GRANITE SUBARU EXPANSION

SP# 03-22

CUP# 02-24

STAFF REPORT

September 25, 2024

SITE: 6 Executive Drive, Map 210 / Lot 001-000

ZONING: Business (B)

PURPOSE OF PLAN: To provide additional customer-restricted vehicle storage and display spaces (156 in total) for Granite Subaru. The proposed development impacts 4,898 sq. ft. of wetlands on Map/Lot 210/001-000 and 36,991 sq. ft. of wetland buffer area.

PLAN UNDER REVIEW:
Non-Residential Site Plan Granite Subaru Expansion SP# 03-22 & CUP# 02-24, Map 210 Lot 001-000, 6 Executive drive, Hudson, NH; prepared by The Dubay Group, 136 Harvey Road Bldg. B101, Londonderry, NH 03053, prepared for Raymond James Granite Prop LLC 193 Lowell Road, Hudson, NH, 03051; consisting of 11 sheets and general notes 1-15 on Sheet 3; dated December 17, 2021, last revised August 12, 2024.

ATTACHMENTS:

1) Revised Application with associated waiver request, dated August 12, 2024 – Attachment "**A**".
2) Conditional Use Permit Application, last revised August 12, 2024 – Attachment "**B**".
3) Department Comments – Attachment "**C**."
4) Peer Review prepared by Fuss & O'Neill (2nd round), dated August 6, 2024 – Attachment **"D"**.
5) Applicant response to Engineering and Peer Review Comments – Attachment "**E**."
6) Stormwater Management Report dated December 17, 2021, last revised August 20, 2024 – Attachment **"F"**.
7) Conservation Commission CUP Site Walk Observations & Recommendation dated September 9, 2024 – Attachment "**G**".

APPLICATION TRACKING:

- February 14, 2022 – Site plan application received.
- August 20, 2024 – Revised plans, Stormwater report, and application recieved.
- September 25, 2024 – Public hearing scheduled.

WAIVERS REQUESTED:

§ 275-8.C.(4) – To allow for proposed parking spaces to be 9' by 18' where 10' by 20' is required.
§ 275-8.C.(5) – To allow for double and triple parked spaces as well as 22' wide drive aisles.
§ 275-8.C.(6) – To not require off-street loading spaces.

§ 275-6.F. – To not require groundwater recharge volumes to be met.
§ 275-8.C.(7). – To not require the interior of the parking lot to be landscaped.
§ 275-8.C.(6)(c). – To allow for loading spaces to be closer than 100 feet to any property in a residential zone.

COMMENTS & RECOMMENDATIONS:

BACKGROUND

The site is approximately 2.34 acres in area and is located in the Business Zoning District. The site has never been developed and has remained vacant up until 2022. The applicant has been storing cars on site for the past two years despite the lack of site plan approval. The current application was developed I response to Code Enforcement action. The site could be served by Town water and sewer, but no connections exist at this time. No section of the property falls within FEMA designated flood zones. The site is home to a large swath of wetland along the southeastern portion of the site. The property is accessed via two easements from Map/Lot 210/001-001, with no additional curb cuts currently in place or proposed as part of the development.

The applicant is seeking six waivers at this time, which are discussed in further detail in a later section. As part of the proposed plan, the applicant has applied for a Conditional Use Permit related to work within Wetland areas identified on site. The applicant received a recommendation from the Conservation Commission on September 9, 2024. More information related to the Conditional Use Permit may be found within the Staff Comment section.

Starting in 2021, the applicant began parking dozens of vehicles on the site, which triggered a complaint. On April 13, 2021, a zoning case was opened in which the applicant agreed to submit a site plan application. The applicant first submitted a plan in February 2022. In September 2023, the applicant returned with a new plan set, which still needed heavy revision. The issue was brought up once again in February, 2024, with a reminder being sent two months later. The current revision is of August 2024, with the applicant parking vehicles on site the entire time this process has played out.

DEPARTMENT COMMENTS

Department staff has submitted the following comments:

Engineering submitted the following comments. In a letter dated August 21, 2024, the applicant provided responses (seen in Italics):

1. Applicant shall provide an explanation of why currently there are parked vehicles there prior to this site plan approval and how long this has been going on. Were any of the vehicles parked within the 75' wetland buffer at any time?

   According to discussions with the applicant, the previous Town Planner gave permission to park the vehicles there while going through the process. Vehicles are outside the buffer and erosion protections have been added to the site

2. Applicant shall provide details regarding winter operation, including guidelines to be followed for snow storage within wetland buffer.

Snow storage areas are shown on the site plan. These areas will drain into the wet pond to be treated. There are additional notes requiring green sno-pro contractors and excess snow to be removed from site to legal dumping sites.

3. Applicant shall add curbing and catch basins alongside of the proposed detention basin. This will eliminate any potential oil or fuel leaks discharged directly to the basin and wetland.

The site has been re-graded with curbing and basins added as requested.

4. Applicant shall equip all catch basins discharging to the proposed detention basin with oil and mechanical separators

All basins are specified to have envirohoods as requested.

5. Applicant shall state if they plan to use SnowPro certified plowing contractors

Requirement for green sno-pro contractors has been noted on the site plan.

6. Applicant shall install 75 foot wetland buffer marks, along the edge of pavement, every 50 feet.

Placards are proposed along the limit of pavement every 50 feet.

Engineering has stated that all comments are resolved at this time. Drainage piping on site is indicated to be a 0.5% grade or lesser, engineering has voiced no objections to this on a private site. Per §930.4 of *Town of Hudson Engineering department Engineering technical guidelines & Typical* Details, Town standards are 2% grade or greater within public right of way. Engineering has requested documentation showing a pipe-velocity of 2ft/s or greater (self-cleaning).

Full Comments can be found in **Attachment "C."** The applicant's letter can be found in **Attachment "E."**

PEER REVIEW

Fuss & O'Neill provided comments and review for the project twice. First on March 16, 2022, then again on August 6, 2024. In their second letter, Fuss & O'Neill noted two issues as outstanding. The applicant provided a response in a letter dated August 13, 2024. The issues are as follows:

1. Current Fuss and O'Neill Comment: The applicant has added the owner's signature to the cover sheet of the plan set. We note that the Town may require a real signature as the one on the plans does not appear to be an actual signature.

a. The owner has now signed the cover which has been scanned to ensure that all copies are signed.

2. Current Fuss and O'Neill Comment: We note the applicant has provided test pit data and BMP worksheets. The applicant should provide additional information on the required type of pre-treatment proposed. If pre-treatment is not proposed, additional waivers may be required.

a. Catch basins with Nyloplast Envirohoods have been added to the pavement to collect all runoff and pre-treat before entering the pond. The drainage model has been updated to reflect the changes in sub catchments areas and routing

Full Comments can be found in **Attachment "D."** The applicant's letter can be found in **Attachment "E."**

CONSERVATION COMMISSION

The Conservation Commission provided a recommendation for approval on September 9, 2024. The Commission has recommended the following conditions:

1. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.
2. The Town Engineer or his representative shall be allowed to inspect the boundaries of the wetland and wetland buffer areas during construction and report any finding to the applicant and the Conservation Commission for remediation.
3. The commission recommends that a stipulation and or note be added to the final plan set that states: "Stockpiling of earthen materials is not allowed in the Wetland Buffer Area.
4. The commission recommends that a stipulation and or note be added to the final plan set that states: "The wetland buffer boundary shall be identified and marked prior to the start of construction per Hudson Zoning Ordinance, Article IX §334-35 (E.)
5. The commission recommends that a stipulation and or note be added to the final plan set that states: " No Cut/No Disturb" signage shall be installed along the wetland buffer boundary prior to issuing Certificates of Occupancy per Hudson Zoning Ordinance, Article IX §334-35 (E.)
6. The commission recommends that a stipulation and or note be added to the final plan set that states: "Snow storage shall not be allowed in any wetland buffer area."
7. The commission recommends that the drive isle along the proposed display area be reduced from twenty-two (22) feet in width to twenty (20) feet in width. (*Staff notes that this is in conjunction with a waiver requested by the applicant)*
8. This motion is based on the plan(s) submitted by the applicant. It is recommended that if additional impacts are required the plan be returned to the Conservation Commission for further review.

WAIVERS REQUESTED

As noted above, the Applicant is seeking six waivers:

1. **§275-8.C.(4)** – To allow for proposed parking spaces to be 9' by 18' where 10' by 20' is required. The applicant states that the parking spaces are intended solely for the storage of vehicles to be sold and are not for public use.

2. **§275-8.C.(5)** – To allow for double and triple parked spaces as well as 22' wide drive aisles. The applicant states that employees will utilize this parking lot to retrieve cars as requested and will have ample room to navigate the lot as simultaneous traffic among employees will be low.
3. **§275-8.C.(6)** – To not require off-street loading spaces as there will be no acceptance or distribution of materials on this parcel.
4. **§275-6.F.** – To not require groundwater recharge volumes to be met. The applicant states that the interconnectivity of this site to abutting properties and depth to seasonal high water table do not allow for a recharge practice to be constructed under the parking lot or adjacent to it.
5. **§275-8.C.(7).** – To not require the interior of the parking lot to be landscaped. The applicant states that the lot will not have public access and will only be used for storage of vehicles.
6. **§275-8.C.(6)(c).** – To allow for loading spaces to be closer than 100 feet to any property in a residential zone. (*Staff notes that this waiver appears to be redundant with waiver 3, to not require a loading space.)*

STAFF COMMENTS

The proposed merger of the two lots and expansion of pavement for parking is intended to bring the lot into compliance with town codes. The applicant has already applied for and received a permit from NHDES for work within a wetland. In conjunction with the recommendation of the Conservation Commission, the work proposed has gone through several rounds of revisions. Staff notes that decisions on the waivers requested will have minimal impact on the scope of work outlined within the permit issued by NHDES. Staff has not compiled a CAP fee sheet due to the nature of the improvements, as no new traffic is anticipated for the site.

RECOMMENDATIONS

Staff recommend acceptance of the application and the holding of a public hearing, followed by deliberation and consideration of the site plan and waiver requests and CUP prior to potential approval or further requests for information/deferment. Staff recommends that the Board determine if any additional studies or information would be required.

DRAFT MOTIONS:

MOTION TO ACCEPT:

I move to accept the Non-Residential Site Plan Granite Subaru Expansion Site Plan SP# 03-22 & Conditional Use Permit CUP# 02-24, Map 210 / Lot 001-000, 6 Executive drive, Hudson, NH.

Motion by: _____Second: _____Carried/Failed: _____

MOTION TO GRANT A WAIVER:

I move to grant a waiver from **§275-8.C.(4)**, Application Submission, to allow for proposed parking spaces to be 9' by 18' where 10' by 20' is 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: _____

I move to grant a waiver from **§275-8.C.(5)**, Application Submission, to allow for parking spaces not directly abutting the drive aisle, in addition to an aisle with a minimum width less than 24', where 24' would 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: _____

I move to grant a waiver from **§275-8.C.(6)**, Application Submission, to not require off-street loading spaces where one would 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: _____

I move to grant a waiver from **§275-6.F**, General Requirements, to not require groundwater recharge volumes to be met where it would elsewise 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: _____

I move to grant a waiver from **§275-8.C.(7)**, Application Submission, to not require off-street loading spaces where one would 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: _____

I move to grant a waiver from **§275-8.C.(6).(c)**, Application Submission, to allow for a loading space within 100' of a residential, where elsewise it would not be allowed, 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: _____

MOTION TO CONTINUE:

I move to continue the site plan application Non-Residential Site Plan Granite Subaru Expansion Site Plan SP# 03-22 & Conditional Use Permit CUP# 02-24, Map 210 / Lot 001-000, 6 Executive drive, Hudson, NH, to date certain, _____, 2024.

Motion by: _____Second: _____Carried/Failed: _____

MOTION TO APPROVE:

I move to approve the site plan application for Non-Residential Site Plan Granite Subaru Expansion Site Plan SP# 03-22 & Conditional Use Permit CUP# 02-24, Map 210 / Lot 001-000, 6 Executive drive, Hudson, NH, 03051; prepared by: The Dubay Group, 136 Harvey Road Bldg. B101, Londonderry, NH 03053, prepared for: Raymond James Granite Prop LLC 193 Lowell Road, Hudson, NH, 03051; consisting of 11 sheets and general notes 1-15 on Sheet 3; dated December 17, 2021, last revised August 12, 2024; and:

The Planning Board finds that this application complies with the Zoning Ordinances and with the Land Use Regulations of the Town of Hudson with consideration for the waivers granted 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 the issuance of a final certificate of occupancy, an L.L.S. Certified "As-Built" site plan shall be provided to the Town of Hudson Land Use Department, confirming that the site conforms to the Planning Board approved Site Plan.
3. Prior to the Planning Board endorsement of the Plan, it shall be subject to final administrative review by Town Planner and Town Engineer.
4. Prior to application for a building permit, the Applicant shall schedule a pre-construction meeting with the Town Engineer.
5. Construction activities involving the subject lot shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. No exterior construction activities shall be allowed on Sundays.
6. Hours of refuse removal shall be exclusive to the hours between 7:00 A.M. and 7:00 P.M., Monday through Friday only.
7. The total number of parking spaces is limited to 156 total, including storage and display spaces. No customer access to the expansion of the dealership shall be allowed.

Together with the following supplemental stipulations based on Conservation Commission recommendations:

1. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.
2. The Town Engineer or his representative shall be allowed to inspect the boundaries of the wetland and wetland buffer areas during construction and report any finding to the applicant and the Conservation Commission for remediation.
3. A note be added to the final plan set that states: "Stockpiling of earthen materials is not allowed in the Wetland Buffer Area.
4. A note be added to the final plan set that states: "The wetland buffer boundary shall be identified and marked prior to the start of construction per Hudson Zoning Ordinance, Article IX §334-35 (E.)
5. A note be added to the final plan set that states: " No Cut/No Disturb" signage shall be installed along the wetland buffer boundary prior to issuing Certificates of Occupancy per Hudson Zoning Ordinance, Article IX §334-35 (E.)
6. A note be added to the final plan set that states: "Snow storage shall not be allowed in any wetland buffer area."
7. The drive isle along the proposed display area shall be reduced from twenty-two (22) feet in width to twenty (20) feet in width.
8. Additional wetland impacts to the plan will require a return to the Conservation Commission for further review.

Motion by: _____Second: _____Carried/Failed: _____

Town of Hudson
12 School Street
Hudson, NH 03501

SITE PLAN APPLICATION

Revised April 2024

The following information must be filed with the Planning Department ***at the time of filing a site plan application***:

1. One (1) original completed application with original signatures.

2. One (1) full plan set *folded* (sheet size: 22" x 34").

3. One (1) original copy of the project narrative.

4. A list of direct abutters and a list of indirect abutters, and two (2) sets of mailing labels for abutter notifications.

5. Site Plan Review Checklist.

6. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.

7. ***All plans shall be folded*** and all pertinent data shall be attached to the plans with an elastic band or other enclosure.

The following information is required to be filed with the Planning Department ***no later than 10:00 A.M., Tuesday ONE WEEK prior to the scheduled Planning meeting***. ***The purpose of these materials is hardcopy distribution to Planning Board members, not review.***
Any plan revisions that require staff review must be submitted no later than 10:00A.M., Tuesday TWO WEEKS prior to the scheduled Planning meeting. Depending on the complexity of changes, more time may be required for review. Please contact the Town Planner if you have any questions on this matter.

1. Submission of fifteen (15) 11" X 17" plan sets *folded*, revised if applicable.

2. Submission of one (1) full plan set *folded* (sheet size: 22" x 34"), if revised.

3. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.

Note: Prior to filing an application, it is recommended to schedule an appointment with the Town Planner.

SITE PLAN APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite Subaru Expansion

Zoning District: Business General SP#: _____
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	same as owner
Address: 193 Lowell Road	
Address: Hudson, NH	
Telephone #	
Email: jim@granitesubaru.com	

PROJECT ENGINEER:	SURVEYOR:
Name: Doug MacGuire, PE	Joel Connolly, LLS
Address: 136 Harvey Road Bldg B101	136 Harvey Road Bldg B101
Address: Londonderry, NH 03053	Londonderry, NH 03053
Telephone # 603-458-6462	603-458-6462
Email: doug@thedubaygroup.com	joel@thedubaygroup.com

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(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: ___

SITE DATA SHEET

PLAN NAME: Granite Subaru Expansion

PLAN TYPE: SITE PLAN

LEGAL DESCRIPTION: MAP 210 LOT 1

DATE: 5/28/2024

Location by Street:	6 Executive Drive
Zoning:	Business
Proposed Land Use:	Commercial
Existing Use:	Undeveloped
Surrounding Land Use(s):	Commercial
Number of Lots Occupied:	1
Existing Area Covered by Building:	0
Existing Buildings to be removed:	0
Proposed Area Covered by Building:	0
Open Space Proposed:	0
Open Space Required:	0
Total Area:	S.F.: 101,976 Acres: 2.34
Area in Wetland:	12,442 Area Steep Slopes: 0
Required Lot Size:	30,000 sf
Existing Frontage:	315'
Required Frontage:	150'

Building Setbacks:	Required*	Proposed
Front:	50'	50'
Side:	15'	15'
Rear:	15'	15'

SITE DATA SHEET
(Continued)

Flood Zone Reference: 33011C0656D

Width of Driveways: 22'

Number of Curb Cuts: 0

Proposed Parking Spaces: 156 display and storage spaces

Required Parking Spaces: N/A

Basis of Required Parking (Use): Vehicle storage for car dealership

Dates/Case #/Description/Stipulations of ZBA, Conservation Commission, NH Wetlands Board Actions:
(Attach stipulations on separate sheet)

Waiver Requests

Town Code Reference:	*Regulation Description:*

(For Town Use Only)

Data Sheets Checked By: _____ Date: _____

SITE PLAN APPLICATION AUTHORIZATION

I hereby apply for *Site 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 *Site 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: Jim Angotti Date: 5/31/24

Print Name of Owner: JAMES ANGOTTI

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

Signature of Developer: _____ Date: _____

Print Name of Developer: _____

- 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. **Site Plan Use** — **Project Size/Fee**

Multi-Family	$105.00/unit for 3-50 units $78.50/unit for each additional unit over 50	$_____
Commercial/Semi Public/Civic or Recreational	$157.00/1,000 sq. ft. for first 100,000 sq.ft. (bldg. area): $78.50/1,000 sq.ft. thereafter.	$_____
Industrial	$150.00/1,000 sq.ft for first 100,000 sq.ft. (bldg. area); $78.50/1,000 sq.ft thereafter.	$_____
No Buildings	$30.00 per 1,000 sq.ft. of proposed developed area	$_____

CONSULTANT REVIEW FEE: (Separate Check)

Total 2.34 acres @ $600.00 per acre, or $1,250.00, whichever is greater. $_____

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:

_____ Direct Abutters Applicant, Professionals, etc. as required by RSA 676:4.1.d @$5.08 **(or Current Certified Mail Rate)** $_____

_____ Indirect Abutters (property owners within 200 feet) @$0.68 **(or Current First Class Rate)** $_____

C. TAX MAP UPDATING FEE: (FLAT FEE) $ 275.00

TOTAL $_____

SCHEDULE OF FEES
(Continued)

(For Town Use)			
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.*****

LOT MERGER APPLICATION FOR TAX ASSESSMENT AND LAND USE PURPOSES

TOWN OF HUDSON, NEW HAMPSHIRE

The undersigned, Raymond James Granite Property LLC (type or print name here) is / are the owner(s) of lots or parcels shown on the Town Tax Maps as follows:

Tax Map 210 Lot 1
Tax Map 216 Lot 11
Tax Map _____ Lot _____

The undersigned requests that the Town of Hudson Planning Board combine the above described parcels or lots into one parcel or one lot to be known as, Tax Map 216, Lot 11 for tax assessment, and land use purposes.

The undersigned acknowledges and agrees that the merged lots or parcels shall be shown as a single lot or single parcel on the Town Tax map and shall be one lot or one parcel for land use purposes. The Town of Hudson will assess the merged lots or merged parcels as a single lot or a single parcel.

If at any time the undersigned, or its heirs, legatees, successors and assigns of the undersigned wish to subdivide the merged lot or merged parcel, subdivision approval must be obtained from the Town of Hudson Planning Board under the Town of Hudson Subdivision of Land Regulations.

The undersigned agrees that the approval of this application shall be filed at the expense of the undersigned in the Hillsborough County Registry of Deeds.

Dated this 19 day of June, 2024.

_____ (SIGN HERE) _____ (SIGN HERE)
LANDOWNER LANDOWNER

Raymond James Granite Property LLC _____
(TYPE OR PRINT NAME) (TYPE OR PRINT NAME)

This application for the merger of lots for tax assessment and land use purposes is approved by action of the Town of Hudson Planning Board. This application shall be recorded in the Hillsborough County Registry of Deeds.

Dated this _____ day of _____, 20____.

_____ (SIGN HERE)
CHAIRPERSON
HUDSON PLANNING BOARD

_____
(TYPE OR PRINT NAME)

Attachment "A"

PROJECT NARRATIVE – SITE PLAN

Proposed Parking Expansion
6 Executive Drive
Map 210, Lot 1
Hudson, New Hampshire
19 June 2024

This site is located at 6 Executive Drive, Hudson, NH and is identified as Map 210 Lot 1. The purpose of this project is to provide additional parking and storage for vehicles on the abutting car dealership lot (Granite Subaru). The site is currently undeveloped. The area of the parcel is 2.34 acres and is in the Business District. It is abutted by Irving Gas to the north and Granite Subaru to the south. It fronts on Lowell Road. The lot being developed will be consolidated with the adjacent Granite Subaru lot (Map 216 Lot 11) as part of this site plan application. The total area of the consolidated lot will be 8.33 acres.

The site currently has no direct access to Route 3A but has two access easements from Map 210 Lot 1-1 from the north. When the lots are consolidated, the site will utilize the existing access to Route 3A from Granite Subaru and the access easements from Map 210 Lot 1-1 will remain. Much of the topography on the site is flat with slopes of one to two percent across. The majority of the site drains towards the on-site wetland and the remaining runoff drains towards either the north or west. The site does not have any drainage systems currently. The soils on site are all hydrologic soil group "D" by NRCS soil mapping and are identified as Ridgebury fine sandy loam. Total area of wetlands on site is 12,442 sf (0.29 acres).

The proposed development will accommodate 156 total parking spaces including storage and display spaces. Customer access to this expansion of the Subaru dealership will not be allowed.

Attachment "A"

The proposed development impacts 4,898 sf of wetlands on Lot 210-1 and 36,991 sf of wetland buffer area.

Construction is anticipated for summer of 2024 and should be completed in approximately 2 months.

The site utilizes a wet pond for portions of the site to detain the runoff, which allows for settling of particles/pollutants, and to meter the flow to the design points. As you access the site through the existing dealership, the parking lot is graded to a high point where the existing pavement ended as to not add any additional flow to the existing catch basin. The remainder of the access way drainage is directed to a catch basin which ultimately finds its way to the proposed detention basin. The detention basin also collects the remainder of the vehicle storage area drainage as it sheet flows across the pavement at approximately a two percent slope. Drainage exits the pond through a 6” orifice that leads to a 12” hdpe pipe. An overflow spillway also assists in outlet control in the larger storm events.

Attachment "A"
The Dubay Group, Inc.
136 Harvey Road, Bldg B101
Londonderry, NH 03053
603-458-6462 thedubaygroup.com

MEMORANDUM

To:	Hudson Planning Board	Date:	April 24, 2024
From:	The Dubay Group, Inc Sam Kauhl	Re:	Waiver Requests Granite Subaru Expansion

Dear Planning Board,

On behalf of our client, we are requesting the following waivers from the Hudson Site Plan Regulations, for plans being submitted regarding the Granite Subaru Parking Expansion located at 193 Lowell Road:

HR 275-8.C.(4) – To allow for proposed parking spaces to be 9' by 18' where 10' by 20' is required. The parking spaces are intended solely for the storage of vehicles to be sold and are not for public use.

HR 275-8.C.(5) – To allow for double and triple parked spaces as well as 22' wide drive aisles. Employees will utilize this parking lot to retrieve cars as requested and will have ample room to navigate the lot as simultaneous traffic among employees will be low.

HR 275-8.C.(6) – To not require off-street loading spaces as there will be no acceptance or distribution of materials on this parcel.

HR 275-6.F. – To not require groundwater recharge volumes to be met. The interconnectivity of this site to abutting properties and depth to seasonal high water table do not allow for a recharge practice to be constructed under the parking lot or adjacent to it.

HR 275-8.C.(7). – To not require the interior of the parking lot to be landscaped as lot will not have public access and will only be used for storage of vehicles.

HR 275-8.C.(6)(c). – To allow for loading spaces to be closer than 100 feet to any property in a residential zone.

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LIST OF ABUTTER NOTIFICATIONS

6 EXECUTIVE DRIVE HUDSON, NH– MAY 28, 2024

(OWNER/ APPLICANT) 210-001-000	RAYMOND JAMES GRANITE PROP LLC 193 LOWELL RD. HUDSON, NH 03051
(CIVIL ENGINEER)	DOUG MACGUIRE, PE THE DUBAY GROUP, INC. 136 HARVEY RD BLDG B101 LONDONDERRY, NH 03053
(SURVEYOR)	JOEL CONNOLLY, LLS THE DUBAY GROUP, INC. 136 HARVEY RD BLDG B101 LONDONDERRY, NH 03053
210-001-001	MICHAEL A. TAMPOSI TRUSTEE TAMPOSI 2010 IRREV TRUST 20 TRAFALGER SUITE 602 NASHUA, NH 03063
216-009-000	NASH FAMILY INVESTMENT PROPERTY 91 AMHERST STREET NASHUA, NH 03064
216-011-000	RAYMOND JAMES GRANITE PROP LLC C/O GRANITE SUBARU 193 LOWELL RD. HUDSON, NH 03051
216-014-000	MISSION POINTE CONDO ASSOCIATION 35 OBLATE DR. HUDSON, NH 03051
210-010-000	PRESENTATION OF MARY CONVENT 182 LOWELL ROAD HUDSON, NH 03051

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6 EXECUTIVE DR
LOT 210-001-000
MAY 28, 2024

RAYMOND JAMES GRANITE PROP LLC
193 LOWELL RD.
HUDSON, NH 03051

DOUG MACGUIRE, PE
JOEL CONNOLLY, LLS
136 HARVEY RD BLDG B101
LONDONDERRY, NH 03053

MISSION POINTE CONDO ASSOCIATION
35 OBLATE DR.
HUDSON, NH 03051

MICHAEL A. TAMPOSI TRUSTEE
TAMPOSI 2010 IRREV TRUST
20 TRAFALGER SUITE 602
NASHUA, NH 03063

NASH FAMILY INVESTMENT PROPERTY
91 AMHERST STREET
NASHUA, NH 03064

PRESENTATION OF MARY CONVENT
182 LOWELL ROAD
HUDSON, NH 03051

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS AND NON-SITE SPECIFIC PERMIT 2022-01911

NOTE CONDITIONS

PERMITTEE:	**GRANITE PROPERTIES LLC** **ATTN: RAYMOND JAMES** **193 LOWELL RD** **HUDSON NH 03051**
PROJECT LOCATION:	**6 EXECUTIVE DR, HUDSON** **TAX MAP #210, LOT #1**
WATERBODY:	**UNNAMED WETLANDS**
APPROVAL DATE:	**SEPTEMBER 25, 2023**

EXPIRATION DATE: SEPTEMBER 25, 2028

Based upon review of permit application 2022-01911 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

PERMIT DESCRIPTION:
Dredge and fill 4,898 square feet within palustrine forested wetlands for parking and stormwater improvements associated with expanding an existing commercial development.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:

1. In accordance with Env-Wt 307.16, all work shall be in accordance with the plans dated December 17, 2021, with plan sheets "3" and "4" and the "Wetland Impact Plan" last revised July 13, 2023 by The Dubay Group, Inc. as received by NHDES on August 21, 2023.
2. In accordance with Env-Wt 524.05(a), the permittee shall submit a construction notice with the department at least 48 hours prior to commencing work.
3. In accordance with Env-Wt 307.11(b), limits of fill shall be clearly identified prior to commencement of work and controlled in accordance with Env-Wt 307.03 to ensure that fill does not spill over or erode into any area where filling is not authorized.
4. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
5. In accordance with Env-Wt 307.10(f), dredged materials to be stockpiled in uplands shall be dewatered in sedimentation basins that are contained within turbidity controls that prevent turbid water from leaving the basins; and located outside of any jurisdictional area.
6. In accordance with Env-Wt 307.03(c)(1), water quality control measures shall be selected and implemented based on the size and nature of the project and the physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
7. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
8. In accordance with Env-Wt 307.11(c), slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters.

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9. In accordance with Env-Wt 307.03(e), all exposed soils and other fills shall be permanently stabilized within 3 days following final grading.
10. In accordance with Env-Wt 307.12(c), any seed mix used shall not contain plant species that are exotic aquatic weeds.
11. In accordance with Env-Wt 307.12(d), mulch used within an area being restored shall be natural straw or equivalent non-toxic, non-seed-bearing organic material.
12. In accordance with Env-Wt 307.03(g)(1)-(4), the person in charge of construction equipment shall inspect for leaking fuel, oil, and hydraulic fluid each day, repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands and maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site.

MONITORING

13. Within 60 days following the completion of the project, a report that describes the stability of wetland systems including a description of any necessary adjustments, shall be submitted to the department, in accordance with Env-Wt 307.18.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.
5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
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 only cursory surveys have been performed, 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.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

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Seta A. Detzel
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____	_____
PERMITTEE SIGNATURE (required)	PRINCIPAL CONTRACTOR SIGNATURE (required)

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Book 9024 Page 2104 Page 1 of 19
Register of Deeds, Hillsborough County
Pamela D Caughlin

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546
Hudson Plan Bd

FEES: 83.82
SURCHARGE: 2.—
CASH:

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
***** Thousand * Hundred 40 Dollars
DATE 11/08/2017 HI093028 AMOUNT $ ******40.00
VOID IF ALTERED

DECLARATION OF COVENANTS AND EASEMENTS
(Executive Drive & Lowell Road, Hudson, N.H.)

THIS DECLARATION is made this 3rd day of November, 2017, by **Lawit, LLC**, a Florida limited liability company, **J.K.S. Realty, LLC**, a New Hampshire limited liability company, **K & T Investment Realty, LLC**, a New Hampshire limited liability company, **Gerald R. Prunier, in his capacity as Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Michael A. Tamposi**, **Richard Thorner, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Nicholas E. Tamposi**, **James R. DeGiacomo, in his capacity as Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Elizabeth M. Tamposi**, **Tamposi Real Estate and Development Company, Inc.**, a New Hampshire corporation, **and Stellos Family Investment Properties**, a New Hampshire general partnership, all with an address c/o The Tamposi Company, 20 Trafalgar Square, Suite 602, Nashua, Hillsborough County, New Hampshire 03063 (collectively, the "Declarants").

