BARRETTS HILL LLC OSD PLAN

SB# 08-23

STAFF REPORT

May 29, 2024

(See March 27, 2024)

SITE: 75 Barretts Hill Road / Map 151 Lot 059

ZONING: General – 1 (G-1)

PURPOSE OF PLAN: To depict a thirteen (13) lot open space subdivision on Map 151, lot 059 and all associated improvements.

PLANS UNDER REVIEW:

Barrett Hill Subdivision SB# 08-23, Map 151/Lot 059, 75 Barretts Hill Road, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, 10 Commerce Park North Suite 3B, Bedford, NH 03110; prepared for: Barrett Hill, LLC, 21 Continental Boulevard, Merrimack NH 03054, consisting of twenty-four sheets, and general notes 1-30 on sheet 1; dated December 6, 2023, last revised May 14, 2024 NHDES with AoT revisions.

ATTACHMENTS:

1) Subdivision Application and applicable waiver date stamped December 11, 2023 – Attachment "**A**".
2) Department Comments – Attachment "**B**".
3) Peer Review, prepared by Fuss & O'Neill, dated March 26, 2024 – Attachment "**C**"
4) Applicant Response to Peer Review, prepared by Keach-Nordstrom Associates, dated May 14, 2024 – Attachment "**D**".
5) 2ND Request for More Information on AoT Permit, prepared by NHDES, dated May 6, 2024 – Attachment "**E**".
6) AoT Response letter, prepared by Keach-Nordstrom Associates, dated May 14, 2024 – Attachment "**F**".
7) NHDES Permit: AoT-2594, dated May 22, 2024 – Attachment "**G**"
8) Traffic Study, prepared by TEPP, LLC, dated May 14, 2024 – Attachment "**H**".
9) CAP Fee Worksheet – Attachment "**I**".

REQUESTED WAIVER:

1) **§289-37.A** – Plan Schedule and Form

APPLICATION TRACKING:

1. December 11, 2023 – Application received.
2. January 4, 2024 – Peer review received.
3. March 5, 2024 – Revisions and responses received.

4. March 26, 2024 – 2nd Peer review received.
5. March 27, 2024 – Public Hearing continued.
6. May 15, 2024 – Revisions and responses received.
7. May 22, 2024 – NHDES AoT Permit received.
8. May 29, 2024 – Public Hearing scheduled.

COMMENTS & RECOMMENDATIONS:

BACKGROUND

The subject lot is approximately 35.36 acres with approximately 1,160 feet of frontage along Barretts Hill Road. The lot is in the General-One (G-1) zone, and is directly abutting residential properties on three sides. The site contains no known wetlands and is not located within any flood zone. The site is served by neither municipal water nor sewer. A utility easement spans across the property within the rear third, and is entirely encapsulated within the proposed open space. The applicant proposes subdividing Map 151 Lot 059 into thirteen lots sized between 43,785 sqft and 77,869 sqft. All lots would have no less than 100 linear feet of frontage along the proposed Windsor lane. The plan proposes 754,352 sqft of open space to be preserved within the development, held within a 17.318 acre space that spans from the street frontage to the rear half of the property.

STAFF COMMENTS

The lot meets all subdivision requirements of the town outside of a waiver that has been requested for phasing of construction. The applicant states that due to the smaller size of the project, it would be best suited to be completed within a year as opposed to the standard two, and would result in less disturbance to residential abutters.

DEPARTMENT COMMENTS

The following new comments have been submitted after the public meeting held on March 27, 2024.

Assessing has provided the following comment:

In re-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.

Current – From Plan	Assigned Map/Lot to be used on plan
Map 151 Lot 59-1	Map 151 Lot 059 Sublot 001
Map 151 Lot 59-2	Map 151 Lot 059 Sublot 002
Map 151 Lot 59-3	Map 151 Lot 059 Sublot 003
Map 151 Lot 59-4	Map 151 Lot 059 Sublot 004
Map 151 Lot 59-5	Map 151 Lot 059 Sublot 005
Map 151 Lot 59-6	Map 151 Lot 059 Sublot 006
Map 151 Lot 59-7	Map 151 Lot 059 Sublot 007
Map 151 Lot 59-8	Map 151 Lot 059 Sublot 008

Map 151 Lot 59-9	Map 151 Lot 059 Sublot 009
Map 151 Lot 59-10	Map 151 Lot 059 Sublot 010
Map 151 Lot 59-11	Map 151 Lot 070 Sublot 000
Map 151 Lot 59-12	Map 151 Lot 071 Sublot 000
Map 151 Lot 59-13	Map 151 Lot 072 Sublot 000

No department comments remain outstanding, and full comments are provided in **Attachment "B"**.

PEER REVIEW

Fuss & O'Neill reviewed the subdivision plan on January 4, 2024 (**Attachment "C"**). The Applicant responded to the Peer Review comments in **Attachment "D"**.

The Applicant has submitted a revised plan set addressing comments provided by Fuss & O'Neill and the Town alongside their response letter.

ALTERATION OF TERRAIN

NHDES had requested additional information in a letter dated May 6, 2024. (Attachment "**E**") The requests detailed included minor changes, and updates to prior sections based on revisions. KNA responded in a letter dated May 15, 2024. (Attachment "**F**") On May 22, 2024, NHDES issued Permit: AoT-2594, which expires on May 22, 2029.

ORGANIZATIONAL DOCUMENTS

The applicant has provided proposed language establishing easements for the cistern, sight distance, and for drainage on site. Additionally, they have provided proposed documentation to establish a HOA and condo association for the property. These will be reviewed by Town Counsel prior to endorsement.

TRAFFIC STUDY

The applicant has provided a traffic study per request of the Planning Board. In line with general expectations, the report estimates a daily vehicle-trip total of 148 vehicles, with a peak rate of 12 per hour during the PM peak. The full report can be found in Attachment "**H**".

RECOMMENDATIONS

Staff recommends resuming the public hearing, followed by deliberation and consideration of the waiver required. Should the waiver be granted, staff recommends the board's consideration for approval. The Applicant has addressed all comments issued by Peer Review and Town Staff, the application meets applicable zoning and land use regulation criteria.

DRAFT MOTIONS:

CONTUINUE the subdivision application:

I move to continue the further consider of this subdivision application SB# 08-23 Barretts Hill Subdivision Plan, Map 151/Lot 059, 75 Barretts Hill Road, Hudson, NH, to date specific, _____, 2024 Planning Board meeting.

Motion by: _____Second: _____Carried/Failed: _____

To GRANT the waiver:

1) § 289-37.A – Plan schedule and form

I move to grant the requested waiver **§289-37.A –** Plan schedule and form, to not require a minimum construction time of two years, where it would typically be required, 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.

Motion by: _____Second: _____Carried/Failed: _____

APPROVE the subdivision application:

I move to approve the subdivision plan entitled: Barrett Hill Subdivision SB# 08-23, Map 151/Lot 059, 75 Barretts Hill Road, Hudson, New Hampshire; prepared by: Keach-Nordstrom Associates, 10 Commerce Park North Suite 3B, Bedford, NH 03110; prepared for: Barrett Hill, LLC, 21 Continental Boulevard, Merrimack NH 03054, consisting of twenty-four sheets, and general notes 1-30 on sheet 1; dated December 6, 2023, last revised May 14, 2024; and:

That the Planning Board finds that this application complies with the Zoning Ordinances, and with the Land Use Regulations; and for the reasons set forth in the written submissions, together with the testimony and factual representations made by the applicant during the public hearing;

Subject to, and revised per, the following stipulations:

1. All stipulations of approval shall be incorporated into the Development Agreement, which shall be recorded at the HCRD, together with the Plan.
2. Prior to Planning Board endorsement of the subdivision Plan-of-Record, Town Counsel shall favorably recommend on the Development Agreement, Declaration of Covenants and Restrictions, Sight Distance, Drainage, and Cistern Easement Deeds.
3. A cost allocation procedure (CAP) amount of $6,194.00 per unit for single-family residential, or of $5,679.00 per unit within a duplex 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 the Planning Board endorsement of the Plan, all necessary NHDES protective well radius easements marked on sheets 6 & 7 shall be recorded at the HCRD.
7. Maintenance of the onsite drainage system shall be constructed and maintained in compliance with local and NHDES requirements for such systems, and the perpetual maintenance of the stormwater treatment structures and treatment and retention basins outside of the ROW, shall be the responsibility of the future homeowner's association compromised of all the homeowners within this subdivision.
8. Construction activities involving the proposed undeveloped lots shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall occur on Sunday.
9. If lot development involves blasting and/or ramming of bedrock materials, said activities shall be limited to the hours between 7:00 A.M. and 5:00 P.M. Monday through Friday only. Said blasting/ramming activities shall be prohibited on Saturday and Sunday.

Motion by: _____Second: _____Carried/Failed: _____

SUBDIVISION APPLICATION

Date of Application: 12/11/23 Tax Map #: 151 Lot #: 59

Site Address: 75 Barretts Hill Road

Name of Project: Subdivision Barrett Hill, LLC

Zoning District: General (G-1) General SB#: _____
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Barrett Hill, LLC	
Address: 21 Continental Boulevard, Door #4	
Address: Merrimack, NH 03054	
Telephone # 603-320-5123	
Email: johngargasz@gmail.com	
PROJECT ENGINEER:	**SURVEYOR:**
Name: Keach-Nordstrom Associates, Inc.	Keach-Nordstrom Associates, Inc.
Address: 10 Commerce Park North, Suite 3	10 Commerce Park North, Suite 3
Address: Bedford, NH 03110	Bedford, NH 03110
Telephone # 603-627-2881	603-627-2881
Email: pchisholm@keachnordstrom.com	chickey@keachnordstrom.com

PURPOSE OF PLAN:

The purpose of this plan is to depict a thirteen (13) lot open space subdivision on the property and all associated improvements.

(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: Barrett Hill, LLC

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

LEGAL DESCRIPTION: MAP 151 LOT 59

DATE: December 11, 2023

Address:	75 Barretts Hill Road
Total Area:	S.F. 1,540,250 Acres: 35.36
Zoning:	General (G-1)
Required Lot Area:	566,280 SF (43,560 SF per Lot)
Required Lot Frontage:	100 FT
Number of Lots Proposed:	Thirteen (13) Residential Lots & One (1) Non-buildable open space lot
Water and Waste System Proposed:	Individual wells and septic systems
Area in Wetlands:	None
Existing Buildings To Be Removed:	None
Flood Zone Reference:	FIRM Map 33011C0517D
Proposed Linear Feet Of New Roadway:	1,213.17 LF

SUBDIVISION PLAN DATA SHEET

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

(Attach Stipulations on
Separate Sheet)

List Permits Required: NHDES AOT

NHDES Subdivision

NHDES Individual Subsurface Disposal

*Waivers Requested:	Hudson Town Code Reference	Regulation Description
	1.	
	2.	
	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: 12/11/2023

Print Name of Owner: JOHN GARGASZ

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

Signature of Developer: _____ Date: 12/11/2023

Print Name of Developer: JOHN GARGASZ

- 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: _____

Street Address: _____

I _____ hereby request that the Planning Board waive the requirements of item _____ of the Hudson Land Use Regulations in reference to a plan presented by _____ _____ (name of surveyor and engineer) dated _____ for property tax map(s) _____ and lot(s) _____ 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):

_____

_____

_____

_____

_____

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):

_____

_____

_____

_____

_____

Signed:

_____

Applicant or Authorized Agent

SCHEDULE OF FEES

A. REVIEW FEES:

1. $170.00 per proposed lot @13 LOTS $ 2,210.00

CONSULTANT REVIEW FEE: (Separate Check)

Total 4.82 acres @ $600.00 per acre, or $1,250.00, whichever is greater. *Disturbed Acreage $ 2,892.00

This is an estimate for cost of consultant review. The fee is expected to cover the amount. A complex project may require additional funds. A simple project may result in a refund.

LEGAL FEE:

The applicant shall be charged attorney costs billed to the Town for the Town's attorney review of any application plan set documents.

B. POSTAGE:

41 Direct Abutters Applicant, Professionals, etc. as required by RSA 676:4.1.d @$5.01 **(or Current Certified Mail Rate)** $ 205.41

10 Indirect Abutters (property owners within 200 feet) @$0.66 **(or Current First Class Rate)** $ 6.60

C. TAX MAP UPDATE FEE

2 to 7 lots (# of lots x $30.00) + $25.00 (min. $85.00) $ _____

8 lots or more (min. $325.00) @13 LOTS $ 415.00

TOTAL $ $2,837.01 CHECK #1
$2,892.00 CHECK #2

(For Town Use Only)	
AMOUNT RECEIVED: $_____	DATE RECEIVED: _____
RECEIPT NO.: _____	RECEIVED BY: _____

NOTE: fees below apply only upon plan approval, NOT collected at time of application.

D. RECORDING:

*****The applicant shall be responsible for the recording of the approved plan, and all documents as required by an approval, at the Hillsborough County Registry of Deeds (HCRD), located at 19 Temple Street, Nashua, NH 03061. Additional fees associated with recording can be found at HCRD.*****

E. COST ALLOCATION PROCEDURE AMOUNT CONTRIBUTION AND OTHER IMPACT FEE PAYMENTS:

To be determined by the Planning Board at time of plan approval and shall be paid by the applicant at the time of submittal of the Certificate of Occupancy Permit requests.

*****The applicant shall be responsible for all fees incurred by the town for processing and review of the applicant's application, plan and related materials.*****

KNA KEACH-NORDSTROM ASSOCIATES, INC.

December 11, 2023

Town of Hudson
Planning Department
12 School Street
Hudson, New Hampshire 03051

Subject: **Subdivision Application – Barrett Hill, LLC**
Tax Map 151; Lot 59
75 Barretts Hill Road – Hudson, New Hampshire
KNA Project No. 23-0414-1

PROJECT NARRATIVE

The proposed subdivision application is being submitted for approval for an open space subdivision comprised of thirteen (13) residential lots and one (1) non-buildable open space lot on the property located at 75 Barretts Hill Road in Hudson, New Hampshire. The property, approximately 1,540,250-sf (35.36 acres) in total area, is located entirely within the General (G-1) Zoning District. It is currently undeveloped consisting mainly of woodlands with a powerline easement crossing the property. There are no wetlands onsite.

The proposed lots will have frontage off a proposed cul-de-sac roadway (Windsor Lane), approximately 1,213.17-lf in length. Each lot will be serviced by individual private wells and septic systems. Other site improvements will include stormwater management provisions, comprised of a closed conveyance system which outlets into a large pocket pond, and underground utilities.

10 Commerce Park North, Suite 3B Bedford, NH 03110 Phone (603) 627-2881 Fax (603) 627-2915

Owner Affidavit

I, John Gargasz, authorized representative of Barrett Hill, LLC and owner of the property referenced on Tax Map 151 as Lot 59, located at 75 Barretts Hill Road, Hudson, New Hampshire, hereby verify that I have authorized Keach-Nordstrom Associates, Inc. to submit on my behalf, any and all applicable State and local permit applications as they pertain to improvements on said property.

Additionally, I authorize Keach-Nordstrom Associates, Inc. to aid in the representation of these applications throughout the approval process.

Signature of Owner: _____

Printed Name of Owner: John Gargasz

Address of Owner: 21 Continental Boulevard, Door #4

Merrimack, NH 03054

Date: 12/11/2023

KNA KEACH-NORDSTROM ASSOCIATES, INC.

March 4, 2024

Mr. Jay Minkarah
Acting Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Subject: **Town of Hudson Planning Board Review**
Barrett Hill Subdivision Plan
Tax Map 151 Lot 59
KNA Project No. 23-0414-1

The Applicant is requesting a waiver from the following section of the Town of Hudson Site Plan Regulation: **Section 289-37(A) Plan Schedule and Form**

Hardship reason(s) for granting this waiver:
The applicant would like to construct the proposed roadway and develop the 13 lots as quickly and efficiently as possible and would prefer not to phase the development for two years as required. Adhering to this rule would cause an unnecessary hardship for the applicant and the surrounding residential abutters, as the overall small scale of the project makes it best suited to be developed within a year and disturbance from construction should be limited as such.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations:
Granting this waiver would not be contrary to the spirit and intent of the regulation because requiring phased construction would only increase the amount and time of disturbance to the surrounding residential abutters, which there are many of.

10 Commerce Park North, Suite 3B Bedford, NH 03110 Phone (603) 627-2881 Fax (603) 627-2915

Attachment "B"

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: Planning

March 29, 2024

From: Jim Michaud, Chief Assessor

Re: **REVISED** memo – 75 Barretts Hill Road - Tax Map 151 Lot 059 Sublot 000

In re-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.

CURRENT-From Plan	Assigned Map/Lot to be used on plan
Map 151 Lot 59-1	Map 151 Lot 059 Sublot 001
Map 151 Lot 59-2	Map 151 Lot 059 Sublot 002
Map 151 Lot 59-3	Map 151 Lot 059 Sublot 003
Map 151 Lot 59-4	Map 151 Lot 059 Sublot 004
Map 151 Lot 59-5	Map 151 Lot 059 Sublot 005
Map 151 Lot 59-6	Map 151 Lot 059 Sublot 006
Map 151 Lot 59-7	Map 151 Lot 059 Sublot 007
Map 151 Lot 59-8	Map 151 Lot 059 Sublot 008
Map 151 Lot 59-9	Map 151 Lot 059 Sublot 009
Map 151 Lot 59-10	Map 151 Lot 059 Sublot 010
Map 151 Lot 59-11	Map 152 Lot 072 Sublot 000
Map 151 Lot 59-12	Map 152 Lot 071 Sublot 000
Map 151 Lot 59-13	Map 152 Lot 072 Sublot 000

FUSS & O'NEILL

March 26, 2024

Mr. Jay Minkarah
Acting Town Planner
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Town of Hudson Planning Board Review
Barrett Hill Subdivision Plan
Tax Map 151, Lot 59; Acct. #1350-085
Reference No. 20030249.2330

Dear Mr. Minkarah:

Fuss & O'Neill, Inc. has reviewed the second submission of the materials received on March 4, 2024, related to the above-referenced project. Authorization to proceed was received on March 12, 2024. 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.

The project appears to consist of subdividing the existing 35.36-acre existing lot to create a thirteen (13)-lot subdivision with open space. 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 private wells and subsurface disposal systems.

The following items have outstanding issues:

2. Driveway Review Codes (HR 193-10)

a. *Former Fuss & O'Neill Comment: HR 193-10. The applicant has shown proposed approximate driveway locations within the Right-of-Way on the plan set, but has not shown any of these further extended into the lots. Due to the extensive grading adjacent to the roadway some driveways may be difficult to construct to meet the Town's maximum slope requirements.*

Current Fuss & O'Neill Comment: The applicant has provided driveway grades on the plans. We note that the applicant has maintained a 2% grade for 10-feet of the driveway adjacent to the roadway. According to the Town of Hudson Engineering Technical Guidelines & Typical Details (ETGTD) Detail R-8, a slope of up to 3% should be maintained for a minimum of 20 feet. The applicant should revise the driveway grades to meet the Regulation.

The Gateway Building
50 Commercial Street
Manchester, NH
03101
t 603.668.8223
800.286.2469

www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

c. *Former Fuss & O'Neill Comment: HR 193-10.E. The applicant has provided sight distance information for the proposed roadway on the plan set. The sight distance looking left (west) from Windsor Lane may be obscured by brush if not maintained and also could be significantly impacted by snowbanks during winter periods. The applicant should clarify how this area is be maintained to provide sufficient sight distance in this direction.*

Current Fuss & O'Neill Comment: The applicant has added a sight distance easement to Lot 59-1 to ensure that sight distance can be maintained. We continue to note that in some places, the sightline is within one foot of the finished grade of the property. Any snow or brush will easily obscure the view.

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

i. *Former Fuss & O'Neill Comment: The applicant should forward any review comments received from the NHDES AoT Bureau to the Town for their review and records.*

Current Fuss & O'Neill Comment: The applicant should keep the Town informed of all communication with NHDES in relation to the required Alteration of Terrain Permit being requested to ensure NHDES comments do not alter drainage design/calculations.

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

b. *Former Fuss & O'Neill Comment: The applicant has shown proposed 4k septic reserve areas and 75-foot protective well radii on the plans for the individual lots. Proposed well radii do not extend onto adjacent lots. They have also provided a typical 4-bedroom residential single family home detail, which shows a water service connection in the rear of the building and a septic tank in the front.*

Current Fuss & O'Neill Comment: The applicant has revised the plan to show 100-foot well easements to accommodate the duplex homes proposed. We note that these well easements now extend onto adjacent lots in many areas. The applicant should review the need to provide well easements for those locations. We also note that the septic area and well radius should be reviewed on Lot 59-6 as they currently overlap. In addition it appears that proposed well locations shown for at least two lots are located very near or within the footprint of proposed houses (lots 59-2 and 59-3). The applicant should review these locations.

The following items require Town evaluation or input:

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

i. *Former Fuss & O'Neill Comment: 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 between six and sixteen lots must be developed over two years per the Regulation.*

Current Fuss & O'Neill Comment: The applicant has requested a waiver for phasing.

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

k. *Former Fuss & O'Neill Comment: The applicant should coordinate with the Town regarding the need for fencing or other means to prevent children, animals, etc. entering the water in the proposed pocket pond.*

Current Fuss & O'Neill Comment: The applicant has noted that several Town agencies did not note fencing at the pond as an area of concern, but will accommodate the Planning Board if they determine that fencing is preferred.

The following items are resolved or have no further Fuss & O'Neill input:

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

a. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(13). The applicant has not shown any signs other than traffic signs on the plan set.*

Current Fuss & O'Neill Comment: The applicant has confirmed that no additional signage is proposed at this time. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: 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.*

Current Fuss & O'Neill Comment: The applicant has added a note to the plan confirming that no lighting is proposed. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(15). The applicant has not shown any buildings within 50 feet of the site.*

Current Fuss & O'Neill Comment: The applicant has confirmed that the only building within 50 feet of the site is located on Lot 13-3 and shown on the plan set. No further Fuss & O'Neill comment.

d. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(16). The applicant has not shown driveways and parking areas within 200 feet of the site on the plan set.*

Current Fuss & O'Neill Comment: The applicant has added a GIS map to the cover sheet to meet this requirement. No further Fuss & O'Neill comment.

e. *Former Fuss & O'Neill Comment: HR 276-11.1.B.(20). The applicant has not shown any existing buildings or features on the existing site. The applicant should confirm that the site was not previously developed in any way.*

Current Fuss & O'Neill Comment: The applicant has confirmed that the site has not been previously developed except for the power line easement. No further Fuss & O'Neill comment.

f. *Former Fuss & O'Neill Comment: HR 289-15. The applicant has noted that the site is not located within a Flood Hazard area.*

g. *Former Fuss & O'Neill Comment: HR 289-22. The applicant shall coordinate with the Town of Hudson regarding the deeding of open space areas.*

Current Fuss & O'Neill Comment: The applicant has confirmed they will continue to work with the Town on this issue. No further Fuss & O'Neill comment.

h. *Former Fuss & O'Neill Comment: HR 289-28.A. The applicant should provide a detail for the proposed granite bounds to be set.*

Current Fuss & O'Neill Comment: The applicant has added a bound note to the plan. We note that the applicant should add the missing dimension to the note for property corners (i.e.., 4"X"X36"). No further Fuss & O'Neill comment.

