

JONES & BEACH ENGINEERS INC.

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

August 16, 2017

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

**RE: Response Letter
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 revisions to the 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 1,134 L.F. of roadway and cul-de-sac from High Street. This project will be serviced with on-site wells and septic systems. We have sent plans and calculations to Civil Works for engineering review. We ask to postpone the next Public Hearing from September 6 to September 20.

The following changes have been made to the plans:

1. The road hammerhead layout has been revised to a 16' wide cul-de-sac, with new driveway locations. The Waiver Request is revised.
2. The detention pond and grading have been revised. The cul-de-sac is sloped to the center.
3. The Brockelbank shed is shown.
4. Note 22 was added to Sheet C2 indicating that the proposed Rain Gardens are to be constructed on each house lot (not for the road). Sample language to be placed in the deed for each lot is attached:

The Town of Stratham Planning Board approval requires an individual rain garden as shown on the herein referenced plan be constructed, owned, and maintained on each lot in accordance with best management practices as set forth by NH DES, which shall be constructed in accordance with Detail Sheet D2. Said individual rain garden shall be a minimum of 1,000 square feet with a 6" deep ponding area.

5. Soil Based Lot Size calculations are provided, therefore that Waiver Request is withdrawn.
6. Our wetland scientist has reevaluated the site, due to concern raised from the abutter in a thickly wooded area.

7. The required sight distance is shown on Sheet C2.

The following items are as revised:

1. Postponement Letter.
2. One (1) revised Waiver Request Form.
3. Soil Based Lot Sizing Calculations.
4. Three (3) bound copies of the revised drainage analysis.
5. Nine (9) complete reduced-size (11"x17") plan sets.
6. 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.

Jonathan S. Ring, P.E.
President

JSR

cc: Robin Sullivan (via email)

Paul Connolly, Civil Works (via email, including application)

JONES & BEACH ENGINEERS INC.

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

August 16, 2017

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



**RE: Planning Board Postponement Letter
112 High Street, Stratham, NH
Tax Map 19, Lot 68
JBE Project No. 13070.1**

Dear Board Members:

On behalf of our client, Robin Sullivan, Jones & Beach Engineers, Inc. respectfully requests a continuance of the pending application for the above-referenced parcel from the September 6th hearing to the September 20th meeting. We also grant a 30-day extension to the 65-day approval clock.

Please contact me if you have any questions. Thank you very much for your time.

Very truly yours,
JONES & BEACH ENGINEERS, INC.


Jonathan S. Ring, PE
President 

cc: Robin Sullivan

J/B		LOT SIZE BY SOIL CLASSIFICATION			J/B
Sullivan Subdivision Robin Sullivan 112 High Street Stratham, NH 03885 JBE PROJECT NO. 13070			JONES & BEACH ENGINEERS INC. 85 PORTSMOUTH AVENUE P.O. BOX 219 STRATHAM, NH 03885 August 16, 2017		
SOIL TYPE	HISS SOIL GROUP	SLOPE CATEGORY	TOWN REGULATION	SOIL AREA	WEIGHTED LOADING FACTOR
LOT 1					
311CH	3	C	60,500	2,018	0.03
343BH	3	B	54,500	85,246	1.56
TOTAL				87,264	1.60
SOIL TYPE	HISS SOIL GROUP	SLOPE CATEGORY	TOWN REGULATION	SOIL AREA	WEIGHTED LOADING FACTOR
LOT 2					
311BH	3	B	54,500	47,432	0.87
311CH	3	C	60,500	15,959	0.26
343BH	3	B	54,500	5,434	0.10
411BH	4	B	77,000	1,697	0.02
443BH	4	B	77,000	14,514	0.19
543BH	5	B	106,000	9,061	0.09
TOTAL				94,097	1.53
SOIL TYPE	HISS SOIL GROUP	SLOPE CATEGORY	TOWN REGULATION	SOIL AREA	WEIGHTED LOADING FACTOR
LOT 3					
311BH	3	B	54,500	6,466	0.12
311CH	3	C	60,500	9,601	0.16
343BH	3	B	54,500	37,345	0.69
411BH	4	B	77,000	12,575	0.16
443BH	4	B	77,000	11,111	0.14
543BH	5	B	106,000	21,417	0.20
TOTAL				98,515	1.47

SOIL TYPE	HISS SOIL GROUP	SLOPE CATEGORY	TOWN REGULATION	SOIL AREA	WEIGHTED LOADING FACTOR
LOT 4					
311CH	3	C	60,500	6,405	0.11
343BH	3	B	54,500	50,679	0.93
411BH	4	B	77,000	19,246	0.25
511BH	5	B	106,000	495	0.00
543BH	5	B	106,000	18,067	0.17
TOTAL				94,892	1.46
SOIL TYPE	HISS SOIL GROUP	SLOPE CATEGORY	TOWN REGULATION	SOIL AREA	WEIGHTED LOADING FACTOR
LOT 5					
311BH	3	B	54,500	18,264	0.34
311CH	3	C	60,500	26,117	0.43
343BH	3	B	54,500	26,440	0.49
411BH	4	B	77,000	14,003	0.18
511BH	5	B	106,000	3,443	0.03
543BH	5	B	106,000	325	0.00
TOTAL				88,592	1.47

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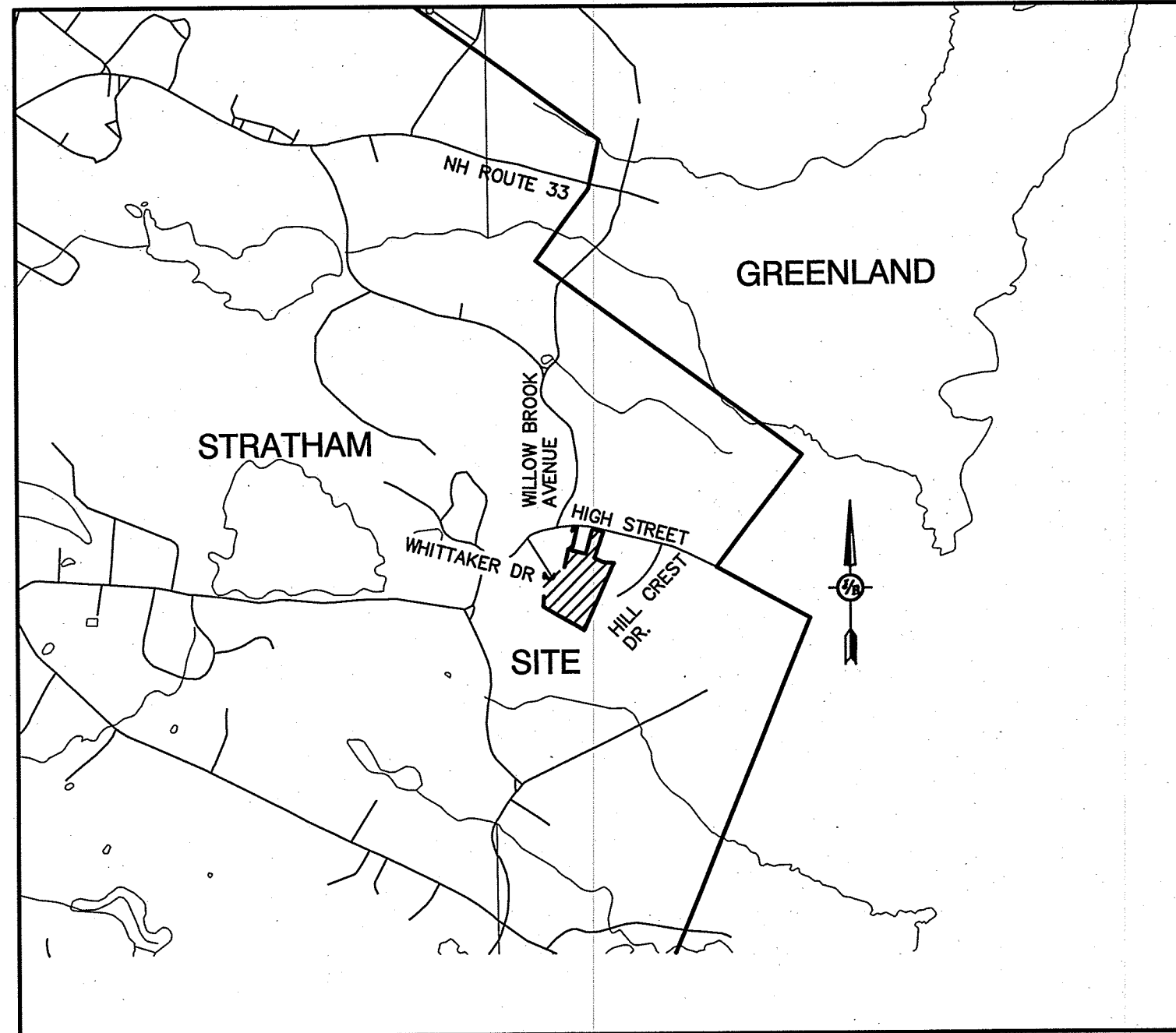
GENERAL LEGEND

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
100	100	MAJOR CONTOUR
98	98	MINOR CONTOUR
---	---	EDGE OF PAVEMENT
X	X	SILT FENCE
D	D	DRAINAGE LINE
OHE	OHE	OVERHEAD ELECTRIC
UGE	UGE	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/WETLANDS
JONES & BEACH ENGINEERS, INC.
85 PORTSMOUTH AVENUE
PO BOX 219
STRATHAM, NH 03885
(603) 772-4746
CONTACT: JONATHAN RING, PE.
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

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

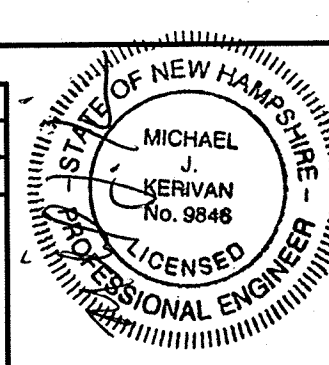
APPLICANT/OWNER
ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885
BK 4199 PG 2969

TOTAL LOT AREA
14.99 ACRES

APPROVED - STRATHAM, NH
PLANNING BOARD

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
2	8/16/17	REVISED PER PLANNING BOARD	LAZ
1	7/5/17	REVISED PER TOWN PLANNER	RMN
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:	COVER SHEET
Project:	SULLIVAN SUBDIVISION 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 8/16/17

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
5796/0753 (02/06/17)

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

BOUNDARY LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 59°07'17" W	129.73
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	66.30
L6	N 60°07'37" W	101.91
L7	N 58°22'06" W	192.48
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	51.45
L12	S 82°39'41" E	50.12
L13	N 12°21'17" W	324.04
L14	S 77°46'53" E	191.08
L15	N 14°41'22" E	333.05
L16	S 77°28'18" E	150.97
L17	S 18°37'14" W	2.00
L18	S 18°37'14" W	364.78
L19	S 63°09'29" E	128.61
L20	S 86°04'20" E	143.87
L21	S 24°10'28" W	53.26
L22	S 24°03'44" W	825.79
L23	N 71°51'25" W	34.42(TIE)
L24	S 89°28'03" E	112.45
L25	N 12°31'28" E	51.19

BOUNDARY CURVE TABLE			
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE
C1	154.36	60.00	147°24'03"
C2	56.06	60.00	153°31'52"

REFERENCE PLANS:

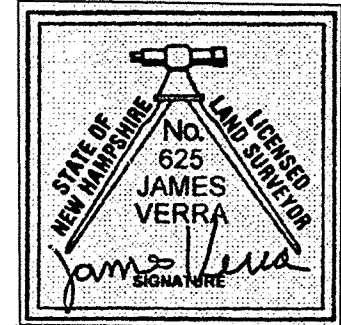
- MINOR SUBDIVISION OF LAND, HIGH STREET, STRATHAM, NEW HAMPSHIRE, FOR TERRA REALTY TRUST, DATED 3/1/1995, REVISED 2/29/1996, RCRD PLAN # D-24555.
- SUBDIVISION OF LAND FOR V.E.T. DEVELOPMENT, STRATHAM, NH DATED 8/3/1987, REVISED 10/16/1987, RCRD PLAN # D-17330.
- FINAL SUBDIVISION PLAN, HILLCREST DRIVE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

WILLOW BROOK AVENUE

CERTIFICATION:

I CERTIFY THAT THIS PLAN WAS PREPARED UNDER MY DIRECT SUPERVISION, THAT IT IS THE RESULT OF A FIELD SURVEY BY THIS OFFICE AND HAS AN UNADJUSTED LINEAR ERROR OF CLOSURE THAT EXCEEDS BOTH THE MINIMUM OF 1:10,000 AS DEFINED IN SECTION 503.04 OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES AND THE MINIMUM OF 1:15,000 AS DEFINED IN SECTION 4.2 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

THIS SURVEY CONFORMS TO A CATEGORY 1 CONDITION 1 SURVEY AS DEFINED IN SECTION 4.1 OF THE N.H.L.S.A. ETHICS AND STANDARDS.

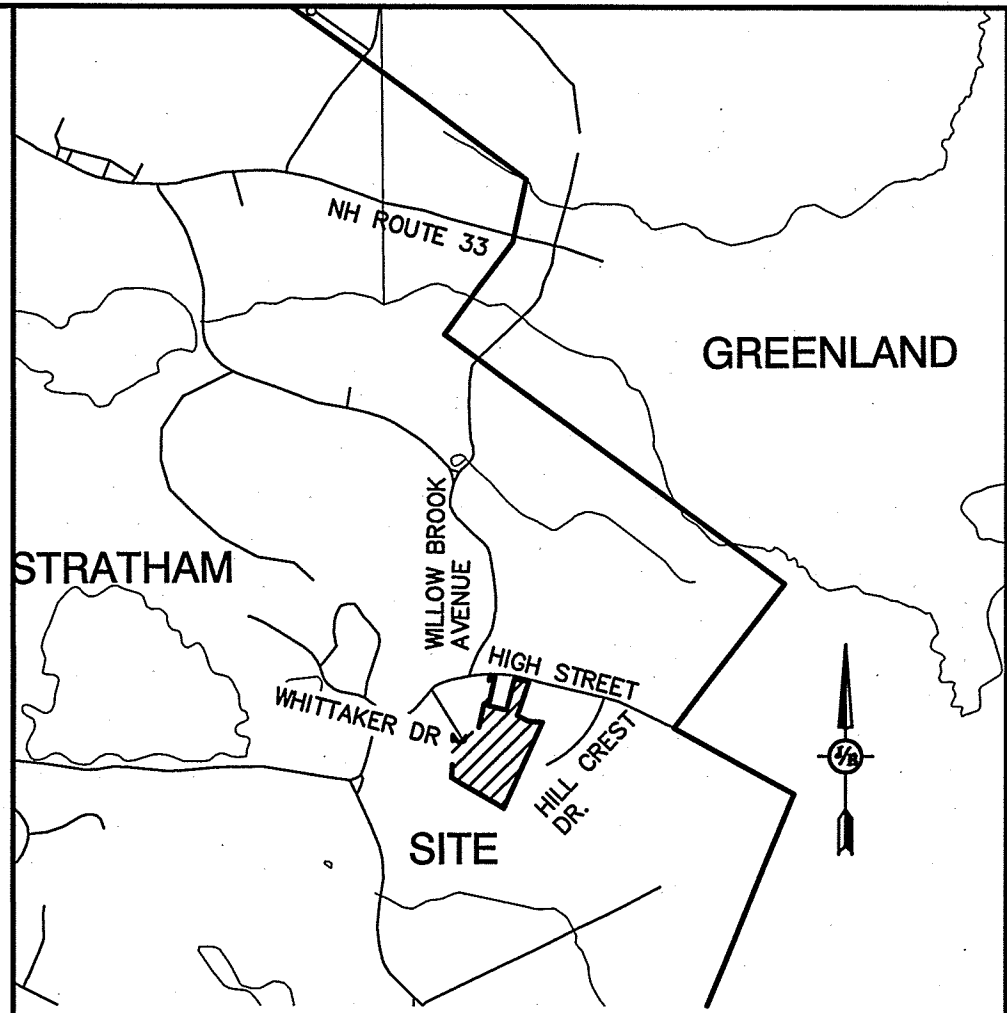


JAMES VERRA, L.L.S.

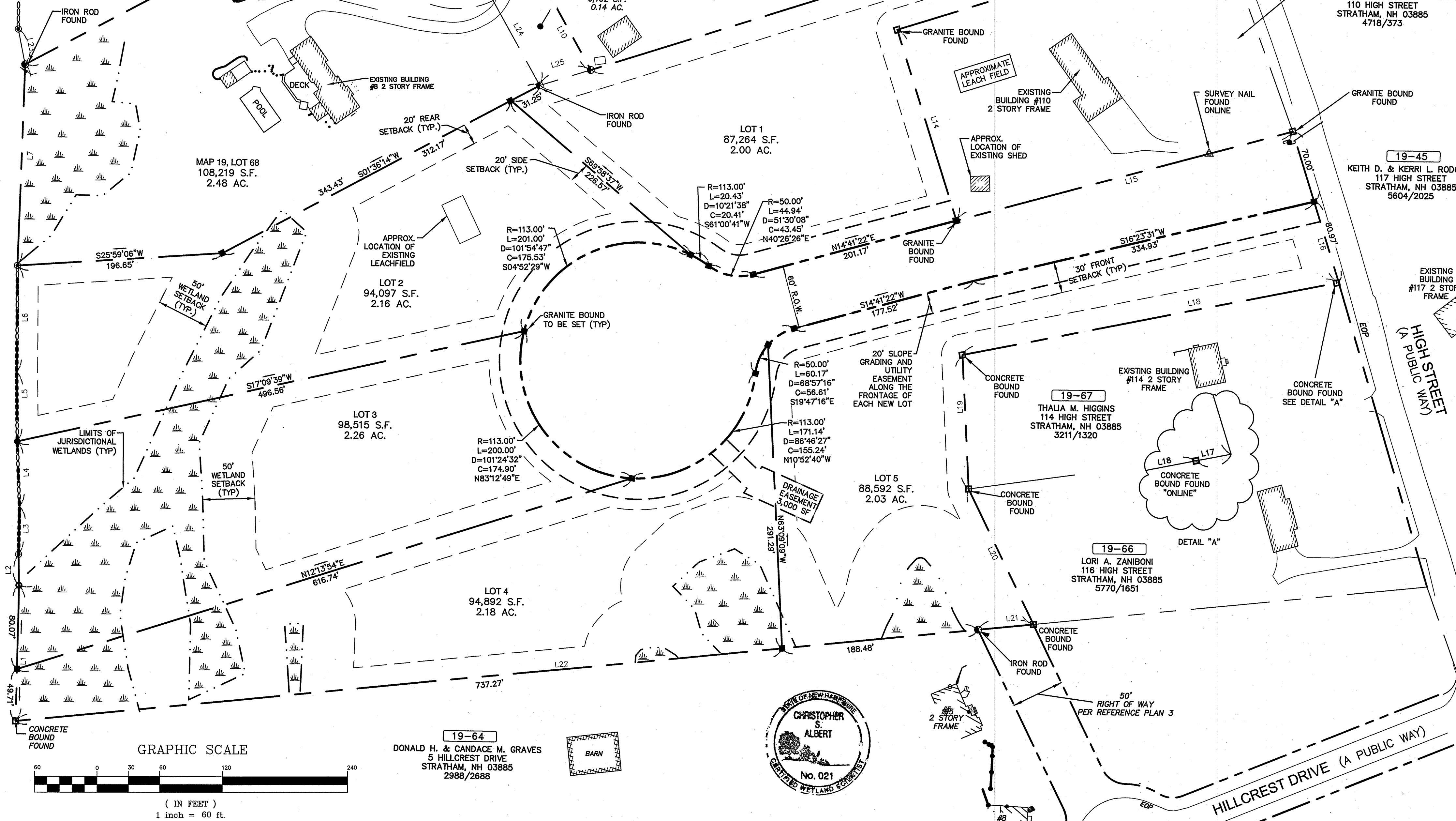
DATE: 8/16/17

SUBDIVISION NOTES:

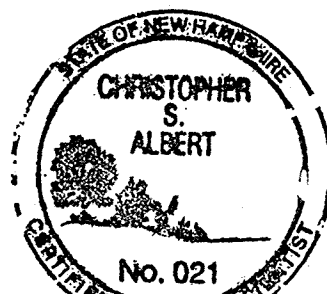
- THE INTENT OF THIS PLAN IS TO SUBDIVIDE MAP 19, LOT 68 INTO FIVE (5) SINGLE FAMILY RESIDENTIAL LOTS WITH ON-SITE WATER, SEPTIC, PLUS EXISTING HOUSE. COMPLETE EIGHT (8) SHEET PLAN SET IS ON FILE AT THE PLANNING BOARD OFFICE.
- ZONING DISTRICT: RESIDENTIAL AGRICULTURAL. LOT AREA MINIMUM = 2 ACRE. LOT FRONTAGE MINIMUM = 200'. BUILDING SETBACKS (MINIMUM): FRONT SETBACK = 30'. SIDE SETBACK = 20'. REAR SETBACK = 20'. WETLAND SETBACK = 50'. MAX BUILDING HEIGHT = 35'.
- WITH APPROVAL OF THIS PLAN BY THE PLANNING BOARD, THE FOLLOWING WAIVERS ARE GRANTED FROM THE "SUBDIVISION REGULATIONS": A) SECTION ADDENDUM TABLE 1-ROAD WIDTH 22' AND 16' ONE-WAY.
- NHDES APPROVAL FOR SUBDIVISION PERMIT NO. DATED
- THIS PLAN SET HAS BEEN PREPARED BY JONES & BEACH ENGINEERS, INC., FOR MUNICIPAL AND STATE APPROVALS AND FOR CONSTRUCTION BASED ON DATA OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, THE CONTRACTOR SHALL INFORM THE ENGINEER IMMEDIATELY OF ANY FIELD DISCREPANCY FROM DATA AS SHOWN ON THE DESIGN PLANS, INCLUDING ANY UNFORESEEN CONDITIONS, SUBSURFACE OR OTHERWISE, FOR EVALUATION AND RECOMMENDATIONS. ANY CONTRADICTION BETWEEN ITEMS ON THIS PLAN/PLAN SET, OR BETWEEN THE PLANS AND ON-SITE CONDITIONS, MUST BE RESOLVED BEFORE RELATED CONSTRUCTION HAS BEEN INITIATED.
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0265E, DATED MAY 17, 2005.
- ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN (S.W.P.P.P.). THIS DOCUMENT IS TO BE KEPT ON-SITE AT ALL TIMES AND UPDATED AS REQUIRED.
- PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND/OR OWNER, IN ORDER TO OBTAIN AND/OR PAY ALL THE NECESSARY LOCAL PERMITS, FEES AND BONDS.
- ALL CONSTRUCTION WILL CONFORM TO TOWN STANDARDS AND REGULATIONS, AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, WHICHEVER IS MORE STRINGENT.
- ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO LABOR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) RULES AND REGULATIONS.
- GRANITE BOUNDS TO BE SET AT ALL ROADWAY POINTS OF CURVATURE AND TANGENCY, AND AT ALL PROPERTY CORNERS AND ANGLE POINTS, UNLESS OTHERWISE INDICATED.
- THE LIMITS OF JURISDICTIONAL WETLANDS WERE DELINEATED BY CHRISTOPHER ALBERT OF JONES & BEACH ENGINEERS, INC., DURING WINTER, 2016.
- LANDOWNERS ARE RESPONSIBLE FOR COMPLYING WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL WETLAND REGULATIONS, INCLUDING PERMITTING REQUIRED UNDER THESE REGULATIONS.
- UPON APPROVAL BY THE TOWN, THE PROPOSED ROAD WILL BE CONVEYED TO THE TOWN.
- ALL UTILITIES SHALL BE INSTALLED UNDERGROUND.
- ALL LOTS ARE SUBJECT TO A 20' WIDE EASEMENT ALONG FRONTAGE FOR SLOPE, GRADING, DRAINAGE AND UTILITIES.
- ALL BOOK AND PAGE NUMBERS REFER TO THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- THE TAX MAP AND LOT NUMBERS AND ABUTTING OWNERS ARE BASED ON THE TOWN OF STRATHAM TAX RECORDS AND ARE SUBJECT TO CHANGE.
- RESEARCH WAS PERFORMED AT THE TOWN OF STRATHAM ASSESSOR'S OFFICE AND THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- THIS SURVEY IS NOT A CERTIFICATION TO OWNERSHIP OR TITLE OF LANDS SHOWN. OWNERSHIP AND ENCUMBRANCES ARE MATTERS OF TITLE EXAMINATION NOT OF A BOUNDARY SURVEY. THE INTENT OF THIS PLAN IS TO RETRACE THE BOUNDARY LINES OF DEEDS REFERENCED HEREON. OWNERSHIP OF ADJOINING PROPERTIES IS ACCORDING TO ASSESSOR'S RECORDS. THIS PLAN MAY OR MAY NOT INDICATE ALL ENCUMBRANCES EXPRESSED, IMPLIED OR PRESCRIPTIVE.
- ANY USE OF THIS PLAN AND OR ACCOMPANYING DESCRIPTIONS SHOULD BE DONE WITH LEGAL COUNSEL TO BE CERTAIN THAT TITLES ARE CLEAR, THAT INFORMATION IS CURRENT, AND THAT ANY NECESSARY CERTIFICATES ARE IN PLACE FOR A PARTICULAR CONVEYANCE, OR OTHER USES.



LOCUS SCALE: 1"=2000'



19-64
DONALD H. & CANDACE M. GRAVES
5 HILLCREST DRIVE
STRATHAM, NH 03885
2988/2688



REV.	DATE	REVISION	BY
2	8/16/17	REVISED PER PLANNING BOARD	LAZ
1	7/5/17	REVISED PER TOWN PLANNER	RMN
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: **SUBDIVISION PLAN**
MAP 19, LOT 68

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

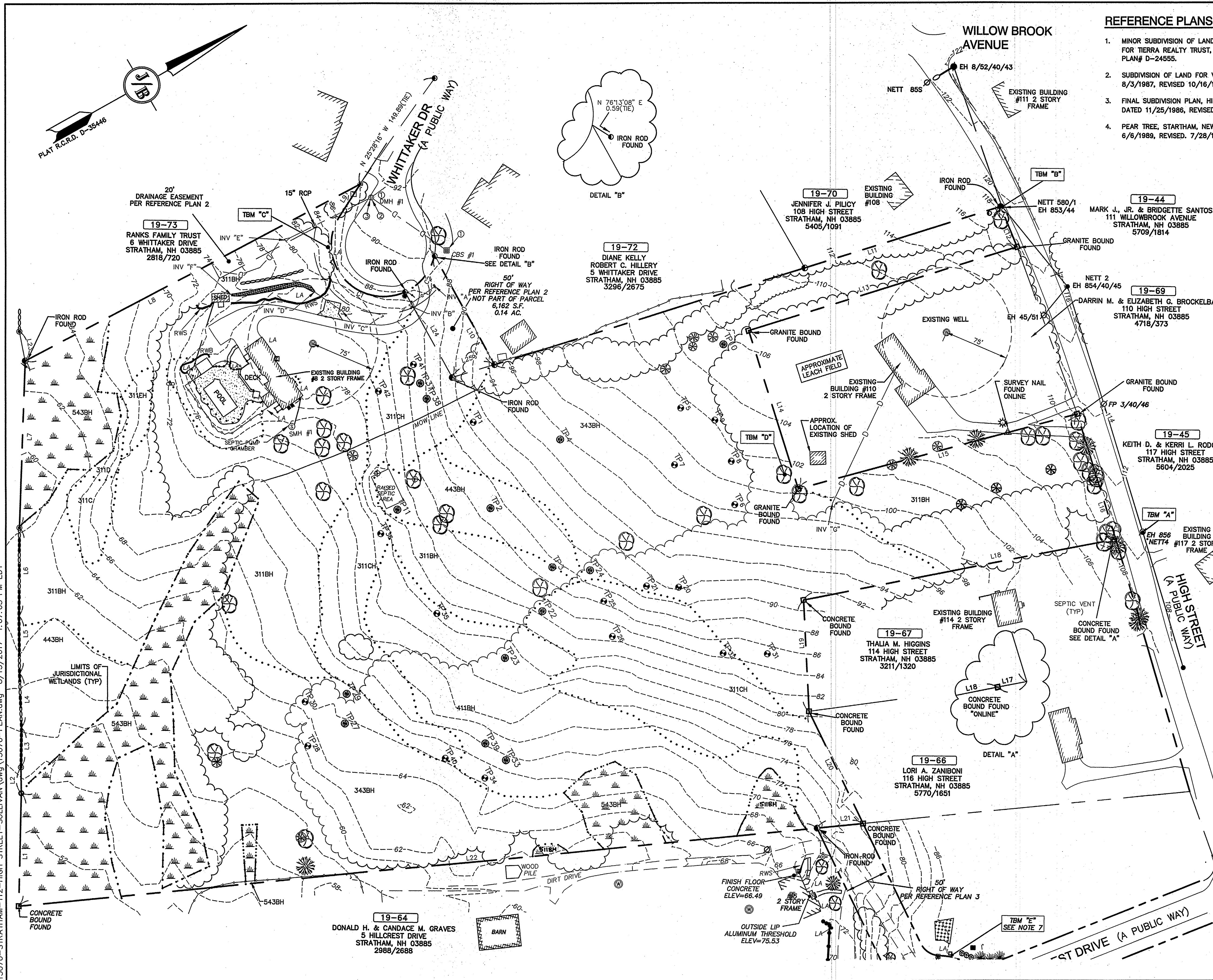
Owner of Record: **ROBIN SULLIVAN**
8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.

A1

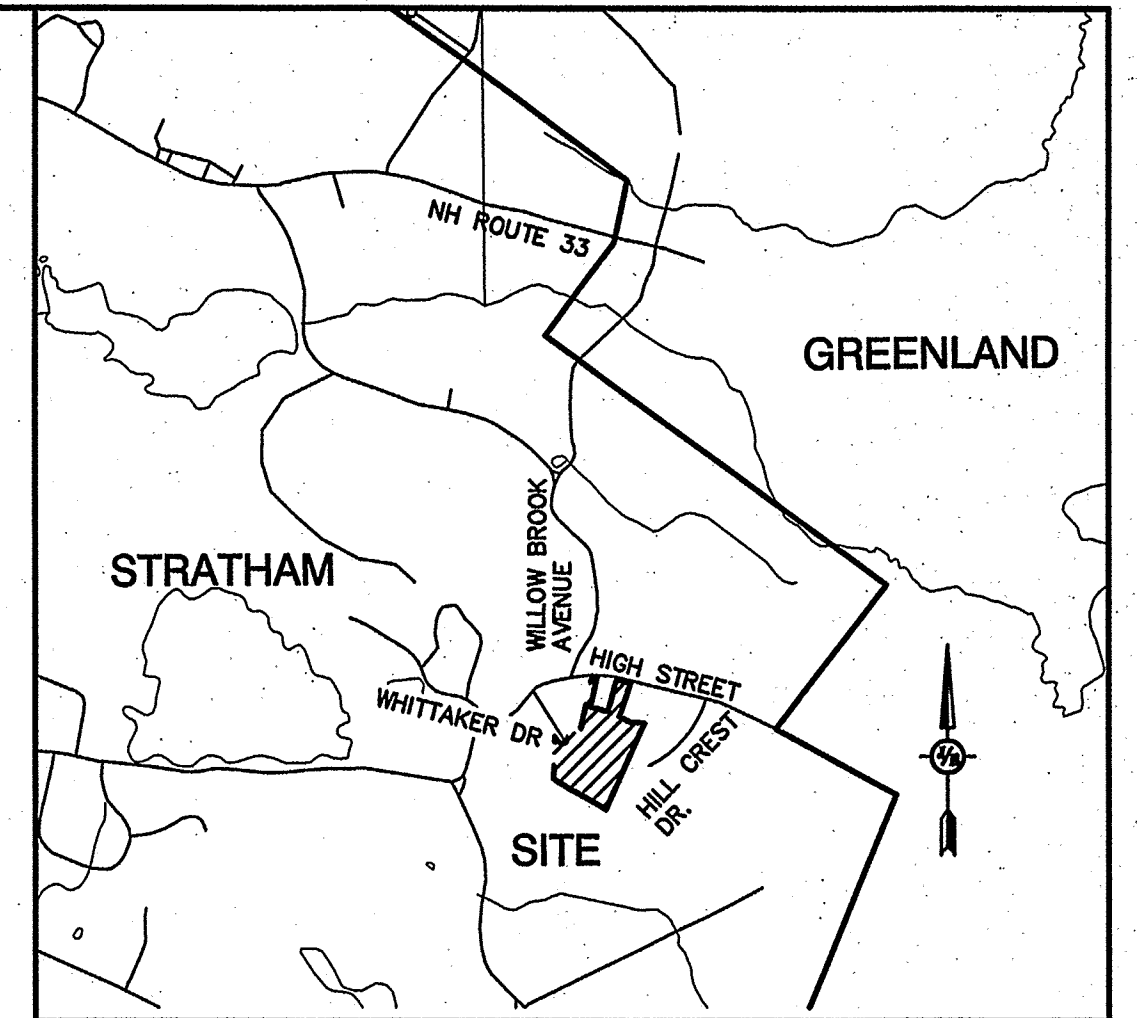
SHEET 2 OF 8
JBE PROJECT NO. 13070.1

F:\Land Projects\3\13070-STRATHAM-112-HIGH STREET-SULLIVAN.dwg 8/15/2017 1:07:05 PM EDT



REFERENCE PLANS:

- 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.
- SUBDIVISION OF LAND FOR V.E.T. DEVELOPMENT, STRATHAM, NH DATED 8/3/1987, REVISED 10/16/1987, RCRD PLAN # D-17330.
- FINAL SUBDIVISION PLAN, HILLCREST DRIVE SUBDIVISION, STRATHAM, NH DATED 11/25/1986, REVISED 12/3/1986, RCRD PLAN # D-15868.
- PEAR TREE, STRATHAM, NEW HAMPSHIRE, SUBDIVISION PLAN DATED 6/6/1989, REVISED 7/28/1989, RCRD PLAN # D-19852.



LOCUS SCALE: 1"=2000'

EXISTING CONDITIONS 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 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).
- VERTICAL DATUM: NAVD 1988
- SUBJECT PROPERTY IS NOT LOCATED WITHIN FEDERALLY DESIGNATED 100 YEAR FLOOD HAZARD ZONE. REFERENCE FEMA COMMUNITY PANEL NO. 33015C0265E, DATED MAY 17, 2005.
- 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:
 - THE CORPS OF ENGINEERS FEDERAL MANUAL FOR IDENTIFYING AND DELINEATING JURISDICTIONAL WETLANDS.
 - THE NORTH CENTRAL & NORTHEAST REGIONAL SUPPLEMENT TO THE FEDERAL MANUAL.
 - 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.
 - THE CURRENT NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS, AS PUBLISHED BY THE US FISH AND WILDLIFE SERVICE.
- 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.
- TEST PITS PERFORMED BY CHRISTOPHER ALBERT AND GIFFORD COLBURN, JONES & BEACH ENGINEERS, INC. 4/20/16, 12/14/16 AND 12/27/16, WITNESSED BY MICHAEL CUOMO, ROCKINGHAM COUNTY CONSERVATION DISTRICT, INSPECTOR.
- 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
- WETLAND BOUNDARIES AND CONSTRUCTION LIMITS ARE TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.

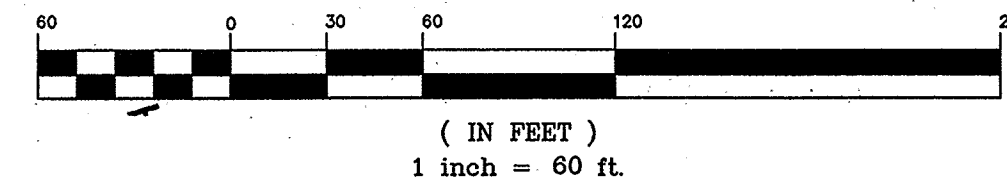
BOUNDARY CURVE TABLE			
CURVE	ARC LENGTH	RADIUS	DELTA ANGLE
C1	154.36	60.00	147°24'03"
C2	56.06	60.00	53°31'52"

BOUNDARY LINE TABLE			
LINE	BEARING	DISTANCE	
L1	N 59°27'21" W	128.78	
L2	N 60°57'12" 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	66.30	
L6	N 60°07'32" W	60.01	
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°27'03" E	143.64	
L11	N 12°21'12" E	611.45	
L12	S 82°39'41" E	60.12	
L13	S 12°21'17" W	324.04	
L14	N 77°46'53" E	191.08	
L15	N 14°31'22" E	133.05	
L16	S 77°28'18" E	150.97	
L17	S 18°37'14" W	2.00	
L18	S 18°37'14" W	364.78	
L19	S 63°09'22" E	128.61	
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°31'25" W	134.42	
L24	S 89°27'03" E	112.45	
L25	N 12°31'28" E	51.19	

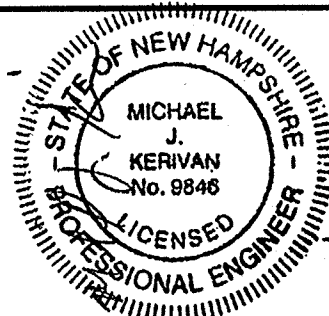
EXISTING RIM AND INVERT DATA
CB #1 RIM = 87.65
(1) INV (12"RCP)=84.4±
SMH #1 RIM = 59.68
SEPTIC COVER
DMH #1 RIM = 91.35
(1) INV (12"RCP)=86.66
(2) INV (12"RCP)=83.53
(3) INV (15"RCP)=83.53
("A") INV (15"CMP)=86.32
("B") INV (12"HDPE)=84.09
("C") INV (12"HDPE)=78.78
("D") INV (12"HDPE)=78.65
("E") INV (15"RCP)=80.01
("F") INV (12"PVC)=74.68±
("G") INV (4" PVC)=99.24

SOIL LEGEND	
315	315 DEERFIELD HSG B
343	343 ELDRIDGE HSG C
443	443 ELDRIDGE VARIANT HSG C
543	543 RIDGEBURY HSG C

GRAPHIC SCALE



Design: JSR Draft: PLB Date: 6/26/13
Checked: JSR Scale: AS NOTED Project No.: 13070.1
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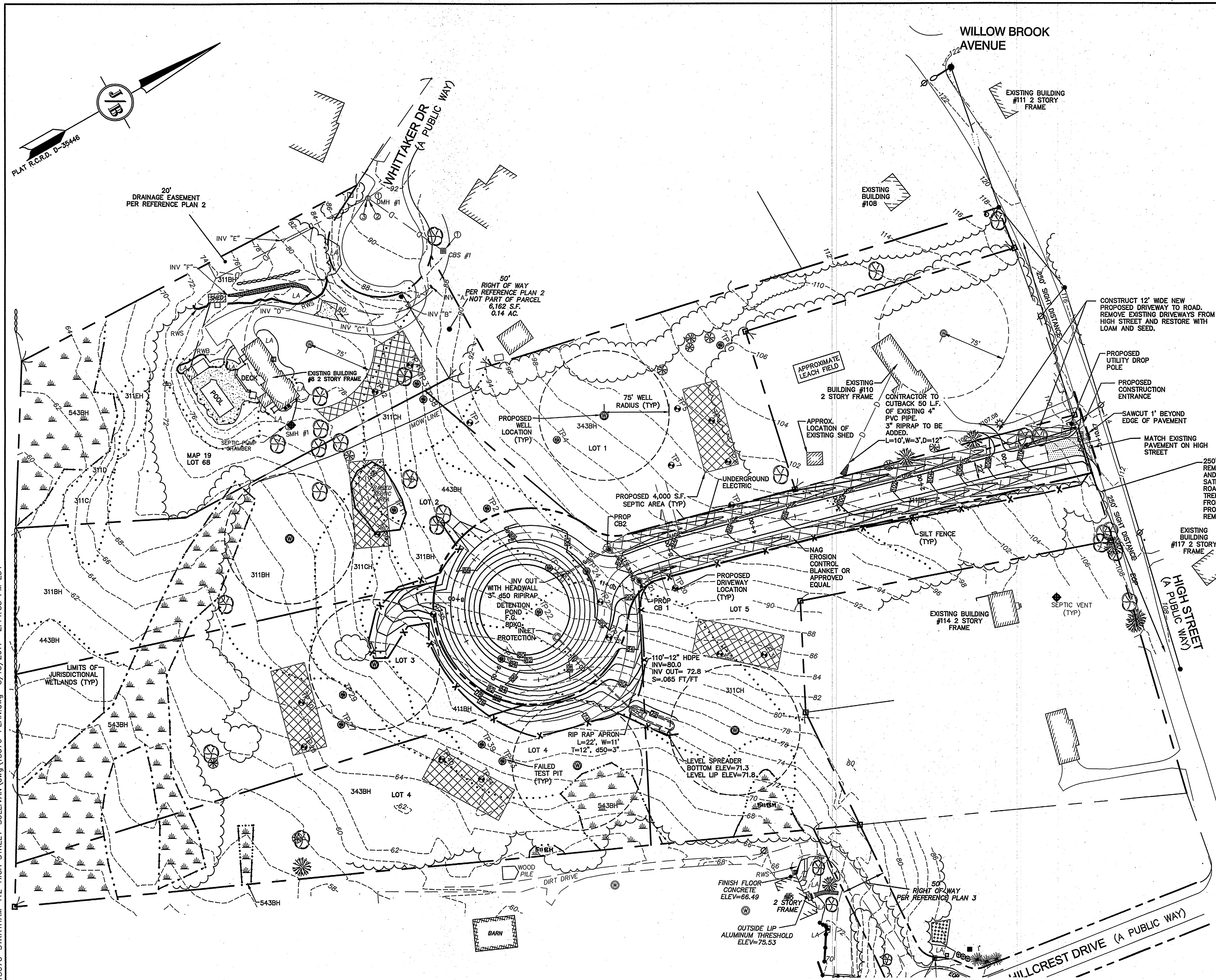
REV.	DATE	REVISION	BY
2	8/16/17	REVISED PER PLANNING BOARD	LAZ
1	7/5/17	REVISED PER TOWN PLANNER	RMN
0	6/29/17	REVISED FOR PLANNING BOARD	PLB

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: **EXISTING CONDITIONS PLAN**
Project: **SULLIVAN SUBDIVISION**
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

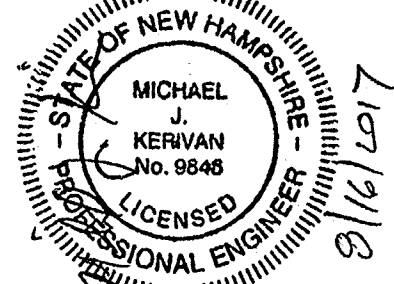
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GRADING AND DRAINAGE NOTES:

- 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 ADJUTING 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.
- EACH NEW LOT SHALL HAVE A STONE DRIP EDGE AROUND EACH HOUSE, AND A RAIN GARDEN AT DRIVEWAY LOW POINT. SEE DETAILS ON SHEET D2. THESE FEATURES SHALL BE SHOWN ON THE SUBSURFACE EFFLUENT DISPOSAL SYSTEM PLAN PREPARED FOR EACH LOT PRIOR TO ISSUANCE OF A BUILDING PERMIT.

