



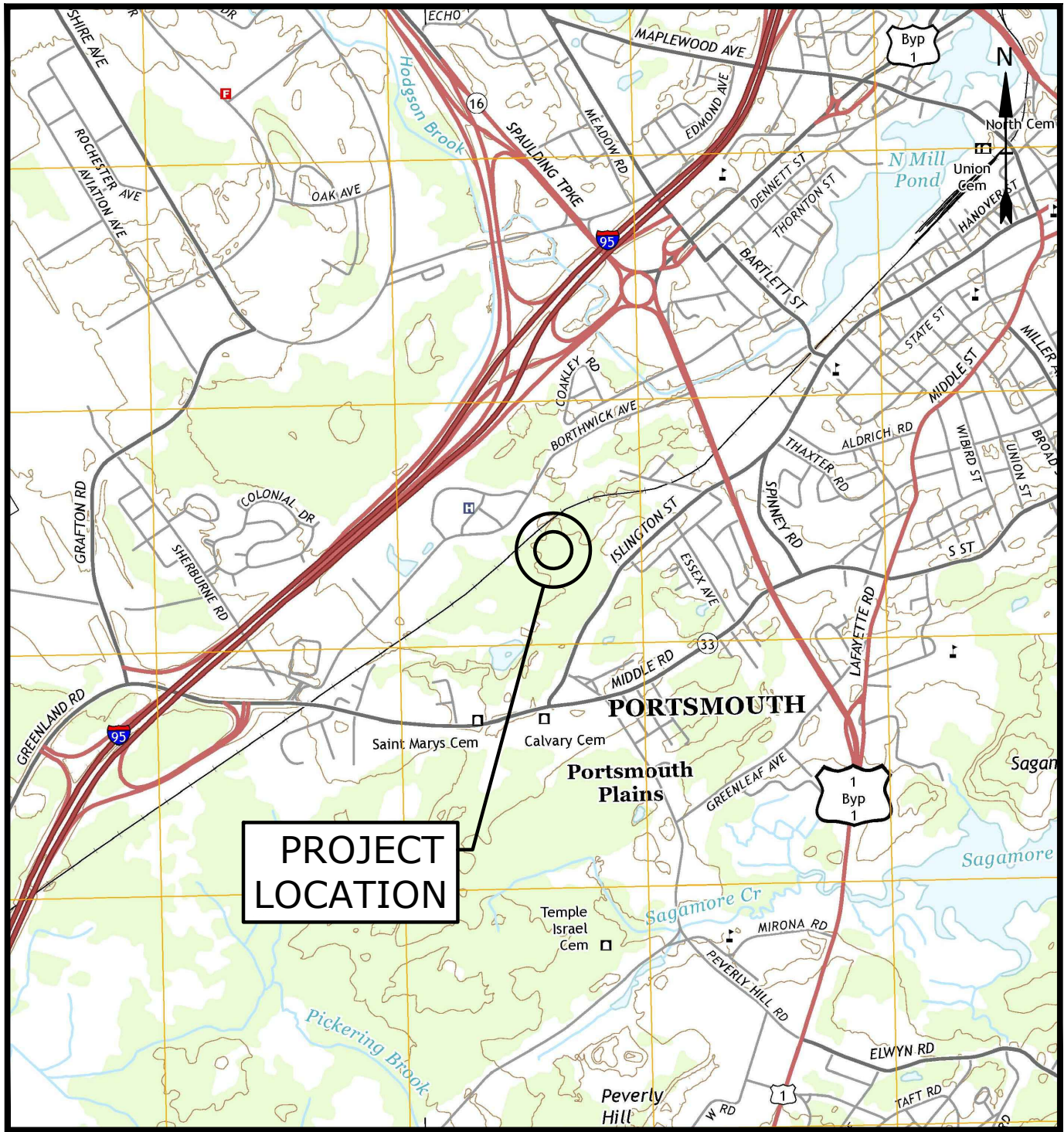
# PROPOSED SUBDIVISION ROAD & OFFICE BUILDING DEVELOPMENT

## PORTSMOUTH, NEW HAMPSHIRE PERMIT DRAWINGS

MARCH 20, 2017

LAST REVISED: JUNE 11, 2019

LIST OF DRAWINGS		
SHEET NO.	SHEET TITLE	LAST REVISED
	COVER SHEET	06/11/2019
1 OF 5	LOT CONSOLIDATION & RESUBDIVISION PLAN	05/04/2018
2 OF 5	LOT CONSOLIDATION & RESUBDIVISION PLAN	05/04/2018
3 OF 5	LOT CONSOLIDATION & RESUBDIVISION PLAN	05/04/2018
4 OF 5	LOT CONSOLIDATION & RESUBDIVISION PLAN	05/04/2018
5 OF 5	LOT CONSOLIDATION & RESUBDIVISION PLAN	05/04/2018
G-101	GENERAL NOTES, ABBREVIATIONS & LEGEND SHEET	06/11/2019
C-101	OVERALL EXISTING CONDITIONS PLAN	03/25/2019
C-101.1	EXISTING CONDITIONS/DEMOLITION PLAN	06/11/2019
C-101.2	EXISTING CONDITIONS/DEMOLITION PLAN	06/11/2019
C-102	OVERALL SITE PLAN	06/11/2019
C-102.1	SITE PLAN & ROADWAY PROFILE	06/11/2019
C-102.2	SITE PLAN	06/11/2019
C-103.1	GRADING, DRAINAGE & EROSION CONTROL PLAN	06/11/2019
C-103.2	GRADING, DRAINAGE & EROSION CONTROL PLAN	06/11/2019
C-104.1	UTILITY PLAN & PROFILES	06/11/2019
C-104.2	UTILITY PLAN	06/11/2019
C-105.1	LANDSCAPE PLAN	06/11/2019
C-105.2	LANDSCAPE PLAN	06/11/2019
C-106	BUFFER RESTORATION & PLANTING SEQUENCING PLAN	06/11/2019
C-501	EROSION CONTROL NOTES SHEET	03/25/2019
C-502	DETAILS SHEET	03/25/2019
C-503	DETAILS SHEET	03/25/2019
C-504	DETAILS SHEET	03/25/2019
C-505	DETAILS SHEET	03/25/2019
C-506	DETAILS SHEET	03/25/2019
C-507	DETAILS SHEET	03/25/2019
C-508	DETAILS SHEET	03/25/2019
C-509	DETAILS SHEET	06/11/2019
1 OF 2	PHOTOMETRICS PLAN	05/13/2019
1 OF 2	PHOTOMETRICS PLAN	05/13/2019
2 OF 2	PHOTOMETRICS PLAN	05/13/2019
A3.01	EXTERIOR ELEVATIONS	05/15/2019
A3.02	EXTERIOR ELEVATIONS	05/15/2019



LOCATION MAP  
SCALE: 1" = 2,000'

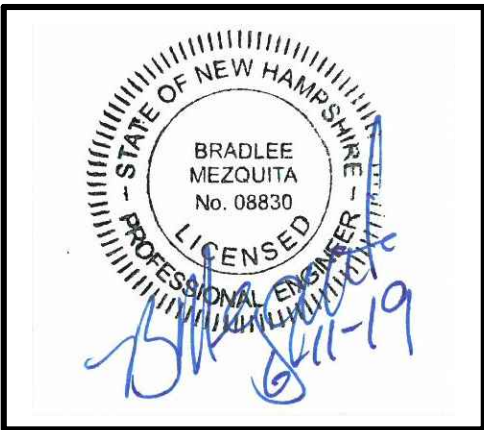
- CONSTRUCTION NOTES:
1. THE CONTRACTOR SHALL NOT RELY ON SCALED DIMENSIONS AND SHALL CONTACT THE ENGINEER FOR CLARIFICATION IF A REQUIRED DIMENSION IS NOT PROVIDED ON THE PLANS.
  2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS AND METHODS, AND FOR SITE CONDITIONS THROUGHOUT CONSTRUCTION. NEITHER THE PLANS NOR THE SEAL OF THE ENGINEER AFFIXED HEREON EXTEND TO OR INCLUDE SYSTEMS REQUIRED FOR THE SAFETY OF THE CONTRACTOR, THEIR EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND IMPLEMENTING SAFETY PROCEDURES AND SYSTEMS AS REQUIRED BY THE UNITED STATES OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), AND ANY STATE OR LOCAL SAFETY REGULATIONS.
  3. TIGHE & BOND, ASSUMES NO RESPONSIBILITY FOR ANY ISSUES LEGAL OR OTHERWISE, RESULTING FROM CHANGES MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION OF TIGHE & BOND.

PREPARED BY:

**Tighe&Bond**  
Engineers | Environmental Specialists



PATRICK M. CRIMMINS, PE

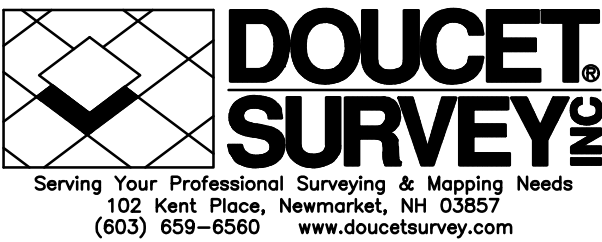


BRAD MEZQUITA, PE

Applicant:

**Borthwick Forest, LLC**  
c/o The Kane Company  
210 Commerce Way  
Portsmouth, New Hampshire 03801

Survey Consultant:



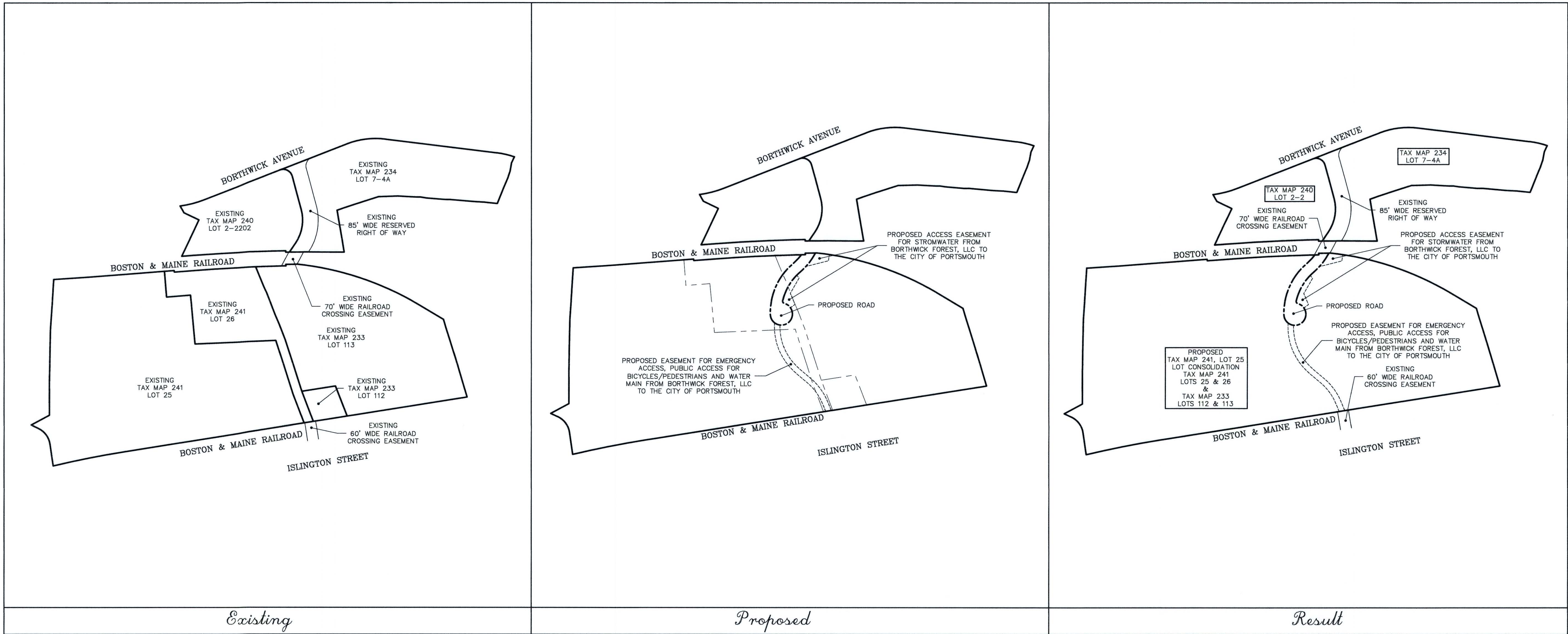
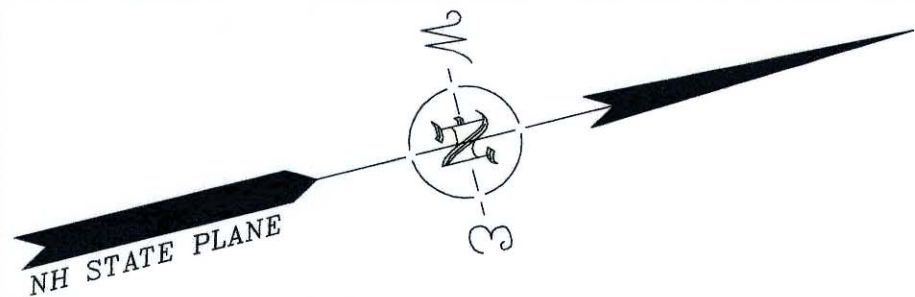
Serving Your Professional Surveying & Mapping Needs  
102 Kent Place, Newmarket, NH 03857  
(603) 659-6560 www.doucetsurvey.com

Wetland Consultant:

**Gove Environmental Services, Inc.**  
8 Continental Dr Bldg 2 Unit H  
Exeter, New Hampshire 03833

**COMPLETE SET 34 SHEETS**





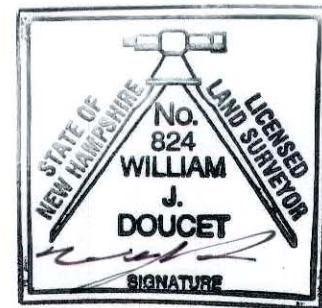
Key Plan (n.t.s.)

LEGEND

	EXISTING PROPERTY LINES
	PROPOSED RIGHT OF WAY
	EXISTING EASEMENT
	PROPOSED EASEMENT
	PROPERTY LINES TO BE ABANDONED

9	2/5/18	REMOVE EASEMENT	MWF
8	11/2/17	FOR RECORDING	MWF
7	9/26/17	REVISE EASEMENTS	MWF
6	4/17/17	ADD ADDITIONAL EASEMENTS	MWF
5	3/17/17	REVISED LAYOUT	MWF
4	3/22/16	REVISED ROAD LAYOUT	MWF
3	3/3/16	REV. LAYOUT & EASEMENTS	MWF
2	1/19/16	REVISED ROAD LAYOUT	MWF
1	11/17/15	PER ATTORNEY	MWF
NO.	DATE	DESCRIPTION	BY

NOTE:  
ALL ELECTRIC, GAS, TEL. WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.



I certify that this survey and plan were prepared by me or by those under my direct supervision and falls under the Urban Survey Classification of the NH Code of Administrative Rules of the Board of Licensure for Land Surveyors. I certify that this survey was made on the ground and is correct to the best of my knowledge and belief. Random traverse survey by Total Station, with a precision greater than 1:15,000.

L.L.S. #824  
5-4-18 DATE

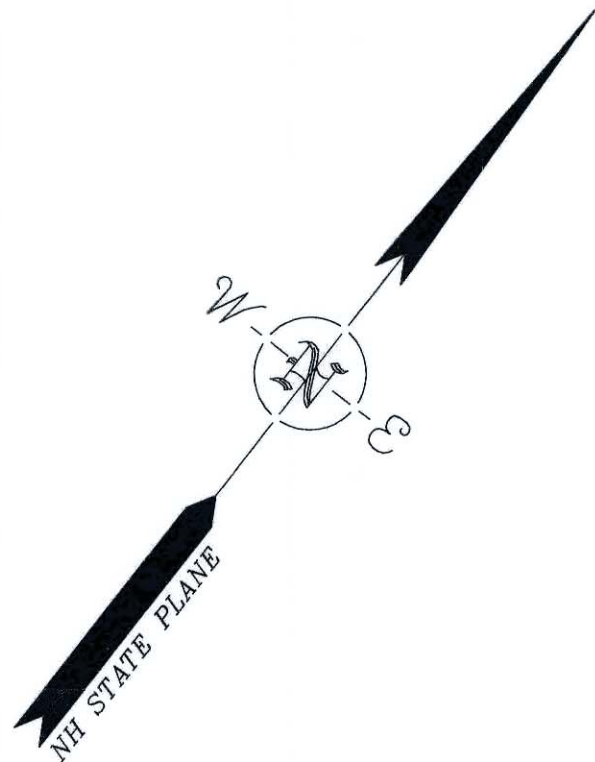
The certifications shown hereon are intended to meet registry of deed requirements and are not a certification to title or ownership of property shown. Owners of adjoining properties are according to current town assessors records.

LOT CONSOLIDATION  
&  
RESUBDIVISION PLAN  
LAND OF BORTHWICK FOREST, LLC  
AND SHOWING LAND OF  
HCA REALTY, INC.  
TAX MAP 233 LOTS 112 & 113, TAX MAP 234  
LOT 7-4A, TAX MAP 240 LOT 2-2202, & TAX  
MAP 241 LOTS 25 & 26 &  
BORTHWICK AVE. & ISLINGTON ST.  
PORTSMOUTH, NH

DRAWN BY:	M.W.F.	DATE:	MARCH 16, 2017
CHECKED BY:	S.V.M.	DRAWING NO.:	3445G
JOB NO.:	3445	SHEET	1 OF 5







- LEGEND**
- WATER SHUTOFF VALVE
  - GRANITE BOUND FOUND
  - DRILL HOLE FOUND
  - IRON PIPE/ROD FOUND
  - 5/8" RE-BAR W/ ID CAP TO BE SET
  - BARBED WIRE FOUND ON GROUND
  - SEWER MANHOLE
  - JURISDICTIONAL WETLAND SYMBOL
  - PROPERTY LINES
  - PROPOSED PROPERTY LINES
  - PROPERTY LINES TO BE ABANDONED
  - SETBACK LINE
  - STOCKADE FENCE
  - WIRE FENCE
  - APPROX. ABUTTERS LOT LINE
  - EASEMENT LINE
  - PROPOSED EASEMENT LINE
  - STONE WALL
  - EDGE OF JURISDICTIONAL WETLAND (SEE NOTE #6)
  - EDGE OF WETLAND (PER REF. PLAN #2)
  - APPROX. WATERLINE LOCATION (PER PORTSMOUTH DPW)
  - ASSESSORS TAX MAP/LOT #
  - FEATURES PER EASTERN TOPOGRAPHICS
  - POST
  - PAVED ROADS
  - GRAVEL ROADS
  - OBSCURED PAVEMENT
  - DRIVEWAYS
  - UNPAVED DRIVEWAY
  - FENCES
  - STONEWALL
  - BROOK/STREAM
  - RAILROAD TRACKS
  - OBSCURED RAILROAD TRACKS

**NOTES:**

- REFERENCE: TAX MAP 233, LOTS 112 & 113  
TAX MAP 234, LOT 7-4A  
TAX MAP 240, LOT 2-2202  
TAX MAP 241, LOTS 25 & 26
- PARCEL AREAS: LOT 112: 0.732 AC.  
LOT 113: 13.815 AC.  
LOT 7-4A: 9.085 AC.  
LOT 2-2202: 4.978 AC.  
LOT 25: 22.807 AC.  
LOT 26: 4.927 AC.
- OWNER OF RECORD: TAX MAP 233, LOTS 112 (R.C.R.D. BOOK 4754, PAGE 626)  
TAX MAP 233, LOT 113 (R.C.R.D. BOOK 4754, PAGE 626)  
TAX MAP 241, LOT 25 (R.C.R.D. BOOK 4754, PAGE 626)  
TAX MAP 241, LOT 26 (R.C.R.D. BOOK 5670, PAGE 1115)  
BORTHWICK FOREST, LLC  
210 COMMERCE WAY, SUITE 300  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 4754, PAGE 626  
  
TAX MAP 234, LOT 7-4A (R.C.R.D. BOOK 4400, PAGE 2048)  
TAX MAP 240, LOT 2-2202 (R.C.R.D. BOOK 5694, PAGE 310)  
HCA REALTY, INC.  
C/O DUCHARME MCILLEN & ASSOC.  
PO BOX 80610  
INDIANAPOLIS, IN 46280
- ZONE: OR (OFFICE RESEARCH) LOTS 112, 113, 7-4A, 2-2, 25 & 26
- DIMENSIONAL REQUIREMENTS: **SEB**  
MIN. LOT AREA 15,000 SQ. FT.  
MIN. FRONTAGE 100 FT.  
MIN. FRONT SETBACK 30 FT.  
MIN. SIDE SETBACK 10 FT.  
MIN. REAR SETBACK 30 FT.  
MAX. BUILDING HEIGHT 35 FT.  
MAX. BUILDING COVERAGE 20%  
  
WETLAND BUFFER: 100 FT.
- FIELD SURVEY PERFORMED BY DOUCET SURVEY, INC., BETWEEN 2003 AND 2013. TRAVERSE ADJUSTMENTS BASED ON LEAST SQUARES ANALYSIS. AERIAL TOPOGRAPHY PROVIDED BY EASTERN TOPOGRAPHICS, INC.
- JURISDICTIONAL WETLANDS DELINEATED BY GOVE ENVIRONMENTAL SERVICES, INC. DURING APRIL 2013 AND AMENDED IN NOVEMBER 2013. WETLANDS DELINEATED IN ACCORDANCE WITH 1987 CORPS OF ENGINEERS WETLANDS DELINEATIONS MANUAL, TECHNICAL REPORT Y-87-1.
- FLOOD HAZARD ZONE: "X", PER FIRM MAP #3301390260E, DATED 5/17/05.
- HORIZONTAL DATUM BASED ON NH STATE PLANE COORDINATE SYSTEM ZONE 1800 AS ESTABLISHED BY VERRA & ASSOCIATES IN MAY 2003.
- VERTICAL DATUM IS BASED ON NGVD 29 PER NHDOT DISK R-50 (379-0150) ELEV.=33.24'.
- THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH AND IN RELATION TO THE CURRENT LEGAL DESCRIPTION, AND IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.
- DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF ISLINGTON STREET & BORTHWICK AVENUE AS DEPICTED HEREON IS BASED ON RESEARCH CONDUCTED AT THE PORTSMOUTH CITY CLERKS OFFICE AND ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- FINAL MONUMENTATION MAY BE DIFFERENT THAN THE PROPOSED MONUMENTATION SHOWN HEREON, DUE TO THE FACT THAT SITE CONDITIONS WILL DICTATE THE ACTUAL LOCATION AND TYPE OF MONUMENTS INSTALLED IN THE FIELD. PLEASE REFER TO EITHER THE "MONUMENTATION LOCATION PLAN" TO BE RECORDED OR CONTACT DOUCET SURVEY, INC. FOR CLARIFICATION OF MONUMENTS SET. (A RECORDED PLAN WILL BE PRODUCED AT THE DISCRETION OF DOUCET SURVEY, INC.).

- AERIAL TOPOGRAPHY WAS CONDUCTED BY EASTERN TOPOGRAPHICS FROM IMAGES TAKEN DURING 04/2003 WITH A PHOTO SCALE OF 1:3600. CONTOURS AND OBJECTS SHOWN WITHIN OBSCURED AREAS ARE APPROXIMATE AND SHOULD BE VERIFIED BEFORE USE FOR DESIGN OR CONSTRUCTION PURPOSES.
- THE PARCELS ARE SUBJECT TO, AND/OR IN BENEFIT OF THE FOLLOWING EASEMENTS, RESTRICTIONS, ETC.  
A) INTENTIONALLY DELETED.  
B) TAX MAP 233, LOTS 112, 113, TAX MAP 234, LOT 7-4A & TAX MAP 241, LOT 25  
C) IN BENEFIT OF AN EASEMENT GRANTED TO ISLINGTON WOODS, LLC BY BOSTON AND MAINE CORPORATION, BOOK 4617, PAGE 2613.  
D) TAX MAP 233, LOT 113  
E) SUBJECT TO A WATER LINE EASEMENT FROM SHUTTLEWORTH TO THE CITY PORTSMOUTH, SEE R.C.R.D. BOOK 583, PAGE 324.  
F) SUBJECT TO A WATER LINE EASEMENT FROM SHUTTLEWORTH TO THE CITY PORTSMOUTH, SEE R.C.R.D. BOOK 1409, PAGE 31.  
G) IN BENEFIT OF A R.O.W. FROM BOSTON AND MAINE CORP., SEE R.C.R.D. BOOK 2400, PAGE 923.  
H) TAX MAP 234, LOT 7-4A  
I) SUBJECT TO A WATER LINE EASEMENT GRANTED BY SPINNEY TO JONES, SEE R.C.R.D. BOOK 551, PAGE 11. (EXACT LOCATION UNDETERMINED).  
J) SUBJECT TO AN ELECTRIC EASEMENT GRANTED BY SAN ANTONIO ET AL TO NH ELECTRIC CO, SEE R.C.R.D. BOOK 1230, PAGE 222.  
K) SUBJECT TO THE RIGHTS OF THE CITY OF PORTSMOUTH TO CONSTRUCT & MAINTAIN A SEWER LINE, AS MENTIONED BY REFERENCE IN R.C.R.D. BOOK 1361, PAGE 235. NO EASEMENT DOCUMENT FOUND.  
L) SUBJECT TO A WATER LINE EASEMENT GRANTED BY ALLEN GREENOUGH TO THE CITY OF PORTSMOUTH, SEE R.C.R.D. BOOK 541, PAGE 254.  
M) SUBJECT TO A SEWER EASEMENT GRANTED BY COAKLEY TO THE CITY OF PORTSMOUTH, SEE R.C.R.D. BOOK 984, PAGE 379.  
N) SUBJECT TO THE RIGHTS OF THE STATE OF NEW HAMPSHIRE, SEE R.C.R.D. BOOK 1158, PAGE 36.  
O) SUBJECT TO THE RIGHT GRANTED IN A DEED FROM COAKLEY ET AL TO BEACON CONSTRUCTION CO., INC., SEE R.C.R.D. BOOK 1284, PAGE 3.  
P) SUBJECT TO ELECTRIC EASEMENT GRANTED BY COAKLEY ET AL TO NH ELECTRIC CO, SEE R.C.R.D. BOOK 1315, PAGE 306.  
Q) SUBJECT TO RESTRICTIONS OUTLINED IN A DEED FROM GARLAND ET AL TO PORTSMOUTH PARK TRUST, SEE R.C.R.D. BOOK 2521, PAGE 999.  
R) SUBJECT TO RESTRICTIVE AGREEMENT BETWEEN PORTSMOUTH PARK TRUST AND HCA REALTY, INC., SEE R.C.R.D. BOOK 2556, PAGE 1764.  
S) GAS LINE EASEMENT RESERVED BY NORTHEAST UTILITIES, BOOK 4392, PAGE 110.  
T) SUBJECT TO AN ACCESS & UTILITY EASEMENT, SEE R.C.R.D. BOOK 4639, PAGE 2128.  
U) TAX MAP 241, LOT 25  
V) SUBJECT TO WATER RIGHTS GRANTED BY SHERBURNE TO THE PROPRIETORS OF THE PORTSMOUTH AQUEDUCT, SEE R.C.R.D. BOOK 488 PAGE 431.  
W) IN BENEFIT OF A R.O.W. FROM BOSTON AND MAINE CORP., SEE R.C.R.D. BOOK 2400, PAGE 923.  
X) SUBJECT TO TWO R.O.W.'S RESERVED IN A DEED FROM COAKLEY TO WALDRON, SEE R.C.R.D. BOOK 1559 PAGE 190.  
Y) IN BENEFIT OF A R.O.W. RESERVED IN A DEED FROM SARGENT TO DEVELATRON CORP., SEE R.C.R.D. BOOK 1563, PAGE 269.  
Z) TAX MAP 233, LOT 113  
AA) SUBJECT TO A WATER LINE EASEMENT FROM SHUTTLEWORTH TO THE CITY PORTSMOUTH, SEE R.C.R.D. BOOK 583, PAGE 324.  
AB) SUBJECT TO A WATER LINE EASEMENT FROM SHUTTLEWORTH TO THE CITY PORTSMOUTH, SEE R.C.R.D. BOOK 1409, PAGE 31.  
AC) IN BENEFIT OF A R.O.W. FROM BOSTON AND MAINE CORP., SEE R.C.R.D. BOOK 2400, PAGE 923.  
AD) IN BENEFIT OF A 12' R.O.W. TO ISLINGTON STREET, SEE R.C.R.D. BOOK 455, PAGE 449.  
AE) TAX MAP 241, LOT 26  
AF) SUBJECT TO AND/OR IN BENEFIT OF ANY PERTINENT EASEMENTS, RESTRICTIONS, ETC. THAT IMPACT TAX MAP 241, LOT 25, SINCE LOT 26 WAS ORIGINALLY PART OF LOT 25.  
AG) SUBJECT TO AN ACCESS EASEMENT, SEE R.C.R.D. BOOK 2375, PAGE 808.  
AH) TAX MAP 240, LOT 2-2202  
AI) SUBJECT TO A SEWER EASEMENT, SEE R.C.R.D. BOOK 984, PAGE 378  
AJ) SUBJECT TO A GAS LINE EASEMENT, SEE R.C.R.D. BOOK 1372, PAGE 148.  
AK) SUBJECT TO A GAS LINE EASEMENT, SEE R.C.R.D. BOOK 4392, PAGE 110.  
AL) SUBJECT TO A 10' WIDE BUFFER, SEE R.C.R.D. BOOK 4639, PAGE 2133.

**ADDITIONAL ABUTTERS**

- TAX MAP 233, LOT 111  
RICHARD L. & MARY C. RASH REV. TRUST 2007  
RICHARD L. & MARY C. RASH, TRUSTEES  
1507 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 4763, PAGE 1360  
  
TAX MAP 233, LOT 110  
JASON R. STILES  
MARGARET ANN KRISTIANSEN  
1527 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 3187, PAGE 1517  
  
TAX MAP 233, LOT 109  
DENNIS A. & CHERYL A. MINARD  
1500 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
TAX MAP 233, LOT 108  
PAUL M. & LAURA L. MANNLE  
1490 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 2837, PAGE 1263  
  
TAX MAP 233, LOT 107  
ZAKARY ROBINSON  
1474 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5596, PAGE 2951  
  
TAX MAP 233, LOT 107-1  
MARC C. THERRIEN  
6 VINE STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5712, PAGE 2092  
  
TAX MAP 233, PAGE 106  
JAMES R. & LINDSAY RICHARD  
1438 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5382, PAGE 1684  
  
TAX MAP 233, LOT 115  
STEPHEN J. CAMARDA  
7 DEBRA LANE  
KITTEERY, ME 03904  
R.C.R.D. BOOK 2737, PAGE 2373  
  
TAX MAP 233, LOT 116-1  
WILLIAM F. & KATJUA P. BECKSTEDT  
1395 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 3745, PAGE 2748  
  
TAX MAP 233, LOT 116-2  
TERRENCE J. RADICAN II  
207 ROCKLAND STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5565, PAGE 2739  
  
TAX MAP 233, LOT 117  
JASON BALDWIN  
1363 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5254, PAGE 331  
  
TAX MAP 233, LOT 118  
KEVIN D. & LIZA E. CONLEY  
1345 ISLINGTON STREET  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 5622, PAGE 1783  
  
TAX MAP 233, LOT 119  
CHRISTOPHER H. GARRETT REV. TRUST 2007  
CHRISTOPHER H. GARRETT, TRUSTEE  
11 BARBERRY LANE  
PORTSMOUTH, NH 03801  
R.C.R.D. BOOK 4862, PAGE 1609

**REFERENCE PLANS:**

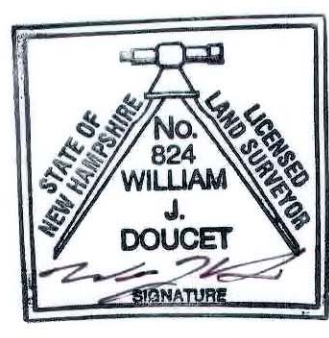
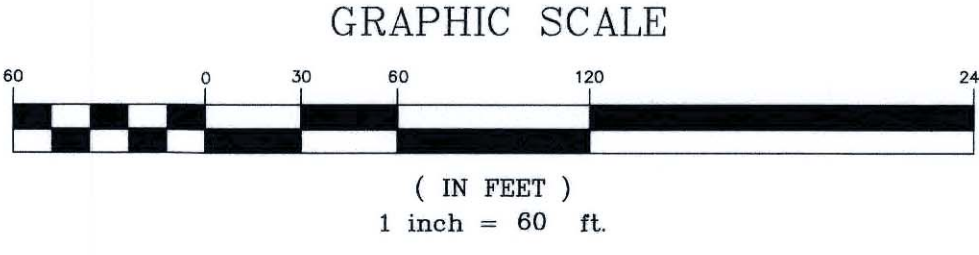
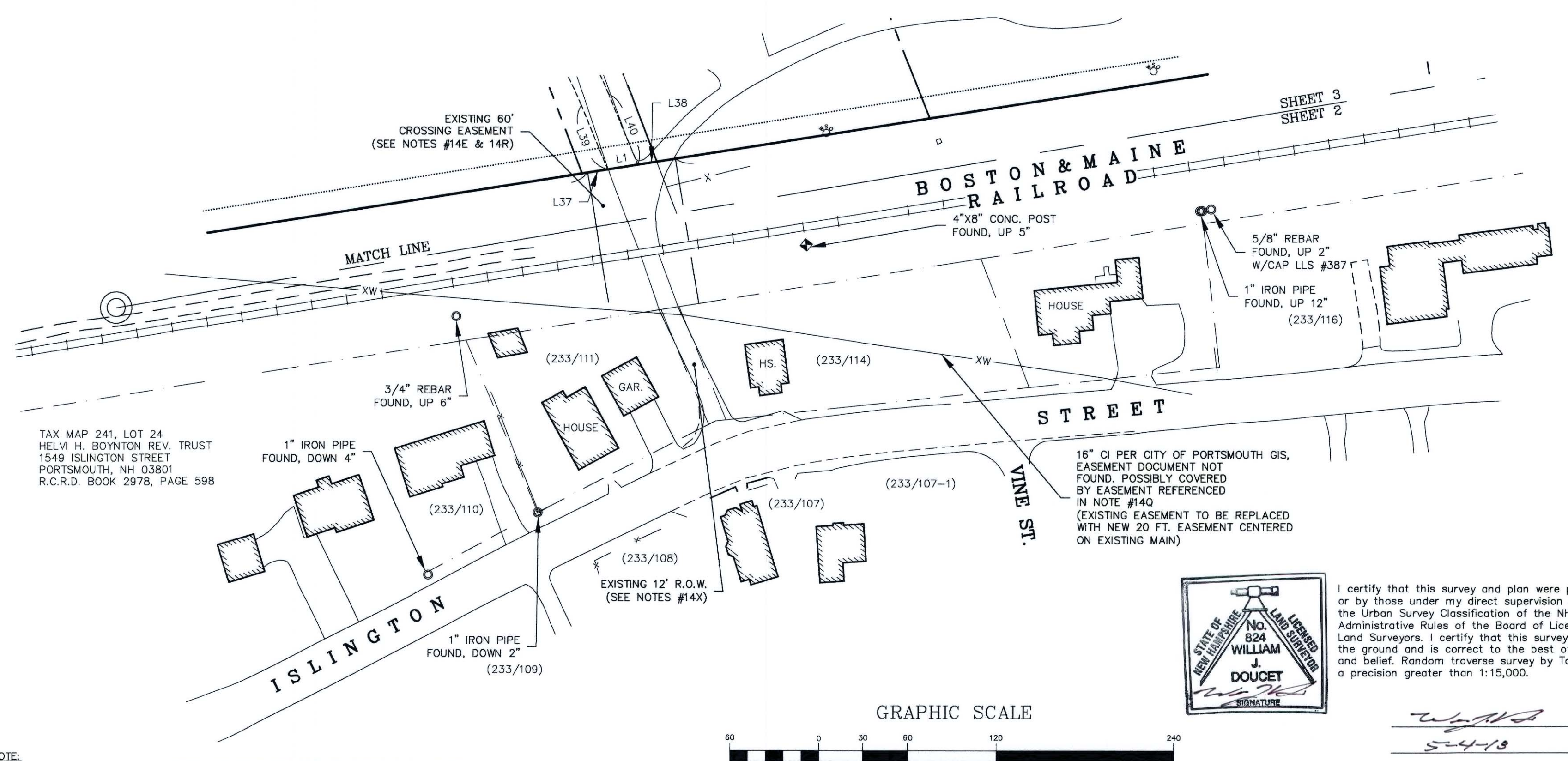
- "PLAT OF LAND BARBERRY LANE PORTSMOUTH, NH FOR NORTHERN UTILITIES, INC.," BY DURGIN-SCHOFIELD ASSOCIATES, DATED 2/21/89, R.C.R.D. PLAN #D-19079.
- "ALTA/ACSM LAND TITLE SURVEY FOR NORTHLAND DEVELOPMENT, BORTHWICK AVENUE, COUNTY OF ROCKINGHAM, PORTSMOUTH, NH," BY MILLETTE, SPRAGUE & COLWELL, INC. DATED 8/19/97.
- "GAS LINE AS-BUILT EASEMENT AND CONSERVATION EASEMENT PLAN," BY KIMBALL CHASE COMPANY, INC. DATED 10/31/85, R.C.R.D. PLAN #D-15830.
- "LAND IN PORTSMOUTH, NH BOSTON AND MAINE CORPORATION TO LANDERS AND GRIFFIN, INC.," J.D. BATCHELER ENGINEER OF DESIGN, DATED 2/66, R.C.R.D. PLAN #B43.
- "SUBDIVISION OF LAND LOCATED IN PORTSMOUTH, NH FOR HOSPITAL CORPORATION OF AMERICA," BY KIMBALL CHASE COMPANY, INC. DATED 2/28/84.
- "SUBDIVISION PLAN OF LAND FOR PORTSMOUTH PARK TRUST BORTHWICK AVE. EXT./ COAKLEY RD. COUNTY OF ROCKINGHAM PORTSMOUTH, NH," BY RICHARD P. MILLETTE AND ASSOCIATES, DATED 3/27/85, R.C.R.D. PLAN #D-13747.
- "PLAT OF PROPERTY AND IMPROVEMENTS, PORTSMOUTH HOSPITAL OFFICE BUILDING, A CONDOMINIUM PORTSMOUTH, NH," BY CESP, INC., DATED 12/12/86, R.C.R.D. PLAN #D-15831.
- "RIGHT-OF-WAY AND TRACK MAP, CONCORD AND PORTSMOUTH R.R. OPERATED BY THE BOSTON AND MAINE R.R., STATION 33+0 TO STATION 85+80, V28/2" BY VALUATION ENGINEERS, DATED 6/30/14.
- "RIGHT-OF-WAY AND TRACK MAP, CONCORD AND PORTSMOUTH R.R. OPERATED BY THE BOSTON AND MAINE R.R., STATION 85+80 TO STATION 138+60, V28/3" BY VALUATION ENGINEERS, DATED 6/30/14.
- "RIGHT-OF-WAY AND TRACK MAP, CONCORD AND PORTSMOUTH R.R. OPERATED BY THE BOSTON AND MAINE R.R., STATION 2928+05 TO STATION 2966+20, V3 NH/54" BY VALUATION ENGINEERS, DATED 6/30/14.
- "LOT LINE RELOCATION PLAN FOR J. HARRISON HOLMAN OFF ISLINGTON ST. COUNTY OF ROCKINGHAM PORTSMOUTH, N.H.," DATED MARCH 6, 1980 BY RICHARD P. MILLETTE AND ASSOCIATES. R.C.R.D. PLAN #D-9356.
- "PLAN OF LAND CURT GOWDY BROADCASTING CORPORATION PORTSMOUTH, N.H.," DATED FEBRUARY 25, 1977 BY THOMAS F. MORAN, INC. R.C.R.D. PLAN #D-6765.
- "CITY OF PORTSMOUTH DEFENSE HOMES LOCATION PLAN" REVISED JUNE 17, 1941 BY JOHN W. DURGIN, R.C.R.D. PLAN #0106.
- "PLAN NO. 220, SHOWING PORTION OF PROPERTY OF THE HEIRS OF CORNELIUS COAKLEY TO BE CONVEYED TO BEACON CONSTRUCTION COMPANY" DATED APRIL 28, 1953 BY MOULTON ENGINEERING CO.
- "SUBDIVISION OF LAND LOCATED IN PORTSMOUTH, N.H.," DATED MARCH 6, 1984 BY KIMBALL CHASE COMPANY, INC. R.C.R.D. PLAN #D-13069.
- "LOT LINE RELOCATION PLAN FOR PORTSMOUTH PARK TRUST AND HOSPITAL CORPORATION OF AMERICA BORTHWICK AVE. EXTENSION COUNTY OF ROCKINGHAM PORTSMOUTH, N.H.," DATED JUNE 14, 1985 BY RICHARD P. MILLETTE AND ASSOCIATES. PLAN #D-15924.
- "SUBDIVISION OF LAND PORTSMOUTH, N.H. FOR J. HARRISON HOLMAN DATED MAY 1982 BY JOHN W. DURGIN ASSOCIATES, INC. R.C.R.D. PLAN #D-10843.
- "LOT LINE REVISION FOR RUTH M. GATS & FREDERICK C. & JACQUELINE O. MURRAY TRUSTEES ISLINGTON STREET PORTSMOUTH N.H.," DATED JANUARY 17, 2002 BY E.J. COTE & ASSOCIATES INC. R.C.R.D. PLAN #C-29645.
- "PERSHING TERRACE PORTSMOUTH, N.H. BELMONT REALTY CO. PROVIDENCE, R.I.," DATED JULY 1918 BY WM. A. GROVER CIVIL ENGINEER, R.C.R.D. PLAN #082.
- "PLAN OF RIGHT OF WAY ROBERT W. MESERVE ET. AL TRUSTEES OF THE PROPERTY OF BOSTON & MAINE CORPORATION TO J. HARRISON HOLMAN OFF ISLINGTON ST. COUNTY OF ROCKINGHAM PORTSMOUTH, N.H.," DATED DECEMBER 1980 BY RICHARD P. MILLETTE AND ASSOCIATES. R.C.R.D. PLAN #D-10458.
- "BASE PLAN OF LOT 7-4A BORTHWICK AVENUE COUNTY OF ROCKINGHAM PORTSMOUTH, N.H.," DATED NOVEMBER 8, 2002 BY MILLETTE, SPRAGUE & COLWELL, INC.
- "STREET REVERSION AND LOT LINE RELOCATION PLAN MAP 233-LOTS 141, 143, 144, 146 & 147 FOR DENNIS COAKLEY, DONNA & WILLIAM GLADHILL, JOSEPH ARNSTEIN AND THE CITY OF PORTSMOUTH FOCH AVENUE, BARBERRY LANE & HAIG AVENUE PORTSMOUTH, N.H. COUNTY OF ROCKINGHAM" DATED JUNE 2001 BY AMBIT ENGINEERING, INC. R.C.R.D. PLAN #D-29809.
- "LOT LINE REVISION PLAN TAX MAP R-34 LOTS 6 & 7-6 LOCATED ON BORTHWICK AVE., COAKLEY ROAD AND U.S. ROUTE 1 BYPASS IN PORTSMOUTH, N.H. COUNTY OF ROCKINGHAM" DATED OCTOBER 20, 1993 BY KIMBALL CHASE. R.C.R.D. PLAN #D-22686.
- "LOT LINE REVISION PERSHING TERRACE BARBERRY LANE & FOCH AVENUE PORTSMOUTH, NEW HAMPSHIRE FOR DENNIS H. COAKLEY" DATED SEPTEMBER 25, 1992. BY DURGIN, VERRA & ASSOCIATES, INC. R.C.R.D. PLAN #D-22042.
- "WATER PIPE EASEMENT PORTSMOUTH, N.H. BOSTON & MAINE RAILROAD-TO-ELDRIDGE BREWING COMPANY, INC.," DATED JUNE 1937 BY W.J. CUMMINGS, R.C.R.D. PLAN #0868.
- "PLAN OF LOT, ISLINGTON ST., PORTSMOUTH, NH FOR EDWIN BOYNTON" DATED MARCH, 1955 BY JOHN W. DURGIN, R.C.R.D. PLAN #1349-227.
- "PLAN OF PORTSMOUTH NATIONAL RECOVERY MUNICIPAL PROTECT NO. 152" DATED 1933, ON FILE AT NHDOT DISTRICT VI.
- "LOT LINE REVISION PLAN FOR PORTSMOUTH HOSPITAL OFFICE BUILDING ASSOCIATION, ISLINGTON WOODS, LLC AND HCA REALTY, INC.," BY DOUCET SURVEY, INC., DATED JANUARY 13, 2008, R.C.R.D. PLAN D-33642.
- "EASEMENT PLAN FOR ISLINGTON WOODS, LLC AND BOSTON & MAINE CORPORATION" BY DOUCET SURVEY, INC., DATED OCTOBER 20, 2005, R.C.R.D. PLAN D-33500.

SEE SHEET 5 FOR LINE & CURVE TABLES

**LOT CONSOLIDATION  
&  
RESUBDIVISION PLAN  
LAND OF BORTHWICK FOREST, LLC  
AND SHOWING LAND OF  
HCA REALTY, INC.  
TAX MAP 233 LOTS 112 & 113, TAX MAP 234  
LOT 7-4A, TAX MAP 240 LOT 2-2202, & TAX  
MAP 241 LOTS 25 & 26 &  
BORTHWICK AVE. & ISLINGTON ST.  
PORTSMOUTH, NH**

9	2/5/18	REMOVE EASEMENT	MWF
8	11/2/17	FOR RECORDING	MWF
7	9/26/17	REVISE EASEMENTS	MWF
6	4/17/17	ADD ADDITIONAL EASEMENTS	MWF
5	3/17/17	REVISED LAYOUT	MWF
4	3/22/16	REVISED ROAD LAYOUT	MWF
3	3/3/16	REV. LAYOUT & EASEMENTS	MWF
2	1/19/16	REVISED ROAD LAYOUT	MWF
1	11/17/15	PER ATTORNEY	MWF
NO.	DATE	DESCRIPTION	BY

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I certify that this survey and plan were prepared by me or by those under my direct supervision and follow under the Urban Survey Classification of the NH Code of Administrative Rules of the Board of Licensure for Land Surveyors. I certify that this survey was made on the ground and is correct to the best of my knowledge and belief. Random traverse survey by Total Station, with a precision greater than 1:15,000.

*William J. Doucet* L.L.S. #824  
DATE *5-4-18*

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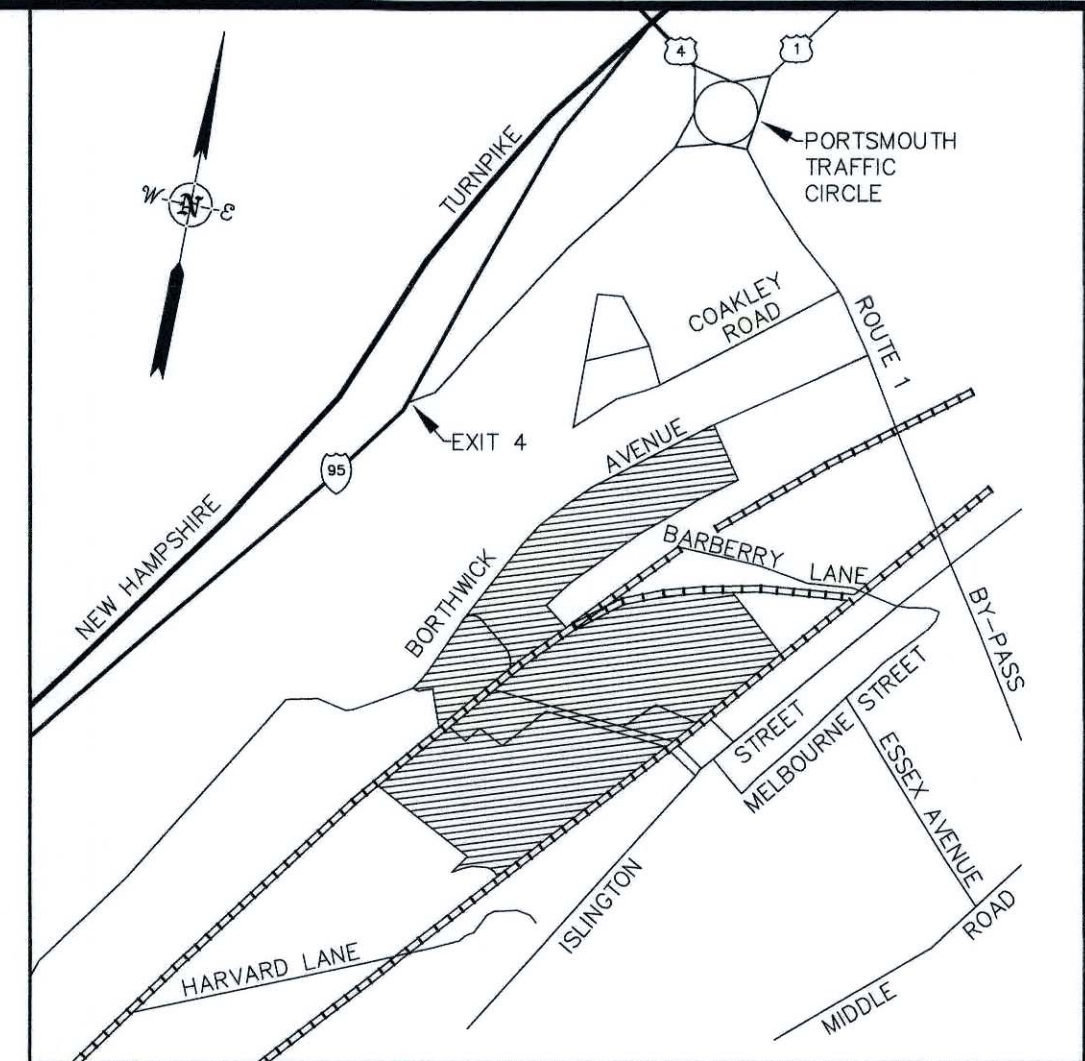
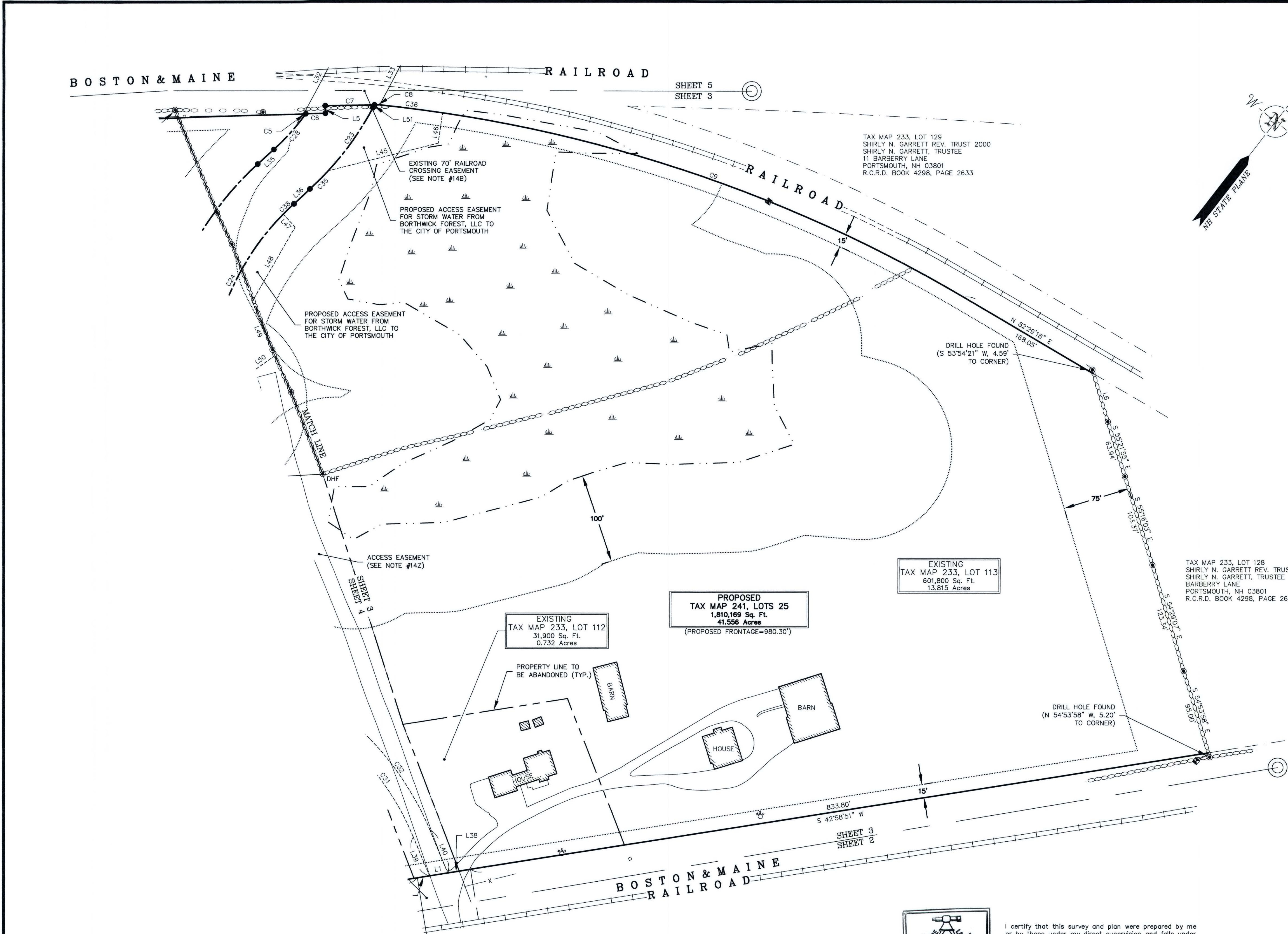
DRAWN BY:	M.W.F.	DATE:	MARCH 16, 2017
CHECKED BY:	S.V.M.	DRAWING NO.:	3445G
JOB NO.:	3445	SHEET	2 OF 5





9	2/5/18	REMOVE EASEMENT	MWF
8	11/2/17	FOR RECORDING	MWF
7	9/26/17	REVISE EASEMENTS	MWF
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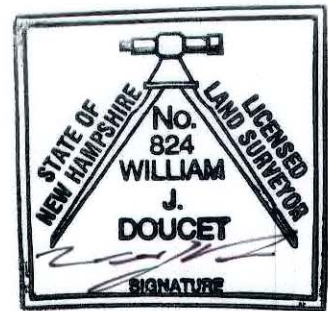
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LEGEND	
	WATER SHUTOFF VALVE
	GRANITE BOUND FOUND
	DRILL HOLE FOUND
	IRON PIPE/ROD FOUND
	5/8" RE-BAR W/ ID CAP TO BE SET
	BARBED WIRE FOUND ON GROUND
	SEWER MANHOLE
	JURISDICTIONAL WETLAND SYMBOL
	PROPERTY LINES
	PROPOSED PROPERTY LINES
	PROPERTY LINES TO BE ABANDONED
	SETBACK LINE
	STOCKADE FENCE
	WIRE FENCE
	APPROX. ABUTTERS LOT LINE
	EASEMENT LINE
	PROPOSED EASEMENT LINE
	STONE WALL
	EDGE OF JURISDICTIONAL WETLAND (SEE NOTE #6)
	EDGE OF WETLAND (PER REF. PLAN #2)
	APPROX. WATERLINE LOCATION (PER PORTSMOUTH DPW)
	ASSESSORS TAX MAP/LOT #
FEATURES PER EASTERN TOPOGRAPHICS	
	POST
	PAVED ROADS
	GRAVEL ROADS
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	DRIVEWAYS
	UNPAVED DRIVEWAY
	FENCES
	STONEWALL
	BROOK/STREAM
	RAILROAD TRACKS
	OBSOURED RAILROAD TRACKS

SEE SHEET 5 FOR LINE & CURVE TABLES

LOT CONSOLIDATION  
&  
RESUBDIVISION PLAN  
LAND OF BORTHWICK FOREST, LLC  
AND SHOWING LAND OF  
HCA REALTY, INC.  
TAX MAP 233 LOTS 112 & 113, TAX MAP 234  
LOT 7-4A, TAX MAP 240 LOT 2-2202, & TAX  
MAP 241 LOTS 25 & 26 &  
BORTHWICK AVE. & ISLINGTON ST.  
PORTSMOUTH, NH



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DATE: 5-4-18

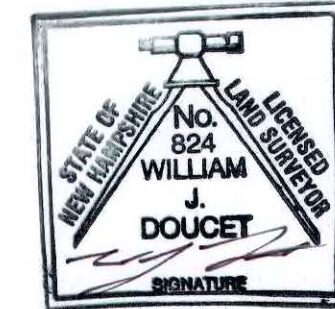
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DRAWN BY:	M.W.F.	DATE:	MARCH 16, 2017
CHECKED BY:	S.V.M.	DRAWING NO.:	3445G
JOB NO.:	3445	SHEET	3 OF 5





LOT CONSOLIDATION  
&  
RESUBDIVISION PLAN  
LAND OF BORTHWICK FOREST, LLC  
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HCA REALTY, INC.  
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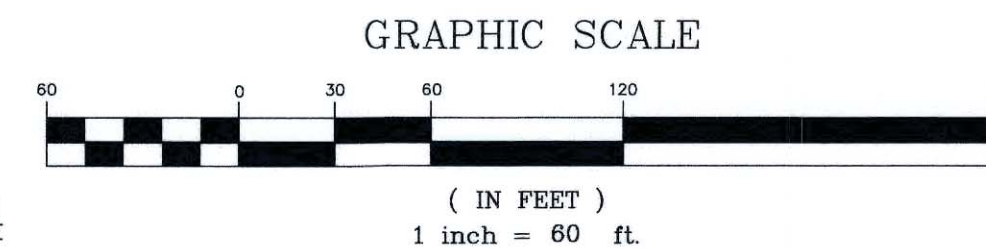


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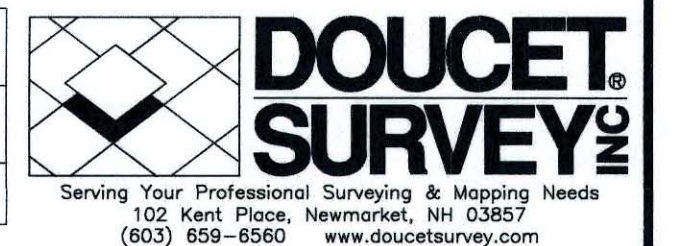
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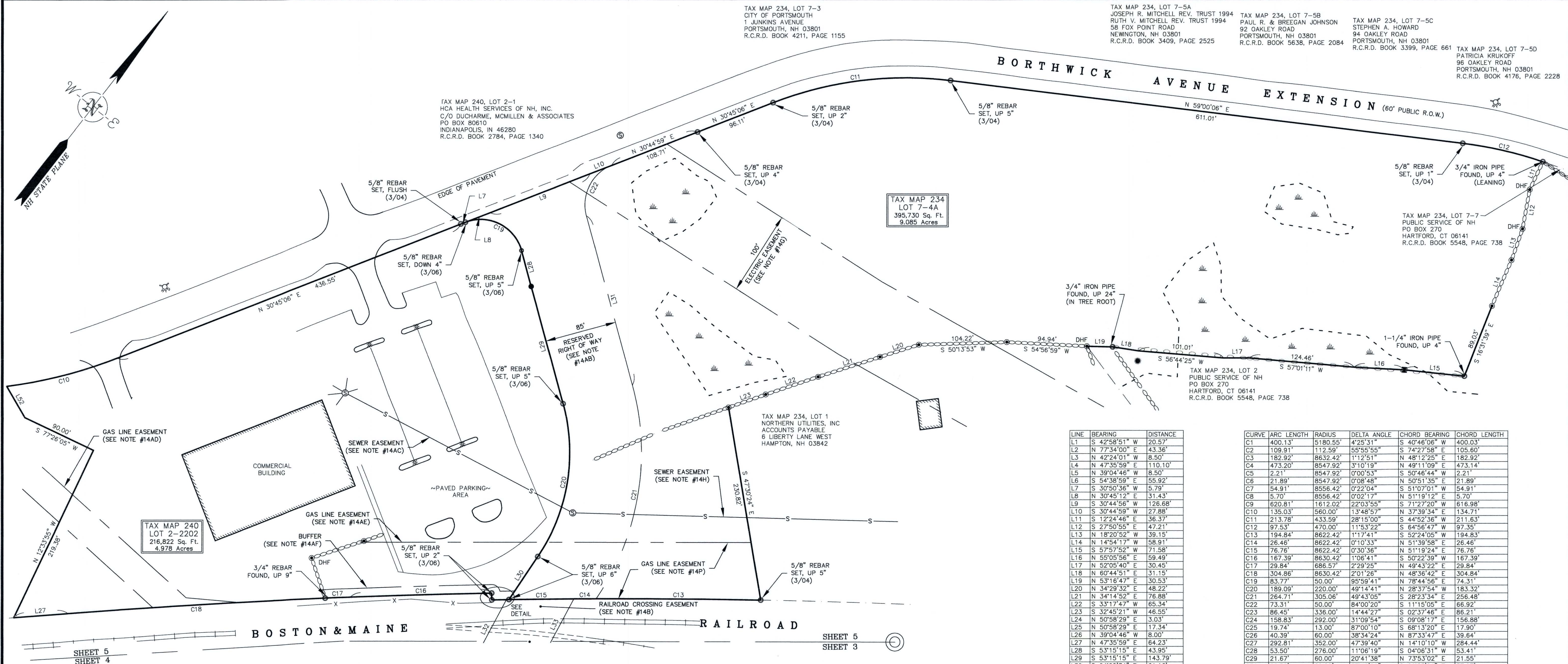


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CHECKED BY:	S.V.M.	DRAWING NO.:	3445G
JOB NO.:	3445	SHEET	4 OF 5