2. Driveway Review Codes (HR 193-10)

b. *Former Fuss & O'Neill Comment: HR 193-10. Several proposed driveway locations are located at property lines (lot 6) or configured in such a way that the driveway may encroach on an adjacent lot (lot 8). Also there doesn't appear to be a proposed driveway location for lot 9.*

Current Fuss & O'Neill Comment: The applicant has revised the driveway locations. No further Fuss & O'Neill comment.

3. Roadway Design

a. *Former Fuss & O'Neill Comment: HR 289-18.B.(5). The applicant should add dead-end sign location to the plan set. Sign details have been provided.*

Current Fuss & O'Neill Comment: The applicant has added the sign location to the plan set. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: The applicant should label the curb curve radii on the plan set.*

Current Fuss & O'Neill Comment: The applicant has added the curb radii on the plan set. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: HR 289-11.1.(21). The applicant has not shown a detectable warning paver at the sidewalk termination at the cul-de-sac.*

Current Fuss & O'Neill Comment: The applicant has added the detectible warning device. No further Fuss & O'Neill comment.

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

a. *Former Fuss & O'Neill Comment: HR 289-20.C.(1). The applicant should confirm that all off-site improvements were coordinated with the Town Engineer, included the runoff leaving the site via the rip-rap lined swale along Barretts Hill Road.*

Current Fuss & O'Neill Comment: The applicant has coordinated with the Town Engineer. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: HR 290-5.B.2.b. The applicant should provide language in the Stormwater Management Report, stating if and how low impact development (LID) strategies for stormwater runoff were evaluated for this project.*

Current Fuss & O'Neill Comment: The applicant has added an explanation and wording to the Drainage Report. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: HR 290-6.A.8. We note the requirement of the applicant to coordinate a pre-construction meeting with the Town Engineer.*

Current Fuss & O'Neill Comment: The applicant has noted this requirement. No further Fuss & O'Neill comment.

d. *Former Fuss & O'Neill Comment: HR 290.6.A.12. The applicant should provide a note for winter stabilization on the erosion control plans.*

   Current Fuss & O'Neill Comment: The applicant has added notes to Plan Sheet 12. No further Fuss & O'Neill comment.

e. *Former Fuss & O'Neill Comment: HR 290-8.A.4 & 5. We note the requirement of the applicant to coordinate the need for a Bond and/or Escrow with the Town Engineer.*

   Current Fuss & O'Neill Comment: The applicant has noted this requirement. No further Fus & O'Neill comment.

f. *Former Fuss & O'Neill Comment: In section D. Summary of the project narrative in the Stormwater Management Report the applicant references the Town of Goffstown Stormwater Regulations. This should be revised to the Town of Hudson.*

   Current Fuss & O'Neill Comment: The applicant has revised the error. No further Fuss & O'Neill comment.

g. *Former Fuss & O'Neill Comment: The applicant should clarify how much of the existing 12" CMP is to be replaced at the Barretts Hill Road crossing near pole PSNH 21B/30.*

   Current Fuss & O'Neill Comment: The applicant has provided an explanation for this proposed work. No further Fuss & O'Neill comment.

h. *Former Fuss & O'Neill Comment: The applicant should clarify if driveway aprons are being replaced as part of the off-site improvements for the drainage swale installation, and if so show this on the plans.*

   Current Fuss & O'Neill Comment: The applicant has added notes to Plan Sheet 11. No further Fuss & O'Neill comment.

j. *Former Fuss & O'Neill Comment: The applicant should confirm that the proposed pocket pond is not considered a dam per NHDES definitions.*

   Current Fuss & O'Neill Comment: The applicant has provided supporting criteria to confirm that the pocket pond is not a dam and we have confirmed this with the NHDES Dam Bureau. No further Fuss & O'Neill comment.

l. *Former Fuss & O'Neill Comment: ETGTD 930.1. The applicant should review the depth of the drainage within the roadway, it does not maintain the Town minimum depth of 4' of cover for all pipes.*

   Current Fuss & O'Neill Comment: The applicant has revised the design. No further Fuss & O'Neill comment.

m. *Former Fuss & O'Neill Comment: ETGTD 930.4. The applicant shall review the slope of the proposed drainage system with the Town Engineer. Slopes within the proposed Right-of-Way are less than the minimum 2% required.*

   Current Fuss & O'Neill Comment: The applicant has revised the design. No further Fuss & O'Neill comment.

n. *Former Fuss & O'Neill Comment: ETGTD 930.10. We note the requirement for curb inlet drainage structures at all vertical sags. CB19 and CB20 are designed at a vertical sag.*

   Current Fuss & O'Neill Comment: The applicant has provided correspondence with the Town Engineer stating that double catch basins can be used. No further Fuss & O'Neill comment.

o. *Former Fuss & O'Neill Comment: ETGTD 930.11. CB18 and CB20 are shown as double catch basins on the plans. The applicant should review this design with the Town Engineer for approval.*

Current Fuss & O'Neill Comment: The applicant has provided correspondence with the Town Engineer stating that double catch basins are acceptable. No further Fuss & O'Neill comment.

p. *Former Fuss & O'Neill Comment: 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.*

Current Fuss & O'Neill Comment: The applicant has noted this requirement. No further Fuss & O'Neill comment.

q. *Former Fuss & O'Neill Comment: 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. *Former Fuss & O'Neill Comment: 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.*

Current Fuss & O'Neill Comment: The applicant has added this note to the plan set. No further Fuss & O'Neill comment.

b. *Former Fuss & O'Neill Comment: HR 334-20. The site is located in the General (G-1) District. The applicant has noted that open space development is the proposed use. The applicant should confirm if the lots are to be single family homes.*

Current Fuss & O'Neill Comment: The applicant has noted that the lots are proposed to be duplex units which are allowed in the G-1 District. No further Fuss & O'Neill comment.

c. *Former Fuss & O'Neill Comment: HR 334-27. We note that the conventional subdivision design appears to meet the lot size and frontage requirements for the district.*

d. *Former Fuss & O'Neill Comment: HR 334-35. The applicant has noted that there are no wetlands located on the site.*

e. *Former Fuss & O'Neill Comment: HR 334-50. The applicant has shown that 13 lots could be accommodated as part of the Conventional Subdivision plan. The applicant has proposed 13 lots reduced the minimum lot areas to 1.0 acre and the frontage to a minimum of 100 feet for each lot.*

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

a. *Former Fuss & O'Neill Comment: The applicant has not shown any provisions for fire protection (cisterns, etc.). The applicant should coordinate with the Hudson Fire Department to ensure adequate fire protection is provided for the site.*

Current Fuss & O'Neill Comment: The applicant has provided a cistern within a proposed easement on the plan set. The applicant has noted it was provided at the Fire Departments recommendation. No further Fuss & O'Neill comment.

7. Erosion Control/Wetland Impacts

a. *Former Fuss & O'Neill Comment: The applicant has noted that the Town reserves the right to require additional erosion control measures should they be found necessary.*

8. State and Local Permits

a. *Former Fuss & O'Neill Comment: The applicant has noted the required permits on the plan set.*
b. *Former Fuss & O'Neill Comment: The applicant has noted the need for a NPDES Notice of Intent and a SWPPP on the plan.*
c. *Former Fuss & O'Neill Comment: Additional local permitting may be required.*

9. Other

a. *Former Fuss & O'Neill Comment: 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.*

Current Fuss & O'Neill Comment: The applicant has added the recommended notes to the plan set. No further Fuss & O'Neill comment.

Please feel free to call if you have any questions.

Very truly yours,

Steven W. Reichert, PE

SWR:elc

Enclosure

cc: Town of Hudson Engineering Division – File
Keach-Nordstrom Associates, Inc.
pchisholm@keachnordstrom.com

FUSS & O'NEILL

MEMORANDUM

TO: File

FROM: Steven W. Reichert PE

DATE: March 26, 2024

RE: Town of Hudson Planning Board Review
Barrett Hill Subdivision Plan
Tax Map 165151, Lot 59; Acct. #1350-085
Fuss & O'Neill Reference No. 20030249.2330

The following list itemizes the second set of documents reviewed related to the Barrett Hill Subdivision Plan, located at 75 Barretts Hill Road in Hudson, New Hampshire.

- Email correspondence between the Town of Hudson and Fuss & O'Neill, dated March 5 to March 12, 2024.
- Letter of transmittal from Keach-Nordstrom Associates, Inc., to Fuss & O'Neill, dated and received March 4, 2024, including the following:

    1. Copy of Waiver letter from Keach-Nordstrom Associates, Inc. to the Town of Hudson, dated March 4, 2024.
    2. Copy of Town Response letter from Keach-Nordstrom Associates, Inc. to the Town of Hudson, dated March 5, 2024.
    3. Copy of F & O Response letter from Keach-Nordstrom Associates, Inc. to the Town of Hudson, dated March 4, 2024.
    4. Copy of emails between Keach-Nordstrom Associates, Inc. and the Town of Hudson, from February 12 to February 13, 2024.
    5. Copy of emails between Keach-Nordstrom Associates, Inc. and the Town of Hudson, from January 23 to January 24, 2024.
    6. Copy of Revised Drainage Report, prepared by Keach-Nordstrom Associates, Inc., dated March 4, 2024.
    7. Copy of *Residential Subdivision, Barrett Hill Subdivision, Map 151; Lot 59, 75 Barretts Hill Road, Hudson, New Hampshire,* prepared by Keach-Nordstrom Associates, Inc., dated December 6, 2023, revised March 4, 2024, unless otherwise noted, including the following:

        a. Title Sheet.
        b. *Project Notes,* Sheet 1 of 24.
        c. *Master Subdivision Plan,* Sheet 2 of 24.
        d. *Subdivision Plan,* Sheets 3 and 4 of 24.
        e. *Topographic Master Subdivision Plan,* Sheet 5 of 24.
        f. *Topographic Subdivision Plan,* Sheets 6 to 7 of 24.
        g. *Roadway Plan & Profile,* Sheets 8 and 9 of 24.
        h. *Grading & Drainage Plan,* Sheet 10 of 24.
        i. *Offsite Grading, Drainage & Erosion Control Plan,* Sheet 11 of 24.
        j. *Erosion Control Plan,* Sheet 12 of 24.
        k. *Sight Distance Plan & Profile*, Sheet 13 of 24.
        l. *Drainage Profiles,* Sheet 14 of 24.
        m. *Driveway Profiles,* Sheet 15 of 24, revised February 26, 2024.
        n. *Construction Details*, Sheets 16 to 22 of 24.
        o. *Test Pit Logs,* Sheet 23 of 24.

p. *Conventional Subdivision Yield Plan,* Sheet 24 of 24.

SWR:elc

cc: Planning Dept. – Town of Hudson
Town of Hudson Engineering Division – File

KNA KEACH-NORDSTROM ASSOCIATES, INC.

May 14, 2024

Steven Reichert, PE
Fuss & O'Neill
50 Commercial Street, Unit 2S
Manchester, NH 03101

Subject: **Town of Hudson Planning Board Review**
Barrett Hill Subdivision
Tax Map 151 Lot 59
KNA Project No. 23-0414-1

Dear Mr. Reichert:

Our office is in receipt of a review letter, dated March 26, 2024. Based on the comments, we have made the required modifications and attached revisions for final review. A response to each comment has been provided below.

1. Driveway Review Codes (HR 193-10)

a. *Former Fuss & O'Neill Comment: HR 193-10. The applicant has shown proposed approximate driveway locations within the Right-of-Way on the plan set, but has not shown any of these further extended into the lots. Due to the extensive grading adjacent to the roadway some driveways may be difficult to construct to meet the Town's maximum slope requirements.*

Current Fuss & O'Neill Comment: The applicant has provided driveway grades on the plans. We note that the applicant has maintained a 2% grade for 10-feet of the driveway adjacent to the roadway. According to the Town of Hudson Engineering Technical Guidelines & Typical Details (ETGTD) Detail R-8, a slope of up to 3% should be maintained for a minimum of 20 feet. The applicant should revise the driveway grades to meet the Regulation.

The driveway grading design has been revised to be consistent with the typical town detail (see Sheet 15).

c. *Former Fuss & O'Neill Comment: HR 193-10.E. The applicant has provided sight distance information for the proposed roadway on the plan set. The sight distance looking left (west) from Windsor Lane may be obscured by brush if not maintained and also could be significantly impacted by snowbanks during winter periods. The applicant should clarify how this area is be maintained to provide sufficient sight distance in this direction.*

Current Fuss & O'Neill Comment: The applicant has added a sight distance easement to Lot 59-1 to ensure that sight distance can be maintained. We continue to note that in some places, the sightline is within one foot of the finished grade of the property. Any snow or brush will easily obscure the view.

The applicant has noted this information.

4. **Drainage Design /Stormwater Management (HR 289-20.C./Chapter 290)**
   i. *Former Fuss & O'Neill Comment: The applicant should forward any review comments received from the NHDES AoT Bureau to the Town for their review and records.*

Current Fuss & O'Neill Comment: The applicant should keep the Town informed of all communication with NHDES in relation to the required Alteration of Terrain Permit being requested to ensure NHDES comments do not alter drainage design/calculations.

NHDES correspondence is included in the resubmittal package to the town for their records. The drainage design has not been significantly altered by revisions related to NHDES comments.

6. **Sewer/Water Design/Conflicts & Utility Design/Conflicts (HR 276-13.E.)**
   b. *Former Fuss & O'Neill Comment: The applicant has shown proposed 4k septic reserve areas and 75-foot protective well radii on the plans for the individual lots. Proposed well radii do not extend onto adjacent lots. They have also provided a typical 4-bedroom residential single family home detail, which shows a water service connection in the rear of the building and a septic tank in the front.*

Current Fuss & O'Neill Comment: The applicant has revised the plan to show 100-foot well easements to accommodate the duplex homes proposed. We note that these well easements now extend onto adjacent lots in many areas. The applicant should review the need to provide well easements for those locations. We also note that the septic area and well radius should be reviewed on Lot 59-6 as they currently overlap. In addition it appears that proposed well locations shown for at least two lots are located very near or within the footprint of proposed houses (lots 59-2 and 59-3). The applicant should review these locations.

Final well locations are subject to change based on lot development and conditions encountered in the field. Specific well easement language can be found under Article 10 within the Condo Declaration (see attached). Additionally, Note #30 on Sheet 1 has been added to provide additional information regarding final well locations. Lastly, the two well locations in question have been updated accordingly.

1. **Administrative and Subdivision Review Codes (HR 276 & HR 289)**
   i. *Former Fuss & O'Neill Comment: 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 between six and sixteen lots must be developed over two years per the Regulation.*

Current Fuss & O'Neill Comment: The applicant has requested a waiver for phasing. ***No response required.***

4. **Drainage Design /Stormwater Management (HR 289-20.C./Chapter 290)**
   k. *Former Fuss & O'Neill Comment: The applicant should coordinate with the Town regarding the need for fencing or other means to prevent children, animals, etc. entering the water in the proposed pocket pond.*

   Current Fuss & O'Neill Comment: The applicant has noted that several Town agencies did not note fencing at the pond as an area of concern, but will accommodate the Planning Board if they determine that fencing is preferred.

   A four-foot-high chain link fence is now proposed along the pond perimeter after planning board comments at the site walk.

If you have any questions or comments, please reach out by phone at (603) 627-2881 or by email at pmadsen@keachnordstrom.com.

Respectfully,

Peter Madsen, EIT
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

SECOND REQUEST FOR MORE INFORMATION

May 6, 2024

John Gargasz
Barrett Hill, LLC
21 Continental Blvd. Door #4
Merrimack, NH 03054
(sent via email to: johngargasz@gmail.com)

RE: Alteration of Terrain Permit Application #231220-249
Barrett Hill Subdivision
Tax Map 151, Lot 59 – Hudson, NH

Dear Mr. Gargasz:

The New Hampshire Department of Environmental Services (NHDES) is in receipt of additional information you provided on April 25, 2024, in response to a Request for More Information (RFMI) dated January 26, 2024 for the above referenced project. After review of the information submitted, the following items need to be addressed for NHDES to make a **final determination** on the application for a permit:

General Requirements:

1. The Grading & Drainage Plan was updated with the resubmittal to now show lot development. Please recalculate the area of disturbance and provide the additional AoT Permit Application fee and the updated application with your resubmittal. If the total disturbance exceeds 5 acres or any phase exceeds 5 acres, environmental monitoring is required and the requirements of Env-Wq 1505.03(d) must be included on the plans and noted in the construction sequence.

Stormwater Management Report:

Channel Protection Requirements

2. The model run time needs to be extended to fully capture the runoff volume from the 24-hour duration storm event, which when routed through post-development detention often doesn't fully drain for a much longer period than 24-hours. Alternatively, the channel protection requirements may be met though further peak flow reduction of the 2-year storm, which may be more feasible for site such as this one where infiltration is difficult. Also note this requirement is in regard to the combined flow to any single downstream receiving water. All three POAs from this project appear to be tributary to the wetland to the northwest, so if you're able to infiltrate or over-detain flow to POA B or C on site that may be a more feasible way to meet the requirement.

Color Soil Maps

3. Shade open water land cover areas as blue and add to legend.

Site Specific Soil Survey

4. Provide the updated Sheets 6 and 7 with your resubmittal.

Revisions:

5. Pursuant to Env-Wq 1503.15(b), changes to the revised plans are to be called out and a revision date must be added to each page that has been changed. Graphical revision callouts should be included on the plans. If any changes to the project documents were made other than those identified above, please indicate what additional changes were made in your response letter.

Electronic Files:

6. Pursuant to Env-Wq 1503.15(e), provide, in electronic format, a copy of all project documents that were modified in response to the request for more information. As a separate document, provide a copy of the complete application with all documents current to reflect any modifications from the original application.

Please be aware that pursuant to RSA 485-A:17, **all the information requested above must be provided in a single and complete response within the next 120 days, by May 25, 2024, or your application will be denied**. Please include the file number on your response to this request, as well as a narrative of the changes from the current application. If you have any questions, please call me at (603) 271-1087 or email at: Jeffrey.W.Price@des.nh.gov.

Sincerely,

Jeffrey W. Price, PE
Alteration of Terrain Bureau

cc: Mitchell Heidler, Keach-Nordstrom Associates, Inc. (mheidler@keachnordstrom.com)
Town of Hudson (bdubowik@hudsonnh.gov, bgroth@hudsonnh.gov)
NHFG (nhfgreview@wildlife.nh.gov)

KNA KEACH-NORDSTROM ASSOCIATES, INC.

May 14, 2024

Jeffrey W. Price, PE
Alteration of Terrain Bureau, NHDES
29 Hazen Drive
Concord, NH 03302

Subject: **AOT Permit Application #231220-249**
Barrett Hill Subdivision – Map 151, Lot 59
KNA Project No. 23-0414-1

Dear Mr. Price:

Our office is in receipt of the Request for More Information, dated May 6, 2024. Based on the comments, we have made the required modifications and attached revisions for final review. A response to each comment has been provided below.

General Requirements:

1. The Grading & Drainage Plan was updated with the resubmittal to now show lot development. Please recalculate the area of disturbance and provide the additional AoT Permit Application fee and the updated application with your resubmittal. If the total disturbance exceeds 5 acres or any phase exceeds 5 acres, environmental monitoring is required and the requirements of Env-Wq 1505.03(d) must be included on the plans and noted in the construction sequence.

   The updated area of disturbance is 420,323 square feet. An additional fee of $2,500 was sent to the department on May 7, and the application has been updated accordingly (see attached). As the area of distance now exceeds five acres, the requirements of Env-Wq 1505.03(d) have been added to the Construction Sequence notes on Sheet 20 as requested.

Stormwater Management Report:
Channel Protection Requirements

2. The model run time needs to be extended to fully capture the runoff volume from the 24-hour duration storm event, which when routed through post-development detention often doesn't fully drain for a much longer period than 24-hours. Alternatively, the channel protection requirements may be met though further peak flow reduction of the 2-year storm, which may be more feasible for site such as this one where infiltration is difficult. Also note this requirement is in regard to the combined flow to any single downstream receiving water. All three POAs from this project appear to be tributary to the wetland to the northwest, so if you're able to infiltrate or over-detain flow to POA B or C on site that may be a more feasible way to meet the requirement.

   A separate drainage analysis and associated exhibit have been developed to demonstrate compliance with the channel protection requirements. The attached

analysis focuses strictly on the area of disturbance in relation to the main drain area on the property. Please see the attached write-up and analysis for more information.

Color Soil Maps

3. Shade open water land cover areas as blue and add to legend.

   Open water land cover has been shaded blue and an appropriate label has been added to the colorized Post Development Drainage Plan as requested (see attached).

Site Specific Soil Survey

4. Provide the updated Sheets 6 and 7 with your resubmittal.

   Please see the attached sheets.

Revisions:

5. Pursuant to Env-Wq 1503.15(b), changes to the revised plans are to be called out and a revision date must be added to each page that has been changed. Graphical revision callouts should be included on the plans. If any changes to the project documents were made other than those identified above, please indicate what additional changes were made in your response letter.

   A revision date has been added to the plans and all changes are shown in red revision clouds for clarity.

Electronic Files:

6. Pursuant to Env-Wq 1503.15(e), provide, in electronic format, a copy of all project documents that were modified in response to the request for more information. As a separate document, provide a copy of the complete application with all documents current to reflect any modifications from the original application.

   Please see the attached documentation which serves to satisfy the requirements.

If you have any questions or comments, please reach out by phone at (603) 627-2881 or by email at pmadsen@keachnordstrom.com.

Respectfully,

Peter Madsen, EIT
Project Engineer
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110

10. ADDITIONAL REQUIRED INFORMATION

A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e)[1]: 12/14/2023.
(Attach proof of delivery)

B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e)[2]: / / .
(Attach proof of delivery)

C. Type of plan required: ☐ Land Conversion ☒ Detailed Development ☐ Excavation, Grading & Reclamation ☐ Steep Slope

D. Additional plans required: ☒ Stormwater Drainage & Hydrologic Soil Groups ☐ Source Control ☐ Chloride Management

E. Total area of disturbance: 420,323 square feet

F. Additional impervious cover as a result of the project: 91,563 square feet (use the "-" symbol to indicate a net reduction in impervious coverage).
Total final impervious cover: 179,729 square feet

G. Total undisturbed cover: 1,119,929 square feet

H. Number of lots proposed: 13

I. Total length of roadway: 1,213 linear feet

J. Name(s) of receiving water(s): _____

K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.

