

**Civil
Site Planning
Environmental
Engineering**

133 Court Street
Portsmouth, NH
03801-4413

November 6, 2020

Juliet T. H. Walker, Planning Director
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

**Re: Site Plan Review
Accessory Storage Building
Assessor's Map 253, Lot 2A
150 Mirona Road
Altus Project No. 5107**

Dear Juliet,

On behalf of the Applicant, Madison Commercial Group, LLC, Altus Engineering, Inc. respectfully submits an application for site plan review for the construction of an accessory storage building at 150 Mirona Road.

We are requesting one waiver from Site Plan Review Section 6.2, Landscaping Plan. The front, street-facing portion of the site is already developed and landscaped and the new building will be behind this and therefore not very visible from Mirona Road. Furthermore, the majority of the remaining areas of the parcel will be either be comprised of stormwater management infrastructure or are encumbered with an existing sewer easement. These constraints limit the area available for landscaping and make a landscaping plan is impractical for this development.

Please call me if you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Erik Saari
Vice President

ebs/5107-APP-PB-CovLtr-110620

eCopy: Patricia Wright

MADISON COMMERCIAL GROUP, LLC

Proposed Accessory Storage Building

150 Mirona Road
Portsmouth, New Hampshire 03801
Assessor's Parcel 253 - 2A

ISSUED FOR TAC

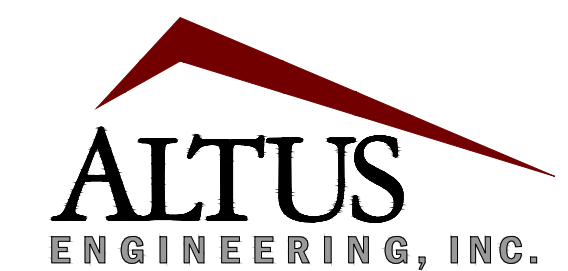
Plan Issue Date:

NOVEMBER 16, 2020

Owner / Applicant:

Madison Commercial Group, LLC
72 Mirona Road, Suite 4
Portsmouth, NH 03801

Civil Engineer:



133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

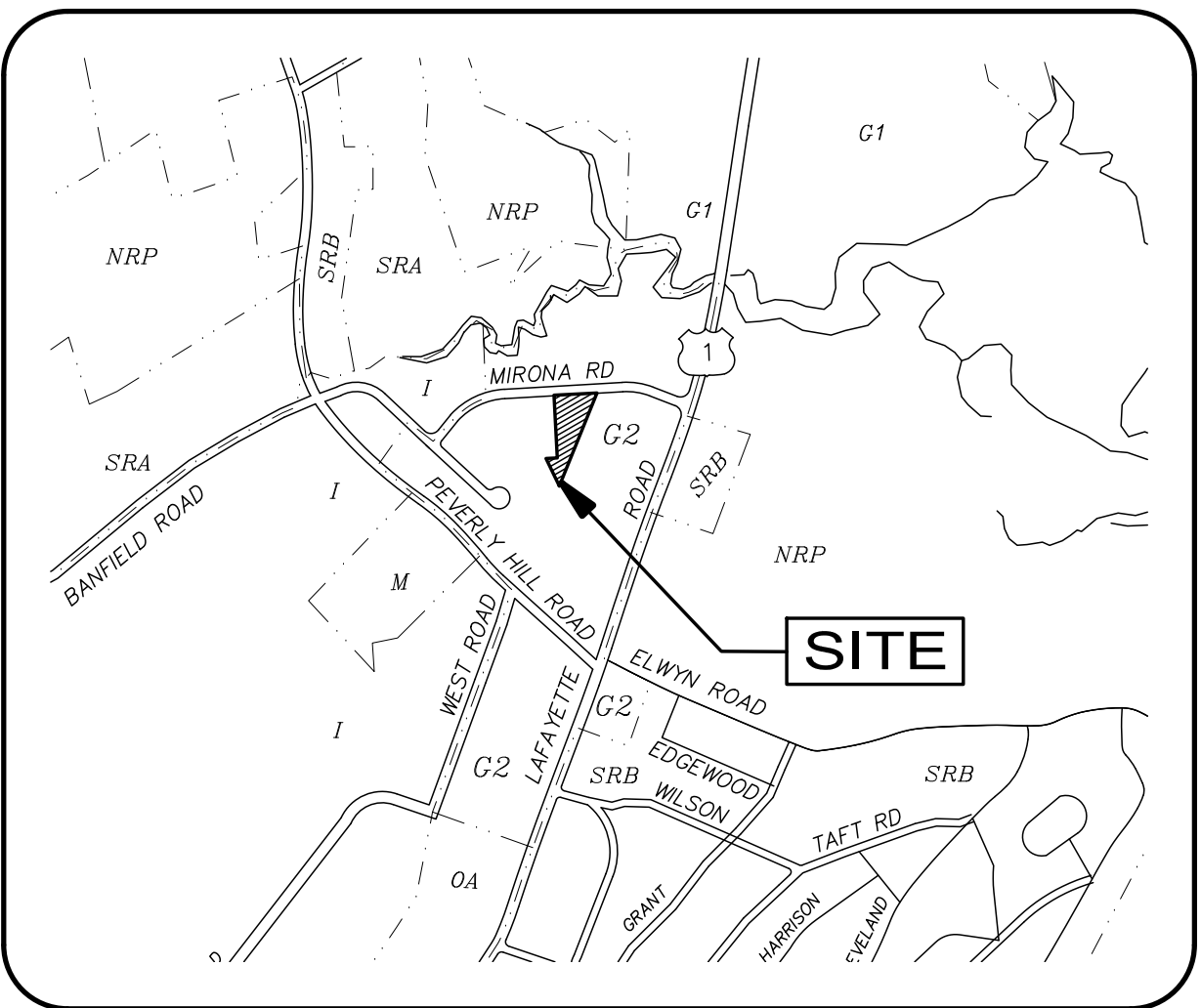
Surveyor:

James Verra and
Associates, Inc.
LAND SURVEYORS

101 SHATTUCK WAY - SUITE 8
NEWINGTON, N.H. 03801- 7876
603-436-3557

Wetland Scientist:

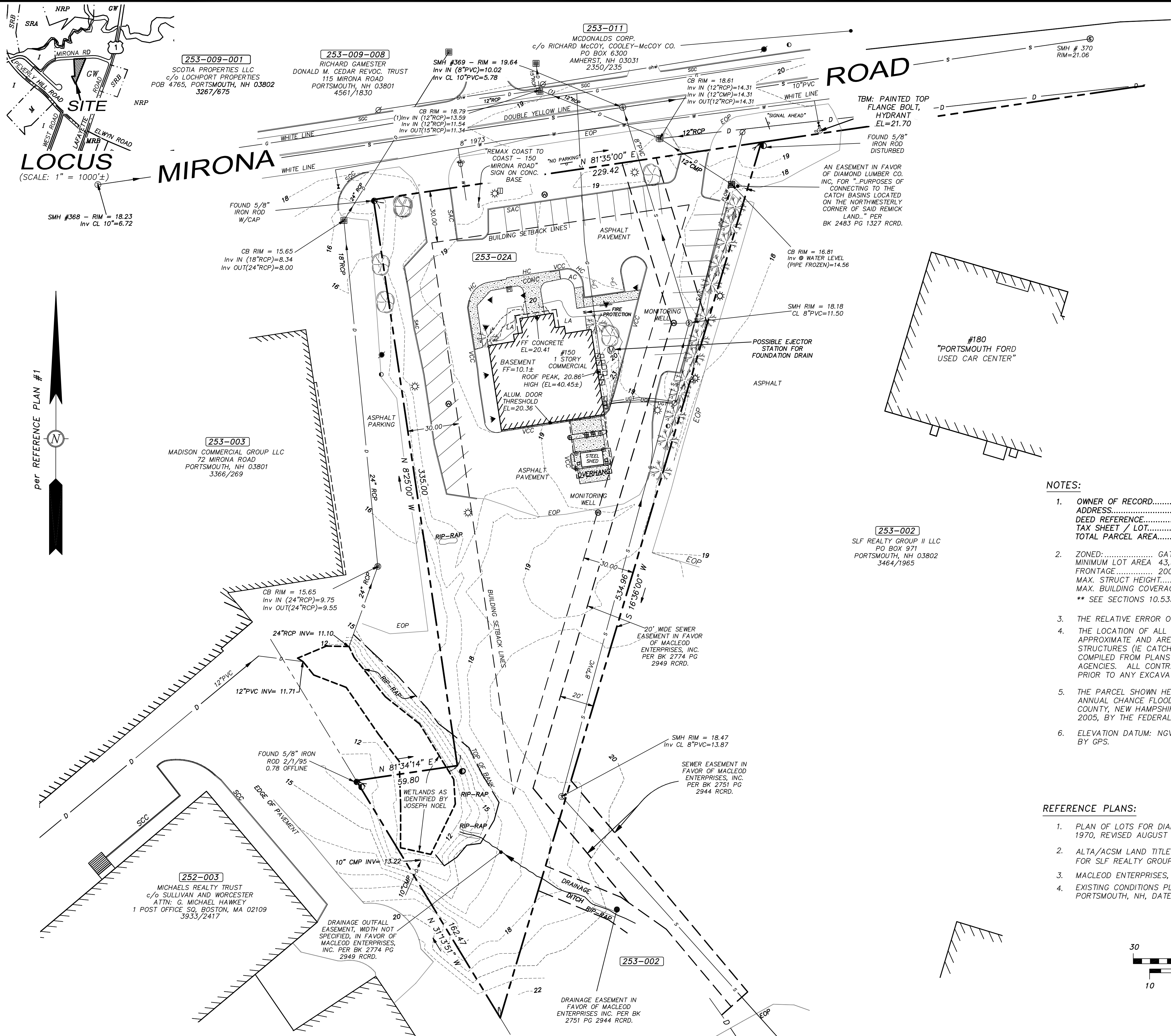
Joseph Noel
P.O. BOX 174
South Berwick, ME 03908
Phone: (207) 384-5587



LOCUS

NOT TO SCALE

<i>Sheet Index Title</i>	<i>Sheet No.:</i>	<i>Rev.</i>	<i>Date</i>
Existing Conditions Plan	C-1	0	01/21/10
Demolition Plan	C-2	1	11/16/20
Site Plan	C-3	1	11/16/20
Stormwater Management Plan	C-4	1	11/16/20
Utility Plan	C-5	1	11/16/20
Lighting Plan	C-6	0	11/16/20
Detail Sheet	C-7	1	11/16/20
Detail Sheet	C-8	1	11/16/20
Detail Sheet	C-9	1	11/16/20
Detail Sheet	C-10	1	11/16/20
Detail Sheet	C-11	1	11/16/20
Detail Sheet	C-12	1	11/16/20
Architectural Elevations	1 of 1	0	10/23/20



LEGEND:

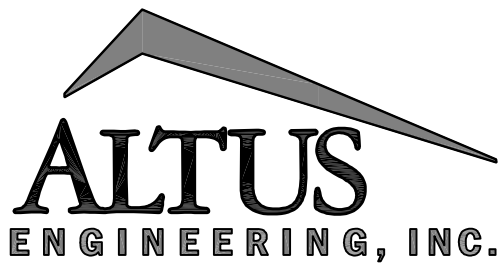
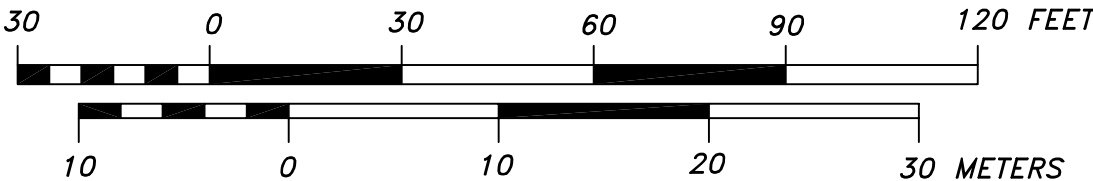
- IRON ROD
- IRON PIPE
- SEWER MANHOLE
- DRAIN MANHOLE
- HYDRANT
- WATER GATE VALVE
- WATER SHUT OFF VALVE
- MONITORING WELL
- GAS METER
- GAS SHUT OFF VALVE
- BOLLARD
- CEMENT CONCRETE PAD
- UTILITY POLE
- LIGHT POLE
- UTILITY POLE W/TRANSFORMER
- GUY
- ELECTRIC METER
- ELECTRICAL BOX
- TELEPHONE RISER
- WALL MOUNTED LIGHT
- SEWER LINE
- WATER LINE
- DRAIN LINE
- GAS LINE
- OVERHEAD WIRES
- UNDERGROUND ELECTRIC
- UNDERGROUND TELEPHONE
- SON
- VERTICAL FACED GRANITE CURB
- VERTICAL FACED ASPHALT CURB
- SLOPED FACED ASPHALT CURB
- VERTICAL FACED CONCRETE CURB
- SLOPED FACED CONCRETE CURB
- HANDICAP SPACE
- DECIDUOUS TREE
- CONIFEROUS TREE
- ASPHALT CONCRETE
- IRRIGATION CONTROL VALVE
- MAIL BOX
- 4' HIGH EXTERIOR LIGHT
- MANHOLE
- PROPERTY LINE
- HANDICAPPED ASSESSABLE

NOTES:

- OWNER OF RECORD.....MADISON COMMERCIAL GROUP, LLC
ADDRESS.....72 MIRONA ROAD, PORTSMOUTH, NH 03801
DEED REFERENCE.....5064/157
TAX SHEET / LOT.....253-02A
TOTAL PARCEL AREA..... 60,621 S.F. 1.39 ACRES
- ZONED:..... GATEWAY (GW) FRONT YARD SETBACK.....30'
MINIMUM LOT AREA 43,560 S.F. SIDE YARD SETBACK.....30' **
FRONTAGE..... 200' REAR YARD SETBACK.....50'
MAX. STRUCT HEIGHT..... 40' MIN. OPEN SPACE.....20%
MAX. BUILDING COVERAGE.....30%
** SEE SECTIONS 10.533 & 10.734 FOR SPECIAL PROVISIONS
- THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
- THE LOCATION OF ALL UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE CATCH BASINS, MANHOLES, WATER GATES ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY COMPANIES AND GOVERNMENTAL AGENCIES. ALL CONTRACTORS SHOULD NOTIFY, IN WRITING, SAID AGENCIES PRIOR TO ANY EXCAVATION WORK AND CALL DIG-SAFE @ 1-888-DIG-SAFE.
- THE PARCEL SHOWN HEREON LIES WITHIN ZONE "X", OUTSIDE OF THE THE 0.2% ANNUAL CHANCE FLOODPLAIN PER FLOOD INSURANCE RATE MAP, ROCKINGHAM COUNTY, NEW HAMPSHIRE, MAP NUMBER 3301SC0270E, EFFECTIVE DATE, MAY 17, 2005, BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
- ELEVATION DATUM: NGVD 1929. PRIMARY BENCH MARK: NHDOT DISK 379-0050, BY GPS.

REFERENCE PLANS:

- PLAN OF LOTS FOR DIAMOND INTERNATIONAL CORP., PORTSMOUTH, N.H., DATE JUNE 1970, REVISED AUGUST 1973, RCRD # D-8831.
- ALTA/ACSM LAND TITLE SURVEY, 180 MIRONA ROAD, PORTSMOUTH, NEW HAMPSHIRE FOR SLF REALTY GROUP II, LLC, DATED 2/15/2000, RCRD #D-27945.
- MACLEOD ENTERPRISES, INC., EASEMENT, DATE 8/23/88, RCRD # D-18425.
- EXISTING CONDITIONS PLAN, MULBERRY CHILD CARE CENTER, INC., 72 MIRONA ROAD, PORTSMOUTH, NH, DATED MARCH 22, 2004, BY ALTUS ENGINEERING.



133 COURT STREET PORTSMOUTH, NH 03801
VOICE: (603) 433-2335
FAX: (603) 433-4194

James Verra
and Associates, Inc.

Land Surveyors

101 Shattuck Way, Suite 8
Newington, N.H. 03801

Voice: 603.436.3557
Fax:: 603.436.8339

JOB # 23300

ISSUED FOR:

CLIENT REVIEW

ISSUE DATE:

01-21-2010

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	CLIENT REVIEW	JV	01-21-2010
0	REV. ZONING	JV	01-25-2010

DRAWN BY:

HRM

APPROVED BY:

JV

DRAWING FILE:

23300.DWG

SCALE:

1"=30'

OWNER/APPLICANT:

MADISON COMMERCIAL
GROUP, LLC
72 MIRONA ROAD
PORTSMOUTH, NH

PROJECT:

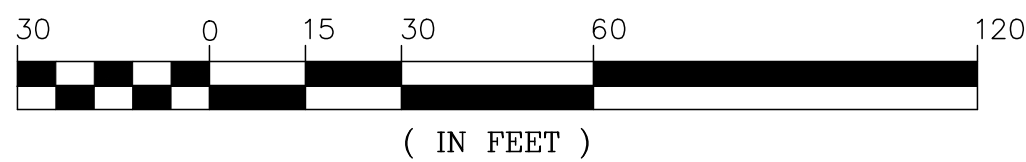
MADISON COMMERCIAL
GROUP, LLC
150 MIRONA ROAD
PORTSMOUTH, NH

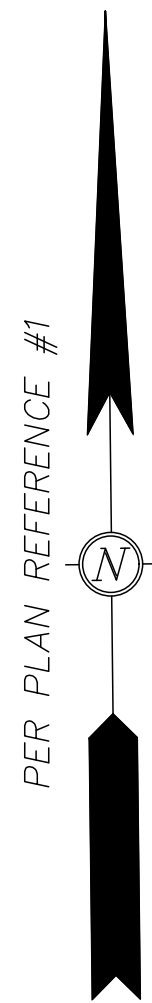
TITLE:

EXISTING
CONDITIONS
PLAN

SHEET NUMBER:

C-1





253-009-001
SCOTIA PROPERTIES LLC
c/o LOCHPORT PROPERTIES
POB 4765, PORTSMOUTH, NH 03802
3267/675

253-009-008
RICHARD GAMESTER
DONALD M. CEDAR REVOC. TRUST
115 MIRONA ROAD
PORTSMOUTH, NH 03801
4561/1830

253-011
MCDONALDS CORP.
c/o RICHARD MCCOY, COOLEY-MCCOY CO.
PO BOX 6300
AMHERST, NH 03031
2350/235

MIRONA

253-003
MADISON COMMERCIAL GROUP LLC
72 MIRONA ROAD
PORTSMOUTH, NH 03801
3366/269

252-003
MICHAELS REALTY TRUST
c/o SULLIVAN AND WORCESTER
ATTN: G. MICHAEL HAWKEY
1 POST OFFICE SQ, BOSTON, MA 02109
3933/2417

DRAINAGE OUTFALL
EASEMENT, WIDTH NOT
SPECIFIED, IN FAVOR OF
MACLEOD ENTERPRISES,
INC. PER BK 2774 PG
2949 RCRD.

DRAINAGE EASEMENT IN
FAVOR OF MACLEOD
ENTERPRISES, INC. PER BK
2751 PG 2944 RCRD.

ROAD

AN EASEMENT IN FAVOR
OF DIAMOND LUMBER CO.
INC. FOR "PURPOSES OF
CONNECTING TO THE
CATCH BASINS LOCATED
ON THE NORTHWESTERLY
CORNER OF SAID REMICK
LAND." PER
BK 2483 PG 1327 RCRD.

