

**TOWN OF HUDSON**  
**PLANNING BOARD**  
**PUBLIC MEETING**  
**TOWN OF HUDSON, NH**  
**MARCH 25, 2015**



12 School Street

Hudson, New Hampshire 03051

603/886-6005

The Town of Hudson Planning Board will hold a regularly scheduled meeting on Wednesday, March 25, 2015 at 7:00 p.m. in the "Buxton Community Development Conference Room" at Town Hall. The following items will be on the agenda:

- I. CALL TO ORDER BY CHAIRPERSON AT 7:00 P.M.
- II. PLEDGE OF ALLEGIANCE
- III. ROLL CALL
- IV. SEATING OF ALTERNATES
- V. MINUTES OF PREVIOUS MEETING(S)
- VI. CASES REQUESTED FOR DEFERRAL
- VII. CORRESPONDENCE
- VIII. PERFORMANCE SURETIES
- IX. ZBA INPUT ONLY
- X. PUBLIC HEARINGS
- XI. OLD BUSINESS/PUBLIC HEARINGS
- XII. DESIGN REVIEW PHASE
- XIII. CONCEPTUAL REVIEW ONLY
  
- XIV. NEW BUSINESS/PUBLIC HEARINGS

A. Cobblestone Village  
SP# 01-15

137 Belknap Road  
Map 184/Lot 27

Purpose of plan: This project proposes the construction of a 28 unit, 55 and older housing community in Hudson, NH. Application Acceptance & Hearing.

- XV. OTHER BUSINESS
  
- XVI. ADJOURNMENT

All plans and applications are available for review in the Planning Office. Comments may be submitted in writing until 10:00 a.m. on the Tuesday prior to the day of the meeting.

The public is invited to attend.

  
John M. Cashell  
Town Planner

POSTED: Town Hall, Library, Post Office -- 03-13-15

# Cobblestone Village Older Persons Housing Development Site Plan Review

## Staff Report

25 March 15

**SITE:** 137 Belknap Road - Map 184/Lot 27 - SP# 01-15

**ZONING:** R-2 & G

**PURPOSE OF PLAN:** This project proposes the construction of a 28 unit, 55 and older housing community in Hudson, NH. Application Acceptance & Hearing.

**PLAN UNDER REVIEW ENTITLED:** "Residential Site Plan Cobblestone Village 137 Belknap Rd, Map 184; Lot 27, Hudson, NH, prepared by Keach-Nordstrom Associates, Inc., dated: Jan. 23, 2015, latest revision date March 5, 2015, consisting of Sheets 1 - 28 and Notes 1 - 37 on Sheet 1 of 28 (plan attached hereto).

**APPLICANT REPRESENTATIVE:** Project Engineers: Patrick Colburn, P.E., Jeffery Merritt and Tony Basso.

### ATTACHMENTS:

1. Site Plan application, Project Narrative, including Waiver Request forms, Existing Aerial Photo of the Site/Surroundings and Building Elevation Drawings, date stamped 02/09/15 - Attachment "A".
2. CLD 2d Comments Report, including Application Checklist, dated 03/16/15-"B".
3. Keach-Nordstrom's CLD Response Letter, dated 03/09/15 - "C".
4. Comment Reports from Zoning Admin., Kevin Desmond, John O'Brien, Deputy Fire Chief, Asst. Assessor and Police Dept. - "D".
5. GPI, Inc., Traffic Impact and Access Study, dated 02/15 - "E".

### REQUESTED WAIVERS:

1. HTC 275-9(C) — Noise Study
2. HTC 289-6(D) -- Fiscal Impact Study

### OUTSTANDING ISSUES:

1. Offsite traffic concerns; **Status:** please read the attached Traffic Impact and Access Study, which indicates that this project will produce a minimum impact on the associated roadway network. Also:
  - a) The offset between the Cobblestone Village entrance drive (aptly named, Cobblestone Drive, is proposed as a private street) and the nearest opposing street (Gordon St., an 8-lot cul-de-sac) meets the minimum separation between opposing streets, i.e., 125 ft., per §289-18(I).
  - b) The 400 ft. safe sight distance, at the Cobblestone Village driveway is provided, i.e., with the removal of several existing trees and undergrowth on

- the opposite side of Belknap Rd. within the ROW, looking west (see Sheet 20 of 28) .
- c) In addition to the CAP Fee of \$459.36, per unit (Note 21, Sheet 1), the Applicant is offering, per Note 24 on said Sheet, \$500, per unit, for offsite road improvements exclusive to Belknap St. NOTE: this is the same offsite road improvement, per unit, paid for by the Oak Ridge Older Persons Housing Development, which actually abuts the present site at the rear of both projects.
  - d) One private cul-de-sac road, looped, connecting to Belknap, 840 ft. in-length.
2. The School Impact Fee doesn't apply to the Cobblestone Village 55+ Older Persons Housing Development, i.e., even though it is provided in Note 22 of Sheet 1. This is in accordance with the 2013 Planning Board action regarding the Sparkling River 55+ Older Persons Housing Development: the collection of the subject School Impact Fee does not meet the rational nexus provision set forth in RSA 674:21.V. To the effect of the foregoing, said Note 22 will have to be amended by deleting reference to the School Impact Fee.
  3. Road width/sprinkler systems. **Status:** because this development will be serviced by municipal water, the private street is less than 1,000 ln. ft., and will have fire hydrants (locations and # approved by the HFD, see recommendation "D", attached herewith), dwelling sprinkler systems are not required, nor recommended by the HFD. Road width is 24 ft. (as recommended by HFD) and the road is looped.
  4. Drainage infrastructure improvements; **Status:** please see CLD's Second Comments Report; all outstanding issues with drainage, which are minor, will be resolved prior to Planning Board endorsement of the Plan.
  5. Water and Sewer: **Status:** this project will be serviced by both Town water and sewer. Please see Sheets 12 & 13.
  6. Wetland Impacts: **Status:** as designed, site development stays outside of the 50 ft. wetland buffer, relative to the two wetlands associated with this development parcel, i.e., there is one each on the north and south sides of the parcel; see Sheet 1, et al.
  7. Landscaping and Exterior Lighting: Please Sheets 14 – 17. Note: proposed lighting includes hooded LED fixtures; see lighting detail on Sheet 16. Green space required 35%, proposed 81%.
  8. Note 36 on Sheet 1 states that refuse removal will be provided, via private, curbside pickup. **Status:** in Hudson, for developments such as this, the Town typically provides curbside pickup of refuse. This item can be discussed at the hearing.
  9. Parking: each of the 28 proposed dwelling units will have 2 garage spaces and at least 2 exterior (tandem) driveway spaces; also, parking is provided at the proposed clubhouse ( i.e., 3 standard parking spaces and 2 HP spaces); the "Mail Station" provides 2 – 3 indented parallel spaces. This development also includes a separate onsite RV & boat storage lot.
  10. All other required notes are included on Sheet 1 of 28. 37 Notes total.

**APPLICATION TRACKING:**

- 09 FEB 15 - Site Plan application submitted.
- 25 MAR 15 - Initial Public Hearing.

**RECOMMENDATION:** For this hearing, staff recommends application acceptance and for the board to conduct the public hearing. If no unsolvable issues arise from the hearing, and because the Town’s engineering consultant and Town staff have thoroughly vetted the issues involving this project, staff recommends upon completion of the hearing approval of this project, i.e., in accordance with the below DRAFT MOTIONS, which are provided for the board’s consideration.

**DRAFT MOTIONS:**

I move for application acceptance of the Cobblestone Village Site Plan application, located at 137 Belknap Road - Map 184/Lot 27.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

I move to defer further review of the Cobblestone Village Site Plan application, located at 137 Belknap Road - Map 184/Lot 27, date specific, to the May 13, 2015 Planning Board meeting .

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

**REQUESTED WAIVERS:**

1. HTC 275-9(D) -- Fiscal Impact Study
2. HTC 275-9(C) -- Noise Study

2) HTC 275-9C – Noise Study

I move to grant the requested waiver: HTC 275-9C - Noise Study - because such a study is unnecessary, taking into consideration that the allowed construction days and hours for this project (i.e., Monday through Saturday only, prohibited on Sunday, and between the hours of 7:00 A.M. to 7:00 P.M.) are provided for in the Town Code, and are days and hours of the week typically granted for such projects in similar settings, as such, the granting of this waiver is not contrary to the spirit and intent of the Site Plan Review regulations.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

3) HTC 275-9D – Fiscal Impact Study

I move to grant the requested waiver: HTC 275-9D - Fiscal Impact Study - because in addition to the submitted plans and submitted application documents, said study is unnecessary in order to evaluate the fiscal impact of this development, and as such, the granting of this waiver is not contrary to the spirit and intent of the Site Plan Review regulations.



Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

I move to approve the Site Plan entitled: "Residential Site Plan Cobblestone Village 137 Belknap Rd, Map 184; Lot 27, Hudson, NH, prepared by Keach-Nordstrom Associates, Inc., dated: Jan. 23, 2015, latest revision date March 5, 2015, consisting of Sheets 1 - 28 and Notes 1 - 37 on Sheet 1 of 28 , in accordance with the following terms and conditions:

1. All stipulations of approval shall be incorporated into the Development Agreement, which shall be recorded at the HCRD, together with the above Site Plan Plan-of-Record (hereafter referred to as the Plan).
2. Prior to the Planning Board endorsement of the Plan, the Condominium Age Restriction and all easement documents shall be favorably reviewed and recommended on by Town Counsel.
3. All improvements shown on the Plan, including Notes 1-37, shall be completed in their entirety and at the expense of the Applicant or his assigns.
4. A C.A.P. fee of \$459.36, per residential unit, shall be paid prior to the issuance of a Certificate of Occupancy for housing unit.
5. Prior to Planning Board endorsement of the Plan, Note 22 on Sheet 1 of 28 shall be amended by deleting reference to the School Impact Fee, which, because this Plan is exclusive to a 55+ older persons housing development, does not apply.
6. A recreation contribution in the amount of \$400.00, per residential unit, shall be paid prior to the issuance of a Certificate of Occupancy.
7. An offsite roadway improvement contribution of \$500.00 shall be paid prior to the Certificate of Occupancy for each dwelling unit. Said contribution shall be exclusive to Belknap Road improvements implemented by the Town.
8. This approval is subject to final engineering review.
9. Maintenance of the onsite drainage system shall be constructed and maintained in compliance with local and NHDES requirements for such systems, and the perpetual maintenance of the stormwater treatment structures and treatment and retention basins outside of the ROW, shall be the responsibility of the future homeowner's association,
10. The number of dwelling units for this development shall be limited to 28; other structural features included in this Plan are: a clubhouse, mail station and RV & boat storage area.
11. If lot development involves blasting and/or ramming of bedrock materials, said activities shall be limited to the hours between 7:00 A.M. and 5:00 P.M. Monday through Friday only. Said blasting/ramming activities shall be prohibited on Saturday and Sunday.
12. Construction activities shall be limited to the hours between 7:00 A.M. and 7:00 P.M., Monday through Saturday. Said activities shall are prohibited on Sunday.

Motion by: \_\_\_\_\_ Second: \_\_\_\_\_ Carried/Failed: \_\_\_\_\_

"A"

**Project Narrative  
Cobblestone Village  
A 55 and Older Community  
KNA Project No.14-0721-1**

The subject project involves the development of property listed on the Hudson Tax Assessor's Map 184 as Lot 27. The property is located at 137 Belknap Road within the Town of Hudson's R-2 - Residential and G - General Zoning Districts. The property is 15.215 acres in area, and is currently undeveloped. Previously, the site contained a single-family home. The home, however, has been removed from the site, which is now vacant.

The proposed project is a 55 and older residential community consisting of 28 detached condominium units and common open space. The community will be accessed from Belknap Road off a new private roadway. Associated site improvements include the construction of a community clubhouse with adjacent parking, an RV/ boat parking area, site landscaping, stormwater management, and the installation/extension of municipal sewer and water mains.

Schauer Environmental Consultants has evaluated the property for the presence of jurisdictional wetlands and has identified two wetland complexes on the property. This project does not require wetland or wetland buffer impacts.

Stormwater runoff associated with the development of this property will be collected in a closed system consisting of pipe and catch basins. The closed system conveys onsite and offsite stormwater to two above-ground stormwater treatment and mitigation areas. One of these areas is a small bio-retention system, which will treat entering stormwater as well as recharge the ground water table. The other is a micro-pool extended detention wet pond, which will treat and mitigate stormwater in order to maintain or reduce the rate of stormwater discharged off of the property.

Underground utilities are proposed throughout the development, including gas, electric, telephone, cable, municipal sewer, and municipal water. All underground utilities are accessed beneath Belknap Road along the property's frontage. The sewer system for the proposed units consists of individual grinder pump systems that each pump waste to a community force main. The force main ends at a proposed sewer manhole, and then discharges via gravity flow to the main under Belknap Road.

**AUTHORIZATION**

Deer Creek Development, LLC hereby authorizes Keach-Nordstrom Associates, Inc., 10 Commerce Park North, Suite 3, Bedford, New Hampshire 03110, to represent it in connection with its Application for Site Plan Approval relative to property at 137 Belknap Road, Hudson, New Hampshire. Such representation shall include, without limitation, appearing before the Hudson Planning Board and presenting testimony, documentation and other information in connection therewith.

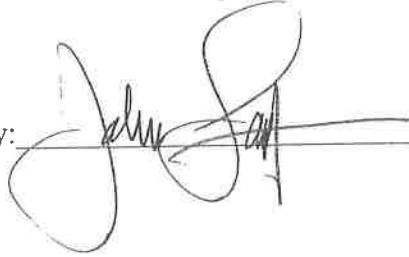
Deer Creek Development, LLC has caused this instrument to be executed this 5<sup>th</sup> day of February, 2015.

Deer Creek Development, LLC



Witness

By:



"A"  
Cont.

PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27  
Name of Project: Cobblestone Village  
Zoning District: \_\_\_\_\_ General SP# 01-15  
(For Town Use) (For Town Use)  
ZBA Action: \_\_\_\_\_



PROPERTY OWNER: DEVELOPER:  
Name: Deer Creek Development, LLC Same as owner  
Address: 25 Flagstone Drive  
Address: Hudson, NH 03051  
Telephone # (978) 337-5835  
Fax # \_\_\_\_\_  
Email: deercreekllc@gmail.com

PROJECT ENGINEER SURVEYOR  
Name: Patrick Colburn, P.E. (KNA) Anthony Basso, L.L.S. (KNA)  
Address: 10 Commerce Park No. Suite 3 10 Commerce Park No. Suite 3  
Address: Bedford, NH 03110 Bedford, NH 03110  
Telephone # (603) 627-2881 (603) 627-2881  
Fax # (603) 627-2915 (603) 627-2915  
Email: pcolburn@keachnordstrom.com abasso@keachnordstrom.com

PURPOSE OF PLAN:

This project proposes the construction of a 28 unit, 55 and older housing community  
in Hudson, NH.

*For Town Use*

Plan Routing Date: 2-11-15 Sub/Site Date: 3-3-15 @ 10:00 AM

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

\_\_\_\_\_  
(Initials) Title: \_\_\_\_\_ Date: \_\_\_\_\_

DEPT:  
 Zoning  Engineering  Assessor  Police  Fire  Planning  
 Consultant  Highway Department

Fees Paid: \_\_\_\_\_

**SITE DATA SHEET**

PLAN NAME: Cobblestone Village

PLAN TYPE: SITE PLAN

LEGAL DESCRIPTION: MAP 184 LOT 27

DATE: 02/09/2015

Location by Street 137 Belknap Road

Zoning: R-2 & G

Proposed Land Use: Residential

Existing Use: Residential

Surrounding Land Use(s): Residential

Number of Lots Occupied: 1

Existing Area Covered by Building: 1828 sf (previously razed)

Existing Buildings to be removed: Two (previously razed)

Proposed Area Covered by Building: 58,968 sf

Open Space Proposed: 81%

Open Space Required: 35%

Total Area: S.F.: 662,991 Acres: 15.2

Area in Wetland: 91,248 sf Area Steep Slopes: 9,284 sf

Required Lot Size: R-2: 43,560 sf / G: 43,560 sf

Existing Frontage: 264.65'

Required Frontage: R-2: 120 ft / G: 150 ft

Building Setbacks:	<u>Required*</u>	<u>Proposed</u>
Front:	<u>R-2: 30 / G: 30</u>	<u>30'</u>
Side:	<u>R-2: 15 / G: 15</u>	<u>32'</u>
Rear:	<u>R-2: 15 / G: 15</u>	<u>15'</u>

**SITE PLAN DATA SHEET  
(Continued)**

Flood Zone Reference: FIRM Map 33011C0518D, Panel 518, 09/25/2009, Not In Flood Zone

Width of Driveways: 24'

Number of Curb Cuts: 1

Proposed Parking Spaces: 2 spaces per unit, 5 spaces clubhouse

Required Parking Spaces: 2 spaces per unit

Basis of Required Parking (Use): Residential

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

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Hudson Town Code		
<u>Waivers Requested:</u>	<u>Reference</u>	<u>Regulation Description</u>
	1. <u>HTC 275-9 (D)</u>	<u>Fiscal Impact Study</u>
	2. <u>HTC 275-9 (C)</u>	<u>Noise Study</u>
	3. _____	_____
	4. _____	_____
	5. _____	_____
	6. _____	_____
	7. _____	_____
	8. _____	_____
<i>(Left column for Town Use)</i>		

Impact Fees:

C.A.P Fee: TBD

\_\_\_\_\_

\_\_\_\_\_

Development Agreement  
Proposed: Yes

\_\_\_\_\_

<i>For Town Use</i>	
Data Sheet Checked By: _____	Date: _____

**APPLICATION FOR SITE PLAN REVIEW  
TOWN OF HUDSON, NEW HAMPSHIRE**

Thirty (30) days prior to Planning Board Meeting, a complete site plan to include all supporting materials/documents must be submitted in final form. The site plan shall comply with the following specifications/requirements:

Applicant Initials		Staff Initials
<u>BJC</u>	a) Submission of nine (9) full sets of Site Plans (sheet size: 22" x 34") shall be submitted at the time of application filing, followed by the submission of seventeen (17) 11" X 17" plan sets (revised if applicable) to the Community Development Department no later than 10:00 A.M., Tuesday the week prior to the scheduled public hearing/conceptual review date.	_____
<u>BJC</u>	b) A Site Plan narrative, describing the purpose, locations, long-range plans, impacts on traffic, schools, and utilities	_____
<u>BJC</u>	c) Plan scale at not less the one inch equals fifty feet (1" = 50')	_____
<u>BJC</u>	d) Locus plan with 1,000' minimum radius of site to surrounding area	_____
<u>BJC</u>	e) Plan date by day/month/year	_____
<u>BJC</u>	f) Revision block inscribed on the plan	_____
<u>BJC</u>	g) Planning Board approval block inscribed on the plan	_____
<u>BJC</u>	h) Title of project inscribed on the plan	_____
<u>BJC</u>	i) Names and addresses of property owners and their signatures inscribed on the plan	_____
<u>BJC</u>	j) North point inscribed on the plan	_____
<u>BJC</u>	k) Property lines: exact locations and dimensions	_____
<u>BJC</u>	l) Square feet and acreage of site	_____
<u>BJC</u>	m) Square feet of each building (existing and proposed)	_____
<u>BJC</u>	n) Names and addresses of bordering abutters, as shown on Tax Assessor's records not more than five (5) days prior to application date to be listed on the plan.	_____

Applicant  
Initials

Staff  
Initials

<u>BJC</u> o)	Location of all structures, roads, wetlands, hydrants, wells, septic systems, 4k reserve areas, floodways/floodplains, driveways, travel areas, parking areas and natural features within 200 feet of the tract	_____
<u>BJC</u> p)	Locations of existing and proposed permanent monuments and bench marks within 200 feet of the development tract	_____
<u>NA</u> q)	Pertinent highway projects	_____
<u>BJC</u> r)	Assessor's Map and Lot number(s)	_____
<u>BJC</u> s)	Waiver application form shall be submitted with the site plan application, note on plan listing waivers requested/granted; and all waivers granted to the site plan regulations shall be listed on the final plan; waivers to checklist shall be reduced to writing and be signed by the Planning Board Chairman and Planning Board Secretary and recorded with the plan	_____
<u>BJC</u> t)	Delineate zoning district on the plan	_____
<u>BJC</u> u)	Storm water drainage plan	_____
<u>BJC</u> v)	Topographical elevations at 2-foot intervals contours: existing and proposed	_____
<u>BJC</u> w)	Utilities: existing and proposed	_____
<u>BJC</u> x)	Parking: existing and proposed	_____
<u>BJC</u> y)	Parking space: length and width	_____
<u>BJC</u> z)	Aisle width/maneuvering space	_____
<u>BJC</u> aa)	Landscaping: existing and proposed	_____
<u>BJC</u> ab)	Building and wetland setback lines	_____
<u>BJC</u> ac)	Curbs cuts	_____
<u>BJC</u> ad)	Rights of way: existing and proposed	_____
<u>BJC</u> ae)	Sidewalks: existing and proposed	_____
<u>BJC</u> af)	Exterior lighting plan	_____
<u>BJC</u> ag)	Sign locations: size and design	_____
<u>BJC</u> ah)	Water mains and sewerage lines	_____
<u>N/A</u> ai)	Location of dumpsters on concrete pads	_____
<u>BJC</u> aj)	All notes from plats	_____



Applicant Initials		Staff Initials
<u>BJC</u>	ak) Buffer as required by site plan regulations	_____
<u>BJC</u>	al) Green and open space requirements met with both types of spaces inscribed on the plan	_____
<u>BJC</u>	am) Soil types and boundaries, Note: If site contains marginal or questionable soils, a High Intensity Soil, Survey (HISS) may be deemed necessary to submit as part of the application. Said HISS, if required, shall be performed by a State of New Hampshire Certified Soil Scientist, who shall affix his/her stamp and signature shall be inscribed on the plan.	_____
<u>BJC</u>	an) Wetlands (and poorly-drained and very poorly-drained soils, also identified as Class 5 and Class 6 High Intensity Soil Survey (HISS soils), and permanent and seasonal wetlands shall be identified on the plan by a New Hampshire certified wetland or soil scientist, who shall affix his/her stamp and signature to the respective plan.	_____
<u>BJC</u>	ao) "Valid for one year after approval" statement inscribed on the plan.	_____
<u>NA</u>	ap) Loading bays/docks	_____
<u>BJC</u>	aq) State of New Hampshire engineer's stamp, signature, surveyor's stamp, and signature	_____
<u>BJC</u>	ar) Error of closure (1 in 10,000 or better)	_____
<u>BJC</u>	as) Drafting errors/omissions	_____
<u>BJC</u>	at) Developer names, addresses, telephone numbers and signatures	_____
<u>BJC</u>	au) Photographs, electronic/digital display or video of site and area	_____
<u>BJC</u>	av) Attach one (1) copy of the building elevations	_____
<u>W</u>	aw) Fiscal impact study	_____
<u>BJC</u>	ax) Traffic study	_____
<u>W</u>	ay) Noise study	_____

Applicant  
Initials

Staff  
Initials

- BJC az) Copies of any proposed or existing easements, covenants, deed restrictions, right of way agreements or other similar documents \_\_\_\_\_
- BJC ba) Copy of applicable Town, State, Federal approval/permits to include but not limited to the following: \_\_\_\_\_
- industrial discharge application
  - sewer application
  - flood plain permit
  - wetlands special exception
  - variance
  - erosion control permit (149:8a)
  - septic construction approval
  - dredge and fill permit
  - curb cut permit
  - shore-land protection certification in accordance with RSA483-B
  - if applicable, review application with Lower Merrimack River Local Advisory Committee (LMRLAC) and attach LMRLAC project comments hereto.
- BJC bb) Presentation plan (colored, with color-coded bar chart) \_\_\_\_\_
- BJC bc) Fees paid to clerk \_\_\_\_\_
- BJC bd) Five (5) 22" x 34" copies of the plan shall be brought to the Planning Board meeting and distributed to the Planning Board members at the meeting. Note: for all subsequent meetings involving revised plans, five 22" x 34" copies of said plan shall be brought to the meeting for distribution to the board members. \_\_\_\_\_

\*Under the purview of the Planning Board, any and all items may be waived.

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**APPLICATION FOR SITE PLAN REVIEW  
TOWN OF HUDSON, NEW HAMPSHIRE**

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 Engineer, the Conservation Commission 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: \_\_\_\_\_

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

Signature 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 Code Enforcement Officer/Building Inspector must be notified within two (2) working days of any change by the individual in charge of the project.

APPLICATION IS DUE AT NOON 21 days prior to the Planning Board Meeting. (The date the Agenda is CLOSED.) Any applications received after that time will be deferred until the next available meeting.

*Reviewed by OLD & Town Staff  
3-18-15*

**SUBDIVISION/SITE PLAN WAIVER REQUEST FORM**

Name of Subdivision/Site Plan: Cobblestone Village: A 55 and Older Community

Street Address: 137 Belknap Road

I, Brenton Cole hereby request that the Planning Board waive the requirements of item HTC 275-9 (D) of the Subdivision/Site Plan Checklist in reference to a plan presented by Keach-Nordstrom Associates, Inc. dated November 2014 for property Tax Map/Lot(s) 184-27 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 Subdivision/Site Plan regulations.

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

A Fiscal Impact study would cause unnecessary additional financial burden to the developer.

Reason(s) for granting this waiver, relative to not being contrary to the Spirit and Intent of the Subdivision/Site Plan regulations: (if additional space is needed please attach the appropriate documentation hereto):

The Town of Hudson will collect an impact fee proportionate to the size of the proposed development. These fees offset any financial impact that this development would have on Town resources. Correspondingly, a fiscal impact study is not needed as the Town of Hudson already has a mechanism in place to ensure that a project does not burden Town resources. Therefore, granting this waiver is not contrary to the spirit and intent of the ordinance.

Signed:



Applicant or Authorized Agent

Planning Board Action:

Waiver Granted: \_\_\_\_\_

Waiver Not Granted: \_\_\_\_\_

**SUBDIVISION/SITE PLAN WAIVER REQUEST FORM**

Name of Subdivision/Site Plan: Cobblestone Village: A 55 and Older Community

Street Address: 137 Belknap Road

I, Brenton Cole hereby request that the Planning Board waive the requirements of item HTC 275-9 (C) of the Subdivision/Site Plan Checklist in reference to a plan presented by Keach-Nordstrom Associates, Inc. dated November 2014 for property Tax Map/Lot(s) 184-27 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 Subdivision/Site Plan regulations.

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

A Noise Impact Study would cause unnecessary financial burden to the developer.

Reason(s) for granting this waiver, relative to not being contrary to the Spirit and Intent of the Subdivision/Site Plan regulations: (if additional space is needed please attach the appropriate documentation hereto):

The ordinance is in place to prevent noise pollution from occurring within areas of mixed use where it may cause disputes amongst neighbors. The project is situated within an area of Town that is already developed and utilized for residential purposes. Given that the propose use of the subject property is consistent with the purpose of the underlying zoning districts and is consistent with abutting uses, a waiver from this requirement would not be contrary to the spirit and intent of the Subdivision/Site Plan regulations.

Signed:



Applicant or Authorized Agent

Planning Board Action:

Waiver Granted: \_\_\_\_\_

Waiver Not Granted: \_\_\_\_\_

**APPLICATION FOR SITE PLAN REVIEW  
TOWN OF HUDSON, NEW HAMPSHIRE**

FOOTNOTES:

1. In the event of the denial of a plan, the recording fees collected will not be reimbursed, but will instead be used as an additional fee to help defray administrative costs associated with a denial.
2. The "Review Fees" are fees estimated necessary to offset costs incurred to review and/or compile plans, data, or other information relative to the proposal.
3. The "Amount Due" does not include fees for studies or reviews as authorized in Section G-2 of this regulation.
4. Fees must be paid in full prior to the commencement of any formal review by the Town of Hudson.

STATUS:

DATE:

- |             |   |                        |
|-------------|---|------------------------|
| <u>    </u> | 1. Application incomplete   | <hr/>                  |
| <u>    </u> | 2. Application complete. Include any applicable requested waivers, fees paid, routing sheet returned                              | <u>    2-12-15    </u> |
| <u>    </u> | 3. Application formally accepted or denied by Planning Board (90-day review clock by RSA 674:43 to start upon acceptance granted) | <hr/>                  |
| <u>    </u> | 4. Final approval granted or denied   | <hr/>                  |
| <u>    </u> | 5. Comments:  |                        |

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**Abutters List**  
**KNA#14-0721-1**  
**Cobblestone Village**  
**Hudson, NH**  
Updated 02-02-2015

<b>Tax Map</b>	<b>Lot</b>	<b>Owner/Applicant</b>
184	27	Deer Creek Development, LLC 25 Flagstone Drive Hudson, NH 03051
 <b>Direct Abutters:</b>		
<b>Tax Map</b>	<b>Lot</b>	<b>Abutter</b>
184	9	Philip G. & Linda S. Roth 32 McIntosh Rd. Danville, NH 03819
184	17	Ralph & Yoshiko Arthur 140 Belknap Rd. Hudson, NH 03051
184	26	John J. McCarthy 141 Belknap Rd. Hudson, NH 03051
184	28	David A. & Laura M. Williams 15 Hardwood Rd. Windham, NH 03087
184	29	Steven L. Clark 125 Belknap Rd. Hudson, NH 03051
184	32	K & M Developers, LLC 46 Lowell Rd. Hudson, NH 03051
185	40	Town of Hudson 12 School St. Hudson, NH 03051
 <b>In-Direct Abutters:</b>		
<b>Tax Map</b>	<b>Lot</b>	<b>Abutter</b>
184	10	Christopher N. Motika (Trustee) Nicole R. Lapointe Motika (Trustee) 7 Governors Lane Nashua, NH 03062

184	16	Joseph F. Jr. & Carol L. Maraldo 229 Old Gage Hill Rd. Pelham, NH 03076
184	18	Roxanne M. & Dennis F. Couturier 146 Belknap Rd. Hudson, NH 03051
184	19	Melissa & Edward J. Flemming 148 Belknap Road Hudson, NH 03051
184	25	Selcuk & Fatma Otova 143 Belknap Rd. Hudson, NH 03051
184	30	Tina Rozier 119 Belknap Road Hudson, NH 03051

Professionals to be notified:

Engineer/ Surveyor

Keach-Nordstrom Associates Inc.  
10 Commerce Park North, Suite 3  
Bedford, NH 03110

Wetland/Soil Scientist

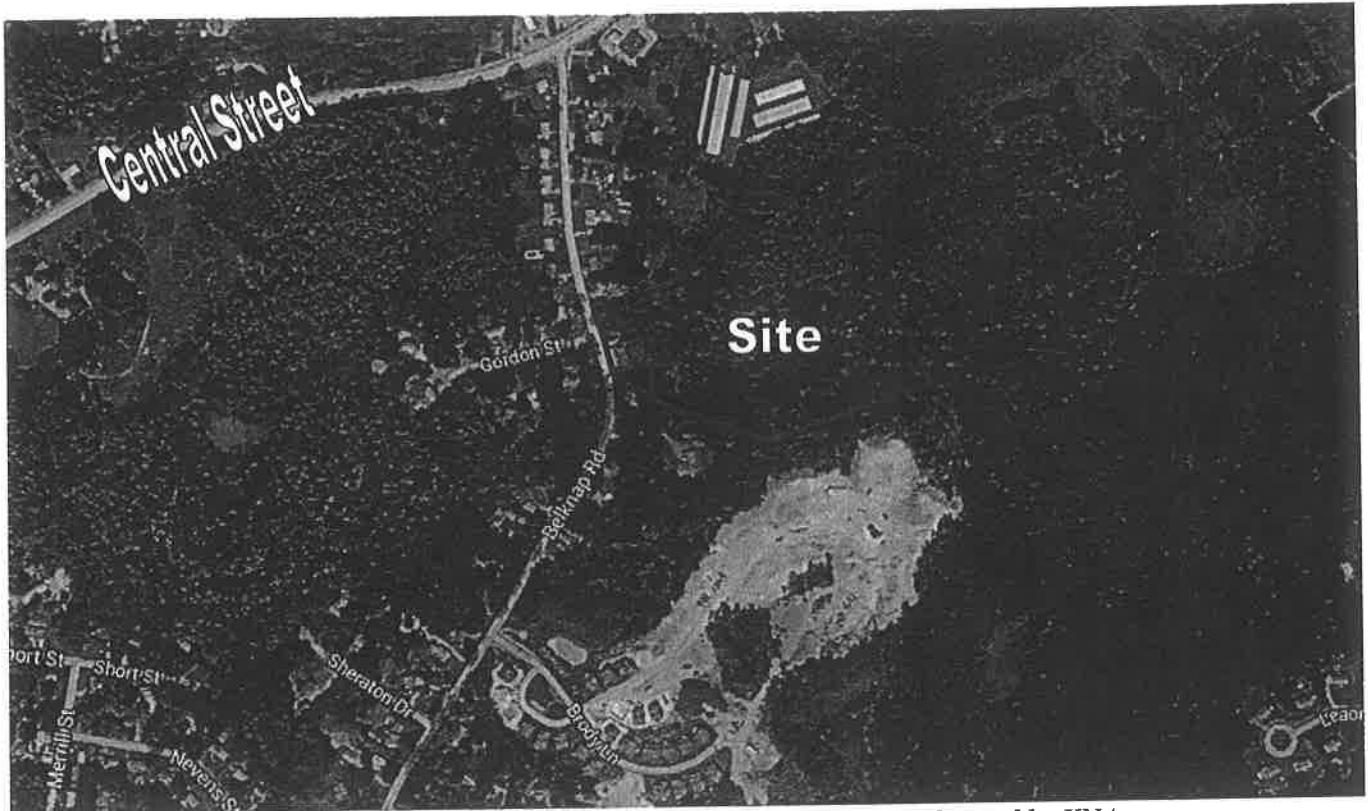
Schauer Environmental Consultants  
722 Route 3A  
Bow, NH 03304

Traffic Consultant

Greenman Pedersen, Inc.  
181 Ballardvale Street, Suite 202  
Wilmington, MA 01887



**Photo No. 1:** A bird's eye view of the subject parcel (Map 184; Lot 27)



*2014 aerial image digitally captured and graphically enhanced by KNA*

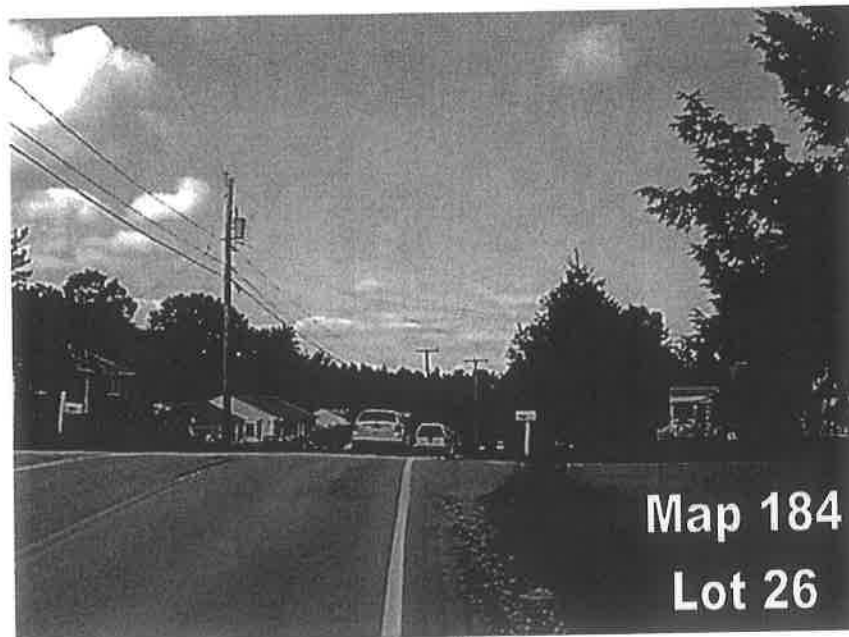


**Photo No. 2:** Looking East from Belknap Road at the existing site.



*Image digitally captured by KNA*

**Photo No. 3:** Looking North along Belknap Road from the abutter property.



*Image digitally captured by KNA*

**Photo No. 4:** Looking West at Gordon Street adjacent to the subject parcel.



*Image digitally captured by KNA*

**Photo No. 5:** Looking South along Belknap Road at the edge of the subject parcel.



*Image digitally captured by KNA*

**APPLICATION FOR SITE PLAN REVIEW  
TOWN OF HUDSON, NEW HAMPSHIRE**

**SCHEDULE OF FEES**

**A. Review Fees**

<u>1. Site Plan Use</u>	<u>Project Size/Fee</u>	
Multi-Family	\$105/unit for 3-50 units \$78.50/unit for each additional unit over 50	\$ <u>2,940</u>
Commercial/Semi Public/Civic or Recreational	\$157/1,000 sq. ft. for first 100,000 sq.ft. (bldg area); \$78.50/1,000 sq.ft. thereafter.	\$ _____
Industrial	\$150/1,000 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	\$ _____

**Plus Consultant Review Fee:**

Total <u>15.215</u> acres @ \$600.00 per acre or \$1,250.00, whichever is greater	\$ <u>9,129</u>
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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.

2. Conceptual Review Only \$100.00	\$ _____
3. ZBA Input Only \$100.00	\$ _____

APPLICATION FOR SITE PLAN REVIEW  
TOWN OF HUDSON, NEW HAMPSHIRE

Cobblestone Village (Site Plan), 137 Belknap Road  
Town of Hudson  
CLD Reference No. 03-0249.1460  
Reviewed February 24, 2015

Thirty (30) days prior to Planning Board Meeting, a complete site plan to include all supporting materials/documents must be submitted in final form. The site plan shall comply with the following specifications/requirements.

Applicant  
Initials

Staff  
Initials

- a) Submission of nine (9) full sets of Site Plans (sheet size: 22" x 34") at the time of application filing, followed by the submission of seventeen (17) 11" x 17" plan sets (revised if applicable) to the Community Development Department no later than 10:00 AM Tuesday the week prior to the scheduled public hearing/conceptual review date.
- b) A Site Plan narrative, describing the purpose, locations, long range plans, impacts on traffic, schools and utilities.
- c) Plan scale at not less than one inch equals fifty feet (1" = 50')
- d) Locus plan with 1,000' minimum radius of site to surrounding area
- e) Plan date by day/month/year
- f) Revision block inscribed on the plan
- g) Planning Board approval block inscribed on the plan
- h) Title of project inscribed on the plan
- i) Names and addresses of property owners and their signatures inscribed on the plan
- j) North point inscribed on the plan
- k) Property lines: exact locations and dimensions
- l) Square feet and acreage of site
- m) Square feet of each building (existing & proposed)
- n) Names and addresses of bordering abutters, as shown on Tax Assessor's records not more than five (5) days prior to application date to be listed on the plan

CLD/KMG  
CLD/KMG

CLD/KMG  
CLD/KMG

CLD/KMG  
CLD/KMG  
CLD/KMG

a) Two sets received by CLD.

b) Discussion regarding impacts to traffic and schools was not included in narrative.

e) Month/Day/Year

g) Language varies from the Regulation.

- m) Only story heights provided for existing structures. Typical size/dimensions provided for proposed units.
- n) Abutters' names and addresses are shown on plan; unable to verify 5-day update criteria.

Applicant  
Initials

- o) Location of all structures, roads, wetlands, hydrants, wells, septic systems, 4k reserve areas, floodways/floodplains, driveways, travel areas, parking areas and natural features within 200 feet of the tract
- p) Locations of existing and proposed permanent monuments and benchmarks within 200 feet of the development tract
- q) Pertinent highway projects
- r) Assessor's Map and Lot number(s)
- s) Waiver application form shall be submitted with the site plan application, note on plan listing waivers requested/ granted; and all waivers granted to the site plan regulations shall be listed on the final plan; waivers to checklist shall be reduced to writing and be signed by the Planning Board Chairman and Planning Board Secretary and recorded with the plan.
- t) Delineate zoning district on the plan
- u) Stormwater drainage plan
- v) Topographical elevations at 2-foot intervals contours: existing and proposed
- w) Utilities: existing and proposed
- x) Parking: existing and proposed
- y) Parking space: length and width
- z) Aisle width/maneuvering space
- aa) Landscaping: existing and proposed
- ab) Building and wetland setback lines
- ac) Curb cuts
- ad) Right of way: existing and proposed
- ae) Sidewalks: existing and proposed
- af) Exterior lighting plan
- ag) Sign locations: size and design
- ah) Water mains and sewerage lines
- ai) Location of dumpsters on concrete pads
- aj) All notes from plans

Staff  
Initials

- CLD/KMG
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- p) One temporary benchmark shown on the plans (NGVD 29). We are unable to verify that all locations of existing monuments within 200 feet of the development tract are shown.
- q) No highway projects noted.
- s) Requested waivers noted on the plans; however, waiver application forms were not received for review.
- w) No service connections have been shown to the Community Building.
- ae) Sidewalk proposed along frontage of units to the north of the site, extending from Unit 28 to eastern tip of the cul-de-sac. (Does not connect to Belknap Road.)
- af) Additional lighting should be provided along proposed sidewalks. No S5 light detail provided.
- ag) Detail not provided for Community Identification sign.
- ah) Several sewer design conflicts that need to be corrected. Minimum separation not met for Unit 9.
- ai) A dumpster pad detail and location was not provided. Details on how solid waste is to be collected on-site were not included.

Applicant  
Initials

ak) Buffer as required by site plan regulations

Staff  
Initials  
CLD/KMG

al) Green and open space requirements met with percentages of both types of spaces inscribed on the plan

CLD/KMG

am) Soil types and boundaries, Note: if site contains marginal or questionable soils, a High Intensity Soil Survey (HISS) may be deemed necessary to submit as part of the application. Said HISS, if required, shall be performed by a State of New Hampshire certified Soil Scientist, who shall affix his/her stamp and signature shall be inscribed on the plan.



am) Regulation was repealed in 2010.

an) Wetlands (and poorly-drained and very poorly-drained soils), also identified as Class 5 and Class 6 High Intensity Soil Survey (HISS soils), and permanent and seasonal wetlands shall be identified on the plan by a New Hampshire certified Wetland or Soil Scientist, who shall affix his/her stamp and signature to the respective plan.



an) Wetlands are shown on-site. No work is proposed within the wetlands or wetlands buffer.

ao) "Valid for one year after approval" statement inscribed on the plan

CLD/KMG  
N/A  
CLD/KMG

ap) No loading area shown. Site is to be used for residential use.

ap) Loading bays/docks

CLD/KMG  
CLD/KMG

at) Phone number not provided.

ar) Error of closure (1 in 10,000 or better)



au) None received for review.

as) Drafting errors/omissions

CLD/KMG

av) None received for review.

at) Developer names, addresses, telephone numbers and signatures

CLD/KMG  
W

aw) Not received, applicant noted waiver requested.

au) Photographs, electronic/digital display or video of site and area

CLD/KMG  
W

av) Attach one (1) copy of the building elevations

CLD/KMG

aw) Fiscal impact study

CLD/KMG

ax) Traffic study

CLD/KMG

ay) Noise study

Applicant  
Initials

az) Copies of any proposed or existing easements, covenants, deed restrictions, right of way agreements or other similar documents  
ba) Copy of applicable Town, State, Federal approval/permits to include but not limited to the following:

- industrial discharge application
- sewer application
- flood plain permit
- wetlands special exception
- variance
- erosion control permit (149.8a)
- septic construction approval
- dredge and fill permit
- curb cut permit
- shoreland protection certification in accordance with RSA483-B
- if applicable, review application with Lower Merrimack River Local Advisory Committee (LMRLAC) and attach LMRLAC project comments hereto.

- bb) Presentation plan (colored, with color coded bar chart)
- bc) Fees paid to clerk
- bd) Five (5) 22" x 34" copies of the plan shall be brought to the Planning Board meeting and distributed to the Planning Board members at the meeting. Note: for all subsequent meetings involving revised plans, five 22" x 34" copies of said plan shall be brought to the meeting for distribution to the board members.

• Under the purview of the Planning Board any and all items may be waived.

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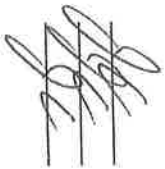
Staff  
Initials

  
  
 N.T.C.D ON  
 RAISON PLANS.

az) No deeds or easement documents received for review.

ba) New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) Permit Application package received for review. NHDES Sewer Connection Permit noted as pending, and National Pollutant Discharge Elimination System (NPDES) Notice of Intent noted as required prior to construction on the plan.

- bb) No presentation plan received, requires a Town action.
- bc) Requires Town action.
- bd) Requires Town action.







"B"

March 16, 2015

Mr. John Cashell, Town Planner  
Town of Hudson  
12 School Street  
Hudson, NH 03051

Re: Town of Hudson Planning Board Review  
Cobblestone Village (Site Plan), 137 Belknap Road  
Tax Map 184, Lot 27; Acct. #1350-857  
CLD Reference No. 03-0249.1460

Dear Mr. Cashell:

CLD Consulting Engineers, Inc. (CLD) has reviewed the second submission of the materials received on March 9, 2015, related to the above-referenced project. 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, and criteria outlined in the CLD Proposal approved September 16, 2003, revised September 20, 2004, June 4, 2007, and September 3, 2008.

We have included a copy of CLD's evaluation of the checklist for your reference. We did not receive a copy of the applicant's checklist. We note that several items could not be verified by CLD and require action by the Town.

The project consists of constructing twenty-eight (28) individual, 2,113-square-foot two-bedroom 55 and older housing units, an RV and Boat storage parking lot, a 480-square-foot community building with associated landscaping and site improvements on this relatively undeveloped site. The site will be serviced by proposed municipal water and public sewer from Belknap Road.

The following items have outstanding issues:

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

c. *Former CLD Comment: HR 275-9.B. Traffic Study Review Comments – We have reviewed the site plan as well as the Traffic Impact Study prepared by GPI for this project and have the following comments:*

2) *From Google Maps street view, we note that there is an existing Horizontal Alignment Warning sign (W1-2R) facing southbound traffic mounted on the utility pole across from the proposed site roadway, but there is not a corresponding sign in the northbound direction. A combination Horizontal Alignment/Intersection sign (W1-10 series) that depicts the presence of both Gordon Street and Cobblestone Drive beyond the curve should be considered for northbound traffic.*

**Current CLD Comment:** The applicant has noted that an existing W1-2L sign facing northbound was found and attached a Google Maps street view photo to document. The applicant has stated that they are willing to replace the existing sign for a W1-10aL sign and have added a note and plan detail. Since the two side streets



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
 March 16, 2015  
 Page - 2

are not directly across from each other, the proposed W1-10aL sign should reflect this layout by using the Offset Side Road symbol (W2-7R) instead of the Cross Road symbol, as noted in Section 2C.46 of the MUTCD.

