

JONES & BEACH ENGINEERS INC.

85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

June 29, 2017

Town of Stratham Planning Board
Attn. Robert Baskerville, PE, Chairman
10 Bunker Hill Avenue
Stratham, NH 03885

RE: Sullivan Subdivision Application
112 High Street
Tax Map 19, Lot 68
JBE Project No. 13070.1

Dear Chairman Baskerville and Members of the Board,

Jones & Beach Engineers, Inc. respectfully submits an Application for Subdivision for the above-referenced parcel on behalf of property owner Robin Sullivan. The intent of this project is to construct a 5-lot residential subdivision, with 650 L.F. of roadway and hammerhead from High Street. This project will be serviced with on-site wells and septic systems.

The following items are provided in support of this Subdivision Application:

1. Application Fee Check in the amount of \$952.00 made payable to "Town of Stratham".
2. Completed Application for Subdivision with Checklist.
3. Two (2) Completed Subdivision Waiver Request Forms.
4. Letter of Authorization from Property Owners.
5. Abutters List and three (3) sets of mailing labels.
6. Tax Map.
7. Test Pits.
8. Three (3) bound copies of drainage analysis.
9. Nine (9) complete reduced-size (11"x17") plan sets.
10. Six (6) complete full-size plan sets.

If you have any questions or need any additional information, please feel free to contact our office. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.



Jonathan S. Ring, P.E.
President

cc: Robin Sullivan



Map# 19 Lot# 68

Form Date: 10/04/2007
11:29 AM



Town of Stratham Subdivision Checklist

TOWN OF STRATHAM

Name of Applicant: Robin Sullivan

Date: June 29, 2017

Map #: 19 Lot # 68

Subdivision Application - Information Checklist

A subdivision application shall contain the following information, where applicable, to be considered complete. However, this checklist is intended only as a guide; the Planning Board may require additional information as deemed necessary. All plans shall conform to the applicable requirements of the Zoning Ordinance, Building Regulations, Subdivision and Site Plan Review Regulations and other state, local, and federal requirements. (All data/information sources should be referenced.)

X – Information Provided

O – Information Not Provided

W – Waiver Requested

I. Preliminary Consultation

- ☐ A. Base map drawn to scale.
- ☐ 1. General description of existing conditions on the site.
- ☐ 2. Any facilities or utilities.
- ☐ 3. Dimensions and sizes of the proposed lots (minimum sizes determined by soil type.)
- ☐ 4. Topographic map showing the proposed layout of streets, lots, etc.

II. Formal Application

- ☒ A. Completed "Application for Subdivision Approval".
- ☒ B. Names and addresses of all abutters.
- ☒ C. Administrative fees (payable to the Town of Stratham).
- ☐ D. High intensity soils information with lot size calculations and cover letter from a soil scientist.
- ☒ E. Data on test pits and percolation tests:
 - ☒ Location of test pits.
 - ☒ Percolation test date and rate
 - ☒ Certification of test witness
 - ☒ Outline of the area reserved for leach fields
- ☒ F. Six complete sets of plans stamped by a N.H. registered land surveyor; roadway, drainage, and utility plans stamped by a professional N.H. engineer. All plans to contain:
 - ☒ Names, addresses, and telephone numbers of : the owner, applicant, agent and/or engineer, architect and/or land surveyor.
 - ☒ Name of the project.
 - ☒ Location of the site.

Town of Stratham Subdivision Checklist

- X Names and addresses of all abutters (including those across the street or stream.)
- X Date, North arrow, and scale.
- X Tax Map reference.
- X G. Additional submission requirements:
 - X Nine 11 X 17 copies of proposed plan.
 - Pending One copy of the plan in a digital format referenced to NH State Plane feet, NAD 83, in a format compatible with the town's ESRI ArcView GIS system.
 - X Three copies of any engineering or impact reports.
 - X Three sets of printed labels for abutter mailing.

- X 1. Design and Sketch Plan (Scale not more than 100' to 1").
 - X a. Vicinity sketch with surrounding streets.
 - X b. Natural features including watercourses, waterbodies, etc.
 - X c. Existing contours at intervals not exceeding two feet; referred to sea-level datum.
 - X d. Bearings and distances of surveyed property lines.
 - X e. Abutting street lines.
 - X f. Description of existing catch basins, culverts, etc.
 - X g. Description of all utilities.
- X 2. Subdivision Plan (Scale not more than 50' to 1").
 - X a. Location, dimensions, and bearings of boundary lines.
 - X b. Location and width of streets, easements, right-of-ways, and setback lines.
 - X c. Locations, dimensions and areas of lots, and the location and setback dimensions of existing structures within 100'.
 - X d. All property to be set aside for park or playground use.
 - X e. Indication of the use of lots.
 - X f. Consecutively numbered or letter lots.
 - X g. Explanation of any easements or reservations.
- X 3. Construction Plan (See Section 4.5, "Construction Standards").
 - X a. Profiles showing existing and proposed elevations along center lines of all roads.
 - X b. Plans and cross-sections of street showing facilities (e.g. signs, drainage, etc.) and utilities (e.g. water, electricity, etc.).
 - X c. Location, size, elevation of existing facilities or utilities.
 - X d. Topographic contours.
 - X e. Site-grading plan.
- 4. Other exhibits, if applicable:
 - a. State and local permits (e.g. state septic systems [RSA 149-E:3], site specific

**Town of Stratham
Subdivision Checklist**

[RSA 149:8-a], driveway access [RSA 236:13], dredge and fill [RSA 483-A], etc.).

- Pending b. Performance Bond.
- X c. Erosion and sedimentation control plan.
- d. Potential Planning Board requirements:
- X Stormwater runoff calculations and engineer's certification.
- Calculations on type and quantity of sanitary waste.
- Traffic impact analysis.
- Protective covenants.
- Deeds conveying streets or right-of-ways.
- Natural/Environmental Recourses Inventory
- Environmental/Forestry Impact Report

ARE THERE ANY STRUCTURES ON THE PROPERTY AT PRESENT? Yes, Existing house on property.

DESCRIPTION: _____

LOCATION: 8 Whittaker Drive

DOES OWNER OF RECORD OWN OR HAVE INTEREST IN A PARTNERSHIP OR CORPORATION
OWNING ABUTTING PROPERTY? No

IS ANY VARIANCE FROM "LAND SUBDIVISION CONTROL REGULATIONS" REQUESTED?

No variance from Land Subdivision Control Regulations is requested.

IF SO HAS LETTER BEEN SUBMITTED STATING REASONS FOR VARIANCE REQUEST?

Note: For more complete information, it is strongly recommended that the applicant read Stratham's "Subdivision and Site Plan Review Regulations" (2004), as well as the Town's Zoning Ordinance (2004) and Building Ordinance. (2002).

I certify that the information provided is complete and correct to the best of my knowledge.

Signed: _____

Jonathan S. Ring, P.E.

Date: June 29, 2017



TOWN OF STRATHAM
10 Bunker Hill Avenue · Stratham, NH 03885
Phone: 603-772-7391 Fax (All Offices) 603-775-0517

SITE PLAN REVIEW / SUBDIVISION WAIVER REQUEST FORM

Name of Subdivision/Site Plan:
Proposed Sullivan Subdivision

Street Address:
112 High Street, Stratham, NH

I Robin Sullivan hereby request that the Planning Board waive the requirements of item(s) Addendum A, Table 1. Roadway Pavement Width of 24' of the Subdivision/Site Plan Checklist in reference to a plan presented by Jones & Beach Engineers, Inc., Attn. Jonathan S. Ring, P.E. (name of surveyor and engineer) dated June 29, 2017 for the property tax map(s) 19 and lot(s) 68 in the Town of Stratham, NH

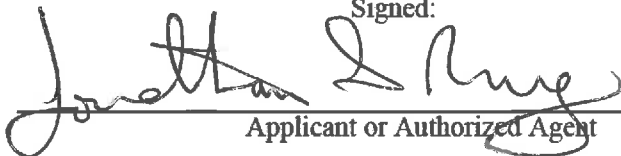
As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n) (For Subdivisions) OR RSA 674:44, III (e) (For Site-Plans). Without the Planning Board granting said waiver, strict conformity would cause an unnecessary hardship to the applicant and waiver would not be contrary to the spirit and intent of the regulations, **OR** the specific circumstances relative to the subdivision/site plan or conditions of the land in the subdivision/site plan indicate that the waiver will properly carry out the spirit and intent of the regulations.

Strict conformity would cause an unnecessary hardship to the applicant and waiver would not be contrary to the spirit and intent of the regulations:

OR:

Specific circumstances relative to the subdivision or conditions of the land in the subdivision indicate that the waiver will properly carry out the spirit and intent of the regulations:

We respectfully request a waiver from the 24' roadway width. In lieu of a 24' wide roadway, we propose a 22' wide roadway due to the limited number of lots that will access through the proposed roadway. The proposed roadway is a hammerhead that will service 5-lots. Therefore, limited traffic will utilize the proposed roadway.

Signed:

Applicant or Authorized Agent

Planning Board Action:

Waiver Granted _____

Waiver Not Granted _____



TOWN OF STRATHAM
10 Bunker Hill Avenue • Stratham, NH 03885
Phone: 603-772-7391 Fax (All Offices) 603-775-0517

SITE PLAN REVIEW / SUBDIVISION WAIVER REQUEST FORM

Name of Subdivision/Site Plan:
Proposed Sullivan Subdivision

Street Address:
112 High Street, Stratham, NH

I Robin Sullivan hereby request that the Planning Board waive the requirements of item(s) II.D. High intensity soils information with lot size calcs. of the Subdivision/Site Plan Checklist in reference to a plan presented by Jones & Beach Engineers, Inc., Attn. Jonathan S. Ring, P.E. (name of surveyor and engineer) dated June 29, 2017 for the property tax map(s) 19 and lot(s) 68 in the Town of Stratham, 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) (For Subdivisions) OR RSA 674:44, III (e) (For Site-Plans). Without the Planning Board granting said waiver, strict conformity would cause an unnecessary hardship to the applicant and waiver would not be contrary to the spirit and intent of the regulations, **OR** the specific circumstances relative to the subdivision/site plan or conditions of the land in the subdivision/site plan indicate that the waiver will properly carry out the spirit and intent of the regulations.

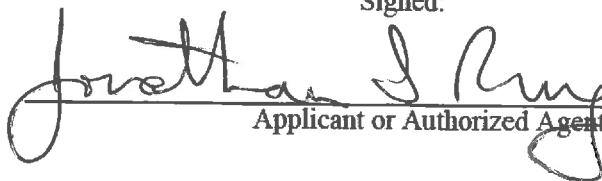
Strict conformity would cause an unnecessary hardship to the applicant and waiver would not be contrary to the spirit and intent of the regulations:

OR:

Specific circumstances relative to the subdivision or conditions of the land in the subdivision indicate that the waiver will properly carry out the spirit and intent of the regulations:

The proposed development contains limited differing soil groups. The soils groups are clearly defined by NRCS.

Signed:


Applicant or Authorized Agent

Planning Board Action:

Waiver Granted _____

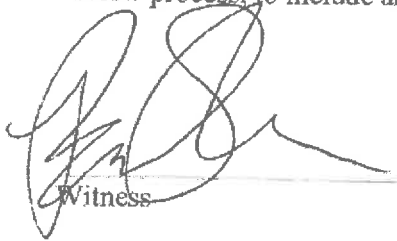
Waiver Not Granted _____

Letter of Authorization

Robin DB Sullivan

I, ~~Brian Sullivan~~, 8 Whittaker Drive, Stratham, NH 03885, owner of property located in Stratham, NH, known as Tax Map 19, Lot 68, do hereby authorize Jones & Beach Engineers, Inc., PO Box 219, Stratham, NH, to act on my behalf concerning the previously mentioned property. The parcel is located on 8 Whittaker Drive in Stratham, NH.

I hereby appoint Jones & Beach Engineers, Inc., as my agent to act on my behalf in the review process, to include any required signatures.


Witness

Robin DB Sullivan
~~Brian Sullivan~~
Robin DB Sullivan

3-17-2016
Date

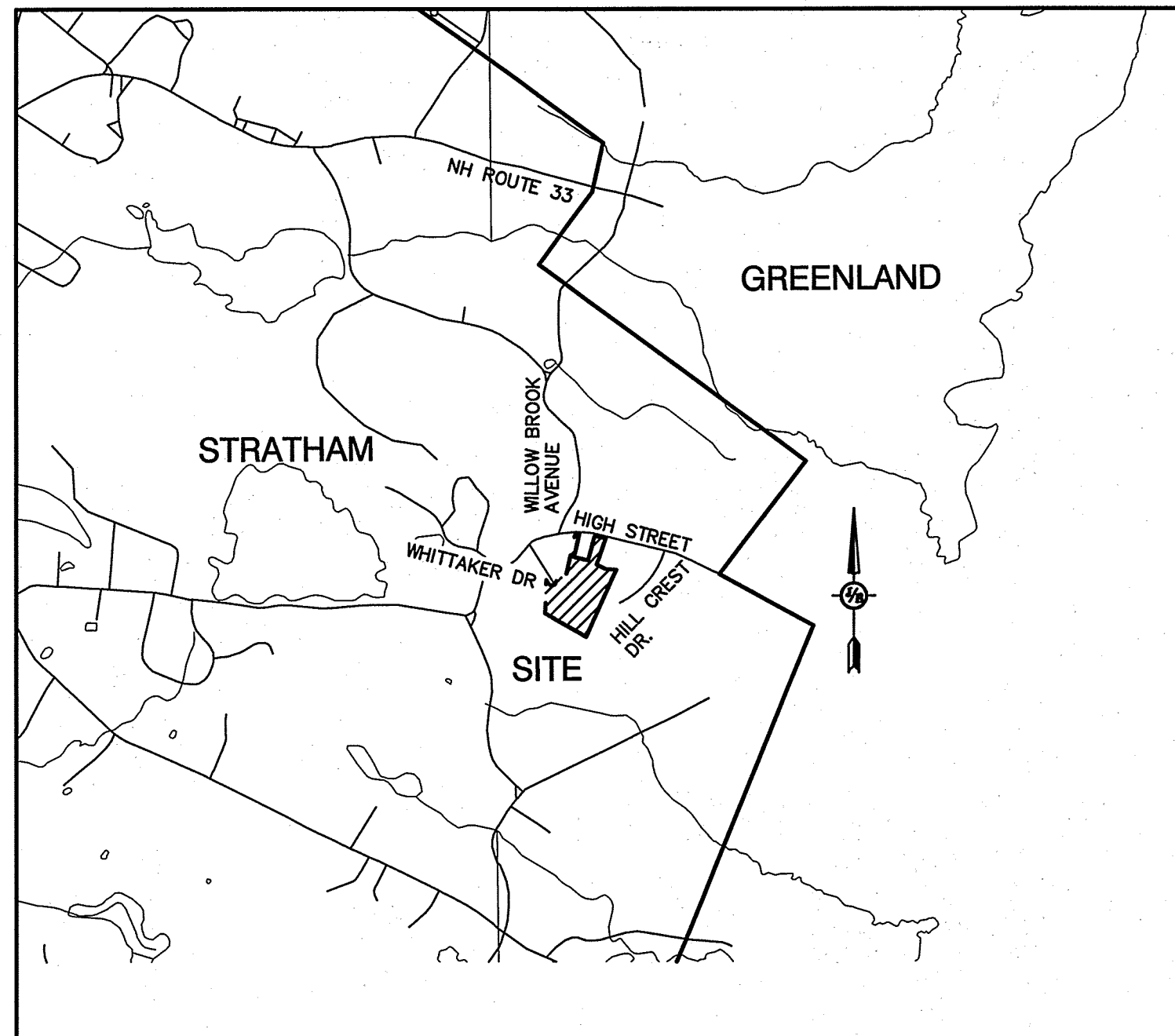
GENERAL LEGEND

EXISTING	PROPOSED	DESCRIPTION
---	---	PROPERTY LINES
---	---	SETBACK LINES
---	---	CENTERLINE
---	---	FRESHWATER WETLANDS LINE
---	---	TREE LINE
---	---	STONEWALL
---	---	BARBED WIRE
---	---	FENCE
---	---	STOCKADE FENCE
---	---	SOIL BOUNDARY
---	---	FLOOD PLAIN LINE
---	---	EASEMENT
---	---	MAJOR CONTOUR
---	---	MINOR CONTOUR
---	---	EDGE OF PAVEMENT
---	---	SILT FENCE
---	---	DRAINAGE LINE
---	---	OVERHEAD ELECTRIC
---	---	UNDERGROUND ELECTRIC
---	---	GUARDRAIL
---	---	IRON PIPE/IRON ROD
---	---	DRILL HOLE
---	---	IRON ROD/DRILL HOLE
---	---	STONE/GRANITE BOUND
---	---	SPOT GRADE
---	---	PAVEMENT SPOT GRADE
---	---	CURB SPOT GRADE
---	---	BENCHMARK (TBM)
---	---	DOUBLE POST SIGN
---	---	SINGLE POST SIGN
---	---	WELL
---	---	TEST PIT
---	---	FAILED TEST PIT
---	---	MONITORING WELL
---	---	PERC TEST
---	---	PHOTO LOCATION
---	---	TREES AND BUSHES
---	---	UTILITY POLE
---	---	LIGHT POLES
---	---	DRAIN MANHOLE
---	---	SINGLE GRATE CATCH BASIN
---	---	DOUBLE GRATE CATCH BASIN
---	---	TRANSFORMER
---	---	CULVERT W/WINGWALLS
---	---	CULVERT W/FLARED END SECTION
---	---	CULVERT W/STRAIGHT HEADWALL
---	---	STONE CHECK DAM
---	---	DRAINAGE FLOW DIRECTION
---	---	4K SEPTIC AREA
---	---	VEGETATED FILTER STRIP
---	---	RIPRAP
---	---	FRESHWATER WETLANDS
---	---	STABILIZED CONSTRUCTION ENTRANCE
---	---	CONCRETE
---	---	GRAVEL
---	---	SNOW STORAGE

SULLIVAN SUBDIVISION PLAN

TAX MAP 19 AND LOT 68

112 HIGH STREET, STRATHAM, NH 03885



LOCUS MAP
SCALE 1" = 2000'

SHEET INDEX

CS	COVER SHEET
A1	SUBDIVISION PLAN
C1	EXISTING CONDITIONS PLAN
C2	GRADING AND DRAINAGE PLAN
P1	PLAN AND PROFILE
D1-D2	DETAIL SHEETS
E1	EROSION AND SEDIMENT CONTROL DETAILS

CIVIL ENGINEER

JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: PROJECT MANAGER
EMAIL: JRING@JONESANDBEACH.COM

OWNER OF RECORD

ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885

SOIL CONSULTANT

GOVE ENVIRONMENTAL SERVICES, INC.
8 CONTINENTAL DRIVE, UNIT H
EXETER, NH 03833-7507
(603) 778-0644
CONTACT: JIM GOVE

SURVEYOR

JAMES VERRA AND ASSOCIATES, INC.
101 SHATTUCK WAY, SUITE 8
NEWINGTON, NH 03801
(603) 436-3557
CONTACT: JAMES VERRA
EMAIL: JAMESV@JVASURVEYORS.COM

ELECTRIC

UNITIL
6 LIBERTY LANE WEST
HAMPTON, NH 03842
(800) 852-7276

TELEPHONE

FAIRPOINT COMMUNICATIONS
1575 GREENLAND ROAD
GREENLAND, NH 03840
(603) 427-5525
CONTACT: JOE CONSIDINE

TELEPHONE

FAIRPOINT COMMUNICATIONS
100 TRI CITY ROAD
SOMERWORTH, NH 03878
ATTN:DAVE KESTNER
(603) 743-1114

CABLE TV

COMCAST COMMUNICATION CORPORATION
334-B CALEF HIGHWAY
EPPING, NH 03042-2325
(603) 679-5695

PROJECT PARCEL
TOWN OF STRATHAM, NH
MAP 19, LOT 68

APPLICANT/OWNER
ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885

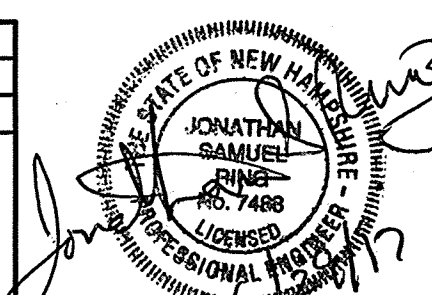
TOTAL LOT AREA
14.99 ACRES

APPROVED - STRATHAM, NH
PLANNING BOARD

DATE:

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Design: JSR	Draft: PLB	Date: 6/26/13
Checked: JSR	Scale: AS NOTED	Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg		
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE).		
ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.		



REV.	DATE	REVISION	BY
0	6/29/17	REVISED FOR PLANNING BOARD	PLB

J/B Jones & Beach Engineers, Inc.
85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

Designed and Produced in NH
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	COVER SHEET
Project:	112 HIGH STREET STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	CS
SHEET 1 OF 8	JBE PROJECT NO. 13070.1

SULLIVAN SUBDIVISION, 112 HIGH STREET, STRATHAM, NH
JBE # 13070.1 REVISION 6/29/17

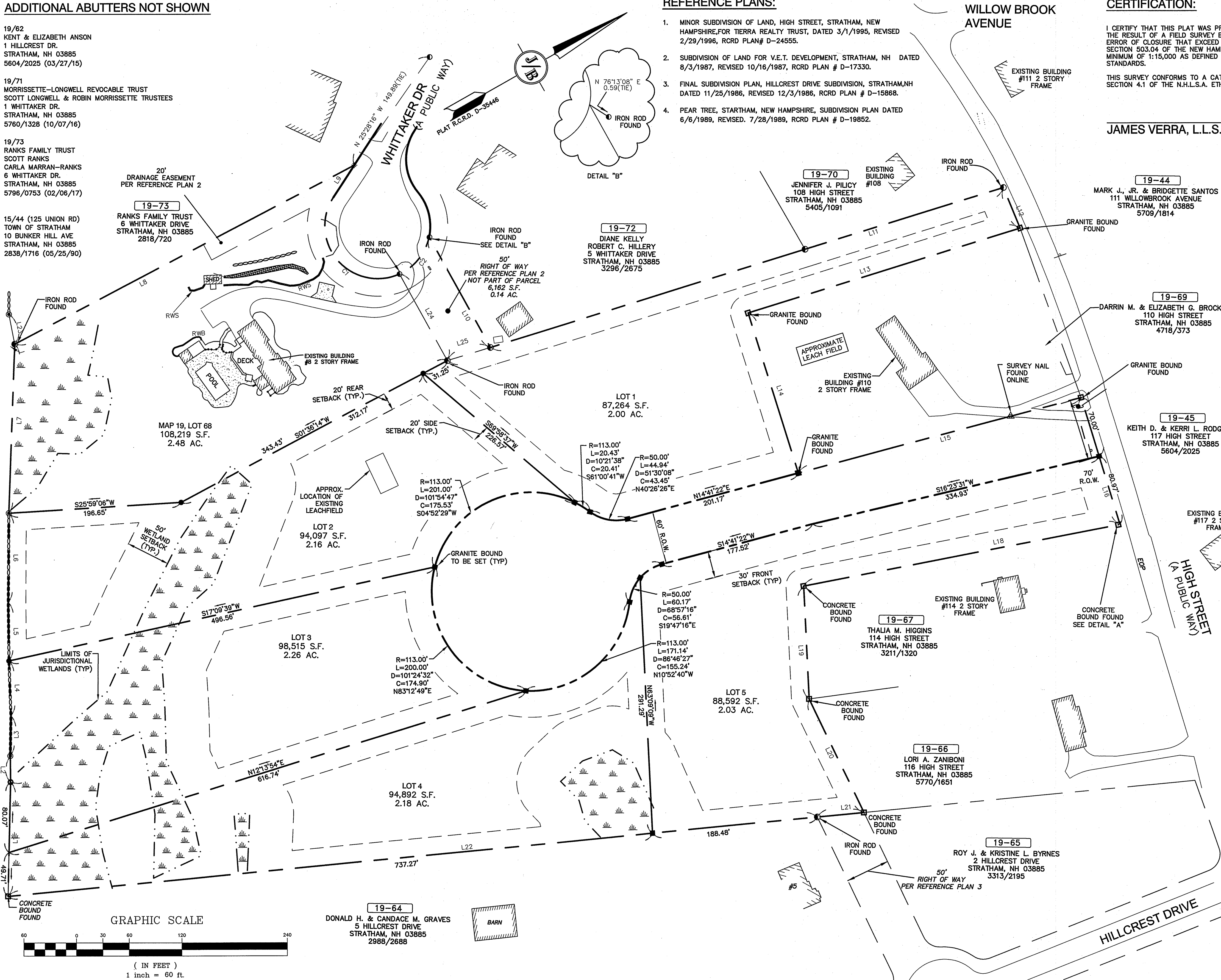
ADDITIONAL ABUTTERS NOT SHOWN

19/62
KENT & ELIZABETH ANSON
1 HILLCREST DR.
STRATHAM, NH 03885
5604/2025 (03/27/15)

19/71
MORRISSETTE-LONGWELL REVOCABLE TRUST
SCOTT LONGWELL & ROBIN MORRISSETTE TRUSTEES
1 WHITTAKER DR.
STRATHAM, NH 03885
5760/1328 (10/07/16)

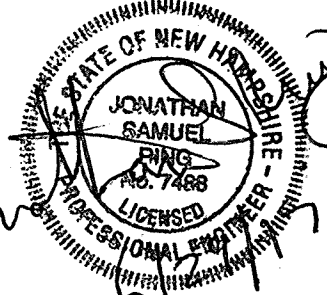
19/73
RANKS FAMILY TRUST
SCOTT RANKS
CARLA MARRAN-RANKS
6 WHITTAKER DR.
STRATHAM, NH 03885
5786/0753 (02/06/17)

15/44 (125 UNION RD)
TOWN OF STRATHAM
10 BUNKER HILL AVE
STRATHAM, NH 03885
2838/1716 (05/25/90)



APPROVED - STRATHAM, NH PLANNING BOARD	PROJECT PARCEL TOWN OF STRATHAM, NH MAP 19, LOT 68
APPLICANT/OWNER ROBIN SULLIVAN 8 WHITTAKER DRIVE STRATHAM, NH 03885	TOTAL LOT AREA 14.99 ACRES
DATE:	

Design: JSR Draft: PLB Date: 6/26/13
Checked: JSR Scale: AS NOTED Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.



