Project Application
Land Use Department

P.O. Box 660; 333 Calef Hwy, Barrington, NH 03825 ♦ Phone: 603-664-5798 ♦ Fax: 603-664-0188

238-36-V-20-SR
Case Number: _____ **Project Name:** Multi-Family Development **Date** 9/15/2020

Staff Signature required PRIOR to submittal

PRELIMINARY APPLICATION: Preliminary Conceptual Review ____ Design Review____ Development of Regional Impact ____

FORMAL APPLICATION:
Subdivision Type: Major____ Minor____ Conventional____ Conservation____
Site Plan Review: Major X Minor____
Conditional Use Permit ____ Sign Permit ____ Boundary Line Adjustment ____ Special Permit ____
Change of Use ____ Extension for Site Plan or Subdivision Completion ____
Amendment to Subdivision/Site Plan Approval ____ Other ____

Project Name: Multi-Family Developement **Area** (Acres or S.F) 21.3
Project Address: 556 Franklin Peirce Highway
Current Zoning District(s): Village District **Map(s)** 238 **Lot(s)** 36
Request: 80 Units

The property owner shall designate an agent for the project. This person (the applicant) shall attend pre-application conferences and public hearings, will receive the agenda, recommendations, and case reports, and will communicate all case information to other parties as required.
All contacts for this project will be made through the *Applicant* listed below.

Owner: James W. Haley
Company Waldron B. Haley Revoc. Trust
Phone: _____ Fax: _____ E-mail: _____
Address: 14 Shakespeare Rd. Nashua, NH 03062

Applicant (Contact): _____
Company J & L Terra Holdings
Phone: _____ Fax: _____ E-mail: _____
Address: 79 Exeter Road, N. Hampton, NH 03862

Developer: same as applicant
Company _____
Phone: _____ Fax: _____ E-mail: _____
Address: _____

Architect: _____
Company _____
Phone: _____ Fax: _____ E-mail: _____
Address: _____

Engineer: Scott D. Cole
Company Beals Associates PLLC
Phone: 603-583-4860 Fax: _____ E-mail scole@bealsassociates.com
Address: 70 Portsmouth Ave, Stratham, NH 03885

Owner Signature _____ Applicant Signature _____

Barbara Irvine 9/15/2020
Staff Signature Date

8/12/20
Date

RECEIVED
SEP 15 2020
LAND USE OFFICE

Revised 12-07-2011

BEALS · ASSOCIATES *PLLC*

70 Portsmouth Avenue
3rd Floor, Unit 2
Stratham, N.H. 03885
Phone: (603)-583-4860
Fax: (603)-583-4863

September, 2020

Barrington Planning Board,
Marcia Gasses (Planner)
PO Box 660
Barrington NH 03825

RE: Map 238 Lot 36, Route 9
Proposed Multi-Family Development

Dear Ms. Gasses:

We are working with J & L Terra Holdings, Inc. who is a land developer and is looking to develop a piece of land on Route 9 currently owned by James Haley. The property is located along Route 9 and consists of 29.3 acres.

The overall goal is to subdivide off approx. 8 acres to remain with the owner along route 125 and develop the 21 acres located in the Village District into a Multi-Family Development. A design has been provided with a proposed private road of approx. 500' with private drives spurring off in a loop configuration to provide for emergency vehicles and safe circulation. The design has 80 Units based on calculations as required in the Town regulations.

We look forward to working with the town on another Residential project.

If you have any questions, please feel free to contact us.

Very truly yours,
BEALS ASSOCIATES, PLLC

Scott D. Cole

Scott D. Cole
Senior Project Manager

Applicant 238-3e-V-20-SR **Map/Lot#** 238 **Case#** 36

Site Review Application Checklist
Barrington Planning Board

This checklist is intended to assist applicants in preparing a complete application for site review as required by the Barrington Site Review Regulations and must be submitted along with all site review applications. An applicant seeking site review approval shall be responsible for all requirements specified in the Barrington Site Review Regulations even if said requirements are omitted from this checklist.

An applicant seeking site review approval shall be responsible for providing all the information listed in the column below entitled "Site Review" and should place an "x" in each box to indicate that this information has been provided

SITE REVIEW APPLICATION CHECKLIST Check the Appropriate Boxes below:	Site Review		Waiver(s)
	Provided	NA	
Section I. **General Requirements**			
1. Completed Application Form **(2.5.1)**	■	☐	
2. Complete abutters list **(2.6.3 (5) or 2.5.1 (6))**	■	☐	
3. Payment of all required fees **(2.6.3 (4) or 2.5.1 (5))**	■	☐	
4. Three (3) full size sets of plans and twelve (12) sets of plans 11" by 17", submitted with all required information in accordance with the site review regulations and this checklist **(2.6.3 (6) or 2.5.1 (7))**	■	☐	
5. Copies of any proposed easement deeds, protective covenants or other legal documents **(3.9.1)**	☐	☐	TBD
6. Any waiver request(s) submitted with justification in writing **(3.9.8)**	■	☐	
7. Completed Application Checklist **(2.5.1 (3))**	■	☐	
Section II. **General Plan Information**			
1. Size and presentation of sheet(s) per registry requirements and the site review regulations **(3.1.2)**	■	☐	
2. Title block information: **(3.2.1)**	■	☐	
a. Drawing title **(3.2.1 (1))**	■	☐	
b. Name of site plan **(3.2.1 (2))**	■	☐	
c. Location of site plan **(3.2.1 (3))**	■	☐	
d. Tax map & lot numbers of subject parcel(s) **(3.2.1 (4))**	■	☐	
e. Name & address of owner(s) **(3.2.1 (5))**	■	☐	
f. Date of plan **(3.2.1 (6))**	■	☐	
g. Scale of plan **(3.2.1 (7))**	■	☐	
h. Sheet number **(3.2.1 (8))**	■	☐	
i. Name, address, & telephone number of design firm **(3.2.1 (9))**	■	☐	
j. Name and address of Applicant **(3.2.1 (10))**	■	☐	
3. Revision block with provision for amendment dates **(3.2.3)**	■	☐	
4. Planning Board approval block provided on each sheet to be recorded **(3.2.2)**	■	☐	
5. Certification block (for engineer or surveyor) **(3.1.1)**	■	☐	
6. Match lines (if any)	■	☐	
7. Zoning designation of subject parcel(s) including overlay districts **(3.2.10 (4))**	■	☐	