RECITALS

WHEREAS, the Declarants are the owners of certain land situated on the westerly side of Lowell Road and the southerly side of Executive Drive in Hudson, Hillsborough County, New Hampshire, being shown as Lot 13-1 on a plan entitled "Subdivision Plan - Lot 13-1 Map 10 Mod-Tap Subdivision Plan 2 Executive Drive Hudson, New Hampshire", dated 12 October 1998 by Hayner/Swanson, Inc., and recorded with the Hillsborough County Registry of Deeds as Plan No. 29681 (the "Parent Tract"); and

WHEREAS, the Parent Tract has been subdivided into two (2) parcels being shown as Lot 210-1 ("Lot 210-1") and Lot 210-1-1 ("Lot 210-1-1") on a plan entitled "Subdivision Plan (Map 210, Lot 1) 4 Executive Drive Hudson, New Hampshire", dated 5 April 2017 by Hayner/Swanson, Inc., and recorded with the Hillsborough County Registry of Deeds as Plan No. 39409 (the "Subdivision Plan");

WHEREAS, the Subdivision Plan contemplates the establishment of access easements and utility easements; and

WHEREAS, the Declarants desire to (i) identify and declare, for the common use of Lot 210-1 and Lot 210-1-1, off-site easements which are appurtenant to Lot 210-1 and Lot 210-1-1 and (ii) establish the various easements called for by the Subdivision Plan; and

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WHEREAS, Lot 210-1 and Lot 210-1-1 are collectively referred to herein as the "Lots" and individually as a "Lot".

DECLARATION

NOW, THEREFORE, for consideration paid, the Declarants hereby declare, grant, convey and establish for the benefit of and burdening Lot 210-1 and Lot 210-1-1 the following restrictions, rights, easements, obligations and covenants regarding Lot 210-1 and/or Lot 210-1-1, as the case may be:

SECTION A

Off-Site Easements Appurtenant to the Lots

The Declarants hereby declare that all easements appurtenant to the Parent Tract, including, without limitation, the following, are appurtenant to each of Lot 210-1 and Lot 210-1-1 and may be used in common by Lot 210-1 and Lot 210-1-1, subject to the terms and conditions set forth in this Declaration.

1. Off-Site Sewer Easements

The right and easement to and drain and convey effluent, wastewater and other substances permitted to be conveyed in a municipal sanitary sewer system through pipes, pumps and other appurtenances (now existing or hereinafter installed) upon and under certain areas of land situated on the southerly and northerly sides of Executive Drive in said Hudson, described as follows:

A. The sewer easements listed as item 1 and item 2 on the second page of the deed of Stellos Family Investment Properties et al. to Mod-Tap NA Corp. dated February 4, 1999 and recorded at Book 6061, Page 989 (the "Mod-Tap Deed"), more particularly detailed and described therein as follows:

(a) "A ... 20 foot wide sewer easement as shown on [a plan of land entitled 'Subdivision Plan – Lot 13-1, Map 10 Mod-Tap Subdivision Plan 2 Executive Drive Hudson, New Hampshire prepared for: Mod-Tap' dated October 12, 1998, and recorded in the Hillsborough County Registry of Deeds as Plan No. 29681 ("Plan No. 29681")], which shall benefit Lot 13-1 as shown on said plan, the area of which easement is further bounded and described as follows:

"Beginning at a point on the boundary line between Lot 13-3 and 13-1 as shown on said Plan at a point which is South 39° 49' 39" East, a distance of 54.74 feet from the southerly sideline of Executive Drive; thence South 39° 49' 39" East, a distance of 20.00 feet along said common boundary line to a point; thence South 49° 37' 58" West, a distance of 214.96 feet to a point; thence North 40° 22' 01" West, a distance of 57.11 feet to a point; thence [Northeasterly] by a curve having a radius of 1,860.47 feet, [a delta of 00° 36' 57" and an arc length of 20.00 feet] to a point; thence South 40° 22' 01" East, a distance of 37.00 feet to a point; thence South 49° 37' 58" West, a distance of 195.15 feet to the point of beginning.

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"Said ... sewer easement containing 5,042 square feet, more or less, according to said Plan."

The above-described easement area is referred to herein as "Sewer Easement Area A," and is shown as "Proposed 20 Ft. Sewer Easement (5,042 SF)" on Plan No. 29681.

(b) "An existing 20 foot wide sewer easement as shown on said plan; and further described in Book 2912, Page 101 and Book 2912, Page 113, Hillsborough County Registry of Deeds."

The above-described easement area is shown as "Existing 20 Ft. Sewer Easement (Vol 2912, Pg 101) (Vol 2912, Pg 113)" on Plan No. 29681.

Together with the rights and easements set forth in (i) the Easement Deed of Palmer B. Worthen and David A. Tonneson, Trustees of the FPW Realty Trust, to Riverview Industrial Park Associates dated April 8, 1982 and recorded at Book 2912, Page 101 (the "Worthen Easement Deed") and (ii) the Warranty Deed of Riverview Industrial Park Associates to M/A-COM, Inc., dated April 8, 1982 and recorded at Book 2912, Page 113.

The above-described easement areas are referred to herein as "Sewer Easement Area B."

B. The rights and easements conveyed by Sewer Easement from RETLAW ASSOCIATES to Riverview Industrial Park Associates dated April 1, 1982 and recorded at Book 2912, Page 109, the location of which is more particularly described as follows (and referred to herein as "Sewer Easement Area C"):

"A certain thirty (30) foot wide sewer easement in said Hudson, more particularly described as follows:

"Beginning at a stone bound on the northerly sideline of Executive Drive, at the southeast corner of land [now or formerly of RETLAW ASSOCIATES] and within described easement; thence

"1. Westerly by a curve to the right of 1,790.47 feet radius, a distance of 30.01 feet to a point; thence across land [now or formerly of RETLAW ASSOCIATES] parallel to the northerly line of said land

"2. North 24 degrees 07' 10" West, 493.89 feet to a point; thence

"3. North 06 degrees 17' 42" East 59.26 feet to the north line of land [now or formerly of RETLAW ASSOCIATES]; thence by said line

"4. South 24 degrees 07' 10" East 545.24 feet to the point of beginning."

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C. The rights and easements conveyed by Easement Deed from Karl E. Norwood and Harold A. Neill, Trustees of the NOR-HUD-WARE Realty Trust, to Riverview Industrial Park Associates dated April 2, 1982 and recorded at Book 2912, Page 111 relative to land situated northerly of Executive Drive in said Hudson, the locus of which is more particularly described in the aforesaid Easement Deed (referred to herein as "Sewer Easement Area D").

2. Drainage Tie-in and Easements

The following rights and easements:

A. The easements labeled as item 3 on the second page of the Mod-Tap Deed, upon and under certain land situated in said Hudson, more particularly described as follows:

"[T]he right to tie into a[n existing] 12" drainage stub and an easement to utilize a[n existing] drainage ditch and swale for the purposes of storm water runoff, which easement area is situated parallel to and within twenty-five feet of the southerly sideline of Executive Drive."

The above-described easement area is referred to herein as ""Drainage Easement Area E".

B. The easements labeled as item 4 on pages 2 and 3 of the Mod-Tap Deed and the 40-foot-wide drainage easement referenced on page 3 of the Mod-Tap Deed, upon and under certain land situated in said Hudson, more particularly described as follows:

"[T]he right and easement to flow storm water within a one hundred foot wide strip of land, parallel to and within the southerly boundary of [Lot 13-3 as shown on Plan No. 29681], utilizing an existing drainage area and culverts leading to the forty (40') foot wide drainage easement described [below] ... [and] a 40 foot wide drainage easement, which easement area is situated by and along the westerly boundary line of [Lot 13-3 as shown on Plan No. 29681], and which is further depicted on Plan No. 22540, Hillsborough County Registry of Deeds."

The above-described easement areas are referred to herein, respectively, as "Drainage Easement Area E" and "Drainage Easement Area F."

C. A certain drainage easement set forth in the Worthen Easement Deed, upon and under certain land situated in said Hudson,the locus, terms and conditions of which are more particularly set forth in the Worthen Easement Deed. The easement area set forth in the Worthen Easement Deed is referred to herein as "Drainage Easement Area G".

D. The drainage easement and related rights upon and under certain land situated in said Hudson, as set forth in the Confirmatory Drainage Easement Deed of Nash Family Investment Properties to the Declarants dated October 5, 2017 and recorded prior hereto (the "Nash Easement Deed"), the locus, terms and conditions of which are more particularly set forth in the Nash

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Easement Deed. The easement area set forth in the Nash Easement Deed is referred to herein as "Drainage Easement Area H".

SECTION B

Easements Called for by Subdivision Plan

The Declarants hereby declare, grant, convey and establish the following rights, easements, obligations and covenants for the use and benefit of Lot 210-1 and Lot 210-1-1, as the case may be:

1. Access, Drainage and Grading Easement (Access Easement Area I)

The non-exclusive right and easement for the benefit of Lot 210-1-1 for egress to the southbound lane of Lowell Road (Route 3A), by foot and by vehicles, over and upon certain land situated on the westerly side of Lowell Road in said Hudson, such land being shown as the "Proposed Access Easement (507 SF)" on the Subdivision Plan (and referred to herein as "Access Easement Area I"), more particularly described as follows:

Beginning at a point on the southwesterly sideline of Lowell Road (a.k.a. Route 3A) and at the easterly corner of Lot 210-1-1 on the Subdivision Plan, said point being the northerly corner of the Access Easement Area I; thence

1. Southeasterly along Lowell Road by a curve to the right, having a radius of 1,938.33 feet, a delta of 1° 03' 21" and an arc length of 35.72 feet to a point; thence

2. Westerly by a curve to the left, having a radius of 70.00 feet, a delta of 40° 36' 14" and an arc length of 49.61 feet to a point at said Lot 210-1-1; thence

3. N 60° 51' 44" E, along said Lot 210-1-1, a distance of 36.39 feet to the point of beginning.

Access Easement Area I contains 507 square feet, more or less.

Together with (a) the right to construct, install, maintain, repair and replace in Access Easement Area I and/or adjacent to Access Easement Area I grading, drainage installations, paving (and pavement), curbing, signage, light poles, hydrants and other improvements incidental to the development and/or use of (i) Lot 210-1-1 and (ii) Access Easement Area I for egress, by persons and vehicles, and (b) the right to drain and flow storm and surface water upon and under Access Easement Area I and the land adjacent thereto.

Access Easement Area I may not be used for ingress from Lowell Road.

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2. Access Easement
(Access Easement Area J)

The non-exclusive right and easement for the benefit of Lot 210-1 for ingress and egress, by foot and by vehicles, over and upon certain land situated on the westerly side of Lowell Road, said Hudson, being shown as the "Proposed Access Easement (6,813 SF)" on the Subdivision Plan (and referred to herein as "Access Easement Area J"), being more particularly described as follows:

Beginning at a point on the southwesterly sideline of Lowell Road (a.k.a Route 3A) and at the northerly corner of Lot 210-1 on the Subdivision Plan, said point being the easterly corner of the Access Easement Area G; thence

1. S 60° 51' 44" W, along Lot 210-1, a distance of 85.34 feet to a point; thence

2. N 23° 39' 00" W, a distance of 61.68 feet to a point; thence

3. N 18° 46' 21" E, a distance of 30.23 feet to a point; thence

4. N 61° 11' 42" E, a distance 40.00 feet to a point; thence

5. Northerly by a curve to the left, having a radius of 15.00 feet, a delta of 49° 47' 09" and an arc length of 13.03 feet to a point; thence

6. Northerly by a curve to the left, having a radius of 75.00 feet, a delta of 14° 53' 07" and an arc length of 19.48 feet to a point at Lowell Road; thence

7. S 28° 48' 18" E, along Lowell Road, a distance of 24.95 feet to a point; thence

8. Southeasterly along Lowell Road by a curve to the right, having a radius of 1,938.33 feet, a delta of 2° 18' 39" and an arc length of 78.17 feet to the point of beginning.

Access Easement Area J contains 6,813 square feet, more or less.

The northerly curb cut at Lowell Road in Access Easement Area J, as shown on the Site Plans (as hereinafter defined), may not be used by Lot 210-1 for egress to Lowell Road.

3. Access and Utility Easement
(Access & Utility Easement Area K)

The non-exclusive right and easement for the benefit of Lot 210-1 for ingress and egress, by foot and by vehicles, and the right to install underground utility lines and underground appurtenances for the provision of natural gas, domestic and fire suppression water service, and stormwater management and drainage services, upon (for ingress and egress) and under (for natural gas, domestic and fire suppression water service and stormwater management and drainage services) certain land situated southerly of Executive Drive in said Hudson, being shown as the

"Proposed Access & Utility Easement (11,774 SF)" on the Subdivision Plan (and referred to herein as "Access & Utility Easement Area K"), and more particularly described as follows:

Beginning at a point on the southeasterly sideline of Executive Drive, said point being the northwesterly corner of Access & Utility Easement Area K and being N 56° 08' 25" E, a distance of 88.10 feet from the northerly corner of Lot 216-9 on said plan; thence

1. N 56° 08' 25" E, along said Executive Drive, a distance of 41.90 feet to a point; thence

2. N 49° 37' 58" E, along said Executive Drive, a distance of 15.73 feet to a point; thence

3. Southerly by a curve to the left, having a radius of 50.00 feet, a delta of 36° 13' 42" and an arc length of 31.62 feet to a point; thence

4. S 29° 08' 16" E, a distance 272.90 feet to a point at Lot 210-1; thence

5. S 60° 51' 44" W, along said Lot 210-1, a distance of 39.00 feet to a point; thence

6. N 29° 08' 16" W, a distance of 274.99 feet to a point; thence

7. Northerly by a curve to the left, having a radius of 30.00 feet, a delta of 44° 16' 35" and an arc length of 23.18 feet to the point of beginning.

Access & Utility Easement Area K contains 11,774 square feet, more or less.

Access & Utility Easement Area K may be used by Lot 210-1 for stormwater management and drainage services in connection with a stormwater management system that is designed for flows from Lot 210-1 that do not exceed .5 cubic feet per second (of stormwater) based on the so-called ten (10) year storm. Access & Utility Easement Area K shall not be used by Lot 210-1 for stormwater management and drainage services unless and until all appropriate local, state and federal permits and approvals therefor have been issued, including, without limitation, non-residential site plan approval by the Hudson Planning Board and a so-called alteration of terrain permit from the New Hampshire Department of Environmental Services.

4. Sewer Easement
(Sewer Easement Area L)

The non-exclusive right and easement for the benefit of Lot 210-1 to drain and convey effluent, wastewater and other substances permitted to be conveyed in a municipal sanitary sewer system through underground pipes, pumps and other appurtenances under certain land situated southerly of Executive Drive, said Hudson, being shown as the "Proposed Sewer Easement (4,818 SF)" on the Subdivision Plan (and referred to herein as "Sewer Easement Area L"), more particularly described as follows:

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Beginning at a point on the westerly corner of Lot 210-1 on the Subdivision Plan, said point being the southwesterly corner of the herein described parcel; thence

1. N 39° 49' 39" W, along Lot 216-9, a distance of 239.04 feet to a point; thence

2. N 50° 10' 21" E, a distance of 20.00 feet to a point; thence

3. S 39° 49' 39" E, a distance of 242.82 feet to a point at said Lot 210-1; thence

4. S 60° 51' 44" W, along said Lot 210-1, a distance 20.35 feet to the point of beginning.

Sewer Easement Area L contains 4,818 square feet, more or less.

Sewer Easement Area L shall not be used by Lot 210-1 until and if it obtains all necessary state and local sewer discharge and related permits and approvals, which may include amendments to any permits and approvals for sewer discharge issued in connection with Lot 210-1-1. No such permits and approvals for Lot 210-1, including any amendments to permits and approvals for Lot 210-1-1, shall conflict with the permits and approvals issued for Lot 210-1-1 nor shall they limit the flows or capacity available to Lot 210-1-1.

5. Drainage Easement
(Drainage Easement Area M)

The non-exclusive right and easement for the benefit of Lot 210-1 to convey and flow storm and surface waters and install pipes and other underground appurtenances under certain land situated southerly of Executive Drive, said Hudson, being shown as the "Proposed Drainage Easement (1,837 SF)" on the Subdivision Plan (and referred to herein as "Drainage Easement Area M"), being more particularly described as follows:

Commencing at a point on the westerly line of Lot 210-1-1 on the Subdivision Plan, said point being S 38° 49' 39" E (along said Lot 216-9) a distance of 15.08 feet from the westerly corner of Lot 210-1; thence

1. N 56° 08' 25" E, a distance of 93.12 feet to a point at the Proposed Access & Utility Easement (11,774 SF) (Access & Utility Easement Area K); thence

2. Southeasterly along Access & Utility Easement Area K by a curve to the right, having a radius of 30 feet, a delta of 12° 35' 07" and an arc length of 6.59 feet to a point; thence

3. S 29° 08' 16" E, along Access & Utility Easement Area K a distance of 13.47 feet to a point; thence

4. S 56° 08' 25" W, a distance of 90.10 feet to a point at said Lot 216-9; thence

Attachment "A"

5. N 39° 49' 39" W, along said Lot 216-9, a distance of 20.11 feet to the point of beginning.

Drainage Easement Area M contains 1,837 square feet, more or less.

Drainage Easement Area M may be used by Lot 210-1 for stormwater management and drainage services in connection with a stormwater management system that is designed for flows from Lot 210-1 that do not exceed .5 cubic feet per second (of stormwater) based on the so-called ten (10) year storm. Access & Utility Easement Area K shall not be used by Lot 210-1 for stormwater management and drainage services unless and until all appropriate local, state and federal permits and approvals therefor have been issued, including, without limitation, non-residential site plan approval by the Hudson Planning Board and a so-called alteration of terrain permit from the New Hampshire Department of Environmental Services.

SECTION C

General

This Declaration is further governed by the following terms and conditions:

1. Sewer Easement Area A, Sewer Easement Area B, Sewer Easement Area C, Sewer Easement Area D, Drainage Easement Area E, Drainage Easement Area F, Drainage Easement Area G, Drainage Easement Area H, Access Easement Area I, Access Easement Area J, Access & Utility Easement Area K, Sewer Easement Area L and Drainage Easement Area M are collectively referred to herein as the "Easement Areas".

2. The Easement Areas may be used by the owners, lessees and other parties in interest of the Lot upon which the particular Easement Area(s) are located for any use a fee simple owner of real estate may use real estate; provided, that such use not preclude the use of an Easement Area for its intended purpose.

3. The Declaration does not preclude or limit the development and use of Lot 210-1-1 as contemplated by the "Site Development Plans for Proposed Retail Motor Fuel Outlet Tax Map 210 Lot 1-1 4 Executive Drive Hudson, New Hampshire" prepared for Irving Oil Marketing, Inc., by MHF Design Consultants, Inc., dated 4/17/17 as revised, consisting of fourteen (14) sheets and related sheets and drawings, as approved by the Hudson Planning Board on June 21, 2017, as finalized (collectively, the "Site Plans"). Without limitation to the foregoing, the building(s), parking areas, drive aisles, walkways, landscaping and site improvements, utility lines, equipment and other appurtenances and installations, stormwater and drainage management improvements, including detention, retention and bioretention ponds and basins, pavement and other impervious surfaces, underground tanks and other improvements and above ground buildings and improvements may be installed, maintained, replaced, repaired and used on Lot 210-1-1, whether or not any such improvements are installed under, upon or above any of the Easement Areas; provided, that no building(s), fueling station(s) or underground fuel storage tanks shall be installed in the Easement Areas.

Attachment "A"

4. The easements described and established hereby shall not benefit or be used to benefit any other real estate but for the Lots.

5. Access Easement Area I, Access Easement Area J and Access & Utility Easement Area K may be used by the Declarants, their lessees and their respective guests, invitees and licensees (which include agents, employees and customers), for ingress and egress, subject to any specific limitations set forth in this Declaration.

6. The easements and rights established under this Declaration, and the obligations and covenants imposed in connection with this Declaration, with respect to Lot 210-1 or Lot 210-1-1, as the case may be, shall run to the benefit of and are binding upon any lessee of Lot 210-1 or Lot 210-1-1, as the case may be, for the term of any such lease. Without limitation to the foregoing, the rights and easements established under this Declaration and the obligations and covenants imposed by this Declaration, to the extent they benefit or burden Lot 210-1-1, run to the benefit of and are binding upon Irving Oil Marketing, Inc., as the tenant or lessee of Lot 210-1-1 under the Lease Agreement by and between the Declarants and Irving Oil Marketing, Inc. dated April 3, 2017, as said Lease Agreement has been and may be amended, extended, modified or renewed, a notice of which has been or will be recorded with said Registry of Deeds.

7. The owner of a Lot benefited by an easement established by this Declaration shall maintain, repair and replace, at its sole cost and expense, all of the equipment, installations and other improvements used by such owner in connection with such easement; provided, that in the event such equipment, installations and improvements are used in common by both of the Lots, the owners of the Lots shall share equally in the cost of such maintenance, repairs and improvements to the particular equipment, installations and improvements so repaired, maintained or replaced. In the event an owner of Lot 210-1 or Lot 210-1-1 disturbs pavement or other surface improvements in connection with subsurface or other work undertaken by such owner, the party undertaking such work shall, at its cost, restore such pavement (including repaving the same) and restore any other such surface improvements.

8. The owners or lessees of either Lot 210-1 or Lot 210-1-1 may install in the Access Easement Area I, Access Easement Area J and the Access & Utility Easement Area K signage for traffic control as may be required or contemplated by governmental approvals with respect to the development and/or use of Lot 210-1-1 and/or Lot 210-1; provided, that no such signage shall be in conflict with the reasonable use of Lot 210-1-1 and/or Lot 210-1 or the approvals therefor.

9. Access Easement Area I, Access Easement Area J and the Access & Utility Easement Area K shall be kept free from obstructions and open for the free flow of persons by foot and travel by vehicles. Vehicles, equipment or other tangible property shall not be parked in Access Easement Area H, Access Easement Area I or the Access & Utility Easement Area J or otherwise obstruct the use of such areas for ingress or egress.

10. This Declaration, including the easements, covenants, restrictions, agreements and obligations contained herein, shall be perpetual, and hereby are deemed to be binding on the heirs, successors and assigns of the present and future owners of Lot 210-1 and Lot 210-1-1 and to be covenants running with the land, and in any deed of conveyance of Lot 210-1, Lot 210-1-1 or any

Attachment "A"

part thereof to any person or entity, the rights referred to herein shall be incorporated therein by reference to this Declaration and the recording hereof shall be considered to vest as easement rights and burdens and shall be established by grant or conveyance of easements confirming the rights of each owner of Lot 210-1 and Lot 210-1-1 set forth in this Declaration.

11. This Declaration and the rights, easements, obligations and covenants established hereby, shall inure to the benefit of and be binding upon the present and future owners of Lot 210-1 and Lot 210-1-1, in accordance with the terms of this Declaration, whether or not this Declaration is referenced in any deed or other instrument of record of Lot 210-1 or Lot 210-1-1. Upon a conveyance of Lot 210-1 or Lot 210-1-1 by the Declarants to a third party, this Declaration shall be deemed re-executed, ratified and affirmed and benefit and burden Lot 210-1 and Lot 210-1-1, as the case may be, in accordance with its terms.

12. Notwithstanding the commonality of ownership of Lot 210-1 and Lot 210-1-1 and the use of the word "easement" herein, the rights and obligations created hereby shall not be defeated, rescinded, revoked, withdrawn or deemed void under any legal doctrine of merger and it is intended that the reciprocal restrictions or covenants herein shall automatically become easements benefitting and burdening Lot 210-1 and Lot 210-1-1 upon the separation of ownership of Lot 210-1 and Lot 210-1-1 by conveyance. Whether or not the ownership of Lot 210-1 and Lot 210-1-1 is separated, the provisions of this paragraph 12 shall not limit the easements, rights, obligations and covenants inuring to the benefit of or binding upon any tenant or lessee of Lot 210-1 or Lot 210-1-1, including, without limitation, the easements, rights, obligations and covenants established pursuant to paragraph 6 above.

13. Any party of interest in or to this Declaration may enforce its rights and easements by all rights and remedies available at law and equity, including the remedies of specific performance and mandatory injunction. Notwithstanding the foregoing, in no event shall any party be liable for special, consequential, or punitive damages, including loss of revenues or profits.

14. None of the access easements established by this Declaration shall be public streets, roads or ways, but shall remain private, the Town of Hudson having no obligation to maintain the same.

15. This Declaration shall be governed by and enforced in accordance with the law of the State of New Hampshire.

For the Declarant's title to the Lots, see deed recorded at Book 5802, Page 1229, Book 5802, Page 1235, Book 8271, Page 71, Book 8271, Page 74 and Book 8271, Page 77.

All recording references are to the Hillsborough County Registry of Deeds.

F:\2016\16-354\documents\Declaration of Covenants & Easements -Final (11-1-17).docx

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 1st day of November, 2017.

Lawit, LLC

Witness

By: _____
Name: Stephen A. Tamposi
Its: Manager

STATE OF New Hampshire
COUNTY OF Hillsborough

This instrument was acknowledged before me this 1st day of November, 2017, by Stephen A. Tamposi, Manager of Lawit, LLC, a Florida limited liability company, on behalf of the company.

_____
Notary Public
My Commission Expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 1st day of November, 2017.

J.K.S. Realty, LLC

Witness

By: _____
Name: Samuel A. Tamposi, Jr.
Its: Manager

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 1st day of November, 2017 by Samuel A. Tamposi, Jr., Manager of J.K.S. Realty, LLC, a New Hampshire limited liability company, on behalf of the company.

Notary Public
My Commission Expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 1st day of November, 2017.

Witness

K & T Investment Realty, LLC

By:
Name: Celina Tamposi Griffin
Its: Manager

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 1st day of November, 2017 by Celina Tamposi Griffin, Manager of K & T Investment Realty, LLC, a New Hampshire limited liability company, on behalf of the company.

Notary Public
My Commission Expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 2nd day of November, 2017.

Witness

Gerald R. Prunier, in his capacity as Trustee
of the Samuel A. Tamposi, Sr. 1992
Nonexempt Trust FBO Michael A. Tamposi

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 2nd day of November, 2017 by Gerald R. Prunier, in his capacity as Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Michael A. Tamposi, on behalf of the trust.

Notary Public
My Commission Expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 3rd day of November, 2017.

Witness

Richard Thorner, Trustee of the
Samuel A. Tamposi, Sr. 1992 Nonexempt
Trust FBO Nicholas E. Tamposi

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 3rd day of November, 2017 by Richard Thorner, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Nicholas E. Tamposi, on behalf of the trust.

Notary Public
My Commission Expires:

SYLVIE L. SMITH
JUSTICE OF THE PEACE
MY COMMISSIONS EXPIRE FEB. 10, 2021
NOTARY PUBLIC
NEW HAMPSHIRE

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 6th day of November, 2017.

Witness

James R. DeGiacomo, in his capacity as Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Elizabeth M. Tamposi

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK

This instrument was acknowledged before me this 6th day of November, 2017 by James R. DeGiacomo, in his capacity as Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Elizabeth M. Tamposi, on behalf of the trust.

Maria D Ververis
Notary Public
My Commission Expires: 12-4-2020

MARIA D. VERVERIS
Notary Public
Commonwealth of Massachusetts
My Commission Expires
December 4, 2020

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 1st day of November, 2017.

Tamposi Real Estate and Development Company, Inc.

Witness

By: _____
Name: Samuel A. Tamposi, Jr.
Its: President

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 1st day of November, 2017 by Samuel A. Tamposi, Jr., President of Tamposi Real Estate and Development Company, Inc., a New Hampshire corporation, on behalf of the corporation.

Notary Public
My Commission Expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Attachment "A"

IN WITNESS WHEREOF, the undersigned Declarant has caused this Declaration of Covenants and Easements to be duly executed this 2nd day of November, 2017.

Witness

Stellos Family Investment Properties

By: Melanie Stellos
Name: Melanie Stellos
Its: Managing Partner

STATE OF NEW HAMPSHIRE
COUNTY OF HILLSBOROUGH

This instrument was acknowledged before me this 2 day of November, 2017 by Melanie Stellos, Managing Partner of Stellos Family Investment Properties, a New Hampshire general partnership, on behalf of the partnership.

LORINE A. ROMANO
MY COMMISSION EXPIRES MAY 6, 2020
NOTARY PUBLIC
NEW HAMPSHIRE

Notary Public
My Commission Expires: May 6, 2020

Doc # 8008930 Mar 7, 2018 8:59 AM
Book 9054 Page 1942 Page 1 of 5
Register of Deeds, Hillsborough County

Attachment "A"

C/H
L-CAP
HIA437222

Return to:
Public Service of NH EVERSOURCE
Attn: Pauline Boire
PO Box 330
Manchester, NH 03105 ENV #
EBA- 25181 104
STORMS# 2993406
Town: 237 Hudson
Tax Parcel ID: Map 210 Lot 1-1

STATE OF NEW HAMPSHIRE
DEPARTMENT OF REVENUE ADMINISTRATION
REAL ESTATE TRANSFER TAX
***** Thousand * Hundred 40 Dollars
DATE 03/07/2018 HI095720 AMOUNT $ ******40.00
VOID IF ALTERED

EASEMENT DEED

KNOW ALL MEN BY THESE PRESENTS that Stellos Family Investment Property (50%); Tamposi Real Estate & Development Company, Inc. (25%); James R. DeGiacomo, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Elizabeth M. Tamposi (4.166%); Eugene M. Van Loan, III, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Nicholas E. Tamposi (4.166%); Gerald R. Prunier, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Michael A. Tamposi (4.166%); K&T Investment Realty, LLC (4.166%); J.K.S. Realty, LLC (4.166%); and Lawit, LLC (4.166%) all having a mailing address c/o Tamposi Real Estate & Development Co., Inc. of 20 Trafalgar Square, Nashua, New Hampshire 03063, (hereinafter called the Grantor(s)), for consideration paid, grant(s) to PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE (PSNH), d/b/a Eversource Energy, a corporation duly established by law, with a mailing address of P.O. Box 330, in Manchester, in the County of Hillsborough, in the State of New Hampshire, 03105, (hereinafter called the Grantee), and its successors, with QUITCLAIM covenants, the RIGHT and EASEMENT to lay, install, construct, reconstruct, operate, maintain, repair, replace, patrol and remove above/underground lines which may consist of wires, cables, pipes, ducts, conduits, manholes, and such testing terminals, transformers and foundations and enclosures for the same, vaults, pedestals, repeaters, markers, poles, and towers together with foundations, crossarms, braces, anchors, guys, grounds and other equipment, for transmitting electric current and/or communications and intelligence, and to do the necessary cutting and trimming of trees and brush, over, under and across land owned by the Grantor(s) off Lowell Road in Hudson, County of Hillsborough, State of New Hampshire. For Grantor's titles see following deeds recorded in the Hillsborough County Registry of Deeds: Stellos - Book 5802, Page 1235; Tamposi and all Trusts - Book 5802, Page 1229; K&T - Book 8271, Page 74; J.K.S. - Book 8271, Page 71; and Lawit - Book 8271, Page 77.