REV.	DATE	REVISION	BY
0	6/29/17	REVISED FOR PLANNING BOARD	PLB
			BY

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave. PO Box 219 Stratham, NH 03885

Civil Engineering Services

603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **SUBDIVISION PLAN**
MAP 19, LOT 68
112 HIGH STREET
STRATHAM, NH 03885

Project: **ROBIN SULLIVAN**
8 WHITTAKER DRIVE, STRATHAM, NH 03885

Owner of Record: **ROBIN SULLIVAN**
8 WHITTAKER DRIVE, STRATHAM, NH 03885

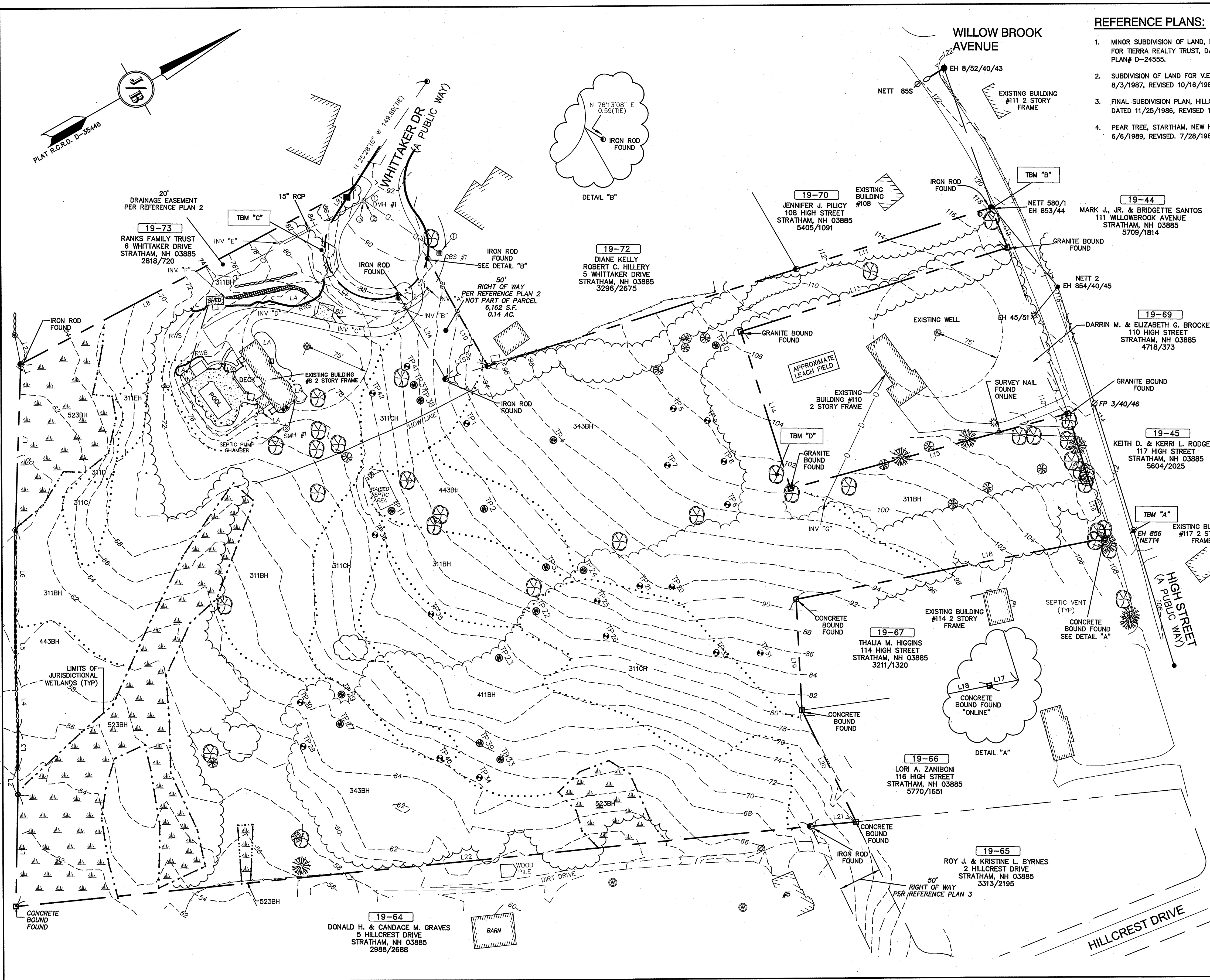
DRAWING No.

A1

SHEET 2 OF 8
JBE PROJECT NO. 13070.1

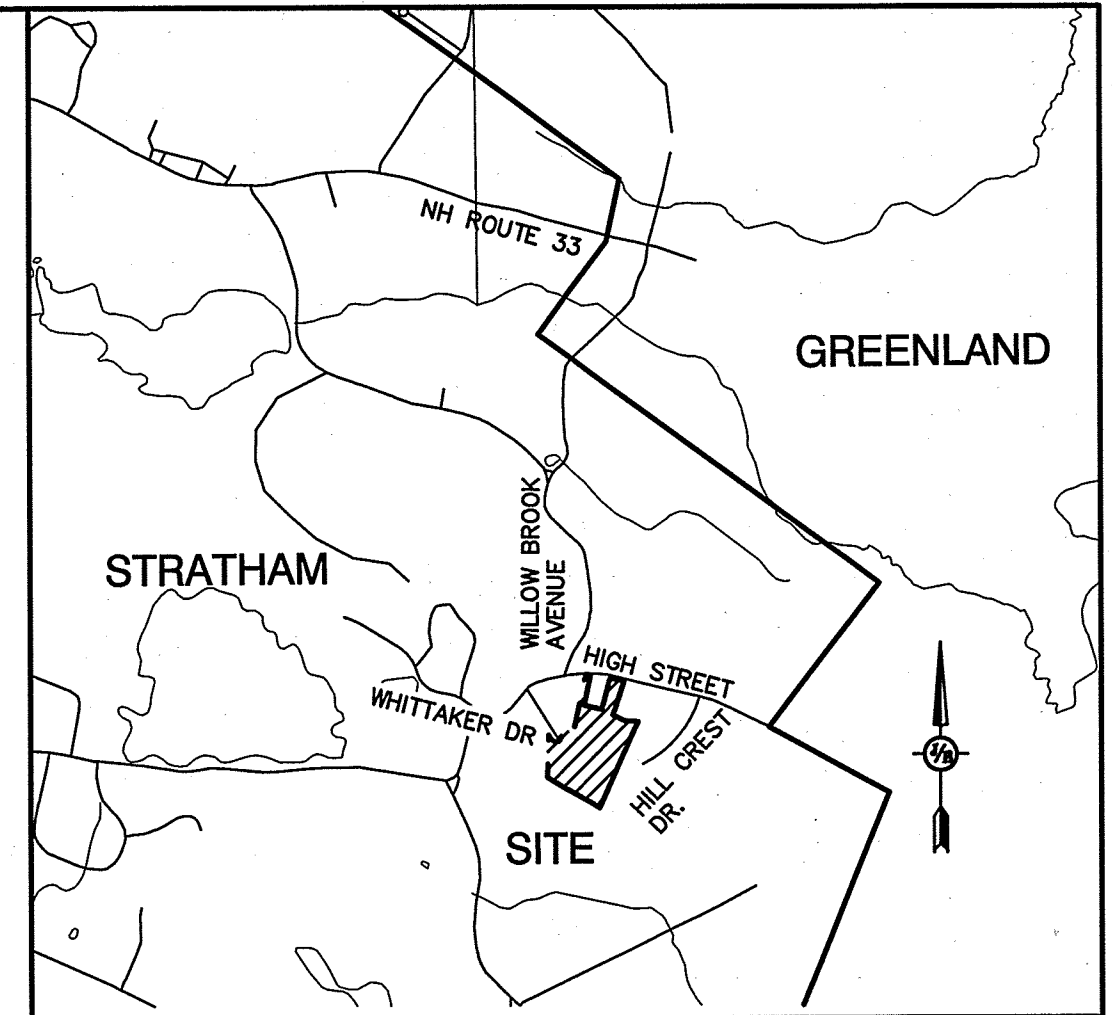
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REFERENCE PLANS:

1. MINOR SUBDIVISION OF LAND, HIGH STREET, STRATHAM, NEW HAMPSHIRE, FOR TERRA REALTY TRUST, DATED 3/1/1995, REVISED 2/29/1996, RCRD PLAN# D-24555.
2. SUBDIVISION OF LAND FOR V.E.T. DEVELOPMENT, STRATHAM, NH DATED 8/3/1987, REVISED 10/16/1987, RCRD PLAN # D-17330.
3. FINAL SUBDIVISION PLAN, HILLCREST DRIVE SUBDIVISION, STRATHAM, NH DATED 11/25/1986, REVISED 12/3/1986, RCRD PLAN # D-15868.
4. PEAR TREE, STARHAM, NEW HAMPSHIRE, SUBDIVISION PLAN DATED 6/6/1989, REVISED, 7/28/1989, RCRD PLAN # D-19852.



LOCUS SCALE: 1"=2000'

EXISTING CONDITIONS NOTES:

1. UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 1-888-DIG-SAFE (1-888-344-7233).
2. VERTICAL DATUM: NAVD 1988
3. SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0265E, DATED MAY 17, 2005.
4. THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY CHRISTOPHER ALBERT OF JONES & BEACH ENGINEERS, INC., DURING WINTER, 2016, IN ACCORDANCE WITH THE FOLLOWING GUIDANCE DOCUMENTS:
 - a. THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
 - b. THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.
 - c. THE CURRENT VERSION OF THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, AS PUBLISHED BY THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION AND/OR THE CURRENT VERSION OF THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, AS PUBLISHED BY THE USDA, NRCS, AS APPROPRIATE.
 - d. THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
5. HIGH INTENSITY SOIL MAPPING WAS PERFORMED BY LUKE HURLEY OF GOVE ENVIRONMENTAL SERVICES DURING FEBRUARY, 2017, TO THE STANDARDS OF HIGH INTENSITY SOIL MAPS FOR NEW HAMPSHIRE. STANDARDS (2002: SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND).
6. TEST PITS PERFORMED BY CHRISTOPHER ALBERT AND GIFFORD COLBURN, JONES & BEACH ENGINEERS, INC. 4/20/16, 12/14/16, 12/27/16, WITNESSED BY MICHAEL CUOMO, ROCKINGHAM COUNTY CONSERVATION DISTRICT, INSPECTOR.
7. TBM "A": LARGE SPIKE SET IN UTILITY POLE 1.0' ABOVE GROUND ELEVATION= 111.44
TBM "B": LARGE SPIKE SET IN UTILITY POLE 1.0' ABOVE GROUND ELEVATION= 120.50
TBM "C": SURVEY NAIL SET 1.0' ABOVE GROUND IN BASE OF 18" OAK ELEVATION= 85.08
TBM "D": SURVEY NAIL SET 1.0' ABOVE GROUND IN 10" CHERRY ELEVATION= 102.37
8. WETLAND BOUNDARIES AND CONSTRUCTION LIMITS ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.

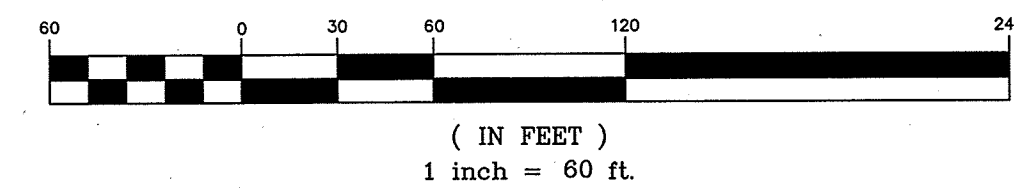
BOUNDARY CURVE TABLE			
CURVE	ARC LENGTH	RADIUS/DELTA ANGLE	CHORD BEARING/CHORD LENGTH
C1	154.36	60.00 (147°24'03")	N 78°45'26" E 115.18
C2	56.06	60.00 (53°31'52")	N 21°42'31" W 54.04

BOUNDARY LINE TABLE	
LINE BEARING	DISTANCE
L1 N 59°07'21" W	129.78
L2 N 60°57'17" W	29.77
L3 N 59°32'42" W	45.60
L4 N 62°25'46" W	62.58
L5 N 60°57'42" W	65.30
L6 N 60°37'37" W	101.91
L7 N 58°22'06" W	192.46
L8 N 01°49'26" E	436.94
L9 S 27°33'01" E	43.93
L10 S 89°28'03" E	143.54
L11 N 12°21'12" E	611.45
L12 S 82°39'41" E	50.12
L13 S 12°21'13" W	324.04
L14 S 17°46'53" E	191.08
L15 N 14°41'22" E	133.05
L16 S 77°28'18" E	150.97
L17 S 18°37'14" W	2.00
L18 S 16°37'14" W	354.78
L19 S 53°09'29" E	128.91
L20 S 86°04'20" E	143.87
L21 S 24°10'28" W	53.26
L22 S 24°03'44" W	925.79
L23 N 71°15'23" W	34.42(TIE)
L24 S 89°28'20" E	112.45
L25 N 12°31'28" E	51.19

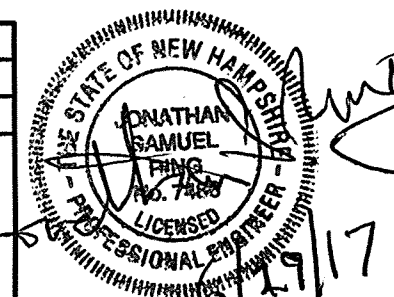
EXISTING RIM AND INVERT DATA
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(1) INV (12"RCP)=84.4±
SEPTIC COVER = 59.68
SMH #1 RIM = 91.35
DNH #1 RIM = 91.35
(1) INV (12"RCP)=88.36
(2) INV (12"RCP)=83.53
(3) INV (15"RCP)=83.53
("A") INV (15"OMP)=86.32
("B") INV (12"HOPE)=84.09
("C") INV (12"HOPE)=78.76
("D") INV (12"HOPE)=78.65
("E") INV (15"RCP#FES)=80.01
("F") INV (12"PVC)=74.68±
("G") INV (4" PVC)=99.24

SOIL LEGEND	
HSS	SSM
311	313 DEERFIELD HSG B
343	38 ELDRIDGE HSG C
443	843 ELDRIDGE VARIANT HSG C
523	656 RIDGEBURY HSG C

GRAPHIC SCALE



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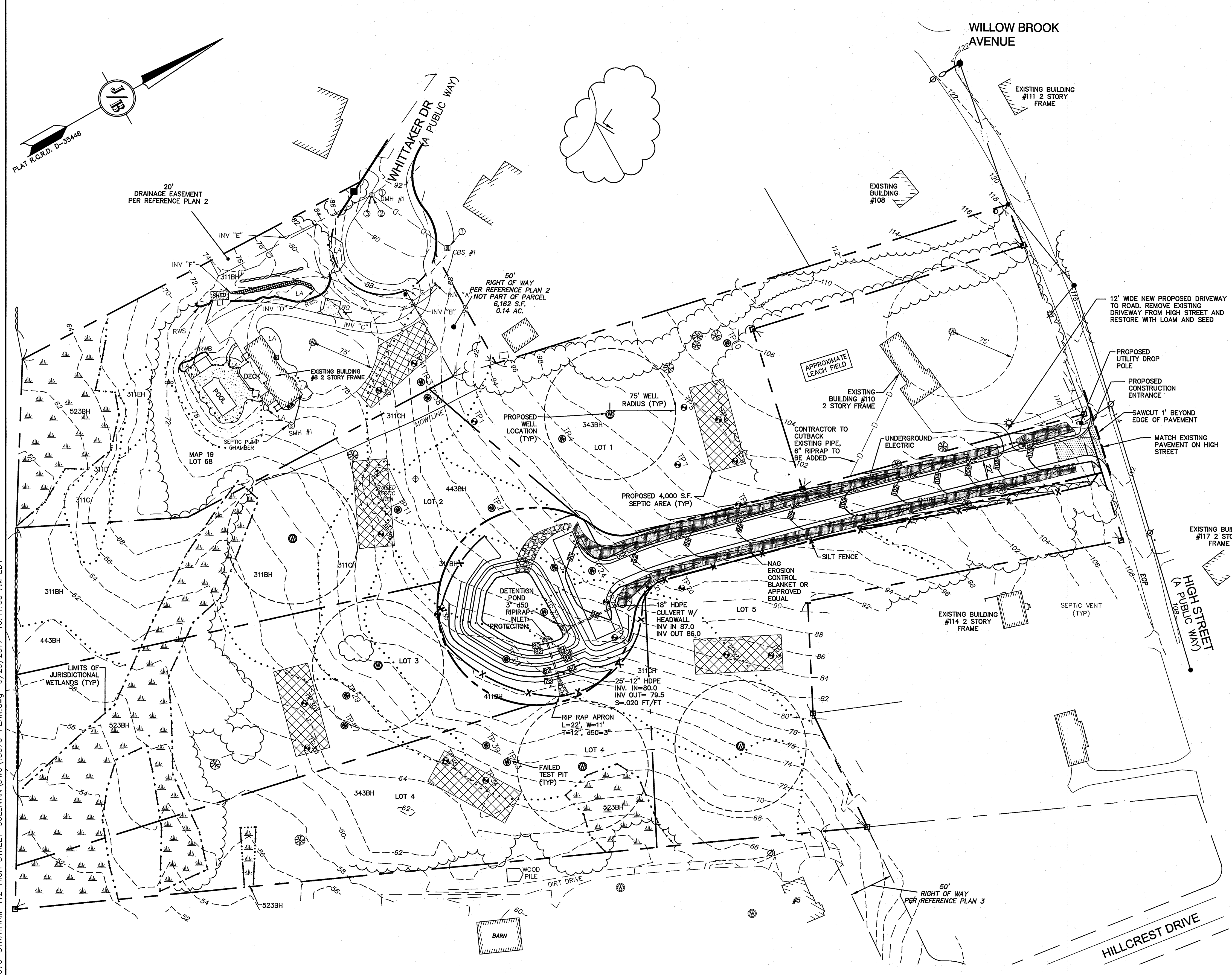
J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave.
PO Box 219
Stratham, NH 03885

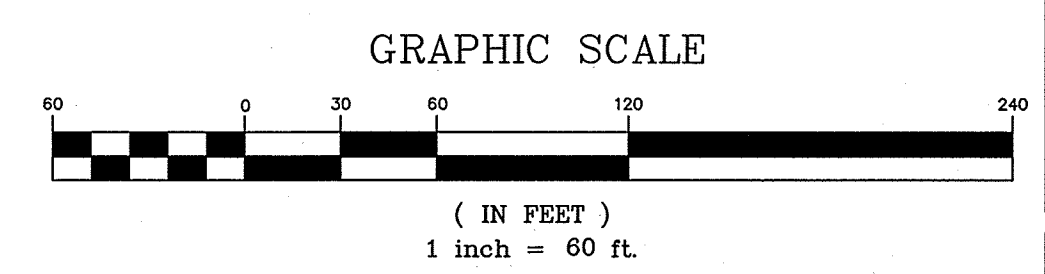
Designed and Produced in NH
Civil Engineering Services
603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EXISTING CONDITIONS PLAN
Project:	112 HIGH STREET STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	C1
SHEET 3 OF 8	JBE PROJECT NO. 13070.1

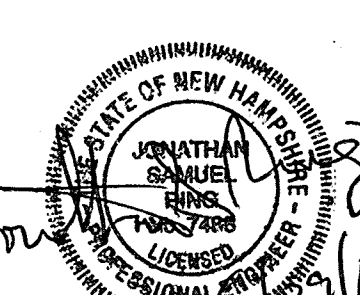


- GRADING AND DRAINAGE NOTES:**
- UNDERGROUND FACILITIES, UTILITIES AND STRUCTURES HAVE BEEN PLOTTED FROM FIELD OBSERVATION AND THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. NEITHER JONES & BEACH ENGINEERS, INC., NOR ANY OF THEIR EMPLOYEES TAKE RESPONSIBILITY FOR THE LOCATION OF ANY UNDERGROUND STRUCTURES AND/OR UTILITIES NOT SHOWN THAT MAY EXIST. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL UNDERGROUND STRUCTURES AND/OR UTILITIES LOCATED PRIOR TO EXCAVATION WORK BY CALLING 888-DIG-SAFE (888-344-7233).
 - ALL BENCHMARKS AND TOPOGRAPHY SHOULD BE FIELD VERIFIED BY THE CONTRACTOR.
 - SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED. SEE CONSTRUCTION SEQUENCE ON SHEET E1.
 - PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR IS REQUIRED TO HAVE THE PROJECT'S LAND SURVEYOR STAKE OR FLAG CLEARING LIMITS. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
 - ALL SWALES AND ANY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER), UNLESS OTHERWISE SPECIFIED.
 - ALL DRAINAGE STRUCTURES AND STORM SEWER PIPES SHALL MEET HEAVY DUTY TRAFFIC H20 LOADING AND SHALL BE INSTALLED ACCORDINGLY.
 - IN AREAS WHERE CONSTRUCTION IS PROPOSED ADJACENT TO ABUTTING PROPERTIES, THE CONTRACTOR SHALL INSTALL ORANGE CONSTRUCTION FENCING ALONG PROPERTY LINES IN ALL AREAS WHERE SILT FENCING IS NOT REQUIRED.
 - ALL DRAINAGE PIPE SHALL BE NON-PERFORATED ADS N-12 OR APPROVED EQUAL.
 - LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY ALL GOVERNING AUTHORITIES. THE GENERAL CONTRACTOR SHALL STRICTLY ADHERE TO THE EPA SWPPP DURING CONSTRUCTION OPERATIONS.
 - NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
 - ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 3 DAYS OF FINAL GRADING.
 - SHOULD CONSTRUCTION STOP FOR LONGER THAN 3 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
 - MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN EVENT OF 0.25" OR GREATER IN A 24 HOUR PERIOD AND AT LEAST ONCE A WEEK.
 - THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE, AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
 - CONSTRUCTION VEHICLES SHALL UTILIZE THE STABILIZED CONSTRUCTION ENTRANCE TO THE EXTENT POSSIBLE THROUGHOUT CONSTRUCTION.
 - IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
 - THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
 - SEDIMENT SHALL BE REMOVED FROM ALL SEDIMENT BASINS BEFORE THEY ARE 25% FULL.
 - ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH PROJECT SPECIFICATIONS.
 - ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED, IF DEEMED NECESSARY BY ON-SITE INSPECTION BY ENGINEER AND/OR REGULATORY OFFICIALS.
 - SEE ALSO EROSION AND SEDIMENT CONTROL SPECIFICATIONS ON SHEET E1.



PROJECT PARCEL TOWN OF STRATHAM, NH MAP 19, LOT 68
APPLICANT/OWNER ROBIN SULLIVAN 8 WHITTAKER DRIVE STRATHAM, NH 03885
TOTAL LOT AREA 14.99 ACRES

Design: JSR Draft: PLB Date: 6/26/13
Checked: JSR Scale: AS NOTED Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg
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Designed and Produced in NH

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85 Portsmouth Ave. PO Box 219 Stratham, NH 03885

Civil Engineering Services

603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

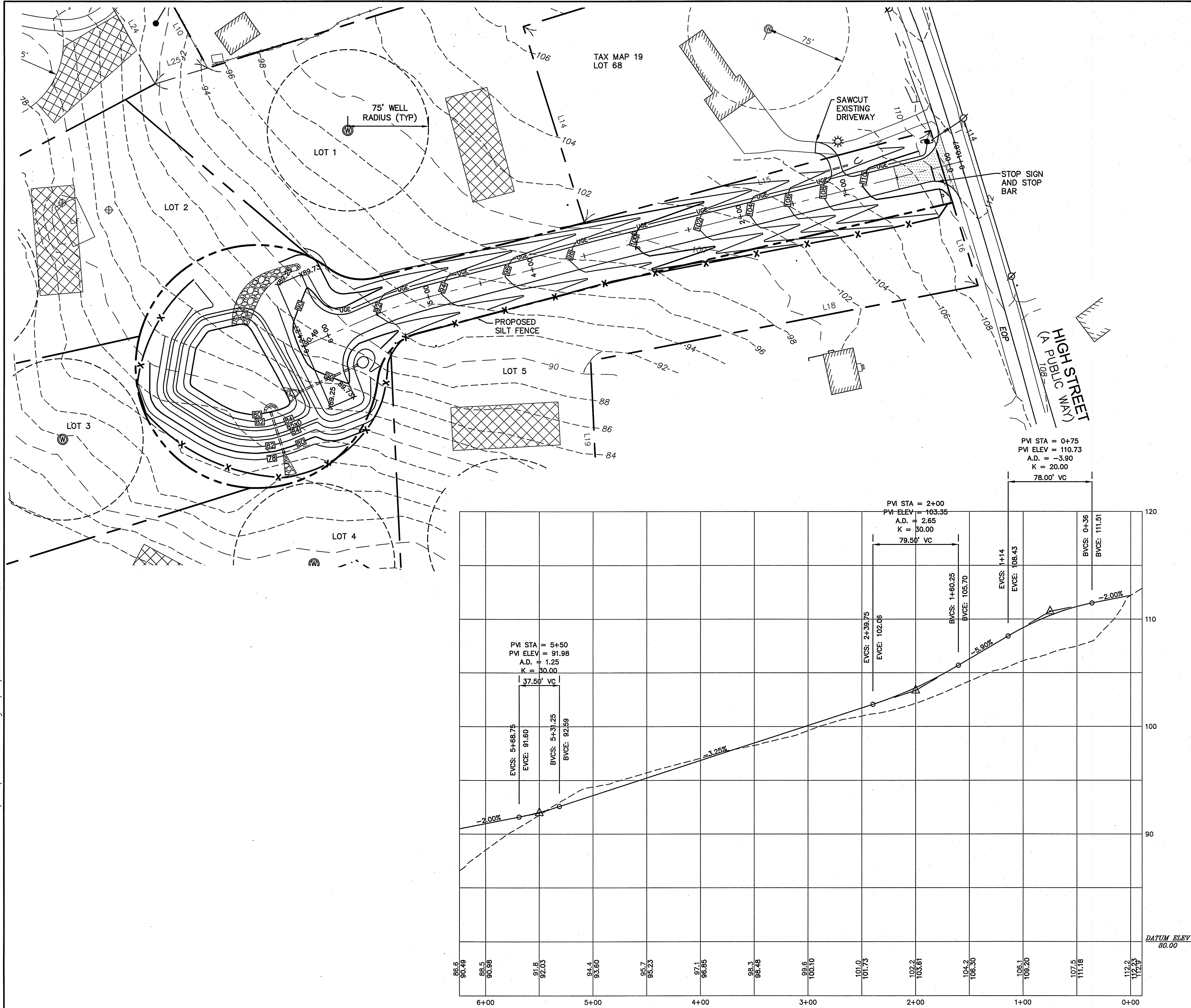
Plan Name:	GRADING AND DRAINAGE PLAN
Project:	112 HIGH STREET STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.

