use and contributing assets the property offers the community.

NOT CONTRARY TO SPIRIT AND INTENT.

The existing parcel, with an area of 62,596 square feet, is located in a Town Residential zone, which zone requires 10,000 square feet per lot. The relief requested in obtaining the Waiver allowing property frontage to be measured along the proposed private way would provide fair and reasonable relief from a hardship and not be contrary to the spirit and intent of the subject land use regulations.

The applicable ordinance requiring the frontage be measured from a public way (334-7.1) was intended to assure and ensure that proper and safe access to residential lots could and would be available to fire, police, rescue and other services if necessary. The proposed private way would adequately provide for the measures necessary to provide the proper and safe accessibility.

Secondly, the fact the property owner would retain all responsibility for the upkeep and maintenance of the private way, (proper documents to be recorded at the Hillsborough County Registry of Deeds), is consistent with the spirit and intent of the Land Use Regulation, as there would be no municipal responsibility in the future. The granting of the requested Waiver would merely allow for the frontage of the four lots to be measured from a 24 foot (24') wide paved private way with a 30 foot (30') right of way width.

Relief of the restrictions imposed by the Land Use Regulation on this particular property would not be contrary to the spirit and intent of the subject ordinance.

Colin Jean
Attorney at Law, LLC

64 McKean Street
P.O. Box 3661
Nashua, New Hampshire 03061

LICENSED IN NH & MA

Tel: (603) 881-5535
E-mail: ColinJean@nhjean.com

Fax: (603) 881-5536

June 27, 2022

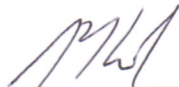
Mr. Brian Groth, MCP
Planning Administrator
Town of Hudson
12 School Street
Hudson, NH 03051

RE: **Authorization for Representation – 25 Webster St., Hudson**

Dear Brian Groth:

Kindly accept this communication as formal notice that I authorize Colin Jean, Esquire of the office of Colin Jean Attorney at Law, LLC and Michael Grainger of MJ Grainger Engineering, Inc., to represent the interests of Tumpney Hurd Clegg, LLC at the Town of Hudson Planning Board meeting scheduled for July 27, 2022 or any subsequent meeting thereafter.

Sincerely,



George Hurd, Member
Tumpney Hurd Clegg, LLC
39 Trigate Road
Hudson, NH 03051

June 27, 2022

PROPOSED RESIDENTIAL SUBDIVISION PLAN

MAP 181 LOT 001-000 & 001-001 25 WEBSTER ST.

SYMBOLS LEGEND

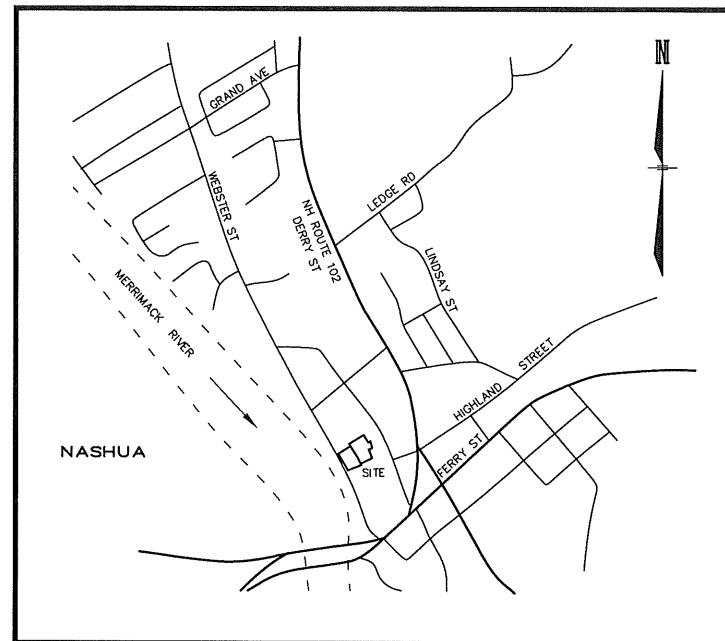
EXISTING	PROPOSED
--- SETBACK LINE	--- SILT FENCE
--- EDGE OF PAVEMENT	⊙ CATCH BASIN
⊙ TEST PIT	--- P7 DRAIN LINE
--- 2' CONTOUR INTERVAL	● DRAIN MANHOLE
--- 10' CONTOUR INTERVAL	--- RUN-OFF FLOW DIRECTION
⊙ IRON ROD FOUND	--- F122 PROPOSED GRADE CONTOUR
⊙ BOUND FOUND	--- STONE CHECK DAM
⊙ UTILITY POLE	⊙ BENCHMARK
● SEWER MANHOLE	▽ HANDICAP RAMP AT STREET CORNER
● DRAIN MANHOLE	--- PROPOSED CURB
⊙ CATCH BASIN	--- EXISTING PAVEMENT
--- OVERHEAD WIRE	--- PROPOSED CURB
--- D DRAIN LINE	--- PROPOSED PAVEMENT
--- W WATER LINE	--- SPOT GRADE
--- S SEWER LINE	--- RIP-RAP STONE
--- HYDRANT	--- PAVED SIDEWALK
--- WATER VALVE	--- INFILTRATION BASIN BERM
--- GAS VALVE	--- CHECKDAM (INFILTRATION BASIN)
	--- RIP RAP OUTLET APRON
	--- W WATER LINE
	--- S SEWER LINE
	● 5/8" REBAR TO BE SET
	■ 4"x4"x36" GRANITE BOUND TO BE SET

THE LOCATION OF ANY UTILITY INFORMATION SHOWN IN THIS PLANSET IS APPROXIMATE. RJB ENGINEERING, LLC, MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ANY UTILITIES WHETHER THEY BE ABOVE OR BELOW GROUND. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-800-DIG-SAFE.

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

CHAIRMAN _____ DATE _____
SECRETARY _____ 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



LOCUS MAP
NOT TO SCALE

OWNER:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

LATEST REVISION DATE: AUGUST 16, 2022

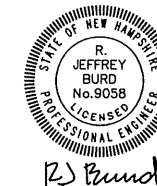
THIS PLANSET CONTAINS A TOTAL OF 14 SHEETS
SHEET 4 IS TO BE RECORDED AT THE H.C.R.D.
THE REMAINDER ARE ON FILE AT TOWN OF HUDSON

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 08-01-22 ENGINEERING REVIEW	08/08/2022
.	.	.
.	.	.

SHEET INDEX

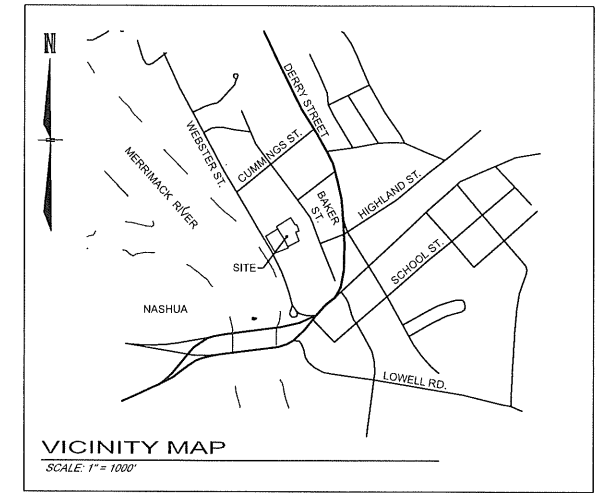
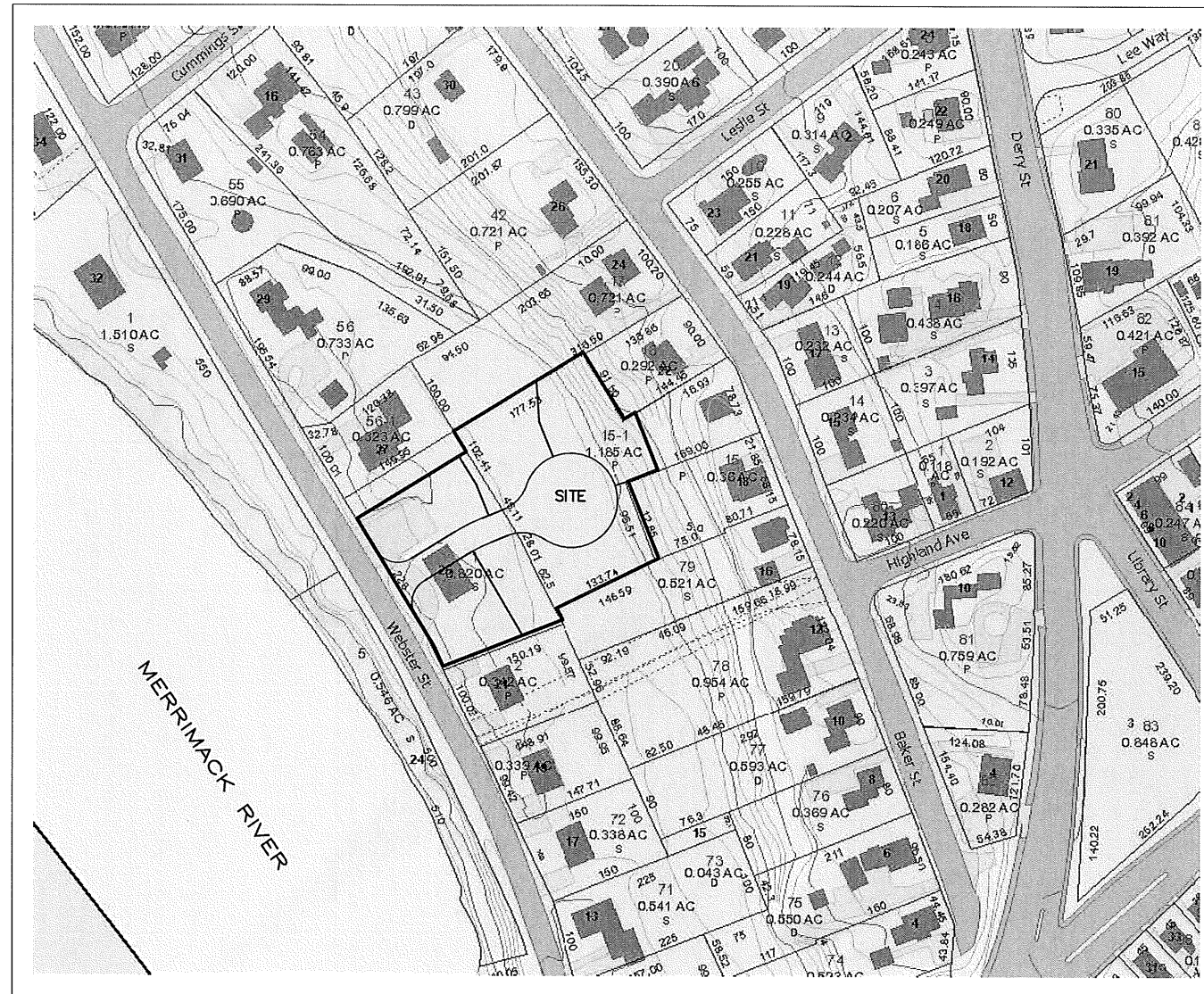
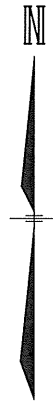
- 1 TITLE SHEET
- 2 OVERVIEW PLAN
- 3 EXISTING CONDITIONS PLAN
- 4 SUBDIVISION PLAN
- 5 TOPOGRAPHIC SUBDIVISION PLAN
- 6 GENERAL ROADWAY PLAN
- 7 ROADWAY PLAN AND PROFILE
- 8 CONSTRUCTION DETAILS
- 9 CONSTRUCTION DETAILS
- 10 WATER SYSTEM DETAILS
- 11 SEWER SYSTEM DETAILS
- 12 ROADWAY CROSS SECTIONS
- 13 EROSION CONTROL DETAILS
- 14 EROSION CONTROL NOTES

STATE APPROVALS
NHDES SHORELAND PERMIT NUMBER _____
NHDES SEWER EXTENSION PERMIT NUMBER _____



PREPARED BY:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

IN ASSOCIATION WITH:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359



NOTES:

- SOURCE OF THIS OVERVIEW MAP IS FROM THE TOWN OF HUDSON ON-LINE GIS MAPS.

No.	DESCRIPTION	DATE
1.	ADD THIS SHEET	08/08/2022
.	.	.
.	.	.

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

CHAIRMAN

SECRETARY

DATE

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

OVERVIEW PLAN
MAP 181, LOT 1 & 1-001
25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

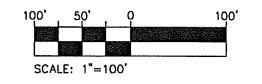
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

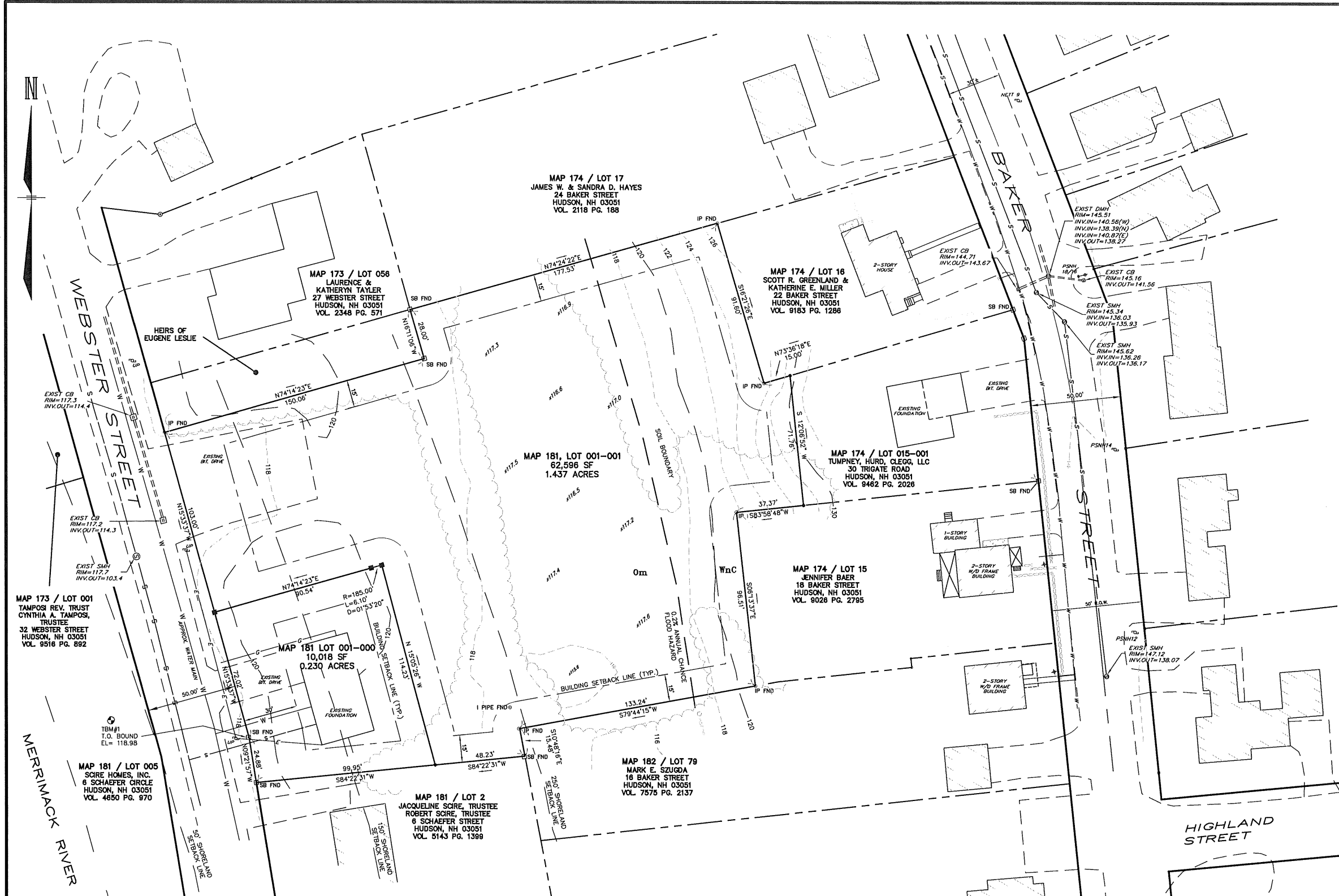
JUNE 27, 2022 SCALE: 1"=100'

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 2 of 14





REFERENCE PLANS:

1. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, O'LOUGHLIN SUBDIVISION, MAP 174, LOTS 15 & 16, 18 & 22 BAKER STREET, HUDSON, NH" PREPARED FOR THOMAS & JEANNE O'LOUGHLIN ET AL, AND COOLAGATTA CAPITAL MANAGEMENT, LLC, BY KEACH NORDSTROM ASSOCIATES, INC. DATED LAST REVISED ON OCTOBER 2, 2008 AND RECORDED AT HCRD AS PLAN No 36,191.
2. A PLAN TITLED "SURVEY PLAN OF LAND OF TUMPNEY HURD CLEGG, LLC, PARCEL ID 181-001, 25 WEBSTER STREET, HUDSON, NH" BY FRANKLIN ASSOCIATES, LLC, DATED FEBRUARY 25, 2021.
3. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, MAP 174, LOT 15-1 & MAP 181, LOT 1, 20 BAKER STREET & 25 WEBSTER STREET, HUDSON, NH" PREPARED BY MJ GRAINGER ENGINEERING, INC. DATED MARCH 30 2022 TO BE RECORDED.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF LOTS 181-001 & 181-001-001.
2. OWNER OF RECORD:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
NASHUA, NH 03051
3. DEED REFERENCE TO PARCELS IS BK 9402, PG 2493 HCRD
4. TOTAL AREA OF LOT 181-1 IS 10,209 SF AND LOT 181-1-001 IS 62,596 SF. THE TOTAL COMBINED AREA IS 72,805 SF = 1.671 ACRES
5. PROPERTIES ARE CURRENTLY ZONED: TR - TOWN RESIDENCE
6. ZONING REQUIREMENTS:
LOT AREA: 10,000 SF
MIN. FRONTAGE: 90 feet
FRONT SETBACK: 30 feet
SIDE SETBACK: 15 feet
REAR SETBACK: 15 feet
7. THERE ARE NO WETLANDS ON THIS PROPERTY.
8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY MAP NUMBER 33011C0514E PANEL 5 OF 10, EFFECTIVE DATE APRIL 18, 2011.
9. PROPERTIES ARE SERVICED BY MUNICIPAL SEWER AND WATER.
10. NO ABUTTING PROPERTIES HAVE BUILDINGS OVER TWO STORIES HIGH

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
2.	ADD BENCH. WATER LINE TO 181-001	08/18/2022

EXISTING CONDITIONS PLAN
MAP 181, LOT 001-000 & 001-001

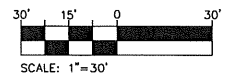
25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022

SCALE: 1"=30'

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194



ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

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

CHAIRMAN _____

DATE _____

SECRETARY _____

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

I CERTIFY THAT THIS PLAN WAS PREPARED FROM THE BOUNDARY INFORMATION REFERENCED ABOVE AND A FIELD SURVEY MADE ON THE GROUND DURING AUGUST AND DECEMBER OF 2021 AND JANUARY OF 2022, WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

MICHAEL GRAINGER, LLS # 851

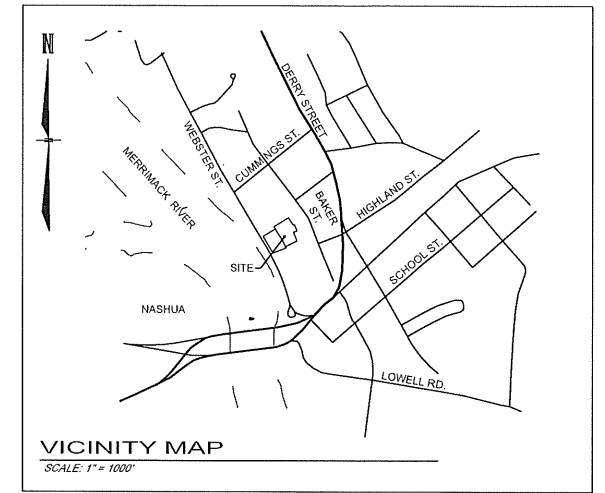
BUILDABLE AREA TABLE				
LOT #	LOT AREA	AREA >25%	WETLAND AREA	BUILDABLE AREA
181-1	10,018 SF	0 SF	0 SF	10,018 SF
181-1-001	10,007 SF	0 SF	0 SF	10,007 SF
181-1-002	10,011 SF	0 SF	0 SF	10,011 SF
181-1-003	11,802 SF	0 SF	0 SF	11,802 SF
181-1-004	15,645 SF	0 SF	0 SF	15,645 SF

REFERENCE PLANS:

1. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, O'LOUGHLIN SUBDIVISION, MAP 174, LOTS 15 & 16, 18 & 22 BAKER STREET, HUDSON, NH" PREPARED FOR THOMAS & JEANNE O'LOUGHLIN ET AL, AND COOLANGATTA CAPITAL MANAGEMENT, LLC, BY KEACH NORDSTROM ASSOCIATES, INC. DATED LAST REVISED ON OCTOBER 2, 2008 AND RECORDED AT HCRD AS PLAN No 36,191.
2. A PLAN TITLED "SURVEY PLAN OF LAND OF TUMPNEY HURD CLEGG, LLC, PARCEL ID 181-001, 25 WEBSTER STREET, HUDSON, NH" BY FRANKLIN ASSOCIATES, LLC, DATED FEBRUARY 25, 2021.
3. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, MAP 174, LOT 15-1 & MAP 181, LOT 1, 20 BAKER STREET & 25 WEBSTER STREET, HUDSON, NH" PREPARED BY MJ GRAINGER ENGINEERING, INC. DATED MARCH 30 2022 TO BE RECORDED.

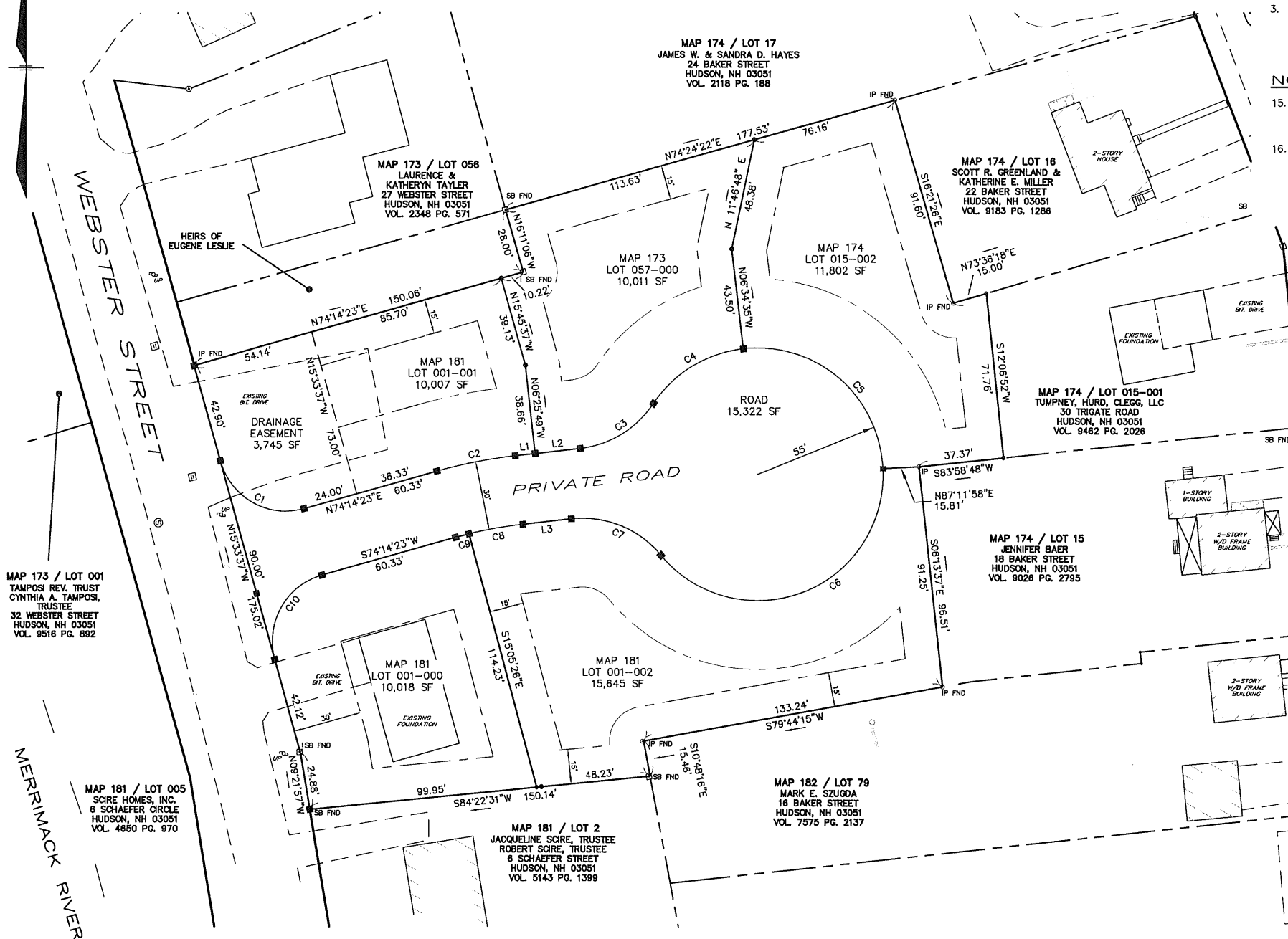
NOTES CONTINUED:

15. A COST ALLOCATION PROCEDURE (CAP) AMOUNT OF \$5,991 PER NEW SINGLE-FAMILY RESIDENTIAL UNIT SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
16. ALL ROADWAY IMPROVEMENTS SHALL BE BONDED PRIOR TO THE PLANNING BOARD ENDORSEMENT OF THE PLAN.



NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE CONSOLIDATION AND SUBDIVISION OF LOTS 181-1 & 181-1-001 INTO FIVE (5) SINGLE FAMILY RESIDENTIAL BUILDING LOTS.
2. OWNER OF RECORD:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
NASHUA, NH 03051
3. DEED REFERENCE TO PARCELS IS BK 9402, PG 2493 HCRD
4. TOTAL AREA OF LOT 181-1 IS 10,209 SF AND LOT 181-1-001 IS 62,596 SF. THE TOTAL COMBINED AREA IS 72,805 SF = 1.671 ACRES
5. PROPERTIES ARE CURRENTLY ZONED: TR - TOWN RESIDENCE
6. ZONING REQUIREMENTS:
LOT AREA: 10,000 SF
MIN. FRONTAGE: 90 feet
FRONT SETBACK: 30 feet
SIDE SETBACK: 15 feet
REAR SETBACK: 15 feet
7. THERE ARE NO WETLANDS ON THIS PROPERTY.
8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY MAP NUMBER 330011C0514E PANEL 5 OF 10, EFFECTIVE DATE APRIL 18, 2011.
9. PROPERTIES ARE SERVICED BY MUNICIPAL SEWER AND WATER.
10. ALL SIGNS ARE SUBJECT TO APPROVAL BY THE HUDSON PLANNING BOARD PRIOR TO INSTALLATION THEREOF.
11. THERE WILL BE NO EXTERIOR LIGHTING.
12. THERE IS MORE THAN 400' SIGHT DISTANCE IN BOTH DIRECTIONS FOR THE PROPOSED ROADWAY AT THE WEBSTER STREET INTERSECTION.
13. THE MAXIMUM BUILDING HEIGHT SHALL NOT EXCEED 38'
14. THE PROPOSED ROAD AND UTILITIES ARE PRIVATE AND SHALL REMAIN PRIVATE AND THE RESPONSIBILITY OF THE HOMEOWNERS ASSOCIATION.



CURVE	RADIUS	LENGTH	DELTA
C1	30.00	47.23	90°12'00"
C2	215.00	35.01	09°19'47"
C3	45.00	38.92	49°33'20"
C4	55.00	47.45	49°25'48"
C5	55.00	90.00	93°45'35"
C6	55.00	137.17	142°53'38"
C7	45.00	44.41	56°32'40"
C8	185.00	24.03	07°26'27"
C9	185.00	6.10	01°53'20"
C10	30.00	47.02	89°48'00"

LINE	BEARING	DISTANCE
L1	N 83°34'11" W	8.82
L2	N 83°34'11" W	20.01
L3	S 83°34'11" E	21.50

MAP 173 / LOT 001
TAMPOSI REV. TRUST
CYNTHIA A. TAMPOSI,
TRUSTEE
32 WEBSTER STREET
HUDSON, NH 03051
VOL. 9516 PG. 892

MAP 181 / LOT 005
SCORE HOMES, INC.
8 SCHAEFER CIRCLE
HUDSON, NH 03051
VOL. 4650 PG. 970

MAP 173 / LOT 056
LAURENCE &
KATHERYN TAYLER
27 WEBSTER STREET
HUDSON, NH 03051
VOL. 2348 PG. 571

MAP 174 / LOT 17
JAMES W. & SANDRA D. HAYES
24 BAKER STREET
HUDSON, NH 03051
VOL. 2118 PG. 188

MAP 174 / LOT 18
SCOTT R. GREENLAND &
KATHERINE E. MILLER
22 BAKER STREET
HUDSON, NH 03051
VOL. 9183 PG. 1288

MAP 174 / LOT 015-001
TUMPNEY, HURD, CLEGG, LLC
30 TRIGATE ROAD
HUDSON, NH 03051
VOL. 9482 PG. 2026

MAP 174 / LOT 15
JENNIFER BAER
18 BAKER STREET
HUDSON, NH 03051
VOL. 9026 PG. 2795

MAP 182 / LOT 79
MARK E. SZUGDA
18 BAKER STREET
HUDSON, NH 03051
VOL. 7575 PG. 2137

MAP 181 / LOT 2
JACQUELINE SCORE, TRUSTEE
ROBERT SCORE, TRUSTEE
6 SCHAEFER STREET
HUDSON, NH 03051
VOL. 8143 PG. 1399

LEGEND

EXISTING STONEWALL		WETLANDS	
ABUTTERS PROPERTY LINES		DRILL HOLE FOUND	
SUBJECT PROPERTY LINES		REBAR W/ CAP FOUND	
PROPOSED PROPERTY LINES		STONE BOUND FOUND	
PROPERTY TIE LINE		5/8" REBAR TO BE SET	
EDGE OF PAVEMENT		4"x4"x36" GRANITE BOUND TO BE SET	
EXISTING TREELINE		PROPOSED WELL	
EXISTING CONTOUR (MNR)	572		
EXISTING CONTOUR (MJR)	-570		
EXISTING BLDG SETBACK			

OWNER OF RECORD:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051
(603) 718-2932

DATE _____

I CERTIFY THAT THIS PLAN WAS PREPARED FROM THE BOUNDARY INFORMATION REFERENCED ABOVE AND A FIELD SURVEY MADE ON THE GROUND DURING AUGUST AND DECEMBER OF 2021 AND JANUARY OF 2022, WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

MICHAEL GRAINGER, LLS # 851

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

CHAIRMAN _____ DATE _____
SECRETARY _____ 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

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 08/01/2022 ENGINEERING REVIEW	08/08/2022

SUBDIVISION PLAN
MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

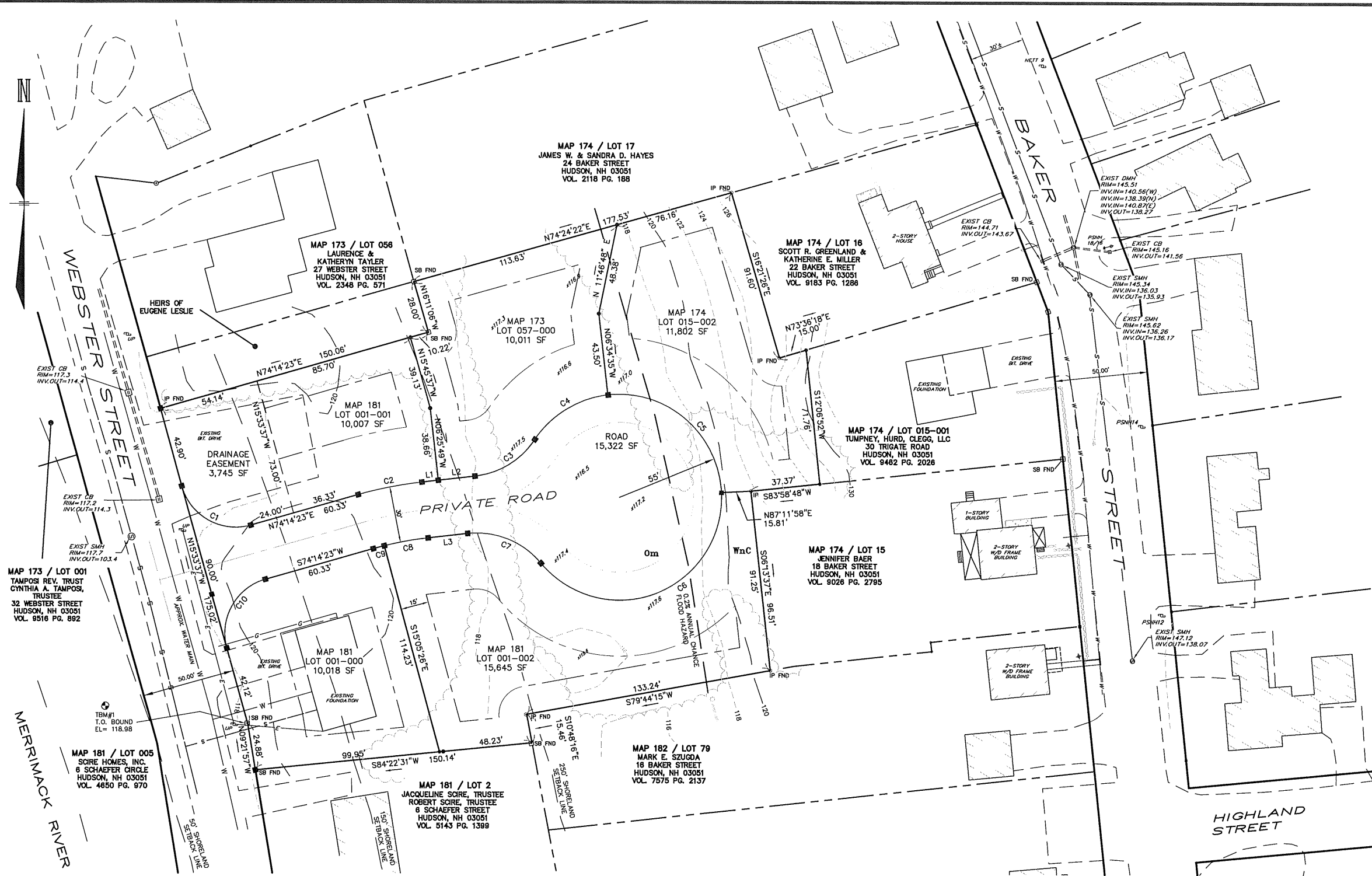
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: 1"=30'

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 4 of 14



- REFERENCE PLANS:**
1. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, O'LOUGHLIN SUBDIVISION, MAP 174, LOTS 15 & 16, 18 & 22 BAKER STREET, HUDSON, NH" PREPARED FOR THOMAS & JEANNE O'LOUGHLIN ET AL. AND COULANGATTA CAPITAL MANAGEMENT, LLC, BY KEACH NORDSTROM ASSOCIATES, INC. DATED LAST REVISED ON OCTOBER 2, 2008 AND RECORDED AT HCRD AS PLAN No 36,191.
 2. A PLAN TITLED "SURVEY PLAN OF LAND OF TUMPNEY HURD CLEGG, LLC, PARCEL ID 181-001, 25 WEBSTER STREET, HUDSON, NH" BY FRANKLIN ASSOCIATES, LLC, DATED FEBRUARY 25, 2021.
 3. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, MAP 174, LOT 15-1 & MAP 181, LOT 1, 20 BAKER STREET & 25 WEBSTER STREET, HUDSON, NH" PREPARED BY MJ GRAINGER ENGINEERING, INC. DATED MARCH 30 2022 TO BE RECORDED.

- NOTES:**
1. THE PURPOSE OF THIS PLAN IS TO SHOW THE CONSOLIDATION AND SUBDIVISION OF LOTS 181-001-000 AND LOT 181-001-001 INTO FIVE (5) SINGLE-FAMILY RESIDENTIAL BUILDING LOTS.
 2. OWNER OF RECORD: TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
NASHUA, NH 03051
 3. DEED REFERENCE TO PARCELS IS BK 9402, PG 2493 HCRD
 4. TOTAL AREA OF LOT 181-001-000 IS 10,209 SF AND LOT 181-001-001 IS 62,596 SF. THE TOTAL COMBINED AREA IS 72,805 SF = 1.671 ACRES
 5. PROPERTIES ARE CURRENTLY ZONED: TR - TOWN RESIDENCE
 6. ZONING REQUIREMENTS:
LOT AREA: 10,000 SF
MIN. FRONTAGE: 90 feet
FRONT SETBACK: 30 feet
SIDE SETBACK: 15 feet
REAR SETBACK: 15 feet
 7. THERE ARE NO WETLANDS ON THIS PROPERTY.
 8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY MAP NUMBER 33011C0514E PANEL 5 OF 10, EFFECTIVE DATE APRIL 18, 2011.
 9. PROPERTIES ARE SERVICED BY MUNICIPAL SEWER AND WATER.

LOT #	LOT AREA	BUILDABLE AREA TABLE		BUILDABLE AREA
		AREA >25%	WETLAND AREA	
181-001-000	10,018 SF	0 SF	0 SF	10,018 SF
181-001-001	10,007 SF	0 SF	0 SF	10,007 SF
173-057-000	10,011 SF	0 SF	0 SF	10,011 SF
174-015-002	11,802 SF	0 SF	0 SF	11,802 SF
181-001-002	15,645 SF	0 SF	0 SF	15,645 SF

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
2.	ADD BENCH, WATERLINE TO 181-001	09/16/2022

- LEGEND**
- EXISTING STONEWALL
 - ABUTTERS PROPERTY LINES
 - SUBJECT PROPERTY LINES
 - PROPOSED PROPERTY LINES
 - PROPERTY TIE LINE
 - EDGE OF PAVEMENT
 - EXISTING TREELINE
 - EXISTING CONTOUR (MNR)
 - EXISTING CONTOUR (MJR)
 - EXISTING BLDG SETBACK
 - WETLANDS
 - DRILL HOLE FOUND
 - REBAR W/ CAP FOUND
 - STONE BOUND FOUND
 - 5/8" REBAR TO BE SET
 - 4"x36" GRANITE BOUND TO BE SET
 - PROPOSED WELL

CURVE	RADIUS	LENGTH	DELTA
C1	30.00	47.23	90°12'00"
C2	215.00	35.01	09°19'47"
C3	45.00	38.92	49°33'20"
C4	55.00	47.45	49°25'48"
C5	55.00	90.00	93°45'35"
C6	55.00	137.17	142°53'38"
C7	45.00	44.41	56°32'40"
C8	185.00	24.03	07°26'27"
C9	185.00	6.10	01°53'20"
C10	30.00	47.02	89°48'00"

LINE	BEARING	DISTANCE
L1	N 83°34'11" W	8.82
L2	N 83°34'11" W	20.01
L3	S 83°34'11" E	21.50



I CERTIFY THAT THIS PLAN WAS PREPARED FROM THE BOUNDARY INFORMATION REFERENCED ABOVE AND A FIELD SURVEY MADE ON THE GROUND DURING AUGUST AND DECEMBER OF 2021 AND JANUARY OF 2022, WITH AN ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000.

MICHAEL GRAINGER, LLS # 851

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

CHAIRMAN _____ DATE _____
SECRETARY _____ 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

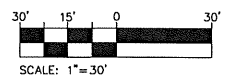
TOPOGRAPHIC SUBDIVISION PLAN
MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

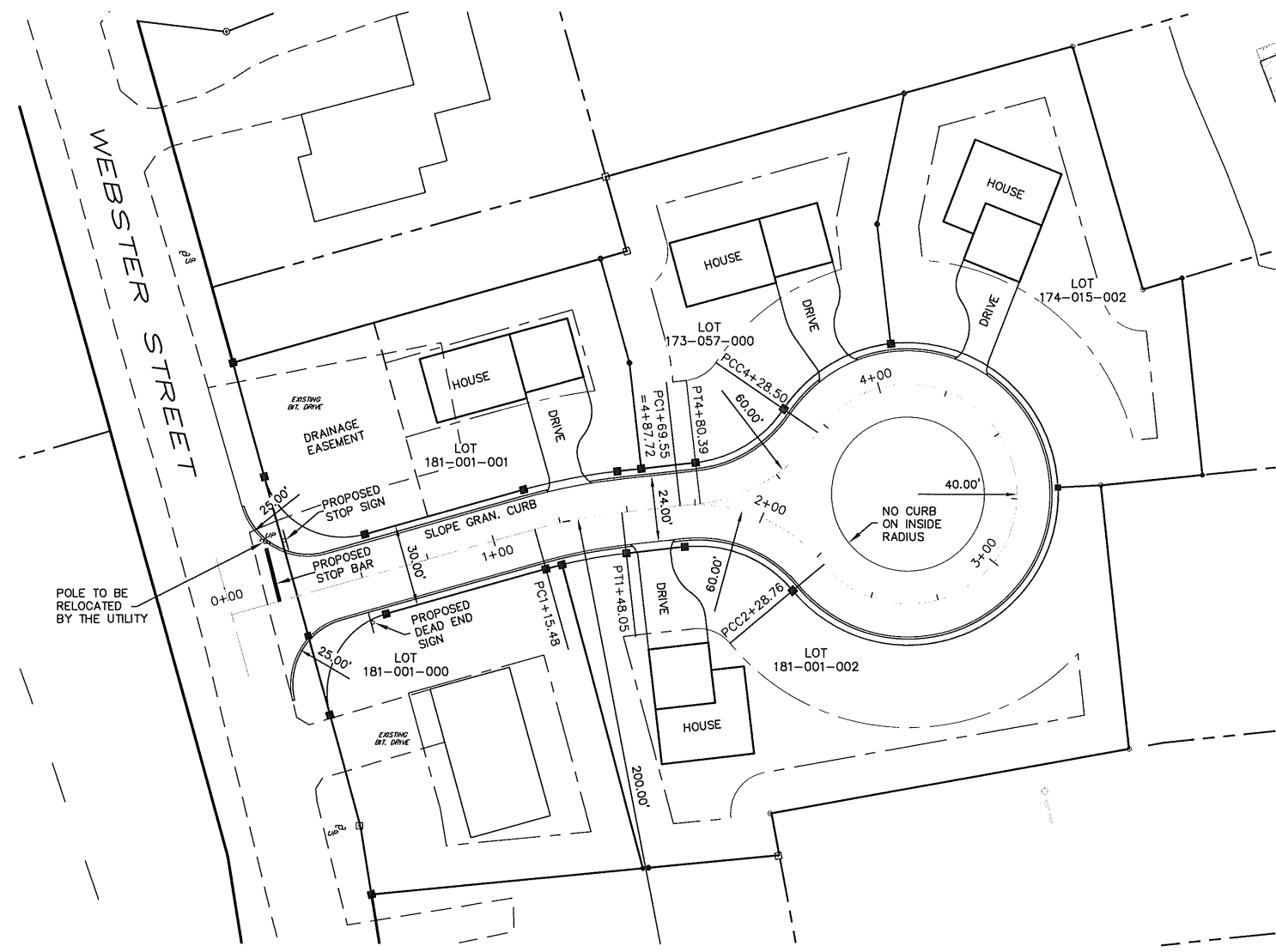
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: 1"=30'

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194



ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359



PLAN
SCALE: 1"=30'



Notes
1. SEE ROADWAY PLAN AND PROFILE FOR GRADING, DRAINAGE, AND UTILITIES.

No.	DESCRIPTION	DATE
1.	ADD THIS SHEET	08/08/2022

GENERAL ROADWAY PLAN
MAP 181, LOT 001-000 & 001-001
 25 WEBSTER ST.
 HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
 39 TRIGATE ROAD
 HUDSON, NH 03051

JUNE 27, 2022 **SCALE: 1"=30'**

ENGINEER:
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 2 GLENDALE ROAD
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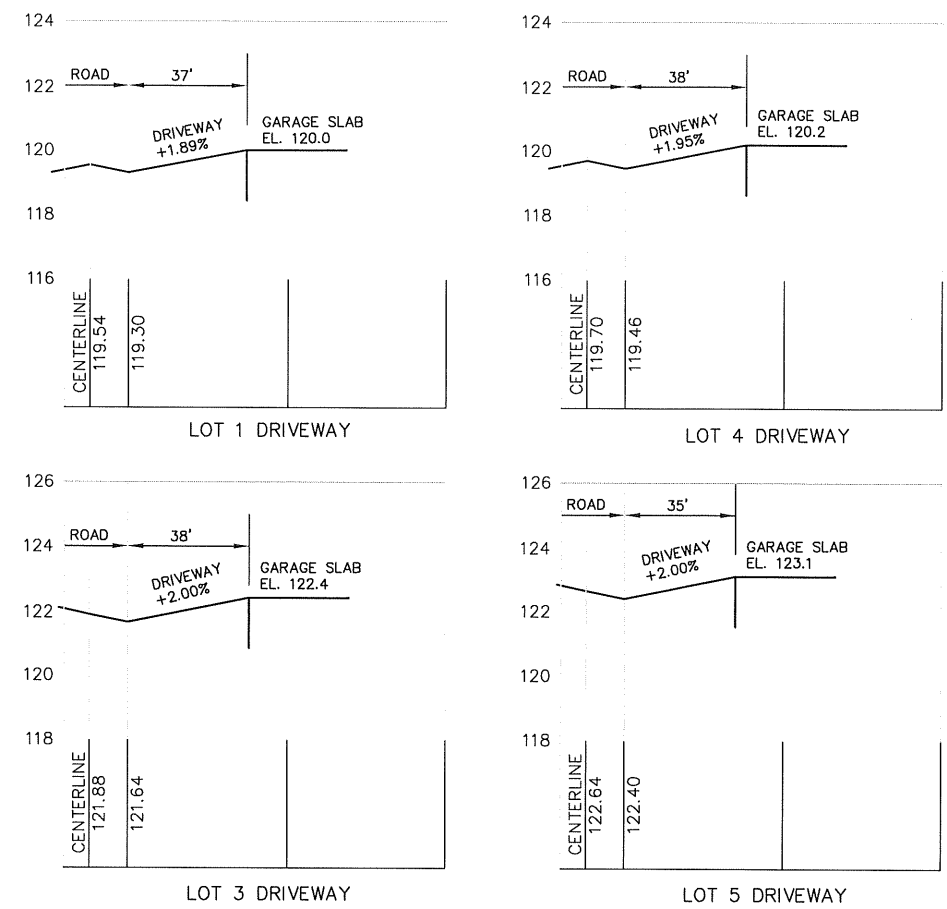
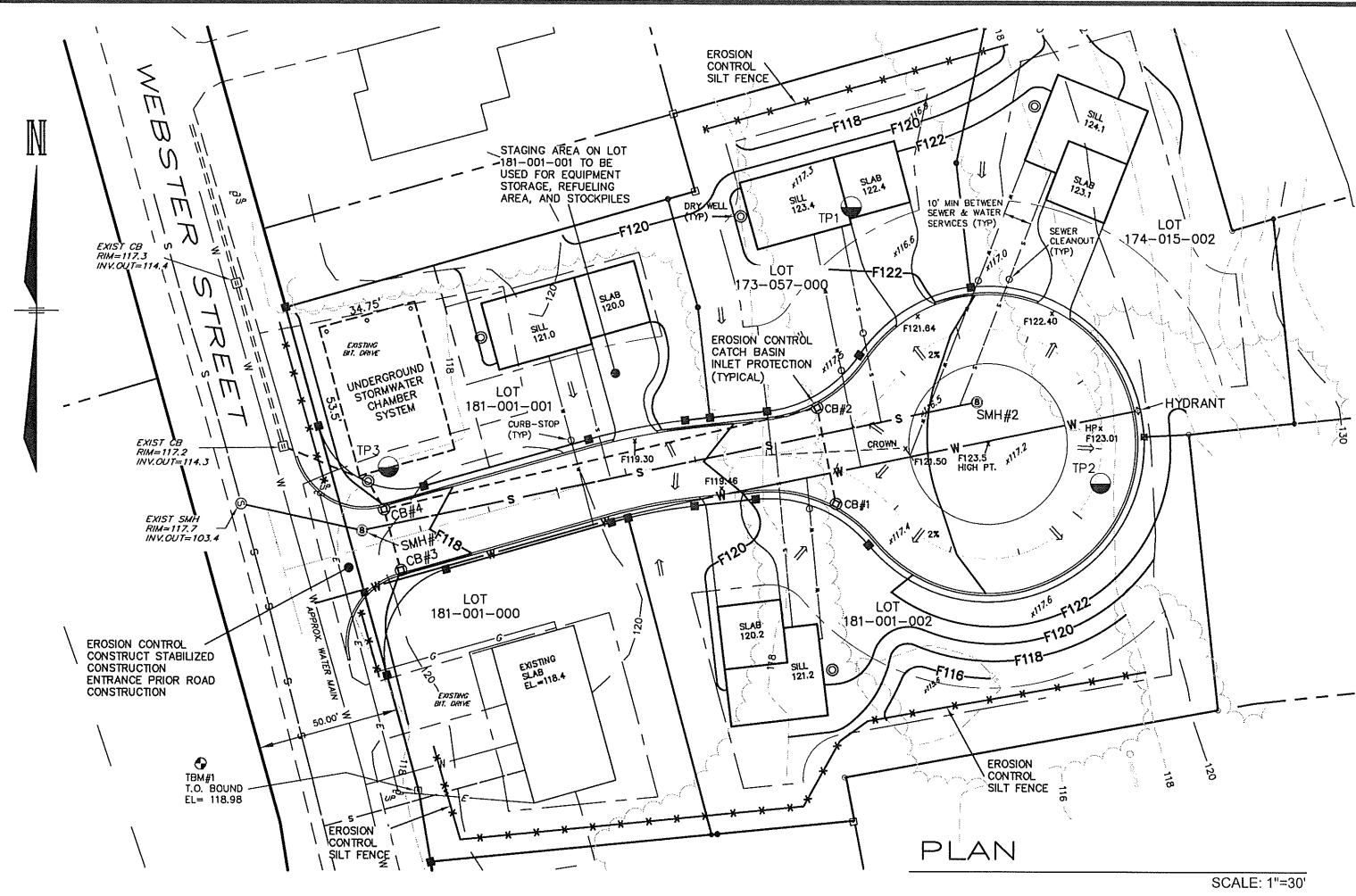
ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
 PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
 220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 6 of 14