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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:	SULLIVAN SUBDIVISION 112 HIGH STREET, STRATHAM, NH 03885
Owner of Record:	ROBIN SULLIVAN 8 WHITTAKER DRIVE, STRATHAM, NH 03885

DRAWING No.

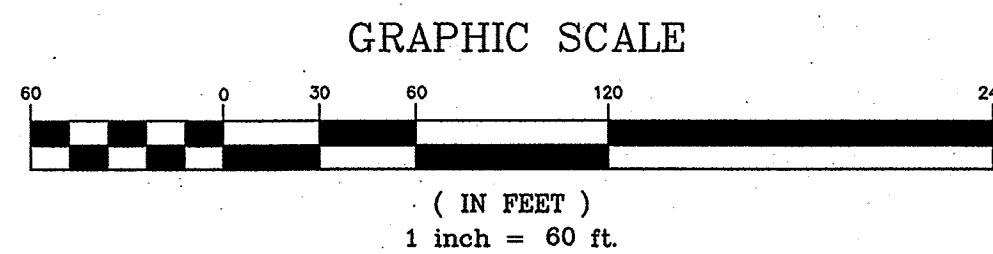
C2

SHEET 4 OF 8
JBE PROJECT NO. 13070.1

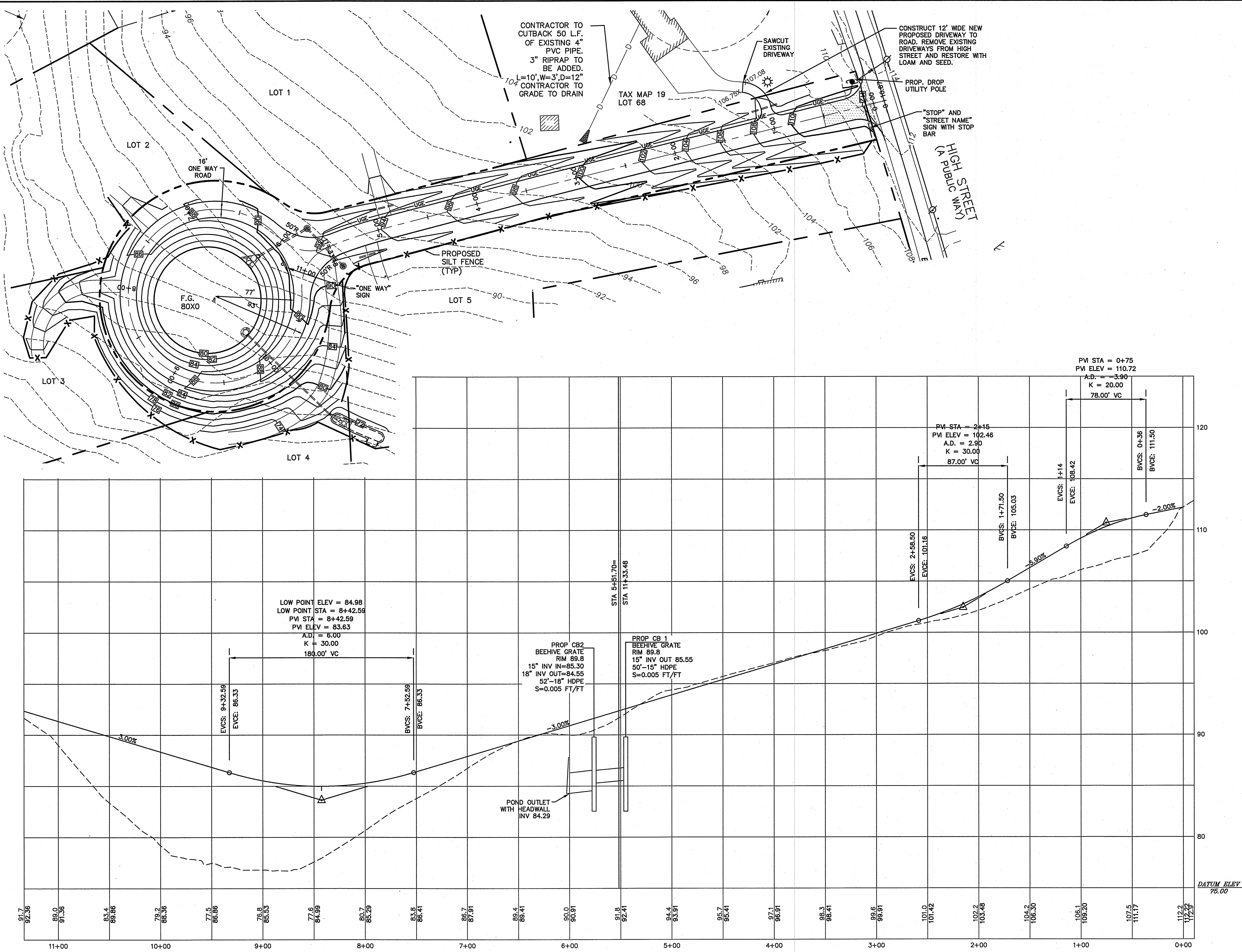
PROJECT PARCEL
TOWN OF STRATHAM, NH
MAP 19, LOT 68

APPLICANT/OWNER
ROBIN SULLIVAN
8 WHITTAKER DRIVE
STRATHAM, NH 03885
BK 4199 PG 2969

TOTAL LOT AREA
14.99 ACRES

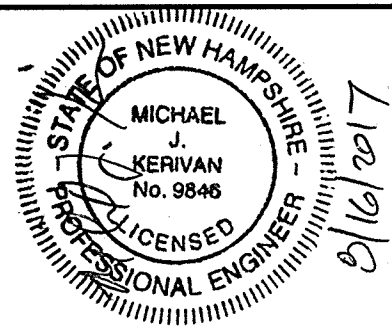


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- NOTES:**
- THIS SITE WILL REQUIRE A USEPA NPDES PERMIT FOR STORMWATER DISCHARGE FOR THE CONSTRUCTION SITE. THE CONSTRUCTION SITE OPERATOR SHALL DEVELOP AND IMPLEMENT A CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP), WHICH SHALL REMAIN 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:
A. FINAL STABILIZATION HAS BEEN ACHIEVED ON ALL PORTIONS OF THE SITE FOR WHICH THE PERMITTEE IS RESPONSIBLE; OR
B. ANOTHER OPERATOR/PERMITEE 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 OBTAINED FROM ON-SITE FIELD SURVEY AND EXISTING MUNICIPAL RECORDS. THROUGHOUT THE CONSTRUCTION PROCESS, 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.
 - 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.
 - 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 EVERY LIFT OF NEWLY PLACED MATERIAL.
 - NO IRRIGATION PIPES OR SPRINKLER HEADS SHALL BE LOCATED WITHIN TOWN RIGHT OF WAY.
 - EACH NEW LOT SHALL HAVE A STONE DRIP EDGE AROUND EACH HOUSE, AND A RAIN GARDEN AT DRIVEWAY LOW POINT. SEE DETAILS ON SHEET D2. THESE FEATURES SHALL BE SHOWN ON THE SUBSURFACE EFFLUENT DISPOSAL SYSTEM PLAN PREPARED FOR EACH LOT PRIOR TO ISSUANCE OF A BUILDING PERMIT.

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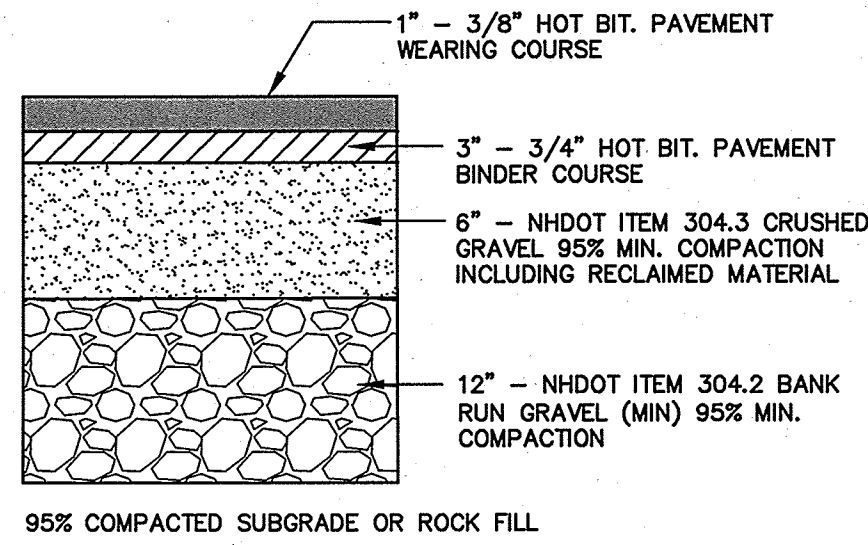
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E-MAIL: JBE@JONESANDBEACH.COM

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

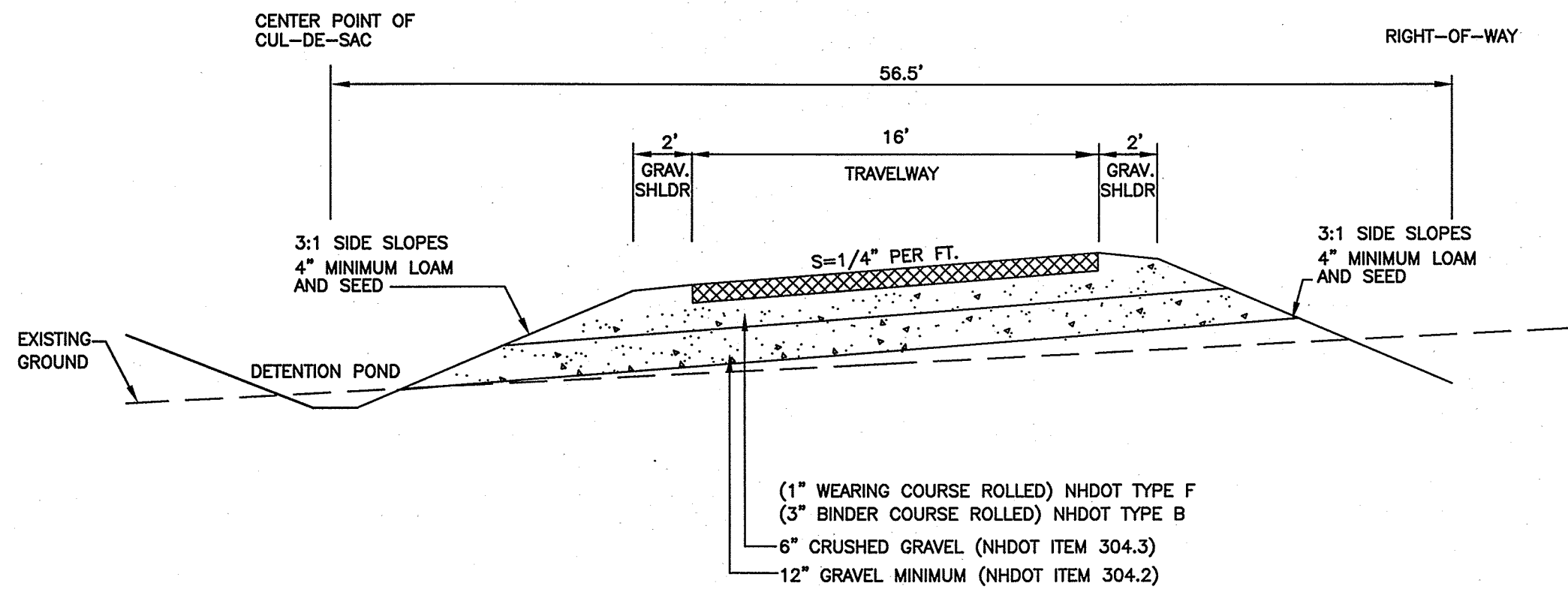
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SHEET 5 OF 8
JBE PROJECT NO. 13070.1

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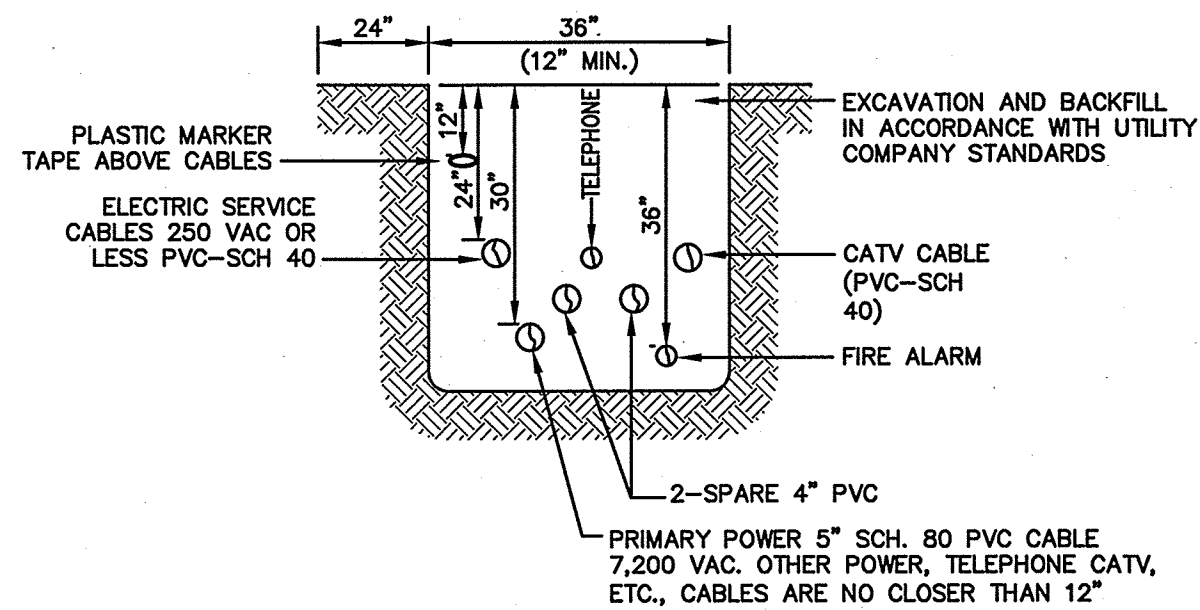
TYPICAL BITUMINOUS PAVEMENT

NOT TO SCALE



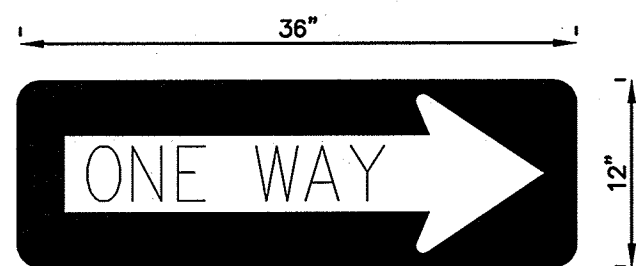
TYPICAL CUL-DE-SAC CROSS SECTION

NOT TO SCALE



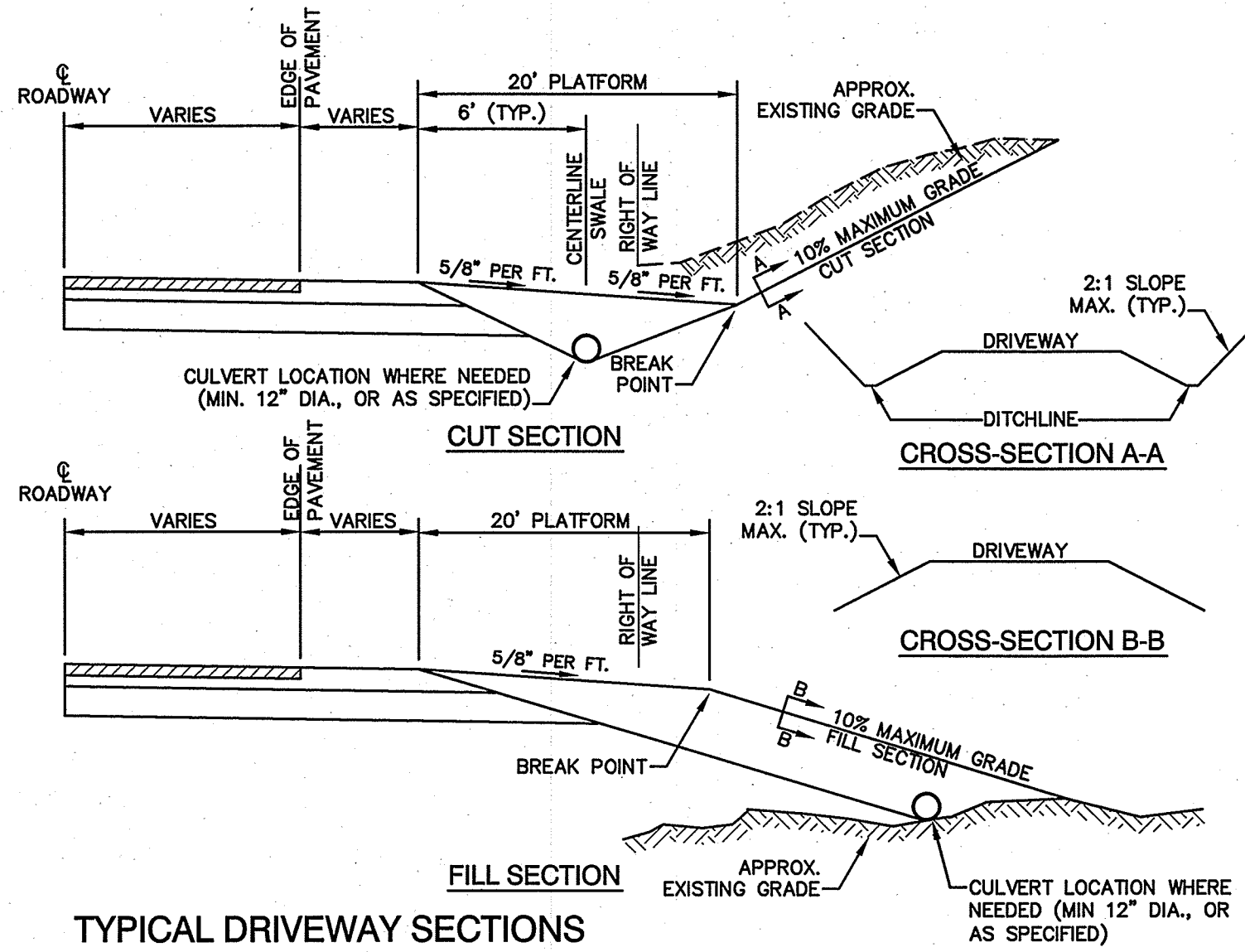
UTILITY TRENCH

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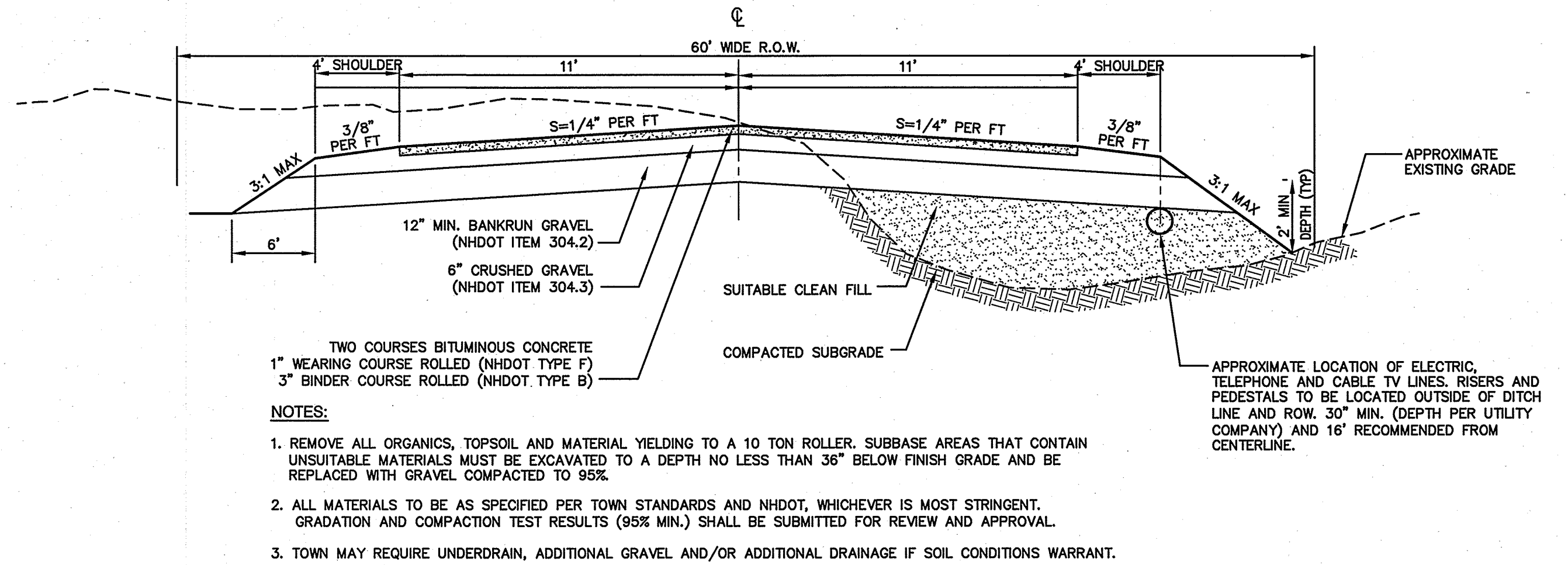
ONE WAY SIGN (R6-1)