- g. *Former CLD Comment: The applicant has shown the bituminous curb stopping abruptly at the right-of-way line. Since the configuration can easily be damaged by plows and vehicles, we suggest that the applicant review other configurations.*

**Current CLD Comment:** The applicant has revised the entrance/exit detail to include granite curbing within the right-of-way and provided a detail for the transition between bituminous and granite curbing. The applicant should provide a detail or note showing the intent for the granite curb transition or tip down at the leading end.

### 3. Utility Design/Conflicts (HR 275-9.E.)

- a. *Former CLD Comment: HR 275-9.E. The applicant has not provided 10 feet of separation between the water and sewer services to Unit 9. The applicant provided underground utility and gas line locations; however, did not show individual unit service connections. The applicant has not shown any service connections to the proposed community building (water, sewer, gas, etc.).*

**Current CLD Comment:** The applicant has revised the spacing at Unit #9 to maintain 10' of separation between the water and sewer services. The applicant has noted that gas and underground utility services are subject to change per final design from the corresponding utility provider and therefore were not put on the plans. It is recommended that a typical detail be developed to show the intent for the utility layout, noting special relationships to other utilities including minimum required spacings. The applicant has added a water connection for the proposed community building, but had not shown a sewer connection or other utilities. The applicant has revised note #4 on sheet 12 to have the contractor verify proposed utility locations with appropriate utility providers prior to construction.

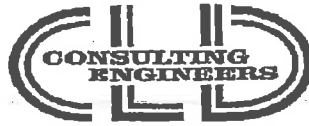
- d. *Former CLD Comment: Env-Wq 704.07 (e) The applicant has proposed 2-inch SDR 21 PVC which does not comply with minimum size specified by NHDES for 28 units.*

**Current CLD Comment:** The applicant has revised the size of the proposed pipe to 3-inch SDR 21 PVC but there are still plan note references to 2" pipe on sheet 13 that should be updated.

- g. *Former CLD Comment: The applicant should review the placement of the label "6" PVC" to verify that it is intended to relate to the sewer. The applicant should also confirm that if 6" PVC is an accurate representation of the existing sewer in Belknap and Gordon Streets, that there is adequate capacity to accept the new flow.*

**Current CLD Comment:** The applicant has revised the size of the existing sewer main on Belknap Road from 6" to 8". The applicant should confirm that the existing main has adequate capacity to accept the new flow from Cobblestone Drive.

- i. *Former CLD Comment: If all force mains are designed to discharge into proposed SMH*



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
 March 16, 2015  
 Page - 3

*#8, the applicant should confirm that there is adequate capacity in the manhole and that scour will not be a problem.*

**Current CLD Comment:** The applicant has noted that there is an 18" drop within the manhole to prevent scour from the high velocities, and that the sewer service will be an 8" sewer line that matches what exists on Belknap Road. Our understanding is that NHDES requires a minimum 24" drop within sewer manholes.

The following items require Town input:

**1. Site Plan Review Codes**

- a. *Former CLD Comment: HR 275-8.B. (17) The applicant has shown one temporary benchmark on the plan set, but has not referenced the survey to a specific United States Geological Survey (USGS) benchmark. The applicant has noted a horizon datum of NAD 83 and vertical datum NGVD 29.*

**Current CLD Comment:** The applicant has revised a plan note relating the benchmark to a NHDOT disk located on Wason Road, but has not provided a specific correlation to a USGS benchmark.

- b. HR 275-8.B. (30) The applicant has not provided an off-street loading area but we note the site is proposed for residential use.
- e. HR 275-9.C. The applicant has noted on the plan set that a waiver from the Noise Study requirement is requested.
- f. HR 275-9.D. The applicant has noted on the plan set that a waiver from the Fiscal and Environmental Impact Study requirement is requested.
- h. HR 275-9.F. Copies of any deeds or easements were not received for review as part of the package.

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

- a. *Former CLD Comment: HR 193-10.A. and D. The applicant should consider revising the proposed driveway entrance. The proposed entrance is extremely close to the existing 131 Belknap Road driveway and the existing utility pole could limit sight distance. As the site is intended for an elderly community, the immediately adjacent driveways could be cause for confusion.*

**Current CLD Comment:** The applicant has stated that the location of the proposed driveway is the only location on the parcel where 400' of all-season sight distance can be achieved to the southern direction, and that their design *could not achieve an intersection directly opposite Gordon Street*. It appears that a 400' southern sight distance cannot be achieved from a location opposite Gordon Street without going through private property on the west side of Belknap Road. The applicant has also added the utility pole to the Site Distance Plan to show that it is not a visual impairment to sight distance to the south.

- d. The applicant proposed bituminous curbing along both sides of the road.



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
 March 16, 2015  
 Page - 4

### 3. Utility Design/Conflicts (HR 275-9.E.)

- c. *Former CLD Comment: Env-Wq 703.07 (a) (6) Since the sewer will serve more than one building, the project must be reviewed by New Hampshire Department of Environmental Service (NHDES) prior to issuance of a Sewer Connection Permit. The applicant will need to provide pump and system force main calculations and address if flow rate at the end of the run is sufficient to provide minimum cleansing velocity.*

**Current CLD Comment:** The applicant has noted that a Sewer Connection Permit is pending with the NHDES, and that pump and system force main calculations will be provided to the Engineering Department and NHDES prior to construction. The applicant also noted that the Town's Engineer requested that the design be reviewed by a third party to ensure proper design. We recommend that the package be reviewed and approved by the Town prior to final plan approval.

- h. *Former CLD Comment: The applicant has proposed individual grinder pump systems for each lot but has not shown the grinder pump vault's relative locations to the proposed structures. We were also unable to find a pump vault detail in the plan set.*

**Current CLD Comment:** The applicant has stated that the individual grinder pump chambers are located just outside the proposed buildings, are 24" in diameter and 8' deep. The applicant stated that these locations and pump details have yet to be designed as these will be designed by others. Details and specifications will be furnished to the Town of Hudson Engineering Department prior to construction. We continue to recommend that additional details regarding the overall concept of the system be provided and reviewed prior to final plan approval.

- p. *Former CLD Comment: The applicant has noted that the proposed water main shall become property of the Town of Hudson Water Utilities after installation and the on-site sewer will remain privately owned. The Town should confirm their acceptance of this arrangement.*

**Current CLD Comment:** The Town should confirm that they will accept ownership of the proposed water utilities.

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

- b. The applicant should keep the Town informed of all communication with NHDES in relation to the Alteration of Terrain (AoT) Permit, and Wetland Permit being requested to ensure NHDES comments do not alter drainage design/calculations.

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

- a. *HR 290-9.B. The applicant has noted the need for a Stormwater Pollution Prevention Plan (SWPPP) and filing a Notice of Intent (NOI) in accordance with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit.*
- b. *The applicant has noted that the NHDES AoT Permit is pending.*
- c. *The applicant has noted that the NHDES Sewer Connection Permit is pending.*
- d. *Additional local permitting may be required.*



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
 March 16, 2015  
 Page - 5

## 8. Other

b. *The applicant has noted proposed snow storage will be along both sides for the roadway, that limited salt will be used and that snow shall be removed from the site if these areas become full.*

g. *Former CLD Comment: The applicant should confirm that the retaining wall to be "designed by others" will be designed by a professional engineer registered in New Hampshire. The applicant's Redi-Rock Retaining Wall with Pedestrian Railing Details show guardrail proposed; however, no guardrail is shown on the plans. The applicant should update the plans and provide a detail for the guardrail.*

**Current CLD Comment:** The applicant has revised the retaining wall detail to include "force protection" instead of pedestrian safety railing or guardrail. Note 4.4.a requires the wall be designed by a qualified PE licensed in New Hampshire. The Town should confirm they are satisfied with this approach.

The following items have been resolved or have no further CLD input:

### 1. Site Plan Review Codes

- c. HR 275-9.A. See comments below.
- d. HR 275-9.B. See comments below.
- g. HR 275-9.E. See comments below.
- i. HR 275-9.G. See comments below.

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

b. *Former CLD Comment: HR 193-10.E. The applicant has noted 400 feet of safe all-season sight distances along Belknap Road, provided proposed bush clearing is completed during construction. However, there appear to be several large trees on the west side of Belknap Road that are needed to be removed for the safe sight distance line to the south.*

**Current CLD Comment:** The applicant has revised the note regarding brush clearing to include tree removal within the ROW to establish this sight distance. No further CLD comment.

c. *HR 275-9.B. Traffic Study Review Comments – We have reviewed the site plan as well as the Traffic Impact Study prepared by GPI for this project and have the following comments:*

- 1) *The traffic study provides a reasonable estimate and evaluation of the projected traffic impacts of the proposed 28-unit residential development on the adjacent street network. We concur with the general finding that the proposed development should have minimal impact on traffic operations in the vicinity of the site, provided the recommendation of clearing of existing vegetation along the existing right-of-way on the west side of Belknap Road south of the site to ensure appropriate sight lines to and from the proposed private roadway are implemented.*



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
 March 16, 2015  
 Page - 6

- e. *Former CLD Comment: The applicant has proposed a 5-foot-wide bituminous concrete sidewalk on the plan; however, the Bituminous Curb Type B with Bituminous Sidewalk Detail shows a 4-foot-wide sidewalk and the Typical Private Roadway Section does not show the proposed sidewalk at all.*

Current CLD Comment: The applicant has revised the sidewalk detail and typical sections to match the proposed 5' sidewalk. No further CLD comment.

- f. *Former CLD Comment: The applicant has not provided a Typical Driveway Detail.*

Current CLD Comment: The applicant has provided a typical driveway detail and cross section on sheet 22. No further CLD comment.

### 3. Utility Design/Conflicts (HR 275-9.E.)

- b. *Former CLD Comment: The proposed class of water pipe should be added to the plan set.*

Current CLD Comment: The applicant has noted on the plans that class 52 water pipe shall be used. No further CLD comment.

- e. *Former CLD Comment: The applicant should review the Typical 1-inch Service and Valve Box Installation Detail to confirm that the detail complies with the latest Town of Hudson/Pennichuck Water Works requirements.*

Current CLD Comment: The applicant has revised the referenced detail to note compliance with Pennichuck Water Works requirements. No further CLD comment.

- f. *Former CLD Comment: The applicant should propose a sewer manhole at the intersection of the existing Belknap Road sewer main and the proposed 8-inch sewer main from Cobblestone Drive for the proposed sewer connection.*

Current CLD Comment: The applicant has added proposed Sewer Manhole #2 on the existing Belknap Road sewer main to accommodate the new sewer from Cobblestone Drive. No further CLD comment.

- j. *Former CLD Comment: The applicant noted with a leader to STA. 3+70 on Sheet 12 for reader to "See Note 7;" however, we were unable to find a relevant Note 7.*

Current CLD Comment: The applicant has corrected the reference. No further CLD comment.

- k. *Former CLD Comment: The applicant should review the design of the water main on Sheet 13. The applicant should provide documentation demonstrating that routing it under a mini-detention pond to a dead-end hydrant will not result in freezing of the water main or other potential future problems. If this configuration remains, the applicant should provide a profile for this section of water.*

Current CLD Comment: The applicant has relocated the water main from under the detention pond. No further CLD comment.

- l. *Former CLD Comment: The applicant should review the close proximity of the water valve to the hydrant near Unit 28 as it is close to the proposed gas line.*



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
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Current CLD Comment: The applicant has relocated the water valve away from the proposed gas line. No further CLD comment.

- m. *Former CLD Comment: The applicant has shown several water shut-offs located within the proposed sidewalk. This is contradictory to the Service Detail on Sheet #25.*

Current CLD Comment: The applicant has relocated the water shut-offs out of the propose sidewalk. No further CLD comment.

- n. *Former CLD Comment: The applicant has not shown water shutoffs for any buildings on Sheet 13.*

Current CLD Comment: The applicant has added water shutoffs for all buildings on Sheet 13. No further CLD comment.

- o. *Former CLD Comment: The applicant has proposed hydrants that are spaced nearly 800 feet apart. The Fire Department should confirm that they have reviewed this proposal.*

Current CLD Comment: The applicant has added a fire hydrant between buildings #21 and #22 per comment from the Hudson Fire Department. No further CLD comment.

- q. *Former CLD Comment: The applicant should relocate the hydrant valve at STA 10+15 designed to fall on the proposed curblin.*

Current CLD Comment: The applicant has relocated this hydrant valve so that it no longer conflicts with the curb. No further CLD comment.

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

- a. *Former CLD Comment: HR 275-9.A(1) "All drainage shall be designed to achieve a zero increase in runoff for both peak and volume where practicable, except where the off-site drainage system has been designed to accommodate the site drainage." Although the rates are reduced, we note there is nearly a 40% increase in volume for the 10-year, 35% for the 25-year, and 30% for the 50-year storm event to the southern wetlands analysis point. The applicant should provide documentation proving that the additional volume to the wetland will not adversely affect the wetland or any property owner adjacent to the wetland.*

Current CLD Comment: The applicant has provided additional information that adequately addresses this comment. No further CLD comment.

- c. *Former CLD Comment: We note the "Infiltration Feasibility Report" within the AoT Application states Test Pit #101 while the plan set and detail sheet illustrates (what is assumed to be) Test Pit 3. The applicant should coordinate the labels.*

Current CLD Comment: The applicant has coordinated the labels as requested. No further CLD comment.

- d. *Former CLD Comment: The applicant should coordinate the Outlet Devices from Pond 18P: Wet Pond-1 within the AoT Application with the Outlet Structure Detail on Sheet 22 of the plan set.*



Mr. John Cashell, Town Planner  
 CLD Reference No. 03-0249.1460  
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Current CLD Comment: The applicant has coordinated the plan detail. No further CLD comment.

- e. *Former CLD Comment: The applicant should revise the proposed Precast Reinforced Drain Manhole Detail as the base should be 8 inches thick and the reducer section should be a minimum of 3 feet.*

Current CLD Comment: The applicant has revised the detail as requested. No further CLD comment.

- f. *Former CLD Comment: The applicant should coordinate the Catch Basin Base Detail as it shows a 5-inch base and the Town prefers 6-inch bases.*

Current CLD Comment: The applicant has coordinated the detail as requested. No further CLD comment.

- g. *Former CLD Comment: The applicant provided an Underdrain Detail; however, has not indicated on the plans or the Typical Private Roadway Section Detail where it is intended to be used.*

Current CLD Comment: The applicant has added an underdrain detail to the Typical Private Roadway Section detail and shown it on the roadway profile. No further CLD comment.

#### 5. Erosion Control/Wetland Impacts

- *Former CLD Comment: The applicant provided a detail for a Hay Bale Barrier; however, we were unable to find the intended location(s) on the plans.*

Current CLD Comment: The applicant has removed hay bale barriers from the plan set, and has noted that the form of erosion control has been switched from silt fence to Silt Soxx due to New Hampshire Fish and Game comments regarding rare snakes. No further CLD comment.

#### 6. Landscaping (HR 275-8B (31))

- *Former CLD Comment: The applicant should clarify the intent of the clearing limits on the northwest side of the site. The proposal appears to install silt fence beyond the clearing limits depicted on the plan.*

Current CLD Comment: The applicant has revised the location of the proposed erosion controls. No further CLD comment.

#### 8. Other

- a. *Former CLD Comment: HR 275-8.B. (35) The applicant has not shown any detectable warning devices to be installed*

Current CLD Comment: The applicant has added detectable warning devices at the proposed crosswalk and added a detail to the plans. No further CLD comment.

- c. *Former CLD Comment: The applicant should coordinate the curb reveal intent on the Sidewalk Ramp Detail, the Bituminous Curb Type B, and with Bituminous Sidewalk*





Mr. John Cashell, Town Planner  
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*Detail.*

**Current CLD Comment:** The applicant has revised the Sidewalk Ramp Detail to show 4" curb reveal to match the other details. No further CLD comment.

- d. *Former CLD Comment:* The applicant should provide a typical detail for the proposed crosswalk.

**Current CLD Comment:** The applicant has added a crosswalk detail on plan sheet 21. No further CLD comment.

- e. *Former CLD Comment:* The applicant should label the intent for the pavement for the community building.

**Current CLD Comment:** The applicant has added a note for the Community building parking spaces. No further CLD comment.

- f. *Former CLD Comment:* The applicant has not provided information on how solid waste will be collected from the site.

**Current CLD Comment:** The applicant has noted that trash will be collected by private curb side pickup. No further CLD comment.

Please feel free to call if you have any questions.

Very truly yours,

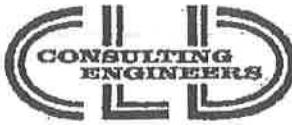
Heidi J. Marshall, P.E.

Paul Konieczka, AICP

HJM/PK:mjt

Enclosure

cc: Town of Hudson Engineering Division – File  
Keach-Nordstrom Associates, Inc.  
10 Commerce Park North, Suite 3B  
Bedford, NH 03110  
Fax (603) 627-2915



540 Commercial Street Manchester, NH 03101  
(603) 668-8223 • Fax: (603) 668-8802  
[cld@cldengineers.com](mailto:cld@cldengineers.com) • [www.cldengineers.com](http://www.cldengineers.com)  
New Hampshire • Vermont • Maine

**TO:** File

**FROM:** Heidi J. Marshall, PE *HJM*

**DATE:** March 16, 2015

**RE:** Town of Hudson Planning Board Review  
Cobblestone Village (Site Plan), 137 Belknap Road  
Tax Map 184, Lot 27; Acct. #1350-857  
CLD Reference No. 03-0249.1460

The following list itemizes the second set of documents reviewed related to the current Cobblestone Village (Site Plan) review comments.

- Letter of Transmittal from the Keach-Nordstrom Associates, Inc. (KNA) to CLD, dated and received March 9, 2015, including the following:
  1. Copy of Letter from KNA to the Town of Hudson, dated March 9, 2015.
  2. Copy of *Residential Site Plan, Cobblestone Village, 137 Belknap, Map 184, Lot 27, Hudson, New Hampshire* Plan Set, prepared by KNA (or as noted), dated January 23, 2015, revised March 5, 2015, including the following:
    - a. Cover Sheet.
    - b. *Master Plan*, Sheet 1 of 28.
    - c. *Existing Conditions Plan*, Sheets 2 and 3 of 28.
    - d. *Removals/Demolition Plan*, Sheets 4 and 5 of 28.
    - e. *Residential Site Layout Plan*, Sheets 6 and 7 of 28.
    - f. *Grading and Drainage Plan*, Sheets 8 and 9 of 28.
    - g. *Erosion Control Plan*, Sheets 10 and 11 of 28.
    - h. *Utility Plan*, Sheets 12 and 13 of 28.
    - i. *Landscape Plan*, Sheets 14 and 15 of 28.
    - j. *Lighting Plan*, Sheets 16 and 17 of 28, prepared by Charron Inc.
    - k. *Roadway Profile*, Sheets 18 and 19 of 28.
    - l. *Sight Distance Plan and Profile*, Sheet 20 of 28.
    - m. *Construction Details*, Sheets 21 and 28 of 28.

HJM:mjt

cc: John Cashell – Town of Hudson Planner  
Town of Hudson Engineering Division – File

*emd/md 3/16/15*



KEACH-NORDSTROM ASSOCIATES, INC.

PACKET 3/25/15  
C

John

March 9, 2015

Mr. John Cashell, Town Planner  
Town of Hudson  
12 School Street  
Hudson, New Hampshire 03051

**Subject: Cobblestone Village – Deer Creek Development, LLC  
Map 184; Lot 27, Belknap Road, Hudson, NH  
KNA Project No. 14-0721-1**



Dear Mr. Cashell:

Our office is in receipt of review comments prepared by CLD Consulting Engineers, dated February 24, 2015 and comments from the Town Engineer via email dated February 12, 2015. Attached under this cover are revised site plans which we believe address all of the comments as listed below. Under each of the comments listed, we offer a brief explanation of our efforts to address the concern, to ease in your review of the same.

**CLD Comments**

**1. Site Plan Review Codes**

- a. HR 275-8.B.(17) The applicant has shown one temporary benchmark on the plan set, but has not referenced the survey to a specific United States Geological Survey (USGS) benchmark. The applicant has noted a horizontal datum of NAD 83 and vertical datum NGVD 29.

*Additional information relating the site to a specific bench mark was added to plan sheet 1, note #11.*

- b. HR 275-8.B.(30) The Applicant has not provided an off-street loading area but we note the site is proposed for residential use.

*No response required.*

- c. HR 275-9.A. See comments below.

*No response required.*

- d. HR 275-9.B. See comments below.

*No response required.*

- e. HR 275-9.C. The applicant has noted on the plan set that a waiver from the Noise Study requirement is requested.

*No response required.*

- f. HR 275-9.D. The applicant has noted on the plan set that a waiver from the Fiscal and Environmental Impact Study requirement is requested.

*No response required.*

- g. HR 275-9.E. See comments below.

*No response required.*

- h. HR 275-9.F. Copies of any deeds or easements were not received for review as part of the package.

*No response required.*

- i. HR 275-9.G. See comments below.

*No response required.*

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

- a. HR 193-10.A, and D. The applicant should consider revising the proposed driveway entrance. The proposed entrance is extremely close to the existing 131 Belknap Road driveway and the existing utility pole could limit sight distance. As the site is intended for an elderly community, the immediately adjacent driveways could be cause for confusion.

*The proposed driveway is located at the only location on the parcel to achieve 400' of all season sight distance to the southern direction. Moving the driveway north would create less than the minimum required sight distance and would also create conflicting turning movements with Gordon Street. Our design could not achieve an intersection directly opposite of Gordon Street therefore positioned the driveway far enough away to meet the minimum 125' while obtaining appropriate sight distance.*

*The site will contain a street sign, granite curbing, and a pronounced development sign indicating the entrance to the community. This will provide enough differentiation between the existing 12' driveway and the 24' proposed entrance.*

*The existing utility pole was added to sheet 20 to indicate there will be no visual impairment to sight distance.*

- b. HR 193-10.E. The applicant has noted 400 feet of safe all-season sight distances along Belknap Road, there appear to be several large trees on the west side of

Belknap Road that are needed to be removed for the safe sight distance line to the south.

*The note on sheet 20 was revised to indicate not only brush to be trimmed, but also trees to be cut. In a conversation with Kevin Burns, the Road Agent for the Town, he confirmed the applicant's ability to cut several trees within the Belknap Road right-of-way. We will trim back only the necessary amount to achieve the required 400' of sight distance.*

- c. HR 275-9.B. Traffic Study Review Comments- We have reviewed the site plan as well as the Traffic Impact Study prepared by GPI for this project and have the following comments:

- 1) The traffic study provides a reasonable estimate and evaluation of the projected traffic impacts of the proposed 28-unit residential development on the adjacent street network. We concur with the general finding that the proposed development should have minimal impact on traffic operations in the vicinity of the site, provided the recommendation of clearing of existing vegetation along the existing right-of-way on the west side of Belknap Road south of the site to ensure appropriate sight lines to and from the proposed private roadway are implemented.

*No response required.*

- 2) From GoogleMaps street view, we note that there is an existing Horizontal Alignment Warning sign (W1-2R) facing southbound traffic mounted on the utility pole across from the proposed site roadway, but there is not a corresponding sign in the northbound direction. A combination Horizontal Alignment/Intersection sign (W1-10 series) that depicts the presence of both Gordon Street and Cobblestone Drive beyond the curve should be considered for northbound traffic.

*The existing Horizontal Alignment Warning sign (W1-2R) facing southbound traffic mounted on the utility pole across from the proposed site roadway is shown below.*



*Contrary to the statement regarding no sign northbound, we were able to find a Horizontal Alignment Warning sign (W1-2L) facing northbound located on a utility pole from GoogleMaps street view. The photo is located below. We are willing to replace the existing sign for a W1-10aL sign that indicates the turn in the road along with our proposed driveway. Labels have been added to sheet 1 as well as a detail to sheet 21.*



- d. The applicant proposed bituminous curbing along both sides of the road.

*No response required.*

- e. The applicant has proposed a 5-foot-wide bituminous concrete sidewalk on the plan; however, the Bituminous Curb Type B with Bituminous Sidewalk Detail shows a 4-foot-wide sidewalk and the Typical Roadway Section does not show the proposed sidewalk at all.

*The details were revised to show a 5' sidewalk throughout the entire plan set.*

- f. The applicant has not provided a Typical Driveway detail.

*A typical driveway detail has been provided on sheet 22.*

- g. The applicant has shown the bituminous curb stopping abruptly at the right-of-way line. Since the configuration can easily be damaged by plows and vehicles, we suggest that the applicant review other configurations.

*The existing configuration was revised to include granite curbing ending at the edge of existing pavement along Belknap Road. Labels were added to sheet 6 as well as details to sheet 21. This proposed configuration should prevent damage by plows and vehicles.*

### **3. Utility Design/Conflicts (HR 275-9.E.)**

- a. HR 275-9.E. The applicant has not provided 10 feet of separation between the water and the sewer services to unit 9. The applicant provided underground utility and gas line locations; however, did not show individual unit service connections. The applicant not shown any service connections to the proposed community building (water, sewer, gas, etc.).

*Unit #9's connections were revised to achieve 10' separation. Proposed service connections for gas and underground utilities are subject to change per final design from the corresponding utility provider therefore were not put on the plans. A water connection is shown to the community building on the revised plan. Note #4 on sheet 12 has been revised to have the contractor verify proposed locations with appropriate utility provider prior to construction.*

- b. The proposed class of water pipe should be added to the plan set.

*Class 52 D.I. pipe was added to the plan.*

- c. Env-Wq 703.07 (a) (6) Since the sewer will serve more than one building, the project must be reviewed by New Hampshire Department of Environmental Service (NHDES) prior to issuance of a Sewer Connection Permit. The applicant will need to

provide pump and system force main calculations and address if flow rate at the end of the run is sufficient to provide minimum cleansing velocity.

*A Sewer Connection Permit is pending with NHDES. Pump and system force main calculations will be provided to the Engineering Department and NHDES prior to construction. The Town's Engineer has also requested that this design be reviewed by a third party to ensure proper design.*

- d. Env-Wq 704.07 (e) The applicant has proposed 2-inch SDR 21 PVC which does not comply with minimum size specified by the NHDES for 28 units.

*Revised as requested.*

- e. The applicant should review the Typical 1-inch Service and Valve Box Installations Detail to confirm that the detail complies with the latest Town of Hudson/Pennichuck Water Works requirements.

*Revised as requested.*

- f. The applicant should propose a sewer manhole at the intersection of the existing Belknap Road sewer main and the proposed 8-inch sewer main from Cobblestone Drive for the proposed sewer connection.

*Revised as requested.*

- g. The applicant should review the placement of the label "6" PVC" to verify that it is intended to relate to the sewer. The applicant should also confirm that if "6" PVC" is an accurate representation of the existing sewer in Belknap and Gordon Streets, that there is adequate capacity to accept the new flow.

*Based upon further discussions with the town, it is in fact an 8" sewer main in Belknap Road.*

- h. The applicant has proposed individual grinder pump systems for each lot but has not shown the grinder pump vault's relative locations to the proposed structures. We were also unable to find a pump vault detail in the plan set.

*The individual pump grinder chamber is located just outside the buildings. The grinder chamber is only 24" in diameter, and 8' deep. The proposed exact location and pump vault details have yet to be designed as it is to be designed by others. These details and specifications will be furnished to the Town of Hudson Engineering Department prior to construction.*

- i. If all force mains are designed to discharge into proposed SMH #8, the applicant should confirm that there is adequate capacity in the manhole and that scour will not be a problem.



*Per Env-Wq-704.15 a sewer manhole shall be installed at the end of each force main. The force main connection detail on sheet 27, you will find an 18" drop within the man hole to prevent scour from the high velocities. The sewer service will be an 8" sewer line that matches what exists in Belknap Road.*

- j. The applicant noted with a leader to STA. 3+70 on sheet 12 for reader to "See Note 7;" however, we were unable to find a relevant Note 7.

*Note #7 has been revised to note #6.*

- k. The applicant should review the design of the water main on sheet 13. The applicant should provide documentation demonstrating that routing it under a mini-detention pond to a dead-end hydrant will not result in freezing of that water main or other potential future problems. If this configuration remains, the applicant should provide a profile for this section of water.

*Although we are not concerned with the freezing of a 5' deep water main under a bioretention pond, we have revised the plans to show the water main and services outside the bioretention pond.*

- l. The applicant should review the close proximity of the water valve to the hydrant near Unit 28 as it is close to the proposed gas line.

*Revised as requested.*

- m. The applicant has shown several water shut-offs located within the proposed sidewalk. This is contradictory to the Service Detail on Sheet #25.

*Water shut-offs have been removed from the sidewalk.*

- n. The applicant has not shown water shut-offs for any buildings on Sheet 13.

*Revised as requested.*

- o. The applicant has proposed hydrants that are spaced nearly 800 feet apart. The fire Department should confirm their acceptance of this arrangement.

*Comments from the Fire Department were received. The only comment that needed to be addressed was the addition of a fire hydrant between units #21 and #22.*

- p. The applicant has noted that the proposed water main shall become property of the Town of Hudson Water Utilities after installation and the on-site sewer will remain privately owned. The Town should confirm their acceptance of this arrangement.

*The town has accepted numerous projects that are synonymous to the proposed community i.e. Sparkling River and Oak Ridge.*

- q. The applicant should relocate the hydrant valve at STA 10+15 designed to fall on the proposed curbline.

*Revised as requested.*

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

- a. HR 275-9.A(1) "All drainage shall be designed to achieve a zero increase runoff for both peak and volume where practicable, except where the off-site drainage system has been designed to accommodate the site drainage." Although the rates are reduced, we note there is nearly a 40% increase in volume for the 10-year, 35% for the 25-year, and 30% for the 50-year storm event to the southern wetlands analysis point. The applicant should provide documentation proving that the additional volume to the wetland will not adversely affect the wetland or any property owner adjacent to the wetland.

*The stormwater report was tailored to meet current Alteration of Terrain requirements, including the method for determining the saturated hydraulic conductivity (Ksat) or infiltration rate of a soil. According to the state regulations, the default method for determining this is to use the SSSNNEE Special Publication No. 5 KSat Values for New Hampshire Soils. After a mandatory factor of safety of 2 is applied, this type of method yields conservative infiltration rates. DES applies these rates to the groundwater recharge requirements (Env-Wq 1507.04) and the channel protection requirements (Env-Wq 1507.05). However, DES does not evaluate flood storm events (10, 25, 50-yr, etc.) for volumetric increases. Rather, they only require peak runoff control for these storm events. In past conversations with NHDES, they acknowledged that matching volumes in the 25 and 50 year storm event would be a monumental task when using the default method for calculating Ksat rates. We have designed the current project to meet NHDES regulations for peak discharge and volume discharge.*

*The project lies between two large wetland complexes that intersect just downstream of the project and eventually into Merrill Brook. The numbers stated in the comment only analyzed the volume reaching Link A. However, this is not an accurate representation of the offsite volume due to Links A and B intersecting soon after the property line limits. When evaluating the wetlands together and the combined flow leaving the site, only an 8% increase in volume for the 10-year, 9% for the 25-year and 9% for the 50-year occurred. This only increases the depth of the wetlands on site by 0.6", 1.1", and 1.5" respectively to the aforementioned storm events. As previously mentioned, this volume is conveyed through a defined channel into Merrill Brook and eventually to Ottarnic Pond less than a mile downstream. These increases in volume will have no effect to the adjacent wetlands due to the size of the downstream wetland and the minimal increase.*

*The reason for reducing stormwater rates is to prevent flooding impacts downstream, erosion and transport of significant suspended solids and pollutants. This was achieved to the extent practicable with the proposed wet pond. The proposed project does not lend itself to being a large infiltration site due to amount the impermeable soils and ledge. The project was designed to meet the minimum required infiltration by the State therefore we do not feel it will have any adverse effect to the property owner downstream of the wetlands.*

- b. The applicant should keep the town informed of all communication with NHDES in relation to the Alteration of Terrain (AoT) Permit, and Wetland Permit being requested to ensure NHDES comments do not alter drainage design/calculations.

*We will keep the town informed regarding the Alteration of Terrain Permit however, a Wetland Permit has not been requested nor does one intend to be due to the project having no wetland or buffer impacts.*

- c. We note the "Infiltration Feasibility Report" within the AoT Application states Test Pit #101 while the plan set and detail sheet illustrates (what is assumed to be) Test Pit 3. The applicant should coordinate the labels.

*Revised as requested and will be resubmitted to AoT upon receiving of their comments.*

- d. The applicant should coordinate the Outlet Devices from Pond 18P: Wet Pond-1 within the AoT Application with the Outlet Structure Detail on Sheet 22 of the plan set.

*Revised as requested.*

- e. The applicant should revise the proposed Precast Reinforced Drain Manhole Detail as the base should be 8 inches thick and the reduced section should be a minimum of 3 feet.

*Revised as requested.*

- f. The application should coordinate the Catch Basin Base Detail as it shows a 5-inch base and the Town prefers 6-inch bases.

*Revised as requested.*

- g. The application provided an Underdrain Detail; however, has not indicated on the plans or the Typical Private Roadway Section Detail where it is intended to be used.

*Revised as requested.*

**5. Erosion Control/Wetland Impacts**

- a. The application provided a detail for a Hay Bale Barrier; however, we were unable to find the intended location(s) on the plans.

*Hay Bale barriers were removed from the plan set. It should also be noted that due to New Hampshire Fish and Game's comments regarding rare snakes, the form of erosion control has been switched from silt fence to Silt Soxx.*

**6. Landscaping (HR 275-9.G.)**

- a. The applicant should clarify the intent of the clearing limits on the northwest side of the site. The proposal appears to install silt fence beyond the clearing limits depicted on the plan.

*Revised as requested.*

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

- a. HR 290-9.B. The applicant has noted the need for a Stormwater Pollution Prevention Plan (SWPPP) and filling a notice of Intent (NOI) in accordance with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit.

*No response required.*

- b. The applicant has noted that the NHDES AoT Permit is pending.

*No response required.*

- c. The applicant has noted that the NHDES Sewer Connection Permit is pending.

*No response required.*

- d. Additional local permitting may be required.

*No response required.*

**8. Other**

- a. HR 275-8.B. (35) The applicant has not shown any detectable warning devices to be installed.

*Detectable warning devices have been added to the sidewalks at the crosswalk location.*

- b. The applicant has noted proposed snow storage will be along both sides for the roadway, that limited salt will be used and that snow shall be removed from the site if these areas become full.

*No response required.*

- c. The applicant should coordinate the curb reveal intent on the Sidewalk Ramp Detail, the Bituminous Curb Type B, and with Bituminous Sidewalk Detail.

*Revised as requested.*

- d. The applicant should provide a typical detail for the proposed crosswalk.

*A sidewalk detail was added to sheet 21.*

- e. The applicant should label the intent for the pavement for the community building.

*A label was added to sheet 7. A detail for the parking lot section is on sheet 21.*

- f. The applicant has not provided information on how solid waste will be collected from the site.

*Trash shall be collected via private, curb side trash pickup service. Note #36 was added to sheet 1.*

- g. The applicant should confirm that the retaining wall to be “designed by others” will be designed by a professional engineer registered in New Hampshire. The applicant’s Redi-Rock Retaining Wall with Pedestrian Railing Details show guardrail proposed; however, no guardrail is shown on the plans. The applicant should update the plans and provide a detail for the guardrail.

*The Redi-Rock Detail on sheet 26 was revised to be a Redi-Rock Force Protection detail. The detail indicates the wall to be designed by a qualified PE licensed in NH on note 4.4.a. This will provide a “guardrail like” force protection and also a pedestrian wall.*

### **Engineering Comments**

1. Add a sewer manhole at the intersection of existing 6” sewer main and proposed 8” sewer main (Belknap Road & Cobblestone Drive).

*Revised as requested.*

2. Proposed entrance is too close to the existing driveway (131 Belknap Road) and could create confusion for the elderly community. In addition the existing utility pole could be limiting the sight distance. Revise the location of the proposed stop bar or relocate the existing utility pole.

*The proposed driveway is located at the only location on the site to achieve 400’ of all season sight distance to the southern direction. Moving the driveway north would create less than the minimum required sight distance and would also create conflicting turning movements with Gordon Street. Our design could not achieve an intersection*

*directly opposite of Gordon Street therefore positioned the driveway far enough away to meet the minimum 125' while obtaining appropriate sight distance.*

*The site will contain a street sign, granite curbing, and a pronounced development sign indicating the entrance to the community. This will provide enough differentiation between the existing 12' driveway and the 24' proposed entrance.*

*The existing utility pole was added to sheet 20 to indicate there will be no visual impairment to sight distance. However, the proposed stop bar was moved ahead by 3' to help sight distance around the pole. The stop bar was not moved further ahead because of sight distance around the curvature in the road.*

3. Revise the following notes:  
A. Sheet 1 /28, note 20. Add: This road shall remain private after construction.

*Revised as requested in note 37 on sheet 1.*

- B. Sheet 1/28, note 26. Add: The drainage system and all its components will remain private.

*Revised as requested.*

- C. Sheet 12/28, note 6. Revise note to state. Final design shall be certified by a NH PE, reviewed by a third party at the expense of the developer and approved by the Town Engineer prior to Engineering Department signing off any building permits.

*Revised as requested.*

We trust the content of this response to CLD and Engineering comments and its attachments will serve to address their concerns as noted. Should you or they have any questions or require further information, please do not hesitate to contact our office.

Respectfully,



Brenton Cole  
Project Engineer

PACKET 3 / 25 / 15 **D**

PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27

Name of Project: Cobblestone Village

Zoning District: \_\_\_\_\_ General SP# 61-15  
(For Town Use) (For Town Use)

ZBA Action: \_\_\_\_\_



PROPERTY OWNER:

DEVELOPER:

Name: Deer Creek Development, LLC  
Address: 25 Flagstone Drive  
Address: Hudson, NH 03051  
Telephone # (978) 337-5835  
Fax # \_\_\_\_\_  
Email: deercreekllc@gmail.com

Same as owner  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT ENGINEER

SURVEYOR

Name: Patrick Colburn, P.E. (KNA)  
Address: 10 Commerce Park No. Suite 3  
Address: Bedford, NH 03110  
Telephone # (603) 627-2881  
Fax # (603) 627-2915  
Email: pcolburn@keachnordstrom.com

Anthony Basso, L.L.S. (KNA)  
10 Commerce Park No. Suite 3  
Bedford, NH 03110  
(603) 627-2881  
(603) 627-2915  
abasso@keachnordstrom.com

PURPOSE OF PLAN:

This project proposes the construction of a 28 unit, 55 and older housing community in Hudson, NH.

*For Town Use*

Plan Routing Date: 2-11-15 Sub/Site Date: 3-3-15 @ 10:00 AM

I have no comments  I have comments (attach to form)   
JOB Title: Deputy Fire Chief Date: 2/13/15  
(Initials)

DEPT:  
\_\_\_\_ Zoning \_\_\_\_\_ Engineering \_\_\_\_\_ Assessor \_\_\_\_\_ Police Fire \_\_\_\_\_ Planning  
\_\_\_\_ Consultant \_\_\_\_\_ Highway Department

Fees Paid: \_\_\_\_\_

**PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE**

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27  
 Name of Project: Cobblestone Village  
 Zoning District: \_\_\_\_\_ General SP# 01-15  
 (For Town Use) (For Town Use)  
 ZBA Action: \_\_\_\_\_



<u>PROPERTY OWNER:</u>	<u>DEVELOPER:</u>
Name: <u>Deer Creek Development, LLC</u>	<u>Same as owner</u>
Address: <u>25 Flagstone Drive</u>	_____
Address: <u>Hudson, NH 03051</u>	_____
Telephone # <u>(978) 337-5835</u>	_____
Fax # _____	_____
Email: <u>deercreekllc@gmail.com</u>	_____

<u>PROJECT ENGINEER</u>	<u>SURVEYOR</u>
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<i>For Town Use</i>	
Plan Routing Date: <u>2-11-15</u>	Sub/Site Date: <u>3-3-15 @ 10:00 AM</u>
<input type="checkbox"/> I have no comments <input checked="" type="checkbox"/> I have comments (attach to form)	
<u>KND</u> (Initials)	Title: <u>Zoning Administrator</u> Date: <u>3-18-15</u>
Use is allowed by site Plan approval by Planning Board	
DEPT: <input checked="" type="checkbox"/> Zoning <input type="checkbox"/> Engineering <input type="checkbox"/> Assessor <input type="checkbox"/> Police <input type="checkbox"/> Fire <input type="checkbox"/> Planning <input type="checkbox"/> Consultant <input type="checkbox"/> Highway Department	
Fees Paid: _____	





# TOWN OF HUDSON

## FIRE DEPARTMENT

39 FERRY STREET, HUDSON, NEW HAMPSHIRE 03051



Emergency 911  
Business 603-886-6021  
Fax 603-594-1164

Robert M. Buxton  
Chief of Department

TO: John M. Cashell  
Town Planner

FR: John J. O'Brien  
Deputy Fire Chief

DT: February 13, 2015

RE: Site Plan Review for Cobblestone Village Map 184 Lot 27

---

These comments are regarding the site plan review from the Hudson Fire Department regarding The above referenced development

Street Name: The proposed street name "Cobblestone Drive" is acceptable to the Fire department.

Addressing: Addressing of each building must be approved by the Hudson Fire Department prior to issuance of a building permit.

Hydrant Locations: In addition to the two hydrants currently proposed, one additional hydrant will be required. This shall be located between Lot 20 and 21. The location is marked on Sheet 12

NFPA 1 Sec 18.4.5.1 Fire Flow requirements for one and two family dwellings

"The minimum fire flow and flow duration requirement for one and two family dwellings having a flow area that does not exceed 5000 sq.ft. shall be 1000 GPM."

The hydrants installed must provide the above flow before the introduction of flammables to the site.

Site Access: NFPA 1 sec 5.2.2 states "Every dead end roadway of more than 300 feet in length shall be provided at the closed end with a turnaround having not less than 120 feet outside diameter of traveled way. The cul-de-sac shall meet those requirements

Town of Hudson Land use regulations Ch 289-18 B (2) Radial Turnaround requires the right of way radius to be 75 feet. The outside edge shall be 65 feet. Please conform to these minimum requirements.

Town of Hudson Land Use regulations Ch 289-18 B (F) Grades of all streets shall conform in general with the terrain, so far as practical, not to exceed 4% for major streets and 7% for minor streets.

If I can be of any further assistance feel free to call or e mail [jobrien@hudsonnh.gov](mailto:jobrien@hudsonnh.gov)

John J. O'Brien  
Deputy Fire Chief

**PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE**

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27  
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 (For Town Use) (For Town Use)  
 ZBA Action: \_\_\_\_\_



<u>PROPERTY OWNER:</u>	<u>DEVELOPER:</u>
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Address: <u>25 Flagstone Drive</u>	_____
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Telephone # <u>(978) 337-5835</u>	_____
Fax # _____	_____
Email: <u>deercreekllc@gmail.com</u>	_____

<u>PROJECT ENGINEER</u>	<u>SURVEYOR</u>
Name: <u>Patrick Colburn, P.E. (KNA)</u>	<u>Anthony Basso, L.L.S. (KNA)</u>
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*For Town Use*

Plan Routing Date: 2-11-15 Sub/Site Date: 3-3-15 @ 10:00 AM

I have no comments  I have comments (attach to form) Csee email.

EZD Title: TOWN Engineer Date: 1/13/15  
 (Initials)

DEPT:  Zoning  Engineering  Assessor  Police  Fire  Planning  
 Consultant  Highway Department

Fees Paid: \_\_\_\_\_

## Lavoie, Pam

---

**From:** Dhima, Elvis  
**Sent:** Thursday, February 12, 2015 1:47 PM  
**To:** Cashell, John  
**Cc:** Buxton, Robert; O'Brien, John; Burns, Kevin; Patrick Colburn; Heidi Marshall; Lavoie, Pam; Forrence, Jess; Stickney, Doreena  
**Subject:** Cobblestone Village Development

John

Below are a few comments regarding the development listed above:

1. Add a sewer manhole at the intersection of existing 6" sewer main and proposed 8" sewer main (Belknap Road & Cobblestone Drive).
2. Proposed entrance is too close to the existing driveway (131 Belknap Road) and could create confusion for the elderly community. In addition the existing utility pole could be limiting the sight distance. Revise the location of the proposed stop bar or relocate the existing utility pole.
3. Revise the following notes:
  - A. Sheet 1 /28 , note 20. Add : This road shall remain private after construction.
  - B. Sheet 1/28, note 26. Add : The drainage system and all its components will remain private.
  - C. Sheet 12/28, note 6. Revise note to state. Final design shall be certified by a NH PE , reviewed by a third party at the expense of the developer and approved by the Town Engineer prior to Engineering Department signing off an any building permits.

My recommendation to the planning Board at this time would be to approve this development with the stipulation that all the comments listed above be addressed at the Engineering Department's satisfaction.

Thank you

Elvis

***Elvis Dhima, P.E.***  
***Town Engineer***

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



**PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE**

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27  
 Name of Project: Cobblestone Village  
 Zoning District: \_\_\_\_\_ General SP# 01-15  
 (For Town Use) (For Town Use)  
 ZBA Action: \_\_\_\_\_



<u>PROPERTY OWNER:</u>	<u>DEVELOPER:</u>
Name: <u>Deer Creek Development, LLC</u>	<u>Same as owner</u>
Address: <u>25 Flagstone Drive</u>	_____
Address: <u>Hudson, NH 03051</u>	_____
Telephone # <u>(978) 337-5835</u>	_____
Fax # _____	_____
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<u>PROJECT ENGINEER</u>	<u>SURVEYOR</u>
Name: <u>Patrick Colburn, P.E. (KNA)</u>	<u>Anthony Basso, L.L.S. (KNA)</u>
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Email: <u>pcolburn@keachnordstrom.com</u>	<u>abasso@keachnordstrom.com</u>

**PURPOSE OF PLAN:**  
 This project proposes the construction of a 28 unit, 55 and older housing community  
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<i>For Town Use</i>	
Plan Routing Date: <u>2-11-15</u>	Sub/Site Date: <u>2-3-15 @ 10:00 AM</u>
I have no comments _____ I have comments (attach to form)	
(Initials) <u>[Signature]</u> Title: <u>Asst. Assessor</u> Date: <u>2-17-15</u>	
DEPT: _____ Zoning _____ Engineering _____ <u>Assessor</u> _____ Police _____ Fire _____ Planning _____ _____ Consultant _____ Highway Department	
Fees Paid: _____	

**PRELIMINARY & FINAL SITE PLAN APPLICATION  
FOR PLAN REVIEW (Also for Wireless)  
TOWN OF HUDSON, NEW HAMPSHIRE**

Date of Application: 02/09/2015 Tax Map # 184 Lot # 27

Name of Project: Cobblestone Village

Zoning District: \_\_\_\_\_ General SP# 01-15  
(For Town Use) (For Town Use)

ZBA Action: \_\_\_\_\_



PROPERTY OWNER:

DEVELOPER:

Name: Deer Creek Development, LLC

Same as owner

Address: 25 Flagstone Drive

Address: Hudson, NH 03051

Telephone # (978) 337-5835

Fax # \_\_\_\_\_

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in Hudson, NH.