253-002
SLF REALTY GROUP II LLC
PO BOX 971
PORTSMOUTH, NH 03802
3464/1965

#180
"PORTSMOUTH FORD
USED CAR CENTER"

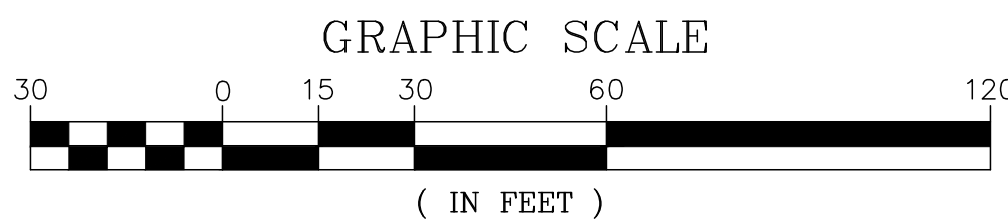
SITE NOTES

- DESIGN INTENT - THIS PLAN IS INTENDED TO DEPICT AN ACCESSORY STORAGE BUILDING FOR USE BY THE OWNER OF LOTS 253-02A AND 253-003.
- THE BASE PLAN USED HERE WAS DEVELOPED FROM "EXISTING CONDITIONS PLAN, 150 MIRONA ROAD, PORTSMOUTH, NH" BY JAMES VERRA AND ASSOCIATES, INC., AS REVISED THROUGH JANUARY 25, 2010.
- LOT SIZE: ±60,621 S.F. (1.39 AC.)
- ZONE: G2 (GATEWAY 2)
- DIMENSIONAL REQUIREMENTS ("SMALL COMMERCIAL BUILDING" PER 10.5B34.60):**

MIN. LOT AREA:	NO REQUIREMENT
MIN. STREET FRONTAGE:	50'
MIN. LOT DEPTH:	NO REQUIREMENT
FRONT SETBACK:	0' MIN./20' MAX.
SIDE SETBACK:	10'
REAR SETBACK:	15'
MAX. BUILDING HEIGHT:	40' OR 3 STORIES
MAX. BUILDING LENGTH:	200'
MAX. BUILDING FOOTPRINT:	10,000 S.F.
MAX. BUILDING COVERAGE:	70% (14.6%/8,855 S.F. PROPOSED)
MIN. OPEN SPACE:	10% (22.5%/13,650 S.F. PROPOSED)
- PARKING REQUIREMENTS:**

OFFICE: 1 SPACE REQUIRED PER 350 S.F.	3,355 S.F./350 = 10 SPACES
ACCESSORY STORAGE: NO REQUIREMENT	11,000 S.F./? = ? SPACES
TOTAL PARKING REQUIRED = 10+? SPACES	
EXISTING PARKING	= 37 SPACES
PROPOSED PARKING	= 3 SPACES
TOTAL PARKING PROVIDED = 40 SPACES	

37 EXISTING PARKING SPACES ASSUMED TO BE PERMITTED PER A SITE PLAN APPROVED UNDER PRIOR ZONING REGULATIONS, NO ZONING RELIEF REQUIRED FOR EXCESS SPACES.
- ON-SITE WETLAND LESS THAN 10,000 S.F. IN AREA, NO BUFFER REQUIRED.
- WETLANDS WERE DELINEATED BY JOSEPH W. NOEL, NH CERTIFIED SOILS SCIENTIST #017 AND NH CERTIFIED WETLAND SCIENTIST #086, ON SEPTEMBER 15, 2020. THE DELINEATION WAS CONDUCTED IN ACCORDANCE WITH THE U.S. ARMY CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH-CENTRAL AND NORTHEAST REGION (VERSION 2, JANUARY 2012).
- OVERALL AREA OF DISTURBANCE LESS THAN 100,000 S.F. OR GREATER, NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
- AREA OF DISTURBANCE UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT NOT REQUIRED.
- SNOW SHALL BE STORED AT THE EDGE OF PAVEMENT, IN AREAS SHOWN HEREON, AND/OR TRUCKED OFF SITE AS APPROPRIATE.
- ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
- ALL CONDITIONS OF THIS APPROVAL SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
- THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
- PAVEMENT MARKINGS SHALL BE CONSTRUCTED USING WHITE, YELLOW, OR BLUE TRAFFIC PAINT (WHERE SPECIFIED) MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F OR EQUAL. PAINTED ISLANDS AND LOADING ZONES SHALL BE 4"-WIDE DIAGONAL WHITE LINES 3'-0" O.C. BORDERED BY 4"-WIDE WHITE LINES. PARKING STALLS SHALL BE SEPARATED BY 4"-WIDE WHITE LINES. SEE DETAILS FOR HANDICAP SYMBOLS, SIGNS AND SIGN DETAILS. PAVEMENT MARKINGS SHALL BE INSTALLED AT LEAST 14-DAYS AFTER INSTALLATION OF WEARING COURSE PAVEMENT. CONTRACTOR SHALL APPLY TWO (2) COATS OF ALL PAVEMENT MARKINGS.
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- ALL IMPROVEMENTS SHOWN ON THIS 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.
- THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.
- SITWORK CONTRACTOR SHALL PREPARE AN AS-BUILT SITE PLAN STAMPED BY A NH-LICENSED LAND SURVEYOR (LLS) & PROVIDE A DIGITAL COPY IN CAD FORMAT FOR THE CITY'S G.I.S. DATABASE.
- SEE THE ENTIRE APPROVED PLAN SET ON FILE WITH THE CITY OF PORTSMOUTH PLANNING DEPARTMENT.



THE SOLE PURPOSE OF THIS PLAN IS TO DEPICT THE LOCATION OF EXISTING AND PROPOSED IMPROVEMENTS ON THE SITE. RECORDING OF THIS PLAN WAS A REQUIREMENT OF THE PORTSMOUTH PLANNING BOARD AS PART OF THEIR APPROVAL.

FOR JAMES VERRA & ASSOCIATES, INC. DATE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

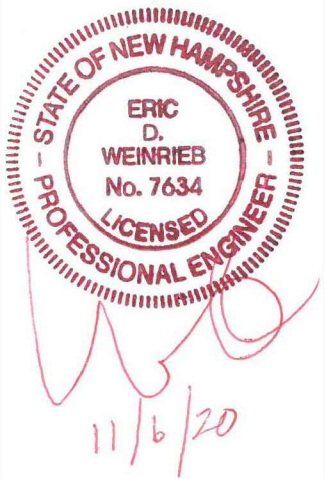
CHAIRMAN

DATE

ALTUS
ENGINEERING, INC.

133 Court Street
(603) 433-2335

Portsmouth, NH 03801
www.altus-eng.com



NOT FOR CONSTRUCTION

ISSUED FOR:

TAC

ISSUE DATE:

NOVEMBER 16, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	10/06/20
1	TAC	EBS	11/16/20

DRAWN BY: EBS

APPROVED BY: EBS

DRAWING FILE: 5107-SITE.dwg

SCALE: 22"x34" 1" = 30'
11"x17" 1" = 60'

OWNER/APPLICANT:

**MADISON COMMERCIAL
GROUP, LLC**

**72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801**

PROJECT:

**PROPOSED
ACCESSORY STORAGE
BUILDING**

**TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801**

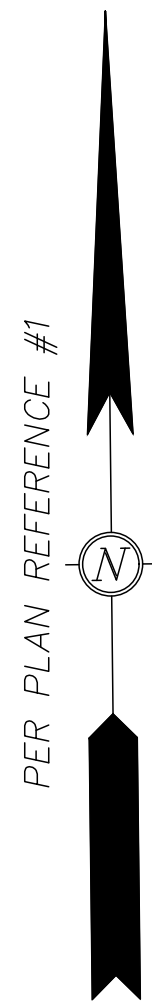
TITLE:

SITE PLAN

SHEET NUMBER:

C-3

P5107



253-009-001
SCOTIA PROPERTIES LLC
c/o LOCHPORT PROPERTIES
POB 4765, PORTSMOUTH, NH 03802
3267/675

253-009-008
RICHARD GAMESTER
DONALD M. CEDAR REVOC. TRUST
115 MIRONA ROAD
PORTSMOUTH, NH 03801
4561/1830

253-011
MCDONALDS CORP.
c/o RICHARD MCCOY, COOLEY-MCCOY CO.
PO BOX 6300
AMHERST, NH 03031
2350/235

MIRONA

253-003
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PORTSMOUTH, NH 03801
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c/o SULLIVAN AND WORCESTER
ATTN: G. MICHAEL HAWKEY
1 POST OFFICE SQ, BOSTON, MA 02109
3933/2417

253-002
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ROAD

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3464/1965

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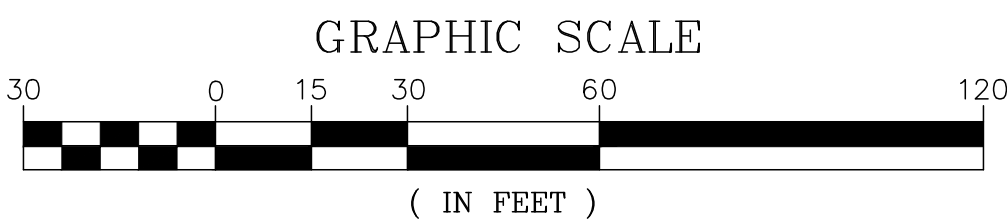
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FOR JAMES VERRA & ASSOCIATES, INC. DATE

APPROVED BY THE PORTSMOUTH PLANNING BOARD

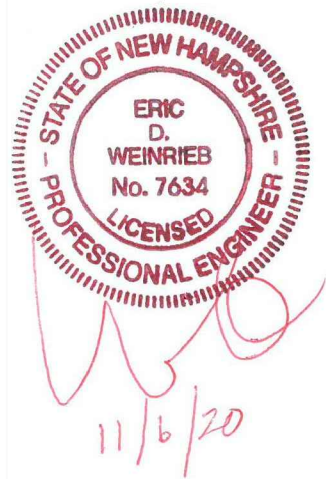
CHAIRMAN

DATE

ALTUS
ENGINEERING, INC.

133 Court Street
(603) 433-2335

Portsmouth, NH 03801
www.altus-eng.com



NOT FOR CONSTRUCTION

ISSUED FOR:

TAC

ISSUE DATE:

NOVEMBER 16, 2020

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	10/06/20
1	TAC	EBS	11/16/20

DRAWN BY:

EBS

APPROVED BY:

EBS

DRAWING FILE:

5107-SITE.dwg

SCALE:

22"x34" 1" = 30'

11"x17" 1" = 60'

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC

**72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801**

PROJECT:

**PROPOSED
ACCESSORY STORAGE
BUILDING**

**TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801**

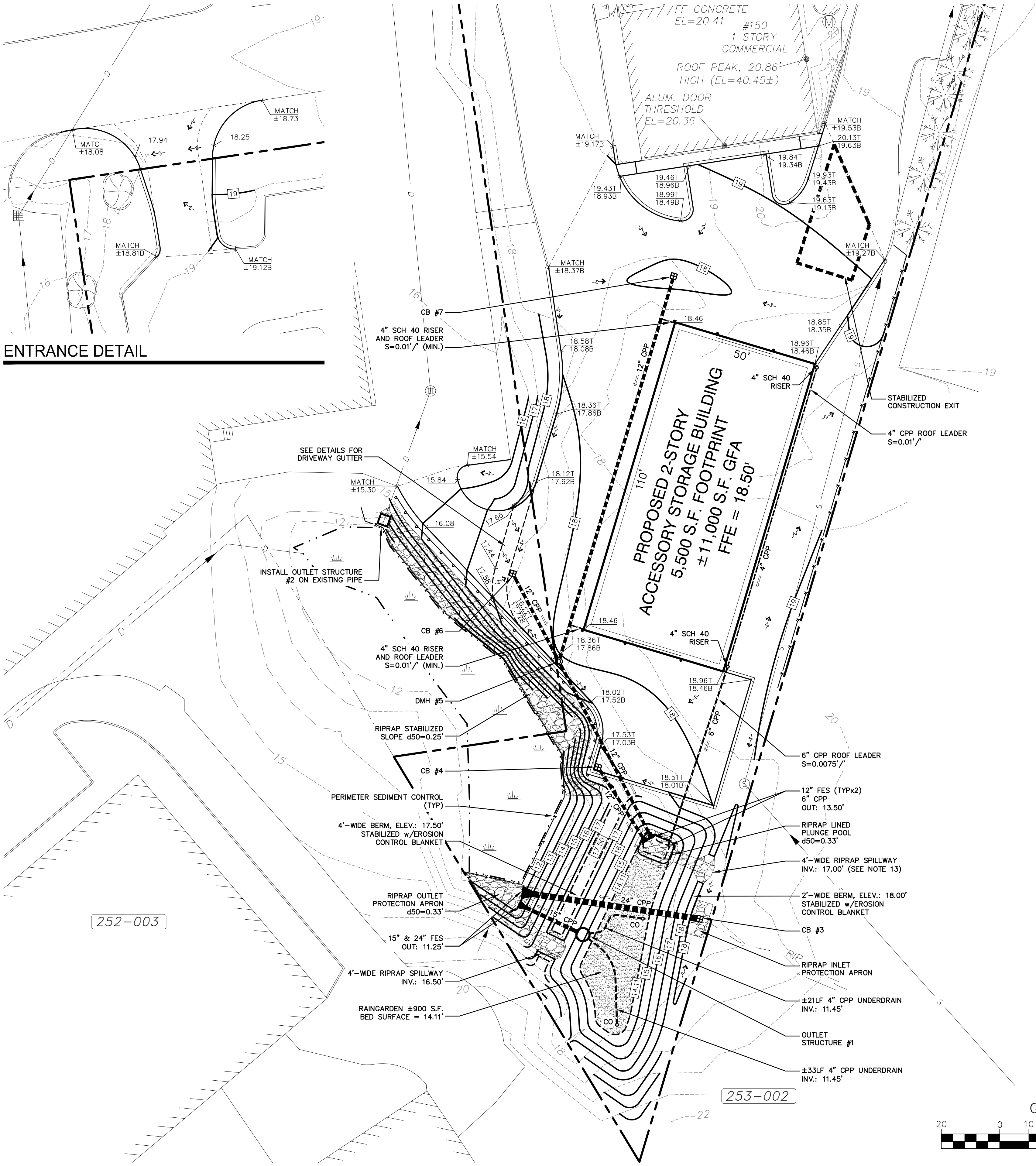
TITLE:

SITE PLAN

SHEET NUMBER:

C-3

P5107



ENTRANCE DETAIL

DRAINAGE SCHEDULE

OUTLET STRUCTURE #1
RIM=16.50'
IN: 11.45' (4" UNDERDRAIN)
IN: 11.45' (4" UNDERDRAIN)
IN: 11.45' (15" CB#3)
OUT: 11.35' (TO POND)
15" CPP w/FES
L=±20' S=0.005'/'
PIPE TO BE INSTALLED w/ANTI-SEEP COLLAR

OUTLET STRUCTURE #2
RIM=14.10'
IN: 11.10' (24"x24" ORIFICE)
OUT: 11.10'
24" RCP (EXISTING)

CB #3
NO SUMP OR GREASE HOOD
RIM=16.50' (w/LDR 48 TRASH RACK)
OUT: 11.53' (TO POND)
24" CPP w/FES
L=±57' S=0.005'/'
PIPE TO BE INSTALLED w/(2) ANTI-SEEP COLLARS, (1) EACH PER BERM CROSSING

CB #4
RIM=16.65'
OUT: ±13.64' (TO RAINGARDEN)
12" CPP w/FES
L=±27' S=0.005'/'

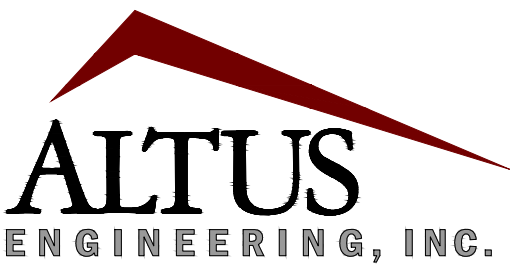
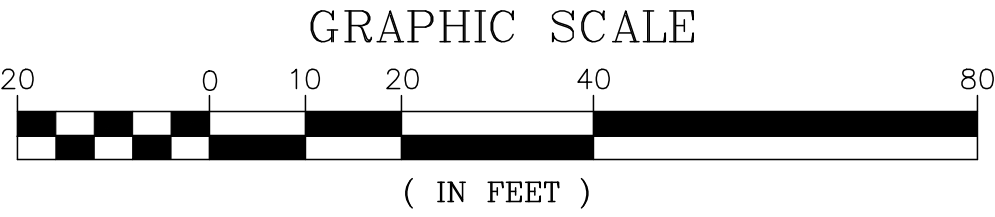
DMH #5
RIM=17.85'
IN: 13.93' (12" CB#5)
IN: 13.93' (12" CB#6)
OUT: 13.83' (TO RAINGARDEN)
12" CPP w/FES
L=±65' S=0.005'/'

CB #6
RIM=17.25'
OUT: ±14.08' (TO DMH #4)
12" CPP
L=±30' S=0.005'/'

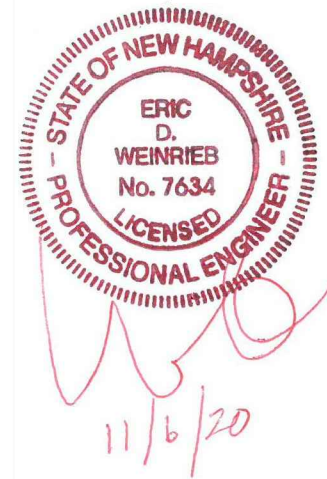
CB #7
RIM=17.80'
OUT: 14.60 (TO DMH #4)
12" CPP
L=±134' S=0.005'/'

GRADING AND DRAINAGE NOTES

- DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
- CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
- UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBM) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
- PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
- TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
- PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
- IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
- ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
- ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
- ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
- CONTRACTOR SHALL ENSURE THAT THE SPILLWAY INVERT IS AT LEAST 4" ABOVE THE BOTTOM OF THE ADJACENT SWALE TO ENSURE THAT FLOW IS DIRECTED TO CB #3.
- EFFECTIVE IMPERVIOUS COVER = 77.5% (46,971 SF).
- IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.



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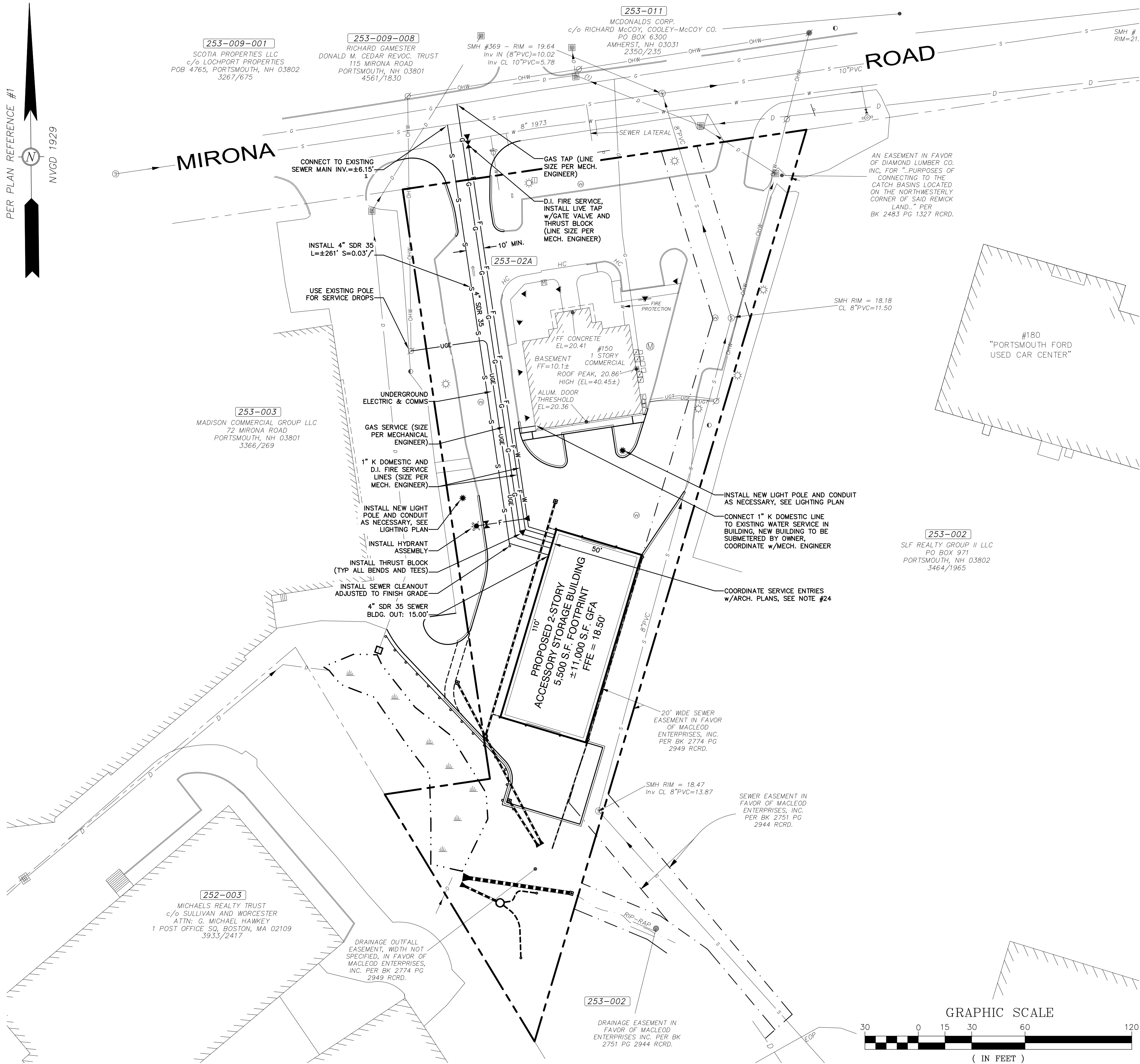
TITLE:

STORMWATER MANAGEMENT PLAN

SHEET NUMBER:

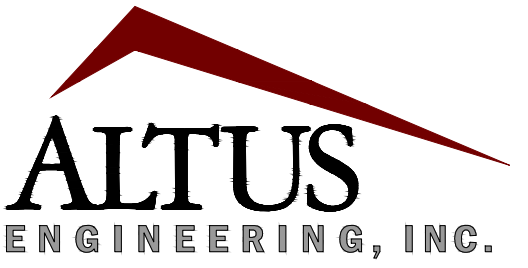
C-4

P5107

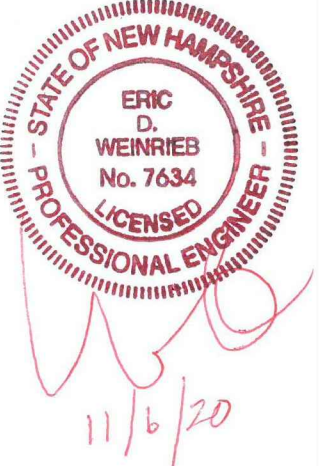


UTILITY NOTES

1. THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE APPROXIMATE AND ARE BASED UPON THE FIELD LOCATION OF ALL VISIBLE STRUCTURES (IE, CATCH BASINS, MANHOLES, WATER GATES, ETC.) AND INFORMATION COMPILED FROM PLANS PROVIDED BY UTILITY PROVIDERS AND GOVERNMENTAL AGENCIES. AS SUCH, THEY ARE NOT INCLUSIVE AS OTHER UTILITIES AND UNDERGROUND STRUCTURES THAT ARE NOT SHOWN ON THE PLANS MAY EXIST. THE ENGINEER, SURVEYOR AND OWNER ACCEPT NO RESPONSIBILITY FOR POTENTIAL INACCURACIES IN THE PLAN AND/OR UNFORESEEN CONDITIONS. THE CONTRACTOR SHALL NOTIFY, IN WRITING, SAID AGENCIES, UTILITY PROVIDERS, CITY OF PORTSMOUTH DPW AND OWNER'S AUTHORIZED REPRESENTATIVE AND CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION WORK.
2. PRIOR TO CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING AND PROPOSED STORMWATER AND UTILITY LINES. CONFLICTS SHALL BE ANTICIPATED AND ALL EXISTING LINES TO BE RETAINED SHALL BE PROTECTED. ANY DAMAGE DONE TO EXISTING UTILITIES SHALL BE REPAIRED AND, IF NECESSARY, EXISTING UTILITIES SHALL BE RELOCATED AT NO EXTRA COST TO THE OWNER. ALL CONFLICTS SHALL BE RESOLVED WITH THE INVOLVEMENT OF THE ENGINEER, DPW AND APPROPRIATE UTILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE POSTING OF ALL BONDS AND PAYMENT OF ALL TAP, TIE-IN AND CONNECTION FEES.
4. ALL ROAD/LANE CLOSURES OR OTHER TRAFFIC INTERRUPTIONS SHALL BE COORDINATED WITH THE PORTSMOUTH POLICE DEPARTMENT AND DPW AT LEAST TWO WEEKS PRIOR TO COMMENCING RELATED CONSTRUCTION.
5. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCHING, BEDDING, BACKFILL & COMPACTION FOR ALL UTILITY TRENCHING IN ADDITION TO ALL CONDUIT INSTALLATION AND COORDINATION OF ALL REQUIRED INSPECTIONS.
7. ALL TRENCHING, PIPE LAYING AND BACKFILLING SHALL CONFORM TO FEDERAL OSHA AND CITY REGULATIONS.
8. SEE ARCHITECTURAL/MECHANICAL DRAWINGS FOR EXACT LOCATIONS & ELEVATIONS OF UTILITY CONNECTIONS AT BUILDING. COORDINATE ALL WORK WITHIN FIVE (5) FEET OF BUILDINGS WITH BUILDING CONTRACTOR AND ARCHITECTURAL/MECHANICAL DRAWINGS. ALL CONFLICTS AND DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY AND PRIOR TO COMMENCING RELATED WORK.
9. FINAL UTILITY LOCATIONS TO BE COORDINATED BETWEEN THE ARCHITECT, CONTRACTOR, APPROPRIATE UTILITY COMPANIES AND THE PORTSMOUTH DPW.
10. WATER: PORTSMOUTH DPW, JIM TOW, (603) 427-1530.
11. TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427-5525.
12. CABLE: COMCAST, MIKE COLLINS, (603) 679-5695, EXT. 1037.
13. ELECTRICAL: EVERSOURCE, MICHAEL BUSBY, (603) 332-4227, EXT. 5555334. ALL ELECTRIC CONDUIT INSTALLATION SHALL BE INSPECTED BY EVERSOURCE PRIOR TO BACKFILL, 48-HOUR MINIMUM NOTICE REQUIRED.
14. GAS: UNITIL, DAVID BEAULIEU, (603) 294-5144.
15. DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
16. ALL WATER MAIN AND SERVICE INSTALLATIONS SHALL BE CONSTRUCTED AND TESTED PER PORTSMOUTH DPW STANDARDS AND SPECIFICATIONS. ALL OTHER UTILITIES SHALL BE TO THE STANDARDS AND SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.
17. WHERE WATER LINES CROSS, RUN ADJACENT TO OR ARE WITHIN 5' OF STORM DRAINAGE PIPES OR STRUCTURES, 2"-THICK CLOSED CELL RIGID BOARD INSULATION SHALL BE INSTALLED FOR FROST PROTECTION.
18. PER PORTSMOUTH DPW SPECIFICATIONS, ALL NEW DUCTILE IRON WATERLINES SHALL BE WRAPPED WITH A WATER TIGHT POLYETHYLENE WRAPPING FOR THEIR FULL LENGTH, ALL DOMESTIC WATER SERVICES SHALL BE PROVIDED WITH BACKFLOW PREVENTERS AND ALL JOINTS SHALL HAVE THREE (3) WEDGES PER JOINT.
19. WATER AND SANITARY SEWER LINES SHALL BE LOCATED AT LEAST 10' HORIZONTALLY FROM EACH OTHER. WHERE CROSSING, 18" MINIMUM VERTICAL CLEARANCE SHALL BE PROVIDED WITH WATER INSTALLED OVER SEWER.
20. SOLAR PANEL INSTALLATION, IF PROPOSED, SHALL COMPLY WITH NFPA 1, 2012, SECTION 11.12, AS AMENDED.
21. FIRE ALARM PANEL SHALL BE MONITORED THROUGH A THIRD-PARTY SECURITY COMPANY. CONTRACTOR SHALL COORDINATE PANEL LOCATION AND INTERCONNECTION WITH CITY FIRE DEPT. AND ARCHITECT.
22. APPLICANT SHALL HAVE A SITE SURVEY CONDUCTED BY A RADIO COMMUNICATIONS CARRIER APPROVED BY THE CITY'S COMMUNICATION 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 APPLICANT SHALL BE REQUIRED TO PAY FOR THE SITE SURVEY WHETHER OR NOT THE SURVEY INDICATES A REPEATER IS NECESSARY. THE OWNER SHALL COORDINATE WITH THE SUPERVISOR OF RADIO COMMUNICATIONS FOR THE CITY. THE SURVEY SHALL BE COMPLETED AND THE REPEATER, IF DETERMINED IT IS REQUIRED, SHALL BE INSTALLED PRIOR TO THE ISSUANCE OF CERTIFICATE OF OCCUPANCY.
23. CONTRACTOR/OWNER SHALL PROVIDE DPW WITH DETAILS OF TEMPORARY & PERMANENT GROUNDWATER DEWATERING DESIGN IF NECESSARY.
24. CONTRACTOR TO PROVIDE BOLLARDS AT SERVICE ENTRANCES PER THE SPECIFICATIONS OF THE RESPECTIVE UTILITY PROVIDERS.



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**72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801**

PROJECT:

**PROPOSED
ACCESSORY STORAGE
BUILDING**

**TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801**

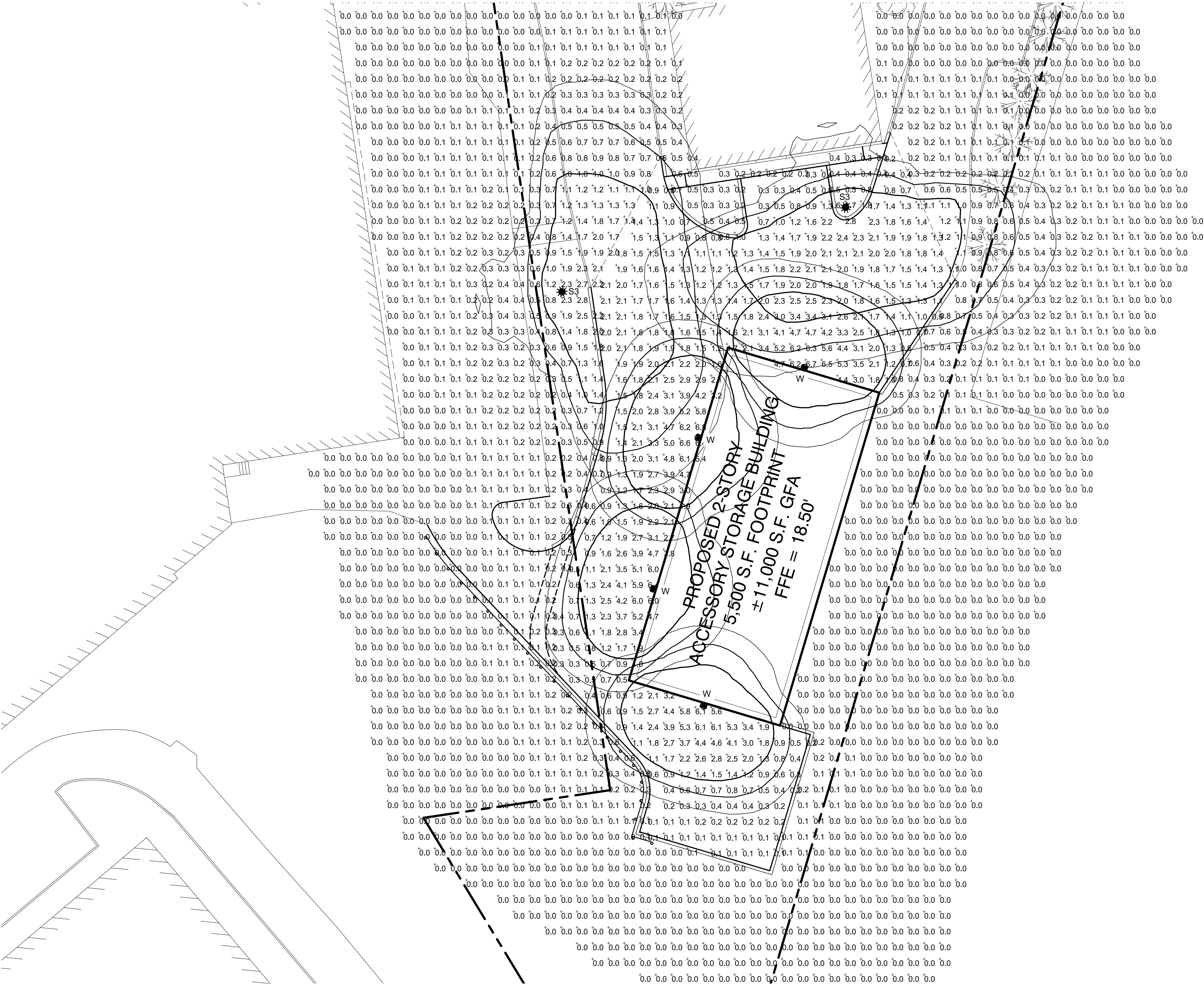
TITLE:

UTILITY PLAN

SHEET NUMBER:

C-5

P5107



Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Outside of Parking Lot	+	0.1 fc	2.8 fc	0.0 fc	N/A	N/A
Parking Lot	+	1.9 fc	6.7 fc	0.1 fc	67.0:1	19.0:1

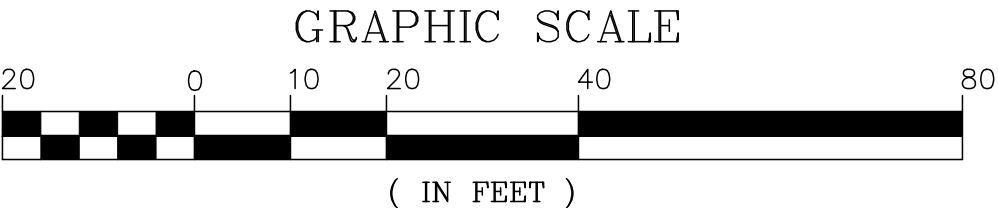
Schedule											
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	S3	2	Lithonia Lighting	DSX0 LED P3 40K T3M MVOLT SPA DDBXD with SSS 20 4C DM19AS DDBXD	DSX0 LED Area Fixture; mounted at 20ft	LED	1	DSX0_LED_P3_40K_T3M_MVOLT.ies	8205	0.9	71
	W	4	Lithonia Lighting	WPX2 LED 40K Mvolt	WPX2 LED Wall Pack; mounted at 15ft	LED	1	WPX2_LED_40K_Mvolt.ies	5896	0.9	47.77

LIGHTING NOTES

- SITE ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATION OF EASEMENTS, UNDERGROUND UTILITIES, AND DRAINAGE BEFORE INSTALLING POLE BASES.
- DETECTABLE WARNING TAPE SHALL BE PLACED OVER THE ENTIRE LENGTH OF ALL BURIED UTILITIES, COLORS PER THE RESPECTIVE UTILITY PROVIDERS.
- LIGHTING CONDUIT SHALL BE PVC SCH 40.
- ALL LIGHTING MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE AND CITY OF PORTSMOUTH REGULATIONS.
- ALL LIGHTING FIXTURES SHALL BE FULL CUT-OFF AND 3000K COLOR TEMPERATURE SO AS TO BE DARK-SKY COMPLIANT.
- CONTRACTOR SHALL COORDINATE WITH ARCHITECT AND BUILDING ELECTRICAL CONTRACTOR FOR ALL SITE ELECTRICAL WORK INCLUDING BUT NOT LIMITED TO ALL SERVICE ENTRANCES/EXITS, RISERS, CIRCUITRY, METERS, SUB-METERS, ETC.
- COORDINATE WITH ARCHITECTURAL PLANS FOR ALL BUILDING-MOUNTED FIXTURES, TYPES, LOCATIONS AND WIRING.
- LUMINAIRE DATA IS TESTED TO INDUSTRY STANDARDS UNDER LABORATORY CONDITIONS. OPERATING VOLTAGE AND NORMAL MANUFACTURING TOLERANCES OF LAMP BALLAST AND LUMINAIRE MAY AFFECT FIELD RESULTS.
- THIS LIGHTING DESIGN IS BASED ON LIMITED INFORMATION PROVIDED BY VISIBLE LIGHT, INC., 24 STICKNEY TERRACE, SUITE 6, HAMPTON, NH 03842. FIELD DEVIATIONS MAY SIGNIFICANTLY AFFECT PREDICTED PERFORMANCE. PRIOR TO INSTALLATION, CRITICAL SITE INFORMATION (POLE LOCATIONS, ORIENTATION, MOUNTING HEIGHT, CIRCUITRY, ETC.) SHALL BE COORDINATED BETWEEN THE CONTRACTOR, ARCHITECT AND SPECIFIER.
- SEE DETAIL SHEETS FOR FIXTURE CUT SHEETS AND POLE BASE DETAIL.

LEGEND

- PROPERTY LINE
- - - BUILDING SETBACK
- . . . EASEMENT LINE
- . . . WETLAND BOUNDARY
- VGC --- SCC EXISTING PAVEMENT/CURB
- VGC --- SCC PROP. PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- EXISTING/PROPOSED GUARDRAIL
- EXISTING CONTOUR
- PROPOSED CONTOUR/DECIMAL CONTOUR
- PROPOSED SPOT GRADE/TOP & BOTTOM
- W --- EXISTING WATER/CURB STOP/VALVE/HYDRANT
- S --- EXISTING SEWER/MANHOLE
- G --- EXISTING GAS/VALVE
- OHW --- UGE --- EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- D --- EXISTING DRAINAGE/CB/DMH
- W --- PROPOSED THRUST BLOCK/CURB STOP/VALVE/HYDRANT
- F --- PROPOSED DOMESTIC/FIRE WATER SERVICE LINE
- S --- PROPOSED SEWER/MANHOLE/CLEANOUT
- FM --- PROPOSED SEWER FORCEMAIN
- G --- PROPOSED GAS
- OHW --- UGE --- PROPOSED OVERHEAD UTILITIES/UTILITY POLE
- UGE --- PROPOSED UNDERGROUND ELECTRIC/PHONE/TV
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- CPP FES HDWL CORRUGATED PLASTIC PIPE/FLARED END SECTION/HEADWALL
- 4% --- PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- X --- SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- PROPOSED SAWCUT
- (44) --- PARKING COUNT PER ROW
- PROPOSED RIPRAP
- PROPOSED RAINGARDEN
- PROPOSED STONE DRIPEDGE



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PROJECT: PROPOSED ACCESSORY STORAGE BUILDING
TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

TITLE:

LIGHTING PLAN

SHEET NUMBER:

C-6

P5107

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

150 MIRONA ROAD
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 253 LOT 2A

LATITUDE: 43.049° N
LONGITUDE: 70.774° W

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC
72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

DESCRIPTION

The project consists of the demolition of a drive thru canopy and improvements to the existing building as well as construction of a two-story accessory storage building along with associated site improvements.

DISTURBED AREA

The total area to be disturbed for the development is approximately ±33,000 S.F. (±0.75 acres). USEPA NPDES Phase II compliance is not required.

PROJECT PHASING

The proposed project will be completed in one phase.

NAME OF RECEIVING WATER

The site drains to a closed drainage system tributary to Sagamore Creek.

SEQUENCE OF MAJOR ACTIVITIES

1. Install temporary erosion control measures including perimeter controls, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
2. Remove landscaping, strip loam and stockpile.
3. Demolish existing site features, drive-thru canopy, utilities, etc. as shown on Demolition Plan.
4. Rough grade site including placement of borrow materials.
5. Construct building and associated improvements.
6. Construct drainage structures, culverts, utilities & sidewalk base course materials.
7. Install base course paving & curbing.
8. Install top course paving and sidewalks.
9. Loom (6" min) and seed all disturbed areas not paved or otherwise stabilized.
10. When all construction activity is complete and site is stabilized, remove all temporary erosion control measures and any sediment that has been trapped by these devices.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 – 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, perimeter controls shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area and permanent measures are established, perimeter controls shall be removed.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through appropriate perimeter controls. All storm drain inlets shall be provided with inlet protection measures.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

1. The smallest practical portion of the site shall be denuded at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built-up sediment shall be removed from perimeter barriers when it has reached one-third the height of the barrier or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. An area shall be considered stable if one of the following has occurred:
 - a. Base coarse gravels have been installed in areas to be paved;
 - b. A minimum of 85% vegetated growth as been established;
 - c. A minimum of 3 inches of non-erosive material such as stone of riprap has been installed; – or –
 - d. Erosion control blankets have been properly installed.
9. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

1. Timing – In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
 - a. Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
 - b. Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on a area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CONTINUED)

Jute and Fibrous Matting (Erosion Blanket)	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	

- The organic matter content is between 80 and 100%, dry weight basis.
- Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85%, passing a 0.75" screen.
- The organic portion needs to be fibrous and elongated.
- Large portions of silts, clays or fine sands are not acceptable in the mix.
- Soluble salts content is less than 4.0 mmhos/cm.
- The pH should fall between 5.0 and 8.0.

3. Maintenance – All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. PERMANENT SEEDING –

1. Bedding – stones larger than 1 1/2", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 5" to prepare a seedbed and mix fertilizer into the soil.

2. Fertilizer – lime and fertilizer should be applied evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests. When a soil test is not available, the following minimum amounts should be applied:

Agricultural Limestone @ 100 lbs. per 1,000 s.f.
10–20–20 fertilizer @ 12 lbs. per 1,000 s.f.