NOT TO SCALE



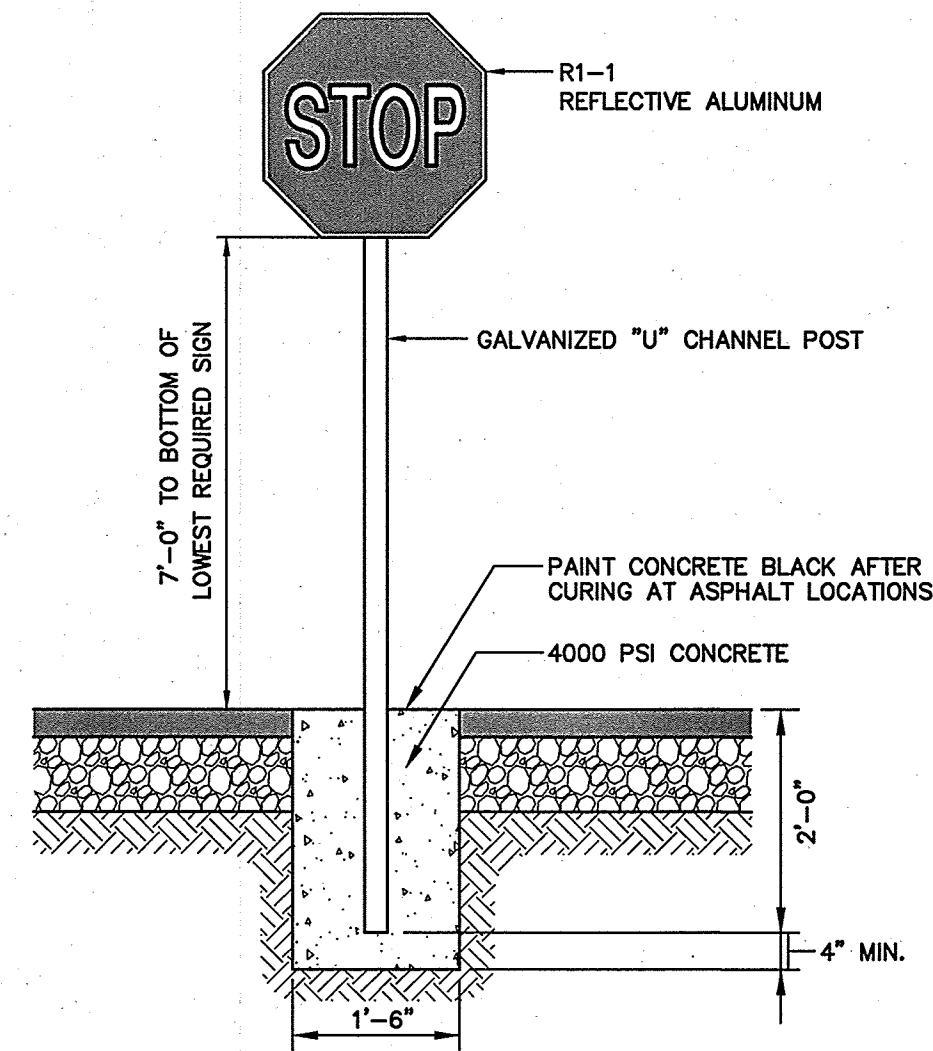
TYPICAL DRIVEWAY SECTIONS

NOT TO SCALE



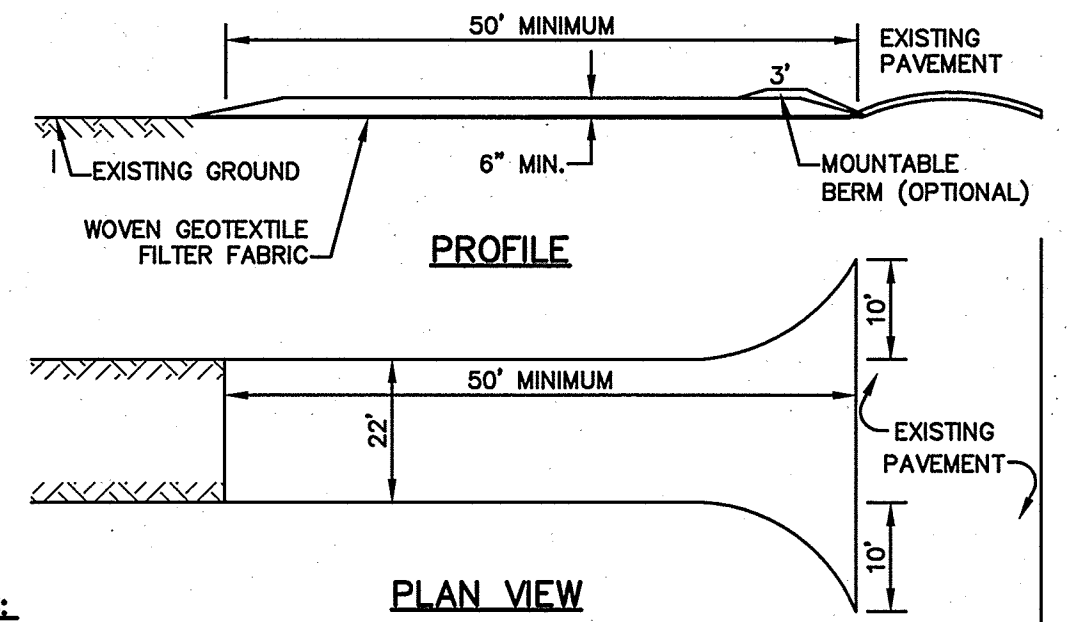
TYPICAL ROADWAY SECTION

NOT TO SCALE



STOP SIGN (R1-1)

NOT TO SCALE

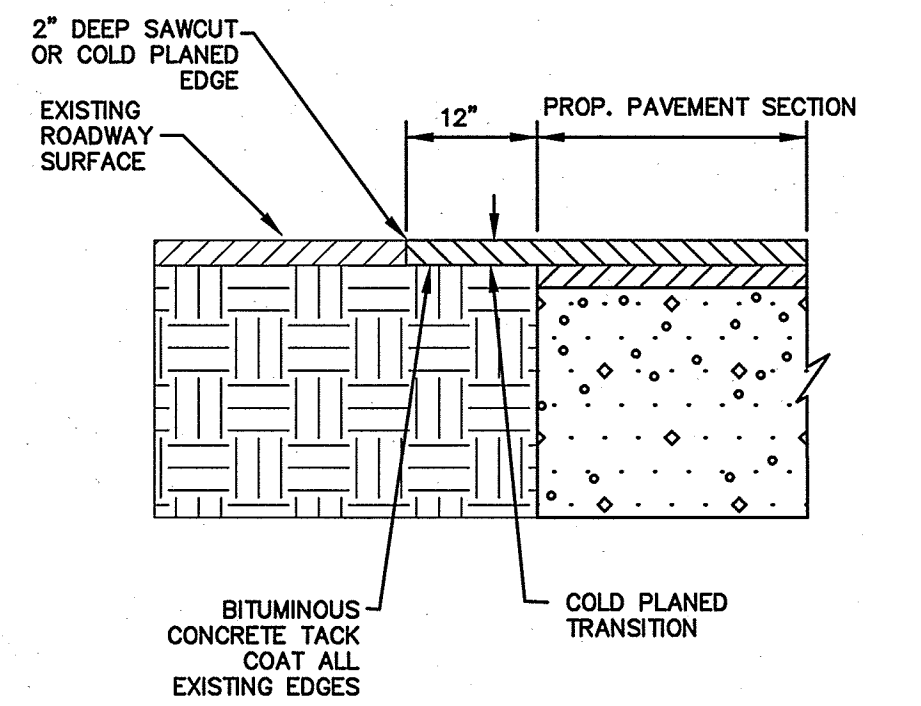


NOTES:

- STONE FOR STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
- THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
- THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
- THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS, OR 10 FEET, WHICHEVER IS GREATER.
- GEOTEXTILE FILTER FABRIC SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER FABRIC IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
- ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A STONE BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE

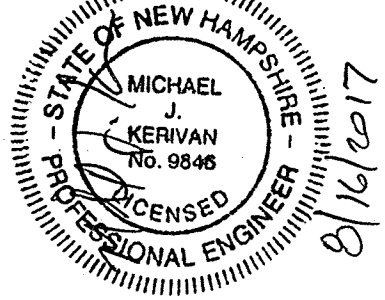
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FULL DEPTH PAVEMENT TRANSITION

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

DRAWING No.	D1
SHEET 6 OF 8	JBE PROJECT NO. 13070.1

TYPICAL RAIN GARDEN PLANTINGS

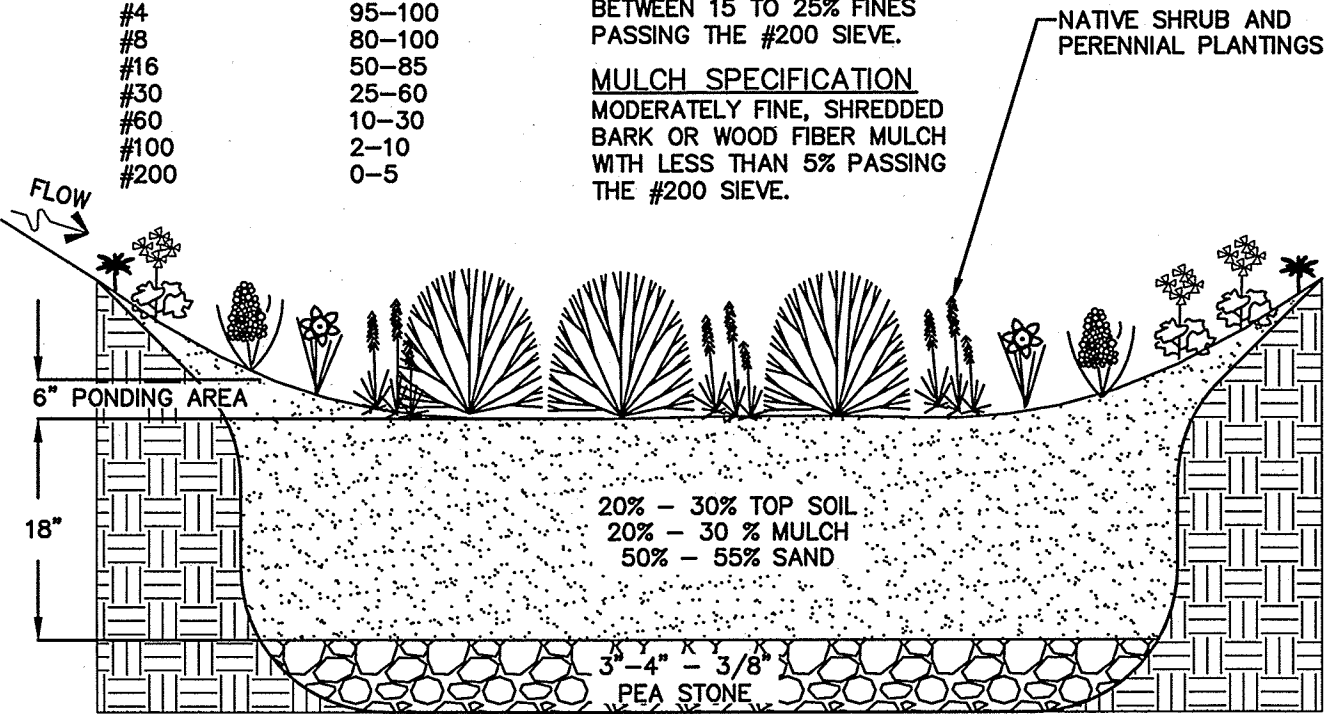
BOTANICAL NAME	COMMON NAME	SIZE
PERENNIALS		
"ANNABELLE" HYDRANGEA	HYDRANGEA	1 GAL.
HEMEROCALLIS 'STELLA D'ORO'	DAYLILY	1 GAL.
VIBURNUM TRILOBUM	AMERICAN CRANBERRY	1 GAL.
AUREA BOWLES' GOLDEN SEDGE	SEDGE GRASS	1 GAL.
SPIREA	BRIDLE VEIL	1 GAL.

DECIDUOUS SHRUBS:

VIBURNUM DENTATUM	ARROWWOOD VIBURNUM
ALNUS INCANA	SPECKLED ALDER
CORNUS STOLONIFERA	REDOSIER DOGWOOD
VACCINIUM CORYMBOSUM	HIGHBUSH BLUEBERRY
LLEX VERTICILLATA	WINTERBERRY

SAND SPECIFICATION	
SIEVE SIZE	% BY WEIGHT
#4	100
#10	95-100
#20	80-100
#40	50-85
#60	25-60
#100	10-30
#200	2-10
	0-5

TOPSOIL SPECIFICATION	
LOAMY SAND TOPSOIL WITH MINIMAL CLAY CONTENT AND BETWEEN 15 TO 25% FINES PASSING THE #200 SIEVE.	
MULCH SPECIFICATION	
MODERATELY FINE, SHREDDED BARK OR WOOD FIBER MULCH WITH LESS THAN 5% PASSING THE #200 SIEVE.	



DESIGN CONSIDERATIONS

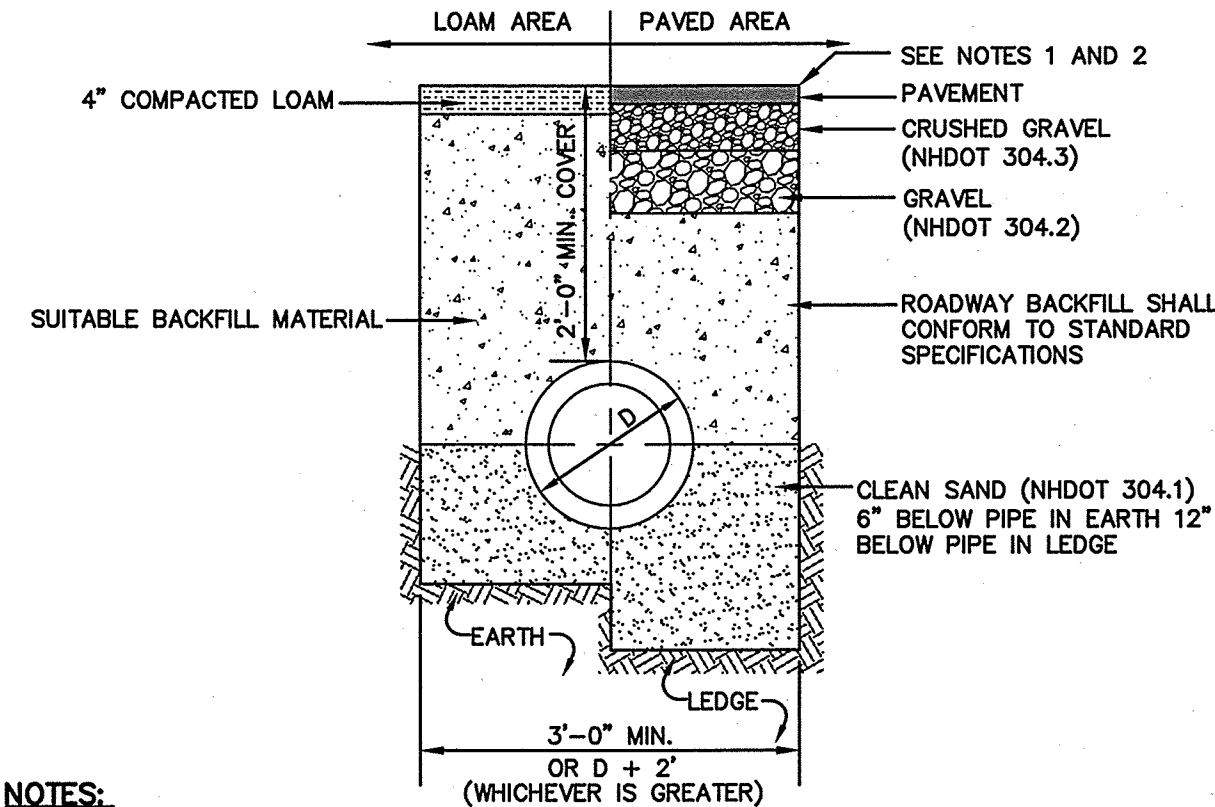
- DO NOT DIRECT RUNOFF TO THE BIORETENTION SYSTEMS UNTIL IT HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
- DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUN-OFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
- DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.
- PLANT LAYOUT WITHIN INDIVIDUAL RAIN GARDENS MAY VARY BETWEEN HOMES HOWEVER ALL RAIN GARDENS ARE TO BE PLANTED FROM EDGE TO EDGE WITH A 1" MAXIMUM SPACING BETWEEN PERENNIALS. LEAVE ENOUGH ROOM BETWEEN SHRUBS FOR FULL GROW-OUT OF EACH SPECIES USED.