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Plan Routing Date: 2-11-15 Sub/Site Date: 3-3-15 @ 10:00 AM

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

(Initials) Title: LIEUTENANT TRAFFIC REVIEW Date: 2/14/15

DEPT: \_\_\_\_\_ Zoning \_\_\_\_\_ Engineering \_\_\_\_\_ Assessor  Police \_\_\_\_\_ Fire \_\_\_\_\_ Planning \_\_\_\_\_  
\_\_\_\_\_ Consultant \_\_\_\_\_ Highway Department

Fees Paid: \_\_\_\_\_

PACKET 3/25/15

**TRAFFIC IMPACT AND ACCESS STUDY**

**RESIDENTIAL DEVELOPMENT  
HUDSON, NEW HAMPSHIRE**

**GPI**

**GPI**

**181 BALLARDVALE STREET, SUITE 202  
WILMINGTON, MASSACHUSETTS 01887  
(978) 570-2999**

**PREPARED FOR:**

**DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NEW HAMPSHIRE 03051**

**FEBRUARY 2015**

*Traffic Impact and Access Study  
Residential Development  
Hudson, New Hampshire  
February 2015*

## TECHNICAL MEMORANDUM

---

**REF:** MAX-2014089

**DATE:** February 3, 2015

**TO:** Mr. Jack Lougee  
Deer Creek Development, LLC  
25 Flagstone Drive  
Hudson, New Hampshire 03051

**FROM:** Ms. Heather L. Monticup, P.E., Project Manager  
Ms. Susannah E. Barnes, E.I.T., Engineer

**RE:** Traffic Impact and Access Study  
Residential Development  
137 Belknap Road – Hudson, New Hampshire

---

### INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed residential subdivision to be located at 137 Belknap Road in Hudson, New Hampshire. The development consists of razing the existing home and constructing a 28-unit, 55 and older, residential detached condominium development. Access is proposed to be provided via one driveway on Belknap Road, 172 feet south of Gordon Street, center-to-center. Figure 1 shows the site in relation to the surrounding roadways.

**GPI** Greenman-Pedersen, Inc.

---

181 BALLARDVALE STREET, SUITE 202, WILMINGTON, MA 01887 TELEPHONE: (978) 570-2999 FACSIMILE: (978) 658-3044

*An Equal Opportunity Employer*



TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire



Figure 1  
Site Location Map

## **TRAFFIC IMPACT AND ACCESS STUDY**

---

Proposed Residential Development – Hudson, New Hampshire

### **EXISTING CONDITIONS**

#### **Study Area**

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and nearby intersections. In preparing this TIAS for the proposed project, the intersections of Belknap Road at the proposed site driveway and Gordon Street have been analyzed and evaluated.

#### **Belknap Road at Gordon Street**

Belknap Road is 1.2 miles in length, spanning from Central Street to Lowell Road (NH Route 3A). Gordon Street is a dead end roadway of approximately 500 feet. The intersection of Belknap Road at Gordon Street forms an unsignalized T-type intersection located west of the study area. Both roadways are maintained by the Town of Hudson. Belknap Road runs in the general northeast/southwest direction while Gordon Street intersects from the west running in the general east/west direction. Belknap Road consists of one free moving general-purpose lane in each direction while Gordon Street is STOP-controlled. Gordon Street is a residential dead-end roadway consisting of single-family homes having no pavement markings. Belknap Road consists of residential homes and undeveloped wooded areas with a posted speed limit of 30 miles per hour (mph). Crosswalks are not present across any approach of the intersection and sidewalks are not present along either roadway.

#### **Traffic Volumes**

Base traffic conditions within the study area were developed by conducting manual turning movement counts (TMCs) and vehicle classification counts in October 2014. The TMCs and vehicle classification counts were performed during the weekday AM peak period (7:00 to 9:00 AM) and weekday PM peak period (4:00 to 6:00 PM) at the study area intersection. Automatic traffic recorders (ATR) were used to obtain weekday daily traffic volumes on Belknap Road adjacent to the site in October 2014. Evaluation of the traffic-count data reveals that the weekday AM peak hour generally occurs between 7:15 and 8:15 AM and the weekday PM peak hour generally occurs between 4:15 and 5:15 PM. All traffic-count data are provided in the Appendix.

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

### Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. Based on New Hampshire Department of Transportation (NHDOT) guidelines for the preparation of a traffic study, existing traffic volumes must represent the peak of the monthly average peak-hour conditions. To determine if the data needed to be adjusted to account for this fluctuation, seasonal adjustment and historical traffic-count data provided by NHDOT were reviewed.<sup>1</sup> This information revealed that the October weekday traffic volumes are 4.0 percent lower than peak-month conditions. Additionally, this information indicated that the October traffic volumes represent the peak-month volumes during weekday AM peak period and are 1.2 percent lower than the peak-month conditions during the weekday PM peak period. Therefore, the October traffic counts were upwardly adjusted as needed to reflect peak-month conditions. The NHDOT seasonal adjustment factors are provided in the Appendix.

Table 1 summarizes the existing traffic volumes on Belknap Road and the 2014 Existing weekday AM and weekday PM peak-hour traffic-volume networks are shown on Figure 2.

**Table 1**  
**EXISTING TRAFFIC-VOLUME SUMMARY**

Location/Time Period	Daily Volume (vph) <sup>a</sup>	Peak Hour Volume (vph) <sup>b</sup>	K Factor (%) <sup>c</sup>	Directional Distribution <sup>d</sup>
<b>Belknap Road adjacent to the site:</b>				
<i>Weekday Daily</i>	5,620			
<i>Weekday AM peak hour</i>		382	6.8	55% SB
<i>Weekday PM peak hour</i>		427	7.6	72% NB

<sup>a</sup> In vehicles per day. ATR data upwardly adjusted by 4.0 percent to reflect monthly peak conditions.

<sup>b</sup> In vehicles per hour. Raw data not adjusted for the weekday AM peak hour and 1.2 percent upwardly adjusted for the weekday PM peak hour to reflect the monthly peak-hour conditions.

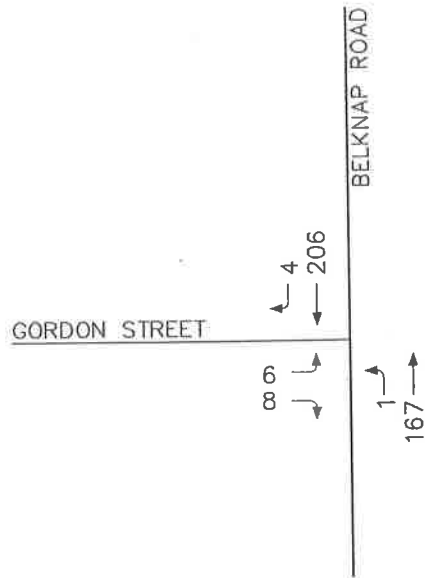
<sup>c</sup> Percentage of daily traffic occurring during the peak hour.

<sup>d</sup> NB = northbound, SB = southbound.

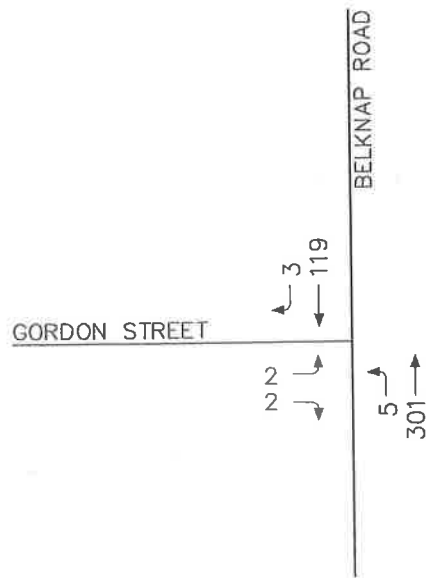
<sup>1</sup> *New Hampshire Department of Transportation Traffic Volume Report; Group 4 Averages—Urban Highways.*

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development - Hudson, New Hampshire



**WEEKDAY AM**



**WEEKDAY PM**



NOT TO SCALE

Figure 2

2014 Existing  
Peak Hour Traffic Volumes

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

### Collision History

Collision data for the study area intersection of Belknap Road at Gordon Street were obtained from the Hudson Police Department (2011 through 2013) and NHDOT (2008 through 2011) for the latest three years available. A summary of the Hudson Police Department and NHDOT collision data at the study area intersection and roadway segment is provided in Table 2.

**Table 2**  
**COLLISION HISTORY SUMMARY**

Location	Number of Crashes		Severity <sup>a</sup>			Percent During <sup>b</sup>	
	Total	Average per Year	PD	PI	F	Commuter Peak	Wet/Icy Conditions
Hudson Police Department (2011-2013)							
Belknap Road at Gordon Street	0	--	--	--	--	--	--
NHDOT (2008-2010)							
Belknap Road at Gordon Street	4	1.33	3	1	0	N/A	75%

Source: Hudson Police Department (2011-2013) and NHDOT Crash Data (2008-2010)

<sup>a</sup> PD = property damage only; PI = personal injury; F = fatality.

<sup>b</sup> Percent of vehicle incidents that occurred during the weekday AM and weekday PM commuter peak periods.

Based on the collision data provided, there are no collisions recorded at the intersection of Belknap Road and Gordon Street in the most recent three-year period (2011-2013). Based on data obtained from the NHDOT, the intersection of Belknap Road and Gordon Street has experienced four reported collisions between 2008 and 2010, averaging 1.33 collisions per year. No collisions occurred in 2008, one occurred in 2009, and three occurred in 2010. Of the reported four collisions, one resulted in injury, and three of the four collisions occurred during wet/icy conditions.

### Vehicle Speeds

Speed measurements were conducted along Belknap Road adjacent to the site by measuring the elapsed time for vehicles traveling a short, pre-measured distance between two checkpoints. The travel time was recorded using ATRs over a 24-hour period, thereby also recording travel speeds during non-peak hours when vehicle speeds are not affected by commuter congestion. Dividing the elapsed time by the measured distance between checkpoints derives the speed. The observed speeds are summarized in Table 3.

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

**Table 3**  
**OBSERVED TRAVEL SPEEDS (in miles per hour)**

Location/Direction	Posted Speed Limit	Average Speed	85 <sup>th</sup> Percentile Speed <sup>a</sup>
<b>Belknap Road adjacent to the site:</b>			
<i>Northbound</i>	30	23	34
<i>Southbound</i>	30	21	31

<sup>a</sup> Speed at, or below which 85 percent of all observed vehicles travel. It is commonly used for posting speed limits.

As shown in Table 3, the average speeds along Belknap Road were found to be between 21 and 23 mph with 85<sup>th</sup> percentile speeds between 31 and 34 mph. The observed speeds along Belknap Road are consistent with the posted speed limit of 30 mph.

## FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the expected opening year (2015) of the development and to the expected opening year plus ten years (2025). These design horizons were chosen to be consistent with Town of Hudson and NHDOT guidelines for the preparation of a traffic study. Traffic volumes on the roadway network at these times will include existing traffic, new traffic due to normal traffic growth, and traffic related to any significant development by others expected to be completed within the area by the 2015 and 2025 design years. Consideration of these factors resulted in the development of 2015 and 2025 No-Build traffic volumes, which assume that the proposed residential development is not built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

### Traffic Growth

To develop the 2015 No-Build and 2025 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined based on the historical traffic-count data obtained from the Nashua Regional Planning Commission (NRPC)<sup>2</sup>

<sup>2</sup> Nashua Regional Planning Commission. *Transportation Planning Traffic Count Data*.

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

and NHDOT<sup>3</sup>. The historical traffic-count data indicate that traffic volumes in the area have been decreasing at a rate of 0.66 percent since 2003 and 0.30 percent per year since 2006, respectively. In order to provide a conservative (worse-case) analysis scenario, a compounded annual traffic growth rate of 1.0 percent per year was assumed to account for general population growth and the traffic generated by smaller area developments. The NRPC and NHDOT historical traffic-volume data are provided in the Appendix.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways by the 2015 and 2025 design years were included. The Dairy Queen expansion at 119 Ferry Street was reviewed. The redevelopment project is not anticipated to have any significant increases in traffic on Belknap Road, and therefore has been assumed to be included in the background growth factor. Based on discussions with officials from the Town of Hudson, there are no specific developments planned in the area that are expected to significantly affect traffic volumes adjacent to the site.

### Planned Roadway Improvements

Officials from the Town of Hudson were contacted to determine if any improvements are planned within the study area. Based on these discussions, there are no roadway improvements planned in the vicinity of the site.

### No-Build Conditions

The 2015 No-Build peak-hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic-growth rate (1.0 percent compounded over one year) to the 2014 Existing traffic volumes. The 2025 No-Build peak-hour traffic volumes were developed by applying a total growth of 11.6 percent (1.0 percent compounded over eleven years) to the 2014 Existing traffic volumes. The 2015 and 2025 No-Build peak hour traffic volumes for the weekday AM and weekday PM peak hours are shown graphically on Figures 3 and 4, respectively.

### Trip Generation

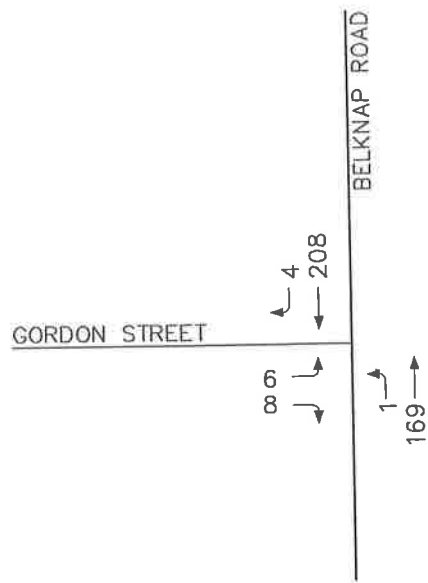
As proposed, the development consists of the construction of 28 detached housing units. To estimate the volume of traffic to be generated by the proposed development, trip-generation rates published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*<sup>4</sup> were

<sup>3</sup> NHDOT Traffic Volume Report; 2012.

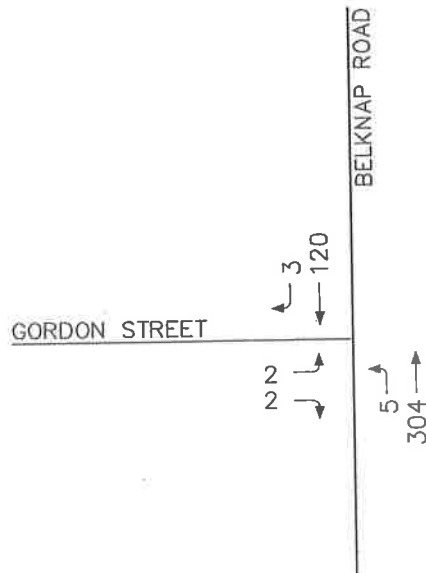
<sup>4</sup> *Trip Generation Manual*, 9<sup>th</sup> Edition; Institute of Transportation Engineers; Washington, DC; 2012.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development - Hudson, New Hampshire



**WEEKDAY AM**



**WEEKDAY PM**



NOT TO SCALE

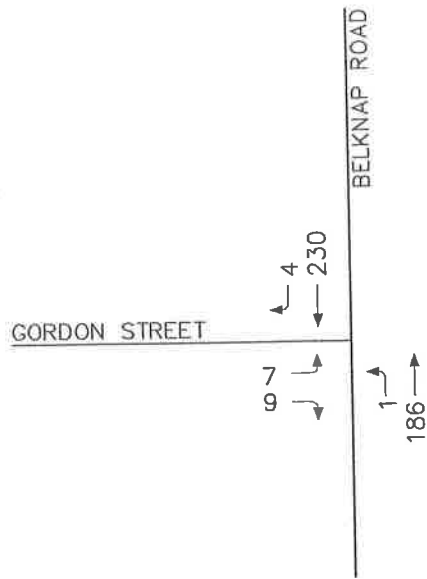
Figure 3

2015 No-Build  
Peak Hour Traffic Volumes

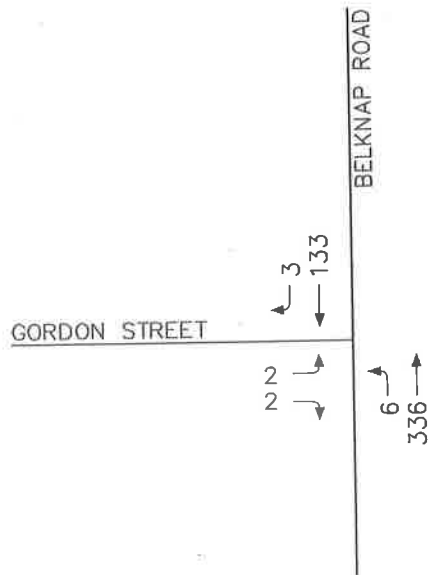


# TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development - Hudson, New Hampshire



WEEKDAY AM



WEEKDAY PM



NOT TO SCALE

Figure 4  
2025 No-Build  
Peak Hour Traffic Volumes

## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

researched. Land Use Code (LUC) 251, Senior Adult Housing – Detached, was used to estimate the potential trip generation of the site. Table 4 summarizes the results of the trip-generation estimates. All trip-generation data are provided in the Appendix.

**Table 4**  
**TRIP-GENERATION SUMMARY**

Time Period/Direction	Proposed Trips <sup>a</sup>
<b>Weekday Daily</b>	100
<b>Weekday AM Peak Hour:</b>	
<i>Enter</i>	12
<i>Exit</i>	<u>23</u>
<i>Total</i>	35
<b>Weekday PM Peak Hour:</b>	
<i>Enter</i>	10
<i>Exit</i>	<u>7</u>
<i>Total</i>	17

<sup>a</sup> ITE LUC 251, Senior Adult Housing – Detached, 28 dwelling units.

As shown in Table 4, the proposed residential development is expected to generate 35 trips (12 entering and 23 exiting) during the weekday AM peak hour and 17 trips (10 entering and 7 exiting) during the weekday PM peak hour.

### Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. Due to the uses of the surrounding area and the proposed project, the distribution of proposed site-generated traffic was based on a combination of the United States Census Bureau Journey-to-Work information and expected travel routes to the site based on existing travel patterns. Accordingly, 40 percent of the future site traffic is expected to and from the north on Belknap Road, and 60 percent to and from the south on Belknap Road. The journey-to-work census data is provided in the Appendix.

### **Sight Distance**

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway location to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO)<sup>5</sup>. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. In addition, the available sight distances were compared with the Town of Hudson's and NHDOT's requirement of 400 feet of All-Season Safe Sight Distance.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major*

<sup>5</sup>A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2004.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Hudson, New Hampshire

road.” Accordingly, the ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveway location were measured and compared to minimum requirements as established by AASHTO. Since the distance required to stop a vehicle is dependent on the speed of that vehicle, speed studies were conducted as presented in the *Existing Conditions: Vehicle Speeds* section. Based on both the posted speed limit and the observed speeds, the SSD and ISD requirements at this intersection were calculated. The required minimum sight distances for each speed are compared to the available distances for the proposed site driveway along Belknap Road, as shown in Table 5.

**Table 5  
SIGHT DISTANCE SUMMARY**

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required <sup>a</sup>	Measured	Minimum Required <sup>b</sup>	Desirable <sup>c</sup>
<b>Site Driveway at Belknap Rd:</b>					
<i>North of intersection (SB)</i>	400+	210	400+ <sup>d</sup>	210	335
<i>South of intersection (NB)</i>	310	240	400+ <sup>d</sup>	240	335

<sup>a</sup> Values based on AASHTO requirements for 85<sup>th</sup> percentile speeds of 31 mph for Belknap Road southbound travel (north of intersection) and 34 mph for Belknap Road northbound travel (south of intersection).

<sup>b</sup> Values based on AASHTO requirements for SSD.

<sup>c</sup> Values based on AASHTO requirements for posted speed limit of 30 mph on Belknap Road.

<sup>d</sup> Values assume trimming of existing overgrown vegetation within the right-of-way and as part of the redevelopment.

As indicated in Table 5, available sight distances at the proposed site driveway intersection exceed the minimum SSD and ISD requirements for safe operation, assuming that overgrown vegetation along the site frontage and along the west part of Belknap Road within the right-of-way is trimmed back as part of the development. In addition, the available sight distances meet the Town of Hudson and NHDOT requirement of 400 feet of All-Season Safe Sight Distance in both directions. Due to the horizontal alignment of the roadway, the SSD in the northbound direction is restricted to 310 feet, which is good for speeds up to 40 mph. To ensure the safe and efficient flow of traffic to and from the site, any proposed plantings, vegetation, landscaping, and signing along the site frontage should be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the edge of the site driveway and adjacent roadway so as not to inhibit the available sight lines.

## **TRAFFIC IMPACT AND ACCESS STUDY**

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Proposed Residential Development – Hudson, New Hampshire

### **Build Conditions**

Based on the traffic-generation and distribution estimates for this project, the traffic volumes from the proposed project were assigned to the roadway network, as shown on Figure 5. The site-generated traffic volumes were then added to the No-Build traffic volumes to develop the Build traffic volumes. The 2015 and 2025 Build weekday AM and weekday PM peak-hour traffic-volume networks are graphically depicted on Figures 6 and 7, respectively.

### **Traffic Increases**

The proposed residential development is expected to result in minimal increases in traffic on the study area roadways. As shown on Figure 5, traffic-volume increases beyond the study area during the peak hours are projected to be in the range of 7 to 21 vehicle trips. These increases represent, on average, one additional vehicle every 2.5 to 8.5 minutes during the critical peak hours.

## **CAPACITY AND QUEUE ANALYSIS**

Capacity and queuing analyses were conducted at the study-area locations under 2014 Existing, 2015 No-Build, 2015 Build, 2025 No-Build, and 2025 Build conditions during the weekday AM and weekday PM peak hours. The impact of site-generated traffic can be measured by comparing No-Build conditions to Build conditions.

### **Methodology**

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM) and is described in the Appendix of this report.<sup>6</sup>

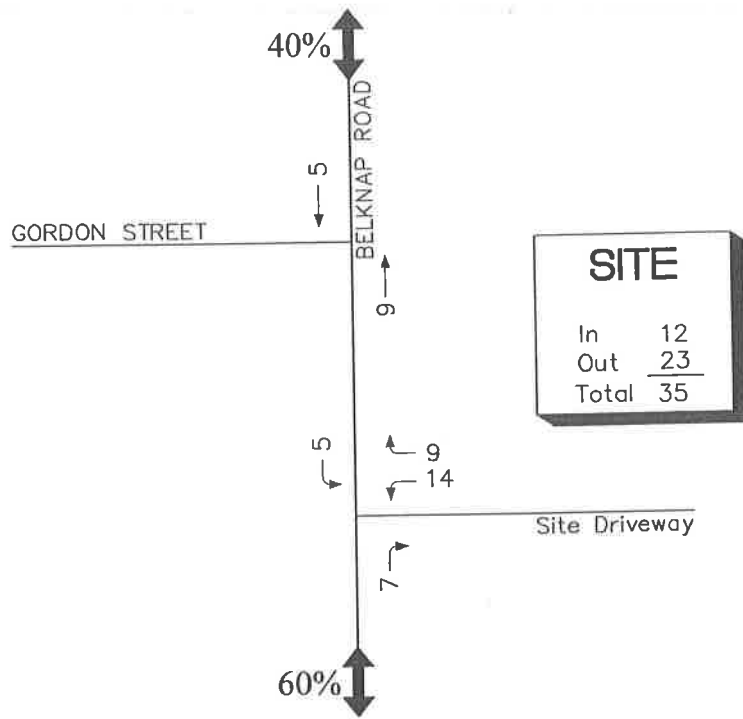
The queue analysis methodology for unsignalized intersections is based on the concepts and procedures described in the HCM. For unsignalized intersections, the 95<sup>th</sup> percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

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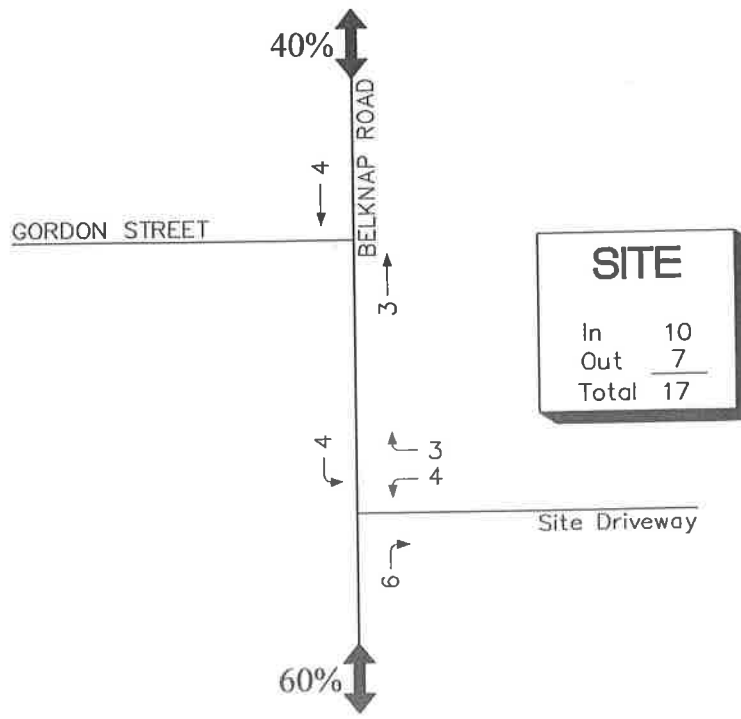
<sup>6</sup> *Highway Capacity Manual 2010*, Transportation Research Board; Washington, D.C.; 2010.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development - Hudson, New Hampshire



**WEEKDAY AM**



**WEEKDAY PM**



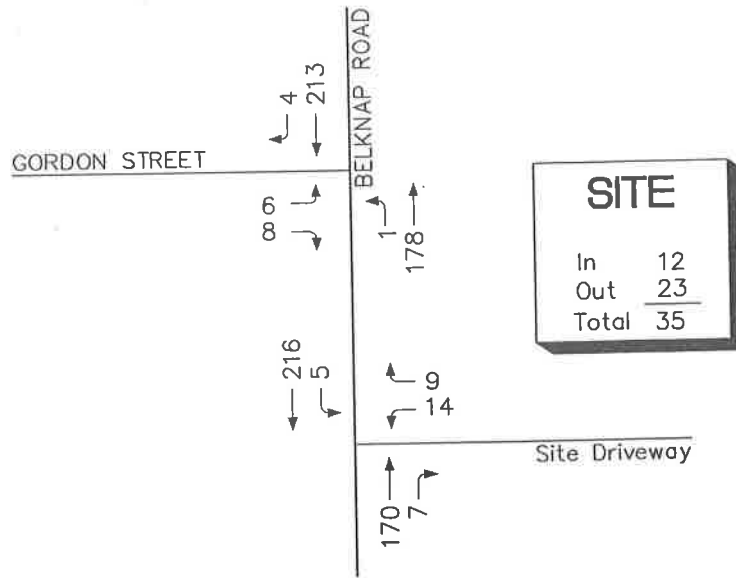
NOT TO SCALE

Figure 5

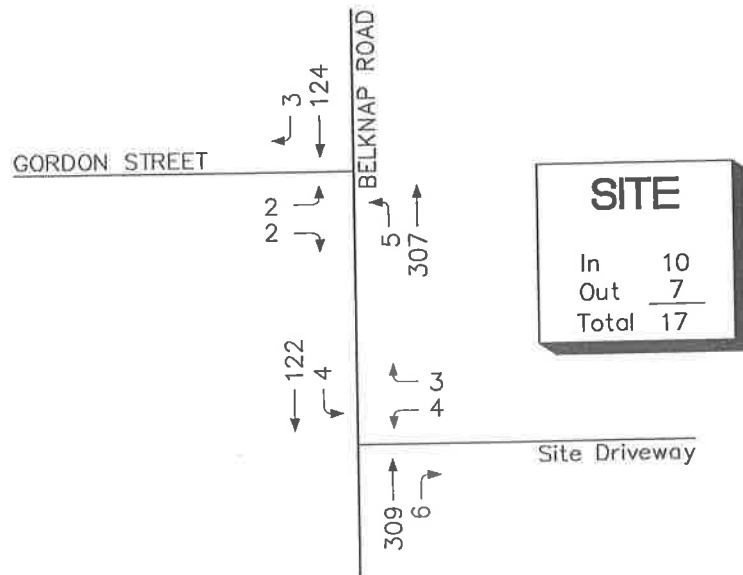
Site-Generated  
Peak Hour Traffic Volumes

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development - Hudson, New Hampshire



**WEEKDAY AM**



**WEEKDAY PM**



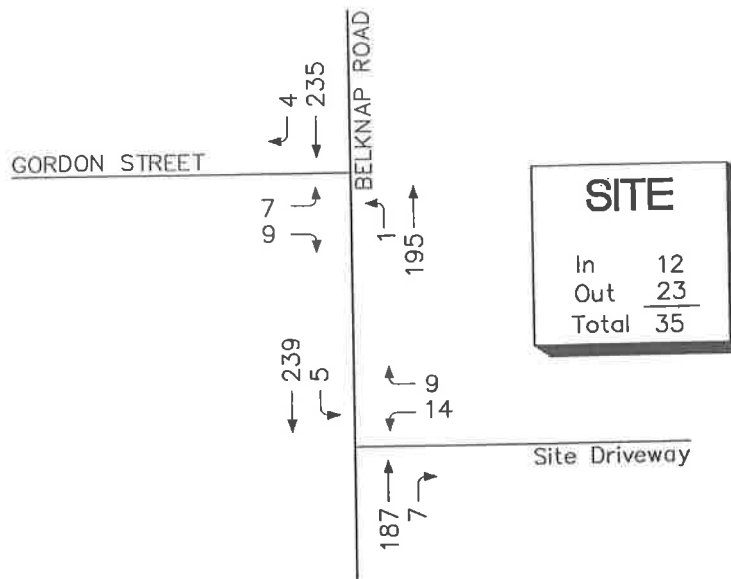
NOT TO SCALE

Figure 6

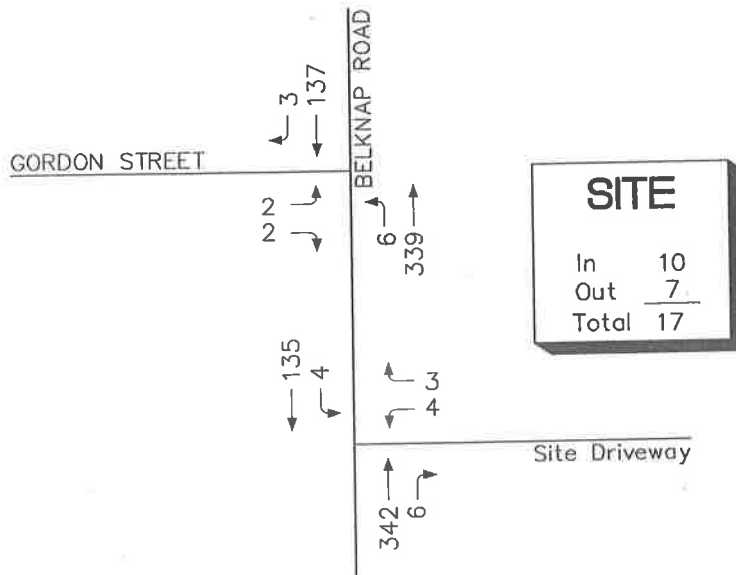
2015 Build  
Peak Hour Traffic Volumes

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development - Hudson, New Hampshire



**WEEKDAY AM**



**WEEKDAY PM**



NOT TO SCALE

Figure 7

2025 Build  
Peak Hour Traffic Volumes



## **TRAFFIC IMPACT AND ACCESS STUDY**

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Proposed Residential Development – Hudson, New Hampshire

### **Analysis Results**

The study area intersections have been analyzed through application of the procedures previously described. The level-of-service (LOS) and queue analysis results are presented in Tables 6 and 7 and are discussed below. All analysis worksheets are provided in the Appendix.

#### **Belknap Road at Gordon Street and Site Driveway**

Under existing and future traffic-volume conditions, the Belknap Road left-turn critical movements are expected to operate at optimal levels (LOS A) and the Gordon Street and site driveway left-turn critical movements are expected to operate at LOS B during the weekday AM and weekday PM peak hour. All delays are anticipated to be less than 12 seconds and 95<sup>th</sup> percentile queues less than one vehicle.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Hudson, New Hampshire

**Table 6  
CAPACITY ANALYSIS SUMMARY – 2015 CONDITIONS**

Intersection/Peak Hour/ Critical Movement	2014 Existing				2015 No-Build				2015 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Belknap Road at Gordon Street</b>												
<i>Weekday AM:</i>												
Belknap Road NB left-turn	0.00	7.6	A	--/0	0.00	7.7	A	--/0	0.00	7.7	A	--/0
Gordon Street EB left-turn	0.04	10.4	B	--/3	0.04	10.4	B	--/3	0.04	10.5	B	--/3
<i>Weekday PM:</i>												
Belknap Road NB left-turn	0.00	7.5	A	--/0	0.00	7.5	A	--/0	0.00	7.5	A	--/0
Gordon Street EB left-turn	0.01	10.6	B	--/0	0.01	10.6	B	--/0	0.01	10.7	B	--/0
<b>Belknap Road at Site Driveway</b>												
<i>Weekday AM:</i>												
Belknap Road SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	7.7	A	--/0
Site Driveway WB left-turn	--	--	--	--/--	--	--	--	--/--	0.04	11.0	B	--/3
<i>Weekday PM:</i>												
Belknap Road SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	8.1	A	--/0
Site Driveway WB left-turn	--	--	--	--/--	--	--	--	--/--	0.01	11.5	B	--/0

<sup>a</sup> Volume-to-capacity ratio.

<sup>b</sup> Average control delay in seconds per vehicle.

<sup>c</sup> Level of service.

<sup>d</sup> Maximum queue length in feet per lane (assuming 25 feet per vehicle) that is not expected to be exceeded 95 percent of the time.

Note: Using Synchro 8 Software & HCM 2010 Analysis.

**TRAFFIC IMPACT AND ACCESS STUDY**

Proposed Residential Development – Hudson, New Hampshire

**Table 7  
CAPACITY ANALYSIS SUMMARY – 2025 CONDITIONS**

Intersection/Peak Hour/ Critical Movement	2014 Existing				2025 No-Build				2025 Build			
	V/C <sup>a</sup>	Del. <sup>b</sup>	LOS <sup>c</sup>	Queue <sup>d</sup>	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
<b>Belknap Road at Gordon Street</b>												
<i>Weekday AM:</i>												
Belknap Road NB left-turn	0.00	7.6	A	--/0	0.00	7.7	A	--/0	0.00	7.7	A	--/0
Gordon Street EB left-turn	0.04	10.4	B	--/3	0.05	10.8	B	--/5	0.05	10.9	B	--/5
<i>Weekday PM:</i>												
Belknap Road NB left-turn	0.00	7.5	A	--/0	0.01	7.5	A	--/0	0.01	7.6	A	--/0
Gordon Street EB left-turn	0.01	10.6	B	--/0	0.01	10.9	B	--/0	0.01	11.0	B	--/0
<b>Belknap Road at Site Driveway</b>												
<i>Weekday AM:</i>												
Belknap Road SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	7.8	A	--/0
Site Driveway WB left-turn	--	--	--	--/--	--	--	--	--/--	0.04	11.4	B	--/3
<i>Weekday PM:</i>												
Belknap Road SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	8.2	A	--/0
Site Driveway WB left-turn	--	--	--	--/--	--	--	--	--/--	0.01	11.9	B	--/0

<sup>a</sup> Volume-to-capacity ratio.

<sup>b</sup> Average control delay in seconds per vehicle.

<sup>c</sup> Level of service.

<sup>d</sup> Maximum queue length in feet per lane (assuming 25 feet per vehicle) that is not expected to be exceeded 95 percent of the time.

Note: Using Synchro 8 Software & HCM 2010 Analysis.

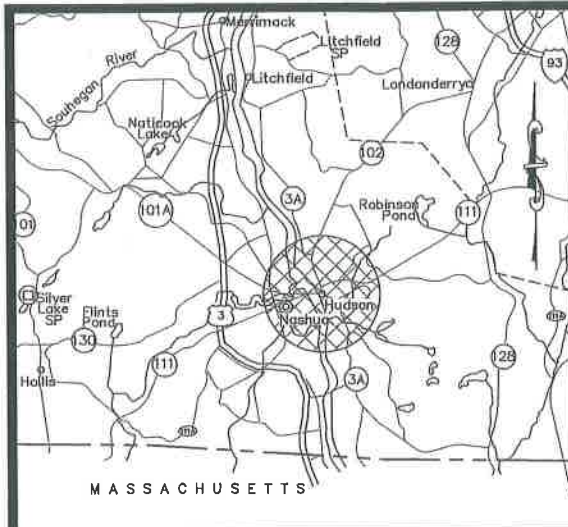
## TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hudson, New Hampshire

### CONCLUSIONS

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed residential development. Conclusions of this effort and recommendations are presented below.

- The development consists of razing the existing home and constructing a 28-unit, 55 and older, residential detached condominium development. Access is proposed to be provided via one driveway on Belknap Road, 172 feet south of Gordon Street, center-to-center.
- The proposed residential development is expected to generate 35 trips (12 entering and 23 exiting) during the weekday AM peak hour and 17 trips (10 entering and 7 exiting) during the weekday PM peak hour. Traffic-volume increases beyond the study area during the peak hours are projected to be in the range of 7 to 21 vehicle trips. These increases represent, on average, one additional vehicle every 2.5 to 8.5 minutes during the critical peak hours.
- Available sight distances at the proposed site driveway exceed the minimum AASHTO requirements for safe operation, assuming that overgrown vegetation along the site frontage and along the west part of Belknap Road within the right-of-way is trimmed back as part of the development. In addition, the available sight distances meet the Town of Hudson and NHDOT requirement of 400 feet of All-Season Safe Sight Distance in both directions. To ensure the safe and efficient flow of traffic to and from the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground or set back sufficiently from the edge of Belknap Road so as not to inhibit the available sight lines.
- Under existing and future traffic-volume conditions, the Belknap Road left-turn critical movements are expected to operate at optimal levels (LOS A) and the Gordon Street and site driveway left-turn critical movements are expected to operate at LOS B during the weekday AM and weekday PM peak hour. All delays are anticipated to be less than 12 seconds and 95<sup>th</sup> percentile queues less than one vehicle.



VICINITY PLAN  
NOT TO SCALE



VICINITY MAP  
SCALE: 1" = 1,000'

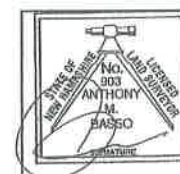
# RESIDENTIAL SITE PLAN COBBLESTONE VILLAGE

137 BELKNAP ROAD  
MAP 184; LOT 27  
HUDSON, NEW HAMPSHIRE



**OWNER & APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NEW HAMPSHIRE 03051

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



3/1/15

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

JANUARY 23, 2015  
REVISED: MARCH 5, 2015  
PROJECT NO. 14-0721-1

<u>SHEET TITLE</u>	<u>SHEET No.</u>
MASTER PLAN	1
EXISTING CONDITIONS PLAN	2 & 3
REMOVALS/DEMOLITION PLAN	4 & 5
RESIDENTIAL SITE LAYOUT PLAN	6 & 7
GRADING & DRAINAGE PLAN	8 & 9
EROSION CONTROL PLAN	10 & 11
UTILITY PLAN	12 & 13
LANDSCAPE PLAN	14 & 15
LIGHTING PLAN	16 & 17
ROADWAY PROFILES	18 & 19
SIGHT DISTANCE PLAN & PROFILE	20
CONSTRUCTION DETAILS	21 - 28

G:\\_project\140721\140721-DETAILS - REV1.dwg, 3/9/2015 1:11:22 PM, 1:1



**REFERENCE PLANS:**

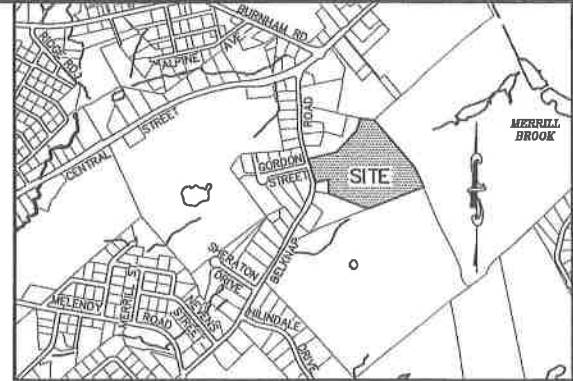
1. "LOT LINE RELOCATION PLAN - MAP 184/LOTS 26 & 27, 141 & 137 BELKNAP ROAD, HUDSON, NEW HAMPSHIRE," SCALE: 1"=50', DATED: JANUARY 20, 2014, PREPARED BY: MAYNARD & PAQUETTE ENGINEERING ASSOCIATES, LLC.
2. "BOUNDARY PLAN: LOT 20-27, DORIS & LOUIS PASKALL, BELKNAP ROAD, HUDSON, N.H.," SCALE: 1"=50', DATED: 16 DEC. 1983, WITH REVISIONS THROUGH 1-6-84, PREPARED BY: GEORGE F. KELLER INC. H.C.R.D. PLAN NO. 27773.
3. "SUBDIVISION PLAN MAP 20/LOT 1, CLARK SUBDIVISION, BELKNAP ROAD, HUDSON, NEW HAMPSHIRE," SCALE: 1"=100', DATED: AUGUST 28, 1994, WITH REVISIONS THROUGH 9-22-95, PREPARED BY: MAYNARD & PAQUETTE, INC. H.C.R.D. PLAN NO. 27871.
4. "GORDON HEIGHTS REVISED, FINAL SUBDIVISION, PLAN OF LAND, OWNED BY: EMILE A. CHAGNON, JR., HUDSON, N.H.," SCALE: 1"=50', DATED: MARCH 17, 1975, PREPARED BY: AMHERST SURVEY ASSOCIATES, INC. H.C.R.D. PLAN NO. 10188.
5. "TAX MAP 184/LOT 23, BOUNDARY PLAN, 149 BELKNAP ROAD, HUDSON, NH," SCALE: 1"=40', DATED: MARCH 8, 2010, WITH REVISIONS THROUGH 3/16/10, PREPARED BY: M.J. GRANGER ENGINEERING, INC. H.C.R.D. PLAN NO. 36717.



**GENERAL NOTES:**

1. THE PURPOSE OF THIS PLAN IS TO DEPICT AN OVERVIEW OF A PROPOSED ELDERLY, AGE RESTRICTED, HOUSING DEVELOPMENT ON TAX MAP 184; LOT 27 CONSISTING OF 28 UNITS, COMMUNITY BUILDING, ACCESS DRIVES, PARKING AND ASSOCIATED SITE IMPROVEMENTS AS SHOWN HEREON.
2. REFERENCE THIS PARCEL AS HUDSON ASSESSOR'S MAP 184; LOT 27.
3. AREA OF SUBJECT PARCEL = 862,803 SF OR 19.215 ACRES.
4. THE SUBJECT PARCEL IS LOCATED IN THE RESIDENTIAL 2 (R-2) AND THE GENERAL (G) ZONING DISTRICTS AND IS SUBJECT TO THE FOLLOWING ZONING REQUIREMENTS:
 

RESIDENTIAL (R-2)		GENERAL (G)	
MINIMUM LOT REQUIREMENTS:			
- LOT AREA	43,580 SF	- LOT AREA	43,580 SF
- LOT FRONTAGE	120 FT (LOCAL)	- LOT FRONTAGE	150 FT (LOCAL)
- LOT FRONTAGE	150 FT (COLLECTOR)	- LOT FRONTAGE	150 FT (COLLECTOR)
MINIMUM BUILDING SETBACKS:			
- FRONT	30 FT (LOCAL)	- FRONT	30 FT (LOCAL)
- FRONT	50 FT (COLLECTOR)	- FRONT	50 FT (COLLECTOR)
- SIDE	15 FT	- SIDE	15 FT
- REAR	15 FT	- REAR	15 FT
5. OWNER OF RECORD: DEER CREEK DEVELOPMENT, LLC, 25 FLAGSTONE DRIVE, HUDSON, NH 03051, BK. 8480, PG. 777.
6. EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAPS (FIRM) FOR THE TOWN OF HUDSON, NEW HAMPSHIRE, HILLSBOROUGH COUNTY, MAP NUMBER 3301C0518D, PANEL NUMBER 518 OF 701, EFFECTIVE DATE: SEPTEMBER 25, 2009 INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
7. BENCHMARKS SET AS NOTED, BASED ON NGVD 1929.