Type of Approval	Application Filed?	Status	
		Pending	If Issued:
1. Water Supply Approval	☐ Yes ☐ No ☒ N/A	☐	Permit number:
2. Wetlands Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
3. Shoreland Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
4. UIC Registration	☐ Yes ☐ No ☒ N/A	☐	Registration date:
5. Large/Small Community Well Approval	☐ Yes ☐ No ☒ N/A	☐	Approval letter date:
6. Large Groundwater Withdrawal Permit	☐ Yes ☐ No ☒ N/A	☐	Permit number:
7. Other:	☐ Yes ☐ No	☐	Permit number:

L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: Blandings Turtle

M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."
N/A

N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? ☐ Yes ☒ No
If yes, name of staff member:

O. Will blasting of bedrock be required? ☐ Yes ☒ No If yes, estimated quantity of blast rock: _____ cubic yards
If yes, standard blasting BMP notes must be placed on the plans, available at:
http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf

NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.

[1] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

[2] Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

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

PREPARATION AND EXECUTION:
1. RAKE THE SUBGRADE OF ALL AREAS TO BE LOAMED AND SEEDED TO REMOVE RUBBISH, STICKS, ROOTS AND STONES LARGER THAN 1 INCH.
2. PLACE LOAM OVER AREAS TO BE SEEDED AND SPREAD.
3. FINE GRADE SURFACE AND SUPPLEMENT WITH SUITABLE LOAM WHERE NEEDED TO CREATE A UNIFORM SURFACE ACCORDING TO THE FINISH GRADES INDICATED; TOP AND BOTTOM OF SLOPES SHALL BE ROUNDED. NO LOAM SHALL BE SPREAD IF THE SUBGRADE IS EXCESSIVELY WET OR FROZEN.
4. IF THE pH OF THE SOIL NEEDS TO BE RAISED, APPLY LIME EVENLY OVER LOAM SURFACE AND THOROUGHLY INCORPORATE LIME INTO THE LOAM BY HEAVY RAKING TO AT LEAST ONE-HALF THE DEPTH OF THE LOAM.
5. APPLY FERTILIZER AND MIX WITH THE UPPER 2 INCHES OF LOAM.
6. DETERMINE APPROPRIATE MIXTURE FOR AREA TO BE SEEDED BASED ON EXAMINATION OF PROJECT PLANS. UNIFORMLY SPREAD THE SEED BY BROADCASTING OR HYDROSEEDING. IF BROADCASTING, LIGHTLY RAKE INTO THE PREPARED SURFACE AND ROLL. IF, HYDROSEEDING, USE 4 TIMES THE RECOMMENDED RATE OF INOCULANT. AFTER SEED IS SPREAD, WATER THOROUGHLY WITH A FINE SPRAY.
7. SEEDING AND INITIAL FERTILIZING SHALL BE DONE BETWEEN APRIL 1 AND JUNE 1 OR BETWEEN AUGUST 15 AND OCTOBER 14, OR AS PERMITTED. SEEDING SHALL NOT BE DONE DURING WINDY WEATHER OR WHEN THE GROUND IS FROZEN, EXCESSIVELY WET OR OTHERWISE UNTILLABLE.
8. WITHIN 24 HOURS AFTER SEEDING OPERATION, UNIFORMLY MULCH THE AREA WITH STRAW. ANCHOR MULCH ON ALL SLOPES EXCEEDING 3 : 1 USING MULCH NETTING INSTALLED IN ACCORDANCE WITH THE MANUFACTURER.
9. PROTECT AND PREVENT AGAINST WASHOUTS, ANY WASHOUTS WHICH OCCUR SHALL BE PROMPTLY REGRADED AND RESEEDED.
10. WHEN IT IS IMPRACTICAL TO ESTABLISH PERMANENT GROWTH ON DISTURBED EARTH BY OCTOBER 14, A TEMPORARY SEED MIXTURE SHALL BE USED. WHEN TEMPORARY SEEDING CANNOT ESTABLISH VISIBLE GROWTH, THE DISTURBED AREA SHALL BE COVERED WITH SIX INCHES OF MULCH FOR THE WINTER.

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

APPLICATION RATES:
1. LOAM SHALL BE APPLIED AT A MINIMUM COMPACTED THICKNESS OF 4 INCHES.
2. LIME SHALL BE USED WHEN NECESSARY TO RAISE THE pH OF THE SOIL AND APPLIED AT ONE OF THE FOLLOWING RATES:

EXISTING SOIL Ph	TONS/ACRE	POUNDS/CUBIC YARD
4.0 - 4.4	3	1.2
4.5 - 4.9	2	0.8
5.0 - 5.4	1	0.4

3. FERTILIZER SHALL BE APPLIED AT THE FOLLOWING RATE:

INITIAL APPLICATION	POUNDS/1,000 SF	MEASUREMENT FACTOR
10-10-10	20.0	1.0
15-15-15	13.4	1.5
19-19-19	10.5	1.9

REFERTILIZATION	POUNDS/1,000 SF	MEASUREMENT FACTOR
10-3-6	20.0	1.0
12-2-8	16.7	1.2
12-4-8	16.7	1.2

4. MULCH SHALL BE APPLIED AT A RATE OF 13 CUBIC YARDS PER 1,000 S.F. OF LANDSCAPE BED.

MATERIALS:
1. LOAM SHALL CONSIST OF LOOSE, FRIABLE TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH. LOAM SHALL BE FREE OF VIABLE PARTS OF PROHIBITED INVASIVE PLANTS AND BE GENERALLY FREE OF STONES, LUMPS, STUMPS AND SIMILAR OBJECTS LARGER THAN 2 INCHES IN GREATEST DIAMETER, SUBSOIL, ROOTS AND WEEDS. THE MINIMUM AND MAXIMUM pH VALUE SHALL BE FROM 5.5 TO 7.6.
2. LIME SHALL BE A CALCIC OR DOLOMITIC GROUND AGRICULTURAL LIMESTONE CONTAINING NOT LESS THAN 95% OF EITHER CALCIUM OR MAGNESIUM CARBONATE, OR BOTH. IT SHALL CONFORM TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS AND SHALL COMPLY WITH ALL STATE AND FEDERAL RULES AND REGULATIONS.
3. FERTILIZER SHALL BE STANDARD COMMERCIAL GRADE FERTILIZER CONFORMING TO ALL STATE AND FEDERAL RULES AND REGULATIONS AND TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. EXCEPT AS PERMITTED, THE ANALYSIS RATIO SHALL BE 1:1:1 FOR INITIAL APPLICATION AND 3:1:2 FOR REFERTILIZATION APPLICATION.
4. GRASS SEED SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE AGRICULTURAL AND VEGETABLE SEED LAWS AND SHALL INCLUDE NO "PRIMARY NOXIOUS WEED SEEDS."
5. SEED MIXTURE FOR LAWN AREAS SHALL CONSIST OF THE FOLLOWING:

KIND OF SEED	MINIMUM PURITY (%)	MINIMUM GERMANATION (%)	POUNDS/ACRE (TOTAL 120 POUNDS)
CREEPING RED FESCUE	96	85	40
PERENNIAL RYEGRASS	98	90	50
KENTUCKY BLUEGRASS	97	85	25
REDTOP	95	80	5

6. SEED MIXTURE FOR SLOPE AREAS SHALL CONSIST OF THE FOLLOWING:

KIND OF SEED	MINIMUM PURITY (%)	MINIMUM GERMANATION (%)	POUNDS/ACRE (TOTAL 95 POUNDS)
CREEPING RED FESCUE	96	85	35
PERENNIAL RYEGRASS	98	90	30
REDTOP	95	80	5
ALSIKE CLOVER	97	90	5
BIRDSFOOT TREFOIL	98	80	5
LANCE-LEAVED COREOPSIS	95	80	4
OXEYE DAISY	95	80	3
BLACKEYED SUSAN	95	80	4
WILD LUPINE	95	80	4

7. TEMPORARY SEEDING MIXTURE SHALL BE APPLIED AT A RATE OF 2 POUNDS PER 1,000 SF AND SHALL BE AN APPROVED CONSERVATION MIX OR CONSIST OF THE FOLLOWING:
   - 15% BLACKWELL OR SHELTER SWITCHGRASS
   - 30% NIAGRA OR KAW BIG BLUESTEM
   - 30% CAMPER OR BLAZE LITTLESTEM
   - 15% NE-27 OR BLAZE SAND LOVEGRASS
   - 10% VIKING BIRDSFOOT TREFOIL

   INOCULUM SPECIFIC TO BIRDSFOOT TREFOIL MUST BE USED WITH THIS MIXTURE. IF SEEDING BY HAND, A STICKING AGENT SHALL BE USED. IF SEEDING WITH A HYDROSEEDER, USE FOUR TIMES THE RECOMMENDED AMOUNT OF INOCULUM.
8. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS, INCLUDING DETENTION BASINS AND VEGETATED TREATMENT SWALES, SHALL BE APPLIED AT A RATE OF 70 POUNDS PER ACRE OR 1.6 POUNDS PER 1,000 SF, AND SHALL CONSIST OF THE FOLLOWING:
   - 25% CREEPING RED FESCUE
   - 15% SWITCH GRASS
   - 15% FOX SEDGE
   - 15% CREEPING BENTGRASS
   - 10% FLATPEA
   - 20% WILDFLOWER VARIETY
9. STRAW USED FOR MULCH SHALL CONSIST OF MOWED AND PROPERLY CURED GRASS OR LEGUME MOWINGS, FREE FROM WEEDS, TWIGS, DEBRIS, INVASIVE SPECIES OR OTHER DELETERIOUS MATERIAL AND ROT OR MOLD.

SOD SPECIFICATIONS:
1. SOD SHALL BE PROVIDED WITH A STRONG ROOT SYSTEM, NOT LESS THAN TWO YEARS OLD AND SHALL BE FREE OF ANY UNDESIRABLE NATIVE GRASSES OR WEEDS.
2. SOD SHALL BE MACHINE CUT TO A THICKNESS NOT LESS THAN 3/4", EXCLUDING THATCH, AND SHALL BE CAPABLE OF VIGOROUS GROWTH WHEN PLANTED.
3. SOD PADS SHALL BE OF UNIFORM SIZE AND COMPOSED OF AT LEAST TWO LOCAL GRASS VARIETIES.
4. LAY SOD TO FORM A SOLID MASS WITH TIGHTLY FITTED JOINTS, DO NOT OVERLAP. STAGGER STRIPS TO OFFSET JOINTS IN ADJACENT COURSES. TAMP SOD TO ENSURE CONTACT WITH WITH SOIL.
5. WATER WITHIN ONE HOUR OF PLANTING WITH A FINE SPRAY.

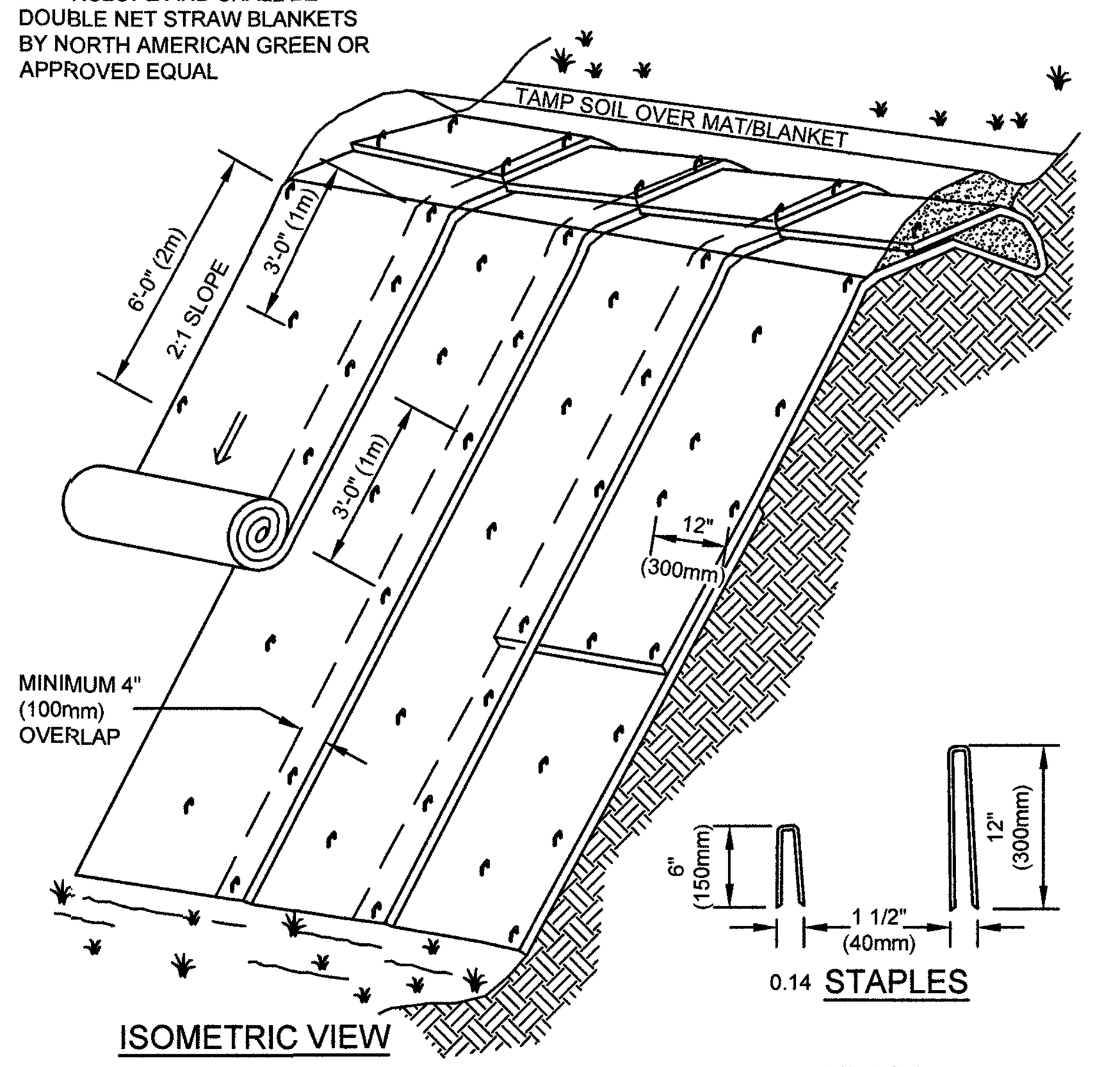
WINTER CONSTRUCTION NOTES:
1. ALL PROPOSED POST-DEVELOPMENT VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 4:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE PLACEMENT OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
2. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
3. AFTER OCTOBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3 OR, IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON, BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT.
4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   - A. BASE COURSE GRAVELS ARE INSTALLED IN AREAS TO BE PAVED;
   - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

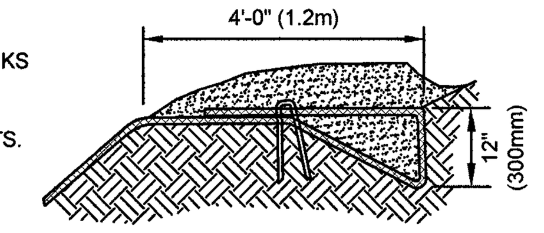
APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: ____________

____________ SIGNATURE DATE: ________

____________ SIGNATURE DATE: ________

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

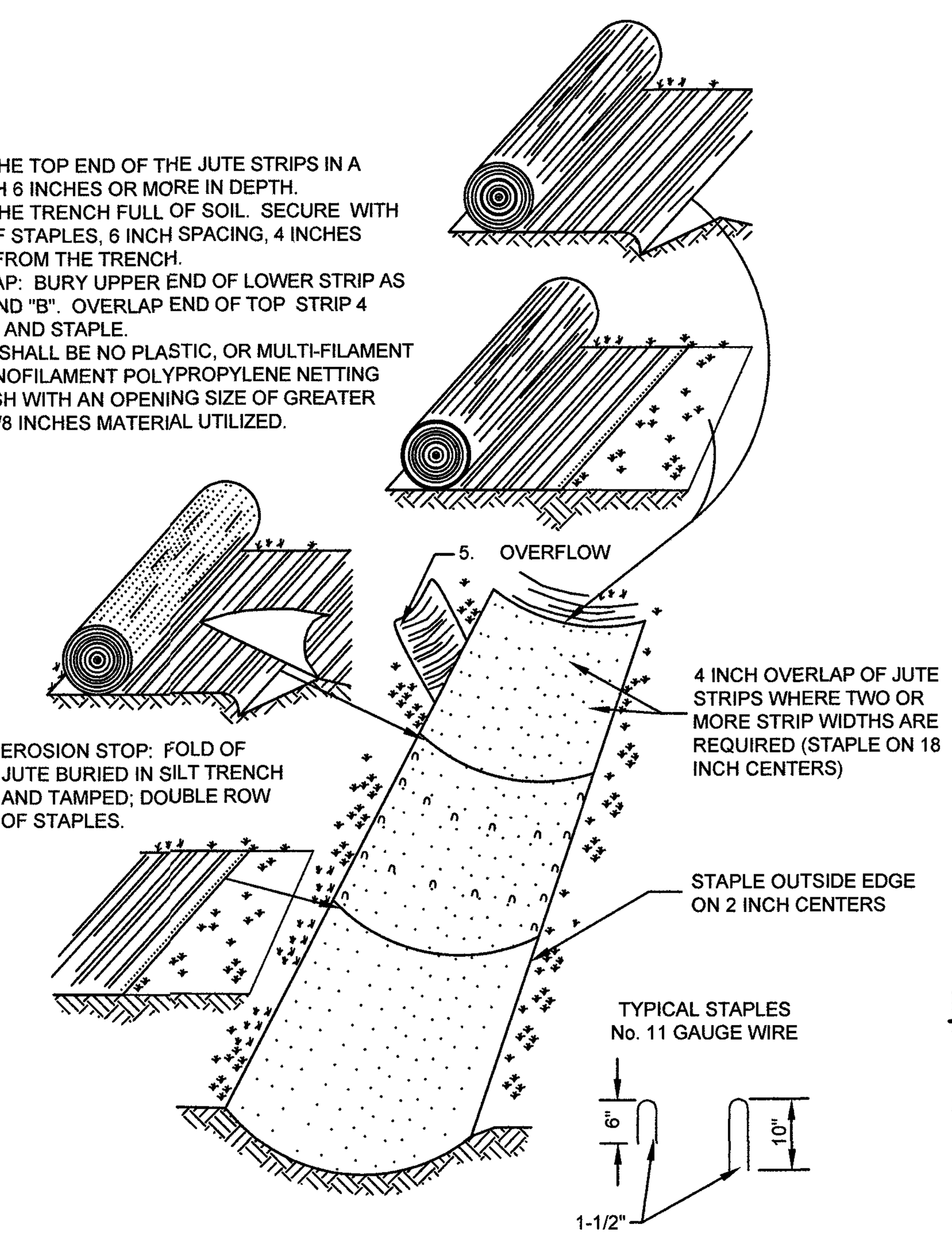




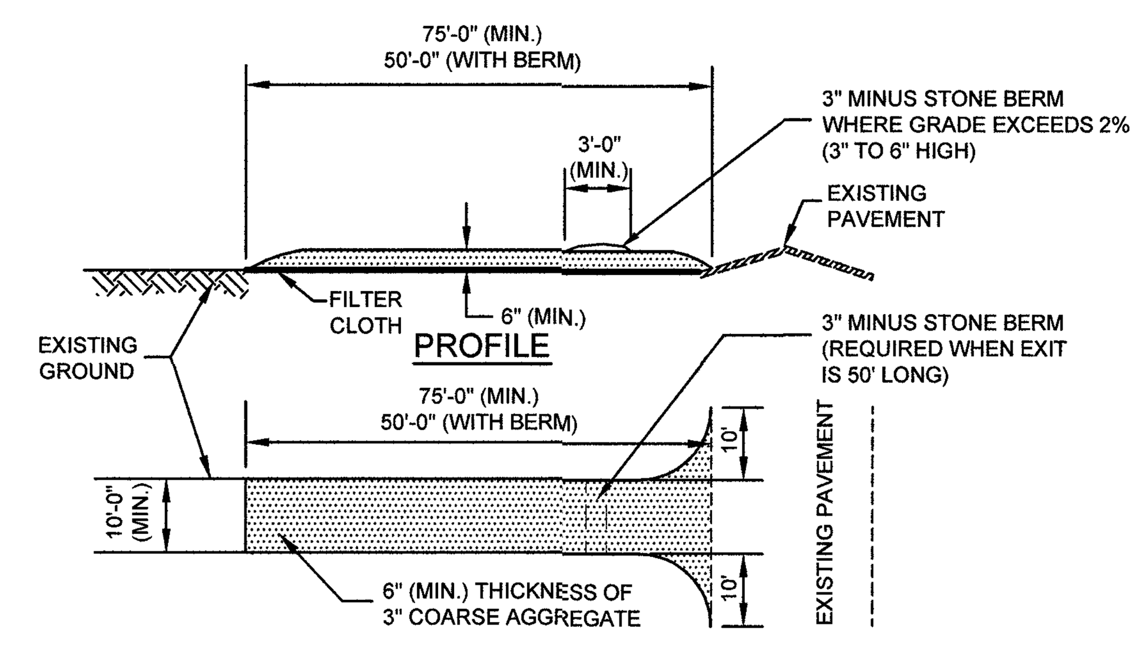
NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.

EROSION CONTROL BLANKETS - SLOPE INSTALLATION
NOT TO SCALE
(AUGUST 2011)

1. BURY THE TOP END OF THE JUTE STRIPS IN A TRENCH 6 INCHES OR MORE IN DEPTH.
2. TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 6 INCH SPACING, 4 INCHES DOWN FROM THE TRENCH.
3. OVERLAP: BURY UPPER END OF LOWER STRIP AS IN "A" AND "B". OVERLAP END OF TOP STRIP 4 INCHES AND STAPLE.
4. THERE SHALL BE NO PLASTIC, OR MULTI-FILAMENT OR MONOFILAMENT POLYPROPYLENE NETTING OR MESH WITH AN OPENING SIZE OF GREATER THAN 1/8 INCHES MATERIAL UTILIZED.