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

CHAIRMAN _____ DATE _____
 SECRETARY _____ DATE _____

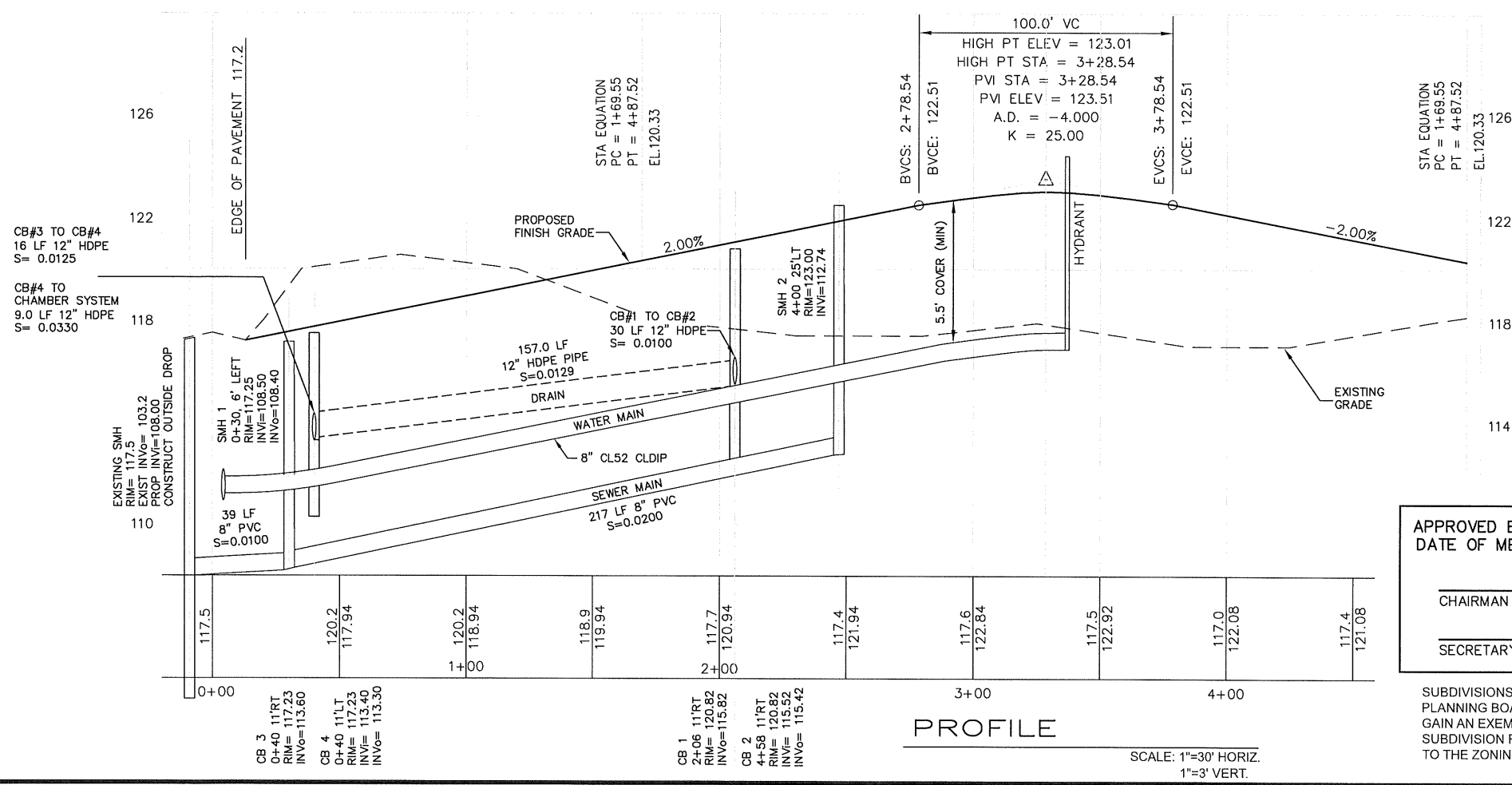
SUBDIVISIONS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39



Test Pit Log

TEST PIT #1	TEST PIT #2	TEST PIT #3
0'-12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE	0'-12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE	0'-12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE
12'-18" BROWN YELLOW (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE	12'-24" BROWNISH YELLOW (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE	12'-28" YELLOWISH BROWN (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE
18'-29" LIGHT BROWNISH YELLOW (10YR 5/6) FINE LOAMY SAND, FRIABLE, SINGLE GRAIN STRUCTURE	24'-96" YELLOW (10YR 7/6) MEDIUM SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 66" (SHWT)	28'-64" YELLOWISH BROWN (10YR 5/6) FINE LOAMY SAND, FRIABLE, SINGLE GRAIN STRUCTURE
29'-100" YELLOWISH BROWN (10YR 5/6) MEDIUM SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 66" (SHWT)	64'-100" VERY PALE BROWN (10YR 7/4) FINE SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 72" (SHWT)	
ESHWIT: 66" ROOTS: TO 36" WATER: 96" LEDGE: NONE OBSERVED TERMINATED AT 100"	ESHWIT: 66" ROOTS: TO 36" WATER: 96" LEDGE: NONE OBSERVED TERMINATED AT 96" (CAVING IN)	ESHWIT: 72" WATER: NONE OBSERVED LEDGE: NONE OBSERVED TERMINATED AT 100" PERCOLATION RATE: <2 MIN/INCH @ 30"

- Notes**
- THE PURPOSE OF THIS PLAN IS TO SHOW CONSTRUCTION OF A NEW ROAD, UTILITIES, AND RELATED IMPROVEMENTS TO PROVIDE ACCESS TO 5 NEW SINGLE FAMILY RESIDENTIAL BUILDING LOTS.
 - PROPERTY BOUNDARIES AND TOPOGRAPHY SHOWN HEREON FROM AN ON GROUND SURVEY PERFORMED BY M.J. GRAINGER ENGINEERING, INC. SEE SHEET 2 OF THIS PLAN SET FOR EXISTING CONDITIONS INFORMATION.
 - ALL WORK SHALL CONFORM TO THE LATEST TOWN OF HUDSON REGULATIONS AND THE NHDOT STANDARD ROAD AND BRIDGE SPECIFICATIONS.
 - CONTRACTOR TO VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. UTILITIES SHOWN HEREON ARE FROM REFERENCE PLANS OR FROM OBSERVATIONS MADE IN UTILITY STRUCTURES. THIS OFFICE DOES NOT GUARANTEE THE LOCATION AND ACCURACY OF THE UTILITY DATA. CONTRACTOR TO NOTIFY DIG SAFE 72 HOURS PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.
 - THE TOWN MAY REQUIRE ADDITIONAL EROSION CONTROL DURING CONSTRUCTION AS DEEMED APPROPRIATE.
 - THE TOTAL AREA OF DISTURBANCE FOR THE CONSTRUCTION OF THE NEW ROAD AND IMPROVEMENTS TO THE EXISTING PUBLIC ROAD IS APPROXIMATELY 32,000 S.F. IT IS NOT REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE U.S.E.P.A. UNDER THE NPDES CONSTRUCTION GENERAL PERMIT OR PREPARE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AS THE TOTAL DISTURBANCE IS UNDER ONE ACRE.
 - STUMPS TO BE DISPOSED OF OFF-SITE AT AN APPROVED LOCATION.
 - A PRE-CONSTRUCTION MEETING IS REQUIRED WITH THE TOWN ENGINEER PRIOR TO CONSTRUCTION.



DIG SAFE

NOTE REGARDING 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 10 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.

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

CHAIRMAN _____ DATE _____
SECRETARY _____ DATE _____

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No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
2.	ADD BENCH	08/16/2022

ROADWAY PLAN & PROFILE
MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

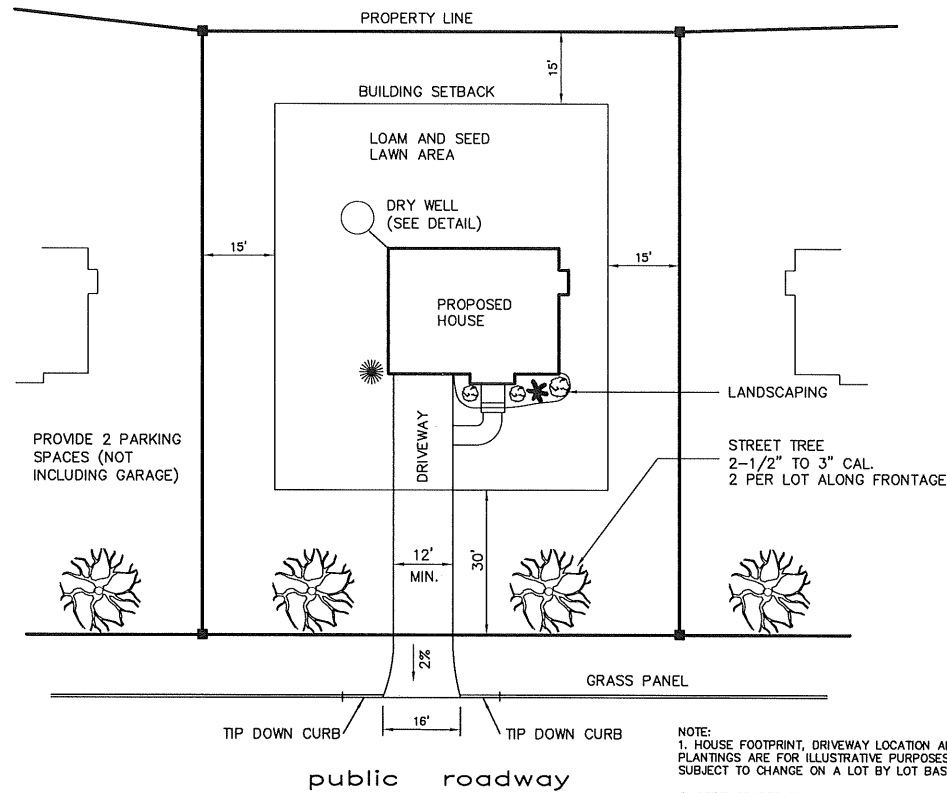
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: 1"=30'

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
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ENGINEER & SURVEYOR:
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SHEET: 7 of 14

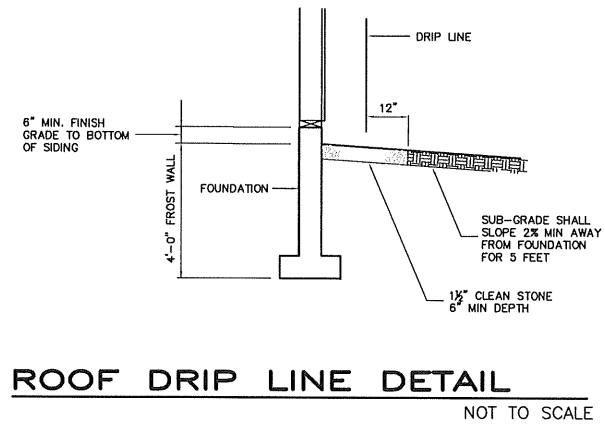


NOTE:

- HOUSE FOOTPRINT, DRIVEWAY LOCATION AND FOUNDATION PLANTINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY AND ARE SUBJECT TO CHANGE ON A LOT BY LOT BASIS.
- DRIVE GRADES SHALL NOT EXCEED 10%. FIRST 10' OF DRIVE TO SLOPE 2% DOWN TO THE STREET & THE GRADE BEYOND THAT MAY VARY AS NEEDED.
- ROOF DRAINAGE TO INFILTRATE INTO SOILS IN EITHER A CRUSHED STONE DRIP LINE AROUND THE PERIMETER OF THE FOUNDATION OR INTO A DRY WELL AS SHOWN HEREON.

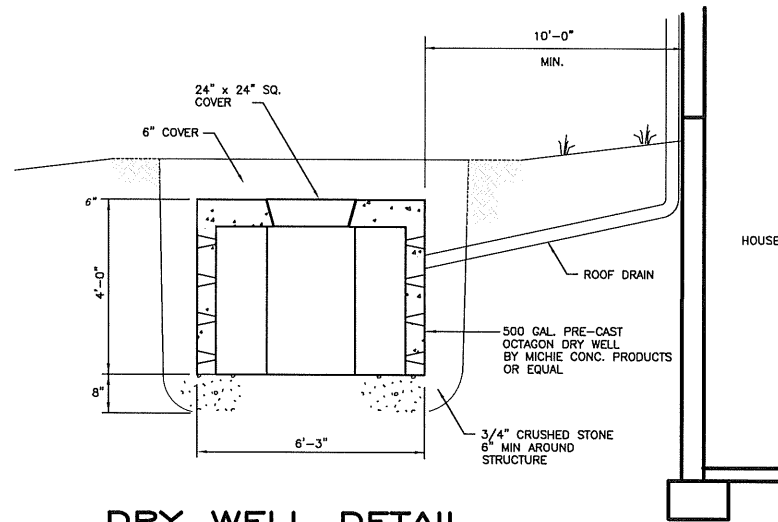
TYPICAL INDIVIDUAL LOT

NOT TO SCALE



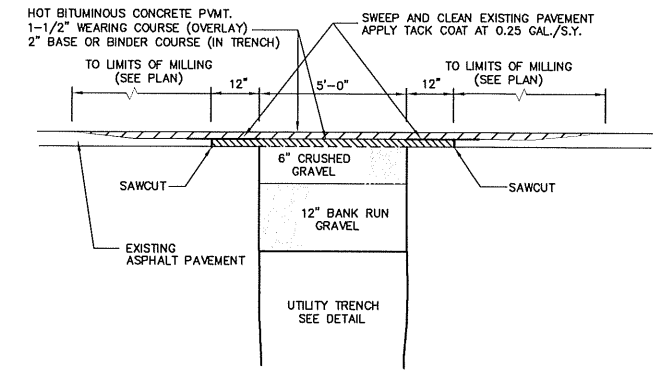
ROOF DRIP LINE DETAIL

NOT TO SCALE



DRY WELL DETAIL

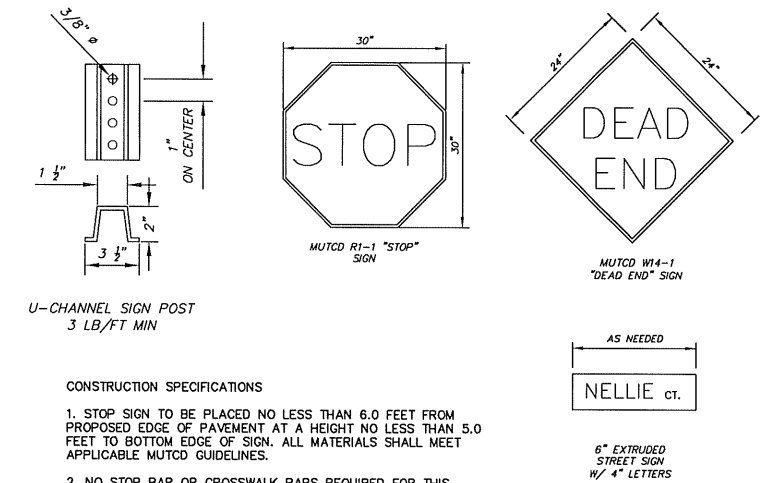
NOT TO SCALE



PAVEMENT TRENCH PATCH

IN LEDGE ROAD

NOT TO SCALE

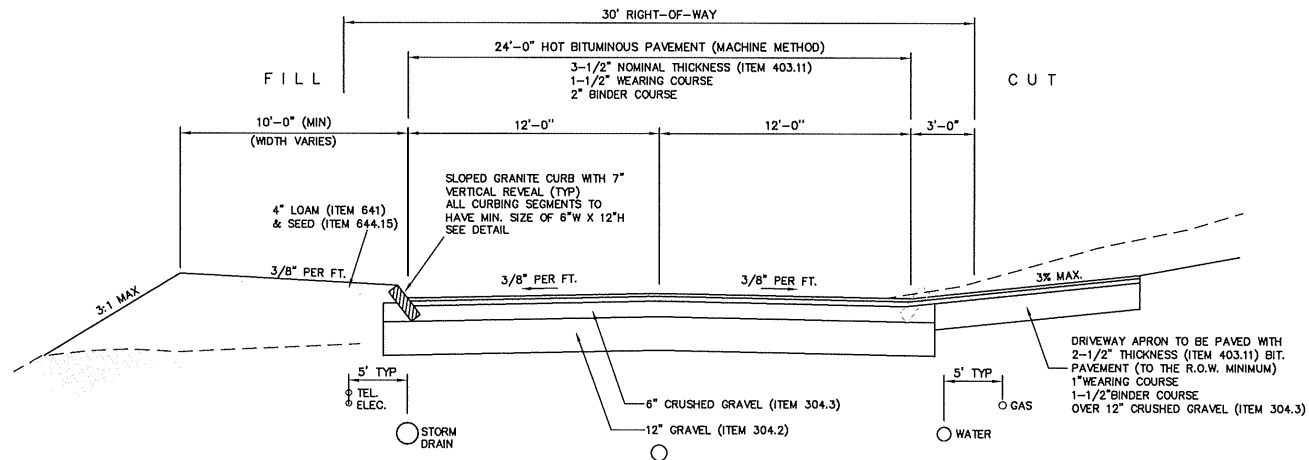


CONSTRUCTION SPECIFICATIONS

- STOP SIGN TO BE PLACED NO LESS THAN 6.0 FEET FROM PROPOSED EDGE OF PAVEMENT AT A HEIGHT NO LESS THAN 5.0 FEET TO BOTTOM EDGE OF SIGN. ALL MATERIALS SHALL MEET APPLICABLE MUTCD GUIDELINES.
- NO STOP BAR OR CROSSWALK BARS REQUIRED FOR THIS APPLICATION PER THE TOWN OF HUDSON STANDARDS FOR MINOR RESIDENTIAL DEAD END STREETS.

SITE SIGNAGE DETAIL

NOT TO SCALE



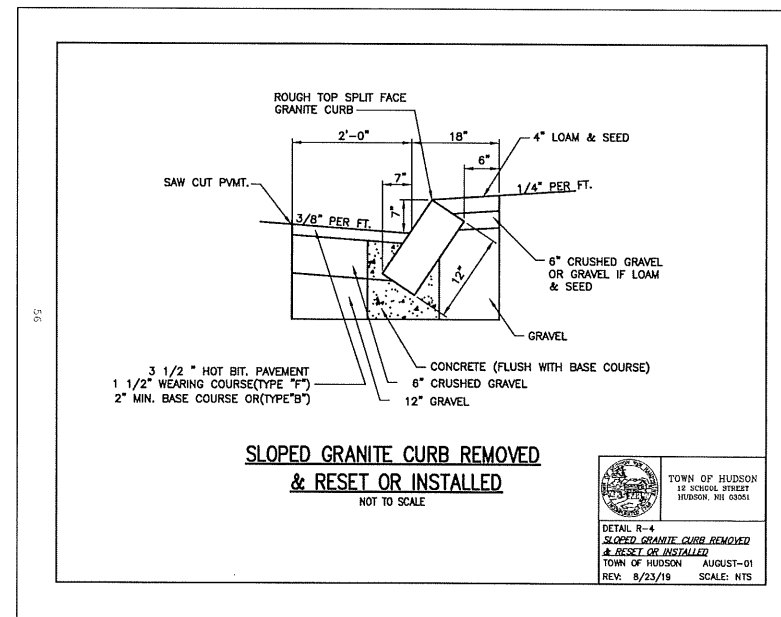
NOTE

- ITEM NUMBERS REFERENCE THE LATEST CONSTRUCTION SPECIFICATIONS FOR NHDOT
- ALL PAVEMENT, BASE MATERIALS, AND WORKMANSHIP SHALL BE IN COMPLIANCE WITH N.H.D.O.T. "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" APPROVED AND ADOPTED 1997.