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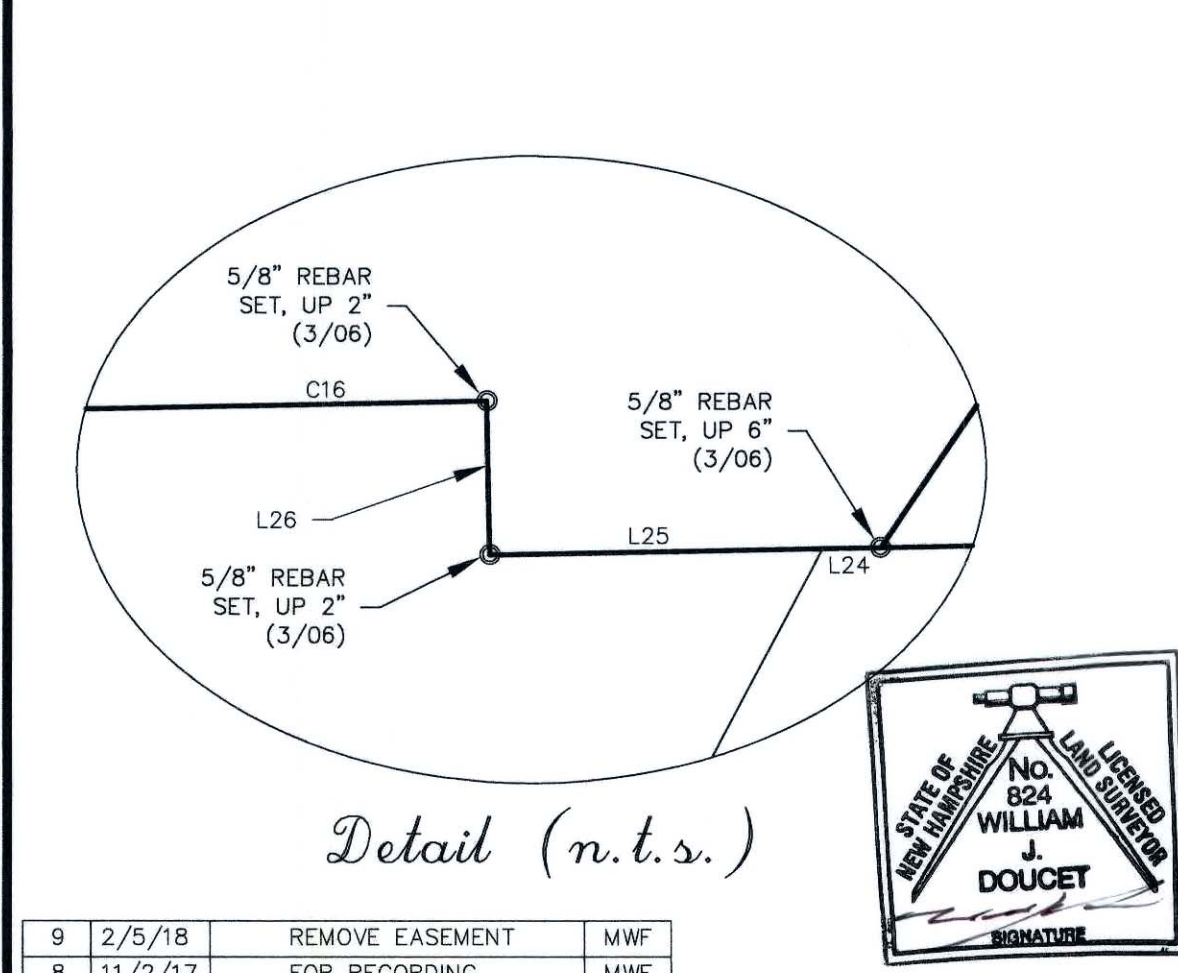
LINE	BEARING	DISTANCE
L1	S 42°58'51" W	20.57'
L2	N 77°34'00" E	43.36'
L3	N 42°24'01" W	8.50'
L4	N 47°35'59" E	110.10'
L5	N 38°04'46" W	8.50'
L6	S 54°38'59" E	55.92'
L7	S 30°50'36" W	5.79'
L8	N 30°45'12" E	31.43'
L9	S 30°44'56" W	126.68'
L10	S 30°44'59" W	27.88'
L11	S 12°24'46" E	36.37'
L12	S 27°50'55" E	47.21'
L13	N 18°20'52" W	39.15'
L14	N 14°54'17" W	58.91'
L15	S 57°57'52" W	71.58'
L16	N 55°05'56" E	59.49'
L17	N 52°05'40" E	30.45'
L18	N 60°44'51" E	31.15'
L19	N 53°16'47" E	30.53'
L20	N 34°29'52" E	48.22'
L21	N 34°14'52" E	76.88'
L22	S 33°17'47" W	65.34'
L23	S 32°45'21" W	46.55'
L24	N 50°58'29" E	3.03'
L25	N 50°58'29" E	17.34'
L26	N 39°04'46" W	8.00'
L27	N 47°35'59" E	64.23'
L28	S 53°15'15" E	43.95'
L29	S 53°15'15" E	143.79'
L30	S 04°00'34" E	61.16'
L31	S 53°15'15" E	207.17'
L32	S 10°00'00" E	85.25'
L33	S 10°00'00" E	75.13'
L34	S 38°00'00" E	5.99'
L35	N 09°39'40" E	24.25'
L36	N 09°39'40" E	24.25'
L37	N 42°58'51" E	13.71'
L38	S 42°58'51" W	25.72'
L39	S 60°34'00" E	46.76'
L40	N 60°34'00" W	51.58'
L41	N 88°00'00" W	78.53'
L42	S 88°00'00" E	78.53'
L43	N 38°00'00" W	19.25'
L44	N 38°00'00" W	11.22'
L45	S 37°55'23" W	126.44'
L46	S 29°34'37" E	34.27'
L47	S 80°20'20" E	19.66'
L48	N 08°02'02" W	95.93'
L49	N 60°43'02" W	65.65'
L50	N 16°50'59" E	30.76'
L51	N 10°00'00" W	3.55'
L52	S 68°07'11" E	42.72'

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	400.13'	5180.55'	4°25'31"	S 40°46'06" W	400.03'
C2	109.91'	112.59'	55°55'55"	S 74°27'58" E	105.60'
C3	182.92'	8632.42'	1°12'51"	N 48°12'25" E	182.92'
C4	473.20'	8547.92'	3°10'19"	N 49°11'09" E	473.14'
C5	2.21'	8547.92'	0°00'53"	S 50°46'44" W	2.21'
C6	21.89'	8547.92'	0°08'48"	N 50°51'35" E	21.89'
C7	54.91'	8556.42'	0°22'04"	S 51°07'01" W	54.91'
C8	5.70'	8556.42'	0°02'17"	N 51°19'12" E	5.70'
C9	620.81'	1612.02'	22°03'55"	S 71°27'20" W	616.98'
C10	135.03'	560.00'	13°48'57"	N 37°39'34" E	134.71'
C11	213.78'	433.59'	28°15'00"	S 44°52'36" W	211.63'
C12	97.53'	470.00'	11°53'22"	S 64°56'47" W	97.35'
C13	194.84'	8622.42'	1°17'41"	S 52°24'05" W	194.83'
C14	26.46'	8622.42'	0°10'33"	N 51°39'58" E	26.46'
C15	76.76'	8622.42'	0°30'36"	N 51°19'24" E	76.76'
C16	167.39'	8630.42'	1°06'41"	S 50°22'39" W	167.39'
C17	29.84'	686.57'	2°29'25"	N 49°43'22" E	29.84'
C18	304.86'	8630.42'	2°01'26"	N 48°36'42" E	304.84'
C19	83.77'	50.00'	95°59'41"	N 78°44'56" E	74.31'
C20	189.09'	220.00'	49°14'41"	N 28°37'54" W	183.32'
C21	264.71'	305.06'	49°43'05"	S 28°23'34" E	256.48'
C22	73.31'	50.00'	84°00'20"	S 11°15'05" E	66.92'
C23	86.45'	336.00'	14°44'27"	S 02°37'46" E	86.21'
C24	158.83'	292.00'	31°09'54"	S 09°08'17" E	156.88'
C25	19.74'	13.00'	87°00'10"	S 68°13'20" E	17.90'
C26	40.39'	60.00'	38°34'24"	N 87°33'47" E	39.64'
C27	292.81'	352.00'	47°39'40"	N 14°10'10" W	284.44'
C28	53.50'	276.00'	11°06'19"	S 04°06'31" W	53.41'
C29	21.67'	60.00'	20°41'38"	N 73°53'02" E	21.55'
C30	60.50'	60.00'	57°46'09"	S 66°53'04" E	57.97'
C31	145.56'	304.00'	27°26'00"	N 74°17'00" W	144.17'
C32	155.13'	324.00'	27°26'00"	S 74°17'00" E	153.65'
C33	282.74'	324.00'	50°00'00"	N 63°00'00" W	273.86'
C34	265.29'	304.00'	50°00'00"	N 63°00'00" W	256.95'
C35	28.85'	336.00'	4°55'13"	N 07°12'04" E	28.85'
C36	70.96'	1612.02'	2°31'20"	S 59°09'43" W	70.95'
C37	143.14'	60.00'	136°41'14"	N 04°48'24" W	111.53'
C38	16.39'	292.00'	3°13'00"	S 08°03'10" W	16.39'

**LOT CONSOLIDATION  
&  
RESUBDIVISION PLAN**  
**LAND OF BORTHWICK FOREST, LLC**  
AND SHOWING LAND OF  
**HCA REALTY, INC.**  
TAX MAP 233 LOTS 112 & 113, TAX MAP 234  
LOT 7-4A, TAX MAP 240 LOT 2-2202, & TAX  
MAP 241 LOTS 25 & 26 &  
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DRAWN BY:	M.W.F.	DATE:	MARCH 16, 2017
CHECKED BY:	S.V.M.	DRAWING NO.:	3445G
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*[Signature]* L.L.S. #824  
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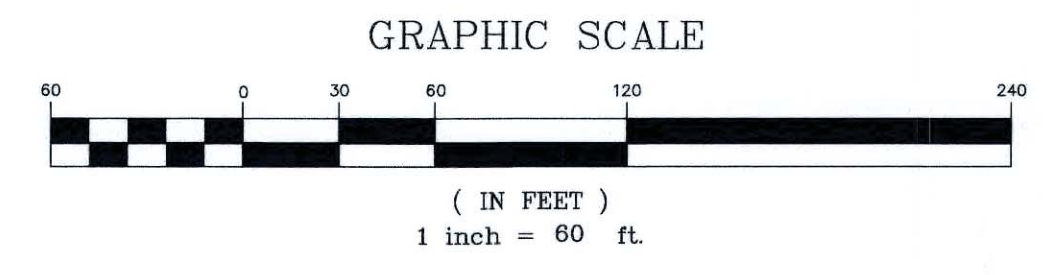
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EDGE OF WETLAND  
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APPROX. WATERLINE LOCATION  
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ASSESSORS TAX MAP/LOT #

**FEATURES PER EASTERN TOPOGRAPHICS**

POST  
PAVED ROADS  
GRAVEL ROADS  
OBSERVED PAVEMENT  
DRIVEWAYS  
UNPAVED DRIVEWAY  
FENCES  
STONE WALL  
BROOK/STREAM  
RAILROAD TRACKS  
OBSERVED RAILROAD TRACKS





Last Save Date: June 11, 2019 11:41 AM By: CML  
Plot Date: Tuesday, June 11, 2019 Plotted By: Craig M. Langton  
File Location: J:\K0076 The Kene Company - General Proposals\0076-13 Borthwick Forest\Drawings-Files\AutoCAD\Xref\K0076-13\_DSGN.dwg Layout Tab: G-101

- GENERAL NOTES:**
- THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
  - COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE CITY OF PORTSMOUTH.
  - THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR OR PROFESSIONAL ENGINEER TO DETERMINE ALL LINES AND GRADES.
  - THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
  - IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
  - THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
  - THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH THE UTILITY COMPANY AND AFFECTED ABUTTER.
  - ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION, "STANDARD SPECIFICATIONS OF ROAD AND BRIDGE CONSTRUCTION", CURRENT EDITION.
  - CONTRACTOR TO SUBMIT AS-BUILT PLANS ON REPRODUCIBLE MYLARS AND IN DIGITAL FORMAT (.DWG FILE) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A NEW HAMPSHIRE LICENSED LAND SURVEYOR OR PROFESSIONAL ENGINEER.
  - CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
  - THE PROPERTY OWNER SHALL PROVIDE AN AS-BUILT RESTORATION PLAN AND FOLLOW-UP MONITORING ONE AND THREE YEARS AFTER THE RESTORATION WORK HAS BEEN COMPLETED TO INSURE A SURVIVAL RATE OF AT LEAST 80% OF THE NEW PLANTINGS. THE MONITORING PLAN SHALL BE SUBMITTED TO THE PLANNING DEPARTMENT AND SHALL INCLUDE A REQUIREMENT THAT ANY NEW INVASIVE SPECIES FOUND IN THE RESTORATION AREA DURING THE SITE MONITORING BE MECHANICALLY REMOVED.
  - ATV USE SHALL BE PROHIBITED IN THE DESCRIBED BLANDING TURTLE NESTING AREA AND THE IMPACTED AREA SHALL BE SIGNED ACCORDINGLY BY THE PROPERTY OWNER.
  - THE SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
  - ALL IMPROVEMENTS SHOWN ON THE SITE PLAN SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE PLAN BY THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS. NO CHANGES SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
  - THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
  - ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
  - THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.

**DEMOLITION NOTES:**

- EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
- ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
- COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
- ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- SAW CUT AND REMOVE PAVEMENT ONE (1) FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN ALL AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
- UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND CITY OF PORTSMOUTH STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED. CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
- PAVEMENT REMOVAL LIMITS ARE SHOWN FOR CONTRACTOR'S CONVENIENCE. ADDITIONAL PAVEMENT REMOVAL MAY BE REQUIRED DEPENDING ON THE CONTRACTOR'S OPERATION. CONTRACTOR TO VERIFY FULL LIMITS OF PAVEMENT REMOVAL PRIOR TO BID.
- THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE PADS, UTILITIES AND PAVEMENT WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ITEMS TO BE REMOVED INCLUDE BUT ARE NOT LIMITED TO: CONCRETE, PAVEMENT, CURBS, LIGHTING, MANHOLES, CATCH BASINS, UNDER GROUND PIPING, POLES, STAIRS, SIGNS, FENCES, RAMPS, WALLS, BOLLARDS, BUILDING SLABS, FOUNDATION, TREES AND LANDSCAPING.
- REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
- CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A NEW HAMPSHIRE LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
- PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT MAY RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
- SEE ROADWAY IMPROVEMENT PLANS FOR OFF-SITE DEMOLITION.
- THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.
- SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL UTILITIES TO BE REMOVED AND PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
- THE CONTRACTOR SHALL REMOVE AND SALVAGE EXISTING GRANITE CURB FOR REUSE.

**SITE NOTES:**

- PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSS WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSWALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
- ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
- SEE DETAILS FOR PAVEMENT MARKINGS, ADA SYMBOLS, SIGNS AND SIGN POSTS.
- CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
- PAINTED ISLANDS SHALL BE FOUR (4) INCH WIDE DIAGONAL LINES AT 3'-0" O.C. BORDERED BY FOUR (4) INCH WIDE LINES.
- STOP BARS SHALL BE EIGHTEEN (18) INCHES WIDE, WHITE THERMOPLASTIC AND CONFORM TO CURRENT MUTCD STANDARDS.
- CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
- SEE ARCHITECTURAL/BUILDING DRAWINGS FOR ALL CONCRETE PADS & SIDEWALKS ADJACENT TO BUILDING.
- COORDINATE ALL OFF-SITE SITE WORK WITH ROADWAY IMPROVEMENT PLANS.
- CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
- ALL LIGHT POLE BASES NOT PROTECTED BY A RAISED CURB SHALL BE PAINTED YELLOW.
- COORDINATE ALL WORK ADJACENT TO BUILDING WITH BUILDING CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING RETAINING WALL DESIGN FROM WALL MANUFACTURERS, AND SUBMITTING DESIGN TO ENGINEER PRIOR TO COMMENCING CONSTRUCTION. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CONSTRUCT WALL IN ACCORDANCE WITH DESIGN APPROVED BY THE ENGINEER. RETAINING WALL SHALL BE SEGMENTAL BLOCK WALL SYSTEM AS OUTLINED IN THE SPECIFICATIONS.
- ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
- EASEMENTS BETWEEN THE APPLICANT AND THE CITY OF PORTSMOUTH SHALL BE RECORDED PRIOR TO EXECUTED SITE REVIEW AGREEMENT.
- APPLICANT SHALL PROVIDE LIGHT POLE BASE, 24 FT ALUMINUM LIGHT POLE WITH 8 FT ARM AND WIRING FOR STREET LIGHTING. CITY OF PORTSMOUTH TO PROVIDE LED FIXTURES.
- UPON FINAL APPROVAL THE APPLICATION AGREES TO PROVIDE ALL REQUIRED PROPERTY LINE MONUMENTATIONS, BENCHMARKS, AND HOUSE NUMBER AS SPECIFIED IN THE SUBDIVISION RULES AND REGULATIONS TO THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.
- APPLICANT SHALL BE RESPONSIBLE FOR IMPLEMENTING THE APPROVED OPERATION AND MAINTENANCE PLAN INCLUDING THE MAINTENANCE REQUIREMENTS FOR THE PROPOSED RAIN GARDEN AND GRAVEL WETLAND SYSTEMS OUTLINED ON SHEET C-103.2. THE APPROVED OPERATION AND MAINTENANCE PLAN SHALL BE RECORDED AT THE RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

**GRADING AND DRAINAGE NOTES:**

- |                                                   |     |
|---------------------------------------------------|-----|
| COMPACTION REQUIREMENTS:                          |     |
| BELOW PAVED OR CONCRETE AREAS                     | 95% |
| TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL | 95% |
| BELOW LOAM AND SEED AREAS                         | 90% |
- \* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557. METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
- ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
  - ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
  - CONTRACTOR SHALL PROVIDE A FINISH PAVEMENT SURFACE AND LAWN AREAS FREE OF LOW SPOTS AND PONDING AREAS. CRITICAL AREAS INCLUDE BUILDING ENTRANCES, EXITS, RAMPS AND LOADING DOCK AREAS ADJACENT TO THE BUILDING.
  - ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
  - ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NHDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, LATEST EDITION.
  - ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4' SUMPS.

**EROSION CONTROL NOTES:**

- SEE SHEET C-501 FOR GENERAL EROSION CONTROL NOTES AND DETAILS.

**UTILITY NOTES:**

- COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY COMPANY.
  - NATURAL GAS - UNITIL
  - WATER - CITY OF PORTSMOUTH
  - SEWER - CITY OF PORTSMOUTH
  - ELECTRIC - EVERSOURCE
  - TELECOMMUNICATIONS - FAIRPOINT & COMCAST
- ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, CEMENT LINED DUCTILE IRON PIPE.
- ALL WATER MAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION PRIOR TO ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE CHLORINATION AND TESTING WITH THE CITY OF PORTSMOUTH WATER DEPARTMENT.
- ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
- CONNECTION TO EXISTING WATER MAIN SHALL BE CONSTRUCTED TO CITY OF PORTSMOUTH STANDARDS.
- EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
- THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH THE BUILDING DRAWINGS AND THE APPLICABLE UTILITY COMPANIES.
- ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
- CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
- A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS.
- SAW CUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVEMENT AREAS TO REMAIN.
- HYDRANTS, GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
- COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.

- ALL SEWER PIPE WITH LESS THAN 6' OF COVER SHALL BE INSULATED.
- CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
- SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER.
- CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
- FINAL DESIGN FOR ALL ELECTRIC, TELECOMMUNICATIONS, AND GAS WORK SHALL BE COORDINATED WITH THE UTILITY COMPANY AND CITY OF PORTSMOUTH PRIOR TO CONSTRUCTION.
- THE APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATIONS DIVISION. THE RADIO COMMUNICATIONS CARRIER MUST BE FAMILIAR AND CONVERSANT WITH THE POLICE AND RADIO CONFIGURATION. IF THE SITE SURVEY INDICATES IT IS NECESSARY TO INSTALL A SIGNAL REPEATER EITHER ON OR NEAR THE PROPOSED PROJECT, THOSE COSTS SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY.

**LANDSCAPE NOTES:**

- THE CONTRACTOR SHALL FURNISH AND PLANT ALL PLANTS IN QUANTITIES AS SHOWN ON THIS PLAN. NO SUBSTITUTIONS WILL BE PERMITTED UNLESS APPROVED BY OWNER. ALL PLANTS SHALL BE NURSERY GROWN.
- ALL PLANTS SHALL BE NURSERY GROWN AND PLANTS AND WORKMANSHIP SHALL CONFORM TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS, INCLUDING BUT NOT LIMITED TO SIZE, HEALTH, SHAPE, ETC., AND SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO ARRIVAL ON-SITE AND AFTER PLANTING.
- PLANT STOCK SHALL BE GROWN WITHIN THE HARDINESS ZONES 4 THRU 7 ESTABLISHED BY THE PLANT HARDINESS ZONE MAP, MISCELLANEOUS PUBLICATIONS NO. 814, AGRICULTURAL RESEARCH SERVICE, UNITED STATES DEPARTMENT AGRICULTURE, LATEST REVISION.
- PLANT MATERIAL SHALL BARE THE SAME RELATIONSHIP TO FINISHED GRADE AS TO THE ORIGINAL PLANTING GRADE PRIOR TO DIGGING.
- THE NUMBER OF EACH INDIVIDUAL PLANT TYPE AND SIZE PROVIDED IN THE PLANT LIST OR ON THE PLAN IS FOR THE CONTRACTOR'S CONVENIENCE ONLY. IF A DISCREPANCY EXISTS BETWEEN THE NUMBER OF PLANTS ON THE LABEL AND THE NUMBER OF SYMBOLS SHOWN ON THE DRAWINGS, THE GREATER NUMBER SHALL APPLY.
- NO SUBSTITUTION OF PLANT MATERIALS WILL BE ALLOWED WITHOUT THE PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL LOCATE, VERIFY AND MARK ALL EXISTING AND NEWLY INSTALLED UNDERGROUND UTILITIES PRIOR TO ANY LAWN WORK OR PLANTING. ANY CONFLICTS WHICH MIGHT OCCUR BETWEEN PLANTING AND UTILITIES SHALL IMMEDIATELY BE REPORTED TO THE OWNER SO THAT ALTERNATE PLANTING LOCATIONS CAN BE DETERMINED.
- ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED, SHALL RECEIVE 6" OF LOAM AND SEED. NO FILL SHALL BE PLACED IN ANY WETLAND AREA.
- THREE INCHES (3") OF UNTREATED BARK MULCH IS TO BE USED AROUND THE TREE AND SHRUB PLANTING AS SPECIFIED IN THE DETAILS. WHERE BARK MULCH IS TO BE USED IN A CURBED ISLAND THE BARK MULCH SHALL MEET THE TOP INSIDE EDGE OF THE CURB. ALL OTHER AREAS SHALL RECEIVE 6" INCHES OF LOAM AND SEED.
- SEE PLANTING DETAILS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- TREE STAKES SHALL REMAIN IN PLACE FOR NO LESS THAN 6 MONTHS AND NO MORE THAN 1 YEAR.
- PLANTING SHALL BE COMPLETED FROM APRIL 15TH THROUGH OCTOBER 1ST. NO PLANTING DURING JULY AND AUGUST UNLESS SPECIAL PROVISIONS ARE MADE FOR DROUGHT.
- PARKING AREA PLANTED ISLANDS TO HAVE MINIMUM OF 1'-0" TOPSOIL PLACED TO WITHIN 3 INCHES OF THE TOP OF CURB ELEVATION. REMOVE ALL CONSTRUCTION DEBRIS BEFORE PLACING TOPSOIL.
- TREES SHALL BE PRUNED IN ACCORDANCE WITH THE LATEST EDITION OF ANSI A300 'TREES, SHRUBS AND OTHER WOOD PLANT MAINTENANCE STANDARD PRACTICES'.
- ALL PLANTS SHALL BE WATERED THOROUGHLY TWICE DURING THE FIRST 24 HOUR PERIOD AFTER PLANTING. ALL PLANTS SHALL BE WATERED WEEKLY, OR MORE OFTEN, IF NECESSARY DURING THE FIRST GROWING SEASON. LANDSCAPE CONTRACTOR SHALL COORDINATE WATERING SCHEDULE WITH OWNER DURING THE ONE (1) YEAR GUARANTEE PERIOD.
- EXISTING TREES AND SHRUBS SHOWN ON THE PLAN ARE TO REMAIN UNDISTURBED, ALL EXISTING TREES AND SHRUBS SHOWN TO REMAIN ARE TO BE PROTECTED WITH A 4-FOOT SNOW FENCE PLACED AT THE DRIP LINE OF THE BRANCHES OR AT 8 FEET MINIMUM FROM THE TREE TRUNK. ANY EXISTING TREE OR SHRUB SHOWN TO REMAIN, WHICH IS REMOVED DURING CONSTRUCTION, SHALL BE REPLACED BY A TREE OF COMPARABLE SIZE AND SPECIES TREE OR SHRUB.
- THE CONTRACTOR SHALL GUARANTEE ALL PLANTINGS TO BE IN GOOD HEALTHY, FLOURISHING AND ACCEPTABLE CONDITION FOR A PERIOD OF ONE (1) YEAR BEGINNING AT THE DATE OF ACCEPTANCE OF SUBSTANTIAL COMPLETION. ALL GRASSES, TREES AND SHRUBS THAT, IN THE OPINION OF THE LANDSCAPE ARCHITECT, SHOW LESS THAN 80% HEALTHY GROWTH AT THE END OF ONE YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR.
- UPON EXPIRATION OF THE CONTRACTOR'S ONE YEAR GUARANTEE PERIOD, THE OWNER SHALL BE RESPONSIBLE FOR LANDSCAPE MAINTENANCE INCLUDING WATERING DURING PERIODS OF DROUGHT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PLANTING AND LAWNS AGAINST DAMAGE FROM ONGOING CONSTRUCTION. THIS PROTECTION SHALL BEGIN AT THE TIME THE PLANT IS INSTALLED AND CONTINUE UNTIL THE FORMAL ACCEPTANCE OF ALL THE PLANTINGS.
- PRE-PURCHASE PLANT MATERIAL AND ARRANGE FOR DELIVERY TO MEET PROJECT SCHEDULE AS REQUIRED IT MAY BE NECESSARY TO PRE-DIG CERTAIN SPECIES WELL IN ADVANCE OF ACTUAL PLANTING DATES.

**ABBREVIATIONS**

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS	NHDES	NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES
AC	ACRES	NRCC	NORTHEAST REGIONAL CLIMATE CENTER
ADA	AMERICANS WITH DISABILITIES ACT	NRCS	NATURAL RESOURCES CONSERVATION SERVICE
AGGR	AGGREGATE	OC	ON CENTER
AOT	ALTERATION OF TERRIAN	OD	OUTSIDE DIAMETER
BLDG	BUILDING	PAD	PROPOSED AREA DRAIN
BMP(S)	BEST MANAGEMENT PRACTICE(S)	PC	POINT OF CURVATURE
BOC	BOTTOM OF CURB	PCB	PROPOSED CATCH BASIN
BOW	BOTTOM OF WALL	PDMH	PROPOSED DRAINAGE MANHOLE
CB	CATCH BASIN	PI	POINT OF INTERSECTION
CCB	CAPE COD BERM	POS	PROPOSED OUTLET STRUCTURE
CMP	CORRUGATED METAL PIPE	PROP	PROPOSED
CONST	CONSTRUCT	PSMH	PROPOSED SEWER MANHOLE
COORD	COORDINATE	PT	POINT OF TANGENCY
DIA	DIAMETER	PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE	PVMT	PAVEMENT
DMH	DRAINAGE MANHOLE	PVD	PROPOSED YARD DRAIN
DWG	DRAWING	R	RADIUS
ELEV	ELEVATION	RCP	REINFORCED CONCRETE PIPE
EP	EDGE OF PAVEMENT	RL	ROOF LEADER
EXIST	EXISTING	ROW	RIGHT OF WAY
FES	FLARED END SECTION	SF	SQUARE FEET
FF	FINISHED FLOOR	SSSNE	SOCIETY OF SOIL SCIENTISTS OF NORTHERN NEW ENGLAND
HDPE	HIGH DENSITY POLYETHYLENE	STD	STANDARD
HMA	HOT MIX ASPHALT	TBR	TO BE REMOVED
HMP	HOT MIX PAVEMENT	TOC	TOP OF CURB
HW	HEADWALL	TOW	TOP OF WALL
HYD	HYDRAULIC	TYP	TYPICAL
ID	INSIDE DIAMETER	UD	UNDERDRAIN
INV	INVERT	USCS	UNIFIED SOIL CLASSIFICATION SYSTEM
L	LENGTH	USDA	UNITED STATES DEPARTMENT OF AGRICULTURE
LF	LINEAR FEET	W	WIDTH
MAX	MAXIMUM	W/	WITH
MIN	MINIMUM	YD	YARD
NCSS	NATIONAL COOPERATIVE SURVEY		DARIN

**LEGEND**

	UTILITY POLE
	UTILITY POLE (PER AERIAL TOPOGRAPHY)
	LIGHT POLE
	LIGHT POLE (PER ARRIAL TOPOGRAPHY)
	IRON ROD FOUND
	DRILL HOLE SET (UNLESS OTHERWISE NOTED)
	5/8" RE-BAR W/ID CAP TO BE SET
	BARBED WIRE FOUND ON GROUND
	SEWER MANHOLE (PER AERIAL TOPOGRAPHY)
	SEWER MANHOLE
	GAS GATE VALVE
	WATER GATE VALVE
	WATER SHUTOFF VALVE
	CATCH BASIN (PER AERIAL TOPOGRAPHY)
	TREE (PER AERIAL TOPOGRAPHY)
	FENCE POST
	HYDRANT
	HYDRANT (PER AERIAL TOPOGRAPHY)
	BOULDER (PER AERIAL TOPOGRAPHY)
EP	EDGE OF PAVEMENT
EOG	EDGE OF GRAVEL
DHF	DRILL HOLE FOUND
	WETLAND
	STRUCTURES
	PILE
	STONE WALL
	REMNANT STONE WALL
	BOX WIRE FENCE
	CHAINLINK FENCE
	RAILROAD TRACKS
	EDGE OF WETLAND (SEE REFERENCE PLAN #32 & #36)
	EDGE OF WETLAND
	TREE LINE
	WATER LINE
	UNDERGROUND GAS LINE (WITNESSED BY ABOVE GROUND MARKER)
	OVERHEAD WIRE
	SEWER LINE
	EASEMENT LINE
	OBSCURED AREA
	PARKING OUTLINE
	MINOR CONTOUR
	MAJOR CONTOUR
	PROPERTY LINES
	APPROXIMATE AB BUTTERS LINE
	STREAM
	ZONING BOUNDARY
	PROPOSED RIGHT OF WAY LINE
	100' WETLAND BUFFER LINE
	SETBACK LINE
	PROPOSED TREELINE
	PROPOSED GAS SERVICE
	PROPOSED UNDERGROUND ELECTRIC/COMMUNICATION
	PROPOSED WATER
	PROPOSED SEWER
	PROPOSED CONTOUR
	PROPOSED PAVEMENT
	PROPOSED PERIMETER EROSION CONTROL
	PROPOSED LIMIT OF CLEARING
	PAVEMENT TO BE REMOVED
	APPROXIMATE LIMIT OF WORK

**Tighe&Bond**  
Engineers | Environmental Specialists

**Proposed  
Subdivision Road  
& Office Building  
Development**

**Borthwick Forest, LLC**

Portsmonth,  
New Hampshire

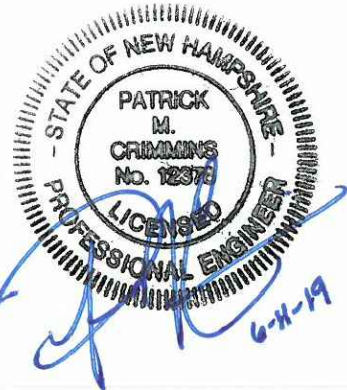
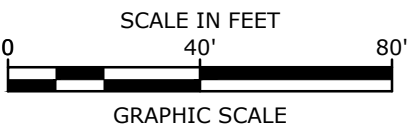
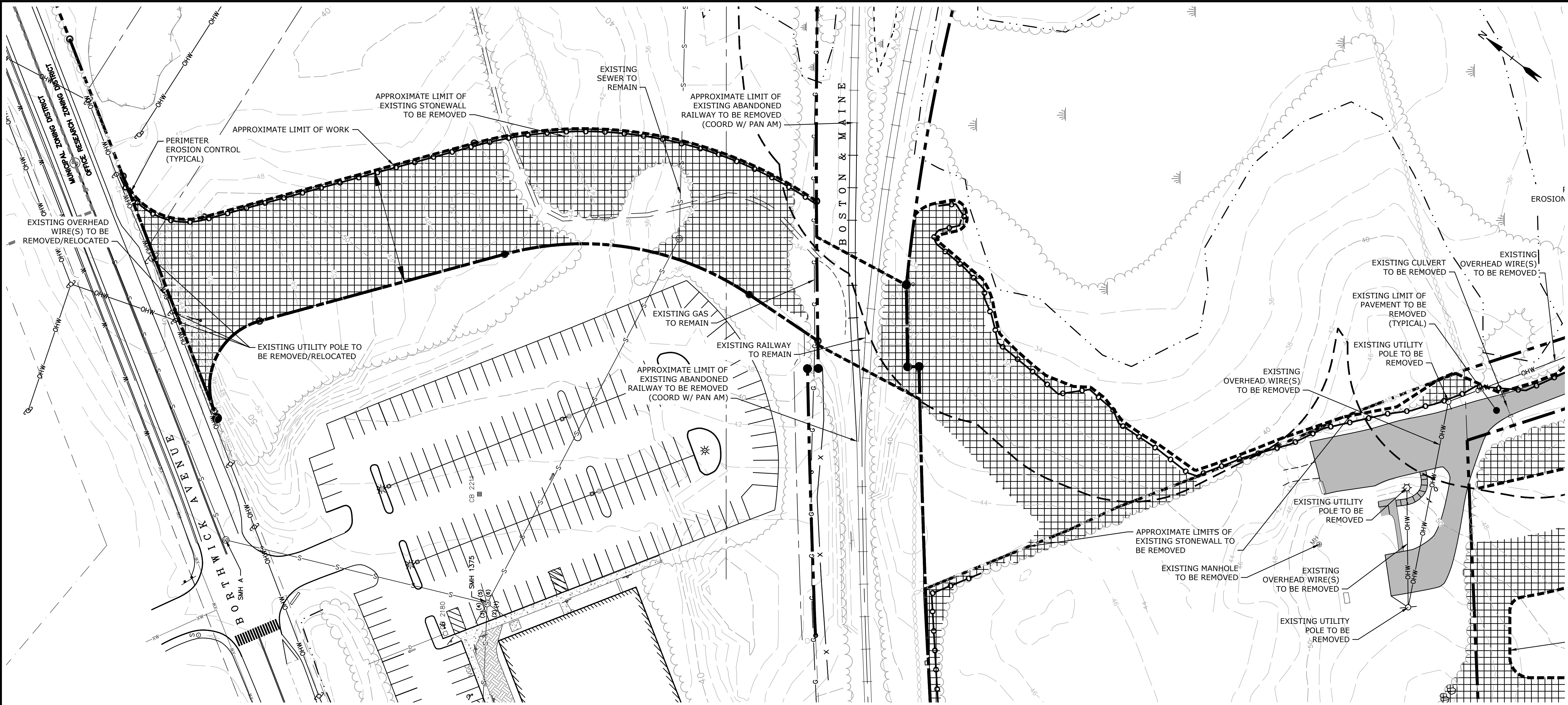
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M	5/8/2018	Submitted for Final Approval
L	5/4/2018	Revised RCRD Submission
K	2/26/2018	GMP Submission
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R	6/11/2019	To PB for Amended Site Plan Approval
Q	5/20/2019	Amended Site Plan Approval
P	3/25/2019	Construction Drawings
O	3/20/2019	Revised GMP Submission
MARK	DATE	DESCRIPTION
PROJECT NO: K0076-13		
DATE: 3/20/2017		
FILE: K0076-13_DSGN.DWG		
DRAWN BY: CML		
CHECKED: PMC		
APPROVED: BLM		
GENERAL NOTES, ABBREVIATIONS & LEGEND SHEET		
SCALE: AS SHOWN		
G-101		







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Plot Date: Tuesday, June 11, 2019 Plotted By: Craig M. Langton  
File Location: J:\K0076 The Kane Company - General Proposals\0076-13 Borthwick Forest\Drawings - Figures\AutoCAD\Xref\K0076-13\_DSGN.dwg Layout Tab: EX-1



## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

N	5/20/2019	Amended Site Plan Approval
M	3/25/2019	Construction Drawings
L	3/20/2019	Revised GMP Submission
K	3/4/2019	Rev Pricing Drawings / Admin Approval
J	5/8/2018	Submitted for Final Approval
I	2/26/2018	GMP Submission
H	2/6/2018	Planning Board Submission
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F	8/21/2017	Revised Planning Board Submission
E	6/2/2017	AoT Submission
D	5/11/2017	Planning Board Submission
C	4/24/2017	TAC & ConCom Submission
B	3/31/2017	TAC Submission
O	6/11/2019	10 PB for Amended Site Plan Approval
MARK	DATE	DESCRIPTION

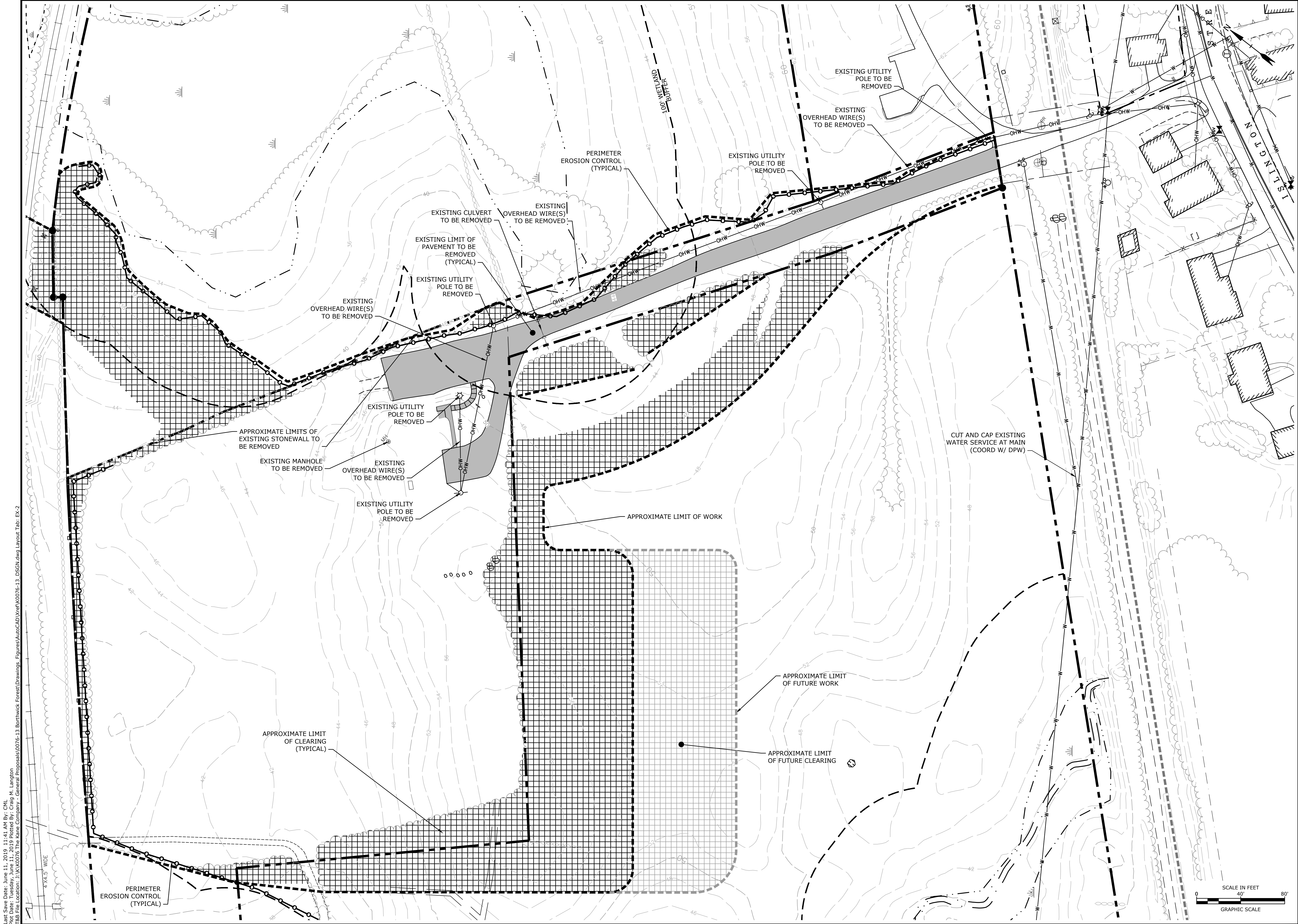
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DATE:	3/20/2017
FILE:	K0076-13_DSGN.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

EXISTING CONDITIONS/  
DEMOLITION PLAN

SCALE: AS SHOWN

C-101.1





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**Tighe&Bond**  
Engineers | Environmental Specialists

STATE OF NEW HAMPSHIRE  
BRADLEE MEZQUITA  
No. 08830  
LICENSED PROFESSIONAL ENGINEER

STATE OF NEW HAMPSHIRE  
PATRICK M. O'BRIEN  
No. 8399  
LICENSED PROFESSIONAL ENGINEER

**Proposed Subdivision Road & Office Building Development**

Borthwick Forest, LLC

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
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M	3/25/2019	Construction Drawings
L	3/20/2019	Revised GMP Submission
K	3/4/2019	Rev Pricing Drawings / Admin Approval
J	5/8/2018	Submitted for Final Approval
I	2/26/2018	GMP Submission
H	2/6/2018	Planning Board Submission
G	1/12/2018	GMP Submission
F	8/21/2017	Revised Planning Board Submission
E	6/2/2017	AoT Submission
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C	4/24/2017	TAC & ConCom Submission
B	3/31/2017	TAC Submission
O	6/11/2019	10 PB for Amended Site Plan Approval

PROJECT NO: K0076-13  
DATE: 3/20/2017  
FILE: K0076-13\_DSGN.DWG  
DRAWN BY: CML  
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APPROVED: BLM

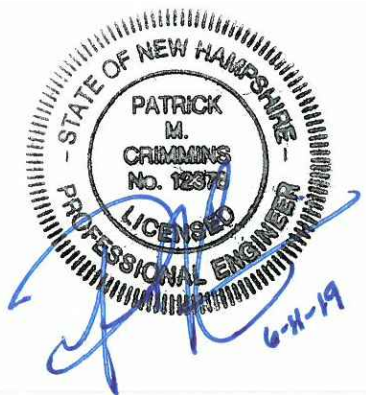
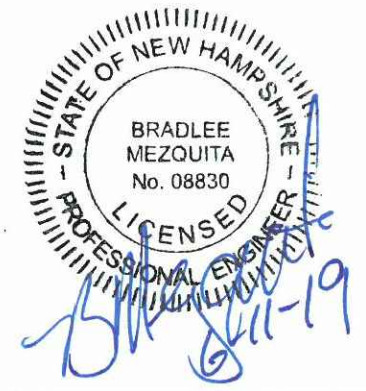
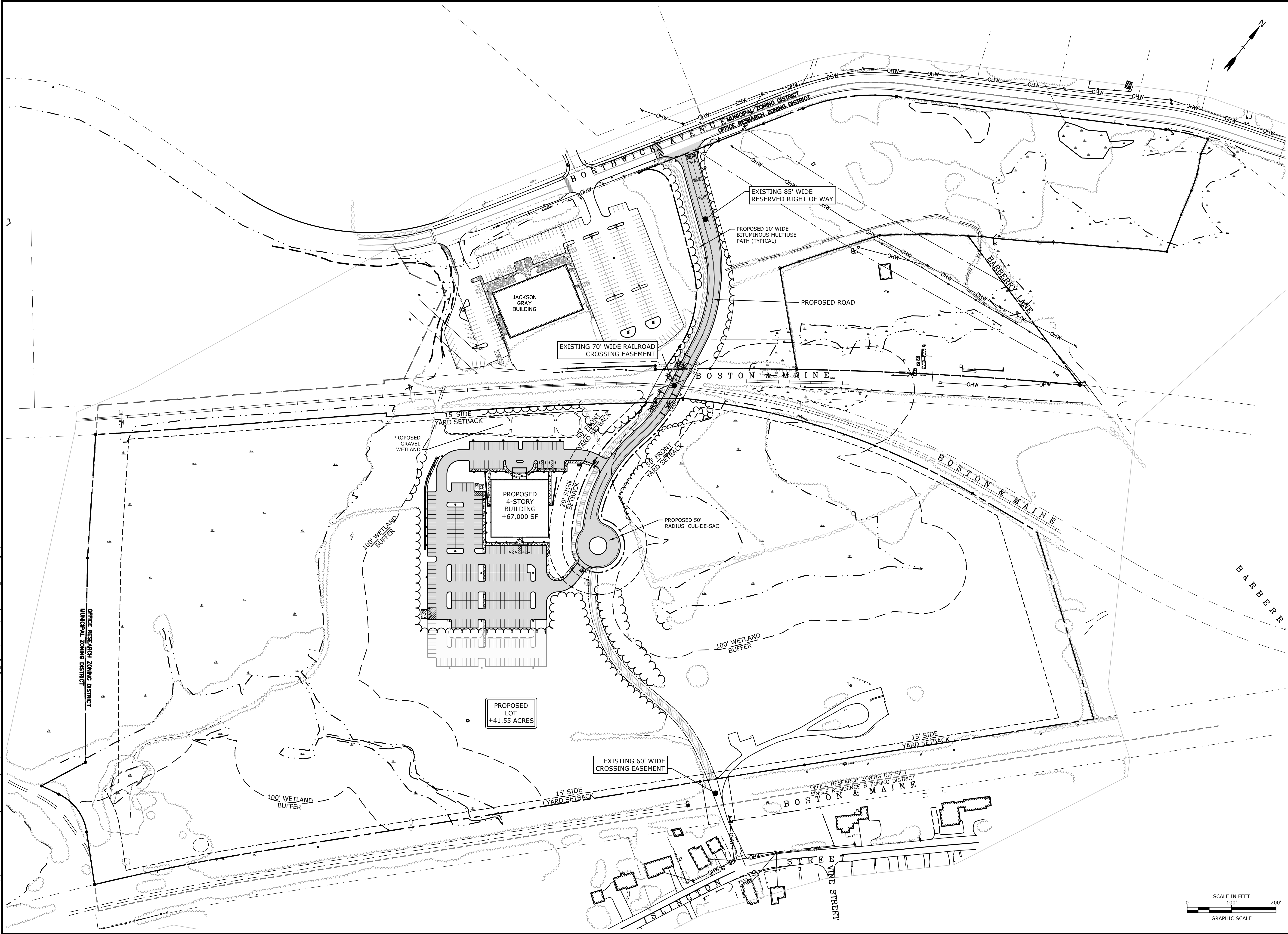
EXISTING CONDITIONS/  
DEMOLITION PLAN

SCALE: AS SHOWN

C-101.2



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## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

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K	3/4/2019	Rev Pricing Drawings / Admin Approval
J	5/8/2018	Submitted for Final Approval
I	2/6/2018	Planning Board Submission
H	1/12/2018	GMP Submission
G	8/21/2017	Revised TAC Submission
F	6/2/2017	AoT Submission
E	5/11/2017	Planning Board Submission
D	4/24/2017	TAC & ConCom Submission
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B	3/29/2017	Conditional Use Permit Submission
O	6/11/2019	10 PS for Amended Site Plan Approval
MARK	DATE	DESCRIPTION

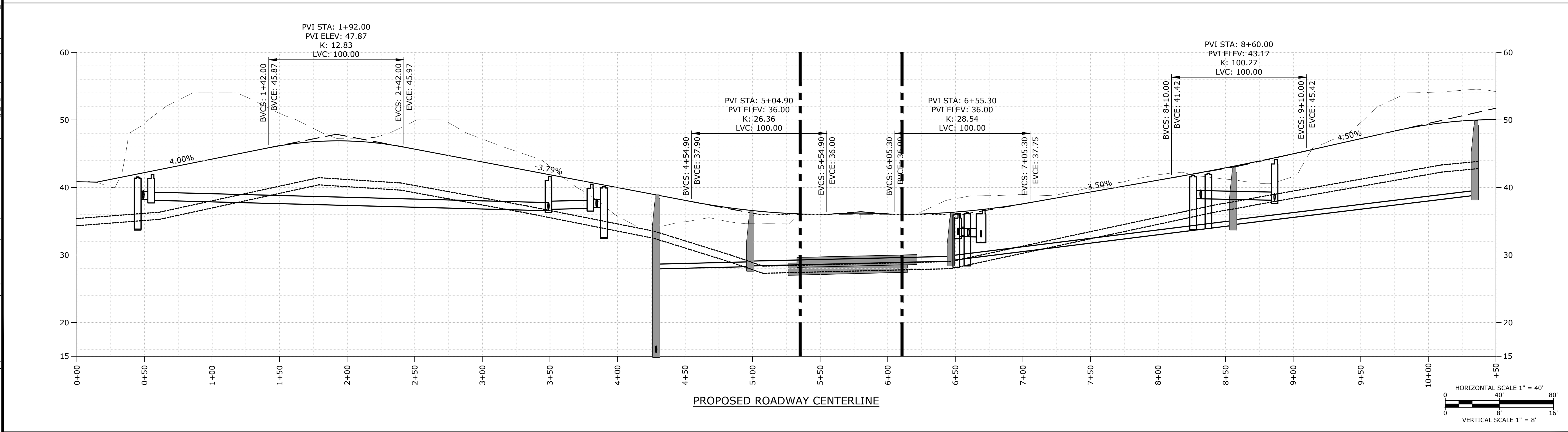
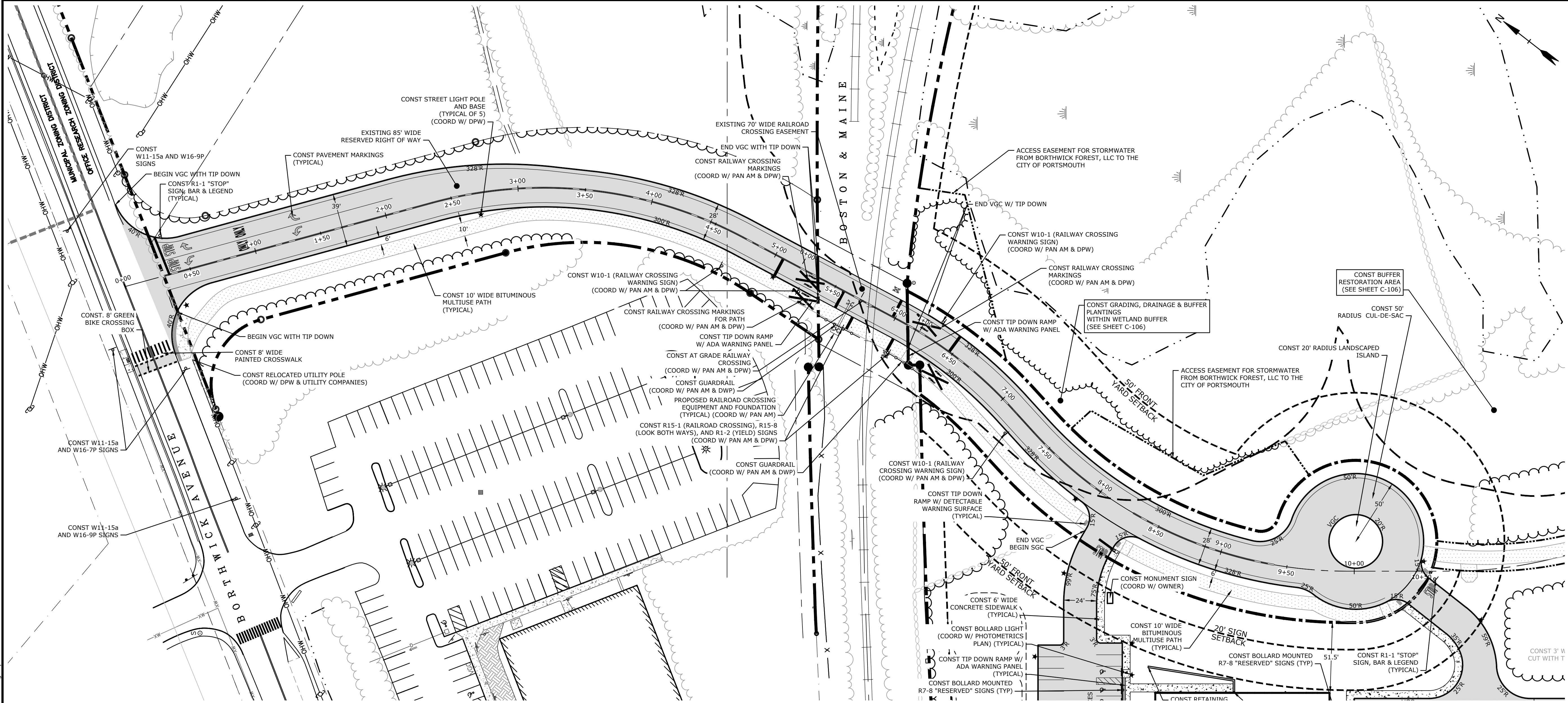
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DATE:	3/20/2017
FILE:	K0076-13_DSGN.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

OVERALL SITE PLAN

SCALE: AS SHOWN

C-102





**Tighe&Bond**  
Engineers | Environmental Specialists

**Proposed Subdivision Road & Office Building Development**

Borthwick Forest, LLC

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
N	3/4/2019	Rev Pricing Drawings / Admin Approval
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O	3/20/2019	Revised GMP Submission

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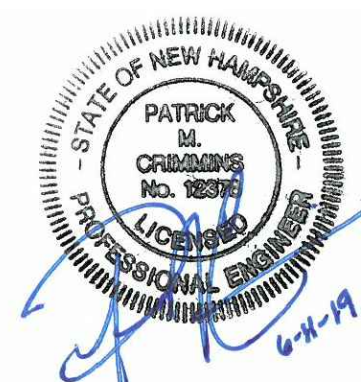
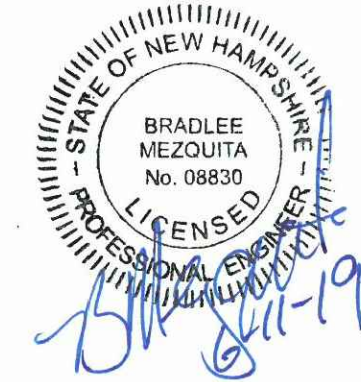
**SITE PLAN**

SCALE: AS SHOWN

**C-102.1**

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## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

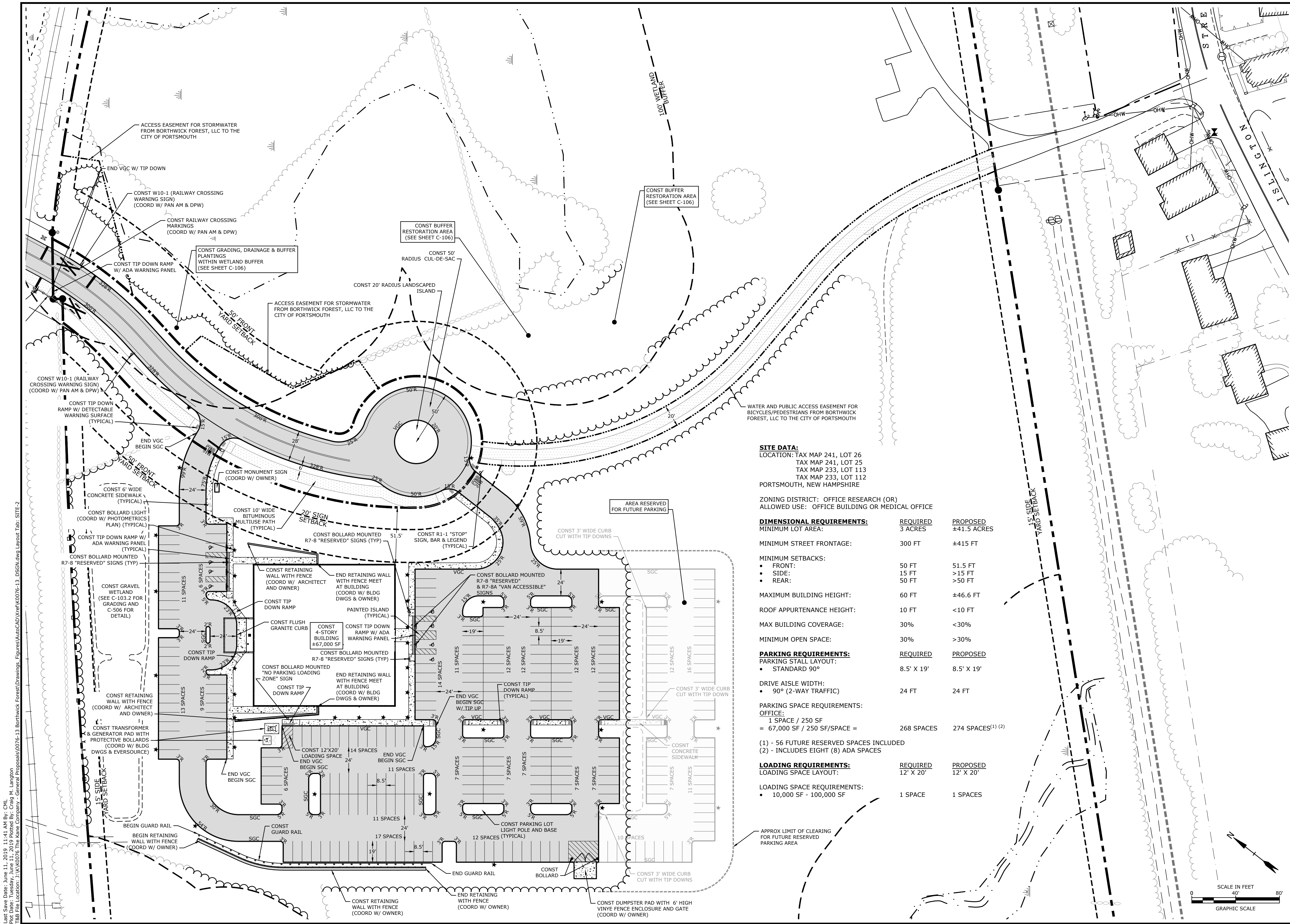
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J	1/12/2018	GMP Submission
I	11/3/2017	For Submission to RCRD
H	8/21/2017	Revised TAC Submission
G	8/3/2017	Per AoT Comments
F	6/2/2017	AoT Submission
E	5/11/2017	Planning Board Submission
R	6/11/2019	To PB for Amended Site Plan Approval
Q	5/20/2019	Amended Site Plan Approval
P	3/25/2019	Construction Drawings
O	3/20/2019	Revised GMP Submission
MARK	DATE	DESCRIPTION

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DATE:	3/20/2017
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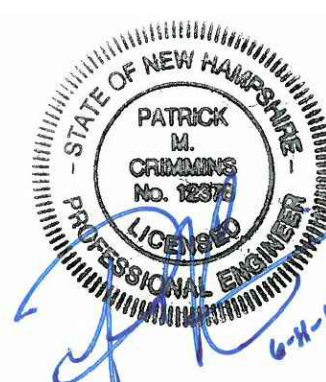
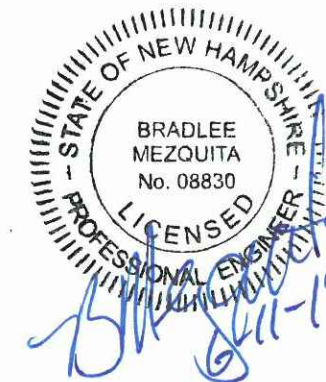
### SITE PLAN

SCALE: AS SHOWN

C-102.2







Proposed  
Subdivision Road  
& Office Building  
Development

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

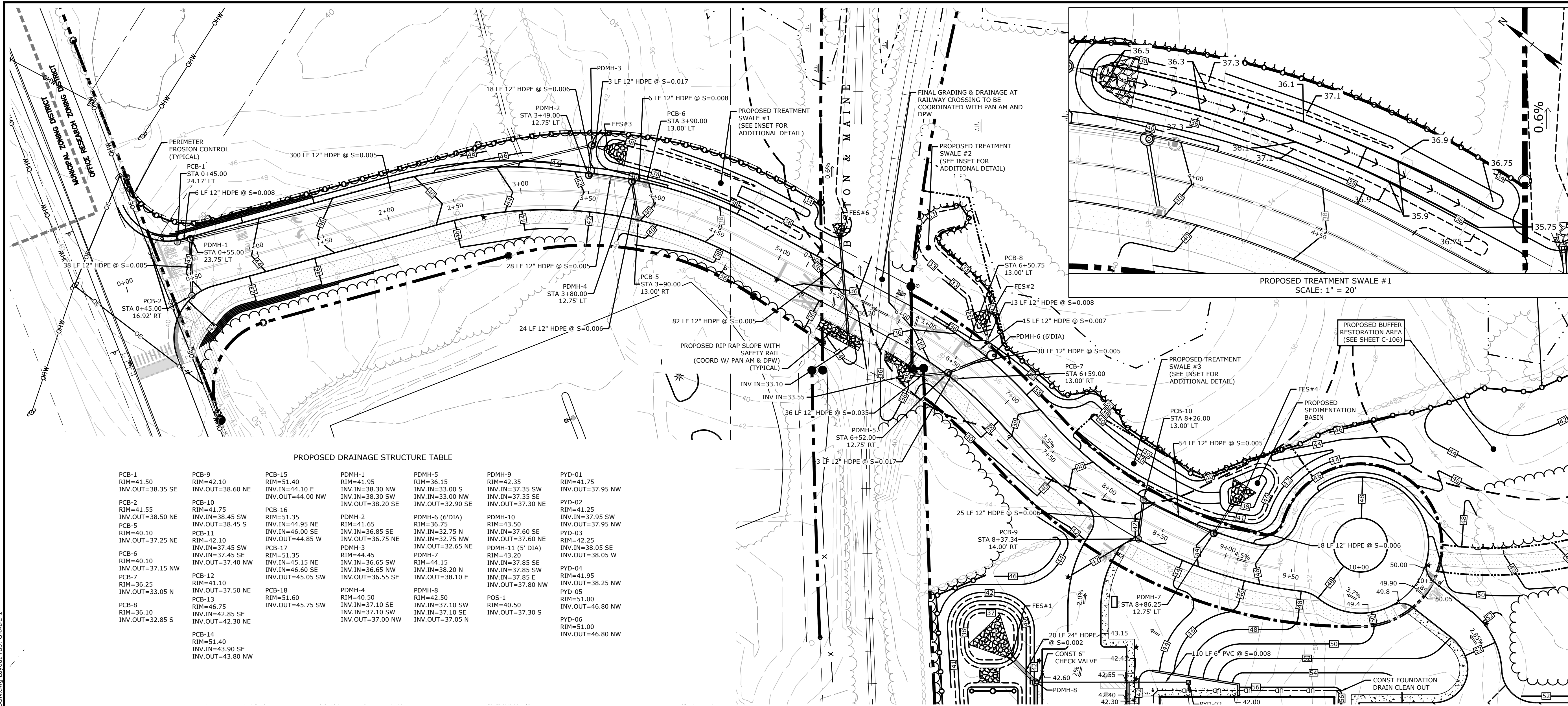
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O	5/20/2019	Amended Site Plan Approval