Said easement will be located within the following described limits:

Beginning at a point on the Grantor's northeasterly boundary at Lowell Road (NH Route 3A), said point being at or near PSNH pole numbered 209/78, thence extending above and/or underground in various directions as may be required to property serve the premises of the Grantor's now or in the future, to include but not limited to pole numbered 209/78-1 and padmounted transformer numbered 209/78-1T1. The final location of the easement shall be determined by the location of the facilities as installed, whenever installed.

The width of this easement shall be 20 feet, measured either 10 feet on each side of the center line of the distribution lines as constructed, or, if less than 10 feet exists on either side to

Attachment "A"

the nearest adjacent boundary line, measured 20 feet from the boundary line. This easement grants the right for guying/anchoring facilities outside the 20-foot strip, together with the right to lay, install, construct, reconstruct, operate, maintain, repair, replace and remove any service cables and related equipment extending to any buildings or structures on said land in order to provide electric or telephone service and/or communications and intelligence thereto. This conveyance shall include the right of access from other land of the Grantor(s) for all purposes in connection with the exercise of the within granted easement; the right to excavate, trench, and backfill by men or machines and temporarily to place excavated earth and other material on adjacent land, provided that the land shall be restored by the Grantee(s) to substantially the condition in which it was immediately prior to such excavation, trenching, and backfilling; the right to go upon adjoining land when working on said lines and associated equipment; and the right to install temporary aboveground lines for temporary periods over and across said land of the Grantor(s) to provide continuity of service thereon when only underground line rights are requested.

The Grantor(s) for themselves and their heirs, executors, administrators, successors and assigns, covenant(s) and agree(s) that they will not erect or maintain, or permit to be erected or maintained, any building or structure of any kind or nature upon the land over said easement and that they will not plant or permit to be planted any trees over said easement.

Witness our hand(s) this 23rd day of February, 2018.

STELLOS FAMILY INVESTMENT PROPERTY

BY: _____

Printed Name: Melanie Colorusso

Title: Partner

TAMPOSI REAL ESTATE & DEVELOPMENT COMPANY, INC.

BY: _____, President

Printed Name: Samuel A. Tamposi, Jr.

Title: President

K&T INVESTMENT REALTY, LLC

BY: _____

Printed Name: Celina T. Griffin

Title: Manager

Attachment "A"

SAMUEL A. TAMPOSI, SR. 1992 NONEXEMPT TRUST

FBO Elizabeth M. Tamposi, Nicholas E. Tamposi, and Michael A. Tamposi

BY: _____
James R. DeGiacomo, Trustee for Elizabeth M. Tamposi

BY: _____
Eugene M. Van Loan, III, Trustee for Nicholas E. Tamposi

BY: _____
Gerald R. Prunier, Trustee for Michael A. Tamposi

J.K.S. REALTY, LLC

BY: _____, Manager
Printed Name: Samuel A. Tamposi, Jr.
Title: MANAGER

LAWITT, LLC

BY: _____
Printed Name: Stephen A. Tamposi
Title: Manager

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 13th day of February, 2018, by Melanie Colorusso, Partner of Stellos Family Investment Property of Nashua, NH.

My Commission expires:
KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

_____
Notary Public/~~Justice of the Peace~~

Attachment "A"

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 12th day of February, 2018, by Samuel A. Tamposi, Jr., President of Tamposi Real Estate and Development Company, Inc.

My Commission expires:
KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Kelly J. Mooshian
Notary Public/~~Justice of the Peace~~

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 14th day of February, 2018, by Celina T. Griffin, manager of K&T Investment Realty, LLC of Nashua, NH.

My Commission expires:
KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Kelly J. Mooshian
Notary Public/~~Justice of the Peace~~

~~State/~~Commonwealth of Massachusetts
County of Suffolk

The foregoing instrument was acknowledged before me this 23rd day of February, 2018, by James R. DeGiacomo, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Elizabeth M. Tamposi of Nashua, NH.

My Commission expires: ~~MARIA D. VERVERIS Notary Public Commonwealth of Massachusetts My Commission Expires December 4, 2020~~

Maria D. Ververis
Notary Public/~~Justice of the Peace~~

MARIA D. VERVERIS
Notary Public
Commonwealth of Massachusetts
My Commission Expires
December 4, 2020

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 15th day of February, 2018, by Eugene M. Van Loan, III, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Nicholas E. Tamposi of Nashua, NH.

My Commission expires:

Sylvie L. Smith
Notary Public/Justice of the Peace

SYLVIE L. SMITH
JUSTICE OF THE PEACE
MY COMMISSIONS EXPIRE FEB. 10, 2021
NOTARY PUBLIC
NEW HAMPSHIRE

Attachment "A"

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 12th day of February, 2018, by Gerald R. Prunier, Trustee of the Samuel A. Tamposi, Sr. 1992 Nonexempt Trust FBO Michael A. Tamposi of Nashua, NH.

My Commission expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Kelly J. Mooshian
Notary Public/~~Justice of the Peace~~

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 20th day of February, 2018, by Stephen Tamposi, Manager of Lawitt, LLC of Hernando, FL.

My Commission expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Kelly J. Mooshian
Notary Public/~~Justice of the Peace~~

State/~~Commonwealth~~ of New Hampshire
County of Hillsborough

The foregoing instrument was acknowledged before me this 12th day of February, 2018, by Samuel A. Tamposi, Jr., Manager of J.K.S. Realty, LLC of Nashua, NH.

My Commission expires:

KELLY J. MOOSHIAN, Notary Public
My Commission Expires January 18, 2022

Kelly J. Mooshian
Notary Public/~~Justice of the Peace~~

Town of Hudson
12 School Street
Hudson, NH 03501

CONDITIONAL USE PERMIT APPLICATION: WETLAND CONSERVATION OVERLAY DISTRICT

Revised April 2024

Applications must be received at least 21 days prior to the Planning Board and Conservation Commission meetings at which the application will be heard. ***The following information must be filed to each board.***

CONSERVATION COMMISSION:

1. Ten (10) copies of the completed application, including the project narrative that demonstrates that the proposal meets the conditions of Article IX of the Zoning Ordinance.
2. Ten (10) reduced size plan sets *folded* (sheet size: 11" X 17"). Plans require the stamp of a licensed land surveyor and a certified wetlands scientist. At a minimum, plans must show topography and any wetland within fifty (50) feet of the proposed project.

***Complete Application material should be delivered to the Engineering Department (603)886-6008.**

PLANNING BOARD:

1. One (1) copy of the completed application, including the project narrative that demonstrates that the proposal meets the conditions of Article IX of the Zoning Ordinance.
2. One (1) full size plan set *folded* (sheet size: 22" x 34") and fifteen (15) reduced size plan sets *folded* (sheet size: 11" X 17"). Plans require the stamp of a licensed land surveyor and a certified wetlands scientist. At a minimum, plans must show topography and any wetland within fifty (50) feet of the proposed project.
3. A list of direct abutters and indirect abutters, and two (2) sets of mailing labels for abutter notifications.
4. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.
5. Check should be made payable to the *Town of Hudson*, and submitted to the Planning Department.

***Complete Application material & check should be delivered to the Planning Department (603)886-6008.**

Revised plans and other application materials must be filed with the Planning Department ***no later than 10:00A.M., Tuesday ONE WEEK prior to the scheduled meeting, as applicable. The purpose of these materials is hardcopy distribution to Planning Board members, not review.***
Any plan revisions that require staff review must be submitted no later than 10:00A.M., Tuesday TWO WEEKS prior to the scheduled Planning meeting. Depending on the complexity of changes, more time may be required for review. Please contact the Town Planner if you have any questions on this matter.

Note: Prior to filing an application, it is recommended to schedule an appointment with the Town Planner and Town Engineer.

CONDITIONAL USE PERMIT APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite State Subaru Expansion

Zoning District: Business General CUP#: _____
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	same as owner
Address: 193 Lowell Road	
Address: Hudson, NH 03051	
Telephone #	
Email: jim@granitesubaru.com	

PROJECT ENGINEER or SURVEYOR:	CERTIFIED WETLANDS SCIENTIST:
Name: Doug MacGuire, PE	Luke Hurley, CWS
Address: 136 Harvey Road Bldg B101	PO Box 356
Address: Londonderry, NH 03053	Epsom, NH 03234
Telephone # 603-458-6462	603-583-1745
Email: doug@thedubaygroup.com	luke@hurleyelp.com

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(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: ___

SITE DATA SHEET

PLAN NAME: Granite Subaru Expansion

PLAN TYPE: (Site Plan, Subdivision, or other) Site Plan

LEGAL DESCRIPTION: MAP 210 LOT 1

DATE: 5/28/2024

Location by Street: 6 Executive Drive

Zoning: Business

Proposed Land Use: Commercial

Existing Use: Undeveloped

Total Site Area: S.F.: 101,976 Acres: 2.34

Total Wetland Area (SF): 12,442

Permanent Wetland Impact Area (SF): 4,898

Permanent Wetland Buffer Impact Area (SF): 36,991

Temporary Wetland Impact Area (SF): 0

Temporary Wetland Buffer Impact Area (SF): 0

Flood Zone Reference: 33011C0656D

Proposed Mitigation:

_____

_____

_____

(For Town Use Only)

Data Sheets Checked By: _____ Date: _____

WETLAND CONDITIONAL USE PERMIT CHECKLIST

Yes	No	NA	QUESTIONS/INFORMATION NEEDED	HCC Comments
NARRATIVE REPORT				
			Existing Conditions	
X	○	○	Has a DES Dredge and Fill Permit been issued for any part of this site? If yes, provide number, date, and description.	
○	X	○	Is there evidence of altered wetlands or surface waters on site?	
X	○	○	All prime and other wetlands in the vicinity, plus any wetlands/watersheds past the immediate vicinity affected by this project	
X	○	○	• Description of each wetland and associated values	
X	○	○	Wetland mapping results – Including the flagging date and technique plus the name, company and qualifications of the wetland scientist	
X	○	○	Was property surveyed? If yes, the date of survey. (Please attach the survey plan)	
			National Wetland Inventory	
X	○	○	• Vegetative cover types	
○	X	○	• Existence of vernal pools and associated habitat	
○	X	○	• Unique geological and cultural features	
X	○	○	• NH Natural Heritage inventory – For list of rare and endangered species, contact the NH Division of Forests and Lands (603)271-3623	
○	X	○	• Wildlife and fauna species, including estimated number and locations (large projects)	
○	○	X	• Public or private wells located within the vicinity	
○	○	X	• Monitoring well(s) located on site	
X	○	○	• Current land use and zoning district	
X	○	○	Photos of existing area (please use color photos)	
			Proposed Project Description	
X	○	○	Entire project and associated activities	
X	○	○	Time table of project and anticipated phasing	
X	○	○	Land use	
X	○	○	Grading plan	
			Impact to Wetlands and/or Buffers	
○	X	○	• Depending on size and proposed impacts, a report from a biologist may be appropriate	
X	○	○	Removing, filling, dredging, or altering (Area square ft. and locations)	
○	X	○	Intercepting or diverging of ground or surface water (Locations and size)	
X	○	○	• Change in run-off characteristics	
X	○	○	Delineation of drainage area contributing to each discharge point	

Yes	*No*	*NA*	*Questions/Information Needed*	***HCC COMMENTS***
X	○	○	Estimated water quality characteristics of runoff at each point of discharge for both pre- and post-development	
X	○	○	Erosion control practices	
X	○	○	• If using rip-rap, attach documentation explaining why other erosion control methods are not feasible	
X	○	○	• How storm water runoff will be handled	
○	○	X	If backyards or lots include a buffer area, buffer restriction wording shall be included in each deed (A physical marker may be requested to designate buffer boundaries at site)	
			Mitigation	
X	○	○	Square footage of mitigation – wetland and upland areas	
○	X	○	Wetland or upland plants identified to replace any losses	
○	X	○	• Restoration plan for planting and vegetation	
○	○	X	Conservation easements, including location and aesthetic, wildlife and vegetative values	
○	○	X	• If easement is on or added to the site(s), a copy of the legal document shall be given to the HCC (HCC conservation easement markers may also be required along the easement)	

CONCEPTUAL SITE PLAN/DRAWING

X	○	○	Locus map depicting project site and vicinity within approximately ½ mile and also on a larger scale	
X	○	○	All prime and other wetlands in the vicinity	
X	○	○	Wetland(s) impacted (identified as prime or other) and the wetland boundaries with 50', buffer areas highlighted in color	
X	○	○	Assessor's sheet(s), lot(s), and property account number(s)	
X	○	○	Existing and proposed structures	
X	○	○	Square footage listed for temporary and permanent impact	
X	○	○	Erosion control plan (Suggested: Biodegradable silt fences so area won't be disturbed again and no hay to avoid invasive species)	
X	○	○	Topographical map with contours	
X	○	○	Storm water treatment swales and basins highlighted in color if in buffer area	
○	○	X	Conservation and utility easements	
X	○	○	Grading plan	
X	○	○	Culvert, arch, bridge - sizes, material, etc.	
X	○	○	Vegetative cover types	
○	○	X	Vernal pools	
X	○	○	Existing and proposed stone walls, tree lines, and unusually large, rare or beautiful trees, and other notable site features	

QUESTIONS TO CONSIDER BEFORE SUBMITTING

- Will the increased discharge cause erosion and channelization?
- Is there potential for off-site flooding?
- Does the decreased infiltration in the drainage area cause vegetation stress due to reduced or increased ground water or surface water discharge into wetland?
- Will the nutrients in the runoff increase eutrophication potential in downstream water bodies?
- Do you own any adjacent parcels or easements for roadways across adjacent parcels which could be used for access to avoid a wetland crossing
- Does a wetland crossing occur where it will result in the least amount of alteration to a wetland?
- Is preservation of upland areas adjacent to the impacted wetland a priority?
- Can using an alternative crossing design such as a bridge, retaining wall, etc. decrease the width or area of wetland alteration?
- Does a proposed road crossing of a wetland exceed the minimum width acceptable to the Planning Board and can this be negotiated downwards?
- Have you established that no reasonable alternative access from a public way to an upland is possible?
- Can the parking lot spaces be decreased?
- Is the roadway designed in such a way that does not restrict the flow of water?
- Is additional information needed to assess water quality impacts due to runoff?
- Is there an increase in other pollutants (e.g., heavy metals, turbidity, coli form) from streets and parking lots?
- Is there a need to restrict or prohibit the use of pesticides and fertilizers?
- Is there a need to restrict the use of roadway salting?

CONDITIONAL USE PERMIT APPLICATION AUTHORIZATION

I hereby apply for *Conditional Use Permit* 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 *Conditional Use Permit* 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 Hudson Conservation Commission, 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: 5/31/24

Print Name of Owner: JAMES ANGOTTI

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

Signature of Developer: _____ Date: _____

Print Name of Developer: _____

- 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.

SCHEDULE OF FEES

(Fee covers both Conservation Commission & Planning Board)

A. REVIEW FEES:

1. Conditional Use Permit
   $100 Flat Fee $ 100.00

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:

_____ Direct Abutters Applicant, Professionals, etc. as required by RSA 676:4.1.d @$5.08 **(or Current Certified Mail Rate)** $ 30.48

_____ Indirect Abutters (property owners within 200 feet) @$0.68 **(or Current First Class Rate)** $_____

TOTAL $ 130.48

(For Town Use)

AMOUNT RECEIVED: $_____ DATE RECEIVED: _____

RECEIPT NO.: _____ RECEIVED BY: _____

Attachment "B"

The Dubay Group, Inc.
136 Harvey Road, Bldg B101
Londonderry, NH 03053
603-458-6462 thedubaygroup.com

NARRATIVE REPORT

To:	Conservation Committee	Date:	May 31, 2024
From:	Sam Kauhl The Dubay Group, Inc.	Re:	Narrative Report Map 210, Lot 1 – Hudson, NH

Existing Conditions

All pertinent information is shown on the Existing Conditions Plan as part of this submittal.

National Wetland Inventory

A printout from the NWI website is included. It was determined by the Wetland Scientist that the on-site wetland is not a vernal pool. A copy of the NHB DataCheck Results Letter is included and no recorded occurrences for sensitive species near this project area were found. The parcel is in the Business District and the current land use is vacant and undeveloped. Photos of the site were taken on February 24, 2022 and are included in this submittal.

Proposed Project Description

The proposed development will accommodate 156 total parking spaces consisting of display spaces and storage spaces. Customer access to this expansion of the Subaru dealership will not be allowed. As you access the site through the existing dealership, the parking lot is graded to a high point where the existing pavement ended as to not add any additional flow to the existing catch basin. The remainder of the access way drainage is directed to a catch basin which ultimately finds its way to the proposed et pond. The wet pond also collects the remainder of the vehicle storage area drainage as it sheet flows across the pavement at approximately a two percent slope. Drainage exits the pond through a 6” orifice that leads to a 12” hdpe pipe. An overflow spillway also assists in outlet control in the larger storm events.

Construction is anticipated for summer of 2024 and should be completed in approximately 2 months.

Impact to Wetlands and/or Buffers

An impact plan is included showing the square footage of impact to both the wetland and the wetland buffer. Stormwater runoff is directed to the proposed wet pond where it discharges to the wetland as it naturally does now. The wet pond allows for settling of particles and pollutants. The 12” pipe along with the overflow spillway meter the flow exiting the pond as to not inundate the wetland during storm events.

Mitigation

An impact plan is included showing the square footage of impact to both the wetland and the wetland buffer.

Site Plans

A full plan set is included in this submittal.

Attachment "B"

The Dubay Group, Inc.
136 Harvey Road, Bldg B101
Londonderry, NH 03053
(603)-458-6462 thedubaygroup.com

To:	NHDES Wetlands Bureau	Date:	July 14, 2023
From:	Sam Kauhl The Dubay Group, Inc.	Re:	Wetland Impact for Access Map 210, Lot 1 – Hudson, NH

This memorandum is in response to the NHDES Wetlands Bureau's request for more information and concern regarding the proposed wetland impacts at 6 Executive Drive in Hudson, NH. The impact will serve as an access way from the abutting Granite Subaru dealership to the proposed car storage lot.

Total area of impact has been reduced to the greatest extent possible from our previous submission. The site layout has been revised by reducing the drive aisle of the access way from 22' to 20' as well as pulling the drive aisle and associated car storage along the access as close to the frontage of Lowell Road as possible. The setback to pavement from the front property line in this zone is 35'. Given the unique geometry of this lot's front property line we were able to work with the town to reduce the setback from the property line while maintaining the appropriate setback distance to Lowell Road, preserving the intent of the town regulations.

Alternative drainage practices were considered in the redesign of this site. However, pre-existing connections to abutting lots restricted the potential for a subsurface practice underneath the parking storage area. Separation to water table could not be met while keeping the parking area cross slopes to a reasonable standard. The current design directs runoff through sheet flow towards the detention basin which outfalls to the onsite wetland.

The previous site design yielded a total wetland impact of 5,986 sf while this revised layout proposes a wetland impact of 4,898 sf. This is a reduction of 18%.

Attachment "B"

The State of New Hampshire
Department of Environmental Services

Robert R. Scott, Commissioner

WETLANDS AND NON-SITE SPECIFIC PERMIT 2022-01911

NOTE CONDITIONS

PERMITTEE:	**GRANITE PROPERTIES LLC** **ATTN: RAYMOND JAMES** **193 LOWELL RD** **HUDSON NH 03051**
PROJECT LOCATION:	**6 EXECUTIVE DR, HUDSON** **TAX MAP #210, LOT #1**
WATERBODY:	**UNNAMED WETLANDS**
APPROVAL DATE:	**SEPTEMBER 25, 2023**

EXPIRATION DATE: SEPTEMBER 25, 2028

Based upon review of permit application 2022-01911 in accordance with RSA 482-A and RSA 485-A:17, the New Hampshire Department of Environmental Services (NHDES) hereby issues this Wetlands and Non-Site Specific Permit. To validate this Permit, signatures of the Permittee and the Principal Contractor are required.

PERMIT DESCRIPTION:
Dredge and fill 4,898 square feet within palustrine forested wetlands for parking and stormwater improvements associated with expanding an existing commercial development.

THIS PERMIT IS SUBJECT TO THE FOLLOWING PROJECT-SPECIFIC CONDITIONS:

1. In accordance with Env-Wt 307.16, all work shall be in accordance with the plans dated December 17, 2021, with plan sheets "3" and "4" and the "Wetland Impact Plan" last revised July 13, 2023 by The Dubay Group, Inc. as received by NHDES on August 21, 2023.
2. In accordance with Env-Wt 524.05(a), the permittee shall submit a construction notice with the department at least 48 hours prior to commencing work.
3. In accordance with Env-Wt 307.11(b), limits of fill shall be clearly identified prior to commencement of work and controlled in accordance with Env-Wt 307.03 to ensure that fill does not spill over or erode into any area where filling is not authorized.
4. In accordance with Env-Wt 307.11(a), fill shall be clean sand, gravel, rock, or other material that meets the project's specifications for its use; and does not contain any material that could contaminate surface or groundwater or otherwise adversely affect the ecosystem in which it is used.
5. In accordance with Env-Wt 307.10(f), dredged materials to be stockpiled in uplands shall be dewatered in sedimentation basins that are contained within turbidity controls that prevent turbid water from leaving the basins; and located outside of any jurisdictional area.
6. In accordance with Env-Wt 307.03(c)(1), water quality control measures shall be selected and implemented based on the size and nature of the project and the physical characteristics of the site, including slope, soil type, vegetative cover, and proximity to jurisdictional areas.
7. In accordance with Env-Wt 307.03(c)(5), water quality control measures shall be maintained to ensure continued effectiveness in minimizing erosion and retaining sediment on-site during and after construction.
8. In accordance with Env-Wt 307.11(c), slopes shall be immediately stabilized by a method specified in Env-Wq 1506 or Env-Wq 1508, as applicable, to prevent erosion into adjacent wetlands or surface waters.

Attachment "B"

9. In accordance with Env-Wt 307.03(e), all exposed soils and other fills shall be permanently stabilized within 3 days following final grading.
10. In accordance with Env-Wt 307.12(c), any seed mix used shall not contain plant species that are exotic aquatic weeds.
11. In accordance with Env-Wt 307.12(d), mulch used within an area being restored shall be natural straw or equivalent non-toxic, non-seed-bearing organic material.
12. In accordance with Env-Wt 307.03(g)(1)-(4), the person in charge of construction equipment shall inspect for leaking fuel, oil, and hydraulic fluid each day, repair any leaks prior to using the equipment in an area where such fluids could reach groundwater, surface waters, or wetlands and maintain oil spill kits and diesel fuel spill kits, as applicable to the type(s) and amount(s) of oil and diesel fuel used, on site.

MONITORING

13. Within 60 days following the completion of the project, a report that describes the stability of wetland systems including a description of any necessary adjustments, shall be submitted to the department, in accordance with Env-Wt 307.18.

THIS PERMIT IS SUBJECT TO THE FOLLOWING GENERAL CONDITIONS:

1. Pursuant to RSA 482-A:12, a copy of this permit shall be posted in a secure manner in a prominent place at the site of the approved project.
2. In accordance with Env-Wt 313.01(a)(5), and as required by RSA 482-A:11, II, work shall not infringe on the property rights or unreasonably affect the value or enjoyment of property of abutting owners.
3. In accordance with Env-Wt 314.01, a standard permit shall be signed by the permittee, and the principal contractor who will build or install the project prior to start of construction, and will not be valid until signed.
4. In accordance with Env-Wt 314.03(a), the permittee shall notify the department in writing at least one week prior to commencing any work under this permit.
5. In accordance with Env-Wt 314.08(a), the permittee shall file a completed notice of completion of work and certificate of compliance with the department within 10 working days of completing the work authorized by this permit.
6. In accordance with Env-Wt 314.06, transfer of this permit to a new owner shall require notification to, and approval of, the NHDES.
7. The permit holder shall ensure that work is done in a way that protects water quality per Env-Wt 307.03; protects fisheries and breeding areas per Env-Wt 307.04; protects against invasive species per Env-Wt 307.05; meets dredging activity conditions in Env-Wt 307.10; and meets filling activity conditions in Env-Wt 307.11.
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 only cursory surveys have been performed, 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.
9. In accordance with Env-Wt 307.06(a) through (c), no activity shall jeopardize the continued existence of a threatened or endangered species, a species proposed for listing as threatened or endangered, or a designated or proposed critical habitat under the Federal Endangered Species Act, 16 U.S.C. §1531 et seq.; State Endangered Species Conservation Act, RSA 212-A; or New Hampshire Native Plant Protection Act, RSA 217-A.
10. In accordance with Env-Wt 307.02, and in accordance with federal requirements, all work in areas under the jurisdiction of the U.S. Army Corps of Engineers (USACE) shall comply with all conditions of the applicable state general permit.

APPROVED:

Attachment "B"

Seta A. Detzel
Wetlands Specialist, Wetlands Bureau
Land Resources Management, Water Division

THE SIGNATURES BELOW ARE REQUIRED TO VALIDATE THIS PERMIT (Env-Wt 314.01).

_____ _____

PERMITTEE SIGNATURE (required) PRINCIPAL CONTRACTOR SIGNATURE (required)

Attachment "B"

GOVE ENVIRONMENTAL SERVICES, INC.

January 13, 2022

Sam Kauhl, EIT
Project Engineer
The Dubay Group Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053

Subject: Subaru, Lowell Road, Hudson
Re: Site Assessment

Dear Mr. Kauhl:

Per your request, this letter is to verify that Gove Environmental Services, Inc., performed a site inspection to identify wetlands at the above-referenced site. Wetlands were evaluated utilizing the following standards:

1. *US Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*, Technical Report ERDC/EL TR-12-1 (January 2012).
2. *Field Indicators for Identifying Hydric Soils in New England – Version 4, April 2019*. New England Hydric Soils Technical Committee.
3. *US Army Corps of Engineers National Wetland Plant List, 2018.*
4. *Classification of Wetlands and Deepwater Habitats of the United States.* USFW Manual FWS/OBS–79/31 (1979).

On wetland was delineated on the parcel on October 11, 2020. This wetland is on the eastern portion of the lot adjacent to Lowell Road. This wetland is poorly drained and drains to the southwest under. This wetland is not a vernal pool as water does not stay pondned for long enough during the spring. Dominant vegetation is red maple and American elm in the tree layer, highbush blueberry and winterberry in the shrub layer and cinnamon and sensitive fern in the herbaceous layer.

The main functions and values of this wetland are some flood flow attenuation and sediment/toxicant retention. Because of the small size of the wetland and its proximity to the adjacent developments and road, overall functions and values are low.

Wetland soils are similar to Walpole poorly drained. The upland is primarily flat in the north and eastern portion of the site and slopes gradually down to the wetland.

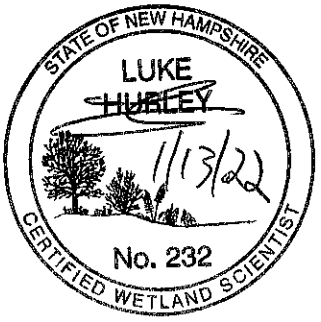
8 Continental Dr Unit H, Exeter, NH 03833-7507
Ph (603) 778 0644 / *Fax* (603) 778 0654
www.gesinc.biz
info@gesinc.biz

The upland if the site is disturbed by past land use and is a combination of open scrub vegetation and bramble, honeysuckle, and bittersweet, and open mowed grass on the northern side and an existing automobile parking area to the south and east..

Please let me know if you have any questions or need anything else.

Sincerely,

Luke D. Hurley, CWS, CSS
Vice President
Gove Environmental Services, Inc.



Attachment "B"

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

To: Jacob Doerfler
136 Harvey Rd
Bldg B101
Londonderry, NH 03053

From: NH Natural Heritage Bureau

Date: 2/28/2022 (This letter is valid through 2/28/2023)

Re: Review by NH Natural Heritage Bureau of request dated 2/28/2022

Permit Type: Hudson

NHB ID: NHB22-0844

Applicant: Jacob Doerfler

Location: Hudson
Tax Map: 210, Tax Lot: 1
Address: 6 Exectutive Drive

Proj. Description: Expansion of parking lot for additional car storage for Granite Subaru. No new buildings.

The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

Based on the information submitted, no further consultation with the NH Fish and Game Department pursuant to Fis 1004 is required.

Attachment "B"

New Hampshire Natural Heritage Bureau
NHB DataCheck Results Letter

MAP OF PROJECT BOUNDARIES FOR: NHB22-0844

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord NH 03301

U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI

Attachment "B"

February 28, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Attachment "B"

Facing west into site.

Facing east into site.

Attachment "B"

From existing Granite Subaru lot facing north into site where proposed connection is to be.

Facing south. On-site wetland.

Dubowik, Brooke

From: Dhima, Elvis
Sent: Thursday, June 6, 2024 2:44 PM
To: Dubowik, Brooke; Gradert Benjamin; Hebert, David; Kirkland, Donald; McElhinney, Steven; Michaud, Jim; Sullivan, Christopher; Malley, Tim; Twardosky, Jason
Subject: RE: Granite Subaru Vehicle Storage SP# 03-22 & CUP# 02-24

Brooke

I have the following comments:

1. Applicant shall provide an explanation of why currently there are parked vehicles there prior to the this site plan approval and how long has this been going on.
   Was any of the vehicles parked within the 75' wetland buffer at anytime ?