EROSION CONTROL BLANKETS - SWALE INSTALLATION
NOT TO SCALE

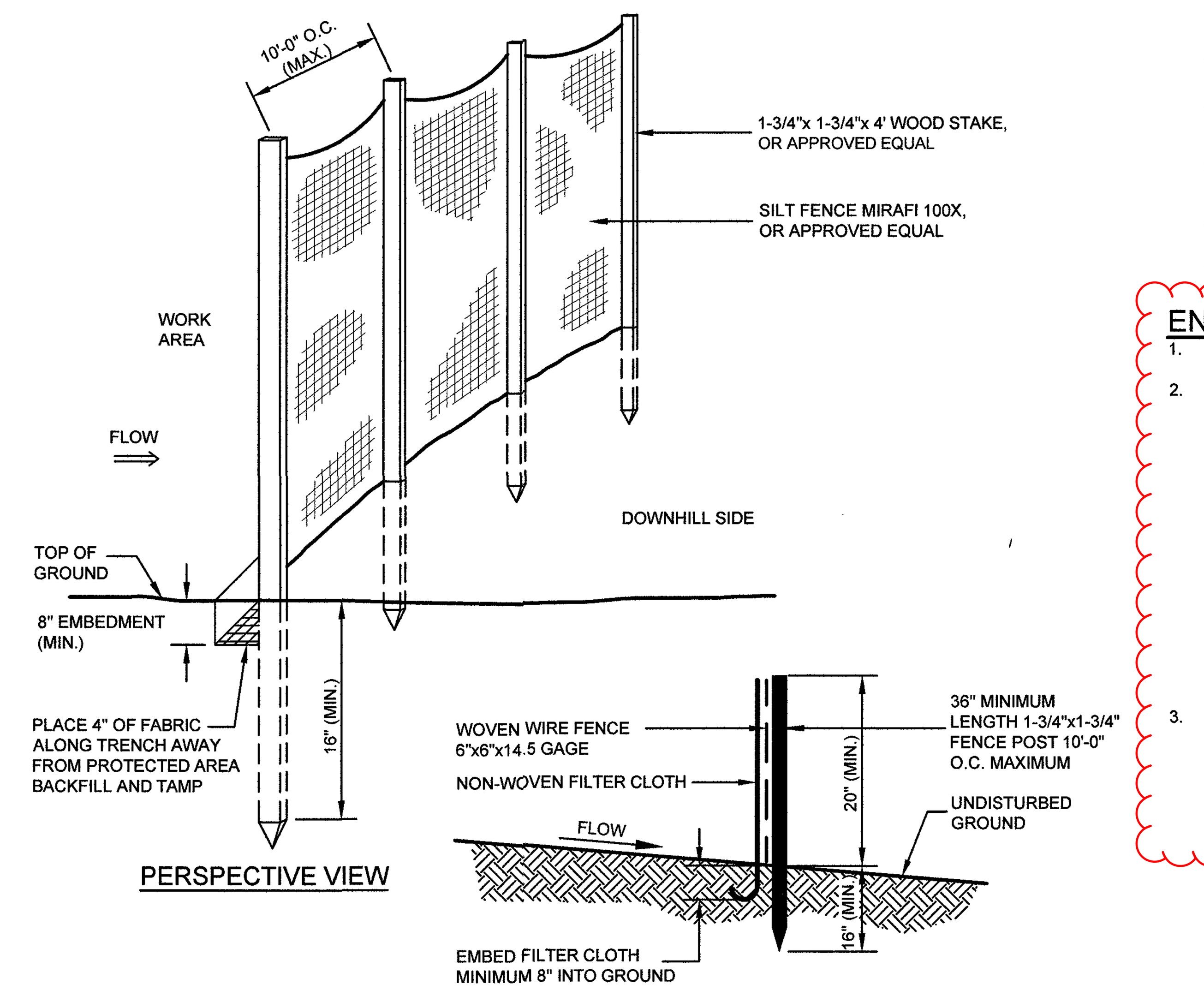


STABILIZED CONSTRUCTION EXIT DETAIL
NOT TO SCALE
(APRIL 2018)

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

IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS:
1. STONE FOR A STABILIZED CONSTRUCTION EXIT SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED EXIT SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED EXIT SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE EXIT SHALL NOT BE LESS THAN THE FULL WIDTH OF THE AREA WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION EXIT SHALL BE PIPED BENEATH THE EXIT. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE EXIT SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY . WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. STABILIZED CONSTRUCTION EXITS SHALL BE A MINIMUM OF 75 FEET LONG UNLESS A 3" TO 6" HIGH 3" MINUS STONE BERM IS PROVIDED, IN WHICH CASE THE LENGTH CAN BE REDUCED TO 50 FEET.



SILT FENCE DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS:
1. THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
2. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
3. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIE OR STAPLES WHERE NOTED OR AS DIRECTED BY DESIGN ENGINEER.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MIDSECTION AND BOTTOM.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
6. FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 16 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

MAINTENANCE:
1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH 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 THE HEIGHT 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.

CONSTRUCTION SEQUENCE
1. CONTRACTOR TO NOTIFY DIG-SAFE 72-HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN ENVIRONMENTAL MONITOR TO COMPLETE ALL NECESSARY INSPECTIONS AND REPORTS REQUIRED BY THE DEPARTMENT OF ENVIRONMENTAL SERVICES AS OUTLINED IN ENV-WQ 1505 (SEE ENVIRONMENTAL MONITORING NOTES).
3. PRIOR TO GRUBBING OF CLEARED AREAS, ALL SILTATION BARRIERS DESIGNED FOR USE AS TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED AS CALLED FOR ON PROJECT PLANS. INSTALL STABILIZED CONSTRUCTION EXIT AT LOCATION OF CONSTRUCTION ACCESS AT LOCATION OF INTERSECTION WITH EXISTING PAVEMENT.
4. CUT AND CLEAR TREES AND BRUSH FROM CONSTRUCTION AREAS TO THE EXTENT NECESSARY. ALL BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF BY CONTRACTOR. THIS PROJECT IS MANAGED TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
5. COMPLETE GRUBBING OPERATIONS UNDER THE ROADWAY AND SLOPE SECTIONS . ALL STUMPS AND SIMILAR DEBRIS SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR. ORGANIC MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLAND AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
6. CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION.
7. STABILIZE ALL DITCHLINES AND PONDS PRIOR TO DIRECTING FLOW INTO THEM, CONSTRUCT DRAINAGE SYSTEM SEWER AND OTHER SUBSURFACE UTILITIES.
8. COMMENCE CONSTRUCTION OF ROADWAY, PERFORM EXCAVATION ACTIVITIES REQUIRED TO ACHIEVE SUBGRADE ELEVATION. ALL EXCAVATED EMBANKMENTS, DITCHES, SWALES AND ROADWAY CROSS CULVERTS SHALL BE INSTALLED AND STABILIZED. ALL SWALES AND DITCHLINES SHALL BE PROTECTED FROM EROSION BY IMPLEMENTATION OF HAY BALE SILTATION FENCES AS SHOWN ON PROJECT PLANS. DIVERT STORMWATER RUNOFF THROUGH THE USE OF TEMPORARY CULVERTS, OR OTHER MEANS NECESSARY PRIOR TO THE COMPLETIONS OF A FUNCTIONAL STORM DRAINAGE SYSTEM. SLOPES AND EMBANKMENTS SHALL BE STABILIZED BY TRACKING AND TEMPORARY SEEDING WITH WINTER RYE PRIOR TO TURF ESTABLISHMENT. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.
9. COMPLETE CONSTRUCTION OF ROADWAY EMBANKMENTS BY ADDING APPROPRIATE BASE MATERIALS GRADED TO PROPER ELEVATION.
10. APPLY TOPSOIL TO ROADWAY SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED SO AS TO BE FREE OF 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. CONSTRUCTION PERSONNEL SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS HAS BECOME ESTABLISHED.
11. PERFORM FINE GRADING OF ROADWAY BASE MATERIALS.
12. MAINTAIN, REPAIR AND REPLACE AS NECESSARY TEMPORARY EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE CONSTRUCTION AREA HAS BEEN STABILIZED (A MINIMUM OF ONE WINTER SHALL HAVE PASSED).
13. AFTER STABILIZATION ,REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
14. MONITOR CONSTRUCTION ACTIVITIES ON 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. ALL DRIVEWAYS ACROSS DITCHLINES SHALL HAVE CULVERTS INSTALLED IN ACCORDANCE WITH LOCAL REQUIREMENTS.
15. LOT DISTURBANCE , OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

EROSION CONTROL NOTES:
1. EXPOSED EARTHWORK SHALL BE CONFINED TO AS LIMITED AN AREA AS IS PRACTICAL AT ANY GIVEN TIME THROUGHOUT THE CONSTRUCTION SEQUENCE. AT NO TIME SHALL MORE THAN FIVE (5) ACRES OF SITE AREA BE IN AN UNSTABLE CONDITION. NO GIVEN AREA OF THE SITE SHALL BE LEFT IN AN UNSTABILIZED CONDITION FOR A PERIOD OF TIME EXCEEDING THIRTY (30) CALENDAR DAYS.
2. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH PROJECT PLANS. IN ADDITION, SIMILAR MEASURES SHALL BE INSTALLED WHERE AND WHEN THE FIELD CONDITION, OR FIELD OPERATION OF THE INDIVIDUAL SITE CONTRACTOR, MAY WARRANT. ALL TEMPORARY EROSION CONTROL MEASURES USED SHALL BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER 0.25" OF RAINFALL OR MORE. THEY SHALL BE CLEANED AND MAINTAINED AND OTHERWISE KEPT IN AN EFFECTIVE OPERATING MANNER THROUGHOUT THE CONSTRUCTION PERIOD.
3. ALL DISTURBED AREAS DESIGNATED TO BE TURF, SHALL RECEIVE A MINIMUM APPLICATION OF 4 INCHES OF LOAM (COMPACTED THICKNESS), PRIOR TO FINAL SEEDING AND MULCHING.
4. ALL SWALES AND DITCHLINES SHALL BE PERIODICALLY CLEANED OF DEPOSITED SEDIMENT SO AS TO MAINTAIN AN EFFECTIVE GRADE AND CROSS SECTION. ALL SWALES AND DITCHLINES SHALL BE FULLY STABILIZED PRIOR TO HAVING STORMWATER DIRECTED TOWARDS THEM.
5. IN THE EVENT THAT, DURING CONSTRUCTION OF ANY PORTION OF THIS PROJECT, A WINTER SHUTDOWN IS NECESSARY, THE CONTRACTOR SHALL STABILIZE ALL INCOMPLETE WORK AND PROVIDE FOR SUITABLE METHODS OF DIVERTING RUNOFF IN ORDER TO ELIMINATE SHEET FLOW ACROSS FROZEN SURFACES.
6. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
   - A. BASE COURSE GRAVELS ARE INSTALLED IN AREAS TO BE PAVED;
   - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED; OR
   - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
7. DUST SHALL BE CONTROLLED BY THE USE OF WATER AS NECESSARY THROUGHOUT THE CONSTRUCTION PERIOD, IN ACCORDANCE WITH ENV-A 1000.
8. IN NO WAY ARE THOSE TEMPORARY EROSION CONTROL MEASURES INDICATED ON THESE PLANS TO BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR SHALL USE JUDGEMENT IN INSTALLING SUPPLEMENTARY EROSION CONTROL MEASURES WHERE AND WHEN SPECIFIC SITE CONDITIONS AND/OR CONSTRUCTION METHODOLOGIES MAY WARRANT.
9. AREAS HAVING FINISH GRADE SLOPES OF 3 : 1 OR STEEPER, SHALL BE STABILIZED WITH JUTE MATTING WHEN AND IF FIELD CONDITIONS WARRANT, OR IF SO ORDERED. JUTE MATTING INSTALLED TO CONFORM WITH THE RECOMMENDED BEST MANAGEMENT PRACTICE OUTLINED IN VOLUME 3 OF THE NEW HAMPSHIRE STORMWATER MANUAL "EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION."
10. ALL DETENTION PONDS AND TREATMENT SWALES SHALL BE CONSTRUCTED PRIOR TO ANY EARTH MOVING ACTIVITIES THAT WILL INFLUENCE STORMWATER RUNOFF.
11. ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
12. ALL CUT AND FILL SLOPES SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

ENVIRONMENTAL MONITORING:
1. THE APPLICANT'S CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AN ENVIRONMENTAL MONITOR TO COMPLETE ALL NECESSARY INSPECTIONS AND REPORTS REQUIRED BY THE DEPARTMENT OF ENVIRONMENTAL SERVICES AS OUTLINED IN ENV-WQ 1505.
2. SUBJECT TO (3), BELOW, THE ENVIRONMENTAL MONITOR SHALL:
   - a. INSPECT THE PROJECT SITE AT LEAST ONCE EACH WEEK FROM THE START OF TERRAIN ALTERATION ACTIVITIES UNTIL ALL TERRAIN ALTERATION ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED;
   - b. IN ADDITION TO REGULAR WEEKLY INSPECTIONS, INSPECT THE PROJECT SITE DURING ANY RAIN EVENT IN WHICH 0.5 INCH OF PRECIPITATION OR MORE FALLS WITHIN A 24 HOUR PERIOD, PROVIDED THAT IF THE ENVIRONMENTAL MONITOR IS UNABLE TO BE PRESENT DURING SUCH A STORM, THE MONITOR SHALL INSPECT THE SITE WITHIN 24 HOURS OF THE RAIN EVENT;
   - c. SUBMIT A WRITTEN REPORT, STAMPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, TO THE DEPARTMENT WITHIN 24 HOURS OF EACH INSPECTION THAT:
     - DESCRIBES THE PROGRESS OF THE PROJECT, INCLUDING WHETHER ALL CONDITIONS OF THE PERMIT ARE BEING MET AND, IF NOT, WHICH REQUIREMENTS ARE NOT BEING MET;
     - IF ANY REQUIREMENTS ARE NOT BEING MET, AN EXPLANATION OF THE CORRECTIVE ACTION(S) THAT WILL BE OR ARE BEING TAKEN TO BRING THE PROJECT INTO COMPLIANCE WITH APPLICABLE REQUIREMENTS AND THE DEADLINE BY WHICH SUCH ACTIONS WILL BE COMPLETED; AND
     - INCLUDES PHOTOGRAPHS OF THE SITE THAT ARE REPRESENTATIVE OF THE PROJECT; AND
   - d. RETAIN A COPY OF THE REPORT PREPARED PURSUANT TO (c), ABOVE, ON-SITE FOR REVIEW DURING SITE INSPECTIONS BY FEDERAL, STATE, AND LOCAL OFFICIALS.
3. ROUTINE INSPECTION FREQUENCY MAY BE REDUCED FROM ONCE EACH WEEK TO AT LEAST ONCE EACH MONTH IF EITHER OF THE FOLLOWING CONDITIONS IS MET:
   - a. WORK HAS BEEN SUSPENDED AND THE ENTIRE SITE IS STABILIZED IN ACCORDANCE WITH ENV-WQ 1505.04; OR
   - b. RUNOFF IS UNLIKELY BECAUSE:
     - THE GROUND IS FROZEN OR THE SITE IS COVERED WITH SNOW OR ICE; AND
     - THE PROJECT IS IN AN AREA WHERE FROZEN CONDITIONS ARE ANTICIPATED TO CONTINUE FOR MORE THAN ONE MONTH.

CONSTRUCTION DETAILS
BARRETT HILL SUBDIVISION
MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

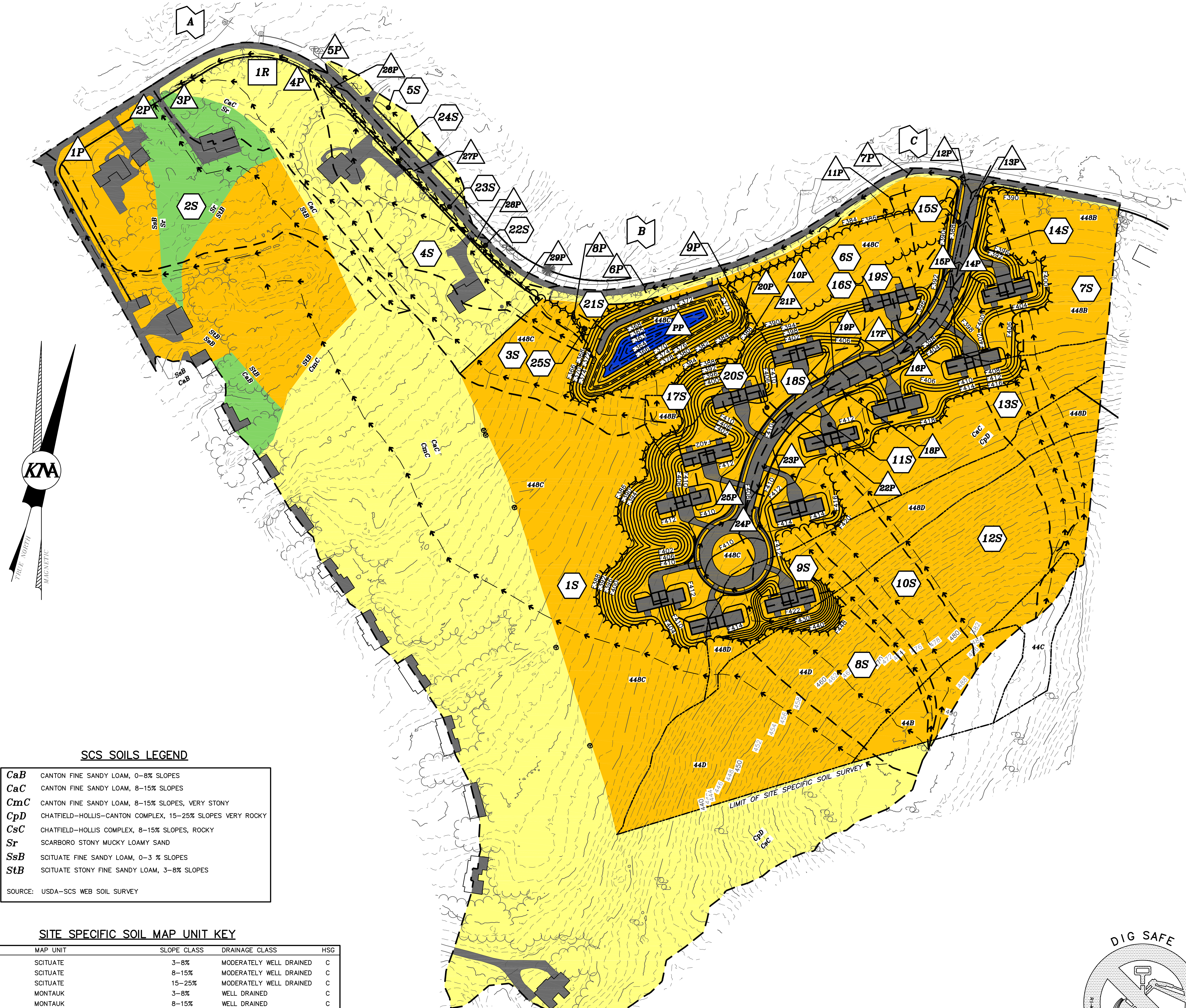
KNA KEACH–NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627–2881

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

REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	4/23/24	NHDES AOT & SITE WALK REVS	PCM
3	5/14/24	NHDES AOT REVISIONS	PCM

DATE: DECEMBER 6, 2023	SCALE: AS SHOWN
PROJECT NO: 23-0414-1	SHEET: 20 OF 24



NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL AFTER DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "TOPOGRAPHIC SUBDIVISION PLAN, BARRETT HILL SUBDIVISION, PREPARED BY KEACH–NORDSTROM ASSOCIATES, INC. DATED DECEMBER 6, 2023."
3. PROPOSED FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "GRADING & DRAINAGE PLAN, BARRETT HILL SUBDIVISION, PREPARED BY KEACH–NORDSTROM ASSOCIATES, INC. DATED DECEMBER 6, 2023."

DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

- SCS SOIL LINES
- SITE SPECIFIC SOIL LINES
- 44B — DENOTES SOIL TYPE
- SOIL GROUP A
- SOIL GROUP B
- SOIL GROUP C
- SOIL GROUP D
- IMPERVIOUS AREA
- OPEN WATER
- P — DENOTES POND
- S — DENOTES SUBCATCHMENT AREA
- L — DENOTES POINT OF INTEREST
- R — DENOTES REACH
- LIMIT OF SUBCATCHMENT AREA
- TIME OF CONCENTRATION
- REACH

SCS SOILS LEGEND

CaB	CANTON FINE SANDY LOAM, 0–8% SLOPES
CaC	CANTON FINE SANDY LOAM, 8–15% SLOPES
CmC	CANTON FINE SANDY LOAM, 8–15% SLOPES, VERY STONY
CpD	CHATFIELD–HOLLIS–CANTON COMPLEX, 15–25% SLOPES VERY ROCKY
CsC	CHATFIELD–HOLLIS COMPLEX, 8–15% SLOPES, ROCKY
Sr	SCARBORO STONY MUCKY LOAMY SAND
SsB	SCITUATE FINE SANDY LOAM, 0–3 % SLOPES
StB	SCITUATE STONY FINE SANDY LOAM, 3–8% SLOPES

SOURCE: USDA–SCS WEB SOIL SURVEY

SITE SPECIFIC SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HSG
448B	SCITUATE	3–8%	MODERATELY WELL DRAINED	C
448C	SCITUATE	8–15%	MODERATELY WELL DRAINED	C
448D	SCITUATE	15–25%	MODERATELY WELL DRAINED	C
44B	MONTAUK	3–8%	WELL DRAINED	C
44C	MONTAUK	8–15%	WELL DRAINED	C
44D	MONTAUK	15–25%	WELL DRAINED	C

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOILS SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP AND MAP KEY.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

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

POST DEVELOPMENT DRAINAGE PLAN (WITH COLOR)

BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

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

REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	4/23/24	NHDES AOT & SITE WALK REVS	PCM
3	5/14/24	NHDES AOT REVISIONS	PCM

DATE: DECEMBER 6, 2023 | SCALE: 1"=100'
PROJECT NO: 23–0414–1 | SHEET: 4 OF 4

KNA KEACH-NORDSTROM ASSOCIATES, INC.