C2

SHEET 4 OF 8
JBE PROJECT NO. 13070.1

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NOTES:

- THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN ON SITE AND BE MADE ACCESSIBLE TO THE PUBLIC. THE CONSTRUCTION SITE OPERATOR SHALL SUBMIT A NOTICE OF INTENT (NOI) TO THE EPA REGIONAL OFFICE SEVEN DAYS PRIOR TO COMMENCEMENT OF ANY WORK ON SITE. EPA WILL POST THE NOI AT [HTTP://CFPUB1.EPA.GOV/NPDES/STORMWATER/NOI/NOISEARCH.CFM](http://cfpub1.epa.gov/npdes/stormwater/noi/noisearch.cfm). AUTHORIZATION IS GRANTED UNDER THE PERMIT ONCE THE NOI IS SHOWN IN "ACTIVE" STATUS ON THIS WEBSITE. A COMPLETED NOTICE OF TERMINATION SHALL BE SUBMITTED TO THE NPDES PERMITTING AUTHORITY WITHIN 30 DAYS AFTER EITHER OF THE FOLLOWING CONDITIONS HAVE BEEN MET:
 - FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
 - ANOTHER OPERATOR/PERMITTEE HAS ASSUMED CONTROL OVER ALL AREAS OF THE SITE THAT HAVE NOT BEEN FINALLY STABILIZED. PROVIDE DPW WITH A COPY OF THE NOTICE OF TERMINATION (NOT).
- ALL ROAD AND DRAINAGE WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR THE TOWN, AND NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
- AS-BUILT PLANS TO BE SUBMITTED TO THE TOWN PRIOR TO ACCEPTANCE OF THE ROADWAY.
- DEVELOPER IS RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING ANY PERMITTING AND SETBACK REQUIREMENTS REQUIRED UNDER THESE REGULATIONS.
- CONTRACTOR TO COORDINATE AND COMPLETE ALL WORK REQUIRED FOR THE RELOCATION AND/OR INSTALLATION OF ELECTRIC, CATV AND TELEPHONE PER UTILITY DESIGN AND STANDARDS. LOCATIONS SHOWN ARE APPROXIMATE. LOW PROFILE STRUCTURES SHALL BE USED TO THE GREATEST EXTENT POSSIBLE.
- THIS PLAN HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC. FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA FROM AN EXISTING MUNICIPAL RECORD. THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA SHOWN ON THE DESIGN PLANS. THIS INCLUDES ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS OF THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
- SILTATION AND EROSION CONTROLS SHALL BE INSTALLED PRIOR TO CONSTRUCTION, SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN UNTIL SITE HAS BEEN STABILIZED WITH PERMANENT VEGETATION. SEE DETAIL SHEET E1 FOR ADDITIONAL NOTES ON EROSION CONTROL.
- ALL DISTURBED AREAS NOT STABILIZED BY NOVEMBER 1st SHALL BE COVERED WITH AN EROSION CONTROL BLANKET. PRODUCT TO BE SPECIFIED BY THE ENGINEER.
- FINAL DRAINAGE, GRADING AND EROSION PROTECTION MEASURES SHALL CONFORM TO REGULATIONS OF THE PUBLIC WORKS DEPARTMENT.
- CONTRACTOR TO VERIFY EXISTING UTILITIES AND TO NOTIFY ENGINEER OF ANY DISCREPANCY IMMEDIATELY.
- 6" PERFORATED ADS UNDER DRAIN PLACEMENT TO BE DETERMINED BY THE ENGINEER DURING TIME OF SUBGRADE INSPECTION. CONTRACTOR TO ADJUST LOCATION IN THE FIELD ONLY WITH PRIOR APPROVAL OF PROJECT ENGINEER OR PUBLIC WORKS DEPARTMENT. CONTRACTOR TO INCLUDE 1200 LF IN BID PRICE.
- ALL DRIVEWAYS TO BE CONSTRUCTED MAXIMUM 10% SLOPE. SEE DETAIL SHEET. ALL DRIVEWAYS TO HAVE CULVERTS UNLESS APPROVED BY THE TOWN ROAD AGENT.
- DRAINAGE INSPECTION AND MAINTENANCE SCHEDULE: SILT FENCING WILL BE INSPECTED DURING AND AFTER STORM EVENTS TO ENSURE THAT THE FENCE STILL HAS INTEGRITY AND IS NOT ALLOWING SEDIMENT TO PASS. SEDIMENT BUILD UP IN SWALES WILL BE REMOVED IF IT IS DEEPER THAN SIX INCHES, AND IS TO BE REMOVED FROM SUMPS BELOW THE INLET OF CULVERTS SEMIANNUALLY, AS WELL AS FROM CATCH BASINS. FOLLOWING MAJOR STORM EVENTS, THE STAGE DISCHARGE OUTLET STRUCTURES ARE TO BE INSPECTED AND ANY DEBRIS REMOVED FROM THE ORIFICE, TRASH TRACK AND EMERGENCY SPILL-WAY. INFREQUENTLY, SEDIMENT MAY ALSO HAVE TO BE REMOVED FROM THE SUMP OF THE STRUCTURE.
- ALL DRAINAGE INFRASTRUCTURE SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING ANY RUNOFF TO IT.
- DETENTION PONDS REQUIRE TIMELY MAINTENANCE AND SHOULD BE INSPECTED AFTER EVERY MAJOR STORM EVENT, AS WELL AS FREQUENTLY DURING THE FIRST YEAR OF OPERATION, AND ANNUALLY THEREAFTER. EVERY FIVE YEARS, THE SERVICES OF A PROFESSIONAL ENGINEER SHOULD BE RETAINED TO PERFORM A THOROUGH INSPECTION OF THE DETENTION POND AND ITS INFRASTRUCTURE. ANY DEBRIS AND SEDIMENT ACCUMULATIONS SHOULD BE REMOVED FROM THE OUTLET STRUCTURE(S) AND EMERGENCY SPILLWAY(S) AND DISPOSED OF PROPERLY. DETENTION POND BERMS SHOULD BE MOWED AT LEAST ONCE ANNUALLY SO AS TO PREVENT THE ESTABLISHMENT OF WOODY VEGETATION. TREES SHOULD NEVER BE ALLOWED TO GROW ON A DETENTION POND BERM, AS THEY MAY DESTABILIZE THE STRUCTURE AND INCREASE THE POTENTIAL FOR FAILURE. AREAS SHOWING SIGNS OF EROSION OR THIN OR DYING VEGETATION SHOULD BE REPAIRED IMMEDIATELY BY WHATEVER MEANS NECESSARY, WITH THE EXCEPTION OF FERTILIZER. RODENT BORROWS SHOULD BE REPAIRED IMMEDIATELY AND THE ANIMALS SHOULD BE TRAPPED AND RELOCATED IF THE PROBLEM PERSISTS.
- THE DETENTION PONDS ARE TO BE CONSTRUCTED PRIMARILY THROUGH EXCAVATION. IN THOSE AREAS WHERE THE BERMS MUST BE CONSTRUCTED BY THE PLACEMENT OF FILL, THE ENTIRE EMBANKMENT AREA OF THE DETENTION PONDS SHALL BE EXCAVATED TO PROPOSED GRADE, STRIPPED OF ALL ORGANIC MATERIALS, COMPACTED TO AT LEAST 95% AND SCARIFIED PRIOR TO THE PLACEMENT OF THE EMBANKMENT MATERIAL. IN THE EVENT THE FOUNDATION MATERIAL EXPOSED DOES NOT ALLOW THE SPECIFIED COMPACTION, AN ADDITIONAL ONE FOOT (1') OF EXCAVATION AND THE PLACEMENT OF A ONE FOOT (1') THICK, TWELVE FOOT (12') WIDE PAD OF THE MATERIAL DESCRIBED IN THE NOTE BELOW, COMPACTED TO 95% OF ASTM D-1557 MAY BE NECESSARY. PLACEMENT AND COMPACTION SHOULD OCCUR AT A MOISTURE CONTENT OF OPTIMUM PLUS OR MINUS 3%, AND NO FROZEN OR ORGANIC MATERIAL SHOULD BE PLACED WITHIN FOR ANY REASON.
- EMBANKMENT MATERIAL FOR THE BERMS SHALL BE CLEAN MINERAL SOIL WITH A CLAY COMPONENT FREE OF ROOTS, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES, AND SHALL CONTAIN NO ROCKS OR LUMPS OVER FOUR INCHES (4") IN DIAMETER. THIS MATERIAL SHOULD BE INSTALLED IN 6" LIFTS AND COMPACTED TO 95% OS ASTM D-1557, AND SHOULD MEET THE FOLLOWING SPECIFICATIONS: 4" PASSING 100%, #4 SIEVE 25-70%, #200 SIEVE 10-28% (IN TOTAL SAMPLE).
- EMBANKMENT IS TO HAVE 3:1 SIDE SLOPES (MAX.) AND IS TO BE BROUGHT TO SPECIFIED GRADES PRIOR TO THE ADDITION OF LOAM (4" MINIMUM) SO AS TO ALLOW FOR THE COMPACTION OF THE STRUCTURE OVER TIME WHILE MAINTAINING THE PROPER BERM ELEVATION.
- COMPACTION TESTING SERVICES (I.E. NUCLEAR DENSITY TESTS) ARE TO BE PERFORMED BY AN INDEPENDENT GEOTECHNICAL ENGINEER RETAINED BY THE CONTRACTOR FOR ROADWAY CONSTRUCTION, AND ON THE FOUNDATION OF THE BERM AND ON EVERY LIFT OF NEWLY PLACED MATERIAL.
- NO IRRIGATION PIPES OR SPRINKLER HEADS SHALL BE LOCATED WITHIN TOWN RIGHT OF WAY.

GRAPHIC SCALE

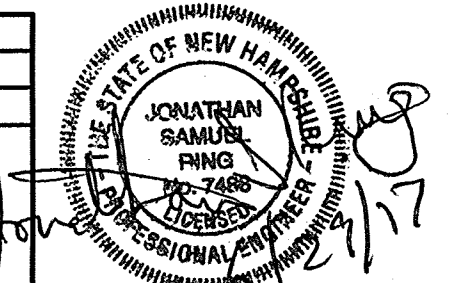
(IN FEET)

1 inch = 50 ft Horiz.

1 inch = 5 ft Vert.

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Checked: JSR Scale: AS NOTED Project No.: 13070.1
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85 Portsmouth Ave. Civil Engineering Services 603-772-4746
PO Box 219 Stratham, NH 03885 FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **PLAN AND PROFILE**

Project: **112 HIGH STREET
STRATHAM, NH 03885**

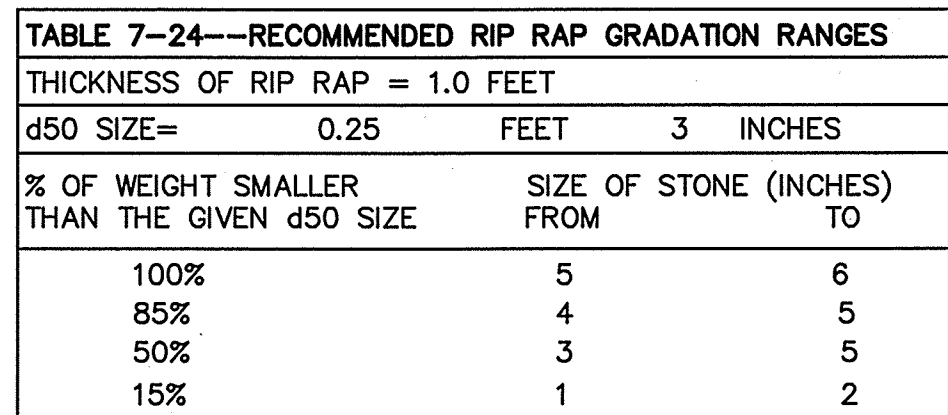
Owner of Record: **ROBIN SULLIVAN
8 WHITTAKER DRIVE, STRATHAM, NH 03885**

DRAWING No. **P1**

SHEET 5 OF 8
JBE PROJECT NO. 13070.1

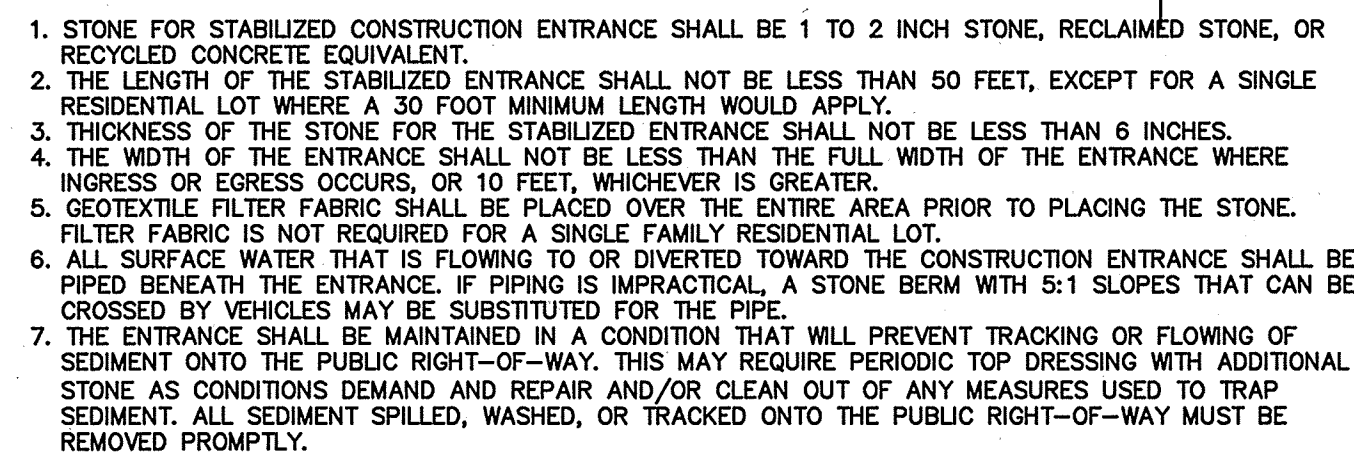


NOT TO SCALE



1. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIP RAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE RIP RAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIP. 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.
4. 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.
5. OUTLETS TO A DEFINED CHANNEL SHALL HAVE 2:1 OR FLATTER SIDE SLOPES AND SHOULD BEGIN AT THE TOP OF THE CULVERT AND TAPER DOWN TO THE CHANNEL BOTTOM THROUGH THE LENGTH OF THE APRON.
6. **MAINTENANCE:** THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. 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 OBSTACLES SUCH AS FALLEN TREES, DEBRIS, AND SEDIMENT THAT COULD CHANGE FLOW PATTERNS AND/OR TAILWATER DEPTHS ON THE PIPES. REPAIRS MUST BE CARRIED OUT IMMEDIATELY TO AVOID ADDITIONAL DAMAGE TO OUTLET PROTECTION.

NOT TO SCALE



NOT TO SCALE

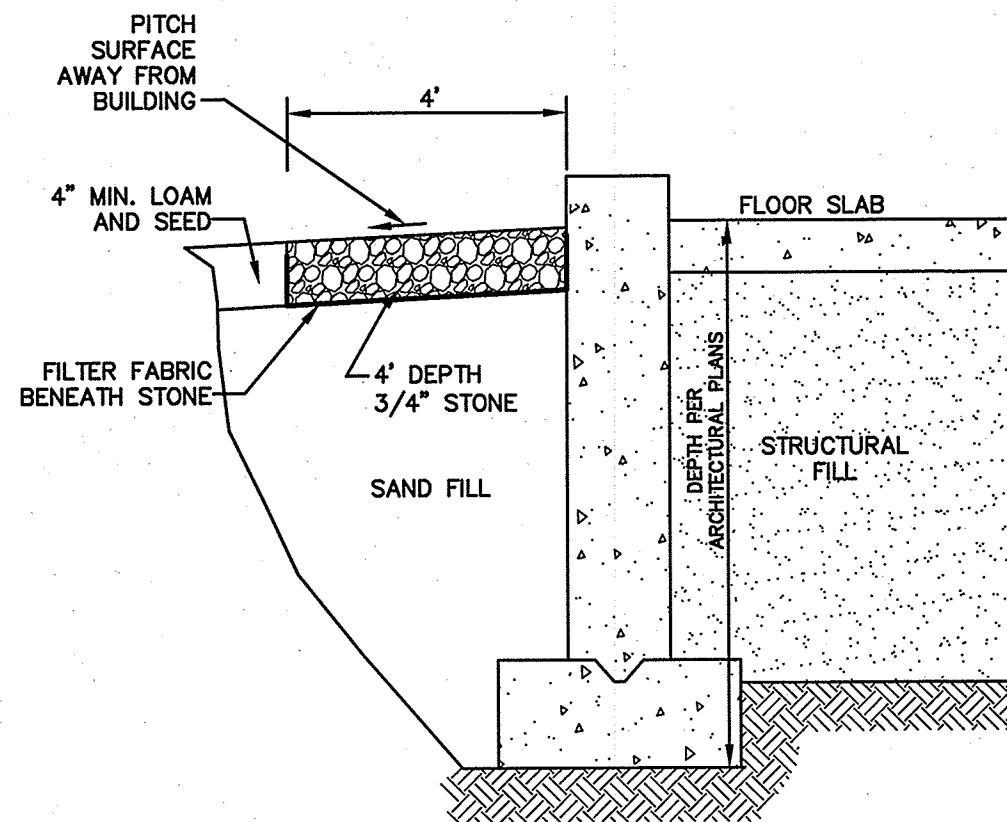


1. REMOVE ALL ORGANICS, TOPSOIL AND MATERIAL YIELDING TO A 10 TON ROLLER. SUBBASE AREAS THAT CONTAIN UNSUITABLE MATERIALS MUST BE EXCAVATED TO A DEPTH NO LESS THAN 36" BELOW FINISH GRADE AND BE REPLACED WITH GRAVEL COMPACTED TO 95%.
2. ALL MATERIALS TO BE AS SPECIFIED PER TOWN STANDARDS AND NHDOT, WHICHEVER IS MOST STRINGENT. GRADATION AND COMPACTION TEST RESULTS (95% MIN.) SHALL BE SUBMITTED FOR REVIEW AND APPROVAL.
3. TOWN MAY REQUIRE UNDERDRAIN, ADDITIONAL GRAVEL AND/OR ADDITIONAL DRAINAGE IF SOIL CONDITIONS WARRANT.
4. WOVEN GEOTEXTILE FABRIC SHALL BE PLACED ABOVE SUBGRADE AT ALL WETLAND CROSSINGS.

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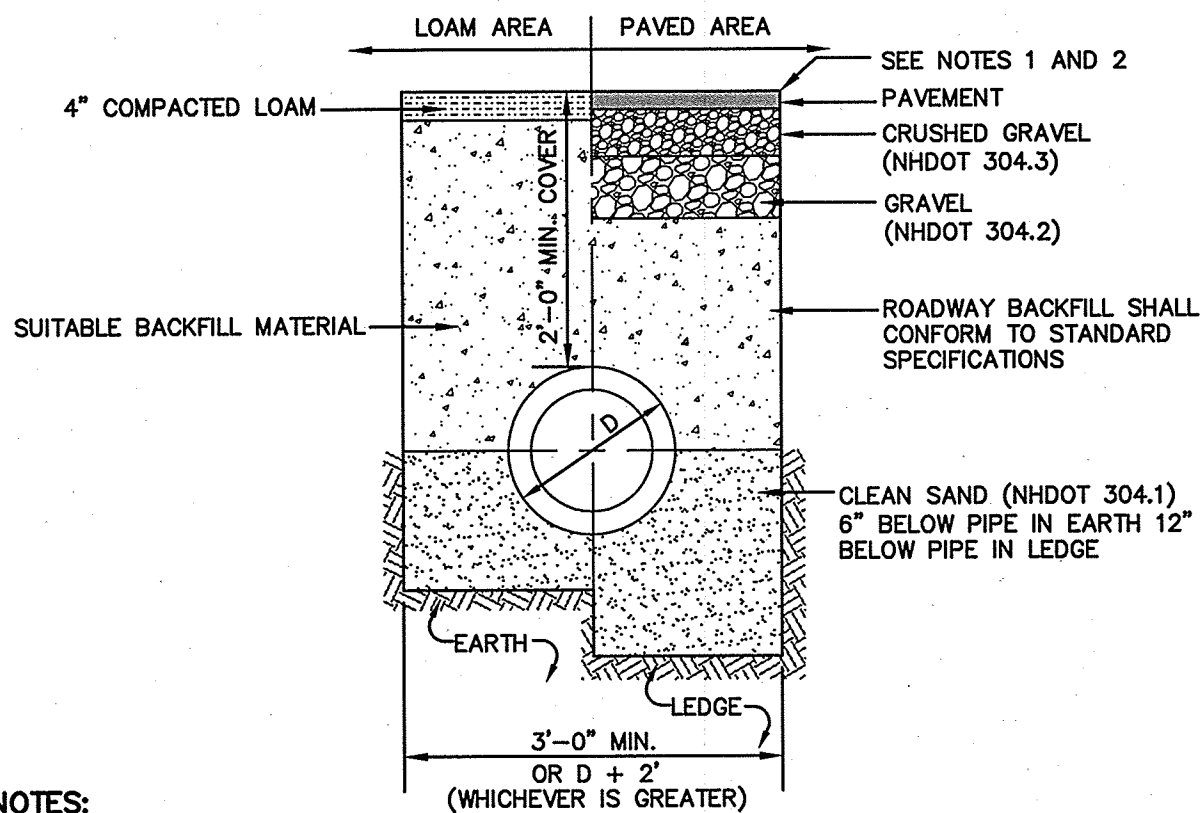


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DRIP EDGE DETAIL

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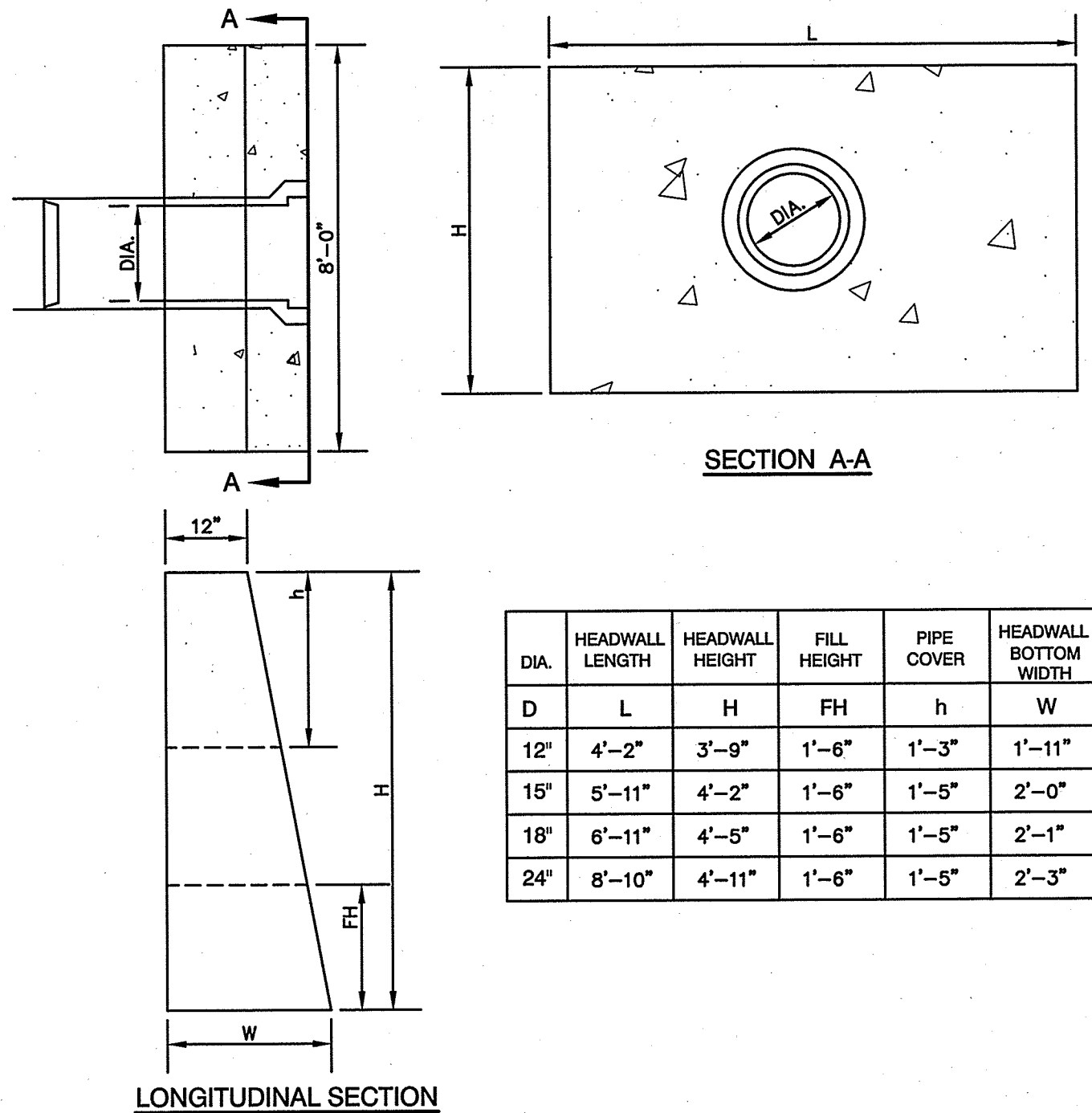


NOTES:

1. PAVEMENT REPAIR IN EXISTING ROADWAYS SHALL CONFORM TO STREET OPENING REGULATIONS.
2. NEW ROADWAY CONSTRUCTION SHALL CONFORM WITH PROJECT AND TOWN SPECIFICATIONS.
3. ALL MATERIALS ARE TO BE COMPACTED TO 95% OF ASTM D-1557.