2. Applicant shall provide details regarding winter operation, including guidelines to be followed for snow storage within wetland buffer
3. Applicant shall add curbing and catch basins alongside of the proposed detention basin. This will eliminate any potential oil or fuel leaks discharge directly to the basin and wetland
4. Applicant shall equip all catch basins discharging to the proposed detention basin with oil and mechanical separators.
5. Applicant shall state if they plan to use SnowPro certified plowing contractors
6. Applicant shall install 75 foot wetland buffer marks, along the edge of pavement, every 50 feet

Thanks

Elvis Dhima, P.E.
Town Engineer

12 School Street
Hudson, NH 03051
Phone: (603) 886-6008
Town of Hudson
NEW HAMPSHIRE 03051

CONDITIONAL USE PERMIT APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite State Subaru Expansion

Zoning District: Business General CUP#: 02-24
(For Town Use Only)

Z.B.A. Action:

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	
Address: 193 Lowell Road	
Address: Hudson, NH 03051	
Telephone #	
Email:	
PROJECT ENGINEER or SURVEYOR:	**CERTIFIED WETLANDS SCIENTIST:**
Name: Doug MacGuire, PE	Luke Hurley, CWS
Address: 136 Harvey Road Bldg B101	8 Continental Drive Bldg 2 Unit H
Address: Londonderry, NH 03053	Exeter, NH 03833
Telephone # 603-458-6462	603-770-5114
Email: doug@thedubaygroup.com	lhurley@gesinc.biz

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(For Town Use Only)

Routing Date: 5/29/24 Deadline Date: 6/5/24 Meeting Date: TBD

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

____ Title: Chief Assessor Date: 6-6-24
(Initials)

Department:

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

SITE PLAN APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite Subaru Expansion

Zoning District: Business General SP#: 03-22
(For Town Use Only)

Z.B.A. Action:

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	
Address: 193 Lowell Road	
Address: Hudson, NH	
Telephone #	
Email:	

PROJECT ENGINEER:	SURVEYOR:
Name: Doug MacGuire, PE	Joel Connolly, LLS
Address: 136 Harvey Road Bldg B101	136 Harvey Road Bldg B101
Address: Londonderry, NH 03053	Londonderry, NH 03053
Telephone # 603-458-6462	603-458-6462
Email: doug@thedubaygroup.com	joel@thedubaygroup.com

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(For Town Use Only)

Routing Date: 5/29/24 Deadline Date: 6/5/24 Meeting Date: tbd

X I have no comments ____ I have comments (attach to form)

JM Title: Chief Assessor Date: 6-6-24
(Initials)

Department:

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

SITE PLAN APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite Subaru Expansion

Zoning District: Business General SP#: 03-22
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	
Address: 193 Lowell Road	
Address: Hudson, NH	
Telephone #	
Email:	

PROJECT ENGINEER:	SURVEYOR:
Name: Doug MacGuire, PE	Joel Connolly, LLS
Address: 136 Harvey Road Bldg B101	136 Harvey Road Bldg B101
Address: Londonderry, NH 03053	Londonderry, NH 03053
Telephone # 603-458-6462	603-458-6462
Email: doug@thedubaygroup.com	joel@thedubaygroup.com

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(For Town Use Only)

Routing Date: 5/29/24 Deadline Date: 6/5/24 Meeting Date: tbd

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

DRH Title: Fire Marshal Date: 6/6/24
(Initials)

Department:

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

SITE PLAN APPLICATION

Date of Application: May 28, 2024 Tax Map #: 210 Lot #: 1

Site Address: 6 Executive Drive

Name of Project: Granite Subaru Expansion

Zoning District: Business General SP#: 03-22
(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Raymond James Granite Prop, LLC	
Address: 193 Lowell Road	
Address: Hudson, NH	
Telephone #	
Email:	

PROJECT ENGINEER:	SURVEYOR:
Name: Doug MacGuire, PE	Joel Connolly, LLS
Address: 136 Harvey Road Bldg B101	136 Harvey Road Bldg B101
Address: Londonderry, NH 03053	Londonderry, NH 03053
Telephone # 603-458-6462	603-458-6462
Email: doug@thedubaygroup.com	joel@thedubaygroup.com

PURPOSE OF PLAN:

To provide additional vehicle storage for Granite Subaru on the adjacent lot.

(For Town Use Only)

Routing Date: 5/29/24 Deadline Date: 6/5/24 Meeting Date: tbd

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

CIS Title: Zoning Admin. Date: 6-6-24
(Initials)

Department:

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

Attachment "D"

FUSS & O'NEILL
50 Commercial Street, Suite 2S
Manchester, NH 03101
603.668.8223
www.fando.com

August 6, 2024

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

Re: Town of Hudson Planning Board Review
Granite Subaru Expansion Site Plan, 193 Lowell Road
Tax Map 210 Lot 1; Acct. #1350-931
Reference No. 20030249.2410

Dear Mr. Minkarah:

Fuss & O'Neill (F&O) has reviewed the second submission of the materials received on June 25, 2024, related to the above-referenced project. Authorization to proceed was received on July 22, 2024. A list of items reviewed is enclosed. The scope of our review is based on the Site 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 the development of a vehicle storage and display parking lot on a previously undeveloped site. Proposed improvements to the site also include the construction of parking areas, drainage improvements, landscaping, lighting, and other associated site improvements. There are no proposed buildings onsite and no water and sewer connections.

The following items have outstanding issues:

2. Administrative Review Codes (HR 276)

a. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (6). The owner's signature is not shown on the plan set.*

Current Fuss and O'Neill Comment: The applicant has added the owner's signature to the cover sheet of the plan set. We note that the Town may require a real signature as the one on the plans does not appear to be an actual signature.

6. Drainage Design/Stormwater Management (HR 275-9. A./Chapter 290)

b. *Former Fuss and O'Neill Comment: HR 275-9. A.3. & 290-5. A.4. The applicant should provide test pit, perc data, and BMP worksheets for the GRV requirement.*

Current Fuss and O'Neill Comment: We note the applicant has provided test pit data and BMP worksheets. The applicant should provide additional information on the required type of pre-treatment proposed. If pre-treatment is not proposed, additional waivers may be required.

The following items require Town evaluation or input:

1. Site Plan Review Codes (HR 275)

c. *Former Fuss and O'Neill Comment: HR 275-8. C. (4). The applicant has proposed spaces that are nine by 18 feet which will require a Planning Board vote.*

Current Fuss and O'Neill Comment: The applicant has provided a waiver request for this approval.

d. *Former Fuss and O'Neill Comment: HR 275-8. C. (5). The applicant has proposed a three spaces deep parking lot layout in two locations and has included aisles that are only 22-foot wide instead of 24-foot. The applicant should review the need for a waiver from the Regulation with the Town.*

Current Fuss and O'Neill Comment: The applicant has provided a waiver request to allow for double and triple parking spaces as well as 22' wide drive aisles.

e. *Former Fuss and O'Neill Comment: HR 275-8. C. (6). The applicant has not provided any off-street loading spaces in the proposed expansion area.*

Current Fuss and O'Neill Comment: The applicant has noted in the waiver request to the Hudson Planning Board to propose to not require off-street loading spaces as there will be no acceptance or distribution of materials on this parcel.

6. Drainage Design/Stormwater Management (HR 275-9. A./Chapter 290)

a. *Former Fuss and O'Neill Comment*: *HR 275-6. F. The applicant should provide additional information on groundwater recharge requirements.*

Current Fuss and O'Neill Comment: The applicant has requested a waiver for this requirement.

7. Zoning (ZO 334)

c. *Former Fuss and O'Neill Comment: ZO 334-33. The applicant has shown wetlands within the site and has proposed an impact to 5,986 square feet of wetlands. The applicant provided a Town of Hudson Conditional Use Permit application with the review document package.*

Current Fuss and O'Neill Comment: The applicant has updated the proposed development to impact 4,898 sf of wetlands on the site and provided a copy of the NHDES Wetlands permit. The applicant has also shown the amended 75-foot wetlands buffer on the plans. It is our understanding that the applicant is still coordinating with the Town regarding the CUP and associated impacts.

9. Landscaping (HR 275-8. C. (7) & 276-11.1. B. (20)) and Lighting (HR 276-11.1. B. (14))

a. *Former Fuss and O'Neill Comment*: *HR 275-8. C. (7). The applicant should provide landscaping calculations on the plan set to show if the interior parking lot landscaping requirements have been met.*

Current Fuss and O'Neill Comment: The applicant has not provided the necessary calculations. The applicant has provided a waiver requesting to not require the interior of the parking lot to be landscaped as the proposed lot will not have public access and will only be used for vehicle storage.

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

1. Site Plan Review Codes (HR 275)

a. *Former Fuss and O'Neill Comment: Hudson Regulation (HR) 275-6. C. The existing site has a sidewalk along Lowell Road. The applicant has not proposed any impacts to this sidewalk.*

b. *Former Fuss and O'Neill Comment: HR 275-8. C. (2) and Zoning Ordinance (ZO) 334-15. A. The applicant has not provided parking calculations on the plan set. We note that improvements to this lot are proposed for vehicle storage and display. The applicant has proposed 168 spaces, which includes 14 new spaces on adjacent lot 216/11.*

f. *Former Fuss and O'Neill Comment: HR 275-8. C. (9). The Regulation states, "All parking spaces provided pursuant to this section shall be on the same lot as the use." The applicant should clarify if they intend to consolidate Lot 11 and Lot 1 as the plans do not note this. If the lots are to remain separate the applicant should review with the Town, the need for a waiver from this Regulation.*

Current Fuss and O'Neill Comment: The applicant has noted on the plan that the lot line shall be eliminated, and Lots (11 and 1) shall be merged via voluntary lot merger. No further Fuss & O'Neill comment.

g. *Former Fuss and O'Neill Comment: HR 275-9. F. The applicant did not provide copies of any easements or deeds as part of the package received for review. A slope easement to the Town of Hudson is shown along Lowell Road. The adjacent lot 1-1 notes an Access and Utility Easement and a separate Access Easement, both of which benefit the subject lot.*

Current Fuss and O'Neill Comment: The applicant has provided copies of noted easements in the resubmission. No further Fuss & O'Neill comment.

2. Administrative Review Codes (HR 276)

b. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (7). The applicant has not shown the owner of lot 11 on the plan set. We note that since the plan has proposed work within that lot and a connection to the parking lot, the applicant should review the need for an access easement to that site.*

Current Fuss and O'Neill Comment: The applicant has added the owner information for Lot 11 on sheet three of the plan set. The applicant has noted that no easement is required as the lot will be merged. No further Fuss & O'Neill comment.

c. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (13). The applicant has not included details for any proposed site signage other than traffic signs. The applicant should include a note stating that, "All signs are subject to approval by the Hudson PLANNING BOARD prior to installation thereof."*

Current Fuss and O'Neill Comment: The applicant has added this note to the plan set on sheet 3 of 11. No further Fuss & O'Neill comment.

d. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (16). The applicant has not shown all driveways and parking areas within 200 feet of the site. We note that approximately 100 feet is visible on the plan set depending on the direction.*

Current Fuss and O'Neill Comment: The applicant has added various visible driveways and parking areas within 200 ft of the site. No further Fuss & O'Neill comment.

e. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (20). & (21). The applicant has not proposed any buildings on the site and no existing buildings are shown.*

f. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (23). The applicant has not noted any pertinent highway projects on the plan set.*

g. *Former Fuss and O'Neill Comment: HR 276-11.1. B. (24). The applicant should provide open space calculations on the plan set.*

Current Fuss and O'Neill Comment: The applicant has provided the required information showing that the site meets the Regulation. No further Fuss & O'Neill comment.

3. Driveway Review Codes (HR 275-8. B. (34)/Chapter 193)

a. *Former Fuss and O'Neill Comment*: *HR 193.10. The applicant has not proposed any new driveways at Lowell Road for this parcel. The applicant has proposed connecting to the existing driveway on lot 1-1 where access easements are located and is also connecting to the parking lot of lot 11.*

4. Traffic

a. *Former Fuss and O'Neill Comment*: *HR 275-9. B. The applicant has not provided any traffic information for review.*

5. Utility Design/Conflicts

a. *Former Fuss and O'Neill Comment*: *HR 275-9. E and 276-13. The applicant has not proposed any utilities or shown any existing connections on the plan set within Lot 1.*

Current Fuss and O'Neill Comment: The applicant has noted that no existing utilities are located on the site. The applicant has provided an updated proposed utility plan on sheet 4 of the plan set which includes underground electric lines for the proposed light poles. No further Fuss and O'Neill comment.

6. Drainage Design/Stormwater Management (HR 275-9. A./Chapter 290)

c. *Former Fuss and O'Neill Comment*: *HR 290-5. A.1. & 290-5. A.3. The applicant should provide language in the Drainage Analysis Report, stating if and how low impact development (LID) strategies for stormwater runoff were evaluated for this project.*

Current Fuss and O'Neill Comment: The applicant added LID wording to the Drainage Analysis Report. No further Fuss & O'Neill Comment.

d. *Former Fuss and O'Neill Comment*: *HR 290-5. A.9. The applicant should provide ESHWT information, to ensure volume within the basin is not occupied and unavailable for storage capacity.*

Current Fuss and O'Neill Comment: The applicant had proposed to line the pond and therefore ESHWT will not be impacted. No further Fuss & O'Neill comment.

e. *Former Fuss and O'Neill Comment: HR 290-5. A.10. The applicant should coordinate with the Town for the potential need for a waiver to allow erosion protection within existing buffer areas. We note NHDES requires a double row of perimeter controls (silt soxx/fence) within 50' of wetlands onsite.*

Current Fuss and O'Neill Comment: The applicant has coordinated with the Town for buffer erosion control. No further Fuss & O'Neill comment.

f. *Former Fuss and O'Neill Comment*: *HR 290-5. A.10. The applicant should keep the Town informed of all communication with NHDES in relation to the required Wetland Impact Permit being requested to ensure NHDES comments do not alter drainage design/calculations.*

Current Fuss and O'Neill Comment: The Wetlands Permit has been approved and provided to the Town. No further Fuss & O'Neill comment.

g. *Former Fuss and O'Neill Comment*: *HR 290-5. A.12. & 290-7. A.9. Due to the site location with respect to the onsite wetlands and the abutting brook, the applicant should also prepare a winter maintenance and salt minimization plan.*

Current Fuss and O'Neill Comment: A salt minimization plan is provided within the Drainage Report and noted on the plan. No further Fuss & O'Neill comment.

h. *Former Fuss and O'Neill Comment*: HR 290-5. A.11. The applicant should provide additional information on intended NHDES treatment and related BMP worksheets for the proposed stormwater design.

Current Fuss and O'Neill Comment: The applicant has provided additional information. No further Fuss & O'Neill comment.

i. *Former Fuss and O'Neill Comment*: *HR 290-5. B. The applicant should provide support documentation and/or calculations illustrating the required removal efficiencies, WQV requirements, and stormwater treatment requirements are being met for all sections of 290.5.B and its sub-categories.*

Current Fuss and O'Neill Comment: The applicant has provided additional information. No further Fuss & O'Neill comment.

j. *Former Fuss and O'Neill Comment*: *HR 290-6. A.8. The applicant should add a note of the requirement to coordinate a pre-construction meeting with the Town Engineer.*

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

k. *Former Fuss and O'Neill Comment*: *HR 290-6. A.9. The applicant should add the required notes from the Regulation to the plan set.*

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

l. *Former Fuss and O'Neill Comment*: *HR 290-7. A.6. The applicant should provide information as to how the stormwater system is designed to account for frozen ground conditions.*

Current Fuss and O'Neill Comment: The applicant has provided information within the Drainage Report. No further Fuss & O'Neill comment.

m. *Former Fuss and O'Neill Comment*: *HR 290-7. A.7. The applicant should confirm with the Town if any additional coordination is required due to the proximity of the onsite wetland.*

Current Fuss and O'Neill Comment: The applicant has coordinated with the Town for wetland impacts. No further Fuss & O'Neill comment.

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

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

o. *Former Fuss and 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.*

p. *Former Fuss and 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.*

7. Zoning (ZO 334)

a. *Former Fuss and O'Neill Comment: ZO-334-15. A. (1). The applicant is proposing parking facilities on the lot adjacent to the lot that is the principal use they are designed to serve. The applicant should clarify if they intend to consolidate the subject lot and lot 216/11, or if a variance from this Ordinance is required.*

Current Fuss and O'Neill Comment: The applicant has noted on the plan set to consolidate these two lots (1 and 11); no variance is required. No further Fuss and O'Neill comment.

b. *Former Fuss and O'Neill Comment*: *ZO 334-17 & 334-21. The applicant has noted that the subject parcel is located within the Business (B) zoning district. The proposed use of vehicle sales is allowed in the district.*

8. Erosion Control/Wetland Impacts

a. *Former Fuss and O'Neill Comment*: *The Town of Hudson should reserve the right to request any additional erosion control measures as needed.*

9. Landscaping (HR 275-8. C. (7) & 276-11.1. B. (20)) and Lighting (HR 276-11.1. B. (14))

b. *Former Fuss and O'Neill Comment*: *HR 275-8. C. (7). The applicant has shown two landscape areas at the sides of the north group of parking spaces that are also called snow storage areas. The applicant should clarify how these areas are to be used for snow storage without damaging any of the landscape plantings.*

Current Fuss and O'Neill Comment: The applicant has revised snow storage areas to be located at the south end of the lot as to not interfere with landscape plantings. No further Fuss and O'Neill comment.

c. *Former Fuss and O'Neill Comment*: *HR 276-11.1. B. (14). The applicant has shown lighting fixture locations on the plans with details and photometric information, and it appears that the light locations have been coordinated with the Landscape plans.*

d. *Former Fuss and O'Neill Comment*: *HR 276-11.1. B. (14). The applicant should note the intended hours of operation for the site lighting on the plan set.*

Current Fuss and O'Neill Comment: The applicant has added the intended hours of operation to be consistent with the existing dealership lot during evening. No further Fuss and O'Neill comment.

10. State and Local Permits (HR 275-9. G.)

a. *Former Fuss and O'Neill Comment*: *HR 275-9. G. The applicant should list required permits and their statuses on the plan set.*

Current Fuss and O'Neill Comment: The applicant has listed the required permits on the plan set. No further Fuss & O'Neill comment.

b. *Former Fuss and O'Neill Comment: HR 275-9. G. The applicant did not provide copies of any applicable Town, State or Federal approvals or permits in the review package.*
Current Fuss and O'Neill Comment: The applicant has provided these copies. No further Fuss and O'Neill comment.

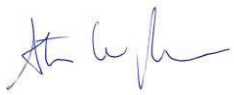
11. Other

a. *Former Fuss and O'Neill Comment*: *ETGTD Section 565.1.1. The applicant is reminded of Town of Hudson requirements for the importing of off-site fill materials for use in constructing this project. It is recommended that these requirements be stated on the plans for the Contractors attention.*

Current Fuss and O'Neill Comment: The applicant has stated these requirements on the plan set. No further Fuss and O'Neill comment.

Please feel free to call if you have any questions.

Very truly yours,



Steven W. Reichert, P.E.

SWR:

Enclosure

cc: Town of Hudson Engineering Division – File
The Dubay Group – doug@thedubaygroup.com

Attachment "E"
The Dubay Group, Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053
(603) 458-6462

August 13, 2024

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

Re: Town of Hudson Planning Board Review
Granite Subaru Expansion Site Plan, 193 Lowell Road
Tax Map 210 Lot 1; Acct. #1350-931
Reference No. 20030249.2410

Dear Mr. Minkarah:

We have received the comment letter from Fuss & O'Neill dated August 6, 2024 for the above referenced project. Based on that review, we offer the following revised plans and responses to comments.

The following items have outstanding issues:

2. Administrative Review Codes (HR 276)

Current Fuss and O'Neill Comment: The applicant has added the owner's signature to the cover sheet of the plan set. We note that the Town may require a real signature as the one on the plans does not appear to be an actual signature.

TDG Response: *The owner has now signed the cover which has been scanned to ensure that all copies are signed.*

6. Drainage Design/Stormwater Management (HR 275-9. A./Chapter 290)

Current Fuss and O'Neill Comment: We note the applicant has provided test pit data and BMP worksheets. The applicant should provide additional information on the required type of pre-treatment proposed. If pre-treatment is not proposed, additional waivers may be required.

TDG Response: *Catch basins with Nyloplast Envirohoods have been added to the pavement to collect all runoff and pre-treat before entering the pond. The drainage model has been updated to reflect the changes in subcatchments areas and routing.*

The following items require Town evaluation or input:

1. Site Plan Review Codes (HR 275)

Current Fuss and O'Neill Comment: The applicant has provided a waiver request for this approval.

TDG Response: *Comment noted.*

Current Fuss and O'Neill Comment: The applicant has provided a waiver request to allow for double and triple parking spaces as well as 22' wide drive aisles.

TDG Response: *Comment noted.*

Current Fuss and O'Neill Comment: The applicant has noted in the waiver request to the Hudson Planning Board to propose to not require off-street loading spaces as there will be no acceptance or distribution of materials on this parcel.

TDG Response: *Comment noted.*

6. Drainage Design/Stormwater Management (HR 275-9. A./Chapter 290)

Current Fuss and O'Neill Comment: The applicant has requested a waiver for this requirement.

TDG Response: *Comment noted.*

7. Zoning (ZO 334)

Current Fuss and O'Neill Comment: The applicant has updated the proposed development to impact 4,898 sf of wetlands on the site and provided a copy of the NHDES Wetlands permit. The applicant has also shown the amended 75-foot wetlands buffer on the plans. It is our understanding that the applicant is still coordinating with the Town regarding the CUP and associated impacts.

TDG Response: *Comment noted.*

9. Landscaping (HR 275-8. C. (7) & 276-11.1. B. (20)) and Lighting (HR 276-11.1. B. (14))

Current Fuss and O'Neill Comment: The applicant has not provided the necessary calculations. The applicant has provided a waiver requesting to not require the interior of the parking lot to be landscaped as the proposed lot will not have public access and will only be used for vehicle storage.

TDG Response: *Comment noted.*

Please let us know if there are any further questions or comments.

Sincerely,
The Dubay Group, Inc.

Sam Kauhl
Project Engineer

Attachment "E"
The Dubay Group, Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053
(603) 458-6462

August 21, 2024

Mr. Elvis Dhima
Town Engineer
Town of Hudson
12 School Street
Hudson, NH 03051

Re: Engineering Comments
Granite Subaru Expansion Site Plan, 193 Lowell Road
Tax Map 210 Lot 1

Dear Mr. Dhima:

We have received your comments dated June 6, 2024 for the above referenced project. Based on that review, we offer the following revised plans and responses to comments.

1. Applicant shall provide an explanation of why currently there are parked vehicles there prior to this site plan approval and how long has this been going on. Was any of the vehicles parked within the 75' wetland buffer at anytime?

TDG Response: *According to discussions with the applicant, the previous Town Planner gave permission to park the vehicles there while going through the process. Vehicles are outside the buffer and erosion protections have been added to the site.*

2. Applicant shall provide details regarding winter operation, including guidelines to be followed for snow storage within wetland buffer

TDG Response: *Snow storage areas are shown on the site plan. These areas will drain into the wet pond to be treated. There are additional notes requiring green sno-pro contractors and excess snow to be removed from site to legal dumping sites.*

3. Applicant shall add curbing and catch basins alongside of the proposed detention basin. This will eliminate any potential oil or fuel leaks discharge directly to the basin and wetland

TDG Response: *The site has been regraded with curbing and basins added as requested.*

4. Applicant shall equip all catch basins discharging to the proposed detention basin with oil and mechanical separators.

TDG Response: *All basins are specified to have envirohoods as requested.*

5. Applicant shall state if they plan to use SnowPro certified plowing contractors

TDG Response: *Requirement for green sno-pro contractors has been noted on the site plan.*

6. Applicant shall install 75 foot wetland buffer marks, along the edge of pavement, every 50 feet

TDG Response: *Placards are proposed along the limit of pavement every 50 feet.*

Please let us know if there are any further questions or comments.

Sincerely,
The Dubay Group, Inc.

Sam Kauhl
Project Engineer

Attachment "F"

STORMWATER MANAGEMENT REPORT
FOR

Granite Subaru Expansion

Map 201 Lot 1
6 Executive Drive
Hudson, NH 03051

PREPARED FOR:

Raymond James Granite Prop LLC
193 Lowell Rd
Hudson, NH 03051

PREPARED BY:

The Dubay Group, Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053
P: 603-458-6462
www.TheDubayGroup.com

December 17, 2021
Revised: August 20, 2024

Engineers **Planners** **Surveyors**

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Stormwater Management Report

I. STORMWATER MANAGEMENT REPORT NARRATIVE

A. Executive Summary
B. Methodology
C. Existing Site Conditions
D. Proposed Site Conditions
E. Stormwater Treatment

I. STORMWATER MANAGEMENT REPORT NARRATIVE

A. Executive Summary

The purpose of this project is to provide additional parking and storage for vehicles on the abutting car dealership lot. The site is currently undeveloped. The area of the parcel is 2.34 acres. The soils on the site are all SCS Hydrologic Soil Group "D" with a wetland on site.

The proposed drainage system has been designed to match post-development drainage flows with pre-development conditions while also providing treatment of the stormwater. Runoff rates show no increase when comparing peak runoff rates in the post-development condition to the pre-development condition.

B. Methodology

In accordance with the provisions of Hudson Development Regulations and generally accepted engineering practice the two (2), ten (10), twenty-five (25), and fifty (50) year storm frequencies have been used in the various aspects of analysis and design of stormwater management considerations for the subject site. Stormwater treatment provisions have been designed to treat the "first flush" of the storm event. The majority of the site flows downhill to the on-site wetland. All drainage facilities and tailwater calculations have been designed for the 25-year return frequency storms.

The hydrological runoff analysis is based on the SCS unit hydrograph procedure with Type-III, 24-hour storms. The SCS unit hydrograph procedure was modeled using HydroCAD, which combines the most used capabilities of SCS TR-20 and TR-55. All runoff from this development is accounted for in the analysis presented.

To calculate hydrographs and runoff quantities, HydroCAD requires a rainfall amount specific to the project site, which is uniformly imposed on the watershed over a 24-hour period. The mass rainfall is converted to mass runoff by using a Runoff Curve Number (CN). CN's are determined by assessing the site and soil characteristics: vegetation type and condition; amount of impervious areas; and amount of interception and surface storage. The calculated runoff is then transformed into a hydrograph by using unit hydrograph theory and routing procedures that depend on runoff travel time through the individual segments of the watershed. Tabular hydrographs are computed based on Runoff Curve Number (CN), Time of Concentration (Tc), Time of Travel (Tt), Area, and Precipitation Input values.

Time of Concentration (Tc) for each subcatchment was computed based on physical characteristics including Surface Type, Manning's Roughness Coefficient, Flow Length, Two Year/ 24-Hour Rainfall Values, and Gradients of the land. Various storage configurations and volumes were analyzed to adjust flood detention times and the hydrograph so that the downstream peak discharge is reduced approximately to or less than pre-development conditions.

Stormwater flows at the project site were verified for existing and proposed conditions in order to include appropriate stormwater Best Management Practices (BMP's) into the facility design, which minimizes negative impacts during construction as well as in the completed project. BMP's were selected from the publications *New Hampshire Stormwater Management Manual, Volumes 2 & 3*, December 2008.

To characterize existing stormwater flows, soil types within the project area were determined from the NRCS Web Soil Survey. Subcatchments were determined from the existing contours plan (see Pre-Development Drainage Plan). SCS Runoff Curve numbers were developed for each area of generally

similar properties within each Subcatchment. The nature of flow, flow length, type of surface (e.g. ground cover), and slope were characterized for each Subcatchment and reach (swale, pipe, etc.) to determine time of concentration and maximum outflow rate.

To determine the proposed drainage conditions, new subcatchments were identified (see Post-Development Watershed Plan) for areas contributing to each of the proposed structures, pipes, and infiltration system. The approximate areas of pavement, woods, grass, and other ground cover types were calculated within each Subcatchment. The outflow from these Subcatchments is treated by a variety of BMP's and routed to reduce the post-development conditions as practicable.

C. Existing Site Conditions

The proposed project location is on Lowell Road (NH Route 3A) in Hudson, NH. The site has no direct access to Route 3A but has two access easements from lot 210 1-1 from the north. Much of the topography on the site is flat with slopes of one to two percent across. The majority of the site drains towards the on-site wetland and the remaining runoff drains towards either the north or west. The site does not have any drainage systems currently. The soils on site are all hydrologic soil group "D"

Analysis of the current conditions has identified three design points for the site. Design points are usually a wetland swale, existing drainage structure, culvert, or simple area of natural sheet flow where a subject site discharges runoff onto an abutting property or right-of-way. These design points remain the same in the pre- and post-development conditions to provide a point of comparison in analyzing the peak runoff or volume change on a site. The design points evaluated in this report are summarized below:

Design Point #1: This design point is located at the western property line. This is the outfall of the on-site wetland.

Design Point #2: This design point is located at western property line and receives the runoff that isn't directed toward the wetland.

Design Point #3: This design point is located at the northern property line where runoff is directed to the abutting property's catch basins.

D. Proposed Site Conditions

The proposed development will accommodate 156 total parking spaces. Customer access to this expansion of the Subaru dealership will not be allowed. As you access the site through the existing dealership, the parking lot is graded to a high point where the existing pavement ended as to not add any additional flow to the existing catch basin. The remainder of the access way drainage is directed to a catch basin which ultimately finds its way to the proposed wet pond. The pond also collects the remainder of the vehicle storage area drainage as it is collected and directed from catch basins. Drainage exits the pond through a 6" orifice that leads to a 12" hdpe pipe. An overflow spillway also assists in outlet control in the larger storm events.

The pre- and post-development runoff rates based on the design storms are tabulated below. All watersheds show a decrease in runoff during post-development conditions as required per the Town of Hudson Regulations, which is shown in the following HydroCAD output.

Low Impact Development Strategies: Disturbance to the wetland and wetland buffer has been kept to a minimum as much as possible in the design of this site. A wet pond was deemed to be the best practice for this site. Given the elevation constraints on site, infiltration practices were not an appropriate way to treat stormwater in this scenario.

Drainage systems will operate as intended under frozen ground and snow melt conditions. No infiltration practices are proposed so this will not be an issue.

Table 1 - Pre vs. Post Runoff Analysis

Design Storm	**Existing Conditions** *Peak Flow Runoff Rate*	**Developed Conditions** *Peak Flow Runoff Rate*	**Change**
	DESIGN POINT #1		
	Node Label - L1	Node Label - L1	
2-Year	1.91	1.46	-0.45
10-Year	3.89	2.39	-1.50
25-Year	5.54	3.97	-1.57
50-Year	7.13	6.73	-0.40
	DESIGN POINT #2		
	Node Label – L2	Node Label – L2	
2-Year	0.59	0.18	-0.41
10-Year	1.19	0.38	-0.81
25-Year	1.70	0.54	-1.16
50-Year	2.17	0.70	-1.47
	DESIGN POINT #3		
	Node Label – L3	Node Label – L3	
2-Year	0.55	0.51	-0.04
10-Year	1.09	0.90	-0.19
25-Year	1.54	1.22	-0.32
50-Year	1.97	1.51	-0.46

E. Stormwater Treatment

In the design of the subject site, utilizing approved Best Management Practices (BMP's) is critical in minimizing pollutant discharge to the various discharge points. This site has been designed in accordance with NHDES Env-Wq 1500 to meet the requirements for stormwater treatment. There are many acceptable methods to provide adequate treatment. This site utilizes a wet pond for portions of the site to detain the runoff, which allows for settling of particles/pollutants, and to meter the flow to the design points. A separate NHDES BMP worksheet is provided for the treatment practice within *Section V. Stormwater Analysis* of the report.