May 14, 2024

Jeffrey W. Price, PE
Alteration of Terrain Bureau, NHDES
29 Hazen Drive
Concord, NH 03302

Subject: **AOT Permit Application #231220-249**
Channel Protection Requirements
Barrett Hill Subdivision – Map 151, Lot 59
KNA Project No. 23-0414-1

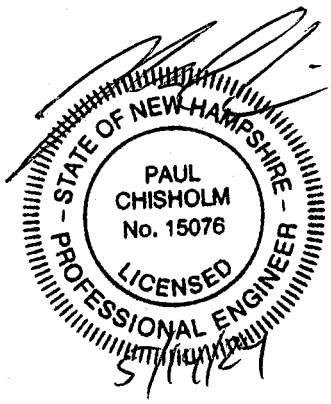
Dear Mr. Price:

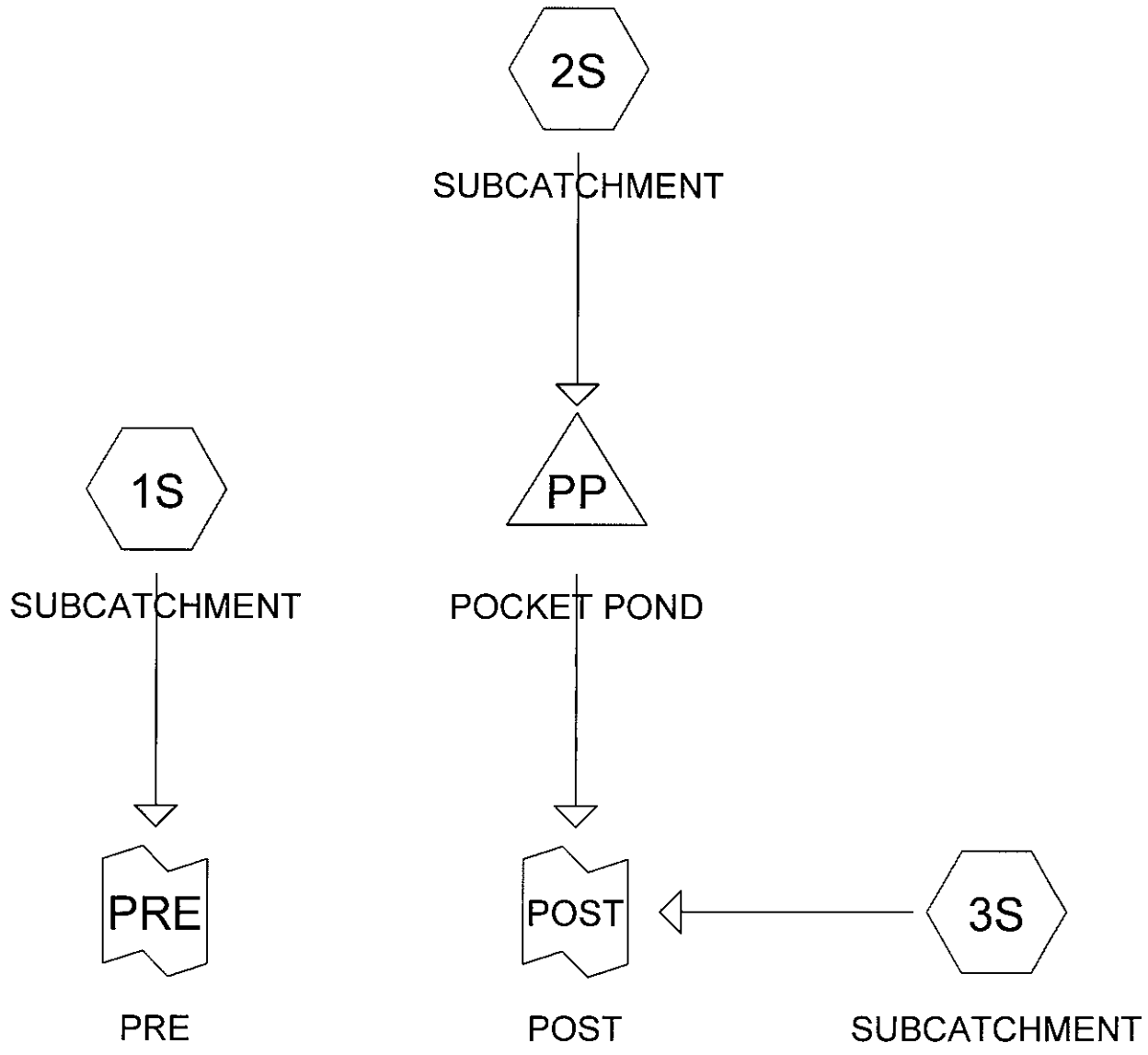
A separate drainage analysis was prepared to demonstrate the project's compliance with Env-Wq 1507.05 Channel Protection Requirements. The standalone drainage analysis focuses solely on the proposed area of disturbance on the subject property and excludes the offsite drainage improvements and contributing drainage areas. In the pre-development scenario, the 1-year frequency storm event produces 5.13 cfs of runoff. In the post-development scenario, the 2-year frequency storm event produces 4.93 cfs of runoff therefore meeting the requirements of Env-Wq 1507.05(b)(3). Please refer to the attached calculations and exhibits, which support these findings.

If you have any questions or comments, please reach out by phone at (603) 627-2881 or by email at pmadsen@keachnordstrom.com.

Respectfully,

Peter Madsen, EIT
Project Engineer
Keach Nordstrom Associates, Inc.
10 Commerce Park North, Suite 3
Bedford, NH 03110





Subcat Reach Pond Link

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.235	74.0	>75% Grass cover, Good, HSG C (1S, 2S, 3S)
0.096	96.0	Gravel surface, HSG C (1S, 2S, 3S)
1.290	98.0	Paved parking (2S)
0.002	98.0	Paved parking, HSG C (3S)
0.608	98.0	Roofs (2S)
0.136	98.0	Roofs, HSG C (3S)
4.099	55.0	Woods, Good, HSG B (1S, 2S, 3S)
38.449	70.0	Woods, Good, HSG C (1S, 2S, 3S)
51.914	**70.5**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
4.099	HSG B	1S, 2S, 3S
45.918	HSG C	1S, 2S, 3S
0.000	HSG D	
1.898	Other	2S
51.914		**TOTAL AREA**

Time span=0.00-128.00 hrs, dt=0.01 hrs, 12801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT Runoff Area=1,130,697 sf 0.00% Impervious Runoff Depth=0.40"
Flow Length=1,268' Tc=30.2 min CN=68.8 Runoff=5.13 cfs 0.87 af

Subcatchment2S: SUBCATCHMENT Runoff Area=649,777 sf 12.72% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=75.0 Runoff=9.85 cfs 0.79 af

Subcatchment3S: SUBCATCHMENT Runoff Area=480,920 sf 1.25% Impervious Runoff Depth=0.39"
Flow Length=712' Tc=16.4 min CN=68.5 Runoff=2.57 cfs 0.36 af

Pond PP: POCKET POND Peak Elev=368.82' Storage=37,729 cf Inflow=9.85 cfs 0.79 af
Primary=0.17 cfs 0.78 af Secondary=0.00 cfs 0.00 af Outflow=0.17 cfs 0.78 af

Link POST: POST Inflow=2.68 cfs 1.14 af
Primary=2.68 cfs 1.14 af

Link PRE: PRE Inflow=5.13 cfs 0.87 af
Primary=5.13 cfs 0.87 af

Total Runoff Area = 51.914 ac Runoff Volume = 2.01 af Average Runoff Depth = 0.47"
96.08% Pervious = 49.879 ac 3.92% Impervious = 2.036 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 5.13 cfs @ 12.54 hrs, Volume= 0.87 af, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.47"

Area (sf)	CN	Description
89,272	55.0	Woods, Good, HSG B
1,039,700	70.0	Woods, Good, HSG C
1,053	74.0	>75% Grass cover, Good, HSG C
672	96.0	Gravel surface, HSG C
1,130,697	68.8	Weighted Average
1,130,697	68.8	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
11.1	1,168	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.2	1,268	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 9.85 cfs @ 12.10 hrs, Volume= 0.79 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.47"

	Area (sf)	CN	Description
	3,479	55.0	Woods, Good, HSG B
	341,476	70.0	Woods, Good, HSG C
	218,738	74.0	>75% Grass cover, Good, HSG C
*	56,188	98.0	Paved parking
*	26,490	98.0	Roofs
	3,406	96.0	Gravel surface, HSG C
	649,777	75.0	Weighted Average
	567,099	71.6	87.28% Pervious Area
	82,678	98.0	12.72% Impervious Area

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

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 2.57 cfs @ 12.30 hrs, Volume= 0.36 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YEAR Rainfall=2.47"

Area (sf)	CN	Description
85,793	55.0	Woods, Good, HSG B
293,669	70.0	Woods, Good, HSG C
95,363	74.0	>75% Grass cover, Good, HSG C
101	96.0	Gravel surface, HSG C
5,927	98.0	Roofs, HSG C
67	98.0	Paved parking, HSG C
480,920	68.5	Weighted Average
474,926	68.1	98.75% Pervious Area
5,994	98.0	1.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.1100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
5.1	612	0.1620	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.4	712	Total			

Summary for Pond PP: POCKET POND

Inflow Area = 14.917 ac, 12.72% Impervious, Inflow Depth = 0.63" for 1-YEAR event
Inflow = 9.85 cfs @ 12.10 hrs, Volume= 0.79 af
Outflow = 0.17 cfs @ 24.04 hrs, Volume= 0.78 af, Atten= 98%, Lag= 716.2 min
Primary = 0.17 cfs @ 24.04 hrs, Volume= 0.78 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Starting Elev= 366.00' Surf.Area= 7,378 sf Storage= 10,599 cf
Peak Elev= 368.82' @ 24.04 hrs Surf.Area= 11,961 sf Storage= 37,729 cf (27,130 cf above start)
Flood Elev= 374.00' Surf.Area= 23,689 sf Storage= 127,049 cf (116,450 cf above start)

Plug-Flow detention time= 2,583.1 min calculated for 0.54 af (68% of inflow)
Center-of-Mass det. time= 1,824.8 min (2,701.2 - 876.5)

Volume	Invert	Avail.Storage	Storage Description
#1	363.00'	127,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 870 cf Overall x 0.0% Voids
		127,049 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
363.00	520	0	0
364.00	2,109	1,315	1,315
365.00	4,541	3,325	4,640
366.00	7,378	5,960	10,599
368.00	10,543	17,921	28,520
370.00	14,007	24,550	53,070
371.00	15,844	14,926	67,996
372.00	18,773	17,309	85,304
374.00	22,972	41,745	127,049

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	153	0	0
371.00	717	870	870

Device	Routing	Invert	Outlet Devices
#1	Primary	364.57'	**15.0" Round Culvert** L= 106.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 364.57' / 356.50' S= 0.0755 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	366.00'	**2.0" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**2.5" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.90'	**5.0' long x 95.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.17 cfs @ 24.04 hrs HW=368.82' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.17 cfs of 11.25 cfs potential flow)
  ├─**2=Orifice** (Orifice Controls 0.17 cfs @ 7.96 fps)
  ├─**3=Orifice** (Controls 0.00 cfs)
  ├─**4=Orifice** (Controls 0.00 cfs)
  └─**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=366.00' TW=0.00' (Dynamic Tailwater)
└─**6=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link POST: POST

Inflow Area = 25.957 ac, 7.84% Impervious, Inflow Depth > 0.53" for 1-YEAR event
Inflow = 2.68 cfs @ 12.30 hrs, Volume= 1.14 af
Primary = 2.68 cfs @ 12.30 hrs, Volume= 1.14 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs

Summary for Link PRE: PRE

Inflow Area = 25.957 ac, 0.00% Impervious, Inflow Depth = 0.40" for 1-YEAR event
Inflow = 5.13 cfs @ 12.54 hrs, Volume= 0.87 af
Primary = 5.13 cfs @ 12.54 hrs, Volume= 0.87 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs

Time span=0.00-128.00 hrs, dt=0.01 hrs, 12801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: SUBCATCHMENT Runoff Area=1,130,697 sf 0.00% Impervious Runoff Depth=0.64"
Flow Length=1,268' Tc=30.2 min CN=68.8 Runoff=9.21 cfs 1.38 af

Subcatchment2S: SUBCATCHMENT Runoff Area=649,777 sf 12.72% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=75.0 Runoff=15.25 cfs 1.15 af

Subcatchment3S: SUBCATCHMENT Runoff Area=480,920 sf 1.25% Impervious Runoff Depth=0.62"
Flow Length=712' Tc=16.4 min CN=68.5 Runoff=4.79 cfs 0.57 af

Pond PP: POCKET POND Peak Elev=369.81' Storage=50,398 cf Inflow=15.25 cfs 1.15 af
Primary=0.29 cfs 1.14 af Secondary=0.00 cfs 0.00 af Outflow=0.29 cfs 1.14 af

Link POST: POST Inflow=4.93 cfs 1.71 af
Primary=4.93 cfs 1.71 af

Link PRE: PRE Inflow=9.21 cfs 1.38 af
Primary=9.21 cfs 1.38 af

Total Runoff Area = 51.914 ac Runoff Volume = 3.10 af Average Runoff Depth = 0.72"
96.08% Pervious = 49.879 ac 3.92% Impervious = 2.036 ac

Summary for Subcatchment 1S: SUBCATCHMENT

Runoff = 9.21 cfs @ 12.50 hrs, Volume= 1.38 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
89,272	55.0	Woods, Good, HSG B
1,039,700	70.0	Woods, Good, HSG C
1,053	74.0	>75% Grass cover, Good, HSG C
672	96.0	Gravel surface, HSG C
1,130,697	68.8	Weighted Average
1,130,697	68.8	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	100	0.0300	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
11.1	1,168	0.1220	1.75		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
30.2	1,268	Total			

Summary for Subcatchment 2S: SUBCATCHMENT

Runoff = 15.25 cfs @ 12.10 hrs, Volume= 1.15 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

	Area (sf)	CN	Description
	3,479	55.0	Woods, Good, HSG B
	341,476	70.0	Woods, Good, HSG C
	218,738	74.0	>75% Grass cover, Good, HSG C
*	56,188	98.0	Paved parking
*	26,490	98.0	Roofs
	3,406	96.0	Gravel surface, HSG C
	649,777	75.0	Weighted Average
	567,099	71.6	87.28% Pervious Area
	82,678	98.0	12.72% Impervious Area

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

Summary for Subcatchment 3S: SUBCATCHMENT

Runoff = 4.79 cfs @ 12.27 hrs, Volume= 0.57 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YEAR Rainfall=2.95"

Area (sf)	CN	Description
85,793	55.0	Woods, Good, HSG B
293,669	70.0	Woods, Good, HSG C
95,363	74.0	>75% Grass cover, Good, HSG C
101	96.0	Gravel surface, HSG C
5,927	98.0	Roofs, HSG C
67	98.0	Paved parking, HSG C
480,920	68.5	Weighted Average
474,926	68.1	98.75% Pervious Area
5,994	98.0	1.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	100	0.1100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.95"
5.1	612	0.1620	2.01		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.4	712	Total			

Summary for Pond PP: POCKET POND

Inflow Area = 14.917 ac, 12.72% Impervious, Inflow Depth = 0.93" for 2-YEAR event
Inflow = 15.25 cfs @ 12.10 hrs, Volume= 1.15 af
Outflow = 0.29 cfs @ 22.75 hrs, Volume= 1.14 af, Atten= 98%, Lag= 639.5 min
Primary = 0.29 cfs @ 22.75 hrs, Volume= 1.14 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.00 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs
Starting Elev= 366.00' Surf.Area= 7,378 sf Storage= 10,599 cf
Peak Elev= 369.81' @ 22.75 hrs Surf.Area= 14,053 sf Storage= 50,398 cf (39,799 cf above start)
Flood Elev= 374.00' Surf.Area= 23,689 sf Storage= 127,049 cf (116,450 cf above start)

Plug-Flow detention time= 2,669.9 min calculated for 0.90 af (78% of inflow)
Center-of-Mass det. time= 2,089.1 min (2,953.1 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	363.00'	127,049 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#2	369.00'	0 cf	**Sediment Forebay (No Storage) (Prismatic)** Listed below (Recalc) 870 cf Overall x 0.0% Voids
		127,049 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
363.00	520	0	0
364.00	2,109	1,315	1,315
365.00	4,541	3,325	4,640
366.00	7,378	5,960	10,599
368.00	10,543	17,921	28,520
370.00	14,007	24,550	53,070
371.00	15,844	14,926	67,996
372.00	18,773	17,309	85,304
374.00	22,972	41,745	127,049

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
369.00	153	0	0
371.00	717	870	870

Device	Routing	Invert	Outlet Devices
#1	Primary	364.57'	**15.0" Round Culvert** L= 106.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 364.57' / 356.50' S= 0.0755 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	366.00'	**2.0" Vert. Orifice** C= 0.600
#3	Device 1	369.45'	**2.5" Vert. Orifice** C= 0.600
#4	Device 1	371.50'	**3.0" Vert. Orifice** C= 0.600
#5	Device 1	373.70'	**48.0" x 48.0" Horiz. Grate** C= 0.600 Limited to weir flow at low heads
#6	Secondary	373.90'	**5.0' long x 95.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.29 cfs @ 22.75 hrs HW=369.81' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.29 cfs of 12.69 cfs potential flow)
↑—**2=Orifice** (Orifice Controls 0.20 cfs @ 9.29 fps)
—**3=Orifice** (Orifice Controls 0.08 cfs @ 2.42 fps)
—**4=Orifice** (Controls 0.00 cfs)
—**5=Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=366.00' TW=0.00' (Dynamic Tailwater)
↑—**6=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link POST: POST

Inflow Area = 25.957 ac, 7.84% Impervious, Inflow Depth > 0.79" for 2-YEAR event
Inflow = 4.93 cfs @ 12.27 hrs, Volume= 1.71 af
Primary = 4.93 cfs @ 12.27 hrs, Volume= 1.71 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs

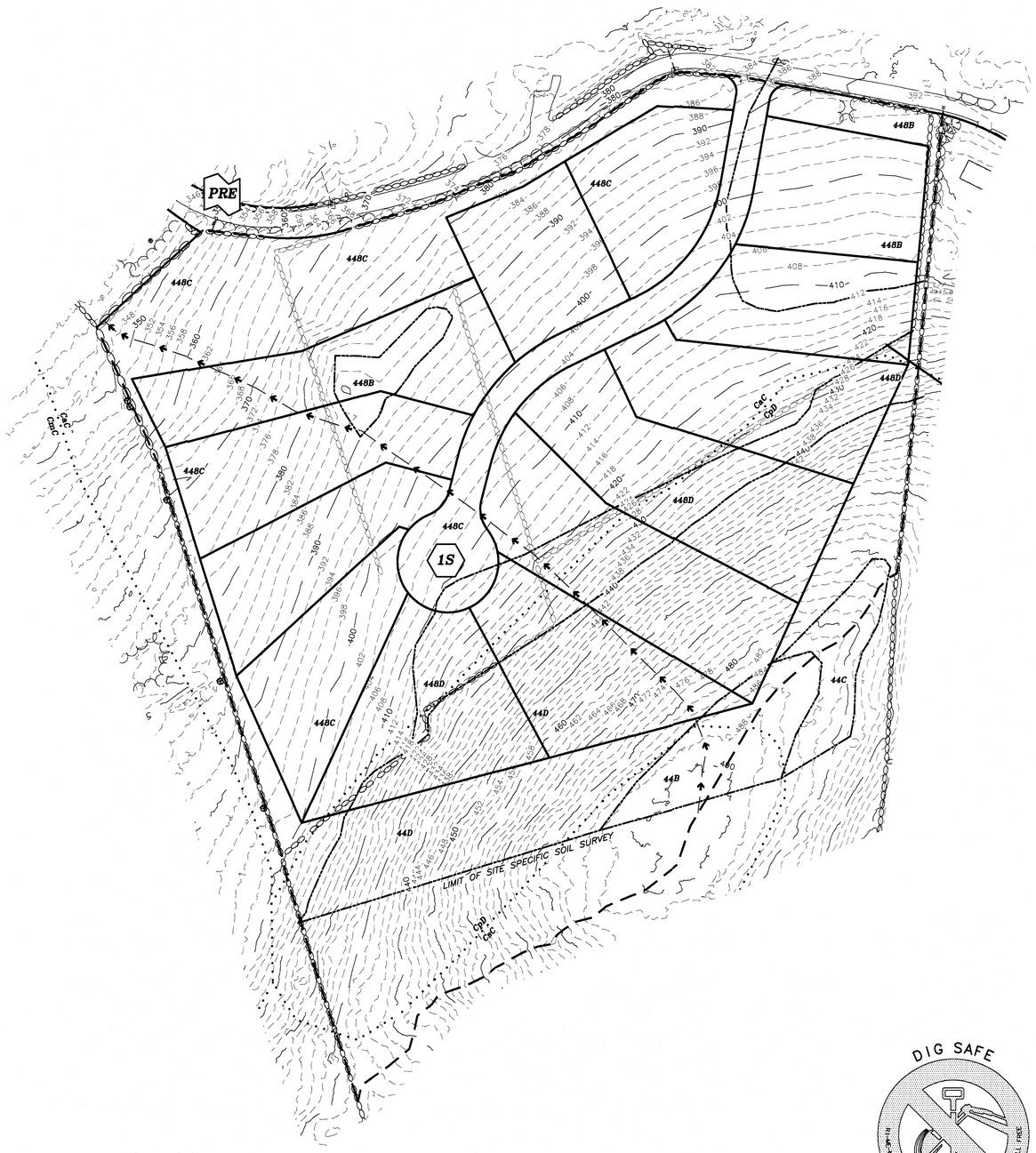
Summary for Link PRE: PRE

Inflow Area = 25.957 ac, 0.00% Impervious, Inflow Depth = 0.64" for 2-YEAR event
Inflow = 9.21 cfs @ 12.50 hrs, Volume= 1.38 af
Primary = 9.21 cfs @ 12.50 hrs, Volume= 1.38 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-128.00 hrs, dt= 0.01 hrs

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL PRIOR TO DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "TOPOGRAPHIC SUBDIVISION PLAN, BARRETT HILL SUBDIVISION, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED DECEMBER 6, 2023."



DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

- SCS SOIL LINES
- SITE SPECIFIC SOIL LINES
- 44B — DENOTES SOIL TYPE
- P — DENOTES POND
- S — DENOTES SUBCATCHMENT AREA
- L — DENOTES POINT OF INTEREST
- R — DENOTES REACH
- LIMIT OF SUBCATCHMENT AREA
- TIME OF CONCENTRATION
- REACH

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SCS SOILS LEGEND

CaB	CANTON FINE SANDY LOAM, 0-8% SLOPES
CaC	CANTON FINE SANDY LOAM, 8-15% SLOPES
CmC	CANTON FINE SANDY LOAM, 8-15% SLOPES, VERY STONY
CpD	CHATFIELD-HOLLIS-CANTON COMPLEX, 15-25% SLOPES VERY ROCKY
CsC	CHATFIELD-HOLLIS COMPLEX, 8-15% SLOPES, ROCKY
Sr	SCARBORO STONY MUCKY LOAMY SAND
SsB	SCITUATE FINE SANDY LOAM, 0-3 % SLOPES
StB	SCITUATE STONY FINE SANDY LOAM, 3-8% SLOPES

SOURCE: USDA-SCS WEB SOIL SURVEY

SITE SPECIFIC SOIL MAP UNIT KEY

SYMBOL	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HSG
448B	SCITUATE	3-8%	MODERATELY WELL DRAINED	C
448C	SCITUATE	8-15%	MODERATELY WELL DRAINED	C
448D	SCITUATE	15-25%	MODERATELY WELL DRAINED	C
44B	MONTAUK	3-8%	WELL DRAINED	C
44C	MONTAUK	8-15%	WELL DRAINED	C
44D	MONTAUK	15-25%	WELL DRAINED	C

THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOILS SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, PRODUCED BY A CERTIFIED SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCE CONSERVATION SERVICE. THERE IS A NARRATIVE REPORT THAT ACCOMPANIES THIS MAP AND MAP KEY.