SITE REVIEW APPLICATION CHECKLIST Check the Appropriate Boxes below:	Site Review		Waiver(s)
	Provided	NA	
8. Minimum lot area, frontage & setbacks dimensions required for district(s) **3.2.10(5)**	■	☐	
9. List Federal Emergency Management Agency (FEMA) sheet(s) used to Identify 100-year flood elevation, locate the elevation **(3.2.10 (12))**	●		
10. Note the following: "If, during construction, it becomes apparent that deficiencies exist in the approved design drawings, the Contractor shall be required to correct the deficiencies to meet the requirements of the regulations at no expense to the Town." **(3.2.10 (16))**	■	☐	
11. Note the following: "Required erosion control measures shall be installed prior to any disturbance of the site's surface area and shall be maintained through the completion of all construction activities. If, during construction, it becomes apparent that additional erosion control measures are required to stop any erosion on the construction site due to actual site conditions, the Owner shall be required to install the necessary erosion protection at no expense to the Town." **(3.2.10(17))**	■	☐	
12. Note identifying which plans are to be recorded and which are on file at the town.	☐	☐	
13. Note the following: "All materials and methods of construction shall conform to Town of Barrington Site Review Regulations and the latest edition of the New Hampshire Department of Transportation's Standard Specifications for Road & Bridge Construction." **(3.2.10 (18))**	■	☐	
14. North arrow **(3.2.5)**	■	☐	
15. Floodplains-Location and elevation(s) of one-hundred (100)-year flood zone per FEMA Flood Insurance Study or as determined by drainage study **(3.3 (18))**	☐	■	
16. Plan and deed references **(3.2.6)**	■	☐	
17. The following notes shall be provided:	☐	☐	
a. Purpose of plan **(3.2.10 (1))**	☐	☐	
b. Existing and proposed use **(3.2.10 (6))**	☐	☐	
c. Water Supply source (name of provider (company) if offsite) **(3.2.10 (10))**	☐	■	Wells
d. Zoning variances/special exceptions with conditions **(3.2.10 (11))**	☐	■	
e. List of required permits and permit approval numbers **(3.2.10 (13))**	■	☐	
f. Vicinity sketch showing 1,000 feet surrounding the site **(3.2.8)**	■	☐	
g. Plan index indicating all sheets **(3.2.9)**	■	☐	
18. Boundaries-existing lot boundary defined by metes and bounds **(3.3 (1))**	■	☐	
19. Boundary monuments **(3.3 (4))**	■	☐	
a. Monuments found **(4.2)**	■	☐	
b. Map number and lot number, name addresses, and zoning of all abutting land owners **(3.3 (5))**	■	☐	
c. Monuments to be set **(3.3 (4) & 4.2)**	■	☐	
20. Existing streets: **(3.3 (6))**	■	☐	
a. Name labeled	■	☐	
b. Status noted or labeled	■	☐	
c. Right-of-way dimensioned	■	☐	
d. Pavement width dimensioned	■	☐	
21. Municipal boundaries (If any) **(3.3 (7))**	☐	■	
22. Existing easements (identified by type) **(3.3 (8))**	☐	■	
a. Drainage easement(s)	☐	■	
b. Slope easement(s)	☐	■	
c. Utility easement(s)	☐	■	
d. Temporary easement(s) (Such as temporary turnaround)	☐	■	

SITE REVIEW APPLICATION CHECKLIST Check the Appropriate Boxes below:	Site Review		Walver(s)
	Provided	NA	
e. No-cut zone(s) along streams & wetlands (as may be requested by the Conservation Commission)	☐	■	
f. Vehicular & pedestrian access easements(s)	■	☐	
g. Visibility easement(s)	☐	■	
h. Fire pond/cistern(s)	■	☐	
i. Roadway widening easement(s)	☐	■	
j. Walking trail easement(s)	☐	■	
a) Other easement(s) Note type(s)	☐	■	
23. Designation of each proposed lot (by Map & Lot numbers as provided by the assessor)	☐	■	
24. Area of each lot being developed (in acres & square feet): **(3.3 (9))**	■	☐	
a. Existing lot(s) **(3.3 (9))**	■	☐	
b. Contiguous upland(s)	■	☐	
25. Wetland delineation (including Prime Wetlands): **(3.3 (13))**	■	☐	
a. Limits of wetlands **(3.3 (13))**	■	☐	
b. Wetland delineation criteria **(3.3 (13))**	■	☐	
c. Wetland Scientist certification **(3.3 (13))**	■	☐	
26. Owner's signature(s) **(3.3 (14))** LOA.	■	☐	
27. All required setbacks **(3.3 (15))**	■	☐	
28. Physical features	■	☐	
a. Buildings **(3.3 (21))**	■	☐	
b. Wells **(3.3 (16))**	■	■	
c. Septic systems **(3.3 (16))**	■	☐	
d. Stone walls **(3.3 (16))** e. Paved drives **(3.3 (16))**	■	☐	
f. Gravel drives **(3.3 (16))**	■	☐	
29. Location & name (if any) of any streams or water bodies **(3.3 (17))**	■	☐	
30. Location of existing overhead utility lines, poles, towers, etc. **(3.3 (19))**	■	☐	
31. Two-foot contour interval topography shown over all subject parcel **(3.3 (3))**	■	☐	
32. Map & Lot #s, name, addresses, & zoning of all abutting land owners **(3.3 (5))**	■	☐	
33.	☐	☐	

APPLICATION AGREEMENT

I hereby apply for Site Plan Review and acknowledge I will comply with all of the Ordinances of the Town of Barrington, 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 Site Plan Review or Application specifications are incomplete, the Application will be considered rejected.

In consideration for approval and the privileges accruing thereto, the subdivider thereby agrees:

E. To carry out the improvements agreed upon and as shown and intended by said plat, including any work made necessary by unforeseen conditions which become apparent during construction of the site plan review.

E. To post all streets "Private" until accepted by the Town and to provide and install street signs as approved by the Selectmen of the Town for all street intersections.

E. To give the Town on demand, proper deeds for land or rights-of-way reserved on the plat for streets, drainage, or other purposes as agreed upon.

E. To save the Town harmless from any obligation it may incur or repairs it may make, because of my failure to carry out any of the foregoing provisions.

E. Mr/Mrs_____of_____The owners, by the communications to the subdivider may be addressed with any proceedings arising out of the agreement herein.

Signature of Owner: _____

Signature of Developer: _____ Jason White

Technical Review Signatures: _____

Town Engineer/Planner Approval Signature: _____ The owners, by the filing of this application as indicated above, hereby give permission for any member of the Barrington Planning Board, the Town Engineer, The Conservation Commission and such agents or employees of the Town or other person 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, test and inspections as may be appropriate.

(Refusal to sign this permission form does not invalidate an application, but the Planning Board may not be able to make an informed decision regarding unseen lands with potential areas of concerns).

Signature of Owner: _____

Note: The developer/individual in charge must have control over all project work and be available to the Road Agent and Code Enforcement Officer during the construction phase of the project. The Road Agent and Code Enforcement Officer must be notified within two (2) working days of any change by the individual in charge of the project.

LETTER OF AUTHORIZATION

I, James W. Haley, Trustee of the Waldron B Haley Revocable Living Trust of 1998 and owner of Tax Map 238 Lot 36.1, Barrington, NH, do hereby authorize Jason White and Lou Sera of J&L Terra Holding, Inc., Agent, and Beals Associates, PLLC, 70 Portsmouth Avenue, Stratham, NH, as agents for J&L Terra Holding, Inc., to act on my behalf in matters to be discussed with the Barrington Planning Board, State Departments and other Land Use Boards concerning the property previously mentioned.

I hereby appoint Beals Associates, PLLC as my agent to act on my behalf in the review process, to include any required signatures.