VICINITY MAP  
SCALE: 1" = 1,000'

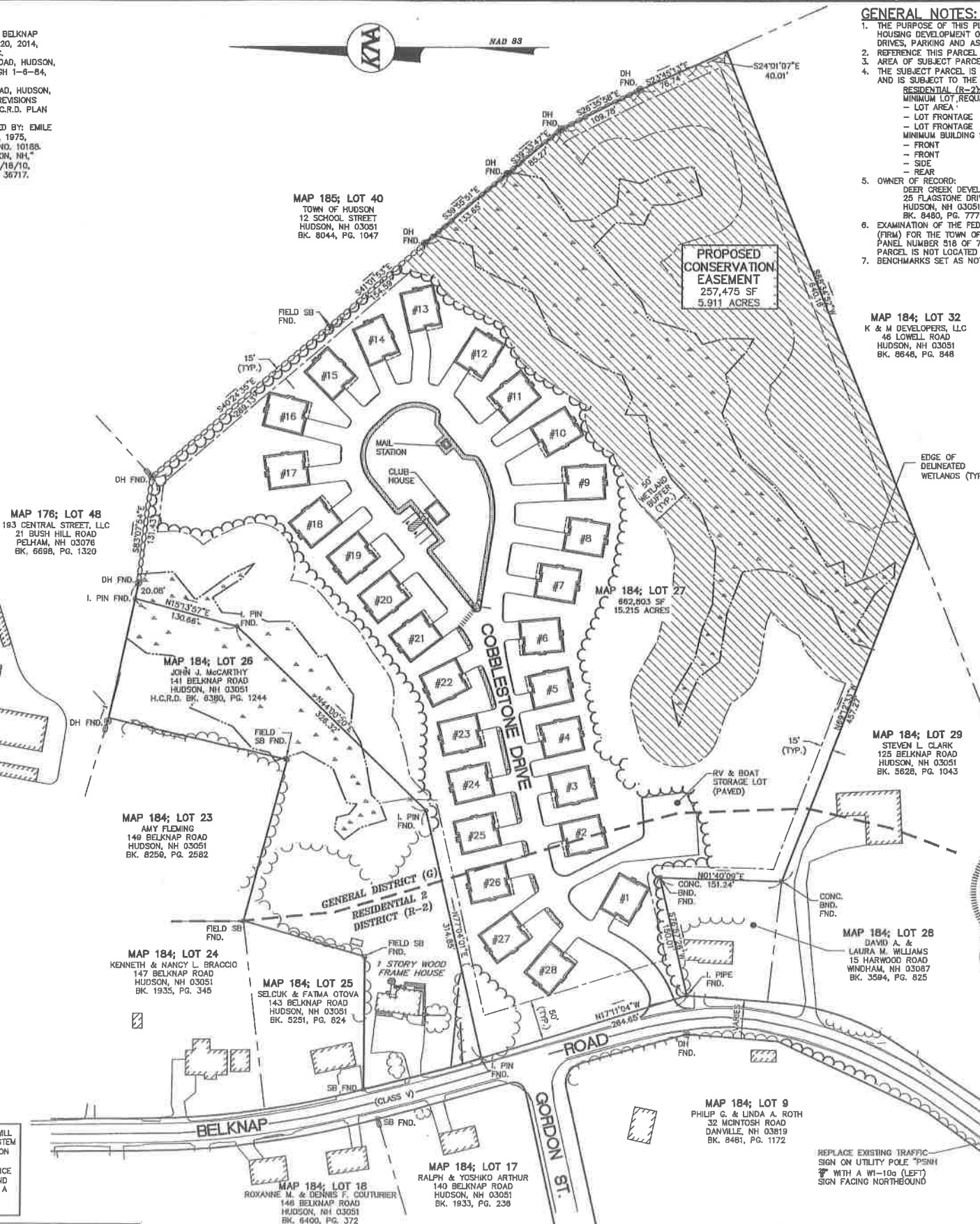
**NOTES: (CONTINUED)**

8. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON THE SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
9. BOUNDARY INFORMATION SHOWN HEREON IS BASED ON A FIELD SURVEY PERFORMED BY THIS OFFICE IN SEPTEMBER 2014.
10. TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED IN PART ON A FIELD SURVEY PERFORMED BY THIS OFFICE IN SEPTEMBER 2014 AND IN PART ON ADDITIONAL FIELD DATA PROVIDED TO KEACH-NORDSTROM ASSOCIATES BY THE OWNER.
11. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD 1929. THE DATA WAS OBTAINED FROM HHDDT DISK - 229-0320 SET IN LEDGE ON WASON ROAD, HUDSON, NH.
12. WETLAND MAPPING WAS PERFORMED BY SCHAUER ENVIRONMENTAL CONSULTANTS, LLC ON AUGUST 12, 2014 AND FIELD LOCATED BY THIS OFFICE.
13. THE SITE-SPECIFIC SOIL MAPPING WAS PERFORMED BY SCHAUER ENVIRONMENTAL CONSULTANTS, LLC ON OCTOBER 17, 2014.
14. SUBJECT PARCEL IS SERVICED BY MUNICIPAL WATER AND SEWER.
15. PROPOSED USE: ELDERLY, AGE RESTRICTED.
16. ALLOWABLE DENSITY:
 

TOTAL LOT AREA	WETLAND AREA	AREA >25% SLOPE	BUILDABLE AREA	FRONTAGE
662,803 SF 15.215 ACRES	91,248 SF 2.095 ACRES	9,384 SF 0.213 ACRES	562,271 SF 12.906 ACRES	284.65'
17. TOTAL BUILDING COVERAGE = 58,898 SF  
 MAXIMUM DENSITY OF HOMES = 1 BEDROOM/10,000 SF OF BUILDABLE LAND = 562,271 SF/10,000 = 56 BEDROOMS  
 = 56 BEDROOMS/2 BEDROOMS PER HOME = 28 HOMES  
 PROPOSED DENSITY OF HOMES = 28 HOMES (2 BEDROOMS EACH)  
 PERCENT BUILDING COVERAGE = 58,898 SF/662,803 SF = 8.9%  
 AVERAGE BUILDING COVERAGE PER UNIT = 58,898 SF/28 UNITS = 2106 SF
18. PERMITS REQUIRED:
  - NHDES ALTERATION OF TERRAIN - PENDING
  - NHDES SEWER CONNECTION PERMIT - PENDING
  - NPDES NOTICE OF INTENT - REQUIRED PRIOR TO CONSTRUCTION
19. WAIVERS REQUESTED:
  - HTO 275-9C - NOISE STUDY
  - HTO 275-9D - FISCAL IMPACT STUDY
20. WINTER ROAD MAINTENANCE SHALL BE CONDUCTED WITH LIMITED SALT USE. SNOW STORAGE SHALL BE ALONG BOTH SIDES OF THE ROADWAY AND IN THE MIDDLE OF THE CUL-DE-SAC. IF THESE AREAS BECOME FULL, SNOW SHALL BE TRUCKED OFF SITE ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS.
21. CAP FEE IN THE AMOUNT OF \$459.36 PER NEW RESIDENTIAL UNIT IS TO BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR EACH UNIT.
22. AN IMPACT FEE IN THE AMOUNT OF \$3,578.00 (SCHOOLS) AND \$124.00 (LIBRARY) PER NEW RESIDENTIAL UNIT IS TO BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR EACH UNIT.
23. A RECREATION CONTRIBUTION IN THE AMOUNT OF \$400 PER RESIDENTIAL UNIT SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR EACH UNIT.
24. AN OFFSITE ROADWAY IMPROVEMENT CONTRIBUTION, EXCLUSIVE TO THE IMPROVEMENTS OF BELKNAP ROAD, OF \$500 PER RESIDENTIAL UNIT SHALL BE PAID PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR EACH UNIT.
25. THIS LOT DEVELOPMENT IS SUBJECT TO A SEWER BETTERMENT FEE IN THE AMOUNT OF \$36,132.72, PAYABLE TO THE TOWN OF HUDSON SEWER UTILITY. THIS FEE IS IN ADDITION TO ALL OTHER APPLICABLE SEWER ASSESSMENT FEES CHARGED PER UNIT.
26. ONSITE DRAINAGE SYSTEM SHALL BE CONSTRUCTED AND MAINTAINED IN COMPLIANCE WITH LOCAL AND NHDES REQUIREMENTS FOR SUCH SYSTEMS. THE DRAINAGE SYSTEM AND ALL ITS COMPONENTS WILL REMAIN PRIVATE.
27. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7:00 AM AND 7:00 PM, MONDAY THROUGH SATURDAY. CONSTRUCTION ACTIVITIES SHALL BE PROHIBITED ON SUNDAYS.
28. IF LOT DEVELOPMENT INVOLVES BLASTING AND/OR RAMMING OF BEDROCK MATERIALS, SAID ACTIVITIES SHALL BE LIMITED TO THE HOURS BETWEEN 7:00 AM AND 5:00 PM, MONDAY THROUGH FRIDAY ONLY. SAID BLASTING/RAMMING ACTIVITIES SHALL BE PROHIBITED ON WEEKENDS.
29. THE ROAD NAME SHALL BE POSTED AT THE BEGINNING OF THE ROAD FOR CERTIFICATION OF OCCUPANCY SIGN OFF BY THE HUDSON FIRE DEPARTMENT.
30. ALL SITE IDENTIFICATION SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE XII OF THE HUDSON ZONING ORDINANCE AND APPROVED BY THE TOWN ZONING ADMINISTRATOR.
31. GREEN SPACE: 35% REQUIRED, 81% PROPOSED.
32. PROPER EROSION AND SEDIMENT CONTROLS SHALL BE INSTALLED PRIOR TO CLEARING AND EXCAVATION. THE CONTROLS SHALL BE MAINTAINED IN GOOD WORKING ORDER UNTIL COMPLETION OF CONSTRUCTION. THE TOWN OF HUDSON RESERVES THE RIGHT TO REQUIRE ADDITIONAL EROSION CONTROL MEASURES DURING CONSTRUCTION, IF NECESSARY.
33. AFTER THE ISSUANCE OF THE FOUNDATION PERMIT FOR EACH OF THE STRUCTURES INCLUDED IN THIS SITE PLAN AND PRIOR TO THE ISSUANCE OF EACH FRAMING PERMIT, THE APPLICANT SHALL SUBMIT TO THE HUDSON COMMUNITY DEVELOPMENT DEPARTMENT FOUNDATION "AS-BUILT" PLANS ON A TRANSPARENT AND TO THE SAME SCALE AS THE APPROVED SITE PLAN. EACH FOUNDATION "AS-BUILT" PLAN SHALL INCLUDE ALL STRUCTURAL DIMENSIONS AND LOT LINE SETBACK MEASUREMENTS TO THE FOUNDATION AND BE STAMPED BY A LICENSED LAND SURVEYOR. ANY DISCREPANCY BETWEEN THE APPROVED SITE PLAN AND FOUNDATION "AS-BUILT" PLAN SHALL BE DOCUMENTED BY THE APPLICANT AND BE PART OF THE FOUNDATION "AS-BUILT" SUBMISSION.
34. PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY, A L.L.S. CERTIFIED "AS-BUILT" SITE PLAN SHALL BE PROVIDED TO THE TOWN OF HUDSON COMMUNITY DEVELOPMENT DEPARTMENT, CONFIRMING THAT THE SITE CONFORMS WITH THE RECORD SITE PLAN.
35. SHEET 1 SHALL BE RECORDED AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS AND A FULL PLAN SET IS LOCATED AT THE HUDSON PLANNING OFFICE.
36. TRASH SHALL BE COLLECTED VIA PRIVATE, CURB SIDE TRASH PICKUP SERVICE.
37. THE PROPOSED ROADWAY SHALL REMAIN PRIVATE AFTER CONSTRUCTION.

**LEGEND**

- STONE BOUND FOUND
- IRON PIN FOUND
- DRILL HOLE
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- CHAIN LINK FENCE
- BARBED WIRE FENCE
- TREELINE
- RETAINING WALL
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- STONEWALL
- BUILDING SETBACK
- EASEMENT
- ZONE LINE
- PROPOSED EDGE OF PAVEMENT
- PROPOSED BITUMINOUS CURB



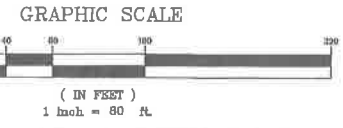
**OWNER MAP 184; LOT 27**  
 SIGNATURE: [Signature]  
 FOR DEER CREEK DEVELOPMENT, LLC  
 DATE: 3/9/15

**NPDES NOTE**

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

**PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.**

**APPROVED BY THE HUDSON, NH PLANNING BOARD**  
 DATE OF MEETING: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
 SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.



PETER S. SCHAUER, CERTIFIED WETLAND SCIENTIST #48, OF SCHAUER ENVIRONMENTAL CONSULTANTS, LLC, OF BOW, NH PERFORMED THE WETLAND MAPPING ON AUGUST 12, 2014 ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, NORTH-CENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.

THIS PLAN AND THE SURVEY UPON WHICH IT IS BASED WAS MADE ON THE GROUND UNDER MY DIRECTION AND SUPERVISION IN SEPTEMBER 2014 IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE STATE OF NEW HAMPSHIRE AND THE CITY/TOWN WITHIN WHICH IT IS LOCATED WITH A TRAVERSE ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000. THE SURVEY PERFORMED IS CLASSIFIED AS AN URBAN STANDARD SURVEY, (CATEGORY 1, CONDITION 1) AS DEFINED IN THE NEW HAMPSHIRE LAND SURVEYORS ASSOCIATION ETHICS AND STANDARDS.

3/9/15  
DATE



**REVISIONS**

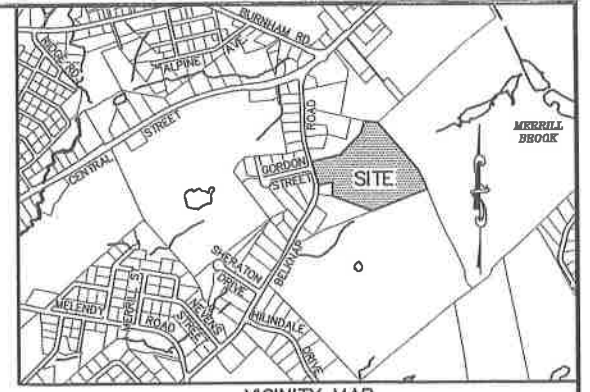
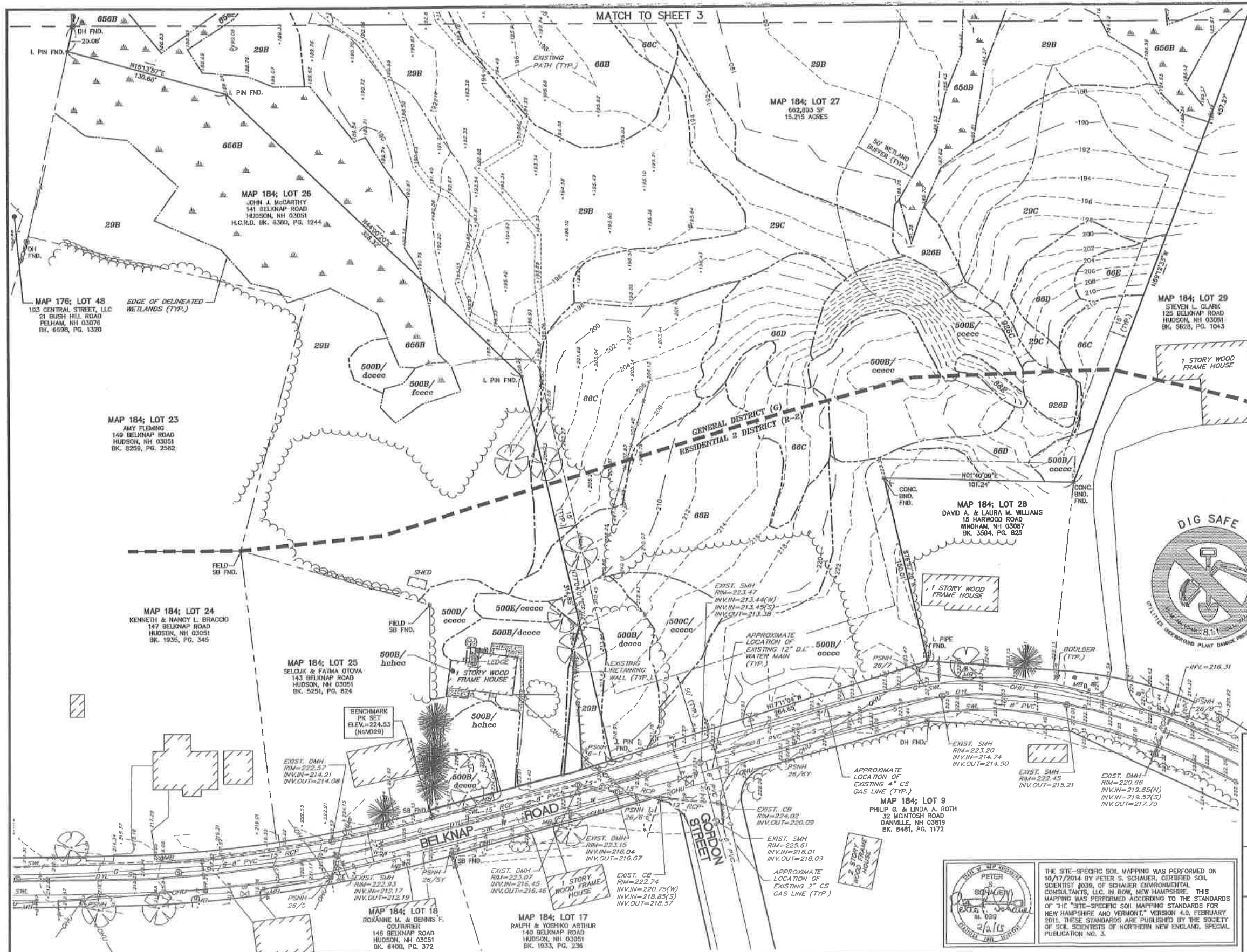
No.	DATE	DESCRIPTION	BY
1	3/9/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015  
 PROJECT NO: 14-0721-1  
 SCALE: 1" = 80'  
 SHEET 1 OF 28

**MASTER PLAN**  
**COBBLESTONE VILLAGE**  
 MAP 184; LOT 27  
 137 BELKNAP ROAD  
 HUDSON, NEW HAMPSHIRE  
 HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KM KEACH-NORDSTROM ASSOCIATES, INC.**  
 Civil Engineering Land Surveying Landscape Architecture  
 10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-8881



VICINITY MAP  
SCALE: 1" = 1,000'

SEE SHEET 3 FOR NOTES, REFERENCE PLANS AND SITE SPECIFIC SOIL MAP UNIT KEY

**LEGEND**

●	STONE BOUND FOUND	---	ABUTTER LINE
○	IRON PIN FOUND	---	PROPERTY LINE
⊙	DRILL HOLE	---	WETLAND
⊙	UTILITY POLE	---	CHAIN LINK FENCE
⊙	SIGN	---	BARBED WIRE FENCE
⊙	LIGHT	---	OVERHEAD UTILITIES
⊙	GAS VALVE	---	GAS LINE
⊙	WATER VALVE	---	WATER LINE
⊙	HYDRANT	---	SEWER LINE
⊙	WATER SHUT OFF	---	DRAINAGE LINE
⊙	SEWER MANHOLE	---	TREELINE
⊙	DRAINAGE MANHOLE	---	RETAINING WALL
⊙	CATCH BASIN	---	EDGE OF PAVEMENT
⊙	BUILDING SETBACK	---	EDGE OF GRAVEL
---	EASEMENT	---	10' CONTOUR
---	ZONE LINE	---	2' CONTOUR
---		---	STONEWALL
---		---	SITE SPECIFIC SOIL LINE

**EXISTING CONDITIONS PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 687-2861

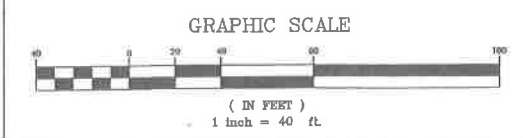
**REVISIONS**

No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 2 OF 28

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

APPROVED BY THE HUDSON, NH PLANNING BOARD  
DATE OF MEETING: \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.



PETER S. SCHAUER, CERTIFIED WETLAND SCIENTIST #48, OF SCHAUER ENVIRONMENTAL CONSULTANTS, L.L.C. OF BOW, NH PERFORMED THE WETLAND MAPPING ON AUGUST 12, 2014 ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, NORTHEASTAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.

THIS PLAN AND THE SURVEY UPON WHICH IT IS BASED WAS MADE ON THE GROUND UNDER MY DIRECTION AND SUPERVISION IN SEPTEMBER 2014 IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE STATE OF NEW HAMPSHIRE AND THE CITY/TOWN WITHIN WHICH IT IS LOCATED WITH A TRAVELER ERROR OF CLOSURE BETTER THAN 1 PART IN 10,000. THE SURVEY PERFORMED IS CLASSIFIED AS AN URBAN STANDARD SURVEY, (CATEGORY 1, CONDITION 1) AS DEFINED IN THE NEW HAMPSHIRE LAND SURVEYORS ASSOCIATION ETHICS AND STANDARDS.

3/16/15  
DATE



**SITE SPECIFIC SOIL MAP UNIT KEY**

SYMBOL	MAP UNIT	SLOPE CLASS	DRAINAGE CLASS	HYDRO. GROUP
29B	WOODBIDGE FINE SANDY LOAM	0-8%	MODERATELY WELL	C
29C	WOODBIDGE FINE SANDY LOAM	8-15%	MODERATELY WELL	C
66B	PAXTON FINE SANDY LOAM	0-8%	WELL	C
66C	PAXTON FINE SANDY LOAM	8-15%	WELL	C
66D	PAXTON FINE SANDY LOAM	15-25%	WELL	C
66E	PAXTON FINE SANDY LOAM	25%+	WELL	C
66E	HOLLIS FINE SANDY LOAM	25%+	WELL	D
500B/ccccc	UDORTHTS, LOAMY	0-8%	WELL	C
500C/ccccc	UDORTHTS, LOAMY	8-15%	WELL	C
500D/ccccc	UDORTHTS, LOAMY	15-25%	WELL	C
500E/ccccc	UDORTHTS, LOAMY	25%+	WELL	C
500B/ccccc	UDORTHTS, LOAMY	0-8%	WELL	C
500C/ccccc	UDORTHTS, LOAMY	8-15%	WELL	C
500D/ccccc	UDORTHTS, LOAMY	15-25%	MODERATELY WELL	C
500E/ccccc	UDORTHTS, LOAMY	25%+	WELL	C
500B/dcccc	UDORTHTS, LOAMY	0-8%	MODERATELY WELL	C
500C/dcccc	UDORTHTS, LOAMY	8-15%	MODERATELY WELL	C
500D/fcccc	UDORTHTS, LOAMY	0-8%	POORLY	C
500B/hcccc	UDORTHTS, LOAMY	0-8%	UNDETERMINABLE	C
656B	RIDGEBURY FINE SANDY LOAM	0-8%	POORLY	C
926B	RIDGEBURY (SPD)	0-8%	SOMEWHAT POORLY	C
926C	RIDGEBURY (SPD)	8-15%	SOMEWHAT POORLY	C

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



THE SITE-SPECIFIC SOIL MAPPING WAS PERFORMED ON 10/17/2014 BY PETER S. SCHAUER, CERTIFIED SOIL SCIENTIST #039, OF SCHAUER ENVIRONMENTAL CONSULTANTS, LLC. IN BOW, NEW HAMPSHIRE. THIS MAPPING WAS PERFORMED ACCORDING TO THE STANDARDS OF THE "SITE-SPECIFIC SOIL MAPPING STANDARDS FOR NEW HAMPSHIRE AND VERMONT," VERSION 4.0, FEBRUARY 2011. THESE STANDARDS ARE PUBLISHED BY THE SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND, SPECIAL PUBLICATION NO. 3.

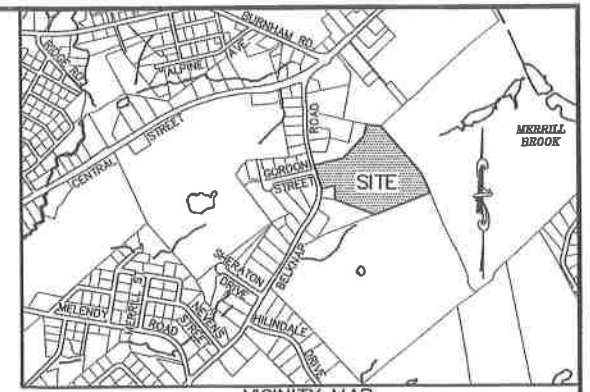
MAP 185; LOT 40  
TOWN OF HUDSON  
12 SCHOOL STREET  
HUDSON, NH 03051  
BK. 8044, PG. 1047

**DIG SAFE**  
811  
CALL BEFORE YOU DIG

MAP 184; LOT 32  
K & M DEVELOPERS, LLC  
46 LOWELL ROAD  
HUDSON, NH 03051  
BK. 8646, PG. 848

**REFERENCE PLANS:**

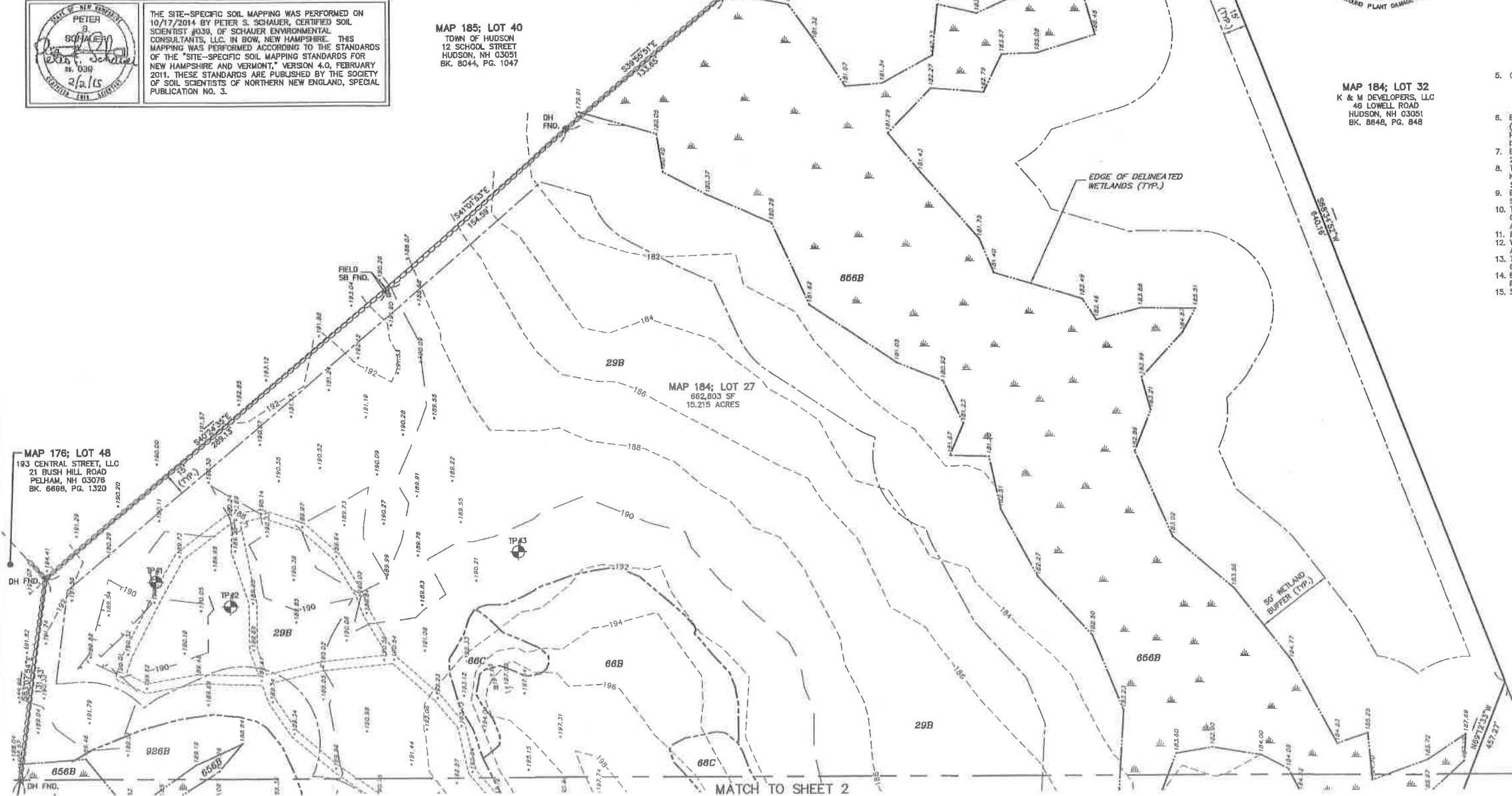
- "LOT LINE RELOCATION PLAN - MAP 184/LOTS 26 & 27, 141 & 137 BELKNAP ROAD, HUDSON, NEW HAMPSHIRE," SCALE: 1"=50', DATED: JANUARY 20, 2014, PREPARED BY: MAYNARD & PAQUETTE ENGINEERING ASSOCIATES, LLC.
- "BOUNDARY PLAN: LOT 20-27, DORIS & LOUIS PASKAL, BELKNAP ROAD, HUDSON, N.H.," SCALE: 1"=50', DATED: 18 DEC. 1983, WITH REVISIONS THROUGH 1-8-84, PREPARED BY: GEORGE F. KELLER INC. H.C.R.D. PLAN NO. 27773.
- "SUBDIVISION PLAN MAP 20/LOT 1, CLARK SUBDIVISION, BELKNAP ROAD, HUDSON, NEW HAMPSHIRE," SCALE: 1"=100', DATED: AUGUST 26, 1984, WITH REVISIONS THROUGH 9-22-95, PREPARED BY: MAYNARD & PAQUETTE, INC. H.C.R.D. PLAN NO. 27871.
- "GORDON HEIGHTS REVISED, FINAL SUBDIVISION, PLAN OF LAND, OWNED BY: EMILE A. CHAGNON, JR., HUDSON, N.H.," SCALE: 1"=50', DATED: MARCH 17, 1975, PREPARED BY: AMHERST SURVEY ASSOCIATES, INC. H.C.R.D. PLAN NO. 10168.
- "TAX MAP 184/LOT 23, BOUNDARY PLAN, 149 BELKNAP ROAD, HUDSON, NH," SCALE: 1"=40', DATED: MARCH 8, 2010, WITH REVISIONS THROUGH 3/16/10, PREPARED BY: M.J. GRANGER ENGINEERING, INC. H.C.R.D. PLAN NO. 36717.



**NOTES:**

- THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF TAX MAP 184; LOT 27 OF THE TOWN OF HUDSON TAX ASSESSORS MAPS.
- REFERENCE THIS PARCEL AS HUDSON ASSESSOR'S MAP 184; LOT 27.
- AREA OF SUBJECT PARCEL = 662,803 SF, OR 15,215 ACRES.
- THE SUBJECT PARCEL IS LOCATED IN THE RESIDENTIAL 2 (R-2) AND THE GENERAL (G) ZONING DISTRICTS AND IS SUBJECT TO THE FOLLOWING ZONING REQUIREMENTS:  

RESIDENTIAL (R-2)	GENERAL (G)
MINIMUM LOT REQUIREMENTS:	MINIMUM LOT REQUIREMENTS:
- LOT AREA 43,560 SF	- LOT AREA 43,560 SF
- LOT FRONTAGE 120 FT (LOCAL)	- LOT FRONTAGE 150 FT (LOCAL)
- LOT FRONTAGE 150 FT (COLLECTOR)	- LOT FRONTAGE 150 FT (COLLECTOR)
MINIMUM BUILDING SETBACKS:	MINIMUM BUILDING SETBACKS:
- FRONT 30 FT (LOCAL)	- FRONT 30 FT (LOCAL)
- FRONT 50 FT (COLLECTOR)	- FRONT 50 FT (COLLECTOR)
- SIDE 15 FT	- SIDE 15 FT
- REAR 15 FT	- REAR 15 FT
- OWNER OF RECORD:  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
BK. 8480, PG. 777
- EXAMINATION OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAPS (FIRM) FOR THE TOWN OF HUDSON, NEW HAMPSHIRE, HILLSBOROUGH COUNTY, MAP NUMBER 33010C05180 PANEL NUMBER 518 OF 701, EFFECTIVE DATE: SEPTEMBER 25, 2009 INDICATES THAT THE SUBJECT PARCEL IS NOT LOCATED WITHIN A FLOOD HAZARD AREA.
- BENCHMARKS SET AS NOTED, BASED ON NGVD 1929. THE DATA WAS OBTAINED FROM NHDOT DISK - 229-0329 SET IN EDGE ON WASHING ROAD, HUDSON, NH.
- THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. KEACH-NORDSTROM ASSOCIATES, INC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 811.
- BOUNDARY INFORMATION SHOWN HEREON IS BASED ON A FIELD SURVEY PERFORMED BY THIS OFFICE IN SEPTEMBER 2014.
- TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED IN PART ON A FIELD SURVEY PERFORMED BY THIS OFFICE IN SEPTEMBER 2014 AND IN PART ON ADDITIONAL FIELD DATA PROVIDED TO KEACH-NORDSTROM ASSOCIATES BY THE OWNER.
- HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NGVD 1929.
- WETLAND MAPPING WAS PERFORMED BY SCHAUER ENVIRONMENTAL CONSULTANTS, LLC ON AUGUST 12, 2014 AND FIELD LOCATED BY THIS OFFICE IN SEPTEMBER 2014.
- THE SITE-SPECIFIC SOIL MAPPING WAS PERFORMED BY SCHAUER ENVIRONMENTAL CONSULTANTS, LLC ON OCTOBER 17, 2014.
- EASEMENTS, RIGHTS AND RESTRICTIONS SHOWN OR IDENTIFIED HEREON ARE THOSE FOUND DURING RESEARCH PERFORMED AT THE HILLSBOROUGH COUNTY REGISTRY OF DEEDS.
- SUBJECT PARCEL IS SERVICED BY MUNICIPAL WATER AND SEWER.



MAP 176; LOT 48  
193 CENTRAL STREET, LLC  
21 BUSH HILL ROAD  
PELHAM, NH 03076  
BK. 6688, PG. 1320

MAP 184; LOT 27  
662,803 SF  
15,215 ACRES

**LEGEND**

●	STONE BOUND FOUND	---	ABUTTER LINE
○	IRON PIN FOUND	---	PROPERTY LINE
○	DRILL HOLE	---	WETLAND
○	UTILITY POLE	---	CHAIN LINK FENCE
○	SIGN	---	BARBED WIRE FENCE
○	LIGHT	---	OVERHEAD UTILITIES
○	GAS VALVE	---	GAS LINE
○	WATER VALVE	---	WATER LINE
○	HYDRANT	---	SEWER LINE
○	WATER SHUT OFF	---	DRAINAGE LINE
○	SEWER MANHOLE	---	TREELINE
○	DRAINAGE MANHOLE	---	RETAINING WALL
○	CATCH BASIN	---	EDGE OF PAVEMENT
○	BUILDING SETBACK	---	EDGE OF GRAVEL
○	EASEMENT	---	10' CONTOUR
○	ZONE LINE	---	2' CONTOUR
○	SITE SPECIFIC SOIL LINE	---	STONEWALL

**EXISTING CONDITIONS PLAN**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

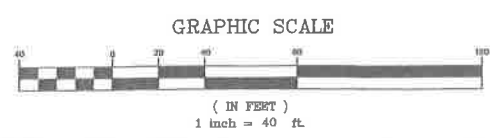
**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2801

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

APPROVED BY THE HUDSON, NH PLANNING BOARD  
DATE OF MEETING: \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.



PETER S. SCHAUER, CERTIFIED WETLAND SCIENTIST #48, OF SCHAUER ENVIRONMENTAL CONSULTANTS, LLC, OF BOW, NH PERFORMED THE WETLAND MAPPING ON AUGUST 12, 2014 ACCORDING TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, NORTH-CENTRAL AND NORTHEAST REGION, VERSION 2.0, JANUARY 2012, US ARMY CORPS OF ENGINEERS.

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3/9/15  
DATE



**REVISIONS**

No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJJ

DATE: JANUARY 23, 2015  
PROJECT NO: 14-0721-1  
SCALE: 1" = 40'  
SHEET 3 OF 26



MATCH TO SHEET 5

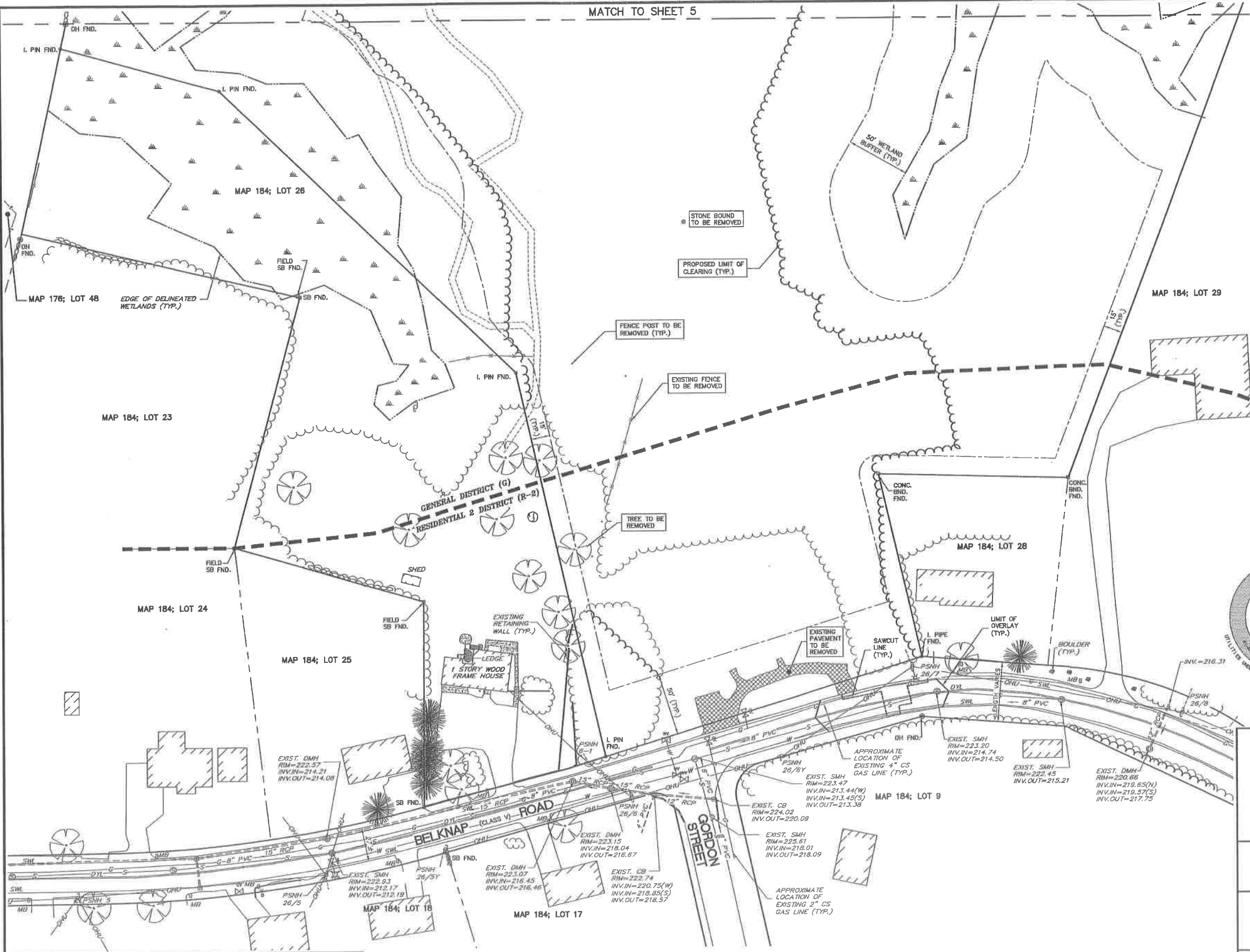
**GENERAL NOTES:**

1. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING FEATURES ON SITE TO BE REMOVED, SALVAGED OR REPLACED.
2. ITEMS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH THE TOWN OF HUDSON REQUIREMENTS.
3. ALL EXISTING PAVEMENT AND GRAVEL WITHIN THE CROSS HATCHED AREA IS TO BE REMOVED DURING THE DEMOLITION PHASE OF THE PROJECT. EXCESS MATERIAL FROM THESE AREAS SHALL BE APPROPRIATELY DISPOSED OF OFFSITE.
4. THE CONTRACTOR SHALL CONTROL ALL DUST GENERATED DURING THE REMOVAL PHASE AND CONSTRUCTION PHASE SO THAT NO DUST LEAVES THE SITE.
5. ANY MONUMENTS DISTURBED DURING CONSTRUCTION, WHICH AREN'T CALLED OUT FOR REMOVAL, SHALL BE RESET BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR AT THE SITE CONTRACTORS EXPENSE.



**LEGEND**

- STONE BOUND FOUND
- IRON PIN FOUND
- DRILL HOLE
- UTILITY POLE
- SIGN
- LIGHT
- GAS VALVE
- WATER VALVE
- HYDRANT
- WATER SHUT OFF
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- BUILDING SETBACK
- EASEMENT
- ZONE LINE
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- CHAIN LINK FENCE
- BARBED WIRE FENCE
- OVERHEAD UTILITIES
- GAS LINE
- WATER LINE
- SEWER LINE
- DRAINAGE LINE
- TREELINE
- RETAINING WALL
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- STONEWALL
- PAVEMENT/PATH TO BE REMOVED



**REMOVALS/DEMOLITION PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

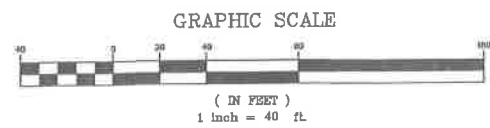
**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

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

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APPROVED BY THE HUDSON, NH PLANNING BOARD  
DATE OF MEETING: \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

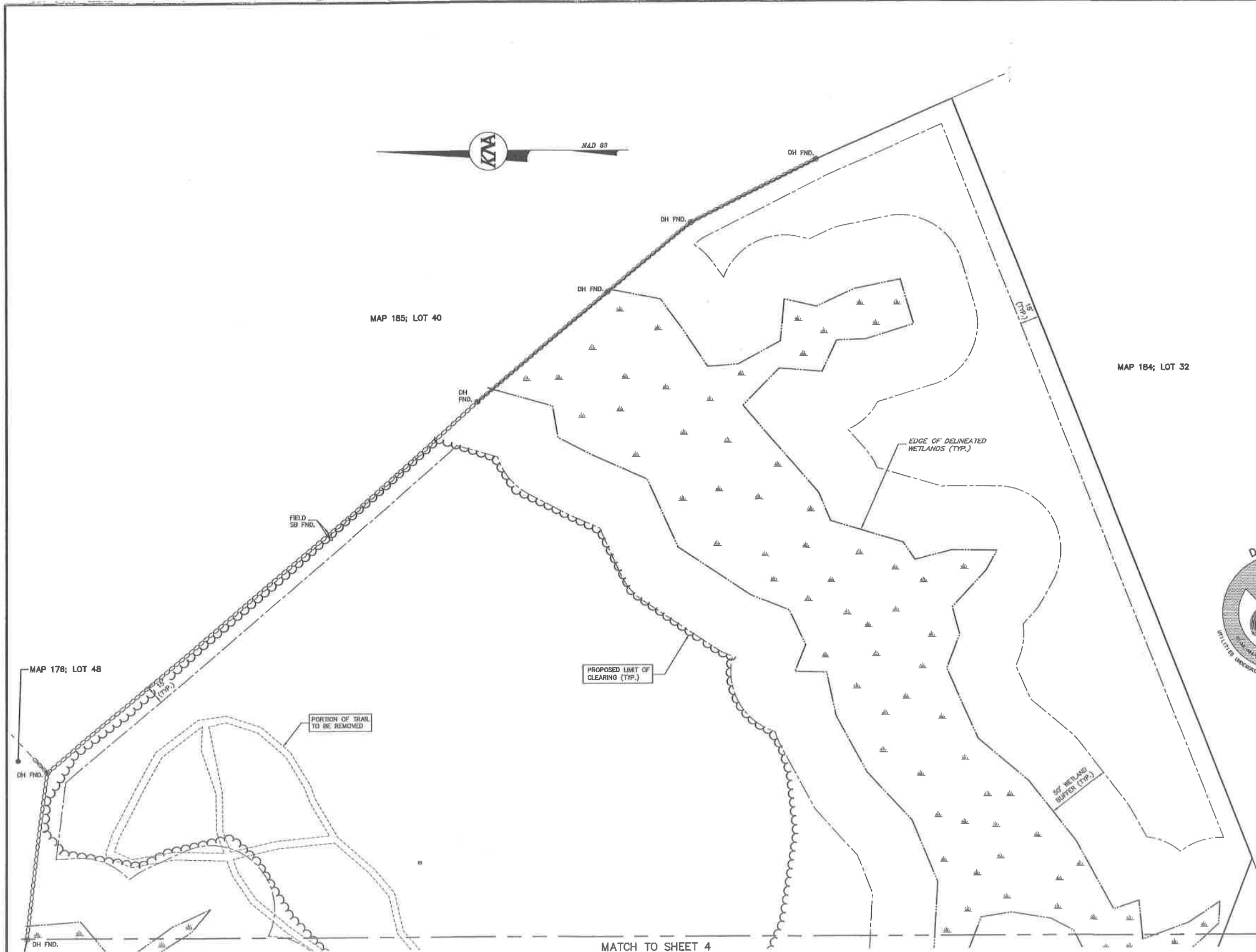
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No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BAC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 4 OF 28

SEE SHEET 4 NOTES



**LEGEND**

- STONE BOUND FOUND
- IRON PIN FOUND
- DRILL HOLE
- UTILITY POLE
- SIGN
- LIGHT
- GAS VALVE
- WATER VALVE
- HYDRANT
- WATER SHUT OFF
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- BUILDING SETBACK
- EASEMENT
- ZONE LINE
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- CHAIN LINK FENCE
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- OVERHEAD UTILITIES
- GAS LINE
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- PAVEMENT/PATH TO BE REMOVED



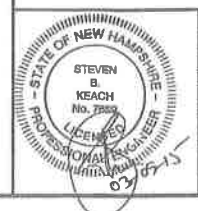
**REMOVALS/DEMOLITION PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

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1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 5 OF 28

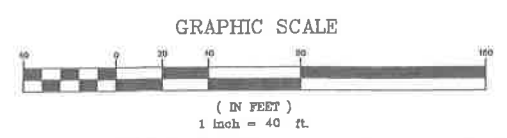
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DATE OF MEETING: \_\_\_\_\_

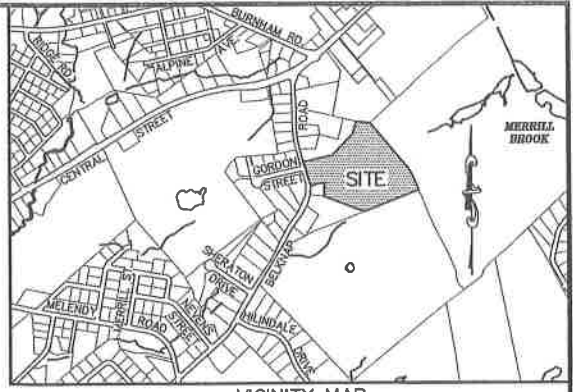
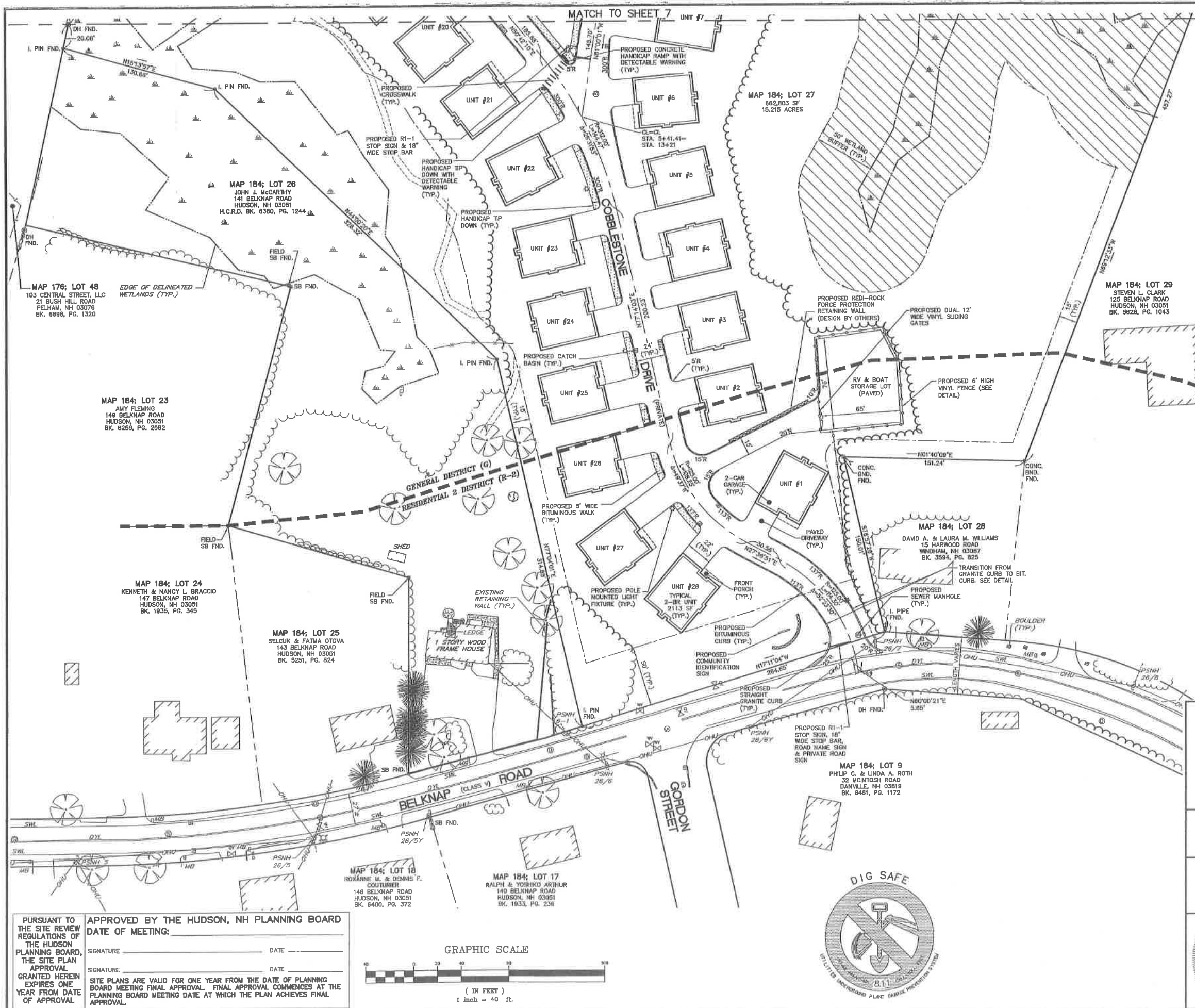
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VICINITY MAP  
SCALE: 1" = 1,000'