PROJECT NO:	K0076-13
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FILE:	K0076-13.DSGN.DWG
DRAWN BY:	CML
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GRADING, DRAINAGE &  
EROSION CONTROL PLAN

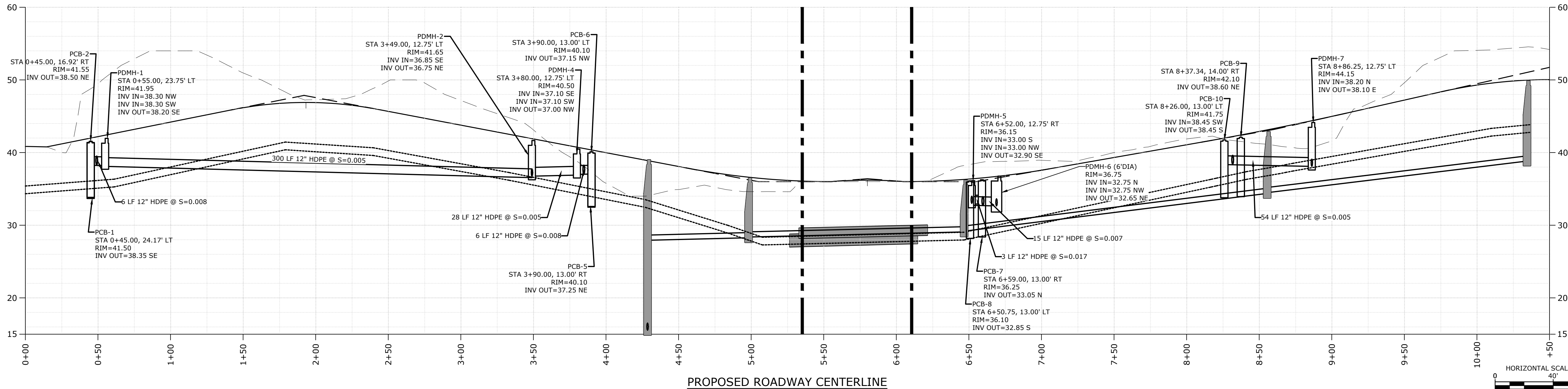
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PROPOSED DRAINAGE STRUCTURE TABLE

PCB-1 RIM=41.50 INV.OUT=38.35 SE	PCB-9 RIM=42.10 INV.OUT=38.60 NE	PCB-15 RIM=51.40 INV.IN=44.10 E INV.OUT=44.00 NW	PDMH-1 RIM=41.95 INV.IN=38.30 NW INV.IN=38.30 SW INV.OUT=38.20 SE	PDMH-5 RIM=36.15 INV.IN=33.00 S INV.IN=33.00 NW INV.OUT=37.35 SE	PDMH-9 RIM=42.35 INV.IN=37.35 SW INV.IN=37.35 SE INV.OUT=37.30 NE	PYD-01 RIM=41.75 INV.OUT=37.95 NW
PCB-2 RIM=41.55 INV.OUT=38.50 NE	PCB-10 RIM=41.75 INV.IN=38.45 SW INV.OUT=38.45 S	PCB-16 RIM=51.35 INV.IN=44.95 NE INV.IN=46.00 SE INV.OUT=44.85 W	PDMH-2 RIM=41.65 INV.IN=36.85 SE INV.IN=36.85 SE INV.OUT=36.75 NE	PDMH-6 (6' DIA) RIM=36.75 INV.IN=32.75 N INV.IN=32.75 NW INV.OUT=32.65 NE	PDMH-10 RIM=43.50 INV.IN=37.60 SE INV.IN=37.60 NE INV.OUT=37.50 NE	PYD-02 RIM=41.25 INV.IN=37.95 SW INV.OUT=37.95 NW
PCB-5 RIM=40.10 INV.OUT=37.25 NE	PCB-11 RIM=42.10 INV.IN=37.45 SW INV.IN=37.45 SE INV.OUT=37.40 NW	PCB-17 RIM=51.35 INV.IN=45.15 NE INV.IN=46.60 SE INV.OUT=45.05 SW	PDMH-3 RIM=44.45 INV.IN=36.65 SW INV.IN=36.65 NW INV.OUT=36.55 SE	PDMH-7 RIM=44.15 INV.IN=37.85 SW INV.IN=37.85 E INV.OUT=37.80 NW	PDMH-11 (5' DIA) RIM=43.20 INV.IN=37.85 SE INV.IN=37.85 E INV.OUT=37.80 NW	PYD-03 RIM=42.25 INV.IN=38.05 SE INV.IN=38.05 W INV.OUT=38.05 W
PCB-6 RIM=40.10 INV.OUT=37.15 NW	PCB-12 RIM=41.10 INV.OUT=37.50 NE INV.OUT=37.40 NW	PCB-18 RIM=51.60 INV.OUT=45.75 SW	PDMH-4 RIM=40.50 INV.IN=37.10 SE INV.IN=37.10 SW INV.OUT=37.00 NW	PDMH-8 RIM=42.50 INV.IN=37.10 SW INV.IN=37.10 SE INV.OUT=37.05 N	POS-1 RIM=40.50 INV.OUT=37.80 S	PYD-04 RIM=41.95 INV.OUT=38.25 NW
PCB-7 RIM=36.25 INV.OUT=33.05 N	PCB-13 RIM=46.75 INV.IN=42.85 SE INV.OUT=42.30 NE					PYD-05 RIM=51.00 INV.OUT=46.80 NW
PCB-8 RIM=36.10 INV.OUT=32.85 S	PCB-14 RIM=51.40 INV.IN=43.90 SE INV.OUT=43.80 NW					PYD-06 RIM=51.00 INV.OUT=46.80 NW

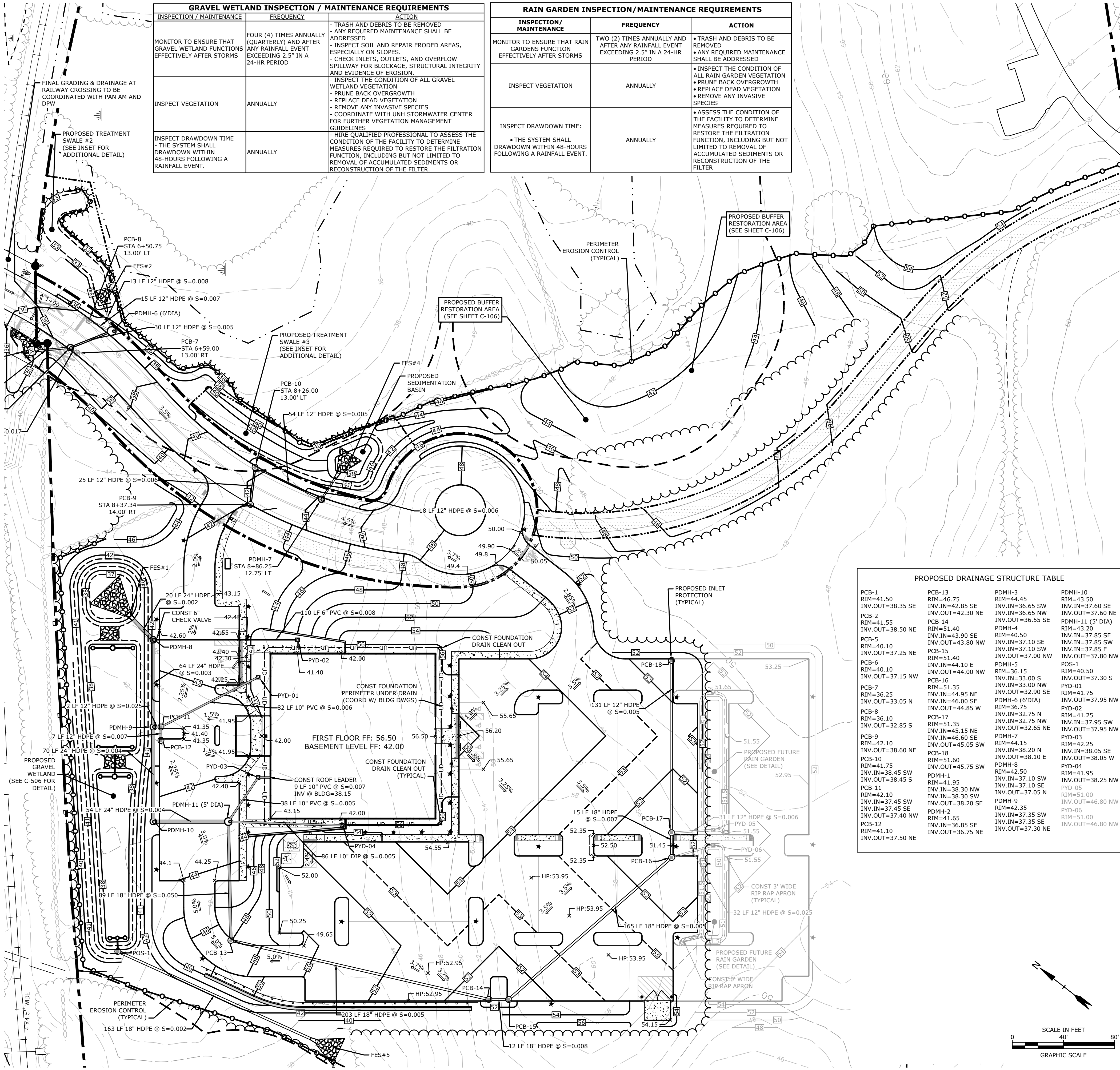




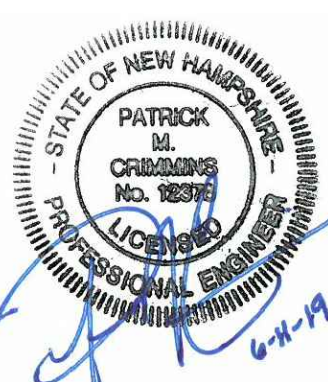
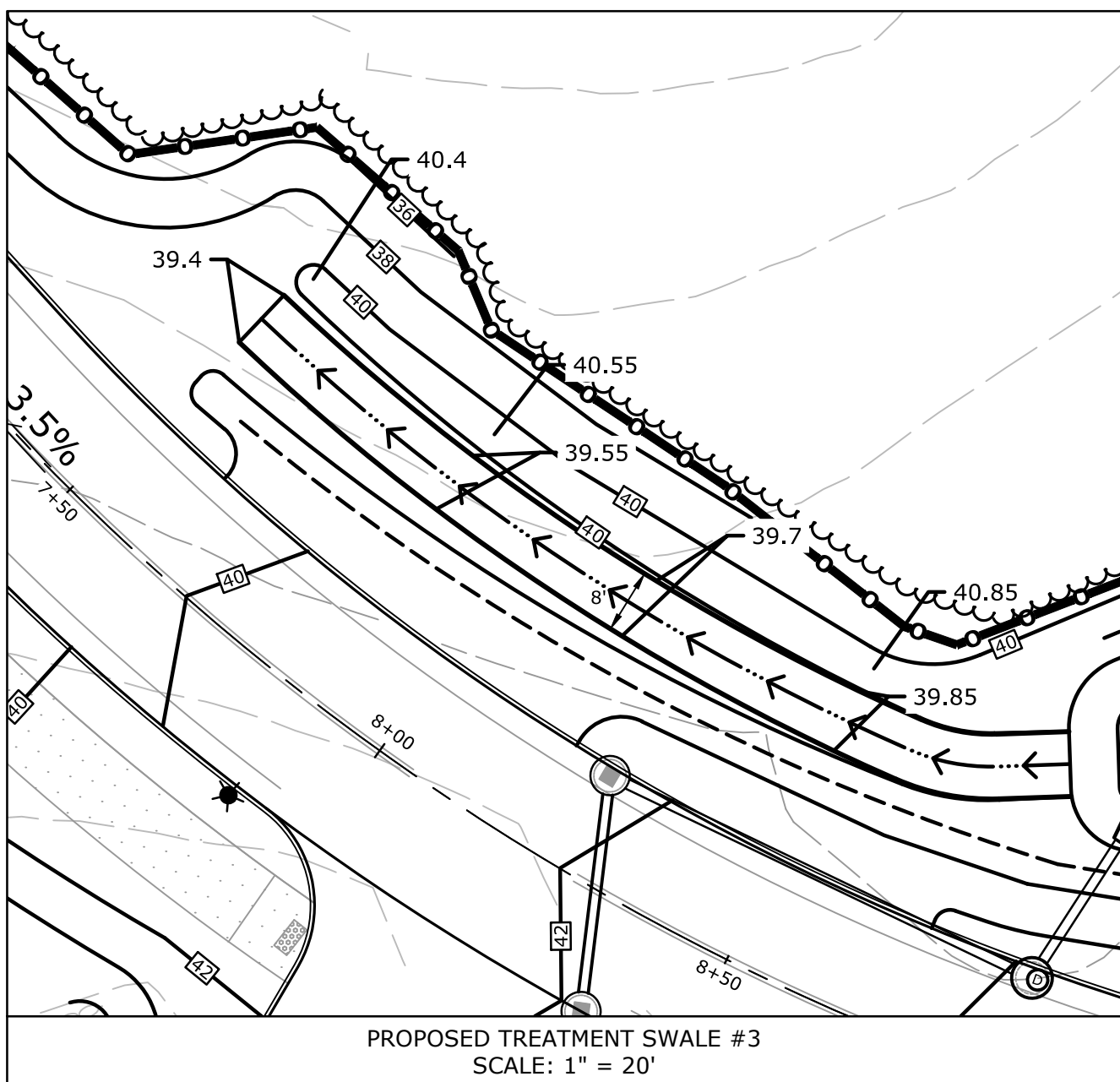
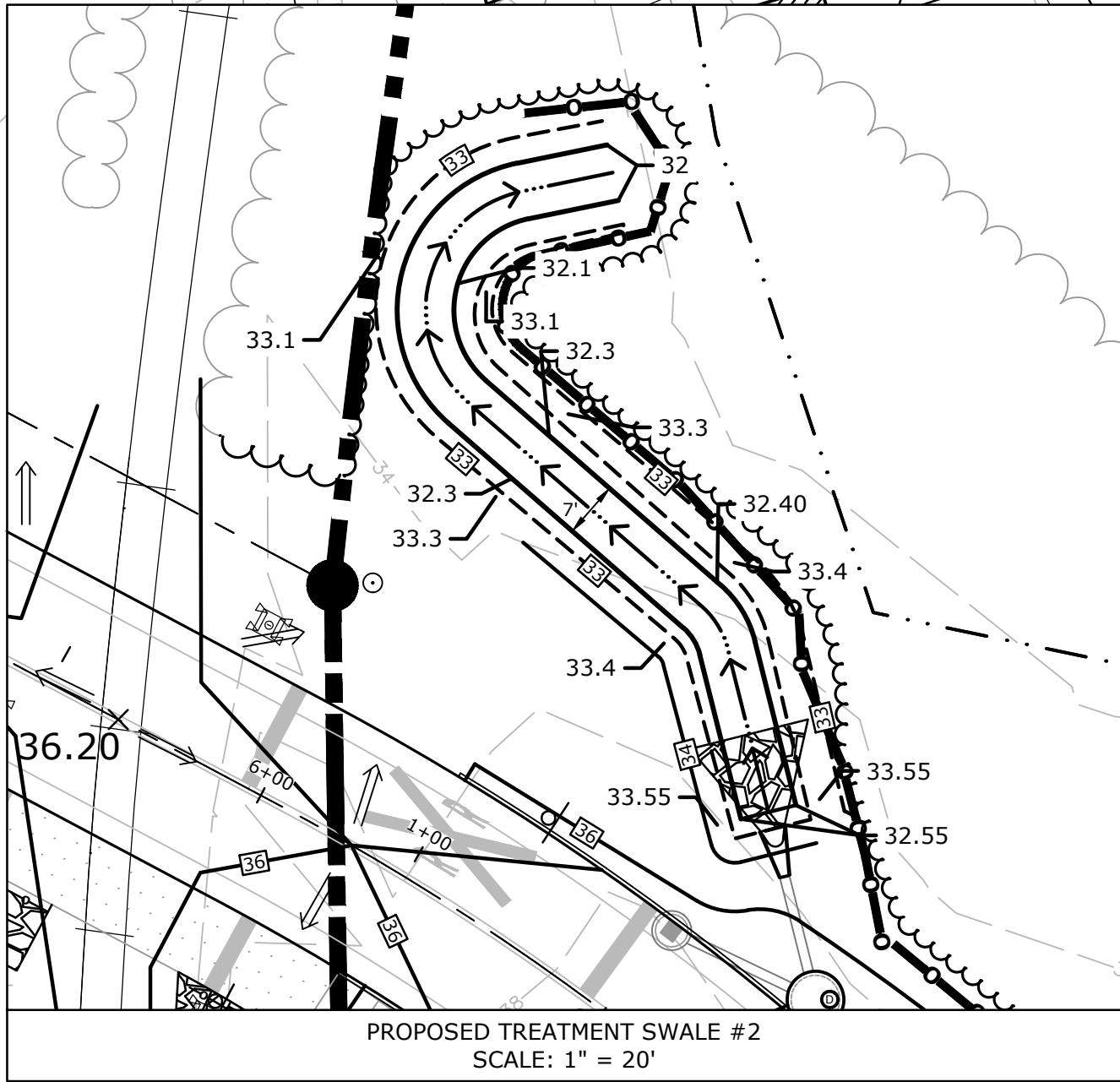
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Plot Date: Tuesday, June 11, 2019 Plotted By: Craig M. Langton  
File Location: Z:\K0076 The Kane Company - General Proposals\0076-13 Borthwick Forest\Drawings - Figures\AutoCAD\Xref\K0076-13\_DSGN.dwg Layout Tab: GRADE-2

GRAVEL WETLAND INSPECTION / MAINTENANCE REQUIREMENTS		
INSPECTION / MAINTENANCE	FREQUENCY	ACTION
MONITOR TO ENSURE THAT GRAVEL WETLAND FUNCTIONS EFFECTIVELY AFTER STORMS	FOUR (4) TIMES ANNUALLY (QUARTERLY) AND AFTER ANY RAINFALL EVENT EXCEEDING 2.5" IN A 24-HR PERIOD	• TRASH AND DEBRIS TO BE REMOVED • ANY REQUIRED MAINTENANCE SHALL BE ADDRESSED • INSPECT SOIL AND REPAIR ERODED AREAS, ESPECIALLY ON SLOPES • CHECK INLETS, OUTLETS, AND OVERFLOW SPILLWAY FOR BLOCKAGE, STRUCTURAL INTEGRITY AND EVIDENCE OF EROSION.
INSPECT VEGETATION	ANNUALLY	• INSPECT THE CONDITION OF ALL GRAVEL WETLAND VEGETATION • PRUNE BACK OVERGROWTH • REPLACE DEAD VEGETATION • REMOVE ANY INVASIVE SPECIES • COORDINATE WITH UNH STORMWATER CENTER FOR FURTHER VEGETATION MANAGEMENT GUIDELINES
INSPECT DRAWDOWN TIME • THE SYSTEM SHALL DRAWDOWN WITHIN 48-HOURS FOLLOWING A RAINFALL EVENT.	ANNUALLY	• HIRE QUALIFIED PROFESSIONAL TO ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE THE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER.

RAIN GARDEN INSPECTION/MAINTENANCE REQUIREMENTS		
INSPECTION/ MAINTENANCE	FREQUENCY	ACTION
MONITOR TO ENSURE THAT RAIN GARDENS FUNCTION EFFECTIVELY AFTER STORMS	TWO (2) TIMES ANNUALLY AND AFTER ANY RAINFALL EVENT EXCEEDING 2.5" IN A 24-HR PERIOD	• TRASH AND DEBRIS TO BE REMOVED • ANY REQUIRED MAINTENANCE SHALL BE ADDRESSED
INSPECT VEGETATION	ANNUALLY	• INSPECT THE CONDITION OF ALL RAIN GARDEN VEGETATION • PRUNE BACK OVERGROWTH • REPLACE DEAD VEGETATION • REMOVE ANY INVASIVE SPECIES
INSPECT DRAWDOWN TIME: • THE SYSTEM SHALL DRAWDOWN WITHIN 48-HOURS FOLLOWING A RAINFALL EVENT.	ANNUALLY	• ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE THE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER



PROPOSED DRAINAGE STRUCTURE TABLE			
PCB-1 RIM=41.50 INV.OUT=38.35 SE	PCB-13 RIM=46.75 INV.IN=42.85 SE INV.OUT=42.30 NE	PDMH-3 RIM=44.45 INV.IN=36.65 SW INV.OUT=36.55 SE	PDMH-10 RIM=43.50 INV.IN=37.60 SE INV.OUT=37.60 NE
PCB-2 RIM=41.55 INV.OUT=38.50 NE	PCB-14 RIM=51.40 INV.IN=43.90 SE INV.OUT=43.80 NW	PDMH-4 RIM=40.50 INV.IN=37.10 SE INV.OUT=37.00 NW	PDMH-11 (5' DIA) RIM=43.20 INV.IN=37.85 SE INV.IN=37.85 SW INV.IN=37.85 E INV.OUT=37.80 NW
PCB-5 RIM=40.10 INV.OUT=37.25 NE	PCB-15 RIM=51.40 INV.IN=44.10 E INV.OUT=44.00 NW	PDMH-5 RIM=36.15 INV.IN=33.00 S INV.IN=33.00 NW INV.OUT=32.90 SE	POS-1 RIM=40.50 INV.OUT=37.30 S
PCB-6 RIM=40.10 INV.OUT=37.15 NW	PCB-16 RIM=51.35 INV.IN=44.95 NE INV.IN=46.00 SE INV.OUT=44.85 W	PDMH-6 (6'DIA) RIM=36.75 INV.IN=32.75 N INV.IN=32.75 NW INV.OUT=32.65 NE	PYD-01 RIM=41.75 INV.OUT=37.95 NW
PCB-7 RIM=36.25 INV.OUT=33.05 N	PCB-17 RIM=51.35 INV.IN=45.15 NE INV.IN=46.00 SE INV.OUT=45.05 SW	PDMH-7 RIM=44.15 INV.IN=37.10 SW INV.IN=37.10 SE INV.OUT=37.05 N	PYD-02 RIM=41.25 INV.IN=37.95 SW INV.OUT=37.95 NW
PCB-8 RIM=36.10 INV.OUT=32.85 S	PCB-18 RIM=51.60 INV.IN=46.60 SE INV.IN=45.75 SW INV.OUT=45.75 SW	PDMH-8 RIM=42.50 INV.IN=37.10 SW INV.IN=37.10 SE INV.OUT=37.05 N	PYD-03 RIM=42.25 INV.IN=38.05 SE INV.IN=38.05 W
PCB-9 RIM=42.10 INV.OUT=38.60 NE	PCB-19 RIM=51.60 INV.IN=46.60 SE INV.IN=45.75 SW INV.OUT=45.75 SW	PDMH-9 RIM=42.35 INV.IN=37.35 SE INV.IN=37.35 SE INV.OUT=37.30 NE	PYD-04 RIM=41.95 INV.OUT=38.25 NW
PCB-10 RIM=41.75 INV.IN=38.45 SW INV.OUT=38.45 S			PYD-05 RIM=51.00 INV.OUT=46.80 NW
PCB-11 RIM=42.10 INV.IN=38.30 SW INV.IN=37.45 SE INV.OUT=37.40 NW			PYD-06 RIM=51.00 INV.OUT=46.80 NW
PCB-12 RIM=41.10 INV.OUT=37.50 NE			



## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
N	3/25/2019	Construction Drawings
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L	3/4/2019	Rev Pricing Drawings / Admin Approval
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D	4/24/2017	TAC & ConCom Submission
C	3/31/2017	TAC Submission
P	6/11/2019	To PB for Amended Site Plan Approval
O	5/20/2019	Amended Site Plan Approval

PROJECT NO:	K0076-13
DATE:	3/20/2017
FILE:	K0076-13_DSGN.DWG
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APPROVED:	BLM

GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: AS SHOWN



Borthwick Forest, LLC

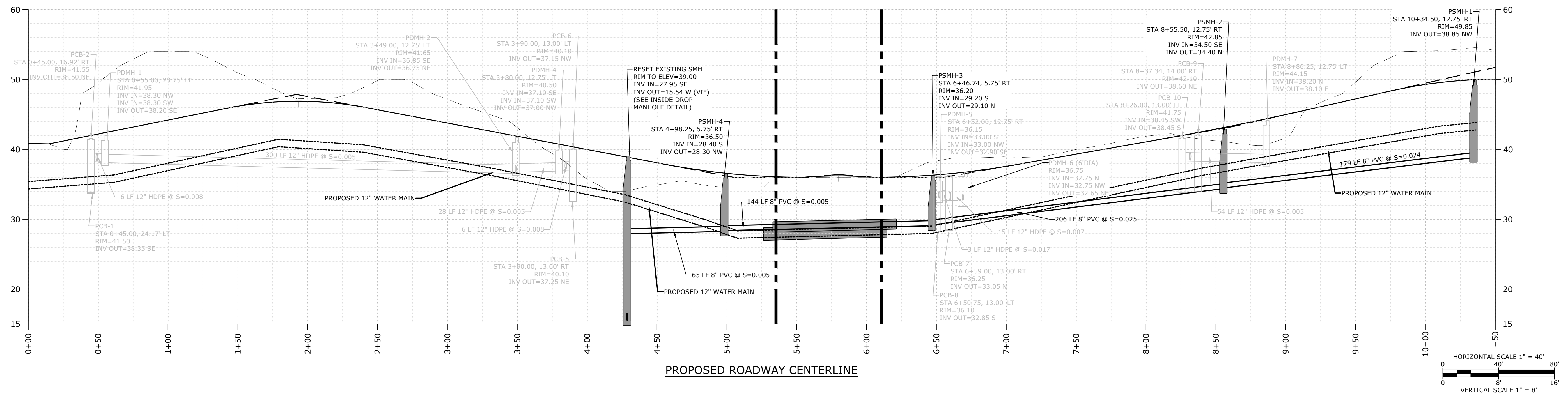
Portsmouth,  
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PROJECT NO:	K0076-13
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UTILITY PLAN

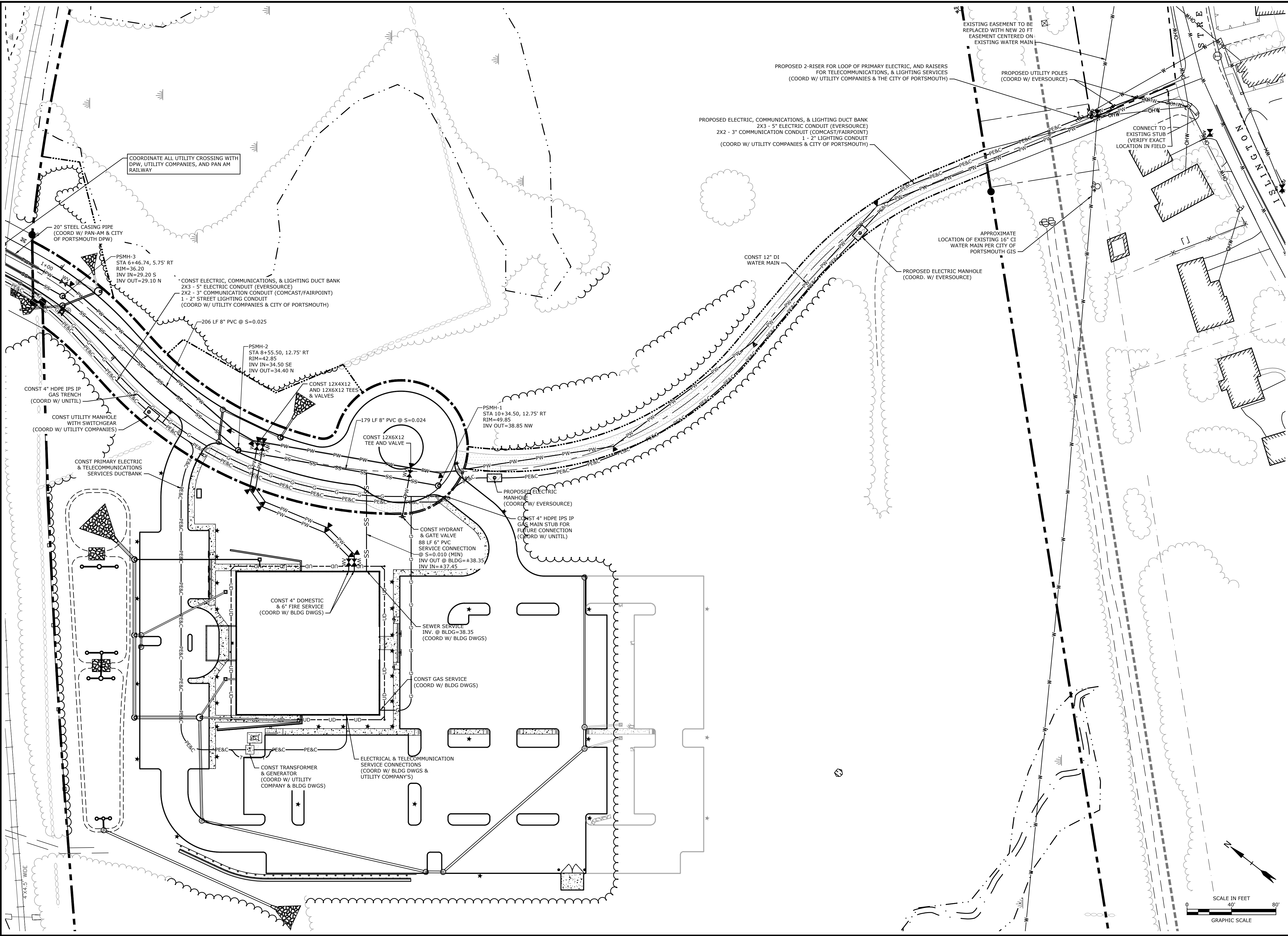
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Last Save Date: June 11, 2019 11:41 AM By: CML  
Plot Date: Tuesday, June 11, 2019 Plotted By: Craig M. Langton  
P&E File Location: J:\K0076 The Kane Company - General Proposals\0076-13 Borthwick Forest\Drawings- Figures\AutoCAD\Xref\K0076-13\_DSGN.dwg Layout Tab: UTIL-2



**Tighe&Bond**  
Engineers | Environmental Specialists

STATE OF NEW HAMPSHIRE  
BRADLEE  
MEZQUITA  
No. 08830  
LICENSED  
PROFESSIONAL ENGINEER

STATE OF NEW HAMPSHIRE  
PATRICK  
M.  
CRABTREE  
No. 8339  
LICENSED  
PROFESSIONAL ENGINEER

**Proposed  
Subdivision Road  
& Office Building  
Development**

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

MARK	DATE	DESCRIPTION
N	3/4/2019	Rev Pricing Drawings / Admin Approval
M	10/22/2018	Rev. per NHDES Sewer Connection Permit Comments
L	6/13/2018	FOR NHDES Sewer Connection Permit Application
K	5/8/2018	Submitted for Final Approval
J	2/26/2018	GMP Submission
I	2/6/2018	Planning Board Submission
H	1/12/2018	GMP Submission
G	8/21/2017	Revised TAC Submission
F	6/2/2017	AoT Submission
E	5/11/2017	Planning Board Submission
R	6/11/2019	To PB for Amended Site Plan Approval
Q	5/20/2019	Amended Site Plan Approval
P	3/25/2019	Construction Drawings
O	3/20/2019	Revised GMP Submission

PROJECT NO: K0076-13  
DATE: 3/20/2017  
FILE: K0076-13\_DSGN.DWG  
DRAWN BY: CML  
CHECKED: PMC  
APPROVED: BLM

UTILITY PLAN

SCALE: AS SHOWN

C-104.2



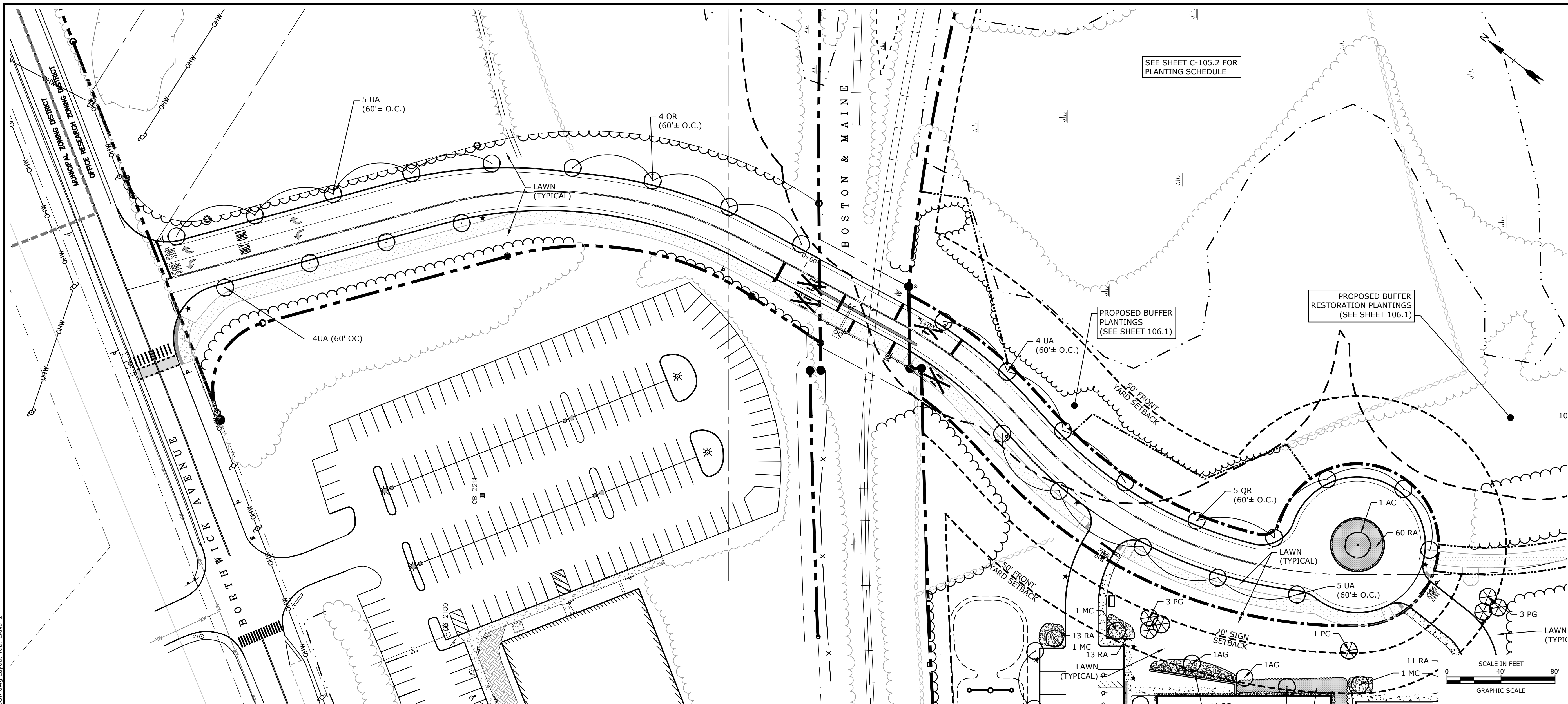
Borthwick Forest, LLC

N	3/25/2019	Construction Drawings
M	3/20/2019	Revised GMP Submission
L	4/4/2019	Rev Pricing Drawings / Admin Approval
K	5/8/2018	Submitted for Final Approval
J	2/26/2018	GMP Submission
I	2/6/2018	Planning Board Submission
H	1/12/2018	GMP Submission
G	8/21/2017	Revised TAC Submission
F	6/2/2017	AOI Submission
E	5/11/2017	Planning Board Submission
D	4/24/2017	TAC & ConCom Submission
C	3/31/2017	TAC Submission
P	6/11/2019	1st PB for Amended Site Plan Approval
O	5/20/2019	Amended Site Plan Approval
MARK	DATE	DESCRIPTION

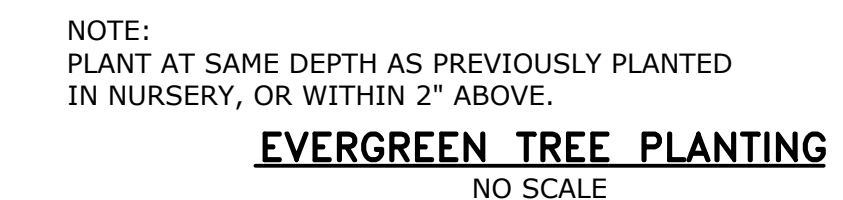
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DATE:	3/20/2017
FILE:	K0076-13_DSGN.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

SCALE: AS SHOWN

C-105.1



**DECIDUOUS TREE PLANTING**  
NO SCALE



**EVERGREEN TREE PLANTING**  
NO SCALE



SHRUB PLANTING  
NO SCALE



## C-105.2

SCALE IN FEET

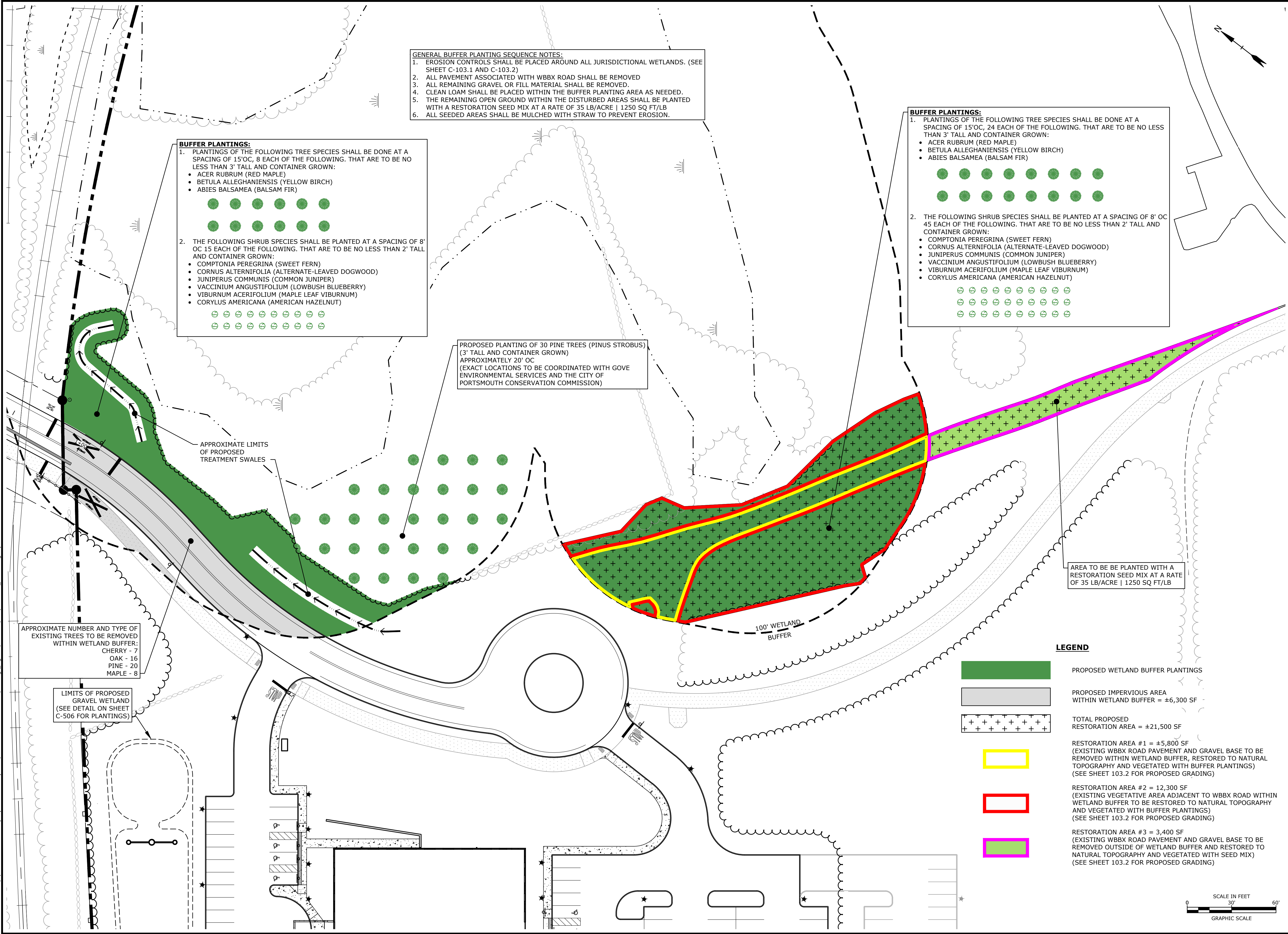
0 40' 80'

GRAPHIC SCALE





Last Save Date: June 11, 2019 11:41 AM By: CML  
Plot Date: Tuesday, June 11, 2019 Plotted By: Craig M. Langton  
File Location: J:\K0076-13 Borthwick Forest\Drawings - General Proposals\0076-13 Borthwick Forest\Drawings - General Proposals\0076-13 DSGN.dwg Layout Tab: BUFF



**Tighe&Bond**  
Engineers | Environmental Specialists

STATE OF NEW HAMPSHIRE  
BRADLEE MEZQUITA  
No. 08830  
LICENSED PROFESSIONAL ENGINEER  
6-11-19

STATE OF NEW HAMPSHIRE  
PATRICK M. CRABTREE  
No. 8397  
LICENSED PROFESSIONAL ENGINEER  
6-11-19

**Proposed Subdivision Road & Office Building Development**

Borthwick Forest, LLC

Portsmouth, New Hampshire

N	6/11/2019	To PB for Amended Site Plan Approval
M	5/20/2019	Amended Site Plan Approval
L	3/25/2019	Construction Drawings
K	3/20/2019	Revised GMP Submission
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H	2/26/2018	GMP Submission
G	2/6/2018	Planning Board Submission
F	1/12/2018	GMP Submission
E	8/21/2017	Revised TAC Submission
D	6/2/2017	AsT Submission
C	5/11/2017	Planning Board Submission
B	5/11/2017	Planning Board Submission
A	4/24/2017	TAC & ConCom Submission

MARK	DATE	DESCRIPTION
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DATE: 4/24/2017		
FILE: K0076-13_DSGN.DWG		
DRAWN BY: CML		
CHECKED: PMC		
APPROVED: BLM		

**BUFFER RESTORATION & PLANTING SEQUENCING PLAN**

SCALE: AS SHOWN

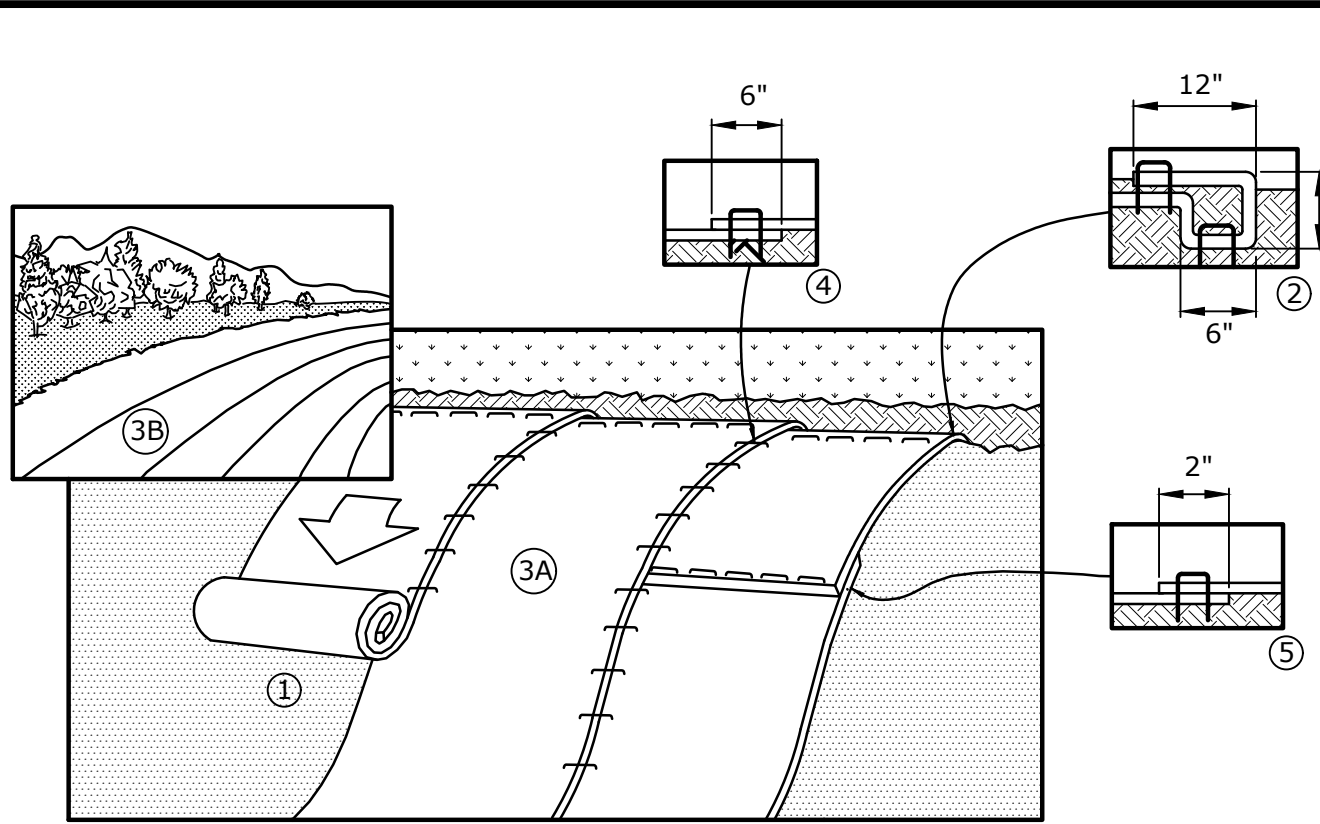
C-106



PROJECT OWNER: BORTHWICK FOREST, LLC c/o THE KANE COMPANY  
210 COMERCE WAY  
PORTSMOUTH, NEW HAMPSHIRE 03801  
PROJECT NAME: PROPOSED SUBDIVISION ROAD & OFFICE BUILDING DEVELOPMENT  
PROJECT ADDRESS: BORTHWICK AVENUE  
PORTSMOUTH, NEW HAMPSHIRE 03801  
PROJECT LATITUDE: 43°-08'-14"N  
PROJECT LONGITUDE: 70°-56'-22"W



Last Save Date: March 25, 2019 11:13 AM By: CHL  
Plot Date: Monday, March 25, 2019 Plotted By: Craig M. Langton  
File Location: J:\K0076-13 Borthwick Forest\Drawings - General\Proposals\K0076-13 Borthwick Forest\Drawings - General\Proposals\K0076-13 DTLS.dwg Layout Tab: C-502

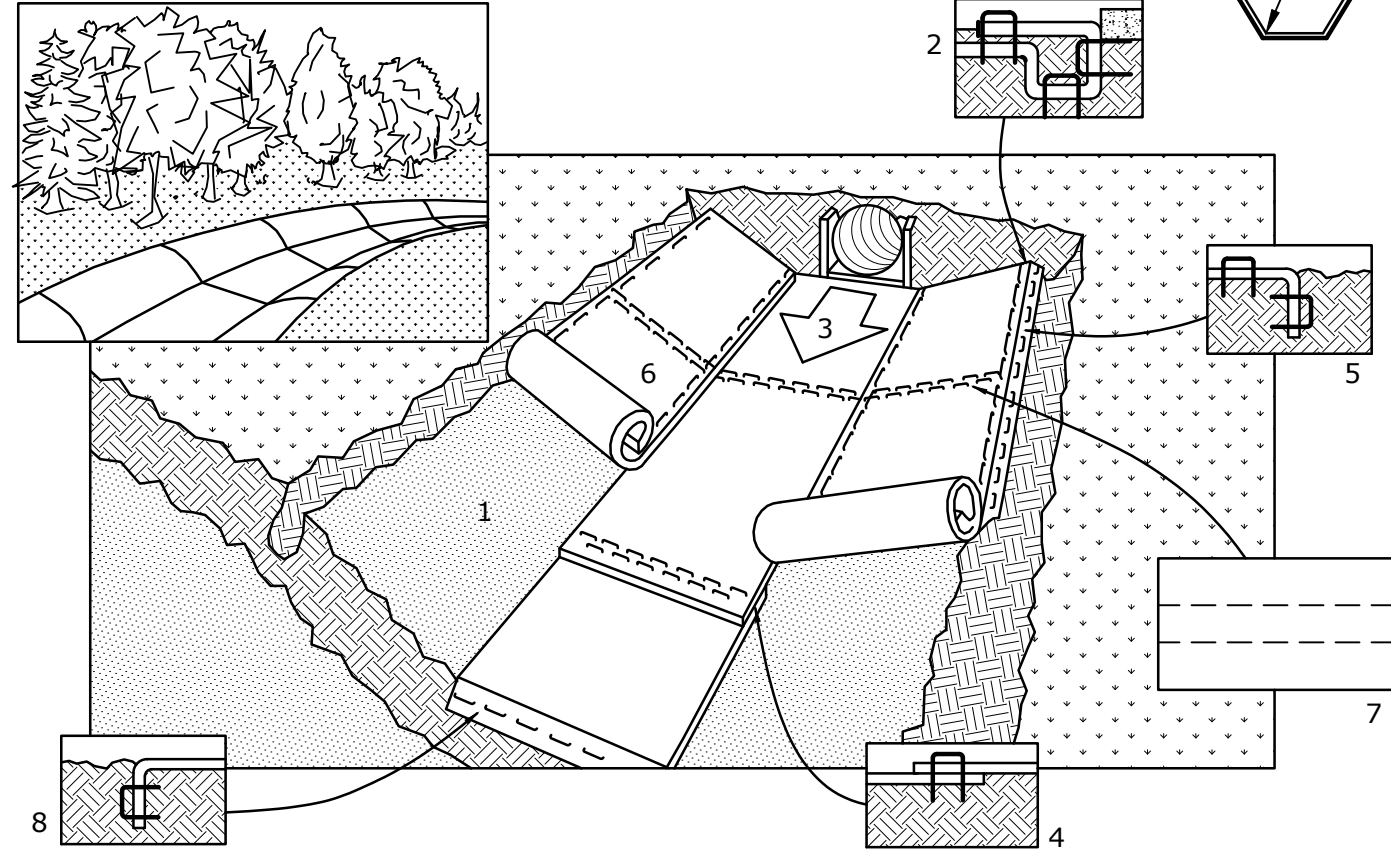


1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF TAPES/STAPLES 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 SPACED 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAPLES IN APPROPRIATE LOCATIONS AS SHOWN ON THE STAPLE PATTERN GUIDE.
4. STAPLE LENGTHS SHALL BE A MINIMUM OF 8 INCHES.
5. EROSION CONTROL BLANKETS SHALL BE BORTH AMERICAN GREEN C125 BN OR EQUAL.

### EROSION CONTROL BLANKET INSTALLATION FOR STEEP SLOPES

NO SCALE

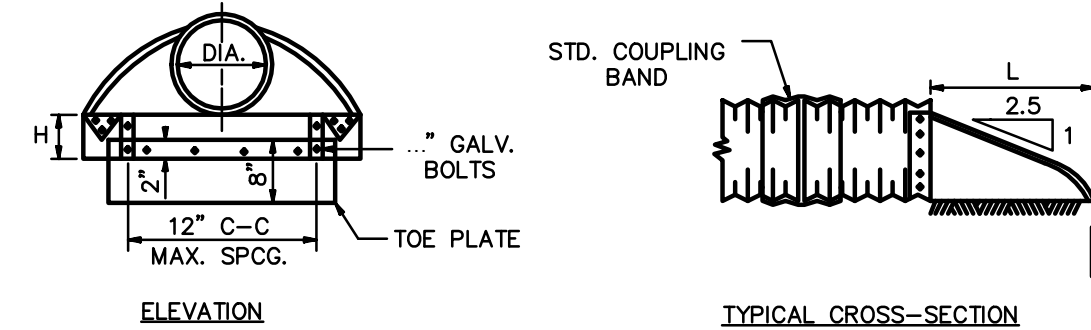
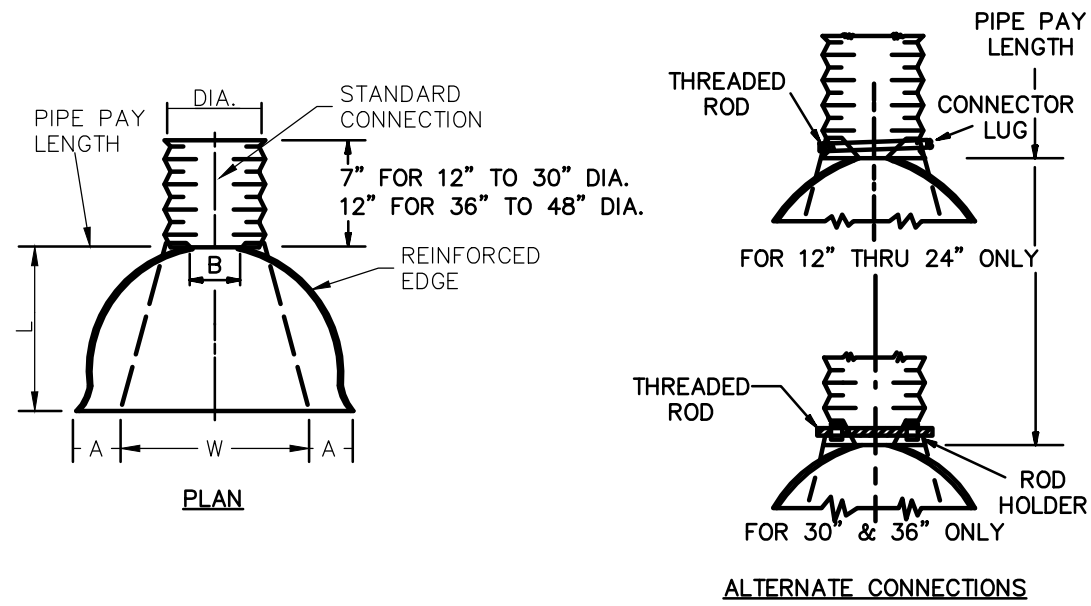
NOTE:  
HORIZONTAL STAPLE SPACING SHOUL BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE REFER TO GENERAL STAPLE PATTERN GUIDE FOR CORRECT STAPLE RECOMMENDATIONS FOR CHANNELS.



- NOTES:
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED.
  2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
  3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW ON BOTTOM OF CHANNEL.
  4. PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH A 6" OVERLAP. USE A DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE BLANKETS.
  5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED IN 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
  6. BLANKETS ON SIDE SLOPES MUST BE OVERLAPPED 4" OVER THE CENTER BLANKET AND STAPLED.
  7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A ROW OF STAPLES 4" APART OVER THE ENTIRE WIDTH OF THE CHANNEL. PLACE A SECOND ROW 4" BELOW THE FIRST ROW IN A STAGGERED PATTERN.
  8. TERMINAL END OF THE BLANKETS MUST BE ANCHORED IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
  9. EROSION CONTROL BLANKETS SHALL BE BORTH AMERICAN GREEN C125 BN OR EQUAL.

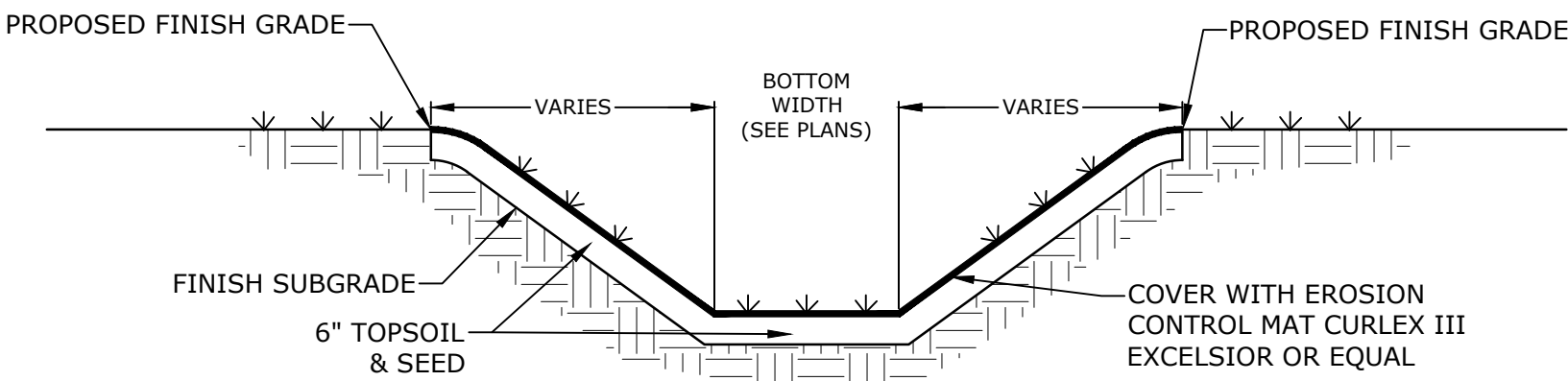
### EROSION CONTROL BLANKET INSTALLATION

NO SCALE



### METAL FLARED END SECTION

NO SCALE



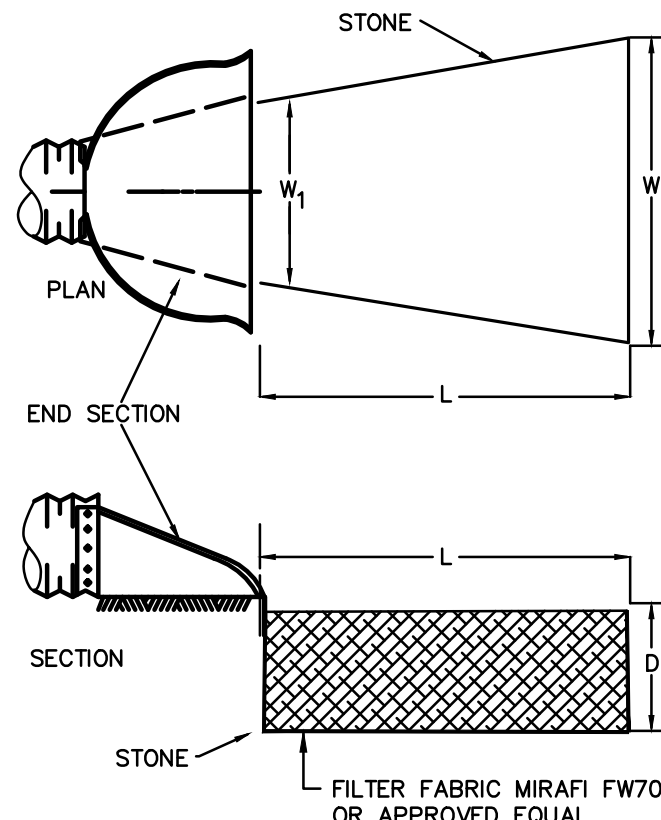
- NOTES:
1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
  2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS-SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
  3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
  4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
  5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
  6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHOULD BE DONE FREQUENTLY ENOUGH TO CONTROL ENCRoACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHOULD NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
  7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER EVERY MAJOR STORM TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

### GRASSED LINED SWALE

NO SCALE

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

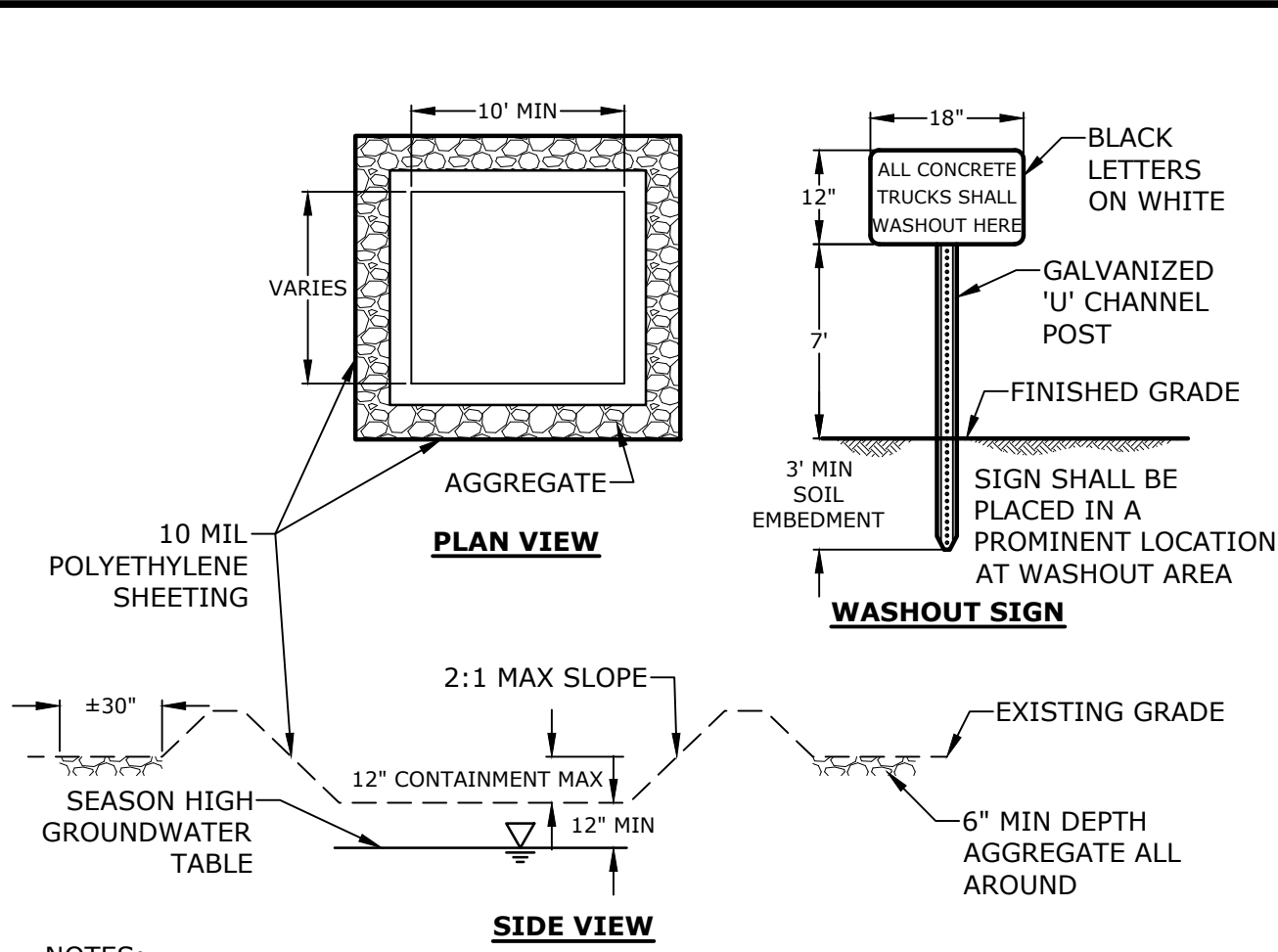
- NOTES:
1. STONE SIZE AND MAT DIMENSIONS DETAILED ON TABLE BELOW.
  2. STONE SHALL CONSIST OF SUB-ANGULAR FIELD STONE OR ROUGH UNIFORM QUARRY STONE OF APPROXIMATELY RECTANGULAR SHAPE. FLAT OR ROUND ROCKS ARE NOT ACCEPTABLE. THE STONE SHALL BE HARD AND OF SUCH QUALITY THAT IT WILL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING, BE CHEMICALLY STABLE AND IT SHALL BE SUITABLE IN ALL OTHER RESPECTS FOR THE PURPOSE INTENDED. THE BULK SPECIFIC GRAVITY (SATURATED SURFACE-DRY BASIS) OF THE INDIVIDUAL STONES SHALL BE AT LEAST 2.5.
  3. THE STONE SHALL BE COMPOSED OF A WELL-GRADED MIXTURE DOWN TO THE ONE-INCH SIZE PARTICLE SUCH THAT 50 PERCENT OF THE MIXTURE BY WEIGHT SHALL BE LARGER THAN THE D50 SIZE SPECIFIED. A WELL-GRADED MIXTURE IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF THE LARGER STONE SIZE BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE PROGRESSIVELY SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE SIZE IN SUCH A MIXTURE SHALL BE 1.5 TIMES THE D50 SIZE.