Witness

Eli Tillinghast

James W. Haley Trustee

James W. Haley

3/14/20

Date

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LAND USE OFFICE

ABUTTERS LIST
FOR
NH- 1263 VILICUS HOMES – BARRINGTON, NH
DATE August 10, 2020

SUBJECT PARCEL

TAX MAP/LOT	OWNER OF RECORD
238-0036 ✓	WALDRON HALEY REV LIV TRUST 14 SHAKESPEARE RD. NASHUA, NH 03062

ABUTTERS

TAX MAP/LOT	OWNER OF RECORD
238-0009 ✓	GEORGE TSOUKALAS GEORGE TSOUKALASREV. TRUST PO BOX 684 BARRINGTON, NH 03825
238-0010 ✓	JASON & CHRISTINA BARROWS 545 FRANKLIN PIERCE HWY BARRINTON, NH 03825
238-0011 ✓	535 FRANKLIN PIERCE LLC SHARYL MURPHY 5 EXETER RD. NORTH HAMPTON, NH 03862
238-0016-0021 ✓	BVP HOMEOWNERS ASSOCIATION CORREY PIPER 26 VILLAGE PLACE DR. BARRINGTON, NH 03825
238-0033 ✓	ANTHONY & SUSAN GAUDIELLO MARY WILSON & COTRS FAM REV TR 528 FRANKLIN PIERCE HWY BARRINGTON, NH 03825
238-0034 ✓	ANTHONY & SUSAN GAUDIELLO MARY WILSON & COTRS FAM REV TR 528 FRANKLIN PIERCE HWY BARRINGTON, NH 03825
238-0035 ✓	RICHARD & VICTORIA SPINALE 534 FRANKLIN PIERCE HWY BARRINGTON, NH 03825
238-0035-0001 ✓	RICHARD & VICTORIA SPINALE 534 FRANKLIN PIERCE HWY BARRINGTON, NH 03825
238-0036-0001 ✓	ALAN D. HALEY 1011 ANDOVER RD. BALTIMORE, MS 21218

ABUTTERS LIST
FOR
NH- 1263 VILICUS HOMES – BARRINGTON, NH
DATE August 10, 2020

238-0037

LAWRENCE HALEY
2908 FRENCH PL
AUSTIN, TX 78722

238-0038

574 FRANKLIN PIERCE HWY LLC
9 COLONIAL WAY STE E
BARRINGTON, NH 03825

238-0040

IRVING OIL PROPERTIES NH CORP.
ATTN: CORP REAL ESTATE
PO BOX 868
CALAIS, ME 04619

238-0041

MAX WINKLER
559 CALEF HWY
BARRINGTON, NH 03825

238-0042

WILLIAM & JULES D'ANTILIO
PO BOX 474
BARRINGTON, NH 03825

238-0044

VIRTUOUS REALTY INC
607 CALEF HWY #200
BARRINGTON, NH 03825

238-0047

LEWIS PALOSKY
49 CERES ST.
PORTSMOUTH, NH 03801

238-0048

PHILIP & CHRISTINE AMAZEEN
PHILS REST
538 CALEF HWY
BARRINGTON, NH 03825

238-0049-000A

CRAIG & KIM JACKSON
538 CALEF HWY
BARRINGTON, NH 03825

239-0007

TOWN CENTER PROPERTIES LLC
PO BOX 727
DOVER, NH 03821

PROFESSIONALS

ENGINEERING FIRM

BEALS ASSOCIATES, PLLC.
70 PORTSMOUTH AVE. 3RD FLOOR
STRATHAM, NH 03885

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LAND USE OFFICE

ABUTTERS LIST
FOR
NH- 1263 VILICUS HOMES – BARRINGTON, NH
DATE August 10, 2020

SOIL SCIENTIST ✓

GOVE ENVIRONMENTAL
8 CONTINENTAL DR. BLDG. 2 UNIT H
EXETER, NH 03833

APPLICANT ✓

VILICUS HOMES
JASON WHITE & LOU SERA
1 WHITEHORSE DR,
RYE, NH 03870

Test Pit Logs for RTE 9 and 125 in Barrington
5/21/2020. JP Gove

Test Pits
5/21/2020

#1

0-10". 10YR3/3. Loamy fine sand. Friable. Granular
10-29". 10YR5/6. Loamy sand. Friable. Granular
29-68". 2.5Y5/3. Loamy sand. Friable. Massive with 30% redox. Loamy very fine sand layer.
Water table at 29".

#2
0-12". 10YR3/3. Loamy fine sand. Friable. Granular
12-31". 10YR5/6. Loamy sand. Friable. Granular
31-70". 2.5Y5/3. Loamy sand. Friable. Massive with 30% redox. Observed water at 60"
Water table at 31".

#3
0-7". 10YR3/3. Loamy fine sand. Friable. Granular
7-32". 10YR5/6. Loamy sand. Friable. Granular
32-68". 2.5Y5/4. Loamy sand. Friable. Massive with 30% redox. Observed water at 55".
Water table at 32".

#4
0-7". 10YR3/3. Fine sandy loam Friable. Granular
7-30". 10YR4/6. Loamy sand. Friable. Granular
30-67". 2.5Y5/2. Silty clay loam. Firm. Platy. 30% redox. Observed water at 33".
Water table at 30".

#5
0-9". 10YR3/3. Loamy fine sand. Friable. Granular
9-30". 10YR5/6. Loamy sand. Friable. Granular
30-69. 2.5Y5/3. Loamy sand. Friable. Massive. 30% redox. Observed water at 68".
Water table at 30".

#6
0-7". 10YR3/3. Loamy fine sand. Friable Granular
7-34". 10YR5/6. Loamy sand. Friable. Granular
34-75". 2.5Y5/3 Sand. Friable. Massive. 30% redox.
Water table at 34".

#7".
0-11". 10YR3/3. Loamy fine sand. Friable. Granular
11-33". 10YR5/6. Loamy sand. Friable Granular
33-73". 2.5Y5/3. Sand. Friable. Massive. 30% redox.
Water table at 33".

#8
0-7". 10YR3/3. Fine sandy loam. Friable Granular. Old fill
7-39". 10YR4/6. Loamy sand. Friable. Granular. Relic mottles at 7".
39-68". 2.5Y5/3. Sand. Friable. Massive. 30% redox
Water table at 39".

GOVE ENVIRONMENTAL SERVICES, INC.