TYPICAL ROADWAY SECTION

TOWN OF HUDSON (MODIFIED)

NOT TO SCALE



No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/09/2022
2.	REVISE CURB TO TOWN DETAIL	08/16/2022

CONSTRUCTION DETAILS

MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: AS NOTED

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 8 of 14

NOTES

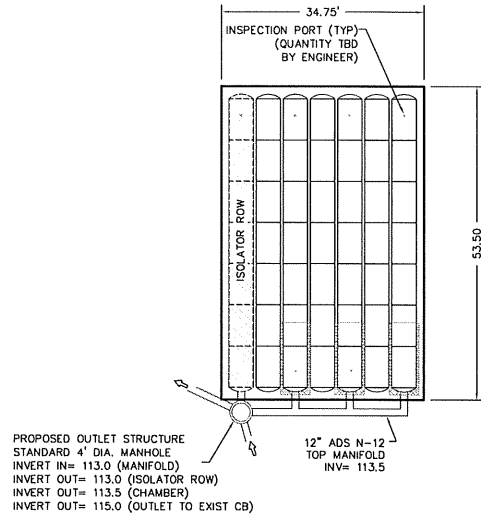
1. CHAMBERS TO BE INSTALLED PER MANUFACTURERS SPECIFICATIONS.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF THE CHAMBER SYSTEM FOR REVIEW BY THE ENGINEER PRIOR TO CONSTRUCTION.
3. MANIFOLD SIZE TO BE 12" HDPE PIPE.
4. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

SYSTEM LAYOUT

(48) STORMTECH SC-740 CHAMBERS
 (14) STORMTECH SC-740 END CAPS
 INSTALLED WITH 6" COVER STONE, 9" BASE STONE, 40% STONE VOID

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	123.00
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	117.00
TOP OF STONE:	116.00
TOP OF CHAMBER:	115.50
12" CONNECTION INVERT:	113.50
24" ISOLATOR ROW CONNECTION INVERT:	113.00
BOTTOM OF CHAMBER:	113.00
BOTTOM OF STONE:	112.25



PROPOSED OUTLET STRUCTURE
 STANDARD 4" DIA. MANHOLE
 INVERT IN= 113.0 (MANIFOLD)
 INVERT OUT= 113.0 (ISOLATOR ROW)
 INVERT OUT= 113.5 (CHAMBER)
 INVERT OUT= 115.0 (OUTLET TO EXIST CB)

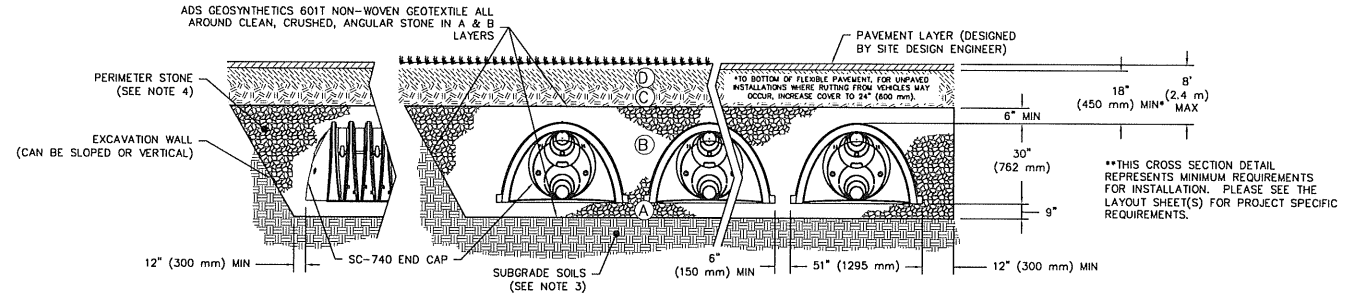
LAYOUT PLAN DETAIL

UNDERGROUND STORMWATER CHAMBER SYSTEM

NOT TO SCALE

PLEASE NOTE:

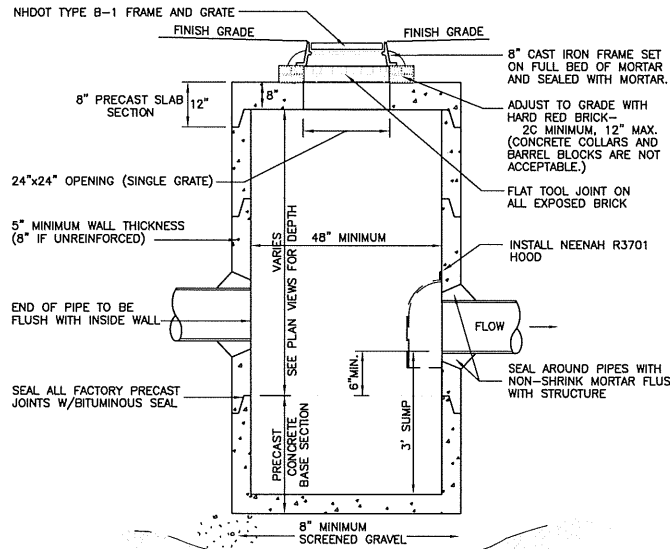
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN, AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

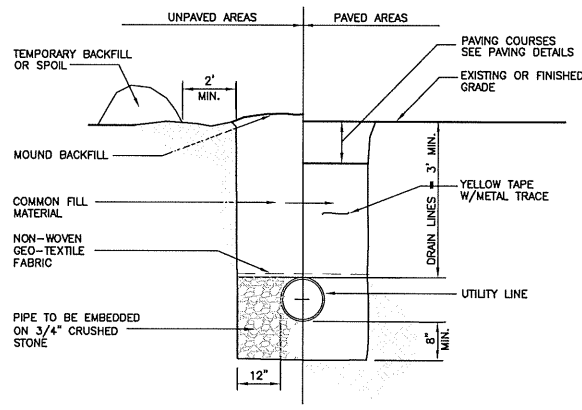
SC-740 CROSS SECTION DETAIL
 (MANUFACTURER DETAIL)



NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

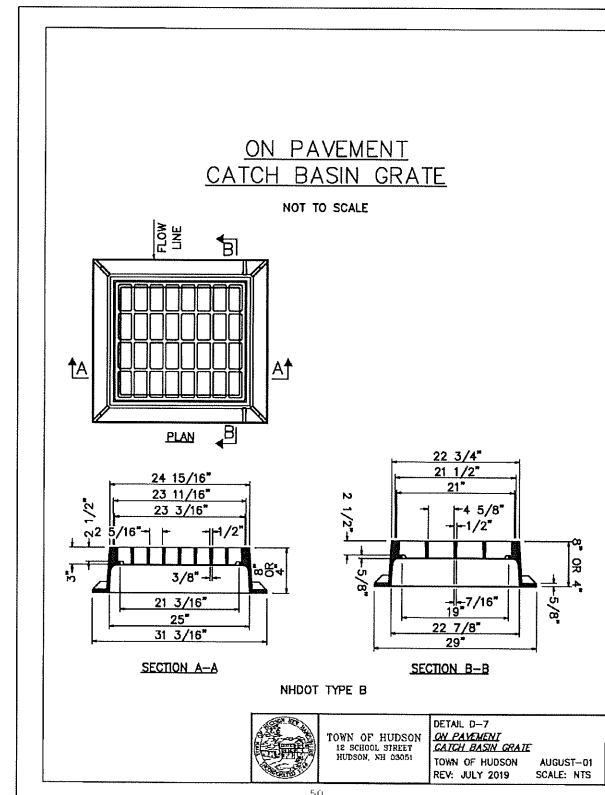
CATCH BASIN

SLAB TOP NOT TO SCALE



TRENCH

FOR DRAIN LINES NOT TO SCALE



ON PAVEMENT CATCH BASIN GRATE

NOT TO SCALE

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
2.	ADD TOWN CB GRATE DETAIL	08/16/2022

CONSTRUCTION DETAILS
 MAP 181, LOT 001-000 & 001-001

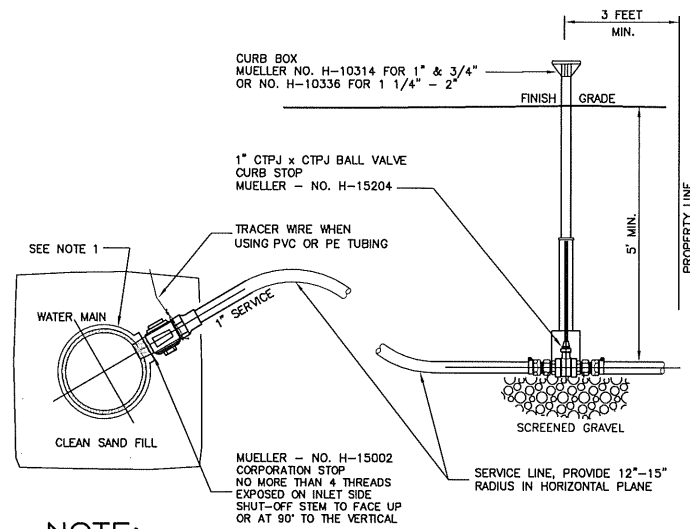
25 WEBSTER ST.
 HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
 39 TRIGATE ROAD
 HUDSON, NH 03051

JUNE 27, 2022 SCALE: AS NOTED

ENGINEER:
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 2 GLENDALE ROAD
 CONCORD, NH 03301
 PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
 PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
 220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

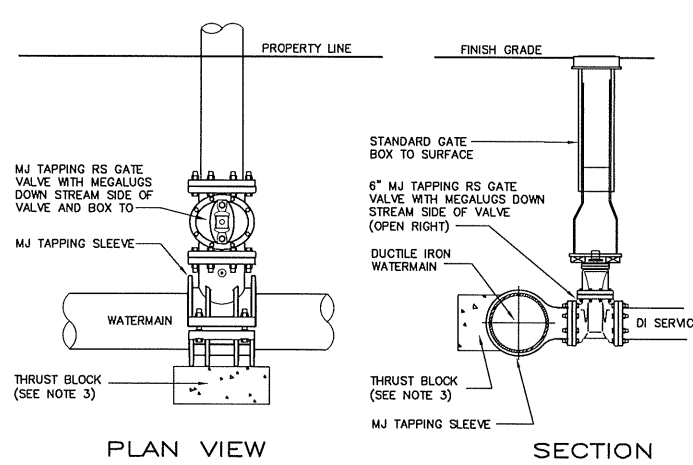


NOTE:

- CORPORATIONS UP TO 1" DIA. (INCLUSIVE) SHALL BE TAPPED DIRECTLY INTO THE MAIN AND CORPORATIONS ABOVE 1-1/2" SHALL BE INSTALLED USING A TAPPING SADDLE AND SHELL CUTTER

SERVICE CONNECTION

NOT TO SCALE

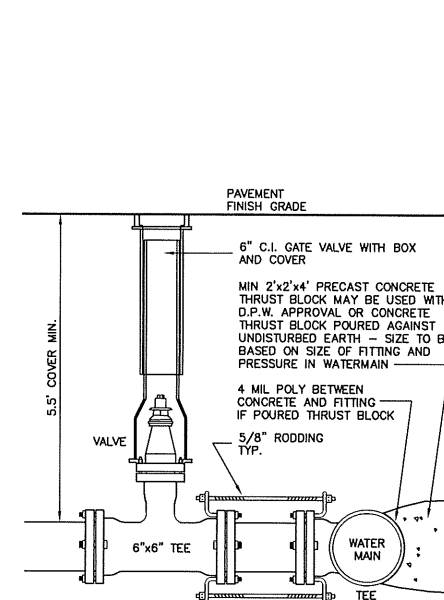


NOTE:

- ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
- ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

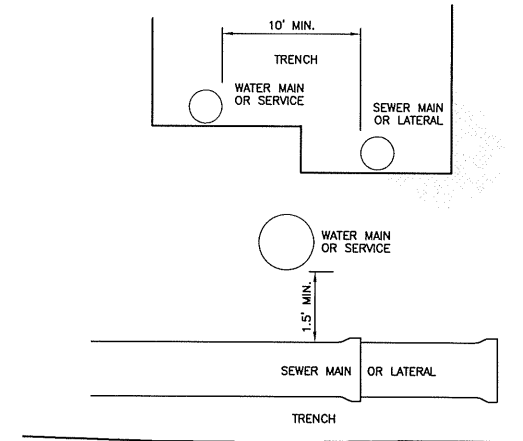
WET TAP TEE INSTALLATION

NOT TO SCALE



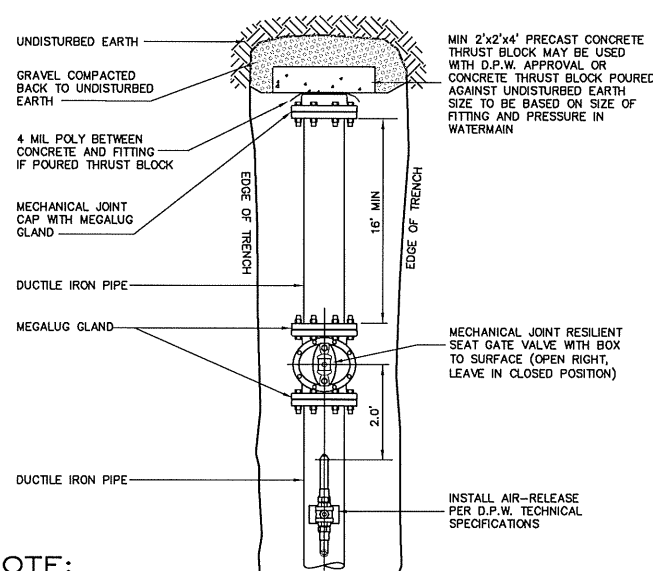
BURIED GATE VALVE

NOT TO SCALE



WATER / SEWER MAIN SEPARATION

NOT TO SCALE

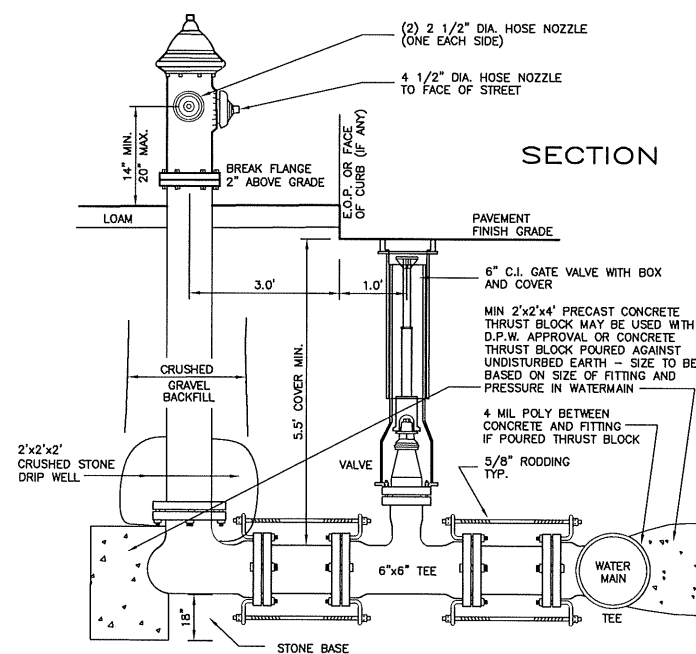


NOTE:

- ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
- ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

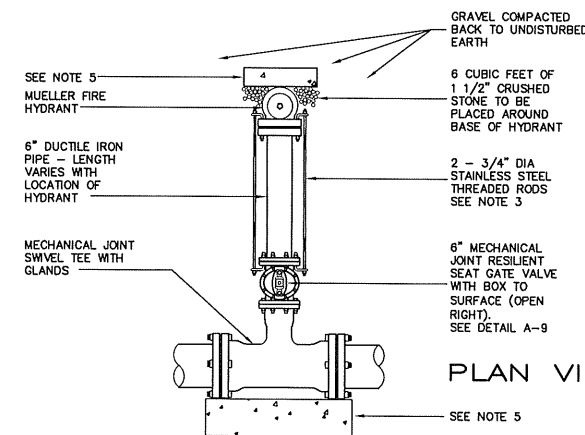
END OF MAIN INSTALLATION

NOT TO SCALE



FIRE HYDRANT AND GATE VALVE

NOT TO SCALE



NOTE:

- ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
- ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
- ALL THREADED RODS AND NUTS MUST BE STAINLESS STEEL.
- WHEN DISTANCE FROM WATERMAIN TO HYDRANT IS MORE THAN 10', SUBSTITUTE MEGALUGS IN LIEU OF THREADED ROD OR GRIP RINGS.
- MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.
- HYDRANT TO BE MUELLER SUPER CENTURION A-423 AS PER TOWN REQUIREMENTS.

No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
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WATER SYSTEM DETAILS
MAP 181, LOT 001-000 & 001-001

*25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE*

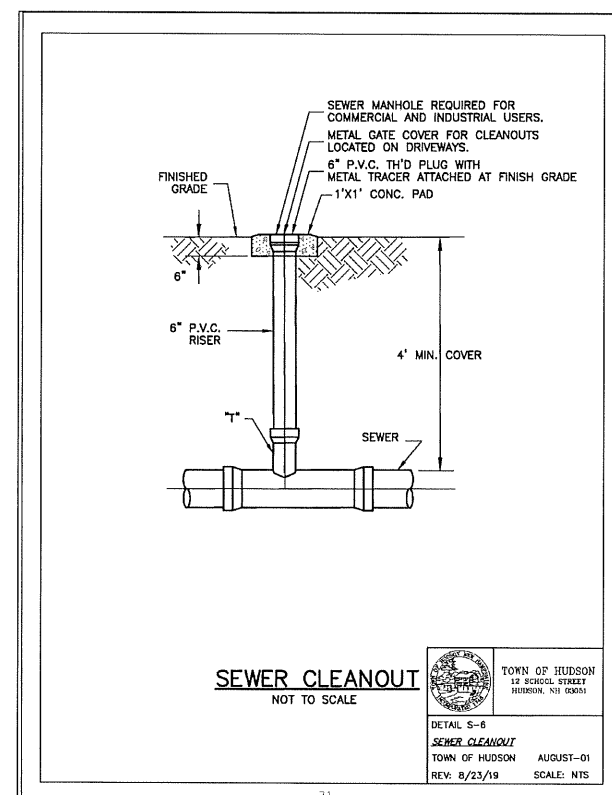
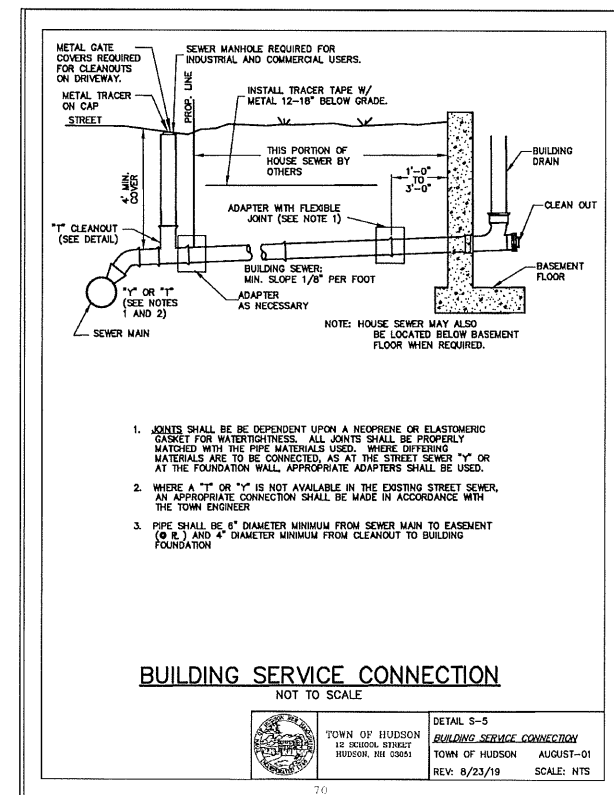
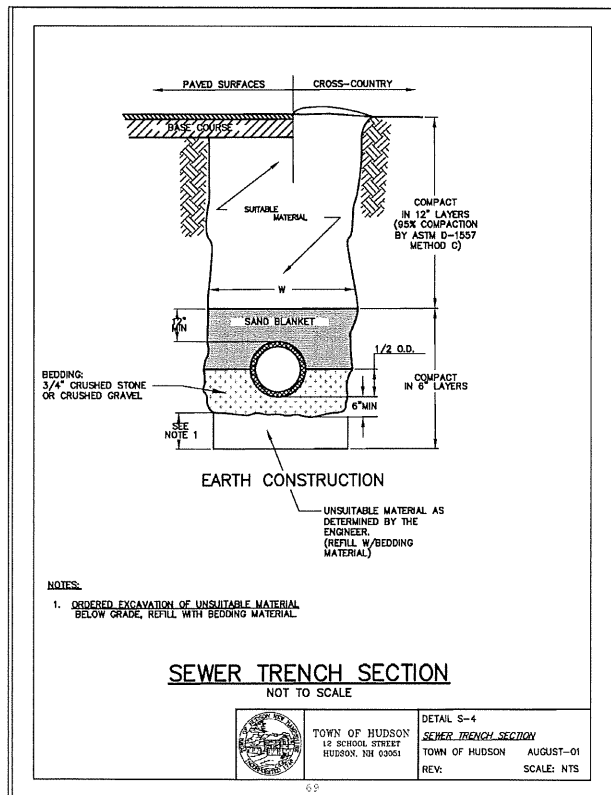
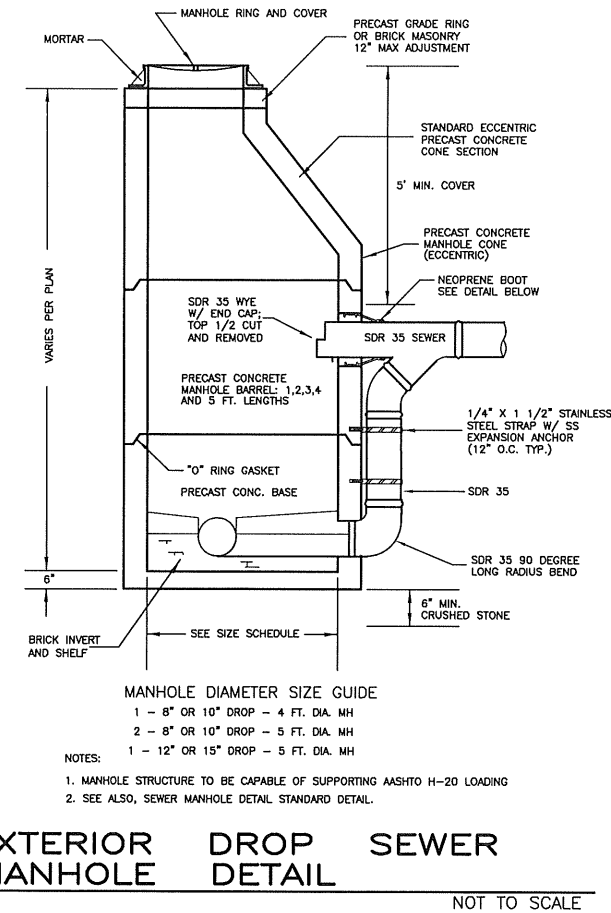
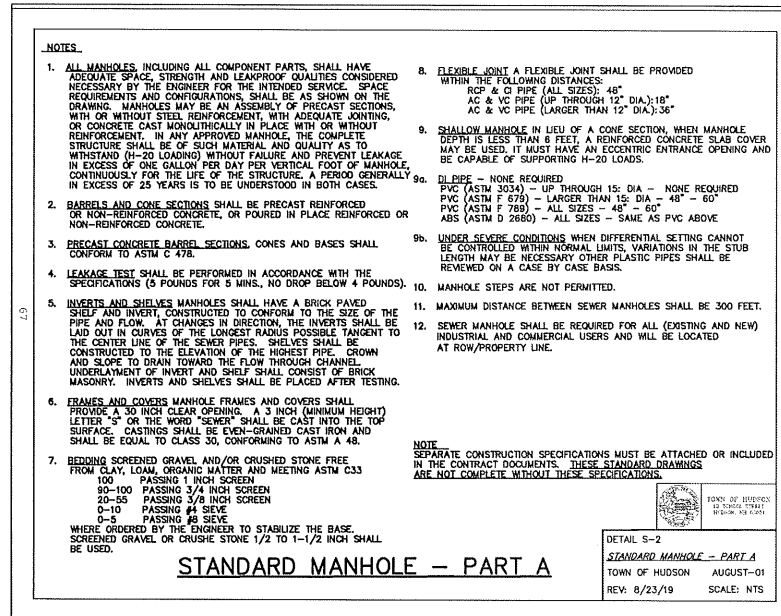
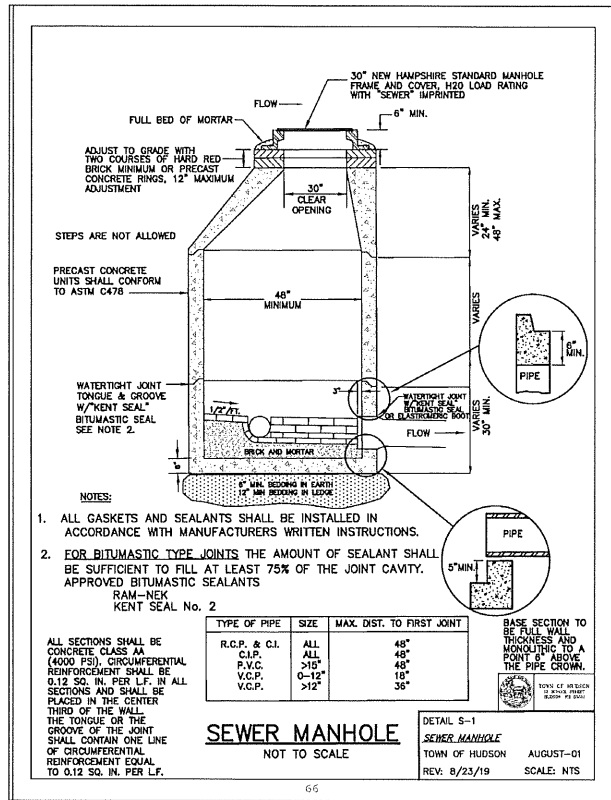
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: AS NOTED

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 10 of 14



No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 08/01/2022 ENGINEERING REVIEW	08/08/2022
2.	ADD TOWN DETAILS	08/16/2022