SEE SHEET 1 FOR REFERENCE PLANS & GENERAL NOTES

**LEGEND**

Symbol	STONE BOUND FOUND
Symbol	IRON PIN FOUND
Symbol	DRILL HOLE
Symbol	UTILITY POLE
Symbol	SIGN
Symbol	LIGHT
Symbol	GAS VALVE
Symbol	WATER VALVE
Symbol	HYDRANT
Symbol	WATER SHUT OFF
Symbol	SEWER MANHOLE
Symbol	DRAINAGE MANHOLE
Symbol	CATCH BASIN
Symbol	BUILDING SETBACK
Symbol	EASEMENT
Symbol	ZONE LINE
Symbol	ABUTTER LINE
Symbol	PROPERTY LINE
Symbol	WETLAND
Symbol	CHAIN LINK FENCE
Symbol	BARBED WIRE FENCE
Symbol	OVERHEAD UTILITIES
Symbol	TREELINE
Symbol	RETAINING WALL
Symbol	EDGE OF PAVEMENT
Symbol	EDGE OF GRAVEL
Symbol	STONEWALL
Symbol	PROPOSED EDGE OF PAVEMENT
Symbol	PROPOSED GRANITE CURB
Symbol	PROPOSED BITUMINOUS CURB
Symbol	PROPOSED CHAIN LINK FENCE
Symbol	PROPOSED VINYL FENCE
Symbol	PROPOSED CONSERVATION EASEMENT

**RESIDENTIAL SITE LAYOUT PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KM KEACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architects  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-2881

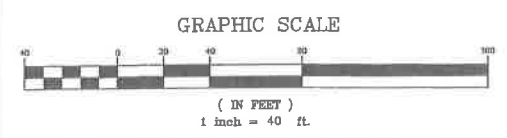
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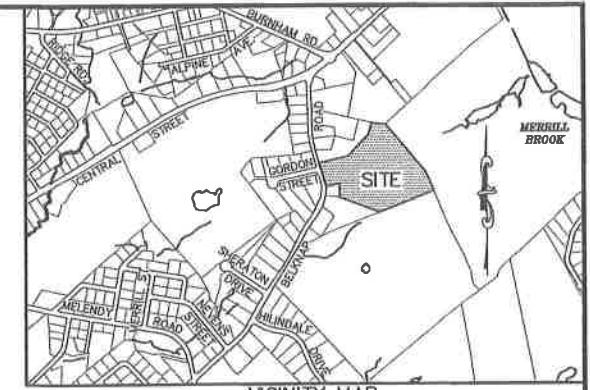
REVISIONS

No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 6 OF 28

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VICINITY MAP  
SCALE: 1" = 1,000'

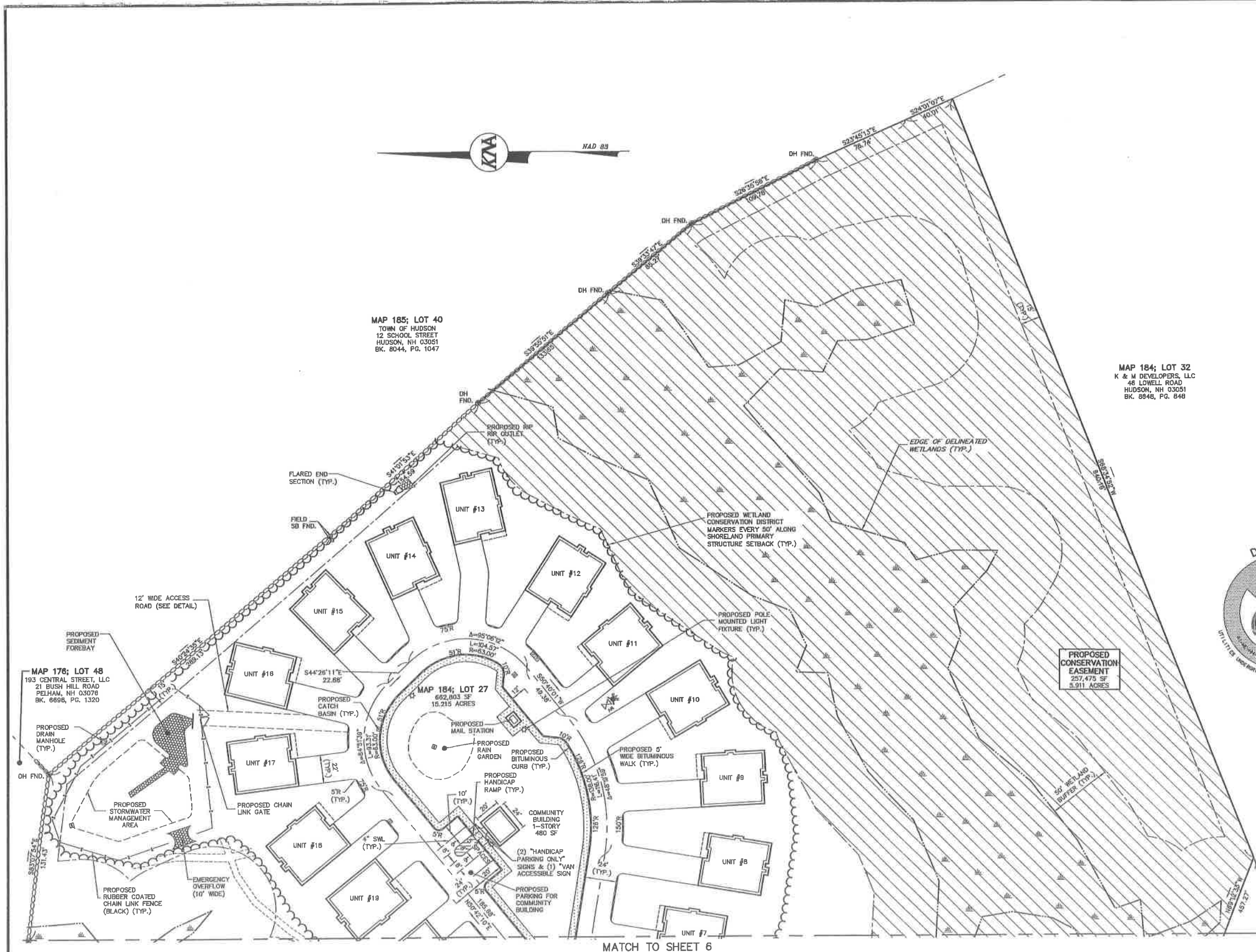
SEE SHEET 1 FOR REFERENCE  
PLANS & GENERAL NOTES

MAP 185; LOT 40  
TOWN OF HUDSON  
12 SCHOOL STREET  
HUDSON, NH 03051  
BK. 8044, PG. 1047

MAP 184; LOT 32  
K & M DEVELOPERS, LLC  
46 LOWELL ROAD  
HUDSON, NH 03051  
BK. 8948, PG. 848

LEGEND

- STONE BOUND FOUND
- IRON PIN FOUND
- DRILL HOLE
- UTILITY POLE
- SIGN
- LIGHT
- GAS VALVE
- WATER VALVE
- HYDRANT
- WATER SHUT OFF
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- BUILDING SETBACK
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- RETAINING WALL
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- STONEWALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED BITUMINOUS CURB
- PROPOSED CHAIN LINK FENCE
- PROPOSED VINYL FENCE



**RESIDENTIAL SITE LAYOUT PLAN**  
**COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
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DATE: JANUARY 23, 2015      SCALE: 1" = 40'  
PROJECT NO: 14-0721-1      SHEET 7 OF 28

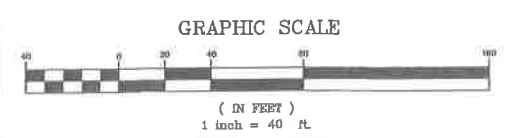
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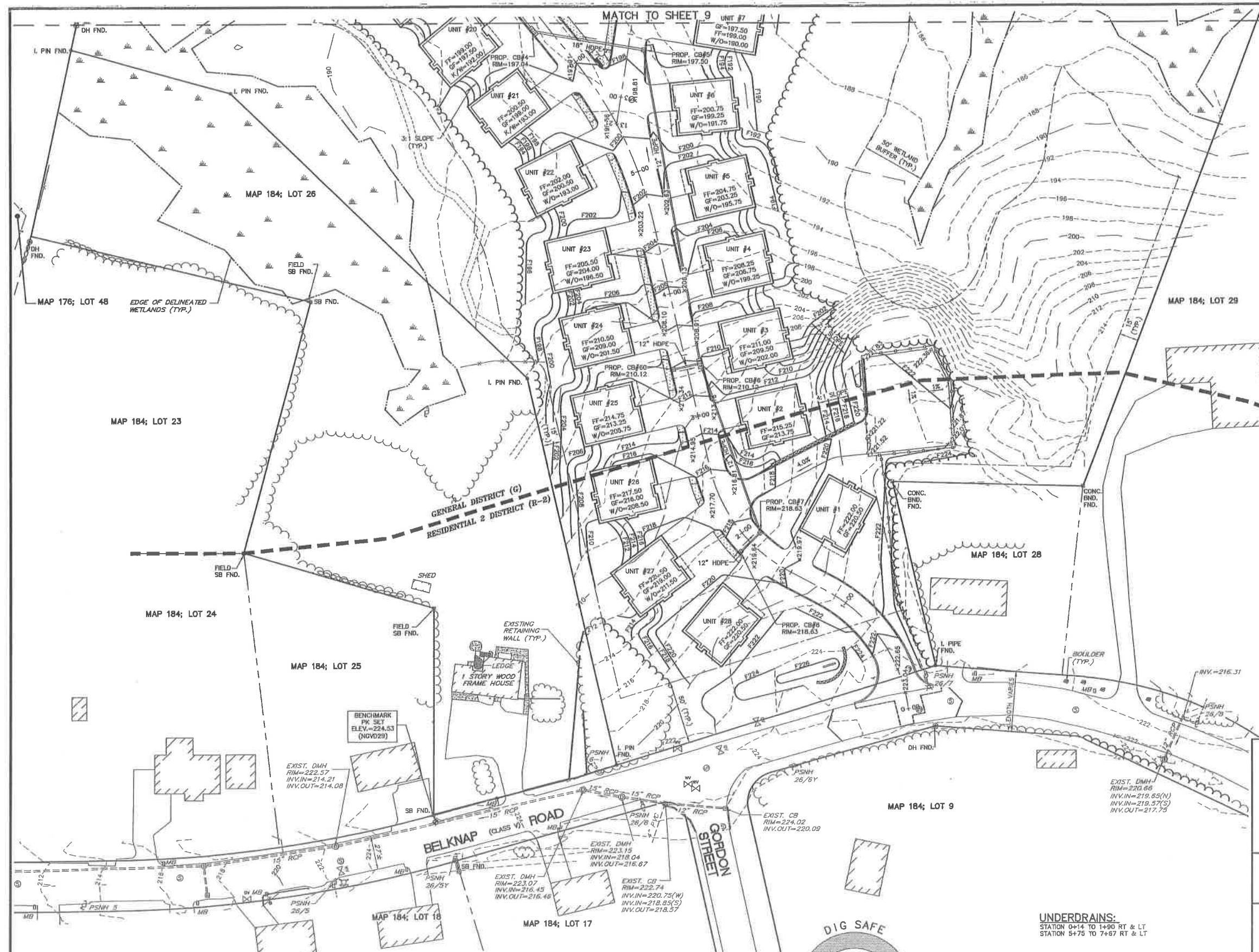
- CONSTRUCTION NOTES:**
1. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2010 ARE HEREBY INCORPORATED BY REFERENCE.
  2. ROAD AND DRAINAGE CONSTRUCTION SHALL CONFORM TO THE TYPICAL SECTIONS AND DETAILS SHOWN ON THE PLANS, AND SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS FOR ROAD CONSTRUCTION, PUBLIC WORKS DEPARTMENT, HUDSON, NEW HAMPSHIRE. CATCH BASIN FRAME AND GRATES SHALL BE TYPE II, AND HAVE 3' SLOPES UNLESS OTHERWISE NOTED.
  3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS. PRIOR TO THE START OF ANY CONSTRUCTION THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
  4. ALL DRAINAGE PIPE SHALL BE FURNISHED AND INSTALLED WITH FLEXIBLE GASKETS. JOINTS SHALL BE MADE WITH OIL RESISTANT COMPRESSION RINGS OF AN ELASTOMERIC MATERIAL CONFORMING TO ASTM C-443. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE FOLLOWED.



**BUILDING NOMENCLATURE:**  
 FF = FIRST FLOOR  
 GF = GARAGE FLOOR  
 W/O = WALK OUT BASEMENT  
 K/W = KNEE WALL

**LEGEND**

●	STONE BOUND FOUND	---	ABUTTER LINE
○	IRON PIN FOUND	---	PROPERTY LINE
○	DRILL HOLE	---	WETLAND
○	UTILITY POLE	---	CHAIN LINK FENCE
○	SIGN	---	BARBED WIRE FENCE
○	LIGHT	---	DRAINAGE LINE
○	GAS VALVE	---	TREELINE
○	WATER VALVE	---	RETAINING WALL
○	HYDRANT	---	EDGE OF PAVEMENT
○	WATER SHUT OFF	---	EDGE OF GRAVEL
○	SEWER MANHOLE	---	10' CONTOUR
○	DRAINAGE MANHOLE	---	2' CONTOUR
○	CATCH BASIN	---	STONEWALL
○	BUILDING SETBACK	---	PROPOSED EDGE OF PAVEMENT
○	EASEMENT	---	PROPOSED BITUMINOUS CURB
○	ZONE LINE	---	PROPOSED CHAIN LINK FENCE
○	SITE SPECIFIC SOIL LINE	---	PROPOSED VINYL FENCE
		---	PROPOSED 2' CONTOUR
		---	PROPOSED DRAINAGE LINE



**GRADING AND DRAINAGE PLAN  
 COBBLESTONE VILLAGE**

MAP 184; LOT 27  
 137 BELKNAP ROAD  
 HUDSON, NEW HAMPSHIRE  
 HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
 Civil Engineering Land Surveying Landscape Architecture  
 10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

**REVISIONS**

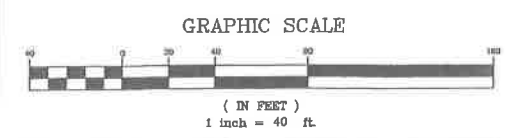
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DATE: JANUARY 23, 2015      SCALE: 1" = 40'  
 PROJECT NO: 14-0721-1      SHEET 8 OF 28

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**UNDERDRAINS:**  
 STATION 0+14 TO 1+90 RT & LT  
 STATION 5+75 TO 7+67 RT & LT

**NPDES NOTE**

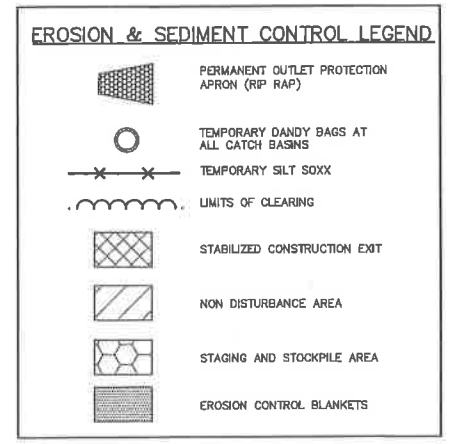
THIS PROJECT DISTURBS IN EXCESS OF 1-ACRE OF LAND. THEREFORE IT WILL BE REQUIRED TO OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE AS ISSUED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE OWNER/DEVELOPER AND "OPERATOR" (GENERAL CONTRACTOR) SHALL EACH BE REQUIRED TO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







- CONSTRUCTION NOTES:**
1. THE PURPOSE OF THIS PLAN IS TO DEPICT THE REQUIRED ONSITE TEMPORARY CONSTRUCTION EROSION CONTROL MEASURES AS WELL AS THE PERMANENT EROSION CONTROL MEASURES.
  2. ALL MEASURES IN THE PLAN SHALL MEET AS A MINIMUM THE BEST MANAGEMENT PRACTICES SET FORTH IN THE "STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE," ROCKINGHAM COUNTY CONSERVATION DISTRICT, NH DEPARTMENT OF ENVIRONMENTAL SERVICES, SOIL CONSERVATION SERVICE (NOW THE NATURAL RESOURCES CONSERVATION SERVICE), AUGUST 2010, AS AMENDED FROM TIME TO TIME.
  3. WHENEVER PRACTICAL, NATURAL VEGETATION SHALL BE RETAINED, PROTECTED OR SUPPLEMENTED. THE STRIPPING OF VEGETATION SHALL BE DONE IN A MANNER THAT MINIMIZES SOIL EROSION.
  4. APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO LAND DISTURBANCE.
  5. THE AREA OF DISTURBANCE SHALL BE KEPT TO A MINIMUM. DISTURBED AREAS REMAINING IDLE FOR MORE THAN 30 DAYS SHALL BE STABILIZED.
  6. MEASURES SHALL BE TAKEN TO CONTROL EROSION WITHIN THE PROJECT AREA. SEDIMENT IN RUNOFF WATER SHALL BE TRAPPED AND RETAINED WITHIN THE PROJECT AREA USING APPROVED MEASURES. WETLAND AREAS AND SURFACE WATERS SHALL BE PROTECTED FROM SEDIMENT.
  7. OFFSITE SURFACE WATER AND RUNOFF FROM UNDISTURBED AREAS SHALL BE DIVERTED AWAY FROM DISTURBED AREAS WHERE FEASIBLE OR CARRIED NON-CROSSIVELY THROUGH THE PROJECT AREA. INTEGRITY OF DOWNSTREAM DRAINAGE SYSTEMS SHALL BE MAINTAINED.
  8. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN FUNCTIONING CONDITION UNTIL FINAL SITE STABILIZATION IS ACCOMPLISHED.
  9. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED AFTER FINAL SITE STABILIZATION. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS RESULTING FROM THE REMOVAL OF TEMPORARY MEASURES SHALL BE PERMANENTLY STABILIZED WITHIN 30 DAYS UNLESS CONDITIONS DICTATE OTHERWISE.
  10. THE TOWN OF HUDSON SHALL RESERVE THE RIGHT TO REQUIRE FURTHER EROSION CONTROL PRACTICES DURING CONSTRUCTION SHOULD THEY FIND IT NECESSARY.
  11. SNOW ACCUMULATED DURING THE WINTER CONSTRUCTION CONDITIONS SHOULD BE STORED IN THE STAGING & STOCKPILE AREA, SURROUNDED BY SILT SOXX.



**EROSION CONTROL PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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PROJECT NO: 14-0721-1      SHEET 10 OF 28

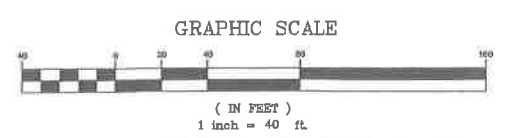
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**NPDES NOTE**

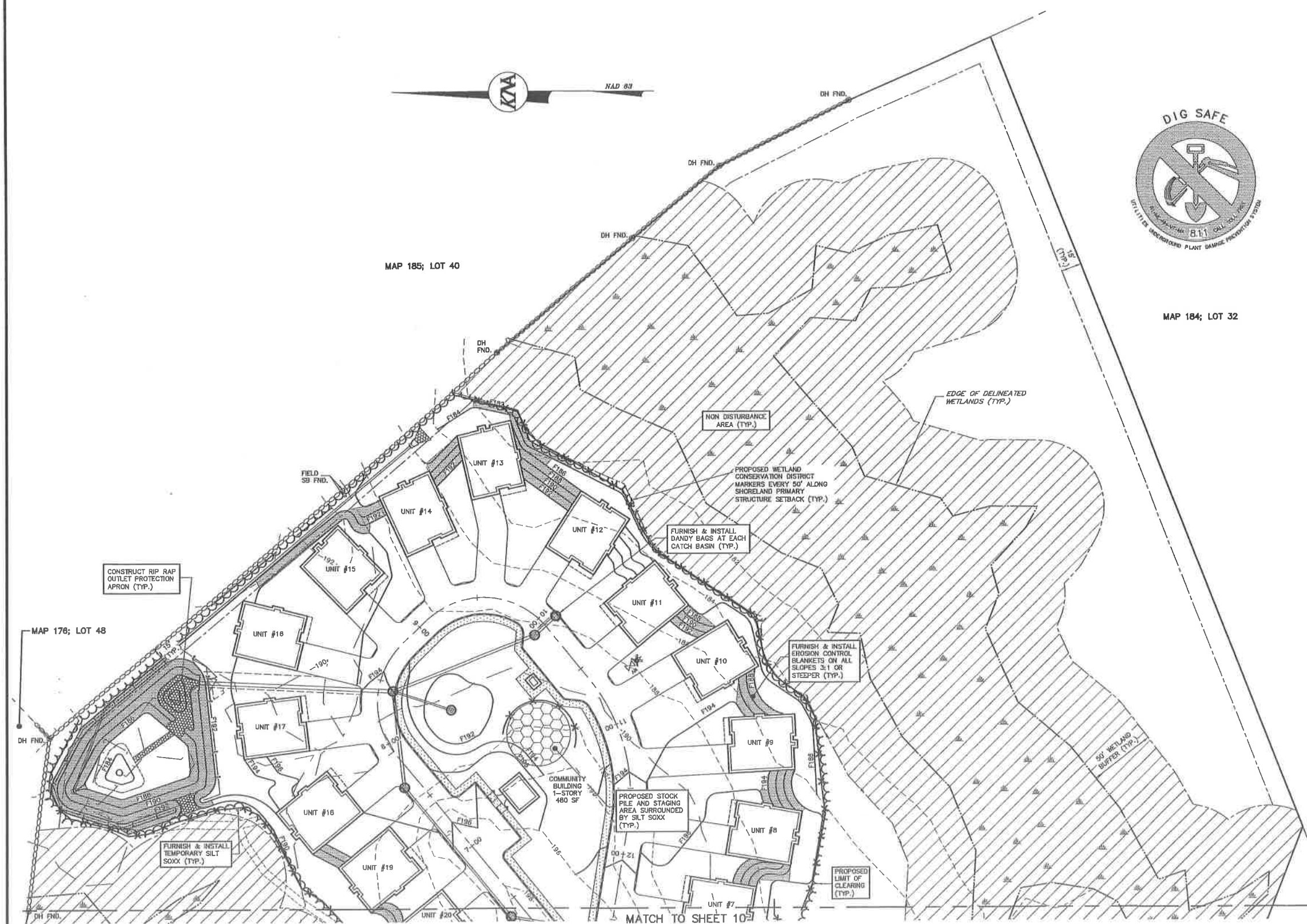
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SEE SHEET 10 FOR NOTES

LOAM & SEED ALL DISTURBED AREAS



**EROSION & SEDIMENT CONTROL LEGEND**

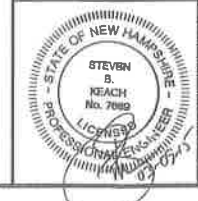
	PERMANENT OUTLET PROTECTION APRON (RIP RAP)
	TEMPORARY DANDY BAGS AT ALL CATCH BASINS
	TEMPORARY SILT FENCE
	LIMITS OF CLEARING
	STABILIZED CONSTRUCTION EXIT
	NON DISTURBANCE AREA
	STAGING AND STOCKPILE AREA
	EROSION CONTROL BLANKETS

**EROSION CONTROL PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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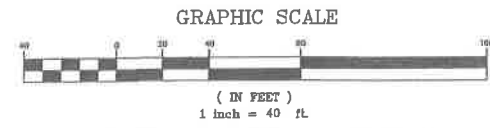


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PROJECT NO: 14-0721-1      SHEET 11 OF 28

**NPDES NOTE**

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



PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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- CONSTRUCTION NOTES:**
1. ALL WORK SHALL CONFORM TO THE APPLICABLE REGULATIONS AND STANDARDS OF THE TOWN OF HUDSON, AND SHALL BE BUILT IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF NEW HAMPSHIRE, DEPARTMENT OF TRANSPORTATION, APPROVED AND ADOPTED 2010 ARE HEREBY INCORPORATED BY REFERENCE.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THESE PLANS, PRIOR TO THE START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION, AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING "DIG SAFE" AT 811 AT LEAST 72 HOURS BEFORE DIGGING.
  3. ALL NEW HYDRANTS IN THE TOWN OF HUDSON SHALL BE METROPOLITAN M-94 WITH VALVES THAT OPEN LEFT (COUNTER CLOCKWISE).
  4. FINAL LAYOUT AND DESIGN OF UNDERGROUND CONDUIT (ELECTRIC CABLE) AND GAS SHALL BE SUPPLIED BY LOCAL UTILITY INCLUDING LOCATIONS OF PULL BOXES AND TRANSFORMER PADS. CONTRACTOR TO VERIFY PROPOSED LOCATIONS WITH APPROPRIATE UTILITY PROVIDER PRIOR TO CONSTRUCTION.
  5. WATERMAIN SHALL BECOME THE PROPERTY OF THE TOWN OF HUDSON WATER UTILITY FOLLOWING INSTALLATION. THE ON-SITE SEWER SHALL REMAIN PRIVATE.
  6. THE PROPOSED SEWER SYSTEM CONSISTS OF INDIVIDUAL GRINDER PUMP SYSTEMS OUTSIDE EACH UNIT THAT EACH PUMP TO A COMMUNITY FORCEMAIN UNDER COBBLESTONE DRIVE. SYSTEM WAS LAID OUT BY AFFORDABLE SEWER SOLUTIONS. FINAL DESIGN SHALL BE CERTIFIED BY A NH PE REVIEWED BY A THIRD PARTY AT THE EXPENSE OF THE DEVELOPER AND APPROVED BY THE TOWN ENGINEER PRIOR TO ENGINEERING DEPARTMENT SIGNING OF ANY BUILDING PERMITS.



**LEGEND**

- STONE BOUND FOUND
- IRON PIN FOUND
- DRILL HOLE
- UTILITY POLE
- SIGN
- LIGHT
- GAS VALVE
- WATER VALVE
- HYDRANT
- WATER SHUT OFF
- SEWER MANHOLE
- DRAINAGE MANHOLE
- CATCH BASIN
- BUILDING SETBACK
- EASEMENT
- ZONE LINE
- ABUTTER LINE
- PROPERTY LINE
- WETLAND
- CHAIN LINK FENCE
- BARBED WIRE FENCE
- CHU OVERHEAD UTILITIES
- GAS LINE
- WATER LINE
- SEWER LINE
- DRAINAGE LINE
- TREE LINE
- RETAINING WALL
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- STONEWALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED BITUMINOUS CURB
- PROPOSED DRAINAGE LINE
- PROPOSED UNDERGROUND UTILITIES
- PROPOSED GAS LINE
- PROPOSED WATER LINE
- PROPOSED SEWER LINE
- FM PROPOSED FORCEMAIN



**UTILITY PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

**KMA KEACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 303, Bedford, NH 03110 Phone (603) 627-2881



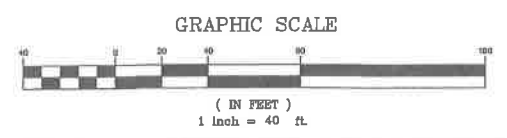
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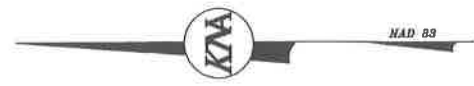


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No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	DJC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 12 OF 28

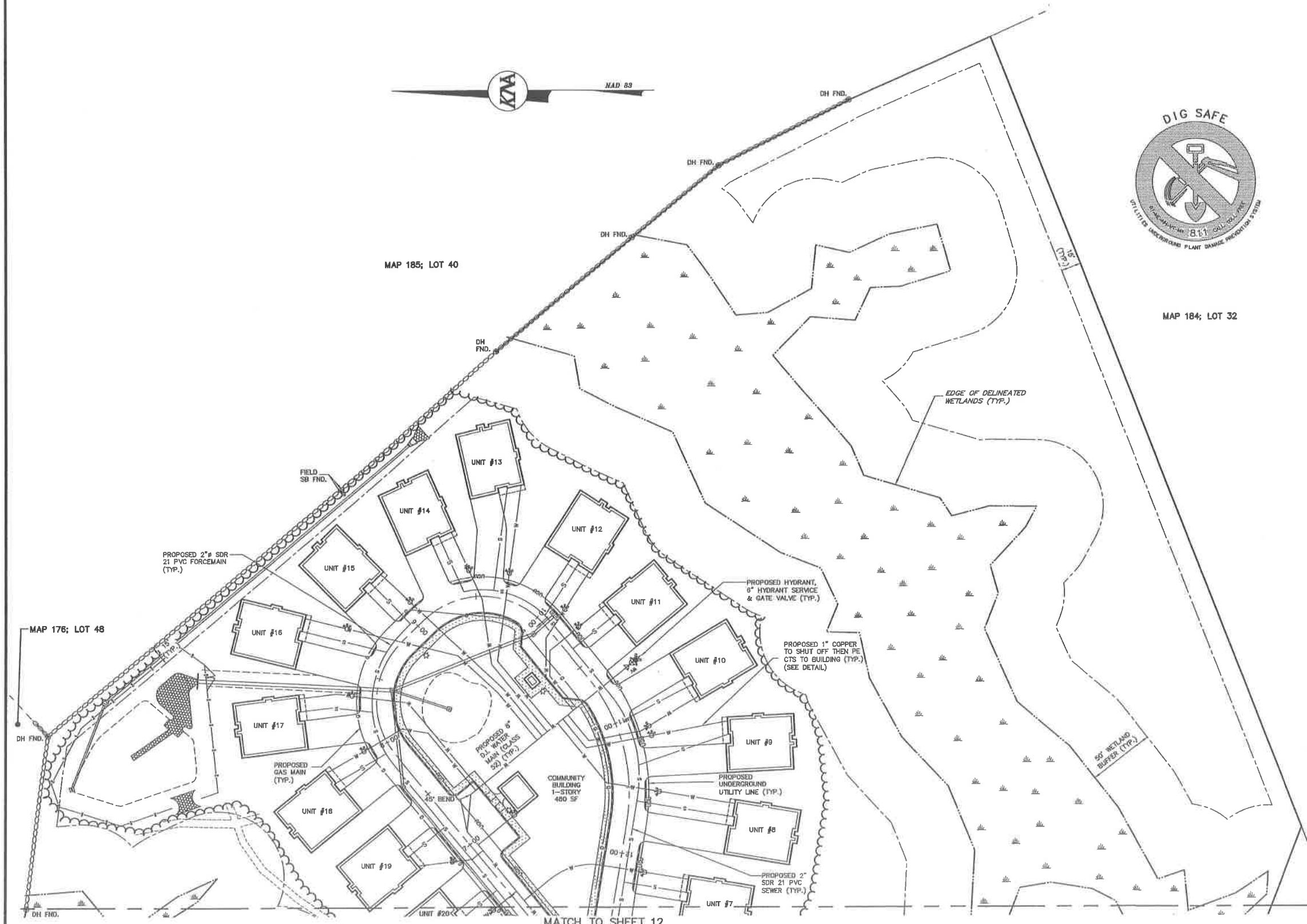
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SEE SHEET 12 FOR NOTES



**LEGEND**

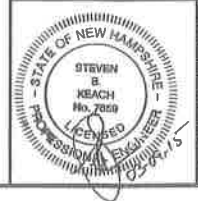
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**UTILITY PLAN**  
**COBBLESTONE VILLAGE**  
 MAP 184; LOT 27  
 137 BELKNAP ROAD  
 HUDSON, NEW HAMPSHIRE  
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<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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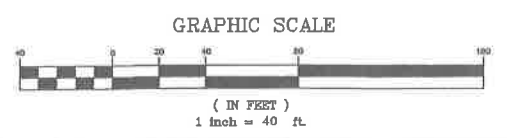
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**LANDSCAPE NOTES:**

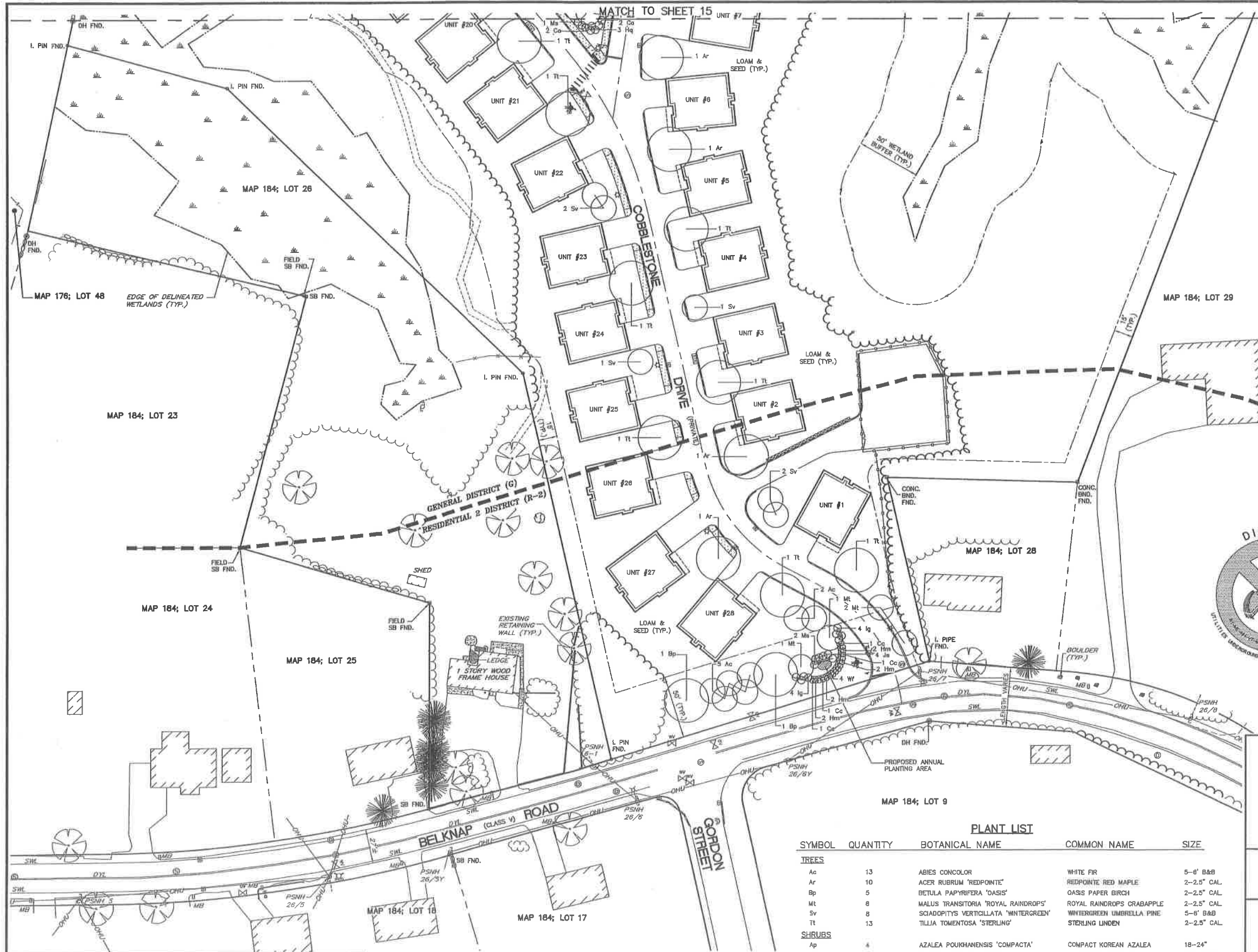
1. ALL PLANT MATERIALS USED SHALL BE NURSERY STOCK AND SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF INSTALLATION. ANY MATERIAL WHICH DIES OR DOES NOT SHOWN HEALTHY APPEARANCE WITHIN THIS TIME SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE, WITH SAME WARRANTY REQUIREMENTS AS THE ORIGINAL. WARRANTIES TYPICALLY DO NOT COVER LOSS DUE TO INSECT INFESTATION OR MECHANICAL DAMAGE (I.E. SNOW STORAGE).
2. IF THE SOIL CONDITIONS ARE EXTREMELY SANDY, ALL TREES SHALL HAVE A 6" LAYER OF COMPACTED TOPSOIL PLACED IN THE BASE OF THE PLANT PIT AS A MOISTURE RETENTION LAYER. THE PLANT PIT SIDEWALLS SHALL BE OVER EXCAVATED BY AN ADDITIONAL 12" BEYOND THE NORMAL OUTSIDE RADIUS OF THE HOLE. A TOPSOIL MIXTURE SHALL BE USED TO BACKFILL THE HOLE AS FOLLOWS: ORGANIC TOPSOIL AMENDED WITH 10% WOOD ASH, 10% MANURE, 30% PEATMOSS AND A GRANULAR HYDROGEL TO ABSORB AND RETAIN WATER.
3. PLANTING BEDS AND SAUCERS SHALL RECEIVE A 4" MINIMUM THICKNESS OF PINE/HEMLOCK BARK MULCH OVER A 5oz. POLYPROPYLENE WEED CONTROL FABRIC.
4. PAVEMENT AND ROAD BASE MATERIAL ENCOUNTERED IN ANY LAWN OR PLANTING BED SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AND SUITABLE AMENDED SOIL INSTALLED AS SPECIFIED IN THE TURF ESTABLISHMENT SCHEDULE.

**NOTES FOR PLANTING AQUATIC BENCHES:**

1. FOR THE PLANTING OF THE AQUATIC BENCHES, THE CONTRACTOR SHALL USE THE EMERGENT WETLAND MIX AS PROVIDED BY STONEY RIDGE ENVIRONMENTAL, OR APPROVED EQUAL.
2. THIS SEED MIX SHALL BE APPLIED AT A RATE OF 1 LB./3,000 SF AND CONSISTS OF THE FOLLOWING:  
 SCORPUS ATROVIRENS (GREEN BULRUSH)  
 SPARGANUM AMERICANUM (EASTERN BUR-REED)  
 SPARGANUM EURYCARPUM (GIANT BUR-REED)  
 PONTEDERIA CORDATA (PICKERELWEED)  
 PELTANDRA VIRGINICA (ARROW ARUM)  
 SAGITTARIA LATIFOLIA (ARROWHEAD)  
 IRIS VERSICOLOR (BLUEFLAG)  
 LEERSIA ORYZOIDES (RICE-CUT GRASS)  
 GLYCERIA CANADENSIS (RATTLESNARE GRASS)  
 ASCLEPIAS INCARNATA (SWAMP MILKWEED)  
 BIDENS CERNUA (NODDING BEGGARS-TICKS)
3. AQUATIC BENCH IS TO REMAIN IN A NATURAL STATE AND SHALL NOT BE MOWED.

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- PROPOSED CHAIN LINK FENCE
- PROPOSED VINYL FENCE



**PLANT LIST**

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
<b>TREES</b>				
Ac	13	ABIES CONCOLOR	WHITE FIR	5-6' B&B
Ar	10	ACER RUBRUM 'REDPOINTE'	REDPOINTE RED MAPLE	2-2.5' CAL
Bp	5	BETULA PAPYRIFERA 'OASIS'	OASIS PAPER BIRCH	2-2.5' CAL
Mt	8	MALUS TRANSITORIA 'ROYAL RAINDROPS'	ROYAL RAINDROPS CRABAPPLE	2-2.5' CAL
Sv	8	SCADOPITIS VERTICILLATA 'WINTERGREEN'	WINTERGREEN UMBRELLA PINE	5-6' B&B
Tl	13	TILIA TOMENTOSA 'STERLING'	STERLING LINDEN	2-2.5' CAL
<b>SHRUBS</b>				
Ap	4	AZALEA POUKHANENSIS 'COMPACTA'	COMPACT KOREAN AZALEA	18-24"
Co	6	CORNUS ALBA 'IVORY HALO'	IVORY HALO DOGWOOD	2.5-3' B&B
Cc	4	CARYOPTERIS CLANDONENSIS 'DARK KNIGHT'	DARK KNIGHT SPIREA	15-18"
Hm	8	HYDRANGEA MACROPHYLLA 'SISTER THERESA'	SISTER THERESA HYDRANGEA	18-24"
Hq	3	HYDRANGEA QUEROCIFOLIA 'SNOW QUEEN'	SNOW QUEEN OAKLEAF HYDRANGEA	2-2.5'
Ig	3	ILEX GLABRA 'COMPACTA'	COMPACT INKBERRY	2-2.5'
Jh	6	JUNIPERUS HORIZONTALIS 'BAR HARBOR'	BAR HARBOR JUNIPER	18-24"
Js	4	JUNIPERUS SCOPULORUM 'WCHITA BLUE'	WCHITA BLUE JUNIPER	4-5' B&B
Wf	4	WEGELA FLORIDA 'DARK HORSE'	DARK HORSE WEGELA	18-24"
<b>PERENNIALS</b>				
Ma	4	MISCANTHUS SINENSIS 'CABARET'	CABARET SILVER GRASS	#3

**LANDSCAPE PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF MAP RECORD:** DEERCREEK DEVELOPMENT, LLC, 25 FLAGSTONE DRIVE, HUDSON, NH 03051, H.C.R.D. BK. 8480, PG. 777

**APPLICANT:** DEERCREEK DEVELOPMENT, LLC, 25 FLAGSTONE DRIVE, HUDSON, NH 03051

**KMA REACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2861



**REVISIONS**

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PROJECT NO: 14-0721-1 SHEET 14 OF 28

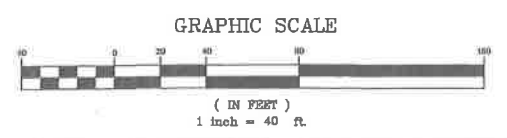
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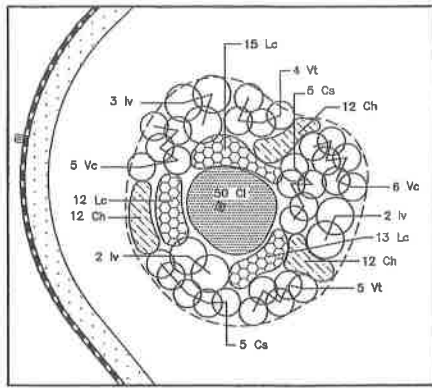
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**RAIN GARDEN PLANT LIST**

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	SIZE
<b>SHRUBS</b>				
Iv	7	ILEX VERTICILLATA	COMMON WINTERBERRY	12-18"
Ca	10	CORNUS SERICEA 'ALLEMANS COMPACTA'	ALLEMAN'S COMPACT RED-OSIER DOGWOOD	18-24"
Vc	11	VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY	18-24"
Vt	9	VBURNUM TRILOBUM 'COMPACTA'	AMERICAN CRANBERRY COMPACT VBURNUM	18-24"
<b>PERENNIALS</b>				
Ch	38	CHELONE 'HOT LIPS'	HOT LIPS TURTLEHEAD	1 QT.
Cl	50	CHASMANTHIUM LATIFOLIUM	NORTHERN SEA OATS	1 QT.
Lc	40	LOBELIA CARDINALIS	CARDINAL FLOWER	1 QT.