3. Seed Mixture (recommended):

Type	Lbs. / Acre	Lbs. / 1,000 sf
Tall Fescue	24	0.55
Creeping Red Fescue	24	0.55
Total	48	1.10

Seed Mixture (For slope embankments):

Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified:

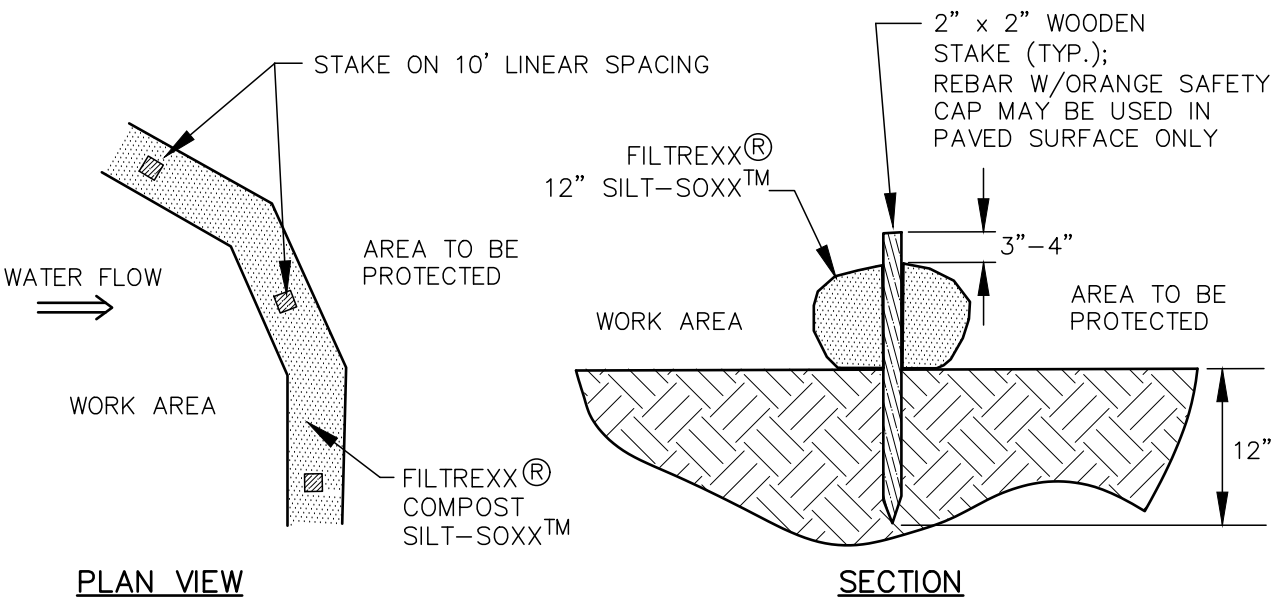
Type	Min. Purity (%)	Min. Germination (%)	Kg./Hectare (Lbs./Acre)
Creeping Red Fescue (c)	98	85	45 (40)
Perennial Rye Grass (a)	98	90	35 (30)
Redtop	95	80	5 (5)
Alsike Clover	97	90(e)	5 (5)
		Total	90 (80)

- a. Ryegrass shall be a certified fine-textured variety such as Pennfine, Fiesta, Yorktown, Diplomat, or equal.
- b. Fescue varieties shall include – Creeping Red and/or Hard Reliant, Scaldis, Koket, or Jamestown.

4. Sodding – sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

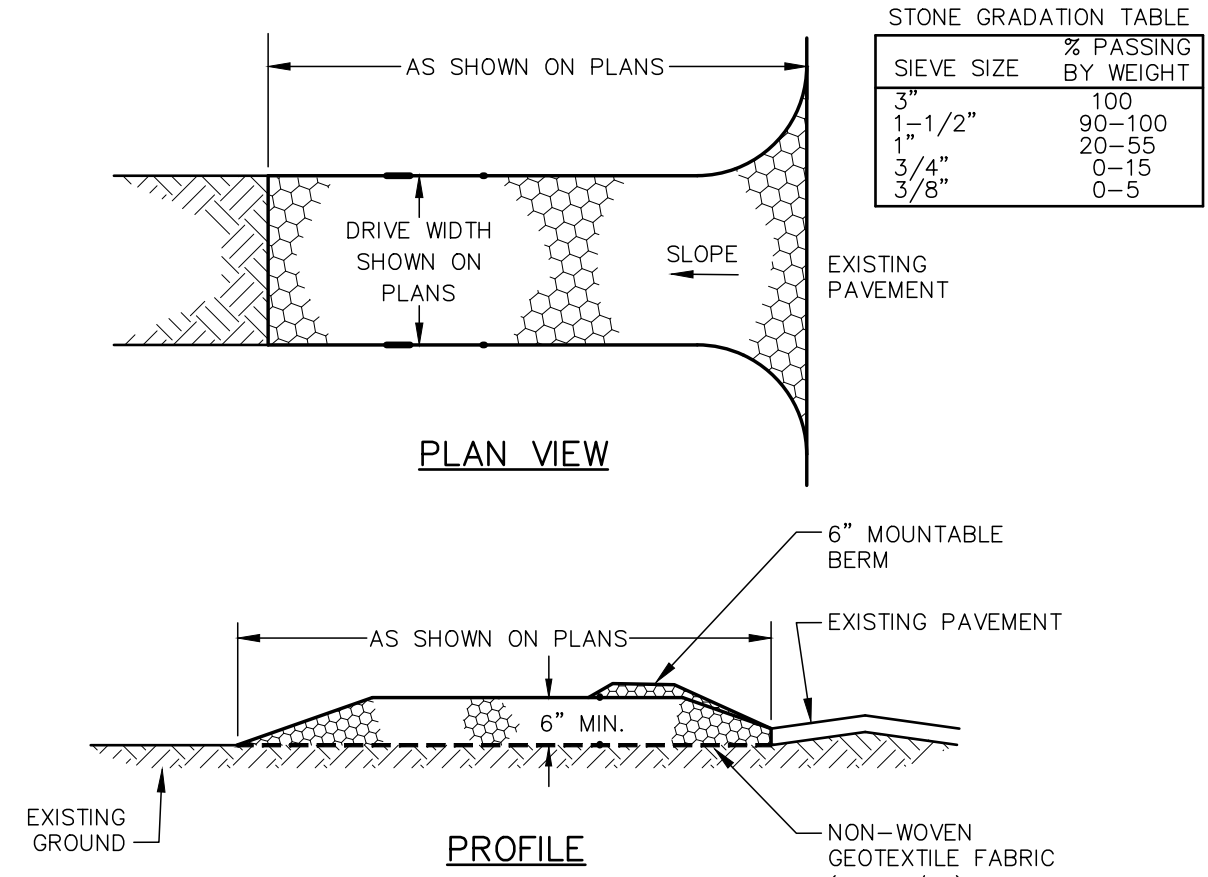


NOTES:

1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/STOCK/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX SHALL BE DISPOSED OF PROPERLY.

TUBULAR SEDIMENT BARRIER

NOT TO SCALE

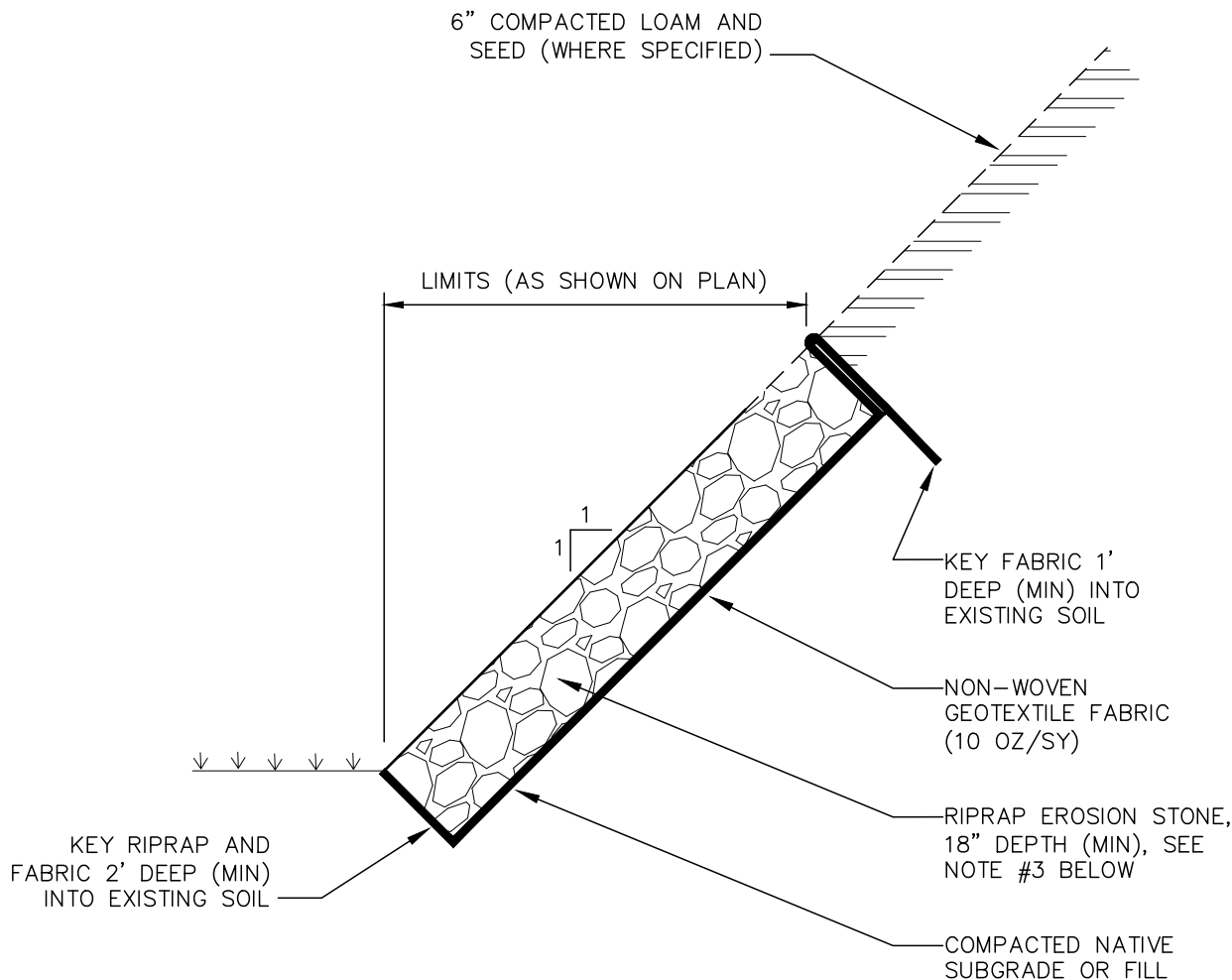


CONSTRUCTION SPECIFICATIONS

1. **STONE SIZE** – NHDOT STANDARD STONE SIZE #4 – SECTION 703 OF NHDOT STANDARD.
2. **LENGTH** – DETAILED ON PLANS (50 FOOT MINIMUM).
3. **THICKNESS** – SIX (6) INCHES (MINIMUM).
4. **WIDTH** – FULL DRIVE WIDTH UNLESS OTHERWISE SPECIFIED.
5. **FILTER FABRIC** – MIRAFI 600X OR EQUAL APPROVED BY ENGINEER.
6. **SURFACE WATER CONTROL** – ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. **MAINTENANCE** – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. **WHEELS** SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. **STABILIZED CONSTRUCTION EXITS** SHALL BE INSTALLED AT ALL ENTRANCES TO PUBLIC RIGHTS-OF-WAY, AT LOCATIONS SHOWN ON THE PLANS, AND/OR WHERE AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE

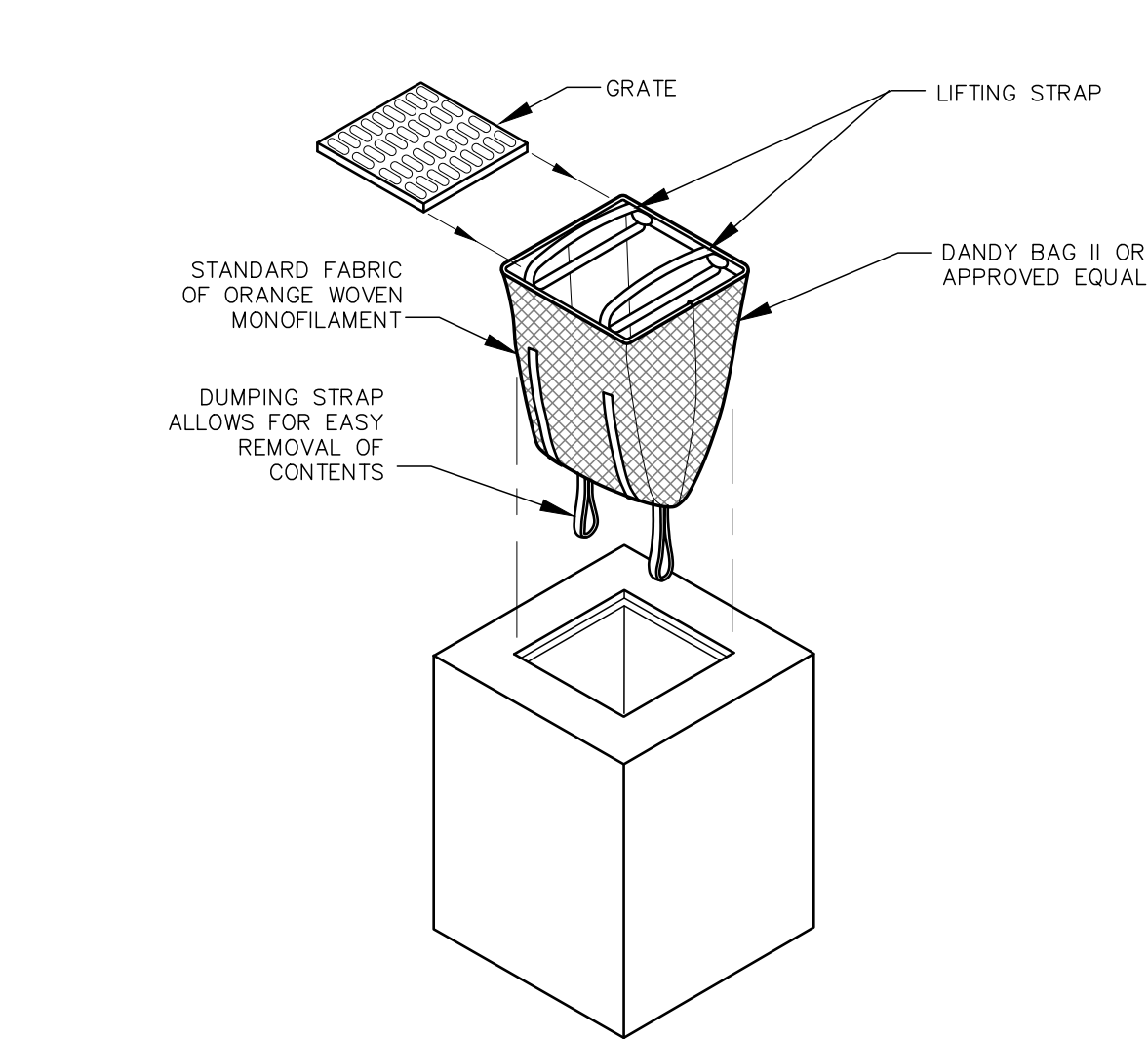


NOTES

1. CONSTRUCT RIP RAP LINED SLOPE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
 2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
 3. EROSION STONE USED FOR THE RIP RAP LINED SLOPE SHALL MEET THE FOLLOWING GRADATION:
- | SIZE | PERCENT PASSING BY WEIGHT |
|------|---------------------------|
| 12" | 100 |
| 6" | 25-50 |
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
 5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP STABILIZED SLOPE

NOT TO SCALE



INSTALLATION AND MAINTENANCE:

INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

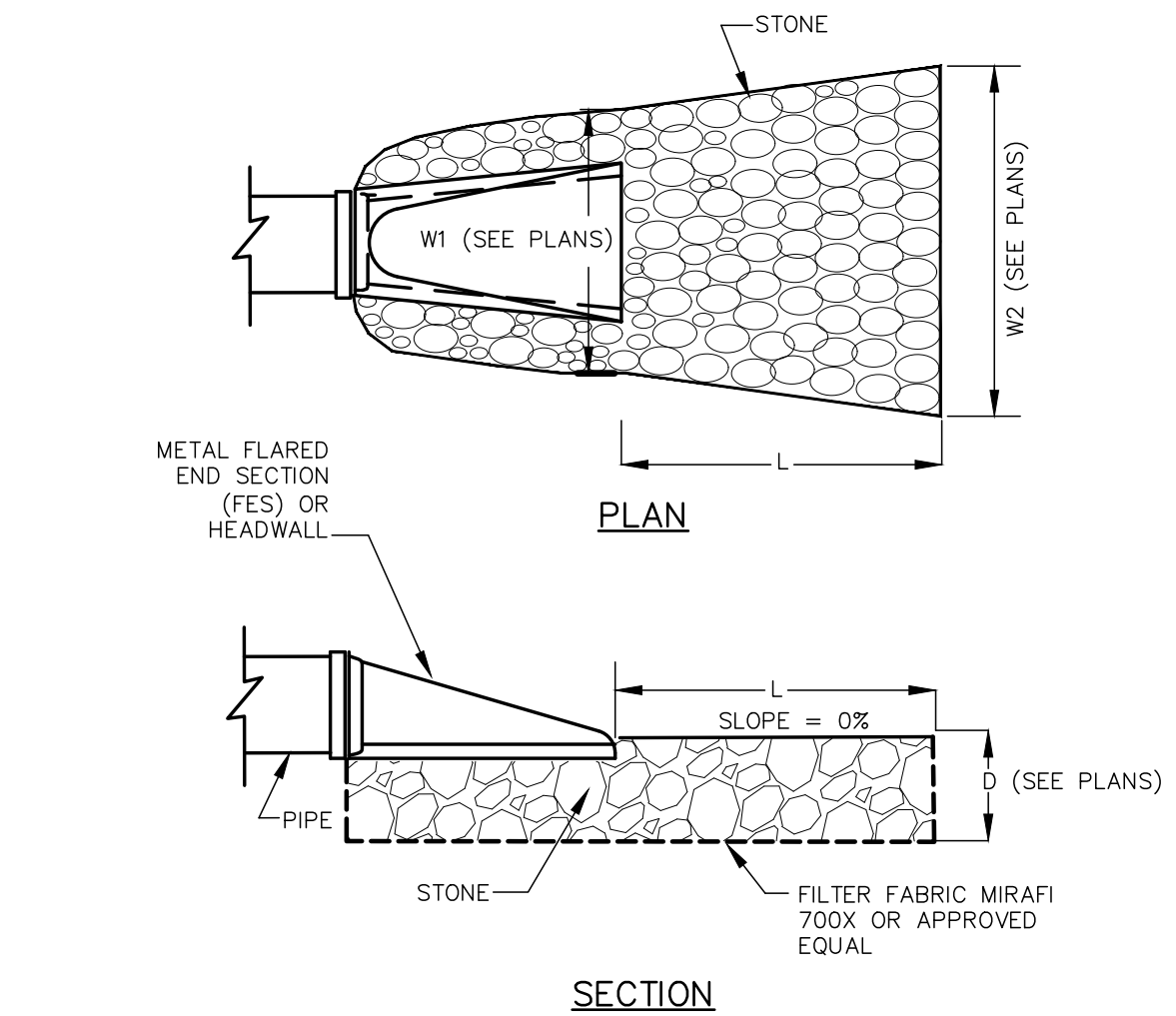
MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURATION.

UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

STORM DRAIN INLET PROTECTION

NOT TO SCALE



MAINTENANCE

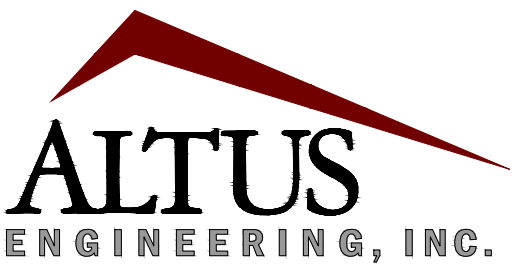
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD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

CONSTRUCTION SPECIFICATIONS

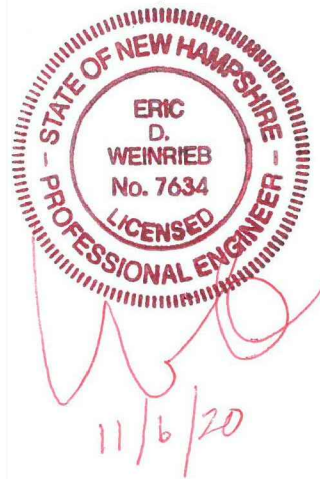
1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT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

RIPRAP OUTLET PROTECTION

NOT TO SCALE



133 Court Street
(603) 433-2335
Portsmouth, NH 03801
www.altus-eng.com



NOT FOR CONSTRUCTION

ISSUED FOR:

TAC

ISSUE DATE:

NOVEMBER 16, 2020

REVISIONS

NO. DESCRIPTION	BY DATE
0 TAC WORK SESSION	EBS 10/06/20
1 TAC	EBS 11/16/20

DRAWN BY:

EBS

APPROVED BY:

EBS

DRAWING FILE:

5107-DETAILS.dwg

SCALE:

22"x34" N.T.S.