SEWER SYSTEM DETAILS
MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

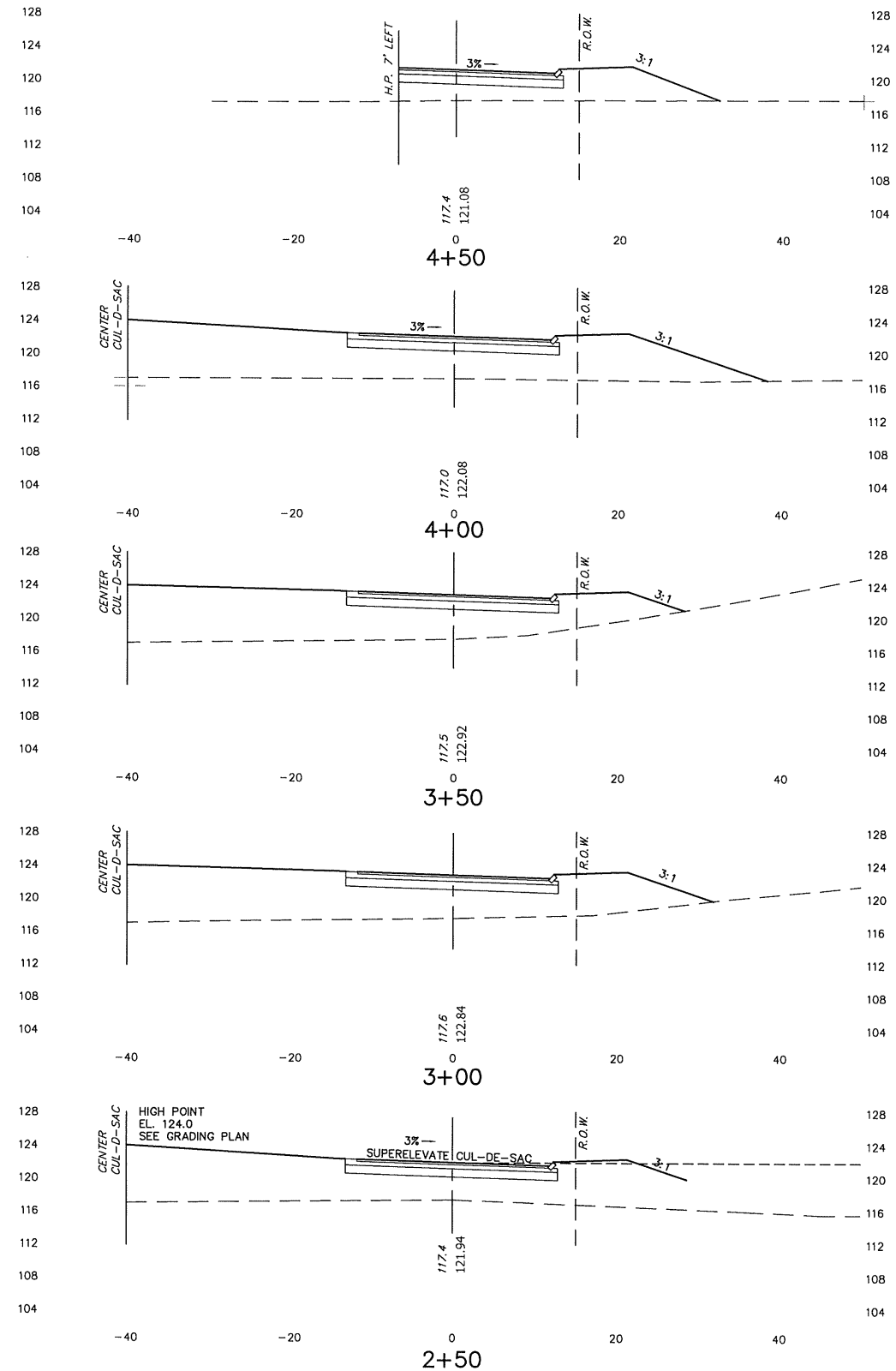
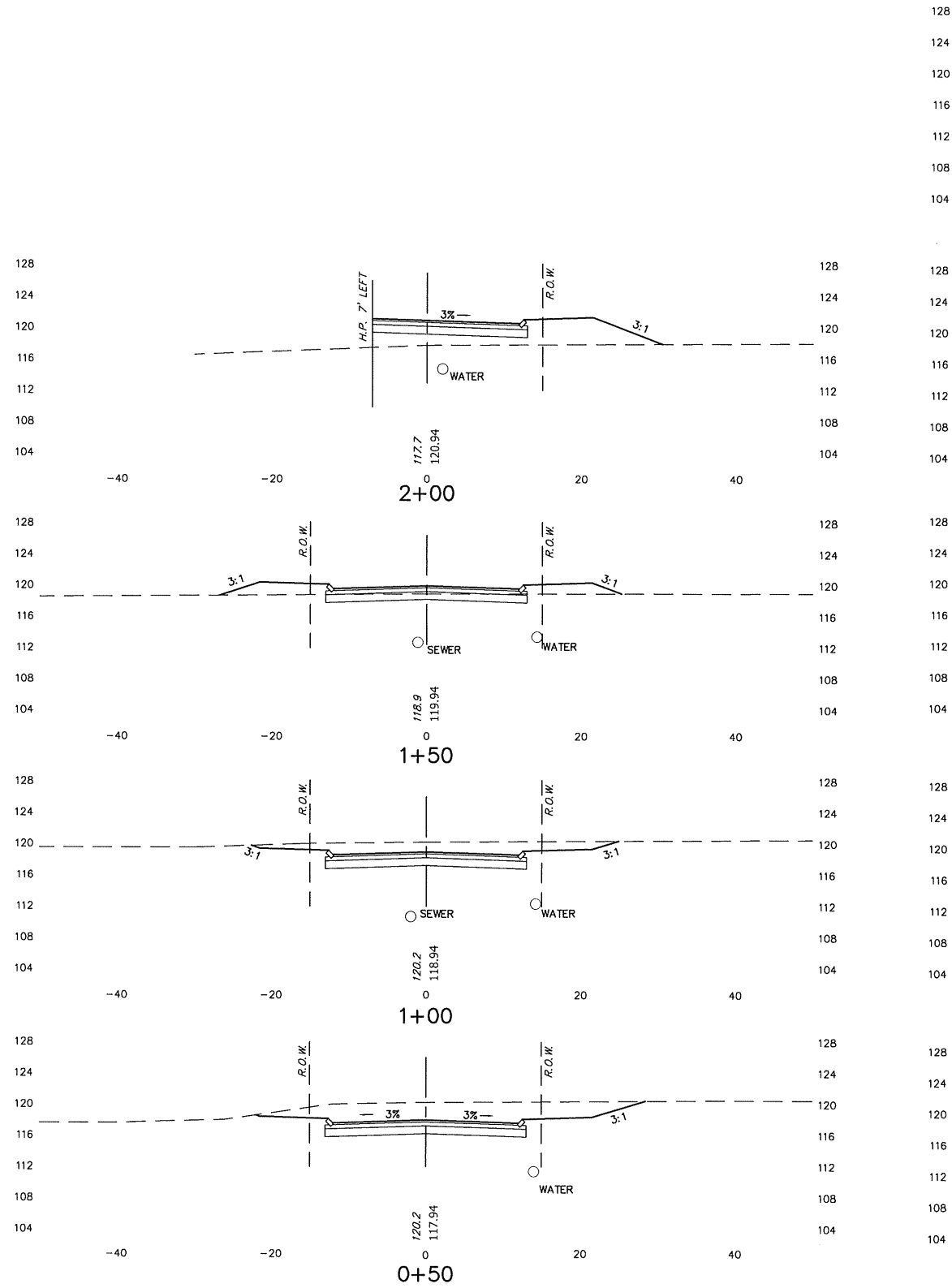
PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: AS NOTED

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH: 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 11 of 14



No.	DESCRIPTION	DATE
1.	MISC REVISIONS PER 06/01/2022 ENGINEERING REVIEW	08/08/2022
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ROADWAY CROSS SECTIONS
 MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
 38 TRIGATE ROAD
 HUDSON, NH 03051

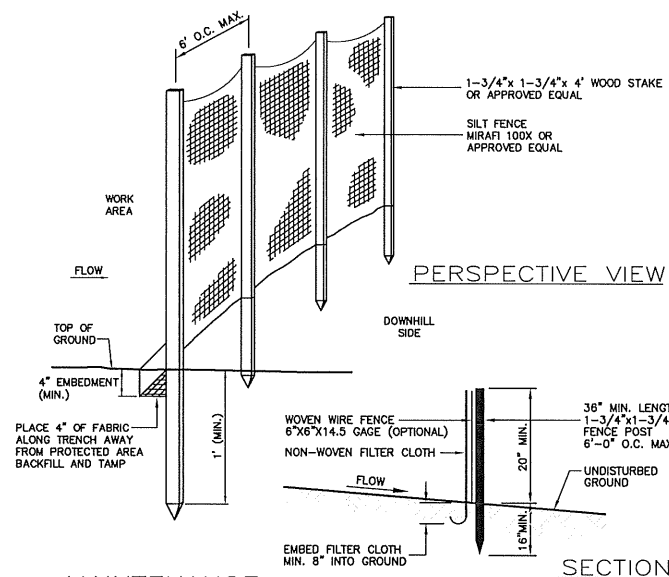
JUNE 27, 2022 **SCALE: 1"=10'**

ENGINEER:
RJB ENGINEERING, LLC
 2 GLENDALE ROAD
 CONCORD, NH 03301
 PH. 603-219-0194

SCALE: 1"=10'

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
 PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
 220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 12 of 14

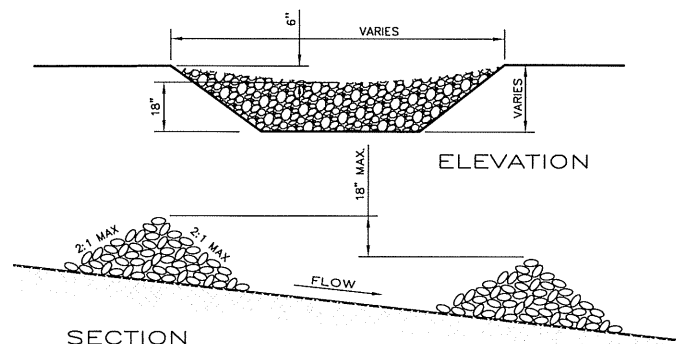


MAINTENANCE

1. SILT FENCES ARE TO BE INSPECTED IMMEDIATELY AFTER EVERY RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE DETAIL

NOT TO SCALE

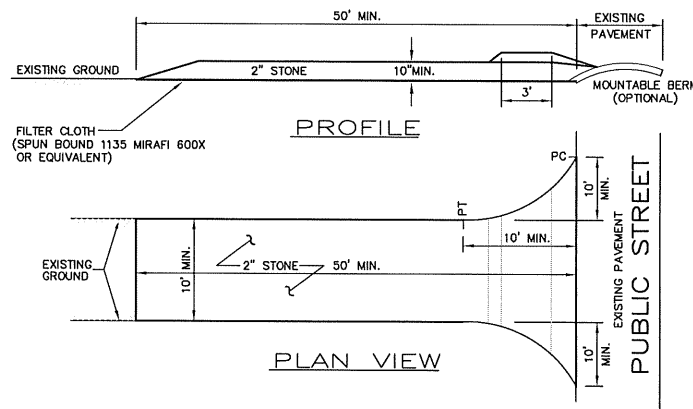


NOTE

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION WILL BE MINIMIZED.
3. WHEN STRAW BALES ARE USED, THEY ARE TO BE EMBEDDED INTO THE SOIL 4 INCHES. WHEN TIMBERS ARE TO BE USED, THE TIMBER SHALL EXTEND AT LEAST 18 INCHES INTO THE SOIL.
4. STRAW OR STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2"x2" STAKES DRIVEN THROUGHOUT THE BALES AT LEAST 18 INCHES INTO THE SOIL.
5. SEEDING, FERTILIZING AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE BMP.
6. STRUCTURES ARE TEMPORARY AND ARE TO BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS EXPIRED, WHEN A SOLID STAND OF GRASS HAS GROWN AND STABILIZED.

STONE CHECK DAM

NOT TO SCALE

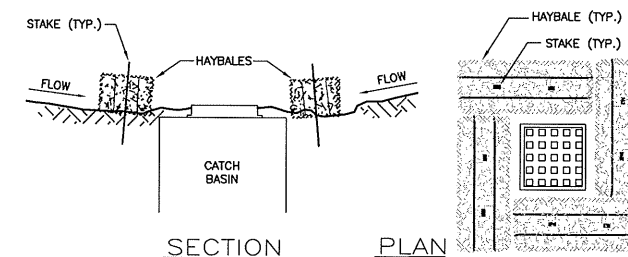


NOTE

1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL BE NOT LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER 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 RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND 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.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



SEDIMENTATION CONTROL AT CATCH BASINS

NOT TO SCALE

No.	DESCRIPTION	DATE
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EROSION CONTROL DETAILS
MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
38 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022 SCALE: AS NOTED

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

GENERAL NOTES:

- PROJECT ENGINEER: RJB ENGINEERING, LLC
- PROJECT SURVEYOR: MICHAEL J. GRAINGER, LLS
- ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO TOWN REGULATIONS AND THE LATEST EDITION OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.
- IF, DURING CONSTRUCTION IT BECOMES APPARENT THAT DEFICIENCIES EXIST IN THE APPROVED DESIGN DRAWINGS, THE CONTRACTOR, DEVELOPER OR OWNER ARE RESPONSIBLE TO DOCUMENT THE APPARENT DEFICIENCIES AND NOTIFY THE DESIGN ENGINEER PRIOR TO CONTINUING CONSTRUCTION ACTIVITIES. THE DESIGN ENGINEER, IN COOPERATION WITH THE CONTRACTOR, DEVELOPER OR OWNER WILL RESOLVE THE APPARENT DEFICIENCIES TO MEET APPLICABLE TOWN REGULATIONS.
- IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT ADDITIONAL EROSION CONTROL MEASURES ARE REQUIRED, THE CONTRACTOR, DEVELOPER OR OWNER SHALL BE REQUIRED TO INSTALL ADDITIONAL EROSION PROTECTION MEASURES.
- THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO VERIFY THE LOCATION OF ALL UTILITIES OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR. (CONTACT DIG SAFE)
- THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AT ALL TIMES.
- NO EXCAVATED AREA SHALL BE LEFT UNATTENDED AND SHALL BE THOROUGHLY SECURED ON A DAILY BASIS.
- THE TOTAL AREA OF DISTURBANCE FOR THE PROJECT IS APPROXIMATELY 82,000 S.F. IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT (NOI) WITH THE U.S.E.P.A. UNDER THE NPDES CONSTRUCTION GENERAL PERMIT 14 DAYS PRIOR TO INITIATING CONSTRUCTION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH THE FEDERAL STORMWATER PERMIT REQUIREMENTS.

CONSTRUCTION SEQUENCE:

- CUT AND CLEAR TREES WITHIN LIMIT OF WORK (PROPOSED TREELINE), UNLESS OTHERWISE NOTED. ALL STUMPS, BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF, PREFERABLY OFF SITE.
- CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AS SHOWN AND DETAILED IN THIS PLAN SET.
- CONSTRUCT TEMPORARY (SILT FENCE) AND PERMANENT EROSION CONTROL FACILITIES (STORMWATER BASINS, TREATMENT SWALES, GRASS SWALES AND EXPILATION BASINS) PRIOR TO ANY EARTH MOVING OPERATION.
- ALL SWALES AND DITCH LINES SHALL BE PROTECTED FROM EROSION. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
- ALL STORM DRAINAGE SYSTEMS SUCH AS DETENTION/INFILTRATION BASINS, TREATMENT SWALES AND LEVEL SPREADERS (IF ANY) SHALL BE PROTECTED FROM EROSION. ALL STORM DRAINAGE SYSTEMS SHALL BE STABILIZED PRIOR TO DIRECTING FLOW INTO THEM.
- NO CATCH BASIN FRAME AND GRATE (IF APPLICABLE) SHALL BE INSTALLED PRIOR TO PAVING. ALL DRAINAGE STRUCTURES ARE TO BE "PLATED" AND CUT OUT FOLLOWING PAVING OPERATIONS, ONLY IF ALL DOWNSTREAM DRAINAGE ELEMENTS ARE STABLE, INCLUDING BUT NOT LIMITED TO OUTLET PROTECTION, ALL SLOPE GRADING, VEGETATED OR RIPRAP SWALES, DETENTION / INFILTRATION BASINS AND TREATMENT SWALES.
- IF FRAME AND GRATES ARE INSTALLED, SPECIFIC SOIL EROSION MEASURES MUST BE INSTALLED SUCH AS SILT SAK PRTECTION DEVICES, GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER OR BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER.
- CONSTRUCT TEMPORARY CULVERTS, DIVERSION DITCHES/SWALES OR BERMS AS REQUIRED TO MINIMIZE THE EROSIIVE EFFECTS OF STORMWATER RUNOFF DURING ALL CONSTRUCTION ACTIVITIES.
- COMPLETE GRUBBING OPERATIONS. ALL STUMPS AND DEBRIS SHALL BE PROPERLY DISPOSED OF, PREFERABLY OFF SITE.
- ALL MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLANDS AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND IF NECESSARY, SURROUNDED WITH SILT FENCE AND/OR STRAW BALES, IN ORDER TO PREVENT OR CONTAIN SOIL EROSION.
- ALL MATERIAL SUITABLE FOR FILL OR SELECT MATERIAL SHALL BE STOCKPILED IN UPLANDS AREAS. ALL STOCKPILES SHALL BE SURROUNDED WITH SILT FENCE AND/OR STRAW BALES, IN ORDER TO CONTAIN SOIL EROSION.
- REMOVE ALL IMPROPER ROADWAY/SITE FOUNDATION MATERIAL WITHIN 18" OF SUBGRADE. REPLACE WITH COMPACTED GRANULAR FILL ACCEPTABLE TO THE STATE/TOWN SPECIFICATIONS. ALL SUITABLE FILL MATERIAL SHALL BE COMPACTED TO AT LEAST 95% OF THE DRY WEIGHT AS DETERMINED BY MODIFIED PROCTOR TESTING (ASTM D-1556) REQUIREMENTS.
- CONSTRUCT ALL UNDERGROUND UTILITIES INCLUDING, BUT NOT LIMITED TO SEWER, WATER, DRAIN, GAS, DATA, CABLE AND POWER.
- ROUGH GRADE ROADWAY/SITE WITHIN LIMIT OF WORK AND COMMENCE CONSTRUCTION OF ROADWAYS AND PARKING AREAS.
- COMPLETE ROADWAY SLOPE GRADING/EMBANKMENT CONSTRUCTION. ALL SLOPES SHALL BE STABILIZED AND SEEDED IMMEDIATELY AFTER GRADING. THE CONTRACTOR SHALL STABILIZE SLOPES WITH APPROPRIATE SEEDING PROGRAM OR JUTE MAT, WHEREVER SPECIFIED.
- APPLY TOPSOIL TO ROADWAY SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED AS TO BE FREE FROM ROOTS, BRANCHES, STONES, AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED, AND MULCHED. THE CONTRACTOR SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS IS ESTABLISHED.
- PERFORM FINAL PAVING OPERATIONS, INSTALL GUARDRAIL (IF APPLICABLE) AND MONUMENTATION AS SHOWN ON THE APPROVED PLANS.
- MAINTAIN, REPAIR, AND REPLACE TEMPORARY EROSION CONTROL MEASURES AS NECESSARY FOR A MINIMUM PERIOD OF 12 MONTHS FOLLOWING SUBSTANTIAL COMPLETION.
- AFTER STABILIZATION (12 MONTHLY FOLLOWING SUBSTANTIAL COMPLETION), REMOVE AND PROPERLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES, PREFERABLY OFF SITE.
- FOLLOWING SUBSTANTIAL COMPLETION OF ALL ROADWAY ACTIVITIES AND ONCE STABLE CONDITIONS ARE ACHIEVED, CAREFULLY AND REGULARLY MONITOR CONSTRUCTION ACTIVITIES ON ALL INDIVIDUAL LOTS TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF ROADWAY EMBANKMENTS, STORMWATER SYSTEMS AND UTILITIES.

NOTE: LOT DISTURBANCE, OTHER THAN SHOWN ON THESE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO THE DESIGN ELEVATION AND ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

WINTER CONSTRUCTION NOTES

- ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
- ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
- AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

SEEDING SPECIFICATIONS

MIXTURE	POUNDS/ACRE	POUNDS/1,000 SF
TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
BIRDSFOOT TREFOIL	8	0.20
TOTAL	48	1.10

- SEEDBED PREPARATION
 - SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
 - STONES LARGER THAN FOUR INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT FOUR INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
- ESTABLISHING A STAND
 - LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
 - AGRICULTURAL LIMESTONE: 2 TONS PER ACRE OR 0.09 LBS. PER SQ. FT.
 - NITROGEN (N): 50 LBS. PER ACRE OR 1.1 LBS. PER 1000 SQ. FT.
 - PHOSPHATE (P₂O₅): 100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.
 - POTASH (K₂O): 100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.
 (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10)
 - SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH 0.25 INCH SOIL OR LESS, BY CULTIPACKING OR RAKING.
 - REFER TO TABLE 7-35 OF "STORMWATER MANAGEMENT AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE", FOR APPROPRIATE SEED MIXTURES AND TABLE 7-36 FOR RATES OF SEEDING. ALL LEGUMES (CROWN VETCH, BIRDSFOOT TREFOIL, AND FLATPEA), MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT.
 - WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.
- MULCH
 - STRAW, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
 - MULCH WILL BE HELD IN PLACE USING TECHNIQUES FROM THE "BEST MANAGEMENT PRACTICE FOR MULCHING", AS SHOWN IN, "STORMWATER MANAGEMENT AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE".
- MAINTENANCE TO ESTABLISH A STAND
 - PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
 - FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
 - IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

EROSION CONTROL NOTES

ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (EPA, NHDES AND TOWN REGULATIONS). THE GENERAL NOTES AND DETAILS CONTAINED IN THIS PLAN SERVE AS A GUIDE ONLY.

- PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS. INSTALLATION OF STRAWBALE BARRIERS AND SILTATION FENCES SHALL BE COMPLETED PRIOR TO THE START OF SITE WORK IN ANY SPECIFIC AREA. PREFABRICATED SILTATION FENCES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
- STRAWBALE BARRIERS AND SILTATION FENCES SHALL BE KEPT CLEAN DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATIVE COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES.
- EXISTING VEGETATION IS TO REMAIN UNDISTURBED WHEREVER POSSIBLE.
- THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. ALL ROADWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE. CUT AND FILL SLOPES SHALL BE LOAMED & SEEDED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE. TEMPORARY AND/OR PERMANENT STABILIZATION SHALL BE INSTALLED WITHIN 60 DAYS OF INITIAL CONSTRUCTION.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:

- BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED
- OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED

TIME LIMIT: ALL AREAS SHALL BE STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE.

5. ALL DISTURBED AREAS SHALL HAVE A MINIMUM OF 4" OF LOAM INSTALLED WITH NOT LESS THAN 1.1 POUNDS OF SEED MIX PER 1,000 SQ. FT. SEE SEEDING SPECIFICATIONS ON THIS SHEET

6. LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE SOIL PRIOR TO OR AT THE TIME OF AT THE TIME OF SEEDING. A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS. PER ACRE OF 10-20-20 FERTILIZER SHALL BE APPLIED. SEEDING PRACTICES SHALL COMPLY WITH LOCAL USDA SOIL CONSERVATION SERVICES RECOMMENDATIONS.

7. STRAW MULCH OR JUTE MATTING SHALL BE USED IF/WHERE INDICATED ON THE PLANS. A MINIMUM OF 1.5 TONS OF MULCH PER ACRE SHALL BE APPLIED. MULCH SHALL BE ANCHORED IN PLACE WHERE NECESSARY. JUTE MATTING SHALL BE LAID IN THE DIRECTION OF RUNOFF FLOW AND APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

8. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS.

No.	DESCRIPTION	DATE
-	-	-
-	-	-
-	-	-

EROSION CONTROL NOTES

MAP 181, LOT 001-000 & 001-001

25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

JUNE 27, 2022

SCALE: AS NOTED

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

SHEET: 14 of 14

STORMWATER MANAGEMENT REPORT

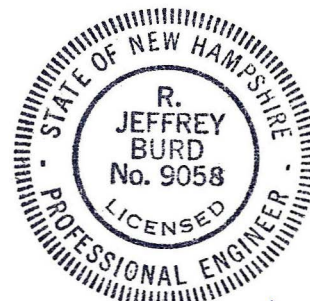
PROPOSED RESIDENTIAL SUBDIVISION

TAX MAP 181, LOT 1 & 1-001
25 WEBSTER ST.
HUDSON, NH

June 27, 2022

Prepared for:
Tumpney, Hurd, Clegg, LLC
39 Trigate Road
Hudson, NH 03051

Prepared By:
RJB Engineering, LLC
2 Glendale Road
Concord, NH 03301



RJBurd

Tax Map 181, Lot 1 & 1-001, Hudson, NH

Stormwater Management Report

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10-year post-development computations – summaries

NRCS Web Soils map

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Infiltration Feasibility Report

Groundwater Recharge Volume

Stormwater Maintenance Manual

Pre-development Drainage Area Plan

Post-development Drainage Area Plan

Map 181, Lot 1 & 1-001, Hudson, NH

Stormwater Management Report

Introduction

This project is a single-family residential subdivision on 1.92 acres in Hudson, New Hampshire. Two properties are being merged and re-subdivided into six building lots. The properties are located between, and have frontage on, Baker Street and Webster Street. There is an existing house on 25 Webster Street that was recently moved to accommodate the proposed development. The project is in a fairly dense residential area of Hudson near the Merrimack River. The property is zoned Town Residence (TR).

The development includes construction of a new road approximately 250 feet long to provide access to and frontage for five new building lots – the sixth lot will have frontage solely on Baker Street. Lots will be served with municipal sewer and water.

The stormwater surface runoff from Baker Street, including all of the 20 Baker Street property and more than half of the 25 Webster Street property is directed to a low depressed area in the middle of the combined parcels where it infiltrates into the underlying soils. The stormwater runoff in the front portion of 25 Webster Street drains to a closed drainage system in Webster Street, which ultimately flows into the Merrimack River.