DRAINAGE TRENCH

NOT TO SCALE

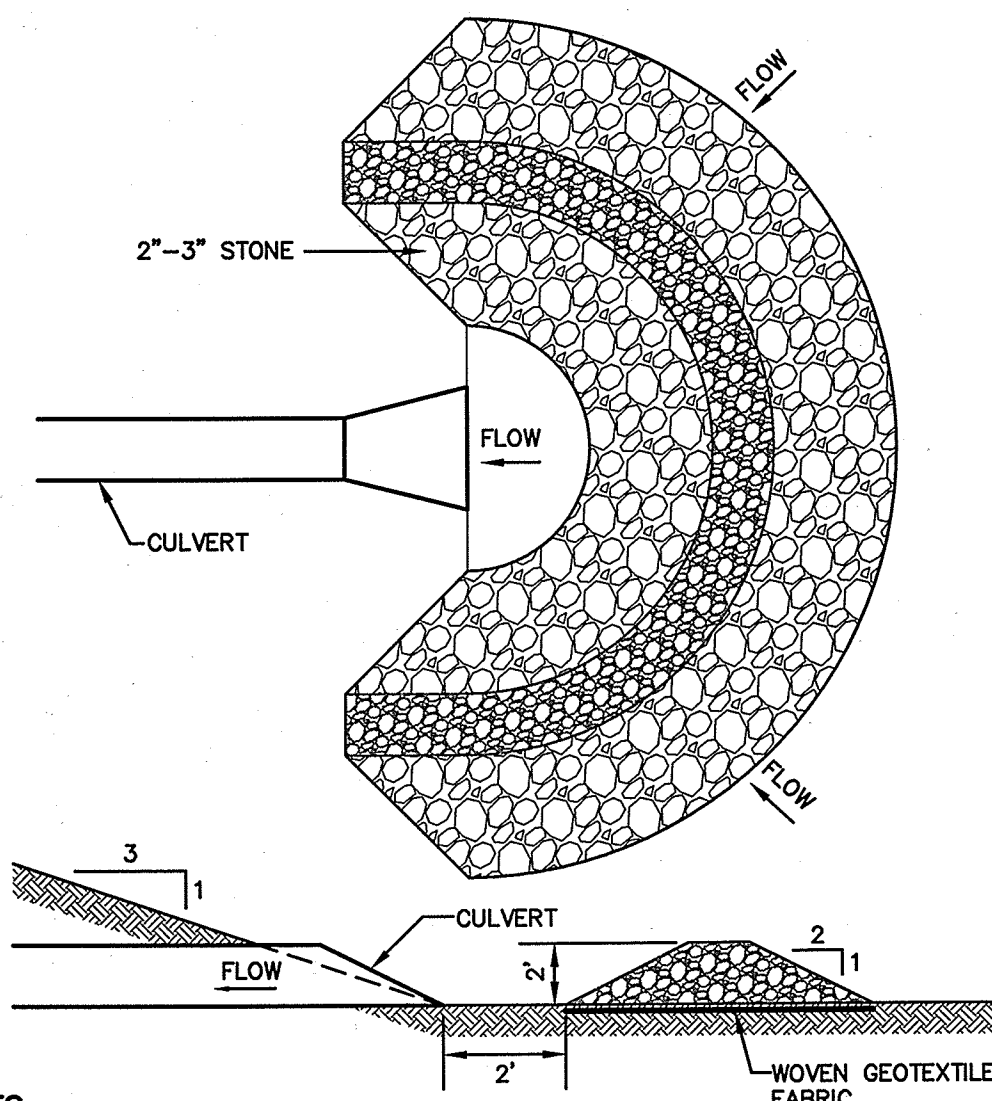


NOTES:

1. ALL DIMENSIONS GIVEN IN FEET & INCHES.
2. PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
3. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS, CEMENT TO BE TYPE III PER ASTM C-150, REINFORCING TO MEET OR EXCEED ASTM A-615 GRADE 60 DEFORMED BARS.
4. 1" THREADED INSERTS PROVIDED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

NOT TO SCALE

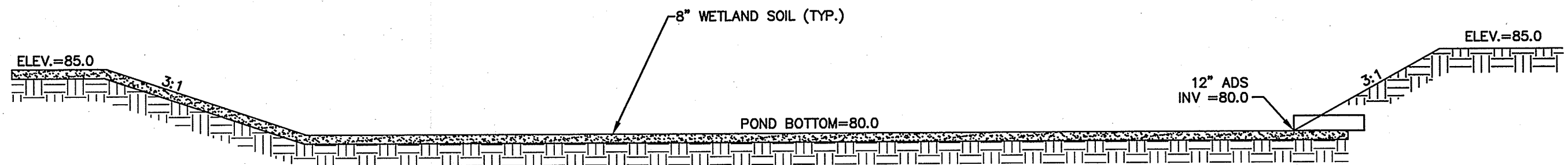


NOTES:

1. TEMPORARY CULVERT INLET PROTECTION CHECK DAMS SHALL BE CONSTRUCTED OF 2-3" STONE OVER WOVEN GEOTEXTILE FABRIC.
2. INLET PROTECTION MEASURES SHALL BE INSTALLED AT THE OPENINGS OF ALL EXISTING AND PROPOSED CULVERTS LOCATED BELOW (DOWNSTREAM) FROM AND WITHIN 100' OF THE PROJECT SITE.
3. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURE WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
4. STRUCTURES SHALL BE REMOVED WHEN THE SITE IS STABILIZED WITH VEGETATION AND THE CHANNEL SHALL BE SMOOTHED AND REVEGETATED.

TEMPORARY CULVERT INLET PROTECTION CHECK DAM

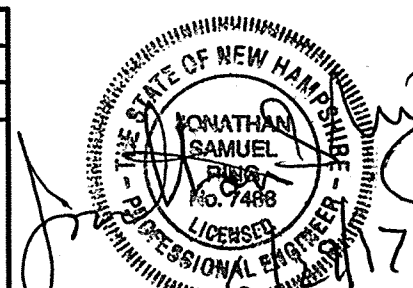
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POCKET DETENTION POND SYSTEM SECTION

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Drawing Name: 13070-PLAN.dwg		
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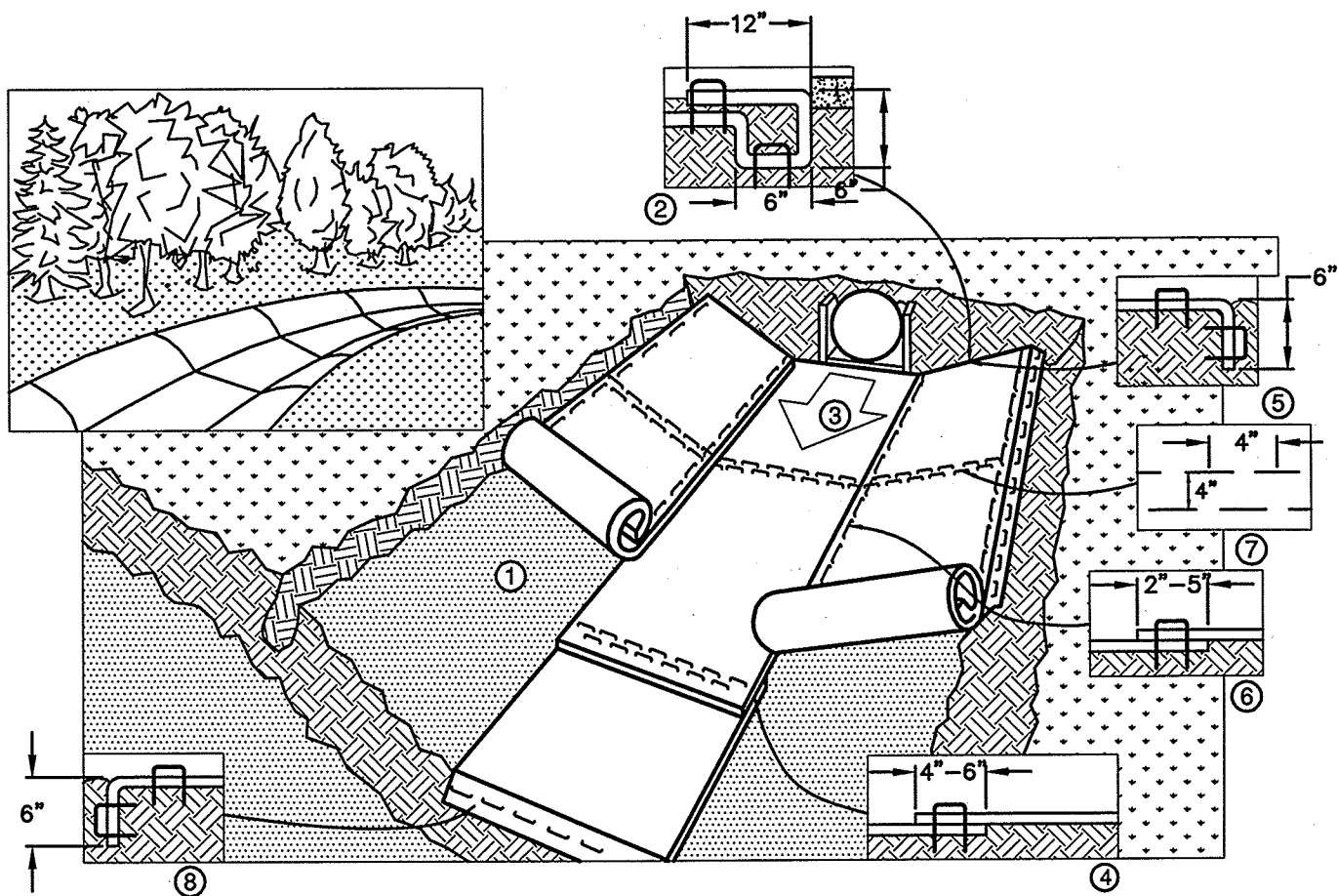
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Civil Engineering Services

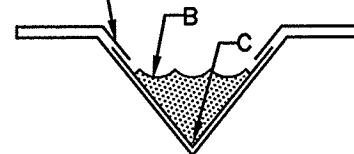
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	DETAIL SHEET
Project:	112 HIGH STREET STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	D2
SHEET 7 OF 8	JBE PROJECT NO. 13070.1

**NOTES:**

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO INSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

CRITICAL POINTS:

- A. OVERLAPS AND SEAMS
- B. PROJECTED WATER LINE
- C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

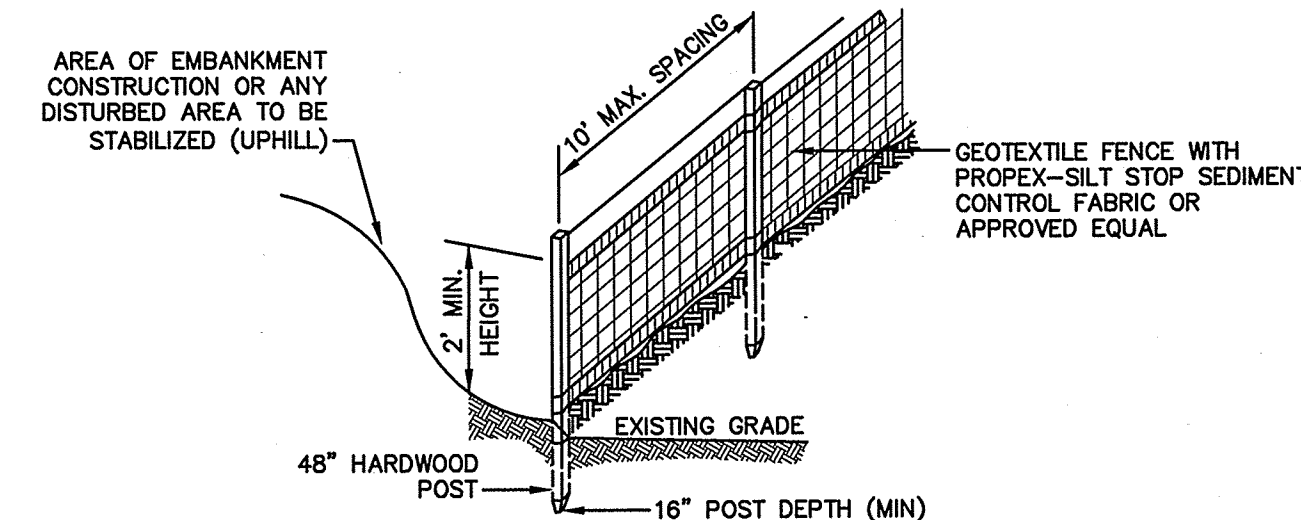
NOTES:

* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

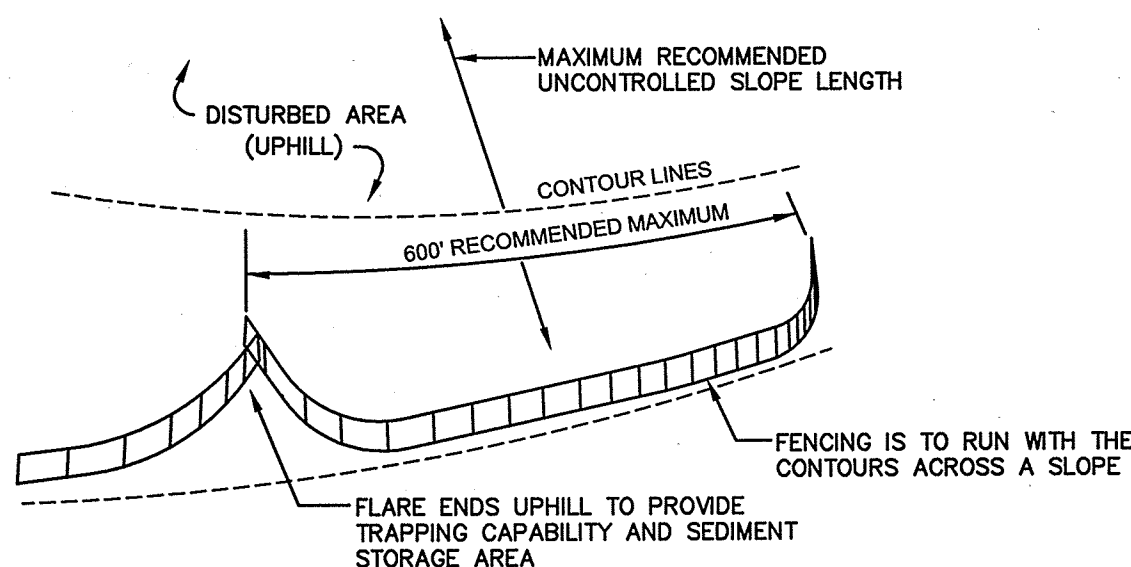
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET SWALE INSTALLATION

NORTH AMERICAN GREEN (800) 772-2040

NOT TO SCALE**CONSTRUCTION SPECIFICATIONS:**

1. WOVEN FABRIC FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. FILTER CLOTH SHALL BE FASTENED TO WOVEN WIRE EVERY 24" AT TOP, MID AND BOTTOM AND EMBEDDED IN THE GROUND A MINIMUM OF 8" AND THEN COVERED WITH SOIL.
2. THE FENCE POSTS SHALL BE A MINIMUM OF 48" LONG, SPACED A MAXIMUM 10' APART, AND DRIVEN A MINIMUM OF 16" INTO THE GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THE ENDS OF THE FABRIC SHALL BE OVERLAPPED 6", FOLDED AND STAPLED TO PREVENT SEDIMENT FROM BY-PASSING.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SEDIMENT REMOVED AND PROPERLY DISPOSED OF WHEN IT IS 6" DEEP OR VISIBLE 'BULGES' DEVELOP IN THE SILT FENCE.
5. PLACE THE ENDS OF THE SILT FENCE UP CONTOUR TO PROVIDE FOR SEDIMENT STORAGE.

SILT FENCE**NOT TO SCALE**

6. SILT FENCES SHALL BE REMOVED WHEN NO LONGER NEEDED AND THE SEDIMENT COLLECTED SHALL BE DISPOSED AS DIRECTED BY THE ENGINEER. THE AREA DISTURBED BY THE REMOVAL SHALL BE SMOOTHED AND REVEGETATED.

MAINTENANCE:

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

SEEDING SPECIFICATIONS**1. GRADING AND SHAPING**

- A. SLOPES SHALL NOT BE STEEPER THAN 2:1 WITHOUT APPROPRIATE EROSION CONTROL MEASURES AS SPECIFIED ON THE PLANS (3:1 SLOPES OR FLATTER ARE PREFERRED).
- B. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.

2. SEEDBED PREPARATION

- A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
- B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND FERTILIZER AND LIME MIXED INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

3. ESTABLISHING A STAND

- A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. TYPES AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ.FT.
NITROGEN(N), 50 LBS. PER ACRE OR 1.1 LBS. PER 1,000 SQ.FT.
PHOSPHATE(P2O5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
POTASH(K2O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ.FT.
(NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10.)
- B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.
- C. REFER TO THE 'SEEDING GUIDE' AND 'SEEDING RATES' TABLES ON THIS SHEET FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT, TREFOIL AND FLATPEA) MUST BE INOCULATED WITH THEIR SPECIFIC INOCULANT PRIOR TO THEIR INTRODUCTION TO THE SITE.
- D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20th OR FROM AUGUST 10th TO SEPTEMBER 1st.

4. MULCH

- A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
- B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING. HAY OR STRAW MULCH SHALL BE PLACED AT A RATE OF 90 LBS PER 1000 S.F.

5. MAINTENANCE TO ESTABLISH A STAND

- A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
- B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME FULLY ESTABLISHED.
- C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, ANNUAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

USE	SEEDING MIXTURE 1/	DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	POOR	GOOD	EXCELLENT	GOOD
	D	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR
	C	GOOD	EXCELLENT	EXCELLENT	FAIR
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT	2/
	F	FAIR	EXCELLENT	EXCELLENT	2/
GRAVEL PIT, SEE NH-PM-24 IN APPENDIX FOR RECOMMENDATION REGARDING RECLAMATION OF SAND AND GRAVEL PITS.					
1/ REFER TO SEEDING MIXTURES AND RATES IN TABLE BELOW.					
2/ POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREA AND ATHLETIC FIELDS.					

NOTE: TEMPORARY SEED MIX FOR STABILIZATION OF TURF SHALL BE WINTER RYE OR OATS AT A RATE OF 2.5 LBS. PER 1000 S.F. AND SHALL BE PLACED PRIOR TO OCTOBER 15th, IF PERMANENT SEEDING NOT YET COMPLETE.

SEEDING GUIDE

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 Sq. Ft.
A. TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95
B. TALL FESCUE	15	0.35
CREeping RED FESCUE	15	0.25
CROWN VETCH	10	0.35
OR		
FLAT PEA	30	0.75
TOTAL	40 OR 55	0.95 OR 1.35
C. TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
BIRDS FOOT TREFOIL	8	0.20
TOTAL	48	1.10
D. TALL FESCUE	20	0.45
FLAT PEA	30	0.75
TOTAL	50	1.20
E. CREeping RED FESCUE 1/	50	1.15
KENTUCKY BLUEGRASS 1/	50	1.15
TOTAL	100	2.30
F. TALL FESCUE 1	150	3.60

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

SEEDING RATES**TEMPORARY EROSION CONTROL NOTES**

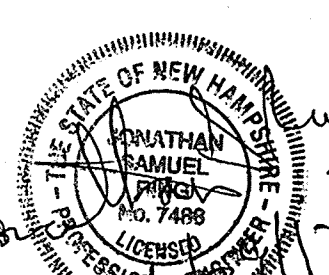
1. THE SMALLEST PRACTICAL AREA OF LAND SHALL BE EXPOSED AT ANY ONE TIME. AT NO TIME SHALL AN AREA IN EXCESS OF 5 ACRES BE EXPOSED AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. EROSION, SEDIMENT AND DETENTION MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AT LOCATIONS AS REQUIRED, DIRECTED BY THE ENGINEER.
3. ALL DISTURBED AREAS (INCLUDING POND AREAS BELOW THE PROPOSED WATERLINE) SHALL BE RETURNED TO PROPOSED GRADES AND ELEVATIONS. DISTURBED AREAS SHALL BE LOAMED WITH A MINIMUM OF 8" OF SCREENED ORGANIC LOAM AND SEEDED WITH SEED MIXTURE 'C' AT A RATE NOT LESS THAN 1.10 POUNDS OF SEED PER 1,000 S.F. OF AREA (48 LBS. / ACRE).
4. SILT FENCES AND OTHER BARRIERS SHALL BE INSPECTED EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF A RAINFALL OF 0.25" OR GREATER. ALL DAMAGED AREAS SHALL BE REPAIRED, AND SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED OF.
5. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, THE TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED AND THE AREA DISTURBED BY THE REMOVAL SMOOTHED AND RE-VEGETATED.
6. AREAS MUST BE SEEDED AND MULCHED OR OTHERWISE PERMANENTLY STABILIZED WITHIN 3 DAYS OF FINAL GRADING, OR TEMPORARILY STABILIZED WITHIN 14 DAYS OF THE INITIAL DISTURBANCE OF SOIL. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
7. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKETS (OR AN EQUIVALENT APPROVED IN WRITING BY THE ENGINEER) ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.
8. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.
9. AFTER NOVEMBER 15th, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3" OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
10. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - c. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH STONE OR RIPRAP HAS BEEN INSTALLED; OR
 - d. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
11. FUGITIVE DUST CONTROL IS REQUIRED TO BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000, AND THE PROJECT IS TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES.
12. PRIOR TO CONSTRUCTION, A PHASING PLAN THAT DELINEATES EACH PHASE OF THE PROJECT SHALL BE SUBMITTED. ALL TEMPORARY SEDIMENT BASINS THAT WILL BE NEEDED FOR DEWATERING WORK AREAS SHALL BE LOCATED AND IDENTIFIED ON THIS PLAN.

CONSTRUCTION SEQUENCE

1. PRIOR TO THE START OF ANY ACTIVITY, IT IS THE RESPONSIBILITY OF THE SITE'S SITE DEVELOPER (OR OWNER) TO FILE A NOTICE OF INTENT (NOI) FORM WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) IN ORDER TO GAIN COVERAGE UNDER THE NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES. A PRE CONSTRUCTION MEETING IS TO BE HELD WITH ALL DEPARTMENT HEADS PRIOR TO THE START OF CONSTRUCTION.
2. WETLAND BOUNDARIES ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION. AT LEAST A TEMPORARY CULVERT OR ROADBED TO BE IN PLACE PRIOR TO THE START OF CONSTRUCTION.
3. CUT AND REMOVE TREES IN CONSTRUCTION AREA AS REQUIRED OR DIRECTED.
4. INSTALL SILT FENCING, HAY BALES AND CONSTRUCTION ENTRANCES PRIOR TO THE START OF CONSTRUCTION. THESE ARE TO BE MAINTAINED UNTIL THE FINAL PAVEMENT SURFACING AND LANDSCAPING AREAS ARE ESTABLISHED.
5. CLEAR, CUT, GRUB AND DISPOSE OF DEBRIS IN APPROVED FACILITIES. THIS INCLUDES ANY REQUIRED DEMOLITION OF EXISTING STRUCTURES, UTILITIES, ETC.
6. CONSTRUCT AND/OR INSTALL TEMPORARY OR PERMANENT SEDIMENT AND/OR DETENTION BASIN(S) AS REQUIRED. THESE FACILITIES SHALL BE INSTALLED AND STABILIZED PRIOR TO DIRECTING RUN-OFF TO THEM.
7. STRIP LOAM AND PAVEMENT, OR RECLAIM EXISTING PAVEMENT WITHIN LIMITS OF WORK PER THE RECOMMENDATIONS OF THE PROJECT ENGINEER AND STOCKPILE EXCESS MATERIAL STABILIZE STOCKPILE AS NECESSARY.
8. PERFORM PRELIMINARY SITE GRADING IN ACCORDANCE WITH THE PLANS.
9. PREPARE BUILDING PAD(S) TO ENABLE BUILDING CONSTRUCTION TO BEGIN.
10. INSTALL THE DRAINAGE SYSTEMS FIRST, THEN ANY OTHER UTILITIES IN ACCORDANCE WITH THE PLAN AND DETAILS. ANY CONFLICTS BETWEEN UTILITIES ARE TO BE RESOLVED WITH THE INVOLVEMENT AND APPROVAL OF THE ENGINEER.
11. ALL SWALES AND DRAINAGE STRUCTURES ARE TO BE CONSTRUCTED AND STABILIZED PRIOR TO HAVING RUN-OFF DIRECTED TO THEM.
12. STORMWATER FLOWS ARE NOT TO BE DIRECTED TO TREATMENT PRACTICES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
13. DAILY, OR AS REQUIRED, CONSTRUCT TEMPORARY BERMS, DRAINAGE DITCHES, CHECK DAMS, SEDIMENT TRAPS, ETC., TO PREVENT EROSION ON THE SITE AND PREVENT ANY SILTATION OF ADJUTING WATERS AND/OR PROPERTY.
14. PERFORM FINAL FINE GRADING, INCLUDING PLACEMENT OF 'SELECT' SUBGRADE MATERIALS.
15. PAVE ALL ROADWAYS WITH INITIAL 'BASE COURSE'.
16. PERFORM ALL REMAINING SITE CONSTRUCTION (i.e. BUILDING, UTILITY CONNECTIONS, ETC.).
17. LOAM AND SEED ALL DISTURBED AREAS AND INSTALL ANY REQUIRED SEDIMENT AND EROSION CONTROL FACILITIES (i.e. RIP RAP, EROSION CONTROL BLANKETS, ETC.).
18. FINISH PAVING ALL ROADWAYS WITH 'FINISH' COURSE.
19. ALL ROADWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
20. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
21. COMPLETE PERMANENT SEEDING AND LANDSCAPING.
22. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER SEEDING AREAS HAVE BEEN 75%-85% ESTABLISHED AND SITE IMPROVEMENTS ARE COMPLETE. SMOOTH AND RE-VEGETATE ALL DISTURBED AREAS.
23. CLEAN SITE AND ALL DRAINAGE STRUCTURES, PIPES AND SUMPS OF ALL SILT AND DEBRIS.
24. INSTALL ALL PAINTED PAVEMENT MARKINGS AND SIGNAGE PER THE PLANS AND DETAILS.
25. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY QUARTER-INCH OF RAINFALL.
26. UPON COMPLETION OF CONSTRUCTION, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY ANY RELEVANT PERMITTING AGENCIES THAT THE CONSTRUCTION HAS BEEN FINISHED IN A SATISFACTORY MANNER.