Stormwater Management Report

II. SUPPLEMENTAL SITE REVIEW CRITERIA

A. Extreme Precipitation Tables

B. Soil Report

Attachment "F"

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.426 degrees West
Latitude	42.739 degrees North
Elevation	0 feet
Date/Time	Mon, 26 Apr 2021 15:00:23 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.69	0.86	1.08	**1yr**	0.74	1.01	1.24	1.56	1.97	2.49	2.73	**1yr**	2.20	2.62	3.06	3.75	4.37	**1yr**
2yr	0.33	0.51	0.64	0.84	1.06	1.33	**2yr**	0.91	1.22	1.53	1.91	2.38	2.97	3.30	**2yr**	2.63	3.17	3.68	4.40	5.01	**2yr**
5yr	0.39	0.61	0.77	1.03	1.32	1.67	**5yr**	1.14	1.52	1.94	2.42	3.02	3.75	4.19	**5yr**	3.32	4.03	4.66	5.54	6.26	**5yr**
10yr	0.44	0.70	0.88	1.20	1.56	2.00	**10yr**	1.35	1.80	2.32	2.91	3.62	4.47	5.03	**10yr**	3.96	4.84	5.58	6.58	7.41	**10yr**
25yr	0.53	0.84	1.07	1.47	1.95	2.52	**25yr**	1.68	2.26	2.94	3.69	4.59	5.65	6.40	**25yr**	5.00	6.16	7.08	8.27	9.27	**25yr**
50yr	0.59	0.95	1.22	1.71	2.31	3.01	**50yr**	1.99	2.67	3.53	4.43	5.50	6.75	7.69	**50yr**	5.98	7.39	8.47	9.84	10.99	**50yr**
100yr	0.68	1.10	1.42	2.01	2.74	3.59	**100yr**	2.36	3.17	4.21	5.30	6.58	8.07	9.24	**100yr**	7.14	8.88	10.15	11.71	13.03	**100yr**
200yr	0.77	1.26	1.64	2.35	3.25	4.29	**200yr**	2.80	3.76	5.05	6.36	7.88	9.65	11.11	**200yr**	8.54	10.68	12.17	13.94	15.46	**200yr**
500yr	0.93	1.53	2.00	2.91	4.08	5.43	**500yr**	3.52	4.72	6.40	8.08	10.01	12.23	14.18	**500yr**	10.82	13.63	15.46	17.57	19.38	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.35	0.42	0.57	0.70	0.80	**1yr**	0.61	0.79	1.06	1.33	1.68	2.30	2.56	**1yr**	2.04	2.47	2.73	3.02	3.80	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.20	**2yr**	0.87	1.18	1.37	1.79	2.30	2.91	3.22	**2yr**	2.58	3.10	3.59	4.31	4.90	**2yr**
5yr	0.36	0.56	0.69	0.95	1.21	1.42	**5yr**	1.04	1.39	1.63	2.12	2.70	3.52	3.92	**5yr**	3.11	3.77	4.32	5.18	5.88	**5yr**
10yr	0.40	0.61	0.76	1.06	1.36	1.61	**10yr**	1.18	1.57	1.82	2.39	3.05	4.06	4.56	**10yr**	3.60	4.38	4.97	5.94	6.73	**10yr**
25yr	0.45	0.69	0.85	1.22	1.61	1.88	**25yr**	1.39	1.84	2.14	2.82	3.56	4.92	5.57	**25yr**	4.35	5.35	5.98	7.14	8.05	**25yr**
50yr	0.49	0.75	0.93	1.34	1.80	2.14	**50yr**	1.55	2.09	2.42	3.21	4.00	5.69	6.49	**50yr**	5.04	6.25	6.89	8.20	9.22	**50yr**
100yr	0.54	0.81	1.02	1.47	2.01	2.41	**100yr**	1.74	2.36	2.73	3.48	4.51	6.58	7.60	**100yr**	5.82	7.31	7.94	9.42	10.53	**100yr**
200yr	0.59	0.89	1.13	1.63	2.27	2.73	**200yr**	1.96	2.67	3.06	3.93	5.11	7.63	8.91	**200yr**	6.75	8.57	9.16	10.83	12.06	**200yr**
500yr	0.67	1.00	1.28	1.86	2.65	3.23	**500yr**	2.29	3.16	3.60	4.63	6.05	9.29	11.04	**500yr**	8.22	10.61	11.05	13.02	14.40	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.58	0.78	0.96	1.13	**1yr**	0.83	1.10	1.28	1.67	2.11	2.64	2.89	**1yr**	2.33	2.78	3.42	4.20	4.78	**1yr**
2yr	0.35	0.55	0.67	0.91	1.12	1.32	**2yr**	0.97	1.29	1.50	1.94	2.48	3.06	3.40	**2yr**	2.70	3.27	3.79	4.52	5.15	**2yr**
5yr	0.44	0.67	0.83	1.15	1.46	1.68	**5yr**	1.26	1.64	1.91	2.44	3.07	4.02	4.52	**5yr**	3.56	4.35	5.00	5.92	6.65	**5yr**
10yr	0.53	0.81	1.00	1.40	1.81	2.05	**10yr**	1.56	2.01	2.32	2.92	3.64	4.97	5.61	**10yr**	4.40	5.40	6.20	7.27	8.11	**10yr**
25yr	0.68	1.03	1.28	1.83	2.41	2.66	**25yr**	2.08	2.61	3.01	3.71	4.55	6.58	7.48	**25yr**	5.82	7.19	8.23	9.55	10.57	**25yr**
50yr	0.82	1.25	1.55	2.23	3.00	3.25	**50yr**	2.59	3.18	3.67	4.44	5.39	8.13	9.29	**50yr**	7.19	8.93	10.19	11.74	12.91	**50yr**
100yr	1.00	1.51	1.89	2.73	3.74	3.98	**100yr**	3.23	3.89	4.47	5.53	6.39	10.08	11.52	**100yr**	8.92	11.08	12.64	14.45	15.80	**100yr**
200yr	1.21	1.83	2.31	3.35	4.67	4.85	**200yr**	4.03	4.75	5.44	6.66	7.58	12.47	14.29	**200yr**	11.03	13.74	15.67	17.80	19.33	**200yr**
500yr	1.58	2.35	3.03	4.40	6.26	6.31	**500yr**	5.40	6.17	7.07	8.53	9.49	16.52	18.96	**500yr**	14.62	18.23	20.84	23.43	25.26	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Attachment "F"

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Hillsborough County, New Hampshire, Eastern Part

April 26, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Attachment "F"

Custom Soil Resource Report
Soil Map

Map Scale: 1:910 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 22, May 29, 2020

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

Date(s) aerial images were photographed: May 22, 2015—Jun 14, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
RbA	Ridgebury fine sandy loam, 0 to 3 percent slopes	2.3	100.0%
Totals for Area of Interest		**2.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hillsborough County, New Hampshire, Eastern Part

RbA—Ridgebury fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w69f
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Drainageways, drumlins, depressions, ground moraines, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Drumlins, ground moraines, hills
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, drumlins, depressions, ground moraines, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Leicester

Percent of map unit: 1 percent
Landform: Drainageways, depressions, ground moraines, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

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United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

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Stormwater Management Report

III. EROSION & SEDIMENTATION CONTROL PROVISIONS

A. Temporary Erosion Control Measures

B. Construction Sequence

C. Permanent Erosion Control Measures

II. EROSION & SEDIMENTATION CONTROL PROVISIONS

A. Temporary Erosion Control Measures

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

B. Construction Sequence

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

C. Permanent Erosion

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

1) Placement of rip-rap where needed to reduce stormwater velocities to manageable levels;

2) Vegetation located in the proposed areas.

3) Specification of a turf establishment schedule and seed mixture, utilizing materials and workmanship recognized as appropriate for the site conditions.

Stormwater Management Report

IV. OPERATION & MAINTENANCE

Attachment "F"

OPERATION AND MAINTENANCE PROCEDURES FOR STORMWATER MANAGEMENT SYSTEMS

Granite Subaru Expansion

Map 201 Lot 1
6 Executive Drive
Hudson, NH 03051

PREPARED FOR:

Raymond James Granite Prop LLC
193 Lowell Road
Hudson, NH 03051

PREPARED BY:

The Dubay Group, Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053
P: 603-458-6462
www.TheDubayGroup.com

December 17, 2021

Engineers **Planners** **Surveyors**

Table of Contents:

Post Construction Operation and Maintenance Plan

MAINTENANCE SCHEDULE		
Frequency	***Actions***	***Follow-up***
Weekly (or after rain event)	Erosion Inspection	Take corrective action(s) if required
Quarterly	Complete Stormwater Inspection Report Reviewing all structures and BMP's	File Stormwater Inspection Report and take any corrective actions as needed
Semi Annually	Perform sediment removal from all structures and pipes as needed	Note any problem areas and inspect as necessary

Property Owner:

Raymond James Granite Prop LLC
193 Lowell Rd
Hudson, NH 03051

Responsible Parties:

Installation:

Raymond James Granite Prop LLC
193 Lowell Rd
Hudson, NH 03051

Operation and Maintenance:

Raymond James Granite Prop LLC
193 Lowell Rd
Hudson, NH 03051

The responsible party shall be responsible for the installation of the drainage mitigation system including the catch basins and construction of the infiltration pond. Upon completion of a particular development phase, operation and maintenance of all stormwater management systems will be the responsibility of the responsible party. The responsible party shall include separate line items for the operation and maintenance of the systems in their yearly budget. Qualified personnel shall perform the required inspections. The responsible party will maintain records of all inspection reports and be the responsible party for implementation of any maintenance recommendations required by the inspector. All required maintenance shall be performed by a qualified contractor experienced with the particular BMP requiring the maintenance. All Stormwater related items and the respective operation and maintenance requirements for each have been detailed in the subsequent sections of the plan.

Proposed Site BMP's

a) Pavement Sweeping

Sweeping should be conducted a minimum of twice a year. Once in the early fall and then immediately following spring (March/April) snowmelt to remove sand and other debris. Sweeping shall be conducted by a high efficiency vacuum sweeper. Pavement surfaces may be swept at other times, basically for aesthetic reasons, such as in the fall after leaves have dropped to remove accumulated debris. Since contaminants typically accumulate within 12 inches of the curb line, street cleaning operations should concentrate in cleaning curb and gutter lines for maximum pollutant removal efficiency. Other areas can also be swept periodically, probably on a less regular basis.

b) Detention Basin

Inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly. Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall)

c) Grass Lined Swale/Vegetated Swales

Inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly. Remove invasive species and treat diseased vegetation as needed. Perform periodic mowing of the swale. Remove and replace dead vegetation twice per year (spring and fall).

d) Stone Lined Outlet Protection Areas

The areas shall be inspected at least once per year to ensure that they are operating as intended. The outlet structure shall be inspected for evidence of clogging or outflow release velocities that are greater than design flow.

e) Catch Basins

Catch basins and OCS's require frequent maintenance and are recommended to be inspected at least twice a year. Inspections should be performed in the spring after the snow melt and in the fall following the leaf drop. Inspections should note the level of accumulated sediment and condition of the structure. Corrective action shall be taken as necessary. Some basins may receive higher sediment loading than others and may require more frequent cleanings. Basins should be cleaned when sediment approaches half the sump depth. Cleaning shall be performed by a licensed vacuum truck company.

During inspections, if floating hydrocarbons are observed, the material should be removed immediately by skimming, absorbent materials, or other method and disposed of in accordance with state and federal regulations.

Stormwater Inspection Report

Project Name

Location
Start/End

Date of Inspection
Inspector's Name(s)
Inspector's Title(s)
Inspector's Contact Info
Type of Inspection

☐ **Regular** ☐ **Pre-storm event** ☐ **During storm event** ☐ **Post-storm event**

Do you suspect that discharges may have occurred since the last inspection?
☐ Yes ☐ No

Are there any discharges at the time of inspection?
☐ Yes ☐ No

	BMP Description	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person
A	Pavement Sweeping			
	• Evidence of oil grease	☐ Yes ☐ No		
B	Detention Basin	☐ Yes ☐ No		
	• Basin bottom or trench surface clear of debris	☐ Yes ☐ No		
	• Inlet/Inflow pipes clear of debris	☐ Yes ☐ No		
	• Overflow spillway clear of debris	☐ Yes ☐ No		
	• Outlet clear of debris	☐ Yes ☐ No		
	• Basin dewaters between storms	☐ Yes ☐ No		
	• Accumulated sediment	☐ Yes ☐ No		
	• Embankment erosion	☐ Yes ☐ No		
	• Unauthorized planting	☐ Yes ☐ No		
	• Other (specify)			
D	• Outlet Protection/Swales	☐ Yes ☐ No		
	• Inlet/Inflow pipes clear of debris	☐ Yes ☐ No		
	• Outlet clear of debris	☐ Yes ☐ No		
	• Evidence subsidence	☐ Yes ☐ No		

	BMP Description	BMP Installed and Operating Properly?	Corrective Action Needed	Date for corrective action/responsible person
	• Tree growth	☐ Yes ☐ No		
	• Other (specify)			
E	• <u>Catch Basins</u>			
	• Inlet and outlet clear of debris	☐ Yes ☐ No		
	• Evidence of oil grease	☐ Yes ☐ No		
	• Accumulated sediment	☐ Yes ☐ No		
	• Evidence of structural deterioration	☐ Yes ☐ No		
	• Evidence of spalling or cracking of structural parts	☐ Yes ☐ No		
	• Other (specify)	☐ Yes ☐ No		

Overall Site Issues _____

	BMP/activity	Implemented?	Maintained?	Corrective Action	Date for corrective action/responsible person
1	Is there evidence of sediment being tracked into the street?	☐ Yes ☐ No	☐ Yes ☐ No		
2	Is trash/litter collected and placed in covered dumpsters?	☐ Yes ☐ No	☐ Yes ☐ No		
3	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	☐ Yes ☐ No	☐ Yes ☐ No		
4	Are materials that are potential stormwater contaminants stored inside or under cover?	☐ Yes ☐ No	☐ Yes ☐ No		

Other Comments:

Inspection and Report prepared by:

Print name: _____

Signature: _____ Date: _____

Copies to:

☐ Owner: _____

☐ City: _____

☐ State: _____

Appendix C. Deicing Application Rates and Documentation Form

Attachment "F"

Deicing Application Rate Guidelines

24' of pavement (typcial two-lane road)

These rates are not fixed values, but rather the middle of a range to be selected and adjusted by an agency according to its local conditions and experience.

			Pounds per two-lane mile			
Pavement Temp. (°F) and Trend (↑↓)	Weather Condition	Maintenance Actions	Salt Prewetted / Pretreated with Salt Brine	Salt Prewetted / Pretreated with Other Blends	Dry Salt*	Winter Sand (abrasives)
> 30° ↑	Snow	Plow, treat intersections only	80	70	100*	Not recommended
	Freezing Rain	Apply Chemical	80 - 160	70 - 140	100 - 200*	Not recommended
30° ↓	Snow	Plow and apply chemical	80 - 160	70 - 140	100 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↑	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	150 - 200	130 - 180	180 - 240*	Not recommended
25° - 30° ↓	Snow	Plow and apply chemical	120 - 160	100 - 140	150 - 200*	Not recommended
	Freezing Rain	Apply Chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↑	Snow or Freezing Rain	Plow and apply chemical	160 - 240	140 - 210	200 - 300*	400
20° - 25° ↓	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↑	Snow	Plow and apply chemical	200 - 280	175 - 250	250 - 350*	Not recommended
	Freezing Rain	Apply Chemical	240 - 320	210 - 280	300 - 400*	400
15° - 20° ↓	Snow or Freezing Rain	Plow and apply chemical	240 - 320	210 - 280	300 - 400*	500 for freezing rain
0° - 15° ↑↓	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	300 - 400	Not recommended	500 - 750 spot treatment as needed
< 0°	Snow	Plow, treat with blends, sand hazardous areas	Not recommended	400 - 600**	Not recommended	500 - 750 spot treatment as needed

* Dry salt is not recommended. It is likely to blow off the road before it melts ice.

** A blend of 6 - 8 gal/ton $MgCl_2$ or $CaCl_2$ added to NaCl can melt ice as low as -10°.

Attachment "F"

Anti-icing Route Data Form				
Truck Station:				
Date:				
Air Temperature	Pavement Temperature	Relative Humidity	Dew Point	Sky
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				

Attachment "F"

Anti-Icing

NH Best Management Practices

GET OUT EARLY

Typically anti-icing is most effective if applied 1-2 hours before the precipitation begins however it can be applied up to 24 hours in advance.

TRY IT FIRST

Trying anti-icing for the first time? Make a 23.3% brine solution and before a storm spray pavement on your own property using a masonry/ plant sprayer. Use this experiment to determine how best to use it with your clients.

LEAVE SOME PAVEMENT BARE

It's always best to use stream nozzles instead of fan tip to avoid creating a slippery condition. If the anti-icing liquid freezes the bare pavement will still provide a traction surface.

USE A FILTER

Having a filter in your liquid dispensing system will reduce clogs in your nozzle. Automotive in line fuel filters work quiet well. If your liquid dispenser is not functioning properly be sure to check the filter first.

A Proactive Treatment

Anti-Icing before a storm is very similar to using a non-stick spray on a pan before cooking. Just like a non-stick spray prevents food from bonding to the pan, anti-icing prevents snow and ice from bonding to the pavement so that it can be plowed away. Anti-icing can save you money as it costs 50% less than reactive deicing.

Make Your Own Salt Brine

When making brine it is important to add enough salt to produce a 23.3% solution which freezes around 0°F. Roughly 2.5lb per gallon of water will produce a 23.3% solution. You can verify using a salometer (~$20) a 23.3% solution will have a specific gravity of 1.176, or 85% salinity. Consult the Brine Making BMP sheet for more info.

How Much Should I Use and When?

You can apply brine up to 24 hours in advance of the storm. Typical application rates range from 0.5 to 0.75 gallon per 1000 sq.ft. (10' x 100' area). Other chemicals such as magnesium are also available—consult your supplier for application rates. Anti-icing is not advised prior to freezing rain events.

Getting Started

Try making your own salt brine by putting 13 lb of salt in 5 gallons of water to get a 23.3% salt brine solution. Mix the brine until all of the salt is dissolved. Using a masonry sprayer apply the liquid several hours before a storm. Start by applying about 0.25—0.5 gallons to a 10' x 50' area. Adjust the application rates based on your experience. Being careful not to over apply and cause a slippery condition.

Produced in partnership with:

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire DOT

Technology Transfer Center
New Hampshire LTAP at UNH

ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

WD-WMB-26 2016

Best Management Practices and Salt-Use Minimization Efforts In Chloride-Impaired Watersheds of New Hampshire

A Guidance Document for Private Developers and Contractors

Scientific studies in the southern part of New Hampshire determined over 40 streams have elevated levels of chloride. The elevated levels were high enough to be harmful to aquatic life, such as fish. Elevated levels can also be a drinking water health concern for people and animals, can lead to plant death, particularly along roadsides, and can cause damage to infrastructure and automobiles. The primary source of these chlorides is salt used for winter snow and ice management. The New Hampshire Department of Environmental Services (NHDES) calculated that a reduction of 25 percent to 45 percent salt use was needed in order to meet water quality standards. The studies also revealed that up to 50 percent of the salt load was coming from parking lots, driveways and private roads from salt that is used for de-icing.

NHDES encourages private developers and contractors, particularly those working within chloride-impaired watersheds, to adopt best management practices (BMPs) and salt-use reduction methods that will help improve water quality. NHDES also encourages private developers and contractors to consider winter maintenance during project design. Salt-use reduction can lead to long-term cost-savings as a result of purchasing less salt and reduced impacts on vegetation (e.g., landscaping) and corrosion of infrastructure and vehicles. This guidance document is designed to help guide developers and contractors in ways to reduce the use of salt, plan for BMPs and salt reduction methods, include design considerations, and document their snow and ice management plans. Taken together, these are the basic elements of a Salt Minimization Plan.

A REDUCTION IN SALT-USE DOES NOT MEAN A REDUCTION IN SAFETY

Liability for damage or personal injury as a result of snow or ice is one of the main reasons that over-salting occurs and many contractors are reluctant to implement salt reduction practices for fear of increased liability. However, recent studies have found there are BMPs that can be used that optimize salt use, reduce the application frequency and amounts applied and, at the same time, achieve safe levels of service. In addition, as of November 2013, Commercial Salt Applicators certified by NHDES under RSA 489-C, and property owners or managers who hire them, are granted limited liability protection against damages arising from snow and ice conditions.

WHAT DOES ALL THIS MEAN FOR PRIVATE DEVELOPERS AND CONTRACTORS?

Implementation plans for chloride reduction have been developed for a number of places in New Hampshire. Some of these plans are required by permits or other regulatory requirements. The NHDOT, towns, and private contractors who maintain parking lots, sidewalks, and roadways will be required to follow the implementation plans through certain federal and state permits. In other places, watershed-wide implementation plans have not yet been developed. In those areas, especially places that drain to chloride impaired waters, requirements to minimize salt usage are likely to be required of many new commercial and residential developments. Even in places with implementation plans, the need to reduce salt may be so extreme that it will require the concerted efforts of the state, municipalities and private landowners to restore water quality.

HOW CAN PRIVATE DEVELOPERS AND CONTRACTORS MINIMIZE SALT LOADING IN THE WATERSHED?

One of the most effective ways for private developers and contractors to reduce their portion of salt loading in the watershed is to learn more about winter maintenance BMPs and ways to be more effective at winter maintenance activities and to apply what is learned to current practices and future projects. There are three important ways for that to happen.

- **GET TRAINED AS A GREEN SNOWPRO**
  The University of New Hampshire Technology Transfer Center (UNH T^2) offers a full day Green SnowPro Training course focused on efficient, more environmentally friendly winter maintenance practices that do not compromise road, parking lot and sidewalk safety. The course covers the basics of salt reduction methods including equipment calibration and rate applications, pre-treatment methods, effective plowing and planning, salt accounting management and environmental impacts of salting. The course is offered several times a year. For more information, visit the UNH T^2 webpage at: http://t2.unh.edu/green-snowpro-training-and-nhdes-certification.

- **BECOME A NEW HAMPSHIRE CERTIFIED SALT APPLICATOR**
  Individuals who attend the Green SnowPro Training and pass the exam are eligible to apply for voluntary NHDES Salt Applicator Certification. The NHDES Salt Applicator Certification program aims to improve efficiency in salt use and reduce the amount of salt used by commercial applicators. The NHDES salt applicator certificate carries the responsibility of annually reporting salt use to NHDES and attending a refresher training course every two years. The Salt Applicator Certificate has proven valuable to the private contractors as well as to their clients and their insurance carriers. To date, 800 individuals have become Certified Salt Applicators. For more information on how to become a NH Certified Salt Applicator or to find a list of Certified Salt Applicators refer to the NHDES webpage at: http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/salt-applicator-certification.htm

THE ANNUAL NEW HAMPSHIRE SALT SYMPOSIUM

Every year the NHDES hosts an annual NH Salt Symposium. Attendees are updated with the latest snow industry technologies and BMPs. The event counts toward continuing education credits for the NH Certified Green SnowPro Certificate, the New Hampshire Salt Applicator Certificate and T2 Roads Scholar Program Contact Hours. People interested in attending can learn more about the event or register online at http://www.sima.org/new-hampshire-salt-symposium.

- **DEVELOP A SALT MINIMIZATION PLAN(s)**
  NHDES encourages developers and contractors to develop a Salt Minimization Plan as part of, or in addition to, their Winter Maintenance Plan or Winter Snow and Ice Control Policy to help reduce and manage the use of salt. Also referred to as Chloride Reduction Plans or Salt Reduction Plans, these plans vary from large, metropolitan city plans to single development plans. Where they exist, the plan should align with the objectives outlined in the town's or watershed's chloride reduction implementation plan. A general outline and description of what information goes into a Salt Minimization Plan is included as an attachment to this guidance document.

OTHER WAYS TO REDUCE SALT-LOADING IN THE WATERSHED
(See Attachment B for a checklist of smart salting practices.)

- Be aware. Find out what the salt loading reduction goals are within the watershed and town where work generally occurs or where the specific project is located.
- Re-evaluate current practices. Source reduction is identified as the most effective method for reducing chloride loading.
- Consider alternative de-icing materials such as calcium magnesium acetate (CMA) and limited use of abrasives (sand, sawdust, cat litter).
- Pre-wet salt with brine to reduce the loss of salt from bounce and scatter (up to a 30% reduction in loss) and increase melting times.
- Be proactive for storm events and anti-ice by applying a small amount of liquid chemical to pavements and overpasses *before* a storm to prevent ice from bonding with the surface.
- If applicable, keep pavement free of potholes and cracks which both minimize the ability for water to pond and/or infiltrate into the ground where ultimately they could end up in groundwater resources. In addition, pavement that is in good condition allows for snow and or ice to be mechanically removed.
- Consider future maintenance needs in project planning.
  - Include development amenities/features such as heated sidewalks or parking garages.
  - Limit the amount of impervious surfaces that require winter maintenance activities. Some options to achieve this are only including sidewalks on one side of the street, the use of porous paving materials and limited use of curb cuts.
  - Properly design parking lots or designated parking areas with appropriate winter maintenance and snow storage practices. This includes considering where plowed snow will be piled, avoiding melt drainage to flow back across cleared areas (freeze/thaw cycle).
  - Consider landscape vegetation that is more salt tolerant and that doesn't shade out sidewalks or parking areas from the sun during the winter.
- Share information with the town and other landowners in the watershed to help track where salt is being applied, what quantity, and how often or the level of service based on the winter management plan. Track what BMPs are being applied to help determine effectiveness.
- Spread the word and encourage co-workers and colleagues to become a New Hampshire Certified Green SnowPro. Educate clients about the benefits of hiring a New Hampshire Certified Green SnowPro. The NHDES has developed a flyer for businesses to share with their colleagues

or clients available on the NHDES website. A link for this flyer and other helpful information is included below.

- Attend the annual New Hampshire Salt Symposium. The event counts toward the continuing education requirement of the New Hampshire Salt Applicator Certificate and as T2 Road Scholar Program contact hours.

OTHER RESOURCES AND REFERENCES:

For the complete list of NHDES resources including links to training and certification application materials available, please visit our website.
http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/index.htm

Assessing the Efficacy of Current Road Salt Management Programs, University of Waterloo (2010)
http://www.saltinstitute.org/wp-content/uploads/2014/01/Road-Using-Best-Road-Salt-Management-Practices-Waterloo-2010-1.pdf

Environment and Climate Change Canada – technical documents, BMPs and general information.
http://www.ec.gc.ca/sels-salts/default.asp?lang=En&n=DECEDD7C-1

Finding Outstanding Resource Waters & Impaired Surface Waters with a 1-Mile Buffer for Development Projects, Quick Reference Guide, NHDES (2008)
http://des.nh.gov/organization/divisions/water/wmb/tmdl/documents/onestop_gis_wgc_ref_guide.pdf

Green SnowPro Business Flyer, NHDES
http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/documents/green-snowpro-business-flyer.pdf

Pre-wetting and Anti-icing – Techniques for Winter Road Maintenance, a Wisconsin Transportation Bulletin - No. 22.
http://epdfiles.engr.wisc.edu/pdf_web_files/tic/bulletins/Bltn_022_prewetting_antiicing.pdf

Salt Reduction Best Management Practices (several Fact Sheet links available)
http://des.nh.gov/organization/divisions/water/wmb/was/salt-reduction-initiative/tech-assist-bmp-practices.htm

Snow and Ice Removal for the Business Owner – Clean Water and Safe Parking Lots, NHDES (2014)
http://des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-24.pdf

Snow Disposal Guidelines, NHDES (2015)
http://des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-3.pdf

Road Salt and Water Quality, NHDES (2016)
http://des.nh.gov/organization/commissioner/pip/factsheets/wmb/documents/wmb-4.pdf

Sensible Salting Strategy of Parking Lots and Sidewalks, The Salt Institute (2015)
http://www.saltinstitute.org/research/sensible-salting-strategy-of-parking-lots-and-sidewalks/

Winter Parking Lot and Sidewalk Maintenance Manual, Minnesota Pollution Control Agency (2015)
https://www.pca.state.mn.us/sites/default/files/p-tr1-10.pdf

ATTACHMENT A - DEVELOPING A SALT MINIMIZATION PLAN

Developing a Salt Minimization Plan will go a long way towards reducing salt-use, i.e., salt loading within the watershed. The development of this plan will help private developers and contractors to hone in on how much salt is needed, when it should be applied, where it needs to be applied, etc. with the ultimate goal of reducing salt-use without compromising safety. Salt-use reduction also leads to long-term cost-savings as a result of purchasing less salt and reduced impacts on vegetation (e.g., landscaping) and corrosion of infrastructure and vehicles, and a reduction in well replacements. Reduction in the use of salt does not mean a reduction in level of service or public safety; in fact many contractors who complete the Green SnowPro training course have been able to provide the same level of service while reducing their salt use by 30%.

It is important to anticipate that this will be a living document that will likely need to be updated at some point. Reduction goals may fluctuate from year to year due to improvements in technology and BMPs, a town's requirements, or state and federal permit conditions that result in private developers or contractors to alter practices, particularly as more development occurs. It is good practice to review and update the plan(s) annually, early in advance of the winter season so that there is time to make any necessary adjustments.

In general NHDES recommends that the plan include:

- **Introduction/Background** – Identify the purpose and need for the plan. This section should describe any current chloride impairments and salt reduction goals within the watershed and town. If there is a Winter Maintenance Plan or Winter Snow and Ice Control Policy already in place, this section should briefly describe how this salt minimization plan fits in with the more general winter maintenance approach and BMP practices. It may be that many of the items below are already adequately covered in the broader Winter Maintenance Plan.
- **Development or Project Area Description** – Describe the development. How many linear feet roadways or sidewalks are there? Discuss the main features and layout of the site including stormwater runoff /topography, as well as vegetation and shaded areas. Including a general map of the development that identifies these features is helpful.
- **Operational Guidelines** – Identify who the responsible party is for the maintenance activities and lists out contracting requirements and minimum specifications for de-icing, anti-icing and pretreatment practices and equipment. This guideline should describe the level of service required by the development which directly impacts maintenance operation plans.
    - **Winter Operator Certification Requirements** – This section outlines employed or contracted contractors training and certification requirements. (Green SnowPro Training is recommended).
    - **Weather Monitoring** – Outline where weather information will be gathered from and how it is used to ensure that winter operators are making informed decisions as to when and to what extent materials are applied to private roadways, sidewalks and parking lots. An important part of this will be developing a good communication plan that identified key personal responsible for weather monitoring.
    - **Equipment Calibration Requirements** – Outline all winter equipment calibration requirements. Typically a 25% reduction in salt use can be achieved simply by calibrating equipment, and is the single most important aspect to achieving salt use reductions.
    - **Mechanical Removal** – Describe mechanical removal practices such as where snow should be stored and how often plowing should occur as well as goals, such as

mechanical removal, that minimize snow- and ice-pack that reduce the need for abrasives, salt and or brine applicants.