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

PRE DEVELOPMENT DRAINAGE PLAN
(DEVELOPED AREA EXHIBIT)
BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

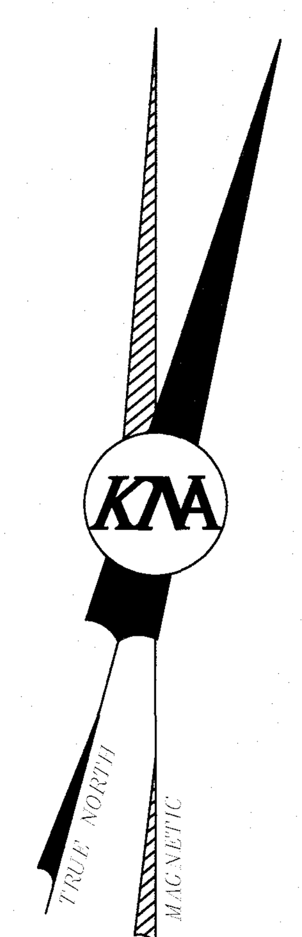
OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

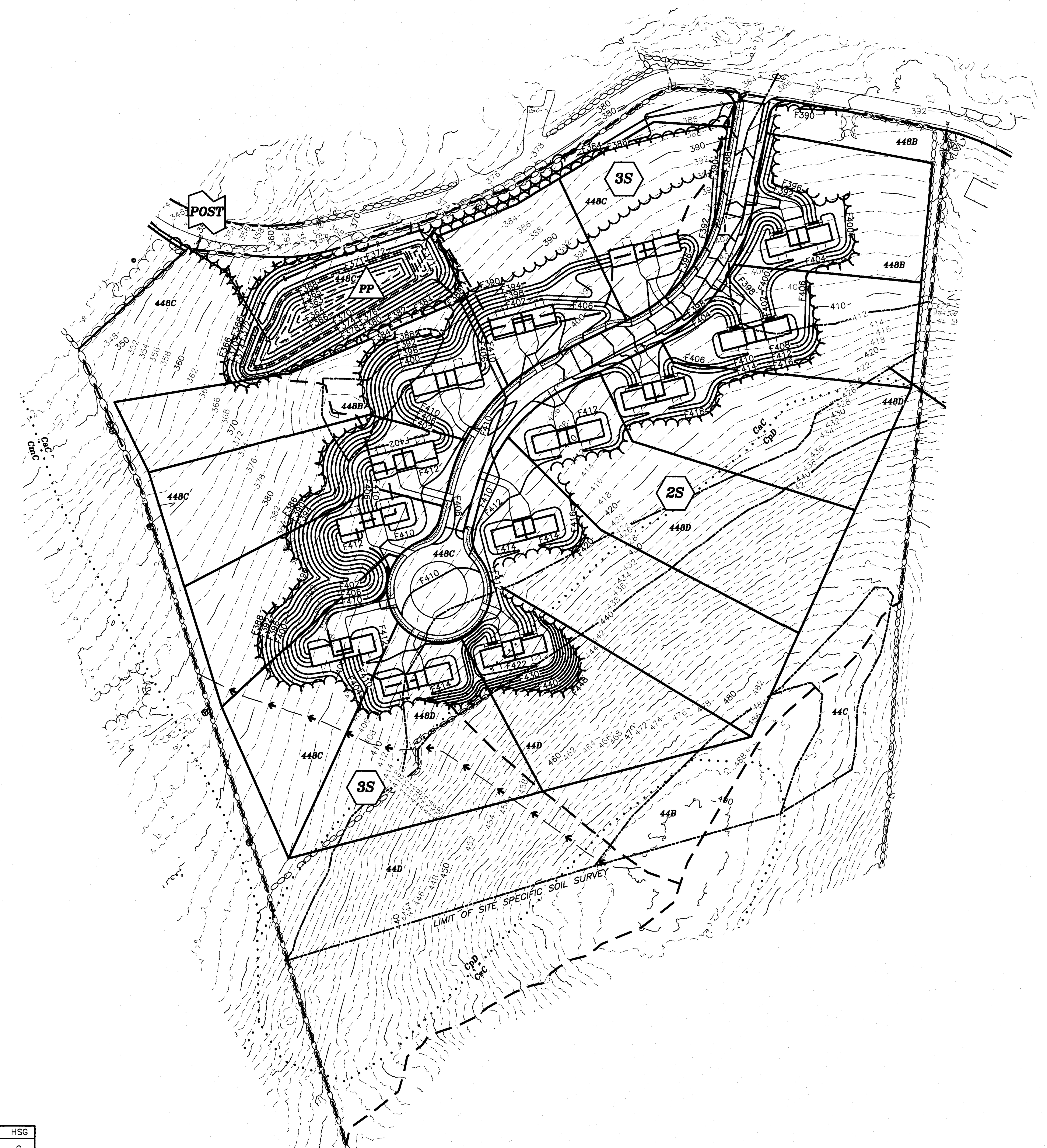
KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	4/23/24	NHDES AOT & SITE WALK REVS	PCM
3	5/14/24	NHDES AOT REVISIONS	PCM

DATE: DECEMBER 6, 2023	SCALE: 1"=100'
PROJECT NO: 23-0414-1	SHEET: 1 OF 2





NOTES:

1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE VARIOUS STORMWATER SUBCATCHMENT AREAS, CORRESPONDING TIMES OF CONCENTRATION, PONDS, AND REACHES ASSOCIATED WITH THE SUBJECT PARCEL AFTER DEVELOPMENT.
2. EXISTING FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "TOPOGRAPHIC SUBDIVISION PLAN, BARRETT HILL SUBDIVISION, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED DECEMBER 6, 2023."
3. PROPOSED FEATURES DEPICTED ON THIS PLAN WERE TAKEN FROM "GRADING & DRAINAGE PLAN, BARRETT HILL SUBDIVISION, PREPARED BY KEACH-NORDSTROM ASSOCIATES, INC. DATED DECEMBER 6, 2023."

DRAINAGE LEGEND:

THE LEGEND BELOW REFLECTS THE HYDROCAD MODEL USED FOR DRAINAGE CALCULATIONS.

· · · · · · · · · · · ·	SCS SOIL LINES
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—— —— ——	REACH

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(IN FEET)
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SOURCE: USDA–SCS WEB SOIL SURVEY

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POST DEVELOPMENT DRAINAGE PLAN (DEVELOPED AREA EXHIBIT)

BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
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KNA *KEACH–NORDSTROM ASSOCIATES, INC.*
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	4/23/24	NHDES AOT & SITE WALK REVS	PCM
3	5/14/24	NHDES AOT REVISIONS	PCM

DATE: DECEMBER 6, 2023	SCALE: 1"=100'
PROJECT NO: 23-0414-1	SHEET: 2 OF 2

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
Robert R. Scott, Commissioner

May 22, 2024

John Gargasz
Barrett Hill, LLC
21 Continental Blvd. Door #4
Merrimack, NH 03054
(sent via email to: johngargasz@gmail.com)

Re: Barrett Hill Subdivision
75 Barretts Hill Road – Hudson
Tax Map 151, Lot 59

Permit: AoT-2594

Dear Applicant:

Based upon the plans and application, approved on May 22, 2024, we are hereby issuing RSA 485-A:17 Alteration of Terrain Permit AoT-2594. The new permit is subject to the following conditions:

PROJECT SPECIFIC CONDITIONS:

1. The plans titled *Barrett Hill Subdivision,* by Keach-Nordstrom Associates, Inc., last revision date May 14, 2024, are a part of this approval. The project must be constructed as shown on the approved plans.

2. **This permit expires on May 22, 2029.** No earth moving activities shall occur on the project after this expiration date unless the permit has been extended by the Department. If requesting an extension, the request must be received by the department before the permit expires. The Amendment Request form is available at: https://www.des.nh.gov/land/land-development.

3. Pursuant to Env-Wq 1504.17, the Permittee shall comply with wildlife protection notes that are incorporated into the project plans, and, if applicable, all recommendations by the New Hampshire Fish and Game Department related to state or federally listed threatened or endangered species that are incorporated into the project plans.

4. No disturbance of individual lots, except as shown on the plans, shall be performed until after the construction and stabilization of all other construction associated with the application has been completed.

5. The permittee shall employ the services of an Environmental Monitor (EM) for the purposes of providing independent professional environmental inspections of the project. The permittee shall receive prior approval of the EM by the Department. The EM shall inspect the project at a minimum frequency of once per week and following rainfall events of 0.5-inch or greater in a 24-hour period. The inspections shall be for the purposes of determining compliance with the permit. The Monitor shall submit a written report, stamped by a qualified engineer or a Certified Professional in Erosion and Sediment Control to the Department within 24 hours of the inspections. The reports shall describe, at a minimum, whether the project is being constructed in accordance with the approved sequence, shall identify any deviation from the conditions of this permit and the approved plans, and identify any other noted deficiencies. Reports shall be submitted to jeffrey.w.price@des.nh.gov.

6. A homeowner's association (HOA) shall have the responsibility to inspect, maintain and repair the stormwater BMPs, pursuant to Env-Wq 1500, when the Applicant or its successors or assigns relinquishes responsibility

through legal instruments. If the HOA is dissolved or otherwise discontinued, the individual homeowners shall have joint and several liability for all inspection, maintenance and repair responsibilities for the stormwater BMPs.

GENERAL CONDITIONS:

1. Activities shall not cause or contribute to any violations of the surface water quality standards established in Administrative Rule Env-Wq 1700.

2. You must submit revised plans for permit amendment prior to any changes in construction details or sequences. You must notify the Department in writing within ten days of a change in ownership.

3. You must notify the Department in writing prior to the start of construction and upon completion of construction. Forms can be submitted electronically at: https://www.des.nh.gov/land/land-development. Paper forms are available at that same web page.

4. **All stormwater practices shall be inspected and maintained in accordance with Env-Wq 1507.07 and the project Inspection and Maintenance (I&M) Manual.** All record keeping required by the I&M Manual shall be maintained by the identified responsible party and be made available to the department upon request. Photographs of the site and BMPs must accompany the I&M submittals.

5. This permit does not relieve the applicant from the obligation to obtain other local, state, or federal permits that may be required (e.g., from US EPA, US Army Corps of Engineers, etc.). Projects disturbing over 1 acre may require a federal stormwater permit from EPA. Information regarding this permitting process can be obtained at: https://www.epa.gov/npdes/2022-construction-general-permit-cgp.

6. In accordance with Env-Wq 1503.21 (c)(1), a written notice signed by the permit holder and a qualified engineer shall be submitted to DES stating that the project was completed in accordance with the approved plans and specifications. If deviations were made, the permit holder shall review the requirements in Env-Wq 1503.21(c)(2).

7. If applicable, no activity shall occur in wetland areas until a Wetlands Permit is obtained from the Department. Issuance of this permit does not obligate the Department to approve a Wetlands Permit for this project.

8. This project has been screened for potential impact to known occurrences of protected species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or have not been surveyed in detail, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species. This permit does not authorize in any way the take of threatened or endangered species, as defined by RSA 212-A:2, or of any protected species or exemplary natural communities, as defined in RSA 217-A:3.

Sincerely,

Jeffrey W. Price, PE
Alteration of Terrain Bureau

cc: Mitchell Heidler, Keach-Nordstrom Associates, Inc. (mheidler@keachnordstrom.com)
Town of Hudson (bdubowik@hudsonnh.gov, bgroth@hudsonnh.gov)
NHFG (nhfgreview@wildlife.nh.gov)

TRAFFIC ASSESSMENT

75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE

May 14, 2024

Prepared for
Barrett Hill, LLC

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING, AND POLICY

TEPP LLC TRANSPORTATION ENGINEERING, PLANNING, AND POLICY

93 Stiles Road, Suite 201, Salem, New Hampshire 03079 USA
800 Turnpike Street, Suite 300, North Andover, Massachusetts 01845 USA
Phone (603) 212-9133 and Fax (603) 226-4108
Email tepp@teppllc.com and Web www.teppllc.com

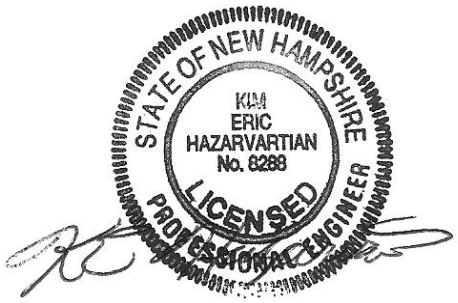
MEMORANDUM

Ref: 1701

Subject: Traffic Assessment
75 Barretts Hill Road
Hudson, New Hampshire

From: Kim Eric Hazarvartian, Ph.D., P.E., PTOE
Principal
keh@teppllc.com

Date: May 14, 2024



INTRODUCTION

Barrett Hill, LLC has retained TEPP LLC to prepare this traffic-assessment memorandum (TAM). This TAM regards a proposed residential development at 75 Barretts Hill Road in the Town of Hudson, New Hampshire. The project will provide a 13-lot duplex condominium development. Figure 1 shows the site location. The project plan is in Appendix A.

In summary, TEPP LLC:

- anticipates no significant area traffic impact due to the project
- confirms that sight distances for the Barretts Hill Road/Windsor Lane intersection are adequate

EXISTING SITE DESCRIPTION

The site:

- is at 75 Barretts Hill Road
- is undeveloped
- is traversed by a power-line easement
- has Barretts Hill Road, a Town street, to the north
- has residential development to the west, south, and east

PROPOSED PROJECT DESCRIPTION

The project will:

Figure 1. Site location.

- provide a 13-lot duplex condominium development
- have Windsor Lane intersecting the west south side of Barretts Hill Road about 300 feet (ft) east of Hilltop Drive

ROAD DESCRIPTION

Barretts Hill Road:

- is under the jurisdiction of the Town
- functions as a collector street that provides access for residential land development
- is a loop between Greeley Street, to the west, and Windham Road, to the south

Barretts Hill Road near the site:

- has a curvilinear horizontal alignment
- includes grades
- has one travel lane per direction
- has asphalt-cement-concrete (ACC) pavement in overall fair condition
- has a posted speed limit of 30 miles per hour (mph)
- includes utility poles on the north or side, depending on location

EXISTING TRAFFIC VOLUMES

TRAFFIC COUNTS

TEPP LLC obtained automatic traffic recorders (ATRs) on:

- Tuesday, April 30, 2024, and Wednesday, May 1, 2024
- Barretts Hill Road west of Hilltop Drive
- Barretts Hill Road east of Windsor Lane

The traffic-count data are in Appendix B.

ADJUSTMENTS

TEPP LLC adjusted the April and May 2024 traffic volumes to reflect peak-month and non-pandemic conditions.

The increase to peak month was 6.0 percent, based on New Hampshire Department of Transportation (NHDOT) 2019 monthly traffic volumes for Group 4 (Urban Highways) averages in Appendix C.

The increase to non-pandemic was 6.2 percent, based on NHDOT continuous count station 82229031, on Daniel Webster Highway north of Hilton Drive, in the Town of Merrimack, in Appendix C. The station showed:

- April 2024 two-way average-daily traffic (ADT) of 15,005 vehicles
- April 2019 non-pandemic two-way ADT of 15,936 vehicles, which is 6.2 percent greater

The combined increase to peak month and non-pandemic was 12.6 percent.

RESULTS

Table 1 shows 2024 existing weekday traffic volumes on Barretts Hill Road.

Table 1. 2024 existing weekday traffic volumes.

	Vehicles			
Location and Time Period	Total (Two Way)	Eastbound	Westbound	K-factor[a]
Barretts Hill Road West of Hilltop Drive				
Daily	706	---	---	---
AM-Street-Peak Hour	66	31 (47%)	35 (53%)	9.3%
PM-Street-Peak Hour	61	28 (46%)	33 (54%)	8.6%
Barretts Hill Road East of Windsor Lane				
Daily	790	---	---	---
AM-Street-Peak Hour	70	34 (49%)	36 (51%)	8.9%
PM-Street-Peak Hour	72	41 (57%)	31 (43%)	9.1%

[a] K = hour volume as a percent of daily volume.

Barretts Hill Road west of Hilltop Drive showed the following weekday vehicles:

- 706 daily (two-way total)
- 66 vehicles for the AM-street-peak hour, 53-percent westbound
- 61 vehicles for the PM-street-peak hour, 54-percent westbound

Barretts Hill Road east of Windsor Lane showed the following weekday vehicles:

- 790 daily (two-way total)
- 70 vehicles for the AM-street-peak hour, 51-percent westbound
- 72 vehicles for the PM-street-peak hour, 57-percent eastbound

VEHICLE SPEEDS

The ATRs collected vehicle speeds on:

- Tuesday, April 30, 2024, and Wednesday, May 1, 2024
- Barretts Hill Road west of Hilltop Drive
- Barretts Hill Road east of Windsor Lane

Table 2 summarizes the data that are in Appendix D. Table 2 indicates that on Barretts Hill Road west of Hilltop Drive the:

Table 2. Vehicle speeds.

		Observed Speeds (mph)[a]		
Location and Direction	Posted Limit (mph)	Mean[b]	Pace[c]	85th Percentile[d]
Barretts Hill Road West of Hilltop Drive				
Eastbound	30	28	24-33	30
Westbound	30	30	25-34	33
Barretts Hill Road East of Windsor Lane				
Eastbound	30	27	22-31	29
Westbound	30	29	25-34	33

[a] From ATR conducted on Tuesday, April 30, 2024, and Wednesday, May 1, 2024.

[b] Mean is the average speed.

[c] Pace is the 10-mph speed range with the greatest number of observed speeds.

[d] 85th-percentile speed is the speed at which or below 85 percent of vehicles travel.

- posted speed limit was 30 mph
- mean speed was 28 mph eastbound and 30 mph westbound
- 85th-percentile speed was 30 mph eastbound and 33 mph westbound

Table 2 indicates that on Barretts Hill Road east of Windsor Lane the:

- posted speed limit was 30 mph
- mean speed was 27 mph eastbound and 29 mph westbound
- 85th-percentile speed was 29 mph eastbound and 33 mph westbound

SIGHT DISTANCES

The American Association of State Highway and Transportation Officials (AASHTO) has established authoritative policy for design sight distances at unsignalized intersections in terms of stopping sight distance (SSD).

SSD:[1]

- provides for safety
- enables a driver, on the major road, to perceive and react accordingly to a vehicle entering the major road from a minor road
- is conservative because it encompasses a wide range of brake-reaction times and deceleration rates

Appendix E includes a sight-distance plan and profile of the Barretts Hill Road/Windsor Lane intersection. As Table 3 shows, available sight distances are adequate.

Table 3. Sight distances.

	View	
Intersection	Barretts Hill Road to/from West	Barretts Hill Road to/from East
Barretts Hill Road/Windsor Lane Intersection		
Sight Distance (ft)[a]	335	335
SSD Design Speed (mph)[b]	43	41
Speed Limit (mph)	30	30
Mean Speed (mph)[c]	27	29
85th Percentile Speed (mph)[c]	29	33
Adequate	Yes	Yes

[a] From Keach-Nordstrom Associates, Inc., Sight Distance Plan & Profile, Barrett Hill Subdivision, May 6, 2024.

[b] The Barretts Hill Road eastbound approach is on an upgrade of about 1.5 percent. The Barretts Hill Road westbound approach is on a downgrade of about 4.0 percent.

[b] From ATR conducted on Tuesday, April 30, 2024, and Wednesday, May 1, 2024.

[1] AASHTO, pages 3-2 to 3-6.

TRIP GENERATION

The Institute of Transportation Engineers (ITE) publishes trip-generation information in the authoritative *Trip Generation Manual*.[2] This information is based on empirical data for a variety of land uses including land use 215, single-family-detached housing, based on dwelling units[3].

Table 4 shows calculated weekday vehicle-trips due to the project as:

Table 4. Calculated weekday trip generation.

Time Period and Direction	Vehicle-Trips[a]
Daily	148
AM-Street-Peak Hour	
In	2
Out	6
Total	8
PM-Street-Peak Hour	
In	7
Out	5
Total	12

[a] Based on ITE, *Trip Generation Manual*, land use 215, single-family-attached housing, 13 duplex dwelling units.

- daily, 148 (total of in and out)
- AM-street-peak hour, 8 (2 in and 6 out)
- PM-street-peak hour, 12 (7 in and 5 out)

POTENTIAL TRAFFIC IMPACTS

ITE suggests that land developments generating at least 100 peak-hour vehicle trips, in the busier direction, are candidates for consideration of traffic impact analysis.[4] Tabulated peak-hour trip generation of the project is well below this national ITE threshold.

[2] ITE, *Trip Generation Manual*, 11th Edition (Washington DC, September 2021).

[3] ITE, *Trip Generation Manual*, Volume 3, pages 237 to 251.

[4] ITE, *Manual of Transportation Engineering Studies* (Prentice Hall: Englewood Cliffs, New Jersey, 2000), page 144.

Tabulated peak-hour trip generation of the project is:

- 8 to 12 vehicle-trips
- split by direction (in or out)
- further split by orientation (north, south, east, or west)

Tabulated peak-hour trip generation approximates the following average traffic increases per direction on Barretts Hill Road north and south of the site:

- 2 to 3 vehicle-trips
- about one vehicle-trip per 20 to 30 minutes

On these bases, TEPP LLC anticipates no significant area traffic impact due to the project.