Existing Conditions

Again, the project includes two properties that are being merged and re-subdivided. The first property is located at 20 Baker Street and includes an area of 1.187 acres. The second parcel is located at 25 Webster Street and has an area of 0.737 acres. The total combined area is approximately 1.92 acres. Both properties have historically been used as single-family residences.

Baker Street is more than 25 feet higher than Webster Street. The land slopes fairly steeply (15 to 25%) behind the house on Baker Street to a low flat grassy area. The back yard of 25 Webster Street also slopes to this low flat area. Slopes in this grassy area range from flat, 0% to less than 1/2%. Portions of both lots are sparsely wooded.

There are no wetlands on the property. Soils on the site are identified on the USDA NRCS Web Soil Survey as a Windsor-urban land complex and Occum fine sandy loam. The Windsor soil is in the Group A hydrologic soil group, having well to excessively drained sands and gravel. The Occum soil is in the Group B hydrologic soil group, having moderately well to well drained soils with moderately fine to moderately coarse sands. Both soils have good infiltration rates.

Map 181, Lot 1 & 1-001, Hudson, NH Stormwater Management Report

Most of the stormwater surface runoff from the combined lots flows to the low flat grassy area in the middle of the parcels. There is no outlet for this depressed area and no evidence of concentrated flows, and as such, it is apparent that the contributing runoff naturally infiltrates into the underlying soils. The stormwater runoff in the front portion of 25 Webster Street drains to a closed drainage system in Webster Street, which ultimately flows into the Merrimack River. The total drainage area included in this analysis is approximately 2.6 acres. Approximately 2.2 acres drains to the low flat grassy area located in the middle of the development.

Proposed development

This project is a single-family residential subdivision that will create a total of six lots. The existing house at 25 Webster Street has been recently moved within the lot in order to accommodate the proposed development. Each lot will exceed 10,000 s.f. in size and will be served by public sewer and water. The proposed road length is less than 300 linear feet and terminates in a cul-de-sac. The road will be curbed with a closed drainage system in accordance with Town standards. The total impervious surface area of the new road is approximately 12,250 s.f. The total area to be disturbed, not including the home construction on each lot, is approximately 32,000 s.f.

Drainage in the new roadway will be routed to a closed drainage system to a single underground stormwater chamber system.

through two detention and infiltration basins. The area that is easterly of the cul-de-sac drains toward and will be captured in two catch basins located on the downhill side and at the throat of the cul-de-sac. These basins are routed to two additional catch basins located at the beginning of the proposed road. These two catch basins will collect stormwater runoff from the lots on both sides of the road and will be routed to an underground chamber system in the northwesterly corner of the property adjacent to Webster Street. This chamber system is designed to detain and infiltrate drainage into the underlying soil. Peak stormwater flows will drain into the existing closed system in Webster Street. The infiltration basins are sufficiently sized to detain and infiltrate increased runoff from the new impervious surfaces. There is no increase in stormwater runoff from the project into the existing closed system in Webster Street.

It is also proposed that each house be constructed with gutters and routed to an infiltration catch basin. This design will minimize any increase in stormwater flows for the new home construction. Details are provided in the plan set.

**Map 181, Lot 1 & 1-001, Hudson, NH
Stormwater Management Report**

The low flat grassy area will remain natural and undisturbed adjacent to the northerly and the southerly property lines – runoff from the back of the parcels on Baker Street will continue to naturally drain to these areas where it will infiltrate into the underlying soils. There will be no increase in runoff to these areas and therefor the adjacent properties will not be affected by the development.

Design methodology

The drainage analysis in this study was completed using HydroCad Version 10.0, a stormwater modeling program utilizing TR-20 and TR-55 methodology. This program performs both the hydrologic computations for determination of runoff flows, and the hydraulic calculations for pipe, ditch, and pond design. Calculations were performed for 2, 10, 25, and 50-year return frequency storms in accordance with Municipal regulations. The following design parameters were used:

- Rainfall distribution: Type III
- 2-year storm rainfall: 2.95 inches
- 10-year storm rainfall: 4.44 inches
- 25-year storm rainfall: 5.61 inches
- 50-year storm rainfall: 6.70 inches

Design analysis

Peak runoff flows have been evaluated in this study to insure that post-development flows do not exceed pre-development flows. Mitigation for increased flows has been provided by using an infiltration basin as previously described. Pre and post development flows were analyzed to the two design nodes. The peak flows are shown in the accompanying table:

Storm frequency	Design node	Pre-development Flow (cfs)	Post-development Flow (cfs)
2-year	CB in Webster St	3P= 0.6	3P= 0.1
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0
10-year	CB in Webster St	3P= 1.2	3P= 0.3
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0

**Map 181, Lot 1 & 1-001, Hudson, NH
Stormwater Management Report**

25-year	CB in Webster St	3P= 1.7	3P= 1.2
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0
50-year	CB in Webster St	3P= 2.2	3P= 3.1
	Grassy flat area	5R= 1.5	7P= 0.0 8P=0.0

It can be seen in the above table that all post-development flows are less than or equal to the pre-development flows except for the 50-year design storm. This area of the property is presently low and flat and would likely experience flooding in a 50-year design storm. A waiver is requested to allow an exception in this case.

Stormwater volumes were also reviewed in accordance with Town Regulations. Post development volumes are less than the pre-development volumes since the detention basin is designed to infiltrate peak stormwater volumes. The peak volumes are shown in the accompanying table:

Storm frequency	Pre-development volume (AF)	Post-development volume (AF)
2-year	3P= 0.045	3P= 0.010
	5R= 0.000	8P=0.000
10-year	3P= 0.088	3P= 0.025
	5R= 0.000	8P=0.000
25-year	3P= 0.125	3P= 0.039
	5R= 0.000	8P=0.000
50-year	3P= 0.160	3P= 0.092
	5R= 0.027	8P=0.000

Map 181, Lot 1 & 1-001, Hudson, NH Stormwater Management Report

The recharge volume was also reviewed in accordance with Town requirements. The calculations demonstrate that the recharge volume exceeds the required minimum:

Impervious area = 18,019 sf
Required recharge volume = $0.40 \times 18,019 / 12 = 601$ cf
Recharge volume provided = 5,215 cf

Stormwater Treatment

Stormwater treatment is provided to reduce pollutants and sediment from discharging into downstream public waters. Several best management practices recommended in the NHDES Stormwater Manual are proposed for this project. While this site does not require a NHDES Alteration of Terrain Permit, the design utilizes practices recommended by NHDES. The following water quality measures were used to minimize downstream impacts:

- Catch basins with sumps (for sediment collection) are proposed in the new road.
- An underground stormwater chamber system is proposed for detention and infiltration into the underlying soils providing further water quality treatment by allowing sediments and pollutants to settle in an isolation row of chambers.

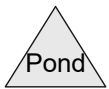
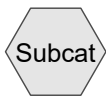
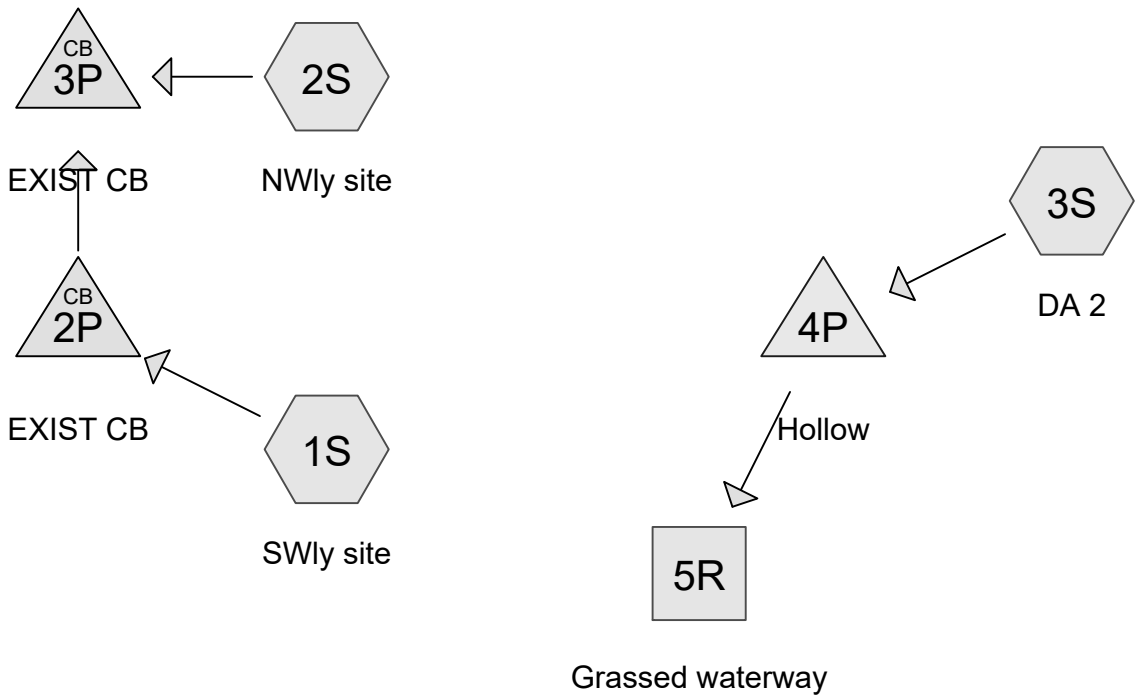
Erosion Control Measures

This site is very flat and the soils are sandy. There is not a high level of concern for erosion during construction. Several best management practices are however proposed to minimize erosion during construction. Following are some of the practices required for the development:

- Silt Fence
- Hay bale barriers
- Stabilized construction entrance
- Proper construction sequencing

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Pre-development computations



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.563	39	Pasture/grassland/range, Good, HSG A (3S)
0.948	61	Pasture/grassland/range, Good, HSG B (1S, 2S, 3S)
0.282	98	Paved roads w/curbs & sewers (1S, 2S, 3S)
0.487	30	Woods, Good, HSG A (3S)
0.336	55	Woods, Good, HSG B (3S)
2.617	54	TOTAL AREA

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=81 Runoff=0.36 cfs 0.026 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=81 Runoff=0.26 cfs 0.019 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.05"
Flow Length=375' Tc=11.9 min CN=48 Runoff=0.02 cfs 0.010 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/ Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=114.89' Inflow=0.36 cfs 0.026 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/ Outflow=0.36 cfs 0.026 af

Pond 3P: EXIST CB Peak Elev=114.41' Inflow=0.61 cfs 0.045 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/ Outflow=0.61 cfs 0.045 af

Pond 4P: Hollow Peak Elev=115.61' Storage=0 cf Inflow=0.02 cfs 0.010 af
Discarded=0.02 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.010 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.055 af Average Runoff Depth = 0.25"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=2.50"
Tc=6.0 min CN=81 Runoff=0.70 cfs 0.051 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=2.50"
Tc=6.0 min CN=81 Runoff=0.51 cfs 0.037 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.39"
Flow Length=375' Tc=11.9 min CN=48 Runoff=0.37 cfs 0.072 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=115.02' Inflow=0.70 cfs 0.051 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=0.70 cfs 0.051 af

Pond 3P: EXIST CB Peak Elev=114.61' Inflow=1.22 cfs 0.088 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.22 cfs 0.088 af

Pond 4P: Hollow Peak Elev=115.94' Storage=147 cf Inflow=0.37 cfs 0.072 af
Discarded=0.30 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.072 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.160 af Average Runoff Depth = 0.73"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=3.53"
Tc=6.0 min CN=81 Runoff=0.99 cfs 0.072 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=3.53"
Tc=6.0 min CN=81 Runoff=0.72 cfs 0.053 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.83"
Flow Length=375' Tc=11.9 min CN=48 Runoff=1.15 cfs 0.152 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=115.11' Inflow=0.99 cfs 0.072 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=0.99 cfs 0.072 af

Pond 3P: EXIST CB Peak Elev=114.76' Inflow=1.71 cfs 0.125 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.71 cfs 0.125 af

Pond 4P: Hollow Peak Elev=116.40' Storage=794 cf Inflow=1.15 cfs 0.152 af
Discarded=0.66 cfs 0.152 af Primary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.152 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.276 af Average Runoff Depth = 1.27"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=81 Runoff=1.26 cfs 0.092 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=81 Runoff=0.92 cfs 0.068 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=1.34"
Flow Length=375' Tc=11.9 min CN=48 Runoff=2.24 cfs 0.244 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.29' Max Vel=0.71 fps Inflow=1.44 cfs 0.027 af
n=0.035 L=20.0' S=0.0025 '/ Capacity=5.09 cfs Outflow=1.46 cfs 0.027 af

Pond 2P: EXIST CB Peak Elev=115.19' Inflow=1.26 cfs 0.092 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/ Outflow=1.26 cfs 0.092 af

Pond 3P: EXIST CB Peak Elev=114.89' Inflow=2.18 cfs 0.160 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/ Outflow=2.18 cfs 0.160 af

Pond 4P: Hollow Peak Elev=116.61' Storage=988 cf Inflow=2.24 cfs 0.244 af
Discarded=0.73 cfs 0.218 af Primary=1.44 cfs 0.027 af Outflow=2.17 cfs 0.244 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.404 af Average Runoff Depth = 1.85"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Summary for Subcatchment 1S: SWly site

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
* 5,862	98	Paved roads w/curbs & sewers
4,795	61	Pasture/grassland/range, Good, HSG B
10,657	81	Weighted Average
4,795		44.99% Pervious Area
5,862		55.01% Impervious Area

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

Summary for Subcatchment 2S: NWly site

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
4,260	98	Paved roads w/curbs & sewers
3,543	61	Pasture/grassland/range, Good, HSG B
7,803	81	Weighted Average
3,543		45.41% Pervious Area
4,260		54.59% Impervious Area

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

Summary for Subcatchment 3S: DA 2

Runoff = 0.37 cfs @ 12.40 hrs, Volume= 0.072 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
2,178	98	Paved roads w/curbs & sewers
24,523	39	Pasture/grassland/range, Good, HSG A
32,952	61	Pasture/grassland/range, Good, HSG B
21,234	30	Woods, Good, HSG A
14,651	55	Woods, Good, HSG B
95,538	48	Weighted Average
93,360		97.72% Pervious Area
2,178		2.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	35	0.0400	0.17		Sheet Flow, Grass: Short n= 0.150 P2= 2.95"
1.9	200	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.7	140	0.0025	0.35		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.9	375	Total			

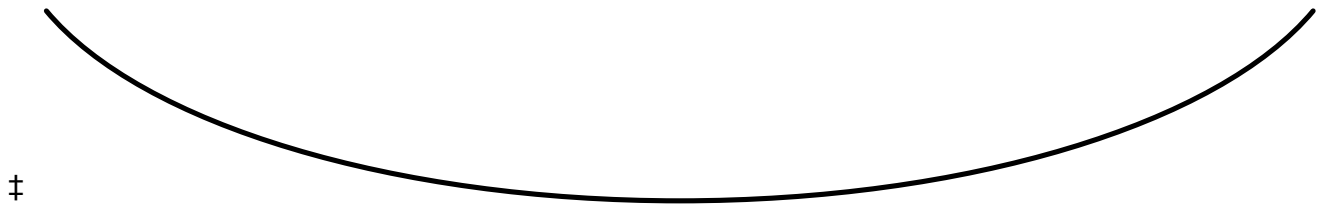
Summary for Reach 5R: Grassed waterway

Inflow Area = 2.193 ac, 2.28% Impervious, Inflow Depth = 0.00" for 10 year event
 Inflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-30.00 hrs, dt= 0.05 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 @ 2.00 hrs
 Average Depth at Peak Storage= 0.00'
 Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 5.09 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
 Length= 20.0' Slope= 0.0025 '/'
 Inlet Invert= 116.50', Outlet Invert= 116.45'



Summary for Pond 2P: EXIST CB

[57] Hint: Peaked at 115.02' (Flood elevation advised)

Inflow Area = 0.245 ac, 55.01% Impervious, Inflow Depth = 2.50" for 10 year event
 Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af
 Outflow = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 115.02' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.60'	12.0" Round Culvert L= 56.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 114.60' / 114.10' S= 0.0089 '/ Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=115.02' (Free Discharge)
 ↑1=Culvert (Inlet Controls 0.69 cfs @ 2.20 fps)

Summary for Pond 3P: EXIST CB

[57] Hint: Peaked at 114.61' (Flood elevation advised)
 [79] Warning: Submerged Pond 2P Primary device # 1 INLET by 0.01'

Inflow Area = 0.424 ac, 54.83% Impervious, Inflow Depth = 2.50" for 10 year event
 Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af
 Outflow = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 114.61' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.00'	12.0" Round Culvert L= 20.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 114.00' / 113.80' S= 0.0100 '/ Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=114.60' (Free Discharge)
 ↑1=Culvert (Barrel Controls 1.19 cfs @ 3.45 fps)

Summary for Pond 4P: Hollow

[92] Warning: Device #1 is above defined storage

Inflow Area = 2.193 ac, 2.28% Impervious, Inflow Depth = 0.39" for 10 year event
 Inflow = 0.37 cfs @ 12.40 hrs, Volume= 0.072 af
 Outflow = 0.30 cfs @ 12.56 hrs, Volume= 0.072 af, Atten= 19%, Lag= 9.7 min
 Discarded = 0.30 cfs @ 12.56 hrs, Volume= 0.072 af
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10 year Rainfall=4.44"

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Peak Elev= 115.94' @ 12.56 hrs Surf.Area= 859 sf Storage= 147 cf

Plug-Flow detention time= 3.3 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 3.3 min (954.8 - 951.5)

Volume	Invert	Avail.Storage	Storage Description
#1	115.60'	988 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.60	20	0	0
116.00	1,020	208	208
116.50	2,100	780	988

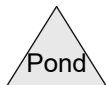
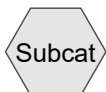
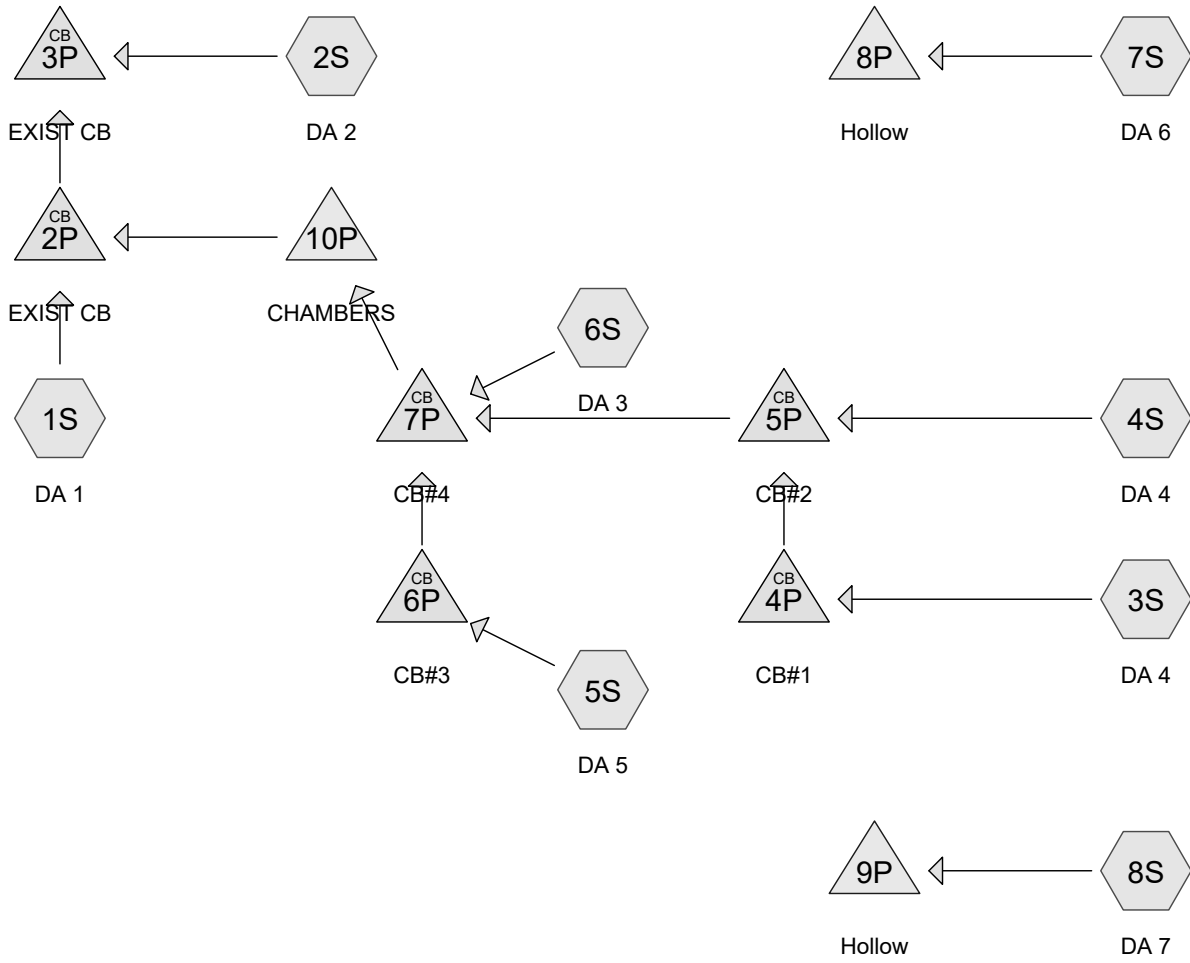
Device	Routing	Invert	Outlet Devices
#1	Primary	116.50'	15.0' long x 10.0' breadth grassed waterway Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	115.60'	15.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.30 cfs @ 12.56 hrs HW=115.93' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=115.60' (Free Discharge)
↑**1=grassed waterway** (Controls 0.00 cfs)

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Post-development computations



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.399	39	Pasture/grassland/range, Good, HSG A (3S, 4S, 7S, 8S)
1.218	61	Pasture/grassland/range, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S)
0.030	98	Paved roads w/curbs & sewers (1S, 2S)
0.088	98	Paved roads w/curbs & sewers-exist (3S, 4S, 5S, 6S, 8S)
0.389	98	Paved roads w/curbs & sewers-prop (3S, 4S, 5S, 6S)
0.090	98	Unconnected roofs (2S, 5S, 6S, 7S, 8S)
0.014	98	Unconnected roofs, HSG B (4S)
0.374	30	Woods, Good, HSG A (3S, 4S, 7S, 8S)
0.015	55	Woods, Good, HSG B (7S)
2.617	62	TOTAL AREA

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Type III 24-hr 2-year Rainfall=2.95"

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Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1	Runoff Area=549 sf 71.40% Impervious Runoff Depth=1.70" Tc=6.0 min CN=87 Runoff=0.02 cfs 0.002 af
Subcatchment 2S: DA 2	Runoff Area=7,690 sf 24.56% Impervious Runoff Depth=0.60" Tc=6.0 min UI Adjusted CN=68 Runoff=0.10 cfs 0.009 af
Subcatchment 3S: DA 4	Runoff Area=17,776 sf 30.52% Impervious Runoff Depth=0.41" Flow Length=430' Tc=6.2 min CN=63 Runoff=0.12 cfs 0.014 af
Subcatchment 4S: DA 4	Runoff Area=24,321 sf 29.70% Impervious Runoff Depth=0.32" Flow Length=430' Tc=6.2 min UI Adjusted CN=60 Runoff=0.09 cfs 0.015 af
Subcatchment 5S: DA 5	Runoff Area=20,101 sf 26.87% Impervious Runoff Depth=0.69" Tc=6.0 min UI Adjusted CN=70 Runoff=0.32 cfs 0.026 af
Subcatchment 6S: DA 3	Runoff Area=12,105 sf 35.57% Impervious Runoff Depth=0.88" Tc=6.0 min CN=74 Runoff=0.26 cfs 0.020 af
Subcatchment 7S: DA 6	Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.05" Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.00 cfs 0.002 af
Subcatchment 8S: DA 7	Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.04" Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.00 cfs 0.001 af
Pond 2P: EXIST CB	Peak Elev=103.27' Inflow=0.02 cfs 0.002 af 12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=0.02 cfs 0.002 af
Pond 3P: EXIST CB	Peak Elev=102.47' Inflow=0.12 cfs 0.011 af 12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.12 cfs 0.011 af
Pond 4P: CB#1	Peak Elev=114.82' Inflow=0.12 cfs 0.014 af 12.0" Round Culvert n=0.010 L=30.0' S=0.0067 '/' Outflow=0.12 cfs 0.014 af
Pond 5P: CB#2	Peak Elev=114.57' Inflow=0.21 cfs 0.029 af 12.0" Round Culvert n=0.010 L=117.5' S=0.0081 '/' Outflow=0.21 cfs 0.029 af
Pond 6P: CB#3	Peak Elev=113.88' Inflow=0.32 cfs 0.026 af 12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=0.32 cfs 0.026 af
Pond 7P: CB#4	Peak Elev=113.75' Inflow=0.78 cfs 0.075 af 12.0" Round Culvert n=0.010 L=9.5' S=0.0316 '/' Outflow=0.78 cfs 0.075 af
Pond 8P: Hollow	Peak Elev=117.50' Storage=0 cf Inflow=0.00 cfs 0.002 af Outflow=0.00 cfs 0.002 af
Pond 9P: Hollow	Peak Elev=115.60' Storage=0 cf Inflow=0.00 cfs 0.001 af Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