**RAIN GARDEN DETAIL**  
SCALE: 1" = 20'

SEE SHEET 14 FOR PLANT LIST & NOTES

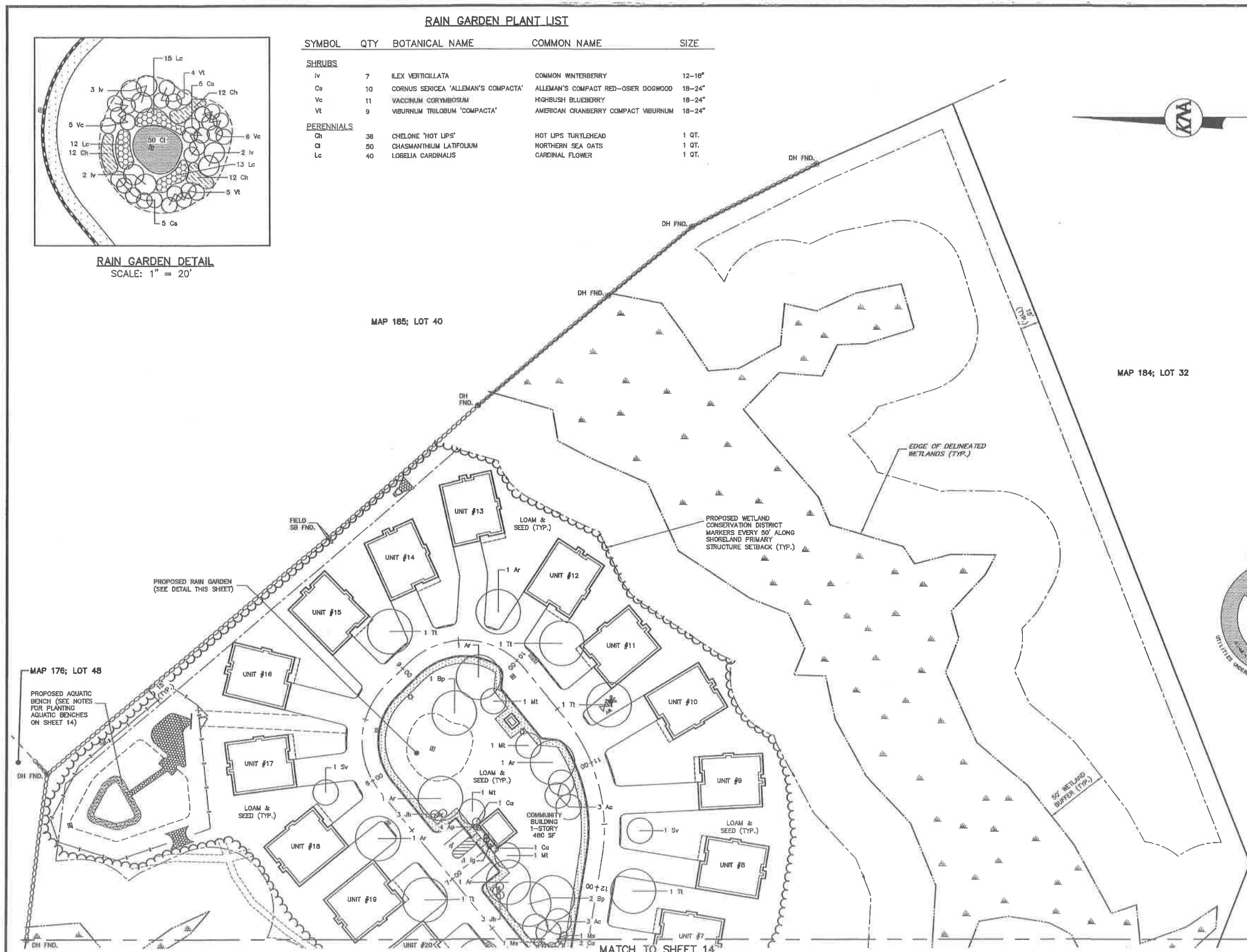
**COMMUNITY BUILDING LANDSCAPE CALCULATIONS**

REQUIRED PARKING LOT INTERIOR LANDSCAPE AREA  
 PROPOSED PARKING AREA PAVED: 2,376 SF  
 10% REQUIRED LANDSCAPE AREA: 238 SF  
 PROVIDED LANDSCAPE AREA: 18,135 SF

REQUIRED PARKING LOT SHADE TREES AND SHRUBS  
 PROPOSED PARKING AREA: 2,376 SF  
 SHADE TREES REQUIRED (2,376/1,600): 2 TREES REQUIRED, OR  
 (OR 1 PER 5 PARKING SPACES) 1 TREES REQUIRED  
 SHADE TREES PROVIDED: 2 TREES PROVIDED  
 SHRUBS REQUIRED (2,376/200): 12 SHRUBS REQUIRED, OR  
 (OR 1.8 x 5 PARKING SPACES) 8 SHRUBS REQUIRED  
 SHRUBS PROVIDED: 13 SHRUBS PROVIDED

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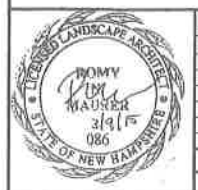


**LANDSCAPE PLAN**  
**COBBLESTONE VILLAGE**  
 MAP 184; LOT 27  
 137 BELKNAP ROAD  
 HUDSON, NEW HAMPSHIRE  
 HILLSBOROUGH COUNTY

**OWNER OF MAP RECORD:**  
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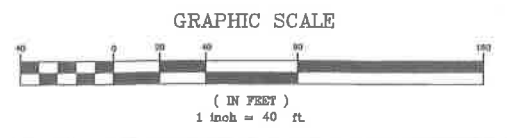
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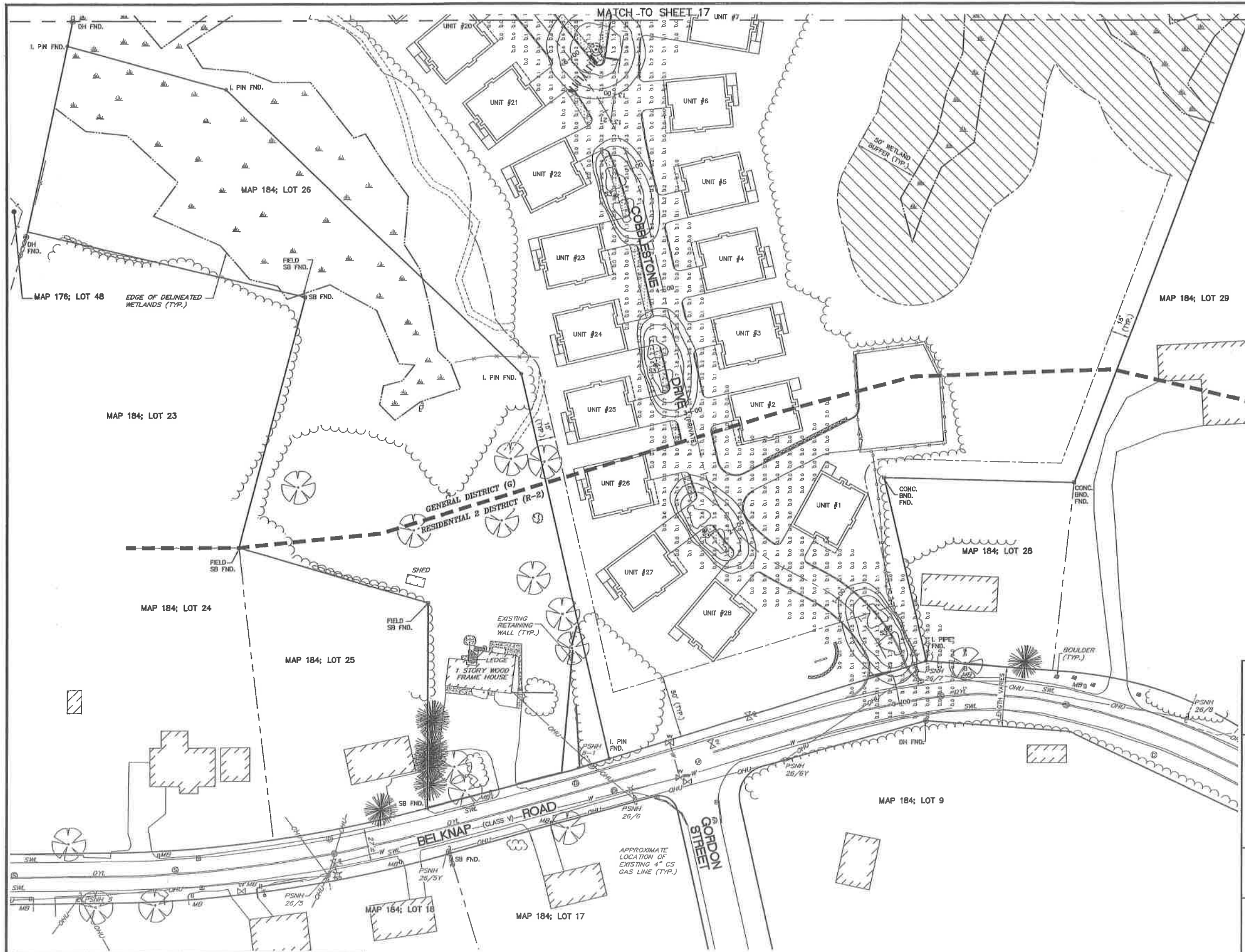
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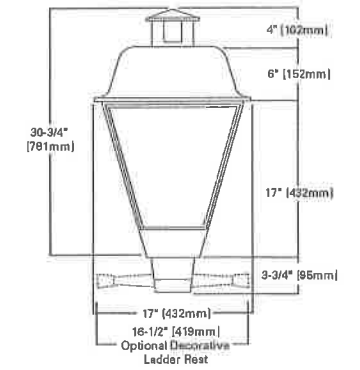


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- LIGHTING NOTES:**
1. ALL FIXTURES ARE FULL CUTOFF.
  2. ALL FIXTURES SHALL BE MOUNTED 12' ABOVE FINISHED GROUND.
  3. INSTALLATION IN ACCORDANCE WITH LOCAL JURISDICTION.



**TRADITIONAIRE LED DOWNLIGHT**  
NOT TO SCALE



**CHARRON**  
INCORPORATED  
P.O. BOX 4550  
MANCHESTER, NH 03806  
(603) 624-8827  
FAX (603) 624-0744

**LIGHTING PLAN  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
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HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

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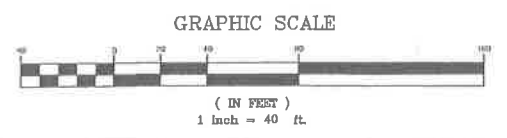
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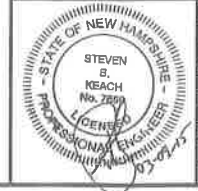
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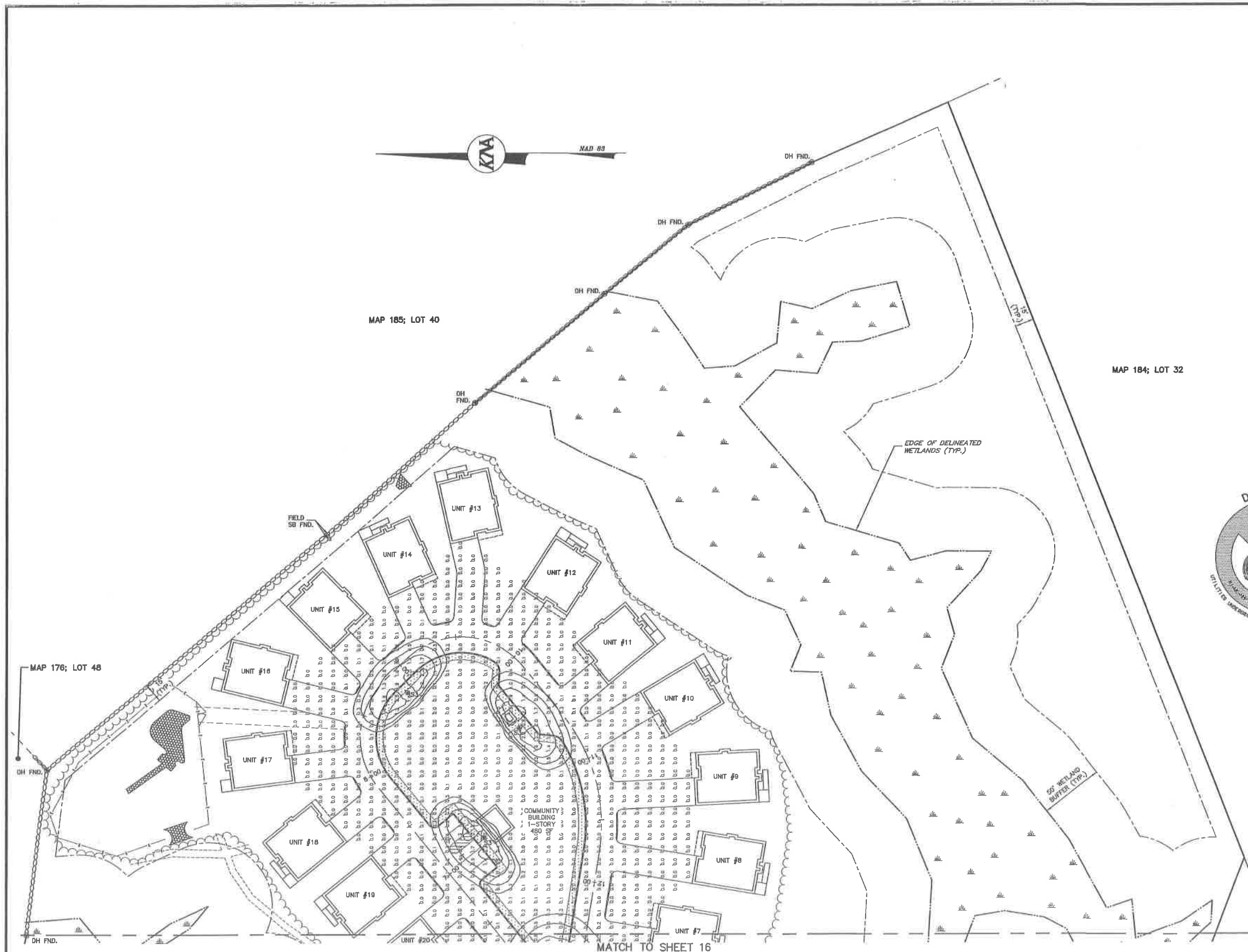
LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
⊙	7	S3	SINGLE	UTLDB02LEDEUSL3/ 12' POLE
⊙	1	S5	SINGLE	UTLDB02LEDEUSW3/ 12' POLE



REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	B.R.

DATE: JANUARY 23, 2015      SCALE: 1" = 40'  
PROJECT NO: 14-0721-1      SHEET 16 OF 28

SEE SHEET 16 FOR LUMINAIRE SCHEDULE & NOTES



**CHARRON**  
INCORPORATED  
P.O. BOX 4650  
MANCHESTER, NH 03106  
(603) 624-4827  
FAX (603) 624-6784

**LIGHTING PLAN**  
**COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 6480, PG. 777

**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2811



REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BAC

DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 17 OF 28

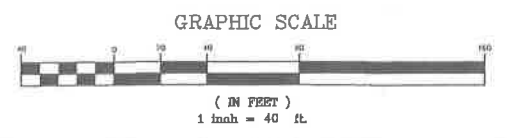
PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

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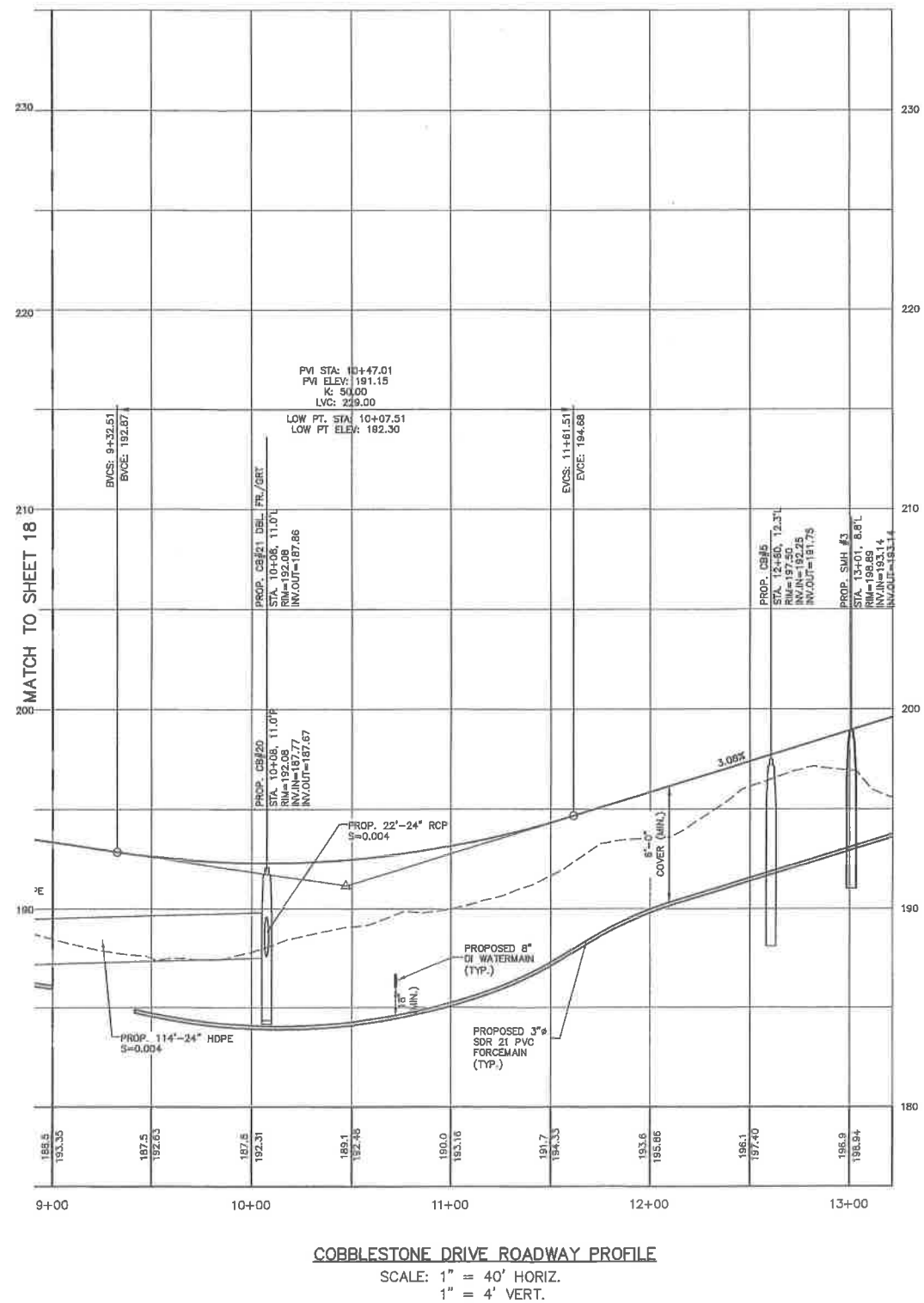
LUMINAIRE SCHEDULE				
SYMBOL	QTY	LABEL	ARRANGEMENT	DESCRIPTION
	7	S3	SINGLE	UTL0B0LE0U5LJ/ 12' POLE
	1	S5	SINGLE	UTL0B0LE0U5WQ/ 12' POLE

g:\\_proj\140721\1407211\dwg\1407211-LIGHTING - REV1.dwg, 3/9/2015 11:52:27 PM, 1:1





Q:\project\140721\140721.dwg - REV1.dwg, 3/9/2015 1:15:54 PM, 1:1



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**ROADWAY PROFILE  
 COBBLESTONE VILLAGE**

MAP 184; LOT 27  
 137 BELKNAP ROAD  
 HUDSON, NEW HAMPSHIRE  
 HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
--	--

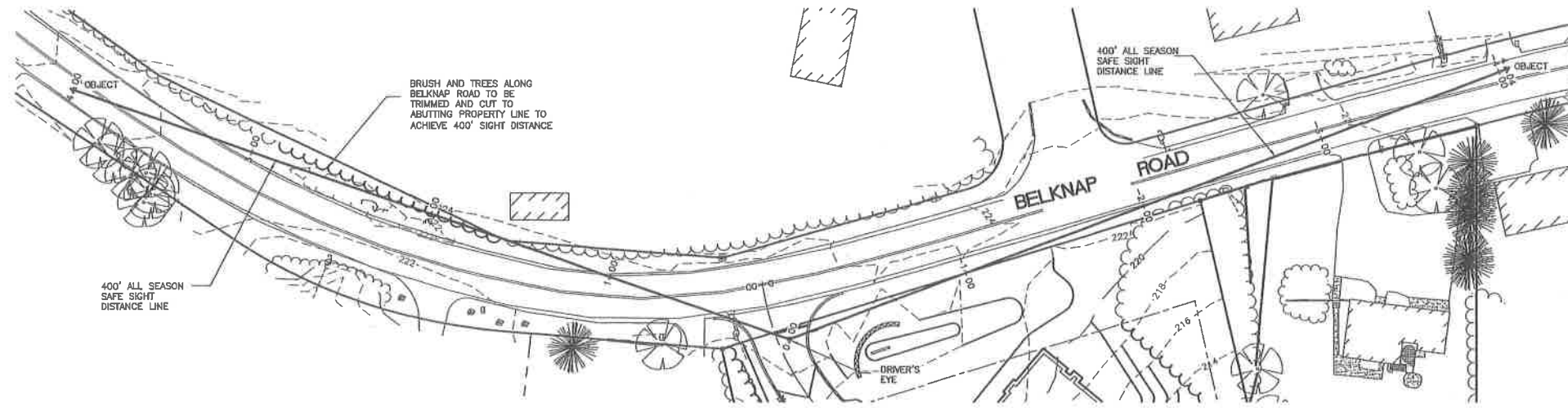
**KM KEACH-NORDSTROM ASSOCIATES, INC.**  
 Civil Engineering Land Surveying Landscape Architecture  
 10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-2891

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

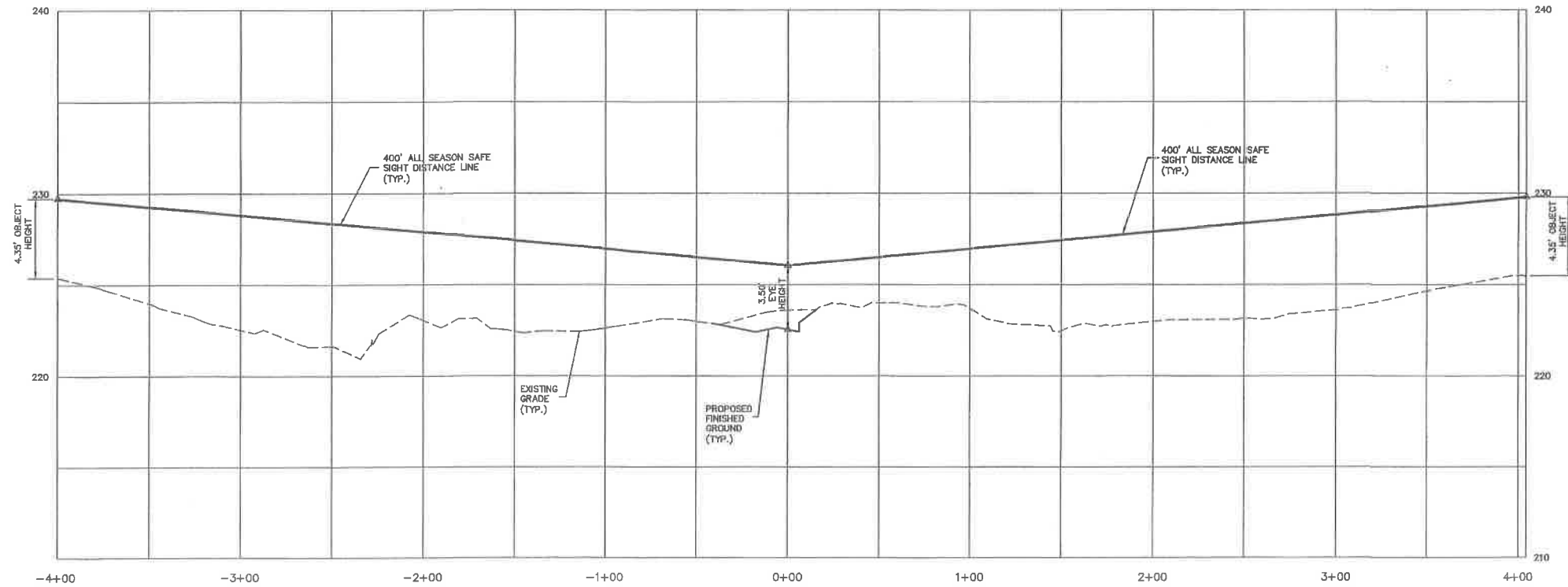
DATE: JANUARY 23, 2015      SCALE: 1" = 40'  
 PROJECT NO: 14-0721-1      SHEET 19 OF 28



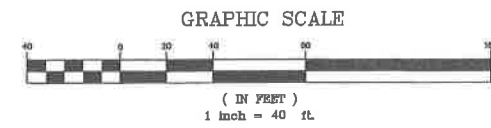




**SIGHT DISTANCE PLAN**  
SCALE: 1" = 40'



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



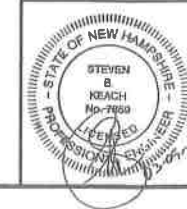
**SIGHT DISTANCE PLAN AND PROFILE  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
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**APPLICANT:**  
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HUDSON, NH 03051

**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
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10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2861



REVISIONS			
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DATE: JANUARY 23, 2015 SCALE: 1" = 40'  
PROJECT NO: 14-0721-1 SHEET 20 OF 28

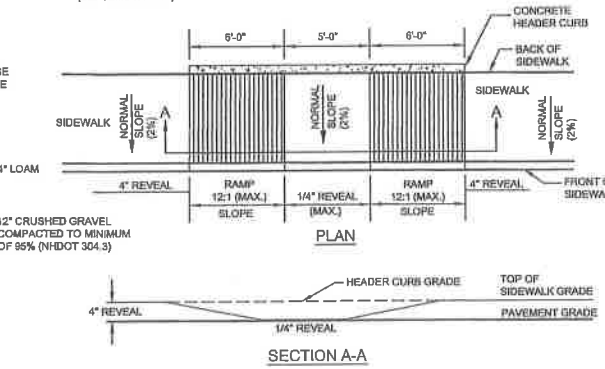
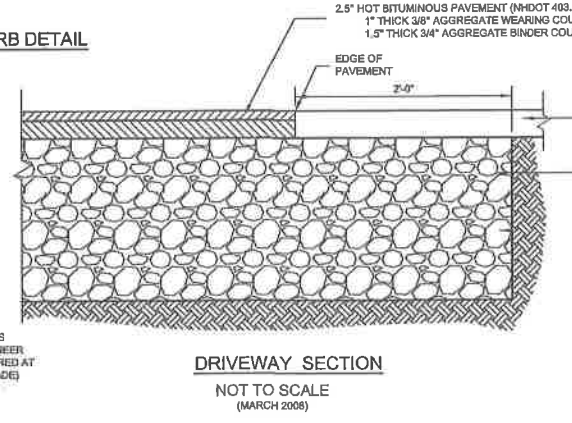
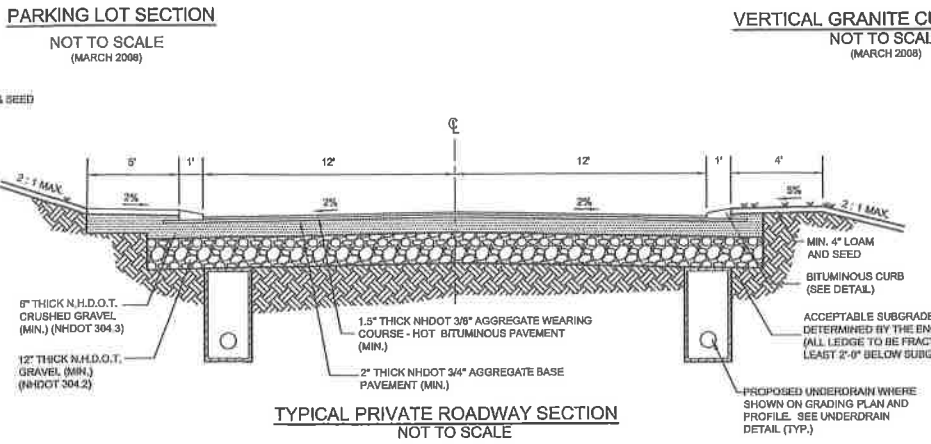
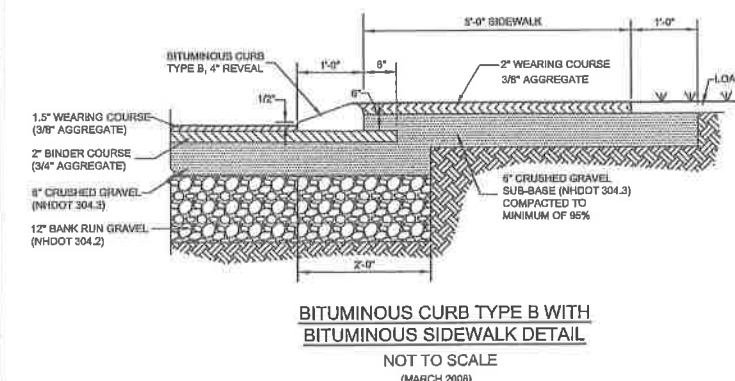
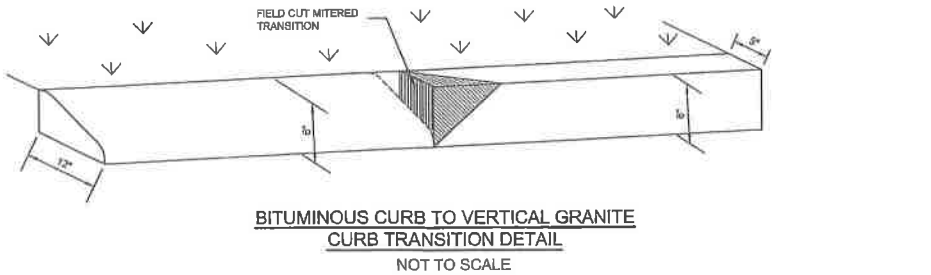
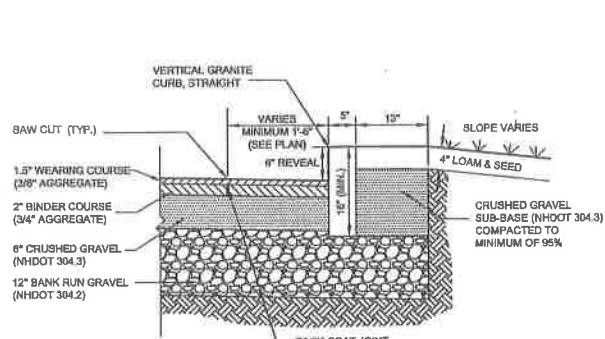
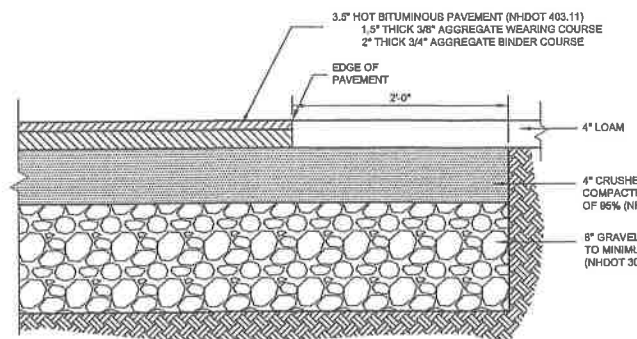
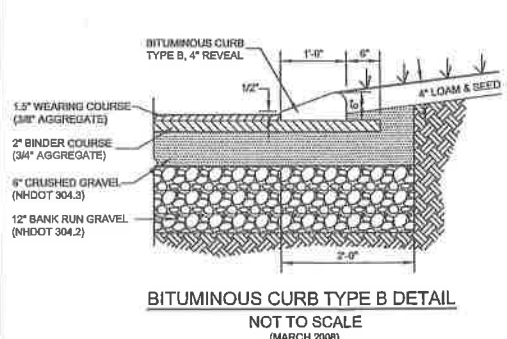
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**TURF ESTABLISHMENT SCHEDULE**

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

**PREPARATION AND EXECUTION:**

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

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

**APPLICATION RATES:**

1. LOAM SHALL BE APPLIED AT A MINIMUM COMPACTED THICKNESS OF 4 INCHES.
2. LIME SHALL BE APPLIED AT A RATE OF 75 TO 100 POUNDS PER 1,000 S.F.
3. FERTILIZER SHALL BE APPLIED AT A RATE OF 30 POUNDS PER 1,000 S.F.
4. SEED MIXTURE FOR LAWN AREAS SHALL BE APPLIED AT A RATE OF AT LEAST 80 POUNDS PER ACRE OR 2 POUNDS PER 1,000 S.F.
5. TEMPORARY SEED MIXTURE SHALL BE APPLIED AT A RATE OF 2 POUNDS PER 1,000 S.F.
6. SEED MIXTURE FOR SLOPE AREAS SHALL BE APPLIED AT A RATE OF 80 POUNDS PER ACRE OR 2 POUNDS PER 1,000 S.F.
7. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS SHALL BE APPLIED AT A RATE OF 70 POUNDS PER ACRE OR 1.5 POUNDS PER 1,000 S.F.
8. MULCH SHALL BE APPLIED AT A RATE OF 90 POUNDS PER 1,000 S.F.

**MATERIALS:**

1. LOAM USED FOR TOPSOIL SHALL BE FRIABLE, FERTILE, NATURAL FREE-DRAINING LOAM FREE OF ROOTS, GRASS, STICKS, WEEDS, CLAY, SOD LUMPS, DEBRIS AND STONES LARGER THAN 1 INCH IN ANY DIMENSION. SOIL SHALL NOT BE EXCESSIVELY ACID OR ALKALINE AND CONTAIN NO TOXIC MATERIALS.
2. LIME SHALL BE GROUND LIMESTONE CONTAINING NO LESS THAN 90% CALCIUM AND MAGNESIUM CARBONATES.
3. FERTILIZER SHALL BE 10-20-20 COMMERCIAL GRADE.
4. SEED MIXTURE FOR LAWN AREAS SHALL BE 99% PURE LIVE SEED AND CONSIST OF THE FOLLOWING:  
25% CREEPING RED FESCUE  
25% KENTUCKY BLUEGRASS  
25% REDTOP  
25% PERENNIAL RYEGRASS
5. TEMPORARY SEEDING MIXTURE SHALL BE AN APPROVED CONSERVATION MIX OR CONSIST OF THE FOLLOWING:  
15% BLACKWELL OR SHELTER SWITCHGRASS  
30% NIAGRA OR KAW BIG BLUESTEM  
30% CAMPER OR BLAZE LITTLESTEM  
15% NE-ZY OR BLAZE SAND LOVEGRASS  
10% VIKING BIRDSFOOT TREFLOIL
6. SEED MIXTURE FOR SLOPE AREAS SHALL BE 99% PURE LIVE SEED AND SHALL CONSIST OF THE FOLLOWING:  
30% CREEPING RED FESCUE  
40% PERENNIAL RYE GRASS  
15% REDTOP  
15% BIRDSFOOT TREFLOIL  
\*IN ADDITION TO THE MIX SPECIFIED ABOVE, GROWN VETCH SHALL BE USED ON ALL SLOPES STEEPER THAN 3:1. GROWN VETCH SHALL BE APPLIED AT A RATE OF 10 POUNDS PER ACRE AND INOCULUM SPECIFIC TO GROWN VETCH MUST BE USED.
7. SEED MIXTURE FOR STORMWATER MANAGEMENT AREAS, INCLUDING DETENTION BASINS AND VEGETATED TREATMENT SWALES SHALL CONSIST OF THE FOLLOWING:  
25% CREEPING RED FESCUE  
15% SWITCH GRASS  
15% FOX SEDGE  
15% CREEPING BENTGRASS  
10% FLATPEA  
20% WILDFLOWER VARIETY
8. HAY USED FOR MULCH SHALL CONSIST OF MOWED AND PROPERLY CURED GRASS OR LEGUME MOWINGS, FREE FROM WEEDS, TWIGS, DEBRIS OR OTHER DELETERIOUS MATERIAL AND NOT ON SOD.



**STOP SIGN DETAIL NOT TO SCALE (MARCH 2008)**

**TRAFFIC SIGN NOTES:**

1. ALL TRAFFIC SIGN FACES AND SHAPES SHALL CONFORM WITH THE MUTCD.
2. ALL SIGN POST MOUNTS SHALL CONFORM WITH THE ASHTO AND NHDOT SPECIFICATIONS.



**STOP BAR**



**W1-10a (LEFT) HORIZONTAL ALIGNMENT SIGN DETAIL NOT TO SCALE**



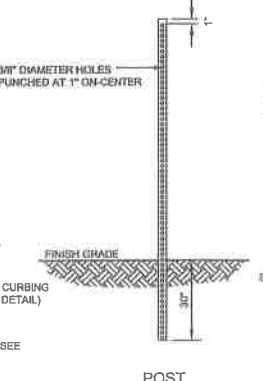
**TYPICAL SIGN PLATE DETAILS NOT TO SCALE**



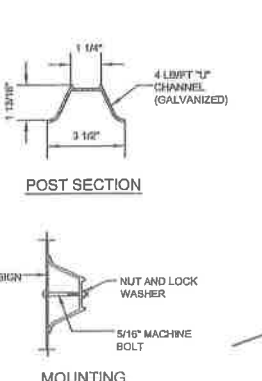
**PRIVATE ROAD SIGN DETAIL NOT TO SCALE**



**VAN ACCESSIBLE HANDICAP PARKING SIGN DETAIL NOT TO SCALE (MARCH 2008)**



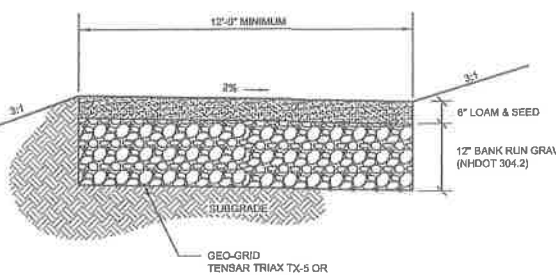
**POST SECTION**



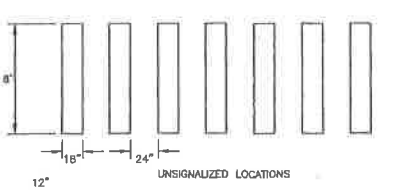
**MOUNTING**

**NOTE:**  
POST SHALL CONFORM TO NHDOT 615.2.5.3

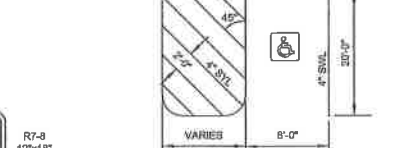
**STEEL SIGN POST DETAIL NOT TO SCALE (MARCH 2008)**



**DRAINAGE ACCESS WAY DETAIL NOT TO SCALE**



**SIDEWALK RAMP NOT TO SCALE (MARCH 2008)**



**PAVEMENT MARKINGS NOT TO SCALE**



**HANDICAP STRIPING DETAIL NOT TO SCALE (MARCH 2008)**

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**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
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25 FLAGSTONE DRIVE  
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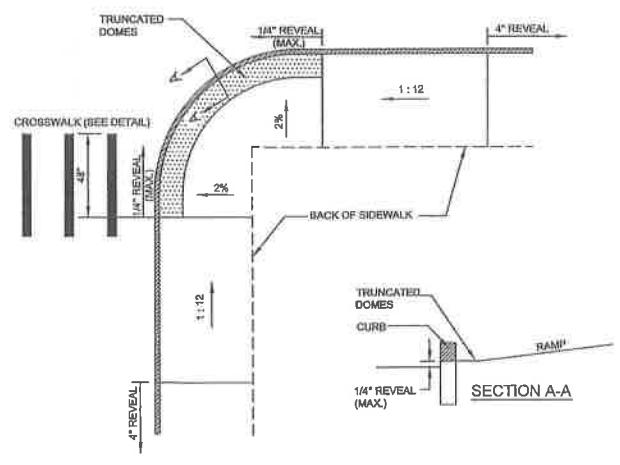
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**K/A KEACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-2881

**REVISIONS**

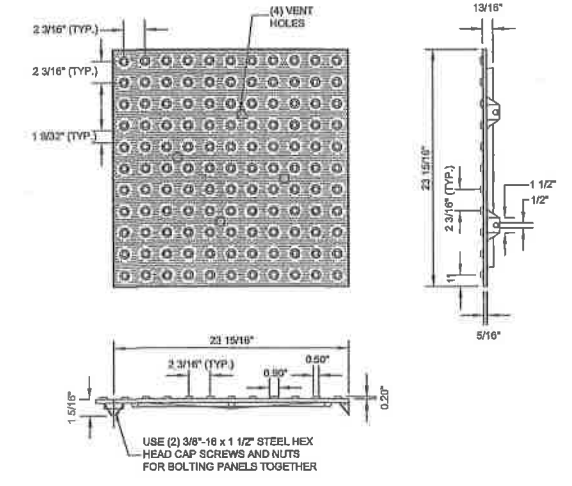
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: AS SHOWN  
PROJECT NO: 14-0721-1 SHEET 21 OF 28



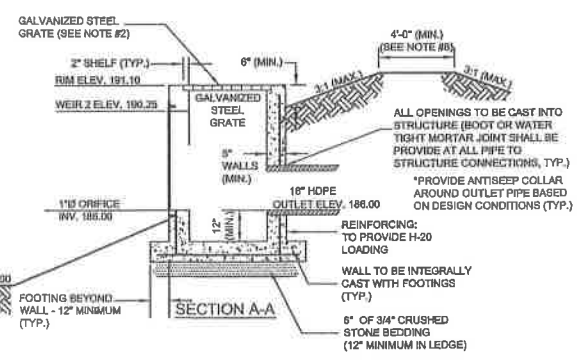
- NOTES:**
- A BROOM FINISH TRANSVERSE TO THE SLOPE OF THE RAMP SHALL BE USED ON PORTLAND CEMENT CONCRETE RAMPS.
  - MAINTAIN THE NORMAL GUTTER PROFILE THROUGHOUT THE RAMP AREA.
  - INTERCEPT DRAINAGE ALONG THE CURB IN ADVANCE OF THE RAMP.
  - MAINTAIN A MAXIMUM 1/4" OF CURB REVEAL AT THE RAMP, SEE SECTION A-A.

**CORNER SIDEWALK RAMP DETAIL**  
NOT TO SCALE  
(MARCH 2009)

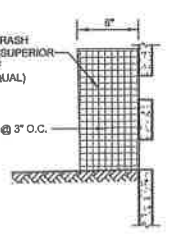


- NOTES:**
- DETECTABLE WARNING PLATE SHALL BE NEENAH FOUNDRY OR APPROVED EQUAL.
  - THE PLATE MUST COMPLY WITH ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES) AND ARCHITECTURAL BARRIER ACT GUIDELINES.
  - MATERIAL SHALL BE CAST GRAY IRON.
  - FINISH: NO PAINT.

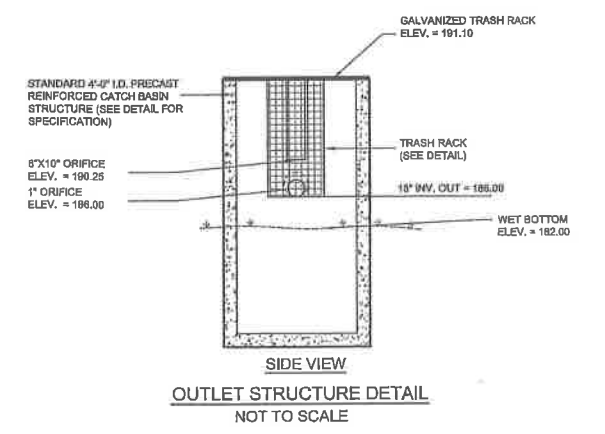
**24"x24" DETECTABLE WARNING PLATE DETAIL**  
NOT TO SCALE  
(MARCH 2009)



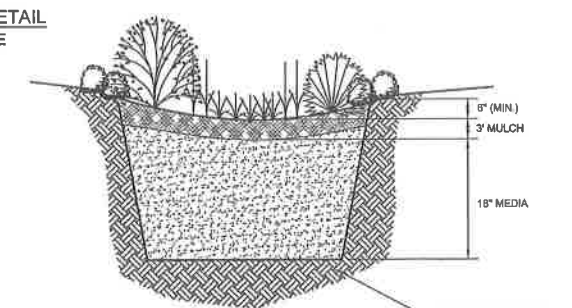
- NOTES:**
- ALL CEMENT CONCRETE TO BE 4000 PSI MINIMUM.
  - GALVANIZED STEEL GRATE SHALL BE BOLTED TO TOP OF STRUCTURE WITH 1/2" STAINLESS STEEL BOLTS AND THREADED INSERTS.
  - OUTLET PIPE SHALL NOT BE LESS THAN 1 1/2" DIAMETER AND SHALL BE SIZED FOR A 60-YEAR STORM.
  - ALL OPENINGS CAST IN AS REQUIRED. MINIMUM CONCRETE WEIR WIDTH SHALL BE 2'.
  - PRECAST REINFORCED CONCRETE STRUCTURE TO MEET ASTM C-78 DESIGNATION AND H-20 LOADING.
  - CONTROL WEIR SHALL BE SIZED TO MITIGATE DESIGN STORM AS REQUIRED BY THE REGULATIONS AND IN ACCORDANCE WITH THE APPROVED DRAINAGE CALCULATIONS. STAINLESS STEEL PLATE SHALL BE USED FOR CONTROL WEIRS LESS THAN 2' WIDE.
  - ALL STAINLESS STEEL SHALL BE GRADE 316.



**TRASH RACK DETAIL**  
NOT TO SCALE

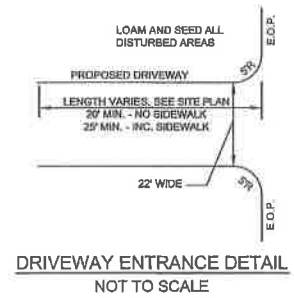


**OUTLET STRUCTURE DETAIL**  
NOT TO SCALE

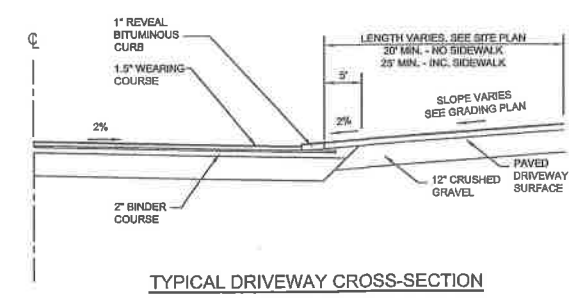


- NOTE:**
- THIS SYSTEM SHALL NOT BE IN SERVICE UNTIL THE SPECIFIED PLANTINGS ARE INSTALLED AND THE CONTRIBUTING SURFACE AREA IS STABILIZED.
  - REFERENCE TYPICAL BIO-RETENTION POND MEDIA FOR COMPONENT MATERIAL.