RIP RAP APRONS					
	W <sub>1</sub>	W <sub>2</sub>	L	D <sub>50</sub>	D
FES #1	6'	32'	26'	7"	13"
FES #2	3'	15'	12'	6"	14"
FES #3	3'	19'	16'	6"	14"
FES #4	5'	19'	14'	6"	14"
FES #5	5'	23'	18'	6"	14"

### RIP-RAP APRON

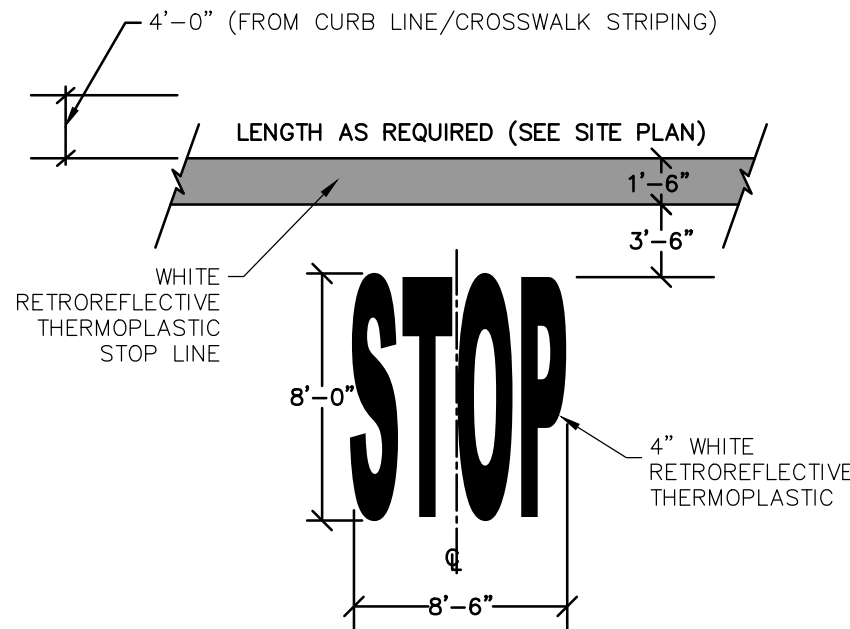
NO SCALE



- NOTES:
1. CONTAINMENT SHALL BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
  2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
  3. WASHOUT SHALL BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE WASHOUT IS 75% FULL.
  4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS
  5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
  6. AT LEAST WEEKLY, REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

### CONCRETE WASHOUT AREA

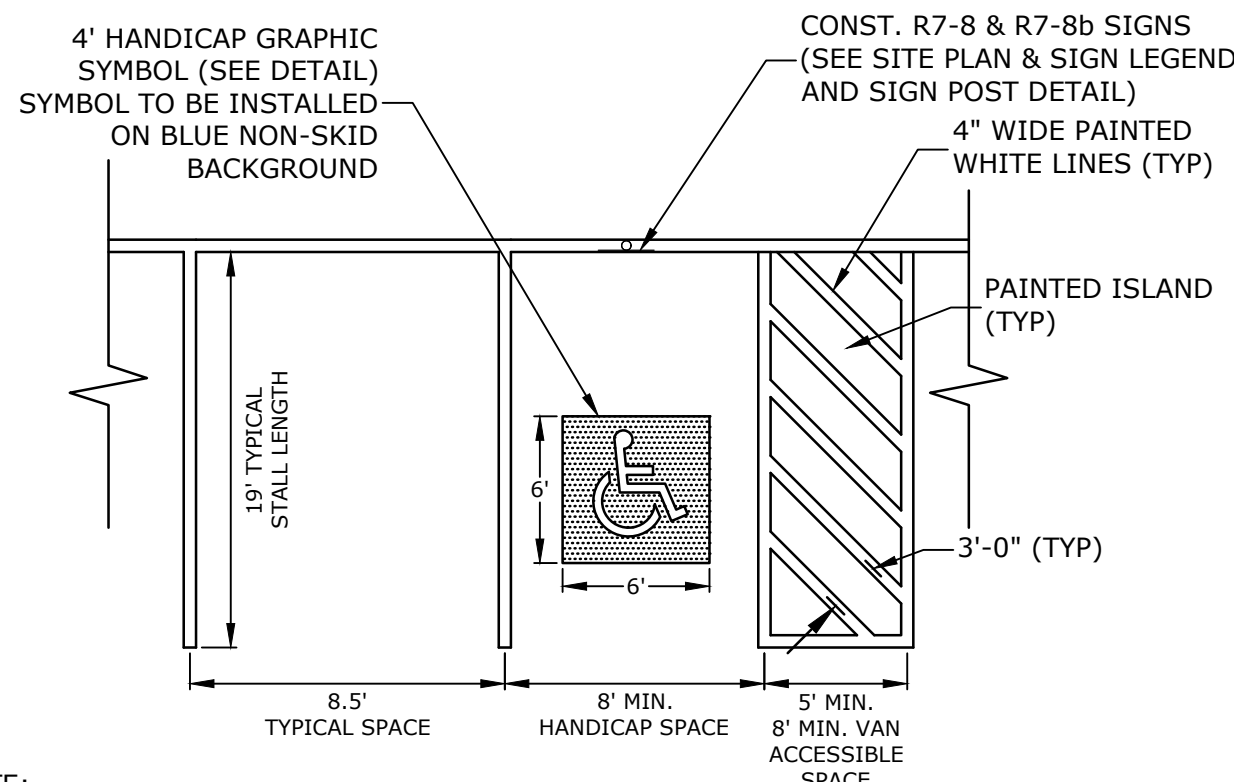
NO SCALE



- NOTE:  
PAVEMENT MARKINGS TO BE INSTALLED IN LOCATIONS AS SHOWN ON SITE PLAN.

### STOP BAR & LEGEND

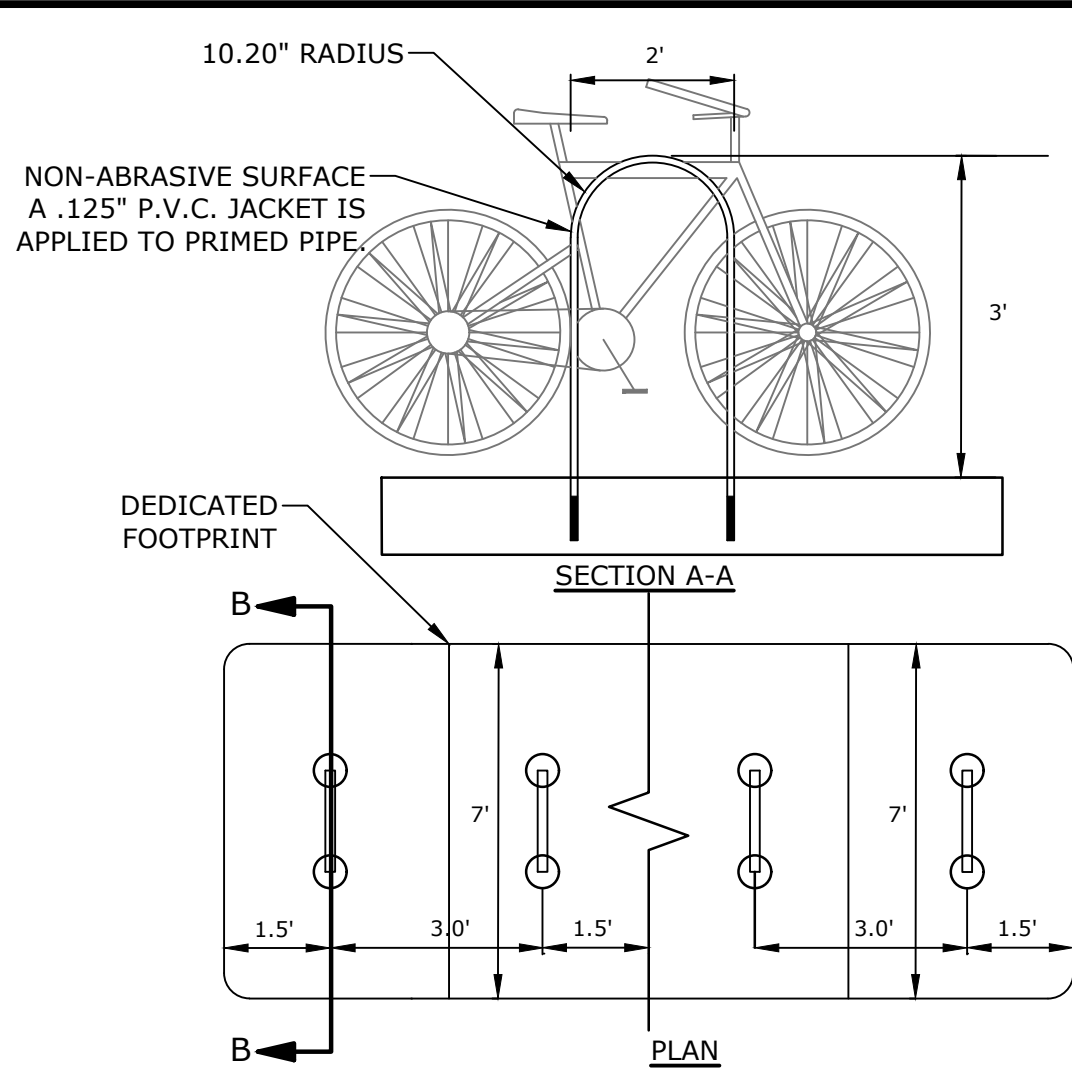
NO SCALE



- NOTE:
1. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY MANUFACTURER.
  2. SYMBOLS & PARKING STALLS SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT AND LOCAL AND STATE REQUIREMENTS.
  3. FINISH PAVEMENT GRADES AT ALL HANDICAP ACCESSIBLE STALLS AND PAINTED ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION.

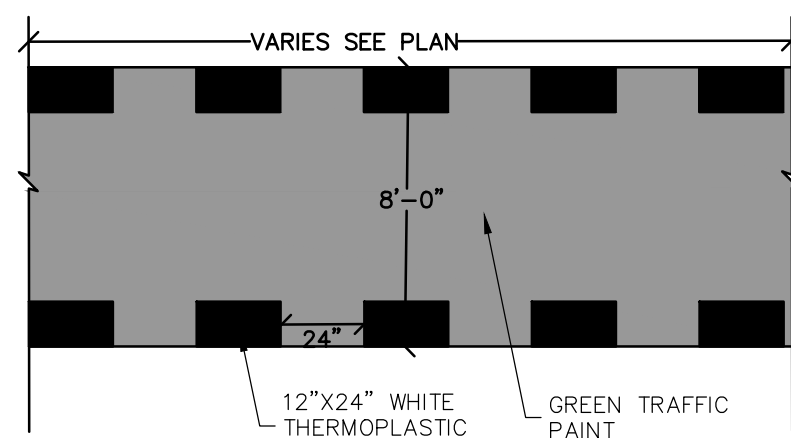
### STALL STRIPING-SINGLE STRIPE

NO SCALE



### BIKE RACK

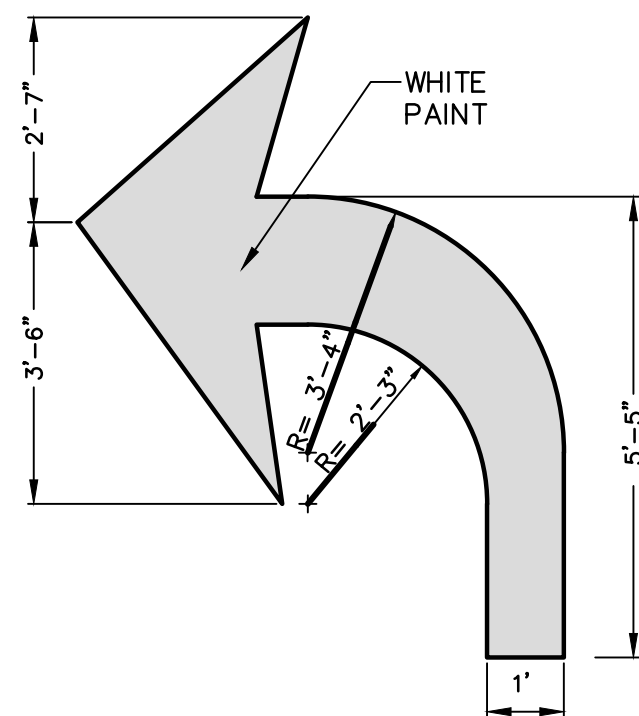
NO SCALE



- NOTE:
1. STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505.
  2. ALL PAINT SHALL BE FAST DRYING TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248-TYPE F. PAINT SHALL BE APPLIED AS SPECIFIED BY THE MANUFACTURER.

### BIKE CROSSING BOX

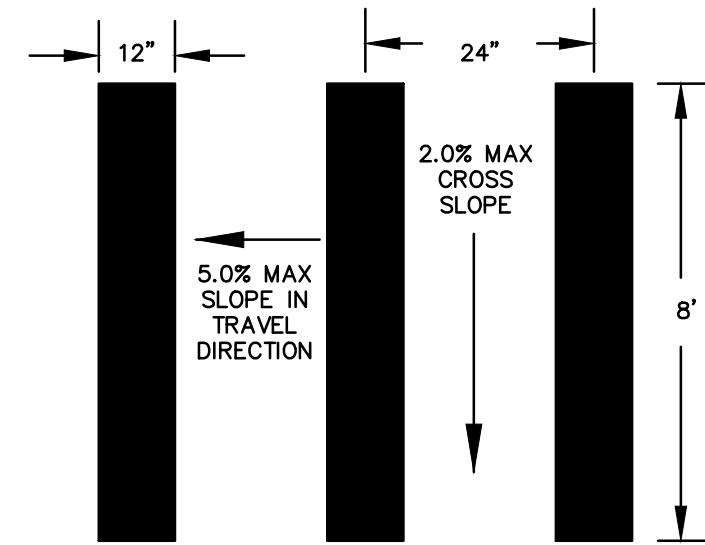
NO SCALE



- NOTES:
- ALL FLOW ARROWS TO BE SOLID WHITE THERMOPLASTIC STRIPING AS PER DIMENSIONS ABOVE. ALL MARKINGS MUST CONFORM TO THE LATEST EDITION OF THE MUTCD.

### TRAFFIC DIRECTIONAL MARKINGS

NO SCALE



- NOTE:  
STRIPING SHALL BE CONSTRUCTED USING WHITE THERMO PLASTIC, REFLECTERIZED PAVMENT MARKING MATERIAL MEETING THE REQUIREMENTS OF ASTM D 4505

### CROSSWALK STRIPING

NO SCALE

**Tighe&Bond**  
Engineers | Environmental Specialists



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Portsmouth, New Hampshire

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C	5/11/2017	Planning Board Submission
B	4/24/2017	TAC & ConCom Submission
A	3/20/2017	TAC Submission

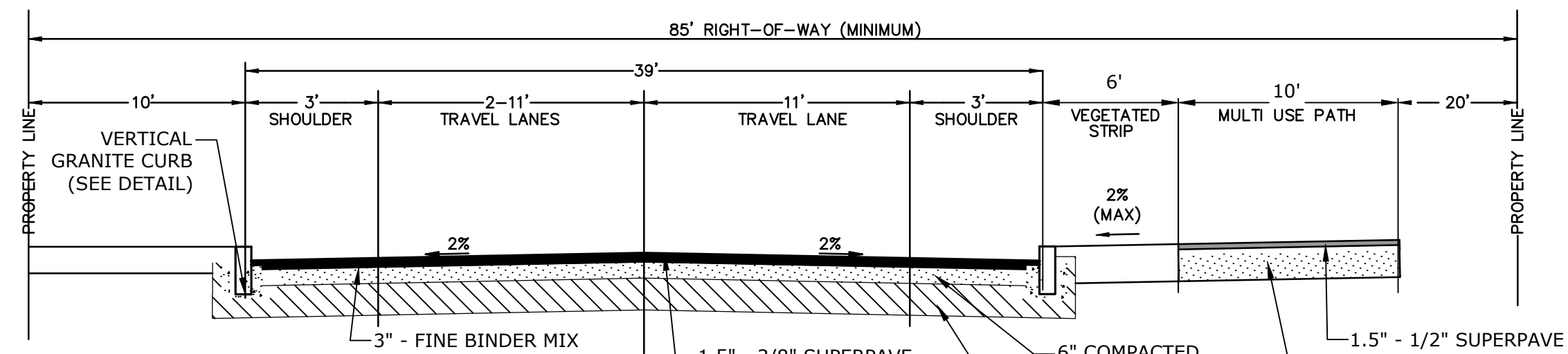
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DATE:	3/20/2017
FILE:	K0076-13_DTLS.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

DETAILS SHEET

SCALE: AS SHOWN

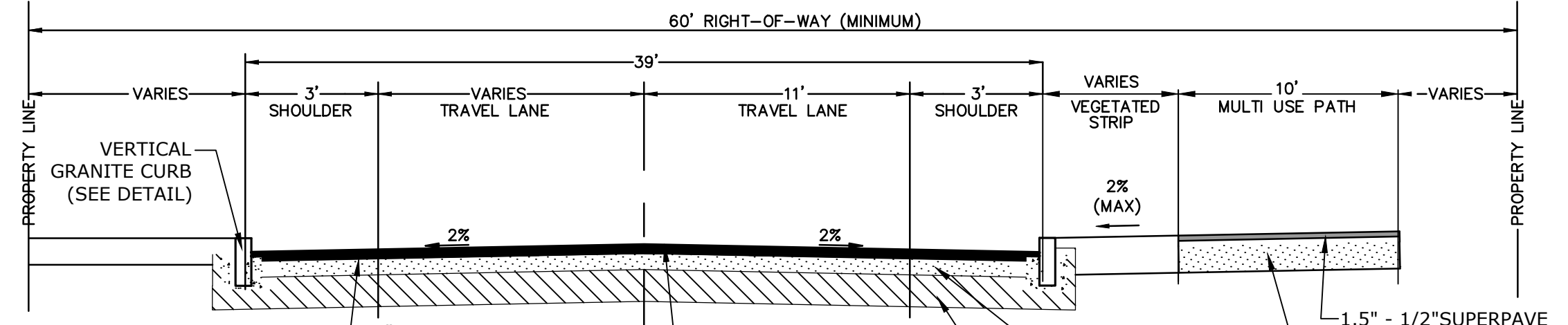
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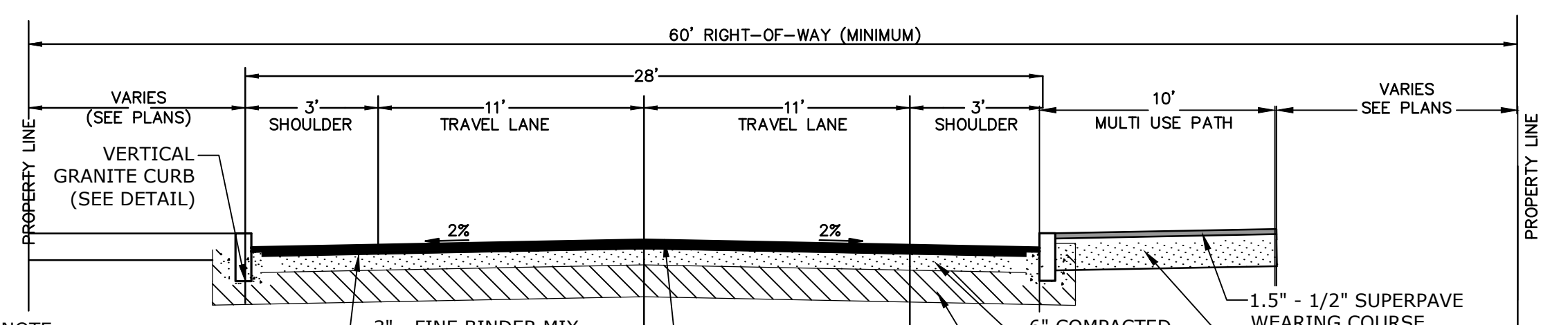
- NOTE:
1. PAVEMENT SECTION DESIGN TO BE PREPARED BY PROJECT GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF PORTSMOUTH DPW.
  2. PAVEMENT MIX DESIGN SHALL BE APPROVED BY PORTSMOUTH DPW PRIOR TO PAVING.

**TYPICAL ROADWAY SECTION**  
**STATION 0+00 - 2+00**  
NO SCALE



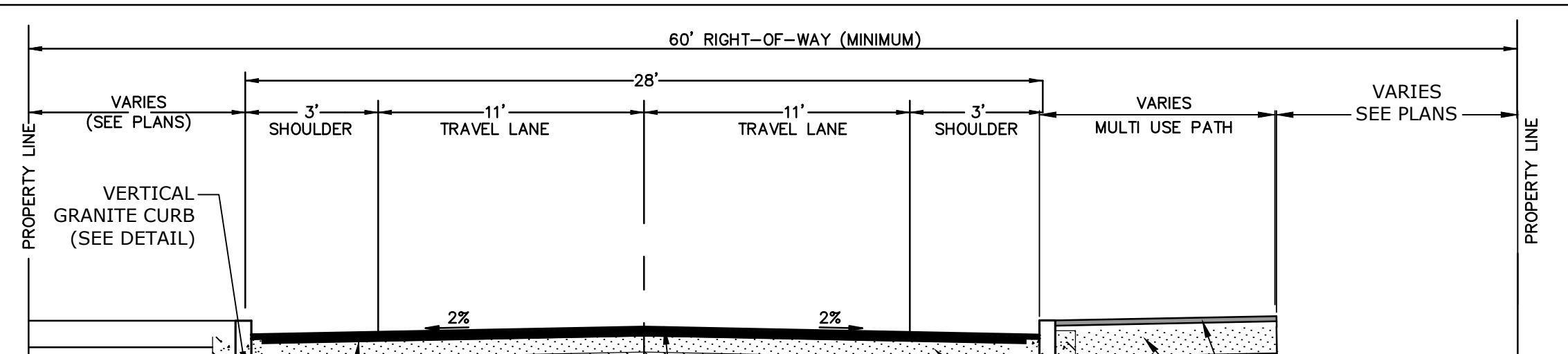
- NOTE:
1. PAVEMENT SECTION DESIGN TO BE PREPARED BY PROJECT GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF PORTSMOUTH DPW.
  2. PAVEMENT MIX DESIGN SHALL BE APPROVED BY PORTSMOUTH DPW PRIOR TO PAVING.

**TYPICAL ROADWAY SECTION**  
**STATION 2+00 - 3+25**  
NO SCALE



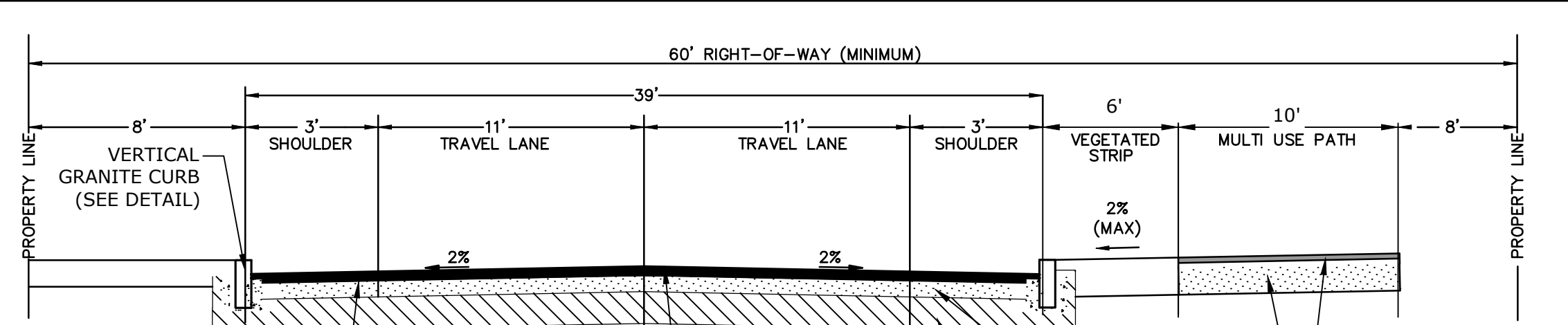
- NOTE:
1. PAVEMENT SECTION DESIGN TO BE PREPARED BY PROJECT GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF PORTSMOUTH DPW.
  2. PAVEMENT MIX DESIGN SHALL BE APPROVED BY PORTSMOUTH DPW PRIOR TO PAVING.

**TYPICAL ROADWAY SECTION**  
**STATION 3+25 - 6+50**  
NO SCALE



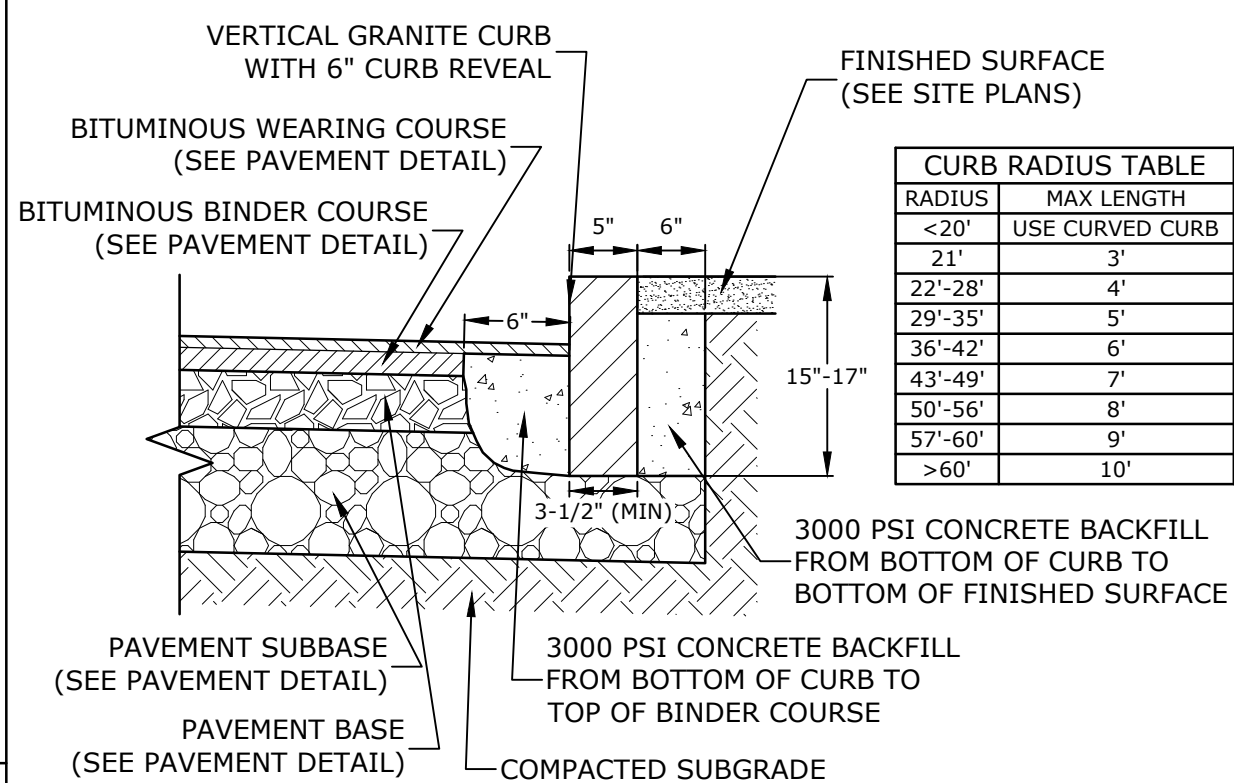
- NOTE:
1. PAVEMENT SECTION DESIGN TO BE PREPARED BY PROJECT GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF PORTSMOUTH DPW.
  2. PAVEMENT MIX DESIGN SHALL BE APPROVED BY PORTSMOUTH DPW PRIOR TO PAVING.

**TYPICAL ROADWAY SECTION**  
**STATION 6+50 - 7+00**  
NO SCALE



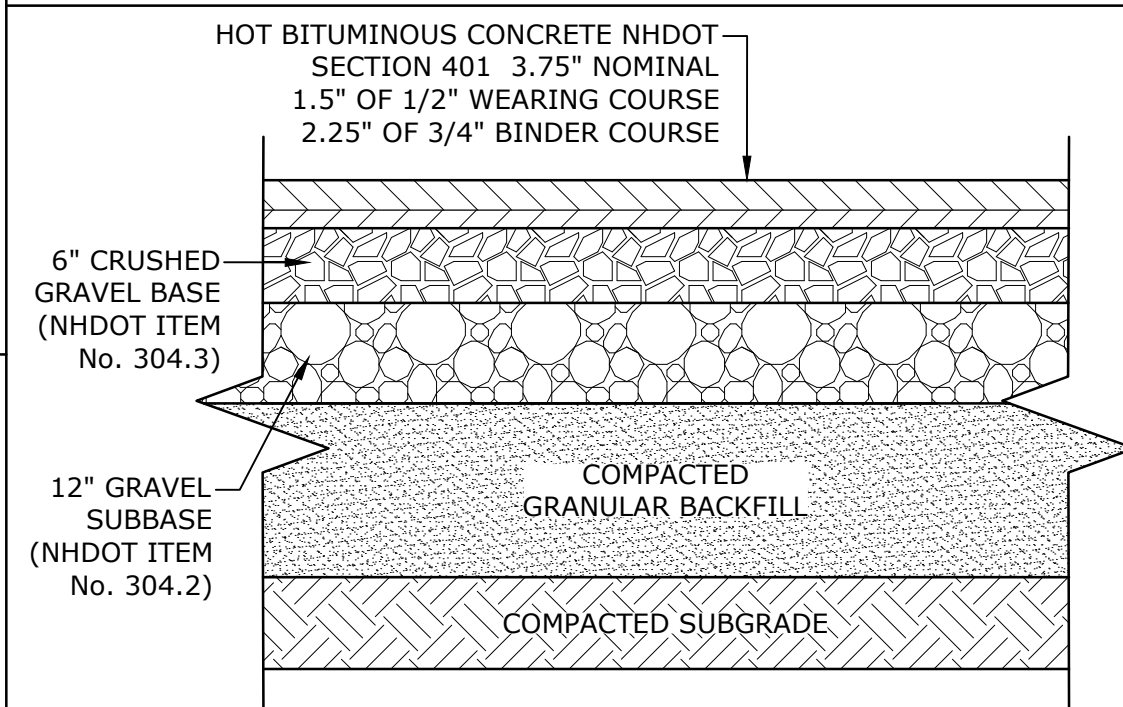
- NOTE:
1. PAVEMENT SECTION DESIGN TO BE PREPARED BY PROJECT GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF PORTSMOUTH DPW.
  2. PAVEMENT MIX DESIGN SHALL BE APPROVED BY PORTSMOUTH DPW PRIOR TO PAVING.

**TYPICAL ROADWAY SECTION**  
**STATION 7+00 - 9+50**  
NO SCALE



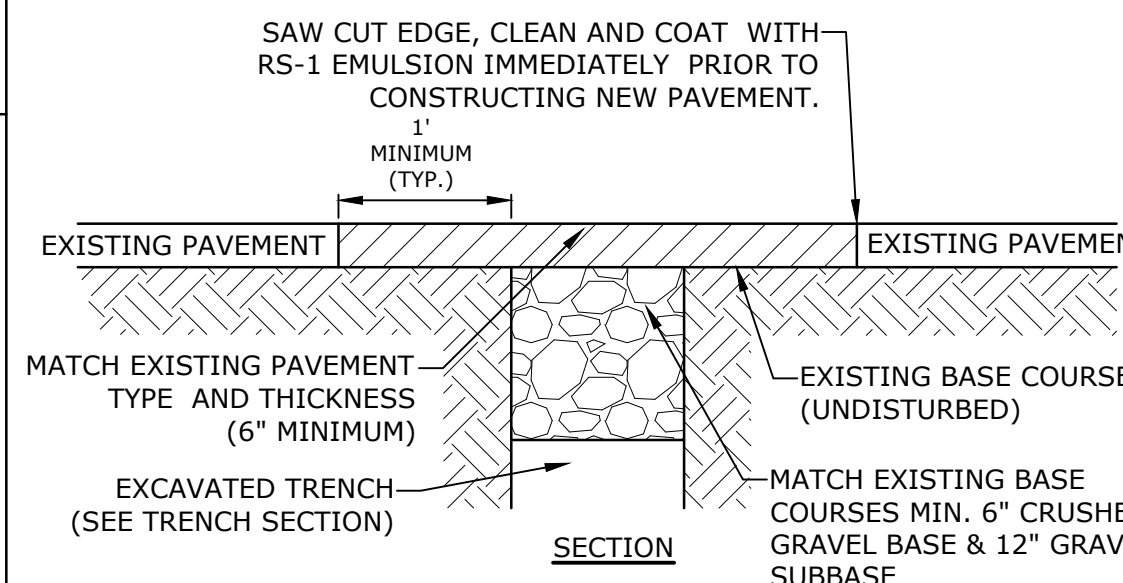
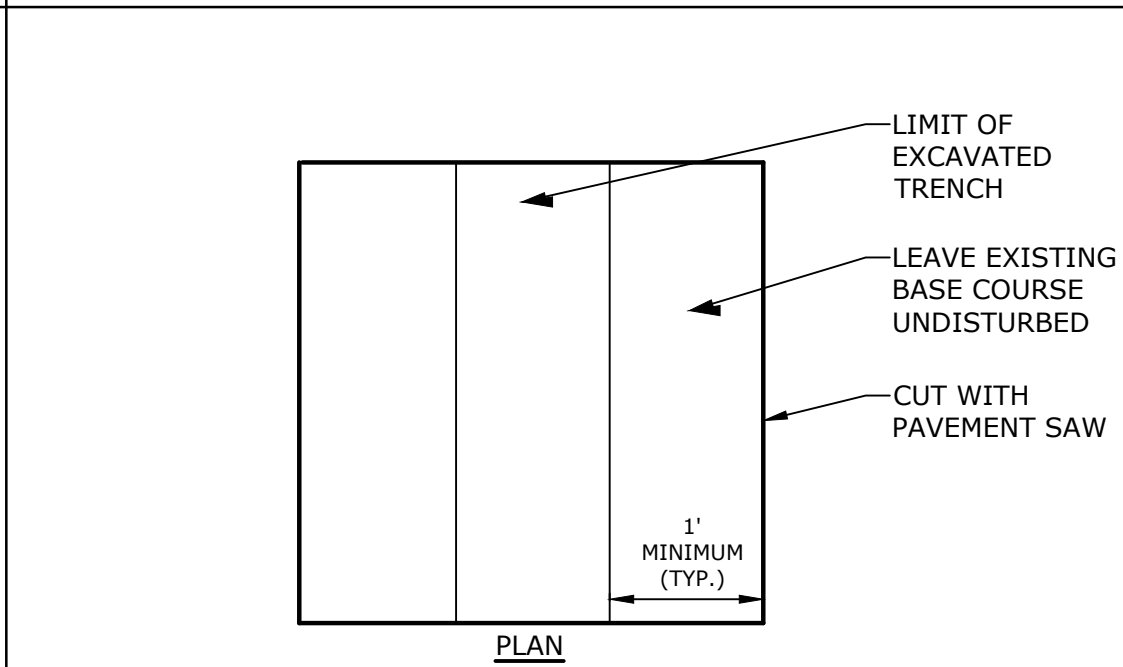
- NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
  2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
  3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 3'.
  4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 10'.
  5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
  6. ALL RADII 20 FEET AND SMALLER SHALL BE CONSTRUCTED USING CURVED SECTIONS.
  7. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

**VERTICAL GRANITE CURB**  
NO SCALE



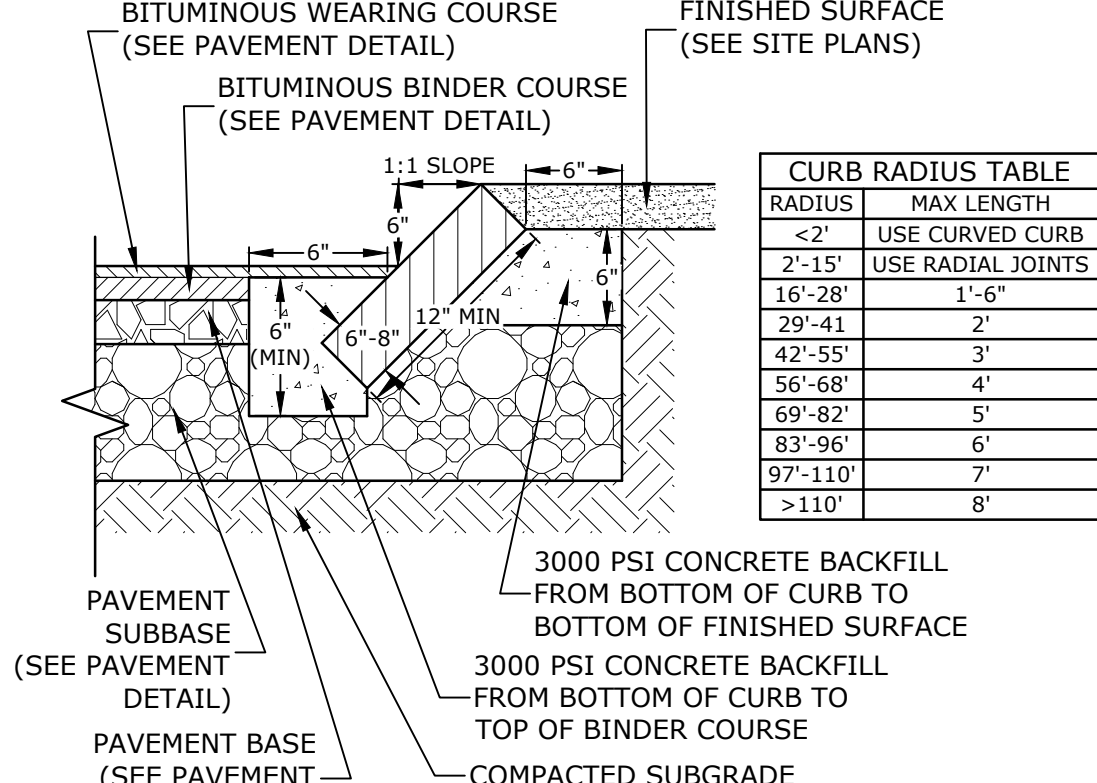
- NOTES:
1. SEE SITE PLAN FOR PAVEMENT WIDTH AND LOCATION.
  2. SEE GRADING, DRAINAGE AND EROSION CONTROL PLAN FOR PAVEMENT SLOPE AND CROSS-SLOPE.
  3. A TACK COAT SHALL BE PLACED ON TOP OF BINDER COURSE PAVEMENT PRIOR TO PLACING WEARING COURSE.

**TYPICAL PARKING LOT PAVEMENT SECTION**  
NO SCALE



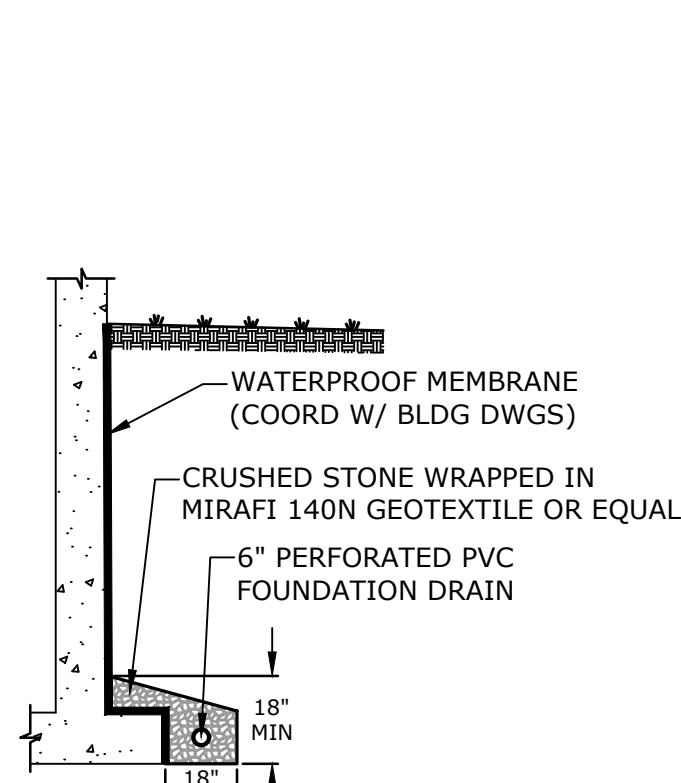
- NOTE:
- COORDINATE AND OBTAIN APPROVAL FOR ALL TRENCHING AND PATCHING WITHIN CITY RIGHT OF WAY WITH CITY OF PORTSMOUTH DPW PRIOR TO COMMENCING WORK.

**ROADWAY TRENCH PATCH**  
NO SCALE

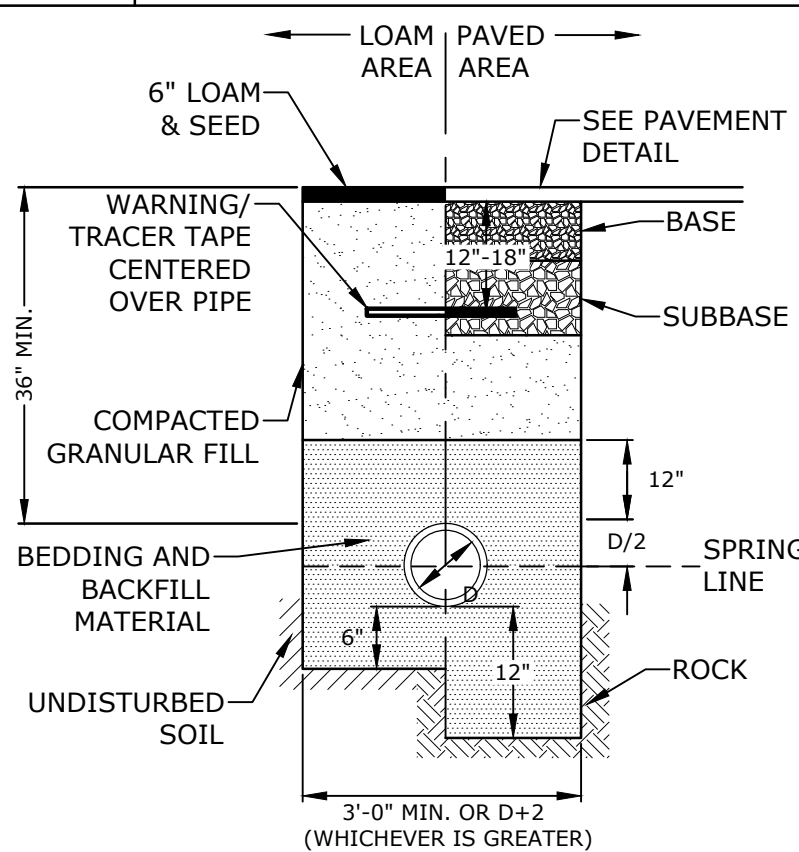


- NOTES:
1. SEE SITE PLAN(S) FOR LIMITS OF VERTICAL GRANITE CURB (VGC).
  2. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
  3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18'.
  4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'.
  5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES (SEE TABLE).
  6. JOINTS BETWEEN STONES SHALL HAVE A MAXIMUM SPACING OF 1/2" AND SHALL BE MORTARED.

**SLOPED GRANITE CURB**  
NO SCALE

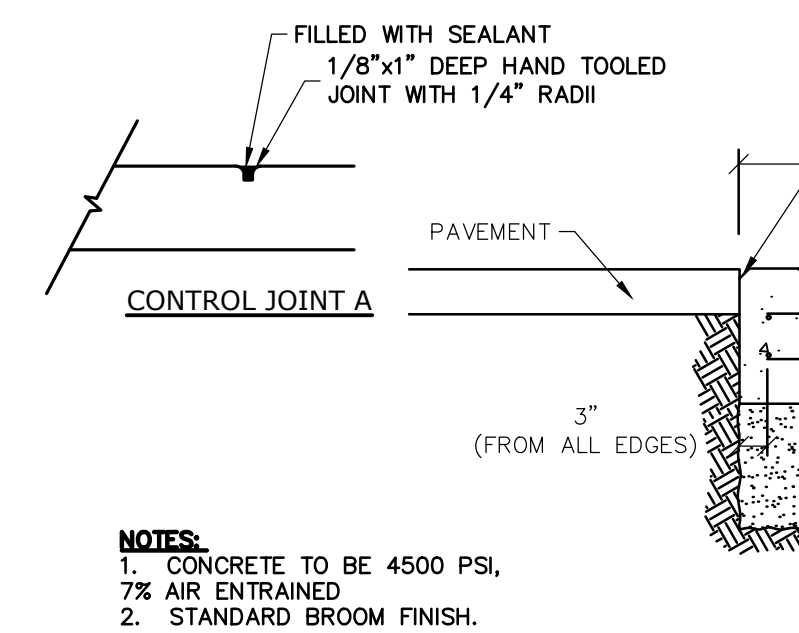
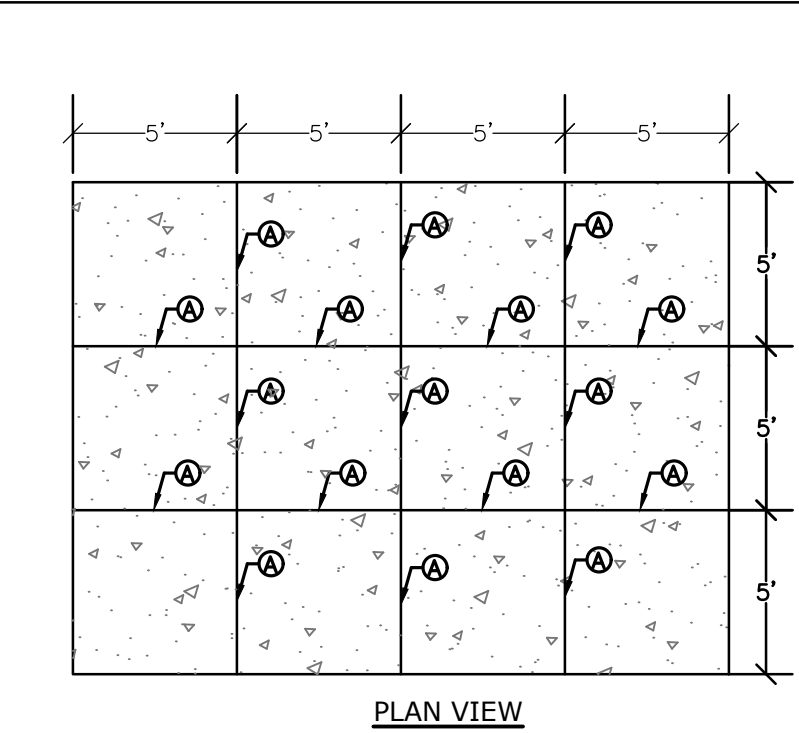


**TYPICAL FOUNDATION DRAIN SECTION**  
NO SCALE



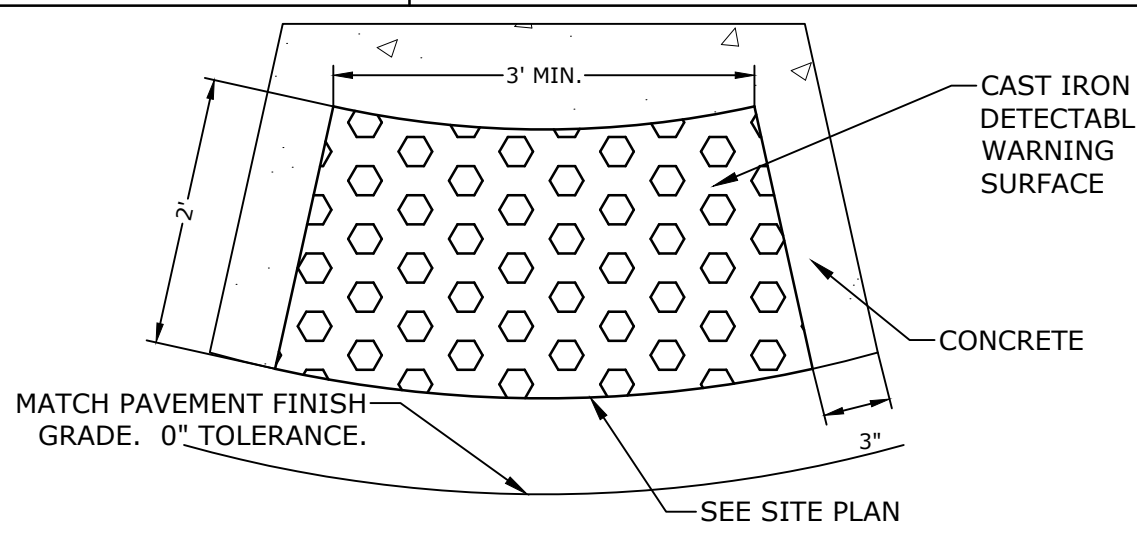
- NOTE:
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" ABOVE TOP OF PIPE.
  2. GAS SHALL BE INSTALLED PER UNTIL STANDARDS. COORDINATE ALL INSTALLATIONS WITH UNTIL AND THE CITY OF PORTSMOUTH.

**GAS TRENCH**  
NO SCALE



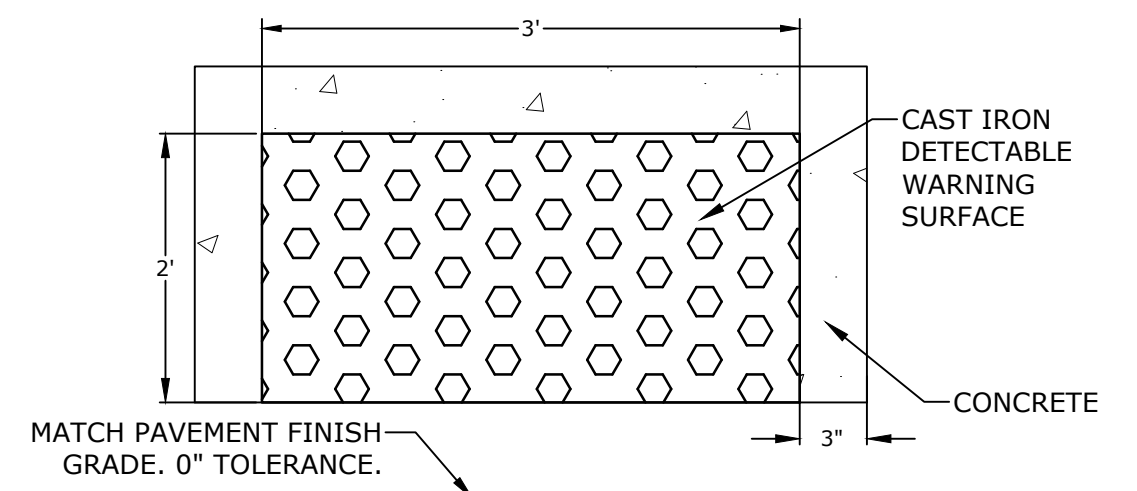
- NOTES:
1. CONCRETE TO BE 4500 PSI, 7% AIR ENTRAINED.
  2. STANDARD BROOM FINISH.

**DUMPSTER PAD**  
NO SCALE



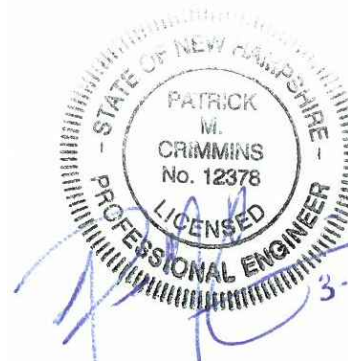
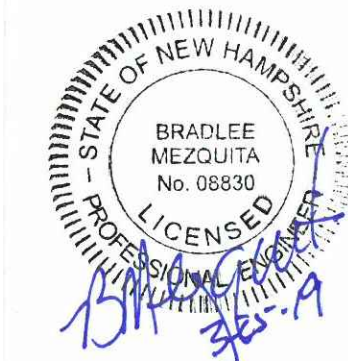
- NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
  2. DETECTABLE WARNING SURFACE SHALL BE CAST IRON WITHIN THE FUTURE CITY OF PORTSMOUTH RIGHT OF WAY. CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR DETECTABLE WARNING SURFACE MATERIAL TYPE FOR ON SITE WARNING PANELS.

**RADIUS TYPE CAST IRON DETECTABLE WARNING SURFACE**  
NO SCALE



- NOTES:
1. DETECTABLE WARNING SURFACE SHALL BE 2' X 3' CAST IRON PANEL SET IN CONCRETE.
  2. DETECTABLE WARNING SURFACE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
  3. DETECTABLE WARNING SURFACE SHALL BE CAST IRON WITHIN THE FUTURE CITY OF PORTSMOUTH RIGHT OF WAY. CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR DETECTABLE WARNING SURFACE MATERIAL TYPE FOR ON SITE WARNING PANELS.

**CAST IRON DETECTABLE WARNING SURFACE**  
NO SCALE



## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth, New Hampshire

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PROJECT NO: K0076-13		
DATE: 3/20/2017		
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DRAWN BY: CML		
CHECKED: PMC		
APPROVED: BLM		

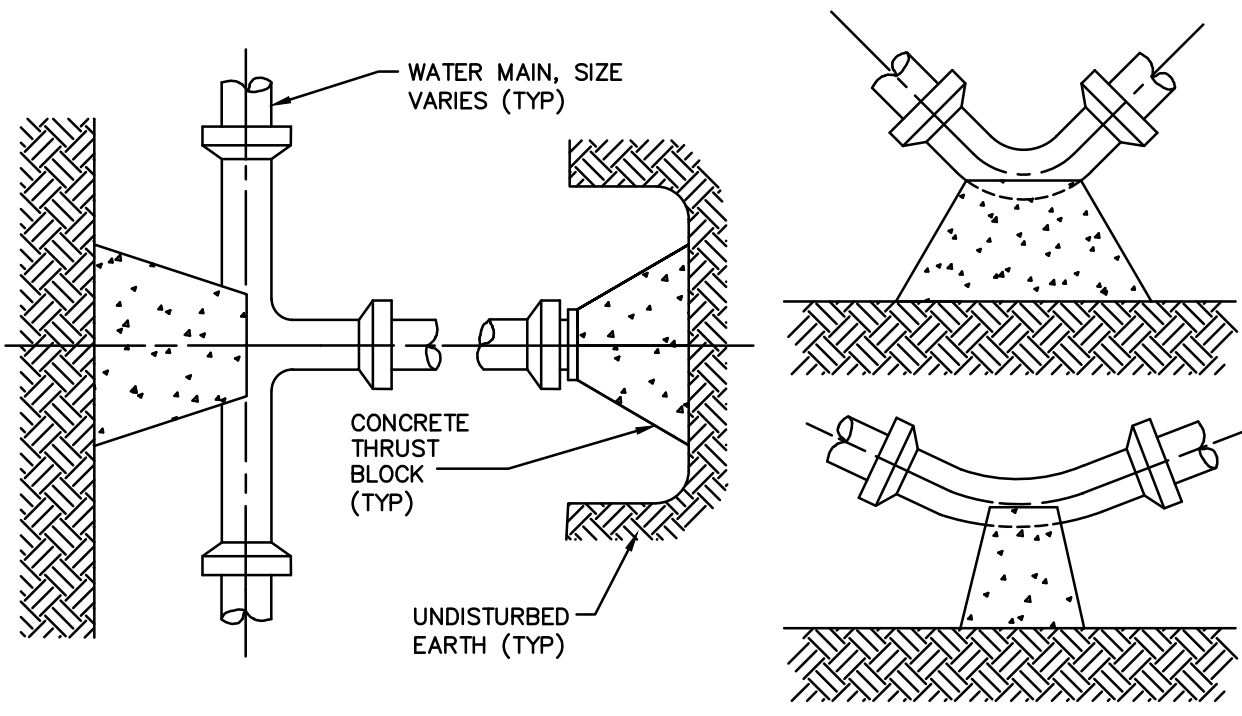
DETAILS SHEET

SCALE: AS SHOWN

C-503



Last Save Date: March 25, 2019 11:13 AM By: CHL  
Plot Date: Monday, March 25, 2019 Plotted By: Craig M. Langton  
File Location: \\K0076-13 Borthwick Forest\Drawings - Figures\AutoCAD\Xref\K0076-13 DTLS.dwg Layout Tab: C-504



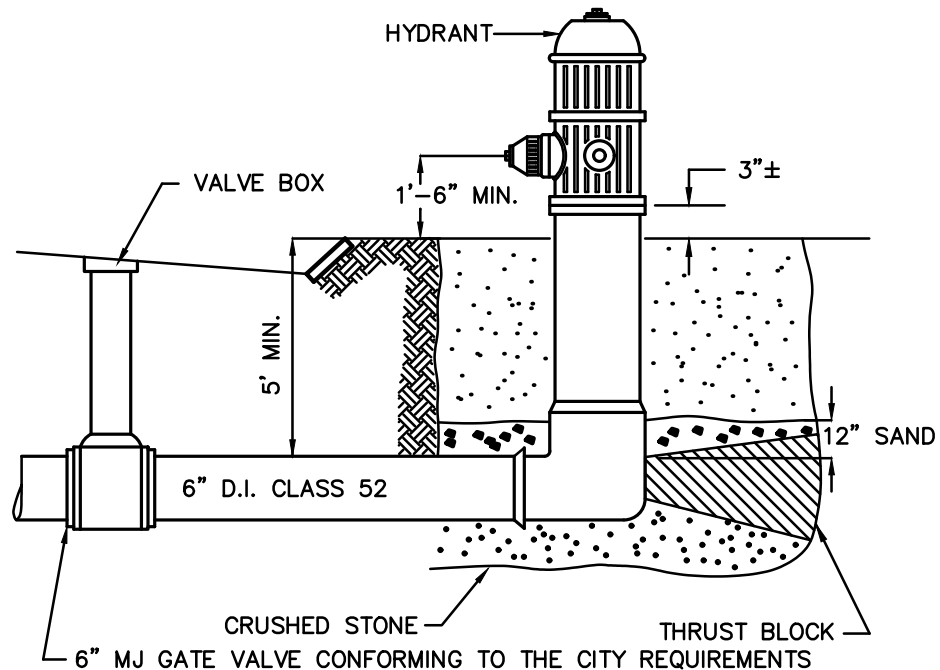
**THRUST BLOCKING DETAIL**

NOT TO SCALE

TEST PRESSURE = 200psi

SQUARE FEET OF CONCRETE THRUST BLOCKING BEARING ON UNDISTURBED MATERIAL						
REACTION TYPE	PIPE SIZE					
	4"	6"	8"	10"	12"	
A 90°	0.89	2.19	3.82	11.14	17.24	
B 180°	0.65	1.55	2.78	8.38	12.00	
C 45°	0.48	1.19	2.12	6.02	9.32	
D 22-1/2°	0.25	0.60	1.06	3.08	4.74	
E 11-1/4°	0.13	0.30	0.54	1.54	2.38	

- NOTES:**
1. POUR THRUST BLOCKS AGAINST UNDISTURBED MATERIAL, WHERE TRENCH WALL HAS BEEN DISTURBED, EXCAVATE LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL. NO JOINTS SHALL BE COVERED WITH CONCRETE.
  2. ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
  3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS.
  4. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.
  5. INSTALLATION AND STANDARD DIMENSIONAL REQUIREMENTS SHALL BE WITH CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS.