TEST PIT DATA

Test Pits 9/1/2020

Project	Rte 9, Barrington	
Client	Jason White	
GES Project No.	2020036	
MM/DD/YY Staff	09-01-20	JP Gove

Test Pit No.		**5005**		Lot No.:	
ESHWT:		55"		WSPCD Group:	
Termination @		70"		Roots to:	
Refusal:		None		SCS Soil:	
Obs. Water:		None		HIS Type:	

Depth	Color	Texture	Structure	Consistence	Mottles; Quantity/Contrast
0–10"	10YR 3/3	Loamy sand	Granular	Friable	NONE
10–55"	10YR5/6	Coarse sand	Massive	Friable	NONE
55-70"	2.5Y 5/2	Fine sand	Massive	Friable	Redox 30%

Test Pit No.		**5006**		Lot No.:	
ESHWT:		62"		WSPCD Group:	
Termination @		68"		Roots to:	
Refusal:		None		SCS Soil:	
Obs. Water:		None		HIS Type:	

Depth	Color	Texture	Structure	Consistence	Mottles; Quantity/Contrast
0-8"	10YR 3/3	Loamy sand	Granular	Friable	NONE
8–62"	10YR5/6	Coarse sand	Massive	Friable	NONE
62-68"	2.5Y 5/3	Coarse sand	Massive	Friable	Redox 30%

Test Pit No.		**101**		Lot No.:	
ESHWT:		35"		WSPCD Group:	
Termination @		50"		Roots to:	
Refusal:		None		SCS Soil:	
Obs. Water:		None		HIS Type:	

Depth	Color	Texture	Structure	Consistence	Mottles; Quantity/Contrast
0–6"	10YR 3/3	Loamy sand	Granular	Friable	NONE
6–35"	10YR5/6	Sand	Single grain	Loose	NONE
35-50"	7.5YR5/8	Sand	Single grain	Loose	Redox 30%

8 Continental Dr Bldg 2 Unit H, Exeter, NH 03833-7526
Ph (603) 778 0644 / *Fax* (603) 778 0654
info@gesinc.biz
www.gesinc.biz

Test Pit No.	**100**	Lot No.:	
ESHWT:	33"	WSPCD Group:	
Termination @	50"	Roots to:	
Refusal:	None	SCS Soil:	
Obs. Water:	None	HIS Type:	

Depth	Color	Texture	Structure	Consistence	Mottles; Quantity/Contrast
0–10"	10YR 3/3	Loamy sand	Granular	Friable	NONE
10–33"	10YR5/6	Sand	Single grain	Loose	NONE
33-50"	7.5YR5/8	Sand	Single grain	Loose	Redox 30%

Stormwater Management Plan

US ROUTE 9 – BARRINGTON, NH
NH-1263

STORMWATER MANAGEMENT/BMP INSPECTION & MAINTENANCE PLAN

Proper construction, inspections, maintenance and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality.

For the purpose of this Stormwater Management Program, a significant rainfall event is considered and event of three (3) inches in a 24-hour period or 0.5 inches in a one-hour period. During construction, inspections should be conducted every week or after a 0.5" rainfall event in a 24-hour period per the EPA NPDES Phase II SWPPP, until the entire disturbed area is fully restabilized. Upon full stabilization of the project and filing of an NOI, inspections need only be conducted after a significant rainfall event as described above or as described in the maintenance guidelines below.

During construction activities J&L Terra Holdings, Inc. – C/O Jason White of 79 Exeter Road, No. Hampton, NH, (The Property Developer) (603-770-5630) or its heirs and/or assigns, shall be responsible for inspections and maintenance activities. Upon completion of the private roadway, the HOA shall be responsible for ongoing inspection and maintenance of the roadway and structures under the roadway. BMP drainage structures and treatment areas shall be inspected and maintained by a private condominium association to be created. The owner shall document the transfer of responsibility in writing to the NHDES AoT Bureau. The owner is responsible to ensure that any subsequent owner or owners association has copies of the Log Form and Annual Report records and fully understands the responsibilities of this plan. The grantor owner will ensure this document is provided to the grantee owner by duplicating the Ownership Responsibility Sheet which is found toward the back of this document, which will be maintained with the Inspection & Maintenance Logs. The Annual Report will be made available to NHDES upon request.

Documentation:
A maintenance log will be kept (i.e. report) summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task (see Stormwater Construction Site Inspection Report attached). If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated.

BMP Maintenance Guidelines

The following provides a list of recommendations and guidelines for managing the Stormwater facilities. The cited areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments and debris. The numbered drainage features below correspond to the specific numbered drainage feature locations on the attached plan.

1. STABILIZED CONSTRUCTION ENTRANCE

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the pad should be between 1 and 2-inch coarse aggregate, and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. A plan view and profile are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

1a. ENVIRONMENTAL DUST CONTROL

Dust will be controlled on the site by the use of multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

1b. TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES

Function – Temporary erosion and sediment control devices are utilized during construction period to divert, store and filter stormwater from non-stabilized surfaces. These devices include, but are not limited to: silt fences, hay bales, filters, sediment traps, stone check dams, mulch and erosion control blankets.

Maintenance – Temporary erosion and sediment control devices shall be inspected and maintained on a weekly basis and following a significant storm event (>0.5-inch rain event) throughout the construction period to ensure that they still have integrity and are not allowing sediment to pass. Sediment build-up in swales will be removed if it is deeper than six inches. Sediment is to be removed from sumps in the catch basin semi-annually. Refer to the Site Plan drawings for the maintenance of temporary erosion and sediment control devices.

1c. INVASIVE SPECIES - THE NH COMMISSIONER OF AGRICULTURE PROHIBITS THE COLLECTION, POSSESSION, IMPORTATION, TRANSPORTATION, SALE, PROPAGATION, TRANSPLANTATION, OR CULTIVATION OF PLANTS BANNED BY NH LAW RSA 430:53 AND NH CODE ADMINISTRATIVE RULES AGR 3800. THE PROJECT SHALL

MEET ALL REQUIREMENTS AND THE INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES

2. Catch Basins/Manholes:
Inspect catch basins 2 times per year (preferably in spring and fall) to ensure that the catch basins are working in their intended fashion and that they are free of debris. Clean structures when sediment depths reach 12" from invert of outlet. If the basin outlet is designed with a hood to trap floatable materials (i.e. Snout), check to ensure watertight seal is working. At a minimum, remove floating debris and hydrocarbons at the time of the inspection.

3. Culverts:
Inspect culverts 2 times per year (preferably in spring and fall) to ensure that the culverts are working in their intended fashion and that they are free of debris. Remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit and to repair any erosion damage at the culvert's inlet and outlet.

4. Bioretention Basin Maintenance
General inspection of the wetland and any structural components must occur at least annually. The perimeter is mowed at least annually.

- Systems should be inspected at least twice annually, and following any rainfall event exceeding 2.5 inches in a 24 hour period, with maintenance or rehabilitation conducted as warranted by such inspection.
- Pretreatment measures should be inspected at least twice annually, and cleaned of accumulated sediment as warranted by inspection, but no less than once annually.
- Trash and debris should be removed at each inspection.
- At least once annually, system should be inspected for drawdown time. If bioretention system does not drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore filtration function or infiltration function (as applicable), including but not limited to removal of accumulated sediments or reconstruction of the filter media.
- Vegetation should be inspected at least annually, and maintained in healthy condition, including pruning, removal and replacement

1. The pre-treatment forebays will need occasional removal of sediment (every 5 years, or when 50% of capacity is lost, whichever occurs first). Inspections should ensure that no sediment is reaching the gravel.
2. All structural components, which include, but are not limited to, level spreader, vegetation, pipes, orifice structures, and spillway structures, should be inspected and any deficiencies repaired. This includes a visual inspection of all storm water control structures for damage and/or accumulation of sediment.

3. All dead or dying vegetation within the extents of the basin should be removed, as well as all herbaceous vegetation rootstock when overcrowding is observed and any vegetation that has a negative impact on storm water flowage through the facility. Any invasive vegetation encroaching upon the perimeter of the facility should be pruned or removed. Wetland plantings typically become well established, but occasional replanting to maintain minimum 50% coverage may be needed.