MAINTENANCE REQUIREMENTS:

- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

RAIN GARDEN (with open side and bottom) - HOUSE LOTS

NOT TO SCALE

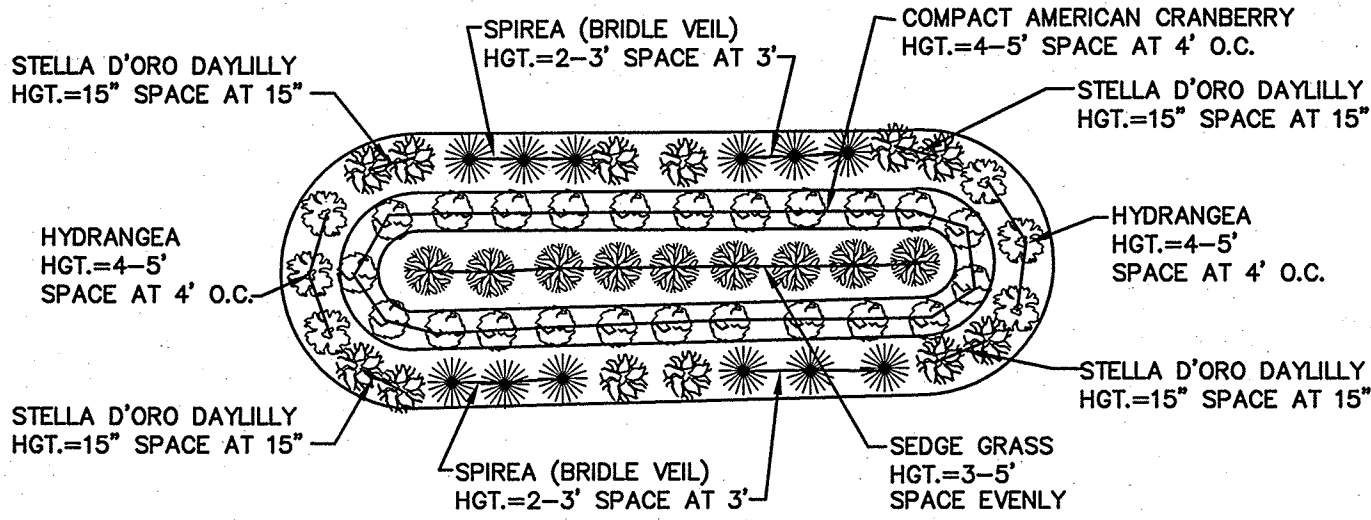


NOTES:

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

DRAINAGE TRENCH

NOT TO SCALE

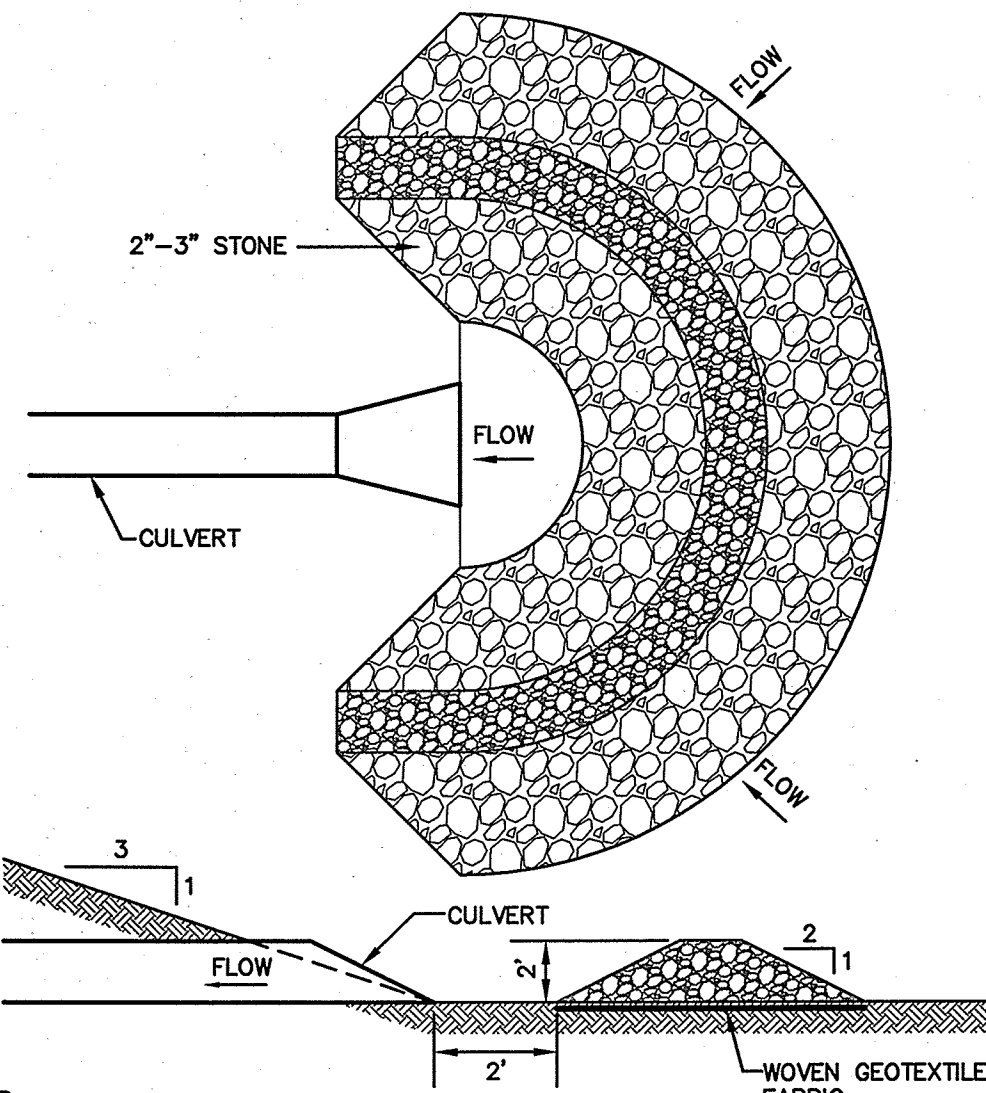


NOTES

- ELEVATIONS VARY BY LOT. CONTRACTOR TO PLACE RAIN GARDENS ON EACH RESIDENTIAL LOT AND PLANT AS SHOWN ABOVE. SHAPE AND DIMENSIONS MAY VARY DEPENDING ON SITE CONDITIONS.
- RAIN GARDENS TO BE 75" MINIMUM FROM SEPTIC SYSTEMS.
- DRIVEWAY RUNOFF MUST BE DIRECTED INTO PROPOSED RAIN GARDENS.
- BOTTOM OF RAIN GARDEN TO BE A MINIMUM 1,000 S.F. SHAPE AND DIMENSIONS MAY VARY DUE TO SITE CONDITIONS.
- VEGETATION WITHIN EACH RAIN GARDEN MUST BE STABILIZED WITH GROWTH PRIOR TO DIRECTING RUNOFF INTO THE RAIN GARDEN.

TYPICAL RAIN GARDEN PLANTINGS - HOUSE LOTS

NOT TO SCALE

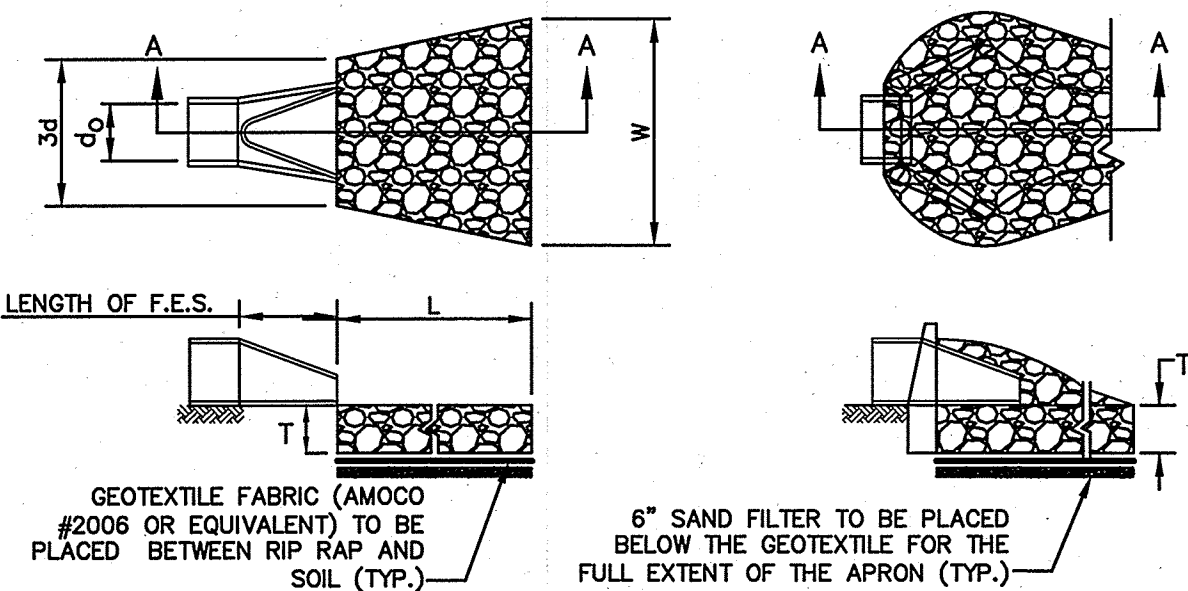


NOTES:

- TEMPORARY CULVERT INLET PROTECTION CHECK DAMS SHALL BE CONSTRUCTED OF 2-3" STONE OVER WOVEN GEOTEXTILE FABRIC.
- 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.
- SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURE WHEN IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE STRUCTURE.
- 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

NOT TO SCALE



SECTION A-A

PIPE OUTLET TO FLAT AREA WITH NO DEFINED CHANNEL

SECTION A-A

PIPE OUTLET TO WELL-DEFINED CHANNEL

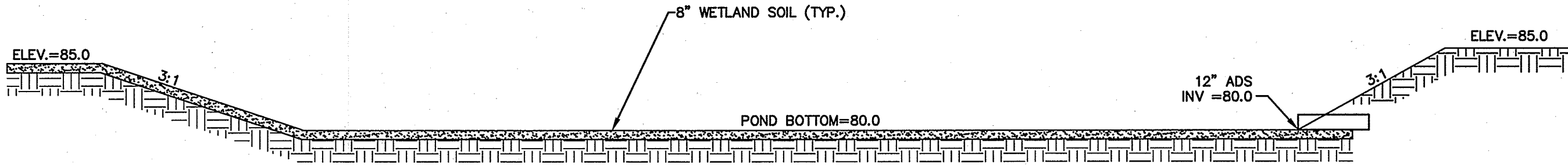
TABLE 7-24--RECOMMENDED RIP RAP GRADATION RANGES			
THICKNESS OF RIP RAP = 1.0 FEET			
d50 SIZE=	0.25	FEET	3 INCHES
% OF WEIGHT SMALLER THAN THE GIVEN d50 SIZE	SIZE OF STONE (INCHES)		
	FROM	TO	
100%	5	6	
85%	4	5	
50%	3	5	
15%	1	2	

NOTES:

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

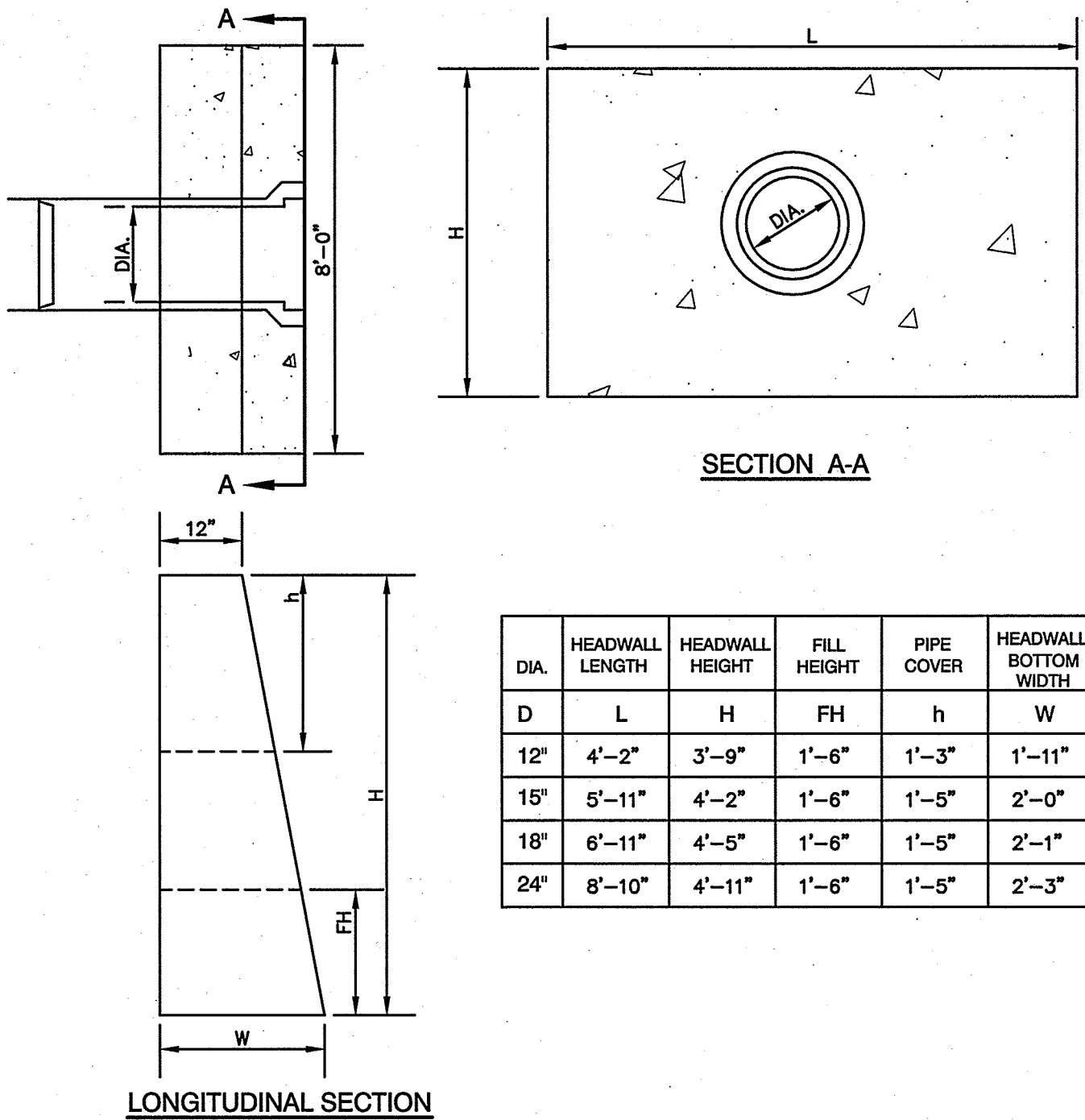
RIP RAP OUTLET PROTECTION APRON

NOT TO SCALE



CUL-DE-SAC DETENTION POND SYSTEM SECTION

NOT TO SCALE



SECTION A-A

DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
12"	4'-2"	3'-9"	1'-6"	1'-3"	1'-11"
15"	5'-11"	4'-2"	1'-6"	1'-5"	2'-0"
18"	6'-11"	4'-5"	1'-6"	1'-5"	2'-1"
24"	8'-10"	4'-11"	1'-6"	1'-5"	2'-3"

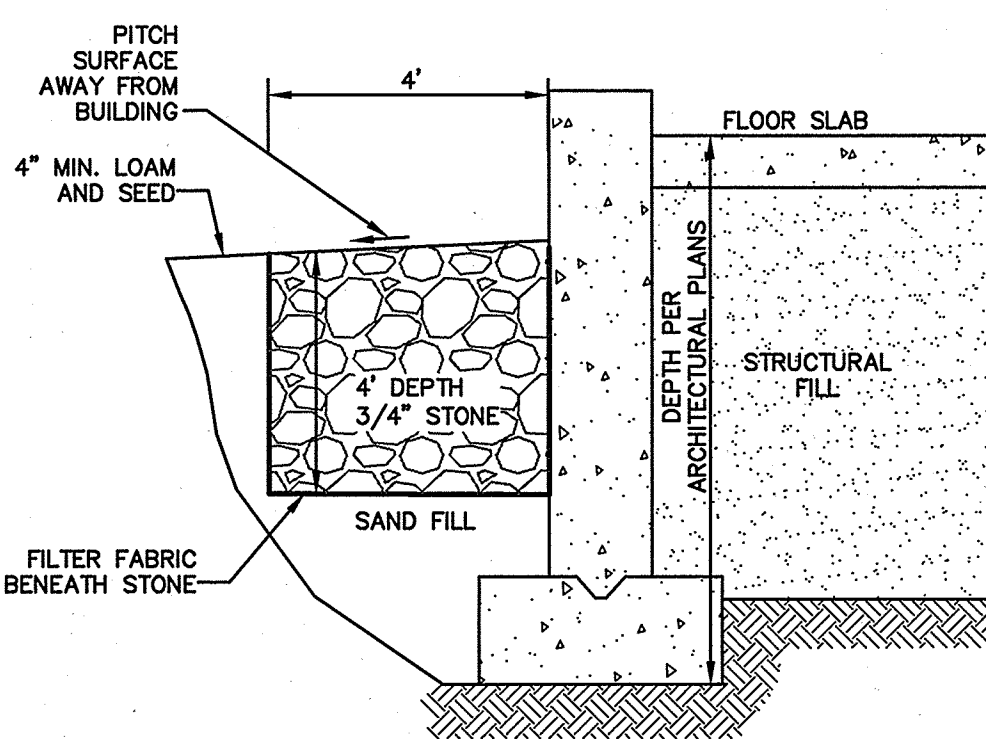
LONGITUDINAL SECTION

NOTES:

- ALL DIMENSIONS GIVEN IN FEET & INCHES.
- PROVIDE BELL END AT INLET HEADWALL, AND SPIGOT END AT OUTLET END HEADWALL.
- 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.
- 1" THREADED INSERTS PROVIDED FOR FINAL ATTACHMENT IN FIELD BY OTHERS.

PRECAST CONCRETE HEADWALL

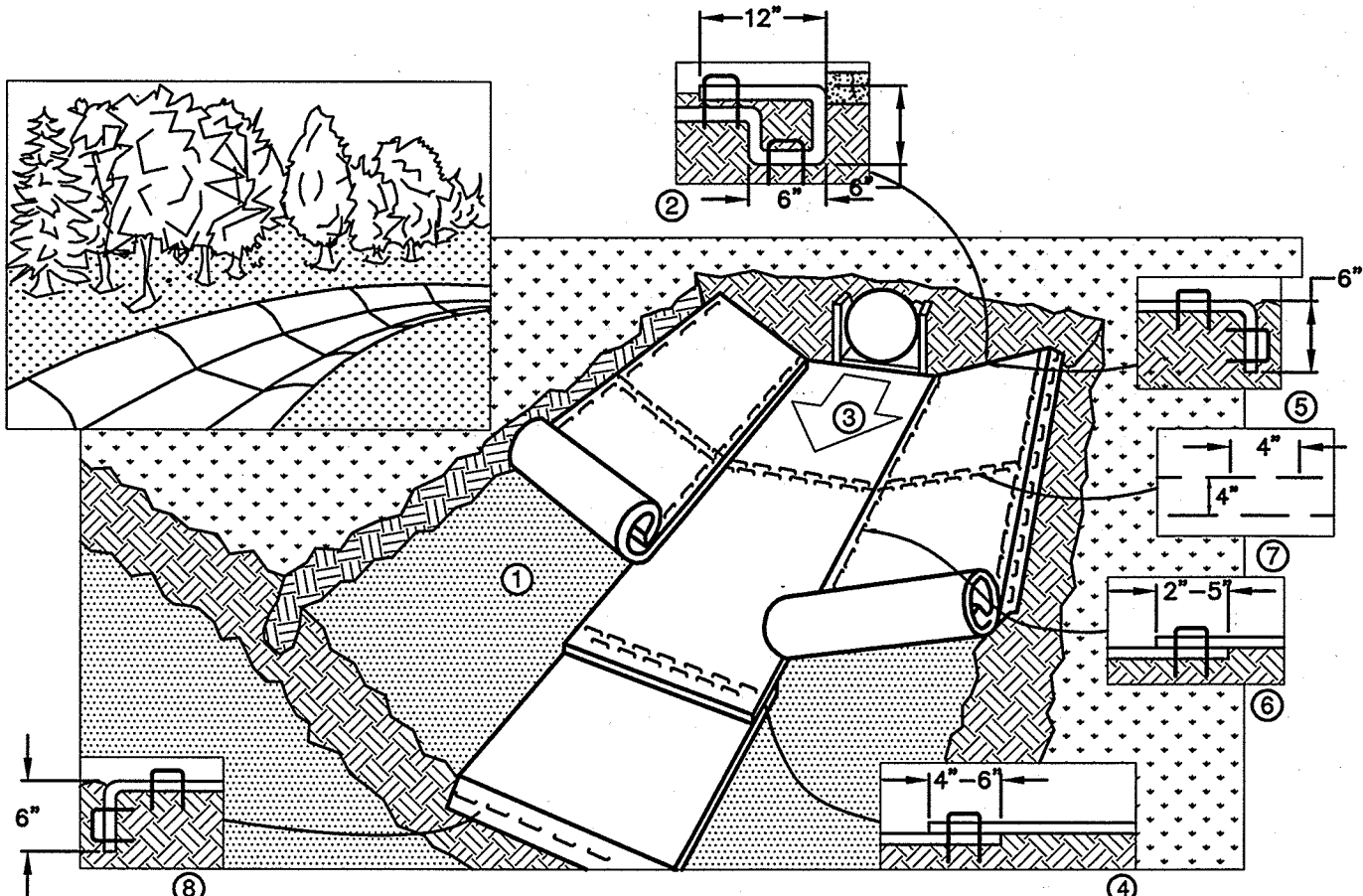
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STONE DRIP EDGE DETAIL

NOT TO SCALE

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- 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" (DEPENDENT 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:

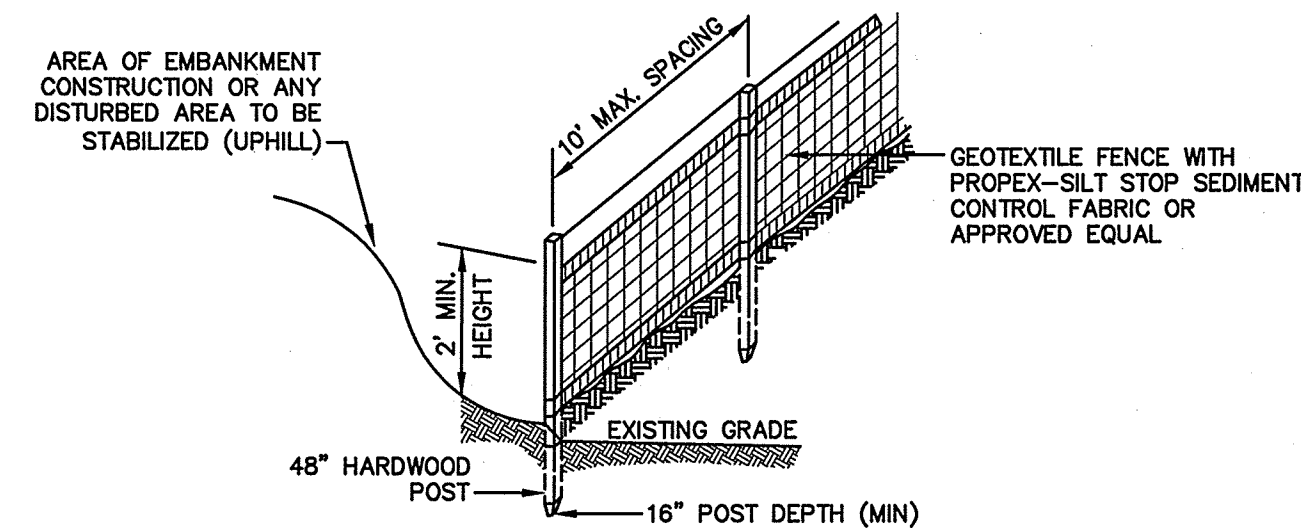
- A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