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Type III 24-hr 2-year Rainfall=2.95"

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Pond 10P: CHAMBERS

Peak Elev=112.54' Storage=219 cf Inflow=0.78 cfs 0.075 af
Discarded=0.43 cfs 0.075 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.075 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.089 af Average Runoff Depth = 0.41"
76.64% Pervious = 2.006 ac 23.36% Impervious = 0.611 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1 Runoff Area=549 sf 71.40% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=87 Runoff=0.04 cfs 0.003 af

Subcatchment 2S: DA 2 Runoff Area=7,690 sf 24.56% Impervious Runoff Depth=1.49"
Tc=6.0 min UI Adjusted CN=68 Runoff=0.29 cfs 0.022 af

Subcatchment 3S: DA 4 Runoff Area=17,776 sf 30.52% Impervious Runoff Depth=1.17"
Flow Length=430' Tc=6.2 min CN=63 Runoff=0.49 cfs 0.040 af

Subcatchment 4S: DA 4 Runoff Area=24,321 sf 29.70% Impervious Runoff Depth=0.99"
Flow Length=430' Tc=6.2 min UI Adjusted CN=60 Runoff=0.54 cfs 0.046 af

Subcatchment 5S: DA 5 Runoff Area=20,101 sf 26.87% Impervious Runoff Depth=1.63"
Tc=6.0 min UI Adjusted CN=70 Runoff=0.84 cfs 0.063 af

Subcatchment 6S: DA 3 Runoff Area=12,105 sf 35.57% Impervious Runoff Depth=1.93"
Tc=6.0 min CN=74 Runoff=0.61 cfs 0.045 af

Subcatchment 7S: DA 6 Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.39"
Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.07 cfs 0.012 af

Subcatchment 8S: DA 7 Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.35"
Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.05 cfs 0.010 af

Pond 2P: EXIST CB Peak Elev=103.30' Inflow=0.04 cfs 0.003 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=0.04 cfs 0.003 af

Pond 3P: EXIST CB Peak Elev=102.59' Inflow=0.33 cfs 0.025 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.33 cfs 0.025 af

Pond 4P: CB#1 Peak Elev=115.02' Inflow=0.49 cfs 0.040 af
12.0" Round Culvert n=0.010 L=30.0' S=0.0067 '/' Outflow=0.49 cfs 0.040 af

Pond 5P: CB#2 Peak Elev=114.87' Inflow=1.03 cfs 0.086 af
12.0" Round Culvert n=0.010 L=117.5' S=0.0081 '/' Outflow=1.03 cfs 0.086 af

Pond 6P: CB#3 Peak Elev=114.08' Inflow=0.84 cfs 0.063 af
12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=0.84 cfs 0.063 af

Pond 7P: CB#4 Peak Elev=114.22' Inflow=2.47 cfs 0.193 af
12.0" Round Culvert n=0.010 L=9.5' S=0.0316 '/' Outflow=2.47 cfs 0.193 af

Pond 8P: Hollow Peak Elev=117.50' Storage=1 cf Inflow=0.07 cfs 0.012 af
Outflow=0.07 cfs 0.012 af

Pond 9P: Hollow Peak Elev=115.68' Storage=9 cf Inflow=0.05 cfs 0.010 af
Discarded=0.05 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.010 af

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Type III 24-hr 10 year Rainfall=4.44"

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Pond 10P: CHAMBERS

Peak Elev=114.14' Storage=2,227 cf Inflow=2.47 cfs 0.193 af
Discarded=0.43 cfs 0.193 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.193 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.241 af Average Runoff Depth = 1.10"
76.64% Pervious = 2.006 ac 23.36% Impervious = 0.611 ac

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Type III 24-hr 25 year Rainfall=5.61"

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Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1	Runoff Area=549 sf 71.40% Impervious Runoff Depth=4.14" Tc=6.0 min CN=87 Runoff=0.06 cfs 0.004 af
Subcatchment 2S: DA 2	Runoff Area=7,690 sf 24.56% Impervious Runoff Depth=2.33" Tc=6.0 min UI Adjusted CN=68 Runoff=0.47 cfs 0.034 af
Subcatchment 3S: DA 4	Runoff Area=17,776 sf 30.52% Impervious Runoff Depth=1.91" Flow Length=430' Tc=6.2 min CN=63 Runoff=0.85 cfs 0.065 af
Subcatchment 4S: DA 4	Runoff Area=24,321 sf 29.70% Impervious Runoff Depth=1.67" Flow Length=430' Tc=6.2 min UI Adjusted CN=60 Runoff=1.00 cfs 0.078 af
Subcatchment 5S: DA 5	Runoff Area=20,101 sf 26.87% Impervious Runoff Depth=2.50" Tc=6.0 min UI Adjusted CN=70 Runoff=1.32 cfs 0.096 af
Subcatchment 6S: DA 3	Runoff Area=12,105 sf 35.57% Impervious Runoff Depth=2.86" Tc=6.0 min CN=74 Runoff=0.91 cfs 0.066 af
Subcatchment 7S: DA 6	Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.83" Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.23 cfs 0.026 af
Subcatchment 8S: DA 7	Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.77" Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.19 cfs 0.022 af
Pond 2P: EXIST CB	Peak Elev=103.72' Inflow=1.00 cfs 0.034 af 12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=1.00 cfs 0.034 af
Pond 3P: EXIST CB	Peak Elev=102.89' Inflow=1.16 cfs 0.069 af 12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.16 cfs 0.069 af
Pond 4P: CB#1	Peak Elev=115.16' Inflow=0.85 cfs 0.065 af 12.0" Round Culvert n=0.010 L=30.0' S=0.0067 '/' Outflow=0.85 cfs 0.065 af
Pond 5P: CB#2	Peak Elev=115.10' Inflow=1.85 cfs 0.143 af 12.0" Round Culvert n=0.010 L=117.5' S=0.0081 '/' Outflow=1.85 cfs 0.143 af
Pond 6P: CB#3	Peak Elev=114.23' Inflow=1.32 cfs 0.096 af 12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=1.32 cfs 0.096 af
Pond 7P: CB#4	Peak Elev=114.96' Inflow=4.08 cfs 0.305 af 12.0" Round Culvert n=0.010 L=9.5' S=0.0316 '/' Outflow=4.08 cfs 0.305 af
Pond 8P: Hollow	Peak Elev=117.62' Storage=59 cf Inflow=0.23 cfs 0.026 af Outflow=0.16 cfs 0.026 af
Pond 9P: Hollow	Peak Elev=115.82' Storage=63 cf Inflow=0.19 cfs 0.022 af Discarded=0.13 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.022 af

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Type III 24-hr 25 year Rainfall=5.61"

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Pond 10P: CHAMBERS

Peak Elev=115.51' Storage=3,782 cf Inflow=4.08 cfs 0.305 af
Discarded=0.43 cfs 0.275 af Primary=0.98 cfs 0.030 af Outflow=1.41 cfs 0.305 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.392 af Average Runoff Depth = 1.80"
76.64% Pervious = 2.006 ac 23.36% Impervious = 0.611 ac

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Type III 24-hr 50 year Rainfall=6.70"

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Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: DA 1	Runoff Area=549 sf 71.40% Impervious Runoff Depth=5.19" Tc=6.0 min CN=87 Runoff=0.07 cfs 0.005 af
Subcatchment 2S: DA 2	Runoff Area=7,690 sf 24.56% Impervious Runoff Depth=3.17" Tc=6.0 min UI Adjusted CN=68 Runoff=0.64 cfs 0.047 af
Subcatchment 3S: DA 4	Runoff Area=17,776 sf 30.52% Impervious Runoff Depth=2.68" Flow Length=430' Tc=6.2 min CN=63 Runoff=1.23 cfs 0.091 af
Subcatchment 4S: DA 4	Runoff Area=24,321 sf 29.70% Impervious Runoff Depth=2.39" Flow Length=430' Tc=6.2 min UI Adjusted CN=60 Runoff=1.48 cfs 0.111 af
Subcatchment 5S: DA 5	Runoff Area=20,101 sf 26.87% Impervious Runoff Depth=3.37" Tc=6.0 min UI Adjusted CN=70 Runoff=1.79 cfs 0.130 af
Subcatchment 6S: DA 3	Runoff Area=12,105 sf 35.57% Impervious Runoff Depth=3.78" Tc=6.0 min CN=74 Runoff=1.21 cfs 0.088 af
Subcatchment 7S: DA 6	Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=1.34" Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.45 cfs 0.041 af
Subcatchment 8S: DA 7	Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=1.26" Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.39 cfs 0.037 af
Pond 2P: EXIST CB	Peak Elev=104.21' Inflow=2.71 cfs 0.103 af 12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=2.71 cfs 0.103 af
Pond 3P: EXIST CB	Peak Elev=103.46' Inflow=3.04 cfs 0.150 af 12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=3.04 cfs 0.150 af
Pond 4P: CB#1	Peak Elev=115.28' Inflow=1.23 cfs 0.091 af 12.0" Round Culvert n=0.010 L=30.0' S=0.0067 '/' Outflow=1.23 cfs 0.091 af
Pond 5P: CB#2	Peak Elev=115.36' Inflow=2.71 cfs 0.202 af 12.0" Round Culvert n=0.010 L=117.5' S=0.0081 '/' Outflow=2.71 cfs 0.202 af
Pond 6P: CB#3	Peak Elev=114.37' Inflow=1.79 cfs 0.130 af 12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=1.79 cfs 0.130 af
Pond 7P: CB#4	Peak Elev=116.07' Inflow=5.70 cfs 0.420 af 12.0" Round Culvert n=0.010 L=9.5' S=0.0316 '/' Outflow=5.70 cfs 0.420 af
Pond 8P: Hollow	Peak Elev=117.74' Storage=172 cf Inflow=0.45 cfs 0.041 af Outflow=0.26 cfs 0.041 af
Pond 9P: Hollow	Peak Elev=115.96' Storage=172 cf Inflow=0.39 cfs 0.037 af Discarded=0.21 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.21 cfs 0.037 af

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Type III 24-hr 50 year Rainfall=6.70"

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Pond 10P: CHAMBERS

Peak Elev=116.00' Storage=4,145 cf Inflow=5.70 cfs 0.420 af
Discarded=0.43 cfs 0.322 af Primary=2.67 cfs 0.098 af Outflow=3.10 cfs 0.419 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.550 af Average Runoff Depth = 2.52"
76.64% Pervious = 2.006 ac 23.36% Impervious = 0.611 ac

Summary for Subcatchment 1S: DA 1

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
392	98	Paved roads w/curbs & sewers
157	61	Pasture/grassland/range, Good, HSG B
549	87	Weighted Average
157		28.60% Pervious Area
392		71.40% Impervious Area

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

Summary for Subcatchment 2S: DA 2

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Adj	Description
902	98		Paved roads w/curbs & sewers
* 987	98		Unconnected roofs
5,801	61		Pasture/grassland/range, Good, HSG B
7,690	70	68	Weighted Average, UI Adjusted
5,801			75.44% Pervious Area
1,889			24.56% Impervious Area
987			52.25% Unconnected

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

Summary for Subcatchment 3S: DA 4

Runoff = 0.49 cfs @ 12.11 hrs, Volume= 0.040 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

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Type III 24-hr 10 year Rainfall=4.44"

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Area (sf)	CN	Description
* 950	98	Paved roads w/curbs & sewers-exist
* 4,475	98	Paved roads w/curbs & sewers-prop
3,510	39	Pasture/grassland/range, Good, HSG A
5,741	61	Pasture/grassland/range, Good, HSG B
3,100	30	Woods, Good, HSG A
17,776	63	Weighted Average
12,351		69.48% Pervious Area
5,425		30.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	25	0.0400	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 2.95"
1.6	165	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	240	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.2	430	Total			

Summary for Subcatchment 4S: DA 4

Runoff = 0.54 cfs @ 12.11 hrs, Volume= 0.046 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Adj	Description
* 619	98		Paved roads w/curbs & sewers-exist
* 5,981	98		Paved roads w/curbs & sewers-prop
624	98		Unconnected roofs, HSG B
3,465	39		Pasture/grassland/range, Good, HSG A
7,517	61		Pasture/grassland/range, Good, HSG B
6,115	30		Woods, Good, HSG A
24,321	61	60	Weighted Average, UI Adjusted
17,097			70.30% Pervious Area
7,224			29.70% Impervious Area
624			8.64% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	25	0.0400	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 2.95"
1.6	165	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	240	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
6.2	430	Total			

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Type III 24-hr 10 year Rainfall=4.44"

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Summary for Subcatchment 5S: DA 5

Runoff = 0.84 cfs @ 12.10 hrs, Volume= 0.063 af, Depth= 1.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Adj	Description
*	1,500	98		Paved roads w/curbs & sewers-exist
*	3,194	98		Paved roads w/curbs & sewers-prop
*	707	98		Unconnected roofs
	14,700	61		Pasture/grassland/range, Good, HSG B
	20,101	71	70	Weighted Average, UI Adjusted
	14,700			73.13% Pervious Area
	5,401			26.87% Impervious Area
	707			13.09% Unconnected

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

Summary for Subcatchment 6S: DA 3

Runoff = 0.61 cfs @ 12.10 hrs, Volume= 0.045 af, Depth= 1.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Description
*	260	98	Paved roads w/curbs & sewers-exist
*	3,298	98	Paved roads w/curbs & sewers-prop
*	748	98	Unconnected roofs
	7,799	61	Pasture/grassland/range, Good, HSG B
	12,105	74	Weighted Average
	7,799		64.43% Pervious Area
	4,306		35.57% Impervious Area
	748		17.37% Unconnected

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

Summary for Subcatchment 7S: DA 6

Runoff = 0.07 cfs @ 12.31 hrs, Volume= 0.012 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

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Type III 24-hr 10 year Rainfall=4.44"

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Area (sf)	CN	Adj	Description
*	1,150	98	Unconnected roofs
	4,430	39	Pasture/grassland/range, Good, HSG A
	6,232	61	Pasture/grassland/range, Good, HSG B
	3,754	30	Woods, Good, HSG A
	641	55	Woods, Good, HSG B
	16,207	50	48 Weighted Average, UI Adjusted
	15,057		92.90% Pervious Area
	1,150		7.10% Impervious Area
	1,150		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	25	0.0500	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 2.95"
3.2	275	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.6	300	Total			

Summary for Subcatchment 8S: DA 7

Runoff = 0.05 cfs @ 12.34 hrs, Volume= 0.010 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Adj	Description
*	489	98	Paved roads w/curbs & sewers-exist
*	350	98	Unconnected roofs
	5,992	39	Pasture/grassland/range, Good, HSG A
	5,102	61	Pasture/grassland/range, Good, HSG B
	3,316	30	Woods, Good, HSG A
	15,249	48	47 Weighted Average, UI Adjusted
	14,410		94.50% Pervious Area
	839		5.50% Impervious Area
	350		41.72% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	25	0.0200	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 2.95"
1.7	175	0.1200	1.73		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
6.6	200	Total			

Summary for Pond 2P: EXIST CB

[57] Hint: Peaked at 103.30' (Flood elevation advised)

Inflow Area = 1.718 ac, 30.39% Impervious, Inflow Depth = 0.02" for 10 year event
 Inflow = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af
 Outflow = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 103.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	103.20'	12.0" Round Culvert L= 56.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 103.20' / 102.60' S= 0.0107 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.04 cfs @ 12.09 hrs HW=103.30' (Free Discharge)
 ↑1=Culvert (Inlet Controls 0.04 cfs @ 1.07 fps)

Summary for Pond 3P: EXIST CB

[57] Hint: Peaked at 102.59' (Flood elevation advised)

Inflow Area = 1.895 ac, 29.85% Impervious, Inflow Depth = 0.16" for 10 year event
 Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af
 Outflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 102.59' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	102.30'	12.0" Round Culvert L= 20.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 102.30' / 102.10' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=102.59' (Free Discharge)
 ↑1=Culvert (Barrel Controls 0.33 cfs @ 2.69 fps)

Summary for Pond 4P: CB#1

[57] Hint: Peaked at 115.02' (Flood elevation advised)

Inflow Area = 0.408 ac, 30.52% Impervious, Inflow Depth = 1.17" for 10 year event
 Inflow = 0.49 cfs @ 12.11 hrs, Volume= 0.040 af
 Outflow = 0.49 cfs @ 12.11 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.49 cfs @ 12.11 hrs, Volume= 0.040 af

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Type III 24-hr 10 year Rainfall=4.44"

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Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 115.02' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.65'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.65' / 114.45' S= 0.0067 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 12.11 hrs HW=115.02' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.48 cfs @ 2.74 fps)**Summary for Pond 5P: CB#2**

[57] Hint: Peaked at 114.87' (Flood elevation advised)

[79] Warning: Submerged Pond 4P Primary device # 1 INLET by 0.22'

Inflow Area = 0.966 ac, 30.05% Impervious, Inflow Depth = 1.06" for 10 year event
 Inflow = 1.03 cfs @ 12.11 hrs, Volume= 0.086 af
 Outflow = 1.03 cfs @ 12.11 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.03 cfs @ 12.11 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 114.87' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.35'	12.0" Round Culvert L= 117.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 114.35' / 113.40' S= 0.0081 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.01 cfs @ 12.11 hrs HW=114.87' (Free Discharge)↑**1=Culvert** (Inlet Controls 1.01 cfs @ 2.45 fps)**Summary for Pond 6P: CB#3**

[57] Hint: Peaked at 114.08' (Flood elevation advised)

Inflow Area = 0.461 ac, 26.87% Impervious, Inflow Depth = 1.63" for 10 year event
 Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.063 af
 Outflow = 0.84 cfs @ 12.10 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.84 cfs @ 12.10 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 114.08' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	113.60'	12.0" Round Culvert L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.60' / 113.40' S= 0.0125 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.84 cfs @ 12.10 hrs HW=114.08' (Free Discharge)

↑1=Culvert (Barrel Controls 0.84 cfs @ 3.29 fps)

Summary for Pond 7P: CB#4

[57] Hint: Peaked at 114.22' (Flood elevation advised)

[79] Warning: Submerged Pond 5P Primary device # 1 OUTLET by 0.82'

[81] Warning: Exceeded Pond 6P by 0.14' @ 12.10 hrs

Inflow Area = 1.706 ac, 30.09% Impervious, Inflow Depth = 1.36" for 10 year event
 Inflow = 2.47 cfs @ 12.10 hrs, Volume= 0.193 af
 Outflow = 2.47 cfs @ 12.10 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.47 cfs @ 12.10 hrs, Volume= 0.193 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 114.22' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	113.30'	12.0" Round Culvert L= 9.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.30' / 113.00' S= 0.0316 1' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.46 cfs @ 12.10 hrs HW=114.22' (Free Discharge)

↑1=Culvert (Inlet Controls 2.46 cfs @ 3.26 fps)

Summary for Pond 8P: Hollow

Inflow Area = 0.372 ac, 7.10% Impervious, Inflow Depth = 0.39" for 10 year event
 Inflow = 0.07 cfs @ 12.31 hrs, Volume= 0.012 af
 Outflow = 0.07 cfs @ 12.32 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.3 min
 Discarded = 0.07 cfs @ 12.32 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 117.50' @ 12.32 hrs Surf.Area= 315 sf Storage= 1 cf

Plug-Flow detention time= 0.4 min calculated for 0.012 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (946.9 - 946.6)

Volume	Invert	Avail.Storage	Storage Description
#1	117.50'	575 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.50	300	0	0
118.00	2,000	575	575

Device	Routing	Invert	Outlet Devices
#1	Discarded	117.50'	10.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.07 cfs @ 12.32 hrs HW=117.50' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.07 cfs)

Summary for Pond 9P: Hollow

[92] Warning: Device #1 is above defined storage

Inflow Area = 0.350 ac, 5.50% Impervious, Inflow Depth = 0.35" for 10 year event
 Inflow = 0.05 cfs @ 12.34 hrs, Volume= 0.010 af
 Outflow = 0.05 cfs @ 12.42 hrs, Volume= 0.010 af, Atten= 6%, Lag= 4.9 min
 Discarded = 0.05 cfs @ 12.42 hrs, Volume= 0.010 af
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 115.68' @ 12.42 hrs Surf.Area= 210 sf Storage= 9 cf

Plug-Flow detention time= 1.1 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 1.1 min (955.6 - 954.5)

Volume	Invert	Avail.Storage	Storage Description
#1	115.60'	988 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.60	20	0	0
116.00	1,020	208	208
116.50	2,100	780	988

Device	Routing	Invert	Outlet Devices
#1	Primary	116.50'	15.0' long x 10.0' breadth grassed waterway 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	115.60'	10.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.05 cfs @ 12.42 hrs HW=115.68' (Free Discharge)

↳2=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=115.60' (Free Discharge)

↳1=grassed waterway (Controls 0.00 cfs)

Summary for Pond 10P: CHAMBERS

[81] Warning: Exceeded Pond 7P by 0.52' @ 12.80 hrs

Inflow Area = 1.706 ac, 30.09% Impervious, Inflow Depth = 1.36" for 10 year event
 Inflow = 2.47 cfs @ 12.10 hrs, Volume= 0.193 af
 Outflow = 0.43 cfs @ 11.85 hrs, Volume= 0.193 af, Atten= 83%, Lag= 0.0 min
 Discarded = 0.43 cfs @ 11.85 hrs, Volume= 0.193 af
 Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

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Type III 24-hr 10 year Rainfall=4.44"

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Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 114.14' @ 12.67 hrs Surf.Area= 1,858 sf Storage= 2,227 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 36.3 min (899.7 - 863.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	112.25'	1,880 cf	34.75'W x 53.46'L x 3.75'H Field A 6,966 cf Overall - 2,266 cf Embedded = 4,700 cf x 40.0% Voids
#2A	113.00'	2,266 cf	ADS_StormTech DC-780 +Cap x 49 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		4,146 cf	Total Available Storage

Storage Group A created with Chamber Wizard

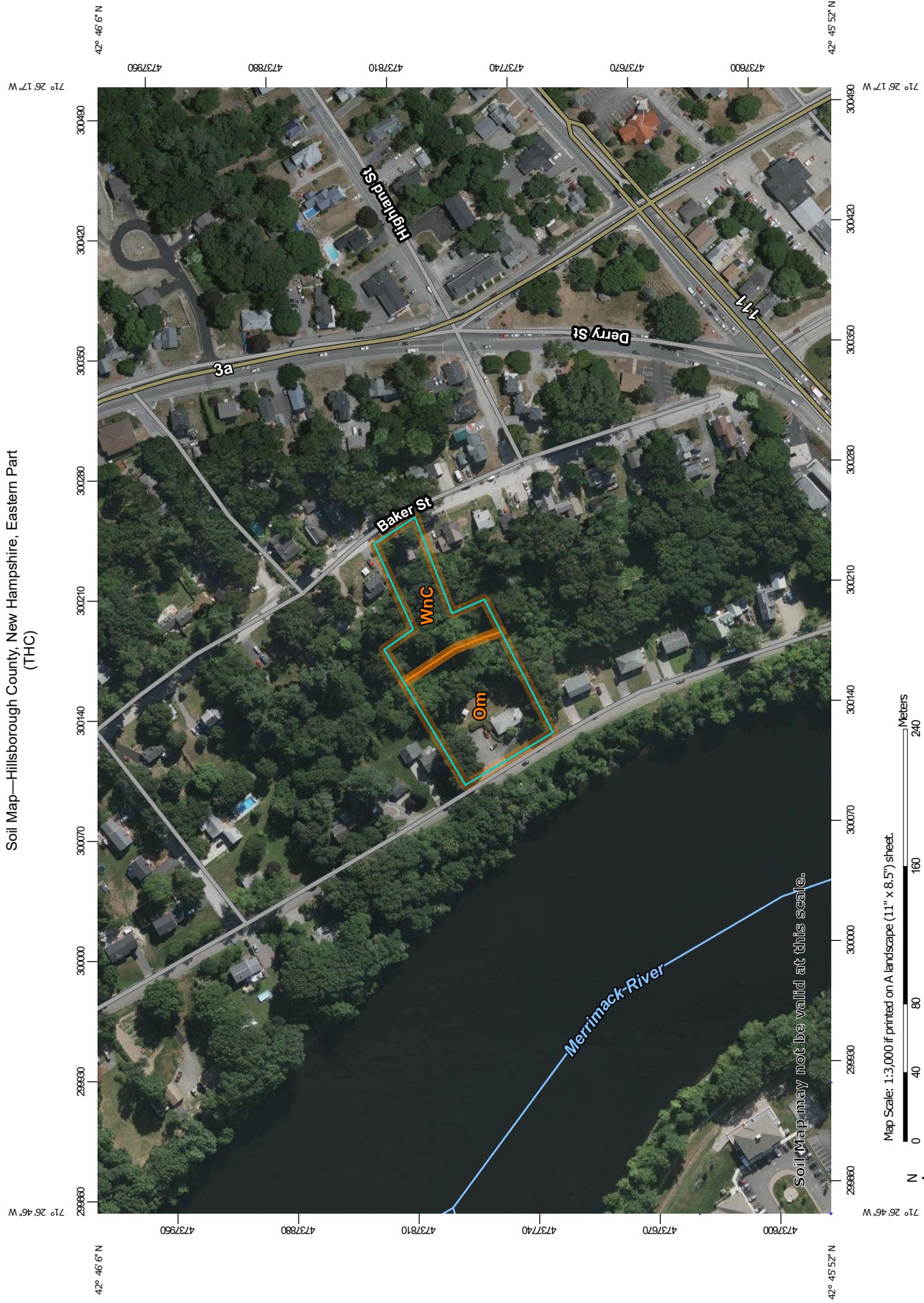
Device	Routing	Invert	Outlet Devices
#1	Discarded	112.25'	10.000 in/hr Exfiltration over Surface area
#2	Primary	115.00'	12.0" Round Culvert L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.00' / 114.40' S= 0.0200 '/ Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.43 cfs @ 11.85 hrs HW=112.29' (Free Discharge)↑1=**Exfiltration** (Exfiltration Controls 0.43 cfs)**Primary OutFlow** Max=0.00 cfs @ 2.00 hrs HW=112.25' (Free Discharge)↑2=**Culvert** (Controls 0.00 cfs)

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

NRCS Web Soils Map

Soil Map—Hillsborough County, New Hampshire, Eastern Part
(THC)







































Soil Map may not be valid at this scale.