Design: JSR	Draft: PLB	Date: 6/26/13
Checked: JSR	Scale: AS NOTED	Project No.: 13070.1
Drawing Name: 13070-PLAN.dwg		

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REV.	DATE	REVISION	BY
0	6/29/17	REVISED FOR PLANNING BOARD	PLB

Designed and Produced in NH

J/B Jones & Beach Engineers, Inc.

85 Portsmouth Ave. PO Box 219 Stratham, NH 03885

Civil Engineering Services

603-772-4746
FAX: 603-772-0227
E-MAIL: JBE@JONESANDBEACH.COM

Plan Name:	EROSION AND SEDIMENT CONTROL DETAILS
Project:	112 HIGH STREET STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.	E1
SHEET 8 OF 8 JBE PROJECT NO. 13070.1	

**ABUTTERS LIST
112 HIGH STREET
STRATHAM, NH
JBE PROJECT No. 13070.1
NOVEMBER 16, 2016
REVISED APRIL 17, 2017
REVISED JUNE 27, 2017**

OWNER OF RECORD/APPLICANT:

TAX MAP 19/ LOT 68
ROBIN D B SULLIVAN REVOC TRUST
ROBIN D B SULLIVAN TRUSTEE
8 WHITTAKER DR
STRATHAM, NH 03885
BK 4199 / PG 2969 (11/26/03)

ABUTTERS:

15/44 (125 UNION RD)
TOWN OF STRATHAM
10 BUNKER HILL AVE
STRATHAM, NH 03885
2838/1716 (05/25/90)

19/44
MARK J. & BRIDGETTE SANTOS JR.
111 WILLOWBROOK AVE
STRATHAM, NH 03885
5709/1814 (04/28/16)

19/45
KEITH D. & KERRI L. RODGERS
117 HIGH ST
STRATHAM, NH 03885
5761/1031 (10/11/16)

19/62
KENT & ELIZABETH ANSON
1 HILLCREST DR.
STRATHAM, NH 03885
5604/2025 (03/27/15)

19/63

TILTON REVOCABLE TRUST
MARION E. TILTON, TRUSTEE
3 HILLCREST DR.
STRATHAM, NH 03885
5804/0476 (03/15/17)

19/64

DONALD H. & CANDACE M. GRAVES
5 HILLCREST DR
STRATHAM, NH 03885
2988/2688

19/65

ROY J. & KRISTINE L. BYRNES
2 HILLCREST DR
STRATHAM, NH 03885
3313/2195 (07/30/98)

19/66

LORI A. ZANIBONI
116 HIGH ST.
STRATHAM, NH 03885
5770/1651 (11/07/16)

19/67

THALIA M. HIGGINS
114 HIGH ST
STRATHAM, NH 03885
3211/1320 (04/30/97)

19/69

DARRIN M. & ELIZABETH G. BROCKELBANK
110 HIGH ST
STRATHAM, NH 03885
4718/0373 (10/10/06)

19/70

JENNIFER J. PILICY
108 HIGH ST
STRATHAM, NH 03885
5405/1091 (02/01/13)

19/71

MORRISSETTE-LONGWELL REVOCABLE TRUST
SCOTT LONGWELL & ROBIN MORRISSETTE TRUSTEES
1 WHITTAKER DR.
STRATHAM, NH 03885
5760/1328 (10/07/16)

19/72

DIANE KELLY
ROBERT C. HILLERY
5 WHITTAKER DR
STRATHAM, NH 03885
3296/2675 (05/29/98)

19/73

RANKS FAMILY TRUST
SCOTT RANKS
CARLA MARRAN-RANKS
6 WHITTAKER DR.
STRATHAM, NH 03885
5796/0753 (02/06/17)

19/74

RUSS REVOCABLE TRUST
BRADLEY & LYNN RUSS TRUSTEES
2 WHITTAKER DR.
STRATHAM, NH 03885
3354/2460 (12/28/98)

19/78 (CL HIGH ST)
PEAR TREE ASSOCIATION
7 BARTLETT RD
STRATHAM, NH 03885

ENGINEERS/SURVEYORS:

JONES & BEACH ENGINEERS, INC.
ATTN: JONATHAN S. RING, PE
PO BOX 219
STRATHAM, NH 03885

LICENSED LAND SURVEYOR:

JAMES VERRA & ASSOCIATES, INC.
ATTN: JAMES VERRA
101 SHATTUCK WAY
SUITE 8
NEWINGTON, NH 03801-7876

**TEST PITS
FOR
8 WHITAKER DRIVE
STRATHAM, NEW HAMPSHIRE
APRIL 20, 2016
JBE Project No. 13070.1**

Performed by: Gifford Colburn, Jones & Beach Engineers, Inc., SSD #1839
Witnessed by: Michael Cuomo, Rockingham County Conservation District

Test Pit #20

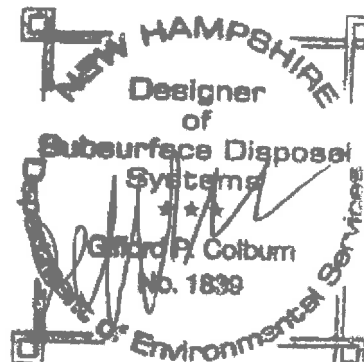
0"- 10"		topsoil
10"-22"	10YR 5/4	yellowish brown fine sandy loam granular, friable
22"-58"	2.5Y 6/3	light yellowish brown sandy loam

SHWT = 22"
Roots to 36"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #21

0"- 10"		topsoil
10"-30"	10YR 5/4	yellowish brown fine sandy loam granular, friable
18"-30"	2.5Y 3/1	very dark gray fine sandy loam granular, friable
30"-60"	2.5Y 6/3	light yellowish brown sandy loam stoney

SHWT = 30"
Roots to 30"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch



Test Pit #22 - FAILED

0"- 12"

topsoil

12"-60"

2.5Y 6/3

light yellowish brown
redox

SHWT = 12"

Roots to 12"

H₂O @ 58"

No Refusal observed

Test Pit #23- FAILED

0"-12"

topsoil

12"-40"

2.5Y 6/3

light yellowish brown
redox

SHWT = 12"

Roots to 12"

H₂O @ 20"

No Refusal observed

Test Pit #24 - FAILED

SHWT = 13"

Depth @ 36"

No Roots observed

No H₂O observed

No Refusal observed

Perc Rate = min/inch

Test Pit #25

0"-8"

topsoil

8"-18"

10YR 5/4

yellowish brown
fine sandy loam

18"-54"

2.5Y 6/3

light yellowish brown
sandy loam

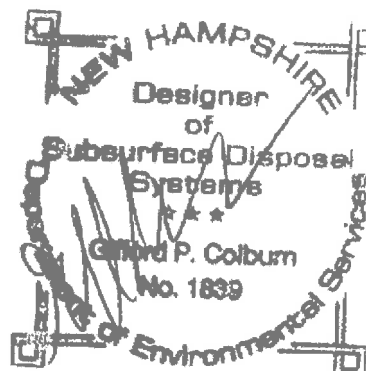
SHWT = 18"

Roots to 18"

No H₂O observed

No Refusal observed

Perc Rate = 8 min/inch



Test Pit #26

0"-8"		topsoil
8"-28"	10YR 5/4	yellowish brown fine sandy loam
28"-52"	2.5Y 6/3	light yellowish brown sandy loam with redox

SHWT = 28"
Roots to 18"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #27- FAILED

0"-13"		topsoil
48"		bottom

SHWT = 13"
Roots to 13"
No H₂O observed
No Refusal observed

Test Pit #28

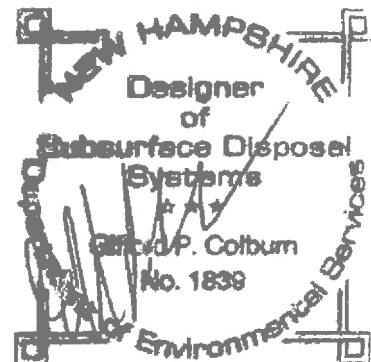
0"-12"		topsoil
12"-20"	10YR 5/4	yellowish brown fine sandy loam
20"-48"	2.5Y 5/1	gray clay firm redox

SHWT = 20"
Roots to 12"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #29- FAILED

0"-15"		topsoil
15"-36"	2.5Y 6/3	light yellowish brown redox firm

SHWT = 15"
Roots to 15"
No H₂O observed
No Refusal observed



Test Pit #30

0"-8"

topsoil

8"-19"

10YR 5/4

yellowish brown
fine sandy loam

19"-48"

2.5Y 5/1

gray
silt loam
firm

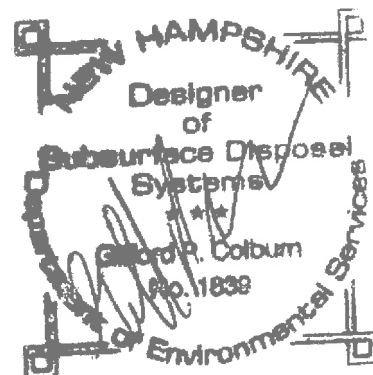
SHWT = 19"

Roots to 19"

No H₂O observed

No Refusal observed

Perc Rate = 8 min/inch



TEST PITS
FOR
112 HIGH STREET
STRATHAM, NEW HAMPSHIRE
DECEMBER 14, 2016
JBE Project No. 13070.1

Performed by: Gifford Colburn, Jones & Beach Engineers, Inc., SSD #1839
Witnessed by: Michael Cuomo, Rockingham County Conservation District

Test Pit #31

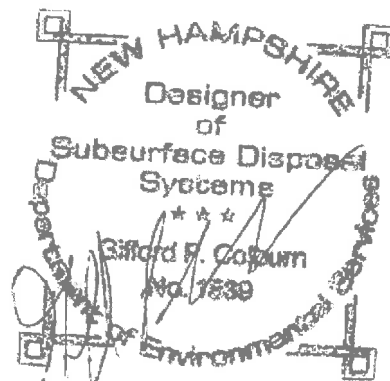
0"- 10"		topsoil/ forest mat
10"-22"	10YR 5/3	brown sandy loam granular, friable
22"-55"	2.5Y 5/2	grayish brown sandy loam with redox

SHWT = 22"
Roots to 10"
H₂O @ 22"
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #32

0"- 10"		topsoil
10"-22"	10YR 5/3	brown sandy loam granular, friable
22"-52"	2.5Y 5/2	grayish brown sandy loam with redox

SHWT = 22"
Roots to 10"
H₂O @ 22"
No Refusal observed
Perc Rate = 8 min/inch



Test Pit #33- Failed

0"- 12"	10YR 4/2	dark grayish brown sandy loam
---------	----------	----------------------------------

12"-57"	2.5Y 5/1	gray silt loam
---------	----------	-------------------

SHWT = 12"
Roots to 12"
H₂O @ 22"
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #34

0"- 10"		topsoil
---------	--	---------

10"-24"	10YR 5/3	brown sandy loam granular, friable
---------	----------	--

24"-55"	10YR 4/3	brown loamy sand gravelly
---------	----------	---------------------------------

SHWT = 24"
Roots to 24"
H₂O @ 50"
No Refusal observed
Perc Rate = 8 min/inch

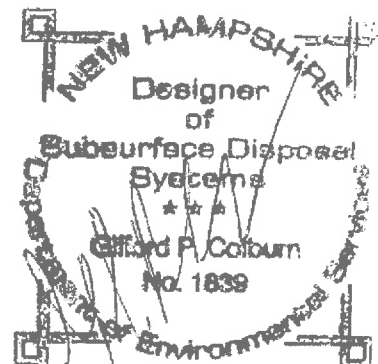
Test Pit #35

0"- 8"		topsoil
--------	--	---------

8"-20"	10YR 4/3	brown sandy loam granular, friable
--------	----------	--

20"-48"	10YR 5/3	brown loamy sand gravelly
---------	----------	---------------------------------

SHWT = 20"
Roots to 10"
H₂O @ 30"
No Refusal observed
Perc Rate = 8 min/inch



Test Pit #36

0"- 6"		topsoil
6"-30"	10YR 4/3	brown sandy loam granular, friable
30"-55"	10YR 5/3	brown loamy sand

SHWT = 30"
Roots to 30"
H₂O @ 50"
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #37- Failed

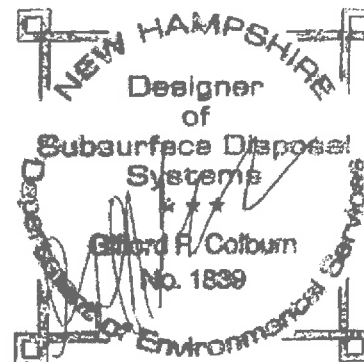
0"- 14"		topsoil
14"-54"		loamy clay

SHWT = 14"
Roots to 14"
H₂O @ 24"
No Refusal observed
Perc Rate = 8 min/inch

Test Pit #38

0"- 10"		topsoil
10"-15"	10YR 4/3	brown sandy loam granular, friable
15"-48"	2.5Y 5/2	grayish brown loamy sand gravelly

SHWT = 15"
No Roots observed
H₂O @ 30"
No Refusal observed
Perc Rate = 8 min/inch



**TEST PITS
FOR
112 HIGH STREET
STRATHAM, NEW HAMPSHIRE
DECEMBER 27, 2016
JBE Project No. 13070.1**

Performed by: Gifford Colburn, Jones & Beach Engineers, Inc., SSD #1839
Witnessed by: Michael Cuomo, Rockingham County Conservation District

Test Pit #39- FAILED

0"- 4" topsoil

SHWT = 11"

Test Pit #40

0"- 8" topsoil

8"-24"	10YR 4/6	dark yellowish brown loamy sand granular, friable
--------	----------	---

24"-60"	10YR 5/2	grayish brown fine sandy loam firm with redox
---------	----------	--

SHWT = 24"
Roots to 18"
H₂O @ 36"
No Refusal observed
Perc Rate = 8 min/inch

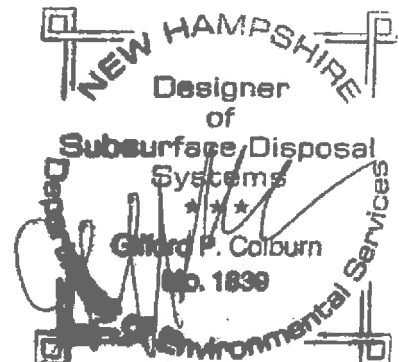
Test Pit #41

0"- 10" topsoil

10"-22"	10YR 4/4	dark yellowish brown sandy loam
---------	----------	------------------------------------

22"-60"	10YR 5/4	yellowish brown silt clay with redox
---------	----------	--

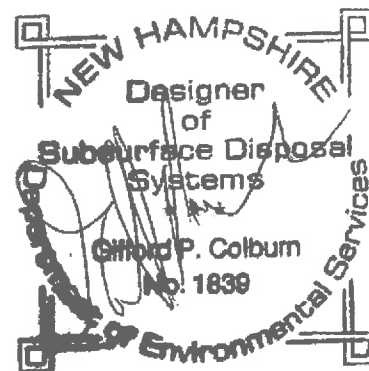
SHWT = 22"
Roots to 18"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch

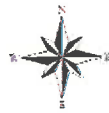


Test Pit #42

0"- 10"		topsoil
10"-22"	10YR 6/4	light yellowish brown sandy loam granular, friable
22"-34"	10YR 4/3	brown silt loam
34"-40"	10YR 4/6	dark yellowish brown loamy sand
40"-60"	10YR 4/3	brown silt loam

SHWT = 22"
Roots to 10"
No H₂O observed
No Refusal observed
Perc Rate = 8 min/inch





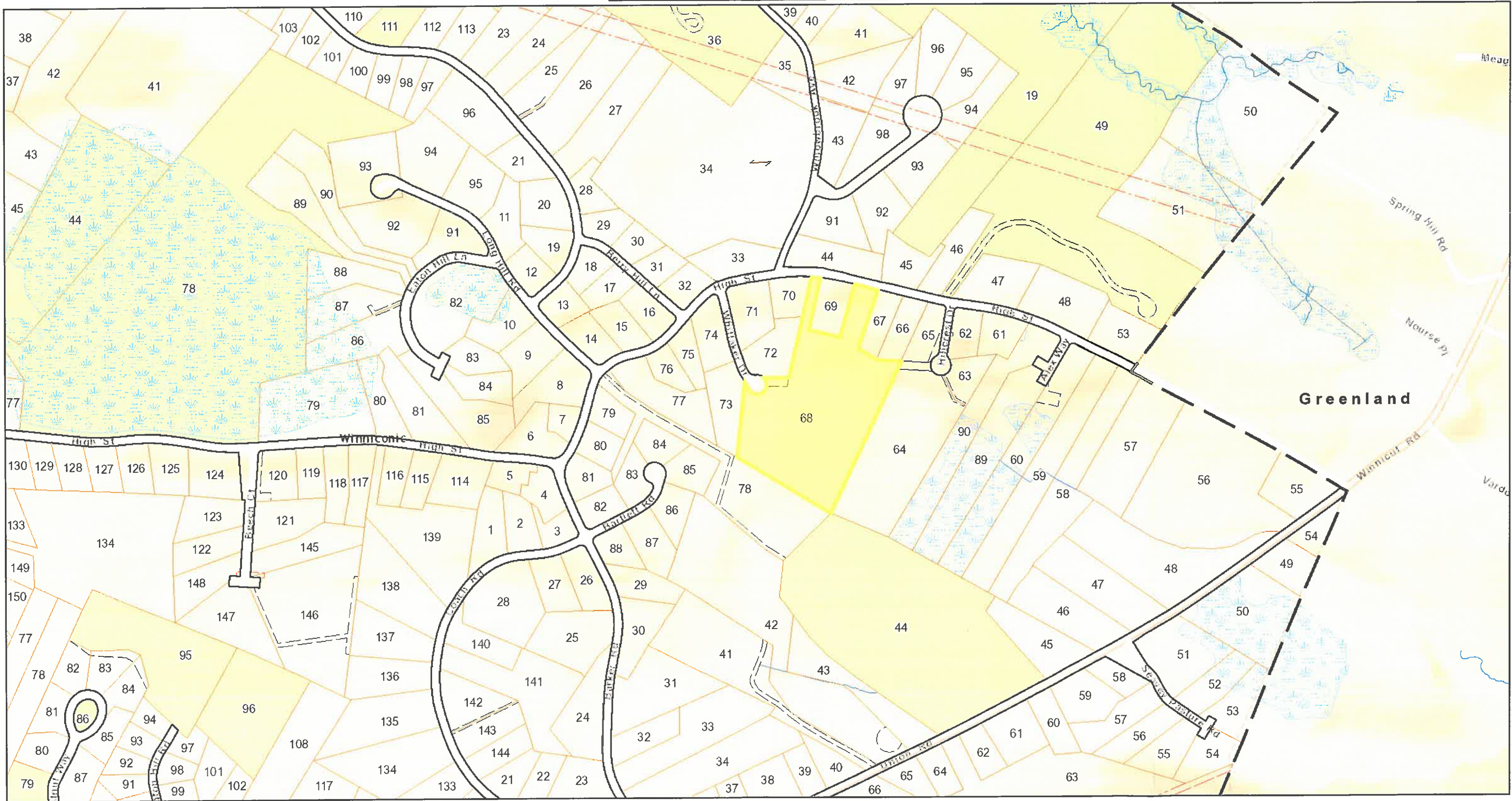
June 27, 2017

Stratham, NH

1 inch = 537 Feet



www.cai-tech.com



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JONES & BEACH ENGINEERS INC.

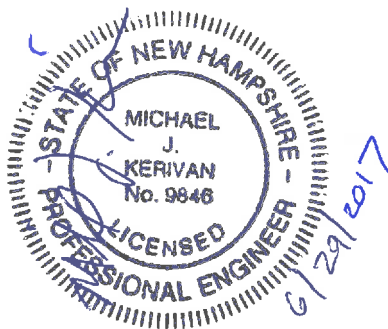
85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

DRAINAGE ANALYSIS

SEDIMENT AND EROSION CONTROL PLAN

Prepared for:

**Sullivan Subdivision
Tax Map 19, Lot 68
High Street
Stratham, NH 03885**



**June 29, 2017
JBE Project No. 13070**

EXECUTIVE SUMMARY

Robin Sullivan proposes to construct a 5-lot subdivision on a ± 14.99 -acre parcel of land located on the south side of High Street in Stratham, NH. A drainage analysis of the entire site and its offsite contributing watershed areas was conducted for the purpose of estimating the peak rate of stormwater runoff and to subsequently design adequate drainage structures. Two models were compiled, one for the area in its existing (pre-construction) condition, and a second for its proposed (post-construction) condition. The analysis was conducted using data for the 2 Year – 24 Hour (3.23"), 10 Year – 24 Hour (4.91"), 25 Year – 24 Hour (6.24"), 50 Year – 24 Hour (7.48") and 100 Year – 24 Hour (8.97") storm events using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. A summary of the existing and proposed conditions peak rates of runoff is as follows:

COMPONENT	ANALYSIS	PEAK RATE OF RUNOFF (CUBIC FEET/SECOND)				
		2 Year	10 Year	25 Year	50 Year	100 Year
Reach #1	Existing	10.13	25.04	38.37	51.43	67.97
Analysis Point #1	Proposed	9.47	23.40	35.85	48.04	63.49
Reach #2	Existing	4.93	14.19	22.75	31.29	41.99
Analysis Point #2	Proposed	4.08	12.46	19.28	25.81	33.78

The project site is located in the Rural Residential Zone. The subject parcel consists primarily of woodland and grass. The site is primarily undeveloped with the exception of an existing house in the western corner adjacent to Whittaker Drive. The existing topography is such that the existing conditions site analysis requires two (2) subcatchments. The site and contributing off-site runoff drains to two wetlands, one located in the southeast corner (Analysis Point #1) and one located on the eastern property line approximately 450' northeast of the southeast corner wetland (Analysis Point #2).

The proposed site development consists of the aforementioned 5-lot subdivision, featuring single-family dwellings. The construction of approximately 625 feet of roadway, driveways, and homes, in addition to site grading, divides the existing drainage basins into three (3) subcatchments. The runoff from these subcatchments has increased from that of the existing conditions due to the addition of the impervious buildings and paving. The runoff from the roadway will be directed via site grading and swales to a detention pond. Stormwater from the houses and driveways will be directed to drip edges. As shown in the above table, the proposed peak rates of stormwater runoff will be reduced from that of existing conditions for all analyzed storm events.

In addition, the potential for increased erosion and sedimentation is handled by way of erosion control blankets, vegetated treatment, and riprap inlet and outlet protection aprons. All land disturbed during construction will be stabilized within thirty days of groundbreaking, and existing wetlands and abutting property owners will suffer minimal adversity resultant of this development.

TABLE OF CONTENTS

Executive Summary

USGS Quadrangle

1.0	Rainfall Characteristics	Page 1
2.0	Existing Conditions Analysis	Page 2
3.0	Proposed Conditions Analysis	Pages 3-4
4.0	Conclusion	Page 5

Appendix I Existing Conditions Analysis

- 2 Year - 24 Hour Complete
- 10 Year - 24 Hour Summary
- 25 Year - 24 Hour Complete
- 50 Year - 24 Hour Summary
- 100 Year - 24 Hour Complete

Appendix II Proposed Conditions Analysis

- 2 Year - 24 Hour Complete
- 10 Year - 24 Hour Summary
- 25 Year - 24 Hour Complete
- 50 Year - 24 Hour Summary
- 100 Year - 24 Hour Complete

Appendix III Charts, Graphs, and Calculations

Enclosed:	Sheet W1	Existing Conditions Watershed Plan
	Sheet W2	Proposed Conditions Watershed Plan

1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as a proposed condition, or post-construction analysis, of the same location. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2 Year – 24 Hour (3.23"), 10 Year – 24 Hour (4.91"), 25 Year – 24 Hour (6.24"), 50 Year – 24 Hour (7.48") and 100 Year – 24 Hour (8.97") storm events.