OWNER/APPLICANT:

MADISON COMMERCIAL
GROUP, LLC

72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

PROJECT:

PROPOSED
ACCESSORY STORAGE
BUILDING

TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

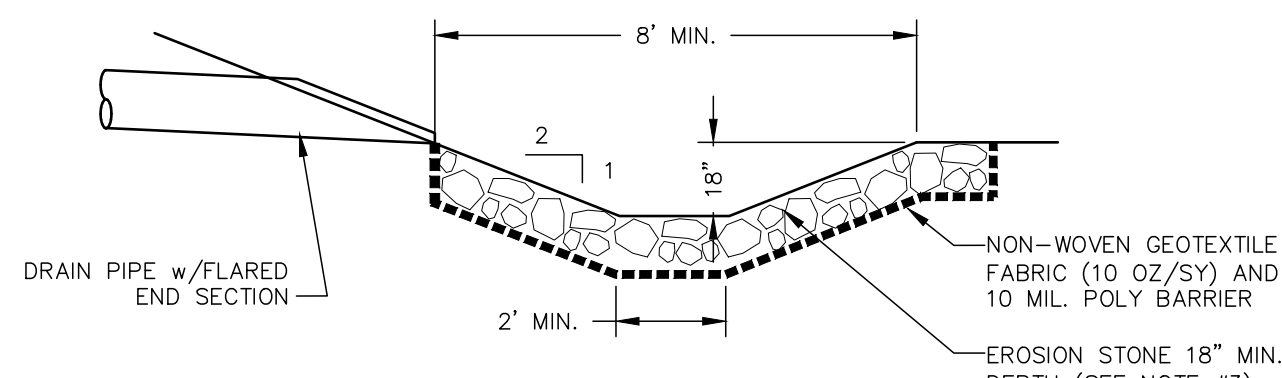
TITLE:

DETAIL SHEET

SHEET NUMBER:

C-7

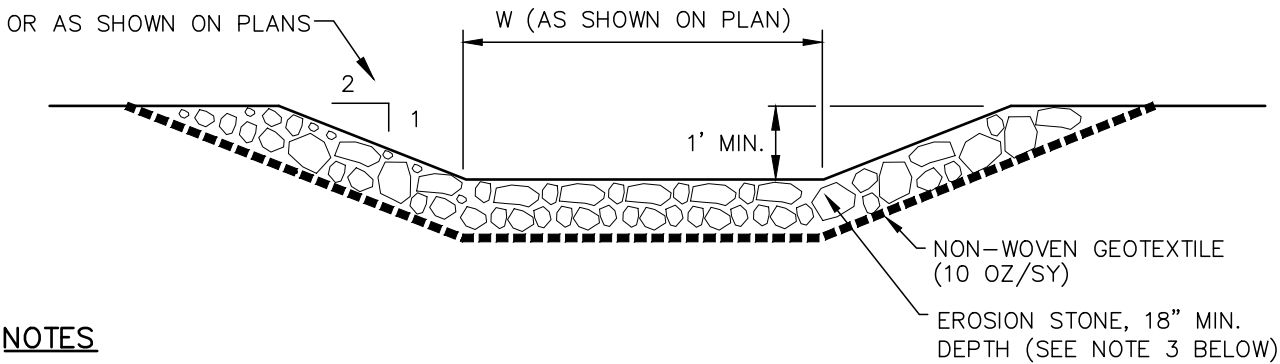
P5107



- NOTES**
1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
 2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO ACCOUNT FOR THE DEPTH OF RIPRAP.
 3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION:

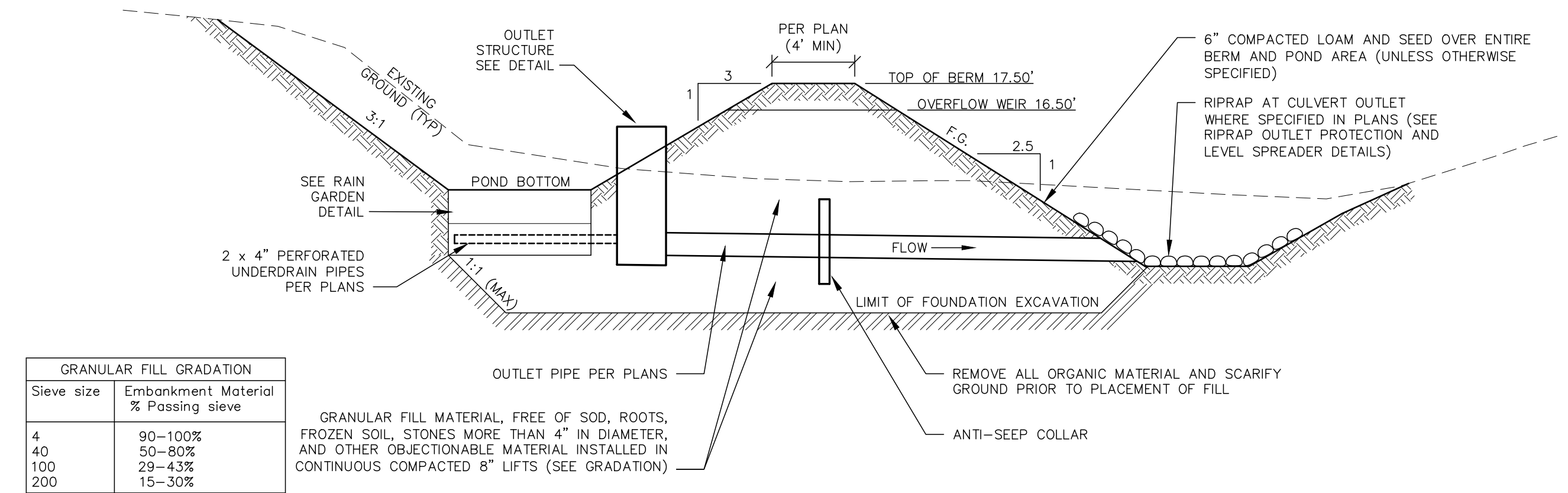
SIZE	PERCENT PASSING BY WEIGHT
18"	100
12"	90-100
4"	0-15
 4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18".
 5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

PLUNGE POOL NOT TO SCALE



- NOTES**
1. CONSTRUCT RIP RAP LINED SWALE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
 2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
 3. EROSION STONE USED FOR THE RIP RAP LINED SWALE SHALL MEET THE GRADATION SHOWN ON THE PLANS.
 4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
 5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP LINED SWALE NOT TO SCALE



GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90-100%
40	50-80%
100	29-43%
200	15-30%

Construction Criteria

1. Foundation Preparation -- The foundation shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, and rubbish. If suitable for reuse, the topsoil and sod shall be stockpiled and spread on the completed embankment and spillways. Foundation surfaces shall be sloped no steeper than 1:1. The foundation area shall be thoroughly scarified before placement of fill material. The surface shall have moisture added and/or it shall be compacted if necessary so that the first layer of fill can be bonded to the foundation.

The cutoff trench and any other required excavations shall be dug to the lines and grades shown on the plans or as staked in the field. If they are suitable, excavated materials shall be used in the permanent fill.

Existing stream channels in the foundation area shall be sloped no steeper than 1:1 and deepened and widened as necessary to remove all stones, gravel, sand, stumps, roots, and other objectionable material and to accommodate compaction equipment.

Foundation areas shall be kept free of standing water when fill is being placed on them.

2. Granular Fill Placement -- The material placed in the fill shall be free of sod, roots, frozen soil, stones more than 4 inches in diameter and other objectionable material.

Selected backfill material shall be placed around structures, pipe conduits, and drainage diaphragm at about the same rate on all sides to prevent damage from unequal loading.

The placing and spreading of fill material shall be started at the lowest point of the foundation and the fill brought up in horizontal layers of such thickness that the required compaction can be obtained. The fill shall be constructed in 8" continuous horizontal layers except where openings or sectionalized fills are required. In those cases, the slope of the bonding surfaces between the embankment in place and the embankment to be placed shall not be steeper than 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the foundation so as to insure a good bond with the new fill.

The distribution and gradation of materials shall be such that no lenses, pockets, streaks, or layers of material differ substantially in texture of gradation from the surrounding material. If it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the center and upstream parts of the fill. If zoned fills of substantially differing materials are specified, the zones shall be placed according to the lines and grades shown on the drawings. The complete work shall conform to the lines, grades, and elevations shown on the drawings or as staked in the field.

3. Moisture Control -- The moisture content of the fill material shall be adequate for obtaining the required compaction. Material that is too wet shall be dried to meet this requirement, and material that is too dry shall have water added and mixed until the requirement is met.
4. Compaction -- Construction equipment shall be operated over the areas of each layer of fill to insure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction.

Fill material shall be compacted to not less than 95% of AASHTO T99 Method C compaction method.

Fill adjacent to structures, pipe conduits, and drainage diaphragm shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tamper or plate vibrators. Fill adjacent to concrete structures shall not be compacted until the concrete is strong enough to support the load.

5. Protection -- A protective cover of vegetation shall be established on all exposed surfaces of the embankment, spillway, and borrow area in accordance with the plans. If soil or climatic conditions preclude the use of vegetation and protection is needed, non-vegetative means, such as mulches or gravel, may be used. In some places, temporary vegetation may be used until conditions permit establishment of permanent vegetation.

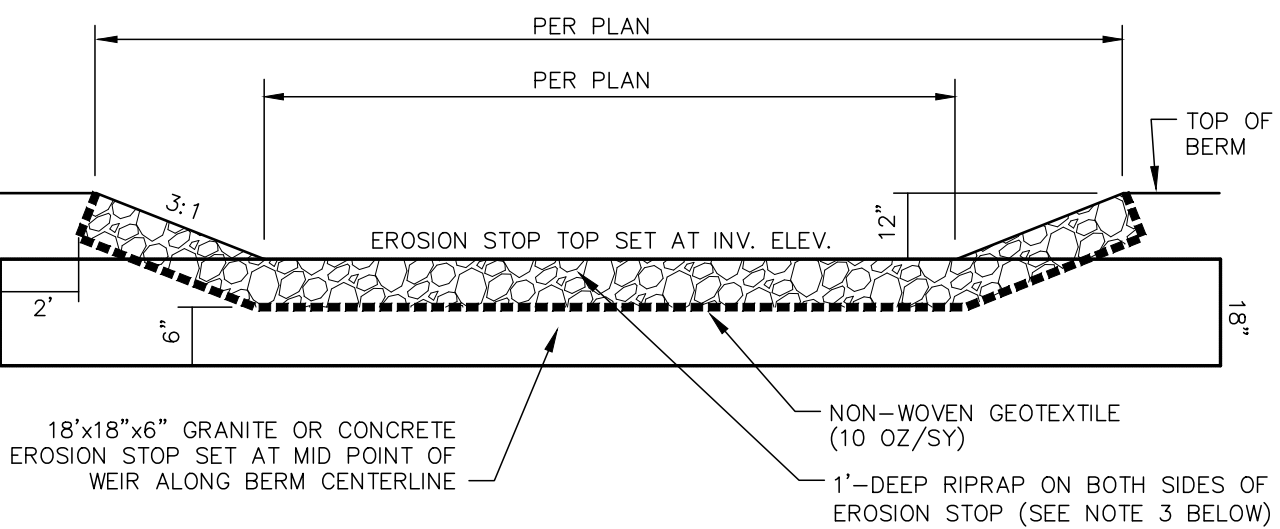
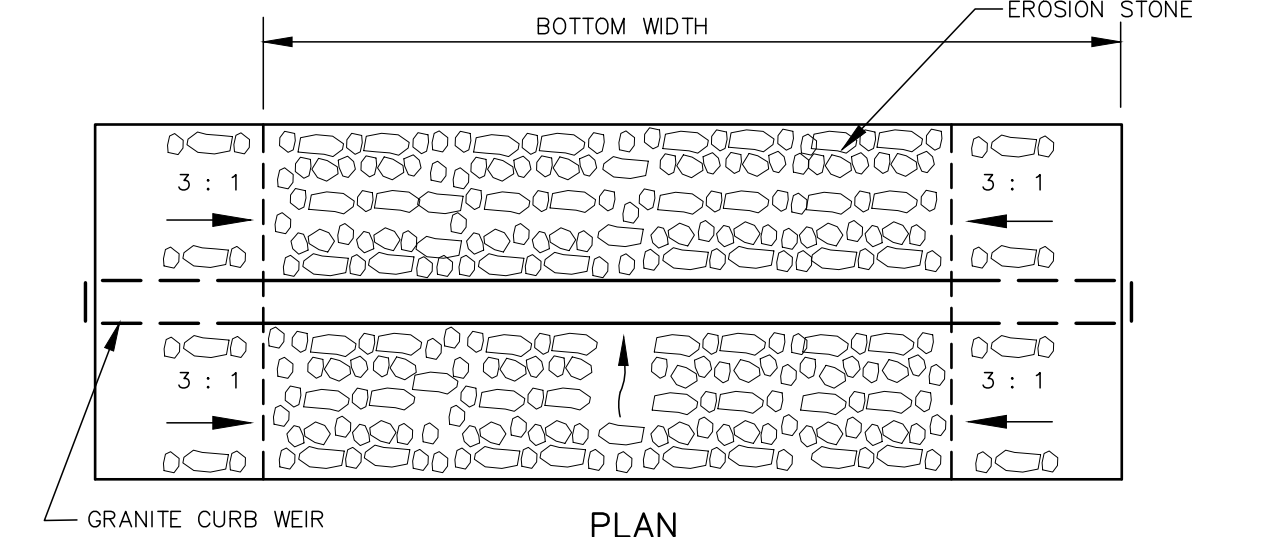
Maintenance

Maintenance is necessary if detention/retention basins are to continue to function as originally designed. A local government, a designated group such as a homeowners' association, or an individual must be assigned responsibility for maintaining the structures and the basin area. A maintenance plan should be developed that outlines the maintenance operations and a schedule for carrying out the procedures.

The following should be considered in formulating a maintenance plan:

1. Embankment -- The embankment should be inspected annually to determine if rodent burrows, wet areas, or erosion of the fill is taking place.
2. Vegetation -- The vegetated areas of the structure should be protected from damage by fire, grazing, traffic, and dense weed growth. Lime and fertilizer should be applied as necessary as determined by soil tests. Trees and shrubs should be kept off the embankment and emergency spillway areas.
3. Inlets -- Pipe inlets and spillway structures should be inspected annually and after every major storm. Accumulated debris and sediment should be removed.
4. Outlets -- Pipe outlets should be inspected annually and after every major storm. The condition of the pipes should be noted and repairs made as necessary. If erosion is taking place, then measures should be taken to stabilize and protect the affected area.
5. Sediment -- Sediment should be continually checked in the basin. When sediment accumulations reach the predetermined design elevation, then the sediment should be removed and properly disposed of.
6. Safety Inspections -- All permanent impoundments should be inspected by a qualified professional engineer on a periodic basis. If there is potential for significant damage or loss of life downstream, then the inspection should be carried out annually.

STORMWATER POND BERM DETAIL NOT TO SCALE

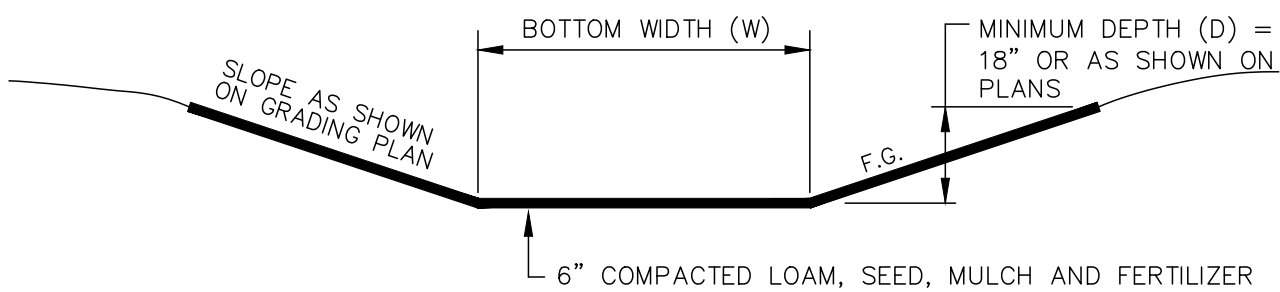


- NOTES**
1. CONSTRUCT EMERGENCY OVERFLOW WEIR TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
 2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
 3. UNLESS OTHERWISE SPECIFIED OR DIRECTED, RIPRAP USED FOR THE EMERGENCY OVERFLOW WEIR SHALL MEET THE FOLLOWING GRADATION:

SIZE	PERCENT PASSING BY WEIGHT
4"	90-100
2"	0-15

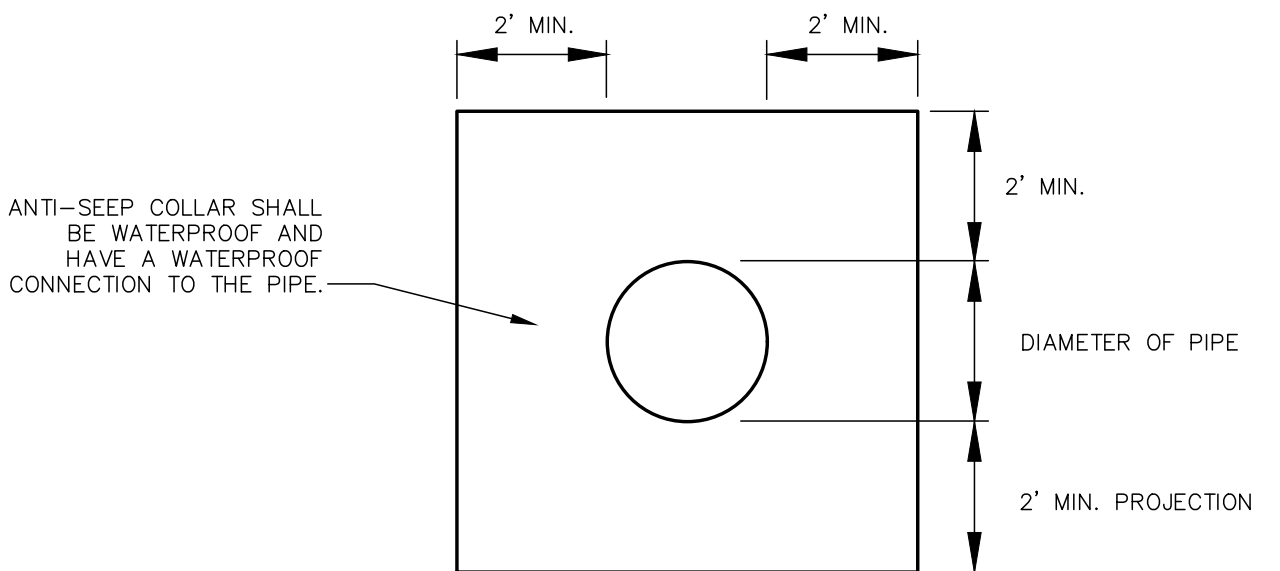
4. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE EROSION STONE. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR REPAIRS OR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 18 INCHES.
5. THE EROSION STONE MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.

RIPRAP SPILLWAY / OVERFLOW WEIR NOT TO SCALE



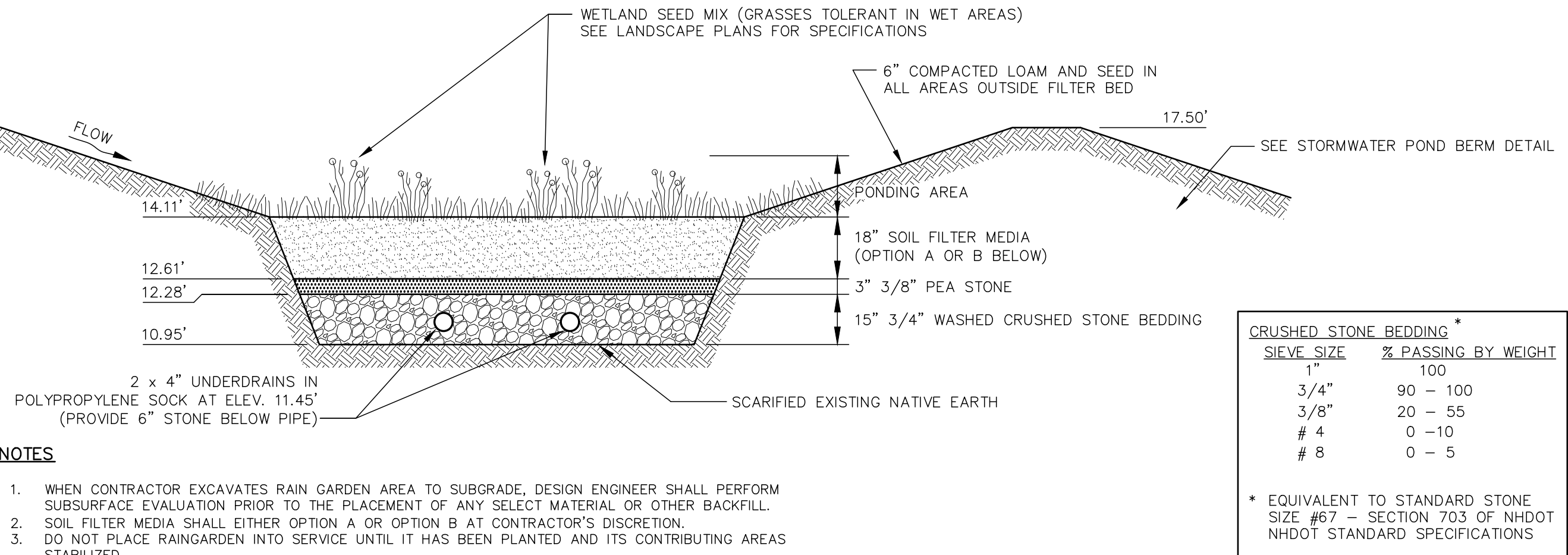
- NOTES**
1. THE FOUNDATION AREA OF THE SWALE SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL.
 2. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA AND BE FREE OF IRREGULARITIES.
 3. EARTH FILLS 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 SWALE.
 4. VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO DIRECTING STORMWATER TO IT.
 5. MAINTENANCE OF THE VEGETATION IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE SWALE. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE SWALE.
 6. THE SWALE SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE ITS CONDITION. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.