Map Scale: 1:3,000 if printed on A landscape (11" x 8.5") sheet.

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

MAP LEGEND

-  Area of Interest (AOI)
-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points
- Special Point Features**
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot
-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Om	Occum fine sandy loam, high bottom	1.1	59.9%
WnC	Windsor-Urban land complex, 3 to 15 percent slopes	0.7	40.1%
Totals for Area of Interest		1.8	100.0%

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Extreme Precipitation Tables

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.442 degrees West
Latitude	42.767 degrees North
Elevation	0 feet
Date/Time	Thu, 31 Mar 2022 09:48:23 -0400

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	2.41	3.00	3.72	4.17	5yr	3.29	4.01	4.64	5.50	6.22	5yr
10yr	0.44	0.70	0.88	1.20	1.56	1.99	10yr	1.34	1.80	2.31	2.90	3.60	4.44	5.00	10yr	3.93	4.81	5.55	6.54	7.36	10yr
25yr	0.53	0.83	1.06	1.46	1.94	2.51	25yr	1.68	2.25	2.92	3.67	4.56	5.61	6.37	25yr	4.97	6.12	7.05	8.22	9.20	25yr
50yr	0.59	0.95	1.21	1.70	2.30	3.00	50yr	1.99	2.66	3.51	4.41	5.47	6.70	7.65	50yr	5.93	7.35	8.45	9.77	10.90	50yr
100yr	0.68	1.10	1.42	2.01	2.73	3.58	100yr	2.36	3.16	4.20	5.28	6.54	8.01	9.19	100yr	7.09	8.84	10.12	11.63	12.92	100yr
200yr	0.77	1.26	1.63	2.35	3.24	4.28	200yr	2.80	3.75	5.03	6.33	7.83	9.57	11.05	200yr	8.47	10.62	12.14	13.83	15.31	200yr
500yr	0.93	1.53	2.00	2.90	4.07	5.41	500yr	3.51	4.70	6.38	8.04	9.94	12.12	14.10	500yr	10.73	13.56	15.44	17.42	19.18	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	2.02	2.46	2.71	3.01	3.68	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	3.21	2yr	2.56	3.08	3.57	4.28	4.88	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	3.49	3.89	5yr	3.09	3.74	4.28	5.14	5.82	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	4.03	4.51	10yr	3.57	4.34	4.91	5.89	6.65	10yr
25yr	0.45	0.68	0.85	1.21	1.59	1.87	25yr	1.38	1.83	2.13	2.81	3.54	4.88	5.51	25yr	4.32	5.30	5.89	7.05	7.91	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	5.65	6.42	50yr	5.00	6.17	6.78	8.08	9.03	50yr
100yr	0.53	0.81	1.01	1.46	2.00	2.40	100yr	1.72	2.35	2.72	3.48	4.49	6.53	7.52	100yr	5.78	7.23	7.82	9.28	10.27	100yr
200yr	0.59	0.88	1.12	1.62	2.25	2.72	200yr	1.94	2.66	3.06	3.94	5.09	7.57	8.82	200yr	6.70	8.48	9.01	10.65	11.71	200yr
500yr	0.66	0.99	1.27	1.84	2.62	3.22	500yr	2.26	3.15	3.60	4.64	6.03	9.23	10.94	500yr	8.17	10.52	10.85	12.78	13.93	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	1.13	1yr	0.83	1.10	1.27	1.66	2.10	2.62	2.88	1yr	2.32	2.77	3.45	4.24	4.77	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	3.04	3.39	2yr	2.69	3.26	3.77	4.49	5.13	2yr
5yr	0.44	0.67	0.83	1.14	1.46	1.67	5yr	1.26	1.63	1.89	2.43	3.05	4.01	4.52	5yr	3.55	4.35	5.00	5.90	6.63	5yr
10yr	0.52	0.81	1.00	1.40	1.80	2.04	10yr	1.56	2.00	2.31	2.90	3.62	4.97	5.62	10yr	4.40	5.41	6.20	7.26	8.09	10yr
25yr	0.68	1.03	1.28	1.83	2.40	2.65	25yr	2.07	2.59	2.99	3.68	4.51	6.58	7.51	25yr	5.83	7.22	8.26	9.54	10.55	25yr
50yr	0.82	1.24	1.55	2.23	3.00	3.23	50yr	2.59	3.16	3.63	4.40	5.33	8.16	9.34	50yr	7.22	8.98	10.25	11.74	12.89	50yr
100yr	1.00	1.51	1.89	2.73	3.74	3.95	100yr	3.23	3.86	4.42	5.46	6.31	10.13	11.60	100yr	8.97	11.16	12.74	14.47	15.79	100yr
200yr	1.21	1.82	2.31	3.34	4.66	4.82	200yr	4.02	4.71	5.37	6.57	7.48	12.55	14.41	200yr	11.10	13.85	15.83	17.83	19.34	200yr
500yr	1.58	2.35	3.02	4.39	6.25	6.25	500yr	5.39	6.11	6.97	8.39	9.35	16.65	19.14	500yr	14.74	18.41	21.10	23.50	25.31	500yr

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Infiltration Feasibility Report

March 30, 2022

Infiltration Feasibility Report

***Proposed 6 lot residential subdivision
Tumpney, Hurd, Clegg, LLC
Tax map 174, lot 15-1 & Map 181, Lot 1
Hudson, NH***

The following provides test pit and infiltration information for the above-referenced project:

Infiltration Basin Data:

The bottom surface area of the pond as designed is 824 sq. ft.
Elevation of existing ground at test pit: approx. 117.5'
Elevation of existing ground at basin: 117.5' to 118'
Design elevation of the pond bottom: 113.0'
Elevation of SHWT: none found to bottom of pit elev. 112'
Elevation of bedrock: none found to bottom of pit elev. 110'

Test Pit #3

0"-12"	Dark Brown (10yr 3#2) Loam (Topsoil), Friable
12"-28"	Yellowish Brown (10yr 5#6) Fine Sandy Loam, Very Friable, Single Grain Structure
28"-64"	Yellowish Brown (10yr 5#4) Fine Loamy Sand, Friable, Single Grain Structure
64"-100"	Very Pale Brown (10yr 7#4) Fine Sand, Loose, Single Grain Structure, Mottling At 72" (Shwt)

ESHWT: 72"
Water: None Observed
Ledge: None Observed
Terminated At 100"
Percolation Rate: <2 Min/Inch @ 30"

Site Specific soil type:

Om: Occum fine sandy loam
Well drained
Hydrologic Soil Group: B

Infiltration rate:

Based on the NRCS Web Soil Survey data the Ksat rates in both the C horizon is estimated between 6.0 to 20.0 inches per hour. The field percolation test estimates the percolation rate at less than 2 min/inch (30 in/hr) exceeding the high value in the tables. For design purposes, the higher rate of 20 in/hr from the table was used, and a safety factor of 2 applied, to provide a design value of 10 in/hr. This value is thought to be a conservative estimate based on the actual field measurement.

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravely sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	organic over loam
Penni	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	chammy silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	chammy silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondcherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	Organic over bedrock (up to 4" of mineral)	frigid	fibril to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	crvic	loamy	yes	less than 20 in. deep
Saimon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravely sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scutuate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Seasport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepsfoot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravely coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	crvic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Steison	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Groundwater Recharge Volume



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

0.41	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	
0.164 ac-in		GRV = AI * Rd	
595 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):

volume of the chamber system below elevation 115.0 = 3318 cf

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Stormwater Maintenance Manual

Stormwater Maintenance Manual

FOR

**Subdivision of
Tax Map 174, Lot 15-1 & Map 181, Lot 1
20 Baker St. & 25 Webster St.
Hudson, NH**

May 2022

Prepared by:

RJB Engineering, LLC
2 Glendale Road
Concord, NH 03301

Compliance with Stormwater Facility Maintenance Requirements

The property owner, Tumpney, Hurd, Clegg, LLC, is the party initially responsible for ensuring that stormwater facilities installed on the properties are properly maintained and that they function as designed. In the future, this maintenance responsibility will be assigned to the Town of Hudson since this road and the associated drainage system will be turned over to the Town and will thereafter be a publicly maintained road.

Long term inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on the developed property. Routine inspections will ensure permit compliance; will reduce the potential for deterioration of infrastructure and the high cost to repair/replace, and will reduced the degradation of water quality. See the attached inspection report form.

Maintaining Stormwater Management Facilities

Stormwater management facilities must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained. Maintenance personnel must be qualified to properly maintain stormwater management facilities. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

The following provides a list of recommendations and guidelines for managing the stormwater facilities.

MANICURED LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Note- This is more applicable to the individual house lots that the road provides access to and frontage on. This section is included for future reference as may be warranted.

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns. Soil tests shall be conducted to determine fertilizer application rates.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
 - Do not apply fertilizer to frozen ground.
 - Clean up any fertilizer spills.
 - Do not allow fertilizer to be broadcast into water bodies.
-

- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

MANICURED LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminants that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

STREET/PARKING LOT SWEEPING

Function – Parking lots accumulate sand and debris. Street sweeping removes the sand and debris, which lowers transport of sediment and pollutants the stormwater systems and into the environment.

Maintenance

- A regular periodic cleaning schedule is recommended. The more frequent, the greater the sediment and pollutant removal. Regular cleaning of paved areas reduces the frequency of cleaning catch basins and drainage systems. It is recommended that the parking lots and access ways shall be swept at least once a month during winter months.

CATCH BASINS, CULVERTS, AND DRAINAGE PIPES

Function – Catch basins collect stormwater runoff and culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas.

Maintenance

- Catch basins should be inspected annually to insure they are working properly and that the inlet and outlet pipes are clean and free from sediment buildup, trash or debris, and that they are able to freely pass stormwater flows. Sediment should be removed from the sump (if any) as necessary.
 - Culverts and drainage pipes shall be inspected annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures.
-

INFILTRATION / DETENTION BASINS

Note- This section is applicable to the grassed depression area inside the cul-de-sac which is designed to temporarily detain and infiltrate stormwater runoff.

Function – These basins are designed to temporarily store stormwater from smaller rainfall events and allow it to exfiltrate into the ground. They also attenuate the peak stormwater runoff from larger events. The sediment forebays preceding each basin are designed to capture sediment before it enters the infiltration basin, and therefore must be periodically inspected and cleared of sediment.

Maintenance

- Periodically mow embankments (one to three times annually)
- Inspect inlet and outlet structures after significant storm events and remove debris
- Annually inspect embankments, inlet/outlet structures and forebay
 - Remove woody vegetation from fill embankments
 - Repair any damaged facilities
 - Repair any erosion;
 - Fill rodent holes
 - Check for invasive species and eradicate if found
- Inspect sediment forebay twice annually and remove accumulated sediment as needed
- Inspect infiltration area twice annually and following a rainfall event exceeding 2.5 inches in a 24-hour period. If the basin is not draining within 72 hours of a rainfall event, then the condition of the basin should be assessed by a qualified professional.

UNDERGROUND STORMWATER CHAMBER SYSTEM

Function – These basins are also designed to temporarily store stormwater from smaller rainfall events and allow it to exfiltrate into the ground. They also attenuate the peak stormwater runoff from larger events. The catch basins preceding the chamber system are designed to with sumps to capture sediment before it enters the chamber system, and therefore must be periodically inspected and cleared of sediment.

Maintenance

- See the ADS cut sheet in the appendix of this manual for the proper care of the chambers.
 - Inspect annually the catch basins preceding the chamber system and remove built up sediment accumulation as necessary.
 - Inspect annually the isolator row of the chamber system and clean any sediment buildup as specified in the ADS cutsheet.
-

EXOTIC (INVASIVE) SPECIES

Most native plant species are very beneficial to our waterbodies, providing food, shelter, and oxygen for organisms in and around the water. Unlike our native species, exotic plant species can reduce the diversity of our native plants, animals and insect species. If exotic species begin to grow in a stormwater management facility, owner shall eradicate the species per best management practices. For additional information on exotic species and procedures for managing them, reference is made to

<http://des.nh.gov/organization/divisions/water/wmb/exoticspecies/categories/publications.htm#factsheets>.

Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training or equipment. A confined space should never be entered without at least one additional person present.

Inspecting Stormwater Management Facilities

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent best management practices. Stormwater management facilities must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. Inspection Procedures

All stormwater management facilities are required to be inspected by a qualified individual at a minimum of once per year. Inspections should follow the inspection guidance found in this Inspection and Maintenance Manual for the specific type of facility.

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility. An inspection and maintenance report is provided.

General Information

This section identifies the facility location, person conducting the inspection, the date and time the facility was inspected, and approximate days since the last rainfall. The reason for the inspection is also identified on the form depending on the nature of the inspection. All facilities should be inspected on an annual basis at a minimum. In addition, all facilities should be inspected after a significant precipitation event to ensure the facility is draining

appropriately and to identify any damage that occurred as a result of the increased runoff. For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches in a 24-hour period or 0.5 inches in a one-hour period. It is anticipated that a short, intense event is likely to have a higher potential of erosion for this site than a longer, high volume event.

Inspection Scoring

For each inspection item, a score must be given to identify the urgency of required maintenance. The scoring is as follows:

- 0 = No deficiencies identified.
- 1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.
- 2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program (See SOP in appendix A). This can include items like vegetation management or debris/trash removal.
- 3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet works, forebay, etc), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

Inspection Summary/Additional Comments

Additional explanations to inspection items, and observations about the facility not covered by the form, are recorded in this section.

C. Verification of Inspection and Form Submittal

The Stormwater Management Facility Inspection Form provides a record of inspection of the facility. The verification and the inspection form(s) shall be reviewed and maintained by the property owner or responsible party. Any transfer in ownership or responsibility shall be documented in writing to NHDES.

**INSPECTION AND MAINTENANCE REPORT FORM
 SUBDIVISION ON TAX MAP 174, LOT 15-1 & MAP 181, LOT 1
 20 Baker St. & 25 Webster St., Hudson, NH**

Inspector: _____

Date: _____

BMP	Date Since Last Inspection	Inspection Scoring	Inspection summary / Additional comments of type and date of repairs made
Manicured Landscape Areas - Litter Control			
Catch basins, Culverts, and Drainage Pipes			
Street/Parking Lot Sweeping			
Underground Chamber System			
De-ice Chemical Use – List Type and Quantity			
Detention Ponds & Grass Swales			
Invasive Species Assessment			

INSPECTION

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

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

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

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

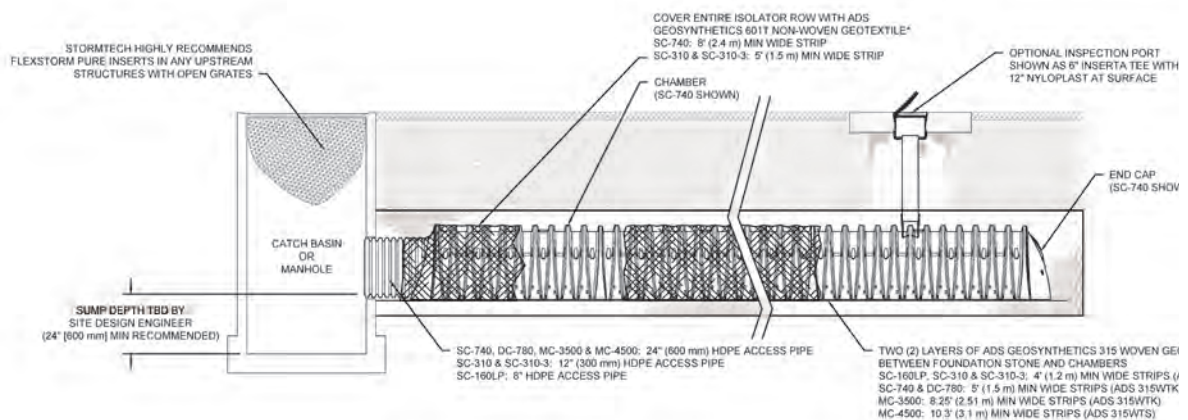
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By “isolating” sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the jetvac process. The jetvac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/jetvac combination vehicles. Selection of an appropriate jetvac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45° are best. Most jetvac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. The jetvac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.



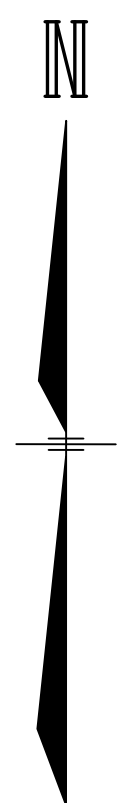
Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)



* NOTE: NON-WOVEN FABRIC IS ONLY REQUIRED OVER THE INLET PIPE CONNECTION INTO THE END CAP FOR SC-160LP, DC-780, MC-3500 & MC-4500 CHAMBER MODELS AND IS NOT REQUIRED OVER THE ENTIRE ISOLATOR ROW.

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Pre-Development Drainage Area Plan



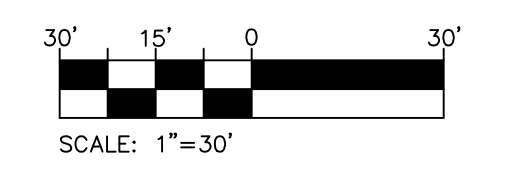
No.	DESCRIPTION	DATE

PREDEVELOPMENT DRAINAGE AREA PLAN
 MAP 174, LOT 15-1
 MAP 181, LOT 1
20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
 39 TRIGATE ROAD
 HUDSON, NH 03051

MARCH 30, 2022 **SCALE: 1"=30'**

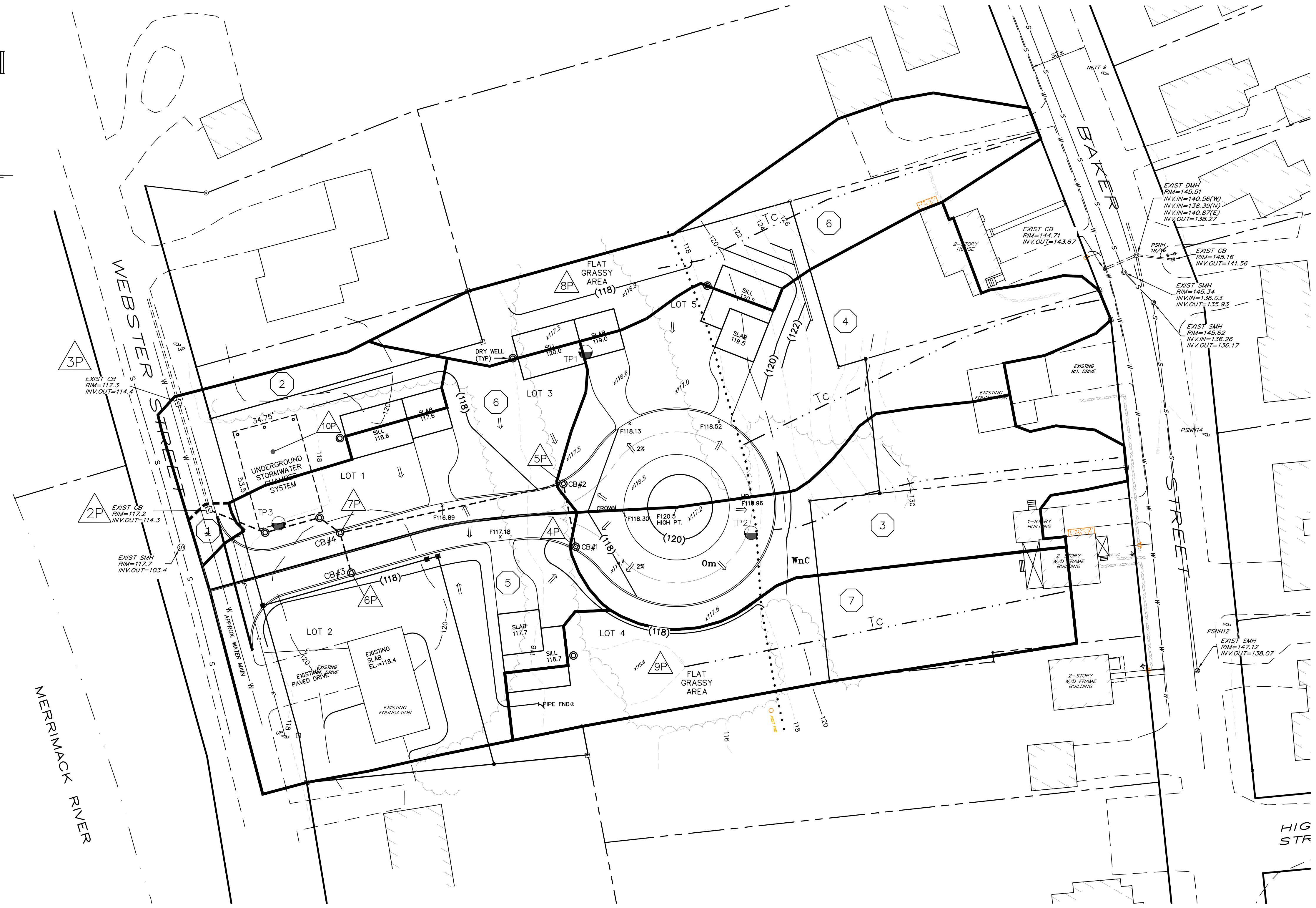
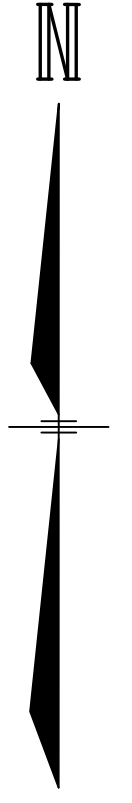
ENGINEER:
RJB ENGINEERING, LLC
 2 GLENDALE ROAD
 CONCORD, NH 03301
 PH. 603-219-0194



ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
 PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
 220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

**Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report**

Post-Development Drainage Area Plan



No.	DESCRIPTION	DATE

POST-DEVELOPMENT DRAINAGE AREA PLAN
 MAP 181, LOT 1 & 1-001

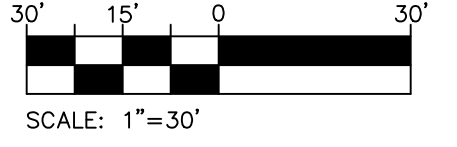
25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:
TUMPNEY, HURD, CLEGG, LLC
 39 TRIGATE ROAD
 HUDSON, NH 03051

JUNE 27, 2022

SCALE: 1"=30'

ENGINEER:
RJB ENGINEERING, LLC
 2 GLENDALE ROAD
 CONCORD, NH 03301
 PH. 603-219-0194



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