As the table in the Executive Summary demonstrates, the proposed peak rates of runoff will be reduced from the existing conditions of the site, thereby minimizing any potential for a negative impact on abutting properties or infrastructure by allowing for better control of peak rates of stormwater runoff.

2.0 EXISTING CONDITIONS ANALYSIS

The subject parcel consists primarily of woodland and grass. The site is primarily undeveloped with the exception of an existing house in the western corner adjacent to Whittaker Drive. The topography of the site varies from flat to steep throughout the site, with few slopes exceeding 15%.

Classified through the use of Natural Resources Conservation Service's Web Soil Survey, the land of the site is composed of a variety of soil types. The in-situ soils are categorized into Hydrologic Soil Groups (HSG) B and C (see appendix for soil types and HSG designations).

The site and contributing off-site runoff drains to two wetlands, one located in the southeast corner (Analysis Point #1) and one located on the eastern property line approximately 450' northeast of the southeast corner wetland (Analysis Point #2).

3.0 PROPOSED CONDITIONS ANALYSIS

The proposed site development consists of the aforementioned 5-lot subdivision, featuring single-family dwellings. The construction of approximately 625 feet of roadway, driveways, and homes, in addition to site grading, divides the existing drainage basins into three (3) subcatchments. The runoff from these subcatchments has increased from that of the existing conditions due to the addition of the impervious buildings and paving.

The addition of the proposed impervious paved areas and homes causes an increase in the curve number (C_n) and a decrease in the time of concentration (T_c), the net result being a potential increase in peak rates of runoff from the site. The proposed site development consists of the aforementioned 5-lot subdivision, featuring single-family dwellings. The construction of approximately 625 feet of roadway, driveways, and homes, in addition to site grading and curbing, divides the existing drainage basins into Three (3) subcatchments.

The runoff from the roadway will be directed via site grading and swales to a detention pond. Stormwater from the houses and driveways will be directed to drip edges. As shown in the above table, the proposed peak rates of stormwater runoff will be reduced from that of existing conditions for all analyzed storm events.

4.0 CONCLUSION

This proposed site development located south of High Street in Tratham, NH will have minimal adverse effect on abutting infrastructures or properties by way of stormwater runoff or siltation. The post-construction peak rates of runoff for the site will be lower than the existing conditions for all analyzed storm events. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of site grading, jute matting, vegetated swales, detention ponds, and riprap outlet protection aprons.

A site specific, terrain alteration permit (RSA 485:A-17) is not required for this site plan due to the area of disturbance being less than 100,000 square-feet.

Respectfully Submitted,
JONES & BEACH ENGINEERS, INC.



Michael Kerivan, P.E.
Project Engineer

APPENDIX I

EXISTING CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Summary 10 YEAR
Complete 25 YEAR
Summary 50 YEAR
Complete 100 YEAR



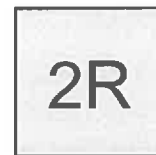
Subcatchment 1S



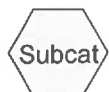
Analysis Point #1



Subcatchment 2S



Analysis Point #2



Routing Diagram for 13070_EX CONDITION

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13070_EX CONDITION

Prepared by Microsoft

Printed 6/29/2017

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.808	61	>75% Grass cover, Good, HSG B (1S, 2S)
8.430	74	>75% Grass cover, Good, HSG C (1S, 2S)
0.153	98	Paved roads w/curbs & sewers, HSG B (2S)
0.222	98	Paved roads w/curbs & sewers, HSG C (1S, 2S)
0.318	98	Roofs, HSG B (1S, 2S)
0.432	98	Roofs, HSG C (1S, 2S)
2.521	55	Woods, Good, HSG B (1S, 2S)
5.846	70	Woods, Good, HSG C (1S, 2S)
22.731	69	TOTAL AREA

13070_EX CONDITION

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Printed 6/29/2017

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
7.801	HSG B	1S, 2S
14.930	HSG C	1S, 2S
0.000	HSG D	
0.000	Other	
22.731		TOTAL AREA

13070_EX CONDITION*Type III 24-hr 2-YR STORM Rainfall=3.23"*

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Page 4

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment 1SRunoff Area=579,886 sf 4.56% Impervious Runoff Depth>0.89"
Flow Length=1,150' Tc=12.6 min CN=71 Runoff=10.13 cfs 0.991 af**Subcatchment 2S: Subcatchment 2S**Runoff Area=410,294 sf 5.51% Impervious Runoff Depth>0.70"
Flow Length=904' Tc=14.1 min CN=67 Runoff=4.93 cfs 0.549 af**Reach 1R: Analysis Point #1**Inflow=10.13 cfs 0.991 af
Outflow=10.13 cfs 0.991 af**Reach 2R: Analysis Point #2**Inflow=4.93 cfs 0.549 af
Outflow=4.93 cfs 0.549 af**Total Runoff Area = 22.731 ac Runoff Volume = 1.540 af Average Runoff Depth = 0.81"**
95.05% Pervious = 21.606 ac 4.95% Impervious = 1.126 ac

13070_EX CONDITION

Type III 24-hr 2-YR STORM Rainfall=3.23"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 10.13 cfs @ 12.20 hrs, Volume= 0.991 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
15,248	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
96,134	61	>75% Grass cover, Good, HSG B
290,072	74	>75% Grass cover, Good, HSG C
33,890	55	Woods, Good, HSG B
133,362	70	Woods, Good, HSG C
579,886	71	Weighted Average
553,458		95.44% Pervious Area
26,428		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 4.93 cfs @ 12.23 hrs, Volume= 0.549 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

13070_EX CONDITION

Type III 24-hr 2-YR STORM Rainfall=3.23"

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Printed 6/29/2017

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Area (sf)	CN	Description
10,444	98	Roofs, HSG B
3,571	98	Roofs, HSG C
6,684	98	Paved roads w/curbs & sewers, HSG B
1,907	98	Paved roads w/curbs & sewers, HSG C
113,323	61	>75% Grass cover, Good, HSG B
77,154	74	>75% Grass cover, Good, HSG C
75,937	55	Woods, Good, HSG B
121,274	70	Woods, Good, HSG C
410,294	67	Weighted Average
387,688		94.49% Pervious Area
22,606		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.4	120	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.1	125	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	184	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.9	425	0.0850	1.46		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.1	904	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13.312 ac, 4.56% Impervious, Inflow Depth > 0.89" for 2-YR STORM event
Inflow = 10.13 cfs @ 12.20 hrs, Volume= 0.991 af
Outflow = 10.13 cfs @ 12.20 hrs, Volume= 0.991 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.419 ac, 5.51% Impervious, Inflow Depth > 0.70" for 2-YR STORM event
Inflow = 4.93 cfs @ 12.23 hrs, Volume= 0.549 af
Outflow = 4.93 cfs @ 12.23 hrs, Volume= 0.549 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

13070_EX CONDITION*Type III 24-hr 10-YR STORM Rainfall=4.91"*

Prepared by Microsoft

Printed 6/29/2017

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=579,886 sf 4.56% Impervious Runoff Depth>2.04"
Flow Length=1,150' Tc=12.6 min CN=71 Runoff=25.04 cfs 2.267 af

Subcatchment 2S: Subcatchment 2S Runoff Area=410,294 sf 5.51% Impervious Runoff Depth>1.73"
Flow Length=904' Tc=14.1 min CN=67 Runoff=14.19 cfs 1.362 af

Reach 1R: Analysis Point #1 Inflow=25.04 cfs 2.267 af
Outflow=25.04 cfs 2.267 af

Reach 2R: Analysis Point #2 Inflow=14.19 cfs 1.362 af
Outflow=14.19 cfs 1.362 af

Total Runoff Area = 22.731 ac Runoff Volume = 3.629 af Average Runoff Depth = 1.92"
95.05% Pervious = 21.606 ac 4.95% Impervious = 1.126 ac

13070_EX CONDITION*Type III 24-hr 25-YR STORM Rainfall=6.24"*

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment 1SRunoff Area=579,886 sf 4.56% Impervious Runoff Depth>3.09"
Flow Length=1,150' Tc=12.6 min CN=71 Runoff=38.37 cfs 3.423 af**Subcatchment 2S: Subcatchment 2S**Runoff Area=410,294 sf 5.51% Impervious Runoff Depth>2.70"
Flow Length=904' Tc=14.1 min CN=67 Runoff=22.75 cfs 2.123 af**Reach 1R: Analysis Point #1**Inflow=38.37 cfs 3.423 af
Outflow=38.37 cfs 3.423 af**Reach 2R: Analysis Point #2**Inflow=22.75 cfs 2.123 af
Outflow=22.75 cfs 2.123 af**Total Runoff Area = 22.731 ac Runoff Volume = 5.546 af Average Runoff Depth = 2.93"**
95.05% Pervious = 21.606 ac 4.95% Impervious = 1.126 ac

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 38.37 cfs @ 12.18 hrs, Volume= 3.423 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
15,248	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
96,134	61	>75% Grass cover, Good, HSG B
290,072	74	>75% Grass cover, Good, HSG C
33,890	55	Woods, Good, HSG B
133,362	70	Woods, Good, HSG C
579,886	71	Weighted Average
553,458		95.44% Pervious Area
26,428		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 22.75 cfs @ 12.20 hrs, Volume= 2.123 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Area (sf)	CN	Description
10,444	98	Roofs, HSG B
3,571	98	Roofs, HSG C
6,684	98	Paved roads w/curbs & sewers, HSG B
1,907	98	Paved roads w/curbs & sewers, HSG C
113,323	61	>75% Grass cover, Good, HSG B
77,154	74	>75% Grass cover, Good, HSG C
75,937	55	Woods, Good, HSG B
121,274	70	Woods, Good, HSG C
410,294	67	Weighted Average
387,688		94.49% Pervious Area
22,606		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.4	120	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.1	125	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	184	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.9	425	0.0850	1.46		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.1	904	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13.312 ac, 4.56% Impervious, Inflow Depth > 3.09" for 25-YR STORM event
 Inflow = 38.37 cfs @ 12.18 hrs, Volume= 3.423 af
 Outflow = 38.37 cfs @ 12.18 hrs, Volume= 3.423 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 9.419 ac, 5.51% Impervious, Inflow Depth > 2.70" for 25-YR STORM event
 Inflow = 22.75 cfs @ 12.20 hrs, Volume= 2.123 af
 Outflow = 22.75 cfs @ 12.20 hrs, Volume= 2.123 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

13070_EX CONDITION*Type III 24-hr 50-YR STORM Rainfall=7.48"*

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment 1S Runoff Area=579,886 sf 4.56% Impervious Runoff Depth>4.12"
Flow Length=1,150' Tc=12.6 min CN=71 Runoff=51.43 cfs 4.572 af

Subcatchment 2S: Subcatchment 2S Runoff Area=410,294 sf 5.51% Impervious Runoff Depth>3.68"
Flow Length=904' Tc=14.1 min CN=67 Runoff=31.29 cfs 2.891 af

Reach 1R: Analysis Point #1 Inflow=51.43 cfs 4.572 af
Outflow=51.43 cfs 4.572 af

Reach 2R: Analysis Point #2 Inflow=31.29 cfs 2.891 af
Outflow=31.29 cfs 2.891 af

Total Runoff Area = 22.731 ac Runoff Volume = 7.464 af Average Runoff Depth = 3.94"
95.05% Pervious = 21.606 ac 4.95% Impervious = 1.126 ac

13070_EX CONDITION*Type III 24-hr 100-YR STORM Rainfall=8.97"*

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment 1SRunoff Area=579,886 sf 4.56% Impervious Runoff Depth>5.42"
Flow Length=1,150' Tc=12.6 min CN=71 Runoff=67.97 cfs 6.013 af**Subcatchment 2S: Subcatchment 2S**Runoff Area=410,294 sf 5.51% Impervious Runoff Depth>4.93"
Flow Length=904' Tc=14.1 min CN=67 Runoff=41.99 cfs 3.866 af**Reach 1R: Analysis Point #1**Inflow=67.97 cfs 6.013 af
Outflow=67.97 cfs 6.013 af**Reach 2R: Analysis Point #2**Inflow=41.99 cfs 3.866 af
Outflow=41.99 cfs 3.866 af**Total Runoff Area = 22.731 ac Runoff Volume = 9.879 af Average Runoff Depth = 5.22"**
95.05% Pervious = 21.606 ac 4.95% Impervious = 1.126 ac

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Type III 24-hr 100-YR STORM Rainfall=8.97"

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Summary for Subcatchment 1S: Subcatchment 1S

Runoff = 67.97 cfs @ 12.17 hrs, Volume= 6.013 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
15,248	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
96,134	61	>75% Grass cover, Good, HSG B
290,072	74	>75% Grass cover, Good, HSG C
33,890	55	Woods, Good, HSG B
133,362	70	Woods, Good, HSG C
579,886	71	Weighted Average
553,458		95.44% Pervious Area
26,428		4.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 2S: Subcatchment 2S

Runoff = 41.99 cfs @ 12.20 hrs, Volume= 3.866 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

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Type III 24-hr 100-YR STORM Rainfall=8.97"

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Area (sf)	CN	Description
10,444	98	Roofs, HSG B
3,571	98	Roofs, HSG C
6,684	98	Paved roads w/curbs & sewers, HSG B
1,907	98	Paved roads w/curbs & sewers, HSG C
113,323	61	>75% Grass cover, Good, HSG B
77,154	74	>75% Grass cover, Good, HSG C
75,937	55	Woods, Good, HSG B
121,274	70	Woods, Good, HSG C
410,294	67	Weighted Average
387,688		94.49% Pervious Area
22,606		5.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
1.4	120	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.1	125	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.2	184	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.9	425	0.0850	1.46		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
14.1	904	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13.312 ac, 4.56% Impervious, Inflow Depth > 5.42" for 100-YR STORM event
Inflow = 67.97 cfs @ 12.17 hrs, Volume= 6.013 af
Outflow = 67.97 cfs @ 12.17 hrs, Volume= 6.013 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

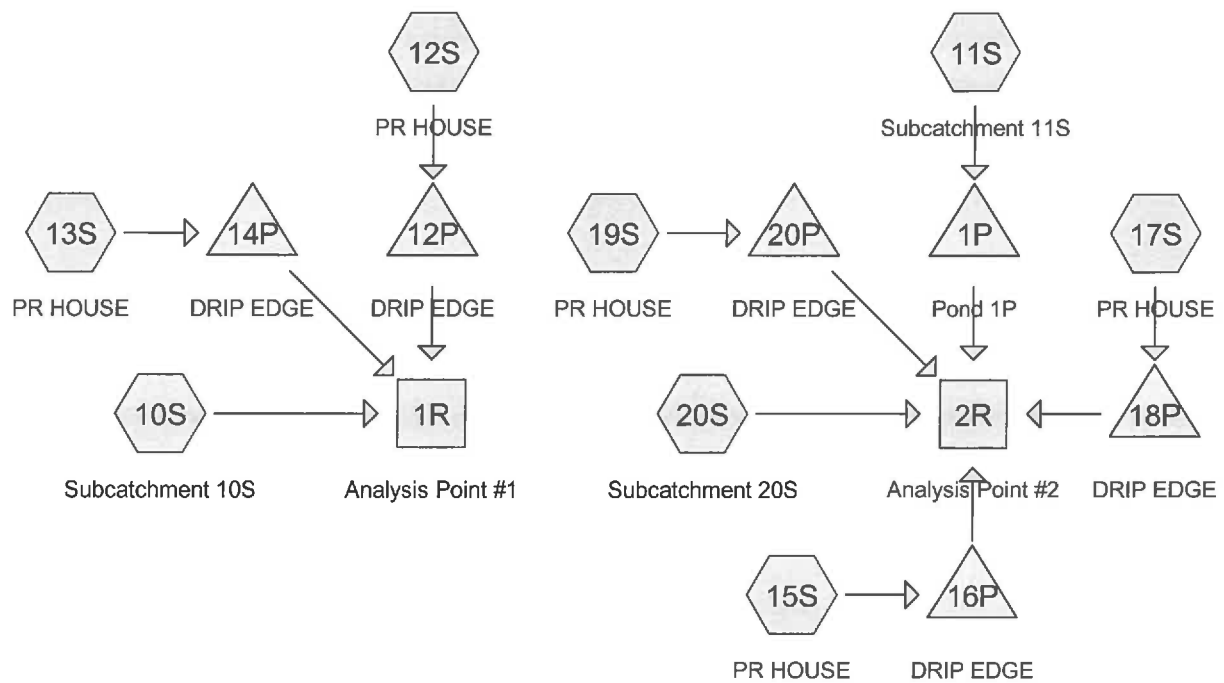
Inflow Area = 9.419 ac, 5.51% Impervious, Inflow Depth > 4.93" for 100-YR STORM event
Inflow = 41.99 cfs @ 12.20 hrs, Volume= 3.866 af
Outflow = 41.99 cfs @ 12.20 hrs, Volume= 3.866 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

APPENDIX II

PROPOSED CONDITIONS DRAINAGE ANALYSIS

Summary 2 YEAR
Summary 10 YEAR
Complete 25 YEAR
Summary 50 YEAR
Complete 100 YEAR



Routing Diagram for 13070_PR CONDITION

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.366	61	>75% Grass cover, Good, HSG B (10S, 11S, 20S)
9.126	74	>75% Grass cover, Good, HSG C (10S, 11S, 20S)
0.011	98	Paved parking, HSG B (19S)
0.046	98	Paved parking, HSG C (12S, 13S, 15S, 17S)
0.312	98	Paved roads w/curbs & sewers, HSG B (11S, 20S)
0.492	98	Paved roads w/curbs & sewers, HSG C (10S, 11S, 20S)
0.341	98	Roofs, HSG B (10S, 11S, 19S, 20S)
0.642	98	Roofs, HSG C (10S, 12S, 13S, 15S, 17S, 20S)
1.771	55	Woods, Good, HSG B (10S, 11S, 20S)
4.625	70	Woods, Good, HSG C (10S, 11S, 20S)
22.731	71	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
7.801	HSG B	10S, 11S, 19S, 20S
14.930	HSG C	10S, 11S, 12S, 13S, 15S, 17S, 20S
0.000	HSG D	
0.000	Other	
22.731		TOTAL AREA

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Subcatchment 10S	Runoff Area=541,688 sf 4.72% Impervious Runoff Depth>0.89" Flow Length=1,150' Tc=12.6 min CN=71 Runoff=9.47 cfs 0.926 af
Subcatchment 11S: Subcatchment 11S	Runoff Area=191,313 sf 13.95% Impervious Runoff Depth>0.89" Flow Length=736' Tc=8.5 min CN=71 Runoff=3.77 cfs 0.327 af
Subcatchment 12S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>3.00" Tc=0.0 min CN=98 Runoff=0.25 cfs 0.017 af
Subcatchment 13S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>3.00" Tc=0.0 min CN=98 Runoff=0.25 cfs 0.017 af
Subcatchment 15S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>3.00" Tc=0.0 min CN=98 Runoff=0.25 cfs 0.017 af
Subcatchment 17S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>3.00" Tc=0.0 min CN=98 Runoff=0.25 cfs 0.017 af
Subcatchment 19S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>3.00" Tc=0.0 min CN=98 Runoff=0.25 cfs 0.017 af
Subcatchment 20S: Subcatchment 20S	Runoff Area=242,179 sf 5.39% Impervious Runoff Depth>0.70" Flow Length=627' Tc=9.5 min CN=67 Runoff=3.36 cfs 0.325 af
Reach 1R: Analysis Point #1	Inflow=9.47 cfs 0.926 af Outflow=9.47 cfs 0.926 af
Reach 2R: Analysis Point #2	Inflow=4.08 cfs 0.635 af Outflow=4.08 cfs 0.635 af
Pond 1P: Pond 1P	Peak Elev=80.66' Storage=3,670 cf Inflow=3.77 cfs 0.327 af 12.0" Round Culvert n=0.013 L=25.0' S=0.0200 ' Outflow=1.53 cfs 0.310 af
Pond 12P: DRIP EDGE	Peak Elev=88.16' Storage=749 cf Inflow=0.25 cfs 0.017 af Outflow=0.00 cfs 0.000 af
Pond 14P: DRIP EDGE	Peak Elev=88.16' Storage=749 cf Inflow=0.25 cfs 0.017 af Outflow=0.00 cfs 0.000 af
Pond 16P: DRIP EDGE	Peak Elev=88.16' Storage=749 cf Inflow=0.25 cfs 0.017 af Outflow=0.00 cfs 0.000 af
Pond 18P: DRIP EDGE	Peak Elev=88.16' Storage=749 cf Inflow=0.25 cfs 0.017 af Outflow=0.00 cfs 0.000 af
Pond 20P: DRIP EDGE	Peak Elev=88.16' Storage=749 cf Inflow=0.25 cfs 0.017 af Outflow=0.00 cfs 0.000 af

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Total Runoff Area = 22.731 ac Runoff Volume = 1.664 af Average Runoff Depth = 0.88"
91.89% Pervious = 20.888 ac 8.11% Impervious = 1.844 ac

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 9.47 cfs @ 12.20 hrs, Volume= 0.926 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
14,383	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
89,203	61	>75% Grass cover, Good, HSG B
279,787	74	>75% Grass cover, Good, HSG C
30,102	55	Woods, Good, HSG B
117,033	70	Woods, Good, HSG C
541,688	71	Weighted Average
516,125		95.28% Pervious Area
25,563		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 3.77 cfs @ 12.14 hrs, Volume= 0.327 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
5,242	98	Roofs, HSG B
9,608	98	Paved roads w/curbs & sewers, HSG B
11,847	98	Paved roads w/curbs & sewers, HSG C
72,521	61	>75% Grass cover, Good, HSG B
63,353	74	>75% Grass cover, Good, HSG C
9,509	55	Woods, Good, HSG B
19,233	70	Woods, Good, HSG C
191,313	71	Weighted Average
164,616		86.05% Pervious Area
26,697		13.95% Impervious Area

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.0	120	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.5	211	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.5	355	0.0325	12.38	173.39	Trap/Vee/Rect Channel Flow, Bot.W=1.00' D=2.00' Z= 3.0 ' Top.W=13.00' n= 0.022 Earth, clean & straight
8.5	736	Total			

Summary for Subcatchment 12S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 13S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Summary for Subcatchment 15S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 17S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 19S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af, Depth> 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
2,500	98	Roofs, HSG B
500	98	Paved parking, HSG B
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 3.36 cfs @ 12.16 hrs, Volume= 0.325 af, Depth> 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR STORM Rainfall=3.23"

Area (sf)	CN	Description
3,685	98	Roofs, HSG B
3,571	98	Roofs, HSG C
3,976	98	Paved roads w/curbs & sewers, HSG B
1,820	98	Paved roads w/curbs & sewers, HSG C
72,016	61	>75% Grass cover, Good, HSG B
54,375	74	>75% Grass cover, Good, HSG C
37,550	55	Woods, Good, HSG B
65,186	70	Woods, Good, HSG C
242,179	67	Weighted Average
229,127		94.61% Pervious Area
13,052		5.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.97		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.1	33	0.1000	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	165	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.6	412	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	627	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 12.573 ac, 5.76% Impervious, Inflow Depth > 0.88" for 2-YR STORM event
 Inflow = 9.47 cfs @ 12.20 hrs, Volume= 0.926 af
 Outflow = 9.47 cfs @ 12.20 hrs, Volume= 0.926 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.158 ac, 11.02% Impervious, Inflow Depth > 0.75" for 2-YR STORM event
 Inflow = 4.08 cfs @ 12.19 hrs, Volume= 0.635 af
 Outflow = 4.08 cfs @ 12.19 hrs, Volume= 0.635 af, Atten= 0%, Lag= 0.0 min

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Type III 24-hr 2-YR STORM Rainfall=3.23"

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Pond 1P

Inflow Area = 4.392 ac, 13.95% Impervious, Inflow Depth > 0.89" for 2-YR STORM event
 Inflow = 3.77 cfs @ 12.14 hrs, Volume= 0.327 af
 Outflow = 1.53 cfs @ 12.49 hrs, Volume= 0.310 af, Atten= 59%, Lag= 21.0 min
 Primary = 1.53 cfs @ 12.49 hrs, Volume= 0.310 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 80.66' @ 12.49 hrs Surf.Area= 5,822 sf Storage= 3,670 cf

Plug-Flow detention time= 68.5 min calculated for 0.310 af (95% of inflow)
 Center-of-Mass det. time= 41.5 min (914.2 - 872.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	80.00'	37,994 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
80.00	5,262	277.0	0	0	5,262
82.00	7,037	314.7	12,256	12,256	7,133
84.00	9,096	357.0	16,089	28,345	9,492
85.00	10,213	377.4	9,649	37,994	10,739

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.50' S= 0.0200 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.53 cfs @ 12.49 hrs HW=80.66' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.53 cfs @ 2.77 fps)

Summary for Pond 12P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 3.00" for 2-YR STORM event
 Inflow = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.16' @ 24.00 hrs Surf.Area= 864 sf Storage= 749 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.99' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 14P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 3.00" for 2-YR STORM event
 Inflow = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.16' @ 24.00 hrs Surf.Area= 864 sf Storage= 749 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.99' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Summary for Pond 16P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 3.00" for 2-YR STORM event
 Inflow = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.16' @ 24.00 hrs Surf.Area= 864 sf Storage= 749 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.99' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 18P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 3.00" for 2-YR STORM event
 Inflow = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.16' @ 24.00 hrs Surf.Area= 864 sf Storage= 749 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.99' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 20P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 3.00" for 2-YR STORM event
 Inflow = 0.25 cfs @ 12.00 hrs, Volume= 0.017 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.16' @ 24.00 hrs Surf.Area= 864 sf Storage= 749 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
 Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.99' TW=0.00' (Dynamic Tailwater)

↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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Type III 24-hr 10-YR STORM Rainfall=4.91"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Subcatchment 10S	Runoff Area=541,688 sf 4.72% Impervious Runoff Depth>2.04" Flow Length=1,150' Tc=12.6 min CN=71 Runoff=23.40 cfs 2.117 af
Subcatchment 11S: Subcatchment 11S	Runoff Area=191,313 sf 13.95% Impervious Runoff Depth>2.05" Flow Length=736' Tc=8.5 min CN=71 Runoff=9.30 cfs 0.749 af
Subcatchment 12S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>4.67" Tc=0.0 min CN=98 Runoff=0.38 cfs 0.027 af
Subcatchment 13S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>4.67" Tc=0.0 min CN=98 Runoff=0.38 cfs 0.027 af
Subcatchment 15S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>4.67" Tc=0.0 min CN=98 Runoff=0.38 cfs 0.027 af
Subcatchment 17S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>4.67" Tc=0.0 min CN=98 Runoff=0.38 cfs 0.027 af
Subcatchment 19S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>4.67" Tc=0.0 min CN=98 Runoff=0.38 cfs 0.027 af
Subcatchment 20S: Subcatchment 20S	Runoff Area=242,179 sf 5.39% Impervious Runoff Depth>1.74" Flow Length=627' Tc=9.5 min CN=67 Runoff=9.55 cfs 0.805 af
Reach 1R: Analysis Point #1	Inflow=23.40 cfs 2.117 af Outflow=23.40 cfs 2.117 af
Reach 2R: Analysis Point #2	Inflow=12.46 cfs 1.530 af Outflow=12.46 cfs 1.530 af
Pond 1P: Pond 1P	Peak Elev=81.48' Storage=8,701 cf Inflow=9.30 cfs 0.749 af 12.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=3.74 cfs 0.725 af
Pond 12P: DRIP EDGE	Peak Elev=89.37' Storage=1,168 cf Inflow=0.38 cfs 0.027 af Outflow=0.00 cfs 0.000 af
Pond 14P: DRIP EDGE	Peak Elev=89.37' Storage=1,168 cf Inflow=0.38 cfs 0.027 af Outflow=0.00 cfs 0.000 af
Pond 16P: DRIP EDGE	Peak Elev=89.37' Storage=1,168 cf Inflow=0.38 cfs 0.027 af Outflow=0.00 cfs 0.000 af
Pond 18P: DRIP EDGE	Peak Elev=89.37' Storage=1,168 cf Inflow=0.38 cfs 0.027 af Outflow=0.00 cfs 0.000 af
Pond 20P: DRIP EDGE	Peak Elev=89.37' Storage=1,168 cf Inflow=0.38 cfs 0.027 af Outflow=0.00 cfs 0.000 af

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Type III 24-hr 10-YR STORM Rainfall=4.91"

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Total Runoff Area = 22.731 ac Runoff Volume = 3.805 af Average Runoff Depth = 2.01"
91.89% Pervious = 20.888 ac 8.11% Impervious = 1.844 ac

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Subcatchment 10S Runoff Area=541,688 sf 4.72% Impervious Runoff Depth>3.09"
 Flow Length=1,150' Tc=12.6 min CN=71 Runoff=35.85 cfs 3.198 af

Subcatchment 11S: Subcatchment 11S Runoff Area=191,313 sf 13.95% Impervious Runoff Depth>3.09"
 Flow Length=736' Tc=8.5 min CN=71 Runoff=14.37 cfs 1.130 af

Subcatchment 12S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>6.00"
 Tc=0.0 min CN=98 Runoff=0.48 cfs 0.034 af

Subcatchment 13S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>6.00"
 Tc=0.0 min CN=98 Runoff=0.48 cfs 0.034 af

Subcatchment 15S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>6.00"
 Tc=0.0 min CN=98 Runoff=0.48 cfs 0.034 af

Subcatchment 17S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>6.00"
 Tc=0.0 min CN=98 Runoff=0.48 cfs 0.034 af

Subcatchment 19S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>6.00"
 Tc=0.0 min CN=98 Runoff=0.48 cfs 0.034 af

Subcatchment 20S: Subcatchment 20S Runoff Area=242,179 sf 5.39% Impervious Runoff Depth>2.71"
 Flow Length=627' Tc=9.5 min CN=67 Runoff=15.28 cfs 1.254 af

Reach 1R: Analysis Point #1 Inflow=35.85 cfs 3.203 af
 Outflow=35.85 cfs 3.203 af

Reach 2R: Analysis Point #2 Inflow=19.28 cfs 2.365 af
 Outflow=19.28 cfs 2.365 af

Pond 1P: Pond 1P Peak Elev=82.25' Storage=14,030 cf Inflow=14.37 cfs 1.130 af
 12.0" Round Culvert n=0.013 L=25.0' S=0.0200 ' /' Outflow=5.00 cfs 1.103 af

Pond 12P: DRIP EDGE Peak Elev=90.00' Storage=1,391 cf Inflow=0.48 cfs 0.034 af
 Outflow=0.01 cfs 0.003 af

Pond 14P: DRIP EDGE Peak Elev=90.00' Storage=1,391 cf Inflow=0.48 cfs 0.034 af
 Outflow=0.01 cfs 0.003 af

Pond 16P: DRIP EDGE Peak Elev=90.00' Storage=1,391 cf Inflow=0.48 cfs 0.034 af
 Outflow=0.01 cfs 0.003 af

Pond 18P: DRIP EDGE Peak Elev=90.00' Storage=1,391 cf Inflow=0.48 cfs 0.034 af
 Outflow=0.01 cfs 0.003 af

Pond 20P: DRIP EDGE Peak Elev=90.00' Storage=1,391 cf Inflow=0.48 cfs 0.034 af
 Outflow=0.01 cfs 0.003 af

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Total Runoff Area = 22.731 ac Runoff Volume = 5.755 af Average Runoff Depth = 3.04"
91.89% Pervious = 20.888 ac 8.11% Impervious = 1.844 ac

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 35.85 cfs @ 12.18 hrs, Volume= 3.198 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
14,383	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
89,203	61	>75% Grass cover, Good, HSG B
279,787	74	>75% Grass cover, Good, HSG C
30,102	55	Woods, Good, HSG B
117,033	70	Woods, Good, HSG C
541,688	71	Weighted Average
516,125		95.28% Pervious Area
25,563		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 14.37 cfs @ 12.12 hrs, Volume= 1.130 af, Depth> 3.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
5,242	98	Roofs, HSG B
9,608	98	Paved roads w/curbs & sewers, HSG B
11,847	98	Paved roads w/curbs & sewers, HSG C
72,521	61	>75% Grass cover, Good, HSG B
63,353	74	>75% Grass cover, Good, HSG C
9,509	55	Woods, Good, HSG B
19,233	70	Woods, Good, HSG C
191,313	71	Weighted Average
164,616		86.05% Pervious Area
26,697		13.95% Impervious Area

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.0	120	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.5	211	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.5	355	0.0325	12.38	173.39	Trap/Vee/Rect Channel Flow, Bot.W=1.00' D=2.00' Z= 3.0 ' Top.W=13.00' n= 0.022 Earth, clean & straight
8.5	736	Total			

Summary for Subcatchment 12S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 13S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Summary for Subcatchment 15S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 17S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 19S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af, Depth> 6.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
2,500	98	Roofs, HSG B
500	98	Paved parking, HSG B
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Type III 24-hr 25-YR STORM Rainfall=6.24"

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Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 15.28 cfs @ 12.14 hrs, Volume= 1.254 af, Depth> 2.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR STORM Rainfall=6.24"

Area (sf)	CN	Description
3,685	98	Roofs, HSG B
3,571	98	Roofs, HSG C
3,976	98	Paved roads w/curbs & sewers, HSG B
1,820	98	Paved roads w/curbs & sewers, HSG C
72,016	61	>75% Grass cover, Good, HSG B
54,375	74	>75% Grass cover, Good, HSG C
37,550	55	Woods, Good, HSG B
65,186	70	Woods, Good, HSG C
242,179	67	Weighted Average
229,127		94.61% Pervious Area
13,052		5.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.97		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.1	33	0.1000	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	165	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.6	412	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	627	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 12.573 ac, 5.76% Impervious, Inflow Depth > 3.06" for 25-YR STORM event
 Inflow = 35.85 cfs @ 12.18 hrs, Volume= 3.203 af
 Outflow = 35.85 cfs @ 12.18 hrs, Volume= 3.203 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.158 ac, 11.02% Impervious, Inflow Depth > 2.79" for 25-YR STORM event
 Inflow = 19.28 cfs @ 12.15 hrs, Volume= 2.365 af
 Outflow = 19.28 cfs @ 12.15 hrs, Volume= 2.365 af, Atten= 0%, Lag= 0.0 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Pond 1P

Inflow Area = 4.392 ac, 13.95% Impervious, Inflow Depth > 3.09" for 25-YR STORM event
 Inflow = 14.37 cfs @ 12.12 hrs, Volume= 1.130 af
 Outflow = 5.00 cfs @ 12.47 hrs, Volume= 1.103 af, Atten= 65%, Lag= 21.0 min
 Primary = 5.00 cfs @ 12.47 hrs, Volume= 1.103 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 82.25' @ 12.47 hrs Surf.Area= 7,278 sf Storage= 14,030 cf

Plug-Flow detention time= 48.7 min calculated for 1.100 af (97% of inflow)
 Center-of-Mass det. time= 34.9 min (870.3 - 835.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	80.00'	37,994 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
80.00	5,262	277.0	0	0	5,262
82.00	7,037	314.7	12,256	12,256	7,133
84.00	9,096	357.0	16,089	28,345	9,492
85.00	10,213	377.4	9,649	37,994	10,739

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.00 cfs @ 12.47 hrs HW=82.25' TW=0.00' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 5.00 cfs @ 6.36 fps)

Summary for Pond 12P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 6.00" for 25-YR STORM event
 Inflow = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af
 Outflow = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af, Atten= 98%, Lag= 372.7 min
 Primary = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.00' @ 18.20 hrs Surf.Area= 864 sf Storage= 1,391 cf

Plug-Flow detention time= 940.6 min calculated for 0.003 af (7% of inflow)
 Center-of-Mass det. time= 507.6 min (1,246.6 - 739.0)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.01 cfs @ 18.21 hrs HW=90.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.06 fps)

Summary for Pond 14P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 6.00" for 25-YR STORM event
Inflow = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af
Outflow = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af, Atten= 98%, Lag= 372.7 min
Primary = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.00' @ 18.20 hrs Surf.Area= 864 sf Storage= 1,391 cf

Plug-Flow detention time= 940.6 min calculated for 0.003 af (7% of inflow)
Center-of-Mass det. time= 507.6 min (1,246.6 - 739.0)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.01 cfs @ 18.21 hrs HW=90.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.06 fps)

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Summary for Pond 16P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 6.00" for 25-YR STORM event
 Inflow = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af
 Outflow = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af, Atten= 98%, Lag= 372.7 min
 Primary = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.00' @ 18.20 hrs Surf.Area= 864 sf Storage= 1,391 cf

Plug-Flow detention time= 940.6 min calculated for 0.003 af (7% of inflow)
 Center-of-Mass det. time= 507.6 min (1,246.6 - 739.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices											
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
			2.50	3.00										
			Coef. (English)	2.69	2.72	2.75	2.85	2.98	3.08	3.20	3.28	3.31		
			3.30	3.31	3.32									

Primary OutFlow Max=0.01 cfs @ 18.21 hrs HW=90.00' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.06 fps)

Summary for Pond 18P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 6.00" for 25-YR STORM event
 Inflow = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af
 Outflow = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af, Atten= 98%, Lag= 372.7 min
 Primary = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.00' @ 18.20 hrs Surf.Area= 864 sf Storage= 1,391 cf

Plug-Flow detention time= 940.6 min calculated for 0.003 af (7% of inflow)
 Center-of-Mass det. time= 507.6 min (1,246.6 - 739.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)	

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Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.01 cfs @ 18.21 hrs HW=90.00' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.06 fps)

Summary for Pond 20P: DRIP EDGE

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 6.00" for 25-YR STORM event
Inflow = 0.48 cfs @ 12.00 hrs, Volume= 0.034 af
Outflow = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af, Atten= 98%, Lag= 372.7 min
Primary = 0.01 cfs @ 18.21 hrs, Volume= 0.003 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.00' @ 18.20 hrs Surf.Area= 864 sf Storage= 1,391 cf

Plug-Flow detention time= 940.6 min calculated for 0.003 af (7% of inflow)
Center-of-Mass det. time= 507.6 min (1,246.6 - 739.0)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.01 cfs @ 18.21 hrs HW=90.00' TW=0.00' (Dynamic Tailwater)

↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.01 cfs @ 0.06 fps)

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Type III 24-hr 50-YR STORM Rainfall=7.48"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Subcatchment 10S Runoff Area=541,688 sf 4.72% Impervious Runoff Depth>4.12"
 Flow Length=1,150' Tc=12.6 min CN=71 Runoff=48.04 cfs 4.271 af

Subcatchment 11S: Subcatchment 11S Runoff Area=191,313 sf 13.95% Impervious Runoff Depth>4.13"
 Flow Length=736' Tc=8.5 min CN=71 Runoff=19.25 cfs 1.510 af

Subcatchment 12S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>7.24"
 Tc=0.0 min CN=98 Runoff=0.58 cfs 0.042 af

Subcatchment 13S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>7.24"
 Tc=0.0 min CN=98 Runoff=0.58 cfs 0.042 af

Subcatchment 15S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>7.24"
 Tc=0.0 min CN=98 Runoff=0.58 cfs 0.042 af

Subcatchment 17S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>7.24"
 Tc=0.0 min CN=98 Runoff=0.58 cfs 0.042 af

Subcatchment 19S: PR HOUSE Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>7.24"
 Tc=0.0 min CN=98 Runoff=0.58 cfs 0.042 af

Subcatchment 20S: Subcatchment 20S Runoff Area=242,179 sf 5.39% Impervious Runoff Depth>3.69"
 Flow Length=627' Tc=9.5 min CN=67 Runoff=21.00 cfs 1.708 af

Reach 1R: Analysis Point #1 Inflow=48.04 cfs 4.290 af
 Outflow=48.04 cfs 4.290 af

Reach 2R: Analysis Point #2 Inflow=25.81 cfs 3.216 af
 Outflow=25.81 cfs 3.216 af

Pond 1P: Pond 1P Peak Elev=82.99' Storage=19,722 cf Inflow=19.25 cfs 1.510 af
 12.0" Round Culvert n=0.013 L=25.0' S=0.0200 '/' Outflow=5.97 cfs 1.479 af

Pond 12P: DRIP EDGE Peak Elev=90.00' Storage=1,392 cf Inflow=0.58 cfs 0.042 af
 Outflow=0.04 cfs 0.010 af

Pond 14P: DRIP EDGE Peak Elev=90.00' Storage=1,392 cf Inflow=0.58 cfs 0.042 af
 Outflow=0.04 cfs 0.010 af

Pond 16P: DRIP EDGE Peak Elev=90.00' Storage=1,392 cf Inflow=0.58 cfs 0.042 af
 Outflow=0.04 cfs 0.010 af

Pond 18P: DRIP EDGE Peak Elev=90.00' Storage=1,392 cf Inflow=0.58 cfs 0.042 af
 Outflow=0.04 cfs 0.010 af

Pond 20P: DRIP EDGE Peak Elev=90.00' Storage=1,392 cf Inflow=0.58 cfs 0.042 af
 Outflow=0.04 cfs 0.010 af

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Total Runoff Area = 22.731 ac Runoff Volume = 7.697 af Average Runoff Depth = 4.06"
91.89% Pervious = 20.888 ac 8.11% Impervious = 1.844 ac

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Type III 24-hr 100-YR STORM Rainfall=8.97"

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Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 10S: Subcatchment 10S	Runoff Area=541,688 sf 4.72% Impervious Runoff Depth>5.42" Flow Length=1,150' Tc=12.6 min CN=71 Runoff=63.49 cfs 5.617 af
Subcatchment 11S: Subcatchment 11S	Runoff Area=191,313 sf 13.95% Impervious Runoff Depth>5.42" Flow Length=736' Tc=8.5 min CN=71 Runoff=25.28 cfs 1.985 af
Subcatchment 12S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>8.73" Tc=0.0 min CN=98 Runoff=0.69 cfs 0.050 af
Subcatchment 13S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>8.73" Tc=0.0 min CN=98 Runoff=0.69 cfs 0.050 af
Subcatchment 15S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>8.73" Tc=0.0 min CN=98 Runoff=0.69 cfs 0.050 af
Subcatchment 17S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>8.73" Tc=0.0 min CN=98 Runoff=0.69 cfs 0.050 af
Subcatchment 19S: PR HOUSE	Runoff Area=3,000 sf 100.00% Impervious Runoff Depth>8.73" Tc=0.0 min CN=98 Runoff=0.69 cfs 0.050 af
Subcatchment 20S: Subcatchment 20S	Runoff Area=242,179 sf 5.39% Impervious Runoff Depth>4.93" Flow Length=627' Tc=9.5 min CN=67 Runoff=28.15 cfs 2.284 af
Reach 1R: Analysis Point #1	Inflow=63.49 cfs 5.653 af Outflow=63.49 cfs 5.653 af
Reach 2R: Analysis Point #2	Inflow=33.78 cfs 4.289 af Outflow=33.78 cfs 4.289 af
Pond 1P: Pond 1P	Peak Elev=83.88' Storage=27,275 cf Inflow=25.28 cfs 1.985 af 12.0" Round Culvert n=0.013 L=25.0' S=0.0200 ' Outflow=6.95 cfs 1.950 af
Pond 12P: DRIP EDGE	Peak Elev=90.01' Storage=1,396 cf Inflow=0.69 cfs 0.050 af Outflow=0.28 cfs 0.018 af
Pond 14P: DRIP EDGE	Peak Elev=90.01' Storage=1,396 cf Inflow=0.69 cfs 0.050 af Outflow=0.28 cfs 0.018 af
Pond 16P: DRIP EDGE	Peak Elev=90.01' Storage=1,396 cf Inflow=0.69 cfs 0.050 af Outflow=0.28 cfs 0.018 af
Pond 18P: DRIP EDGE	Peak Elev=90.01' Storage=1,396 cf Inflow=0.69 cfs 0.050 af Outflow=0.28 cfs 0.018 af
Pond 20P: DRIP EDGE	Peak Elev=90.01' Storage=1,396 cf Inflow=0.69 cfs 0.050 af Outflow=0.28 cfs 0.018 af

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Total Runoff Area = 22.731 ac Runoff Volume = 10.137 af Average Runoff Depth = 5.35"
91.89% Pervious = 20.888 ac 8.11% Impervious = 1.844 ac

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Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 63.49 cfs @ 12.17 hrs, Volume= 5.617 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
3,413	98	Roofs, HSG B
14,383	98	Roofs, HSG C
7,767	98	Paved roads w/curbs & sewers, HSG C
89,203	61	>75% Grass cover, Good, HSG B
279,787	74	>75% Grass cover, Good, HSG C
30,102	55	Woods, Good, HSG B
117,033	70	Woods, Good, HSG C
541,688	71	Weighted Average
516,125		95.28% Pervious Area
25,563		4.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	10	0.0200	0.87		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.7	40	0.0800	0.25		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.3	155	0.0250	1.11		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
5.1	550	0.0650	1.78		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.3	395	0.0350	2.81		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
12.6	1,150	Total			

Summary for Subcatchment 11S: Subcatchment 11S

Runoff = 25.28 cfs @ 12.12 hrs, Volume= 1.985 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
5,242	98	Roofs, HSG B
9,608	98	Paved roads w/curbs & sewers, HSG B
11,847	98	Paved roads w/curbs & sewers, HSG C
72,521	61	>75% Grass cover, Good, HSG B
63,353	74	>75% Grass cover, Good, HSG C
9,509	55	Woods, Good, HSG B
19,233	70	Woods, Good, HSG C
191,313	71	Weighted Average
164,616		86.05% Pervious Area
26,697		13.95% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	13	0.0200	0.92		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
3.3	37	0.0400	0.18		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.0	120	0.0400	1.00		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.5	211	0.0400	1.40		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.5	355	0.0325	12.38	173.39	Trap/Vee/Rect Channel Flow, Bot.W=1.00' D=2.00' Z= 3.0 ' Top.W=13.00' n= 0.022 Earth, clean & straight
8.5	736	Total			

Summary for Subcatchment 12S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 8.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 13S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 8.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Summary for Subcatchment 15S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 8.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 17S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 8.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
2,500	98	Roofs, HSG C
500	98	Paved parking, HSG C
3,000	98	Weighted Average
3,000		100.00% Impervious Area

Summary for Subcatchment 19S: PR HOUSE

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af, Depth> 8.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
2,500	98	Roofs, HSG B
500	98	Paved parking, HSG B
3,000	98	Weighted Average
3,000		100.00% Impervious Area

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Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 28.15 cfs @ 12.14 hrs, Volume= 2.284 af, Depth> 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YR STORM Rainfall=8.97"

Area (sf)	CN	Description
3,685	98	Roofs, HSG B
3,571	98	Roofs, HSG C
3,976	98	Paved roads w/curbs & sewers, HSG B
1,820	98	Paved roads w/curbs & sewers, HSG C
72,016	61	>75% Grass cover, Good, HSG B
54,375	74	>75% Grass cover, Good, HSG C
37,550	55	Woods, Good, HSG B
65,186	70	Woods, Good, HSG C
242,179	67	Weighted Average
229,127		94.61% Pervious Area
13,052		5.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	0.97		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.23"
2.1	33	0.1000	0.26		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
2.5	165	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
4.6	412	0.0900	1.50		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.5	627	Total			

Summary for Reach 1R: Analysis Point #1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 12.573 ac, 5.76% Impervious, Inflow Depth > 5.40" for 100-YR STORM event
 Inflow = 63.49 cfs @ 12.17 hrs, Volume= 5.653 af
 Outflow = 63.49 cfs @ 12.17 hrs, Volume= 5.653 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Analysis Point #2

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 10.158 ac, 11.02% Impervious, Inflow Depth > 5.07" for 100-YR STORM event
 Inflow = 33.78 cfs @ 12.14 hrs, Volume= 4.289 af
 Outflow = 33.78 cfs @ 12.14 hrs, Volume= 4.289 af, Atten= 0%, Lag= 0.0 min

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Pond 1P

Inflow Area = 4.392 ac, 13.95% Impervious, Inflow Depth > 5.42" for 100-YR STORM event
 Inflow = 25.28 cfs @ 12.12 hrs, Volume= 1.985 af
 Outflow = 6.95 cfs @ 12.52 hrs, Volume= 1.950 af, Atten= 72%, Lag= 24.0 min
 Primary = 6.95 cfs @ 12.52 hrs, Volume= 1.950 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.88' @ 12.52 hrs Surf.Area= 8,967 sf Storage= 27,275 cf

Plug-Flow detention time= 51.7 min calculated for 1.946 af (98% of inflow)
 Center-of-Mass det. time= 41.4 min (860.7 - 819.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	80.00'	37,994 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
80.00	5,262	277.0	0	0	5,262
82.00	7,037	314.7	12,256	12,256	7,133
84.00	9,096	357.0	16,089	28,345	9,492
85.00	10,213	377.4	9,649	37,994	10,739

Device	Routing	Invert	Outlet Devices
#1	Primary	80.00'	12.0" Round Culvert L= 25.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 79.50' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.95 cfs @ 12.52 hrs HW=83.88' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 6.95 cfs @ 8.85 fps)

Summary for Pond 12P: DRIP EDGE

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 8.73" for 100-YR STORM event
 Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af
 Outflow = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af, Atten= 59%, Lag= 18.3 min
 Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.01' @ 12.30 hrs Surf.Area= 864 sf Storage= 1,396 cf

Plug-Flow detention time= 367.4 min calculated for 0.018 af (36% of inflow)
 Center-of-Mass det. time= 189.2 min (923.5 - 734.3)

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Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.26 cfs @ 12.30 hrs HW=90.01' TW=0.00' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 0.26 cfs @ 0.20 fps)

Summary for Pond 14P: DRIP EDGE

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 8.73" for 100-YR STORM event
 Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af
 Outflow = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af, Atten= 59%, Lag= 18.3 min
 Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.01' @ 12.30 hrs Surf.Area= 864 sf Storage= 1,396 cf

Plug-Flow detention time= 367.4 min calculated for 0.018 af (36% of inflow)
 Center-of-Mass det. time= 189.2 min (923.5 - 734.3)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00

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Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31
3.30 3.31 3.32

Primary OutFlow Max=0.26 cfs @ 12.30 hrs HW=90.01' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.20 fps)**Summary for Pond 16P: DRIP EDGE**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 8.73" for 100-YR STORM event
Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af
Outflow = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af, Atten= 59%, Lag= 18.3 min
Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 90.01' @ 12.30 hrs Surf.Area= 864 sf Storage= 1,396 cf

Plug-Flow detention time= 367.4 min calculated for 0.018 af (36% of inflow)
Center-of-Mass det. time= 189.2 min (923.5 - 734.3)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.26 cfs @ 12.30 hrs HW=90.01' TW=0.00' (Dynamic Tailwater)↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.20 fps)**Summary for Pond 18P: DRIP EDGE**

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 8.73" for 100-YR STORM event
Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af
Outflow = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af, Atten= 59%, Lag= 18.3 min
Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af

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Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.01' @ 12.30 hrs Surf.Area= 864 sf Storage= 1,396 cf

Plug-Flow detention time= 367.4 min calculated for 0.018 af (36% of inflow)
 Center-of-Mass det. time= 189.2 min (923.5 - 734.3)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823

Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.26 cfs @ 12.30 hrs HW=90.01' TW=0.00' (Dynamic Tailwater)
 1=Broad-Crested Rectangular Weir (Weir Controls 0.26 cfs @ 0.20 fps)

Summary for Pond 20P: DRIP EDGE

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=3)

Inflow Area = 0.069 ac, 100.00% Impervious, Inflow Depth > 8.73" for 100-YR STORM event
 Inflow = 0.69 cfs @ 12.00 hrs, Volume= 0.050 af
 Outflow = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af, Atten= 59%, Lag= 18.3 min
 Primary = 0.28 cfs @ 12.30 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 90.01' @ 12.30 hrs Surf.Area= 864 sf Storage= 1,396 cf

Plug-Flow detention time= 367.4 min calculated for 0.018 af (36% of inflow)
 Center-of-Mass det. time= 189.2 min (923.5 - 734.3)

Volume	Invert	Avail.Storage	Storage Description
#1	85.99'	1,823 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.99	864	0.0	0	0
86.00	864	40.0	3	3
89.99	864	40.0	1,379	1,382
90.00	864	100.0	9	1,391
90.50	864	100.0	432	1,823


Device	Routing	Invert	Outlet Devices
#1	Primary	90.00'	230.0' long x 1.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.26 cfs @ 12.30 hrs HW=90.01' TW=0.00' (Dynamic Tailwater)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.20 fps)

APPENDIX III

Charts, Graphs, and Calculations

Select Product ?	Select Location ? <i>Double-click the map to place a marker, or enter address or latitude/longitude.</i>										
Extreme Precipitation Tables - HTML ?	<table border="1"><thead><tr><th>Locate by Address ?</th><th>Locate by Lat/Lon ?</th><th>Locate by State/County ?</th></tr></thead><tbody><tr><td><input type="text"/></td><td><input type="text"/>°N <input type="text"/>°W</td><td><input type="text"/></td></tr></tbody></table>	Locate by Address ?	Locate by Lat/Lon ?	Locate by State/County ?	<input type="text"/>	<input type="text"/> °N <input type="text"/> °W	<input type="text"/>				
Locate by Address ?	Locate by Lat/Lon ?	Locate by State/County ?									
<input type="text"/>	<input type="text"/> °N <input type="text"/> °W	<input type="text"/>									
Extreme Precipitation Tables - Text/CSV ?											
Partial Duration Series - by Point ?											
Partial Duration Series - by Station ?											
Distribution Curves - Graphical ?											
Distribution Curves - Text/TBL ?											
Intensity Frequency Duration Graphs ?											
Precipitation Frequency Duration Graphs ?											
GIS Data Files ?											
Regional/State Maps ?											
	<table border="1"><thead><tr><th>Select Options ?</th></tr></thead><tbody><tr><td><table border="1"><thead><tr><th>Smoothing ?</th></tr></thead><tbody><tr><td><input type="text" value="Yes"/></td></tr></tbody></table></td><td><table border="1"><thead><tr><th>Delivery ?</th></tr></thead><tbody><tr><td><input type="text" value="Popup"/></td></tr></tbody></table></td></tr><tr><td colspan="2"><table border="1"><tr><td>Submit ?</td></tr></table></td></tr></tbody></table>	Select Options ?	<table border="1"><thead><tr><th>Smoothing ?</th></tr></thead><tbody><tr><td><input type="text" value="Yes"/></td></tr></tbody></table>	Smoothing ?	<input type="text" value="Yes"/>	<table border="1"><thead><tr><th>Delivery ?</th></tr></thead><tbody><tr><td><input type="text" value="Popup"/></td></tr></tbody></table>	Delivery ?	<input type="text" value="Popup"/>	<table border="1"><tr><td>Submit ?</td></tr></table>		Submit ?
Select Options ?											
<table border="1"><thead><tr><th>Smoothing ?</th></tr></thead><tbody><tr><td><input type="text" value="Yes"/></td></tr></tbody></table>	Smoothing ?	<input type="text" value="Yes"/>	<table border="1"><thead><tr><th>Delivery ?</th></tr></thead><tbody><tr><td><input type="text" value="Popup"/></td></tr></tbody></table>	Delivery ?	<input type="text" value="Popup"/>						
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Submit ?											