**TYPICAL RAIN GARDEN SECTION**  
NOT TO SCALE



**DRIVEWAY ENTRANCE DETAIL**  
NOT TO SCALE



**TYPICAL DRIVEWAY CROSS-SECTION**  
NOT TO SCALE

**TP #1**  
LOGGED BY JAN  
DATE: 10/28/14  
IMPERVIOUS LAYER: NONE  
WATER ENCOUNTERED: NONE

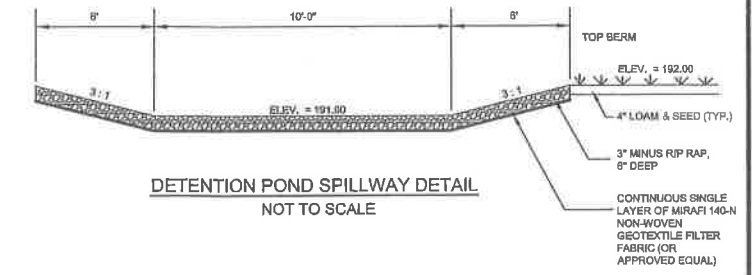
2"	O	FOREST MAT
0"	A	10YR 3/4, WEAK GRANULAR, FRIABLE LOAMY, MANY ROOTS
4"	B	10YR 6/8, WEAK GRANULAR, FRIABLE, FINE SANDY LOAM, COMMON ROOTS
22"	C-1	2.5Y 6/3, WEAK GRANULAR, FRIABLE, LOAMY SAND
36"	E.S.H.W.T.	
72"	C-2	2.5Y 7/2, ANGULAR BLOCKY, FIRM, MOIST, CLAYEY SAND, COMMON DISTINCT FE CONC. (MOTTLES) THROUGHOUT
		48" BOTTOM OF HOLE AT LEDGE

**TP #2**  
LOGGED BY JAN  
DATE: 10/28/14  
IMPERVIOUS LAYER: 48"  
WATER ENCOUNTERED: NONE

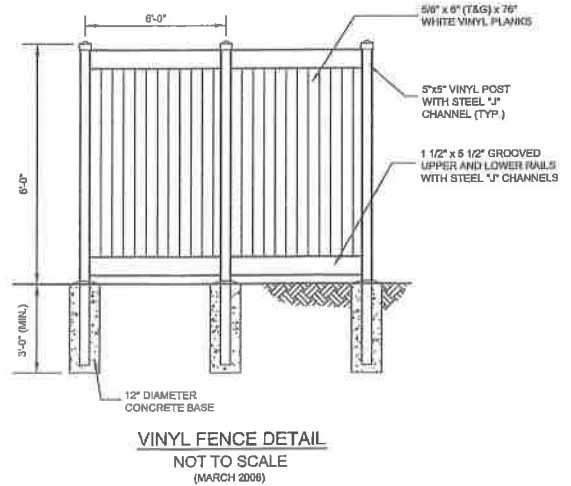
2"	O	FOREST MAT
0"	A	10YR 3/4, WEAK GRANULAR, FRIABLE LOAMY, MANY ROOTS
4"	B	10YR 6/8, WEAK GRANULAR, FRIABLE, FINE SANDY LOAM, COMMON ROOTS
18"	C-1	2.5Y 6/3, WEAK GRANULAR, FRIABLE, LOAMY SAND
28"	E.S.H.W.T.	
36"	C-2	2.5Y 7/2, ANGULAR BLOCKY, FIRM, MOIST, CLAYEY SAND, COMMON DISTINCT FE CONC. (MOTTLES) @ 38"
48"		48" BOTTOM OF HOLE AT LEDGE

**TP #3**  
LOGGED BY JAN  
DATE: 10/28/14  
IMPERVIOUS LAYER: NONE  
WATER ENCOUNTERED: NONE

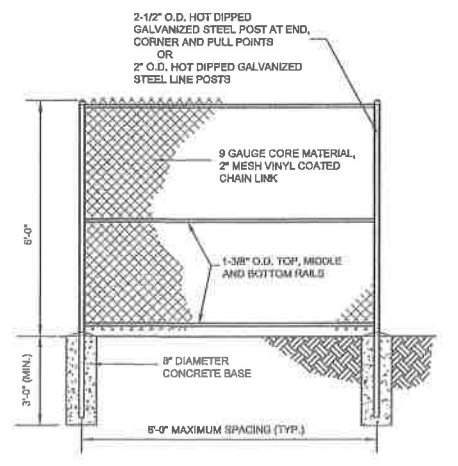
2"	O	FOREST MAT
0"	A	10YR 3/4, WEAK GRANULAR, FRIABLE LOAMY, MANY ROOTS
4"	B	10YR 6/8, WEAK GRANULAR, FRIABLE, FINE SANDY LOAM, COMMON ROOTS
20"	C-1	2.5Y 6/3, WEAK GRANULAR, FRIABLE, LOAMY SAND
38"	E.S.H.W.T.	
76"	C-2	2.5Y 7/2, ANGULAR BLOCKY, FIRM, MOIST, CLAYEY SAND, COMMON DISTINCT FE CONC. (MOTTLES) THROUGHOUT
		76" BOTTOM OF HOLE



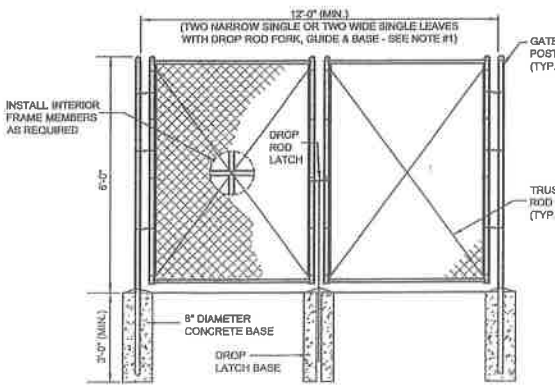
**DETENTION POND SPILLWAY DETAIL**  
NOT TO SCALE



**VINYL FENCE DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**CHAIN LINK FENCE (BLACK RUBBER COATED) DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**DOUBLE LEAF GATE**  
NOT TO SCALE

- NOTES:**
- REINFORCE THE GATE FRAME CORNERS WITH A MALLEABLE IRON OR PRESSED STEEL FITTING DESIGNED FOR THE PURPOSE OR SHOP WELD THE CORNERS. GRIND SMOOTH ALL WELDS AND PAINT WITH AN APPROVED ZINC RICH PAINT. FURNISH EACH GATE WITH THE NECESSARY HINGES, LATCH AND DROP ROD LOCKING DEVICE DESIGNED FOR THE TYPE OF GATE POSTS AND GATE USED ON THE PROJECT. PROVIDE POSITIVE TYPE LATCHING DEVICES WITH PROVISIONS FOR PAD LOCKING AT ALL GATES. PROVIDE KEEPERS TO RETAIN THE GATE IN THE OPEN POSITION.
  - APPROVED ALTERNATIVE GATE FRAMES CONSTRUCTED OF STEEL SECTIONS, OTHER THAN PIPE, MAY BE USED.
  - THE DESIGN OF THE CHAIN LINK HARDWARE MAY VARY FROM THE DETAILS SHOWN, HOWEVER, ALL HARDWARE AND MATERIALS USED IN A SINGLE INSTALLATION SHALL BE UNIFORM AND COMPATIBLE.

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

**APPLICANT:**  
DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

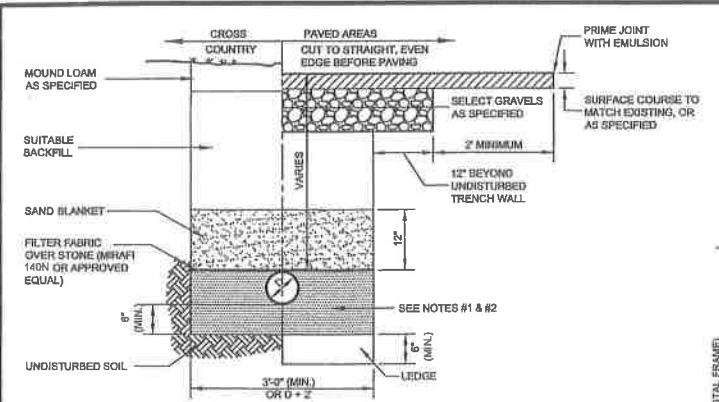
**KM KEACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 309, Bedford, NH 03110 Phone (603) 627-2881

**REVISIONS**

No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BAC

DATE: JANUARY 23, 2015 SCALE: AS SHOWN  
PROJECT NO: 14-0721-1 SHEET 22 OF 28



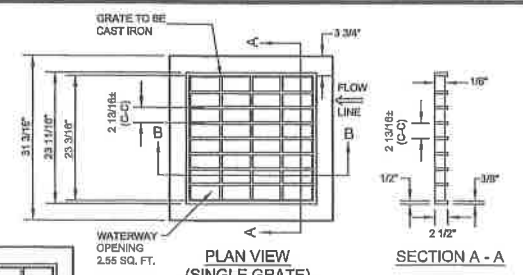


**NOTES**

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

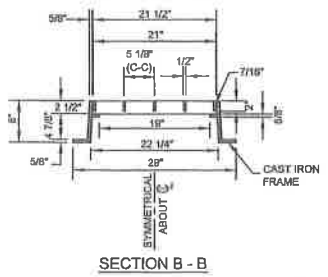
NOTE: FOR DOUBLE GRATE, OMIT FLANGE ON ONE SIDE ON EACH FRAME

**STORM DRAINAGE TRENCH DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**PLAN VIEW (SINGLE GRATE)**

**SECTION A - A**

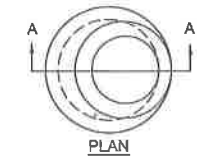


**SECTION B - B**

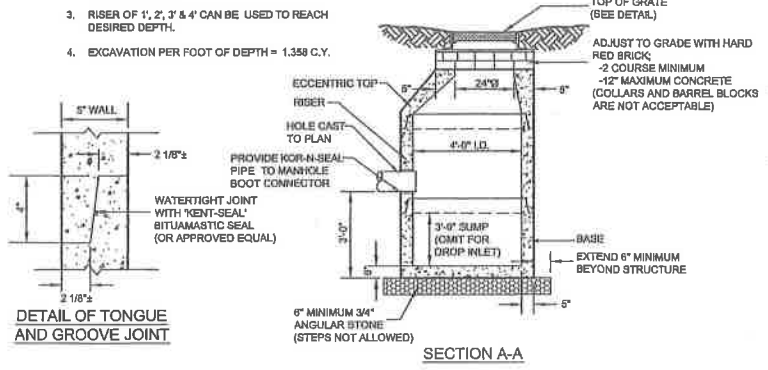
**TYPE B FRAME & GRATE DETAIL**  
NOT TO SCALE  
(MARCH 2008)

**NOTES:**

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

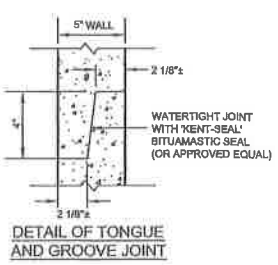


**PLAN**

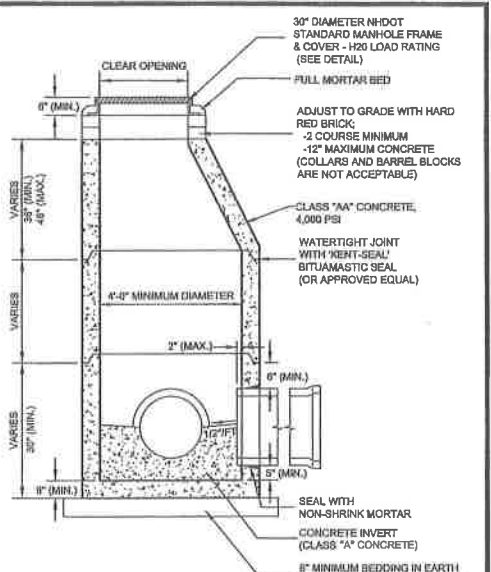


**SECTION A-A**

**PRECAST REINFORCED CATCH BASIN**  
NOT TO SCALE  
(MARCH 2008)



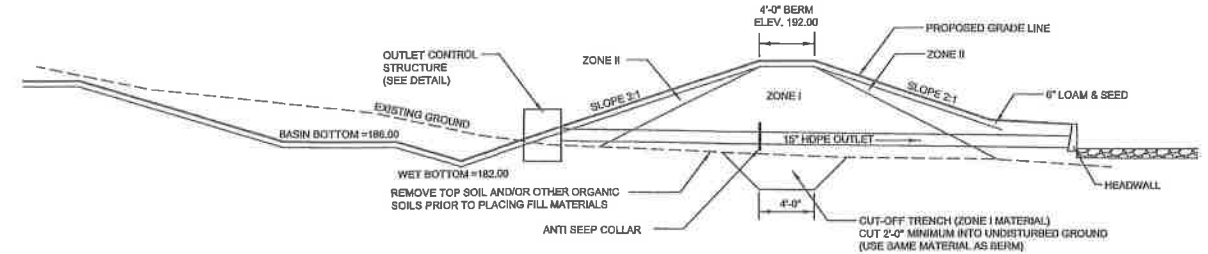
**DETAIL OF TONGUE AND GROOVE JOINT**



**PRECAST REINFORCED DRAIN MANHOLE DETAIL**  
NOT TO SCALE  
(MARCH 2008)

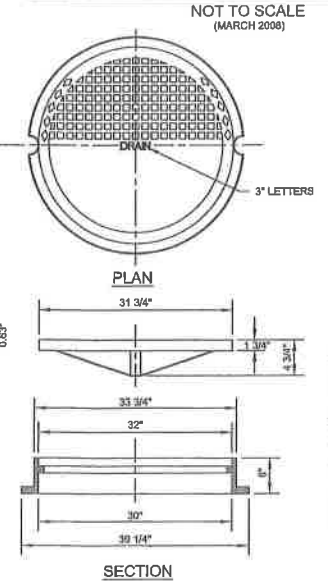
**STORMWATER PONDS CONSTRUCTION SEQUENCE**

1. CONTRACTOR TO NOTIFY DIG-SAFE 72 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. CUT AND CLEAR TREES AND BRUSH FROM CONSTRUCTION AREAS TO THE EXTENT NECESSARY. ALL BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
3. PRIOR TO GRUBBING OF CLEARED AREAS, ALL SILTATION BARRIERS DESIGNED FOR USE AS TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED AS CALLED FOR ON PROJECT PLANS.
4. COMPLETE GRUBBING OPERATIONS. ALL STUMPS AND SIMILAR DEBRIS SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR. ORGANIC MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLAND AREAS. ALL STOCKPILES SHALL BE SEED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
5. CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION.
6. CONSTRUCT CUT-OFF TRENCH (PART OF ZONE I).
7. CONSTRUCT OUTLET AND OVERFLOW STRUCTURE, CULVERT, ANTI SEEP COLLARS, HEADWALL, AND RIP RAP OUTLET PROTECTION AS SHOWN ON PLANS.
8. CONSTRUCT ZONE I PORTION OF EARTH EMBANKMENT.
9. CONSTRUCT ZONE II PORTION OF EARTH EMBANKMENT.
10. APPLY TOPSOIL TO SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED SO AS TO BE FREE OF ROOTS, BRANCHES, STONES, AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED AND MULCHED. CONSTRUCTION PERSONNEL SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS HAS BECOME ESTABLISHED.
11. MAINTAIN, REPAIR, AND REPLACE AS NECESSARY TEMPORARY EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE CONSTRUCTION AREA HAS BEEN STABILIZED (A MINIMUM OF ONE WINTER SHALL HAVE PASSED).
12. AFTER STABILIZATION, REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
13. MONITOR CONSTRUCTION ACTIVITIES TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF EARTH EMBANKMENTS, STORMWATER CONTROL STRUCTURE, CULVERT AND RIP RAP OUTLET PROTECTION.



**TYPICAL CROSS SECTION DETENTION POND**  
NOT TO SCALE

**PRECAST REINFORCED DRAIN MANHOLE DETAIL**



**SECTION**

**NOTES:**  
NEW HAMPSHIRE MAINTAINS A CLEAR OPENING DESIGNATION OF 30\"/>

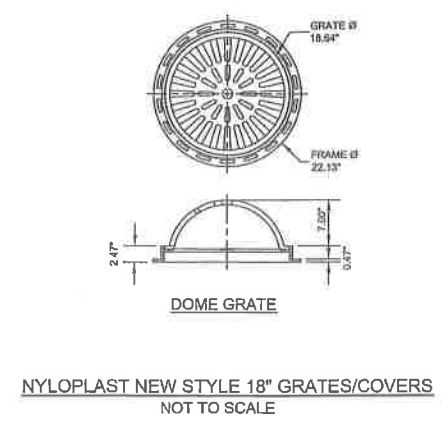
**FEATURES:**

- 3\"/>

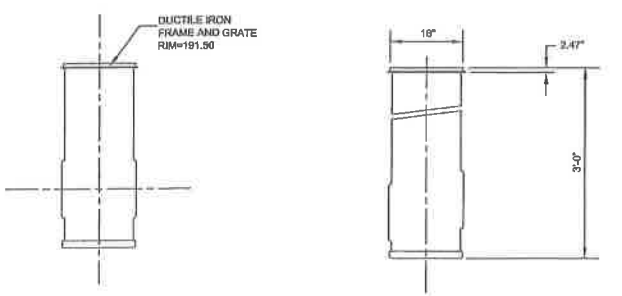
**SPECIFICATIONS:**

- FULLY MACHINED FRAME AND COVER
- H-20 LOAD RATED
- GRAY CAST IRON MEETS ASTM A8 CLASS 30

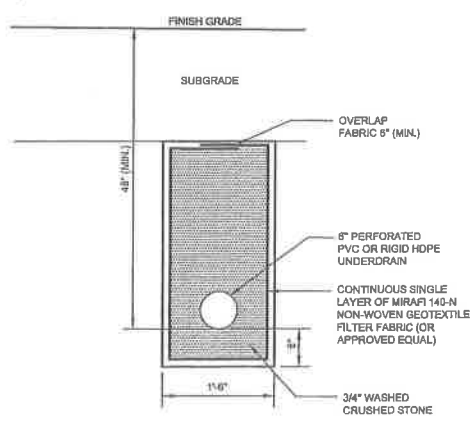
**DRAIN MANHOLE FRAME AND COVER DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**NYLOPLAST NEW STYLE 18\"/>**



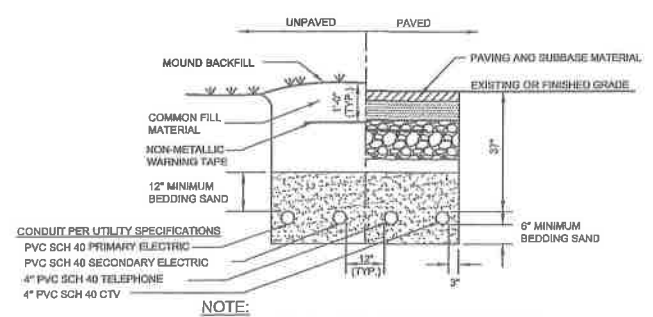
**18\"/>**



**UNDERDRAIN**  
NOT TO SCALE  
(MARCH 2008)

**MATERIAL TYPE/SPECIFICATIONS**

- ZONE I**  
WELL GRADED MIXTURE OF GRAVEL, SAND, SILT OR CLAY WITH MAX. 6-INCH SIZE STONE AND DEGRADATION AS INDICATED BELOW. PLACE IN MAX. 12-INCH THICK LIFTS TO 95% OF MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D1557. SCARIFY SURFACE PRIOR TO PLACING SUBSEQUENT LIFT. IN ADDITION, REMOVE ORGANIC SOILS.
- | SIEVE SIZE | PERCENT BY WEIGHT PASSING |
|------------|---------------------------|
| 8-INCH     | 100                       |
| NO. 4      | 50 TO 100                 |
| NO. 40     | 30 TO 70                  |
| NO. 200    | 20 TO 40                  |
- ZONE II**  
DRAINAGE LAYER: PLACE IN MAX. 12-INCH THICK LIFTS TO 95% OF MAX. DRY DENSITY IN ACCORDANCE WITH ASTM D1557.
- | SIEVE SIZE | PERCENT BY WEIGHT PASSING   |
|------------|-----------------------------|
| 1-INCH     | 100                         |
| NO. 4      | 70-100                      |
| NO. 200    | 0-12 (IN SAND PORTION ONLY) |



**UTILITY TRENCH DETAIL**  
NOT TO SCALE  
(MARCH 2008)

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

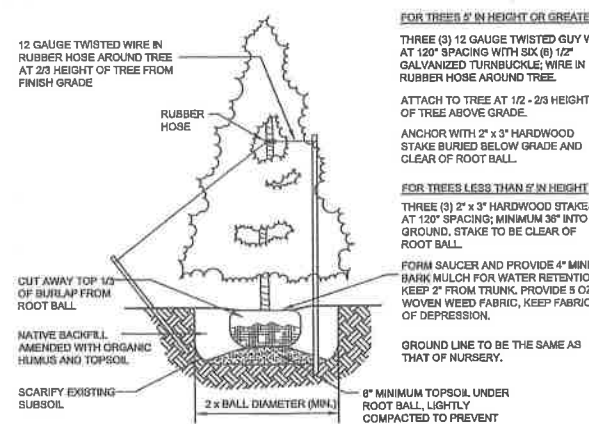
**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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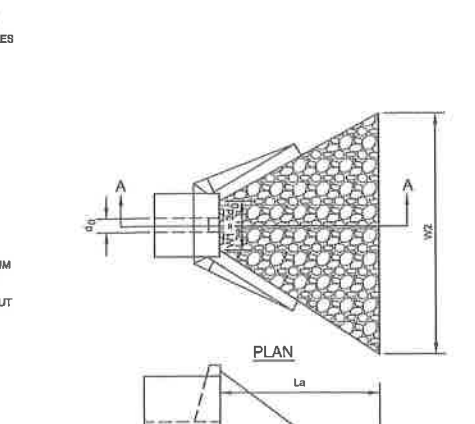
**KM REACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/9/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: AS SHOWN  
PROJECT NO: 14-0721-1 SHEET 23 OF 28



**EVERGREEN TREE PLANTING DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL**  
NOT TO SCALE  
(MARCH 2008)

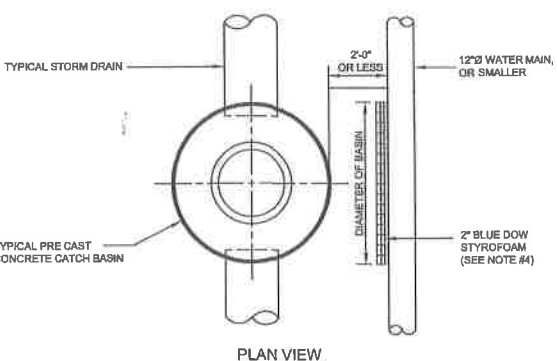
LOCATION	La	W1	W2	d50	DEPTH
PROP. HW#1	31'	8'	20'	4"	12"
PROP. HW#2	15'	5'	10'	6"	18"

TABLE 7-24 - RECOMMENDED RIP RAP GRADATION RANGES

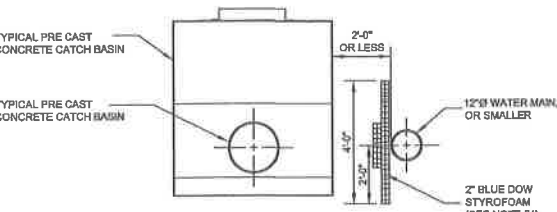
PERCENT OF WEIGHT SMALLER THAN THE GIVEN SIZE	SIZE OF STONE
100%	1.5 TO 2.0 d50
96%	1.3 TO 1.8 d50
90%	1.0 TO 1.5 d50
16%	0.3 TO 0.5 d50

- CONSTRUCTION SPECIFICATIONS:**
- THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
  - THE ROCK OR GRAVEL USED FOR FILTER OR RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
  - GEOTEXTILE FABRICS SHALL BE PROTECTED FROM FRACTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP RAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
  - STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

**MAINTENANCE:**  
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR RAIN EVENT. IF THE RIP RAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD BE KEPT CLEAR OF OBSTRUCTIONS SUCH AS FALLEN TREES, DEBRIS AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAIL WATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO THE OUTLET PROTECTION APRON.



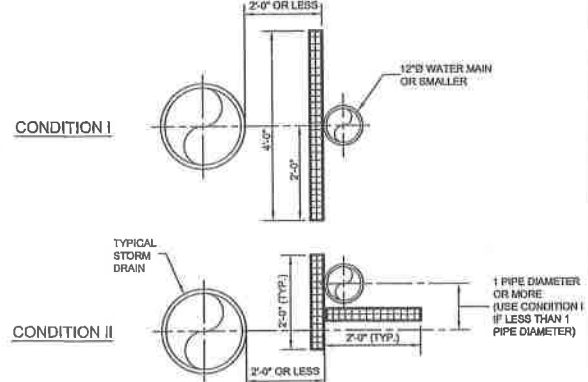
**PLAN VIEW**



**ELEVATION VIEW**

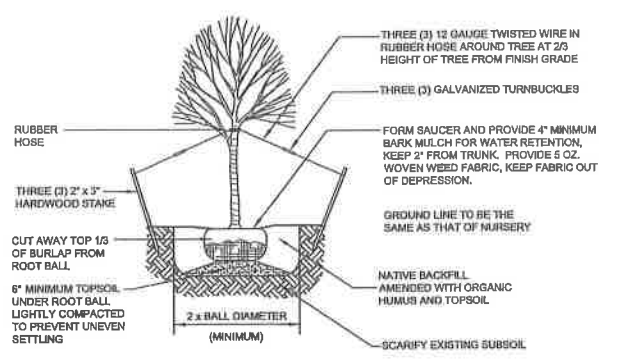
- NOTES:**
- ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  - ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
  - THE TOWN OF HUDSON RESERVES THE RIGHT TO MODIFY INSULATION REQUIREMENTS AS NECESSARY BASED ON FIELD CONDITIONS, ETC.
  - ALL BUTT JOINT SEAMS TO BE OVERLAPPED WITH 1'-0" PIECE OF INSULATION CENTERED OVER SEAM.

**CATCH BASIN INSULATION DETAIL**  
(A-16)  
NOT TO SCALE  
(MARCH 2008)



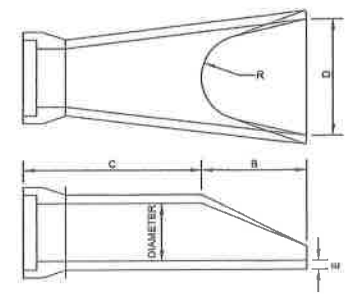
- NOTES:**
- ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  - ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  - THE TOWN OF HUDSON RESERVES THE RIGHT TO MODIFY INSULATION REQUIREMENTS AS NECESSARY BASED ON FIELD CONDITIONS, ETC.
  - INSULATION TO BE RUN HORIZONTALLY AS LONG AS CONDITIONS I, II, OR III ABOVE EXIST. ALL BUTT JOINT SEAMS TO BE OVERLAPPED WITH 1' PIECE OF INSULATION CENTERED OVER SEAM.
  - 1/2" (MIN) BLUE DOW STYROFOAM

**STORM DRAIN / WATER MAIN PARALLEL RUNS - ELEVATION VIEW**  
(A-17)  
NOT TO SCALE  
(MAY 2010)



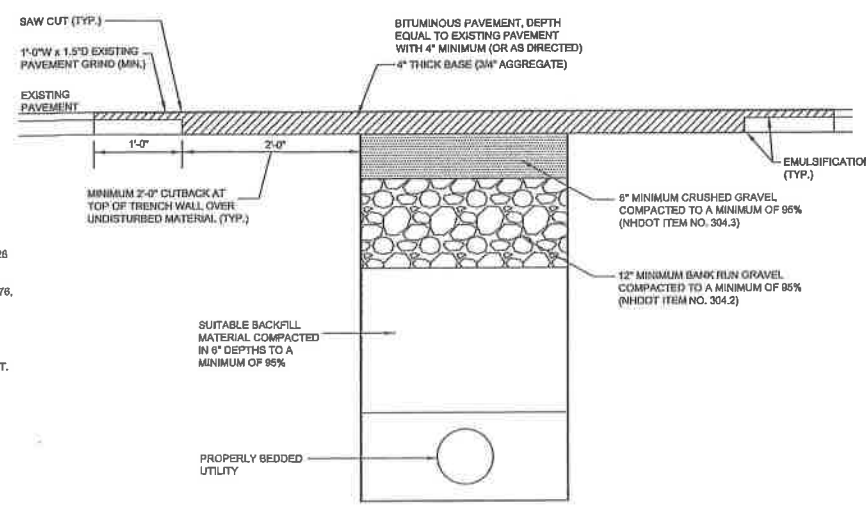
**DECIDUOUS TREE PLANTING DETAIL**  
NOT TO SCALE  
(MARCH 2008)

- NOTES:**
- CONCRETE STRENGTH SHALL BE 4000 PSI AT 28 DAYS.
  - REINFORCING IN ACCORDANCE WITH ASTM C-76, CLASS III.
  - INLET END SECTIONS AND OUTLET END SECTIONS AVAILABLE (OUTLET SHOWN).
  - OTHER DIAMETERS AVAILABLE UPON REQUEST.

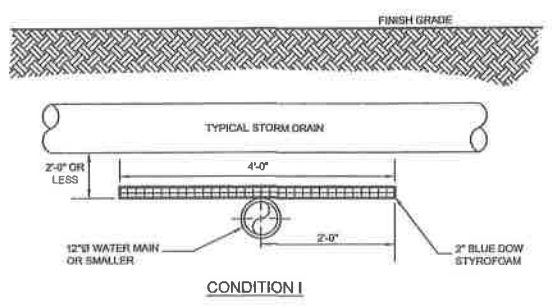


DIAMETER	A	B	C	D	E	R
12"	4"	2'-0"	4'-0 7/8"	2'-0"	2"	9"
15"	6"	2'-3"	3'-10"	2'-6"	2 1/8"	11"
18"	9"	2'-3"	3'-10"	3'-0"	2 1/2"	13"
21"	9"	2'-11"	3'-2"	3'-0"	2 3/4"	13"
24"	9 1/2"	3'-7 1/2"	3'-2"	4'-0"	3"	14"
30"	12"	4'-0"	3'-7 3/4"	5'-0"	3 1/2"	16"
36"	15"	5'-3"	2'-10 3/4"	6'-0"	4"	20"

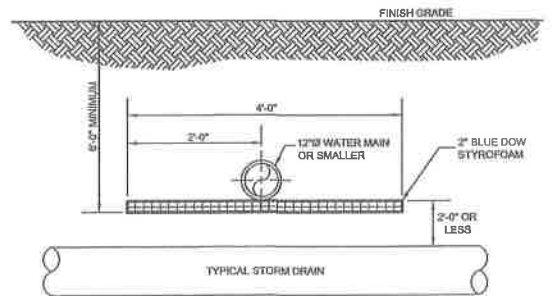
**RCP FLARED END SECTION DETAIL**  
NOT TO SCALE  
(MARCH 2008)



**PERMANENT PAVEMENT REPAIR**  
NOT TO SCALE  
(MARCH 2008)



**CONDITION I**



**CONDITION II**

- NOTES:**
- THE TOWN OF HUDSON RESERVES THE RIGHT TO MODIFY INSULATION REQUIREMENTS AS NECESSARY BASED ON FIELD CONDITIONS, ETC.
  - THE LENGTH OR WIDTH OF INSULATION SHALL EXTEND 1 STORM DRAIN PIPE DIAMETER BEYOND THE EDGE OF STORM DRAIN PIPE IN EACH DIRECTION OR A MINIMUM OF 2' BEYOND THE CENTERLINE OF THE STORM DRAIN PIPE, WHICHEVER IS GREATER.
  - ALL BUTT JOINT SEAMS TO BE OVERLAPPED WITH A 1' PIECE OF INSULATION CENTERED OVER SEAM.

**STORM DRAIN/WATER MAIN INTERSECTION RUNS - ELEVATION VIEW**  
(A-18)  
NOT TO SCALE

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

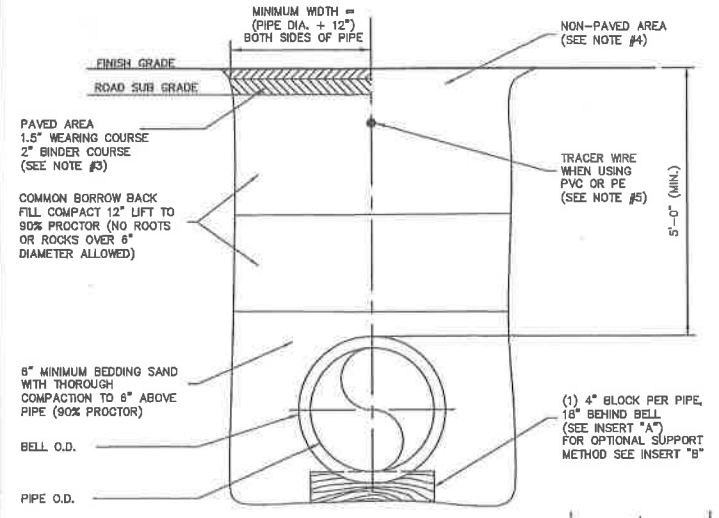
<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

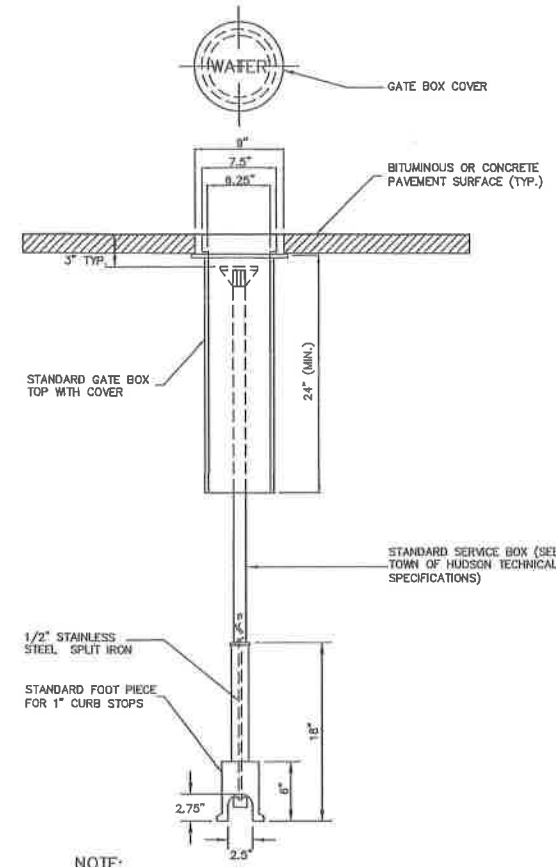
REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015      SCALE: AS SHOWN  
PROJECT NO: 14-0721-1      SHEET 24 OF 28

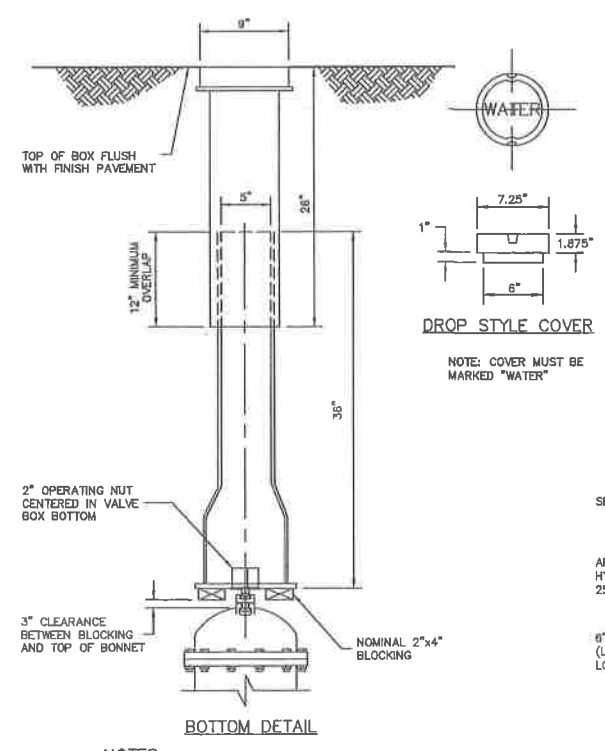
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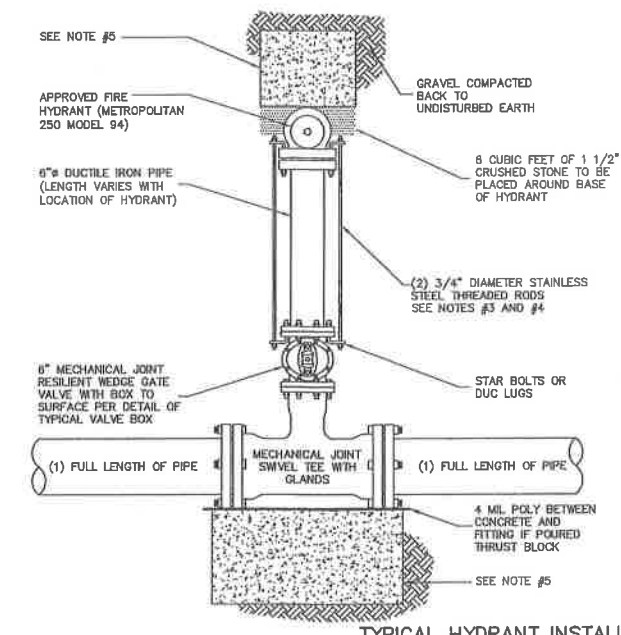
- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE, UNLESS INSULATION IS SPECIFIED.
  3. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE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



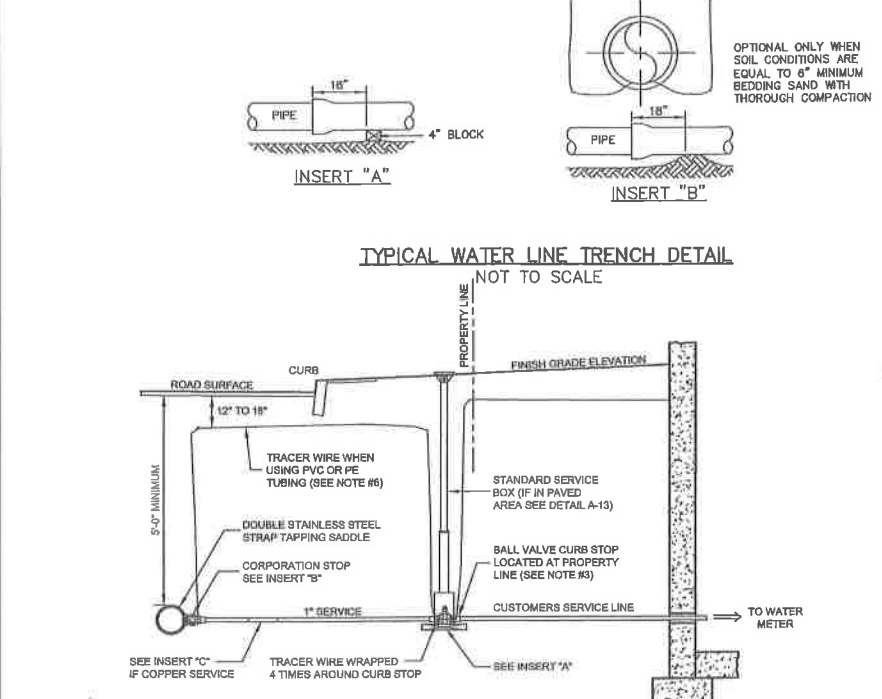
**TYPICAL SERVICE BOX DETAIL IN PAVED AREAS**  
NOT TO SCALE



**TYPICAL VALVE BOX DETAIL**  
NOT TO SCALE

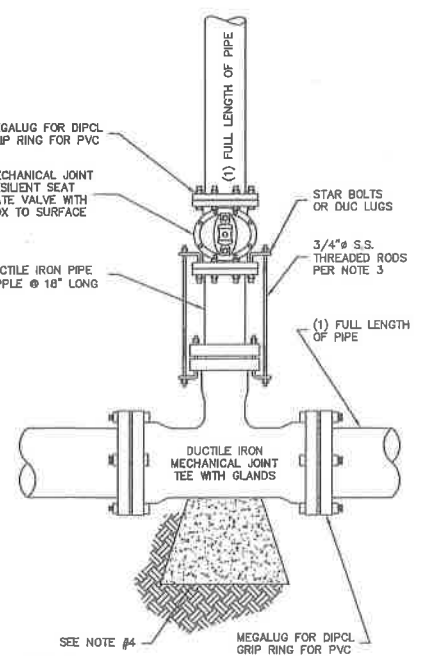


- NOTES:**
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO THE TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. 3/4\"/>



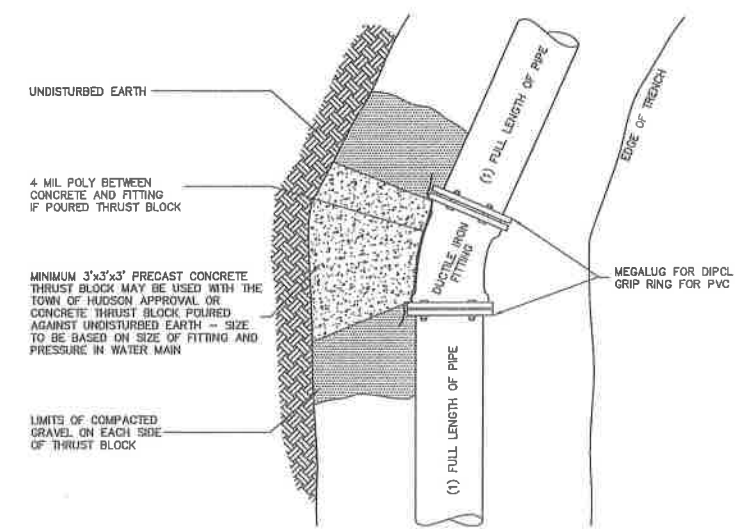
- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO PENNICKUCK WATER WORKS, INC. TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0\"/>

**1\"/>**



- NOTES:**
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO THE TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. 3/4\"/>

**TYPICAL TEE INSTALLATION**  
NOT TO SCALE



- NOTES:**
1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO THE TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
  3. 3/4\"/>

**TYPICAL THRUST BLOCK BEHIND FITTINGS INSTALLATION**  
NOT TO SCALE

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

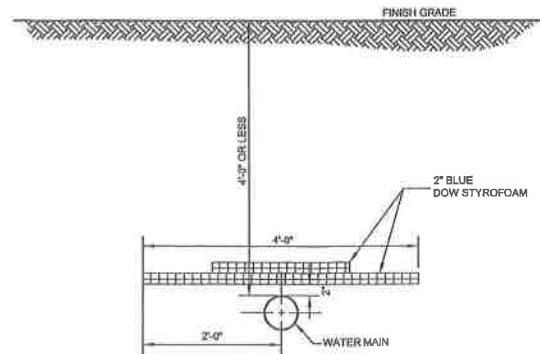
<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KMA** KEACH-NORDSTROM ASSOCIATES, INC.  
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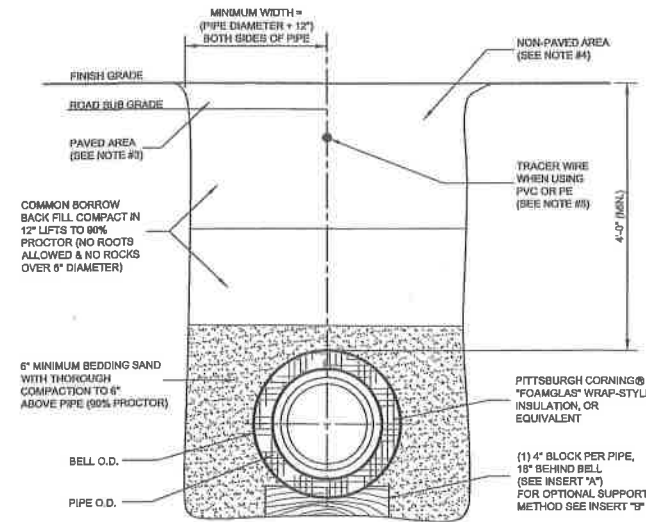
DATE: JANUARY 23, 2015      SCALE: AS SHOWN  
PROJECT NO: 14-0721-1      SHEET 25 OF 28





- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO TOWN OF HUDSON TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
  3. THE TOWN OF HUDSON RESERVES THE RIGHT TO MODIFY INSULATION REQUIREMENTS AS NECESSARY BASED ON FIELD CONDITIONS, ETC.
  4. ALL BUTT JOINT SEAMS TO BE OVERLAPPED WITH 2" PIECE OF INSULATION CENTERED OVER SEAM.

**INSULATION DETAIL FOR LESS THAN 4'-0" OF COVER**  
(A-31)  
NOT TO SCALE  
(MARCH 2006)

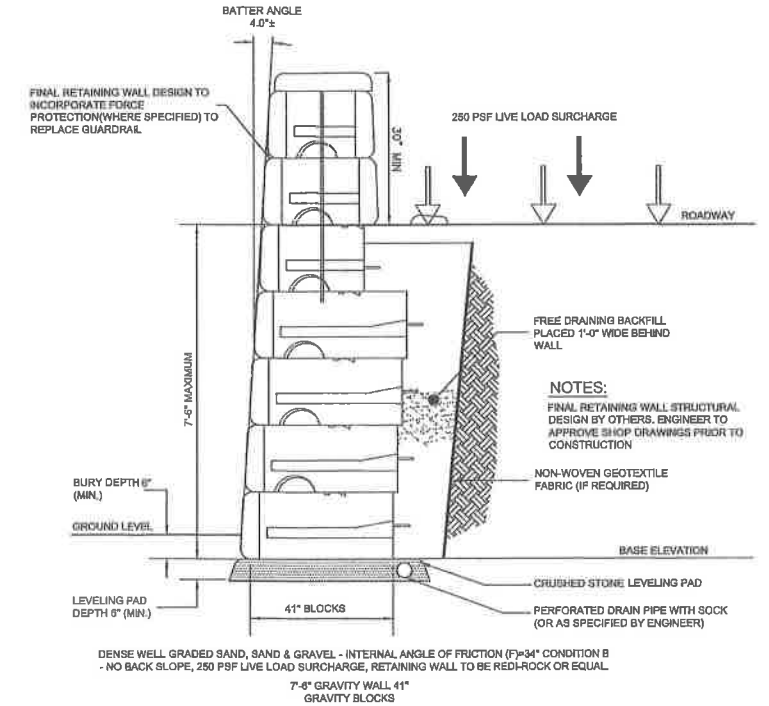


- NOTES:**
1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO PENNICKUCK WATER WORKS, INC. TECHNICAL SPECIFICATIONS.
  2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5'-0" FROM TOP OF PIPE TO FINISH GRADE.
  3. REQUIREMENTS FOR SUBBASE AND BASE MATERIAL TYPE ARE TO BE IN ACCORDANCE WITH LOCAL AUTHORITY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

**WRAP INSULATION DETAIL**  
(A-16A)  
NOT TO SCALE  
(JANUARY 2011)

**WATER DISTRIBUTION SYSTEM NOTES**

1. ALL DISTRIBUTION MATERIAL INCLUDING MAINS, FITTINGS AND VALVES TO MEET APPLICABLE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES - BUREAU OF WATER SUPPLY ENGINEERING, DRINKING WATER AND GROUNDWATER BUREAU (DWGB), TOWN OF HUDSON WATER DEPARTMENT AND AMERICAN WATER WORKS ASSOCIATION (AWWA) STANDARDS.
2. ALL INSTALLATION OF MATERIAL CONFORMS TO APPLICABLE DWGB, TOWN OF HUDSON AND AWWA STANDARDS AND SPECIFICATIONS FOR WATER SYSTEMS.
3. ALL VALVES, TEES, BENDS AND THEIR RELATED JOINTS ARE PROPERLY RESTRAINED USING APPROVED "MEGA-LUG" OR APPROVED EQUAL, RETAINER KITS AT EACH JOINT.
4. ALL WATER MAIN AND APPURTENANCES SHALL BE APPROVED MATERIALS MANUFACTURED IN ACCORDANCE WITH CURRENT AWWA STANDARDS. ALL 8" AND 12" DIAMETER WATER MAIN AND APPURTENANCES SHALL BE AN APPROVED AWWA CLASS 52 CEMENT LINED DUCTILE IRON PIPE. PIPE SIZING IS AS SHOWN ON THE KEACH-NORDSTROM ASSOCIATES, INC. PLANS APPROVED BY THE TOWN PLANNING BOARD AND NHDWGB. FIRE HYDRANTS MEETING AWWA C-503 STANDARDS, OPEN LEFT AND TO BE INSTALLED AT LOCATIONS AS APPROVED BY THE HUDSON FIRE DEPARTMENT. ALL WATER MAIN AND SERVICE LINES TO BE INSTALLED WITH A MINIMUM OF 60" OF COVER AND SHALL BE PROPERLY SAND BEDDED, COMPACTED AND BACKFILLED WITH SUITABLE MATERIALS.
5. GATE VALVES SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE APPROVED UTILITY PLANS. ALL GATE VALVES SHALL BE AWWA APPROVED, EPOXY COATED, RESILIENT WEDGE TYPE, BEING OPEN LEFT COUNTER CLOCKWISE. VALVE BOXES SHALL BE AWWA APPROVED, SLIP TYPE WITH 36" BASE, 36" TOP AND COVER ARE A ONE-PIECE CAST COVER LABELED "WATER".
6. FIRE HYDRANTS SHALL BE TOWN OF HUDSON APPROVED, OPEN LEFT (CO) INSTALLED AT LOCATION SHOWN ON THE PROJECT PLANS. DOMESTIC SERVICES SHALL HAVE SERVICE LINE SIZING BEING 2" DIAMETER COPPER TUBING BETWEEN MAIN AND CURB STOP, AND 2" PE-CITS TUBING SIZE FROM STOP TO INSIDE HOME FOR THE FIRE SPRINKLER SERVICE, AND 1" PE-CITS TUBING SIZE WITH A TEE FROM 2" FOR DOMESTIC WATER, USING BRASS COMPRESSION JOINTS FOR SERVICE FITTINGS AND CORPORATION STOPPS. STAINLESS STEEL INSERTS ON HOPE PIPE, BALL VALVE SHUT OFFS AND ADJUSTABLE ERIE TYPE CURB BOXES. SERVICES SHALL BE RUN INTO EACH OF THE INDIVIDUAL HOMES FROM THE WATER MAINS.
7. SEPARATION OF WATER MAINS AND SEWER ARE IN ACCORDANCE WITH DWGB STANDARDS. ON PARALLEL INSTALLATION, WATER MAINS WERE LAID AT LEAST TEN FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED SEWER. IF LESS THAN TEN FEET, WATER MAIN LAID IN A SEPARATE TRENCH, OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SEWER AT SUCH AN ELEVATION THAT THE BOTTOM OF THE MAIN IS AT LEAST 18" ABOVE THE TOP OF THE SEWER WITH AT LEAST THREE FEET HORIZONTAL SEPARATION. AT CROSSINGS THERE IS A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE WATER MAIN AND SEWER. WATER MAIN WITH A MINIMAL LAYING LENGTH OF 18 FEET IS TO BE USED AT ALL CROSSINGS, WITH BOTH JOINTS BEING LOCATED AS FAR FROM THE SEWER AS POSSIBLE.
8. ALL WATER MAINS SHALL BE FLUSHED, PRESSURE TESTED AND DISINFECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AWWA C-400 AND C-951, PRIOR TO ACCEPTANCE. WRITTEN CERTIFICATION OF TESTING AND BACTERIOLOGICAL TEST RESULTS BY A THIRD PARTY CONTRACTOR SHALL BE PROVIDED.
9. A RECORD DRAWING OF WATER MAINS AND APPURTENANCES SHALL BE PROVIDED FOLLOWING INSTALLATION, IN ACCORDANCE WITH NHDWGB AND TOWN OF HUDSON STANDARDS.