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

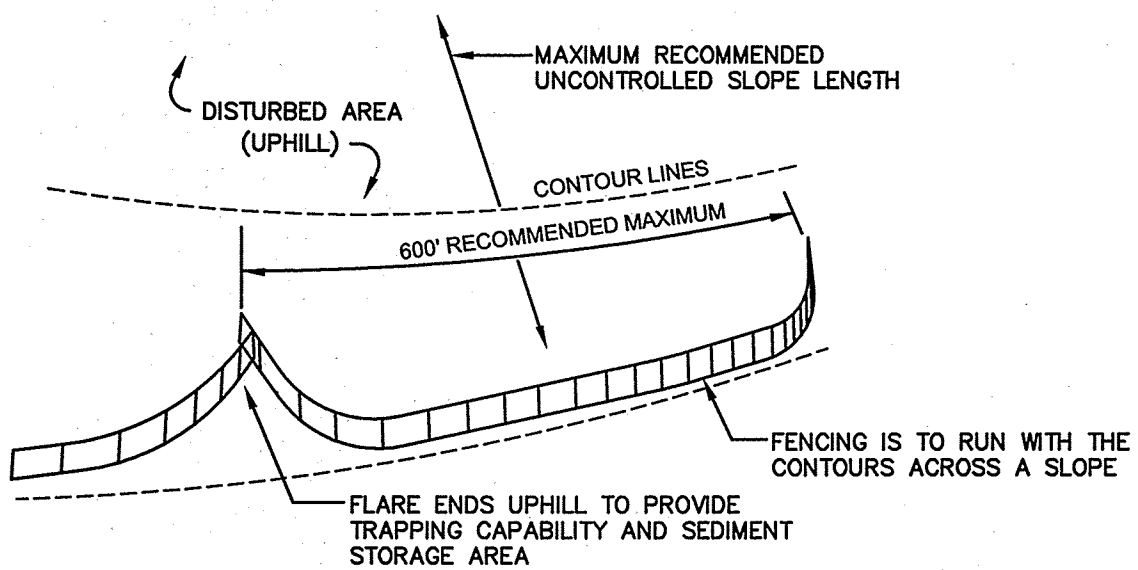


CONSTRUCTION SPECIFICATIONS:

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. THE SEEDBED 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 (CROWN VETCH, BIRDSFOOT, TREFOL 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 SHOULD 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
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	10	0.25
CROWN VETCH	15	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 TREFOL	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

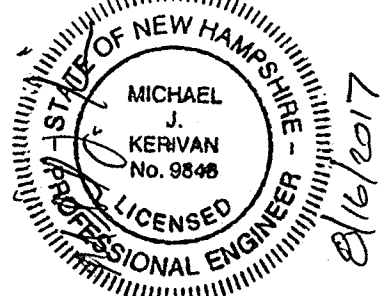
TEMPORARY EROSION CONTROL NOTES

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 6" 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 430:55 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 ABUTTING 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		
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
2	8/16/17	REVISED PER PLANNING BOARD	LAZ
1	7/5/17	REVISED PER TOWN PLANNER	RMN
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:	EROSION AND SEDIMENT CONTROL DETAILS
Project:	SULLIVAN SUBDIVISION 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

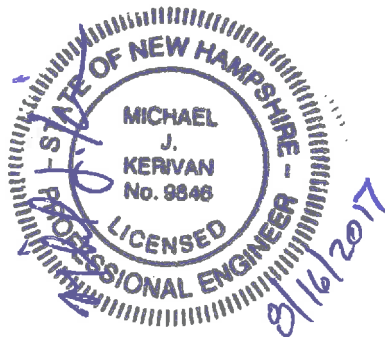
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85 Portsmouth Avenue, PO Box 219, Stratham, NH 03885
603.772.4746 - JonesandBeach.com

DRAINAGE ANALYSIS SEDIMENT AND EROSION CONTROL PLAN

Prepared for:

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



**June 29, 2017
Revised August 16, 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	9.30	22.97	35.20	47.18	62.35
Reach #2	Existing	4.93	14.19	22.75	31.29	41.99
Analysis Point #2	Proposed	4.43	12.68	19.41	25.88	33.80

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 1,133 feet of roadway, driveways, and homes, in addition to site grading, divides the existing drainage basins into five (5) 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 Summary
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 Summary
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 1,133 feet of roadway, driveways, and homes, in addition to site grading, divides the existing drainage basins into five (5) 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.

4.0 CONCLUSION

This proposed site development located south of High Street in Stratham, 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

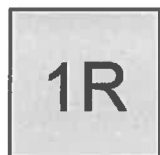
APPENDIX I

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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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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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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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 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 1S: Subcatchment 1SRunoff 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

13070_EX CONDITION

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"

13070_EX CONDITION

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 1SRunoff 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 1S Runoff 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

13070_EX CONDITION

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)

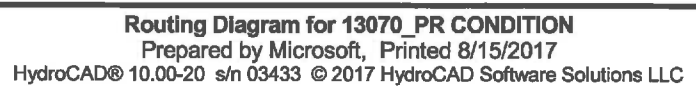
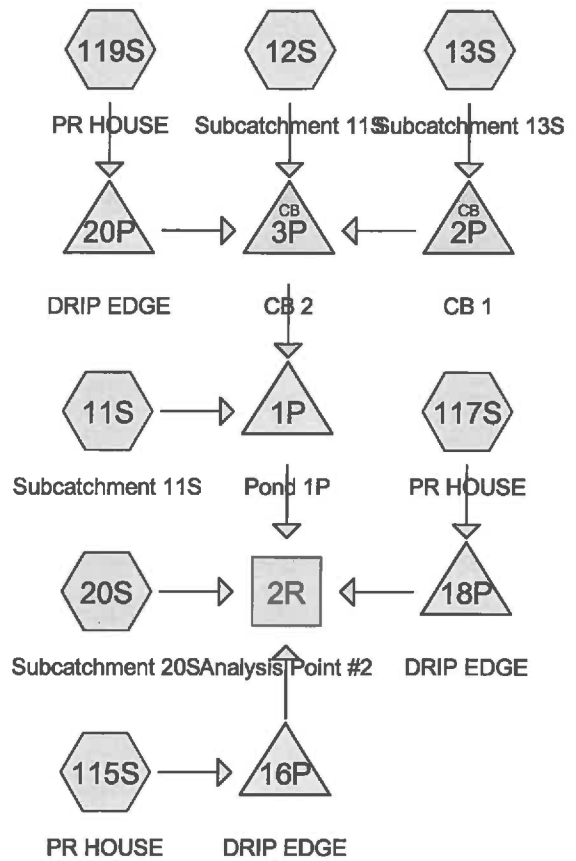
Inflow Area = 9.419 ac, 5.51% Impervious, Inflow Depth > 4.93" for 100-YR STORM event
Inflow = 41.99 cfs @ 12.20 hrs, Volume= 3.866 af
Outflow = 41.99 cfs @ 12.20 hrs, Volume= 3.866 af, Atten= 0%, Lag= 0.0 min

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



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
5.588	61	>75% Grass cover, Good, HSG B (10S, 11S, 12S, 13S, 20S)
9.151	74	>75% Grass cover, Good, HSG C (10S, 11S, 12S, 13S, 20S)
0.057	98	Paved parking, HSG C (112S, 113S, 115S, 117S, 119S)
0.379	98	Paved roads w/curbs & sewers, HSG B (11S, 12S, 13S, 20S)
0.518	98	Paved roads w/curbs & sewers, HSG C (10S, 11S, 12S, 13S, 20S)
0.281	98	Roofs, HSG B (10S, 12S, 20S)
0.699	98	Roofs, HSG C (10S, 20S, 112S, 113S, 115S, 117S, 119S)
1.553	55	Woods, Good, HSG B (10S, 20S)
4.504	70	Woods, Good, HSG C (10S, 11S, 12S, 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, 12S, 13S, 20S
14.930	HSG C	10S, 11S, 12S, 13S, 20S, 112S, 113S, 115S, 117S, 119S
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=531,948 sf 4.81% Impervious Runoff Depth>0.89" Flow Length=1,150' Tc=12.6 min CN=71 Runoff=9.30 cfs 0.909 af
Subcatchment 11S: Subcatchment 11S	Runoff Area=60,477 sf 15.00% Impervious Runoff Depth>1.23" Flow Length=611' Tc=11.2 min CN=77 Runoff=1.63 cfs 0.142 af
Subcatchment 12S: Subcatchment 11S	Runoff Area=127,930 sf 12.65% Impervious Runoff Depth>0.84" Flow Length=736' Tc=8.5 min CN=70 Runoff=2.34 cfs 0.207 af
Subcatchment 13S: Subcatchment 13S	Runoff Area=14,396 sf 43.66% Impervious Runoff Depth>1.42" Tc=6.0 min CN=80 Runoff=0.54 cfs 0.039 af
Subcatchment 20S: Subcatchment 20S	Runoff Area=240,429 sf 5.06% Impervious Runoff Depth>0.70" Flow Length=627' Tc=9.5 min CN=67 Runoff=3.34 cfs 0.322 af
Subcatchment 112S: 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 113S: 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 115S: 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 117S: 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 119S: 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
Reach 1R: Analysis Point #1	Inflow=9.30 cfs 0.909 af Outflow=9.30 cfs 0.909 af
Reach 2R: Analysis Point #2	Inflow=4.43 cfs 0.692 af Outflow=4.43 cfs 0.692 af
Pond 1P: Pond 1P	Peak Elev=80.78' Storage=4,340 cf Inflow=4.40 cfs 0.388 af 12.0" Round Culvert n=0.013 L=110.0' S=0.0655 ' Outflow=1.96 cfs 0.370 af
Pond 2P: CB 1	Peak Elev=86.03' Inflow=0.54 cfs 0.039 af 15.0" Round Culvert n=0.013 L=50.0' S=0.0050 ' Outflow=0.54 cfs 0.039 af
Pond 3P: CB 2	Peak Elev=85.91' Inflow=2.82 cfs 0.246 af 24.0" Round Culvert n=0.013 L=52.0' S=0.0048 ' Outflow=2.82 cfs 0.246 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

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Pond 14P: DRIP EDGEPeak 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**Total Runoff Area = 22.731 ac Runoff Volume = 1.706 af Average Runoff Depth = 0.90"**
91.49% Pervious = 20.797 ac 8.51% Impervious = 1.935 ac

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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=531,948 sf 4.81% Impervious Runoff Depth>2.04" Flow Length=1,150' Tc=12.6 min CN=71 Runoff=22.97 cfs 2.079 af
Subcatchment 11S: Subcatchment 11S	Runoff Area=60,477 sf 15.00% Impervious Runoff Depth>2.54" Flow Length=611' Tc=11.2 min CN=77 Runoff=3.46 cfs 0.294 af
Subcatchment 12S: Subcatchment 11S	Runoff Area=127,930 sf 12.65% Impervious Runoff Depth>1.97" Flow Length=736' Tc=8.5 min CN=70 Runoff=5.95 cfs 0.481 af
Subcatchment 13S: Subcatchment 13S	Runoff Area=14,396 sf 43.66% Impervious Runoff Depth>2.81" Tc=6.0 min CN=80 Runoff=1.07 cfs 0.077 af
Subcatchment 20S: Subcatchment 20S	Runoff Area=240,429 sf 5.06% Impervious Runoff Depth>1.74" Flow Length=627' Tc=9.5 min CN=67 Runoff=9.48 cfs 0.799 af
Subcatchment 112S: 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 113S: 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 115S: 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 117S: 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 119S: 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
Reach 1R: Analysis Point #1	Inflow=22.97 cfs 2.079 af Outflow=22.97 cfs 2.079 af
Reach 2R: Analysis Point #2	Inflow=12.68 cfs 1.627 af Outflow=12.68 cfs 1.627 af
Pond 1P: Pond 1P	Peak Elev=81.68' Storage=10,075 cf Inflow=10.26 cfs 0.853 af 12.0" Round Culvert n=0.013 L=110.0' S=0.0655 ' Outflow=4.11 cfs 0.828 af
Pond 2P: CB 1	Peak Elev=86.55' Inflow=1.07 cfs 0.077 af 15.0" Round Culvert n=0.013 L=50.0' S=0.0050 ' Outflow=1.07 cfs 0.077 af
Pond 3P: CB 2	Peak Elev=86.51' Inflow=7.01 cfs 0.559 af 24.0" Round Culvert n=0.013 L=52.0' S=0.0048 ' Outflow=7.01 cfs 0.559 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

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Page 7**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**Total Runoff Area = 22.731 ac Runoff Volume = 3.865 af Average Runoff Depth = 2.04"**
91.49% Pervious = 20.797 ac 8.51% Impervious = 1.935 ac

13070_PR 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 10S: Subcatchment 10S Runoff Area=531,948 sf 4.81% Impervious Runoff Depth>3.09"
 Flow Length=1,150' Tc=12.6 min CN=71 Runoff=35.20 cfs 3.140 af

Subcatchment 11S: Subcatchment 11S Runoff Area=60,477 sf 15.00% Impervious Runoff Depth>3.68"
 Flow Length=611' Tc=11.2 min CN=77 Runoff=5.02 cfs 0.426 af

Subcatchment 12S: Subcatchment 11S Runoff Area=127,930 sf 12.65% Impervious Runoff Depth>2.99"
 Flow Length=736' Tc=8.5 min CN=70 Runoff=9.29 cfs 0.732 af

Subcatchment 13S: Subcatchment 13S Runoff Area=14,396 sf 43.66% Impervious Runoff Depth>4.00"
 Tc=6.0 min CN=80 Runoff=1.51 cfs 0.110 af

Subcatchment 20S: Subcatchment 20S Runoff Area=240,429 sf 5.06% Impervious Runoff Depth>2.71"
 Flow Length=627' Tc=9.5 min CN=67 Runoff=15.17 cfs 1.245 af

Subcatchment 112S: 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 113S: 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 115S: 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 117S: 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 119S: 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

Reach 1R: Analysis Point #1 Inflow=35.20 cfs 3.145 af
 Outflow=35.20 cfs 3.145 af

Reach 2R: Analysis Point #2 Inflow=19.41 cfs 2.492 af
 Outflow=19.41 cfs 2.492 af

Pond 1P: Pond 1P Peak Elev=82.51' Storage=15,979 cf Inflow=15.40 cfs 1.271 af
 12.0" Round Culvert n=0.013 L=110.0' S=0.0655 ' Outflow=5.36 cfs 1.242 af

Pond 2P: CB 1 Peak Elev=87.03' Inflow=1.51 cfs 0.110 af
 15.0" Round Culvert n=0.013 L=50.0' S=0.0050 ' Outflow=1.51 cfs 0.110 af

Pond 3P: CB 2 Peak Elev=86.97' Inflow=10.72 cfs 0.845 af
 24.0" Round Culvert n=0.013 L=52.0' S=0.0048 ' Outflow=10.72 cfs 0.845 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

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Pond 14P: DRIP EDGEPeak 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**Total Runoff Area = 22.731 ac Runoff Volume = 5.826 af Average Runoff Depth = 3.08"**
91.49% Pervious = 20.797 ac 8.51% Impervious = 1.935 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 = 35.20 cfs @ 12.18 hrs, Volume= 3.140 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
98,769	61	>75% Grass cover, Good, HSG B
260,481	74	>75% Grass cover, Good, HSG C
30,102	55	Woods, Good, HSG B
117,033	70	Woods, Good, HSG C
531,948	71	Weighted Average
506,385		95.19% Pervious Area
25,563		4.81% 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 = 5.02 cfs @ 12.16 hrs, Volume= 0.426 af, Depth> 3.68"

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
3,900	98	Paved roads w/curbs & sewers, HSG B
5,174	98	Paved roads w/curbs & sewers, HSG C
1,866	61	>75% Grass cover, Good, HSG B
42,233	74	>75% Grass cover, Good, HSG C
7,304	70	Woods, Good, HSG C
60,477	77	Weighted Average
51,403		85.00% Pervious Area
9,074		15.00% 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
5.6	50	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
5.3	495	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	36	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	30	0.3300	4.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.2	611	Total			

Summary for Subcatchment 12S: Subcatchment 11S

Runoff = 9.29 cfs @ 12.12 hrs, Volume= 0.732 af, Depth> 2.99"

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
5,122	98	Roofs, HSG B
6,235	98	Paved roads w/curbs & sewers, HSG B
4,824	98	Paved roads w/curbs & sewers, HSG C
63,142	61	>75% Grass cover, Good, HSG B
41,943	74	>75% Grass cover, Good, HSG C
6,664	70	Woods, Good, HSG C
127,930	70	Weighted Average
111,749		87.35% Pervious Area
16,181		12.65% 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"
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 'f' Top.W=13.00' n= 0.022 Earth, clean & straight
8.5	736	Total			

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

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Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 1.51 cfs @ 12.09 hrs, Volume= 0.110 af, Depth> 4.00"

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
3,684	98	Paved roads w/curbs & sewers, HSG B
2,602	98	Paved roads w/curbs & sewers, HSG C
4,639	61	>75% Grass cover, Good, HSG B
3,471	74	>75% Grass cover, Good, HSG C
14,396	80	Weighted Average
8,110		56.34% Pervious Area
6,286		43.66% Impervious Area

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

Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 15.17 cfs @ 12.14 hrs, Volume= 1.245 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
2,703	98	Paved roads w/curbs & sewers, HSG B
2,218	98	Paved roads w/curbs & sewers, HSG C
75,016	61	>75% Grass cover, Good, HSG B
50,500	74	>75% Grass cover, Good, HSG C
37,550	55	Woods, Good, HSG B
65,186	70	Woods, Good, HSG C
240,429	67	Weighted Average
228,252		94.94% Pervious Area
12,177		5.06% 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
0.3	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 Subcatchment 112S: 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 113S: 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 115S: 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"

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

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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 117S: 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 119S: 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 Reach 1R: Analysis Point #1

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

Inflow Area = 12.350 ac, 5.87% Impervious, Inflow Depth > 3.06" for 25-YR STORM event
 Inflow = 35.20 cfs @ 12.18 hrs, Volume= 3.145 af
 Outflow = 35.20 cfs @ 12.18 hrs, Volume= 3.145 af, Atten= 0%, Lag= 0.0 min

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

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Summary for Reach 2R: Analysis Point #2

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

Inflow Area = 10.382 ac, 11.66% Impervious, Inflow Depth > 2.88" for 25-YR STORM event
 Inflow = 19.41 cfs @ 12.15 hrs, Volume= 2.492 af
 Outflow = 19.41 cfs @ 12.15 hrs, Volume= 2.492 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 Pond 1P: Pond 1P

Inflow Area = 4.725 ac, 16.78% Impervious, Inflow Depth > 3.23" for 25-YR STORM event
 Inflow = 15.40 cfs @ 12.13 hrs, Volume= 1.271 af
 Outflow = 5.36 cfs @ 12.49 hrs, Volume= 1.242 af, Atten= 65%, Lag= 21.7 min
 Primary = 5.36 cfs @ 12.49 hrs, Volume= 1.242 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
 Peak Elev= 82.51' @ 12.49 hrs Surf.Area= 7,538 sf Storage= 15,979 cf

Plug-Flow detention time= 48.9 min calculated for 1.242 af (98% of inflow)
 Center-of-Mass det. time= 35.8 min (867.4 - 831.5)

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= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 72.80' S= 0.0655 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.36 cfs @ 12.49 hrs HW=82.51' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 5.36 cfs @ 6.83 fps)

Summary for Pond 2P: CB 1

Inflow Area = 0.330 ac, 43.66% Impervious, Inflow Depth > 4.00" for 25-YR STORM event
 Inflow = 1.51 cfs @ 12.09 hrs, Volume= 0.110 af
 Outflow = 1.51 cfs @ 12.09 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.51 cfs @ 12.09 hrs, Volume= 0.110 af

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

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Peak Elev= 87.03' @ 12.16 hrs

Flood Elev= 89.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.55'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 85.55' / 85.30' S= 0.0050 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=86.72' TW=86.90' (Dynamic Tailwater)