- **Salt Usage Evaluation and Monitoring** – Describe how salt usage will be documented and how salt use will be monitored and evaluated in conjunction with the town's salt reduction plan (if applicable). Monitoring salt usage as well as winter maintenance actions is key to determining what works, how much salt and other winter maintenance materials were used and estimating what is needed for the next winter season, and if salt minimization plan goals contributed to salt load reductions in the watershed. It is recommended that a report be developed annually shortly following the winter season, and provided to the town in which the development or work is occurring in for use in documenting private contractor use and allocations in the watershed. A schedule for how often the Salt Minimization Plan is updated should be included and tracked within this section as well.

Salt Evaluation and Monitoring Elements:
- ✓ Where the maintenance is occurring.
- ✓ What the activity being performed is and/or what equipment is being used.
- ✓ What the weather conditions are - include:
  - Event timing (pre-storm, during, post-weather event)
  - Air and ground temperatures
- ✓ Time of activity
- ✓ Application rates
- ✓ Results
- ✓ Other info – BMPs in practice for consideration, etc.

- **Analysis of Alternative De-icing Materials**, **Site Design Considerations and Watershed Offsets** – Describe alternative de-icing materials that could be used for winter maintenance activities, such as calcium magnesium acetate, and discuss what was considered, incorporated, and/or eliminated and why. Discuss what site design features or amenities were incorporated or considered, such as parking garages, heated sidewalks, vegetation, etc., to minimize salt use. Include a discussion on other options for offsets within the watershed such as educating others and applying good salt application strategies to other facilities.

Not all items above need to be included within the plan, generally the more complex the project, the more detailed the plan. In addition, some of these items may already be thoroughly covered in the broader Winter Maintenance Plan. NHDES staff are available to discuss and help identify what level of detail is necessary to achieve salt-minimization for any type or size of project.

ATTACHMENT B – SMART SALTING PRACTICES

A checklist for snow and ice maintenance contractors.

Recommended practice	Check which response applies to current practices and anticipated site maintenance activities for job site.				
	Already do	Will do	Might do	Will not do	If "will not do"….why not?
Use an application rate chart.					
Calibrate equipment each year.					
Learn about the deicer ingredients and use the appropriate one for the condition.					
Look for reasons if and why materials are leaking or spilling from vehicles and fix them (e.g. gaps, overfilling, etc).					
Develop a comprehensive winter maintenance policy. Follow your policy.					
Measure and use pavement temperatures.					
Use anti-icing appropriately prior to the storm.					
Plow before applying deicers.					
Use wet materials (pre-wet or pre-treated).					
Don't apply sodium chloride (road salt) for pavement temperatures below 15ºF.					
Don't apply deicers for pavement temps under -10º F. It's too cold.					
Separate salt and sand. Use salt for melting. Use sand for traction.					
Apply deicers in the center of the road or on the high side of the curve.					
Store the salt in a building or under secure cover.					
Store salt away from water flow and direct the water away from storage area.					
Store snow away from lakes, ponds and wetlands.					
Sweep up sand, dispose of properly.					
For each event, document what you did and how well it worked. Use this information to make improvements.					

Checklist is adapted from worksheet created by Fortin Consulting as a part of the Minnesota Pollution Control Agency Smart Salting Voluntary Certification Program.

Stormwater Management Report

V. STORMWATER ANALYSIS

A. Best Management Practice Worksheets
   i. Wet Pond P1 - BMP Worksheet

B. Drainage Analysis
   i. Pre-Development Drainage Diagram
   ii. Pre-Development Area Listing and Soil Listing
   iii. HydroCAD Output, Existing 2-Year Storm, Node List
   iv. HydroCAD Output, Existing 10-Year Storm, Node List & Full Summary
   v. HydroCAD Output, Existing 25-Year Storm, Node List & Full Summary
   vi. HydroCAD Output, Existing 50-Year Storm, Node List
   vii. Post-Development Drainage Diagram
   viii. Post-Development Area Listing and Soil Listing
   ix. HydroCAD Output Proposed 2-Year Storm, Node List
   x. HydroCAD Output Proposed 10-Year Storm, Node List & Full Summary
   xi. HydroCAD Output Proposed 25-Year Storm, Node List & Full Summary
   xii. HydroCAD Output Proposed 50-Year Storm, Node List

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Attachment "F"

Type/Node Name: **Wet Pond P1**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable.

1.59	ac	A = Area draining to the practice	
1.05	ac	A_I = Impervious area draining to the practice	
0.66	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.64	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
1.02	ac-in	WQV= 1" x Rv x A	
3,719	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
372	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
1,859	cf	50% x WQV (check calc for extended detention volume)	
	cf	V_{SED} = Sediment forebay volume	**≥ 10%WQV**
4,741	cf	V_{PP} = Permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
no	cf	Extended Detention?[1]	**≤ 50% WQV**
-		V_{ED} = Volume of extended detention (if "yes" is given in box above)	
		E_{ED} = Elevation of WQV if "yes" is given in box above[2]	
-	cfs	$2Q_{avg}$ = 2* V_{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q_{EDmax} below)	
	cfs	Q_{EDmax} = Discharge at the E_{ED} (attach stage-discharge table)	**< $2Q_{avg}$**
-	hours	T_{ED} = Drawdown time of extended detention = $2V_{ED}/Q_{EDmax}$	**≥ 24-hrs**
3.00	:1	Pond side slopes	**≥3:1**
180.00	ft	Elevation of seasonal high water table	
180.00	ft	Elevation of lowest pond outlet	
175.00	ft	Max floor = Maximum elevation of pond bottom (ft)	
172.00	ft	Minimum floor (to maintain depth at less than 8')	**≤ 8 ft**
175.00	ft	Elevation of pond floor[3]	**≤ Max floor and > Min floor**
100.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
30.00	ft	Average width ([average of the top width + average bottom width]/2)	
3.33	:1	Length to average width ratio	**≥ 3:1**
yes	Yes/No	Is the perimeter curvilinear.	**← Yes**
yes	Yes/No	Are the inlet and outlet located as far apart as possible.	**← Yes**
no	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
If no state why:			
		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
182.07	ft	Peak elevation of the 50-year storm event	
182.50	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	**←yes**

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.

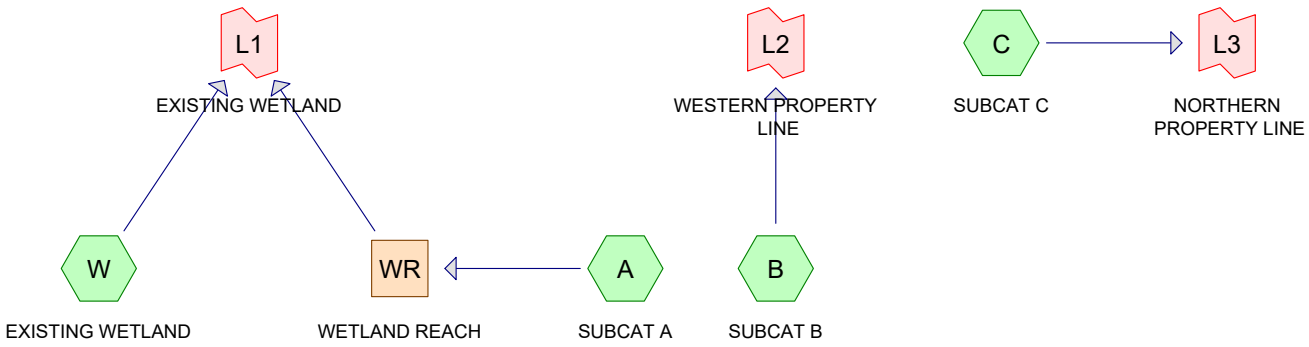
2. This is the elevation of WQV **if** the hydrologic analysis is set up to include the permanent pool storage in the node description.

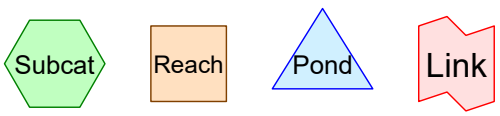
3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

Stage-Area-Storage for Pond P1: POND-P1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
175.00	5	0
175.10	9	1
175.20	14	2
175.30	21	4
175.40	29	6
175.50	37	9
175.60	48	14
175.70	59	19
175.80	71	25
175.90	85	33
176.00	100	42
176.10	121	54
176.20	145	67
176.30	171	83
176.40	198	101
176.50	228	122
176.60	260	147
176.70	294	174
176.80	330	206
176.90	368	240
177.00	408	279
177.10	451	322
177.20	495	369
177.30	541	421
177.40	590	478
177.50	641	539
177.60	693	606
177.70	748	678
177.80	805	756
177.90	864	839
178.00	925	929
178.10	1,003	1,025
178.20	1,085	1,129
178.30	1,170	1,242
178.40	1,258	1,363
178.50	1,349	1,494
178.60	1,443	1,633
178.70	1,541	1,783
178.80	1,642	1,942
178.90	1,746	2,111
179.00	1,853	2,291
179.10	1,963	2,482
179.20	2,077	2,684
179.30	2,194	2,897
179.40	2,313	3,122
179.50	2,437	3,360
179.60	2,563	3,610
179.70	2,692	3,873
179.80	2,825	4,148
179.90	2,961	4,438
180.00	3,100	4,741
180.10	3,230	5,057
180.20	3,362	5,387
180.30	3,497	5,730
180.40	3,635	6,086
180.50	3,775	6,457
180.60	3,918	6,841
180.70	4,064	7,241
180.80	4,212	7,654
180.90	4,363	8,083
181.00	4,517	8,527
181.10	4,673	8,987
181.20	4,832	9,462
181.30	4,994	9,953
181.40	5,158	10,461
181.50	5,325	10,985
181.60	5,495	11,526
181.70	5,667	12,084
181.80	5,842	12,659
181.90	6,020	13,253
182.00	6,200	13,863
182.10	6,505	14,499
182.20	6,818	15,165
182.30	7,138	15,863
182.40	7,465	16,593
182.50	**7,800**	**17,356**





Routing Diagram for 469-PRE
Prepared by The Dubay Group, Inc., Printed 12/16/2021

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
59,752	80	>75% Grass cover, Good, HSG D (A, B, C)
1,233	98	Ex. Pavement (C)
12,442	98	Ex. Wetland (W)
36,269	77	Woods, Good, HSG D (A, B, C)
109,696	**81**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
96,021	HSG D	A, B, C
13,675	Other	C, W
109,696		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment A: SUBCAT A Runoff Area=58,516 sf 0.00% Impervious Runoff Depth>1.01"
Flow Length=180' Tc=9.2 min CN=78 Runoff=1.49 cfs 4,948 cf

Subcatchment B: SUBCAT B Runoff Area=20,632 sf 0.00% Impervious Runoff Depth>1.13"
Flow Length=180' Slope=0.0150 '/' Tc=9.1 min CN=80 Runoff=0.59 cfs 1,942 cf

Subcatchment C: SUBCAT C Runoff Area=18,106 sf 6.81% Impervious Runoff Depth>1.19"
Flow Length=100' Slope=0.0100 '/' Tc=8.9 min CN=81 Runoff=0.55 cfs 1,796 cf

Subcatchment W: EXISTING WETLAND Runoff Area=12,442 sf 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=0.80 cfs 2,657 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.07' Max Vel=0.50 fps Inflow=1.49 cfs 4,948 cf
n=0.030 L=140.0' S=0.0036 '/' Capacity=395.10 cfs Outflow=1.36 cfs 4,924 cf

Link L1: EXISTING WETLAND Inflow=1.91 cfs 7,581 cf
Primary=1.91 cfs 7,581 cf

Link L2: WESTERN PROPERTY LINE Inflow=0.59 cfs 1,942 cf
Primary=0.59 cfs 1,942 cf

Link L3: NORTHERN PROPERTY LINE Inflow=0.55 cfs 1,796 cf
Primary=0.55 cfs 1,796 cf

Total Runoff Area = 109,696 sf Runoff Volume = 11,343 cf Average Runoff Depth = 1.24"
87.53% Pervious = 96,021 sf 12.47% Impervious = 13,675 sf

Summary for Subcatchment A: SUBCAT A

Runoff = 1.49 cfs @ 12.14 hrs, Volume= 4,948 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

Area (sf)	CN	Description
32,801	77	Woods, Good, HSG D
25,715	80	>75% Grass cover, Good, HSG D
58,516	78	Weighted Average
58,516		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.8	91	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	27	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	180	Total			

Summary for Subcatchment B: SUBCAT B

Runoff = 0.59 cfs @ 12.14 hrs, Volume= 1,942 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

Area (sf)	CN	Description
3,332	77	Woods, Good, HSG D
17,300	80	>75% Grass cover, Good, HSG D
20,632	80	Weighted Average
20,632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
2.5	130	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	180	Total			

Summary for Subcatchment C: SUBCAT C

Runoff = 0.55 cfs @ 12.13 hrs, Volume= 1,796 cf, Depth> 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
	136	77	Woods, Good, HSG D
	16,737	80	>75% Grass cover, Good, HSG D
*	1,233	98	Ex. Pavement
	18,106	81	Weighted Average
	16,873		93.19% Pervious Area
	1,233		6.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.2	50	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	Total			

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 0.80 cfs @ 12.09 hrs, Volume= 2,657 cf, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
*	12,442	98	Ex. Wetland
	12,442		100.00% Impervious Area

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

Summary for Reach WR: WETLAND REACH

Inflow Area = 58,516 sf, 0.00% Impervious, Inflow Depth > 1.01" for 2-YR event
Inflow = 1.49 cfs @ 12.14 hrs, Volume= 4,948 cf
Outflow = 1.36 cfs @ 12.19 hrs, Volume= 4,924 cf, Atten= 9%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.50 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.23 fps, Avg. Travel Time= 10.0 min

Peak Storage= 383 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 395.10 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0036 '/'
Inlet Invert= 180.00', Outlet Invert= 179.50'

‡

Summary for Link L1: EXISTING WETLAND

Inflow Area = 70,958 sf, 17.53% Impervious, Inflow Depth > 1.28" for 2-YR event
Inflow = 1.91 cfs @ 12.15 hrs, Volume= 7,581 cf
Primary = 1.91 cfs @ 12.15 hrs, Volume= 7,581 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 20,632 sf, 0.00% Impervious, Inflow Depth > 1.13" for 2-YR event
Inflow = 0.59 cfs @ 12.14 hrs, Volume= 1,942 cf
Primary = 0.59 cfs @ 12.14 hrs, Volume= 1,942 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 18,106 sf, 6.81% Impervious, Inflow Depth > 1.19" for 2-YR event
Inflow = 0.55 cfs @ 12.13 hrs, Volume= 1,796 cf
Primary = 0.55 cfs @ 12.13 hrs, Volume= 1,796 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment A: SUBCAT A Runoff Area=58,516 sf 0.00% Impervious Runoff Depth>2.11"
Flow Length=180' Tc=9.2 min CN=78 Runoff=3.14 cfs 10,265 cf

Subcatchment B: SUBCAT B Runoff Area=20,632 sf 0.00% Impervious Runoff Depth>2.27"
Flow Length=180' Slope=0.0150 '/' Tc=9.1 min CN=80 Runoff=1.19 cfs 3,899 cf

Subcatchment C: SUBCAT C Runoff Area=18,106 sf 6.81% Impervious Runoff Depth>2.35"
Flow Length=100' Slope=0.0100 '/' Tc=8.9 min CN=81 Runoff=1.09 cfs 3,548 cf

Subcatchment W: EXISTING WETLAND Runoff Area=12,442 sf 100.00% Impervious Runoff Depth>3.94"
Tc=6.0 min CN=98 Runoff=1.22 cfs 4,080 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.11' Max Vel=0.67 fps Inflow=3.14 cfs 10,265 cf
n=0.030 L=140.0' S=0.0036 '/' Capacity=395.10 cfs Outflow=2.99 cfs 10,223 cf

Link L1: EXISTING WETLAND Inflow=3.89 cfs 14,303 cf
Primary=3.89 cfs 14,303 cf

Link L2: WESTERN PROPERTY LINE Inflow=1.19 cfs 3,899 cf
Primary=1.19 cfs 3,899 cf

Link L3: NORTHERN PROPERTY LINE Inflow=1.09 cfs 3,548 cf
Primary=1.09 cfs 3,548 cf

Total Runoff Area = 109,696 sf Runoff Volume = 21,792 cf Average Runoff Depth = 2.38"
87.53% Pervious = 96,021 sf 12.47% Impervious = 13,675 sf

Summary for Subcatchment A: SUBCAT A

Runoff = 3.14 cfs @ 12.14 hrs, Volume= 10,265 cf, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

Area (sf)	CN	Description
32,801	77	Woods, Good, HSG D
25,715	80	>75% Grass cover, Good, HSG D
58,516	78	Weighted Average
58,516		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.8	91	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	27	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	180	Total			

Summary for Subcatchment B: SUBCAT B

Runoff = 1.19 cfs @ 12.13 hrs, Volume= 3,899 cf, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

Area (sf)	CN	Description
3,332	77	Woods, Good, HSG D
17,300	80	>75% Grass cover, Good, HSG D
20,632	80	Weighted Average
20,632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
2.5	130	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	180	Total			

Summary for Subcatchment C: SUBCAT C

Runoff = 1.09 cfs @ 12.13 hrs, Volume= 3,548 cf, Depth> 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
	136	77	Woods, Good, HSG D
	16,737	80	>75% Grass cover, Good, HSG D
*	1,233	98	Ex. Pavement
	18,106	81	Weighted Average
	16,873		93.19% Pervious Area
	1,233		6.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.2	50	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	Total			

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 4,080 cf, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
*	12,442	98	Ex. Wetland
	12,442		100.00% Impervious Area

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

Summary for Reach WR: WETLAND REACH

Inflow Area = 58,516 sf, 0.00% Impervious, Inflow Depth > 2.11" for 10-YR event
Inflow = 3.14 cfs @ 12.14 hrs, Volume= 10,265 cf
Outflow = 2.99 cfs @ 12.17 hrs, Volume= 10,223 cf, Atten= 5%, Lag= 2.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.67 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.25 fps, Avg. Travel Time= 9.2 min

Peak Storage= 619 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 395.10 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0036 '/'
Inlet Invert= 180.00', Outlet Invert= 179.50'

‡

Summary for Link L1: EXISTING WETLAND

Inflow Area = 70,958 sf, 17.53% Impervious, Inflow Depth > 2.42" for 10-YR event
Inflow = 3.89 cfs @ 12.15 hrs, Volume= 14,303 cf
Primary = 3.89 cfs @ 12.15 hrs, Volume= 14,303 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 20,632 sf, 0.00% Impervious, Inflow Depth > 2.27" for 10-YR event
Inflow = 1.19 cfs @ 12.13 hrs, Volume= 3,899 cf
Primary = 1.19 cfs @ 12.13 hrs, Volume= 3,899 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 18,106 sf, 6.81% Impervious, Inflow Depth > 2.35" for 10-YR event
Inflow = 1.09 cfs @ 12.13 hrs, Volume= 3,548 cf
Primary = 1.09 cfs @ 12.13 hrs, Volume= 3,548 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment A: SUBCAT A Runoff Area=58,516 sf 0.00% Impervious Runoff Depth>3.05"
Flow Length=180' Tc=9.2 min CN=78 Runoff=4.54 cfs 14,887 cf

Subcatchment B: SUBCAT B Runoff Area=20,632 sf 0.00% Impervious Runoff Depth>3.24"
Flow Length=180' Slope=0.0150 '/' Tc=9.1 min CN=80 Runoff=1.70 cfs 5,576 cf

Subcatchment C: SUBCAT C Runoff Area=18,106 sf 6.81% Impervious Runoff Depth>3.34"
Flow Length=100' Slope=0.0100 '/' Tc=8.9 min CN=81 Runoff=1.54 cfs 5,040 cf

Subcatchment W: EXISTING WETLAND Runoff Area=12,442 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=1.54 cfs 5,195 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.14' Max Vel=0.78 fps Inflow=4.54 cfs 14,887 cf
n=0.030 L=140.0' S=0.0036 '/' Capacity=395.10 cfs Outflow=4.38 cfs 14,830 cf

Link L1: EXISTING WETLAND Inflow=5.54 cfs 20,026 cf
Primary=5.54 cfs 20,026 cf

Link L2: WESTERN PROPERTY LINE Inflow=1.70 cfs 5,576 cf
Primary=1.70 cfs 5,576 cf

Link L3: NORTHERN PROPERTY LINE Inflow=1.54 cfs 5,040 cf
Primary=1.54 cfs 5,040 cf

Total Runoff Area = 109,696 sf Runoff Volume = 30,699 cf Average Runoff Depth = 3.36"
87.53% Pervious = 96,021 sf 12.47% Impervious = 13,675 sf

Summary for Subcatchment A: SUBCAT A

Runoff = 4.54 cfs @ 12.13 hrs, Volume= 14,887 cf, Depth> 3.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

Area (sf)	CN	Description
32,801	77	Woods, Good, HSG D
25,715	80	>75% Grass cover, Good, HSG D
58,516	78	Weighted Average
58,516		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.8	91	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.7	27	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	12	0.1500	1.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
9.2	180	Total			

Summary for Subcatchment B: SUBCAT B

Runoff = 1.70 cfs @ 12.13 hrs, Volume= 5,576 cf, Depth> 3.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

Area (sf)	CN	Description
3,332	77	Woods, Good, HSG D
17,300	80	>75% Grass cover, Good, HSG D
20,632	80	Weighted Average
20,632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.6	50	0.0150	0.13		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
2.5	130	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.1	180	Total			

Summary for Subcatchment C: SUBCAT C

Runoff = 1.54 cfs @ 12.13 hrs, Volume= 5,040 cf, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
	136	77	Woods, Good, HSG D
	16,737	80	>75% Grass cover, Good, HSG D
*	1,233	98	Ex. Pavement
	18,106	81	Weighted Average
	16,873		93.19% Pervious Area
	1,233		6.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.7	50	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.97"
1.2	50	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	100	Total			

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 1.54 cfs @ 12.09 hrs, Volume= 5,195 cf, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
*	12,442	98	Ex. Wetland
	12,442		100.00% Impervious Area

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

Summary for Reach WR: WETLAND REACH

Inflow Area = 58,516 sf, 0.00% Impervious, Inflow Depth > 3.05" for 25-YR event
Inflow = 4.54 cfs @ 12.13 hrs, Volume= 14,887 cf
Outflow = 4.38 cfs @ 12.17 hrs, Volume= 14,830 cf, Atten= 3%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.78 fps, Min. Travel Time= 3.0 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 8.7 min

Peak Storage= 781 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 395.10 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0036 '/'
Inlet Invert= 180.00', Outlet Invert= 179.50'

‡

Summary for Link L1: EXISTING WETLAND

Inflow Area = 70,958 sf, 17.53% Impervious, Inflow Depth > 3.39" for 25-YR event
Inflow = 5.54 cfs @ 12.15 hrs, Volume= 20,026 cf
Primary = 5.54 cfs @ 12.15 hrs, Volume= 20,026 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 20,632 sf, 0.00% Impervious, Inflow Depth > 3.24" for 25-YR event
Inflow = 1.70 cfs @ 12.13 hrs, Volume= 5,576 cf
Primary = 1.70 cfs @ 12.13 hrs, Volume= 5,576 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 18,106 sf, 6.81% Impervious, Inflow Depth > 3.34" for 25-YR event
Inflow = 1.54 cfs @ 12.13 hrs, Volume= 5,040 cf
Primary = 1.54 cfs @ 12.13 hrs, Volume= 5,040 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment A: SUBCAT A Runoff Area=58,516 sf 0.00% Impervious Runoff Depth>3.98"
Flow Length=180' Tc=9.2 min CN=78 Runoff=5.87 cfs 19,401 cf

Subcatchment B: SUBCAT B Runoff Area=20,632 sf 0.00% Impervious Runoff Depth>4.19"
Flow Length=180' Slope=0.0150 '/' Tc=9.1 min CN=80 Runoff=2.17 cfs 7,203 cf

Subcatchment C: SUBCAT C Runoff Area=18,106 sf 6.81% Impervious Runoff Depth>4.30"
Flow Length=100' Slope=0.0100 '/' Tc=8.9 min CN=81 Runoff=1.97 cfs 6,482 cf

Subcatchment W: EXISTING WETLAND Runoff Area=12,442 sf 100.00% Impervious Runoff Depth>6.01"
Tc=6.0 min CN=98 Runoff=1.85 cfs 6,232 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.16' Max Vel=0.87 fps Inflow=5.87 cfs 19,401 cf
n=0.030 L=140.0' S=0.0036 '/' Capacity=395.10 cfs Outflow=5.71 cfs 19,330 cf

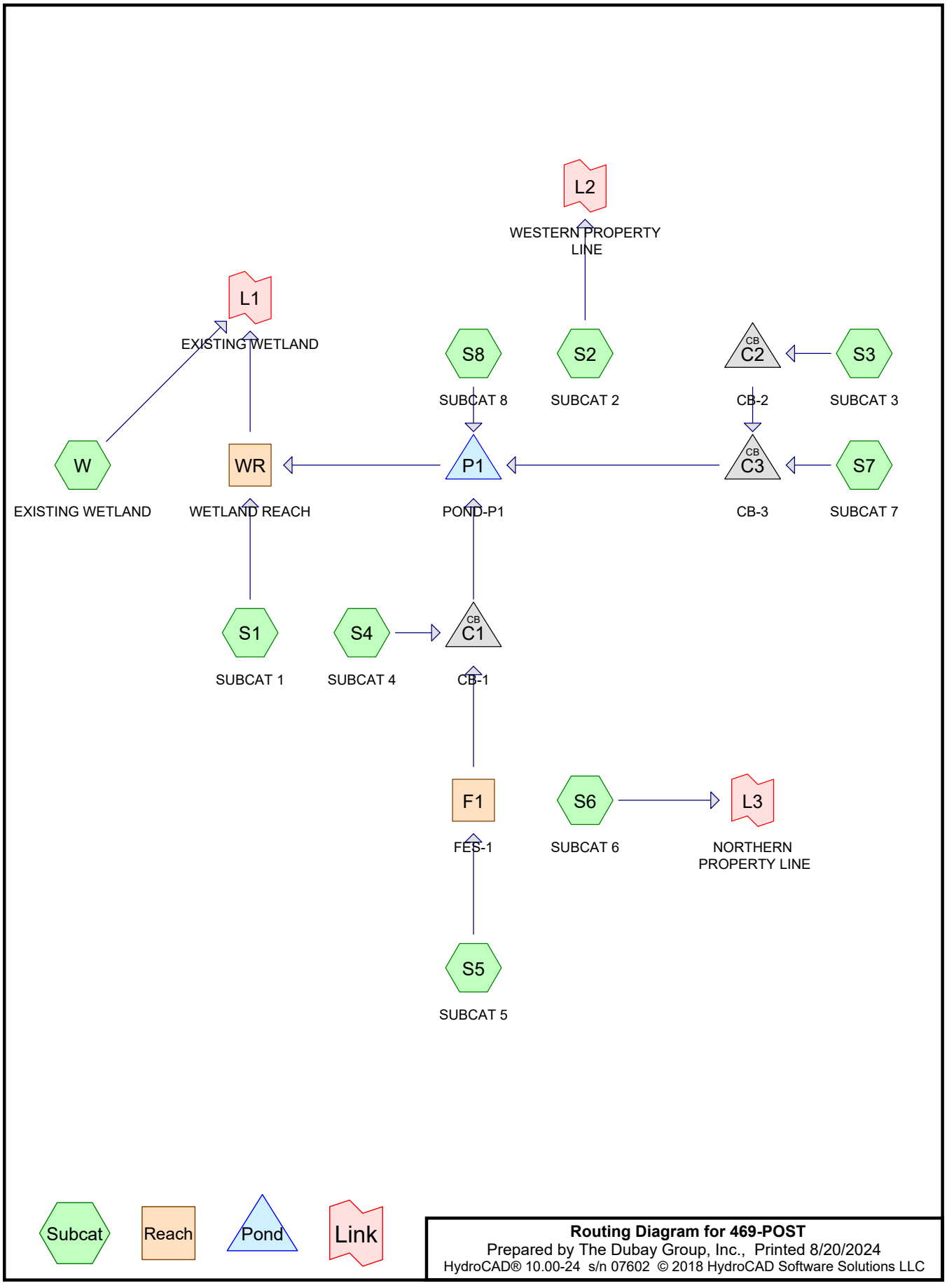
Link L1: EXISTING WETLAND Inflow=7.13 cfs 25,562 cf
Primary=7.13 cfs 25,562 cf

Link L2: WESTERN PROPERTY LINE Inflow=2.17 cfs 7,203 cf
Primary=2.17 cfs 7,203 cf

Link L3: NORTHERN PROPERTY LINE Inflow=1.97 cfs 6,482 cf
Primary=1.97 cfs 6,482 cf

Total Runoff Area = 109,696 sf Runoff Volume = 39,317 cf Average Runoff Depth = 4.30"
87.53% Pervious = 96,021 sf 12.47% Impervious = 13,675 sf

Attachment "F"



Routing Diagram for 469-POST
Prepared by The Dubay Group, Inc., Printed 8/20/2024
HydroCAD® 10.00-24 s/n 07602 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
39,181	80	>75% Grass cover, Good, HSG D (S1, S2, S5, S6, S8)
1,233	98	Ex. Pavement (S6)
7,531	98	Ex. Wetland (W)
49,775	98	Proposed Pavement (S3, S4, S6, S7)
12,400	77	Woods, Good, HSG D (S1, S2, S6)
110,120	**89**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
51,581	HSG D	S1, S2, S5, S6, S8
58,539	Other	S3, S4, S6, S7, W
110,120		**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment S1: SUBCAT 1 Runoff Area=15,592 sf 0.00% Impervious Runoff Depth>1.02"
Tc=6.0 min CN=78 Runoff=0.44 cfs 1,320 cf

Subcatchment S2: SUBCAT 2 Runoff Area=6,110 sf 0.00% Impervious Runoff Depth>1.07"
Tc=6.0 min CN=79 Runoff=0.18 cfs 546 cf

Subcatchment S3: SUBCAT 3 Runoff Area=17,045 sf 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=1.10 cfs 3,640 cf