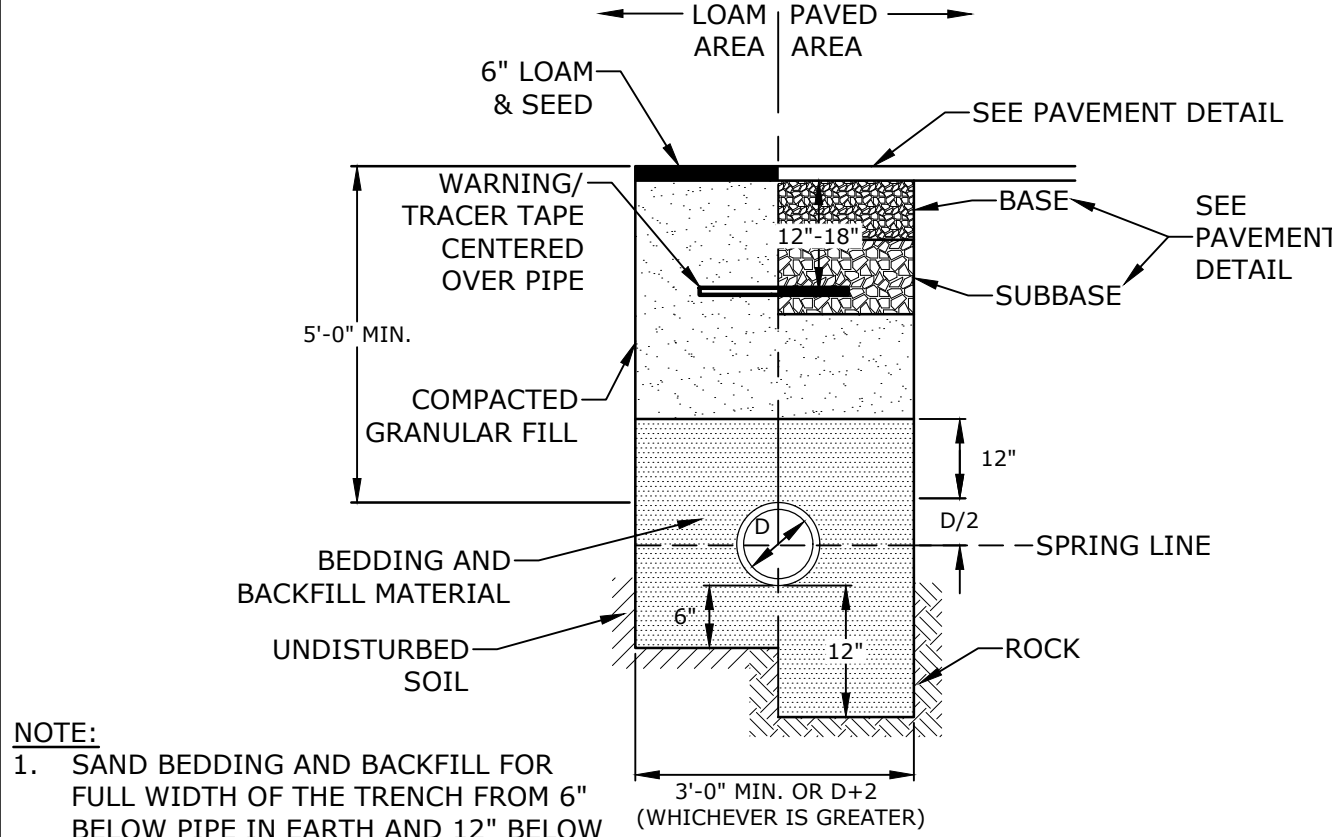


**FIRE HYDRANT DETAIL**

**FIRE HYDRANT DETAIL**

NOT TO SCALE

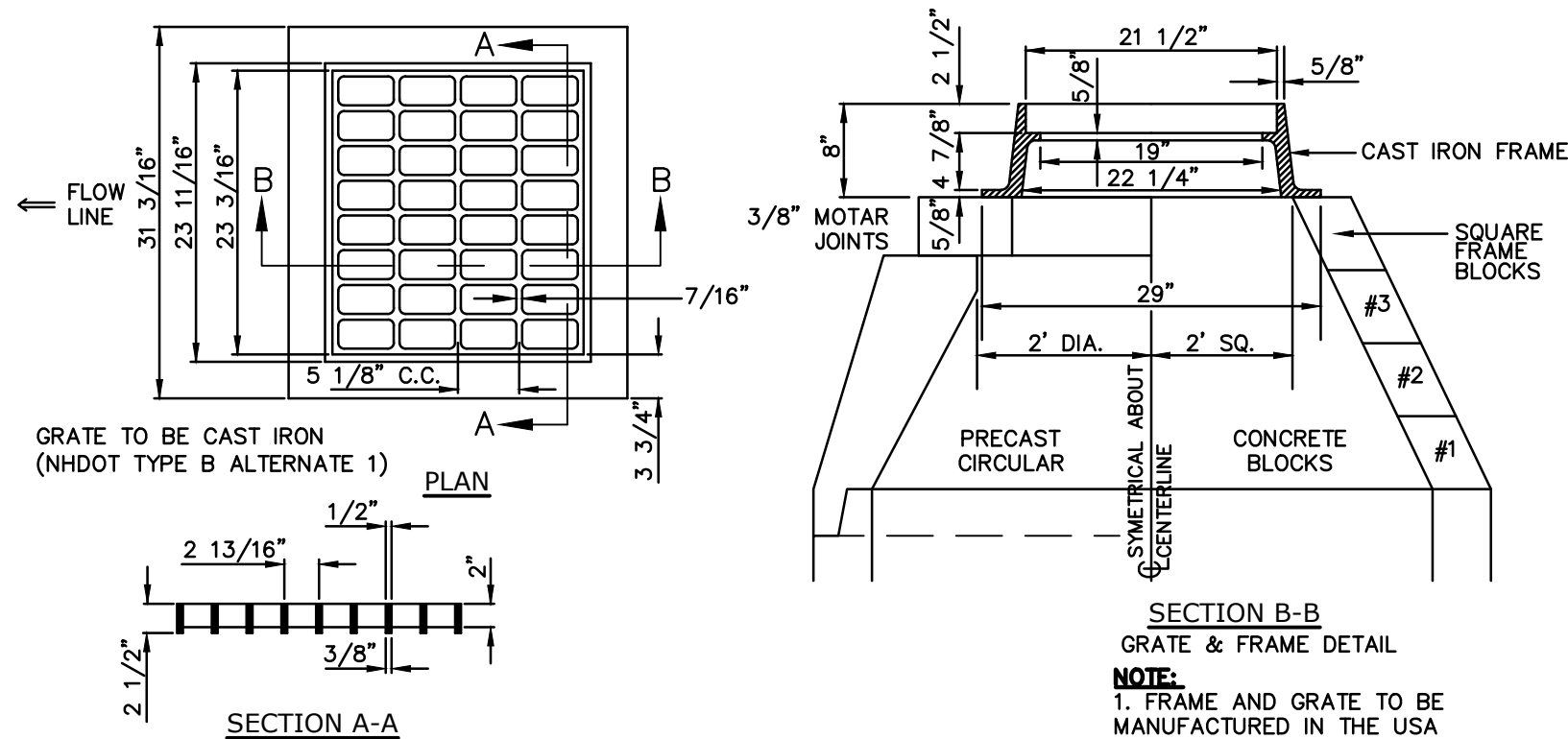
- NOTES:**
1. HYDRANT TO BE KENNEDY TYPE K-81, RIGHT OPEN (NO EQUAL). COORDINATE WITH CITY OF PORTSMOUTH WATER DEPARTMENT AND CITY OF PORTSMOUTH FIRE DEPARTMENT.
  2. PAINT HYDRANT IN ACCORDANCE WITH CITY STANDARD SPECIFICATIONS AFTER INSTALLATION.



**WATER TRENCH**

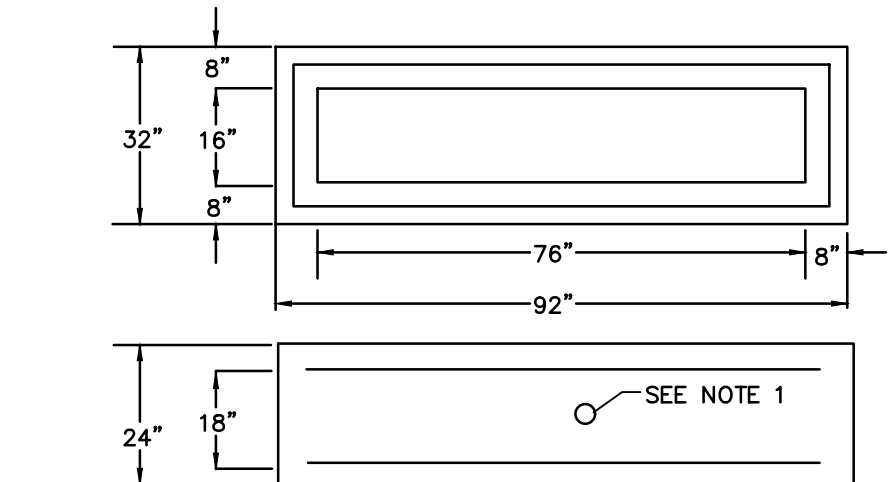
NO SCALE

- NOTE:**
1. SAND BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 12" ABOVE TOP OF PIPE.
  2. WATER MAIN SHALL BE INSTALLED PER CITY OF PORTSMOUTH STANDARDS. COORDINATE ALL INSTALLATIONS WITH THE CITY OF PORTSMOUTH.



**CATCHBASIN FRAME & GRATE**

NOT TO SCALE



**TYPICAL THREE PHASE SECTOR**

**TYPICAL THREE PHASE SECTOR**

NOT TO SCALE

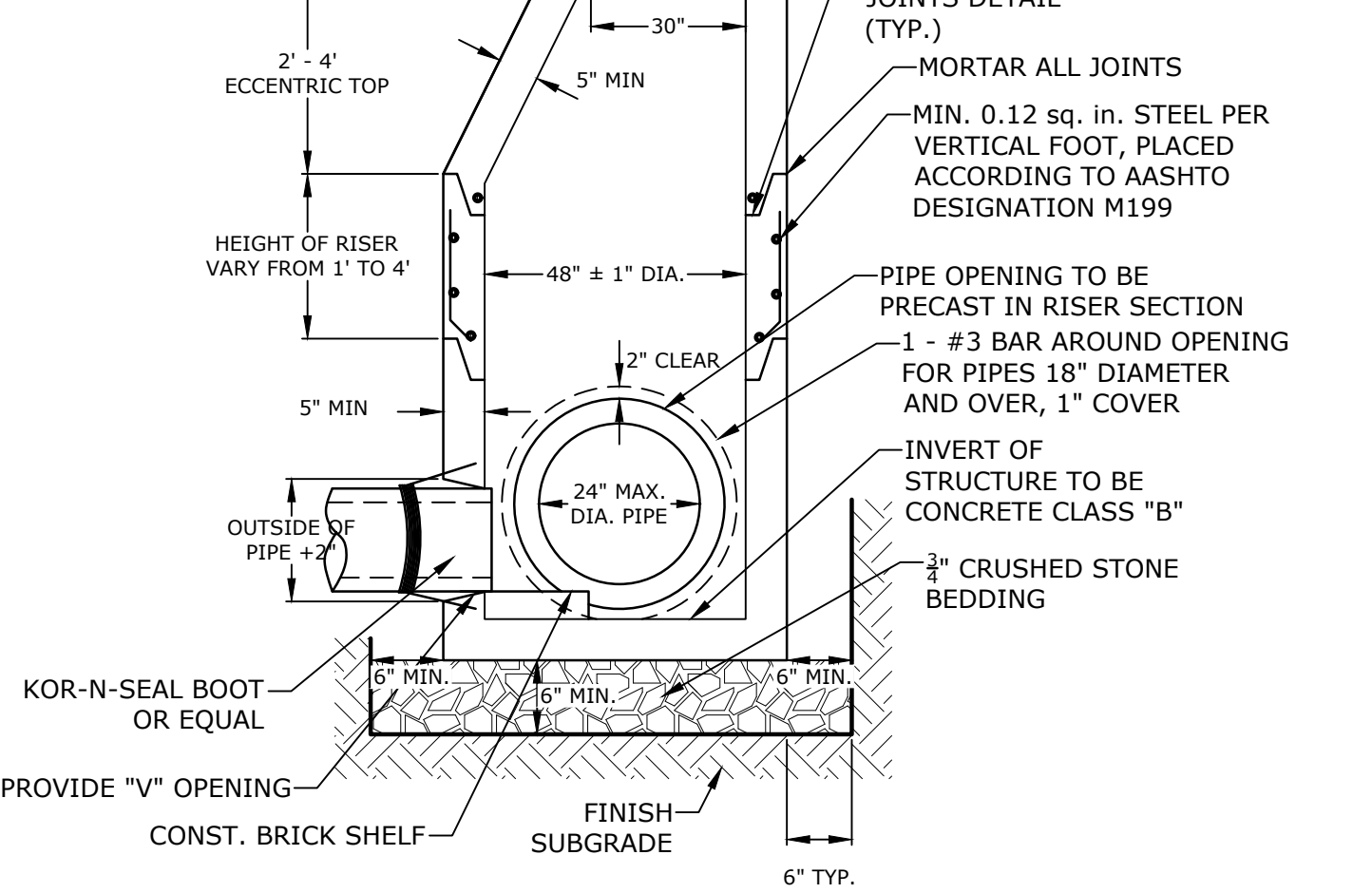
- NOTES:**
1. 1" PVC CONDUIT SLEEVE THROUGH FOUNDATION FOR GROUNDING LEADS.
  2. ALL REBAR TO BE #5.
  3. TOP OF FOUNDATION SHOULD BE EXPOSED 3 TO 6 INCHES ABOVE GROUND LEVEL.
  4. CONCRETE SHALL HAVE A MINIMUM COMPRESSION STRENGTH OF 3500 PSI.
  5. ALL REINFORCING SHALL BE TIED AS ONE UNIT.
  6. CHAMFER ALL EXPOSED CONCRETE EDGES 1 INCH.
  7. REMOVE ALL ORGANIC MATERIAL UNDER FOUNDATION.
  8. MINIMUM OF 3 INCHES OF CONCRETE OVER REINFORCING STEEL.
  9. SECTOR CABINET LOCATIONS AND DETAILS SHALL BE APPROVED BY EVERSOURCE PRIOR TO CONSTRUCTION.

- NOTE:**
1. CRUSHED STONE BEDDING AND BACKFILL FOR FULL WIDTH OF THE TRENCH FROM 6" BELOW PIPE IN EARTH AND 12" BELOW PIPE IN ROCK UP TO 6" ABOVE TOP OF PIPE.
  2. ALL UTILITIES SHALL BE INSTALLED PER THE INDIVIDUAL UTILITY COMPANY STANDARDS. COORDINATE ALL INSTALLATIONS WITH INDIVIDUAL UTILITY COMPANIES AND THE CITY OF PORTSMOUTH.

**STORM DRAIN TRENCH**

NO SCALE

MANHOLE FRAME AND COVER SHALL BE JORDAN IRON WORKS HINGE COVER PER CITY OF PORTSMOUTH STANDARD



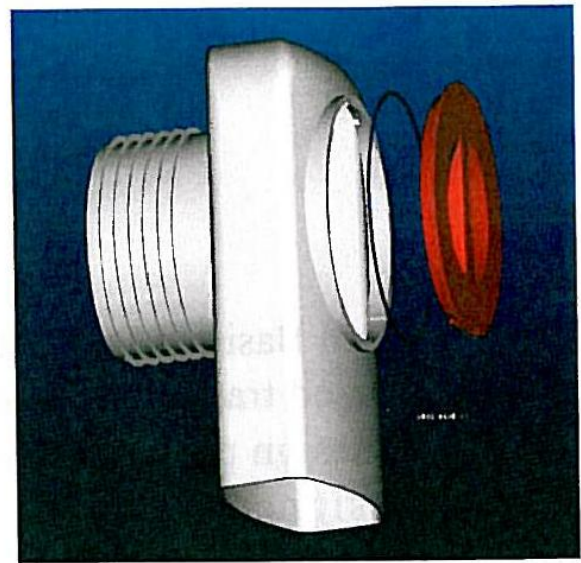
**4' DIAMETER DRAIN MANHOLE**

NO SCALE

- NOTES:**
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE.
  2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
  3. THE TONGUE AND GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT. THE STRUCTURES SHALL BE DESIGNED FOR H2O LOADING.
  4. CONSTRUCT CRUSHED STONE BEDDING AND BACKFILL UNDER (6" MINIMUM THICKNESS) THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
  5. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
  6. FITTING FRAME TO GRADE MAY BE DONE WITH PREFABRICATED ADJUSTMENT RINGS OR CLAY BRICKS (2 COURSES MAX.).
  7. CONE SECTIONS MAY BE EITHER CONCENTRIC OR ECCENTRIC, OR FLAT SLAB TOPS MAY BE USED WHERE PIPE WOULD OTHERWISE ENTER INTO THE CONE SECTION OF THE STRUCTURE AND WHERE PERMITTED.
  8. PIPE ELEVATIONS SHOWN ON PLANS SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
  9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
  10. PRECAST SECTIONS SHALL HAVE A TONGUE AND GROOVE JOINT 4" HIGH AT AN 11° ANGLE CENTERED IN THE WIDTH OF THE WALL AND SHALL BE ASSEMBLED USING AN APPROVED FLEXIBLE SEALANT IN JOINTS.
  11. THE TONGUE AND GROOVE JOINT SHALL BE SEALED WITH ONE STRIP OF BUTYL RUBBER SEALANT.
  12. "ELIMINATOR" OIL/WATER SEPARATOR SHALL BE INSTALLED TIGHT TO INSIDE OF CATCHBASINS WITHIN THE FUTURE CITY OF PORTSMOUTH RIGHT OF WAY.
  13. SUMP FOR CATCH BASINS WITHIN THE FUTURE CITY OF PORTSMOUTH RIGHT OF WAY SHALL BE 4'. THERE SHALL BE NO SUMPS FOR CATCH BASINS ON SITE.

**DRAIN MANHOLE**

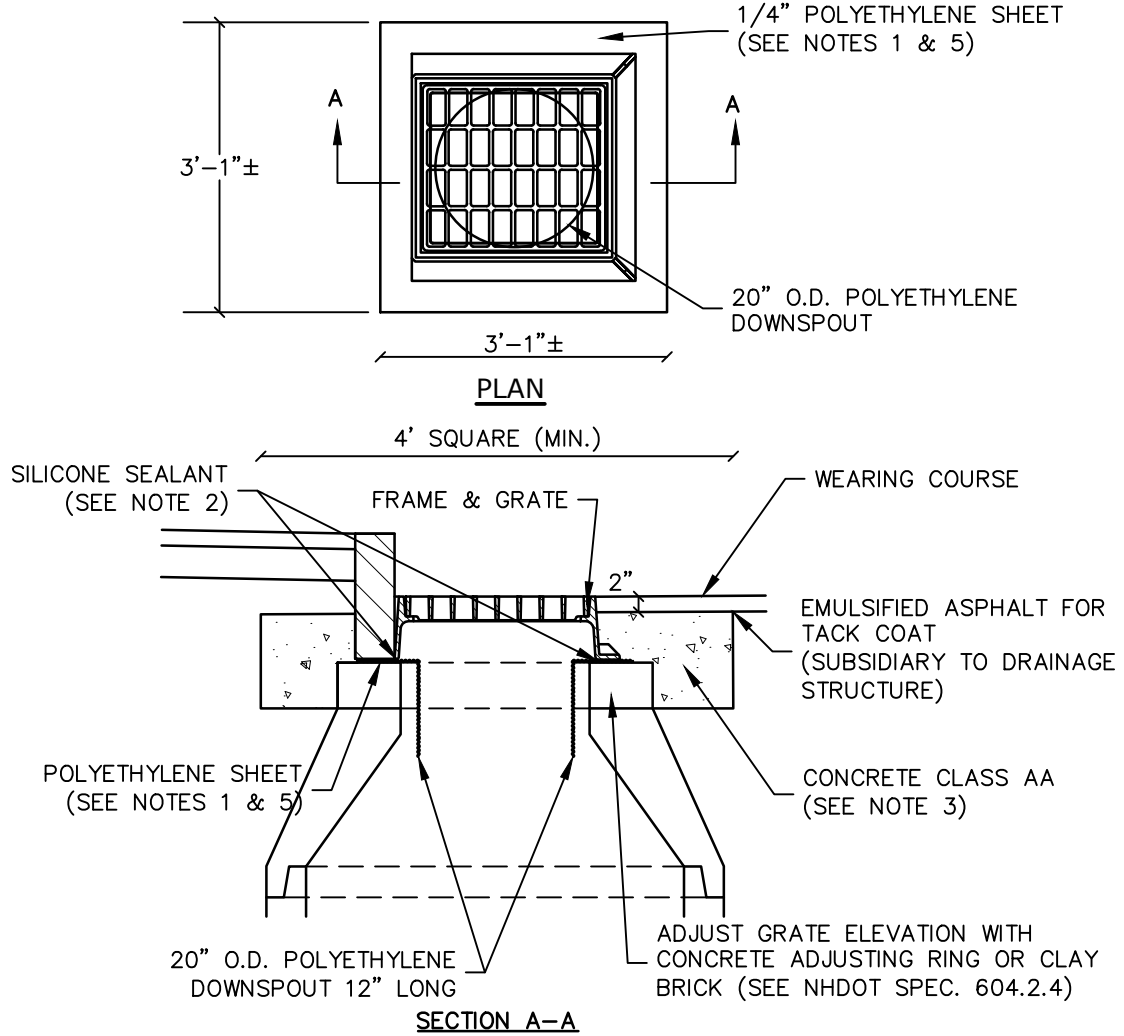
NO SCALE



- NOTES:**
1. ALL CATCH BASIN OUTLETS WITHIN CITY OF PORTSMOUTH RIGHT OF WAY TO HAVE "ELIMINATOR" OIL AND FLOATING DEBRIS TRAP MANUFACTURED BY KLEANSTREAM (NO EQUAL)

**"ELIMINATOR" OIL & FLOATING DEBRIS TRAP**

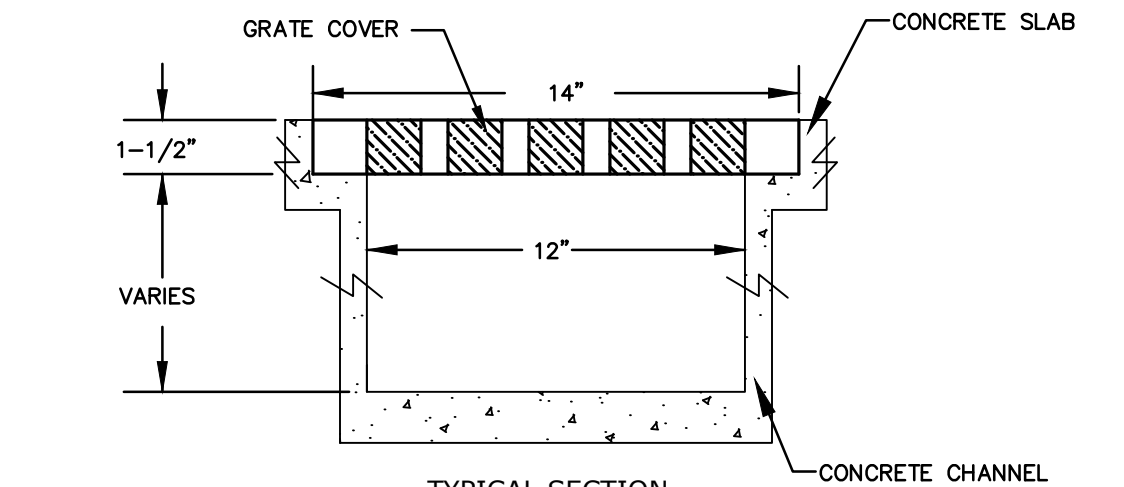
NOT TO SCALE



**POLYETHYLENE LINER**

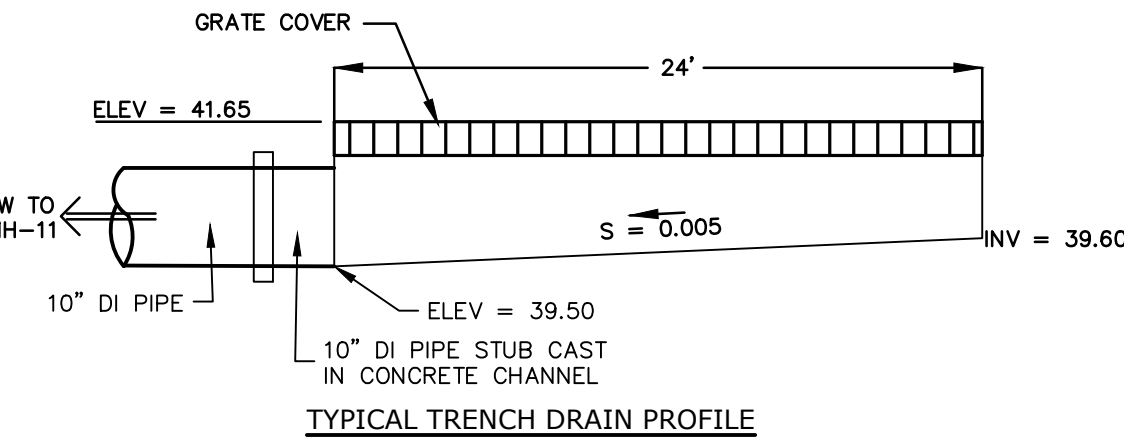
NO SCALE

- NOTES:**
1. POLYETHYLENE LINER (NHDOT ITEM 604.0007) SHALL BE FABRICATED AT THE SHOP.
  2. DOWNSPOUT SHALL BE EXTRUSION FILLET WELDED TO THE POLYETHYLENE SHEET.
  3. PLACE A CONTINUOUS BEAD OF AN APPROVED SILICONE SEALANT (SUBSIDIARY TO NHDOT ITEM 604.0007) BETWEEN FRAME AND POLYETHYLENE SHEET.
  4. PLACE CLASS AA CONCRETE TO 2" BELOW THE TOP OF THE GRATE ELEVATION.
  5. TRIM POLYETHYLENE SHEET A MAXIMUM OF 4" OUTSIDE THE FLANGE ON THE FRAME FOR THE CATCH BASIN BEFORE PLACING CONCRETE (EXCEPT AS SHOWN WHEN USED WITH 3-FLANGE FRAME AND CURB).
  6. THE CENTER OF THE GRATE & FRAME MAY BE SHIFTED A MAXIMUM OF 6" FROM THE CENTER OF THE DOWNSPOUT IN ANY DIRECTION.
  7. PLACED ONLY IN DRAINAGE STRUCTURES IN PAVEMENT WITHIN THE CITY OF PORTSMOUTH RIGHT OF WAY.
  8. SEE NHDOT DR-04, "DI-DB, UNDERDRAIN FLUSHING BASIN AND POLYETHYLENE LINER DETAILS", FOR ADDITIONAL INFORMATION.



**TYPICAL SECTION**

NOT TO SCALE



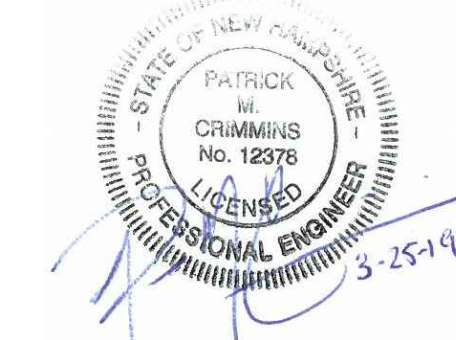
**TYPICAL TRENCH DRAIN PROFILE**

NOT TO SCALE

- NOTES:**
1. TRENCH DRAIN FRAME AND GRATE SHALL BE MULTIDRAIN ECONODRAIN SERIES #12 OR EQUAL WITH ADA COMPLIANT GRATE.
  2. CONCRETE CHANNEL TO BE CAST AS PART OF SLAB (COORDINATE WITH BUILDING DRAWINGS).

**TRENCH DRAIN DETAIL**

NOT TO SCALE



## Proposed Subdivision Road & Office Building Development

Borthwick Forest, LLC

Portsmouth, New Hampshire

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B	4/24/2017	TAC & ConCom Submission
A	3/20/2017	TAC Submission

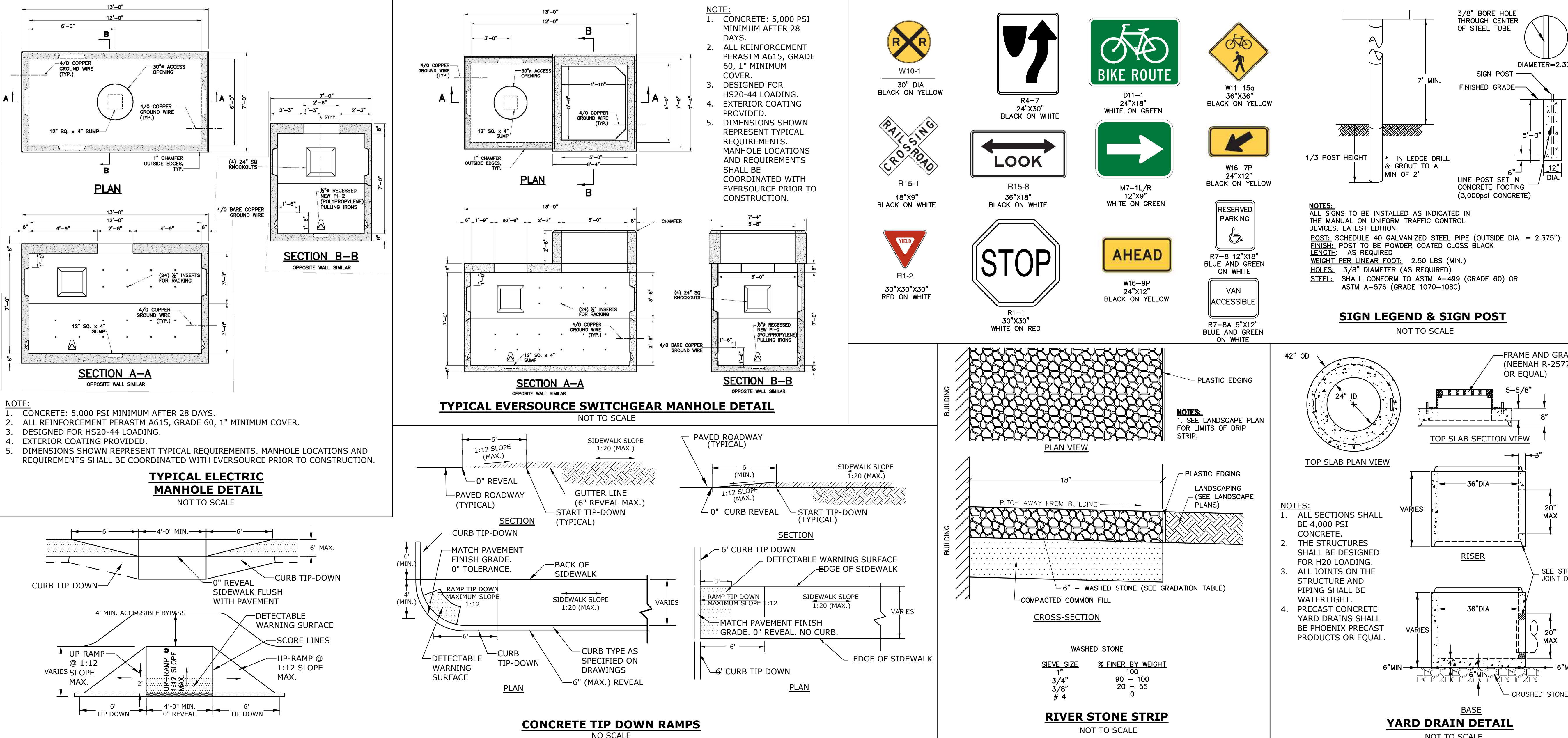
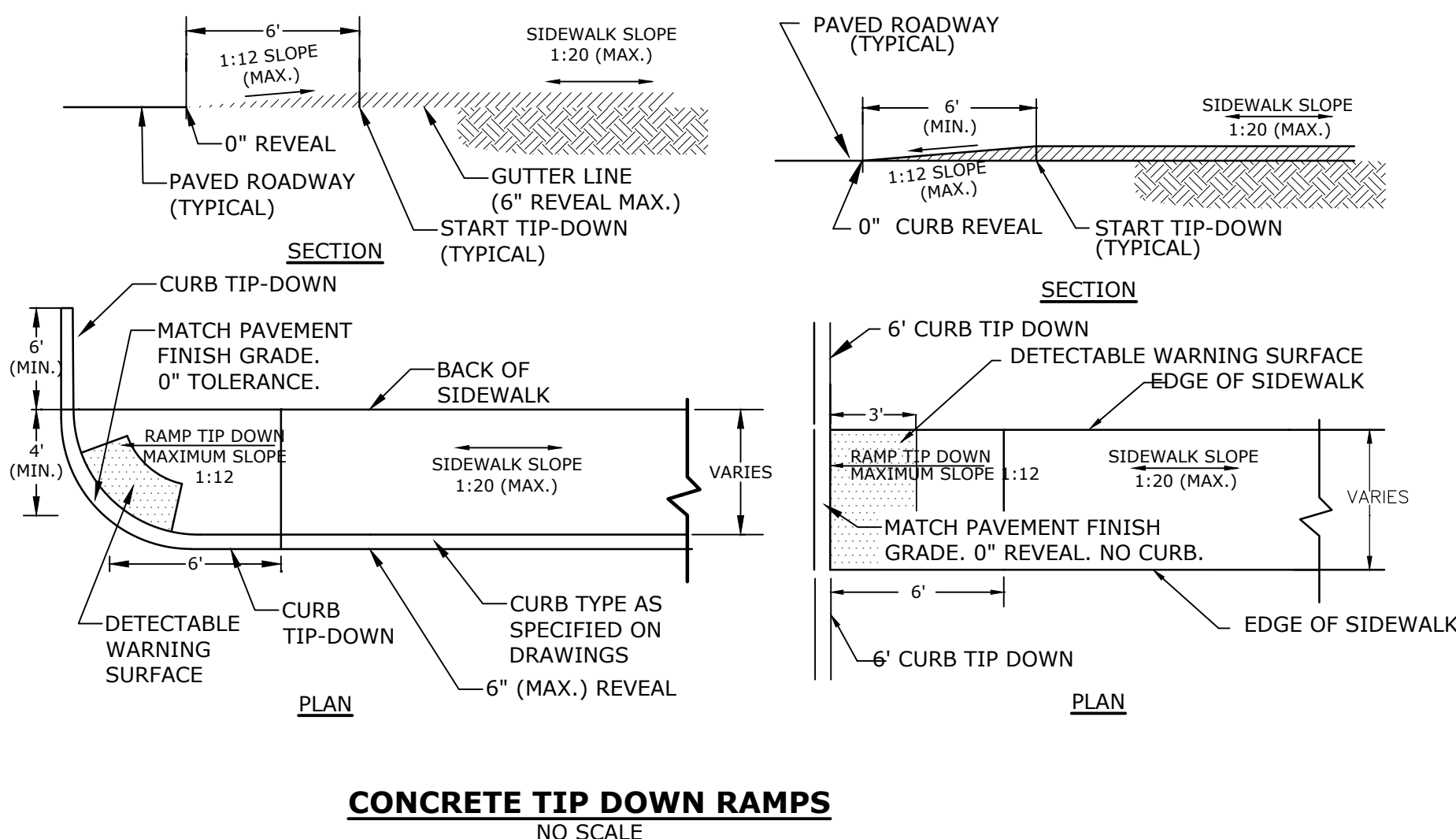
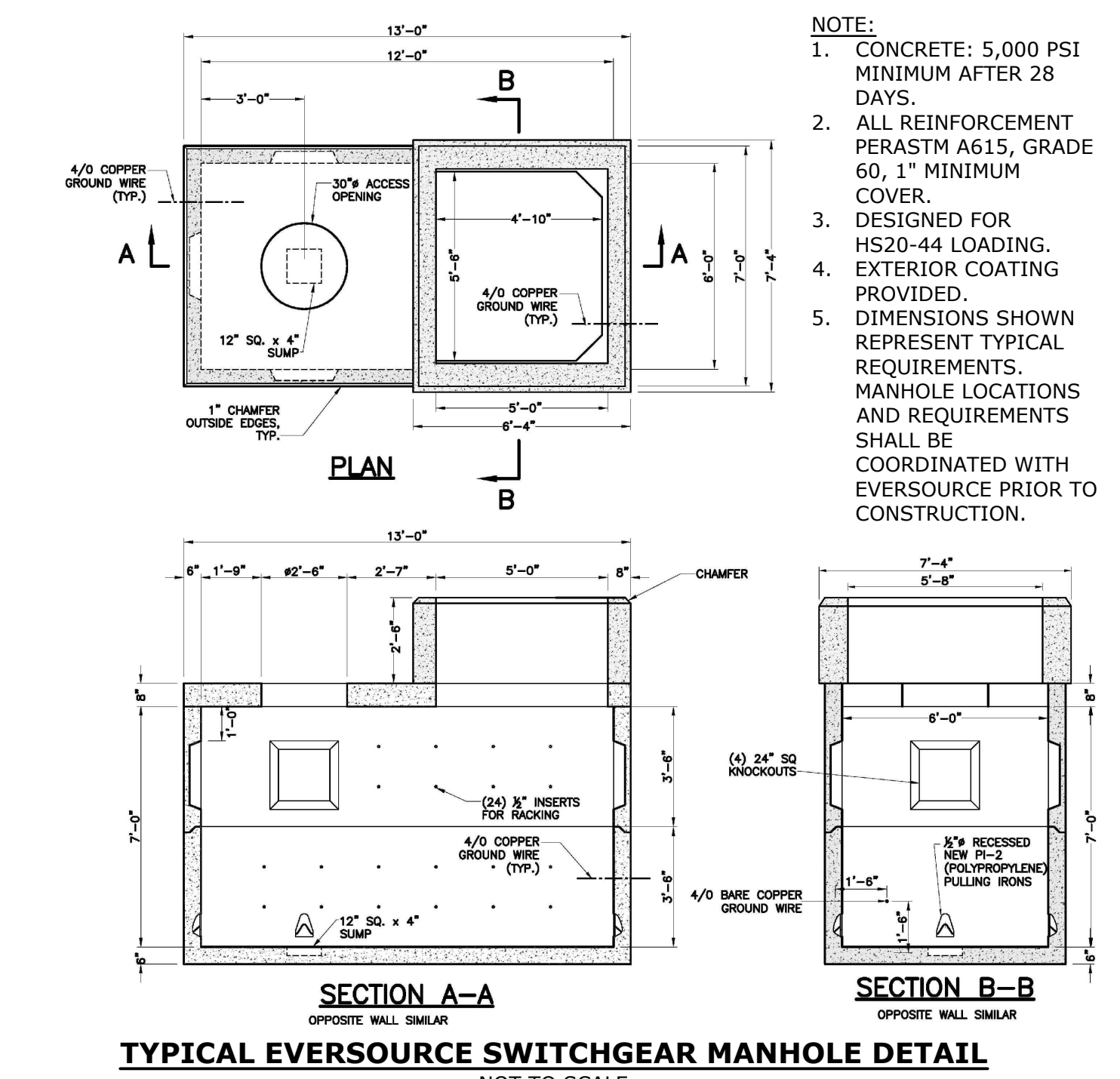
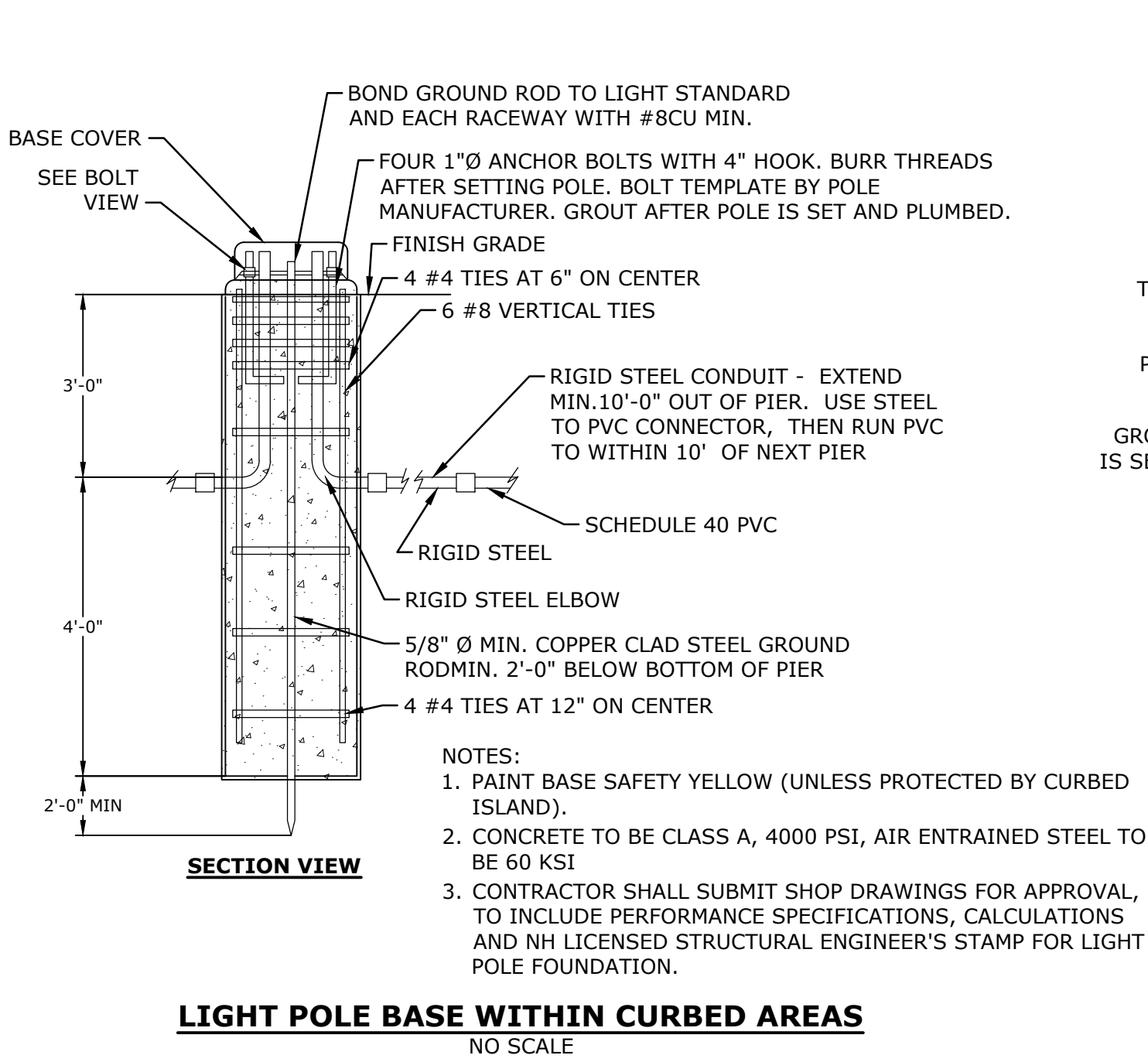
PROJECT NO:	K0076-13
DATE:	3/20/2017
FILE:	K0076-13_DTLS.DWG
DRAWN BY:	CHL
CHECKED:	PMC
APPROVED:	BLM

## DETAILS SHEET

SCALE: AS SHOWN

C-504

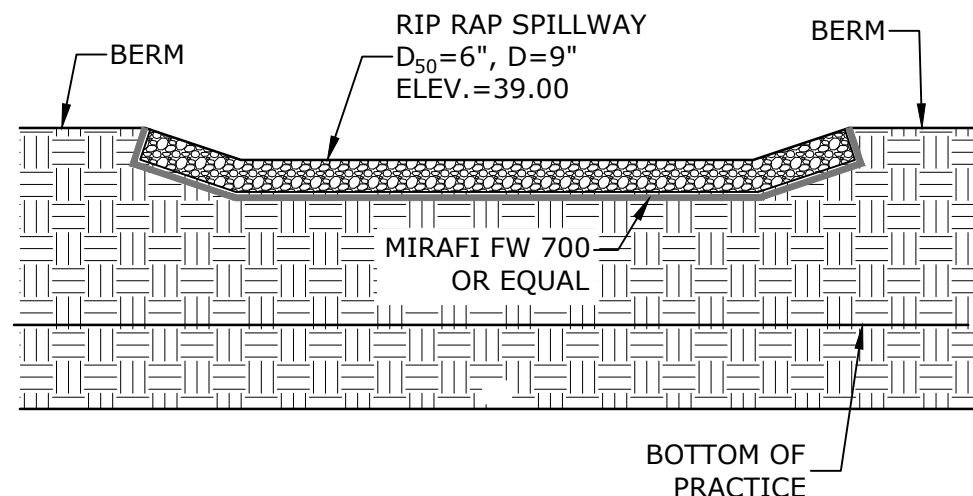




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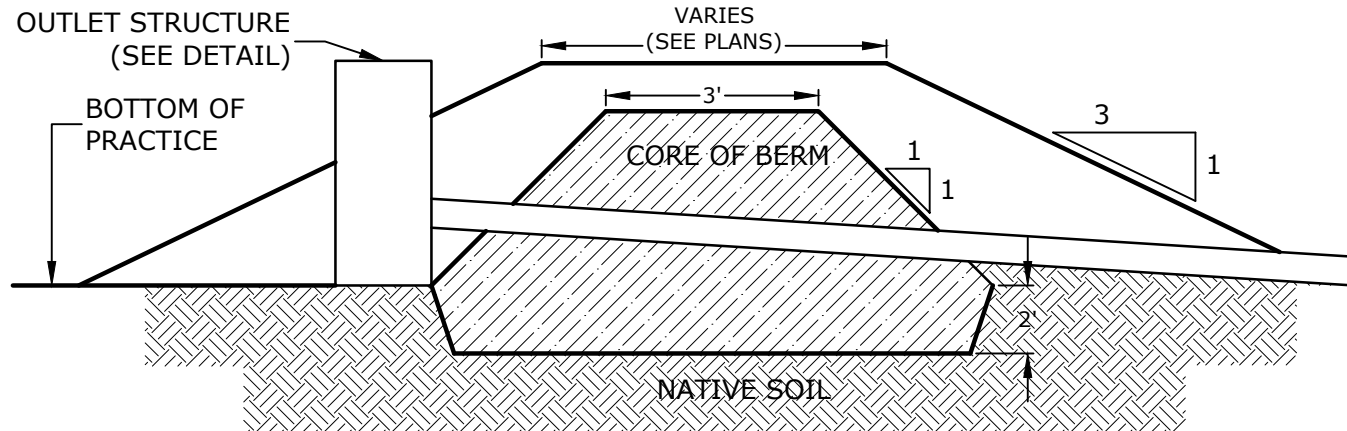


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Plot Date: Monday, March 25, 2019 Plotted By: Craig M. Langton  
File Location: \\K:\0076-13 Borthwick Forest\Drawings - General\Proposals\0076-13 Borthwick Forest\Drawings - General\Proposals\0076-13 DTLS.dwg Layout Tab: C-506



NOTES:  
1. SEE GRADING & DRAINAGE PLAN(S) FOR LOCATION(S) AND DIMENSIONS.

#### RIP RAP SPILLWAY NO SCALE

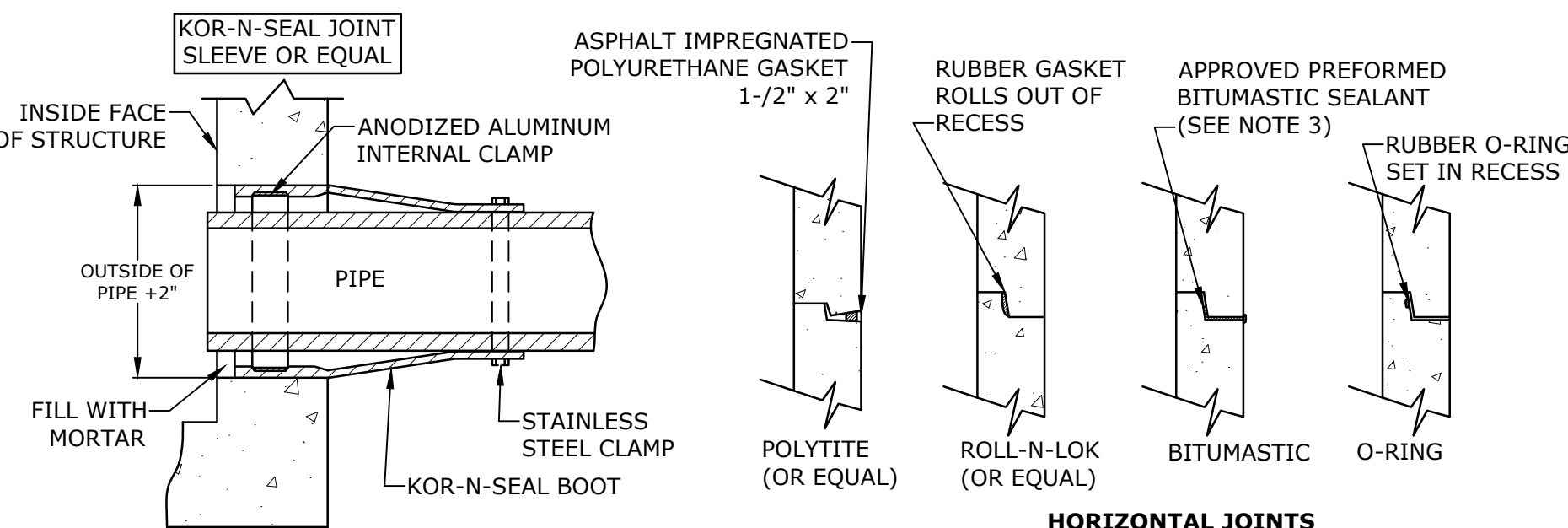


NOTES:  
1. CORE MATERIAL SHALL MEET USGS CLASSIFICATION SC, SM, CL OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000005 CM/S, AND MEET THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100
# 200	50 -100.

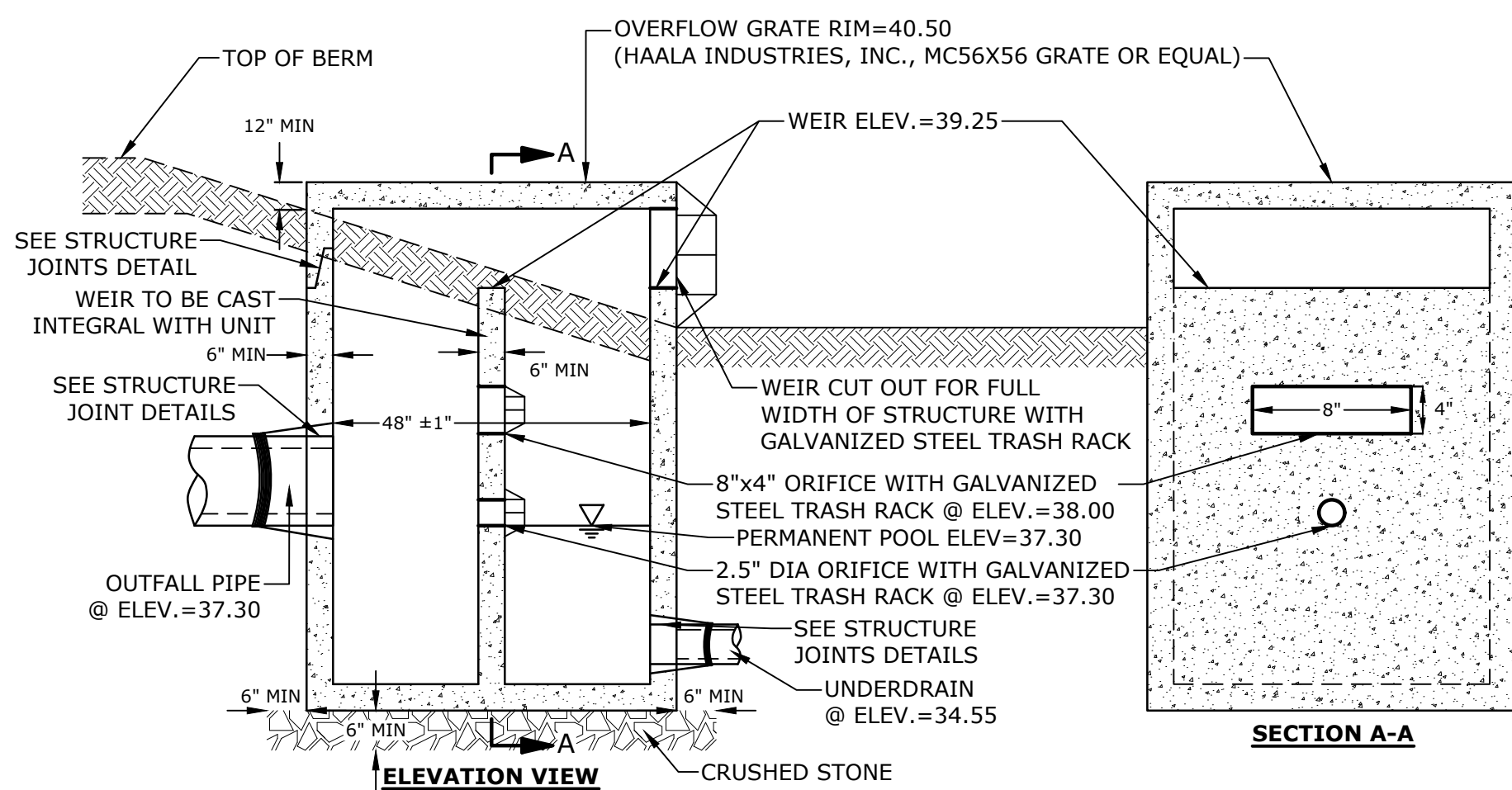
2. PIPE SHALL BE FULLY EMBEDDED IN CORE TO ELIMINATE SEEPAGE

#### CLAY CORE BERM NO SCALE



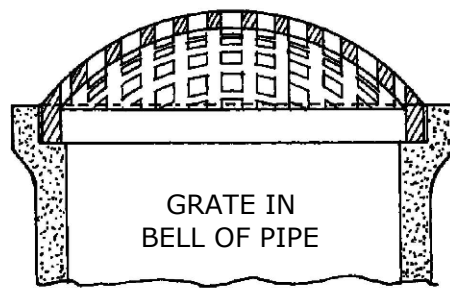
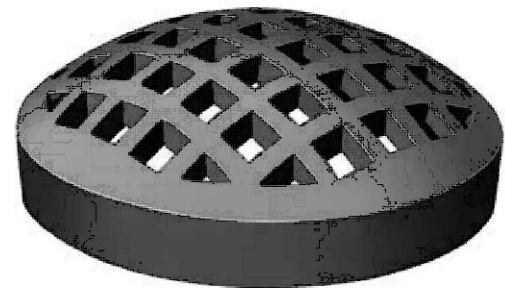
NOTES:  
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.  
2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.  
3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.  
4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

#### STRUCTURE JOINTS NO SCALE



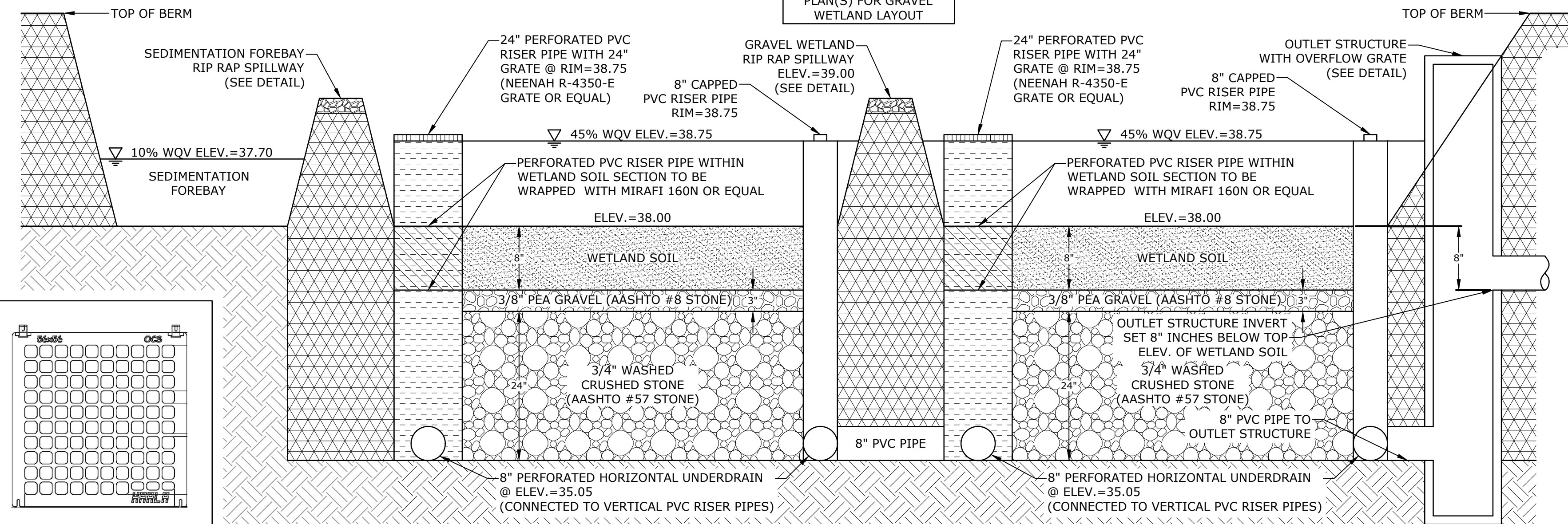
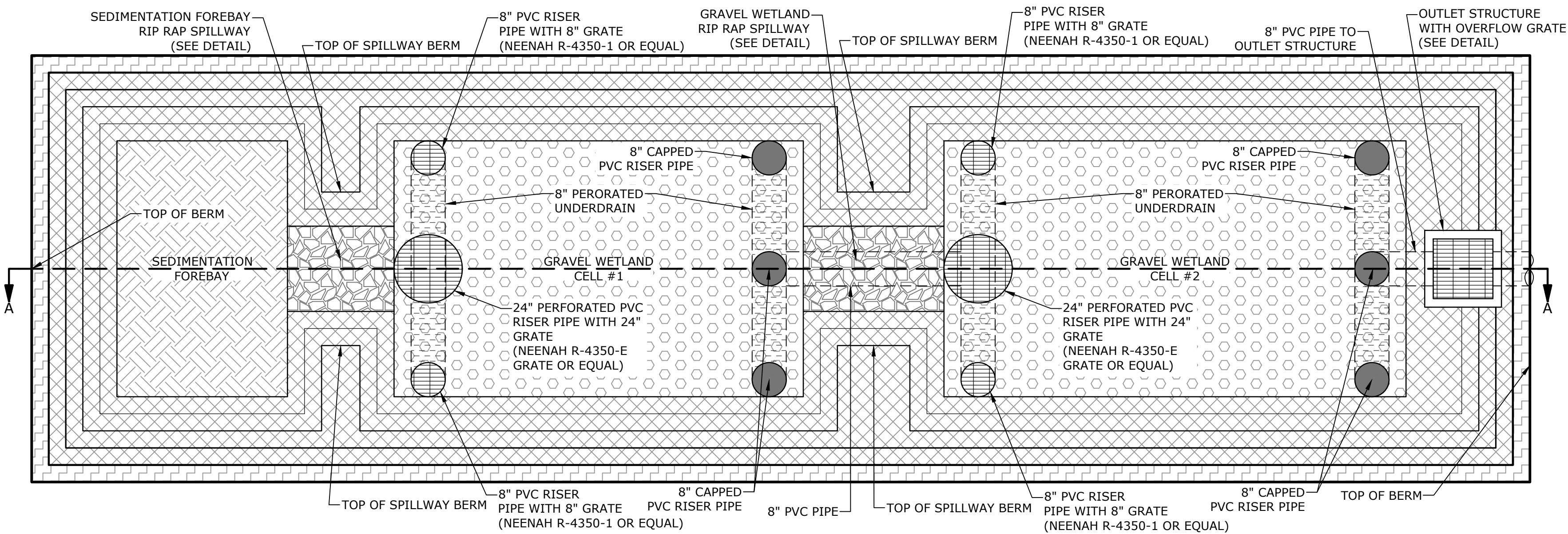
NOTES:  
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).  
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQUARE INCHES PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER OF THE THIRD WALL.  
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQUARE INCHES PER LINEAR FOOT.  
4. THE STRUCTURES SHALL BE DESIGNED FOR H2O LOADING.  
5. ALL JOINTS ON THE STRUCTURE AND PIPING SHALL BE WATERTIGHT.

#### OUTLET STRUCTURE NO SCALE



NOTES:  
1. 8" GRAVEL WETLAND GRATES SHALL NEENAH R-4350-1 GRATE OR EQUAL.  
2. 24" GRAVEL WETLAND GRATES SHALL NEENAH R-4350-E GRATE OR EQUAL.

#### NEENAH R-4350 SERIES GRATE NO SCALE



NOTES:  
1. OUTLET STRUCTURE GRATE SHALL BE HAALA INDUSTRIES, INC. MC56X56 TOP MOUNT GRATE OR EQUAL.  
2. GRATE TO BE SECURED TO CONCRETE STRUCTURE.