5. Wet Pond Maintenance

General inspection of the pond and any structural components must occur at least annually. The perimeter is mowed at least annually.

Maintenance Requirements:
- Periodic mowing of embankments
- Removal of woody vegetation from embankments
- Removal of invasive species from semi-wet, marsh, and deep water areas
- Monitoring and replanting, as warranted, of wetland vegetation
- Removal of debris from outlet structures
- Removal of accumulated sediment
- Inspection and repair of embankments, inlet and outlet structures, and appurtenances

1. The pre-treatment forebay will need occasional removal of sediment (every 5 years, or when 50% of capacity is lost, whichever occurs first). Inspections should ensure that no sediment is reaching the gravel.
2. All structural components, which include, but are not limited to, trash racks, access gates, valves, pipes, weir walls, orifice structures, and spillway structures, should be inspected and any deficiencies repaired. This includes a visual inspection of all storm water control structures for damage and/or accumulation of sediment.
3. All dead or dying vegetation within the extents of the wet pond should be removed, as well as all herbaceous vegetation rootstock when overcrowding is observed and any vegetation that has a negative impact on storm water flowage through the facility. Any invasive vegetation encroaching upon the perimeter of the facility should be pruned or removed. Wetland plantings typically become well established, but occasional replanting to maintain minimum 50% coverage may be needed.

6. Pretreatment Structures

Inspect all upstream pre-treatment measures (fore bays, etc.) for sediment and floatable accumulation. Remove and dispose of sediments or debris as needed. Inspect structure on a semiannual basis by using inspection port and/or access structure. Remove sediment as needed when average depths reach 1".

7. Drainage Swales/Stormwater Conveyances

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet 7 using seed mixture C. As a general rule, velocities in the swale should not

exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

Maintenance

- Inspect annually for erosion, sediment accumulation, vegetation loss and presence of invasive species.
- Perform periodic mowing; frequency depends on location and type of grass. Do not cut shorter than Water Quality Flow depth (maximum 4 inches)
- Remove debris and accumulated sediment, based on inspection.
- Repair eroded areas, remove invasive species and dead vegetation, and reseed With applicable grass mix as warranted by inspection.

9. Vegetated Areas:
Inspect slopes and embankments early in the growing season to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows. The facilities will be inspected after major storms and any identified deficiencies will be corrected.

10. Roadway: Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

11. Invasive Species:
During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described on the following pages. They should be controlled as described on the following pages.
Background:
Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:
becoming weedy and overgrown;
killing established shade trees;
obstructing pipes and drainage systems;
forming dense beds in water;
lowering water levels in lakes, streams, and wetlands;
destroying natural communities;
promoting erosion on stream banks and hillsides; and
resisting control except by hazardous chemical.

Methods for Disposing Non-Native Invasive Plants

Prepared by the Invasive Species Outreach Group, volunteers interested in helping people control invasive plants. Assistance provided by the Piscataquog Land Conservancy and the NH Invasive Species Committee. Edited by Karen Bennett, Extension Forestry Professor and Specialist.

Non-native invasive plants crowd out natives in natural and managed landscapes. They cost taxpayers billions of dollars each year from lost agricultural and forest crops, decreased biodiversity, impacts to natural resources and the environment, and the cost to control and eradicate them.

Lonicera tatarica
USDA-NRCS PLANTS Database / Britton, N.L., and
A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 3: 282.

Invasive plants grow well even in less than desirable conditions such as sandy soils along roadsides, shaded wooded areas, and in wetlands. In ideal conditions, they grow and spread even faster. There are many ways to remove these non- native invasives, but once removed, care is needed to dispose the removed plant material so the plants don't grow where disposed.

Knowing how a particular plant reproduces indicates its method of spread and helps determine

the appropriate disposal method. Most are spread by seed and are dispersed by wind, water, animals, or people. Some reproduce by vegetative means from pieces of stems or roots forming new plants. Others spread through both seed and vegetative means.

New Hampshire Regulations

Prohibited invasive species shall only be disposed of in a manner that renders them nonliving and nonviable. (Agr. 3802.04)

No person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties, listed in Table 3800.1 of the New Hampshire prohibited invasive species list. (Agr 3802.01)

Because movement and disposal of viable plant parts is restricted (see NH Regulations), viable invasive parts can't be brought to most transfer stations in the state. Check with your transfer station to see if there is an approved, designated area for invasives disposal. This fact sheet gives recommendations for rendering plant parts non- viable.

Control of invasives is beyond the scope of this fact sheet. For information about control visit www.nhinvasives.org or contact your UNH Cooperative Extension office.

How and When to Dispose of Invasives?

To prevent seed from spreading remove invasive plants before seeds are set (produced). Some plants continue to grow, flower and set seed even after pulling or cutting. Seeds can remain viable in the ground for many years. If the plant has flowers or seeds, place the flowers and seeds in a heavy plastic bag "head first" at the weeding site and transport to the disposal site. The following are general descriptions of disposal methods. See the chart for recommendations by species.

Burning: Large woody branches and trunks can be used as firewood or burned in piles. For outside burning, a written fire permit from the local forest fire warden is required unless the ground is covered in snow. Brush larger than 5 inches in diameter can't be burned. Invasive plants with easily airborne seeds like black swallow-wort with mature seed pods (indicated by their brown color) shouldn't be burned as the seeds may disperse by the hot air created by the fire.

Bagging (solarization): Use this technique with softer- tissue plants. Use heavy black or clear plastic bags (contractor grade), making sure that no parts of the plants poke through. Allow the bags to sit in the sun for several weeks and on dark pavement for the best effect.

Tarping and Drying: Pile material on a sheet of plastic

Japanese knotweed
Polygonum cuspidatum USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 1: 676.

and cover with a tarp, fastening the tarp to the ground and monitoring it for escapes. Let the material dry for several weeks, or until it is clearly nonviable.

Chipping: Use this method for woody plants that don't reproduce vegetatively.

Burying: This is risky, but can be done with watchful diligence. Lay thick plastic in a deep pit before placing the cut up plant material in the hole. Place the material away from the edge of the plastic before covering it with more heavy plastic. Eliminate as much air as possible and toss in soil to weight down the material in the pit. Note that the top of the buried material should be at least three feet underground. Japanese knotweed should be at least 5 feet underground!

Drowning: Fill a large barrel with water and place soft-tissue plants in the water. Check after a few weeks and look for rotted plant material (roots, stems, leaves, flowers). Well- rotted plant material may be composted. A word of caution- seeds may still be viable after using this method. Do this before seeds are set. This method isn't used often. Be prepared for an awful stink!

Composting: Invasive plants can take root in compost. Don't compost any invasives unless you know there is no viable (living) plant material left. Use one of the above techniques (bagging, tarping, drying, chipping, or drowning) to render the plants nonviable before composting. Closely examine the plant before composting and avoid composting seeds.

Be diligent looking for seedlings for years in areas where removal and disposal took place.

Suggested Disposal Methods for Non-Native Invasive Plants

This table provides information concerning the disposal of removed invasive plant material. If the infestation is treated with herbicide and left in place, these guidelines don't apply. Don't bring invasives to a local transfer station, unless there is a designated area for their disposal, or they have been rendered non-viable. This listing includes wetland and upland plants from the New Hampshire Prohibited Invasive Species List. The disposal of aquatic plants isn't addressed.