- NOTES:**
1. AS PERMISSIBLE, THE STRUCTURAL ENGINEER CHARGED WITH RETAINING WALL DESIGN SHALL SPECIFY SALT RESISTANT BLOCK CONSTRUCTION WHERE WALLS ARE TO BE CONSTRUCTED NEAR ROADWAYS OR PARKING AREAS.
  2. RETAINING WALL DRAIN TO "DAYLIGHT" AT LOW POINT OR TIE TO DRAIN STRUCTURE AS SHOWN IN PLAN VIEW.
  3. THE STAMPED SHOP DRAWINGS AND CALCULATIONS FOR THE ACTUAL RETAINING WALL MUST BE PROVIDED FOR REVIEW AND APPROVAL AT OR PRIOR TO THE PROJECT'S REQUIRED PRE CONSTRUCTION MEETING.
  4. THE PROVIDED PLANS AND SUPPORTING CALCULATIONS MUST ADDRESS THE FOLLOWING CRITERIA:
    - 4.a. DESIGN CALCULATIONS STAMPED BY QUALIFIED PE LICENSE IN NH
    - 4.b. STABILITY CALCULATIONS (INCLUDING BEARING CAPACITY, GLOBAL STABILITY, OVERTURNING & SLIDING, IMPACT)
    - 4.c. GEGRID PULLOUT AND OTHER PERTINENT DATA & ELEVATIONS
    - 4.d. CONSTRUCTION INSTALLATION SPECIFICATION
    - 4.e. LATERAL EARTH PRESSURE COEFFICIENT
    - 4.f. SURCHARGE LOAD, EMBEDMENT DEPTH
    - 4.g. BOTH A PLAN AND PROFILE OF EACH WALL SECTION

**MODULAR BLOCK(REDI-ROCK OR EQUAL) RETAINING WALL**  
NOT TO SCALE  
(AUGUST 2011)

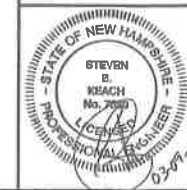
**CONSTRUCTION DETAILS  
COBBLESTONE VILLAGE**

MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:**  
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25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 8480, PG. 777

**APPLICANT:**  
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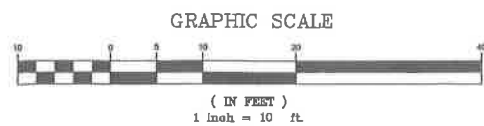


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PROJECT NO: 14-0721-1 SHEET 26 OF 28



**WETLAND CONSERVATION DISTRICT  
BOUNDARY MARKER**  
NOT TO SCALE  
(MARCH 2010)



PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

APPROVED BY THE HUDSON, NH PLANNING BOARD  
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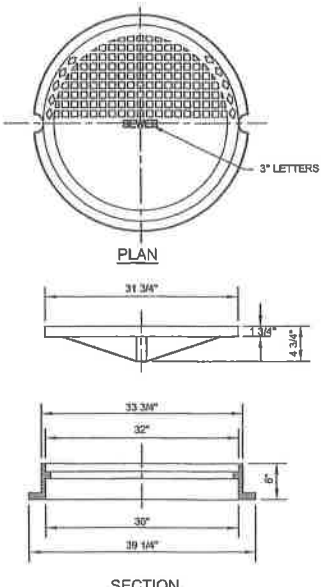
**BEST MANAGEMENT PRACTICES FOR BLASTING**

IF MORE THAN 5000 CUBIC YARDS ARE BLASTED: IDENTIFY DRINKING WATER WELLS LOCATED WITHIN 2000 FEET OF THE PROPOSED BLASTING ACTIVITIES. DEVELOP A GROUNDWATER QUALITY SAMPLING PROGRAM TO MONITOR FOR NITRATE AND NITRITE EITHER IN THE DRINKING WATER SUPPLY WELLS OR IN OTHER WELLS THAT ARE REPRESENTATIVE OF THE DRINKING WATER SUPPLY WELLS IN THE AREA. THE PLAN MUST INCLUDE PRE AND POST BLAST WATER QUALITY MONITORING AND BE APPROVED BY NHDES PRIOR TO INITIATING BLASTING. THE GROUNDWATER SAMPLING PROGRAM MUST BE IMPLEMENTED ONCE APPROVED BY NHDES.

**BEST MANAGEMENT PRACTICES FOR BLASTING**

ALL ACTIVITIES RELATED TO BLASTING SHALL FOLLOW BEST MANAGEMENT PRACTICES (BMPs) TO PREVENT CONTAMINATION OF GROUNDWATER INCLUDING PREPARING, REVIEWING AND FOLLOWING AN APPROVED BLASTING PLAN; PROPER DRILLING, EXPLOSIVE HANDLING AND LOADING PROCEDURES; OBSERVING THE ENTIRE BLASTING PROCEDURES; EVALUATING BLASTING PERFORMANCE; AND HANDLING AND STORAGE OF BLASTED ROCK.

- (1) **LOADING PRACTICES.**  
THE FOLLOWING BASTHOLE LOADING PRACTICES TO MINIMIZE ENVIRONMENTAL EFFECTS SHALL BE FOLLOWED:
- DRILLING LOGS SHALL BE MAINTAINED BY THE DRILLER AND COMMUNICATED DIRECTLY TO THE BLASTER. THE LOGS SHALL INDICATE DEPTHS AND LENGTHS OF VOIDS, CAVITIES, AND FAULT ZONES OR OTHER WEAK ZONES ENCOUNTERED AS WELL AS GROUNDWATER CONDITIONS.
  - EXPLOSIVE PRODUCTS SHALL BE MANAGED ON SITE SO THAT THEY ARE EITHER USED IN THE BOREHOLE, RETURNED TO THE DELIVERY VEHICLE, OR PLACED IN SECURE CONTAINERS FOR OFF SITE DISPOSAL.
  - SPILLAGE AROUND THE BOREHOLE SHALL EITHER BE PLACED IN THE BOREHOLE OR CLEANED UP AND RETURNED TO AN APPROPRIATE VEHICLE FOR HANDLING OR PLACEMENT IN SECURED CONTAINERS FOR OFF SITE DISPOSAL.
  - LOADED EXPLOSIVES SHALL BE DETONATED AS SOON AS POSSIBLE AND SHALL NOT BE LEFT IN THE BASTHOLE OVERNIGHT, UNLESS WEATHER OR OTHER SAFETY CONCERNS REASONABLY DICTATE THAT DETONATION SHOULD BE POSTPONED.
  - LOADING EQUIPMENT SHALL BE CLEANED IN AN AREA WHERE WASTEWATER CAN BE PROPERLY CONTAINED AND HANDLED IN A MANNER THAT PREVENTS RELEASE OF CONTAMINANTS TO THE ENVIRONMENT.
  - EXPLOSIVES SHALL BE LOADED TO MAINTAIN GOOD CONTINUITY IN THE COLUMN LOAD TO PROMOTE COMPLETE DETONATION. INDUSTRY ACCEPTED LOADING PRACTICES FOR PRIMING, STEMMING, DECKING AND COLUMN RISE NEED TO BE ATTENDED TO.
- (2) **EXPLOSIVE SELECTION.**  
THE FOLLOWING BMPs SHALL BE FOLLOWED TO REDUCE THE POTENTIAL FOR GROUNDWATER CONTAMINATION WHEN EXPLOSIVES ARE USED:
- EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT ARE APPROPRIATE FOR SITE CONDITIONS AND SAFE BLAST EXECUTION.
  - EXPLOSIVE PRODUCTS SHALL BE SELECTED THAT HAVE THE APPROPRIATE WATER RESISTANCE FOR THE SITE CONDITIONS PRESENT TO MINIMIZE THE POTENTIAL FOR HAZARDOUS EFFECT OF THE PRODUCT UPON GROUNDWATER.
- (3) **PREVENTION OF MISFIRES.**  
APPROPRIATE PRACTICES SHALL BE DEVELOPED AND IMPLEMENTED TO PREVENT MISFIRES.
- (4) **MUCK PILE MANAGEMENT.**  
MUCK PILES (THE BLASTED PIECES OF ROCK) AND ROCK PILES SHALL BE MANAGED IN A MANNER TO REDUCE THE POTENTIAL FOR CONTAMINATION BY IMPLEMENTING THE FOLLOWING MEASURES:
- REMOVE THE MUCK PILE FROM THE BLAST AREA AS SOON AS REASONABLY POSSIBLE.
  - MANAGE THE INTERACTION OF BLASTED ROCK PILES AND STORMWATER TO PREVENT CONTAMINATION OF WATER SUPPLY WELLS OR SURFACE WATER.
- (5) **SPILL PREVENTION MEASURES AND SPILL MITIGATION.**  
FILL PREVENTION AND SPILL MITIGATION MEASURES SHALL BE IMPLEMENTED TO PREVENT THE RELEASE OF FUEL AND OTHER RELATED SUBSTANCES TO THE ENVIRONMENT. THE MEASURES SHALL INCLUDE AT A MINIMUM:
- STORAGE OF REGULATED SUBSTANCES ON AN IMPERVIOUS SURFACE.
  - SECURE STORAGE AREAS AGAINST UNAUTHORIZED ENTRY.
  - LABEL REGULATED CONTAINERS CLEARLY AND VISIBLY.
  - INSPECT STORAGE AREAS WEEKLY.
  - COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS.
  - WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS.
  - SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
- (B) THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
- EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED.
  - PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS.
  - HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS.
  - USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES.
  - PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
- (C) THE TRAINING OF ON SITE EMPLOYEES AND THE ON SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
- (D) FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT WILL COMPLY WITH THE REGULATIONS OF THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NOTE THESE REQUIREMENTS ARE SUMMARIZED IN WD-DW06-22-B BEST MANAGEMENT PRACTICES FOR FUELING AND MAINTENANCE OF EXCAVATION AND EARTHMOVING EQUIPMENT OR ITS SUCCESSOR DOCUMENT).



**NOTES:**  
NEW HAMPSHIRE MAINTAINS A CLEAR OPENING DESIGNATION OF 30\"/>

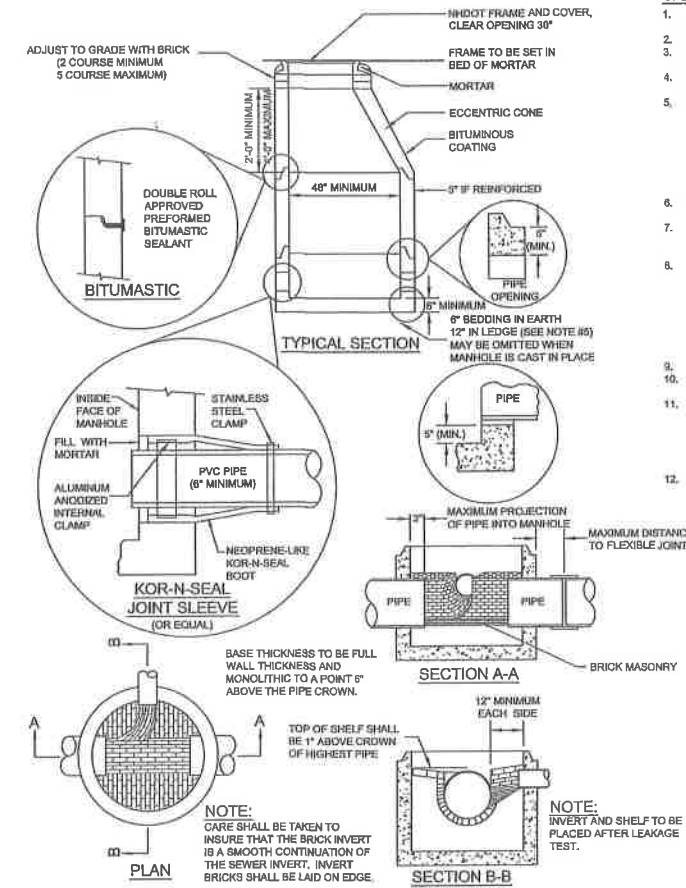
**FEATURES:**

- 3\"/>
- COVERS MARKED SEWER
- NONROCKING COVER
- DIAMOND SURFACE DESIGN

**SPECIFICATIONS:**

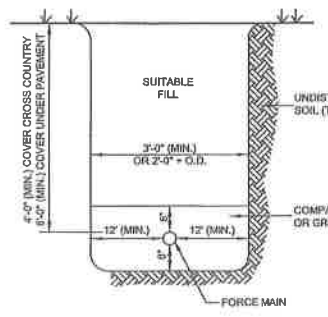
- FULLY MACHINED FRAME AND COVER
- H-20 LOAD RATED
- GRAY CAST IRON MEETS ASTM A48 CLASS 30

**SEWER MANHOLE FRAME AND COVER DETAIL**  
NOT TO SCALE  
(MARCH 2008)

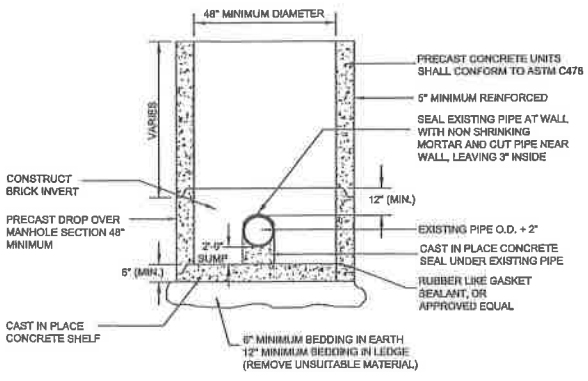


- SANITARY SEWER MANHOLE NOTES: (NHDES ENV WQ700 - 2008)**
- ALL COMPONENT PARTS OF MANHOLE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE AND SPACE NECESSARY FOR THE INTENDED SERVICE.
  - MANHOLE STRUCTURES SHALL HAVE A LIFE EXPECTANCY IN EXCESS OF 25 YEARS.
  - MANHOLE STRUCTURES SHALL BE DESIGNED TO WITHSTAND H-20 LOADING AND SHALL NOT LEAK IN EXCESS OF ONE GPD PER VERTICAL FOOT OF MANHOLE FOR THE LIFE OF THE STRUCTURE.
  - BARRELS AND CONE SECTIONS SHALL BE CONSTRUCTED OF PRECAST REINFORCED CONCRETE AND SHALL CONFORM TO ASTM C478.
  - BEDDING: CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33 100% PASSING 1 INCH SCREEN  
80% PASSING 3/4 INCH SCREEN  
20-85% PASSING 3/8 INCH SCREEN  
0-10% PASSING #4 SIEVE  
0-9% PASSING #6 SIEVE  
WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, CRUSHED STONE 1/2 INCH TO 1-1/2 INCH SHALL BE USED.
  - BASE SECTIONS SHALL BE OF MONOLITHIC CONSTRUCTION TO A POINT AT LEAST 8 INCHES ABOVE THE CROWN OF THE INCOMING PIPE.
  - HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC-LIKE SEALANT.
  - PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
    - ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
    - CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
    - ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
    - NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
  - MANHOLE CONE SECTIONS SHALL BE ECCENTRIC IN SHAPE.
  - ALL PRECAST SECTIONS AND BASES SHALL HAVE THE DATE OF MANUFACTURE AND THE NAME OR TRADEMARK OF THE MANUFACTURER IMPRESSED OR INDELIBLY MARKED ON THE INSIDE WALL.
  - MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND BLED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
  - MATERIALS OF CONSTRUCTION FOR MANHOLES SHALL CONFORM TO THE REQUIREMENTS FOR CLASS AA CONCRETE IN THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
    - REINFORCING FOR CAST-IN-PLACE CONCRETE SHALL BE STEEL OR STRUCTURAL FIBERS THAT CONFORM TO THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
    - PRECAST CONCRETE BARREL SECTIONS, CONES AND BASES SHALL CONFORM TO ASTM C478-06;
    - THE MANHOLE FRAME AND COVER SHALL PROVIDE A 36-INCH DIAMETER CLEAR OPENING;
    - THE MANHOLE COVER SHALL HAVE THE WORD "SEWER" IN 3-INCH LETTERS CAST INTO THE TOP SURFACE;
    - THE CASTINGS SHALL BE OF EVEN-GRAINED CAST IRON, SMOOTH AND FREE FROM SCALE, LUMPS, BLISTERS, SAND HOLES AND DEFECTS;
    - CONTACT SURFACES OF COVERS AND FRAMES SHALL BE MACHINED AT THE FOUNDRY TO PREVENT ROCKING OF COVERS IN ANY ORIENTATION;
    - CASTINGS SHALL BE EQUAL TO CLASS 30, CONFORMING TO ASTM A48M-03;
    - BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C290S, CLAY OR SHALE FOR GRADES 88 HARD BRICK;
    - MORTAR SHALL BE COMPOSED OF PORTLAND CEMENT AND SAND WITH OR WITHOUT HYDRATED LIME ADDITION;
    - PROPORTIONS IN MORTAR OF PARTS BY VOLUMES SHALL BE:
      - 4.5 PARTS SAND AND 1.5 PARTS CEMENT; OR
      - 4.5 PARTS SAND, ONE PART CEMENT AND 0.5 PARTS HYDRATED LIME;
    - CEMENT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C150-05;
    - HYDRATED LIME SHALL BE TYPE S CONFORMING TO THE ASTM C207-06 STANDARD SPECIFICATIONS FOR HYDRATED LIME FOR MASONRY PURPOSES;
    - SAND SHALL CONSIST OF INERT NATURAL SAND CONFORMING TO THE ASTM C33-03 "STANDARD SPECIFICATIONS FOR CONCRETE, FINE AGGREGATES";
    - CONCRETE FOR DROP SUPPORTS SHALL CONFORM TO THE REQUIREMENT FOR CLASS AAA CONCRETE OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION";
    - SUBJECT TO (C) BELOW, A FLEXIBLE PIPE JOINT SHALL BE PROVIDED WITHIN THE FOLLOWING DISTANCES FROM ANY MANHOLE CONNECTION:
      - WITHIN 48-INCHES FOR REINFORCED CONCRETE (RC) PIPE; AND
      - WITHIN 60-INCHES FOR PVC PIPE LARGER THAN 15-INCH DIAMETER;
    - NO FLEXIBLE JOINT SHALL BE REQUIRED FOR DI PIPE OR FOR PVC PIPE UP THROUGH 15-INCH DIAMETER; AND
    - WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED IN LIEU OF A CONE SECTION, PROVIDED THE SLAB HAS AN ECCENTRIC ENTRANCE OPENING AND IS CAPABLE OF SUPPORTING H-20 LOADS.
  - MANHOLE STEPS SHALL:
    - BE PERMITTED ONLY AT THE REQUEST OF THE SYSTEM OWNER;
    - BE MANUFACTURED OF STAINLESS, PLASTIC-COVERED STEEL OR PLASTIC;
    - BE SHAPED SO THAT THEY CANNOT BE PULLED OUT OF THE CONCRETE WALL INTO WHICH THEY ARE SECURED;
    - MEET THE REQUIREMENTS OF ASTM C478-06 FOR LOAD CARRYING CAPACITY AND PULL-OUT RESISTANCE;
    - NOT BE SECURED WITH MORTAR;
    - BE APPROXIMATELY 14-INCHES BY 10-INCHES IN DIMENSION;
    - HAVE A DROP SECTION OR RAISED ABUTMENTS TO PREVENT SIDEWAYS SLIPPAGE OFF THE STEP; AND
    - HAVE NON-SKID SAFETY SERRATIONS ON THE FOOT CONTACT SURFACES.
  - MANHOLE TESTING:
    - MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST.
    - THE MANHOLE VACUUM TEST SHALL CONFORM TO THE FOLLOWING:
      - THE INITIAL VACUUM GAUGE TEST PRESSURE SHALL BE 10 INCHES Hg; AND
      - THE MINIMUM ACCEPTABLE TEST HOLD TIME FOR A 1-INCH Hg PRESSURE DROP TO 3 INCH Hg SHALL BE:
        - NOT LESS THAN 2 MINUTES FOR MANHOLES LESS THAN 10 FEET DEEP IN DEPTH;
        - NOT LESS THAN 2.5 MINUTES FOR MANHOLES 10 TO 15 FEET DEEP; AND
        - NOT LESS THAN 3 MINUTES FOR MANHOLES MORE THAN 15 FEET DEEP;
    - THE MANHOLE SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED IN (B) ABOVE.
    - FOLLOWING COMPLETION OF THE LEAKAGE TEST, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN OR ANIMALS UNTIL THE CONTRACTOR IS READY TO MAKE FINAL ADJUSTMENTS TO GRADE.

**SANITARY SEWER MANHOLE**  
NOT TO SCALE  
(MARCH 2008)

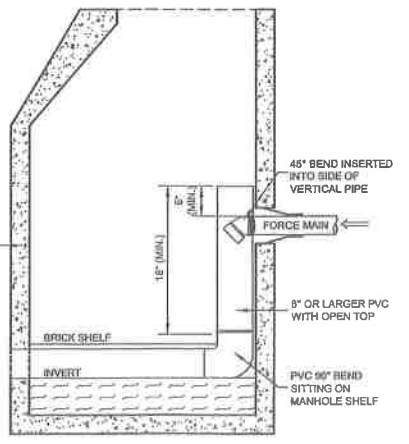


**SEWER FORCE MAIN TRENCH DETAIL**  
NOT TO SCALE  
(MARCH 2006)

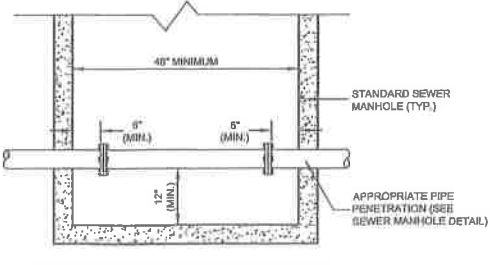


**PRECAST REINFORCED CONCRETE DROP OVER MANHOLE/CATCH BASIN DETAIL**  
NOT TO SCALE  
(MARCH 2008)

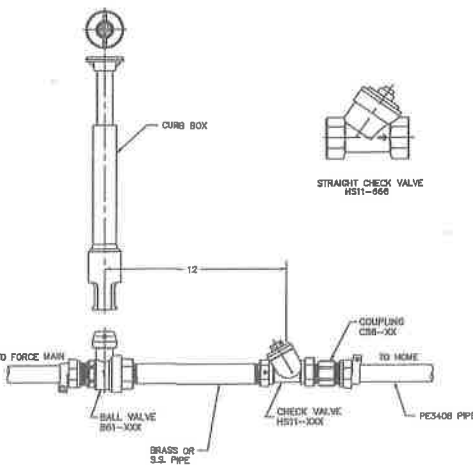
- SEWER FORCE MAIN CONSTRUCTION:**
- PER ENV-WQ 704.04(i) ALL FORCE MAINS SHALL BE RATED TO WITHSTAND 2.5 TIMES DESIGN DYNAMIC HEAD.
  - PER ENV-WQ 705.07(a) FORCE MAINS SHALL FLOW AT 3FPS OR GREATER FOR CONSTANT SPEED PUMPS AND PER ENV-WQ 705.07(b) FLOW AT 2FPS OR GREATER AT AVERAGE DAILY DESIGN FLOW FOR VARIABLE SPEED PUMPS.
  - FORCE MAINS SHALL MEET TRENCH AND BEDDING REQUIREMENTS OF GRAVITY SEWERS.
  - FORCE MAINS SHALL BE CONSTRUCTED FROM DUCTILE IRON, HIGH DENSITY POLYETHYLENE, OR PVC PER ENV-WQ 704.08(a).  
PVC SHALL CONFORM TO ASTM D2241-05 OR ASTM D1785-05  
HDPE SHALL CONFORM TO ASTM D3035-03a  
DI SHALL BE CORROSION PROTECTED IN CORROSIVE ENVIRONMENTS
  - FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 4 OF AWWA C900-05 AT 1.5 DESIGN DYNAMIC PRESSURE OR 100 PSI, WHICHEVER IS GREATER, PER ENV-WQ 704.08.



**FORCE MAIN CONNECTION TO SEWER MANHOLE**  
NOT TO SCALE  
(MARCH 2006)



**SEWER FORCE MAIN CLEANOUT MANHOLE DETAIL**  
NOT TO SCALE  
(MARCH 2006)



**SEWER CURB STOP AND CHECK VALVE**  
(TO BE DESIGNED BY OTHERS)  
NOT TO SCALE

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

**APPROVED BY THE HUDSON, NH PLANNING BOARD**  
DATE OF MEETING: \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

**OWNER OF RECORD:** DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051  
H.C.R.D. BK. 6480, PG. 777

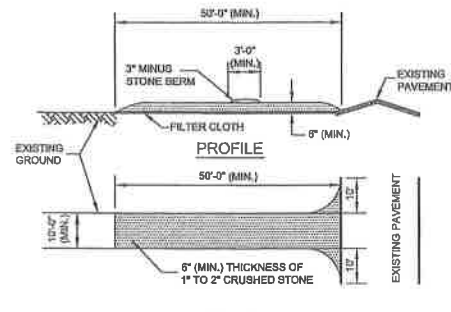
**APPLICANT:** DEER CREEK DEVELOPMENT, LLC  
25 FLAGSTONE DRIVE  
HUDSON, NH 03051

**K&A KEACH-NORDSTROM ASSOCIATES, INC.**  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-2881

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: AS SHOWN  
PROJECT NO: 14-0721-1 SHEET 27 OF 28





**STABILIZED CONSTRUCTION ENTRANCE DETAIL**  
NOT TO SCALE  
(MARCH 2008)

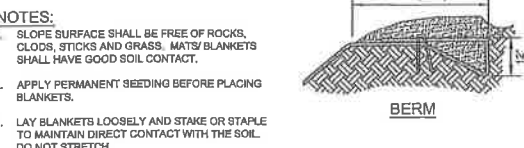
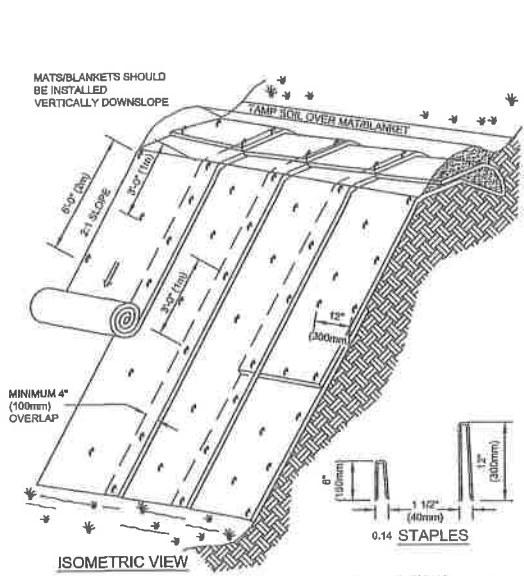
**MAINTENANCE:**

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

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

**CONSTRUCTION SPECIFICATIONS:**

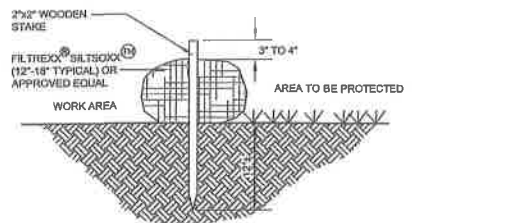
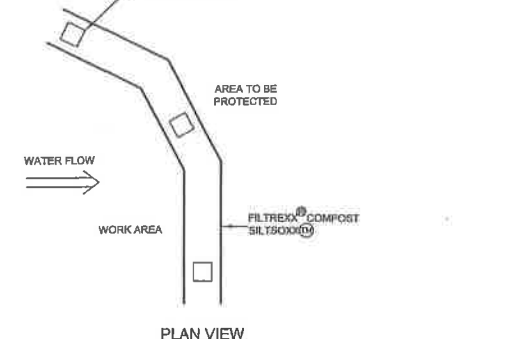
- STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE OR RECYCLED CONCRETE EQUIVALENT.
- THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
- THE THICKNESS OF THE STONE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



**EROSION BLANKET DETAIL-SLOPE INSTALLATION**  
NOT TO SCALE  
(MARCH 2008)

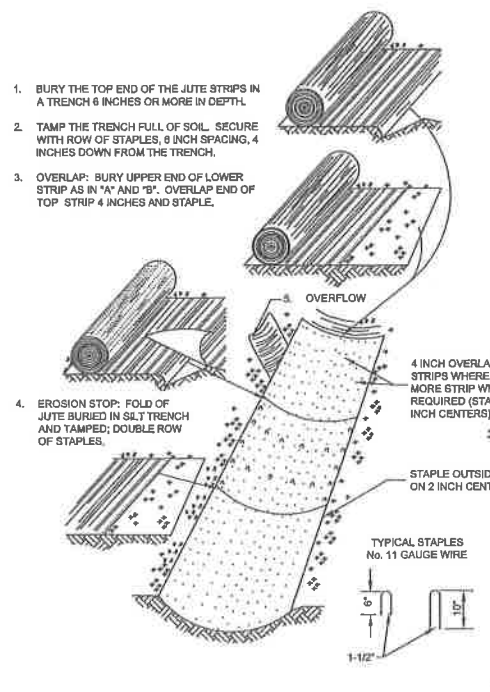
**NOTES:**

- SLOPE SURFACE SHALL BE FREE OF ROCKS, CLOGS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
- APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
- LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.



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

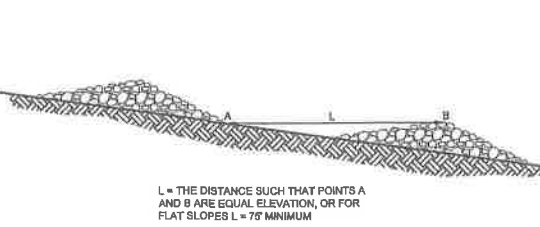
**FILTREXX® SILTSOXX® DETAIL**  
NOT TO SCALE  
(AUGUST 2011)



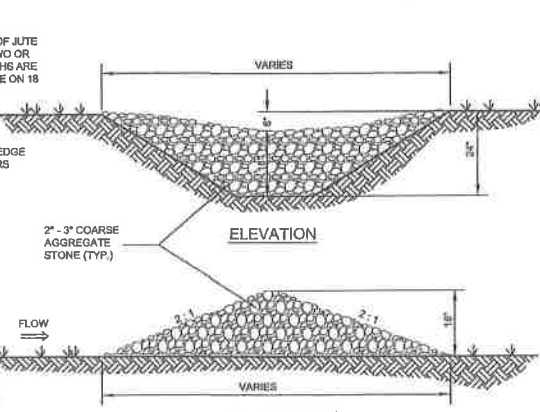
**EROSION CONTROL BLANKETS - SWALE INSTALLATION**  
NOT TO SCALE  
(MARCH 2008)

**NOTES:**

- BURY THE TOP END OF THE JUTE STRIPS IN A TRENCH 8 INCHES OR MORE IN DEPTH.
- TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 8 INCH SPACING, 4 INCHES DOWN FROM THE TRENCH.
- OVERLAP: BURY UPPER END OF LOWER STRIP AS IN "A" AND "B". OVERLAP END OF TOP STRIP 4 INCHES AND STAPLE.
- EROSION STOP: FOLD OF JUTE BURIED IN SILT TRENCH AND TAMPED; DOUBLE ROW OF STAPLES.



**STONE CHECK DAM SPACING DETAIL**  
NOT TO SCALE  
(MARCH 2008)



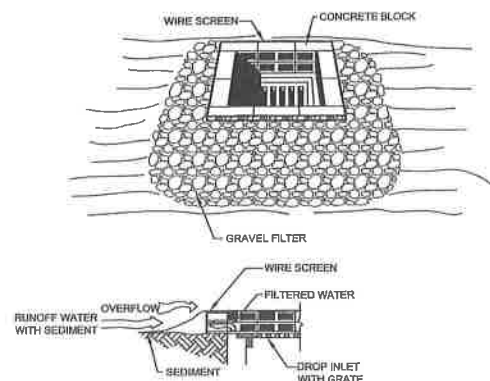
**STONE CHECK DAM DETAIL**  
NOT TO SCALE  
(MARCH 2008)

**CONSTRUCTION SEQUENCE**

- PRIOR TO ANY CONSTRUCTION, ALL CONSTRUCTION PERSONNEL MUST BE MADE AWARE OF THE POTENTIAL PRESENCE AND PROTECTED STATUS OF THE HOGNOSE SNAKE. PLEASE REFER TO "WWW.WILDLIFE.STATE.NH.US/WILDLIFE/ORGANISMS/GAME\_FISH/HOGNOSE\_SNAKE\_FLYER.PDF" FOR A FLYER THAT IS TO BE DISTRIBUTED TO ALL PERSONNEL. IT IS ILLEGAL TO HARM, HARASS, OR KILL HOGNOSE SNAKES IN NEW HAMPSHIRE. ALL OBSERVATIONS OF HOGNOSE SNAKES SHOULD BE IMMEDIATELY REPORTED TO THE NH FISH & GAME DEPARTMENT (MICHAEL MARCHAND - (603) 271-3016 OR BRENDAN CLIFFORD - (603) 271-6465).
- IN ADDITION, CLOSE ATTENTION IS TO BE MADE OF THE POTENTIAL ENCOUNTER WITH THE SPOTTED TURTLE AND BLANDINGS TURTLE (ESPECIALLY WITHIN LAY MAY AND EARLY JUNE). IF BLANDINGS TURTLE OR SPOTTED TURTLE ARE FOUND LAYING EGGS IN A WORK AREA, PLEASE CONTACT KIM TUTTLE - (603) 271-6544 OR MICHAEL MARCHAND - (603) 271-3016 WITH THE NH FISH AND GAME. IF A BLANDINGS TURTLE OR SPOTTED TURTLE ARE SEEN AT ANY TIME, DOCUMENTATION INCLUDING PICTURES AND A REPORT IS TO BE SENT TO RAVIP OR "WILDLIFE SIGHTINGS".
- CONTRACTOR TO NOTIFY DIG-SAFE 72-HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- PRIOR TO GRUBBING OF CLEARED AREAS, ALL SILTATION BARRIERS DESIGNED FOR USE AS TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED AS CALLED FOR ON PROJECT PLANS. INSTALL STABILIZED CONSTRUCTION EXIT AT LOCATION OF CONSTRUCTION ACCESS AT INTERSECTION WITH EXISTING PAVEMENT.
- CUT AND CLEAR TREES AND BRUSH FROM CONSTRUCTION AREAS TO THE EXTENT NECESSARY. ALL BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF BY CONTRACTOR.
- COMPLETE GRUBBING OPERATIONS UNDER THE ROADWAY AND SLOPE SECTIONS. ALL STUMPS AND SIMILAR DEBRIS SHALL BE PROPERLY DISPOSED OF BY CONTRACTOR. ORGANIC MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLAND AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND, IF NECESSARY, SURROUNDED WITH HAY BALES IN ORDER TO PREVENT LOSS DUE TO EROSION.
- CONSTRUCT TEMPORARY CULVERTS AS NECESSARY TO FACILITATE CONSTRUCTION ACTIVITIES. ALL SUCH CROSSINGS SHALL BE PROTECTED WITH HAY BALE BARRIERS TO LIMIT EROSION.
- STABILIZE ALL DITCHLINES AND PONDS PRIOR TO DIRECTING FLOW INTO THEM. CONSTRUCT DRAINAGE SYSTEM SEWER AND OTHER SUBSURFACE UTILITIES.
- COMMENCE CONSTRUCTION OF ROADWAY. PERFORM EXCAVATION ACTIVITIES REQUIRED TO ACHIEVE SUBGRADE ELEVATION. ALL EXCAVATED EMBANKMENTS, DITCHES, SWALES AND ROADWAY CROSS CULVERTS SHALL BE INSTALLED AND STABILIZED. ALL SWALES AND DITCHLINES SHALL BE PROTECTED FROM EROSION BY IMPLEMENTATION OF TEMPORARY STONE CHECK DAMS AS SHOWN ON PROJECT PLANS. DIVERT STORMWATER RUNOFF THROUGH THE USE OF TEMPORARY CULVERTS, OR OTHER MEANS NECESSARY PRIOR TO THE COMPLETION OF A FUNCTIONAL STORM DRAINAGE SYSTEM. SLOPES AND EMBANKMENTS SHALL BE STABILIZED BY TRACKING AND TEMPORARY SEEDING WITH WINTER RYE PRIOR TO TURF ESTABLISHMENT. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO HAVING RUNOFF DIRECTED TO THEM.
- COMPLETE CONSTRUCTION OF ROADWAY EMBANKMENTS BY ADDING APPROPRIATE BASE MATERIALS GRADED TO PROPER ELEVATION. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- APPLY TOPSOIL TO ROADWAY SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED SO AS TO BE FREE OF ROOTS, BRANCHES, STONES AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED AND MULCHED. CONSTRUCTION PERSONNEL SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS HAS BECOME ESTABLISHED.
- PERFORM FINE GRADING OF ROADWAY BASE MATERIALS. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- MAINTAIN, REPAIR AND REPLACE AS NECESSARY TEMPORARY EROSION CONTROL MEASURES UNTIL SUCH TIME AS THE ENTIRE CONSTRUCTION AREA HAS BEEN STABILIZED (A MINIMUM OF ONE WINTER SHALL HAVE PASSED).
- AFTER STABILIZATION, REMOVE AND SUITABLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES.
- MONITOR CONSTRUCTION ACTIVITIES FOR EACH UNIT TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF ROADWAY EMBANKMENTS, STORMWATER SYSTEMS AND UTILITIES. ALL DRIVEWAYS ACROSS DITCHLINES SHALL HAVE CULVERTS INSTALLED IN ACCORDANCE WITH LOCAL REQUIREMENTS.

**EROSION CONTROL NOTES**

- EXPOSED EARTHWORK SHALL BE CONFINED TO AS LIMITED AN AREA AS IS PRACTICAL AT ANY GIVEN TIME THROUGHOUT THE CONSTRUCTION SEQUENCE. AT NO TIME SHALL MORE THAN FIVE ACRES OF SITE AREA BE IN AN UNSTABLE CONDITION. NO GIVEN AREA OF THE SITE SHALL BE LEFT IN AN UNSTABILIZED CONDITION FOR A PERIOD OF TIME EXCEEDING FIVE CALENDAR DAYS.
- TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH PROJECT PLANS. IN ADDITION, SIMILAR MEASURES SHALL BE INSTALLED WHERE AND WHEN THE FIELD CONDITION, OR FIELD OPERATION OF THE INDIVIDUAL SITE CONTRACTOR MAY WARRANT. ALL TEMPORARY EROSION CONTROL MEASURES USED SHALL BE INSPECTED WEEKLY AND AFTER EVERY 0.5" OF RAINFALL. CLEANED AND MAINTAINED AND OTHERWISE KEPT IN AN EFFECTIVE OPERATIONS MANNER THROUGHOUT THE CONSTRUCTION PERIOD.
- ALL DISTURBED AREAS DESIGNATED TO BE TURF, SHALL RECEIVE A MINIMUM APPLICATION OF 4-INCHES OF LOAM (COMPACTED THICKNESS), PRIOR TO FINAL SEEDING AND MULCHING.
- ALL SWALES AND DITCHLINES SHALL BE PERIODICALLY CLEANED OF DEPOSITED SEDIMENT SO AS TO MAINTAIN AN EFFECTIVE GRADE AND CROSS SECTION. ALL SWALES AND DITCHLINES SHALL BE FULLY STABILIZED PRIOR TO HAVING STORMWATER DIRECTED TOWARDS THEM.
- IN THE EVENT THAT DURING CONSTRUCTION OF ANY PORTION OF THIS PROJECT, A WINTER SHUTDOWN IS NECESSARY, THE CONTRACTOR SHALL STABILIZE ALL INCOMPLETE WORK AND PROVIDE FOR SUITABLE METHODS OF DIVERTING RUNOFF IN ORDER TO ELIMINATE SHEET FLOW ACROSS FROZEN SURFACES.
- DUST SHALL BE CONTROLLED BY THE USE OF WATER AS NECESSARY THROUGHOUT THE CONSTRUCTION PERIOD.
- IN NO WAY ARE THOSE TEMPORARY EROSION CONTROL MEASURES INDICATED ON THESE PLANS TO BE CONSIDERED ALL INCLUSIVE. THE CONTRACTOR SHALL USE JUDGMENT IN INSTALLING SUPPLEMENTARY EROSION CONTROL MEASURES WHERE AND WHEN SPECIFIC SITE CONDITIONS AND/OR CONSTRUCTION METHODOLOGIES MAY WARRANT.
- AREAS HAVING FINISH GRADE SLOPES OF 3:1 OR STEEPER, SHALL BE STABILIZED WITH JUTE MATTING WHEN AND IF FIELD CONDITIONS WARRANT, OR IF SO ORDERED. JUTE MATTING INSTALLED TO CONFORM WITH THE RECOMMENDED BEST MANAGEMENT PRACTICE OUTLINED IN THE "STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE".
- THE DETENTION PONDS AND TREATMENT SWALES SHALL BE CONSTRUCTED PRIOR TO ANY EARTH MOVING ACTIVITIES THAT WILL INFLUENCE STORMWATER RUNOFF.
- ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.



**BLOCK & GRAVEL DROP INLET SEDIMENT FILTER**  
NOT TO SCALE  
(MARCH 2008)

**NOTES:**

- CONCRETE BLOCKS SHOULD BE PLACED LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET. THE ENDS OF EACH BLOCK SHOULD BE BUTTING. THE HEIGHT OF THE BARRIER CAN BE VARIED DEPENDING ON THE DESIGN BY STACKING VARIOUS COMBINATIONS OF DIFFERENT SIZED BLOCKS. THE BARRIER SHOULD BE A MINIMUM OF 12 INCHES HIGH AND A MAXIMUM OF 24 INCHES HIGH.
- HARDWARE CLOTH OR WIRE MESH SHOULD BE PLACED OVER OPENINGS OF THE CONCRETE BLOCKS AND EXTENDED AT LEAST 12 INCHES AROUND THE OPENING TO PREVENT AGGREGATE FROM BEING TRANSPORTED THROUGH THE OPENINGS IN THE BLOCK.
- SEWER STONE OR OTHER CLEAN COARSE AGGREGATE SHOULD BE PLACED AGAINST THE BLOCK TO THE TOP OF THE BARRIER.

**WINTER CONSTRUCTION NOTES:**

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

PURSUANT TO THE SITE REVIEW REGULATIONS OF THE HUDSON PLANNING BOARD, THE SITE PLAN APPROVAL GRANTED HEREIN EXPIRES ONE YEAR FROM DATE OF APPROVAL.

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

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

SITE PLANS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FINAL APPROVAL COMMENCES AT THE PLANNING BOARD MEETING DATE AT WHICH THE PLAN ACHIEVES FINAL APPROVAL.

**CONSTRUCTION DETAILS**  
**COBBLESTONE VILLAGE**  
MAP 184; LOT 27  
137 BELKNAP ROAD  
HUDSON, NEW HAMPSHIRE  
HILLSBOROUGH COUNTY

<b>OWNER OF RECORD:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051 H.C.R.D. BK. 8480, PG. 777	<b>APPLICANT:</b> DEER CREEK DEVELOPMENT, LLC 25 FLAGSTONE DRIVE HUDSON, NH 03051
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**KM** KEACH-NORDSTROM ASSOCIATES, INC.  
Civil Engineering Land Surveying Landscape Architecture  
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 827-2881

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	3/5/2015	REV. PER TOWN COMMENTS	BJC

DATE: JANUARY 23, 2015 SCALE: AS SHOWN  
PROJECT NO: 14-0721-1 SHEET 28 OF 28