VEGETATED SWALE NOT TO SCALE



- NOTES**
- ANTI-SEEP COLLARS SHALL BE CLAY, CONCRETE, PLASTIC (AGRI-DRAIN), OR EQUAL APPROVED BY THE ENGINEER.

ANTI-SEEP COLLAR NOT TO SCALE



NOTES

1. WHEN CONTRACTOR EXCAVATES RAIN GARDEN AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE RAINGARDEN INTO SERVICE UNTIL IT HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS STABILIZED.
4. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE RAINGARDEN DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF RAINGARDEN WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.

MAINTENANCE REQUIREMENTS

- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS A WARRANTED BY SUCH INSPECTION.
- PRETREATMENT MEASURES SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND CLEANED OF ACCUMULATED SEDIMENT AS WARRANTED BY INSPECTION, BUT NO LESS THAN ONCE ANNUALLY.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF BIORETENTION SYSTEM DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, WEED WHACKING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

DESIGN REFERENCES

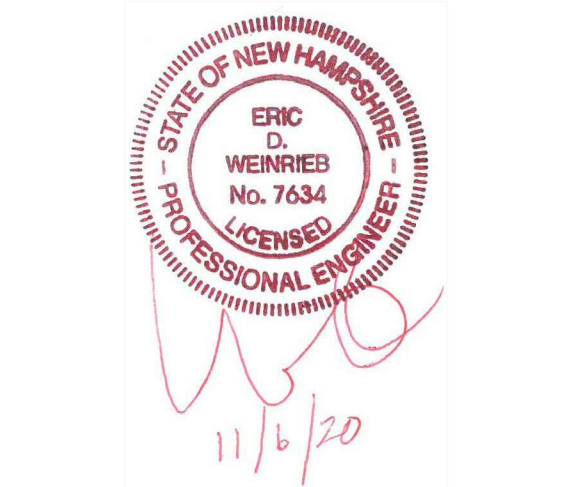
- UNH STORMWATER CENTER
- EPA (1999A)
- NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL, VOLUME 2, DECEMBER 2008 AS AMENDED.

TYPICAL RAINGARDEN NOT TO SCALE

ALTUS
ENGINEERING, INC.

133 Court Street
(603) 433-2335

Portsmouth, NH 03801
www.altus-eng.com



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ISSUED FOR:

TAC

ISSUE DATE:

NOVEMBER 16, 2020

REVISIONS	NO. DESCRIPTION	BY	DATE
0	TAC WORK SESSION	EBS	10/06/20
1	TAC	EBS	11/16/20

DRAWN BY: EBS

APPROVED BY: EBS

DRAWING FILE: 5107-DETAILS.dwg

SCALE:

22"x34" N.T.S.

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC

**72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801**

PROJECT:

**PROPOSED
ACCESSORY STORAGE
BUILDING**

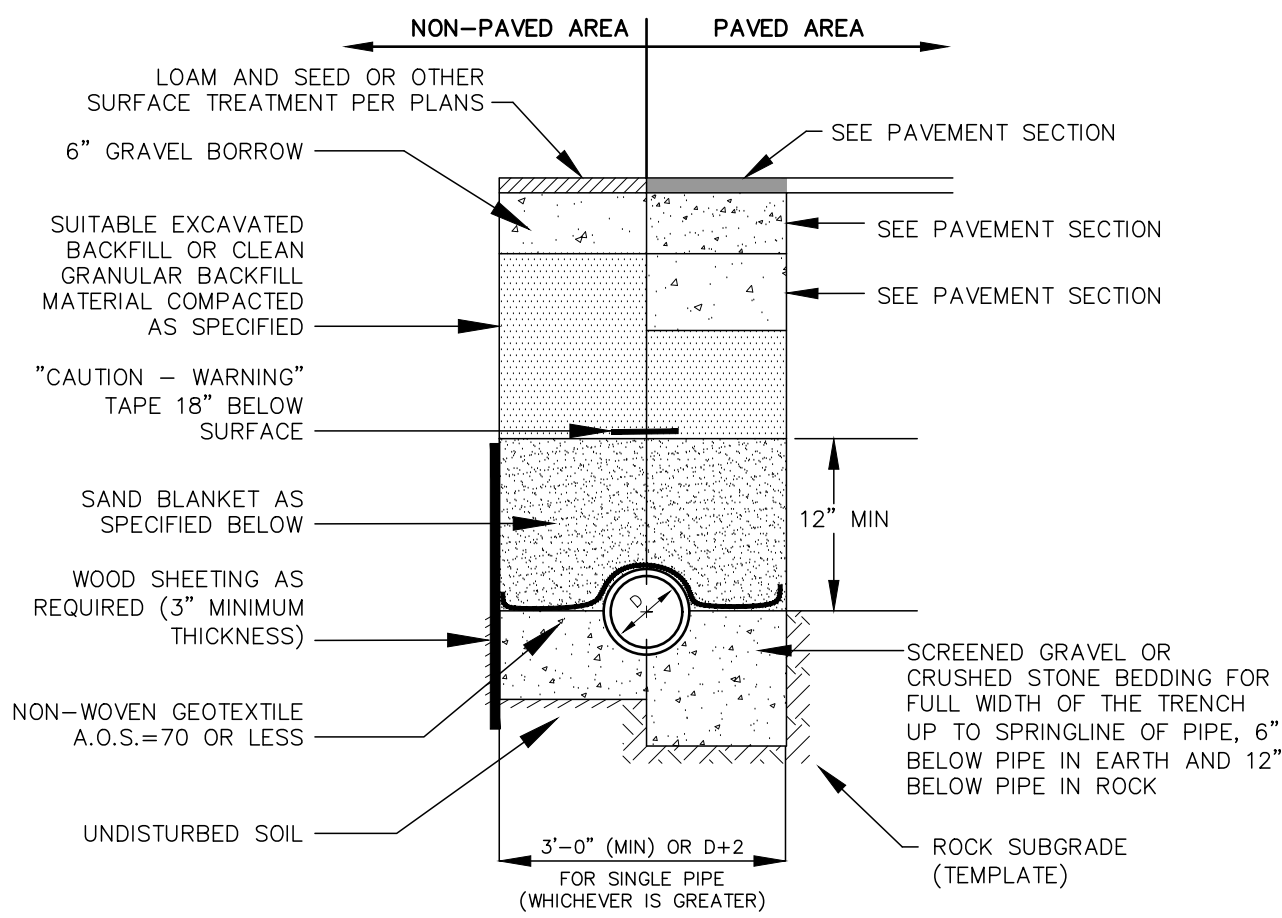
**TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801**

TITLE:

DETAIL SHEET

SHEET NUMBER:

C-8



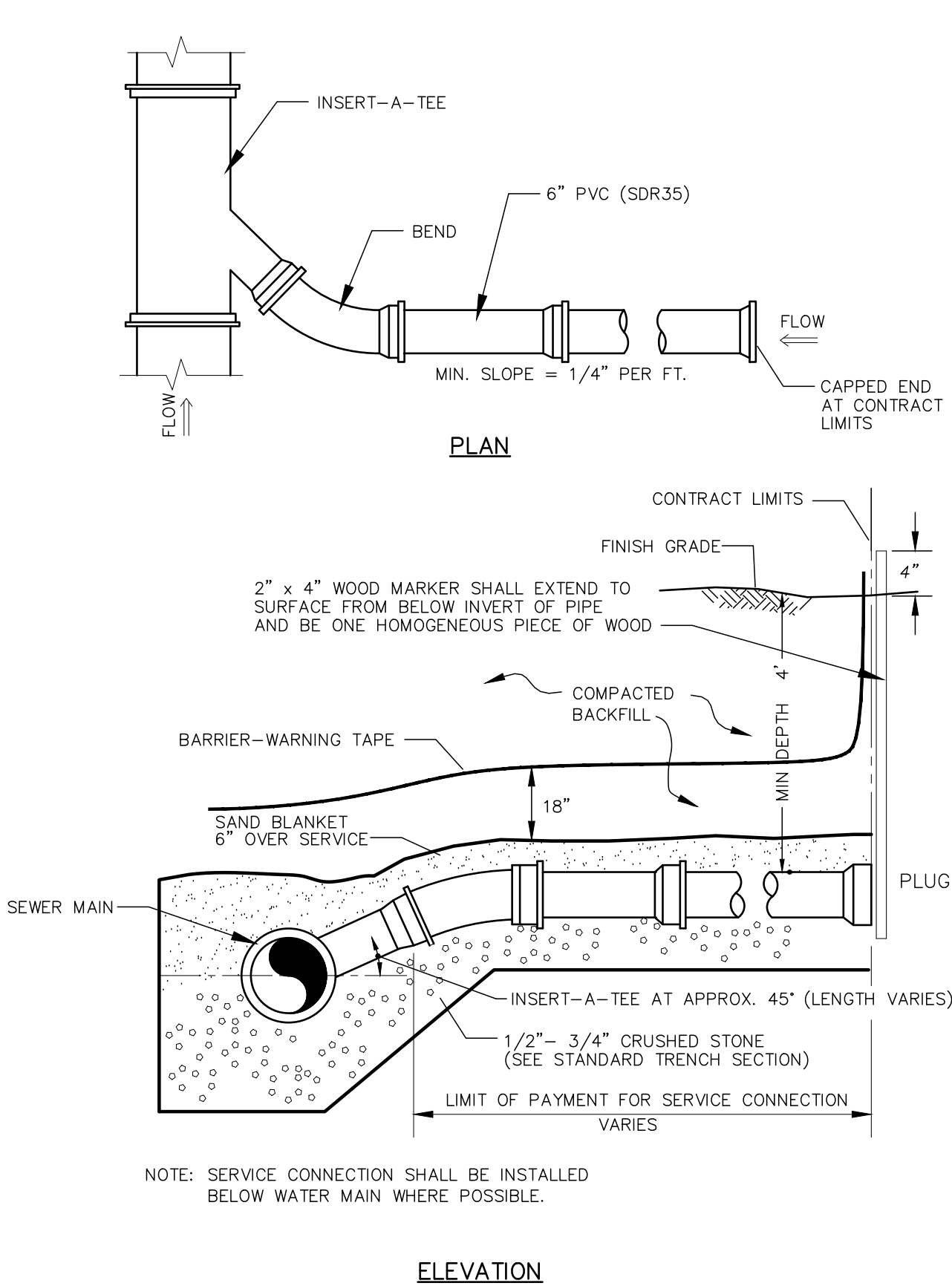
- NOTES**
- BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
 - INSULATE GRAVITY SEWER AND FORCEMAINS WHERE THERE IS LESS THAN 5'-0" OF COVER WITH 2" THICK CLOSED CELL RIGID BOARD INSULATION, 18" ON EACH SIDE OF PIPE.
 - MAINTAIN 12" MINIMUM HORIZONTAL SEPARATION AND WIDEN TRENCH ACCORDINGLY IF MULTIPLE PIPES ARE IN TRENCH.

SAND BLANKET/BARRIER		SCREENED GRAVEL OR CRUSHED STONE BEDDING*	
SIEVE SIZE	% FINER BY WEIGHT	SIEVE SIZE	% PASSING BY WEIGHT
1/2"	90 - 100	1"	100
200	0 - 15	3/4"	90 - 100
		3/8"	20 - 55
		# 4	0 - 10
		# 8	0 - 5

* EQUIVALENT TO STANDARD STONE SIZE #67 - SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

DRAINAGE, SEWER & FORCEMAIN TRENCH

NOT TO SCALE

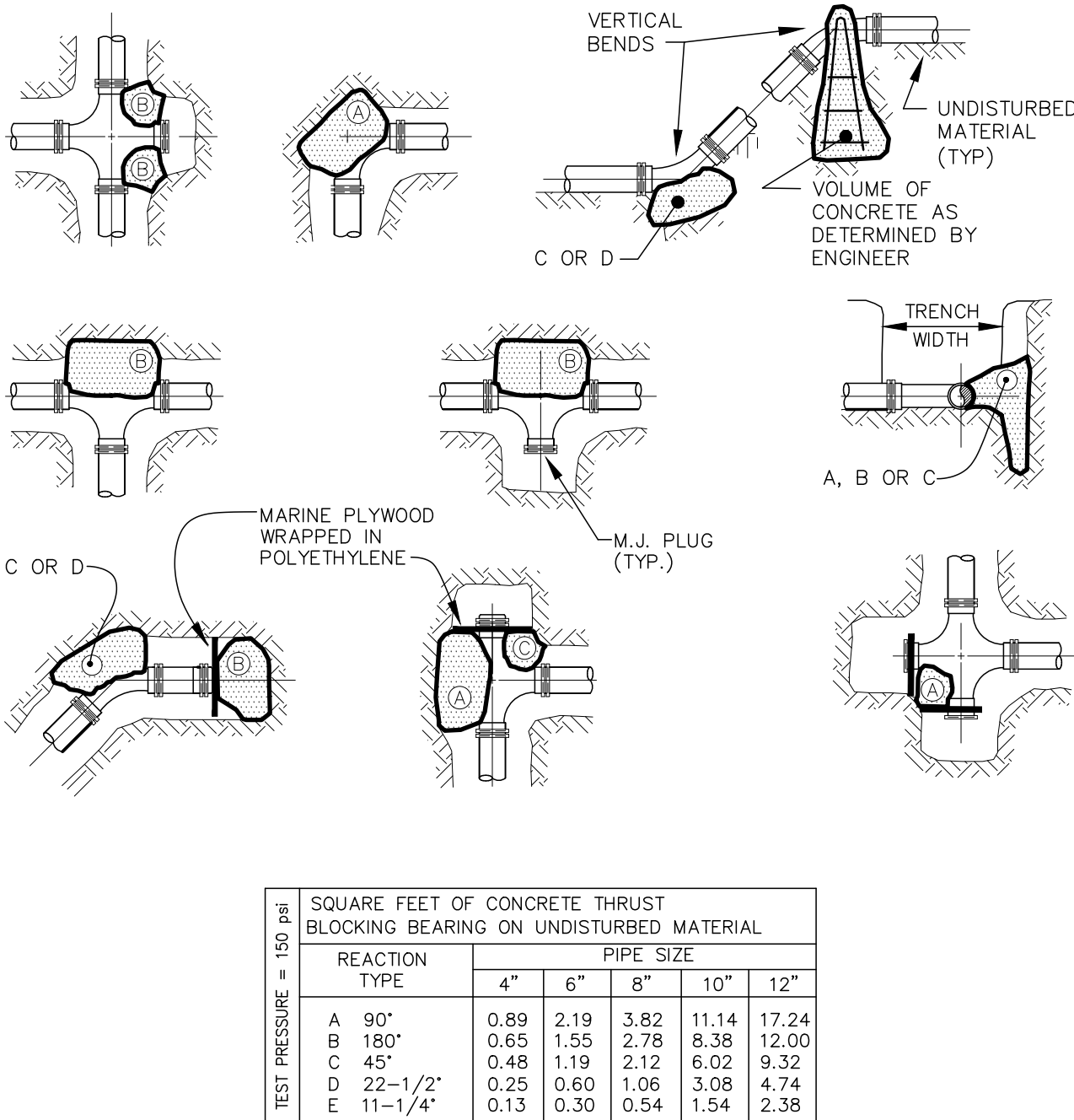


SEWER SERVICE CONNECTION

NOT TO SCALE

STANDARD TRENCH NOTES

- ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN ON THE DRAWING.
- BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1-1/2 INCH TO 1/2 INCH SHALL BE USED.
- SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER MEETING THE GRADATION SHOWN IN THE TRENCH DETAIL. BLANKET MAY BE REPLACED WITH BEDDING MATERIAL FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE AND THE GEOTEXTILE IS RELOCATED ACCORDINGLY.
- SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION, AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION. IN CROSS COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT, IF SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION WILL BE PRESERVED.
- BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.
- SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.
- W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
- FOR CROSS COUNTRY CONSTRUCTION, BACKFILL, FILL AND/OR LOAM SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
CEMENT: 6.0 BAGS PER CUBIC YARD
WATER: 5.75 GALLONS PER BAG
CEMENT MAXIMUM SIZE OF AGGREGATE: 1 INCH
CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
- CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
- NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO TOWN'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.

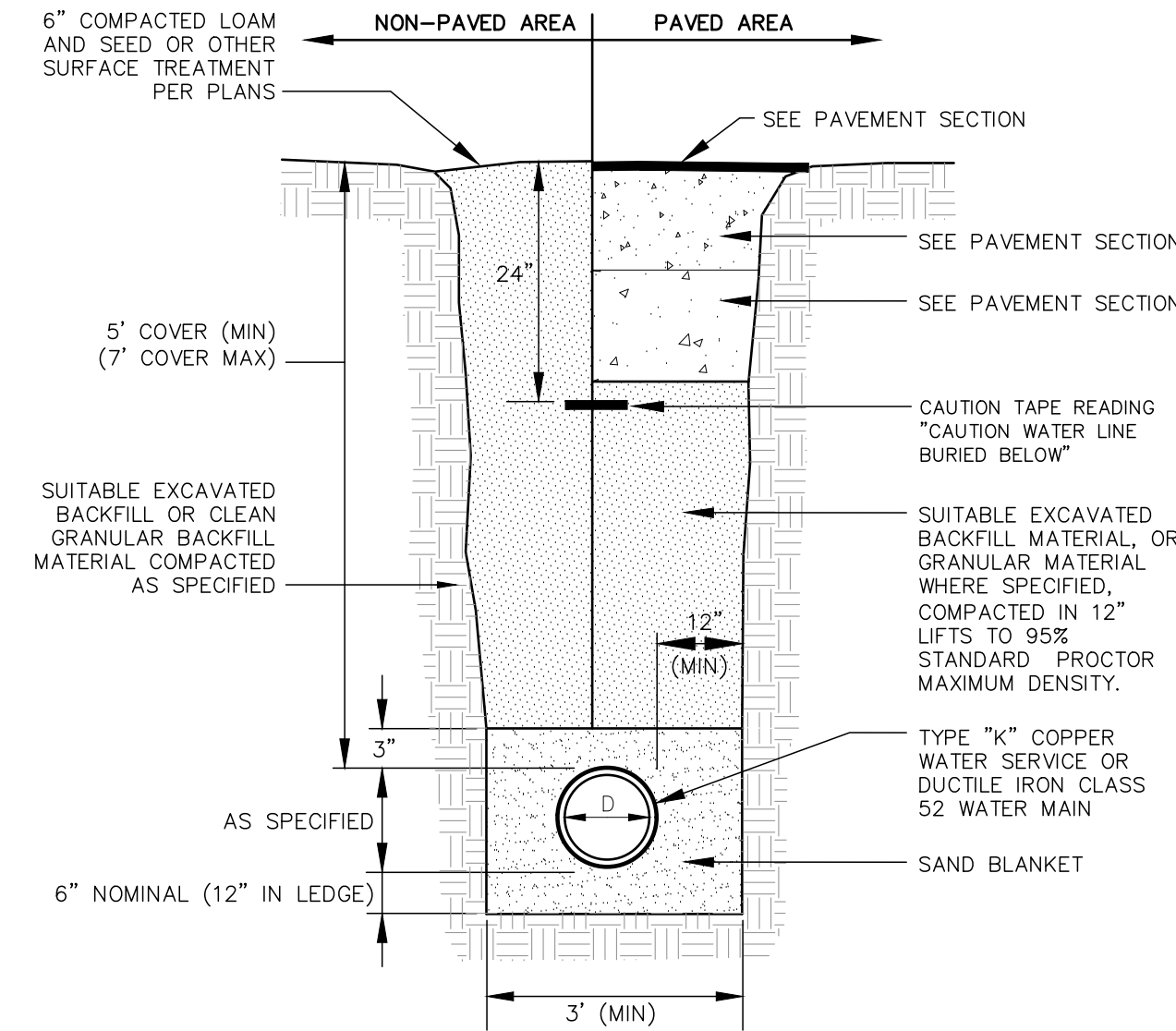


NOTES

- 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. POLYETHYLENE (6 MIL) SHALL BE PLACED AROUND FITTINGS PRIOR TO CONCRETE PLACEMENT.
- ON BENDS AND TEES, EXTEND THRUST BLOCKS FULL LENGTH OF FITTING.
- PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCKS. WHERE M.J. PIPE IS USED, M.J. PLUG WITH RETAINER GLAND MAY BE SUBSTITUTED FOR END BLOCKINGS.