#### HAALA MC56X56 GRATE NO SCALE

NOTES:  
1. WETLAND SOIL SHALL BE A SANDY CLAY LOAM WITH A HYDRAULIC CONDUCTIVITY OF 0.1-0.01 FT/DAY. ORGANIC CONTENT SHALL BE GREATER THAN 15% BY VOLUME. CLAY CONTENT SHALL BE LESS THAN 15% BY VOLUME.  
2. INFILTRATION TESTING OF THE NATIVE SOILS AT THE SUBGRADE AND WITHIN THE VICINITY OF THE PROPOSED GRAVEL WETLAND SHALL OCCUR PRIOR TO THE INSTALLATION OF THE GRAVEL WETLAND AND SHALL BE COORDINATED WITH THE ENGINEER. IF THE NATIVE SOILS EXCEED A PERMEABILITY RATE OF 0.03 FT/DAY OR IF EXCESSIVELY FRACTURED BEDROCK IS ENCOUNTERED THE SOILS SHOULD AMENDED OR LINER ADDED AS DETERMINED BY THE ENGINEER.  
3. PERFORATED PVC RISERS SHALL HAVE VERTICAL SLOTS CUT INTO PVC RISERS ABOVE GRADE MEASURING 3"x1/8".

#### TYPICAL GRAVEL WETLAND NO SCALE

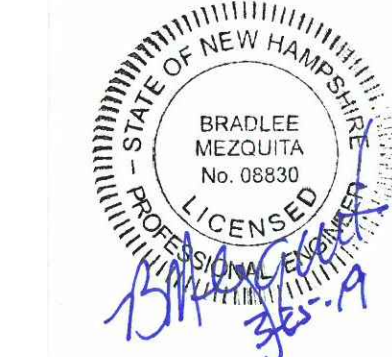
GRAVEL WETLAND INSPECTION / MAINTENANCE REQUIREMENTS		
INSPECTION / MAINTENANCE	FREQUENCY	ACTION
MONITOR TO ENSURE THAT GRAVEL WETLAND FUNCTIONS EFFECTIVELY AFTER STORMS	FOUR (4) TIMES ANNUALLY (QUARTERLY) AND AFTER ANY RAINFALL EVENT EXCEEDING 2.5" IN A 24-HR PERIOD	- TRASH AND DEBRIS TO BE REMOVED - ANY REQUIRED MAINTENANCE SHALL BE ADDRESSED - INSPECT SOIL AND REPAIR ERODED AREAS, ESPECIALLY ON SLOPES. - CHECK INLETS, OUTLETS, AND OVERFLOW SPILLWAY FOR BLOCKAGE, STRUCTURAL INTEGRITY AND EVIDENCE OF EROSION.
INSPECT VEGETATION	ANNUALLY	- INSPECT THE CONDITION OF ALL GRAVEL WETLAND VEGETATION - PRUNE BACK OVERGROWTH - REPLACE DEAD VEGETATION - REMOVE ANY INVASIVE SPECIES - COORDINATE WITH UNH STORMWATER CENTER FOR FURTHER VEGETATION MANAGEMENT GUIDELINES
INSPECT DRAWDOWN TIME - THE SYSTEM SHALL DRAWDOWN WITHIN 48-HOURS FOLLOWING A RAINFALL EVENT.	ANNUALLY	- HIRE QUALIFIED PROFESSIONAL TO ASSESS AND IMPLEMENT THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE THE FILTRATION FUNCTION, INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER.

#### GRAVEL WETLAND PLANTING PLAN

SPECIES	PLANT SIZE	QUANTITY/SPACING
NEW ENGLAND EROSION CONTROL/RESTORATION MIX OR EQUIVALENT		35LB/ACRE
"RED OSIER DOGWOOD" CORNUS SERICEA	2'-3'	8'-10' ON CENTER
"SILKY DOGWOOD" CORNUS AMOMMUM		
AND	2'-3'	8'-10' ON CENTER
"Highbush Blueberry" VACCINIUM CORYBOSSUM		

**Tighe&Bond**

Engineers | Environmental Specialists



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E	8/3/2017	Per AoT Comments
D	6/2/2017	AoT Submission
C	5/11/2017	Planning Board Submission
B	4/24/2017	TAC & ConCom Submission
A	3/20/2017	TAC Submission
PROJECT NO:	K0076-13	
DATE:	3/20/2017	
FILE:	K0076-13_DTLS.DWG	
DRAWN BY:	CML	
CHECKED:	PMC	
APPROVED:	BLM	

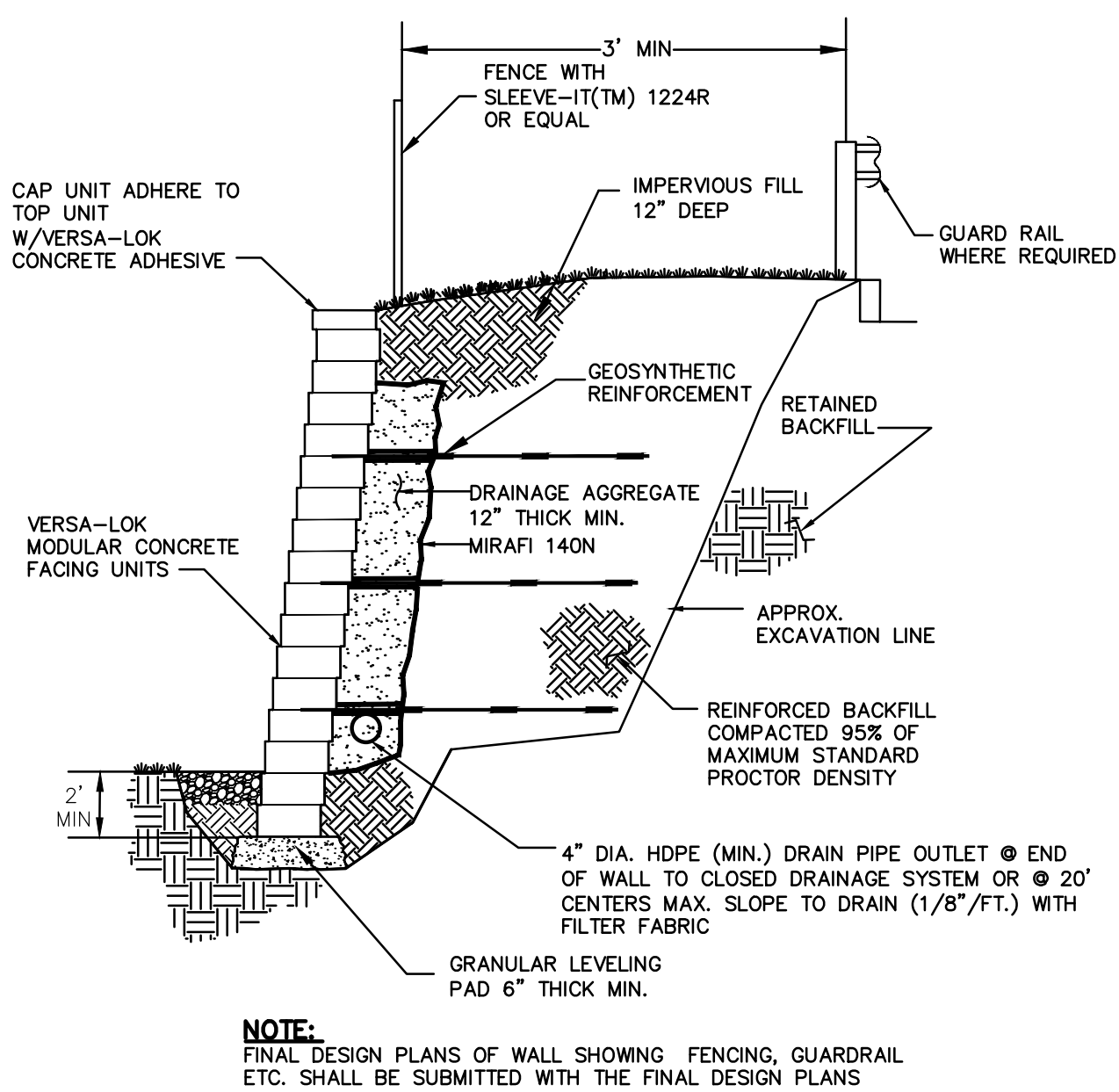
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SCALE: AS SHOWN

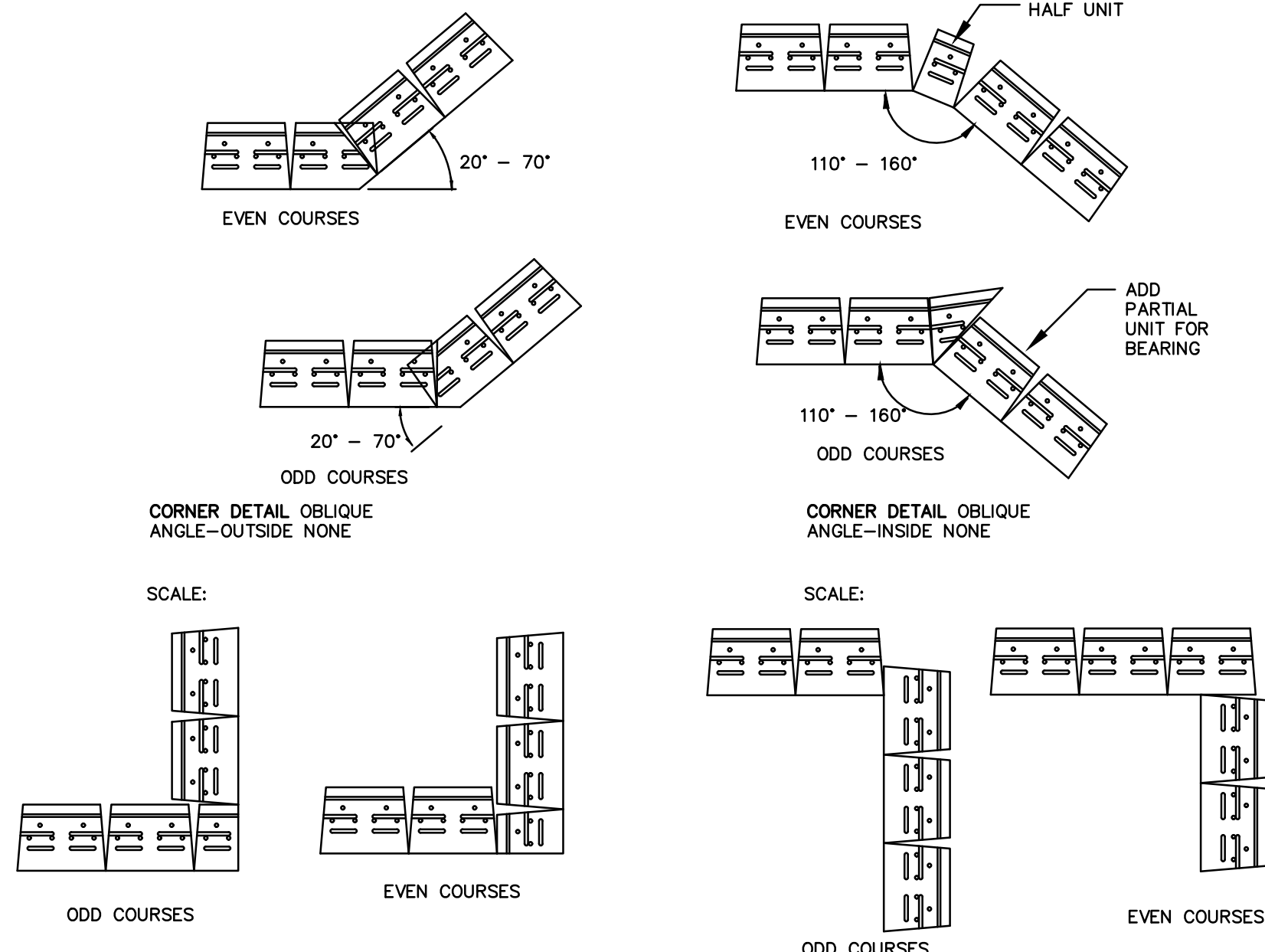
C-506



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Plot Date: Monday, March 25, 2019 Plotted By: Craig M. Langton  
P&E File Location: J:\K0076 The Kane Company - General Proposals\0076-13 Borthwick Forest\Drawings Figures\AutoCAD\Xref\K0076-13 DTLS.dwg Layout Tab: C-507



**TYPICAL SECTION REINFORCED RETAINING WALL**  
NOT TO SCALE



DRAINAGE FILL	
DRAINAGE FILL SHALL BE CLEAN 1 INCH MINUS CRUSHED STONE OR GRANULAR FILL MEETING THE FOLLOWING GRADATION:	
SIEVE SIZE	% PASSING BY WEIGHT
1 INCH	75-100
3/4 INCH	50-75
No. 4	0-60
No. 40	0-50
No. 200	0-5

MINIMUM PARAMETERS		
SOIL	SOIL UNIT WEIGHT	Φ
FOUNDATION SOIL	130	32°

APPLIED SURCHARGE LOADING = 0.31 TIMES THE VERTICAL SURCHARGE LOAD UNIFORMLY DISTRIBUTED OVER THE HEIGHT OF THE WALL  
STATIC ACTIVE LATERAL EARTH PRESSURE = 40 PSF/FT  
OVERTURNING F.S. = 2.0  
SLIDING F.S. = 1.5

- MANUFACTURER'S DESIGN:**
- CONCRETE UNIT RETAINING WALL SHALL BE BY VERSA-LOK OR APPROVED EQUAL
  - DESIGN SHALL BE FROM THE WALL MANUFACTURER AND SHALL INCLUDE A GLOBAL STABILITY ANALYSIS.
  - MANUFACTURER DESIGN ENGINEER SHALL BE LICENSED IN THE STATE OF NEW HAMPSHIRE.
  - DESIGN CALCULATIONS AND PLANS SHALL BE SUBMITTED TO THE WALL DESIGN ENGINEER SHALL COMPLETE SUFFICIENT INSPECTIONS DURING CONSTRUCTION TO CERTIFY WORK IS COMPLETE IN ACCORDANCE WITH DESIGN.
  - SUBMIT AS-BUILT DRAWINGS OF WALL WITH WALL DESIGNER'S CERTIFICATION TO OWNER.

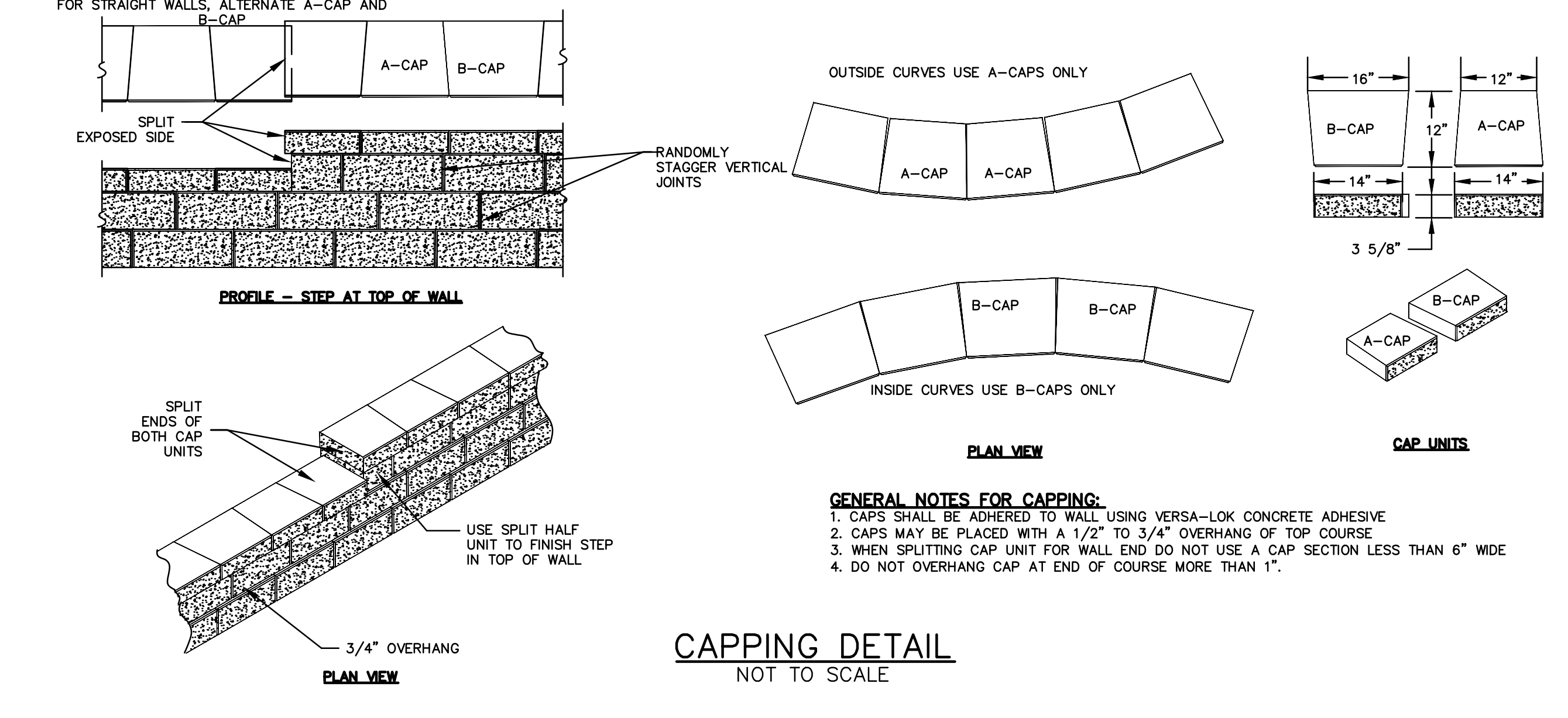
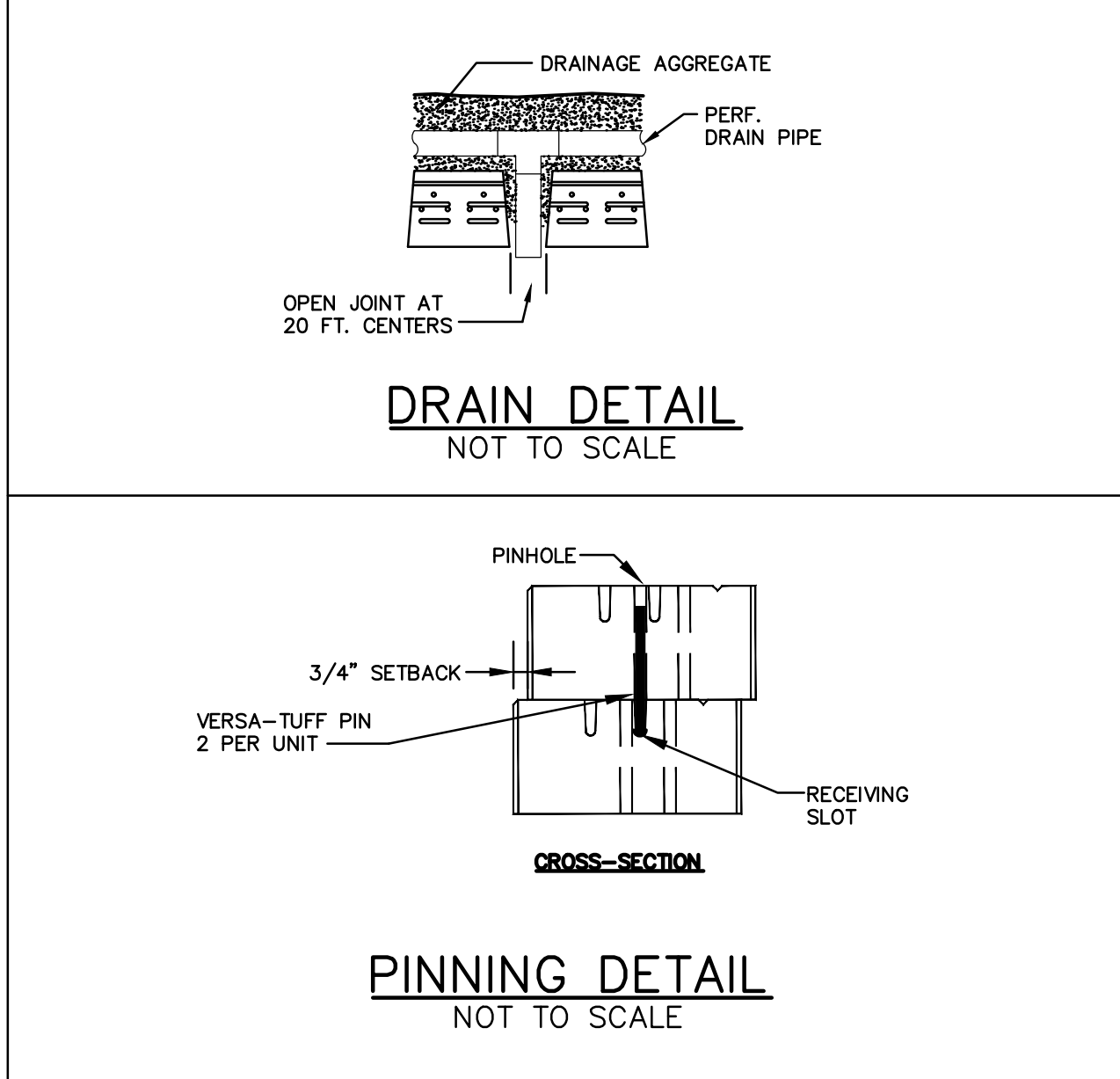
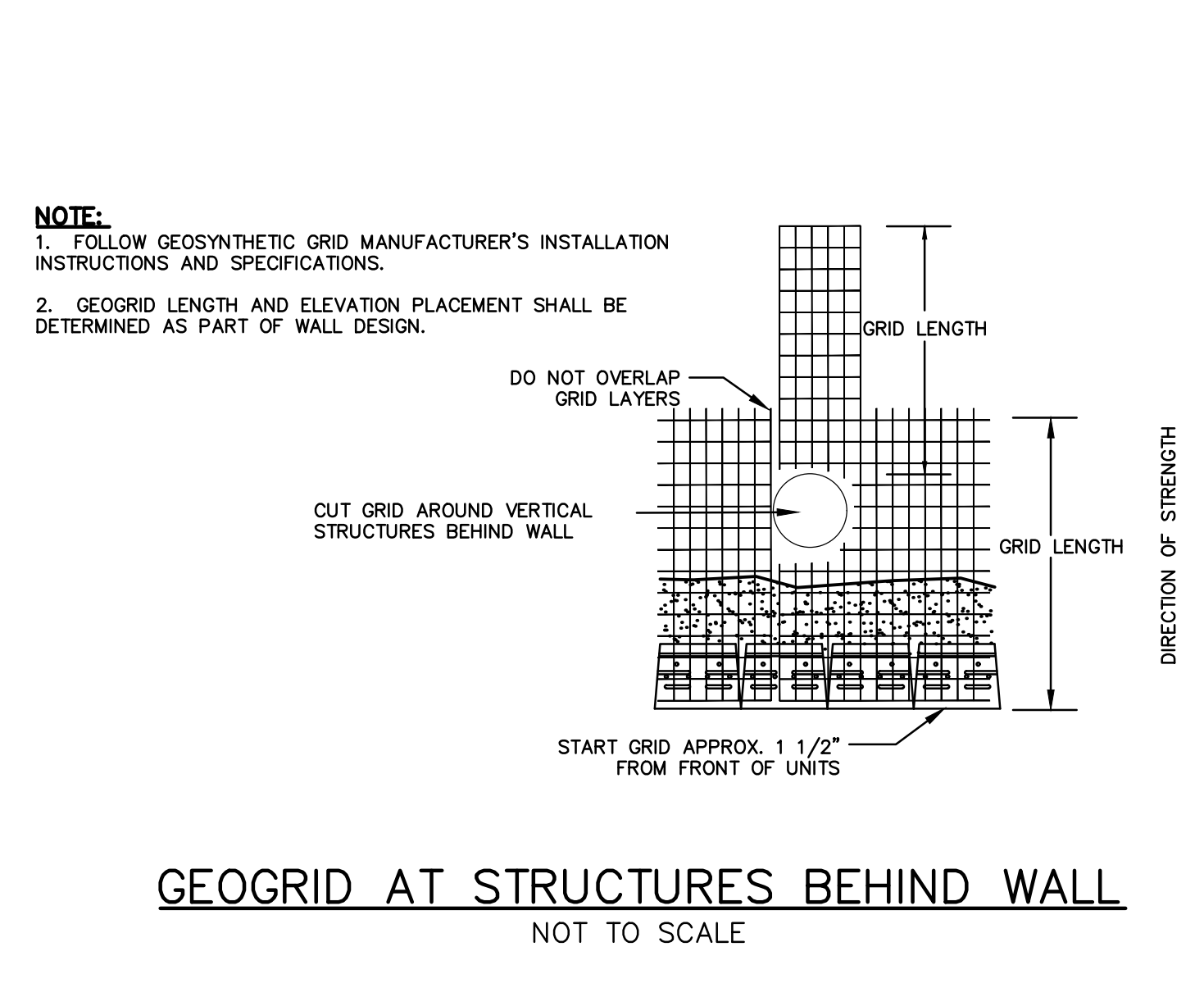
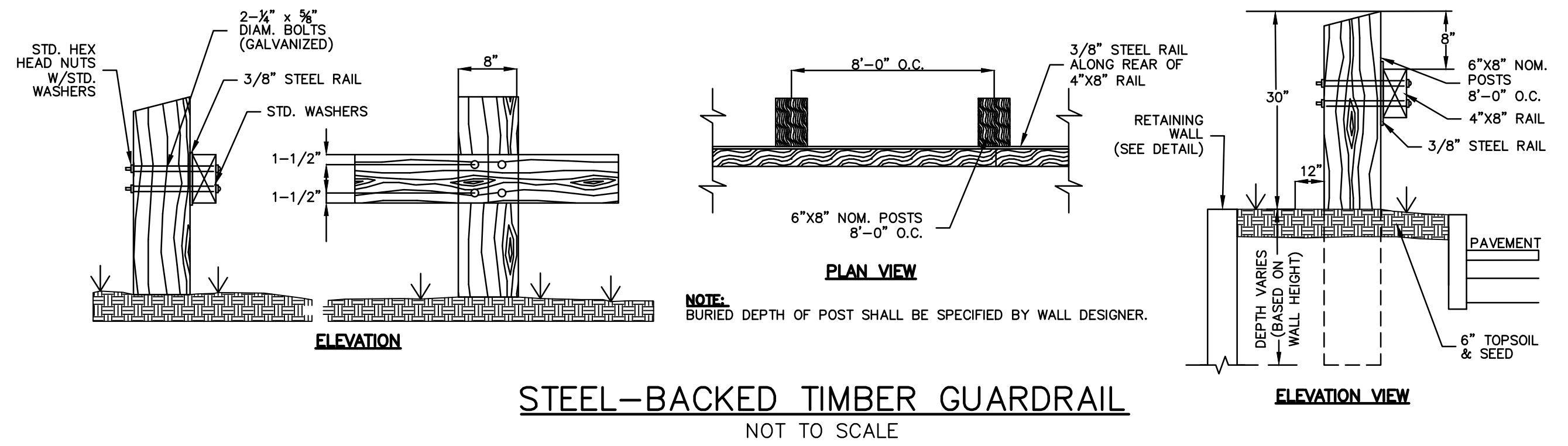
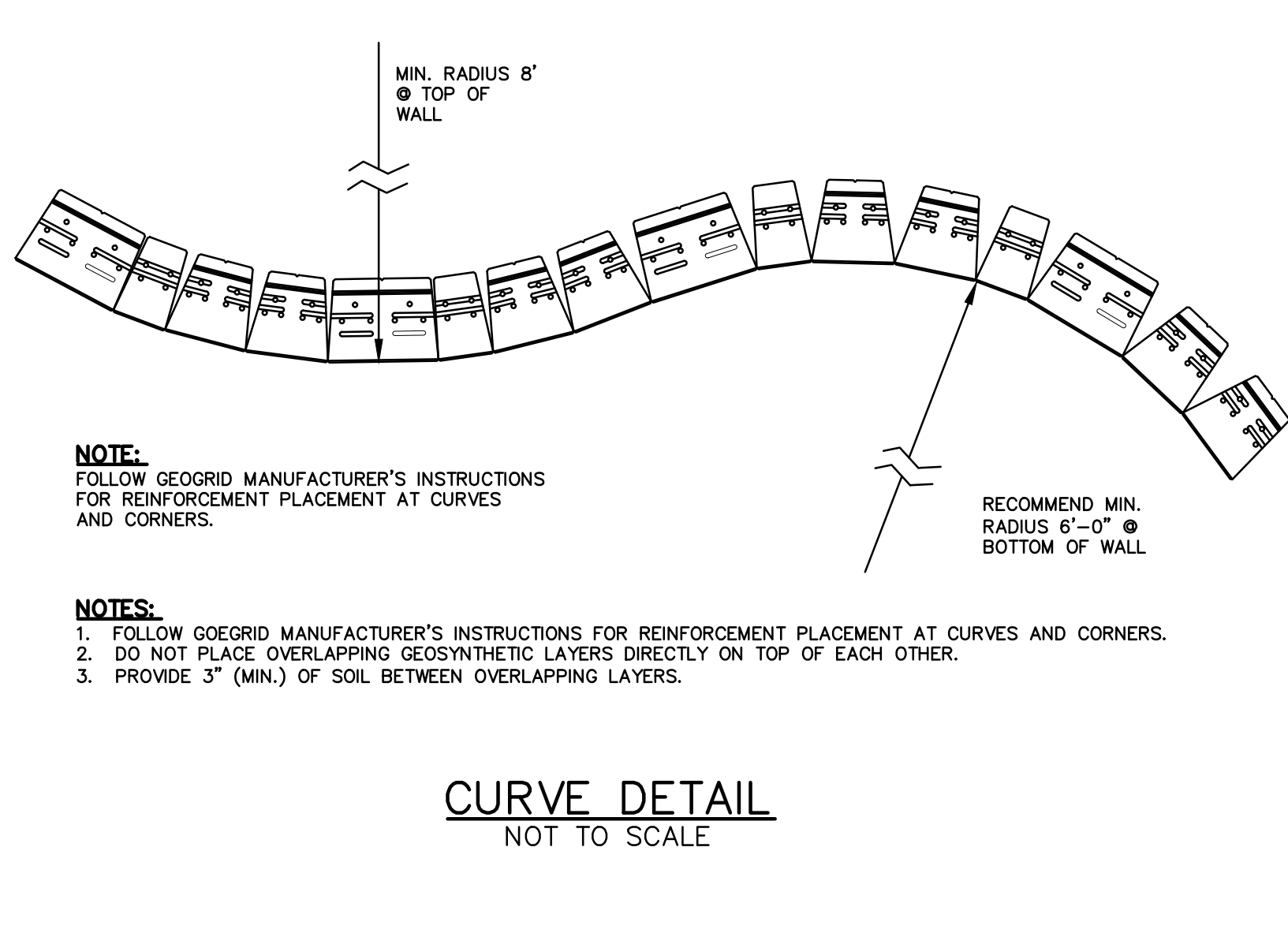
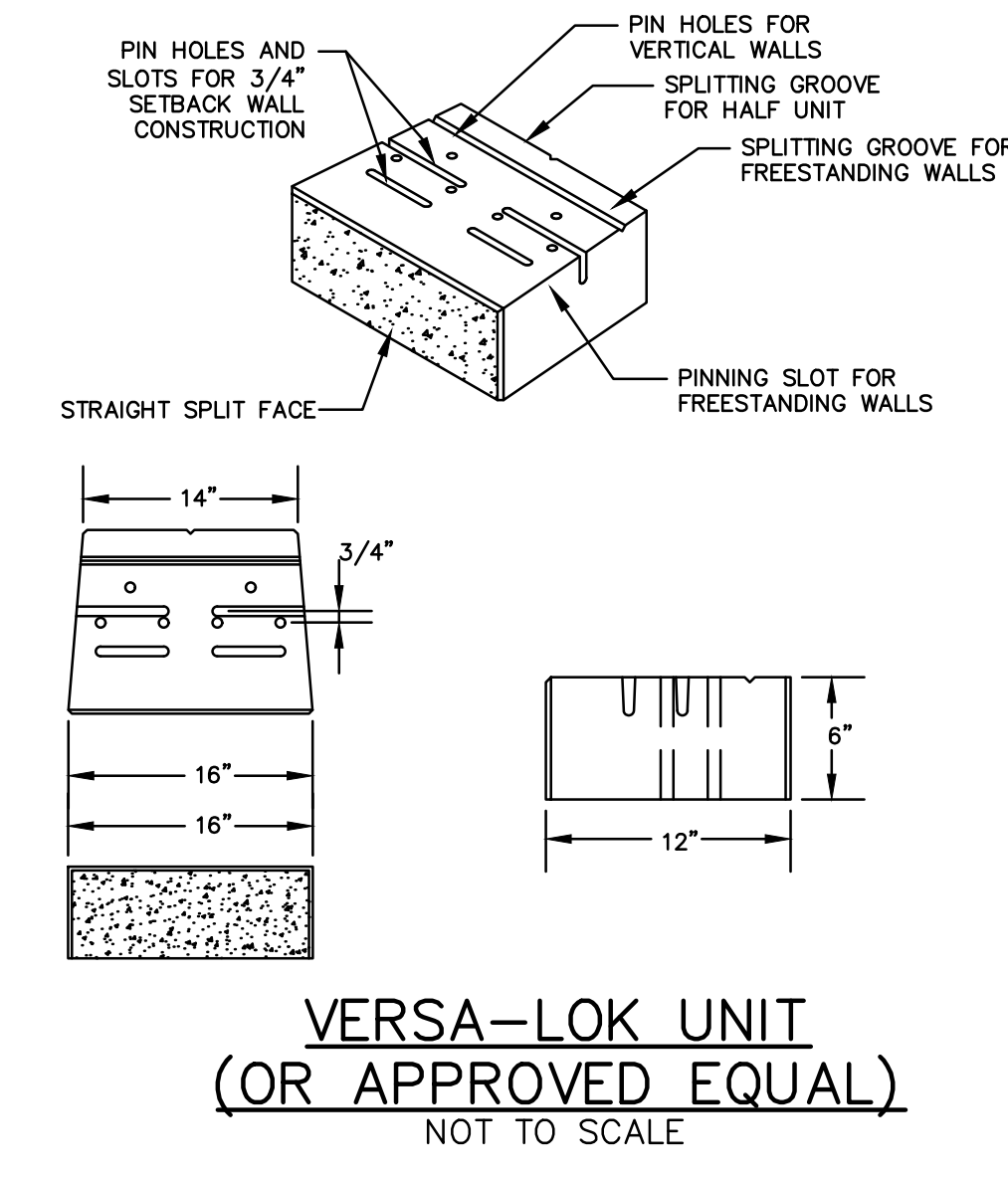
LEVELING PAD	
LEVELING PAD MATERIAL SHALL CONSIST OF HARD DURABLE PARTICLES OR FRAGMENTS OF STONE OR GRAVEL. FINE PARTICLES SHALL CONSIST OF NATURAL OR PROCESSED SAND. THE MATERIAL SHALL MEET THE FOLLOWING GRADATION:	
SIEVE SIZE	% PASSING BY WEIGHT
3 INCH	100
1 INCH	55-85
No. 4	27-52
No. 200*	0-12

\* FRACTION PASSING THE No. 4 SIEVE

**REINFORCED BACKFILL**  
IMPORTED REINFORCED BACKFILL MATERIAL SHALL BE CLEAN, FREE-DRAINING WELL GRADED GRANULAR SOIL WITH A MAXIMUM PARTICLE SIZE OF 4" AND NOT MORE THAN 12% BY WEIGHT PASSING THE #200 SIEVE.

ON-SITE MATERIAL SHALL NOT BE USED FOR REINFORCED BACKFILL MATERIAL UNLESS IT MEETS THE ABOVE NOTED REQUIREMENTS.

- DRAINAGE NOTES:**
- CONTRACTOR SHALL DIRECT SURFACE RUNOFF AWAY FROM THE WALL DURING CONSTRUCTION.
  - ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT OR OTHER SURFACE TREATMENT SHALL BE INSTALLED IN THE AREA OF THE WALL IMMEDIATELY AFTER THE WALL IS COMPLETE. OR OTHER MEASURES SHALL BE TAKE TO PROTECT THE WALL FROM RUNOFF.
- GENERAL NOTES:**
- ALL INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION "DESIGN & INSTALLATION GUIDELINES", BY VERSA-LOK. WHERE INFORMATION ON THESE PLANS CONFLICTS WITH THE GUIDELINES, THE PLANS SHALL SUPERSEDE.
  - STRIP ORGANIC SOILS FROM THE WALL AND GRID ALIGNMENT AREA.
  - BENCH CUT ALL EXCAVATED SLOPES.
  - DO NOT OVER EXCAVATE UNLESS DIRECTED TO DO SO BY THE GEOTECHNICAL ENGINEER.
  - GEOTECHNICAL ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN STANDARDS AND PARAMETERS.
  - MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE INDICATED ON THE WALL DESIGN DRAWINGS.
  - WHERE PERFORATED DRAINS ARE USED, PROVIDE OUTLETS AT THE ENDS OF THE WALL TO CLOSED DRAINAGE SYSTEM OR AT 20' INTERVALS, SEE DETAILS.
  - BACKFILL AND COMPACT THE FILL MATERIAL BEHIND THE WALL IN 12 INCH MAXIMUM LIFTS AS THE WALL IS INSTALLED.
  - COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. EACH LIFT SHALL BE TESTED AT INTERVALS NOT EXCEEDING 100 FEET OF WALL LENGTH.
  - COMPACTION SHALL BE TO 95% OF MAXIMUM MODIFIED PROCTOR DENSITY OF THE FILL MATERIAL (ASTM D-1557).
  - PULL GEOGRID TIGHT PRIOR TO BACKFILLING.
  - SEE PROFILE FOR FINISH GRADE AT TOP AND ENDS OF WALL.
  - SEE PROFILE FOR WALL LAYOUT INFORMATION.
  - COMPACTION OF AREAS LOCATED WITHIN 15 FEET OF THE TOP OF THE WALL SHALL BE PERFORMED WITH NON-VIBRATORY ROLLING EQUIPMENT. PLATE VIBRATORY TAMPERS SHALL BE USED IN AREAS WITHIN 5 FEET OF THE WALL.
  - GEOGRID CUT LENGTHS ARE MEASURED FROM THE FACE OF THE RETAINING WALL.
  - GEOSYNTHETIC SHALL BE PLACED WITH STRONGER DIRECTION PERPENDICULAR TO WALL FACE.
  - WHERE GUARDRAIL OR FENCE POSTS ARE INSTALLED SUCH THAT THEY WILL PENETRATE A GEOGRID LAYER, THE GEOGRID SHALL BE PRE-CUT AND SLEEVED SO AS NOT TO DISTURB THE GEOGRID WITH THE INSERTION OF THE POST. THE POST SHALL NOT BE FORCED THROUGH ANY LAYER OF GEOGRID. FORCING A POST THROUGH A GEOGRID LAYER WOULD COMPROMISE THE STRUCTURAL INTEGRITY OF THE GEOGRID AND, HENCE, THE RETAINING WALL SYSTEM.
  - ANY PLANTINGS SET BEHIND THE WALLS SHALL BE PLACED WITHOUT CUTTING OF THE GEOGRID REINFORCING LAYERS. THIS CAN BE ACCOMPLISHED BY SETTING PLANTINGS ABOVE THE GEOGRID LAYERS OR BEYOND THE LIMITS OF THE GEOGRID LAYERS.
  - INSTALLATION OF A VERTICAL SEGMENTAL RETAINING WALL REQUIRES THAT EXTRA ATTENTION BE GIVEN TO LEVELING OF THE BLOCK, AT ALL ELEVATIONS AND IN ALL DIRECTIONS.
  - IF CONDITIONS ARE DIFFERENT THAN THOSE STATED IN THESE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR MUST CONTACT THE DESIGN ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.
  - WALL DESIGNS SHALL CONSIDER EFFECTS OF SLOPE, TRAFFIC LOADS, AND/OR BUILDING LOADS AS REQUIRED.
  - ALL WALLS 4' OR GREATER REQUIRE INSTALLATION OF A SAFETY RAIL.



**Proposed Subdivision Road & Office Building Development**

Borthwick Forest, LLC

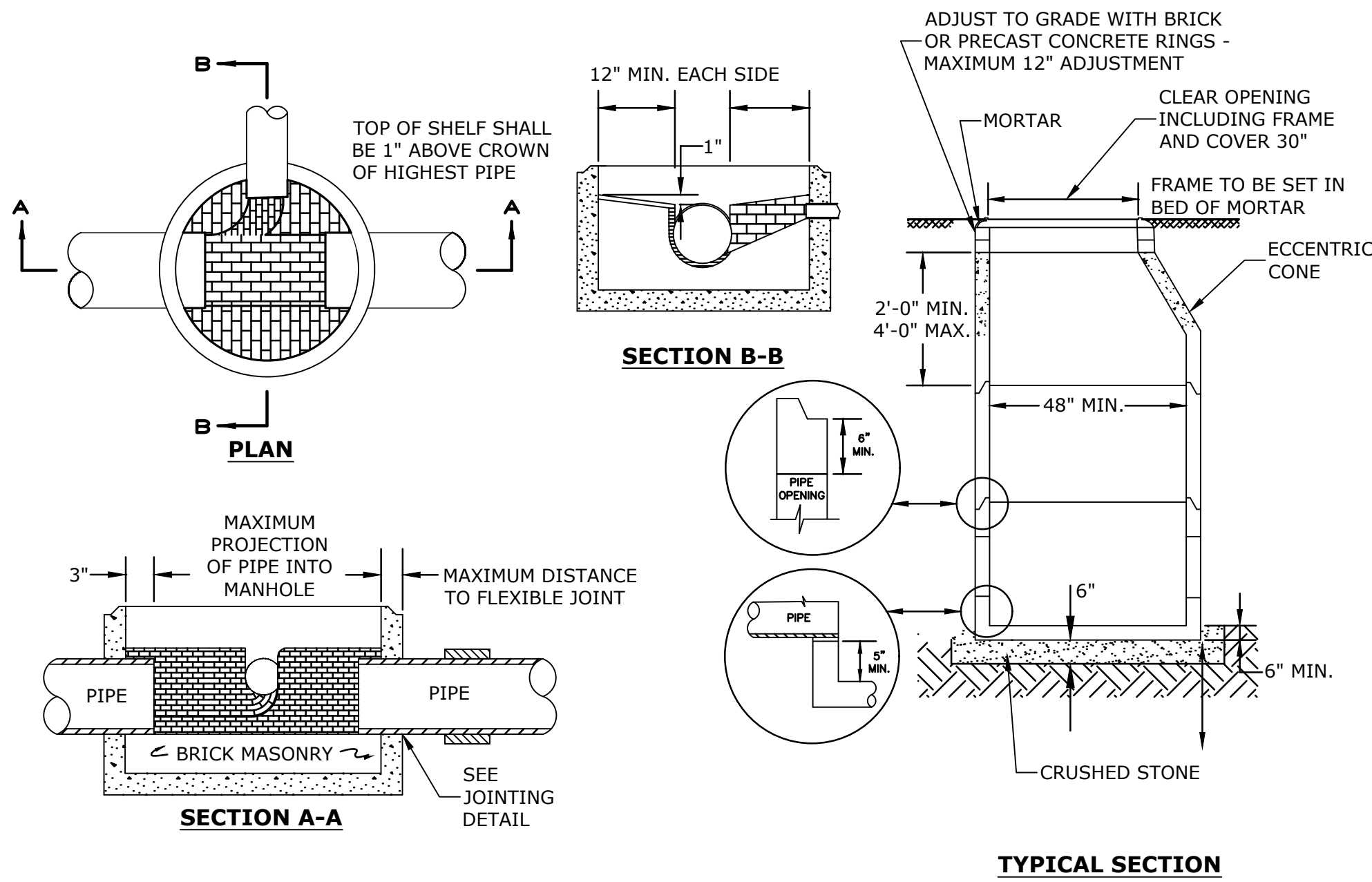
Portsmouth, New Hampshire

MARK	DATE	DESCRIPTION
K	3/25/2019	Construction Drawings
J	3/20/2019	Revised GMP Submission
I	3/4/2019	Rev Pricing Drawings / Admin Approval
H	5/8/2018	Submitted for Final Approval
G	2/26/2018	GMP Submission
F	2/6/2018	Planning Board Submission
E	1/12/2018	GMP Submission
D	6/2/2017	AsT Submission
C	5/11/2017	Planning Board Submission
B	4/24/2017	TAC & ConCom Submission
A	3/20/2017	TAC Submission

PROJECT NO:	K0076-13
DATE:	3/20/2017
FILE:	K0076-13 DTLS.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

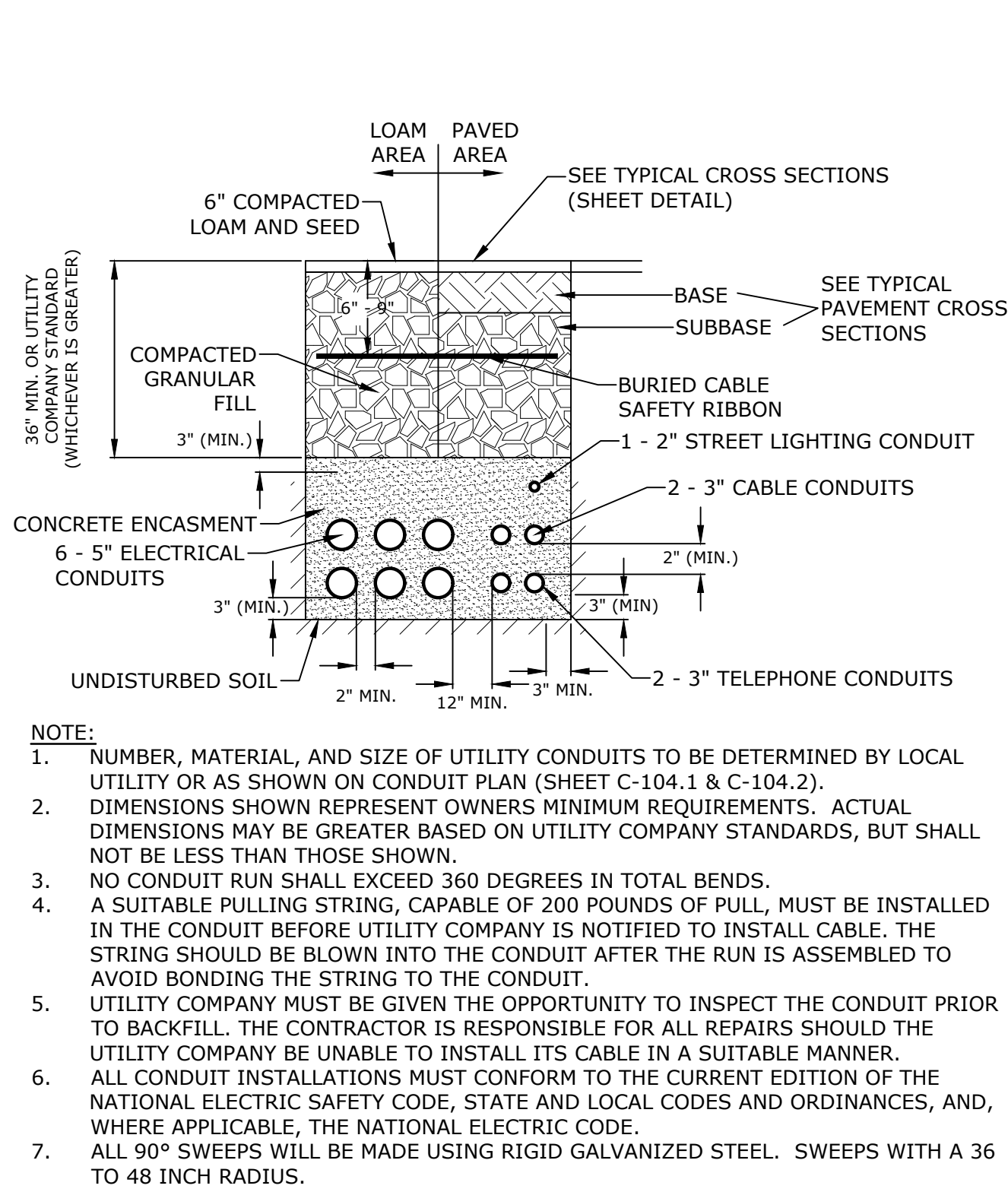


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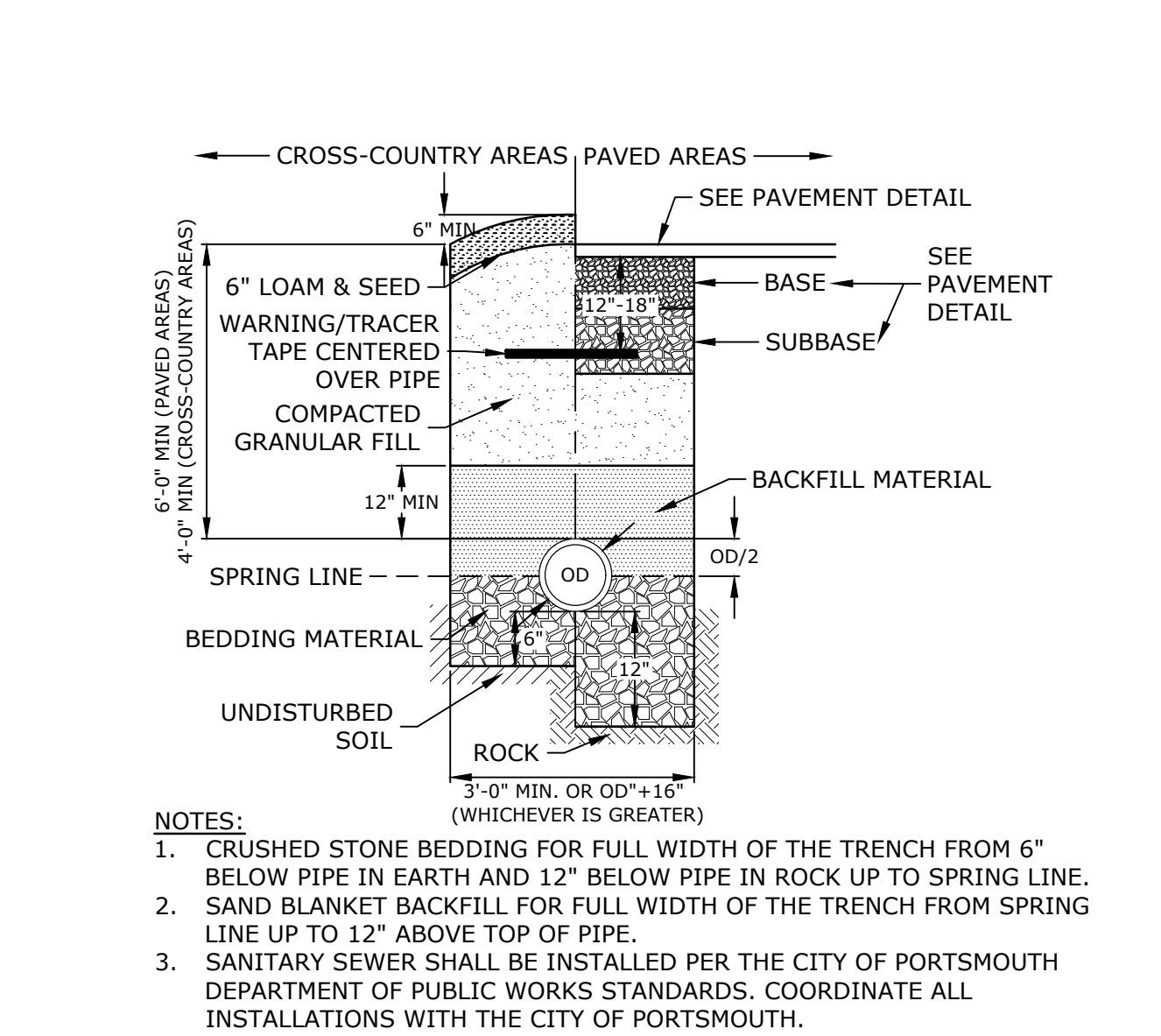


- NOTES:**
1. INVERT AND SHELF TO BE PLACED AFTER EACH LEAKAGE TEST.
  2. CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT.
  3. INVERT BRICKS SHALL BE LAID ON EDGE.
  4. BITUMINOUS WATERPROOF COATING TO BE APPLIED TO ENTIRE EXTERIOR OF MANHOLE.
  5. FRAMES AND COVERS: MANHOLE FRAMES AND COVERS WITHIN CITY RIGHT OF WAY SHALL BE CITY STANDARD HINGE COVERS MANUFACTURED BY E.J. FRAMES AND COVERS WILL BE PURCHASED FROM THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.
  6. HORIZONTAL JOINTS SHALL BE SEALED FOR WATER TIGHTNESS USING A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT.
  7. BARREL AND CONE SECTIONS SHALL BE PRECAST REINFORCED CONCRETE DESIGNED FOR H20 LOADING, AND CONFORMING TO ASTM C478-06.

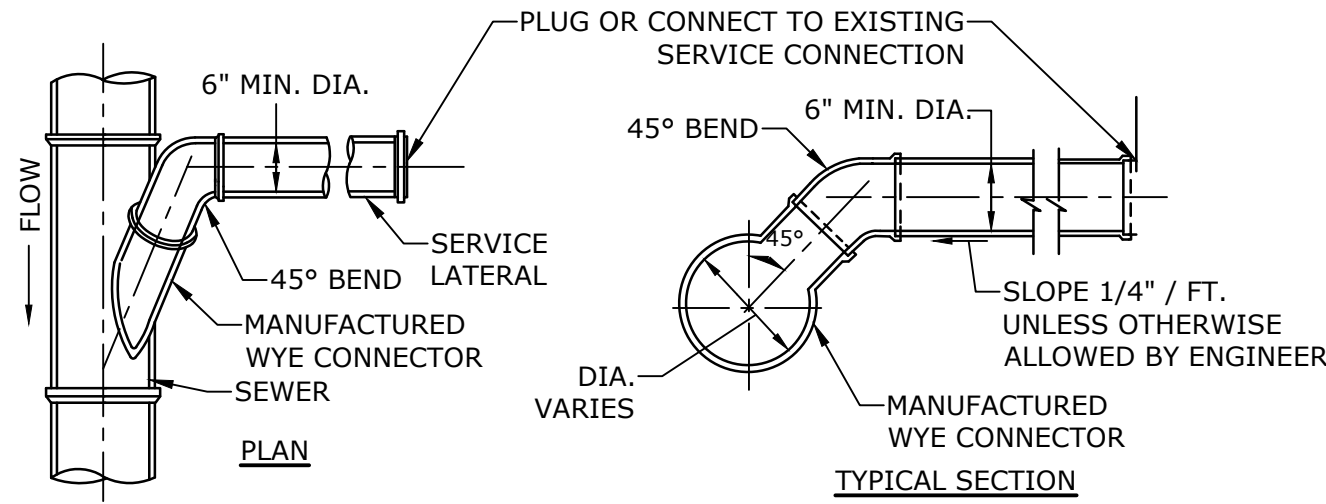
**SEWER MANHOLE**  
NO SCALE



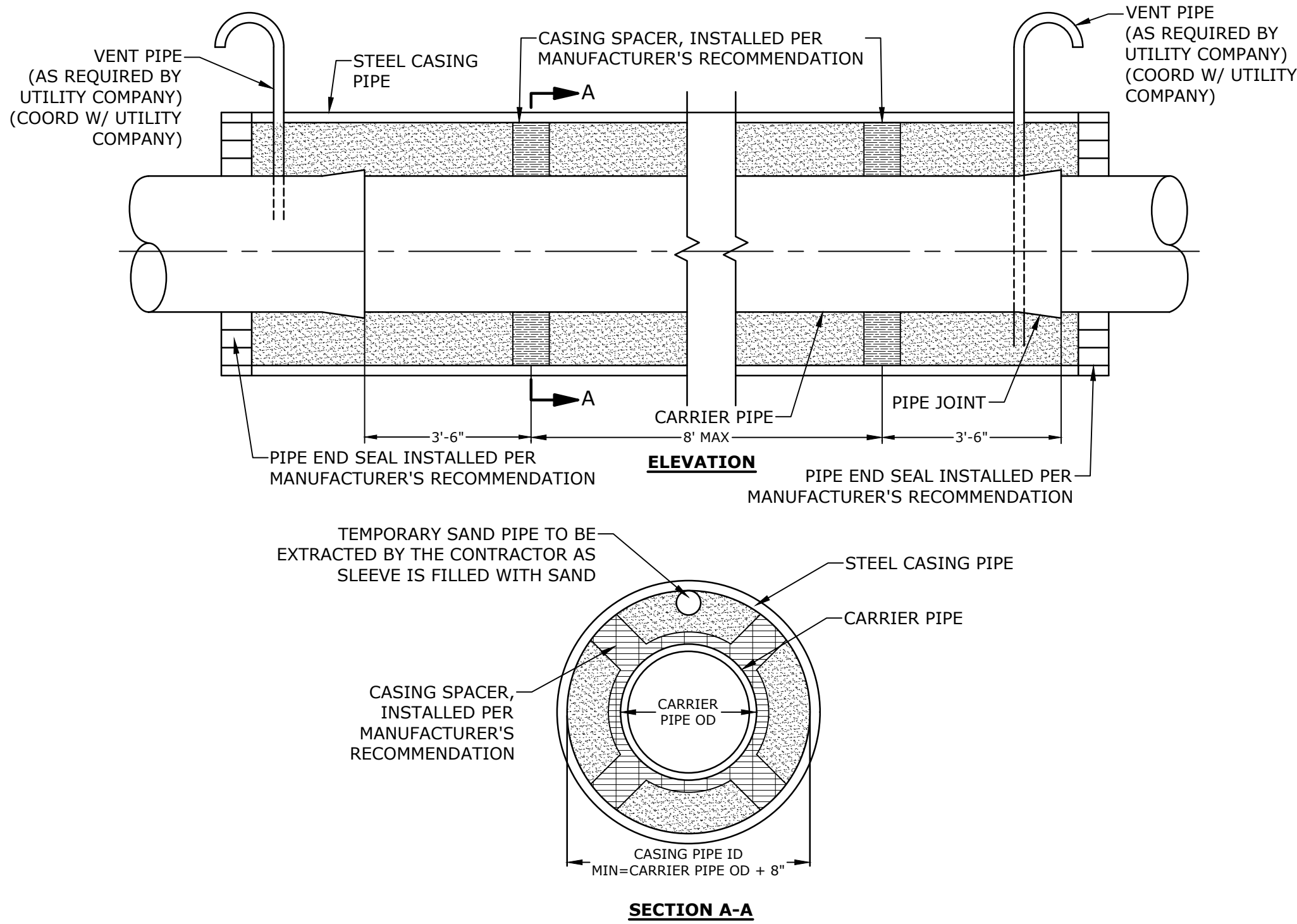
**ELECTRICAL AND COMMUNICATION CONDUIT**  
NO SCALE



**SEWER TRENCH**  
NO SCALE

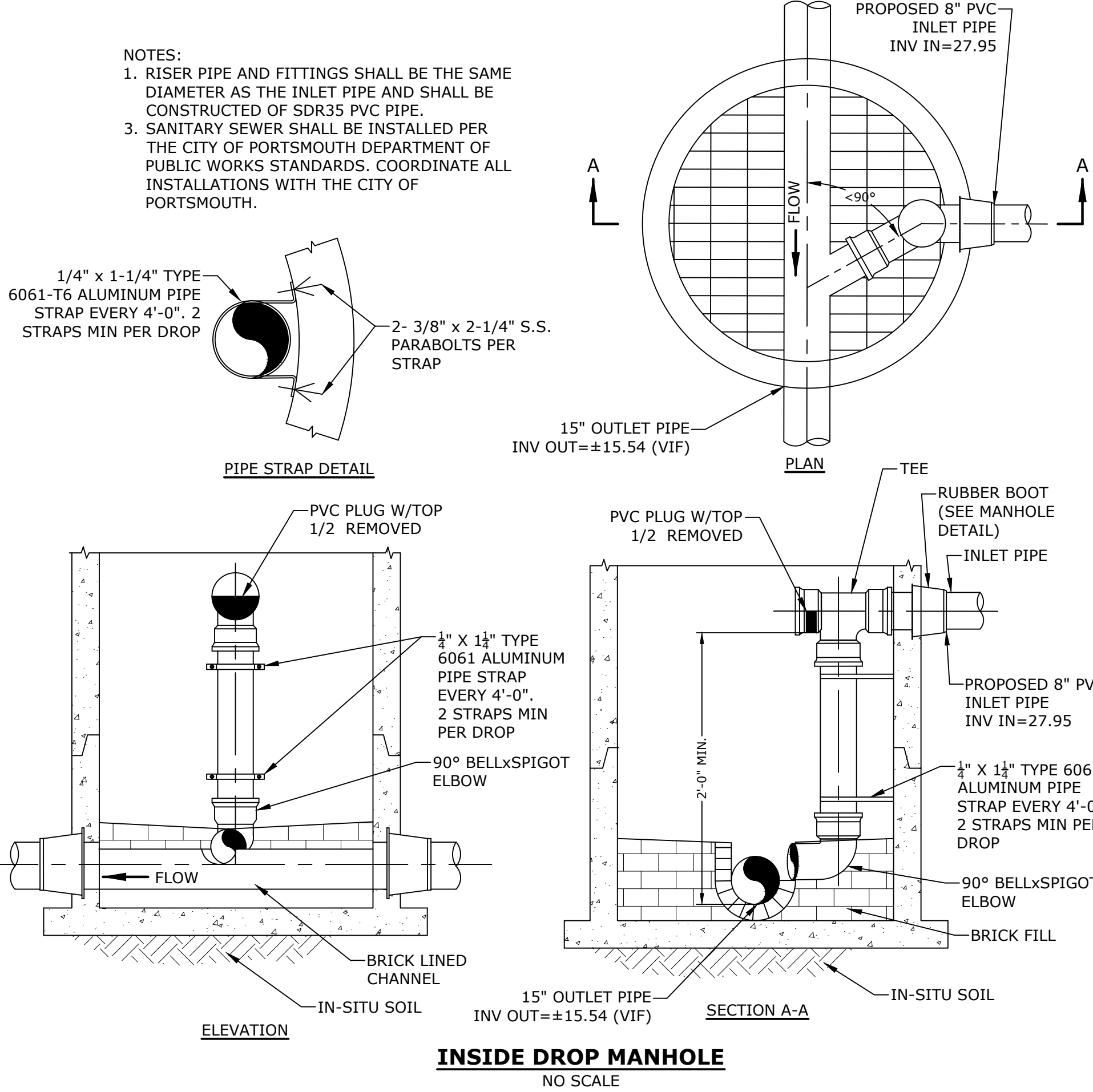


**STANDARD SERVICE LATERAL CONNECTION**  
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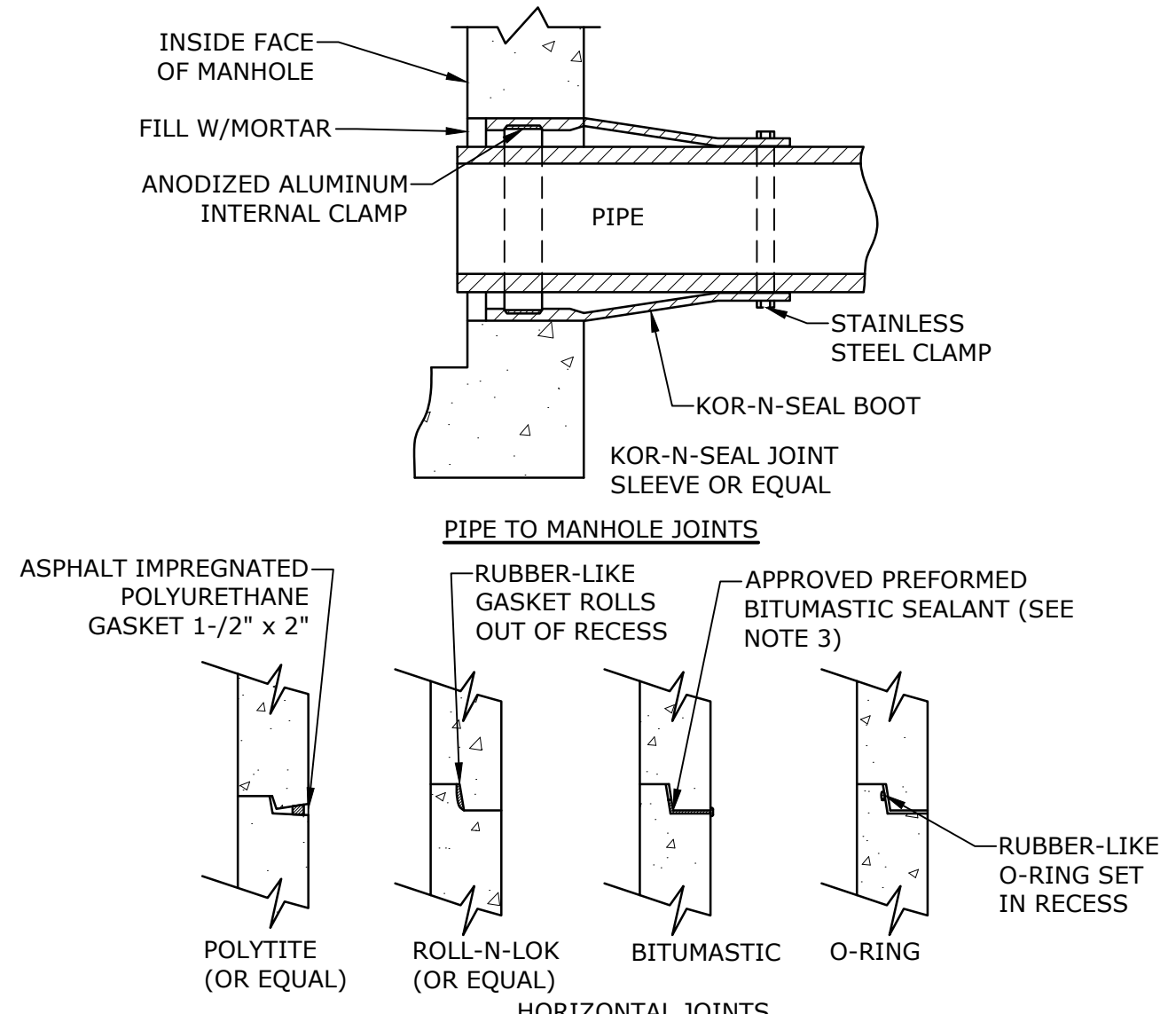


- NOTES:**
1. SEAL ENDS OF SLEEVE TO PREVENT MIGRATION OF MATERIAL AND WATER THROUGH ANNULAR SPACE BETWEEN CASING PIPE AND CARRIER PIPE
  2. STEEL CASING PIPE SHALL MEET COOPERS E-80 RAILROAD LOADING WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI AND SHALL CONFORM TO THE LATEST REVISIONS OF THE REQUIREMENTS OF A.W.A. STANDARDS FOR FABRICATING ELECTRICALLY WELDED STEEL WATER PIPES OR ITS EQUIVALENT.
  3. STEEL CASING PIPE JOINTS SHALL BE FULLY WELDED AROUND THE COMPLETE CIRCUMFERENCE OF THE PIPE.
  4. CONTRACTOR SHALL COORDINATE ALL UTILITY AND CARRIER PIPE WORK WITHIN THE RAIL ROAD RIGHT OF WAY WITH PAN-AM, EVERSOURCE, UNITIL, & AND THE CITY PORTSMOUTH DPW PRIOR TO CONSTRUCTION.