1=Culvert (Controls 0.00 cfs)

Summary for Pond 3P: CB 2

[80] Warning: Exceeded Pond 2P by 0.18' @ 12.05 hrs (1.77 cfs 0.017 af)

Inflow Area = 3.336 ac, 17.52% Impervious, Inflow Depth > 3.04" for 25-YR STORM event
Inflow = 10.72 cfs @ 12.12 hrs, Volume= 0.845 af
Outflow = 10.72 cfs @ 12.12 hrs, Volume= 0.845 af, Atten= 0%, Lag= 0.0 min
Primary = 10.72 cfs @ 12.12 hrs, Volume= 0.845 af

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

Peak Elev= 86.97' @ 12.12 hrs

Flood Elev= 89.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.05'	24.0" Round Culvert L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 85.05' / 84.80' S= 0.0048 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.41 cfs @ 12.12 hrs HW=86.94' TW=81.59' (Dynamic Tailwater)

1=Culvert (Barrel Controls 10.41 cfs @ 4.39 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=85.30' (Dynamic Tailwater)

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

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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=531,948 sf 4.81% Impervious Runoff Depth>4.12"
 Flow Length=1,150' Tc=12.6 min CN=71 Runoff=47.18 cfs 4.194 af

Subcatchment 11S: Subcatchment 11S Runoff Area=60,477 sf 15.00% Impervious Runoff Depth>4.79"
 Flow Length=611' Tc=11.2 min CN=77 Runoff=6.50 cfs 0.554 af

Subcatchment 12S: Subcatchment 11S Runoff Area=127,930 sf 12.65% Impervious Runoff Depth>4.02"
 Flow Length=736' Tc=8.5 min CN=70 Runoff=12.52 cfs 0.983 af

Subcatchment 13S: Subcatchment 13S Runoff Area=14,396 sf 43.66% Impervious Runoff Depth>5.14"
 Tc=6.0 min CN=80 Runoff=1.92 cfs 0.141 af

Subcatchment 20S: Subcatchment 20S Runoff Area=240,429 sf 5.06% Impervious Runoff Depth>3.69"
 Flow Length=627' Tc=9.5 min CN=67 Runoff=20.84 cfs 1.696 af

Subcatchment 112S: 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 113S: 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 115S: 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 117S: 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 119S: 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

Reach 1R: Analysis Point #1 Inflow=47.18 cfs 4.213 af
 Outflow=47.18 cfs 4.213 af

Reach 2R: Analysis Point #2 Inflow=25.88 cfs 3.371 af
 Outflow=25.88 cfs 3.371 af

Pond 1P: Pond 1P Peak Elev=83.30' Storage=22,233 cf Inflow=20.41 cfs 1.688 af
 12.0" Round Culvert n=0.013 L=110.0' S=0.0655 ' Outflow=6.33 cfs 1.655 af

Pond 2P: CB 1 Peak Elev=87.57' Inflow=1.92 cfs 0.141 af
 15.0" Round Culvert n=0.013 L=50.0' S=0.0050 ' Outflow=1.92 cfs 0.141 af

Pond 3P: CB 2 Peak Elev=87.48' Inflow=14.35 cfs 1.134 af
 24.0" Round Culvert n=0.013 L=52.0' S=0.0048 ' Outflow=14.35 cfs 1.134 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

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Pond 14P: DRIP EDGEPeak 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**Total Runoff Area = 22.731 ac Runoff Volume = 7.776 af Average Runoff Depth = 4.11"**
91.49% Pervious = 20.797 ac 8.51% Impervious = 1.935 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=531,948 sf 4.81% Impervious Runoff Depth>5.42"
 Flow Length=1,150' Tc=12.6 min CN=71 Runoff=62.35 cfs 5.516 af

Subcatchment 11S: Subcatchment 11S Runoff Area=60,477 sf 15.00% Impervious Runoff Depth>6.16"
 Flow Length=611' Tc=11.2 min CN=77 Runoff=8.30 cfs 0.713 af

Subcatchment 12S: Subcatchment 11S Runoff Area=127,930 sf 12.65% Impervious Runoff Depth>5.30"
 Flow Length=736' Tc=8.5 min CN=70 Runoff=16.53 cfs 1.297 af

Subcatchment 13S: Subcatchment 13S Runoff Area=14,396 sf 43.66% Impervious Runoff Depth>6.53"
 Tc=6.0 min CN=80 Runoff=2.42 cfs 0.180 af

Subcatchment 20S: Subcatchment 20S Runoff Area=240,429 sf 5.06% Impervious Runoff Depth>4.93"
 Flow Length=627' Tc=9.5 min CN=67 Runoff=27.95 cfs 2.268 af

Subcatchment 112S: 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 113S: 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 115S: 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 117S: 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 119S: 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

Reach 1R: Analysis Point #1 Inflow=62.35 cfs 5.552 af
 Outflow=62.35 cfs 5.552 af

Reach 2R: Analysis Point #2 Inflow=33.80 cfs 4.476 af
 Outflow=33.80 cfs 4.476 af

Pond 1P: Pond 1P Peak Elev=84.24' Storage=30,592 cf Inflow=26.56 cfs 2.208 af
 12.0" Round Culvert n=0.013 L=110.0' S=0.0655 ' Outflow=7.32 cfs 2.172 af

Pond 2P: CB 1 Peak Elev=88.67' Inflow=2.42 cfs 0.180 af
 15.0" Round Culvert n=0.013 L=50.0' S=0.0050 ' Outflow=2.42 cfs 0.180 af

Pond 3P: CB 2 Peak Elev=88.53' Inflow=18.84 cfs 1.496 af
 24.0" Round Culvert n=0.013 L=52.0' S=0.0048 ' Outflow=18.84 cfs 1.496 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

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Pond 14P: DRIP EDGEPeak 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**Total Runoff Area = 22.731 ac Runoff Volume = 10.224 af Average Runoff Depth = 5.40"**
91.49% Pervious = 20.797 ac 8.51% Impervious = 1.935 ac

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

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Summary for Subcatchment 10S: Subcatchment 10S

Runoff = 62.35 cfs @ 12.17 hrs, Volume= 5.516 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
98,769	61	>75% Grass cover, Good, HSG B
260,481	74	>75% Grass cover, Good, HSG C
30,102	55	Woods, Good, HSG B
117,033	70	Woods, Good, HSG C
531,948	71	Weighted Average
506,385		95.19% Pervious Area
25,563		4.81% 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 = 8.30 cfs @ 12.16 hrs, Volume= 0.713 af, Depth> 6.16"

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
3,900	98	Paved roads w/curbs & sewers, HSG B
5,174	98	Paved roads w/curbs & sewers, HSG C
1,866	61	>75% Grass cover, Good, HSG B
42,233	74	>75% Grass cover, Good, HSG C
7,304	70	Woods, Good, HSG C
60,477	77	Weighted Average
51,403		85.00% Pervious Area
9,074		15.00% Impervious Area

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

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.23"
5.3	495	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	36	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.1	30	0.3300	4.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
11.2	611	Total			

Summary for Subcatchment 12S: Subcatchment 11S

Runoff = 16.53 cfs @ 12.12 hrs, Volume= 1.297 af, Depth> 5.30"

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
5,122	98	Roofs, HSG B
6,235	98	Paved roads w/curbs & sewers, HSG B
4,824	98	Paved roads w/curbs & sewers, HSG C
63,142	61	>75% Grass cover, Good, HSG B
41,943	74	>75% Grass cover, Good, HSG C
6,664	70	Woods, Good, HSG C
127,930	70	Weighted Average
111,749		87.35% Pervious Area
16,181		12.65% 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"
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			

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Summary for Subcatchment 13S: Subcatchment 13S

Runoff = 2.42 cfs @ 12.09 hrs, Volume= 0.180 af, Depth> 6.53"

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
3,684	98	Paved roads w/curbs & sewers, HSG B
2,602	98	Paved roads w/curbs & sewers, HSG C
4,639	61	>75% Grass cover, Good, HSG B
3,471	74	>75% Grass cover, Good, HSG C
14,396	80	Weighted Average
8,110		56.34% Pervious Area
6,286		43.66% Impervious Area

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

Summary for Subcatchment 20S: Subcatchment 20S

Runoff = 27.95 cfs @ 12.14 hrs, Volume= 2.268 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
2,703	98	Paved roads w/curbs & sewers, HSG B
2,218	98	Paved roads w/curbs & sewers, HSG C
75,016	61	>75% Grass cover, Good, HSG B
50,500	74	>75% Grass cover, Good, HSG C
37,550	55	Woods, Good, HSG B
65,186	70	Woods, Good, HSG C
240,429	67	Weighted Average
228,252		94.94% Pervious Area
12,177		5.06% Impervious Area

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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 Subcatchment 112S: 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 113S: 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 115S: 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"

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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 117S: 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 119S: 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 Reach 1R: Analysis Point #1

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

Inflow Area = 12.350 ac, 5.87% Impervious, Inflow Depth > 5.40" for 100-YR STORM event

Inflow = 62.35 cfs @ 12.17 hrs, Volume= 5.552 af

Outflow = 62.35 cfs @ 12.17 hrs, Volume= 5.552 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 = 10.382 ac, 11.66% Impervious, Inflow Depth > 5.17" for 100-YR STORM event
 Inflow = 33.80 cfs @ 12.14 hrs, Volume= 4.476 af
 Outflow = 33.80 cfs @ 12.14 hrs, Volume= 4.476 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 Pond 1P: Pond 1P

Inflow Area = 4.725 ac, 16.78% Impervious, Inflow Depth > 5.61" for 100-YR STORM event
 Inflow = 26.56 cfs @ 12.13 hrs, Volume= 2.208 af
 Outflow = 7.32 cfs @ 12.54 hrs, Volume= 2.172 af, Atten= 72%, Lag= 25.1 min
 Primary = 7.32 cfs @ 12.54 hrs, Volume= 2.172 af

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

Peak Elev= 84.24' @ 12.54 hrs Surf.Area= 9,362 sf Storage= 30,592 cf

Plug-Flow detention time= 53.1 min calculated for 2.167 af (98% of inflow)

Center-of-Mass det. time= 43.3 min (859.6 - 816.3)

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= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.00' / 72.80' S= 0.0655 ' S= 0.0655 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=7.32 cfs @ 12.54 hrs HW=84.24' TW=0.00' (Dynamic Tailwater)

1=Culvert (Inlet Controls 7.32 cfs @ 9.31 fps)

Summary for Pond 2P: CB 1

Inflow Area = 0.330 ac, 43.66% Impervious, Inflow Depth > 6.53" for 100-YR STORM event
 Inflow = 2.42 cfs @ 12.09 hrs, Volume= 0.180 af
 Outflow = 2.42 cfs @ 12.09 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.42 cfs @ 12.09 hrs, Volume= 0.180 af

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

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Peak Elev= 88.67' @ 12.16 hrs

Flood Elev= 89.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.55'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 85.55' / 85.30' S= 0.0050 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=87.70' TW=88.28' (Dynamic Tailwater)

←1=Culvert (Controls 0.00 cfs)

Summary for Pond 3P: CB 2

[80] Warning: Exceeded Pond 2P by 0.62' @ 12.10 hrs (3.67 cfs 0.044 af)

Inflow Area = 3.336 ac, 17.52% Impervious, Inflow Depth > 5.38" for 100-YR STORM event
Inflow = 18.84 cfs @ 12.12 hrs, Volume= 1.496 af
Outflow = 18.84 cfs @ 12.12 hrs, Volume= 1.496 af, Atten= 0%, Lag= 0.0 min
Primary = 18.84 cfs @ 12.12 hrs, Volume= 1.496 af

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

Peak Elev= 88.53' @ 12.12 hrs

Flood Elev= 89.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	85.05'	24.0" Round Culvert L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 85.05' / 84.80' S= 0.0048 ' / Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=18.34 cfs @ 12.12 hrs HW=88.41' TW=82.66' (Dynamic Tailwater)

←1=Culvert (Inlet Controls 18.34 cfs @ 5.84 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

13070_PR CONDITION

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

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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

13070_PR CONDITION

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

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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)

13070_PR CONDITION

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

Prepared by Microsoft

Printed 8/15/2017

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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=86.90' (Dynamic Tailwater)

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

APPENDIX III

Charts, Graphs, and Calculations

Select Product ?

Extreme Precipitation Tables - HTML ?

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 ?

Select Location ? Double-click the map to place a marker, or enter address or latitude/longitude.

Locate by Address ?

Locate by Lat/Lon ?

Locate by State/County ?



Select Options ?

Smoothing ?

Yes ▾

Delivery ?

Popup ▾

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	5.14	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	5.75	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	6.32	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	6.99	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	7.86	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

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

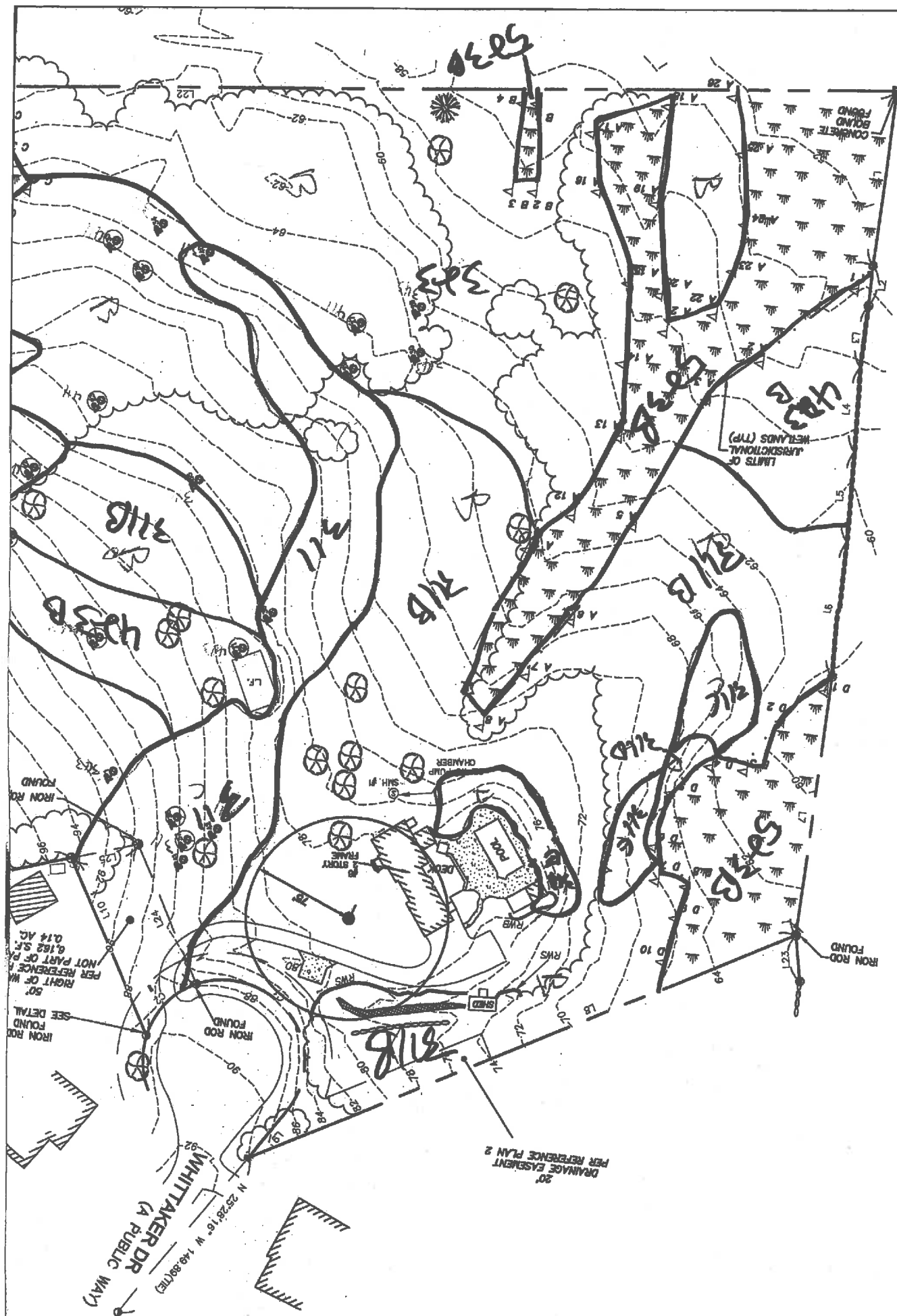
Kate - p/f/s/t. Jon

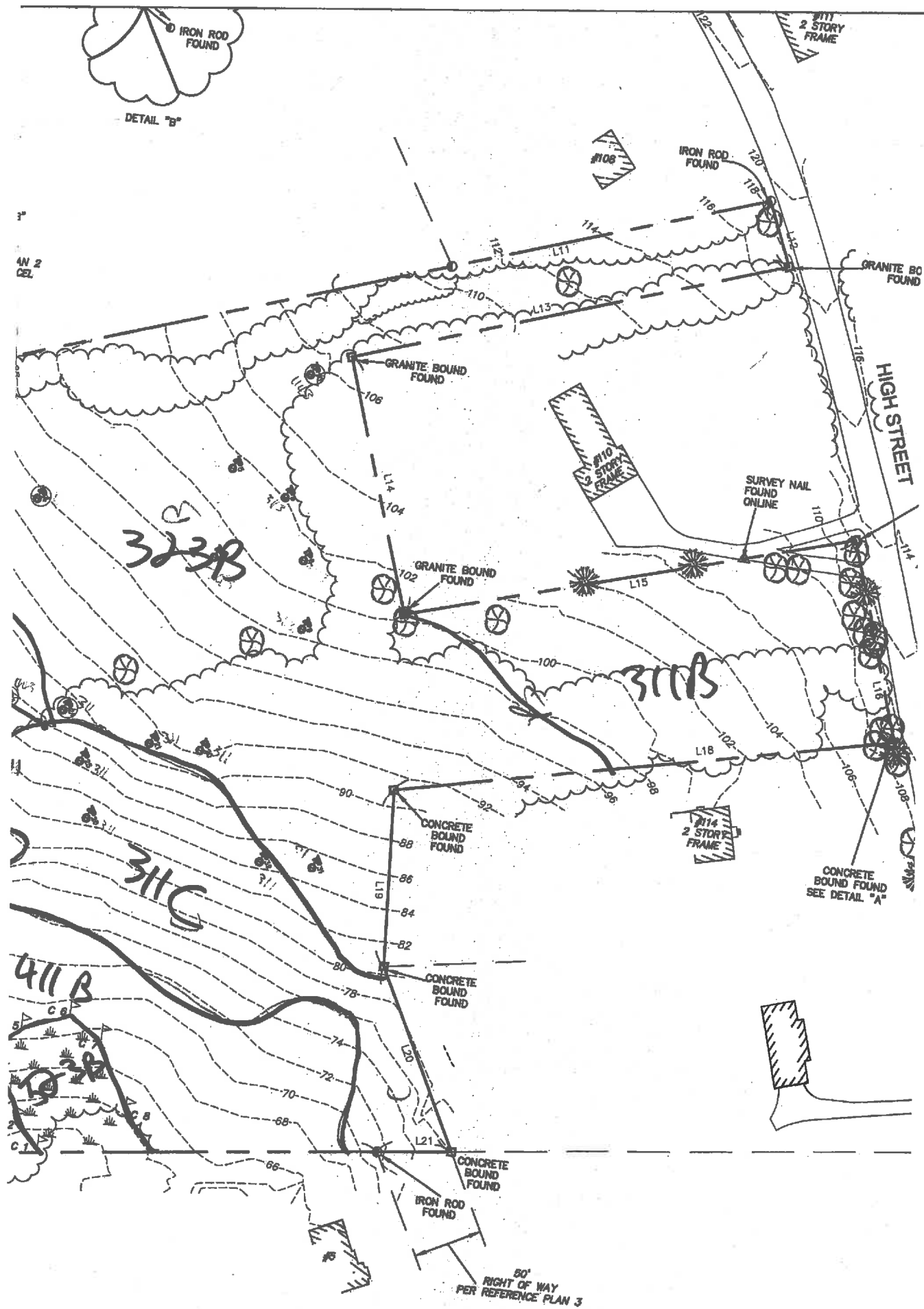
-----Original Message-----

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

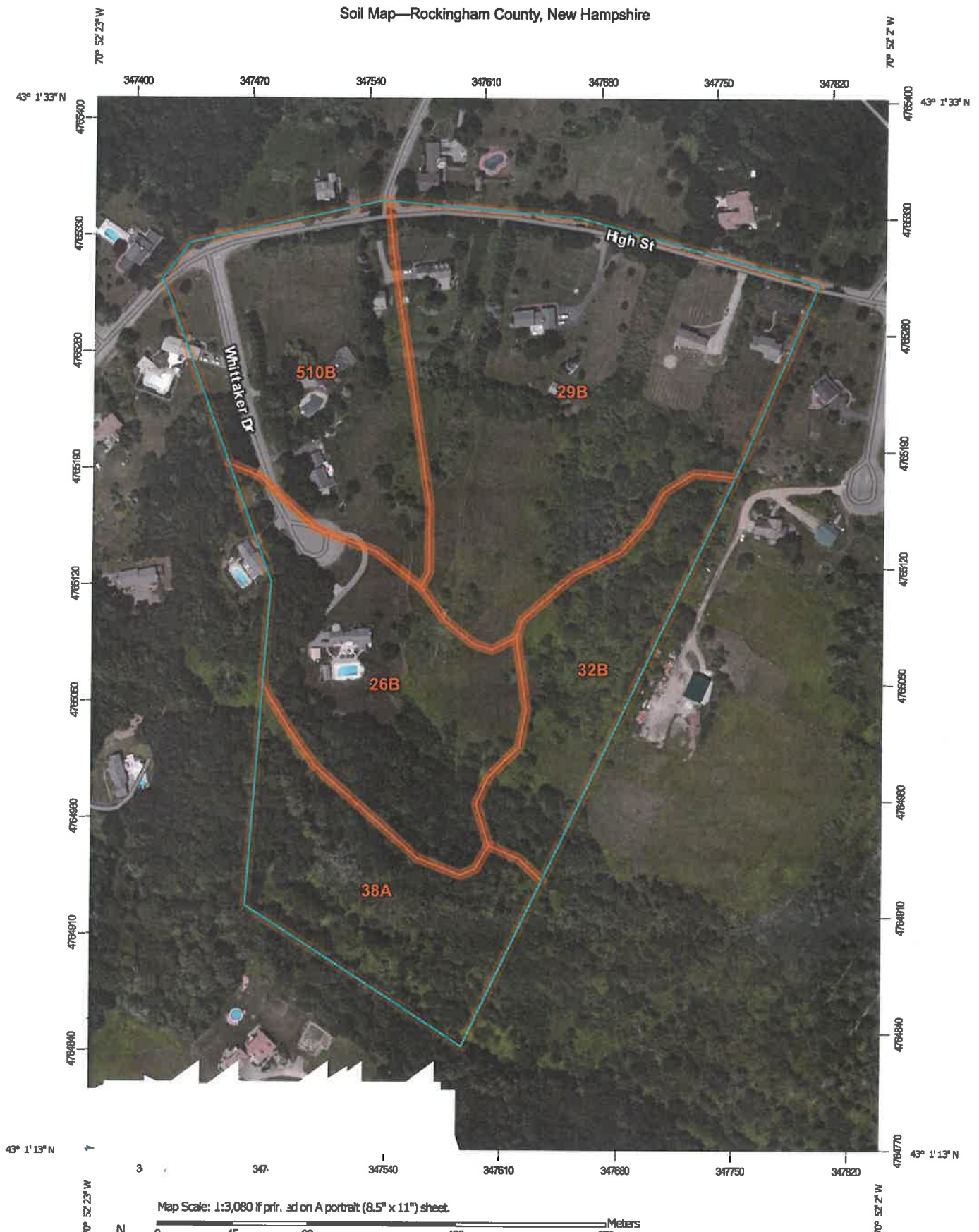
Here is the soil map. Please note when you mark it up to change the 323 to 343:

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)
Soils	
 Soil Map Unit Polygons	 Soil Map Unit Polygons
 Soil Map Unit Lines	 Soil Map Unit Lines
 Soil Map Unit Points	 Soil Map Unit Points
Special Point Features	Special Line Features
 Blowout	 Streams and Canals
 Borrow Pit	 Ralls
 Clay Spot	 Interstate Highways
 Closed Depression	 US Routes
 Gravel Pit	 Major Roads
 Gravelly Spot	 Local Roads
 Landfill	 Background
 Lava Flow	 Aerial Photography
 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	

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

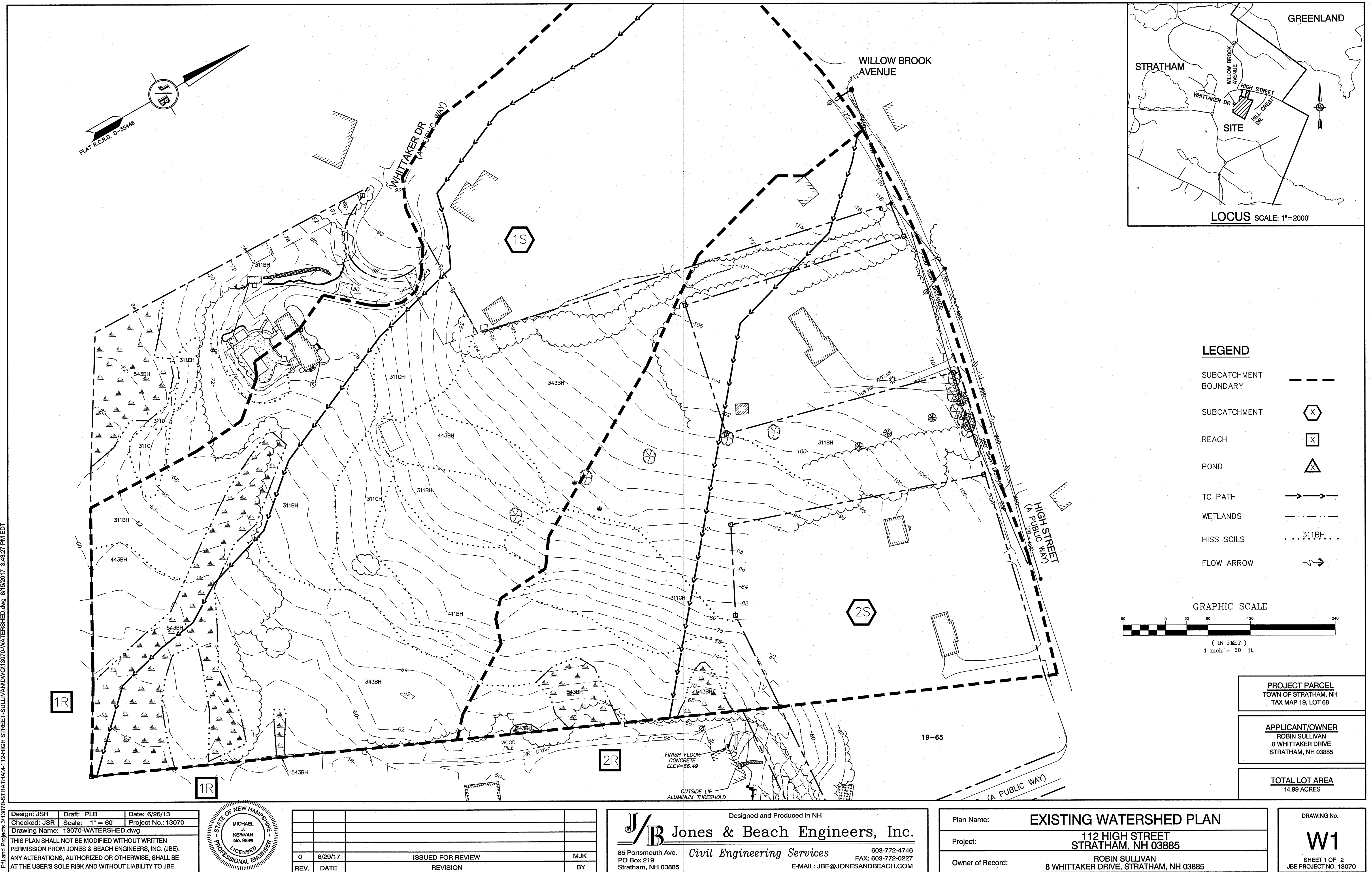
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

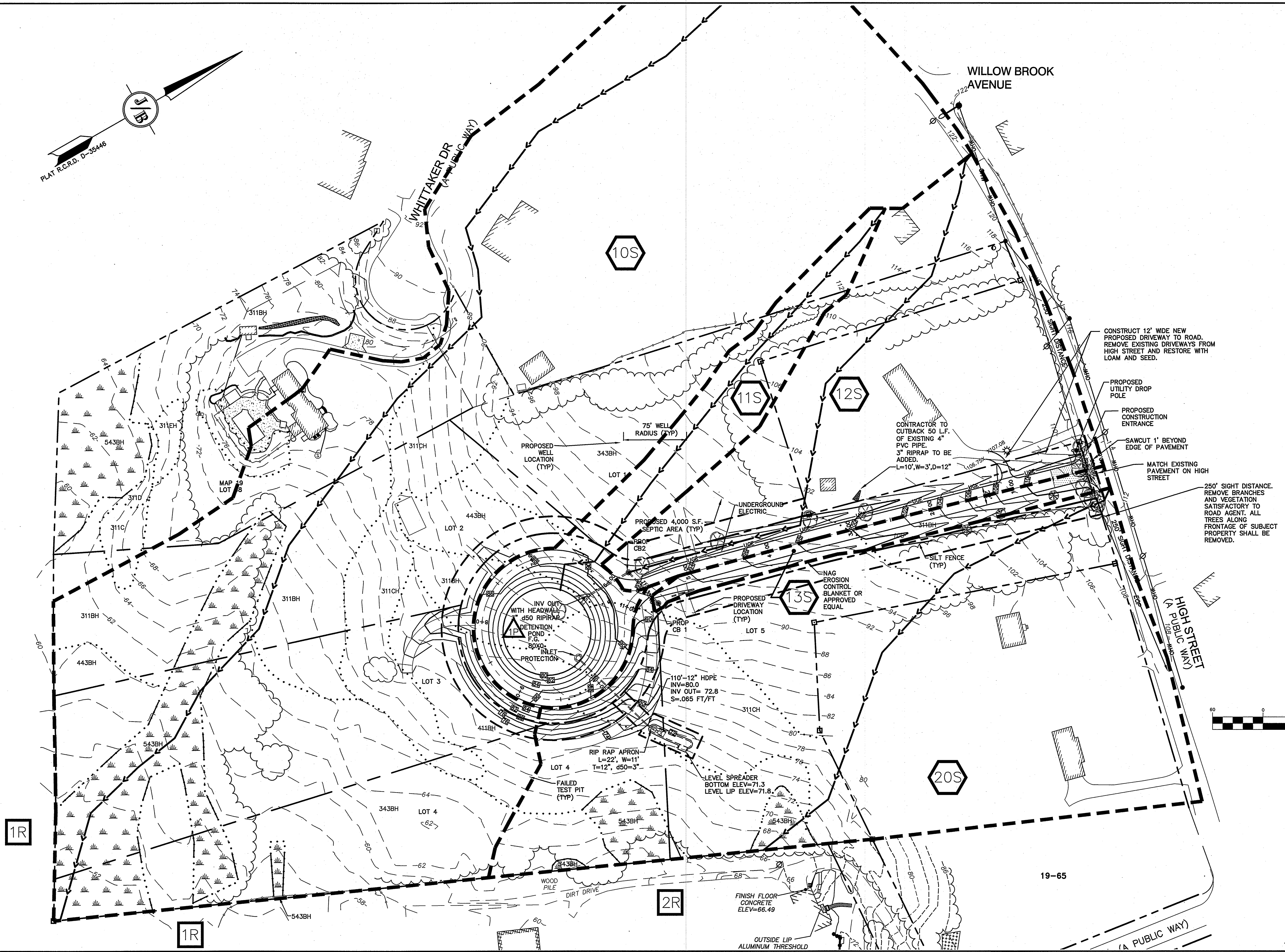
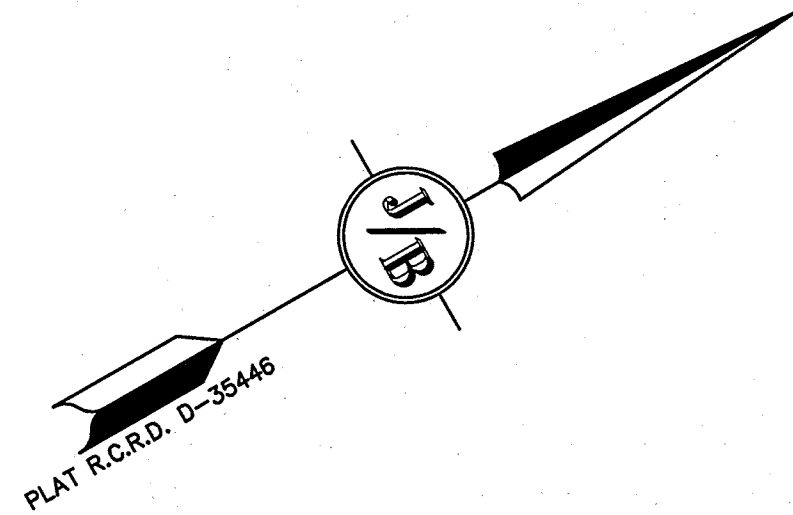
Date(s) aerial images were photographed: Jun 20, 2010—Jul 18, 2010

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.

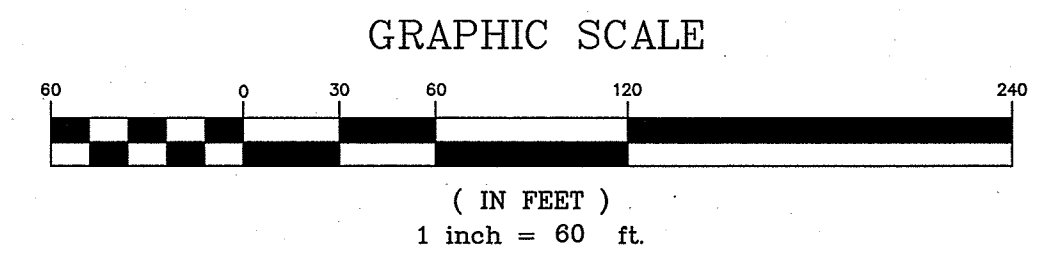
Map Unit Legend

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%





- LEGEND**
- SUBCATCHMENT BOUNDARY
 - SUBCATCHMENT
 - REACH
 - POND
 - TC PATH
 - WETLANDS
 - HISS SOILS
 - FLOW ARROW



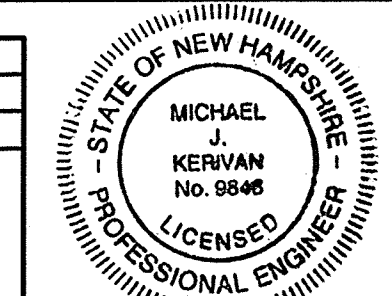
PROJECT PARCEL
TOWN OF STRATHAM, NH
TAX MAP 19, LOT 68

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

TOTAL LOT AREA
14.99 ACRES

F:\Land Projects\313070-STRATHAM-112-HIGH STREET-SULLIVAN\DWG\13070-WATERSHED.dwg 8/15/2017 3:43:27 PM 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.



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

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

DRAWING No.
W2
SHEET 2 OF 2
JBE PROJECT NO. 13070

CIVILWORKS NEW ENGLAND

181 WATSON ROAD
P.O. BOX 1166
DOVER, NH 03821-1166
PHONE: (603) 750.4266 FAX: (603) 749.7348

September 14, 2017

Stratham Planning Board
10 Bunker Hill Avenue
Stratham, NH 03885

Attn: Tavis Austin, Town Planner
(via email): TAustin@strathamNH.gov

Re: Subdivision Plan Review – Sullivan
Tax Map 19, Lot No. 68
112 High Street, Stratham, NH
Our Reference No. 1768

Dear Mr. Austin:

At your request, we have reviewed subdivision plans of the proposed Sullivan subdivision submitted by Jones & Beach Engineers, Inc. (JBE) in support of their application for Planning Board approval under subdivision review. The titles of the submitted plan sheets are listed below and are dated as noted:

PLAN NO.	TITLE	DATE	REV.
CS	Cover Sheet	8-16-17	2
A1	Subdivision Plan	8-16-17	2
C1	Existing Conditions Plan	8-16-17	2
C2	Grading and Drainage Plan	8-16-17	2
P1	Plan and Profile	8-16-17	2
D1	Detail Sheet	8-16-17	2
D2	Detail Sheet	8-16-17	2
E1	Erosion and Sediment Control Details	8-16-17	2

We are also in receipt of the above plan set noted as "Revision 1" and dated 7/5/17. Additionally, we have received plan sheets entitled "CONCEPTUAL SUBDIVISION PLAN" dated: 4/91/17 (Revision 1) and dated: 11/10/16 (Revision 0).

All plan sheets have been prepared by JBE. Also submitted were:

1. "DRAINAGE ANALYSIS SEDIMENT AND EROSION CONTROL PLAN", dated: June 29, 2017 and revised: August 16, 2017; as prepared by JBE.
2. Correspondence from JBE to the Stratham Planning Board dated: August 16, 2017.
3. "SITE PLAN REVIEW/SUBDIVISION WAIVER REQUEST FORM" requesting a 22' wide paved roadway width where 24' is required.
4. "LOT SIZE BY SOIL CLASSIFICATION" computations prepared by JBE and dated: August 16, 2017.
5. Logs of "TEST PITS FOR 8 WHITAKER DRIVE, STRATHAM, NEW HAMPSHIRE", APRIL 20, 2016; DECEMBER 14 & 27, 2016; as prepared by JBE.

The scope of our subdivision plan review includes:

1. Check for conformance with the Stratham Zoning Ordinance
2. Check for conformance with the Stratham Subdivision Regulations
3. Subdivision engineering and design review

As part of our review, we visited the subject site on August 22, 2017.

ZONING ORDINANCE CONFORMANCE REVIEW:

All appears to be in order. As such, we have no comments to share at this time.

SUBDIVISION REGULATIONS CONFORMANCE REVIEW:

1. Section 3.3.2 states the scale of the "Subdivision Plan" should be no greater than 1"=50'. The submitted "subdivision plan" is at a scale of 1"=60' and as such, will require a WAIVER from the Regulations to be acceptable.
2. A plan and profile of existing conditions on High Street within 300' either side of the proposed roadway is required per Section 3.3.3(a.) of the Regulations.
3. Section 4.4.3 of the Regulations requires (in part) ".....the arrangement of streets in a subdivision shall provide for the continuation of the principal street existing in the adjoining subdivisions.....". The submitted CONCEPTUAL SUBDIVISION PLAN dated 4/19/17 provides for said continuation. The more recently submitted subdivision pan

revisions do not provide for any continuation and instead, sets forth another dead end, cul-de-sac street proposal.

4. Section 4.5.3 addresses the (possible) need for a fire cistern at this proposed subdivision. The Planning Board should address this matter with the applicant.
5. TABLE 1 (p. 66) of the Regulations allows for a maximum centerline road grade of 2% in a cul-de-sac turnaround. The proposed roadway sets forth a centerline roadway grade of 3%. For this to be approvable by the Planning Board, a WAIVER from the Regulations will be required.

SUBDIVISION ENGINEERING AND DESIGN REVIEW:

1. A NHDOT specification should be shown and included for the "suitable clean fill" called for in the "TYPICAL ROADWAY SECTION" shown on plan sheet D1.
2. NHDES Subdivision Approval will be required for this subdivision proposal.
3. A "HISS" mapping legend should be provided on plan sheet C1 and C2 for proper interpretation of the "HISS" mapping data shown.
4. The available safe sight distances should be identified and shown for the proposed roadway's intersection with High Street.
5. We have no submitted data or logs for Soil Test Pits identified as #1 through #20 shown on plan sheets C1 and C2.
6. The stormwater drainage design appears to be satisfactory.
7. In general, we have no objections to the submitted WAIVER request. The Town Road Agent should be consulted for his input on the WAIVER request. Additionally, the Planning Board should give due consideration of the request as same relates to municipal policy and history relative to these matters.

RECOMMENDATIONS:

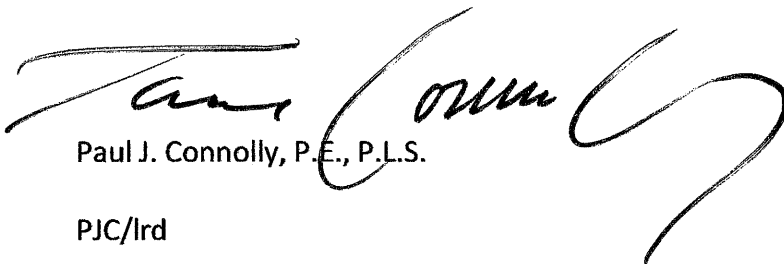
We have several reservations with regard to the Planning Board's consideration of approval for this subdivision. Our primary concerns are:

1. The proposal of a dead end cul-de-sac where alternatively, the continuation of existing streets; which will form a non-dead end "through street" and eliminate two (2) existing dead end cul-de-sacs would seem to be more logical, safer, and in closer alliance with the stated Subdivision Regulations of the Town.
2. Provision of a fire cistern for fire/life safety purposes.
3. The apparent limited safe sight distances at the proposed roadway's intersection with High Street.

The Board may wish to have the applicant address the comments contained herein prior to taking any action on the disposition of the plans.

Please feel free to contact me if there are any questions or comments regarding this subdivision review.

Very truly yours,
CIVILWORKS, INC.



Paul J. Connolly, P.E., P.L.S.

PJC/lrd

cc: Jonathan Ring, P.E. (JBE), via email: jring@Jonesandbeach.com