Subcatchment S4: SUBCAT 4 Runoff Area=8,797 sf 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=0.57 cfs 1,879 cf

Subcatchment S5: SUBCAT 5 Runoff Area=11,386 sf 0.00% Impervious Runoff Depth>1.13"
Tc=6.0 min CN=80 Runoff=0.36 cfs 1,073 cf

Subcatchment S6: SUBCAT 6 Runoff Area=11,333 sf 41.15% Impervious Runoff Depth>1.60"
Tc=6.0 min CN=87 Runoff=0.51 cfs 1,511 cf

Subcatchment S7: SUBCAT 7 Runoff Area=20,503 sf 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=1.32 cfs 4,378 cf

Subcatchment S8: SUBCAT 8 Runoff Area=11,823 sf 0.00% Impervious Runoff Depth>1.13"
Tc=6.0 min CN=80 Runoff=0.38 cfs 1,114 cf

Subcatchment W: EXISTING WETLAND Runoff Area=7,531 sf 100.00% Impervious Runoff Depth>2.56"
Tc=6.0 min CN=98 Runoff=0.49 cfs 1,608 cf

Reach F1: FES-1 Avg. Flow Depth=0.16' Max Vel=4.43 fps Inflow=0.36 cfs 1,073 cf
12.0" Round Pipe n=0.012 L=54.0' S=0.0278 '/' Capacity=6.43 cfs Outflow=0.36 cfs 1,073 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.07' Max Vel=0.39 fps Inflow=1.18 cfs 12,920 cf
n=0.030 L=140.0' S=0.0021 '/' Capacity=300.90 cfs Outflow=1.11 cfs 12,854 cf

Pond C1: CB-1 Peak Elev=181.75' Inflow=0.93 cfs 2,951 cf
15.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=0.93 cfs 2,951 cf

Pond C2: CB-2 Peak Elev=181.83' Inflow=1.10 cfs 3,640 cf
15.0" Round Culvert n=0.012 L=119.0' S=0.0050 '/' Outflow=1.10 cfs 3,640 cf

Pond C3: CB-3 Peak Elev=181.27' Inflow=2.42 cfs 8,018 cf
18.0" Round Culvert n=0.012 L=15.0' S=0.0053 '/' Outflow=2.42 cfs 8,018 cf

Pond P1: POND-P1 Peak Elev=181.14' Storage=9,170 cf Inflow=3.73 cfs 12,084 cf
Outflow=0.89 cfs 11,600 cf

Link L1: EXISTING WETLAND Inflow=1.46 cfs 14,462 cf
Primary=1.46 cfs 14,462 cf

Link L2: WESTERN PROPERTY LINE Inflow=0.18 cfs 546 cf
Primary=0.18 cfs 546 cf

Link L3: NORTHERN PROPERTY LINE Inflow=0.51 cfs 1,511 cf
Primary=0.51 cfs 1,511 cf

Total Runoff Area = 110,120 sf Runoff Volume = 17,070 cf Average Runoff Depth = 1.86"
46.84% Pervious = 51,581 sf 53.16% Impervious = 58,539 sf

Summary for Subcatchment S1: SUBCAT 1

Runoff = 0.44 cfs @ 12.10 hrs, Volume= 1,320 cf, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

Area (sf)	CN	Description
6,184	80	>75% Grass cover, Good, HSG D
9,408	77	Woods, Good, HSG D
15,592	78	Weighted Average
15,592		100.00% Pervious Area

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

Summary for Subcatchment S2: SUBCAT 2

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 546 cf, Depth> 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

Area (sf)	CN	Description
3,191	80	>75% Grass cover, Good, HSG D
2,919	77	Woods, Good, HSG D
6,110	79	Weighted Average
6,110		100.00% Pervious Area

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

Summary for Subcatchment S3: SUBCAT 3

Runoff = 1.10 cfs @ 12.09 hrs, Volume= 3,640 cf, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
*	17,045	98	Proposed Pavement
	17,045		100.00% Impervious Area

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

Summary for Subcatchment S4: SUBCAT 4

Runoff = 0.57 cfs @ 12.09 hrs, Volume= 1,879 cf, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
	0	80	>75% Grass cover, Good, HSG D
*	8,797	98	Proposed Pavement
	8,797	98	Weighted Average
	8,797		100.00% Impervious Area

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

Summary for Subcatchment S5: SUBCAT 5

Runoff = 0.36 cfs @ 12.10 hrs, Volume= 1,073 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
	11,386	80	>75% Grass cover, Good, HSG D
*	0	98	Proposed Pavement
	11,386	80	Weighted Average
	11,386		100.00% Pervious Area

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

Summary for Subcatchment S6: SUBCAT 6

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 1,511 cf, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
	6,597	80	>75% Grass cover, Good, HSG D
*	3,430	98	Proposed Pavement
	73	77	Woods, Good, HSG D
*	1,233	98	Ex. Pavement
	11,333	87	Weighted Average
	6,670		58.85% Pervious Area
	4,663		41.15% Impervious Area

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

Summary for Subcatchment S7: SUBCAT 7

Runoff = 1.32 cfs @ 12.09 hrs, Volume= 4,378 cf, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
*	20,503	98	Proposed Pavement
	20,503		100.00% Impervious Area

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

Summary for Subcatchment S8: SUBCAT 8

Runoff = 0.38 cfs @ 12.10 hrs, Volume= 1,114 cf, Depth> 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

Area (sf)	CN	Description
11,823	80	>75% Grass cover, Good, HSG D
11,823		100.00% Pervious Area

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

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 0.49 cfs @ 12.09 hrs, Volume= 1,608 cf, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=2.97"

	Area (sf)	CN	Description
*	7,531	98	Ex. Wetland
	7,531		100.00% Impervious Area

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

Summary for Reach F1: FES-1

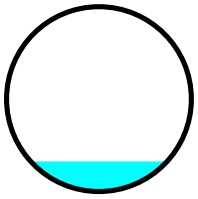
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 11,386 sf, 0.00% Impervious, Inflow Depth > 1.13" for 2-YR event
Inflow = 0.36 cfs @ 12.10 hrs, Volume= 1,073 cf
Outflow = 0.36 cfs @ 12.10 hrs, Volume= 1,073 cf, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.43 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.5 min

Peak Storage= 4 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.43 cfs

12.0" Round Pipe
n= 0.012
Length= 54.0' Slope= 0.0278 '/'
Inlet Invert= 183.00', Outlet Invert= 181.50'



Summary for Reach WR: WETLAND REACH

Inflow Area = 85,146 sf, 54.43% Impervious, Inflow Depth > 1.82" for 2-YR event
Inflow = 1.18 cfs @ 12.12 hrs, Volume= 12,920 cf
Outflow = 1.11 cfs @ 12.22 hrs, Volume= 12,854 cf, Atten= 6%, Lag= 5.9 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.39 fps, Min. Travel Time= 6.0 min
Avg. Velocity = 0.21 fps, Avg. Travel Time= 11.2 min

Peak Storage= 400 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 300.90 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0021 '/'
Inlet Invert= 179.79', Outlet Invert= 179.50'

‡

Summary for Pond C1: CB-1

[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach F1 OUTLET depth by 0.09' @ 12.10 hrs

Inflow Area = 20,183 sf, 43.59% Impervious, Inflow Depth > 1.75" for 2-YR event
Inflow = 0.93 cfs @ 12.09 hrs, Volume= 2,951 cf
Outflow = 0.93 cfs @ 12.09 hrs, Volume= 2,951 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.93 cfs @ 12.09 hrs, Volume= 2,951 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.75' @ 12.09 hrs
Flood Elev= 185.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 181.10' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.91 cfs @ 12.09 hrs HW=181.75' TW=180.82' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.91 cfs @ 2.97 fps)

Summary for Pond C2: CB-2

[82] Warning: Early inflow requires earlier time span

Inflow Area = 17,045 sf,100.00% Impervious, Inflow Depth > 2.56" for 2-YR event
Inflow = 1.10 cfs @ 12.09 hrs, Volume= 3,640 cf
Outflow = 1.10 cfs @ 12.09 hrs, Volume= 3,640 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.10 cfs @ 12.09 hrs, Volume= 3,640 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.83' @ 12.10 hrs
Flood Elev= 183.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 119.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 180.65' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.02 cfs @ 12.09 hrs HW=181.82' TW=181.25' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.02 cfs @ 2.73 fps)

Summary for Pond C3: CB-3

[82] Warning: Early inflow requires earlier time span

Inflow Area = 37,548 sf,100.00% Impervious, Inflow Depth > 2.56" for 2-YR event
Inflow = 2.42 cfs @ 12.09 hrs, Volume= 8,018 cf
Outflow = 2.42 cfs @ 12.09 hrs, Volume= 8,018 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.42 cfs @ 12.09 hrs, Volume= 8,018 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.27' @ 12.09 hrs
Flood Elev= 183.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	180.40'	**18.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 180.40' / 180.32' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.36 cfs @ 12.09 hrs HW=181.25' TW=180.80' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.36 cfs @ 3.27 fps)

Summary for Pond P1: POND-P1

[82] Warning: Early inflow requires earlier time span

Inflow Area = 69,554 sf, 66.63% Impervious, Inflow Depth > 2.08" for 2-YR event
Inflow = 3.73 cfs @ 12.09 hrs, Volume= 12,084 cf
Outflow = 0.89 cfs @ 12.48 hrs, Volume= 11,600 cf, Atten= 76%, Lag= 23.7 min
Primary = 0.89 cfs @ 12.48 hrs, Volume= 11,600 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 180.00' Surf.Area= 3,100 sf Storage= 4,741 cf
Peak Elev= 181.14' @ 12.48 hrs Surf.Area= 4,735 sf Storage= 9,170 cf (4,429 cf above start)
Flood Elev= 182.50' Surf.Area= 7,800 sf Storage= 17,356 cf (12,615 cf above start)

Plug-Flow detention time= 223.7 min calculated for 6,834 cf (57% of inflow)
Center-of-Mass det. time= 60.6 min (812.1 - 751.5)

Volume	Invert	Avail.Storage	Storage Description
#1	175.00'	17,356 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
175.00	5	0	0	5
176.00	100	42	42	102
178.00	925	886	929	940
180.00	3,100	3,812	4,741	3,136
182.00	6,200	9,123	13,863	6,273
182.50	7,800	3,492	17,356	7,879

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 180.00' / 179.79' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	180.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	181.75'	**10.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=0.89 cfs @ 12.48 hrs HW=181.14' TW=179.86' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.89 cfs of 2.90 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.89 cfs @ 4.54 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link L1: EXISTING WETLAND

Inflow Area = 92,677 sf, 58.13% Impervious, Inflow Depth > 1.87" for 2-YR event
Inflow = 1.46 cfs @ 12.14 hrs, Volume= 14,462 cf
Primary = 1.46 cfs @ 12.14 hrs, Volume= 14,462 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 6,110 sf, 0.00% Impervious, Inflow Depth > 1.07" for 2-YR event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 546 cf
Primary = 0.18 cfs @ 12.10 hrs, Volume= 546 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 11,333 sf, 41.15% Impervious, Inflow Depth > 1.60" for 2-YR event
Inflow = 0.51 cfs @ 12.09 hrs, Volume= 1,511 cf
Primary = 0.51 cfs @ 12.09 hrs, Volume= 1,511 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment S1: SUBCAT 1 Runoff Area=15,592 sf 0.00% Impervious Runoff Depth>2.11"
Tc=6.0 min CN=78 Runoff=0.93 cfs 2,738 cf

Subcatchment S2: SUBCAT 2 Runoff Area=6,110 sf 0.00% Impervious Runoff Depth>2.19"
Tc=6.0 min CN=79 Runoff=0.38 cfs 1,114 cf

Subcatchment S3: SUBCAT 3 Runoff Area=17,045 sf 100.00% Impervious Runoff Depth>3.94"
Tc=6.0 min CN=98 Runoff=1.67 cfs 5,590 cf

Subcatchment S4: SUBCAT 4 Runoff Area=8,797 sf 100.00% Impervious Runoff Depth>3.94"
Tc=6.0 min CN=98 Runoff=0.86 cfs 2,885 cf

Subcatchment S5: SUBCAT 5 Runoff Area=11,386 sf 0.00% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=80 Runoff=0.73 cfs 2,154 cf

Subcatchment S6: SUBCAT 6 Runoff Area=11,333 sf 41.15% Impervious Runoff Depth>2.89"
Tc=6.0 min CN=87 Runoff=0.90 cfs 2,728 cf

Subcatchment S7: SUBCAT 7 Runoff Area=20,503 sf 100.00% Impervious Runoff Depth>3.94"
Tc=6.0 min CN=98 Runoff=2.01 cfs 6,724 cf

Subcatchment S8: SUBCAT 8 Runoff Area=11,823 sf 0.00% Impervious Runoff Depth>2.27"
Tc=6.0 min CN=80 Runoff=0.76 cfs 2,237 cf

Subcatchment W: EXISTING WETLAND Runoff Area=7,531 sf 100.00% Impervious Runoff Depth>3.94"
Tc=6.0 min CN=98 Runoff=0.74 cfs 2,470 cf

Reach F1: FES-1 Avg. Flow Depth=0.23' Max Vel=5.44 fps Inflow=0.73 cfs 2,154 cf
12.0" Round Pipe n=0.012 L=54.0' S=0.0278 '/' Capacity=6.43 cfs Outflow=0.73 cfs 2,153 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.09' Max Vel=0.47 fps Inflow=1.88 cfs 21,713 cf
n=0.030 L=140.0' S=0.0021 '/' Capacity=300.90 cfs Outflow=1.76 cfs 21,609 cf

Pond C1: CB-1 Peak Elev=181.94' Inflow=1.59 cfs 5,038 cf
15.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=1.59 cfs 5,038 cf

Pond C2: CB-2 Peak Elev=182.02' Inflow=1.67 cfs 5,590 cf
15.0" Round Culvert n=0.012 L=119.0' S=0.0050 '/' Outflow=1.67 cfs 5,590 cf

Pond C3: CB-3 Peak Elev=181.74' Inflow=3.68 cfs 12,314 cf
18.0" Round Culvert n=0.012 L=15.0' S=0.0053 '/' Outflow=3.68 cfs 12,314 cf

Pond P1: POND-P1 Peak Elev=181.74' Storage=12,301 cf Inflow=6.03 cfs 19,589 cf
Outflow=1.15 cfs 18,974 cf

Link L1: EXISTING WETLAND Inflow=2.39 cfs 24,078 cf
Primary=2.39 cfs 24,078 cf

Link L2: WESTERN PROPERTY LINE Inflow=0.38 cfs 1,114 cf
Primary=0.38 cfs 1,114 cf

Link L3: NORTHERN PROPERTY LINE Inflow=0.90 cfs 2,728 cf
Primary=0.90 cfs 2,728 cf

Total Runoff Area = 110,120 sf Runoff Volume = 28,640 cf Average Runoff Depth = 3.12"
46.84% Pervious = 51,581 sf 53.16% Impervious = 58,539 sf

Summary for Subcatchment S1: SUBCAT 1

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 2,738 cf, Depth> 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

Area (sf)	CN	Description
6,184	80	>75% Grass cover, Good, HSG D
9,408	77	Woods, Good, HSG D
15,592	78	Weighted Average
15,592		100.00% Pervious Area

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

Summary for Subcatchment S2: SUBCAT 2

Runoff = 0.38 cfs @ 12.09 hrs, Volume= 1,114 cf, Depth> 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

Area (sf)	CN	Description
3,191	80	>75% Grass cover, Good, HSG D
2,919	77	Woods, Good, HSG D
6,110	79	Weighted Average
6,110		100.00% Pervious Area

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

Summary for Subcatchment S3: SUBCAT 3

Runoff = 1.67 cfs @ 12.09 hrs, Volume= 5,590 cf, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
*	17,045	98	Proposed Pavement
	17,045		100.00% Impervious Area

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

Summary for Subcatchment S4: SUBCAT 4

Runoff = 0.86 cfs @ 12.09 hrs, Volume= 2,885 cf, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
	0	80	>75% Grass cover, Good, HSG D
*	8,797	98	Proposed Pavement
	8,797	98	Weighted Average
	8,797		100.00% Impervious Area

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

Summary for Subcatchment S5: SUBCAT 5

Runoff = 0.73 cfs @ 12.09 hrs, Volume= 2,154 cf, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
	11,386	80	>75% Grass cover, Good, HSG D
*	0	98	Proposed Pavement
	11,386	80	Weighted Average
	11,386		100.00% Pervious Area

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

Summary for Subcatchment S6: SUBCAT 6

Runoff = 0.90 cfs @ 12.09 hrs, Volume= 2,728 cf, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
	6,597	80	>75% Grass cover, Good, HSG D
*	3,430	98	Proposed Pavement
	73	77	Woods, Good, HSG D
*	1,233	98	Ex. Pavement
	11,333	87	Weighted Average
	6,670		58.85% Pervious Area
	4,663		41.15% Impervious Area

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

Summary for Subcatchment S7: SUBCAT 7

Runoff = 2.01 cfs @ 12.09 hrs, Volume= 6,724 cf, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
*	20,503	98	Proposed Pavement
	20,503		100.00% Impervious Area

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

Summary for Subcatchment S8: SUBCAT 8

Runoff = 0.76 cfs @ 12.09 hrs, Volume= 2,237 cf, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

Area (sf)	CN	Description
11,823	80	>75% Grass cover, Good, HSG D
11,823		100.00% Pervious Area

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

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 0.74 cfs @ 12.09 hrs, Volume= 2,470 cf, Depth> 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.47"

	Area (sf)	CN	Description
*	7,531	98	Ex. Wetland
	7,531		100.00% Impervious Area

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

Summary for Reach F1: FES-1

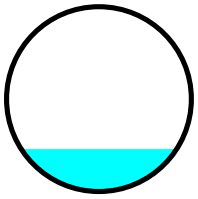
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 11,386 sf, 0.00% Impervious, Inflow Depth > 2.27" for 10-YR event
Inflow = 0.73 cfs @ 12.09 hrs, Volume= 2,154 cf
Outflow = 0.73 cfs @ 12.10 hrs, Volume= 2,153 cf, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.44 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 0.4 min

Peak Storage= 7 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.43 cfs

12.0" Round Pipe
n= 0.012
Length= 54.0' Slope= 0.0278 '/'
Inlet Invert= 183.00', Outlet Invert= 181.50'



Summary for Reach WR: WETLAND REACH

Inflow Area = 85,146 sf, 54.43% Impervious, Inflow Depth > 3.06" for 10-YR event
Inflow = 1.88 cfs @ 12.11 hrs, Volume= 21,713 cf
Outflow = 1.76 cfs @ 12.17 hrs, Volume= 21,609 cf, Atten= 6%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.47 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.24 fps, Avg. Travel Time= 9.6 min

Peak Storage= 530 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 300.90 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0021 '/'
Inlet Invert= 179.79', Outlet Invert= 179.50'

‡

Summary for Pond C1: CB-1

[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach F1 OUTLET depth by 0.21' @ 12.10 hrs

Inflow Area = 20,183 sf, 43.59% Impervious, Inflow Depth > 3.00" for 10-YR event
Inflow = 1.59 cfs @ 12.09 hrs, Volume= 5,038 cf
Outflow = 1.59 cfs @ 12.09 hrs, Volume= 5,038 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.59 cfs @ 12.09 hrs, Volume= 5,038 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.94' @ 12.09 hrs
Flood Elev= 185.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 181.10' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.56 cfs @ 12.09 hrs HW=181.93' TW=181.22' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.56 cfs @ 3.33 fps)

Summary for Pond C2: CB-2

[82] Warning: Early inflow requires earlier time span

Inflow Area = 17,045 sf,100.00% Impervious, Inflow Depth > 3.94" for 10-YR event
Inflow = 1.67 cfs @ 12.09 hrs, Volume= 5,590 cf
Outflow = 1.67 cfs @ 12.09 hrs, Volume= 5,590 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.09 hrs, Volume= 5,590 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 182.02' @ 12.10 hrs
Flood Elev= 183.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 119.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 180.65' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.51 cfs @ 12.09 hrs HW=182.00' TW=181.49' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.51 cfs @ 2.83 fps)

Summary for Pond C3: CB-3

[82] Warning: Early inflow requires earlier time span

Inflow Area = 37,548 sf,100.00% Impervious, Inflow Depth > 3.94" for 10-YR event
Inflow = 3.68 cfs @ 12.09 hrs, Volume= 12,314 cf
Outflow = 3.68 cfs @ 12.09 hrs, Volume= 12,314 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.68 cfs @ 12.09 hrs, Volume= 12,314 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.74' @ 12.57 hrs
Flood Elev= 183.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	180.40'	**18.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 180.40' / 180.32' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.21 cfs @ 12.09 hrs HW=181.49' TW=181.20' (Dynamic Tailwater)
↑**1=Culvert** (Outlet Controls 3.21 cfs @ 3.27 fps)

Summary for Pond P1: POND-P1

[82] Warning: Early inflow requires earlier time span
[80] Warning: Exceeded Pond C3 by 0.01' @ 12.35 hrs (0.66 cfs 508 cf)

Inflow Area = 69,554 sf, 66.63% Impervious, Inflow Depth > 3.38" for 10-YR event
Inflow = 6.03 cfs @ 12.09 hrs, Volume= 19,589 cf
Outflow = 1.15 cfs @ 12.53 hrs, Volume= 18,974 cf, Atten= 81%, Lag= 26.6 min
Primary = 1.15 cfs @ 12.53 hrs, Volume= 18,974 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 180.00' Surf.Area= 3,100 sf Storage= 4,741 cf
Peak Elev= 181.74' @ 12.53 hrs Surf.Area= 5,734 sf Storage= 12,301 cf (7,560 cf above start)
Flood Elev= 182.50' Surf.Area= 7,800 sf Storage= 17,356 cf (12,615 cf above start)

Plug-Flow detention time= 193.1 min calculated for 14,229 cf (73% of inflow)
Center-of-Mass det. time= 70.4 min (818.6 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1	175.00'	17,356 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
175.00	5	0	0	5
176.00	100	42	42	102
178.00	925	886	929	940
180.00	3,100	3,812	4,741	3,136
182.00	6,200	9,123	13,863	6,273
182.50	7,800	3,492	17,356	7,879

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 180.00' / 179.79' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	180.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	181.75'	**10.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=1.15 cfs @ 12.53 hrs HW=181.74' TW=179.87' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.15 cfs of 4.21 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.15 cfs @ 5.87 fps)
- **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link L1: EXISTING WETLAND

Inflow Area = 92,677 sf, 58.13% Impervious, Inflow Depth > 3.12" for 10-YR event
Inflow = 2.39 cfs @ 12.12 hrs, Volume= 24,078 cf
Primary = 2.39 cfs @ 12.12 hrs, Volume= 24,078 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 6,110 sf, 0.00% Impervious, Inflow Depth > 2.19" for 10-YR event
Inflow = 0.38 cfs @ 12.09 hrs, Volume= 1,114 cf
Primary = 0.38 cfs @ 12.09 hrs, Volume= 1,114 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 11,333 sf, 41.15% Impervious, Inflow Depth > 2.89" for 10-YR event
Inflow = 0.90 cfs @ 12.09 hrs, Volume= 2,728 cf
Primary = 0.90 cfs @ 12.09 hrs, Volume= 2,728 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment S1: SUBCAT 1 Runoff Area=15,592 sf 0.00% Impervious Runoff Depth>3.06"
Tc=6.0 min CN=78 Runoff=1.34 cfs 3,971 cf

Subcatchment S2: SUBCAT 2 Runoff Area=6,110 sf 0.00% Impervious Runoff Depth>3.15"
Tc=6.0 min CN=79 Runoff=0.54 cfs 1,604 cf

Subcatchment S3: SUBCAT 3 Runoff Area=17,045 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=2.11 cfs 7,117 cf

Subcatchment S4: SUBCAT 4 Runoff Area=8,797 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=1.09 cfs 3,673 cf

Subcatchment S5: SUBCAT 5 Runoff Area=11,386 sf 0.00% Impervious Runoff Depth>3.25"
Tc=6.0 min CN=80 Runoff=1.04 cfs 3,080 cf

Subcatchment S6: SUBCAT 6 Runoff Area=11,333 sf 41.15% Impervious Runoff Depth>3.95"
Tc=6.0 min CN=87 Runoff=1.22 cfs 3,728 cf

Subcatchment S7: SUBCAT 7 Runoff Area=20,503 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=2.54 cfs 8,561 cf

Subcatchment S8: SUBCAT 8 Runoff Area=11,823 sf 0.00% Impervious Runoff Depth>3.25"
Tc=6.0 min CN=80 Runoff=1.08 cfs 3,199 cf

Subcatchment W: EXISTING WETLAND Runoff Area=7,531 sf 100.00% Impervious Runoff Depth>5.01"
Tc=6.0 min CN=98 Runoff=0.93 cfs 3,145 cf

Reach F1: FES-1 Avg. Flow Depth=0.27' Max Vel=6.01 fps Inflow=1.04 cfs 3,080 cf
12.0" Round Pipe n=0.012 L=54.0' S=0.0278 '/' Capacity=6.43 cfs Outflow=1.04 cfs 3,080 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.15' Max Vel=0.62 fps Inflow=3.72 cfs 28,896 cf
n=0.030 L=140.0' S=0.0021 '/' Capacity=300.90 cfs Outflow=3.64 cfs 28,775 cf

Pond C1: CB-1 Peak Elev=182.07' Inflow=2.13 cfs 6,753 cf
15.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=2.13 cfs 6,753 cf

Pond C2: CB-2 Peak Elev=182.16' Inflow=2.11 cfs 7,117 cf
15.0" Round Culvert n=0.012 L=119.0' S=0.0050 '/' Outflow=2.11 cfs 7,117 cf

Pond C3: CB-3 Peak Elev=181.97' Inflow=4.66 cfs 15,678 cf
18.0" Round Culvert n=0.012 L=15.0' S=0.0053 '/' Outflow=4.66 cfs 15,678 cf

Pond P1: POND-P1 Peak Elev=181.94' Storage=13,467 cf Inflow=7.86 cfs 25,630 cf
Outflow=3.14 cfs 24,925 cf

Link L1: EXISTING WETLAND Inflow=3.97 cfs 31,919 cf
Primary=3.97 cfs 31,919 cf

Link L2: WESTERN PROPERTY LINE Inflow=0.54 cfs 1,604 cf
Primary=0.54 cfs 1,604 cf

Link L3: NORTHERN PROPERTY LINE Inflow=1.22 cfs 3,728 cf
Primary=1.22 cfs 3,728 cf

Total Runoff Area = 110,120 sf Runoff Volume = 38,078 cf Average Runoff Depth = 4.15"
46.84% Pervious = 51,581 sf 53.16% Impervious = 58,539 sf

Summary for Subcatchment S1: SUBCAT 1

Runoff = 1.34 cfs @ 12.09 hrs, Volume= 3,971 cf, Depth> 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

Area (sf)	CN	Description
6,184	80	>75% Grass cover, Good, HSG D
9,408	77	Woods, Good, HSG D
15,592	78	Weighted Average
15,592		100.00% Pervious Area

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

Summary for Subcatchment S2: SUBCAT 2

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 1,604 cf, Depth> 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

Area (sf)	CN	Description
3,191	80	>75% Grass cover, Good, HSG D
2,919	77	Woods, Good, HSG D
6,110	79	Weighted Average
6,110		100.00% Pervious Area

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

Summary for Subcatchment S3: SUBCAT 3

Runoff = 2.11 cfs @ 12.09 hrs, Volume= 7,117 cf, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
*	17,045	98	Proposed Pavement
	17,045		100.00% Impervious Area

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

Summary for Subcatchment S4: SUBCAT 4

Runoff = 1.09 cfs @ 12.09 hrs, Volume= 3,673 cf, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
	0	80	>75% Grass cover, Good, HSG D
*	8,797	98	Proposed Pavement
	8,797	98	Weighted Average
	8,797		100.00% Impervious Area

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

Summary for Subcatchment S5: SUBCAT 5

Runoff = 1.04 cfs @ 12.09 hrs, Volume= 3,080 cf, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
	11,386	80	>75% Grass cover, Good, HSG D
*	0	98	Proposed Pavement
	11,386	80	Weighted Average
	11,386		100.00% Pervious Area

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

Summary for Subcatchment S6: SUBCAT 6

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 3,728 cf, Depth> 3.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
	6,597	80	>75% Grass cover, Good, HSG D
*	3,430	98	Proposed Pavement
	73	77	Woods, Good, HSG D
*	1,233	98	Ex. Pavement
	11,333	87	Weighted Average
	6,670		58.85% Pervious Area
	4,663		41.15% Impervious Area

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

Summary for Subcatchment S7: SUBCAT 7

Runoff = 2.54 cfs @ 12.09 hrs, Volume= 8,561 cf, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
*	20,503	98	Proposed Pavement
	20,503		100.00% Impervious Area

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

Summary for Subcatchment S8: SUBCAT 8

Runoff = 1.08 cfs @ 12.09 hrs, Volume= 3,199 cf, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

Area (sf)	CN	Description
11,823	80	>75% Grass cover, Good, HSG D
11,823		100.00% Pervious Area

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

Summary for Subcatchment W: EXISTING WETLAND

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 3,145 cf, Depth> 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.65"

	Area (sf)	CN	Description
*	7,531	98	Ex. Wetland
	7,531		100.00% Impervious Area

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

Summary for Reach F1: FES-1

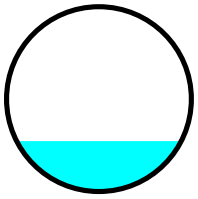
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 11,386 sf, 0.00% Impervious, Inflow Depth > 3.25" for 25-YR event
Inflow = 1.04 cfs @ 12.09 hrs, Volume= 3,080 cf
Outflow = 1.04 cfs @ 12.09 hrs, Volume= 3,080 cf, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.43 cfs

12.0" Round Pipe
n= 0.012
Length= 54.0' Slope= 0.0278 '/'
Inlet Invert= 183.00', Outlet Invert= 181.50'



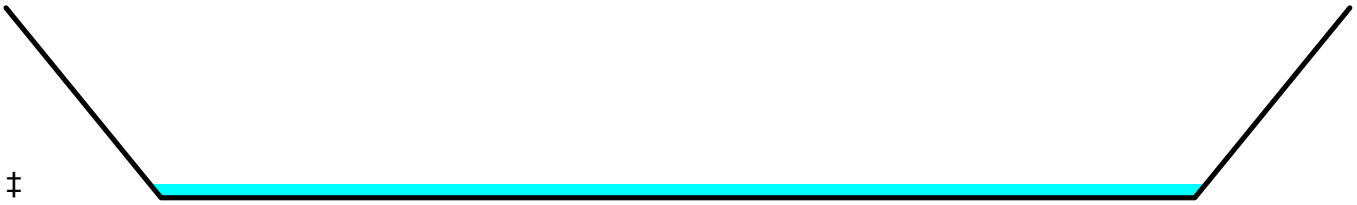
Summary for Reach WR: WETLAND REACH

Inflow Area = 85,146 sf, 54.43% Impervious, Inflow Depth > 4.07" for 25-YR event
Inflow = 3.72 cfs @ 12.30 hrs, Volume= 28,896 cf
Outflow = 3.64 cfs @ 12.35 hrs, Volume= 28,775 cf, Atten= 2%, Lag= 2.8 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.62 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.27 fps, Avg. Travel Time= 8.8 min