CONCLUSION

In conclusion, TEPP LLC:

- anticipates no significant area traffic impact due to the project
- confirms that sight distances for the Barretts Hill Road/Windsor Lane intersection are adequate

APPENDIX

Appendix A: Project Plan

CONSTRUCTION NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED ROADWAY DESIGN, GRADING, AND UTILITIES FOR THIS SITE.
2. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL WORK PERFORMED IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2016 ARE HEREBY INCORPORATED BY REFERENCE.
3. CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. ALL DRAINAGE PIPES SHOWN SHALL BE HDPE. CATCH BASINS SHALL BE TYPE B, AND HAVE 3' SUMPS UNLESS OTHERWISE NOTED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
5. ALL DRAINAGE PIPE SHALL BE INSTALLED FOLLOWING MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. ALL LOT DEVELOPMENT SHOWN ON THIS PLAN INCLUDING BUT NOT LIMITED TO DRIVEWAYS, BUILDING LOCATIONS, AND GRADING ARE SHOWN FOR PROOF OF CONCEPT ONLY. FINAL LOT LAYOUT SHALL BE COORDINATED WITH THE OWNER, THE ENGINEER OF RECORD, AND TOWN STAFF FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

LOAM & SEED ALL DISTURBED AREAS (TYP.)

SEE SHEET 15 FOR DRIVEWAY PROFILES

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

_____ SIGNATURE DATE: _____

_____ SIGNATURE DATE: _____

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

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

NPDES NOTE

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

MAP 151 LOT 58
NICHOLE A. SULLIVAN
76 BARRETTS HILL ROAD
HUDSON, N.H. 03051
BK. 9235 PG. 1168

MAP 151 LOT 57
JOHN & KATHRYN K BURKE, TRUSTEES
2 HILLTOP DRIVE
HUDSON, N.H. 03051
BK. 8579 PG. 298

MATCH TO SHEET 11

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

GRADING & DRAINAGE PLAN

BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

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

PAUL CHISHOLM No. 15076 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	4/23/24	NHDES AOT & SITE WALK REVS	PCM

DATE: DECEMBER 6, 2023 | SCALE: 1" = 40'
PROJECT NO: 23-0414-1 | SHEET: 10 OF 24

Appendix B: Traffic Counts

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Hilltop Drive
City/State: Hudson, NH

Site Code: 17010001

4/29/2024	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,
12:00 AM	*	*	0	1	0	1	*	*	*	*	*	*	*	*	0	1
1:00	*	*	0	0	0	1	*	*	*	*	*	*	*	*	0	0
2:00	*	*	2	1	0	0	*	*	*	*	*	*	*	*	1	0
3:00	*	*	0	1	1	2	*	*	*	*	*	*	*	*	0	2
4:00	*	*	2	0	6	2	*	*	*	*	*	*	*	*	4	1
5:00	*	*	12	1	9	2	*	*	*	*	*	*	*	*	10	2
6:00	*	*	19	15	17	19	*	*	*	*	*	*	*	*	18	17
7:00	*	*	34	30	23	32	*	*	*	*	*	*	*	*	28	31
8:00	*	*	24	29	24	33	*	*	*	*	*	*	*	*	24	31
9:00	*	*	13	16	7	13	*	*	*	*	*	*	*	*	10	14
10:00	*	*	12	10	12	11	*	*	*	*	*	*	*	*	12	10
11:00	*	*	9	18	12	16	*	*	*	*	*	*	*	*	10	17
12:00 PM	*	*	9	15	17	19	*	*	*	*	*	*	*	*	13	17
1:00	*	*	9	12	15	21	*	*	*	*	*	*	*	*	12	16
2:00	*	*	28	22	27	18	*	*	*	*	*	*	*	*	28	20
3:00	*	*	27	25	25	23	*	*	*	*	*	*	*	*	26	24
4:00	*	*	23	33	27	25	*	*	*	*	*	*	*	*	25	29
5:00	*	*	26	28	15	33	*	*	*	*	*	*	*	*	20	30
6:00	*	*	21	21	11	27	*	*	*	*	*	*	*	*	16	24
7:00	*	*	12	17	14	12	*	*	*	*	*	*	*	*	13	14
8:00	*	*	9	14	12	10	*	*	*	*	*	*	*	*	10	12
9:00	*	*	8	10	4	8	*	*	*	*	*	*	*	*	6	9
10:00	*	*	3	10	9	7	*	*	*	*	*	*	*	*	6	8
11:00	*	*	2	5	2	3	*	*	*	*	*	*	*	*	2	4
Total	0	0	304	334	289	338	0	0	0	0	0	0	0	0	294	333
Day	0		638		627		0		0		0		0		627	
AM Peak			7:00	7:00	8:00	8:00									7:00	7:00
Volume			34	30	24	33									28	31
PM Peak			2:00	4:00	2:00	5:00									2:00	5:00
Volume			28	33	27	33									28	30
Comb Total	0		638		627		0		0		0		0		627	
ADT	ADT: 632		AADT: 632													

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Tiger Road
City/State: Hudson, NH

Site Code: 17010002

4/29/2024	Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday		Week Average	
Time	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,	EB,	WB,
12:00 AM	*	*	0	3	0	1	*	*	*	*	*	*	*	*	0	2
1:00	*	*	0	0	0	1	*	*	*	*	*	*	*	*	0	0
2:00	*	*	2	1	0	0	*	*	*	*	*	*	*	*	1	0
3:00	*	*	0	1	1	2	*	*	*	*	*	*	*	*	0	2
4:00	*	*	3	0	7	2	*	*	*	*	*	*	*	*	5	1
5:00	*	*	13	2	11	2	*	*	*	*	*	*	*	*	12	2
6:00	*	*	22	15	21	18	*	*	*	*	*	*	*	*	22	16
7:00	*	*	34	31	25	34	*	*	*	*	*	*	*	*	30	32
8:00	*	*	25	31	28	32	*	*	*	*	*	*	*	*	26	32
9:00	*	*	20	16	12	13	*	*	*	*	*	*	*	*	16	14
10:00	*	*	18	10	14	11	*	*	*	*	*	*	*	*	16	10
11:00	*	*	8	19	15	17	*	*	*	*	*	*	*	*	12	18
12:00 PM	*	*	11	14	20	20	*	*	*	*	*	*	*	*	16	17
1:00	*	*	8	14	18	21	*	*	*	*	*	*	*	*	13	18
2:00	*	*	32	25	32	21	*	*	*	*	*	*	*	*	32	23
3:00	*	*	35	26	31	22	*	*	*	*	*	*	*	*	33	24
4:00	*	*	35	32	37	25	*	*	*	*	*	*	*	*	36	28
5:00	*	*	31	28	18	36	*	*	*	*	*	*	*	*	24	32
6:00	*	*	25	21	16	27	*	*	*	*	*	*	*	*	20	24
7:00	*	*	17	17	16	13	*	*	*	*	*	*	*	*	16	15
8:00	*	*	12	14	12	11	*	*	*	*	*	*	*	*	12	12
9:00	*	*	9	11	4	8	*	*	*	*	*	*	*	*	6	10
10:00	*	*	4	10	9	9	*	*	*	*	*	*	*	*	6	10
11:00	*	*	2	5	1	3	*	*	*	*	*	*	*	*	2	4
Total	0	0	366	346	348	349	0	0	0	0	0	0	0	0	356	346
Day	0		712		697		0		0		0		0		702	
AM Peak			7:00	7:00	8:00	7:00									7:00	7:00
Volume			34	31	28	34									30	32
PM Peak			3:00	4:00	4:00	5:00									4:00	5:00
Volume			35	32	37	36									36	32
Comb Total	0		712		697		0		0		0		0		702	
ADT		ADT: 704		AADT: 704												

Appendix C: Traffic-Volume Adjustments

Year 2019 Monthly Data

Group 4 Averages: Urban Highways

Month	ADT	Adjustment to Average	Adjustment to Peak
January	11,431	1.12	1.23
February	11,848	1.08	1.18
March	12,141	1.06	1.15
April	12,860	1.00	1.09
May	13,551	0.95	1.03
June	13,785	0.93	1.02
July	13,942	0.92	1.01
August	14,016	0.92	1.00
September	13,379	0.96	1.05
October	13,339	0.96	1.05
November	12,265	1.05	1.14
December	11,496	1.12	1.22

Average ADT: 12,838
Peak ADT: 14,016

New Hampshire DOT

02297001: Monthly Hourly Volume for April 2019

Location ID:	**02297001**	**Seasonal Factor Group:**	**04**
County:	**HILLSBOROUGH**	**Daily Factor Group:**	
Functional Class	**4**	**Axle Factor Group:**	**E**
Location:	**Daniel Webster Hwy**	**Growth Factor Group:**	

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	55	23	34	46	124	289	834	1,563	1,249	802	801	814	860	845	942	1,221	1,476	1,561	976	650	459	330	171	99	16,224	Accepted
2	56	29	31	49	132	295	892	1,657	1,390	944	989	926	949	951	1,059	1,270	1,509	1,646	1,063	610	544	356	198	123	17,668	Accepted
3	54	34	36	42	141	302	846	1,675	1,449	873	915	993	1,075	898	1,067	1,426	1,575	1,671	1,162	706	528	357	185	132	18,142	Accepted
4	59	25	37	43	143	280	906	1,606	1,339	882	874	873	982	960	1,017	1,253	1,616	1,748	1,098	753	560	407	236	153	17,850	Accepted
5	65	49	33	47	133	284	850	1,471	1,165	900	898	928	1,031	970	1,103	1,393	1,546	1,667	1,103	729	501	444	275	211	17,796	Accepted
6	127	56	46	33	68	89	213	443	656	810	1,050	1,178	1,260	1,241	1,104	1,169	1,104	1,086	911	708	531	426	309	197	14,815	Accepted
7	123	64	34	34	43	60	144	247	451	755	829	1,003	1,110	1,033	1,053	1,026	941	828	698	562	373	220	166	90	11,887	Accepted
8	54	26	32	44	125	277	831	1,507	1,507	819	731	786	778	714	952	1,259	1,379	1,546	901	535	438	329	147	89	15,806	Accepted
9	53	22	22	51	118	323	874	1,618	1,397	993	924	867	936	864	1,082	1,301	1,430	1,560	1,151	620	460	314	196	128	17,304	Accepted
10	53	32	42	36	120	306	880	1,653	1,245	825	854	893	903	928	1,103	1,312	1,482	1,609	1,003	685	576	359	197	122	17,218	Accepted
11	65	39	33	50	124	305	868	1,653	1,254	887	818	858	944	876	1,073	1,297	1,507	1,680	1,172	690	606	371	201	134	17,505	Accepted
12	82	32	30	55	124	310	852	1,678	1,257	866	879	927	1,063	995	1,205	1,380	1,568	1,642	1,047	732	575	435	298	217	18,249	Accepted
13	125	65	39	39	50	87	221	447	690	937	1,049	1,045	1,166	1,197	1,183	1,227	1,128	1,109	867	765	525	406	326	208	14,901	Accepted
14	124	84	40	30	43	66	137	261	495	712	809	1,036	1,037	1,054	1,038	1,057	900	790	693	513	350	231	182	89	11,771	Accepted
15	47	36	28	42	124	286	826	1,497	1,334	871	804	803	883	878	1,042	1,212	1,410	1,497	922	538	400	320	180	103	16,083	Accepted
16	74	41	18	49	132	336	918	1,696	1,405	935	827	841	1,000	963	1,106	1,336	1,503	1,684	1,183	752	566	375	184	128	18,052	Accepted
17	70	27	32	40	136	319	861	1,641	1,290	880	833	870	1,016	924	1,043	1,363	1,525	1,653	1,098	722	548	384	193	129	17,597	Accepted
18	62	33	35	39	129	295	900	1,613	1,396	906	840	903	948	900	1,073	1,356	1,629	1,739	1,110	741	533	345	221	133	17,879	Accepted
19	69	36	36	50	128	274	785	1,471	1,161	874	934	1,009	1,138	1,100	1,261	1,450	1,502	1,457	1,199	801	652	448	300	208	18,343	Accepted
20	125	70	47	48	64	88	207	389	707	939	1,083	1,125	1,091	1,158	1,081	1,098	933	951	791	614	491	393	283	178	13,954	Accepted
21	108	53	42	26	36	59	143	257	383	572	738	827	1,100	829	637	732	757	755	758	626	344	189	175	76	10,222	Accepted
22	43	13	29	39	129	297	762	1,276	1,051	839	762	857	945	918	912	1,062	1,314	1,557	921	531	399	356	176	108	15,296	Accepted
23	53	38	27	55	131	302	765	1,333	1,071	916	863	916	940	920	1,010	1,138	1,356	1,523	993	653	446	376	211	120	16,156	Accepted
24	60	31	39	40	127	272	770	1,287	1,092	789	816	879	980	865	969	1,231	1,382	1,508	1,035	705	517	344	213	123	16,074	Accepted
25	67	27	21	45	135	301	768	1,335	1,081	866	863	886	983	961	1,009	1,177	1,402	1,643	1,032	685	542	364	246	135	16,574	Accepted
26	77	49	29	49	123	263	746	1,205	1,030	760	840	911	1,075	1,025	1,063	1,139	1,484	1,555	922	631	498	373	279	220	16,346	Accepted
27	109	71	51	35	69	99	242	457	639	885	1,003	1,080	1,104	1,133	1,128	1,089	1,026	995	741	682	468	368	288	198	13,960	Accepted
28	135	71	44	30	35	63	159	294	468	755	840	1,033	1,115	981	928	928	795	756	677	484	305	222	166	96	11,380	Accepted
29	56	35	36	37	124	323	940	1,520	1,254	774	698	807	836	936	957	1,258	1,434	1,483	1,026	614	461	328	156	120	16,213	Accepted
30	39	25	32	40	150	317	868	1,545	1,395	914	804	797	889	803	1,012	1,289	1,406	1,593	1,085	645	480	349	220	118	16,815	Accepted
Avg																									15,936	

New Hampshire DOT

02297001: Monthly Hourly Volume for April 2024

Location ID: 02297001
County: HILLSBOROUGH
Functional Class 4
Location: Daniel Webster Hwy

Seasonal Factor Group:
Daily Factor Group:
Axle Factor Group:
Growth Factor Group:

	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	TOTAL	QC Status
1	40	19	20	38	127	294	753	1,220	1,081	789	802	816	916	872	1,004	1,224	1,362	1,334	932	583	424	299	154	91	15,194	Accepted
2	36	47	27	49	135	285	842	1,384	1,205	920	834	966	982	928	1,103	1,351	1,439	1,432	1,005	589	447	361	193	119	16,679	Accepted
3	42	30	28	50	127	291	789	1,287	1,126	774	818	832	949	796	990	1,309	1,266	1,195	720	442	369	234	123	87	14,674	Accepted
4	56	31	28	70	101	177	382	504	518	424	358	385	433	401	446	554	680	686	510	359	251	192	137	77	7,760	Accepted
5	55	33	39	63	117	273	706	1,236	1,112	938	860	938	944	934	1,149	1,321	1,469	1,497	1,016	792	533	391	258	192	16,866	Accepted
6	105	60	37	49	66	95	214	397	565	821	997	1,028	1,057	1,025	1,035	1,020	962	983	756	619	516	388	252	183	13,230	Accepted
7	114	67	41	19	36	76	146	260	411	631	837	968	971	1,024	930	895	752	730	637	478	362	235	140	96	10,856	Accepted
8	42	19	23	38	148	297	790	1,357	1,142	861	802	837	973	885	1,032	998	1,251	1,234	845	591	436	329	177	141	15,248	Accepted
9	75	70	35	62	137	303	773	1,339	1,196	923	845	980	1,025	991	1,137	1,311	1,435	1,494	1,081	689	502	375	201	96	17,075	Accepted
10	33	38	14	47	132	317	823	1,416	1,164	1,153	841	863	999	924	1,082	1,391	1,471	1,456	977	634	488	369	178	116	16,926	Accepted
11	55	38	29	49	136	301	785	1,358	1,188	867	843	848	1,013	905	1,072	1,246	1,410	1,507	986	669	499	362	214	113	16,493	Accepted
12	63	44	32	33	118	269	745	1,213	1,067	850	774	909	992	1,005	1,170	1,353	1,443	1,400	868	676	585	466	310	206	16,591	Accepted
13	117	58	34	41	57	106	196	441	694	851	1,125	1,272	1,229	1,092	1,119	1,081	980	930	839	654	521	409	299	203	14,348	Accepted
14	104	89	35	28	36	79	108	322	431	728	916	1,088	1,143	1,110	976	902	828	806	608	478	291	246	121	85	11,558	Accepted
15	58	28	37	48	129	280	773	1,419	1,120	773	782	880	942	893	1,129	1,348	1,404	1,567	1,127	686	434	354	201	91	16,503	Accepted
16	53	35	26	53	144	312	833	1,411	1,204	928	889	919	1,018	944	1,125	1,356	1,455	1,479	1,067	681	507	375	188	94	17,096	Accepted
17	52	40	29	53	131	302	832	1,376	1,209	898	818	875	980	953	1,121	1,366	1,529	1,472	1,019	759	553	384	198	118	17,067	Accepted
18	66	36	26	58	135	285	807	1,424	1,146	871	830	859	951	896	1,138	1,387	1,457	1,551	951	665	494	349	186	109	16,677	Accepted
19	59	39	28	39	112	312	767	1,346	1,128	881	868	988	995	1,029	1,266	1,474	1,500	1,398	1,053	737	550	389	288	189	17,435	Accepted
20	95	56	29	52	46	103	224	360	591	862	1,044	1,109	1,131	1,096	1,084	1,026	953	911	811	584	484	361	274	196	13,482	Accepted
21	100	40	32	28	35	60	149	270	469	726	824	970	1,088	926	915	809	863	711	657	468	395	255	141	82	11,013	Accepted
22	54	33	24	55	128	275	688	1,198	1,259	836	867	872	918	951	990	1,130	1,269	1,253	755	556	382	294	165	109	15,061	Accepted
23	63	31	24	47	131	298	721	1,127	1,046	869	848	912	963	990	1,082	1,156	1,395	1,345	1,006	735	526	373	182	91	15,961	Accepted
24	46	29	26	43	128	287	692	1,119	988	795	809	896	980	939	1,018	1,172	1,298	1,384	848	616	529	365	194	91	15,292	Accepted
25	63	44	27	56	128	296	664	1,062	989	824	856	877	1,001	938	1,051	1,252	1,349	1,351	947	651	524	351	208	112	15,621	Accepted
26	76	59	36	53	113	268	640	1,012	938	851	911	1,066	1,228	1,103	1,167	1,274	1,332	1,527	1,112	706	513	384	283	189	16,841	Accepted
27	98	46	33	31	74	98	197	422	631	898	1,020	1,063	1,118	1,154	1,128	1,108	1,004	974	776	673	533	406	282	192	13,959	Accepted
28	87	60	52	34	25	72	144	308	507	714	888	919	1,050	998	1,085	912	919	832	717	583	399	233	143	84	11,765	Accepted
29	64	19	27	40	140	305	784	1,363	1,096	904	839	867	896	857	1,055	1,269	1,395	1,378	969	730	464	301	165	85	16,012	Accepted
30	65	28	20	51	138	318	789	1,388	1,190	928	838	882	970	903	1,137	1,391	1,454	1,520	1,117	626	478	325	201	109	16,866	Accepted
Avg																									15,005	

Appendix D: Vehicle Speeds

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Hilltop Drive
City/State: Hudson, NH
Direction: EB,

Site Code: 17010001

4/30/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
5:00	0	0	0	0	0	0	0	0	4	5	2	1	0	0	12
6:00	0	0	0	0	0	0	1	1	5	9	2	1	0	0	19
7:00	0	0	0	0	0	2	3	8	7	6	7	1	0	0	34
8:00	0	0	0	0	0	0	1	2	7	8	6	0	0	0	24
9:00	0	0	0	0	0	0	2	2	4	2	2	1	0	0	13
10:00	0	0	0	0	0	0	0	2	6	2	1	1	0	0	12
11:00	0	0	1	0	1	0	0	0	2	3	2	0	0	0	9
12:00 PM	0	0	0	0	0	0	0	2	1	3	3	0	0	0	9
1:00	0	0	0	0	0	0	0	0	4	2	3	0	0	0	9
2:00	0	0	0	0	0	0	2	3	5	8	6	1	3	0	28
3:00	0	0	0	0	0	1	5	2	6	9	3	1	0	0	27
4:00	0	0	0	0	0	0	1	1	4	9	7	1	0	0	23
5:00	0	0	0	0	0	0	3	3	5	7	6	2	0	0	26
6:00	0	0	0	0	0	0	0	0	5	6	9	1	0	0	21
7:00	0	0	0	0	0	0	0	0	4	4	1	3	0	0	12
8:00	0	0	0	0	0	0	0	1	1	3	3	1	0	0	9
9:00	0	0	0	0	0	0	0	0	1	3	2	0	2	0	8
10:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
11:00	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
Total	0	0	1	0	1	3	19	28	75	91	66	15	5	0	304

	Percentile	15th	50th	85th	95th
	Speed	23	27	31	33
Mean Speed (Average)		27.9			
10 MPH Pace Speed		25-34			
Number in Pace		243			
Percent in Pace		80.0%			
Number > 27 MPH		177			
Percent > 27 MPH		58.2%			

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Hilltop Drive
City/State: Hudson, NH
Direction: EB,

Site Code: 17010001

5/1/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4:00	0	0	0	0	0	0	0	0	1	4	1	0	0	0	6
5:00	0	0	0	0	0	0	0	4	1	1	1	2	0	0	9
6:00	0	0	0	0	0	0	5	4	2	6	0	0	0	0	17
7:00	0	0	0	0	0	0	1	3	10	6	1	1	0	1	23
8:00	0	0	0	1	2	0	2	2	6	10	0	0	1	0	24
9:00	0	0	0	0	0	0	0	1	2	2	2	0	0	0	7
10:00	0	0	0	0	0	0	3	2	2	4	1	0	0	0	12
11:00	0	0	0	0	0	0	0	0	6	2	3	1	0	0	12
12:00 PM	0	0	0	0	0	0	1	1	8	5	1	1	0	0	17
1:00	0	0	0	0	0	0	0	2	4	6	2	1	0	0	15
2:00	0	0	1	0	0	0	2	2	14	7	1	0	0	0	27
3:00	0	0	0	0	0	0	1	2	9	8	3	1	0	1	25
4:00	0	0	0	0	0	0	1	2	6	13	5	0	0	0	27
5:00	0	0	0	0	0	0	0	1	8	2	3	0	1	0	15
6:00	0	0	0	0	0	0	0	1	5	1	3	1	0	0	11
7:00	0	0	0	0	0	0	0	2	3	7	1	0	1	0	14
8:00	0	0	0	0	0	0	1	3	2	4	2	0	0	0	12
9:00	0	0	0	0	0	0	0	1	3	0	0	0	0	0	4
10:00	0	0	0	0	0	0	1	1	4	3	0	0	0	0	9
11:00	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
Total	0	0	1	1	2	0	18	34	96	92	32	8	3	2	289
			Percentile	15th	50th	85th	95th								
			Speed	22	26	29	32								
		Mean Speed (Average)		27.1											
		10 MPH Pace Speed		23-32											
		Number in Pace		231											
		Percent in Pace		83.0%											
		Number > 27 MPH		137											
		Percent > 27 MPH		47.4%											
Grand Total	0	0	2	1	3	3	37	62	171	183	98	23	8	2	593
Stats			Percentile	15th	50th	85th	95th								
			Speed	22	26	30	33								
		Mean Speed (Average)		27.5											
		10 MPH Pace Speed		24-33											
		Number in Pace		476											
		Percent in Pace		81.0%											
		Number > 27 MPH		314											
		Percent > 27 MPH		53.0%											