**UTILITY PIPELINE SLEEVE DETAIL (CARRIER PIPE)**  
NO SCALE



**INSIDE DROP MANHOLE**  
NO SCALE



- NOTES:**
1. HORIZONTAL JOINTS BETWEEN THE SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE PER CITY OF PORTSMOUTH DPW STANDARD AND SHALL BE SEALED FOR WATERTIGHTNESS USING A DOUBLE ROW ELASTOMERIC OR MASTIC-LIKE GASKET.
  2. PIPE TO MANHOLE JOINTS SHALL BE PER CITY OF PORTSMOUTH STANDARD.
  3. FOR BITUMASTIC TYPE JOINTS THE AMOUNT OF SEALANT SHALL BE SUFFICIENT TO FILL AT LEAST 75% OF THE JOINT CAVITY.
  4. ALL GASKETS, SEALANTS, MORTAR, ETC. SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' WRITTEN INSTRUCTIONS.

**MANHOLE JOINTS**  
NO SCALE



**Proposed Subdivision Road & Office Building Development**

Borthwick Forest, LLC

Portsmouth, New Hampshire


H	3/20/2019	Revised GMP Submission
G	3/4/2019	Rev Pricing Drawings / Admin Approval
F	10/22/2018	Rev. per NHDES Sewer Connection Permit Comments
E	6/13/2018	FOR NHDES Sewer Connection Permit Application
D	5/8/2018	Submitted for Final Approval
C	2/26/2018	GMP Submission
B	2/6/2018	Planning Board Submission
A	1/12/2018	GMP Submission
MARK	DATE	DESCRIPTION
PROJECT NO:	K0076-13	
DATE:	1/12/2018	
FILE:	K0076-13_DTLS.DWG	
DRAWN BY:	CML	
CHECKED:	PMC	
APPROVED:	BLM	

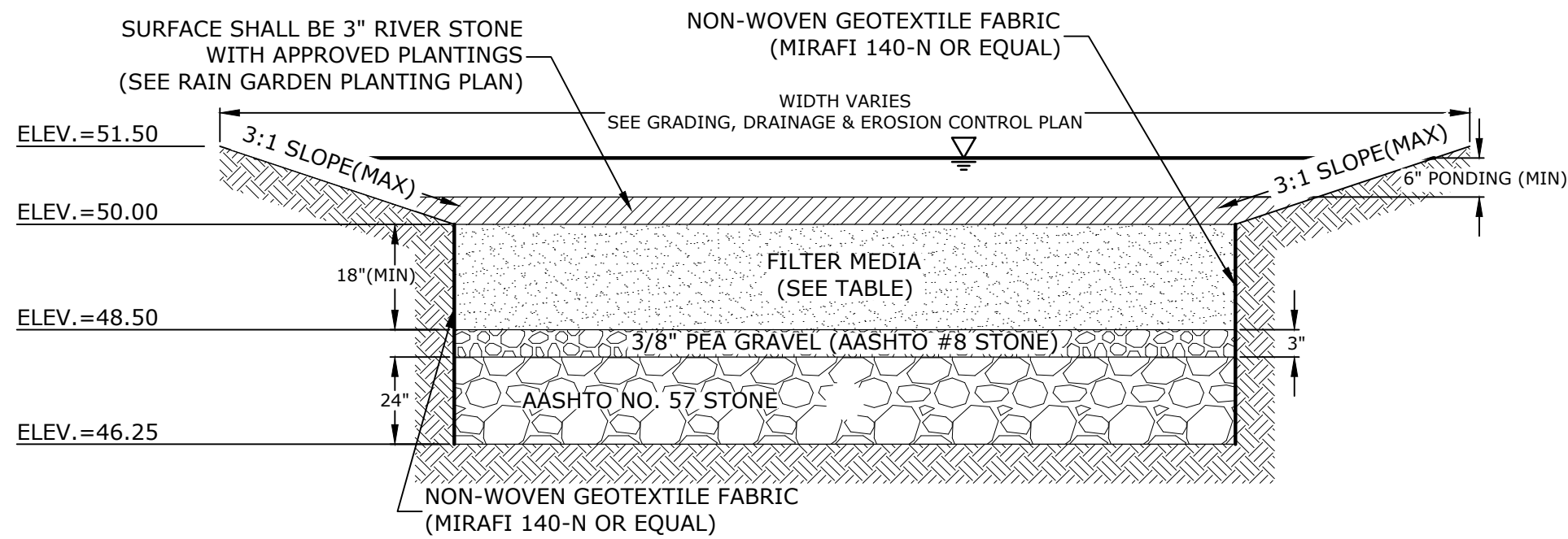
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SCALE: AS SHOWN

C-508



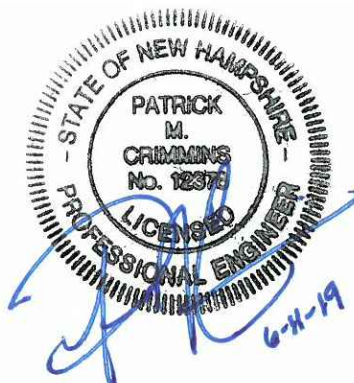
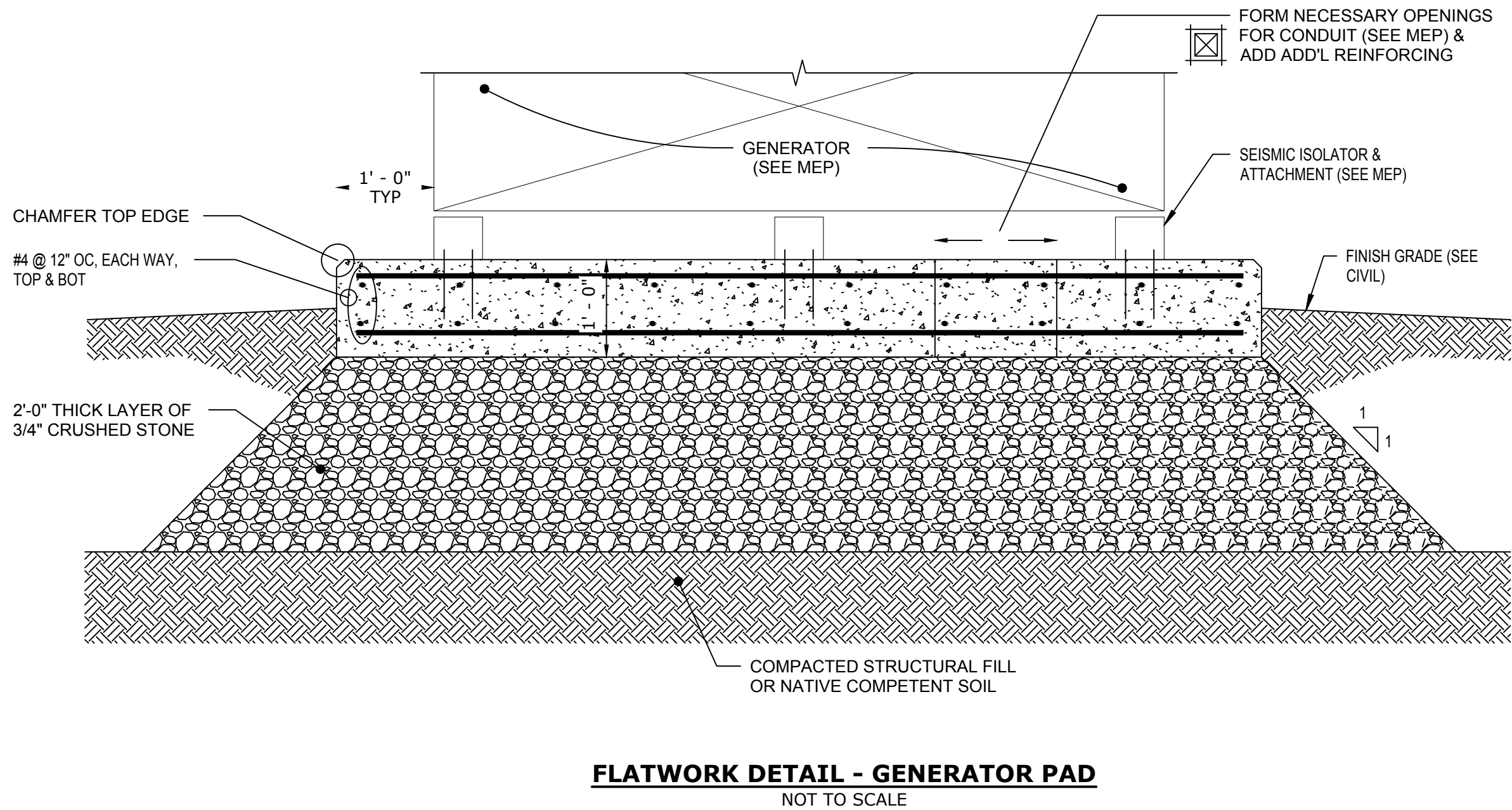
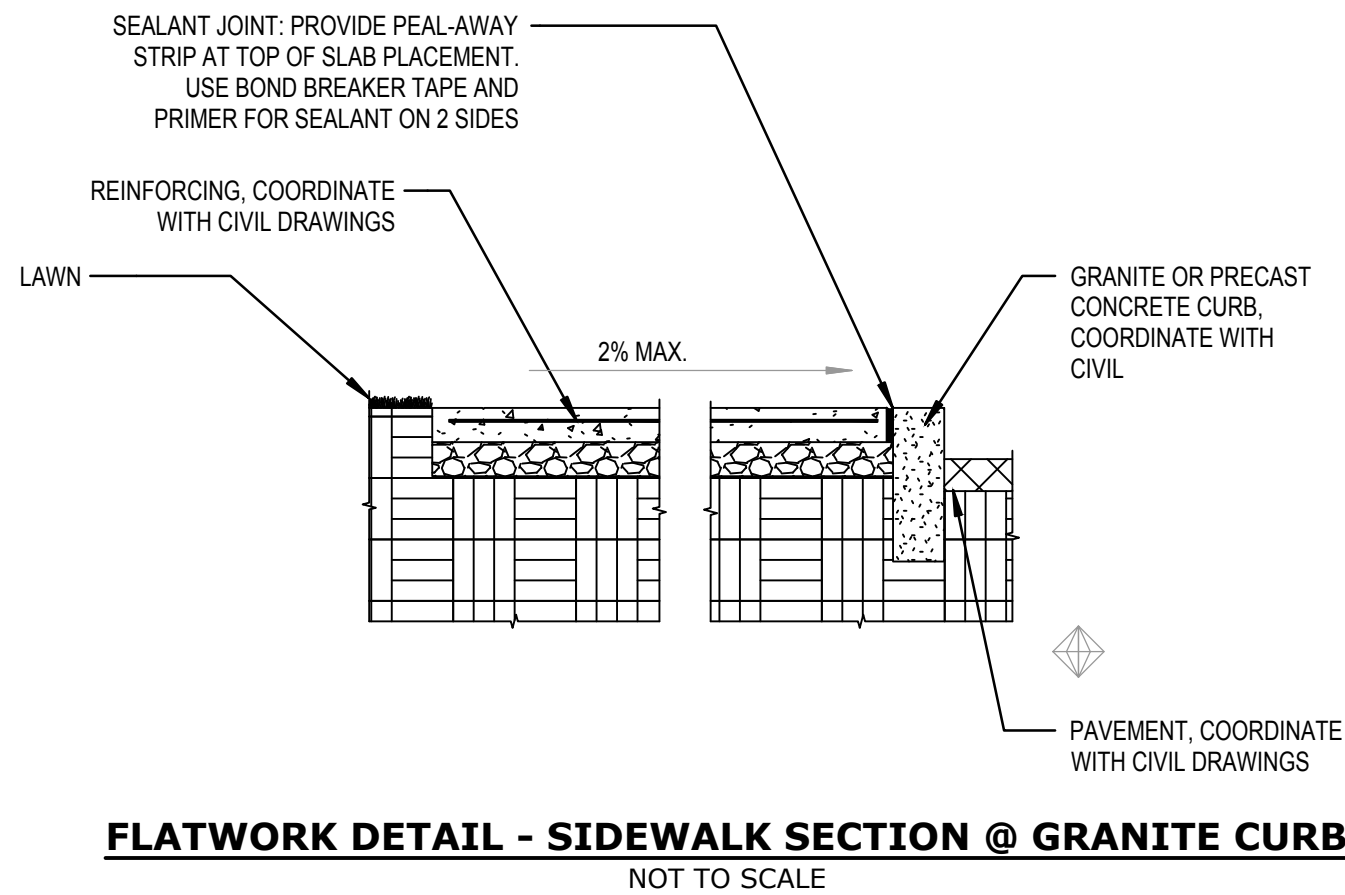
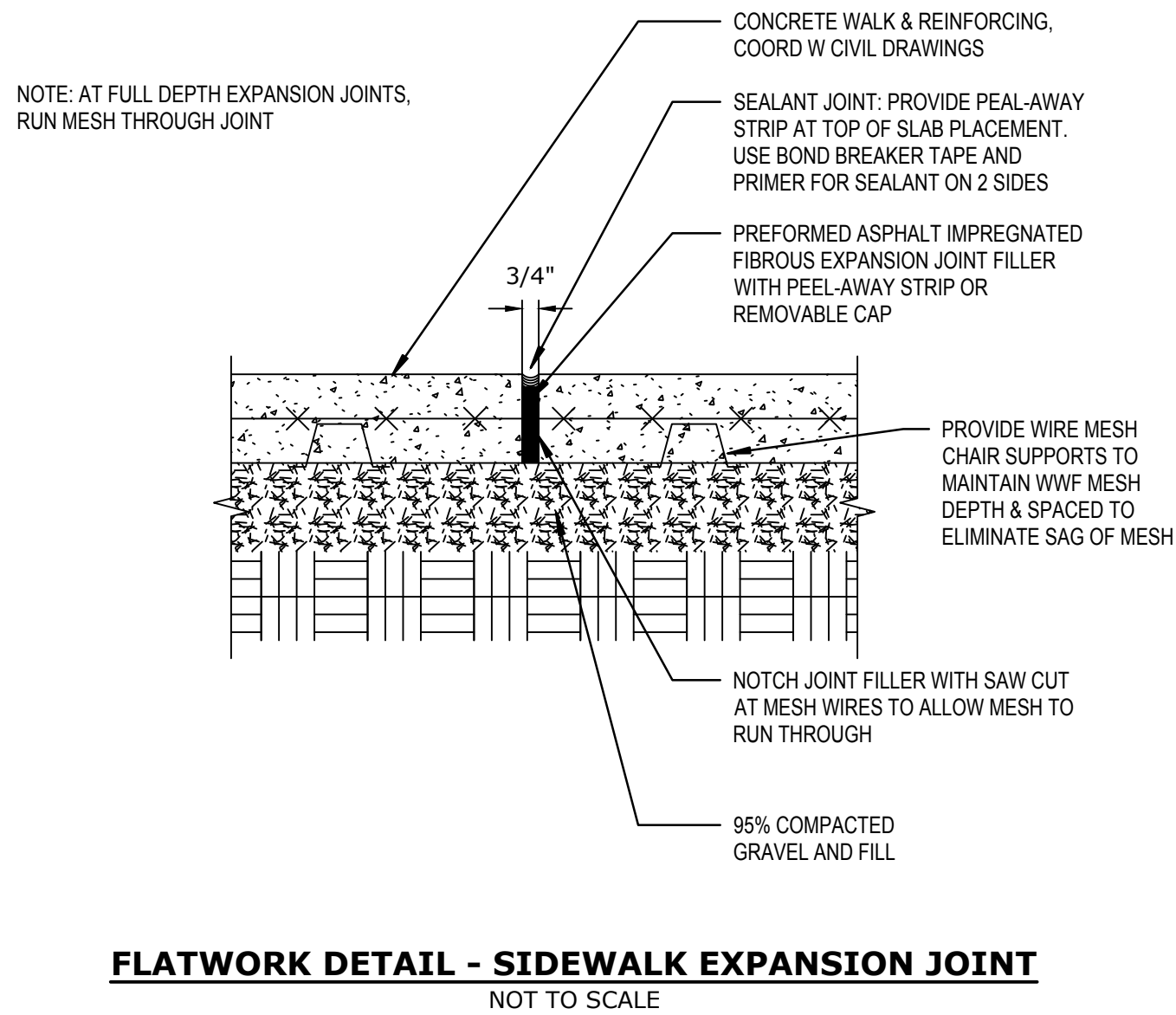
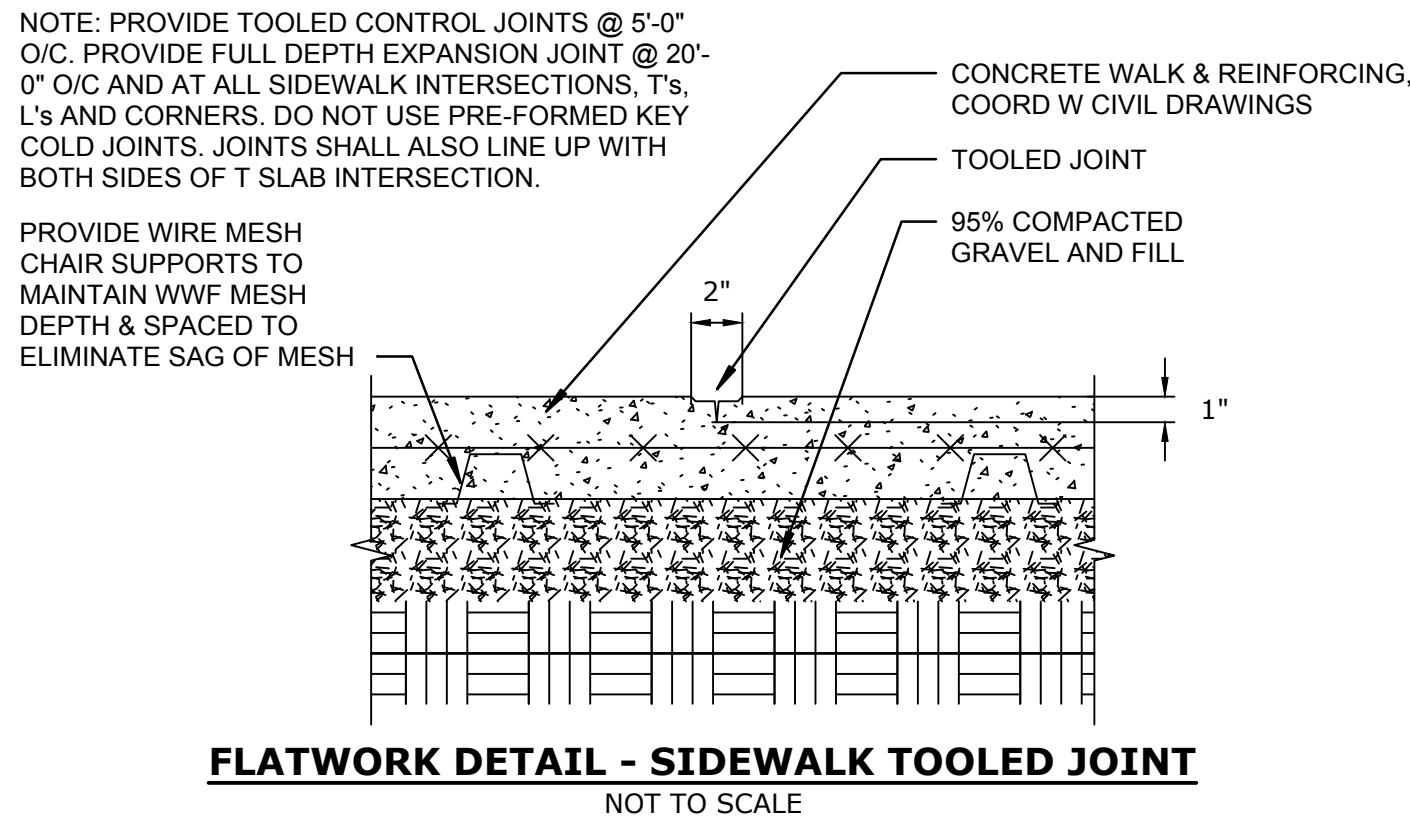
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FILTER MEDIA COMPOSITION:			
COMPONENT MATERIAL	PERCENT BY MIXTURE BY VOLUME	GRADATION OF MATERIAL SIEVE NO.	PERCENT PASSING
ASTM C-33 CONCRETE SAND	50-55	200	SEE NOTE #5
LOAMY SAND TOPSOIL	20-30	200	15-25
MODERATELY FINE SHREDDED BARK OR WOOD FIBER MULCH	20-30	200	5 MAX

- NOTES:
- RAIN GARDENS SHALL NOT BE PLACED INTO SERVICE UNTIL THE PRACTICE HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
  - DO NOT TRAFFIC EXPOSED SOIL SURFACES WITH CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL KEEP ALL EXCAVATION EQUIPMENT OUTSIDE OF THE LIMIT OF THE RAIN GARDEN.
  - SEE GRADING, DRAINAGE & EROSION CONTROL PLAN FOR LOCATIONS, LAYOUTS, AND ELEVATIONS.
  - THE SAND PORTION OF THE FILTER MEDIA SHALL MEET THE FOLLOWING GRADATION (ASTM C-33):
- | SIEVE SIZE | PERCENT PASSING |
|------------|-----------------|
| 3/8"       | 100             |
| #4         | 95-100          |
| #8         | 80-100          |
| #16        | 50-85           |
| #30        | 25-60           |
| #50        | 5-30            |
| #100       | 0-10            |

**FUTURE RAIN GARDENS**  
NO SCALE



**Proposed  
Subdivision Road  
& Office Building  
Development**

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

MARK	DATE	DESCRIPTION
D	6/11/2019	To PB for Amended Site Plan Approval
C	5/20/2019	Amended Site Plan Approval
B	3/25/2019	Construction Drawings
A	3/20/2019	Revised GMP Submission

PROJECT NO:	K0076-13
DATE:	3/20/2019
FILE:	K0076-13_DTLS.DWG
DRAWN BY:	CML
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APPROVED:	BLM

**DETAILS SHEET**

SCALE: AS SHOWN

**C-509**

FLATWORK DETAILS  
PROVIDED BY PROCON,  
INC. ON MARCH 14, 2019





Statistics				
Description	Symbol	Avg	Max	Min
Front sidewalk	◇	3.2 f.c.	10.4 f.c.	0.4 f.c.
Parking	+	3.0 f.c.	10.1 f.c.	0.4 f.c.
Rear sidewalk	□	3.6 f.c.	11.8 f.c.	0.7 f.c.

Luminaire Locations											
		Location				Aim					
No.	Label	X	Y	Z	MH	Orientation	Tilt	X	Y	Z	
1	A	115.01	-181.45	19.50	19.50	360.00	0.00	115.01	-180.20	0.00	
2	A	-157.73	-145.89	19.50	19.50	44.07	0.00	-158.86	-145.00	0.00	
3	A	213.68	-129.07	19.50	19.50	270.00	0.00	212.43	-129.07	0.00	
4	A	-193.75	-75.92	19.50	19.50	90.00	0.00	-192.54	-75.92	0.00	
5	A	213.68	-57.91	19.50	19.50	270.00	0.00	212.43	-57.91	0.00	
6	A	-193.75	-7.95	19.50	19.50	90.00	0.00	-192.54	-7.95	0.00	
7	A	213.68	58.93	19.50	19.50	270.00	0.00	212.43	58.93	0.00	
8	A	-193.75	68.49	19.50	19.50	90.00	0.00	-192.54	68.49	0.00	
9	A	-193.75	119.55	19.50	19.50	90.00	0.00	-192.54	119.55	0.00	
10	A	137.74	147.56	19.50	19.50	235.58	0.00	136.71	146.85	0.00	
11	A	-172.07	181.49	19.50	19.50	103.83	0.00	-170.86	181.19	0.00	
2	B	-48.84	-116.49	19.50	19.50	360.00	0.00	-48.84	-115.24	0.00	
3	B	56.60	-116.49	19.50	19.50	360.00	0.00	56.60	-115.24	0.00	
4	B	105.00	-57.91	19.50	19.50	270.00	0.00	103.75	-57.91	0.00	
6	B	104.99	58.93	19.50	19.50	270.00	0.00	103.74	58.93	0.00	
1	C	-101.39	-37.11	12.00	12.00	180.00	0.00	-101.39	-37.11	0.00	
2	C	-75.39	-37.11	12.00	12.00	180.00	0.00	-75.39	-37.11	0.00	
3	C	-49.39	-37.11	12.00	12.00	180.00	0.00	-49.39	-37.11	0.00	
4	C	-99.36	94.22	12.00	12.00	0.00	0.00	-99.36	94.22	0.00	
5	C	-74.36	94.22	12.00	12.00	0.00	0.00	-74.36	94.22	0.00	
6	C	-49.36	94.22	12.00	12.00	0.00	0.00	-49.36	94.22	0.00	
1	E	-121.79	-73.37	3.50	3.50	270.00	0.00	-121.79	-73.37	0.00	
2	E	-121.79	-49.87	3.50	3.50	270.00	0.00	-121.79	-49.87	0.00	
2	E	-20.14	-46.31	3.50	3.50	180.00	0.00	-20.14	-46.31	0.00	
4	E	-8.16	-46.31	3.50	3.50	180.00	0.00	-8.16	-46.31	0.00	
5	E	13.82	-46.31	3.50	3.50	180.00	0.00	13.82	-46.31	0.00	
6	E	-121.79	-25.37	3.50	3.50	270.00	0.00	-121.79	-25.37	0.00	
7	E	35.82	-23.83	3.50	3.50	90.00	0.00	35.82	-23.83	0.00	
8	E	-121.79	-1.87	3.50	3.50	270.00	0.00	-121.79	-1.87	0.00	
9	E	35.83	-1.03	3.50	3.50	90.00	0.00	35.83	-1.03	0.00	
10	E	-121.79	59.14	3.50	3.50	270.00	0.00	-121.79	59.14	0.00	
11	E	36.10	59.66	3.50	3.50	90.00	0.00	36.10	59.66	0.00	
12	E	-121.79	82.64	3.50	3.50	270.00	0.00	-121.79	82.64	0.00	
13	E	36.10	83.66	3.50	3.50	90.00	0.00	36.10	83.66	0.00	
14	F	-121.79	106.64	3.50	3.50	270.00	0.00	-121.79	106.14	0.00	
15	E	-121.79	129.64	3.50	3.50	270.00	0.00	-121.79	129.64	0.00	
1	F	35.84	-46.32	3.50	3.50	0.00	0.00	35.84	-46.32	0.00	
2	F	35.84	21.48	3.50	3.50	0.00	0.00	35.84	21.48	0.00	
3	F	36.10	35.66	3.50	3.50	90.00	0.00	36.10	35.66	0.00	
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2	G	-115.20	16.41	13.00	13.00	0.00	0.00	-115.20	16.41	0.00	
3	G	-127.20	28.41	13.00	13.00	0.00	0.00	-127.20	28.41	0.00	
4	G	-115.20	28.41	13.00	13.00	0.00	0.00	-115.20	28.41	0.00	
5	G	-127.20	40.41	13.00	13.00	0.00	0.00	-127.20	40.41	0.00	
6	G	-115.20	40.41	13.00	13.00	0.00	0.00	-115.20	40.41	0.00	

Schedule										
Symbol	Label	Quantity	Manufacturer	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
□ o a	A	11	Lithonia Lighting	DSX2 LED P1 50K T4M MVOLT with Inceoxide shield	LED	1	DSX2_LED_P1_50K_T4M_M_VOLT_HS.ies	14580	1	140
□ a	B	4	Lithonia Lighting	DSX2 LED P4 50K T5M MVOLT	LED	1	DSX2_LED_P4_50K_T5M_M_VOLT.ies	35104	1	270
□	C	6	Lithonia Lighting	DSXW1 LED WITH (1) 10 LED LIGHT ENGINES, TYPE T3M OPTIC, 5000K, @ 350ma	LED	1	DSXW1_LED_10C_350_50K_T3M_MVOLT.ies	1497	1	13.3
□	D	0	Lithonia Lighting	DSXW2 LED WITH 2 LIGHT ENGINES, 20 LED's, 350ma DRIVER, 5000K LED, TYPE 4 MEDIUM OPTIC	LED	1	DSXW2_LED_20C_350_50K_T4M_MVOLT.ies	2977	1	25
⊙	E	15	Lithonia Lighting	D-SERIES BOLLARD WITH 12 5000K LEDS OPERATED AT 350ma AND ASYMMETRIC DISTRIBUTION	LED	1	DSXB_LED_12C_350_50K_ASY.ies	1291	1	16
⊙	F	3	Lithonia Lighting	D-SERIES BOLLARD WITH 16 5000K LEDS OPERATED AT 350ma AND SYMMETRIC DISTRIBUTION	LED	1	DSXB_LED_16C_350_50K_SY.ies	1685	1	20
⊙	G	6	Lithonia Lighting	6IN LDW, 3500K, 1500LM, 80CRI, CLEAR, MATTE DIFFUSE REFLECTOR	LED	1	LDN6_35_15_LOSAR_ID.ies	1365	1	20.48

Plan View  
Scale: 1"=20'





Statistics				
Description	Symbol	Avg	Max	Min
Front sidewalk	◊	3.2 fc	10.4 fc	0.4 fc
Future Parking	×	3.0 fc	7.5 fc	0.7 fc
parking	+	3.2 fc	10.1 fc	0.4 fc
Rear sidewalk	□	3.6 fc	11.8 fc	0.7 fc

Luminaire Locations												
Location												
Aim												
No.	Label	X	Y	Z	MH	Orientation	Tilt	X	Y	Z		
1	A	115.01	-181.45	19.50	19.50	360.00	0.00	115.01	-180.20	0.00		
2	A	-157.73	-145.89	19.50	19.50	44.07	0.00	-156.86	-145.90	0.00		
3	A	319.46	-129.07	19.50	19.50	270.00	0.00	318.21	-129.07	0.00		
4	A	-103.70	-75.92	10.50	19.50	90.00	0.00	-102.54	-75.92	0.00		
5	A	319.46	-56.51	19.50	19.50	270.00	0.00	318.21	-56.51	0.00		
6	A	-193.79	-7.95	19.50	19.50	90.00	0.00	-192.54	-7.95	0.00		
7	A	319.46	58.93	19.50	19.50	270.00	0.00	318.21	58.93	0.00		
8	A	-193.79	68.49	19.50	19.50	90.00	0.00	-192.54	68.49	0.00		
9	A	-193.79	119.55	19.50	19.50	90.00	0.00	-192.54	119.55	0.00		
10	A	137.74	147.56	19.50	19.50	235.58	0.00	136.71	146.85	0.00		
11	A	-102.07	181.49	19.50	19.50	103.83	0.00	-100.86	181.19	0.00		
1	B	213.69	-129.07	19.50	19.50	270.00	0.00	212.44	-129.07	0.00		
2	B	-48.84	-116.49	19.50	19.50	360.00	0.00	-48.84	-115.24	0.00		
3	B	56.60	-116.49	19.50	19.50	360.00	0.00	56.60	-115.24	0.00		
4	B	104.99	-57.79	19.50	19.50	270.00	0.00	103.74	-57.79	0.00		
5	B	213.78	-57.79	19.50	19.50	270.00	0.00	212.53	-57.79	0.00		
6	B	104.99	58.83	19.50	19.50	270.00	0.00	103.74	58.83	0.00		
7	B	213.69	58.93	19.50	19.50	270.00	0.00	212.44	58.93	0.00		
1	C	-101.39	-37.11	12.00	12.00	180.00	0.00	-101.39	-37.11	0.00		
2	C	-75.39	-37.11	12.00	12.00	180.00	0.00	-75.39	-37.11	0.00		
3	C	-49.39	-37.11	12.00	12.00	180.00	0.00	-49.39	-37.11	0.00		
4	C	-99.36	94.22	12.00	12.00	0.00	0.00	-99.36	94.22	0.00		
5	C	-74.36	94.22	12.00	12.00	0.00	0.00	-74.36	94.22	0.00		
6	C	-49.36	94.22	12.00	12.00	0.00	0.00	-49.36	94.22	0.00		
1	E	-121.79	-73.37	3.50	3.50	270.00	0.00	-121.79	-73.37	0.00		
2	F	-121.79	-49.87	3.50	3.50	270.00	0.00	-121.79	-49.87	0.00		
3	E	-30.14	-46.34	3.50	3.50	180.00	0.00	-30.14	-46.34	0.00		
4	E	-8.16	-46.31	3.50	3.50	180.00	0.00	-8.16	-46.31	0.00		
5	E	13.62	-46.31	3.50	3.50	180.00	0.00	13.62	-46.31	0.00		
6	E	-121.79	-25.37	3.50	3.50	270.00	0.00	-121.79	-25.37	0.00		
7	E	35.82	-23.83	3.50	3.50	90.00	0.00	35.82	-23.83	0.00		
8	E	-121.79	-1.87	3.50	3.50	270.00	0.00	-121.79	-1.87	0.00		
9	F	35.83	-1.03	3.50	3.50	90.00	0.00	35.83	-1.03	0.00		
10	E	-121.79	59.14	3.50	3.50	270.00	0.00	-121.79	59.14	0.00		
11	E	36.10	59.66	3.50	3.50	90.00	0.00	36.10	59.66	0.00		
12	E	-121.79	82.64	3.50	3.50	270.00	0.00	-121.79	82.64	0.00		
13	E	36.10	83.66	3.50	3.50	90.00	0.00	36.10	83.66	0.00		
14	E	-121.79	106.14	3.50	3.50	270.00	0.00	-121.79	106.14	0.00		
15	E	-121.79	129.64	3.50	3.50	270.00	0.00	-121.79	129.64	0.00		
1	F	35.84	-46.32	3.50	3.50	0.00	0.00	35.84	-46.32	0.00		
2	F	35.84	21.48	3.50	3.50	0.00	0.00	35.84	21.48	0.00		
3	F	36.10	35.66	3.50	3.50	90.00	0.00	36.10	35.66	0.00		
1	G	-127.20	16.41	13.00	13.00	0.00	0.00	-127.20	16.41	0.00		
2	G	-115.20	16.41	13.00	13.00	0.00	0.00	-115.20	16.41	0.00		
3	G	-127.20	28.41	13.00	13.00	0.00	0.00	-127.20	28.41	0.00		
4	G	-115.20	28.41	13.00	13.00	0.00	0.00	-115.20	28.41	0.00		
5	G	-127.20	40.41	13.00	13.00	0.00	0.00	-127.20	40.41	0.00		
6	G	-115.20	40.41	13.00	13.00	0.00	0.00	-115.20	40.41	0.00		

Schedule												
Symbol	Label	Quantity	Manufacturer	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage	Catalog Number	
	A	11	Lithonia Lighting	DSX2 LED P1 SOK T4M MVOLT with hexacode shield	LED	1	DSX2_LED_P1_SOK_T4M_M_Volt.rls	14580	1	140	DSX2 LED P1 SOK T4M MVOLT HS	
	B	7	Lithonia Lighting	DSX2 LED P4 SOK TSM MVOLT	LED	1	DSX2_LED_P4_SOK_TSM_M_Volt.rls	35104	1	270	DSX2 LED P4 SOK TSM MVOLT	
	C	6	Lithonia Lighting	DSXW1 LED WITH (1) 10 LED LIGHT ENGINES, TYPE T3M OPTIC, 5000K, @ 350mA	LED	1	DSXW1_LED_10C_30K_T3M_MVOLT.rls	1497	1	13.3	DSXW1 LED 10C 30K T3M MVOLT	
	D	0	Lithonia Lighting	DSXW2 LED WITH 2 LIGHT ENGINES, 20 LED's, 350mA DRIVER, 5000K LED, TYPE 4 MEDIUM OPTIC	LED	1	DSXW2_LED_20C_30K_T4M_MVOLT.rls	2977	1	25	DSXW2 LED 20C 30K T4M MVOLT	
	E	15	Lithonia Lighting	D-SERIES BOLLARD WITH 12 5000K LEDS OPERATED AT 350mA AND ASYMMETRIC DISTRIBUTION	LED	1	DSXB_LED_12C_30K_50K_ASY.rls	1291	1	16	DSXB LED 12C 30K 50K ASY	
	F	3	Lithonia Lighting	D-SERIES BOLLARD WITH 16 5000K LEDS OPERATED AT 350mA AND SYMMETRIC DISTRIBUTION	LED	1	DSXB_LED_16C_30K_50K_SYNL.rls	1685	1	20	DSXB LED 16C 30K 50K SYM	
	G	6	Lithonia Lighting	6IN LDN, 3500K, 1500LM, 80CRI, CLEAR, MATTE DIFFUSE REFLECTOR	LED	1	LDN6_35_15_LOSAR_ID.rls	1365	1	20.48	LDN6 35/15 LOSAR LD	

Plan View  
Scale: 1" = 20'

Portsmouth Medical Park  
Portsmouth NH  
Future Parking Area Included

Designer  
REMCarthy  
Date  
05/13/2019  
Scale  
Not to Scale  
Drawing No.  
Summary





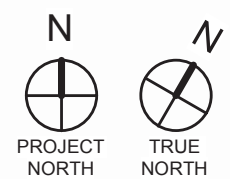




1. COMPONENT AND CLADDING ELEMENTS SHALL BE INSTALLED TO SATISFY THE REQUIREMENTS OF THE - 2009 INTERNATIONAL BUILDING CODE - WIND LOADS.
2. ALL COMPONENTS AND CLADDING ELEMENTS WHICH ARE ELEMENTS OF THE BUILDING ENVELOPE THAT DO NOT QUALIFY AS PART OF THE MAIN WINDFORCE RESISTING SYSTEM, SHALL BE DESIGNED AND INSTALLED TO SATISFY THE WINDLOAD CRITERIA FOR THE BUILDING. THIS SHALL INCLUDE INCREASES FOR EXPOSURE PER ASCE 7-05, AS WELL AS DESIGN FOR HEIGHT, EDGE STRIPS, AND END ZONE CONDITIONS AS DEFINED BY FIGURE 6.3 OF ASCE 7-05.
3. FOR THIS BUILDING DESIGN WINDLOAD IS TO BE **100 MPH EXPOSURE B** - REFER TO DRAWING S.O.1 FOR WIND PRESSURES.
4. THESE COMPONENTS AND CLADDING SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
  - A. ROOFING INCLUDING SHEATHING, TRIM, SHINGLES, MEMBRANE ROOFING, ETC.
  - B. FENESTRATIONS INCLUDING WINDOWS, STOREFRONT, ENTRANCES, DOORS, ETC. (MANUFACTURED CLOSET DOORS SHALL BE LABELED TO CLEAREY 150 PSF, ALL OTHER DOORS SHALL BE LABELED TO CLEAREY NOT LESS THAN 31 PSF.)
  - C. CLADDING INCLUDING VINYL, SIDING, FIBER CEMENT SIDING, BRICK, TRIM, FLASHINGS AND GUTTERS.
5. FASTENERS SHALL BE DESIGNED TO ANCHOR TO STUDS OR OTHER STRUCTURAL COMPONENTS WITH BRACING AND TYPE OF FASTENER DESIGNED TO INDIVIDUALLY SUPPORT THE TRIBUTARY AREA OF THE COMPONENT OR CLADDING (SUPPORTING BY AND INDIVIDUAL FASTENER).
6. EXTERIOR GLASS AND GLAZING IN WINDOWS AND STOREFRONTS SHALL COMPLY WITH MA 780 CMR SECTION 2404 FOR WIND, SNOW, SEISMIC AND DEAD LOADING



<b>MAS-1</b>	MASONRY VENEER. ARJISCAFT RENAISSANCE COLOR: WHITE
<b>BELG-2</b>	BELGIQ GAGE MASONRY VENEER. ADAR LIMESTONE COLOR: BLUE-GREY VENEER. EXTENTS OF MAS-2. MASONRY VENEER SHADED GREY IN ELEVATION
<b>INT-P1</b>	METAL PANEL. ALUCOBOND COLOR: BRUSHED 50 REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>INT-P2</b>	METAL PANEL. ALUCOBOND COLOR: BRILLIANT SILVER METALLIC REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>INT-P3</b>	METAL PANEL. ALUCOBOND COLOR: BRUSHED 50 REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>INT-BND</b>	METAL PANEL BAND. ALUCOBOND COLOR: BRUSHED 50 REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>INT-FAS</b>	METAL FASCIA. ALUCOBOND COLOR: BRUSHED 50 REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>INT-CAN</b>	METAL CANOPY. ALUCOBOND. COLOR: BRUSHED 50 REFER TO EXTERIOR ELEVATIONS FOR REVEALS REFER TO EXTERIOR ELEVATIONS FOR DETAILS
<b>ALUM-SF</b>	KAWNEER STOREFRONT SYSTEM COLOR: TO BE DETERMINED OR AS APPROVED FROM MANUF. FULL RANGE OF COLOR SAMPLES
<b>ALUM-SB</b>	KAWNEER STOREFRONT SYSTEM SPANDREL OR AS APPROVED FROM MANUF. FULL RANGE OF COLOR SAMPLES
<b>INMR</b>	HOLLOW METAL DOOR & FRAME (INSULATED). COLOR: TO BE DETERMINED REFER TO MOOR SCHEDULE FOR MORE INFORMATION
<b>O-DR</b>	INSULATED ROOF OR PANEL COLOR: GREY REFER TO DOOR SCHEDULE FOR MORE INFORMATION
<b>RF-SL</b>	ROOF SCREEN. COLOR: GREY REFER TO SPECIFICATION FOR MORE INFORMATION
<b>LOU-R</b>	LOUVER. COLOR: GREY REFER TO SPECIFICATION FOR MORE INFORMATION



	Date	Issue Description
	3/20/2019	ISSUED FOR GMP
ASI 005	5/15/2019	ASI005

Architect:	JAL
Drawn By:	JW
Project No.:	301701
Copyright:	2019 PROCON, LLC.

Drawing Sheet Title:

**EXTERIOR  
ELEVATIONS**

Drawing Sheet Number:

## A3.01





1. COMPONENT AND CLADDING ELEMENTS SHALL BE INSTALLED TO SATISFY THE REQUIREMENTS OF THE - 2009 INTERNATIONAL BUILDING CODE - WIND LOADS.
2. THE COMPONENTS AND CLADDING ELEMENTS WHICH ARE ELEMENTS OF THE BUILDING ENVELOPE THAT DO NOT QUALIFY AS PART OF THE MAIN WINDFORCING RESISTING SYSTEM, SHALL BE DESIGNED AND INSTALLED TO SATISFY THE WINDLOAD CRITERIA FOR THE BUILDING. THIS SHALL INCLUDE INCREASES FOR EXPOSURE PER ASCE 7-05 AS WELL AS FOR HEIGHT, EDGE STRIPS, AND END ZONE CONDITIONS AS DEFINED BY FIGURE 6.3 OF ASCE 7-05.
3. FOR THIS BUILDING DESIGN CATEGORY IT SHALL BE **100 MPH EXPOSURE B** - REFER TO DRAWING 501 FOR WIND PRESSURES.
4. THE COMPONENTS AND CLADDING SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
  - A. ROOFING INCLUDING SHEATHING, TRIM, SHINGLES, MEMBRANE ROOFING, ETC.
  - B. PENETRATIONS INCLUDING WINDOWS, STOREFRONT, ENTRANCES, DOORS, ETC., MANUFACTURED COMPONENTS SHALL BE LABELED TO CLEARLY INDICATE THEIR WIND DESIGN WIND PRESSURE BUT NOT LESS THAN 31 PSF.)
  - C. CLADDING INCLUDING VINYL, SIDING, FIBER CEMENT SIDING, BRICK, TRIM, FLASHINGS, AND GUTTERS
5. FASTENERS SHALL BE INSTALLED TO SATISFY THE WINDLOAD CRITERIA AND IN ACCORDANCE WITH THE SIZE AND TYPE OF FASTENER DESIGNED TO INDIVIDUALLY SUPPORT THE TRIBUTARY AREA OF THE COMPONENT OR CLADDING SUPPORTED BY INDIVIDUAL FASTENER.)
6. EXTERIOR GLASS AND GLAZING IN WINDOW OR STOREFRONT SHALL COMPLY WITH MA 780 CMR SECTION 2404 FOR WIND, SNOW, SEISMIC AND DEAD LOADING.



	Date	Issue Description
	3/20/2019	ISSUED FOR GMP
ASI 005	5/15/2019	ASI005

Architect:	JAL
Drawn By:	JW
Project No.:	301701
Copyright:	2019 PROCON, LLC.

Drawing Sheet Title:

**EXTERIOR  
ELEVATIONS**

Drawing Sheet Number:

## A3.02



K0076-013  
June 11, 2019

Mr. Dexter Legg, Chairman  
City of Portsmouth Planning Board  
1 Junkins Avenue  
Portsmouth, New Hampshire 03801

Re: **Borthwick Forest, LLC**  
**Amended Site Plan Review Application**

Dear Juliet:

On behalf of Borthwick Forest, LLC, we are pleased to submit the following materials relative to an Amended Site Plan Review Application for the above-referenced project which includes a proposed subdivision road and office building development:

- Twelve (12) copies (1 full size & 11 half-size) of the Site Plan Set last revised June 11, 2019
- Twelve (12) copies of the Owner Authorization dated May 17, 2019;
- Twelve (12) copies of the Drainage Memorandum last revised May 20, 2019
- Twelve (12) copies of the Operation & Maintenance Plan last revised June 11, 2019
- Twelve (12) copies of the Fire Truck Turning Exhibit Plan dated June 11, 2019
- Twelve (12) copies of Trip Generation Analysis letter dated June 11, 2019
- One (1) CD containing digital copies of the above-listed materials

The previously approved Site Plan included a basement level parking area. In the latest building design, the basement will be fitted out with office space in lieu of the basement parking which results in a  $\pm 67,000$  SF building where  $\pm 50,000$  SF was previously approved. With the additional building square footage and the loss of the basement level parking, additional surface parking spaces are needed to meet the revised parking requirement. The amended site design provides a total of 274 parking spaces where 268 are required. The applicant is proposing to construct 218 spaces at this time and is requesting that 56 spaces be reserved as future parking. The applicant would only construct these spaces in the future should they find that the parking demand warrants the need for these additional 56 spaces. A benefit of the reserve parking area is that it minimizes the additional impervious surface and clearing needed at this time. Stormwater management for the reserved future parking area includes two (2) proposed rain gardens. These rain gardens would be constructed in the future if the reserve parking area were to be constructed. A revised drainage analysis has been provided to include these future rain gardens.

On June 4, 2019, the Technical Advisory Committee (TAC) voted to recommend Site Plan Review approval with the following stipulations *italicized* and our responses to them **bolded**.

Stipulations to be addressed prior to Planning Board Review:

1. *A trip generation memo using the traffic generation for medical office use shall be submitted to the City's Transportation and Parking Engineer, Eric Eby, to determine if a revision of the previous Traffic Study is required.*

**Peak hour trip generation calculations were prepared and submitted to Eric Eby on June 5, 2019. Eric Eby confirmed a revised Traffic Study was not required. Enclosed is a trip generation memorandum summarizing the peak hour trip generation calculations.**



2. *Fire truck turning templates shall be submitted to the City's Deputy Fire Chief, Patrick Howe, for review and approval. Any additional modifications required for the design parking lot and accessways shall be reviewed and approved by the Deputy Fire Chief and the Transportation and Parking Engineer.*

**A Fire trucking Turning Exhibit Plan has been prepared and was submitted to Deputy Chief Howe via email on June 6, 2019. A copy of the exhibit plan has been included in this submission.**

3. *The entrance to the bike lane from the cul-de-sac shall be adjusted to avoid conflict with the proposed driveway.*

**The bike lane entrance and path have been adjusted to avoid conflict with the proposed driveway.**

Stipulations to be included in Planning Board Approval:

1. *Prior to the construction of the reserve parking area, the plans shall be submitted to the Conservation Commission for review.*

**Agreed.**

2. *Prior to construction, the stormwater maintenance plan, revised to incorporate the proposed rain gardens, shall include a schedule for annual inspection and maintenance of the proposed rain gardens to be continued in perpetuity. An amended site plan including a note referencing the stormwater maintenance plan and annual inspection and maintenance schedule shall be recorded at the Rockingham County Registry of Deeds.*

**The Stormwater Operation and Maintenance Plan have been revised to include a section for maintenance and inspection requirements for the proposed future rain gardens should they be constructed. A note referencing the stormwater operation and maintenance requirements has been added to the site plan to be recorded at the Rockingham County Registry of Deeds.**

We respectfully request to be placed on the Planning Board meeting agenda for June 20, 2019. If you have any questions or need any additional information, please contact Patrick Crimmins by phone at (603) 433-8818 or by email at [pmcrimmins@tighebond.com](mailto:pmcrimmins@tighebond.com).

Very truly yours,

**TIGHE & BOND, INC.**



Patrick M. Crimmins, PE  
Senior Project Manager



Craig M. Langton, PE  
Project Engineer

Copy: The Kane Co. (via email)  
DTC Lawyers (via email)



K0076-13  
June 11, 2019

Mr. Eric Eby, City Traffic Engineer  
City of Portsmouth Department of Public Works  
680 Peverly Hill Road  
Portsmouth, New Hampshire 03801

Re: **Trip Generation Analysis**  
**Proposed Subdivision Road & Office Building Office Development – Borthwick Avenue, Portsmouth, NH**

Dear Eric:

Tighe & Bond has performed a trip generation analysis for the traffic related to the proposed  $\pm 67,000$  SF medical office development off of Borthwick Avenue, where a previous  $\pm 50,000$  SF medical office development has been approved. This analysis was performed utilizing the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10<sup>th</sup> edition.

Trip generation was calculated with ITE Land Use Code (LUC) 720 – Medical Dental Office for the weekday morning peak hour and weekday evening peak hour. The supporting trip generation calculations are enclosed with this letter.

The Planning Board previously approved a proposed  $\pm 50,000$  SF medical office development at this site. The following analysis provides a comparison of the previously approved project and the currently proposed  $\pm 67,000$  SF medical office.

ITE Land Use Code	Square Footage	AM Peak Trips	AM Peak Trips Increase from Approved 50k Office	PM Peak Trips	PM Peak Trips Increase from Approved 50k Office
Office (710) (ITE 9 <sup>th</sup> Edition)	50,000 SF	110	-	134	-
Medical Office (720)	67,000 SF	156	<b>46</b>	229	<b>95</b>

As depicted above the proposed change in use does not trigger the need for a revised traffic study as the proposed increase in peak trips does not exceed 100 additional trips.

The prior approved Traffic Study assumed that 55% of the site generated trips would be coming/going toward Greenland Road/Route 33 and 45% of the site generated trips would be coming/going toward Route 1 Bypass:

- Route 33/Greenland Road – The change to medical office use and additional 17,000 SF of building area result in approximately 25 additional trips during the AM peak and 52 additional trips during the PM peak hour towards Route 33/Greenland Road. These added trips from the prior approval are not a significant impact when considering the overall roadway network. In addition, the Planning Board approval from May 2017 already stipulates that the applicant shall monitor the intersection of Greenland/Borthwick/Sherburne one year from occupancy.





- Route 1 Bypass – The change to medical office use and additional 17,000 SF of building area result in approximately 21 additional trips during the AM peak and 43 additional trips during the PM peak hour towards Route 1 Bypass. It should be noted the West End Yards development project performed recent traffic counts and prepared a Traffic Study that included the previously approved 50,000 SF office building in their background. The West Yards Traffic Study also included other current development projects occurring in the West End in their background. The added trips from this additional 17,000 SF are not a significant impact when considering the overall roadway network and the current proposed development project's occurring in the City's west end.

Please feel free to contact me at 603.433.8818 or [pmcrimmins@tighebond.com](mailto:pmcrimmins@tighebond.com) if you have any questions.

Very truly yours,

**TIGHE & BOND, INC.**

A handwritten signature in blue ink, appearing to read 'P. Crimmins', with a horizontal line extending to the right.

Patrick M. Crimmins, PE  
Senior Project Manager

J:\K\K0076 The Kane Company - General Proposals\0076-13 Borthwick Forest\Report\_Evaluation\Applications\20190611\_PB Submission\Trip Generation Analysis.docx



***Institute of Transportation Engineers (ITE) (9th Edition)***  
**Land Use Code (LUC) 710 - General Office Building**

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area  
Independent Variable (X): 50.000

**WEEKDAY MORNING PEAK HOUR OF GENERATOR**

$$\ln T = 0.80 \ln (X) + 1.57$$

$$\ln T = 0.80 \ln 50.000 + 1.57$$

$$\ln T = 4.70$$

$$T = 109.91$$

$$T = 110 \text{ vehicle trips}$$

with 88% ( 97 vph) entering and 12% ( 13 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF GENERATOR**

$$T = 1.12 * (X) + 78.45$$

$$T = 1.12 * 50.000 + 78.45$$

$$T = 134.45$$

$$T = 134 \text{ vehicle trips}$$

with 17% ( 23 vph) entering and 83% ( 111 vph) exiting.

---

***Institute of Transportation Engineers (ITE) (10th Edition)***  
**Land Use Code (LUC) 720 - Medical-Dental Office Building**

Average Vehicle Trips Ends vs: 1,000 Sq. Feet Gross Floor Area  
Independent Variable (X): 67.000

**WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$\ln T = 0.89 \ln (X) + 1.31$$

$$\ln T = 0.89 \ln 67.000 + 1.31$$

$$\ln T = 5.05$$

$$T = 156.36$$

$$T = 156 \text{ vehicle trips}$$

with 78% ( 122 vph) entering and 22% ( 34 vph) exiting.

**WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC**

$$T = 3.39 * (X) + 2.02$$

$$T = 3.39 * 67.000 + 2.02$$

$$T = 229.15$$

$$T = 229 \text{ vehicle trips}$$

with 28% ( 64 vph) entering and 72% ( 165 vph) exiting.



## Owner's/Agent Letter of Authorization

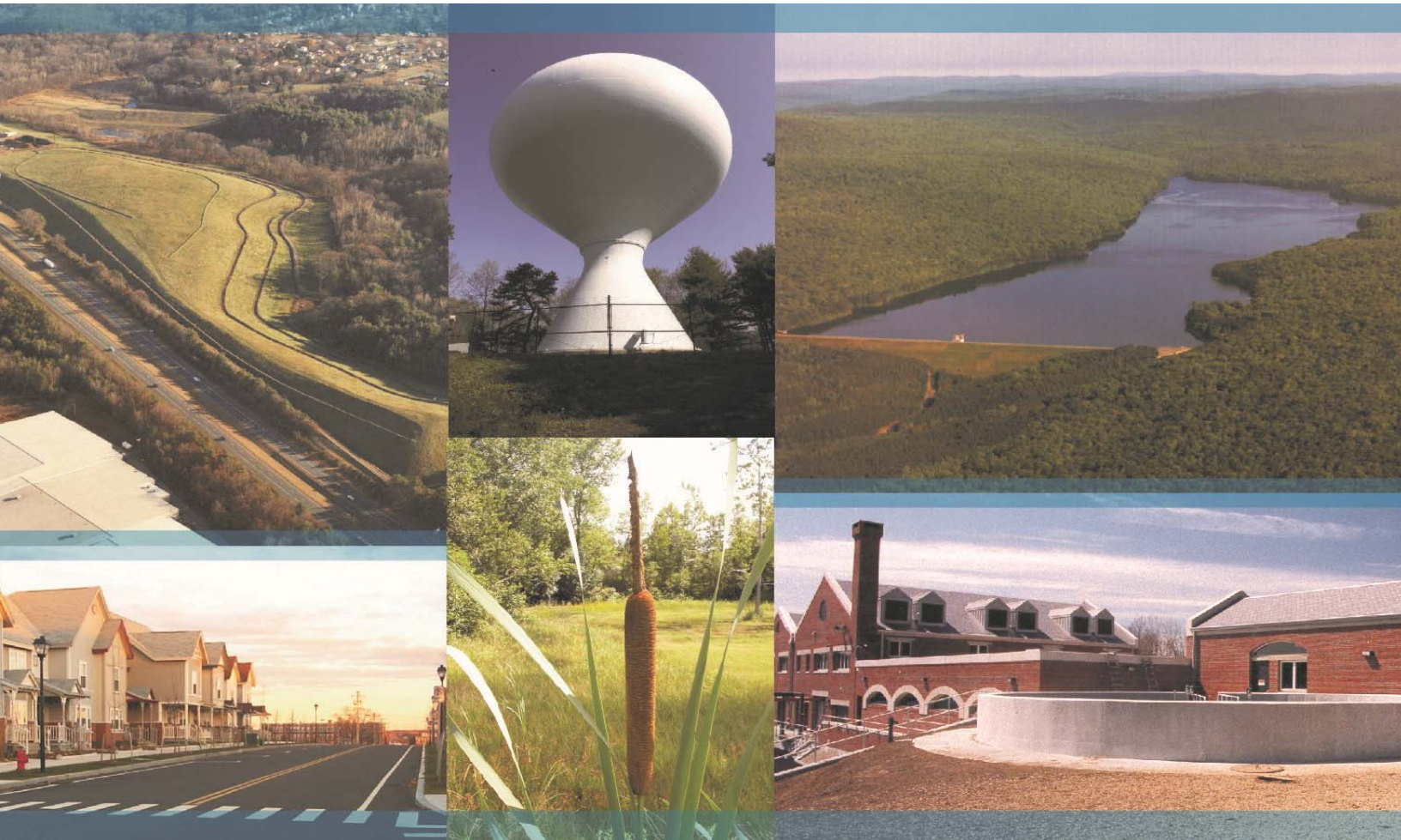
I, Michael Kane, of Borthwick Forest, LLC c/o The Kane Company (Applicant) hereby give Tighe & Bond (Civil Engineer) permission to be my agent in all matters concerning all state and local permitting for the proposed project off Borthwick Avenue in Portsmouth, New Hampshire. This project includes the construction of a  $\pm 67,000$  SF office building and subdivision road with associated site improvements. This authorization shall include any required signatures for all state and local permit applications.