Peak Storage= 823 cf @ 12.35 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 2.00' Flow Area= 92.0 sf, Capacity= 300.90 cfs

40.00' x 2.00' deep channel, n= 0.030 Stream, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 52.00'
Length= 140.0' Slope= 0.0021 '/'
Inlet Invert= 179.79', Outlet Invert= 179.50'



Summary for Pond C1: CB-1

[82] Warning: Early inflow requires earlier time span
[62] Hint: Exceeded Reach F1 OUTLET depth by 0.33' @ 12.35 hrs

Inflow Area = 20,183 sf, 43.59% Impervious, Inflow Depth > 4.02" for 25-YR event
Inflow = 2.13 cfs @ 12.09 hrs, Volume= 6,753 cf
Outflow = 2.13 cfs @ 12.09 hrs, Volume= 6,753 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.13 cfs @ 12.09 hrs, Volume= 6,753 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 182.07' @ 12.09 hrs
Flood Elev= 185.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 181.10' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.08 cfs @ 12.09 hrs HW=182.06' TW=181.53' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.08 cfs @ 3.54 fps)

Summary for Pond C2: CB-2

[82] Warning: Early inflow requires earlier time span

Inflow Area = 17,045 sf,100.00% Impervious, Inflow Depth > 5.01" for 25-YR event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 7,117 cf
Outflow = 2.11 cfs @ 12.09 hrs, Volume= 7,117 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.09 hrs, Volume= 7,117 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 182.16' @ 12.11 hrs
Flood Elev= 183.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	181.25'	**15.0" Round Culvert** L= 119.0' Ke= 0.500 Inlet / Outlet Invert= 181.25' / 180.65' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.81 cfs @ 12.09 hrs HW=182.13' TW=181.69' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.81 cfs @ 2.75 fps)

Summary for Pond C3: CB-3

[82] Warning: Early inflow requires earlier time span

Inflow Area = 37,548 sf,100.00% Impervious, Inflow Depth > 5.01" for 25-YR event
Inflow = 4.66 cfs @ 12.09 hrs, Volume= 15,678 cf
Outflow = 4.66 cfs @ 12.09 hrs, Volume= 15,678 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.66 cfs @ 12.09 hrs, Volume= 15,678 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 181.97' @ 12.33 hrs
Flood Elev= 183.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	180.40'	**18.0" Round Culvert** L= 15.0' Ke= 0.500 Inlet / Outlet Invert= 180.40' / 180.32' S= 0.0053 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.15 cfs @ 12.09 hrs HW=181.69' TW=181.51' (Dynamic Tailwater)
1=Culvert (Outlet Controls 3.15 cfs @ 2.62 fps)

Summary for Pond P1: POND-P1

[82] Warning: Early inflow requires earlier time span
[80] Warning: Exceeded Pond C3 by 0.01' @ 12.20 hrs (0.97 cfs 174 cf)

Inflow Area = 69,554 sf, 66.63% Impervious, Inflow Depth > 4.42" for 25-YR event
Inflow = 7.86 cfs @ 12.09 hrs, Volume= 25,630 cf
Outflow = 3.14 cfs @ 12.32 hrs, Volume= 24,925 cf, Atten= 60%, Lag= 13.8 min
Primary = 3.14 cfs @ 12.32 hrs, Volume= 24,925 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 180.00' Surf.Area= 3,100 sf Storage= 4,741 cf
Peak Elev= 181.94' @ 12.32 hrs Surf.Area= 6,083 sf Storage= 13,467 cf (8,726 cf above start)
Flood Elev= 182.50' Surf.Area= 7,800 sf Storage= 17,356 cf (12,615 cf above start)

Plug-Flow detention time= 168.4 min calculated for 20,177 cf (79% of inflow)
Center-of-Mass det. time= 65.1 min (811.4 - 746.3)

Volume	Invert	Avail.Storage	Storage Description
#1	175.00'	17,356 cf	**Custom Stage Data (Conic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
175.00	5	0	0	5
176.00	100	42	42	102
178.00	925	886	929	940
180.00	3,100	3,812	4,741	3,136
182.00	6,200	9,123	13,863	6,273
182.50	7,800	3,492	17,356	7,879

Device	Routing	Invert	Outlet Devices
#1	Primary	180.00'	**12.0" Round Culvert** L= 21.0' Ke= 0.500 Inlet / Outlet Invert= 180.00' / 179.79' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Device 1	180.00'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	181.75'	**10.0' long x 7.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78

Primary OutFlow Max=3.11 cfs @ 12.32 hrs HW=181.93' TW=179.93' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.23 cfs of 4.53 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.23 cfs @ 6.25 fps)
- **3=Broad-Crested Rectangular Weir** (Weir Controls 1.89 cfs @ 1.03 fps)

Summary for Link L1: EXISTING WETLAND

Inflow Area = 92,677 sf, 58.13% Impervious, Inflow Depth > 4.13" for 25-YR event
Inflow = 3.97 cfs @ 12.34 hrs, Volume= 31,919 cf
Primary = 3.97 cfs @ 12.34 hrs, Volume= 31,919 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L2: WESTERN PROPERTY LINE

Inflow Area = 6,110 sf, 0.00% Impervious, Inflow Depth > 3.15" for 25-YR event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 1,604 cf
Primary = 0.54 cfs @ 12.09 hrs, Volume= 1,604 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link L3: NORTHERN PROPERTY LINE

Inflow Area = 11,333 sf, 41.15% Impervious, Inflow Depth > 3.95" for 25-YR event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 3,728 cf
Primary = 1.22 cfs @ 12.09 hrs, Volume= 3,728 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 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

Subcatchment S1: SUBCAT 1 Runoff Area=15,592 sf 0.00% Impervious Runoff Depth>3.98"
Tc=6.0 min CN=78 Runoff=1.74 cfs 5,175 cf

Subcatchment S2: SUBCAT 2 Runoff Area=6,110 sf 0.00% Impervious Runoff Depth>4.09"
Tc=6.0 min CN=79 Runoff=0.70 cfs 2,081 cf

Subcatchment S3: SUBCAT 3 Runoff Area=17,045 sf 100.00% Impervious Runoff Depth>6.01"
Tc=6.0 min CN=98 Runoff=2.53 cfs 8,538 cf

Subcatchment S4: SUBCAT 4 Runoff Area=8,797 sf 100.00% Impervious Runoff Depth>6.01"
Tc=6.0 min CN=98 Runoff=1.31 cfs 4,406 cf

Subcatchment S5: SUBCAT 5 Runoff Area=11,386 sf 0.00% Impervious Runoff Depth>4.19"
Tc=6.0 min CN=80 Runoff=1.33 cfs 3,979 cf

Subcatchment S6: SUBCAT 6 Runoff Area=11,333 sf 41.15% Impervious Runoff Depth>4.95"
Tc=6.0 min CN=87 Runoff=1.51 cfs 4,674 cf

Subcatchment S7: SUBCAT 7 Runoff Area=20,503 sf 100.00% Impervious Runoff Depth>6.01"
Tc=6.0 min CN=98 Runoff=3.04 cfs 10,270 cf

Subcatchment S8: SUBCAT 8 Runoff Area=11,823 sf 0.00% Impervious Runoff Depth>4.19"
Tc=6.0 min CN=80 Runoff=1.38 cfs 4,131 cf

Subcatchment W: EXISTING WETLAND Runoff Area=7,531 sf 100.00% Impervious Runoff Depth>6.01"
Tc=6.0 min CN=98 Runoff=1.12 cfs 3,772 cf

Reach F1: FES-1 Avg. Flow Depth=0.31' Max Vel=6.45 fps Inflow=1.33 cfs 3,979 cf
12.0" Round Pipe n=0.012 L=54.0' S=0.0278 '/' Capacity=6.43 cfs Outflow=1.33 cfs 3,978 cf

Reach WR: WETLAND REACH Avg. Flow Depth=0.20' Max Vel=0.76 fps Inflow=6.43 cfs 35,712 cf
n=0.030 L=140.0' S=0.0021 '/' Capacity=300.90 cfs Outflow=6.20 cfs 35,578 cf

Pond C1: CB-1 Peak Elev=182.18' Inflow=2.63 cfs 8,384 cf
15.0" Round Culvert n=0.012 L=15.0' S=0.0100 '/' Outflow=2.63 cfs 8,384 cf

Pond C2: CB-2 Peak Elev=182.32' Inflow=2.53 cfs 8,538 cf
15.0" Round Culvert n=0.012 L=119.0' S=0.0050 '/' Outflow=2.53 cfs 8,538 cf

Pond C3: CB-3 Peak Elev=182.15' Inflow=5.57 cfs 18,807 cf
18.0" Round Culvert n=0.012 L=15.0' S=0.0053 '/' Outflow=5.57 cfs 18,807 cf

Pond P1: POND-P1 Peak Elev=182.06' Storage=14,219 cf Inflow=9.58 cfs 31,323 cf
Outflow=5.45 cfs 30,537 cf

Link L1: EXISTING WETLAND Inflow=6.73 cfs 39,350 cf
Primary=6.73 cfs 39,350 cf

Link L2: WESTERN PROPERTY LINE Inflow=0.70 cfs 2,081 cf
Primary=0.70 cfs 2,081 cf

Link L3: NORTHERN PROPERTY LINE Inflow=1.51 cfs 4,674 cf
Primary=1.51 cfs 4,674 cf

Total Runoff Area = 110,120 sf Runoff Volume = 47,025 cf Average Runoff Depth = 5.12"
46.84% Pervious = 51,581 sf 53.16% Impervious = 58,539 sf

Stormwater Management Report

VI. DRAINAGE AREA PLANS

A. Pre-Development Drainage Area Plan

B. Post-Development Drainage Area Plan

Attachment "F"

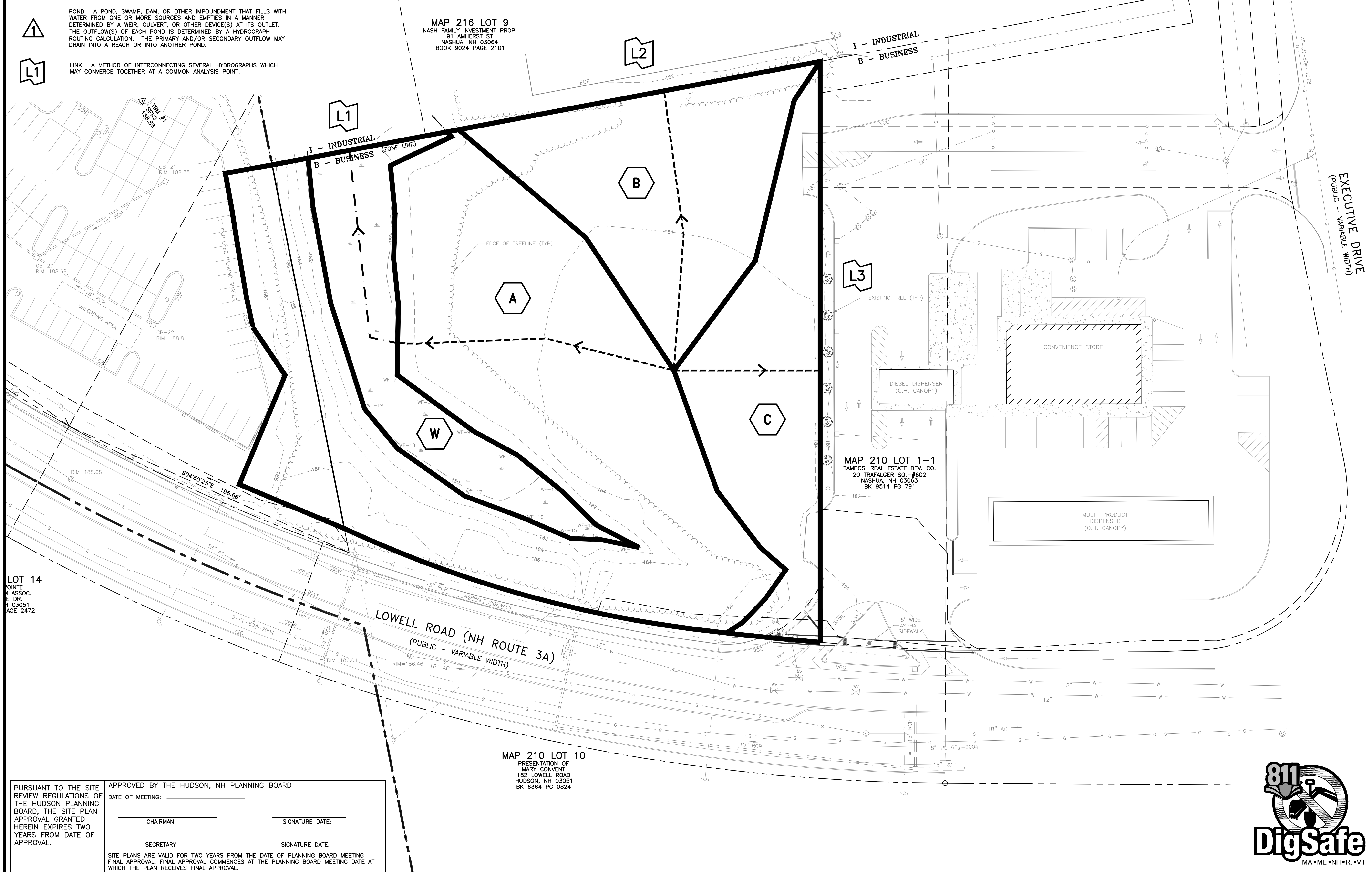
WATERSHED LEGEND:

⬡1 SUBCATCHMENT: A RELATIVELY HOMOGENEOUS AREA OF LAND THAT DRAINS INTO A SINGLE REACH OR POND. EACH SUBCATCHMENT GENERATES A RUNOFF HYDROGRAPH. (A SUBCATCHMENT MAY ALSO BE USED TO ACCOUNT FOR THE RAIN FALLING DIRECTLY ON THE SURFACE OF A POND.)

□1 REACH: A UNIFORM STREAM, CHANNEL, OR PIPE THAT CONVEYS WATER FROM ONE POINT TO ANOTHER REACH OR POND. THE OUTFLOW OF EACH REACH IS DETERMINED BY A HYDROGRAPH ROUTING CALCULATION.

△1 POND: A POND, SWAMP, DAM, OR OTHER IMPOUNDMENT THAT FILLS WITH WATER FROM ONE OR MORE SOURCES AND EMPTIES IN A MANNER DETERMINED BY A WEIR, CULVERT, OR OTHER DEVICE(S) AT ITS OUTLET. THE OUTFLOW(S) OF EACH POND IS DETERMINED BY A HYDROGRAPH ROUTING CALCULATION. THE PRIMARY AND/OR SECONDARY OUTFLOW MAY DRAIN INTO A REACH OR INTO ANOTHER POND.

L1 LINK: A METHOD OF INTERCONNECTING SEVERAL HYDROGRAPHS WHICH MAY CONVERGE TOGETHER AT A COMMON ANALYSIS POINT.



PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL.	APPROVED BY THE HUDSON, NH PLANNING BOARD DATE OF MEETING: ______ CHAIRMAN ______ SIGNATURE DATE: ______ SECRETARY ______ SIGNATURE DATE: ______ SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

N:_=PROJECTS\469-Angotti-Subaru, Hudson\DWG\CURRENT\469-PRE-DEVELOPMENT.dwg

811 DigSafe MA•ME•NH•RI•VT

The Dubay Group, Inc.
136 Harvey Road Bldg B101
Londonderry, NH 03053
603-458-6462

Engineers
Planners
Surveyors
TheDubayGroup.com

1 INCH = 30 FEET

STATE OF NEW HAMPSHIRE — DOUGLAS G. MacGUIRE No. 13325 — LICENSED PROFESSIONAL ENGINEER

REVISIONS:

REV:	DATE:	COMMENT:	BY:

DRAWN BY: SJK
CHECKED BY: DGM
DATE: DEC. 17, 2021
SCALE: 1"=30'
FILE: 469-PRE-DEVELOPMENT
DEED REF:
H.C.R.D.: BK. 9403 PG. 2706

PROJECT:

GRANITE SUBARU EXPANSION
MAP 210 LOT 1
6 EXECUTIVE DRIVE
HUDSON, NH 03051

FOR

RAYMOND JAMES GRANITE PROP LLC
193 LOWELL RD
HUDSON, NH 03051

SHEET TITLE:

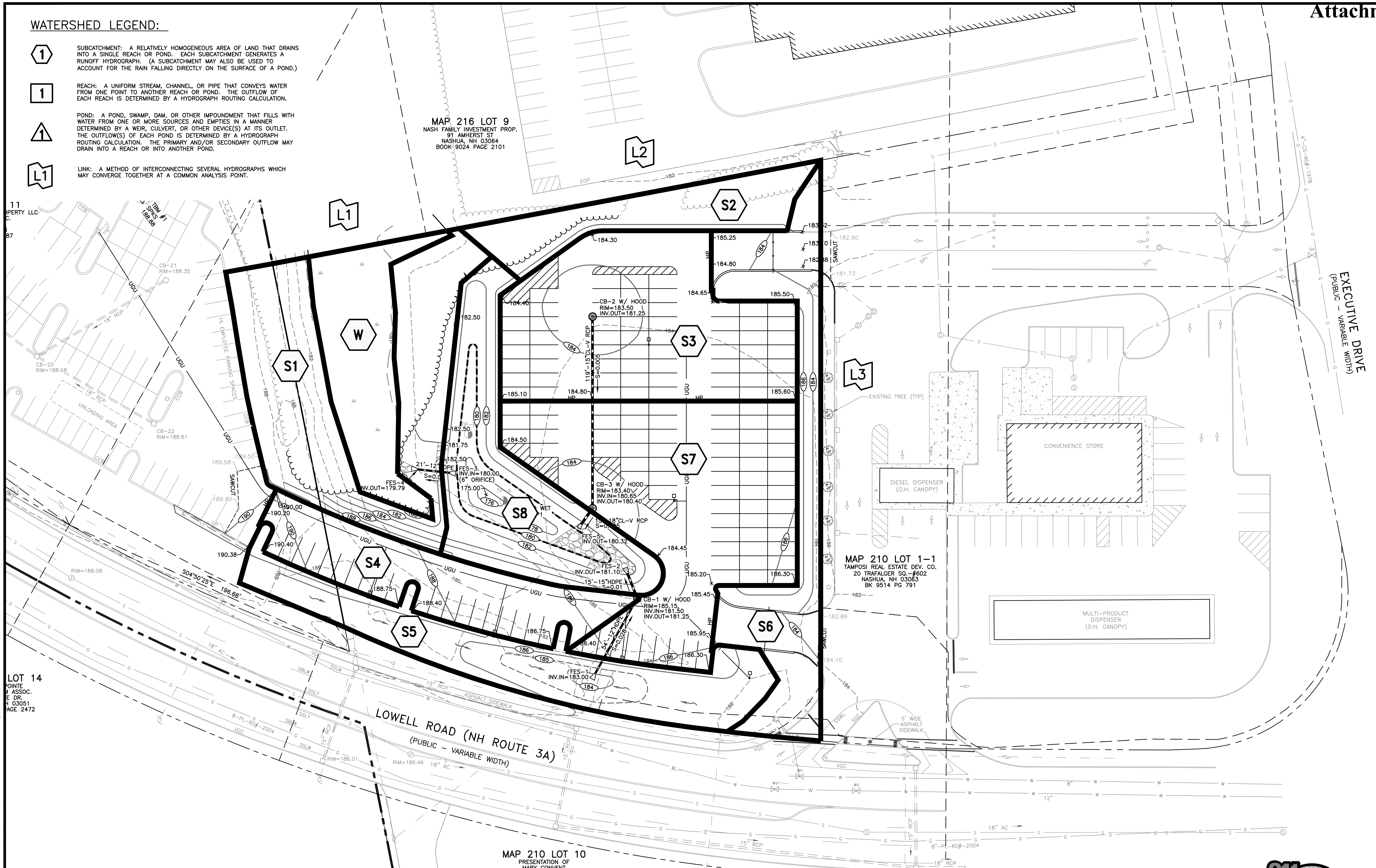
PRE DEVELOPMENT WATERSHED PLAN

PROJECT #469 SHEET S1 of S2

Attachment "F"

WATERSHED LEGEND:

- **1 (hexagon)** — SUBCATCHMENT: A RELATIVELY HOMOGENEOUS AREA OF LAND THAT DRAINS INTO A SINGLE REACH OR POND. EACH SUBCATCHMENT GENERATES A RUNOFF HYDROGRAPH. (A SUBCATCHMENT MAY ALSO BE USED TO ACCOUNT FOR THE RAIN FALLING DIRECTLY ON THE SURFACE OF A POND.)
- **1 (square)** — REACH: A UNIFORM STREAM, CHANNEL, OR PIPE THAT CONVEYS WATER FROM ONE POINT TO ANOTHER REACH OR POND. THE OUTFLOW OF EACH REACH IS DETERMINED BY A HYDROGRAPH ROUTING CALCULATION.
- **1 (triangle)** — POND: A POND, SWAMP, DAM, OR OTHER IMPOUNDMENT THAT FILLS WITH WATER FROM ONE OR MORE SOURCES AND EMPTIES IN A MANNER DETERMINED BY A WEIR, CULVERT, OR OTHER DEVICE(S) AT ITS OUTLET. THE OUTFLOW(S) OF EACH POND IS DETERMINED BY A HYDROGRAPH ROUTING CALCULATION. THE PRIMARY AND/OR SECONDARY OUTFLOW MAY DRAIN INTO A REACH OR INTO ANOTHER POND.
- **L1** — LINK: A METHOD OF INTERCONNECTING SEVERAL HYDROGRAPHS WHICH MAY CONVERGE TOGETHER AT A COMMON ANALYSIS POINT.



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STATE OF NEW HAMPSHIRE — DOUGLAS G. MacGUIRE No. 13325 LICENSED PROFESSIONAL ENGINEER

REVISIONS:

REV:	DATE:	COMMENT:	BY:
3	4/24/24	TOWN COMMENTS	SJK
4	8/12/24	TOWN COMMENTS	SJK

DRAWN BY: SJK
CHECKED BY: DGM
DATE: DEC. 17, 2021
SCALE: 1"=30'
FILE: 469-POST-DEVELOPMENT
DEED REF:
H.C.R.D.: BK. 9403 PG. 2706

PROJECT:

GRANITE SUBARU EXPANSION
MAP 210 LOT 1
6 EXECUTIVE DRIVE
HUDSON, NH 03051

FOR

RAYMOND JAMES GRANITE PROP LLC
193 LOWELL RD
HUDSON, NH 03051

SHEET TITLE:

POST DEVELOPMENT WATERSHED PLAN

PROJECT #469 SHEET S2 of S2

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES TWO YEARS FROM DATE OF APPROVAL.

APPROVED BY THE HUDSON, NH PLANNING BOARD

DATE OF MEETING: ______________

______________ CHAIRMAN ______________ SIGNATURE DATE:

______________ SECRETARY ______________ SIGNATURE DATE:

SITE PLANS ARE VALID FOR TWO YEARS FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN RECEIVES FINAL APPROVAL.

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N:\=PROJECTS\469-Angotti-Subaru, Hudson\DWG\CURRENT\469-POST-DEVELOPMENT.dwg

Attachment "G"

TOWN OF HUDSON

Conservation Commission

William Collins, Chairman Dave Morin, Selectmen Liaison

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

Date: September 9, 2024

Case: Granite Subaru Expansion
6 Executive Drive
Hudson, New Hampshire
Map 210, Lot 1 Zone: Business (B)

Note: This CUP is a revised application to a previously submitted Conditional Use Permit Application reviewed by the HCC on April 11, 2022.

Description of work to be performed: The project entails construction of a paved vehicle storage area and a vehicle display area along with a new Wet Pond basin for Stormwater treatment and management. If built as proposed there will be a permanent wetland impact of 4,898 square feet and a permanent wetland buffer impact of 36,991 square feet. Note: The Wetland Buffer impact is slightly higher from the original amount of 26,829 (4/11/22) square feet due to the town's adoption of a 75 foot wetland buffer for non-residential use.

Conservation Members Stepping Down: None

Alternates Seated: Linda Krisciunas seated for Brian Pinsonneault

Applicant Representative(s): Not Present

Motion to "Recommend" is based on revised Grading, Drainage & Utility Plan sheet 4 of 11 showing a revision date of 7/11/24

Ken Dickinson moved to recommend acceptance by the Hudson Planning Board of the Conditional Use Permit application filed for the proposed "Granite Subaru Expansion" reference Tax Map 210, Lot 1, and dated May 28, 2024. After application review and site visit, the Hudson Conservation Commission finds that the use presented by the applicant comply with Hudson Zoning Ordinance 334, Article IX- Wetland Conservation Overlay District, paragraphs 334-36(C) 2 and 334-37(1) (d) (e) and 334-37(2).Commission members concur that the proposed use will not have a detrimental impact to remaining wetlands and wetland buffer area on the site if constructed per revised Grading, Drainage& Utility plan, sheet 4 of 11 revision date 7/11/24. This favorable acceptance is contingent upon Planning Board approval of the proposed plan and with the Conservation Commission recommendations listed below.

1. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.

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

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

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

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

6. The commission recommends that a stipulation and or note be added to the final plan set that states "Snow storage shall not be allowed in any wetland buffer area."

7. The commission recommends that the drive isle along the proposed display area be reduced from twenty-two (22) feet in width to twenty (20) feet in width

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

Motion second Carl Murphy, Motion Carried 5 / 0 /0

William Collins

_____

William Collins
HCC Chairman

A copy of this recommendation should be stapled to the CUP application and forward it to the Town Planning Office for inclusion in the Planning Board Member Packets.

Attachment "G"

Forward to: Town Planner Brian Groth and Planning Board Chairman Tim Malley

6 Executive Drive Site Walk: Granite Subaru Expansion CUP

Site Walk Observations and Conclusions

On March 24, 2022 members of the Hudson Conservation Commission conducted a site walk of property owned by Raymond James Granite Prop. LLC, 193 Lowell Road, The actual proposed project site is located at 6 Executive Drive, Map 242, Lot 28. The purpose of the site walk was to evaluate the impact to an onsite wetland and the wetland buffer area associated with construction of a proposed parking lot expansion for purpose of displaying and storing new vehicles**.** If built as designed there will be a permanent wetland impact of 5,986 sq. ft. and permanent wetland buffer impact area of 26,829. Note: this is only a partial disturbance as the actual wetland complex measure approximately 33,000 sq. ft. extending along the southern property line and onto an adjacent lot. While on site commission members observed the following. A large portion of the wetland buffer has been disturbed and is no longer naturalized along the westerly side of the proposed impact area. Invasive plant species plague the wetland buffer along Lowell Road trapping trash and other debris. There is currently standing water in the wetlands but the source of the water was unclear at the time of the site walk as there had been no sustained rainfall and seasonal snow had already melted. Review of the town's GIS shows wetlands on the easterly side of Lowell Road in close proximity to the subject property which could lead to the assumption that this complex is hydrologically connected. Utilizing the towns GIS system it appears that the outflow of the subject wetland flows southwesterly towards a series of ponds and may act as a minor contributor to their water levels during winter snow melt and heavy rain events.

Commission members concur with the Wetland Scientist report that the wetlands are of a forested type and comprised of hydric and poorly drained soils and that the main function would be flood flow attenuation and sediment retention. Although the CWS graded the wetlands as a "low value" on site observations and the report mentioned that plant species such as "highbush blueberry and winter berry where present in the shrub layer". These types of plants provide a sustainable food source for numerous bird and animal species during the winter months when other food source are scarce. There is also a mature stand of trees and other desirable vegetation that offer temporary nesting and resting areas for migratory birds and offer a protective cover corridor to animals traversing the property. As anecdotal evidence to this fact, prior to departing the site walk commission members observed a pair of ducks landing in the area of proposed impact for their evening roost.

The commission concludes that although this project poses a considerable impact to a portion of the onsite wetland and wetland buffer area the mitigation steps proposed by the applicant such as invasive plant removal and control, a highly robust landscaping plan and well thought out storm water management plan should result in an overall improvement to the remaining undisturbed wetland area. As a bonus removing the invasive plant species and incorporating a more aesthetically pleasing landscape design along frontage of Lowell Road will result with less trash and other debris being trapped and an area easy to maintain.

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

After review of the actual site conditions and a post site walk meeting with Applicant's Representative on April 11, 2022 the Conservation Commission members ask that the Planning Board take into consideration the following recommendations.

Drive Isle Width: Display Area along Lowell Road

1. The applicant's representative was amenable to the request by the commission that the drive isle width of the display area (not the vehicle storage area) be reduced from 22 feet to 20 feet to further minimize impacts. Reducing the width of this drive isle will result in a reduction of impervious surface cover and impacts in the WCOD of approximately 550 square feet. The commission members ask that the Planning Board take this into consideration during Site Plan review and either request the site plan be amended or add this as condition of approval.

Landscaping:

2. The applicant's representative presented a revised Landscape Plan showing a more robust planting scheme around the infiltration basin that will include plants and shrubs that support a variety of wildlife species. This robust planting scheme will enhance the site and mitigate some of the losses realized during the construction phase. With that said, during the post site walk meeting it was asked that some of these plantings be moved towards the vehicle storage area to help attenuate storm water sheet flow and trap pollutants coming off the paved area during heavy rain events. The applicant's representative was amenable to this recommendation.

In addition to the above recommendations the commission also asks that the Planning Board include the following stipulations to the finale Site Plan.

3. During construction and restoration erosion control barriers shall be installed and maintained to the satisfaction of the Town Engineer.

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

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

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

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

8. The commission recommends that a stipulation and or note be added to the final plan set that states "Snow storage shall not be allowed in any wetland buffer areas."

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

Mr. Kallgren moved to forward recommendations 1 through 9 above to the Planning Board for their consideration as Conditions of Approval for the Conditional Use Permit application submitted by Raymond James Granite Prop. LLC, 193 Lowell Road, Hudson.

Motion Second Mr. Pinnsoneault Motion carried 5/0/0

William Collins

_____

William Collins, HCC Chairman