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Hilltop Drive
City/State: Hudson, NH
Direction: WB,

Site Code: 17010001

4/30/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
3:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
6:00	0	0	0	0	0	0	0	0	2	3	8	0	2	0	15
7:00	0	0	0	0	0	0	2	2	3	8	10	2	1	2	30
8:00	0	0	0	0	0	0	2	1	8	3	8	5	2	0	29
9:00	0	0	0	0	0	0	0	1	2	5	5	2	0	1	16
10:00	0	0	0	0	0	0	0	0	5	2	2	0	1	0	10
11:00	0	0	0	0	0	0	0	0	4	6	5	1	2	0	18
12:00 PM	0	0	0	0	0	0	0	1	5	4	4	1	0	0	15
1:00	0	0	0	0	0	0	0	0	1	4	1	4	2	0	12
2:00	0	0	0	0	0	0	0	0	2	9	6	4	1	0	22
3:00	0	0	0	0	0	0	2	0	4	5	11	1	1	1	25
4:00	0	0	0	0	0	0	0	1	6	15	11	0	0	0	33
5:00	0	0	0	0	0	1	0	1	2	10	9	3	2	0	28
6:00	0	0	0	0	0	0	0	0	3	9	5	3	0	1	21
7:00	0	0	0	0	0	0	0	1	4	5	4	2	1	0	17
8:00	0	0	0	0	0	0	1	0	0	3	8	0	2	0	14
9:00	0	0	0	0	0	0	0	0	1	4	4	1	0	0	10
10:00	0	0	0	0	0	0	0	2	4	1	2	1	0	0	10
11:00	0	0	0	0	0	0	0	0	1	0	3	0	1	0	5
Total	0	0	0	0	0	1	8	10	58	97	107	30	18	5	334

Percentile	15th	50th	85th	95th
Speed	25	29	33	36

Mean Speed (Average)	30.1
10 MPH Pace Speed	25-34
Number in Pace	277
Percent in Pace	83.0%
Number > 27 MPH	257
Percent > 27 MPH	76.9%

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Hilltop Drive
City/State: Hudson, NH
Direction: WB,

Site Code: 17010001

5/1/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2
4:00	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
5:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
6:00	0	0	0	0	0	0	0	0	4	5	4	5	1	0	19
7:00	0	0	0	0	0	0	1	3	5	6	8	6	3	0	32
8:00	0	0	0	0	0	0	1	1	5	7	13	6	0	0	33
9:00	0	0	0	0	0	0	0	0	2	4	5	1	1	0	13
10:00	0	0	0	0	0	0	1	0	3	3	3	0	1	0	11
11:00	0	0	0	0	0	0	0	2	3	7	1	3	0	0	16
12:00 PM	0	0	0	0	0	0	0	0	2	7	6	1	3	0	19
1:00	0	0	0	0	0	0	0	3	1	8	6	3	0	0	21
2:00	0	0	0	0	0	0	0	0	4	8	4	1	1	0	18
3:00	0	0	0	0	0	0	0	3	5	4	6	4	1	0	23
4:00	0	0	0	1	0	0	0	1	1	7	11	3	1	0	25
5:00	0	0	0	0	0	0	0	0	3	13	14	3	0	0	33
6:00	0	0	0	0	0	0	0	0	7	7	8	4	1	0	27
7:00	0	0	0	0	0	0	0	0	3	2	3	4	0	0	12
8:00	0	0	0	0	0	0	0	0	0	4	3	3	0	0	10
9:00	0	0	0	0	0	0	0	0	1	2	3	2	0	0	8
10:00	0	0	0	0	0	0	0	0	1	2	2	1	1	0	7
11:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	3
Total	0	0	0	1	0	0	4	15	53	99	101	51	14	0	338
			Percentile	15th	50th	85th	95th								
			Speed	25	29	33	34								
		Mean Speed (Average)		30.2											
		10 MPH Pace Speed		26-35											
		Number in Pace		267											
		Percent in Pace		81.0%											
		Number > 27 MPH		265											
		Percent > 27 MPH		78.4%											
Grand Total	0	0	0	1	0	1	12	25	111	196	208	81	32	5	672
Stats			Percentile	15th	50th	85th	95th								
			Speed	25	29	33	35								
		Mean Speed (Average)		30.2											
		10 MPH Pace Speed		25-34											
		Number in Pace		550											
		Percent in Pace		82.0%											
		Number > 27 MPH		522											
		Percent > 27 MPH		77.7%											

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Tiger Road
City/State: Hudson, NH
Direction: EB,

Site Code: 17010002

4/30/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3
5:00	0	0	0	0	0	0	1	0	2	5	2	2	1	0	13
6:00	0	0	0	0	0	1	0	6	7	7	1	0	0	0	22
7:00	0	0	0	0	0	0	1	5	14	10	4	0	0	0	34
8:00	0	0	0	0	0	0	1	8	5	6	4	1	0	0	25
9:00	0	0	0	0	0	0	1	3	5	8	2	1	0	0	20
10:00	0	0	0	0	0	0	0	4	9	3	2	0	0	0	18
11:00	0	0	0	0	1	0	1	0	1	3	1	1	0	0	8
12:00 PM	0	0	0	0	0	0	0	3	5	3	0	0	0	0	11
1:00	0	0	0	0	0	0	0	0	3	2	1	2	0	0	8
2:00	0	0	0	0	0	0	4	4	12	5	4	1	2	0	32
3:00	0	0	2	0	1	0	3	8	10	8	2	0	1	0	35
4:00	0	0	0	0	0	0	1	7	14	10	2	1	0	0	35
5:00	0	0	0	0	1	0	2	8	10	6	2	2	0	0	31
6:00	0	0	0	0	0	1	0	5	6	4	7	2	0	0	25
7:00	0	0	0	0	0	0	1	3	5	6	2	0	0	0	17
8:00	0	0	0	0	0	1	0	1	7	3	0	0	0	0	12
9:00	0	0	0	0	0	0	1	0	3	3	0	1	0	1	9
10:00	0	0	0	0	0	0	0	0	3	1	0	0	0	0	4
11:00	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
Total	0	0	2	0	3	3	17	66	123	96	37	14	4	1	366

Percentile	15th	50th	85th	95th
Speed	22	25	29	33

Mean Speed (Average)	26.7
10 MPH Pace Speed	22-31
Number in Pace	304
Percent in Pace	83.0%
Number > 27 MPH	152
Percent > 27 MPH	41.5%

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Tiger Road
City/State: Hudson, NH
Direction: EB,

Site Code: 17010002

5/1/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
4:00	0	0	0	0	0	0	0	1	1	1	3	1	0	0	7
5:00	0	0	0	0	0	0	0	2	5	2	1	1	0	0	11
6:00	0	0	0	0	1	0	0	5	7	6	2	0	0	0	21
7:00	0	0	0	0	0	1	0	7	7	7	2	0	1	0	25
8:00	0	0	0	0	1	2	1	3	4	11	5	0	0	1	28
9:00	0	0	0	0	0	1	1	3	3	3	1	0	0	0	12
10:00	0	0	1	1	0	0	0	4	7	0	1	0	0	0	14
11:00	0	0	0	0	0	0	1	3	4	5	0	2	0	0	15
12:00 PM	0	0	0	0	0	1	1	3	9	4	2	0	0	0	20
1:00	0	0	1	0	0	0	0	4	9	2	1	1	0	0	18
2:00	0	0	0	0	2	0	2	7	6	8	4	2	0	1	32
3:00	0	0	0	0	0	0	1	2	12	9	5	0	1	1	31
4:00	0	0	0	0	1	0	1	4	9	16	6	0	0	0	37
5:00	0	0	0	0	0	0	0	2	4	7	4	1	0	0	18
6:00	0	0	0	0	0	0	0	5	3	3	4	1	0	0	16
7:00	0	0	0	0	0	0	1	4	5	3	0	3	0	0	16
8:00	0	0	0	0	0	0	1	3	5	2	1	0	0	0	12
9:00	0	0	0	0	0	0	1	1	1	1	0	0	0	0	4
10:00	0	0	0	0	0	0	1	5	1	1	1	0	0	0	9
11:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	2	1	5	5	12	68	102	91	43	13	3	3	348
			Percentile	15th	50th	85th	95th								
			Speed	21	26	30	33								
		Mean Speed (Average)		26.7											
		10 MPH Pace Speed		22-31											
		Number in Pace		275											
		Percent in Pace		81.0%											
		Number > 27 MPH		153											
		Percent > 27 MPH		44.0%											
Grand Total	0	0	4	1	8	8	29	134	225	187	80	27	7	4	714
Stats			Percentile	15th	50th	85th	95th								
			Speed	21	25	29	33								
		Mean Speed (Average)		26.7											
		10 MPH Pace Speed		22-31											
		Number in Pace		587											
		Percent in Pace		82.0%											
		Number > 27 MPH		305											
		Percent > 27 MPH		42.7%											

Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Tiger Road
City/State: Hudson, NH
Direction: WB,

Site Code: 17010002

4/30/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
3:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
6:00	0	0	0	0	0	0	0	1	2	5	4	2	1	0	15
7:00	0	0	0	0	0	0	2	4	4	6	8	3	3	1	31
8:00	0	0	0	0	0	1	3	2	4	9	5	5	2	0	31
9:00	0	0	0	0	0	0	1	0	4	5	4	2	0	0	16
10:00	0	0	0	0	0	0	0	0	4	4	2	0	0	0	10
11:00	0	0	0	0	0	0	1	2	3	4	6	1	2	0	19
12:00 PM	0	0	0	0	0	0	1	1	5	4	2	1	0	0	14
1:00	0	0	0	0	0	0	0	1	0	4	1	5	2	1	14
2:00	0	0	0	1	0	0	1	1	3	8	6	5	0	0	25
3:00	0	0	0	0	0	2	3	1	3	7	7	2	1	0	26
4:00	0	0	0	0	0	0	1	2	9	8	9	3	0	0	32
5:00	0	0	0	0	0	0	1	2	5	6	6	4	4	0	28
6:00	0	0	0	0	0	0	0	0	3	8	5	4	1	0	21
7:00	0	0	0	0	0	0	0	2	4	4	7	0	0	0	17
8:00	0	0	0	0	0	0	0	0	2	4	5	2	1	0	14
9:00	0	0	0	0	0	0	0	0	1	3	7	0	0	0	11
10:00	0	0	0	0	0	0	0	0	5	2	2	0	1	0	10
11:00	0	0	0	0	0	0	0	0	1	1	2	1	0	0	5
Total	0	0	0	1	0	3	17	21	64	92	88	40	18	2	346

Percentile	15th	50th	85th	95th
Speed	24	28	33	35

Mean Speed (Average)	29.4
10 MPH Pace Speed	25-34
Number in Pace	262
Percent in Pace	76.0%
Number > 27 MPH	240
Percent > 27 MPH	69.4%

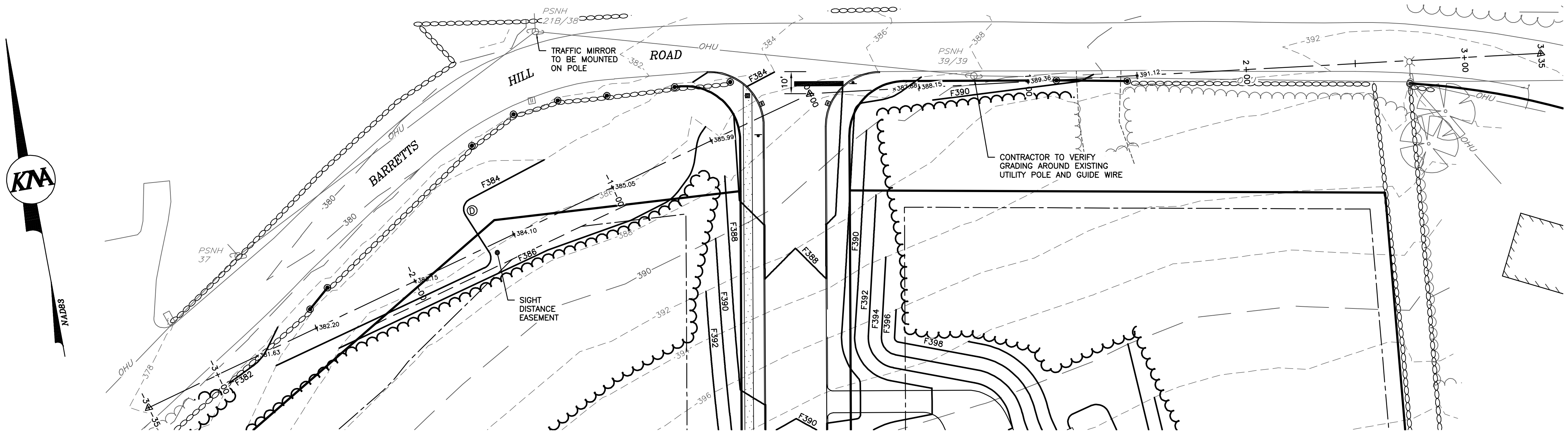
Accurate Counts
978-664-2565

Location : Barretts Hill Road
Location : West of Tiger Road
City/State: Hudson, NH
Direction: WB,

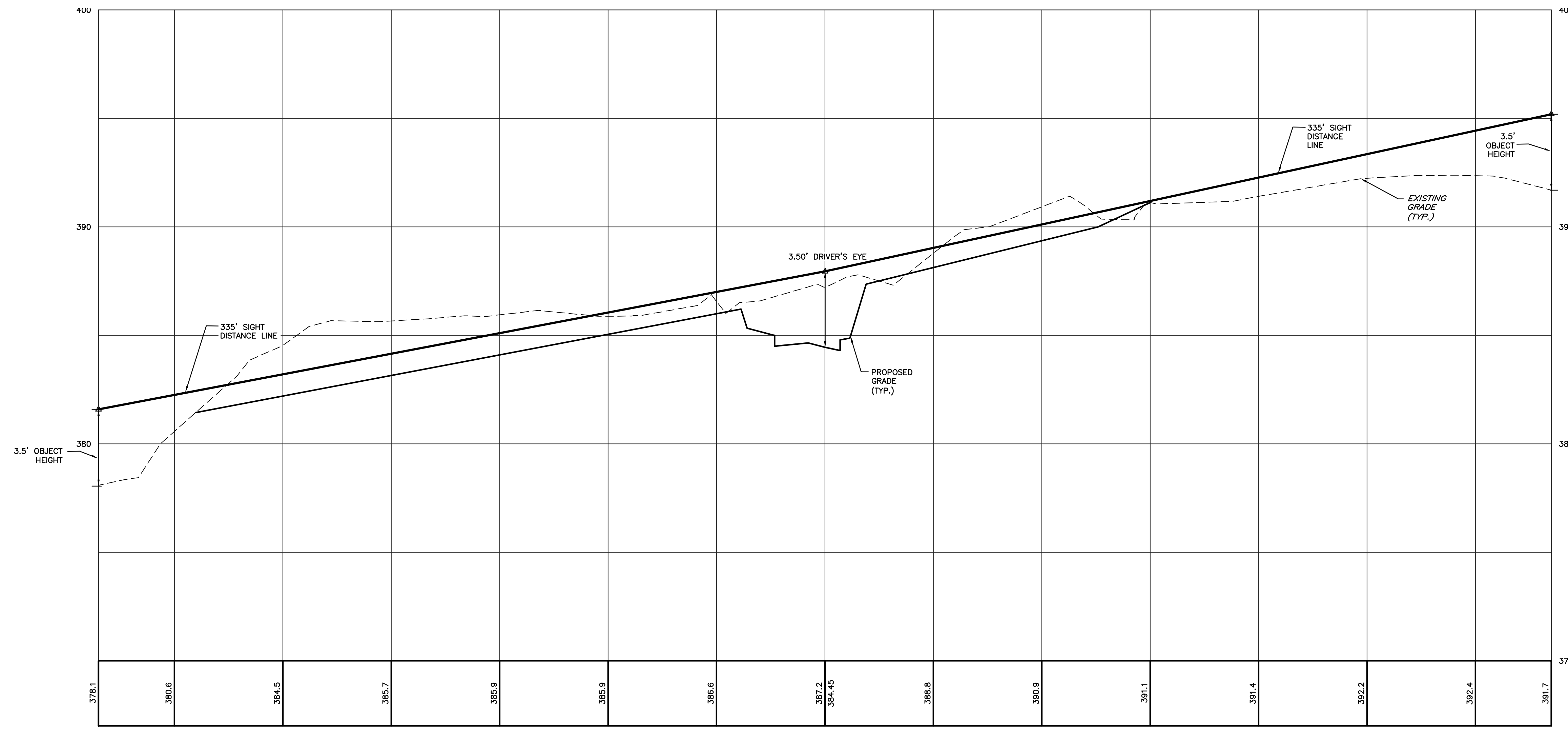
Site Code: 17010002

5/1/2024 Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total
12:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
1:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2
5:00	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2
6:00	0	0	0	0	0	1	0	2	4	1	5	4	1	0	18
7:00	0	0	0	0	0	1	1	4	6	9	8	4	1	0	34
8:00	0	0	0	0	0	0	4	0	6	7	8	5	2	0	32
9:00	0	0	0	0	0	0	0	2	1	3	3	4	0	0	13
10:00	0	0	0	0	0	0	0	0	2	6	2	0	1	0	11
11:00	0	0	0	0	0	0	0	2	5	4	5	0	1	0	17
12:00 PM	0	0	0	0	0	0	1	0	3	8	3	2	1	2	20
1:00	0	0	0	0	0	0	0	3	4	5	5	3	1	0	21
2:00	0	0	0	0	0	0	2	1	7	6	3	1	1	0	21
3:00	0	0	0	0	0	0	1	3	5	7	3	1	2	0	22
4:00	0	0	0	0	0	0	1	1	1	8	7	3	3	1	25
5:00	0	0	0	0	0	0	0	2	3	14	11	4	2	0	36
6:00	0	0	0	0	0	0	1	1	3	10	6	5	1	0	27
7:00	0	0	0	0	0	0	1	0	3	2	3	4	0	0	13
8:00	0	0	0	0	0	0	0	0	0	3	6	0	2	0	11
9:00	0	0	0	2	0	0	1	0	0	1	3	0	0	1	8
10:00	0	0	0	0	0	0	0	0	2	3	1	2	1	0	9
11:00	0	0	0	0	0	0	1	0	0	2	0	0	0	0	3
Total	0	0	0	2	0	2	17	22	57	100	83	42	20	4	349
			Percentile	15th	50th	85th	95th								
			Speed	23	29	33	36								
		Mean Speed (Average)		29.5											
		10 MPH Pace Speed		25-34											
		Number in Pace		250											
		Percent in Pace		74.0%											
		Number > 27 MPH		249											
		Percent > 27 MPH		71.3%											
Grand Total	0	0	0	3	0	5	34	43	121	192	171	82	38	6	695
Stats			Percentile	15th	50th	85th	95th								
			Speed	23	28	33	35								
		Mean Speed (Average)		29.4											
		10 MPH Pace Speed		25-34											
		Number in Pace		519											
		Percent in Pace		75.0%											
		Number > 27 MPH		489											
		Percent > 27 MPH		70.4%											

Appendix E: Sight-Distance Plan and Profile



SIGHT DISTANCE PLAN
SCALE: 1" = 30'



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

LEGEND

Symbol	Description
GB-F	GRANITE BOUND FOUND
IPIN-F	IRON PIN FOUND
DH-F	DRILL HOLE FOUND
IPP-F	IRON PIPE FOUND
RRS-F	RAILROAD SPIKE FOUND
	UTILITY POLE
	SIGN
	LIGHT
	WELL
	SEWER MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	ABUTTER LINE
	PROPERTY LINE
	STREAM
	WETLAND
OHU	OVERHEAD UTILITIES
	DRAINAGE LINE
	TREELINE
	10' CONTOUR
	2' CONTOUR
	STONEWALL
	BUILDING SETBACK
	EASEMENT
	PROPOSED WATER VALVE
	PROPOSED HYDRANT
	PROPOSED WELL
	PROPOSED DRAINAGE MANHOLE
	PROPOSED CATCH BASIN
	PROPOSED PROPERTY LINE
	PROPOSED GUARDRAIL
UGU	PROPOSED UNDERGROUND UTILITIES
G	PROPOSED GAS LINE
W	PROPOSED WATER LINE
	PROPOSED DRAINAGE LINE
	PROPOSED TREELINE
	PROPOSED EDGE OF PAVEMENT
	PROPOSED SLOPED GRANITE CURB
	PROPOSED 2' CONTOUR

DIG SAFE
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
RI-ME-NH-VT-MA 811 CALL TOLL FREE

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

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

____________ SIGNATURE DATE: ____________

____________ SIGNATURE DATE: ____________

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

SIGHT DISTANCE PLAN & PROFILE

BARRETT HILL SUBDIVISION

MAP 151 LOT 59
75 BARRETTS HILL ROAD
HUDSON, NEW HAMPSHIRE
HILLSBOROUGH COUNTY

OWNER/APPLICANT:
BARRETT HILL, LLC
21 CONTINENTAL BLVD. DOOR #4
MERRIMACK, NH 03054
H.C.R.D. BK. 9700 PG. 287

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

REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/4/24	STAFF & REVIEW ENGINEER REVS	PCM
2	5/6/24	NHDES AOT & SITE WALK REVS	PCM

DATE: DECEMBER 6, 2023	SCALE: 1" = 30'
PROJECT NO: 23-0414-1	SHEET: 13 OF 24

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 - 2024

Date: 03-21-24 Zone # 1 Map/Lot: 151/059-000
75 Barretts Hill Rd.
Project Name: SB# 08-23 Barrett Hill LLC OSD Subdivision

Proposed ITE Use #1: Duplex 2- Family

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

CAP FEES: (ONE CHECK NEEDED)

1.	**(Bank 09) 2070-701**	**Traffic Improvements**	**$ 2,216.00**
2.	**(Bank 09) 2050-182**	**Recreation**	**$ 400.00**
3.	**(Bank 09) 2080-051**	**School**	**$ 3,063.00**
		Total CAP Fee	**$ 5,679.00**

****** CAP FEE AMOUNT IS PER UNIT ******

Check should be made payable to the Town of Hudson.

Thank you,

Brooke Dubowik

Planning Administrative Aid II