Woody Plants	Method of Reproducing	Methods of Disposal
Norway maple (Acer platanoides) European barberry (Berberis vulgaris) Japanese barberry (Berberis thunbergii) autumn olive (Elaeagnus umbellata) burning bush (Euonymus alatus) Morrow's honeysuckle (Lonicera morrowii) Tatarian honeysuckle (Lonicera tatarica) showy bush honeysuckle (Lonicera x bella) common buckthorn (Rhamnus cathartica) glossy buckthorn (Frangula alnus)	Fruit and Seeds	Prior to fruit/seed ripening Seedlings and small plants Pull or cut and leave on site with roots exposed. No special care needed. Larger plants Use as firewood. Make a brush pile. Chip. After fruit/seed is ripe Don't remove from site. Burn. Make a covered brush pile. Chip once all fruit has dropped from branches. Leave resulting chips on site and monitor.
oriental bittersweet (Celastrus orbiculatus) multiflora rose (Rosa multiflora)	Fruits, Seeds, Plant Fragments	Prior to fruit/seed ripening Seedlings and small plants Pull or cut and leave on site with roots exposed. No special care needed. Larger plants Make a brush pile. Burn. After fruit/seed is ripe Don't remove from site. Burn. Make a covered brush pile. Chip – only after material has fully dried (1 year) and all fruit has dropped from branches. Leave resulting chips on site and monitor.

	Method of Reproducing	Methods of Disposal

garlic mustard (Alliaria petiolata) spotted knapweed (Centaurea maculosa) Sap of related knapweed can cause skin irritation and tumors. Wear gloves when handling. black swallow-wort (Cynanchum nigrum) May cause skin rash. Wear gloves and long sleeves when handling. pale swallow-wort (Cynanchum rossicum) giant hogweed (Heracleum mantegazzianum) Can cause major skin rash. Wear gloves and long sleeves when handling. dame's rocket (Hesperis matronalis) perennial pepperweed (Lepidium latifolium) purple loosestrife (Lythrum salicaria) Japanese stilt grass (Microstegium vimineum) mile-a-minute weed (Polygonum perfoliatum)	Fruits and Seeds	Prior to flowering Depends on scale of infestation Small infestation Pull or cut plant and leave on site with roots exposed. Large infestation Pull or cut plant and pile. (You can pile onto or cover with plastic sheeting). Monitor. Remove any re-sprouting material. During and following flowering Do nothing until the following year or remove flowering heads and bag and let rot. Small infestation Pull or cut plant and leave on site with roots exposed. Large infestation Pull or cut plant and pile remaining material. (You can pile onto plastic or cover with plastic sheeting). Monitor. Remove any re-sprouting material.
common reed (Phragmites australis) Japanese knotweed (Polygonum cuspidatum) Bohemian knotweed (Polygonum x bohemicum)	Fruits, Seeds, Plant Fragments Primary means of spread in these species is by plant parts. Although all care should be given to preventing the dispersal of seed during control activities, the presence of seed doesn't materially influence disposal activities.	Small infestation Bag all plant material and let rot. Never pile and use resulting material as compost. Burn. Large infestation Remove material to unsuitable habitat (dry, hot and sunny or dry and shaded location) and scatter or pile. Monitor and remove any sprouting material. Pile, let dry, and burn.

In the event that invasive species are noticed growing in any of the stormwater management practices, the invasive vegetation shall be removed completely to include root matter and disposed of properly. Prior to disposal, the vegetation shall be placed on and completely cover with a plastic tarp for a period of two – three weeks until plants are completely dead. If necessary or to expedite the process, spray only the invasive vegetation and roots with a systemic nonselective herbicide after placement on the tarp (to prevent chemical migration) and then cover as described above.

Annual Report:
Description: The owner is responsible to keep an **I & M** Activity Log that documents inspection, maintenance and repairs to the storm water management system, and a **Deicing Log** is to be provided by the Barrington DPW to track the amount and type of deicing material applied to the site. The original owner is responsible to ensure that any subsequent owner(s) have copies of the Stormwater System Operation and Maintenance Plan & Inspection and Maintenance Manual, copies of past logs and check lists. This includes any owner association for potential condominium conversion of the property. The Annual Report will be prepared and submitted to the Barrington DPW upon request.

STORMWATER CONSTRUCTION SITE INSPECTION REPORT

Inspection & Maintenance Manual Checklist

North Road
Barrington, NH

BMP / System	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance / Cleanout Threshold
Pavement Sweeping	Twice Per Year (Town)	N/A	N/A
Litter/Trash Removal	Routinely	Inspect ponds and swale areas.	Site will be free of litter/trash.
Deicing Agents	N/A	N/A	Use salt as the primary agent for roadway safety during winter.
Drainage Pipes/Catch Basins & DMH's	1 time per 2 years	Check for sediment accumulation & clogging.	Less than 2" sediment depth
Bioretention System / Rain Garden	Twice Annually After every 2.5" or rain or greater.	72-Hour drawdown time evaluation and vegetation evaluation.	Remove dead & diseased vegetation along with all debris; take corrective measures of filtration media if required.
Riprap Outlet Protection	Annually	Check for sediment buildup and structure damage.	Remove excess sediment and repair damage.

Wet Pond	2 times per year After every 2.5" or rain or greater.	Mow embankments, remove woody vegetation from embankment	Remove debris from outlet structures, Remove accumulated sediment, Repair embankments, outlet structures and appurtenances
Annual Report	1 time per year	Submit Annual Report to Town of Barrington Inspector upon request	

Inspection Notes:

STORMWATER SYSTEM OPERATION AND MAINTENANCE PLAN

Inspection & Maintenance Manual Log Form

Multifamily Development

US Route 9

Barrington, NH

BMP / System	Date Inspected	Inspector	Cleaning/Repair (List Items & Comments)	Repair Date	Performed By:

J&L Terra Holdings, . .: NH-1263
Barrington, NH

9/22/20

CHECKLIST FOR INSPECTION OF WET POND

Location: Inspector:
Date: Time: Site
Conditions: Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or	Comments/Corrective Action
1st Year Post-Construction Monitoring (After every major storm for the first three months)		
Plants are stable, roots not exposed	S U	
Vegetation is established and thriving	S U	
No evidence of holes in the wetland soil causing short- circuiting	S U	
No evidence of erosion at inlet and outlet structures	S U	
Post-Construction Routine Monitoring (at least every 6 months thereafter as per USEPA Good House-Keeping Requirements. Inspection frequency can be reduced to annual following 2 years of monitoring indicating the rate of sediment accumulation is less than cleaning criteria listed below.)		
1. Standing Water		
Gravel wetland surface is free of standing water or other evidence of clogging, such as discolored or accumulated sediments	S U	
2. Short Circuiting & Erosion		
No evidence of animal burrows or other holes	S U	
No evidence of erosion	S U	
3. Drought Conditions (As needed)		
Water plants as needed	S U	
Dead or dying plants	S U	
4. Sedimentation Chamber or Forebay Inlet Inspection		
No evidence of sediment accumulation, trash, and debris.	S U	
Good condition, no need for repair	S U	
5. Vegetation Coverage		
50 % coverage established throughout system by first year	S U	
Robust coverage by year 2 or later	S U	
6. Inlet and Outlet Controls		
Flow is unobstructed in openings (grates, orifices, etc)	S U	
Structures are operational with no evidence of deterioration	S U	
7. Vegetation removal (once every 3 years)		
Prune dead, diseased, or decaying plants	S U	

Corrective Action Needed	Due Date
1.	
2.	
3.	