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.870 degrees West
Latitude	43.024 degrees North
Elevation	0 feet
Date/Time	Tue, 27 Jun 2017 15:12:58 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.66	0.82	1.04	1yr	0.71	0.99	1.22	1.57	2.04	2.68	2.93	1yr	2.38	2.82	3.23	3.95	4.57	1yr
2yr	0.32	0.50	0.62	0.81	1.02	1.30	2yr	0.88	1.18	1.52	1.94	2.50	3.23	3.59	2yr	2.86	3.45	3.96	4.70	5.35	2yr
5yr	0.37	0.58	0.73	0.97	1.25	1.61	5yr	1.08	1.46	1.89	2.44	3.16	4.10	4.61	5yr	3.63	4.43	5.07	5.98	6.75	5yr
10yr	0.41	0.65	0.82	1.11	1.45	1.89	10yr	1.25	1.72	2.23	2.90	3.77	4.91	5.57	10yr	4.35	5.36	6.12	7.17	8.05	10yr
25yr	0.48	0.76	0.97	1.33	1.77	2.34	25yr	1.53	2.14	2.78	3.65	4.77	6.24	7.16	25yr	5.52	6.89	7.85	9.13	10.17	25yr
50yr	0.54	0.86	1.10	1.54	2.07	2.76	50yr	1.79	2.52	3.29	4.34	5.71	7.48	8.67	50yr	6.62	8.33	9.49	10.96	12.14	50yr
100yr	0.59	0.96	1.24	1.77	2.42	3.26	100yr	2.08	2.97	3.91	5.19	6.83	8.97	10.49	100yr	7.94	10.09	11.46	13.16	14.50	100yr
200yr	0.67	1.10	1.42	2.04	2.82	3.84	200yr	2.44	3.51	4.63	6.17	8.16	10.77	12.70	200yr	9.53	12.21	13.85	15.82	17.33	200yr
500yr	0.80	1.31	1.71	2.48	3.47	4.77	500yr	3.00	4.38	5.78	7.76	10.33	13.70	16.35	500yr	12.12	15.72	17.81	20.18	21.94	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	1yr	0.63	0.87	0.92	1.30	1.62	2.22	2.62	1yr	1.96	2.52	2.89	3.20	3.92	1yr
2yr	0.32	0.49	0.60	0.81	1.00	1.19	2yr	0.87	1.16	1.37	1.82	2.34	3.08	3.50	2yr	2.73	3.37	3.86	4.59	5.10	2yr
5yr	0.35	0.54	0.68	0.93	1.18	1.41	5yr	1.02	1.38	1.62	2.13	2.74	3.85	4.29	5yr	3.41	4.13	4.77	5.64	6.36	5yr
10yr	0.39	0.60	0.74	1.04	1.34	1.61	10yr	1.16	1.58	1.82	2.40	3.08	4.45	5.01	10yr	3.94	4.82	5.59	6.57	7.36	10yr
25yr	0.45	0.68	0.85	1.21	1.59	1.92	25yr	1.37	1.88	2.11	2.78	3.57	4.76	6.14	25yr	4.21	5.90	6.90	8.06	8.94	25yr
50yr	0.49	0.75	0.94	1.35	1.81	2.20	50yr	1.56	2.15	2.36	3.11	3.99	5.38	7.15	50yr	4.76	6.87	8.10	9.41	10.35	50yr
100yr	0.55	0.84	1.05	1.52	2.08	2.52	100yr	1.80	2.46	2.64	3.46	4.44	6.05	8.32	100yr	5.35	8.00	9.53	10.99	11.97	100yr
200yr	0.62	0.93	1.18	1.71	2.38	2.88	200yr	2.05	2.81	2.95	3.84	4.92	6.78	9.69	200yr	6.00	9.32	11.22	12.84	13.88	200yr
500yr	0.72	1.08	1.39	2.01	2.87	3.46	500yr	2.47	3.38	3.44	4.40	5.67	7.88	11.86	500yr	6.98	11.40	13.94	15.80	16.82	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	1yr	0.77	1.06	1.26	1.74	2.20	3.02	3.11	1yr	2.67	2.99	3.62	4.37	5.09	1yr
2yr	0.33	0.51	0.63	0.86	1.06	1.26	2yr	0.91	1.24	1.48	1.95	2.50	3.45	3.68	2yr	3.05	3.54	4.06	4.83	5.68	2yr
5yr	0.40	0.62	0.76	1.05	1.33	1.61	5yr	1.15	1.58	1.87	2.51	3.21	4.36	4.91	5yr	3.86	4.72	5.38	6.33	7.13	5yr
10yr	0.47	0.72	0.89	1.24	1.61	1.97	10yr	1.39	1.92	2.26	3.07	3.88	5.37	6.11	10yr	4.76	5.88	6.68	7.79	8.69	10yr
25yr	0.57	0.87	1.08	1.55	2.04	2.55	25yr	1.76	2.49	2.92	4.01	5.02	7.84	8.17	25yr	6.94	7.86	8.86	10.26	11.34	25yr
50yr	0.67	1.01	1.26	1.81	2.44	3.10	50yr	2.11	3.03	3.55	4.90	6.12	9.82	10.19	50yr	8.69	9.80	10.99	12.62	13.86	50yr
100yr	0.78	1.18	1.48	2.14	2.93	3.76	100yr	2.53	3.68	4.31	6.02	7.47	12.30	12.71	100yr	10.89	12.22	13.61	15.55	16.96	100yr
200yr	0.91	1.37	1.74	2.52	3.51	4.59	200yr	3.03	4.49	5.25	7.39	9.11	15.44	15.87	200yr	13.67	15.26	16.87	19.15	20.77	200yr
500yr	1.12	1.67	2.15	3.13	4.45	5.94	500yr	3.84	5.81	6.80	9.73	11.88	20.88	21.28	500yr	18.48	20.46	22.39	25.24	27.16	500yr

RIP RAP CALCULATIONS
Sullivan Property - Rural Residential Zone
High Street
Stratham, NH

Jones & Beach Engineers, Inc.
P.O. Box 219
Stratham, NH 03885
29-Jun-17

Rip Rap equations were obtained from the *Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire*.
Aprons are sized for the 25-Year storm event.

TAILWATER < HALF THE D_o

$$L_a = (1.8 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = L_a + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T _w	Discharge (C.F.S.) Q	Diameter of Pipe D _o	Length of Rip Rap L _a (feet)	Width of Rip Rap W (feet)	d ₅₀ -Median Stone Rip Rap d50 (feet)
				#DIV/0!	#DIV/0!	#DIV/0!

TAILWATER > HALF THE D_o

$$L_a = (3.0 \times Q) / D_o^{3/2} + (7 \times D_o)$$

$$W = (0.4 \times L_a) + (3 \times D_o) \text{ or defined channel width}$$

$$d_{50} = (0.02 \times Q^{4/3}) / (T_w \times D_o)$$

Culvert or Catch Basin (Sta. No.)	Tailwater (Feet) T _w	Discharge (C.F.S.) Q	Diameter of Pipe D _o	Length of Rip Rap L _a (feet)	Width of Rip Rap W (feet)	d ₅₀ -Median Stone Rip Rap d50 (feet)
12" ADS (Pond #1)	0.76	4.69	1	21.1	11	0.21

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d ₅₀ Size =	0.25	Feet	3	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d ₅₀ Size		From		To
100%		5		6
85%		4		5
50%		3		5
15%		1		2

Table 7-24 -- Recommended Rip Rap Gradation Ranges				
d ₅₀ Size =	0.5	Feet	6	Inches
% of Weight Smaller	Size of Stone (Inches)			
Than the Given d ₅₀ Size		From		To
100%		9		12
85%		8		11
50%		6		9
15%		2		3

Michael Kerivan

From: Jonathan Ring
Sent: Monday, February 06, 2017 10:54 AM
To: Katelyn Joyal
Cc: Lynn Zebrowski; Paige Libbey; Patrick Bogle
Subject: JBE 13070.1: Sullivan HISS, High Street, Stratham
Attachments: Scanned image_copier@sbmweb.com_20170131_114946_0000f12e81b0.pdf

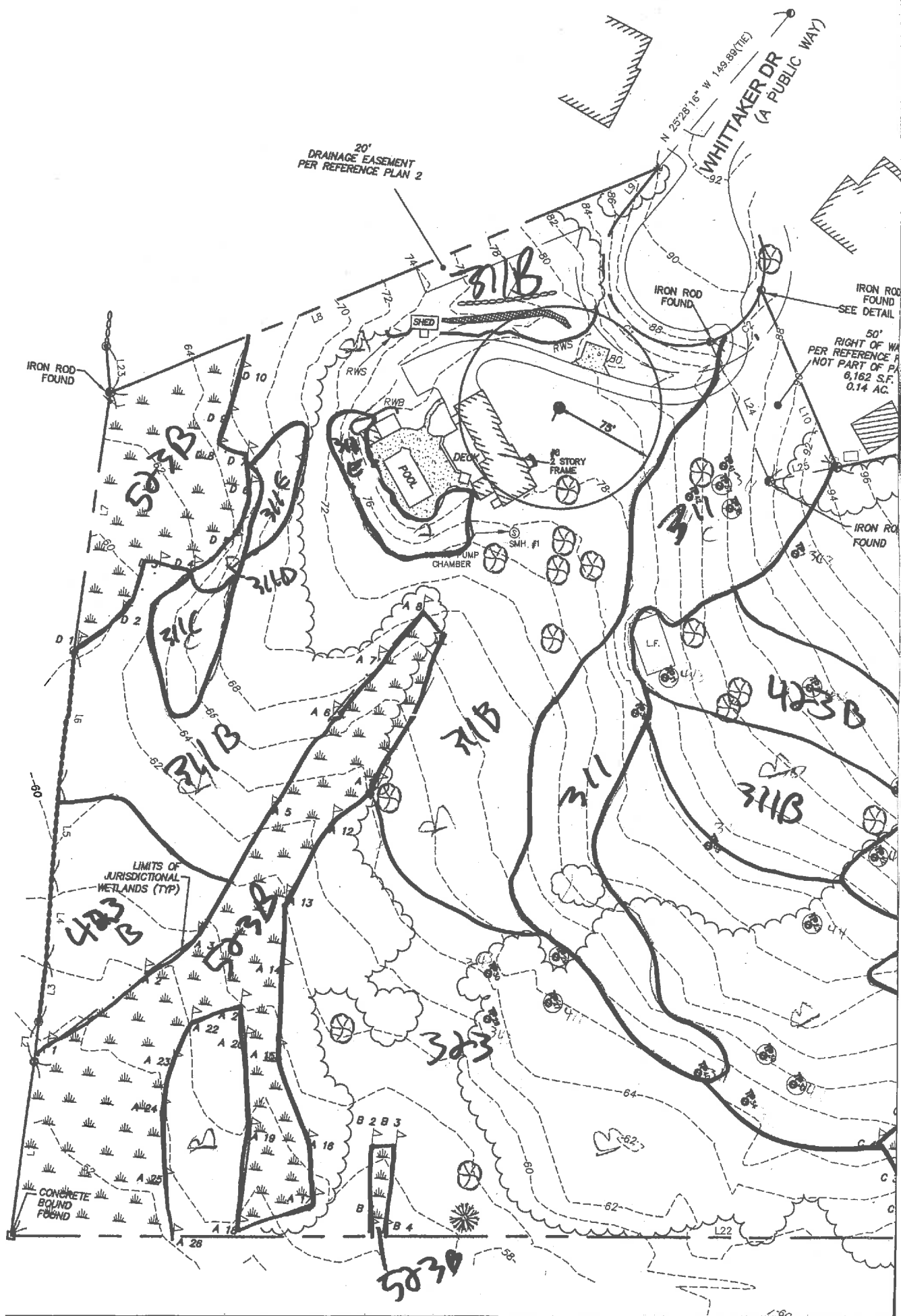
Kate - p/f/s/t. Jon

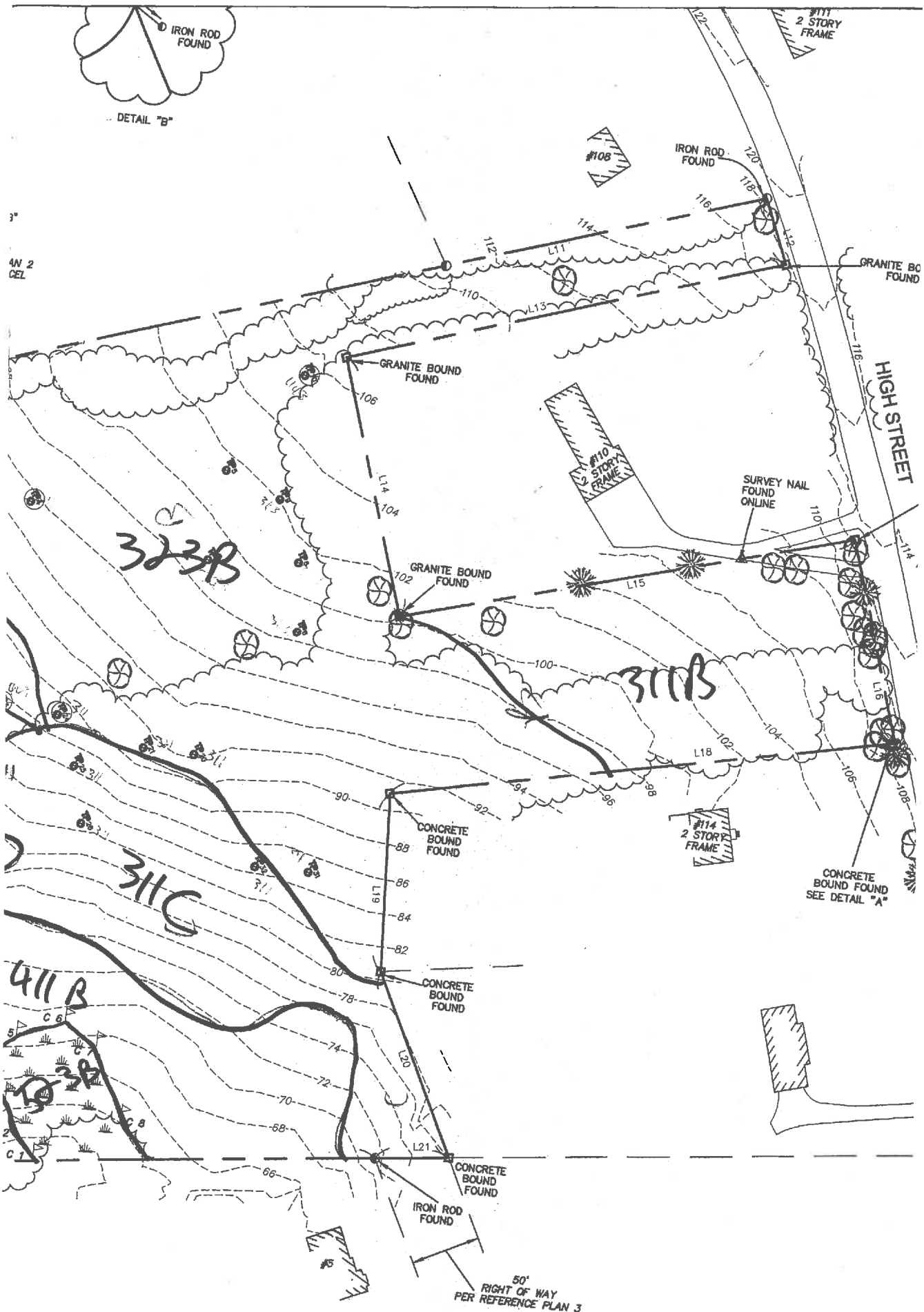
-----Original Message-----

From: Luke Hurley [<mailto:lhurley@gesinc.biz>]
Sent: Tuesday, January 31, 2017 11:07 AM
To: Jonathan Ring
Subject: RE: Sullivan HISS

Here is the soil map. Please note when you mark it up to change the 323 to 343:

HISS	SSSM
311	313 Deerfield HSG B
343	38 Eldridge HSG C
443	943 Eldridge Variant HSG C
523	656 Ridgebury HSG C





Soil Map—Rockingham County, New Hampshire







































Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/27/2017
Page 1 of 3

MAP LEGEND

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

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 18, Sep 15, 2016

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

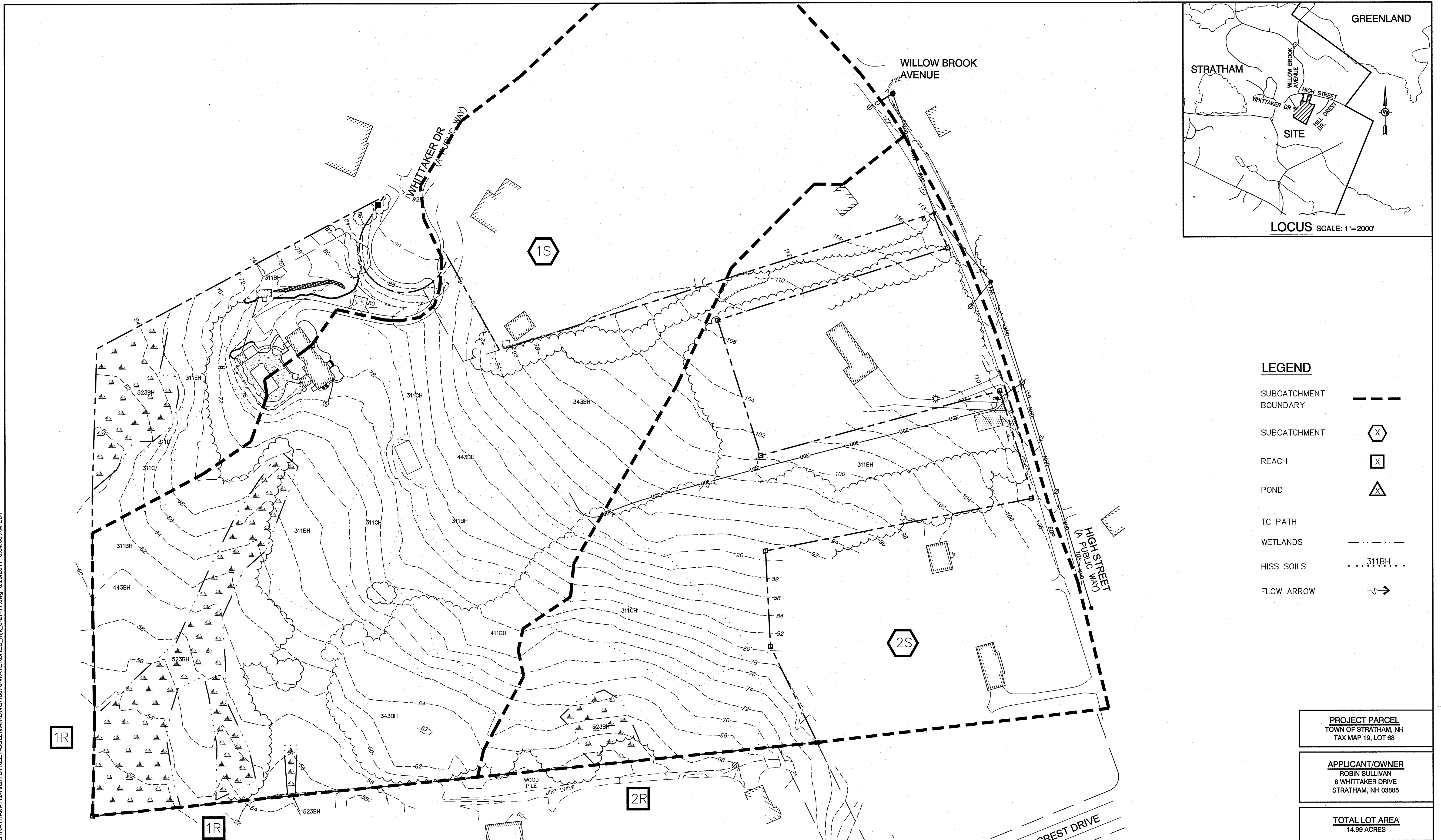
Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

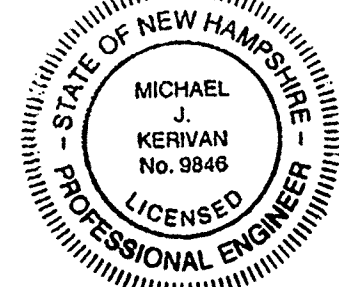
Map Unit Legend

Rockingham County, New Hampshire (NH015)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26B	Windsor loamy sand, 3 to 8 percent slopes	5.4	18.3%
29B	Woodbridge fine sandy loam, 3 to 8 percent slopes	10.8	36.4%
32B	Boxford silt loam, 3 to 8 percent slopes	3.4	11.5%
38A	Eldridge fine sandy loam, 0 to 3 percent slopes	4.2	14.0%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	5.8	19.6%
Totals for Area of Interest		29.6	100.0%

F:\Land Projects\3113070-STRATHAM-112-HIGH STREET-SULLIVAN\DWG\13070-WATERSHED_mjk_6-27-17.dwg 6/29/2017 8:34:03 AM EDT



Design: JSR Draft: PLB Date: 6/26/13
Checked: JSR Scale: 1" = 60' Project No.: 13070
Drawing Name: 13070-WATERSHED.dwg
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM JONES & BEACH ENGINEERS, INC. (JBE). ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO JBE.



0	6/29/17	ISSUED FOR REVIEW	MJK
REV.	DATE	REVISION	BY

J/B Jones & Beach Engineers, Inc.
Civil Engineering Services
85 Portsmouth Ave. PO Box 219 Stratham, NH 03885
603-772-4746 FAX: 603-772-0227 E-MAIL: JBE@JONESANDBEACH.COM

Plan Name: **EXISTING WATERSHED PLAN**
Project: **112 HIGH STREET STRATHAM, NH 03885**
Owner of Record: **ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885**

DRAWING No. **W1**
SHEET 1 OF 2
JBE PROJECT NO. 13070

LEGEND
SUBCATCHMENT BOUNDARY ---
SUBCATCHMENT (X)
REACH (X)
POND (X)
TC PATH ---
WETLANDS ---
HISS SOILS ... 311BH ...
FLOW ARROW -->

PROJECT PARCEL
TOWN OF STRATHAM, NH
TAX MAP 19, LOT 68
APPLICANT/OWNER
ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885
TOTAL LOT AREA
14.99 ACRES