  
Signature

Michael Kane  
Print Name

May 17, 2019  
Date





Proposed Subdivision Road & Office Building  
Development  
Portsmouth, NH

## **Long Term Operation and Maintenance Plan**

Borthwick Forest, LLC

June 11, 2019



**Section 1 Operation & Maintenance Plan**

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J:\K\K0076	The Kane Company - General Proposals\0076-13	Borthwick
Forest\Report_Evaluation\Applications\20190611_PB Submission\K0076-13_O&M.doc		



# **Section 1**

## **Operation & Maintenance Plan**

It is the intent of this Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high quality stormwater runoff.

### **1.1 Contact/Responsible Party**

Borthwick Forest, LLC.  
210 Commerce Way Suite, 300  
Portsmouth NH, 03801

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

### **1.2 Maintenance Items**

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catchbasin Cleaning
- Pavement Sweeping
- Gravel Wetland Maintenance
- Treatment Swale Maintenance
- Sedimentation Basin Maintenance
- Rain Garden Maintenance

The following maintenance items and schedule represent the minimum action required. Periodic site inspections shall be conducted and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris



### 1.3 Overall Site Operation & Maintenance Schedule

Overall Site Operation and Maintenance Schedule		
Maintenance Item	Frequency of Maintenance	Operation
Litter/Debris Removal	Weekly	Management Company
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually	Parking Lot Sweeper
Treatment Swales & Sedimentation Basin - Trash and debris to be removed including at check dam. - Embankment to be mowed. - Any required maintenance shall be addressed. - Inspect sediment accumulation and clean as needed.	Periodically (At least two (2) times annually)	Management Company
Gravel wetland - Trash and debris to be removed including at outlet structure. - Embankment to be mowed. - Any required maintenance shall be addressed.	Periodically (At least two (2) times annually)	Management Company
Rip Rap Aprons - Trash and debris to be removed. - Any required maintenance shall be addressed.	Annually	Management Company
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils.	Annually	Vacuum Truck
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring	Management Company
Rain Garden -Trash and debris to be removed. -Any required maintenance shall be addressed.	Two (2) times annually and after any rainfall event exceeding 2.5" in a 24-hr period	Management Company



<b>Treatment Swales &amp; Sediment Forebay Inspection/Maintenance Requirements</b>		
<b>Inspection/ Maintenance</b>	<b>Frequency</b>	<b>Action</b>
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required
Visual inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

<b>Gravel Wetland Inspection/Maintenance Requirements</b>		
<b>Inspection/ Maintenance</b>	<b>Frequency</b>	<b>Action</b>
Monitor to ensure that Gravel Wetland functions effectively after storms	Four (4) times annually (quarterly) and after any rainfall event exceeding 2.5" in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- Inspect the condition of all gravel wetland vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species -Coordinate with UNH Stormwater Center for further vegetation management guidelines
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	- Hire qualified professional to assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.



**Additional Gravel Wetland Operation and Maintenance Requirements:**

- **1st Year Post-Construction:** Inspection frequency shall be after every storm in the first year following construction.
- Inspect to be certain system drains within 24 - 48 hours (within the design period, but also not so quickly as to minimize stormwater treatment).
- Watering plants as necessary during the first growing season.
- Re-vegetating poorly established areas as necessary.
- Treating diseased vegetation as necessary.
- Inspect soil and repair eroded areas, especially on slopes, at a minimum quarterly.
- Check inlets, outlets, and overflow spillway for blockage, structural integrity and evidence of erosion.

***Cleaning Criteria for Gravel Wetland Treatment Cells:*** Sediment shall be removed from the gravel wetland surface when it accumulates to a depth of several inches (>10 cm) across the wetland surface. Materials shall be removed with rakes rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment may be used if the equipment is located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments shall be dewatered (if necessary) and disposed of in accordance with all local, state and federal requirements. Removal of vegetation within the gravel wetland shall occur every three (3) growing seasons, or the end of the summer of the third year. This is to prevent decay and release of nutrients from accumulated biomass.

Rain Garden Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Monitor to ensure that Rain Gardens function effectively after storms	Two (2) times annually and after any rainfall event exceeding 2.5" in a 24-hr period	<ul style="list-style-type: none"> <li>- Trash and debris to be removed</li> <li>- Any required maintenance shall be addressed</li> </ul>
Inspect Vegetation	Annually	<ul style="list-style-type: none"> <li>- Inspect the condition of all Rain Garden vegetation</li> <li>- Prune back overgrowth</li> <li>- Replace dead vegetation</li> <li>- Remove any invasive species</li> </ul>
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	<ul style="list-style-type: none"> <li>- Assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.</li> </ul>



Rip Rap Inspection/Maintenance Requirements		
Inspection/ Maintenance	Frequency	Action
Visual Inspection	Annually	<ul style="list-style-type: none"><li>- Visually inspect for damage and deterioration</li><li>- Repair damages immediately</li></ul>

### 1.3.1 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

### 1.3.2 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan). Salt storage areas shall be covered or located such that no direct untreated discharges are possible to receiving waters from the storage site. Salt and sand shall be used to the minimum extent practical (refer to the New Hampshire Stormwater Management Manual, Volume 2, for de-icing application rate guidelines).



Typical Deicing Log Form				
Truck Station:				
Date:				
<u>Air Temperature</u>	<u>Pavement Temp.</u>	<u>Relative Humidity</u>	<u>Dew Point</u>	<u>Sky</u>
Reason for applying:				
Route:				
Chemical:				
Application Time:				
Application Amount:				
Observation (first day):				
Observation (after event):				
Observation (before next application):				
Name:				



### **1.3.3 Annual Updates and Log Requirements**

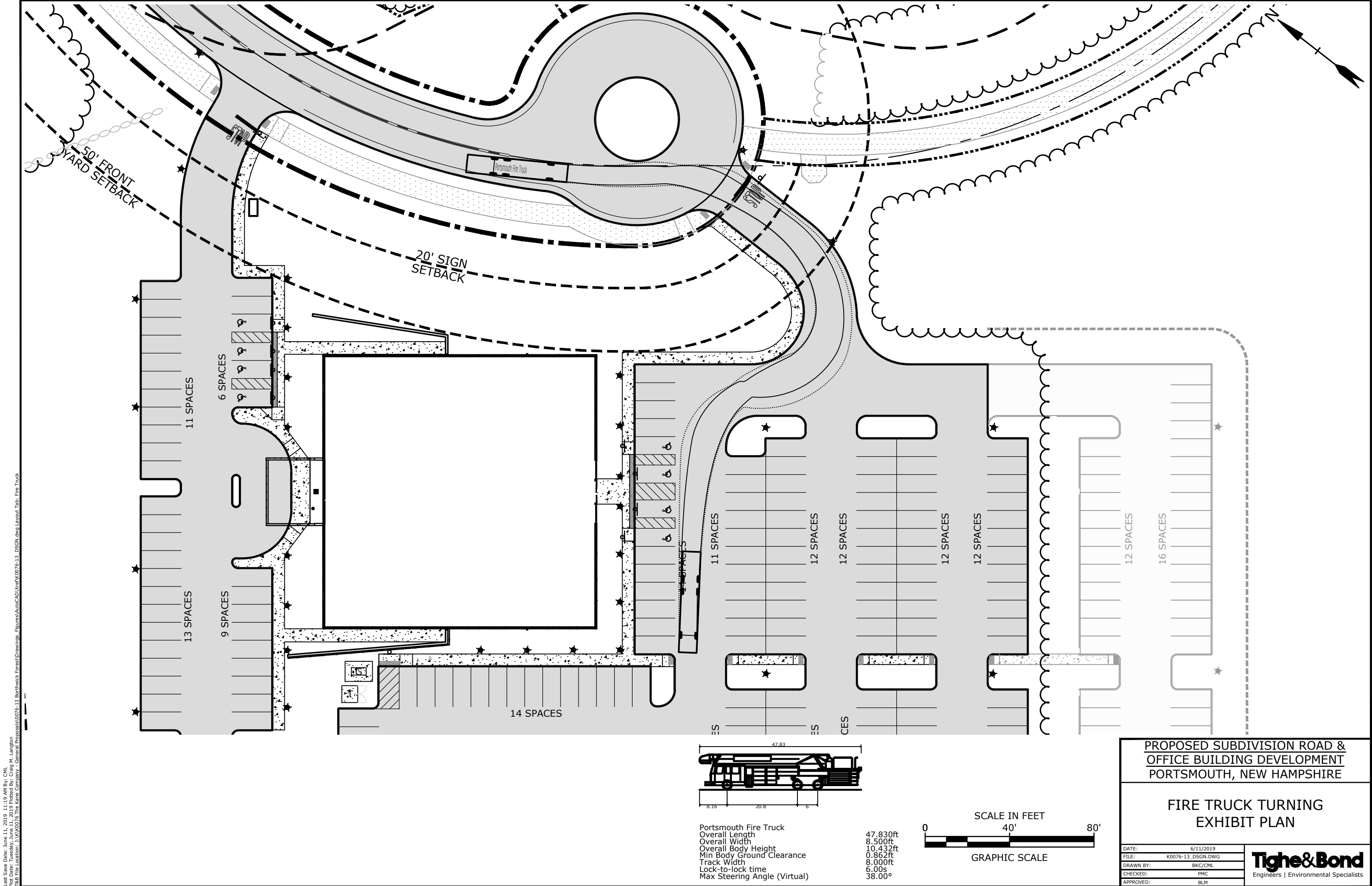
The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site.



Typical Overall Site Operation and Maintenance Report Log						
Project Name:						
Observation Item	Date of Inspection	Observer	Maintenance Needed?	Comments	Date of Cleaning/ Repair	Performed By
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			
			<input type="checkbox"/> Yes <input type="checkbox"/> No			







## **Drainage Analysis**

**To:** City of Portsmouth Technical Advisory Committee (TAC)  
**FROM:** Patrick M. Crimmins, P.E., Tighe & Bond  
**CC:** Borthwick Forest, LLC  
**DATE:** March 20, 2017  
**LAST REVISED:** May 20, 2019

---

### **1.0 Project Description**

The proposed project is for a subdivision and site development that includes the construction of a 1,100-foot roadway with 50-foot cul-de-sac off Borthwick Avenue, a public access path from Islington Street at the location of the existing WBBX Road to the proposed cul-de-sac, as well as the construction of a, four (4) story, 67,000 SF office building. The proposed project includes the former WBBX radio station property off Islington Street, three undeveloped parcels of land adjacent to WBBX, a residential property along Islington Street, and an access easement located on an undeveloped parcel of land along Borthwick Avenue. The proposed project will result in approximately 9 acres of disturbance.

The site consists of terrain that slopes from the south to north at grades of  $\pm 0$  - 50 percent. The topography of the site has a high point of elevation 60 on Islington Street and a low point of elevation 30 in unnamed wetlands on the northern side of the proposed road.

For the purposes of this analysis, runoff generated by the site has been analyzed at two (2) distinct points of analysis (PA-1 and PA-2). PA-1 is located in the northwestern side of the Boston Maine Railroad PA-2 is located in an unnamed wetland on the southeast side of the proposed development. The proposed project includes the use of multiple stormwater Best Management Practices (BMP's), including three (3) treatment swales, a gravel wetland, two (2) rain gardens, and deep sump catch basins.

The proposed project will disturb over 100,000 SF of the site. Thus, the project will require a New Hampshire Department of Environmental Services (NHDES) Alteration of Terrain (AoT) Permit.

### **2.0 Drainage Analysis**

#### **2.1 Calculation Methods**

The parcels on-site watersheds were analyzed under this section. The design storms analyzed in this study are the 2-year, 10-year, 25-year, and 50-year 24-hour duration storm as per NHDES AoT Regulations (Env-Wq 1500), last revised August 15, 2017. The stormwater modeling system, HydroCAD 10.0 was utilized to predict the peak runoff rates from these storm events. A Type III storm pattern was used in the model.

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow, and channel flow. Runoff curve numbers were calculated by estimating the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.



## References

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Selection and Design, December 2008.
3. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC), 26 June 2012.

## 2.2 Pre-Development Conditions

To analyze the pre-development condition, the site has been divided into two (2) distinct points of analysis (PA-1 and PA-2). These points of analysis and watersheds are depicted on the plan entitled "Pre-Development Watershed Plan", Sheet WS-1.

Each of the points of analysis and their contributing watershed areas are described below:

### **Point of Analysis One (PA-1)**

Pre-Development Watershed Area 1 has been divided into one area (Pre-1) in order to separate areas with proposed disturbance from areas not scheduled to be disturbed. This area includes the areas within the existing access easements as well as the remainder of the areas proposed to be disturbed.

### **Point of Analysis Two (PA-2)**

Pre-Development Watershed Area 2 has been divided into one area (Pre-2) in order to separate areas with proposed disturbance from areas not scheduled to be disturbed. This watershed area is located in the mostly grass area to the west of the existing WBBX development.

## 2.3 Post-Development Conditions

The post-development drainage condition is characterized by six (6) watershed areas modeled at the same two (2) points of analysis as the pre-development condition. These points of analysis and watersheds are depicted on the plan entitled "Post Development Watershed Plan", Sheets WS-2.

Each of the points of analysis and their contributing watershed areas are described below:

### **Point of Analysis One (PA-1)**

Point of analysis 1 is comprised of Post; 1.1, 1.2, 1.3, 1.4, & 1.5, as depicted on the plan entitled "Post Development Watershed Plan", Sheets WS-2.

### **Point of Analysis One (PA-2)**

Point of analysis 2 is comprised of Post; 2, 2A, & 2B, as depicted on the plan entitled "Post Development Watershed Plan", Sheets WS-2.



## 2.4 Peak Rate Comparisons

Table 2.4.1 summarizes and compares the pre- and post-development peak runoff rates for the 1-year, 2-year, 10-year, 25-year, and 50-year storm events at each discharge point.

**Table 2.4.1 - Comparison of Pre- and Post-Development flows (cfs)**

Point of Analysis	Pre/ <b>Post</b> 2-Year Storm Peak Flow (cfs)	Pre/ <b>Post</b> 10-Year Storm Peak Flow (cfs)	Pre/ <b>Post</b> 25-Year Storm Peak Flow (cfs)	Pre/ <b>Post</b> 50-Year Storm Peak Flow (cfs)
PA1	4.28/ <b>3.46</b>	11.42/ <b>8.45</b>	17.9/ <b>13.75</b>	24.31/ <b>18.36</b>
PA2	1.17/ <b>0.83</b>	3.96/ <b>3.90</b>	6.63/ <b>5.86</b>	9.34/ <b>6.74</b>

As depicted in Table 2.4.1, the post-development peak runoff rates are less than the pre-development rates.

## 2.4 Stormwater Treatment

The stormwater management system has been designed to provide stormwater treatment as required by the City of Portsmouth Site Review Regulations and NHDES Aot Regulations (Env-Wq 1500).

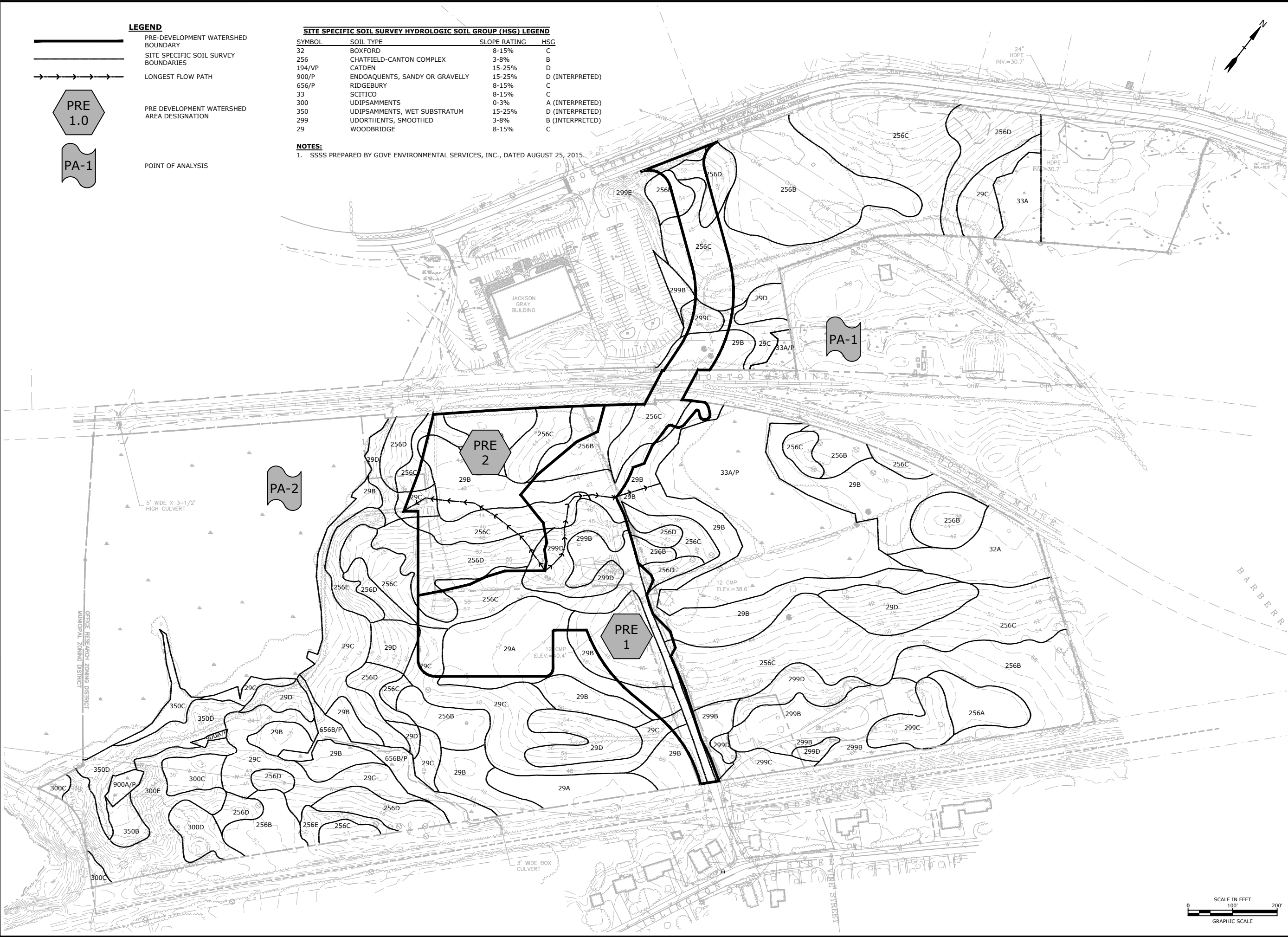
The stormwater management system includes Best Management Practices (BMP) to provide stormwater treatment. These BMP's have been designed in accordance with the New Hampshire Stormwater Manual. Pretreatment for the roadway and office building development will be provided by catch basins equipped with deep sumps and oil separator hoods. Stormwater treatment will be provided by three (3) treatment swales, one (1) gravel wetland, and two (2) rain gardens. Runoff generated by the proposed roadway and cul-de-sac will be conveyed into a closed drainage system and directed to the stormwater treatment swales. The proposed Gravel Wetland will treat runoff generated from the proposed office building and associated parking areas.

## 3.0 Conclusion

The proposed project will result in a reduction in post-development peak runoff rates from the pre-development condition. The impervious area resulting from the proposed project will be treated by proposed treatment swales a gravel wetland, and two (2) rain gardens. The project will require an amendment to an NHDES Aot Permit. A copy of the amended Aot Permit Application will be provided to the City of Portsmouth when it is submitted to NHDES.



Last Save Date: May 14, 2019 3:17 PM By: CML  
Plot Date: Monday, May 20, 2019 Plotted By: Craig M. Langton  
Plot File Location: J:\WORK\2019\20190520\Borthwick Forest\Drawings - Figures\AutoCAD\Sheet\20190520\_Watershed Plans.dwg Layout Tab: Pre



**LEGEND**

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POINT OF ANALYSIS

**SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND**

SYMBOL	SOIL TYPE	SLOPE RATING	HSG
32	BOXFORD	8-15%	C
256	CHATFIELD-CANTON COMPLEX	3-8%	B
194/VP	CATDEN	15-25%	D
900/P	ENDOQUENTS, SANDY OR GRAVELLY	15-25%	D (INTERPRETED)
656/P	RIDGEBURY	8-15%	C
33	SCITICO	8-15%	C
300	UDIPSAMMENTS	0-3%	A (INTERPRETED)
350	UDIPSAMMENTS, WET SUBSTRATUM	15-25%	D (INTERPRETED)
299	UDORTHERENTS, SMOOTHED	3-8%	B (INTERPRETED)
29	WOODBIDGE	8-15%	C

**NOTES:**

- SSSS PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC., DATED AUGUST 25, 2015.

**Proposed  
Subdivision Road  
& Office Building  
Development**

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

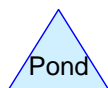
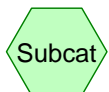
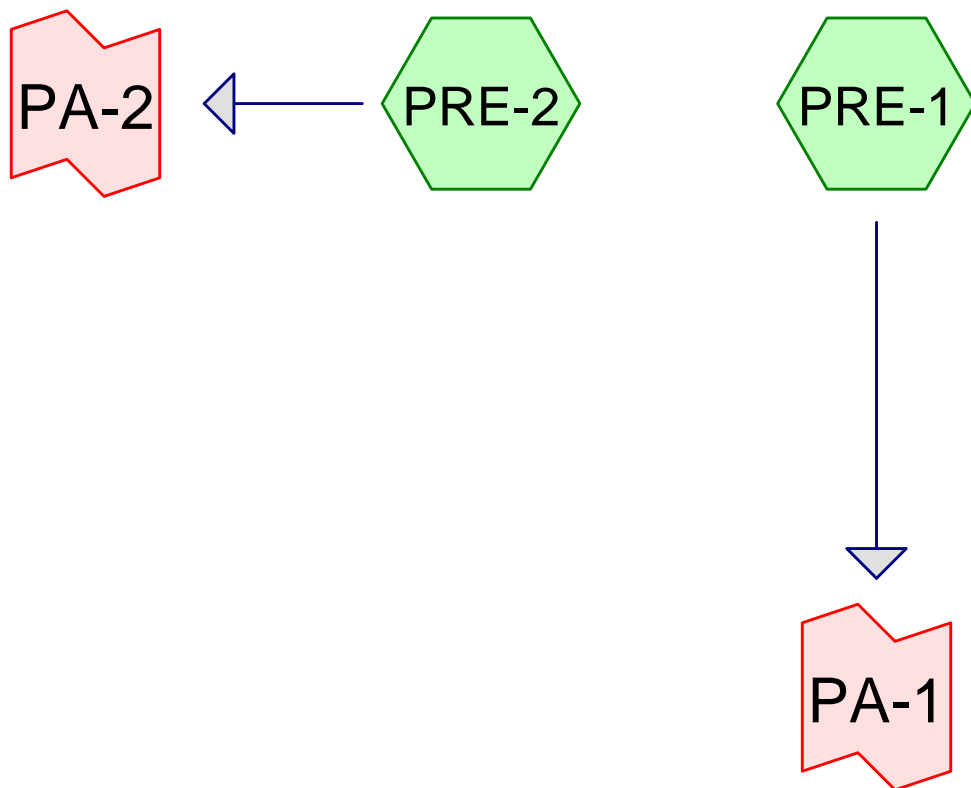
MARK	DATE	DESCRIPTION
D	5/20/2019	Amended Site Plan Approval
C	8/21/2017	Revised Planning Board Submission
B	6/2/2017	AoT Submission
A	3/20/2017	TAC Submission
PROJECT NO: K0076-13		
DATE: 3/20/2017		
FILE: 20190520_WATERSHED PLANS.DWG		
DRAWN BY: CML		
CHECKED: PMC		
APPROVED: BLM		

**PRE-DEVELOPMENT  
WATERSHED PLAN**

SCALE: AS SHOWN

WS-1







**K0076-13-PRE**

Prepared by Tighe &amp; Bond

Printed 5/16/2019

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Page 2

**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
1.306	69	50-75% Grass cover, Fair, HSG B (299) (PRE-1, PRE-2)
1.810	61	>75% Grass cover, Good, HSG B (256) (PRE-1, PRE-2)
0.822	74	>75% Grass cover, Good, HSG C (29) (PRE-1, PRE-2)
0.125	96	Gravel surface, HSG C (Rail Road) (PRE-1)
0.444	98	Paved parking, HSG C (PRE-1)
0.078	60	Woods, Fair, HSG B (299) (PRE-1)
1.539	55	Woods, Good, HSG B (256) (PRE-1, PRE-2)
0.558	55	Woods, Good, HSG B (256) - Additional Area (PRE-1, PRE-2)
0.755	70	Woods, Good, HSG C (29) (PRE-1)
0.497	70	Woods, Good, HSG C (29) - Additional Area (PRE-1)
0.577	70	Woods, Good, HSG C (29) - Amended Site Plan (PRE-1)
<b>8.511</b>	<b>66</b>	<b>TOTAL AREA</b>



**K0076-13-PRE**

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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
5.290	HSG B	PRE-1, PRE-2
3.221	HSG C	PRE-1, PRE-2
0.000	HSG D	
0.000	Other	
<b>8.511</b>		<b>TOTAL AREA</b>



**K0076-13-PRE***Type III 24-hr 2-YR Rainfall=3.22"*

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Page 4

Time span=0.00-48.00 hrs, dt=0.10 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 PRE-1:** Runoff Area=255,559 sf 7.57% Impervious Runoff Depth=0.74"  
Flow Length=288' Slope=0.0594 '/' Tc=5.0 min CN=68 Runoff=4.28 cfs 0.363 af

**Subcatchment PRE-2:** Runoff Area=115,185 sf 0.00% Impervious Runoff Depth=0.53"  
Flow Length=391' Slope=0.0588 '/' Tc=5.0 min CN=63 Runoff=1.17 cfs 0.116 af

**Link PA-1:** Inflow=4.28 cfs 0.363 af  
Primary=4.28 cfs 0.363 af

**Link PA-2:** Inflow=1.17 cfs 0.116 af  
Primary=1.17 cfs 0.116 af

**Total Runoff Area = 8.511 ac Runoff Volume = 0.480 af Average Runoff Depth = 0.68"**  
**94.78% Pervious = 8.067 ac 5.22% Impervious = 0.444 ac**



**K0076-13-PRE***Type III 24-hr 10-YR Rainfall=4.88"*

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Page 5

Time span=0.00-48.00 hrs, dt=0.10 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 PRE-1:** Runoff Area=255,559 sf 7.57% Impervious Runoff Depth=1.79"  
Flow Length=288' Slope=0.0594 '/' Tc=5.0 min CN=68 Runoff=11.42 cfs 0.877 af

**Subcatchment PRE-2:** Runoff Area=115,185 sf 0.00% Impervious Runoff Depth=1.43"  
Flow Length=391' Slope=0.0588 '/' Tc=5.0 min CN=63 Runoff=3.96 cfs 0.316 af

**Link PA-1:** Inflow=11.42 cfs 0.877 af  
Primary=11.42 cfs 0.877 af

**Link PA-2:** Inflow=3.96 cfs 0.316 af  
Primary=3.96 cfs 0.316 af

**Total Runoff Area = 8.511 ac Runoff Volume = 1.193 af Average Runoff Depth = 1.68"**  
**94.78% Pervious = 8.067 ac 5.22% Impervious = 0.444 ac**



**K0076-13-PRE***Type III 24-hr 25-YR Rainfall=6.19"*

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Page 6

Time span=0.00-48.00 hrs, dt=0.10 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 PRE-1:** Runoff Area=255,559 sf 7.57% Impervious Runoff Depth=2.77"  
Flow Length=288' Slope=0.0594 '/' Tc=5.0 min CN=68 Runoff=17.90 cfs 1.353 af

**Subcatchment PRE-2:** Runoff Area=115,185 sf 0.00% Impervious Runoff Depth=2.31"  
Flow Length=391' Slope=0.0588 '/' Tc=5.0 min CN=63 Runoff=6.63 cfs 0.509 af

**Link PA-1:** Inflow=17.90 cfs 1.353 af  
Primary=17.90 cfs 1.353 af

**Link PA-2:** Inflow=6.63 cfs 0.509 af  
Primary=6.63 cfs 0.509 af

**Total Runoff Area = 8.511 ac Runoff Volume = 1.862 af Average Runoff Depth = 2.63"**  
**94.78% Pervious = 8.067 ac 5.22% Impervious = 0.444 ac**



**K0076-13-PRE***Type III 24-hr 50-YR Rainfall=7.41"*

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Page 7

Time span=0.00-48.00 hrs, dt=0.10 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 PRE-1:** Runoff Area=255,559 sf 7.57% Impervious Runoff Depth=3.74"  
Flow Length=288' Slope=0.0594 '/' Tc=5.0 min CN=68 Runoff=24.31 cfs 1.831 af

**Subcatchment PRE-2:** Runoff Area=115,185 sf 0.00% Impervious Runoff Depth=3.21"  
Flow Length=391' Slope=0.0588 '/' Tc=5.0 min CN=63 Runoff=9.34 cfs 0.708 af

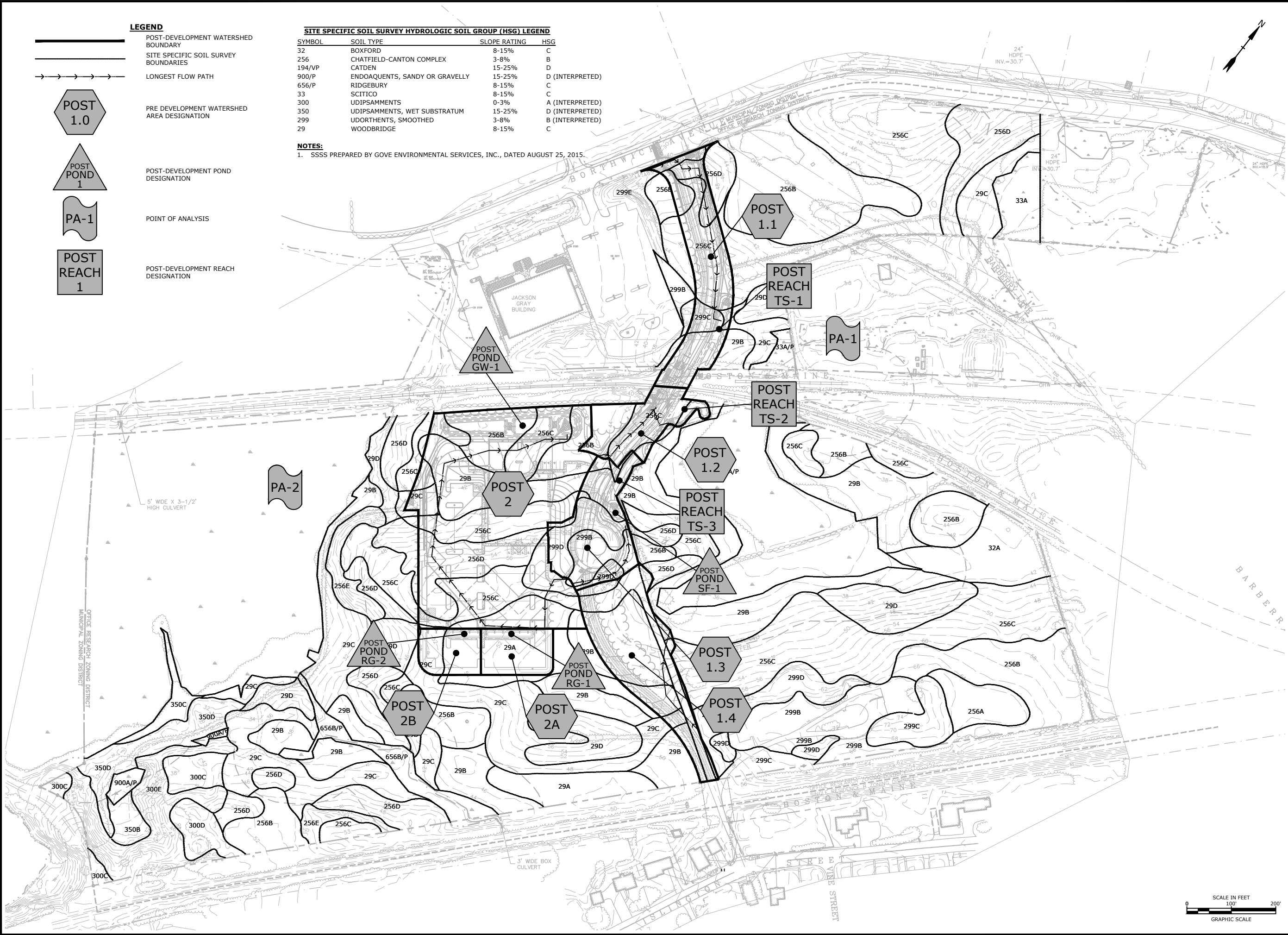
**Link PA-1:** Inflow=24.31 cfs 1.831 af  
Primary=24.31 cfs 1.831 af

**Link PA-2:** Inflow=9.34 cfs 0.708 af  
Primary=9.34 cfs 0.708 af

**Total Runoff Area = 8.511 ac Runoff Volume = 2.538 af Average Runoff Depth = 3.58"**  
**94.78% Pervious = 8.067 ac 5.22% Impervious = 0.444 ac**



Last Save Date: May 14, 2019 3:17 PM By: CML  
Plot Date: Monday, May 20, 2019 Plotted By: Craig M. Langton  
File Location: J:\WORK\2019\Borthwick Forest\Drawings - Figures\AutoCAD\Sheet 20190520 Watershed Plans.dwg Layout Tab: Post



**LEGEND**

- POST-DEVELOPMENT WATERSHED BOUNDARY
- SITE SPECIFIC SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0
- POST POND 1
- PA-1
- POST REACH 1
- PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST-DEVELOPMENT POND DESIGNATION
- POINT OF ANALYSIS
- POST-DEVELOPMENT REACH DESIGNATION

**SITE SPECIFIC SOIL SURVEY HYDROLOGIC SOIL GROUP (HSG) LEGEND**

SYMBOL	SOIL TYPE	SLOPE RATING	HSG
32	BOXFORD	8-15%	C
256	CHATFIELD-CANTON COMPLEX	3-8%	B
194/VP	CATDEN	15-25%	D
900/P	ENDOQUENTS, SANDY OR GRAVELLY	15-25%	D (INTERPRETED)
656/P	RIDGEBURY	8-15%	C
33	SCITICO	8-15%	C
300	UDIPSAMMENTS	0-3%	A (INTERPRETED)
350	UDIPSAMMENTS, WET SUBSTRATUM	15-25%	D (INTERPRETED)
299	UDORTHERNTS, SMOOTHED	3-8%	B (INTERPRETED)
29	WOODBIDGE	8-15%	C

**NOTES:**

- SSSS PREPARED BY GOVE ENVIRONMENTAL SERVICES, INC., DATED AUGUST 25, 2015.

**Proposed  
Subdivision Road  
& Office Building  
Development**

Borthwick Forest, LLC

Portsmouth,  
New Hampshire

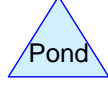
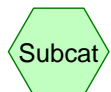
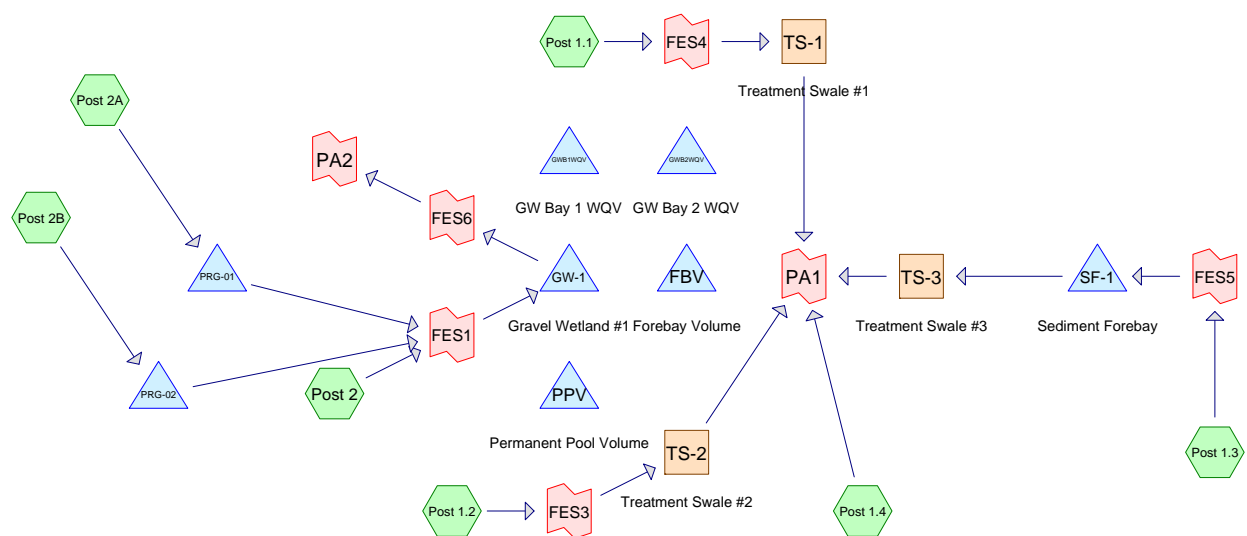
MARK	DATE	DESCRIPTION
D	5/20/2019	Amended Site Plan Approval
C	8/21/2017	Revised Planning Board Submission
B	6/2/2017	AoT Submission
A	3/20/2017	TAC Submission
PROJECT NO:	K0076-13	
DATE:	3/20/2017	
FILE:	20190520_WATERSHED PLANS.DWG	
DRAWN BY:	CML	
CHECKED BY:	PMC	
APPROVED BY:	BLM	

**POST-DEVELOPMENT  
WATERSHED PLAN**

SCALE: AS SHOWN

WS-2







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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.673	69	50-75% Grass cover, Fair, HSG B (299) (Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2)
1.712	61	>75% Grass cover, Good, HSG B (256) (Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2)
1.455	74	>75% Grass cover, Good, HSG C (29) (Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2, Post 2A, Post 2B)
0.349	74	>75% Grass cover, Good, HSG C (29) - Additional Area (Post 1.4)
0.055	96	Gravel surface, HSG C (Rail Road) (Post 1.1, Post 1.2)
3.280	98	Paved parking, HSG C (Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2, Post 2A, Post 2B)
0.544	98	Paved parking, HSG C - Additional Area (Post 2)
0.013	60	Woods, Fair, HSG B (299) (Post 1.4)
0.274	55	Woods, Good, HSG B (256) (Post 1.2, Post 1.4, Post 2)
0.156	70	Woods, Good, HSG C (29) (Post 1.4)
<b>8.511</b>	<b>81</b>	<b>TOTAL AREA</b>



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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.672	HSG B	Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2
5.839	HSG C	Post 1.1, Post 1.2, Post 1.3, Post 1.4, Post 2, Post 2A, Post 2B
0.000	HSG D	
0.000	Other	
<b>8.511</b>		<b>TOTAL AREA</b>



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Type III 24-hr 2-YR Rainfall=3.22"

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Time span=0.00-60.00 hrs, dt=0.10 hrs, 601 points x 2  
 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 Post 1.1:** Runoff Area=47,167 sf 50.65% Impervious Runoff Depth=1.55"  
 Flow Length=483' Tc=5.0 min CN=82 Runoff=1.86 cfs 0.140 af

**Subcatchment Post 1.2:** Runoff Area=28,752 sf 31.34% Impervious Runoff Depth=1.17"  
 Flow Length=213' Tc=5.0 min CN=76 Runoff=0.83 cfs 0.064 af

**Subcatchment Post 1.3:** Runoff Area=42,156 sf 28.79% Impervious Runoff Depth=1.23"  
 Flow Length=229' Tc=5.0 min CN=77 Runoff=1.29 cfs 0.099 af

**Subcatchment Post 1.4:** Runoff Area=61,172 sf 7.80% Impervious Runoff Depth=0.94"  
 Flow Length=238' Tc=5.0 min CN=72 Runoff=1.38 cfs 0.110 af

**Subcatchment Post 2:** Runoff Area=154,617 sf 61.84% Impervious Runoff Depth=1.77"  
 Flow Length=951' Tc=5.0 min CN=85 Runoff=6.97 cfs 0.525 af

**Subcatchment Post 2A:** Runoff Area=19,925 sf 57.73% Impervious Runoff Depth=2.01"  
 Flow Length=951' Tc=5.0 min CN=88 Runoff=1.01 cfs 0.077 af

**Subcatchment Post 2B:** Runoff Area=16,954 sf 56.89% Impervious Runoff Depth=2.01"  
 Flow Length=951' Tc=5.0 min CN=88 Runoff=0.86 cfs 0.065 af

**Reach TS-1: Treatment Swale #1** Avg. Flow Depth=0.44' Max Vel=0.36 fps Inflow=1.86 cfs 0.140 af  
 n=0.150 L=150.0' S=0.0050 '/ Capacity=6.46 cfs Outflow=1.49 cfs 0.140 af

**Reach TS-2: Treatment Swale #2** Avg. Flow Depth=0.30' Max Vel=0.29 fps Inflow=0.83 cfs 0.064 af  
 n=0.150 L=110.0' S=0.0050 '/ Capacity=5.79 cfs Outflow=0.67 cfs 0.064 af

**Reach TS-3: Treatment Swale #3** Avg. Flow Depth=0.12' Max Vel=0.17 fps Inflow=0.35 cfs 0.049 af  
 n=0.150 L=115.0' S=0.0052 '/ Capacity=6.60 cfs Outflow=0.18 cfs 0.049 af

**Pond FBV: Forebay Volume** Peak Elev=0.00' Storage=0 cf  
 12.0" Round Culvert n=0.013 L=1.0' S=0.0500 '/ Primary=0.00 cfs 0.000 af

**Pond GW-1: Gravel Wetland #1** Peak Elev=38.55' Storage=11,740 cf Inflow=6.97 cfs 0.539 af  
 Outflow=0.83 cfs 0.517 af

**Pond GWB1WQV: GW Bay 1 WQV** Peak Elev=0.00' Storage=0 cf  
 Primary=0.00 cfs 0.000 af

**Pond GWB2WQV: GW Bay 2 WQV** Peak Elev=0.00' Storage=0 cf  
 Primary=0.00 cfs 0.000 af

**Pond PPV: Permanent Pool Volume** Peak Elev=0.00' Storage=0 cf  
 8.0" Round Culvert n=0.013 L=1.0' S=0.0000 '/ Primary=0.00 cfs 0.000 af

**Pond PRG-01:** Peak Elev=51.01' Storage=2,342 cf Inflow=1.01 cfs 0.077 af  
 Discarded=0.02 cfs 0.065 af Primary=0.02 cfs 0.002 af Outflow=0.04 cfs 0.067 af



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*Type III 24-hr 2-YR Rainfall=3.22"*

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**Pond PRG-02:**

Peak Elev=51.03' Storage=1,639 cf Inflow=0.86 cfs 0.065 af  
Discarded=0.02 cfs 0.046 af Primary=0.08 cfs 0.012 af Outflow=0.09 cfs 0.058 af

**Pond SF-1: Sediment Forebay**

Peak Elev=40.15' Storage=1,951 cf Inflow=1.29 cfs 0.099 af  
Discarded=0.01 cfs 0.031 af Primary=0.35 cfs 0.049 af Outflow=0.36 cfs 0.080 af

**Link FES1:**

Inflow=6.97 cfs 0.539 af  
Primary=6.97 cfs 0.539 af

**Link FES3:**

Inflow=0.83 cfs 0.064 af  
Primary=0.83 cfs 0.064 af

**Link FES4:**

Inflow=1.86 cfs 0.140 af  
Primary=1.86 cfs 0.140 af

**Link FES5:**

Inflow=1.29 cfs 0.099 af  
Primary=1.29 cfs 0.099 af

**Link FES6:**

Inflow=0.83 cfs 0.517 af  
Primary=0.83 cfs 0.517 af

**Link PA1:**

Inflow=3.46 cfs 0.363 af  
Primary=3.46 cfs 0.363 af

**Link PA2:**

Inflow=0.83 cfs 0.517 af  
Primary=0.83 cfs 0.517 af

**Total Runoff Area = 8.511 ac   Runoff Volume = 1.081 af   Average Runoff Depth = 1.52"**  
**55.07% Pervious = 4.687 ac   44.93% Impervious = 3.824 ac**



**K0076-13-POST**

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Type III 24-hr 10-YR Rainfall=4.88"

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Time span=0.00-60.00 hrs, dt=0.10 hrs, 601 points x 2  
 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 Post 1.1:** Runoff Area=47,167 sf 50.65% Impervious Runoff Depth=2.97"  
 Flow Length=483' Tc=5.0 min CN=82 Runoff=3.54 cfs 0.268 af

**Subcatchment Post 1.2:** Runoff Area=28,752 sf 31.34% Impervious Runoff Depth=2.44"  
 Flow Length=213' Tc=5.0 min CN=76 Runoff=1.78 cfs 0.134 af

**Subcatchment Post 1.3:** Runoff Area=42,156 sf 28.79% Impervious Runoff Depth=2.52"  
 Flow Length=229' Tc=5.0 min CN=77 Runoff=2.70 cfs 0.203 af

**Subcatchment Post 1.4:** Runoff Area=61,172 sf 7.80% Impervious Runoff Depth=2.11"  
 Flow Length=238' Tc=5.0 min CN=72 Runoff=3.25 cfs 0.246 af

**Subcatchment Post 2:** Runoff Area=154,617 sf 61.84% Impervious Runoff Depth=3.26"  
 Flow Length=951' Tc=5.0 min CN=85 Runoff=12.59 cfs 0.963 af

**Subcatchment Post 2A:** Runoff Area=19,925 sf 57.73% Impervious Runoff Depth=3.56"  
 Flow Length=951' Tc=5.0 min CN=88 Runoff=1.74 cfs 0.136 af

**Subcatchment Post 2B:** Runoff Area=16,954 sf 56.89% Impervious Runoff Depth=3.56"  
 Flow Length=951' Tc=5.0 min CN=88 Runoff=1.48 cfs 0.115 af

**Reach TS-1: Treatment Swale #1** Avg. Flow Depth=0.65' Max Vel=0.46 fps Inflow=3.54 cfs 0.268 af  
 n=0.150 L=150.0' S=0.0050 '/ Capacity=6.46 cfs Outflow=2.99 cfs 0.268 af

**Reach TS-2: Treatment Swale #2** Avg. Flow Depth=0.48' Max Vel=0.38 fps Inflow=1.78 cfs 0.134 af  
 n=0.150 L=110.0' S=0.0050 '/ Capacity=5.79 cfs Outflow=1.52 cfs 0.134 af

**Reach TS-3: Treatment Swale #3** Avg. Flow Depth=0.45' Max Vel=0.38 fps Inflow=2.27 cfs 0.152 af  
 n=0.150 L=115.0' S=0.0052 '/ Capacity=6.60 cfs Outflow=1.60 cfs 0.152 af

**Pond FBV: Forebay Volume** Peak Elev=0.00' Storage=0 cf  
 12.0" Round Culvert n=0.013 L=1.0' S=0.0500 '/ Primary=0.00 cfs 0.000 af

**Pond GW-1: Gravel Wetland #1** Peak Elev=39.58' Storage=21,743 cf Inflow=13.20 cfs 1.079 af  
 Outflow=3.90 cfs 1.056 af

**Pond GWB1WQV: GW Bay 1 WQV** Peak Elev=0.00' Storage=0 cf  
 Primary=0.00 cfs 0.000 af

**Pond GWB2WQV: GW Bay 2 WQV** Peak Elev=0.00' Storage=0 cf  
 Primary=0.00 cfs 0.000 af

**Pond PPV: Permanent Pool Volume** Peak Elev=0.00' Storage=0 cf  
 8.0" Round Culvert n=0.013 L=1.0' S=0.0000 '/ Primary=0.00 cfs 0.000 af

**Pond PRG-01:** Peak Elev=51.16' Storage=2,582 cf Inflow=1.74 cfs 0.136 af  
 Discarded=0.02 cfs 0.069 af Primary=0.83 cfs 0.056 af Outflow=0.86 cfs 0.125 af



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*Type III 24-hr 10-YR Rainfall=4.88"*

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**Pond PRG-02:**

Peak Elev=51.21' Storage=1,837 cf Inflow=1.48 cfs 0.115 af  
Discarded=0.02 cfs 0.048 af Primary=1.20 cfs 0.060 af Outflow=1.22 cfs 0.108 af

**Pond SF-1: Sediment Forebay**

Peak Elev=40.56' Storage=2,511 cf Inflow=2.70 cfs 0.203 af  
Discarded=0.01 cfs 0.032 af Primary=2.27 cfs 0.152 af Outflow=2.28 cfs 0.184 af

**Link FES1:**

Inflow=13.20 cfs 1.079 af  
Primary=13.20 cfs 1.079 af

**Link FES3:**

Inflow=1.78 cfs 0.134 af  
Primary=1.78 cfs 0.134 af

**Link FES4:**

Inflow=3.54 cfs 0.268 af  
Primary=3.54 cfs 0.268 af

**Link FES5:**

Inflow=2.70 cfs 0.203 af  
Primary=2.70 cfs 0.203 af

**Link FES6:**

Inflow=3.90 cfs 1.056 af  
Primary=3.90 cfs 1.056 af

**Link PA1:**

Inflow=8.45 cfs 0.801 af  
Primary=8.45 cfs 0.801 af

**Link PA2:**

Inflow=3.90 cfs 1.056 af  
Primary=3.90 cfs 1.056 af

**Total Runoff Area = 8.511 ac   Runoff Volume = 2.066 af   Average Runoff Depth = 2.91"**  
**55.07% Pervious = 4.687 ac   44.93% Impervious = 3.824 ac**



**K0076-13-POST**

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Type III 24-hr 25-YR Rainfall=6.19"

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Time span=0.00-60.00 hrs, dt=0.10 hrs, 601 points x 2

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

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

<b>Subcatchment Post 1.1:</b>	Runoff Area=47,167 sf 50.65% Impervious Runoff Depth=4.16" Flow Length=483' Tc=5.0 min CN=82 Runoff=4.90 cfs 0.376 af
<b>Subcatchment Post 1.2:</b>	Runoff Area=28,752 sf 31.34% Impervious Runoff Depth=3.54" Flow Length=213' Tc=5.0 min CN=76 Runoff=2.58 cfs 0.195 af
<b>Subcatchment Post 1.3:</b>	Runoff Area=42,156 sf 28.79% Impervious Runoff Depth=3.65" Flow Length=229' Tc=5.0 min CN=77 Runoff=3.89 cfs 0.294 af
<b>Subcatchment Post 1.4:</b>	Runoff Area=61,172 sf 7.80% Impervious Runoff Depth=3.15" Flow Length=238' Tc=5.0 min CN=72 Runoff=4.89 cfs 0.369 af
<b>Subcatchment Post 2:</b>	Runoff Area=154,617 sf 61.84% Impervious Runoff Depth=4.48" Flow Length=951' Tc=5.0 min CN=85 Runoff=17.09 cfs 1.326 af
<b>Subcatchment Post 2A:</b>	Runoff Area=19,925 sf 57.73% Impervious Runoff Depth=4.81" Flow Length=951' Tc=5.0 min CN=88 Runoff=2.32 cfs 0.183 af
<b>Subcatchment Post 2B:</b>	Runoff Area=16,954 sf 56.89% Impervious Runoff Depth=4.81" Flow Length=951' Tc=5.0 min CN=88 Runoff=1.98 cfs 0.156 af
<b>Reach TS-1: Treatment Swale #1</b>	Avg. Flow Depth=0.79' Max Vel=0.51 fps Inflow=4.90 cfs 0.376 af n=0.150 L=150.0' S=0.0050 '/ Capacity=6.46 cfs Outflow=4.22 cfs 0.376 af
<b>Reach TS-2: Treatment Swale #2</b>	Avg. Flow Depth=0.60' Max Vel=0.43 fps Inflow=2.58 cfs 0.195 af n=0.150 L=110.0' S=0.0050 '/ Capacity=5.79 cfs Outflow=2.26 cfs 0.195 af
<b>Reach TS-3: Treatment Swale #3</b>	Avg. Flow Depth=0.65' Max Vel=0.47 fps Inflow=3.50 cfs 0.242 af n=0.150 L=115.0' S=0.0052 '/ Capacity=6.60 cfs Outflow=3.03 cfs 0.242 af
<b>Pond FBV: Forebay Volume</b>	Peak Elev=0.00' Storage=0 cf 12.0" Round Culvert n=0.013 L=1.0' S=0.0500 '/ Primary=0.00 cfs 0.000 af
<b>Pond GW-1: Gravel Wetland #1</b>	Peak Elev=40.18' Storage=28,765 cf Inflow=20.61 cfs 1.527 af Outflow=5.86 cfs 1.504 af
<b>Pond GWB1WQV: GW Bay 1 WQV</b>	Peak Elev=0.00' Storage=0 cf Primary=0.00 cfs 0.000 af
<b>Pond GWB2WQV: GW Bay 2 WQV</b>	Peak Elev=0.00' Storage=0 cf Primary=0.00 cfs 0.000 af
<b>Pond PPV: Permanent Pool Volume</b>	Peak Elev=0.00' Storage=0 cf 8.0" Round Culvert n=0.013 L=1.0' S=0.0000 '/ Primary=0.00 cfs 0.000 af
<b>Pond PRG-01:</b>	Peak Elev=51.30' Storage=2,815 cf Inflow=2.32 cfs 0.183 af Discarded=0.02 cfs 0.070 af Primary=2.01 cfs 0.102 af Outflow=2.03 cfs 0.173 af



**K0076-13-POST***Type III 24-hr 25-YR Rainfall=6.19"*

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**Pond PRG-02:**

Peak Elev=51.27' Storage=1,915 cf Inflow=1.98 cfs 0.156 af  
Discarded=0.02 cfs 0.049 af Primary=1.81 cfs 0.099 af Outflow=1.83 cfs 0.149 af

**Pond SF-1: Sediment Forebay**

Peak Elev=40.74' Storage=2,784 cf Inflow=3.89 cfs 0.294 af  
Discarded=0.01 cfs 0.033 af Primary=3.50 cfs 0.242 af Outflow=3.51 cfs 0.275 af

**Link FES1:**

Inflow=20.61 cfs 1.527 af  
Primary=20.61 cfs 1.527 af

**Link FES3:**

Inflow=2.58 cfs 0.195 af  
Primary=2.58 cfs 0.195 af

**Link FES4:**

Inflow=4.90 cfs 0.376 af  
Primary=4.90 cfs 0.376 af

**Link FES5:**

Inflow=3.89 cfs 0.294 af  
Primary=3.89 cfs 0.294 af

**Link FES6:**

Inflow=5.86 cfs 1.504 af  
Primary=5.86 cfs 1.504 af

**Link PA1:**

Inflow=13.75 cfs 1.181 af  
Primary=13.75 cfs 1.181 af

**Link PA2:**

Inflow=5.86 cfs 1.504 af  
Primary=5.86 cfs 1.504 af

**Total Runoff Area = 8.511 ac   Runoff Volume = 2.898 af   Average Runoff Depth = 4.09"**  
**55.07% Pervious = 4.687 ac   44.93% Impervious = 3.824 ac**



**K0076-13-POST**

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Type III 24-hr 50-YR Rainfall=7.41"

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Time span=0.00-60.00 hrs, dt=0.10 hrs, 601 points x 2  
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

<b>Subcatchment Post 1.1:</b>	Runoff Area=47,167 sf 50.65% Impervious Runoff Depth=5.30" Flow Length=483' Tc=5.0 min CN=82 Runoff=6.18 cfs 0.478 af
<b>Subcatchment Post 1.2:</b>	Runoff Area=28,752 sf 31.34% Impervious Runoff Depth=4.62" Flow Length=213' Tc=5.0 min CN=76 Runoff=3.35 cfs 0.254 af
<b>Subcatchment Post 1.3:</b>	Runoff Area=42,156 sf 28.79% Impervious Runoff Depth=4.74" Flow Length=229' Tc=5.0 min CN=77 Runoff=5.02 cfs 0.382 af
<b>Subcatchment Post 1.4:</b>	Runoff Area=61,172 sf 7.80% Impervious Runoff Depth=4.18" Flow Length=238' Tc=5.0 min CN=72 Runoff=6.49 cfs 0.489 af
<b>Subcatchment Post 2:</b>	Runoff Area=154,617 sf 61.84% Impervious Runoff Depth=5.65" Flow Length=951' Tc=5.0 min CN=85 Runoff=21.26 cfs 1.670 af
<b>Subcatchment Post 2A:</b>	Runoff Area=19,925 sf 57.73% Impervious Runoff Depth=5.99" Flow Length=951' Tc=5.0 min CN=88 Runoff=2.86 cfs 0.228 af
<b>Subcatchment Post 2B:</b>	Runoff Area=16,954 sf 56.89% Impervious Runoff Depth=5.99" Flow Length=951' Tc=5.0 min CN=88 Runoff=2.43 cfs 0.194 af
<b>Reach TS-1: Treatment Swale #1</b>	Avg. Flow Depth=0.91' Max Vel=0.55 fps Inflow=6.18 cfs 0.478 af n=0.150 L=150.0' S=0.0050 '/ Capacity=6.46 cfs Outflow=5.39 cfs 0.478 af
<b>Reach TS-2: Treatment Swale #2</b>	Avg. Flow Depth=0.69' Max Vel=0.47 fps Inflow=3.35 cfs 0.254 af n=0.150 L=110.0' S=0.0050 '/ Capacity=5.79 cfs Outflow=2.97 cfs 0.254 af
<b>Reach TS-3: Treatment Swale #3</b>	Avg. Flow Depth=0.77' Max Vel=0.52 fps Inflow=4.22 cfs 0.329 af n=0.150 L=115.0' S=0.0052 '/ Capacity=6.60 cfs Outflow=4.09 cfs 0.329 af
<b>Pond FBV: Forebay Volume</b>	Peak Elev=0.00' Storage=0 cf 12.0" Round Culvert n=0.013 L=1.0' S=0.0500 '/ Primary=0.00 cfs 0.000 af
<b>Pond GW-1: Gravel Wetland #1</b>	Peak Elev=40.81' Storage=36,961 cf Inflow=25.93 cfs 1.953 af Outflow=6.74 cfs 1.930 af
<b>Pond GWB1WQV: GW Bay 1 WQV</b>	Peak Elev=0.00' Storage=0 cf Primary=0.00 cfs 0.000 af
<b>Pond GWB2WQV: GW Bay 2 WQV</b>	Peak Elev=0.00' Storage=0 cf Primary=0.00 cfs 0.000 af
<b>Pond PPV: Permanent Pool Volume</b>	Peak Elev=0.00' Storage=0 cf 8.0" Round Culvert n=0.013 L=1.0' S=0.0000 '/ Primary=0.00 cfs 0.000 af
<b>Pond PRG-01:</b>	Peak Elev=51.34' Storage=2,889 cf Inflow=2.86 cfs 0.228 af Discarded=0.02 cfs 0.072 af Primary=2.54 cfs 0.146 af Outflow=2.57 cfs 0.218 af



**K0076-13-POST***Type III 24-hr 50-YR Rainfall=7.41"*

Prepared by Tighe &amp; Bond

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**Pond PRG-02:**

Peak Elev=51.31' Storage=1,966 cf Inflow=2.43 cfs 0.194 af  
Discarded=0.02 cfs 0.050 af Primary=2.24 cfs 0.137 af Outflow=2.26 cfs 0.187 af

**Pond SF-1: Sediment Forebay**

Peak Elev=40.86' Storage=2,967 cf Inflow=5.02 cfs 0.382 af  
Discarded=0.01 cfs 0.033 af Primary=4.22 cfs 0.329 af Outflow=4.23 cfs 0.362 af

**Link FES1:**

Inflow=25.93 cfs 1.953 af  
Primary=25.93 cfs 1.953 af

**Link FES3:**

Inflow=3.35 cfs 0.254 af  
Primary=3.35 cfs 0.254 af

**Link FES4:**

Inflow=6.18 cfs 0.478 af  
Primary=6.18 cfs 0.478 af

**Link FES5:**

Inflow=5.02 cfs 0.382 af  
Primary=5.02 cfs 0.382 af

**Link FES6:**

Inflow=6.74 cfs 1.930 af  
Primary=6.74 cfs 1.930 af

**Link PA1:**

Inflow=18.36 cfs 1.551 af  
Primary=18.36 cfs 1.551 af

**Link PA2:**

Inflow=6.74 cfs 1.930 af  
Primary=6.74 cfs 1.930 af

**Total Runoff Area = 8.511 ac   Runoff Volume = 3.697 af   Average Runoff Depth = 5.21"**  
**55.07% Pervious = 4.687 ac   44.93% Impervious = 3.824 ac**