J&L Terra Holdings, L.: NH-1263
Barrington, NH

9/22/20

CHECKLIST FOR INSPECTION OF BIORETENTION SYSTEM / TREE FILTERS

Location: Inspector:
Date: Time: Site Conditions:
Date Since Last Rain Event:

Inspection Items	Satisfactory (S) or Unsatisfactory (U)	Comments/Corrective Action
1. Initial Inspection After Planting and Mulching		
Plants are stable, roots not exposed	S U	
Surface is at design level, typically 4" below overpass	S U	
Overflow bypass / inlet (if available) is functional	S U	
2. Debris Cleanup (2 times a year minimum, Spring & Fall)		
Litter, leaves, and dead vegetation removed from the system	S U	
Prune perennial vegetation	S U	
3. Standing Water (1 time a year, After large storm events)		
No evidence of standing water after 72 hours	S U	
4. Short Circuiting & Erosion (1 times a year, After large storm events)		
No evidence of animal burrows or other holes	S U	
No evidence of erosion	S U	
5. Drought Conditions (As needed)		
Water plants as needed	S U	
Dead or dying plants	S U	
6. Overflow Bypass / Inlet Inspection (1 times a year, After large storm events)		
No evidence of blockage or accumulated leaves	S U	
Good condition, no need for repair	S U	
7. Vegetation Coverage (once a year)		
50 % coverage established throughout system by first year	S U	
Robust coverage by year 2 or later	S U	
8. Mulch Depth (if applicable)(once every 2 years)		
Mulch at original design depth after tilling or replacement	S U	
9. Vegetation Health (once every 3 years)		
Dead or decaying plants removed from the system	S U	
10. Tree Pruning (once every 3 years)		
Prune dead, diseased, or crossing branches	S U	

Corrective Action Needed	Due Date
1.	
2.	
3.	

J&L Terra Holdings, . .: NH-1263
Barrington, NH

9/22/20

Anti-icing Data Log Form			
Truck:			
Date:			
Air Temperature	Pavement Temperature	Sky	
Reason for applying:			
Road Name:			
Chemical: Sand/Salt - Salt - Other (List below) (Circle one)			
Application Time:			
Application Amount:			
Name:			

DESIGN METHOD OBJECTIVES

J & L Terra Holdings, Inc. proposes an 80-unit residential condominium development on approximately 21+-acres of land located off Route 9 in Barrington, NH. A drainage analysis of the area (including 2-offsite subcatchments) was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. It should be noted that all roof runoff from the newly proposed buildings will be required to be infiltrated by stone trench drip edges. Two models were compiled, one for the area in its existing (pre-construction) condition, and a second for its proposed (post-construction) condition. The analysis was conducted using data for the 2, 10 & 50 Yr – 24 Hr storm event using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall data is based on the Extreme Precipitation Tables as published by the Northeast Regional Climate Center of Cornell University. The purpose of this analysis is to estimate the peak rates of run-off from the site for swale adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

METHODOLOGY

Modeling consists of identifying all surface water flow paths that drain to, across and from the property as applicable. The "watershed area", is divided into discrete subcatchments based on natural drainage patterns. HydroCAD models each drainage structure and subcatchment as an individual interconnected node. Subcatchment nodes are modeled as individual watersheds with unique physical characteristics consisting of surface area, surface condition, overland flow lengths and associated land slope. Appropriate input parameters were determined through field observation, and analysis of field surveyed AutoCAD drawings. Rainfall distribution and depth are standardized inputs, based on geographic location. The Time-of-Concentration, or Tc, is the time required for runoff to travel from the most hydrologically distant point of the subcatchment to the point of collection. The time of concentration (Tc) is determined by summing the travel time (Tt) for each consecutive flow segment along the subcatchment's hydraulic path. This process requires identification of the type of flow occurring in each segment, and application of the appropriate method for calculating the Tc. For sheet flow segments, no longer than 50' is used in the analysis though shorter lengths are used where logical (transition of ground cover e.g. paved to grass, etc.) Tc values for subcatchments that resulted in less than 6-minutes/inch were direct input at 6-minutes as is standard practice. Subcatchment area take-offs are broken out by ground cover type and hydrologic soil group. Each unique area within a subcatchment is given a runoff curve number (CN) and the areas are summed to result in a weighted CN for the overall subcat. As a single roof runoff/infiltration Subcat & pond have demonstrated that the 3' wide x 4.5' deep stone trenches will handle the entire roof runoff for the 50-YR storm without overtopping, the remaining building areas have been eliminated from the model which is the reason the overall area in the proposed model is slightly less than that of the existing.

ANALYSIS — COMPONENT PEAK RATE of DISCHARGE (CFS)

	2 YR		10 YR		50YR	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Reach #100	1.08	1.05	6.63	6.52	20.23	20.13
Reach #200	0.00	0.00	0.01	0.01	0.26	0.26

BEALS · ASSOCIATES *PLLC*

70 Portsmouth Avenue
Stratham
N. H. 03885
Phone: 603-583-4860
Fax: 603-583-4863

September 22, 2020

Re: Trip Generation calculations – Rt 9, Barrington, NH

The proposed development consists of multi-family dwellings (3-4 units per building). A total of 80 2-BR units are proposed. ITE code 221 (Multifamily Housing (Mid-Rise) was used for calculations. Mid-Rise is used for multifamily dwellings with 3-10 units per building.

Weekday Vehicle Trip Ends:

Code 221: Where T = Avg. Trip Ends & X = Number of Dwelling Units

Fitted curve equation; T = 5.45(x)-1.75

Trip Generation Calculations

T = 5.45(80)- 1.75
T = 434 trip ends/day (50% entering, 50% exiting)

Total avg TE/D = **434**

Weekday Trip Ends (Peak hour of adjacent traffic, one hour between 7 and 9 a.m.):

Fitted curve equation; Ln(T) = 0.98Ln(X)-0.98;
Ln(T) = 0.98(80) – 0.98
Ln(T) = 3.31
T = $e^{3.31}$ = 27.505 Trip ends (26% entering, 74% exiting)

Total avg TE = **28**

Weekday Trip Ends (Peak hour of adjacent traffic, one hour between 4 and 6 p.m.):

Fitted curve equation; Ln(T) = 0.96Ln(X)-0.63

Ln(T) = 0.96Ln(80) - 0.63
Ln(T) = 3.57
T = $e^{3.57}$ = 35.75
T = 35.75 trip ends (61% entering, 39% exiting)

Total avg TE = **36**

Please see ITE select pages attached for fitted curves used in calculations.

Multifamily Housing (Mid-Rise)
(221)

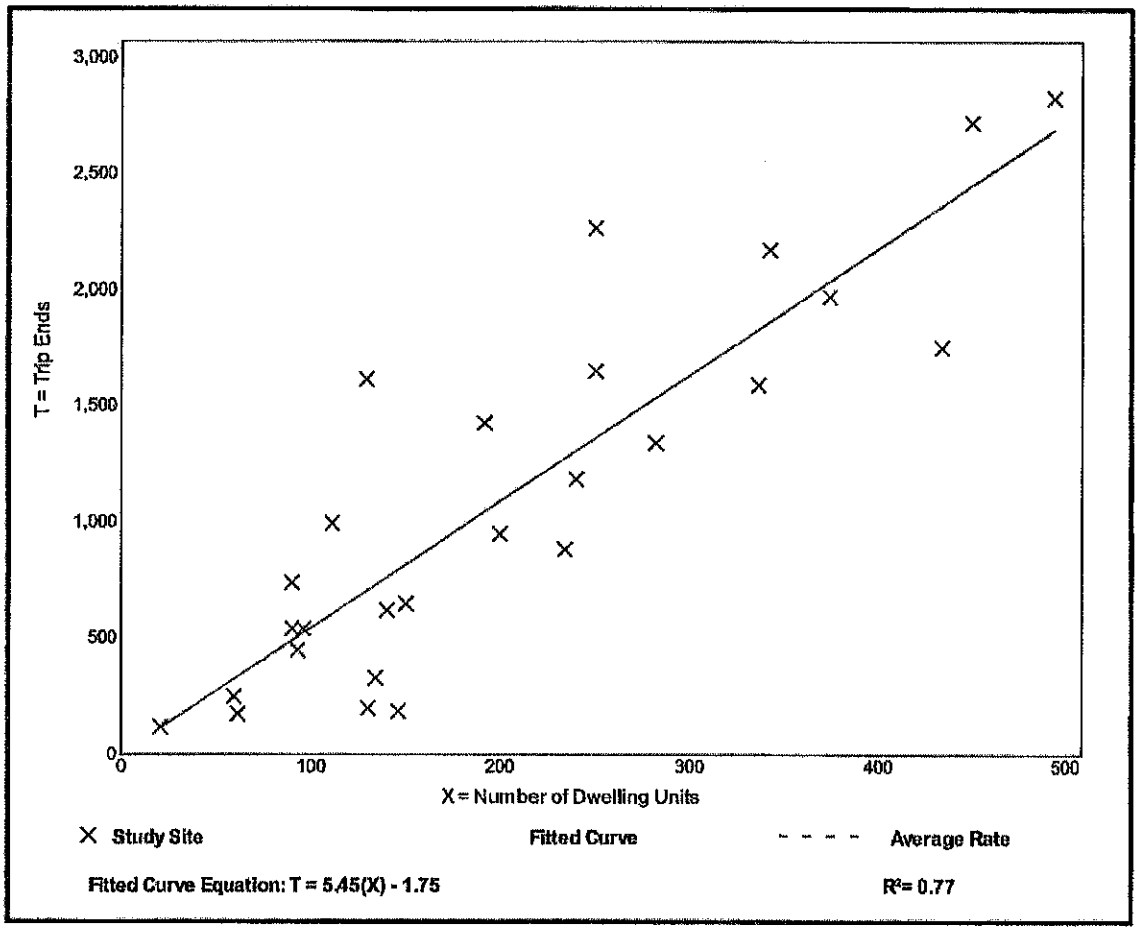
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 27
Avg. Num. of Dwelling Units: 205
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
5.44	1.27 - 12.50	2.03

Data Plot and Equation



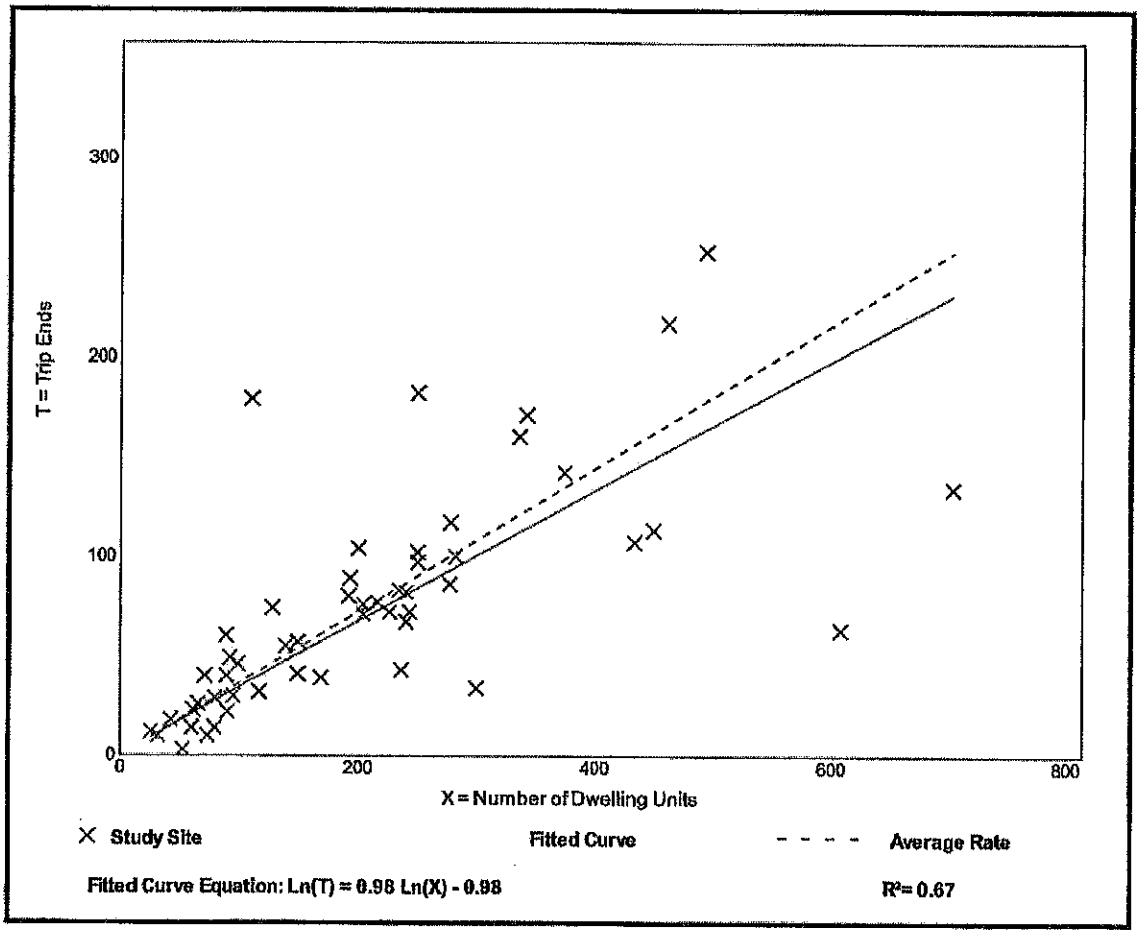
Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 53
Avg. Num. of Dwelling Units: 207
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.06 - 1.61	0.19

Data Plot and Equation



Multifamily Housing (Mid-Rise)
(221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 60
Avg. Num. of Dwelling Units: 208
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 1.11	0.19

Data Plot and Equation