THRUST BLOCKING

NOT TO SCALE

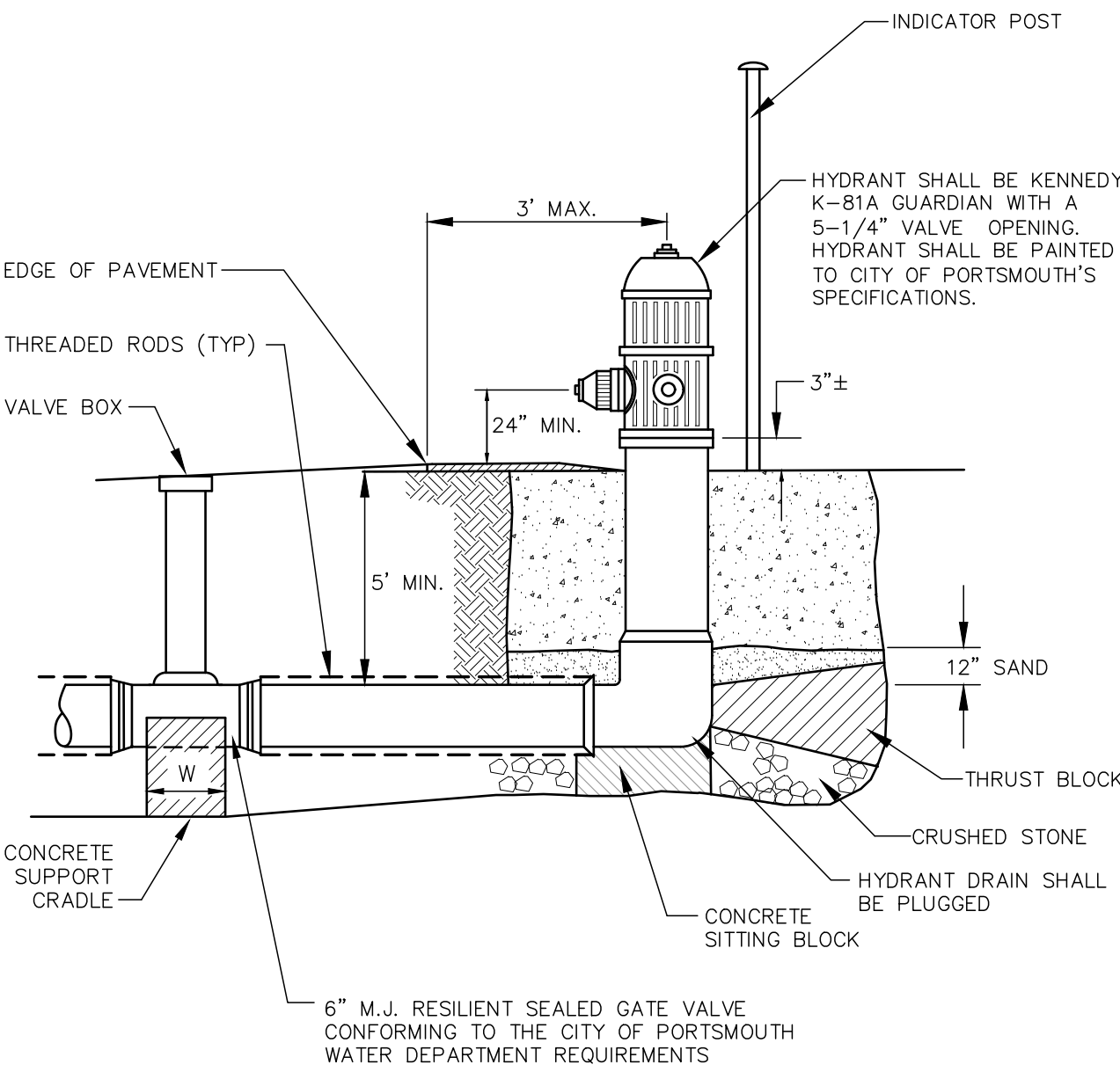


NOTES

- BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
- DUCTILE IRON WATER MAINS SHALL BE POLY WRAPPED FOR THEIR ENTIRE LENGTH.
- WATER MAINS SHALL HAVE 3 WEDGES PER JOINT.

WATER MAIN TRENCH

NOT TO SCALE

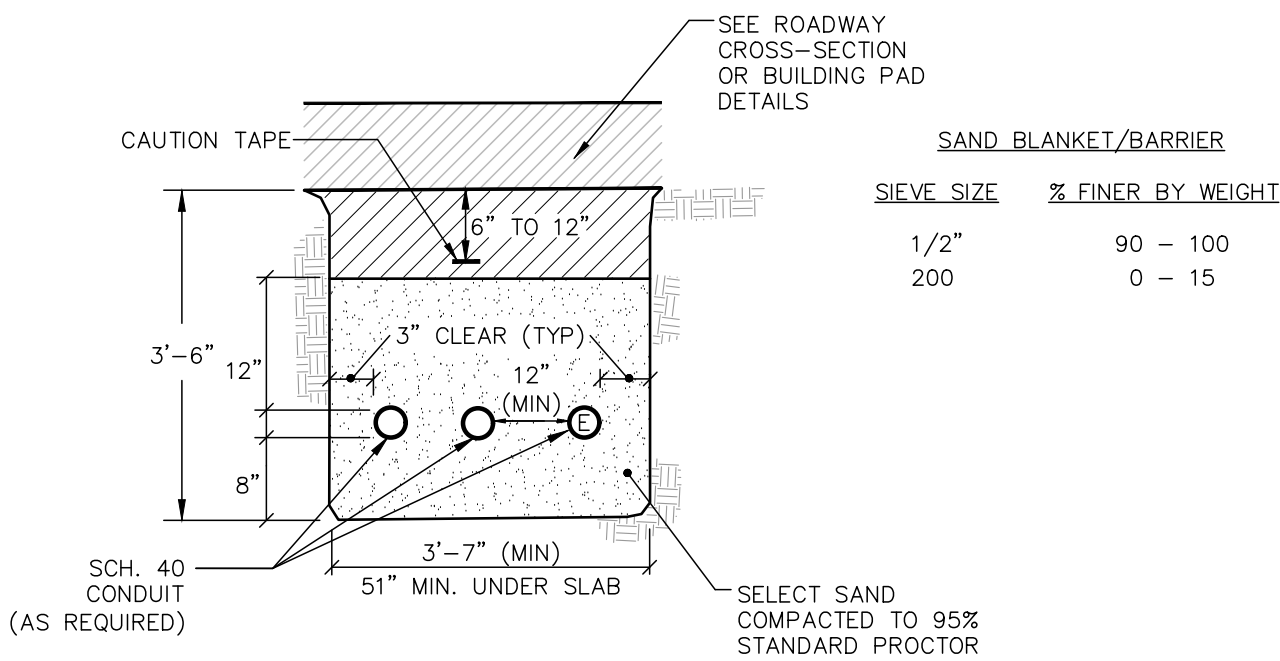


NOTES

- HYDRANT INSTALLATION AND OPERATION TO CONFORM TO REGULATIONS OF THE CITY OF PORTSMOUTH WATER & FIRE DEPARTMENTS.
- GATE VALVES & HYDRANTS TO OPEN RIGHT (CLOCKWISE).

FIRE HYDRANT

NOT TO SCALE

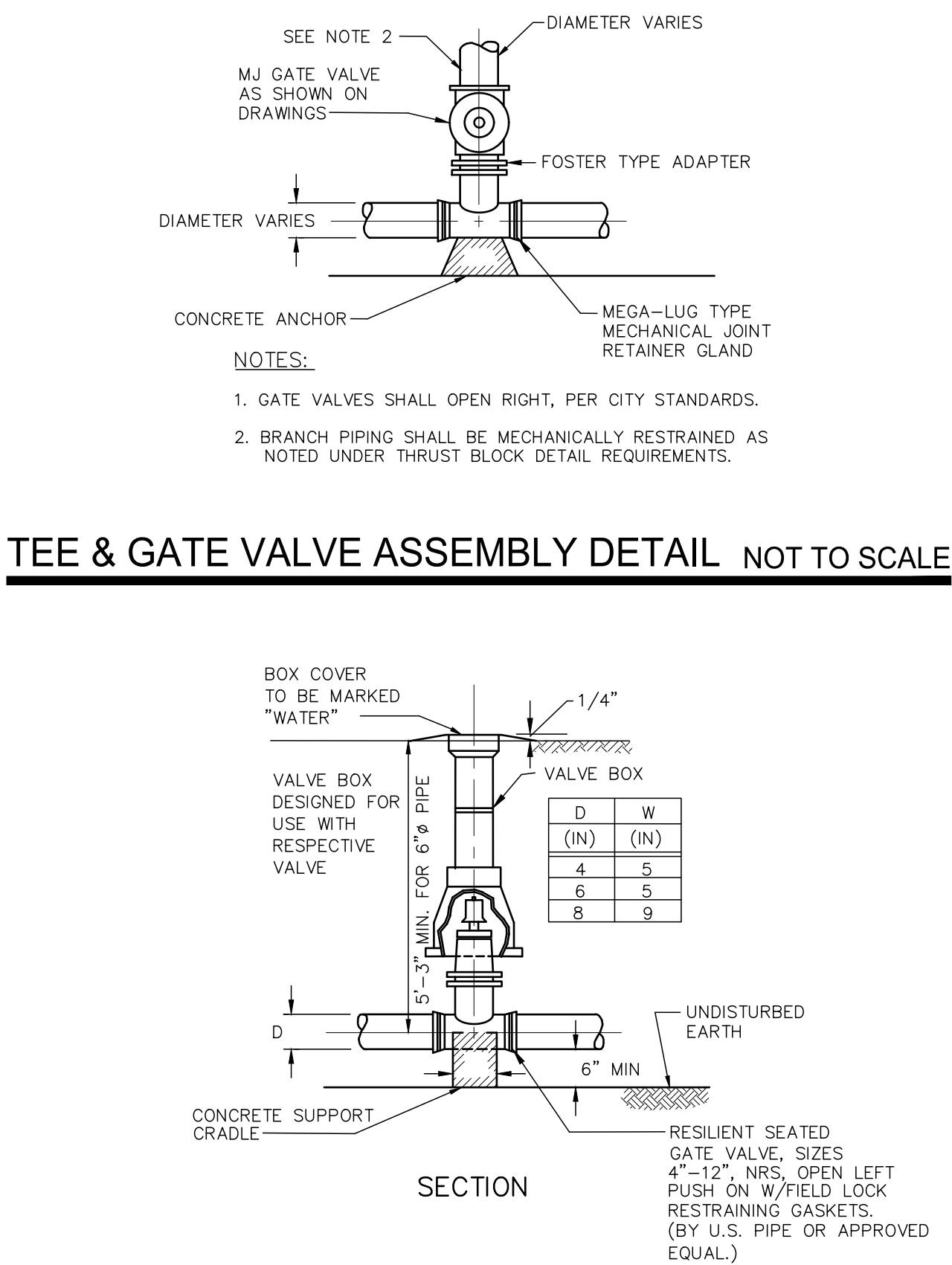


NOTES

- ALL CONDUIT IS TO BE SCHEDULE 40 PVC, ELECTRICAL GRADE, GRAY IN COLOR AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. A 10-FOOT HORIZONTAL SECTION OF RIGID GALVANIZED STEEL CONDUIT WILL BE REQUIRED AT EACH SWEEP, UNLESS IN THE OPINION OF THE SERVICE PROVIDER DESIGNER, THE SWEEP-PVC JOINT IS NOT SUBJECT TO FAILURE DURING PULLING OF THE CABLE. ALL JOINTS ARE TO BE WATERTIGHT.
- ALL 90 DEGREE SWEEPS WILL BE MADE WITH RIGID GALVANIZED STEEL WITH A MINIMUM RADIUS OF 36 INCHES FOR PRIMARY CABLES AND 24 INCHES FOR SECONDARY CABLES.
- BACKFILL MAY BE MADE WITH EXCAVATED MATERIAL OR COMPARABLE, UNLESS MATERIAL IS DEEMED UNSUITABLE BY SERVICE PROVIDER. BACKFILL SHALL BE FREE OF FROZEN LUMPS, ROCKS, DEBRIS, AND RUBBISH. ORGANIC MATERIAL SHALL NOT BE USED AS BACKFILL. BACKFILL SHALL BE IN 6-INCH LAYERS AND THOROUGHLY COMPACTED.
- A SUITABLE PULLING STRING, CAPABLE OF 300 POUNDS OF PULL, MUST BE INSTALLED IN THE CONDUIT BEFORE SERVICE PROVIDER IS NOTIFIED TO INSTALL CABLE. THE STRING SHOULD BE BLOWN INTO THE CONDUIT AFTER THE RUN IS ASSEMBLED TO AVOID BONDING THE STRING TO THE CONDUIT. A MINIMUM OF TWENTY-FOUR (24") INCHES OF ROPE SLACK SHALL REMAIN AT THE END OF EACH DUCT. PULL ROPE SHALL BE INSTALLED IN ALL CONDUIT FOR FUTURE PULLS. PULL ROPE SHALL BE NYLON ROPE HAVING A MINIMUM TENSILE STRENGTH OF THREE HUNDRED (300#) LBS.
- SERVICE PROVIDER SHALL BE GIVEN THE OPPORTUNITY TO INSPECT ALL CONDUIT PRIOR TO BACKFILL. THE CONTRACTOR IS RESPONSIBLE FOR ALL REPAIRS SHOULD SERVICE PROVIDER BE UNABLE TO INSTALL ITS CABLE IN A SUITABLE MANNER.
- TYPICAL CONDUIT SIZES ARE 3-INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4-INCH FOR THREE PHASE SECONDARY AND 5-INCH FOR THREE PHASE PRIMARY. HOWEVER, SERVICE PROVIDERS MAY REQUIRE DIFFERENT NUMBERS, TYPES AND SIZES OF CONDUIT THAN THOSE SHOWN HERE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL CONDUIT SIZES, TYPES AND NUMBERS WITH EACH SERVICE PROVIDER PRIOR TO ORDERING THEM.
- ROUTING OF CONDUIT, LOCATION OF MANHOLES, TRANSFORMERS, CABINETS, HANDHOLES, ETC., SHALL BE DETERMINED BY SERVICE PROVIDER DESIGN PERSONNEL. THE CONTRACTOR SHALL COORDINATE WITH ALL SERVICE PROVIDERS PRIOR TO THE INSTALLATION OF ANY CONDUIT.
- ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE, THE NATIONAL ELECTRIC CODE. WHERE REQUIRED BY UTILITY PROVIDER, CONDUIT SHALL BE SUPPORTED IN PLACE USING PIPE STANCHIONS PLACED EVERY FIVE (5') FEET ALONG THE CONDUIT RUN.
- UNDER A BUILDING SLAB THE CONDUIT SHALL BE ENCASED IN 8" OF CONCRETE ON ALL SIDES.
- ALL CONDUIT TERMINATIONS SHALL BE CAPPED TO PREVENT DEBRIS FROM ENTERING CONDUIT.

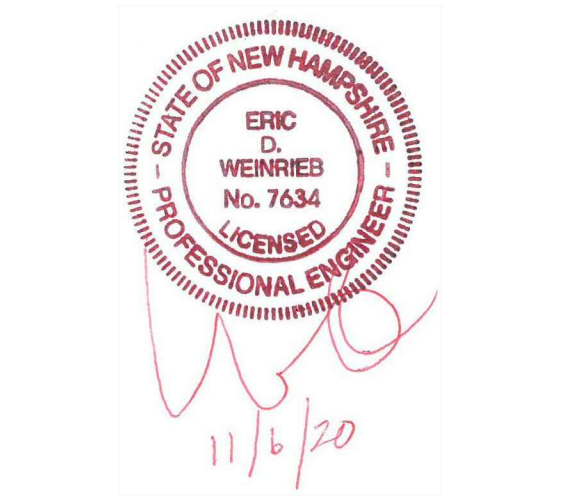
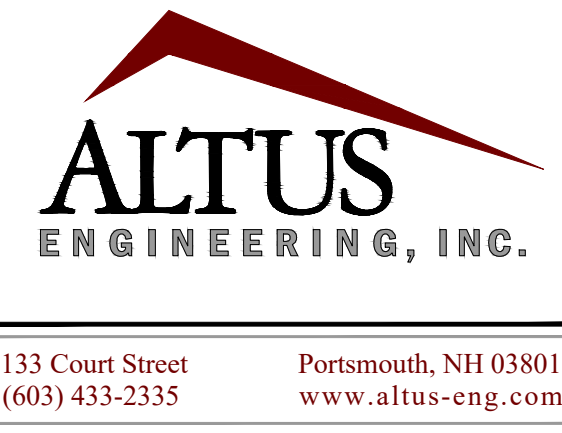
ELECTRIC / COMMUNICATION TRENCH

NOT TO SCALE



WATER VALVE DETAIL

NOT TO SCALE



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ISSUED FOR:

TAC

ISSUE DATE:

NOVEMBER 16, 2020

NO. DESCRIPTION	BY	DATE
0 TAC WORK SESSION	EBS	10/06/20
1 TAC	EBS	11/16/20

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SCALE:

22"x34" N.T.S.

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC

72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

PROJECT:

PROPOSED
ACCESSORY STORAGE
BUILDING

TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

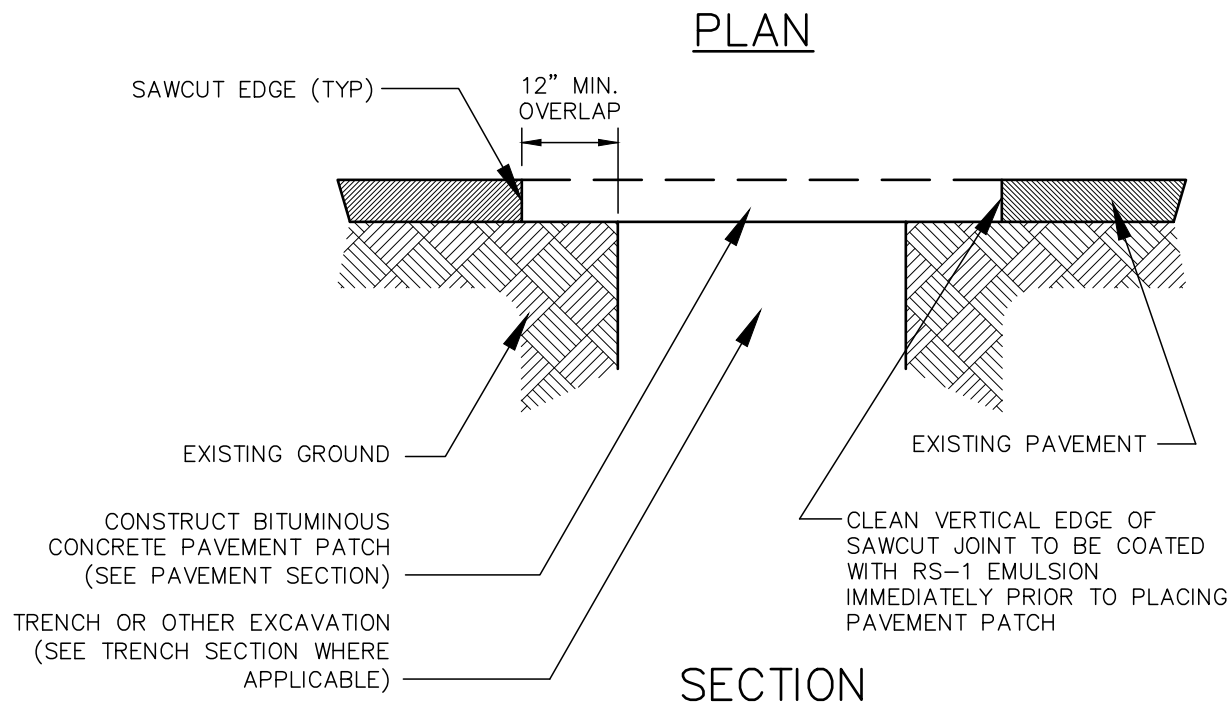
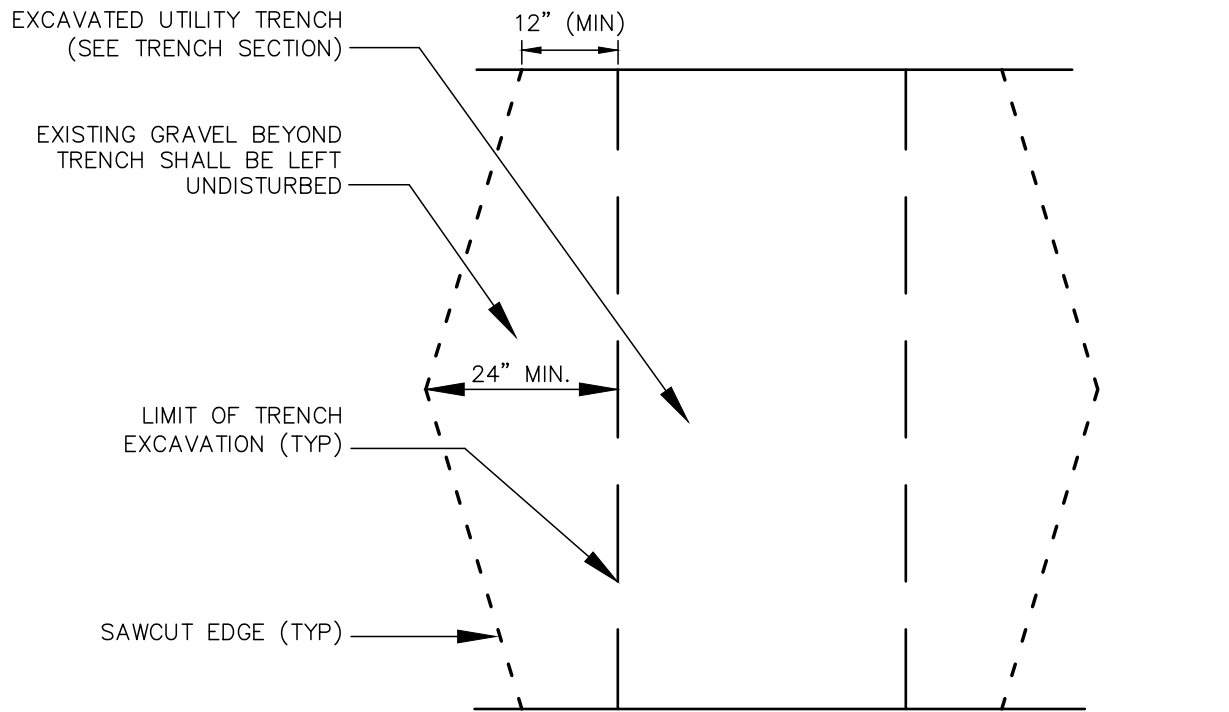
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SHEET NUMBER:

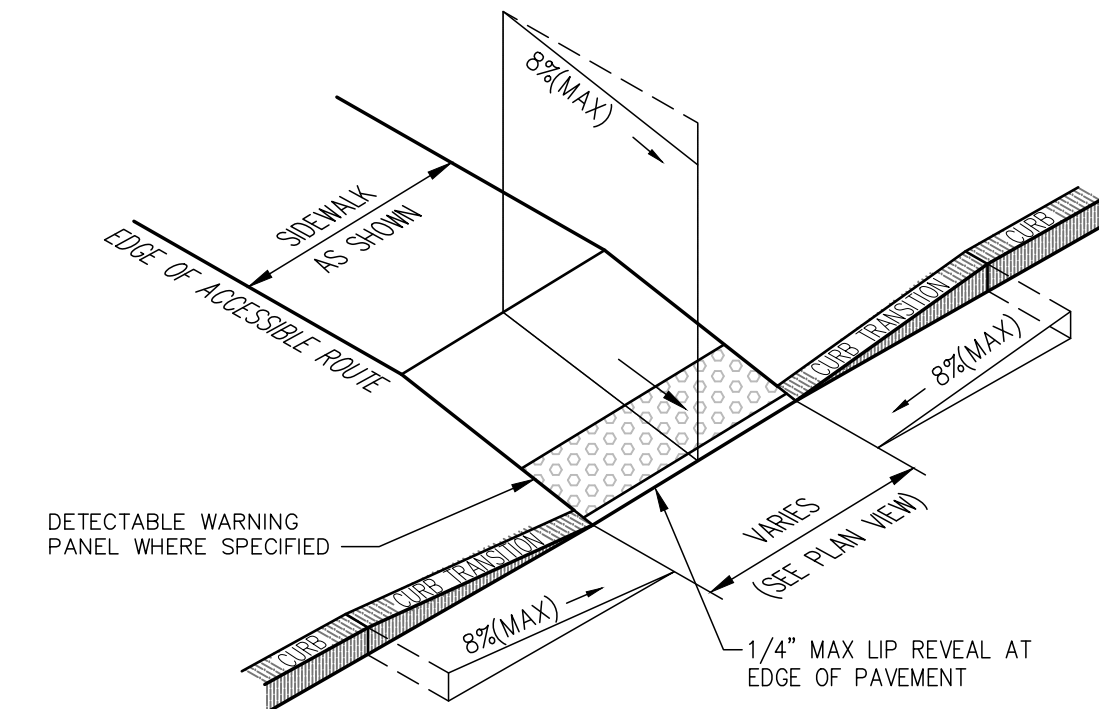
C-10

P5107



- NOTES**
1. MACHINE CUT EXISTING PAVEMENT.
 2. ALL TEMPORARY, DAMAGED OR DEFECTIVE PAVEMENT SHALL BE REMOVED PRIOR TO PLACEMENT OF PERMANENT TRENCH REPAIRS.
 3. DIAMOND PATCHES, SHALL BE REQUIRED FOR ALL TRENCHES CROSSING ROADWAY. DIAMOND PATCHES SHALL MEET NHDOT REQUIREMENTS.

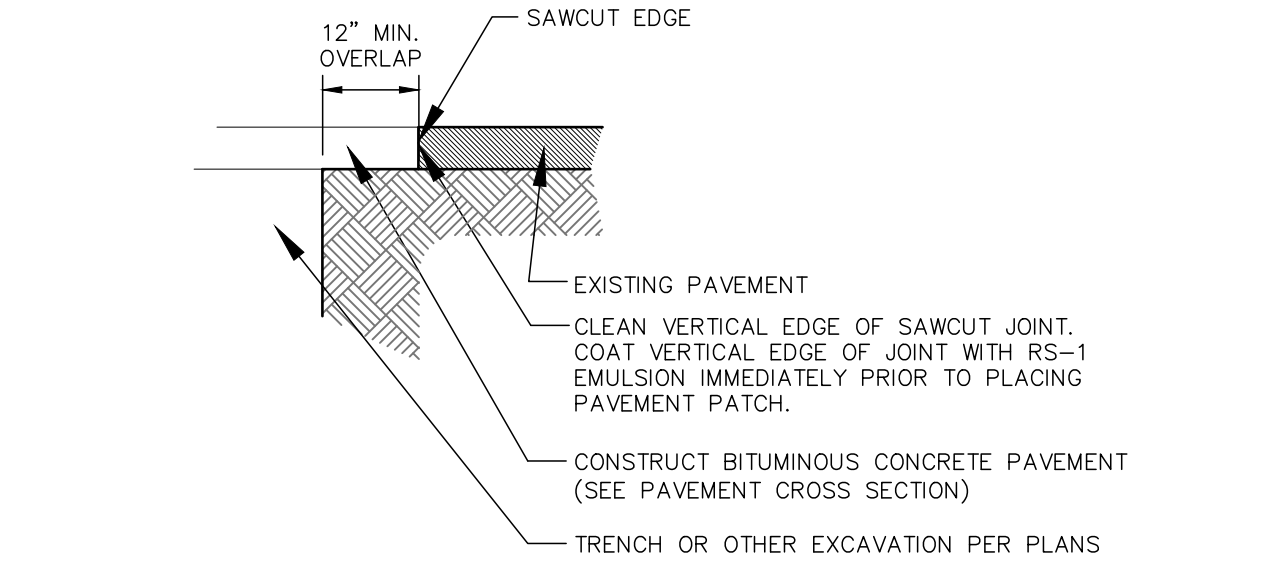
TYPICAL TRENCH PATCH NOT TO SCALE



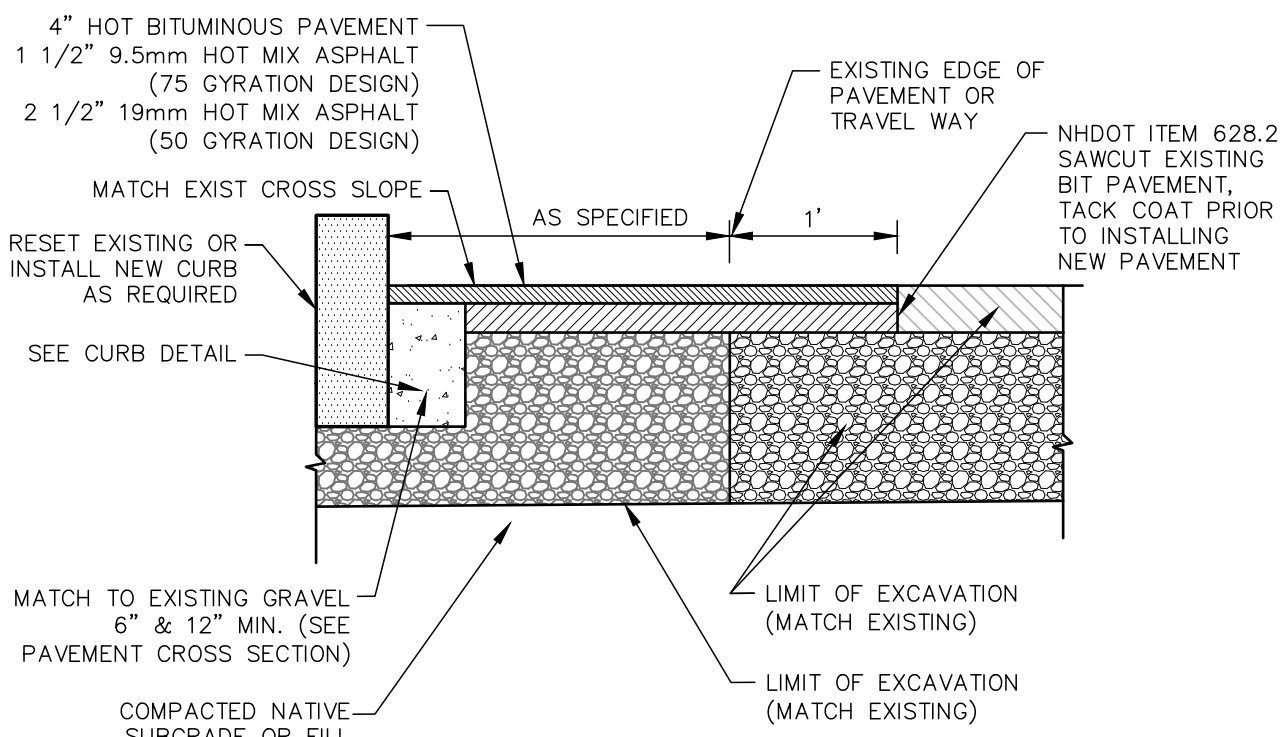
CURB RAMP (TYPE 'F') NOT TO SCALE

- NOTES APPLICABLE TO ALL CURB RAMPS:**
1. THE MAXIMUM ALLOWABLE CROSS SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) AND CURB SHALL BE 1.5%.
 2. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
 3. THE MAXIMUM ALLOWABLE RUNNING SLOPE OF AN ACCESSIBLE ROUTE (SIDEWALK) CURB RAMP SHALL BE 8.3% FOR A MAXIMUM ELEVATION CHANGE OF 6".
 4. CURB TREATMENT VARIES, SEE PLANS FOR CURB TYPE.
 5. BASE OF RAMP SHALL BE GRADED TO PREVENT THE PONDING OF WATER.
 6. SEE CONCRETE SIDEWALK SECTION FOR RAMP CONSTRUCTION.
 7. ALL CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH AMERICANS WITH DISABILITIES ACT (ADA) AND ALL APPLICABLE CODES.
 8. FLUSH CURB SECTIONS SHALL HAVE A MAXIMUM LIP REVEAL OF 1/4" WITH A BEVEL AT THE EDGE OF PAVEMENT.
 9. EDGES OF SIDEWALK FOOTINGS ALONG FLUSH CURBS SHALL BE HAUNCHED SO AS TO EXTEND TO A MINIMUM DEPTH OF 1' BELOW FINISH GRADE.
 10. NO RAMP SHALL BE LESS THAN 4' IN WIDTH.
 11. CURB RAMPS SHALL HAVE A FLAT 2% MAX LANDING AT THE TOP AND BOTTOM OF THE RAMPS WHEN THERE IS A CHANGE IN DIRECTION.

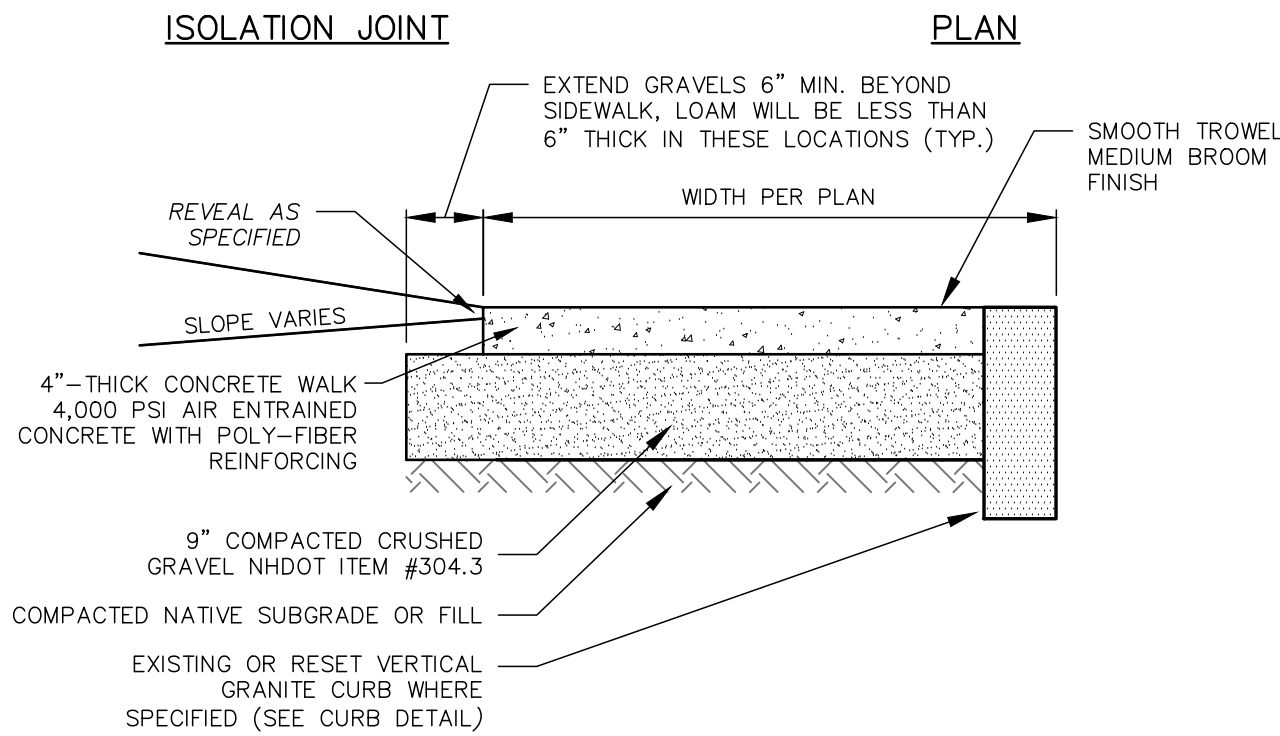
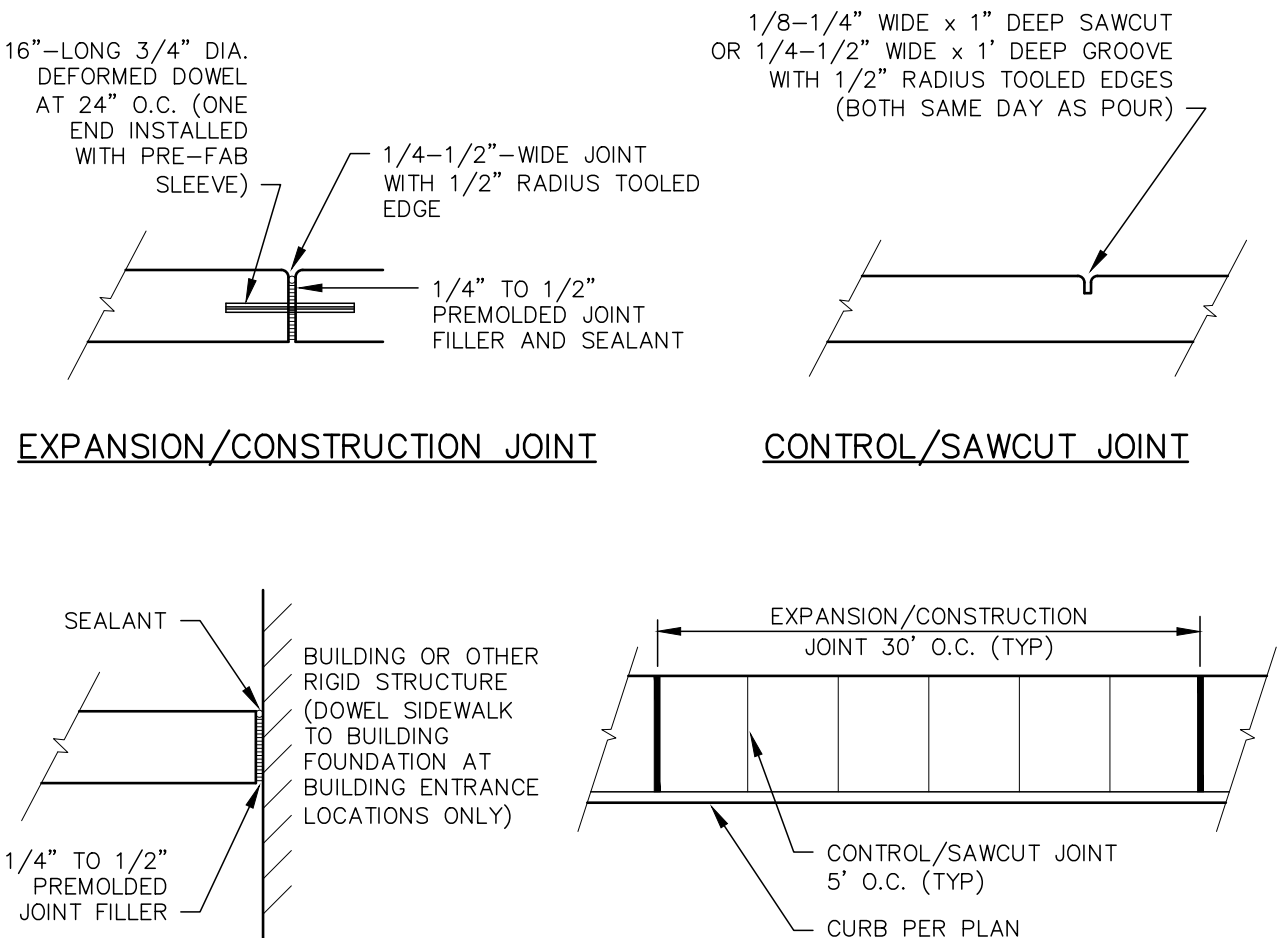
CURB RAMP NOTES NOT TO SCALE



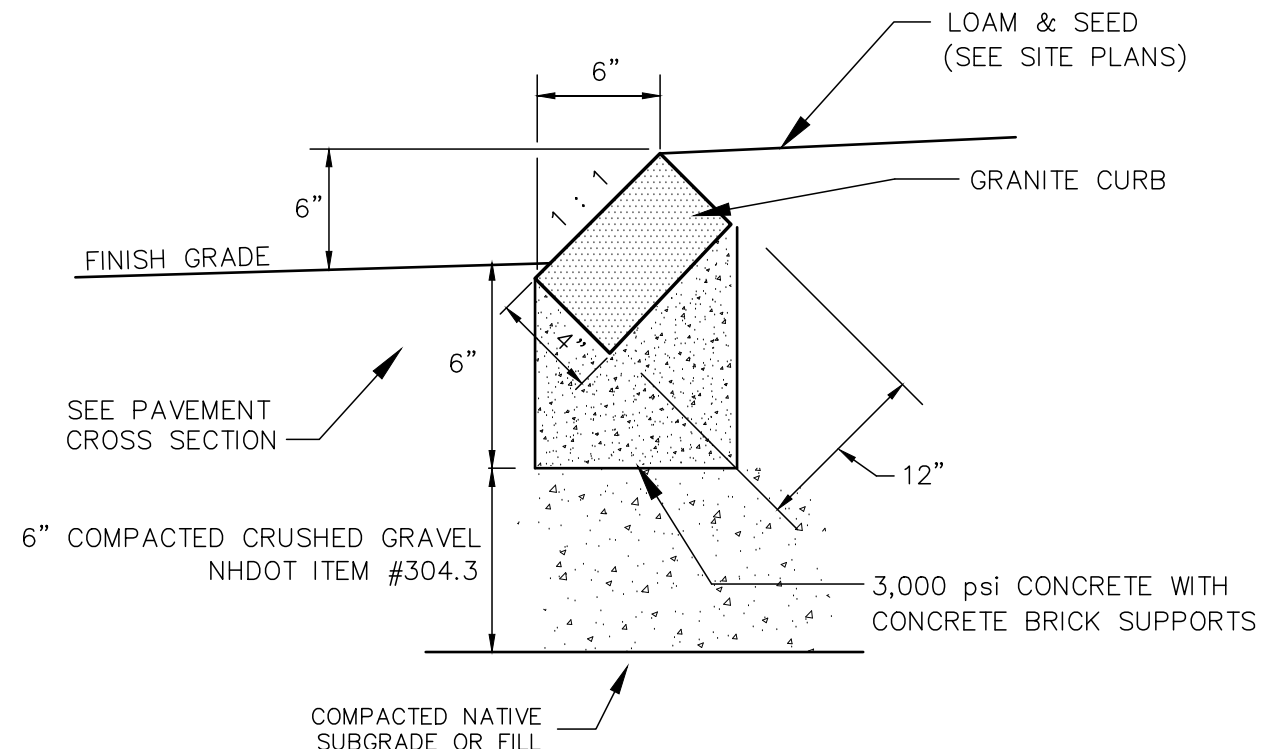
TYPICAL PAVEMENT SAWCUT NOT TO SCALE



SAWCUT AND PAVEMENT PATCH NOT TO SCALE



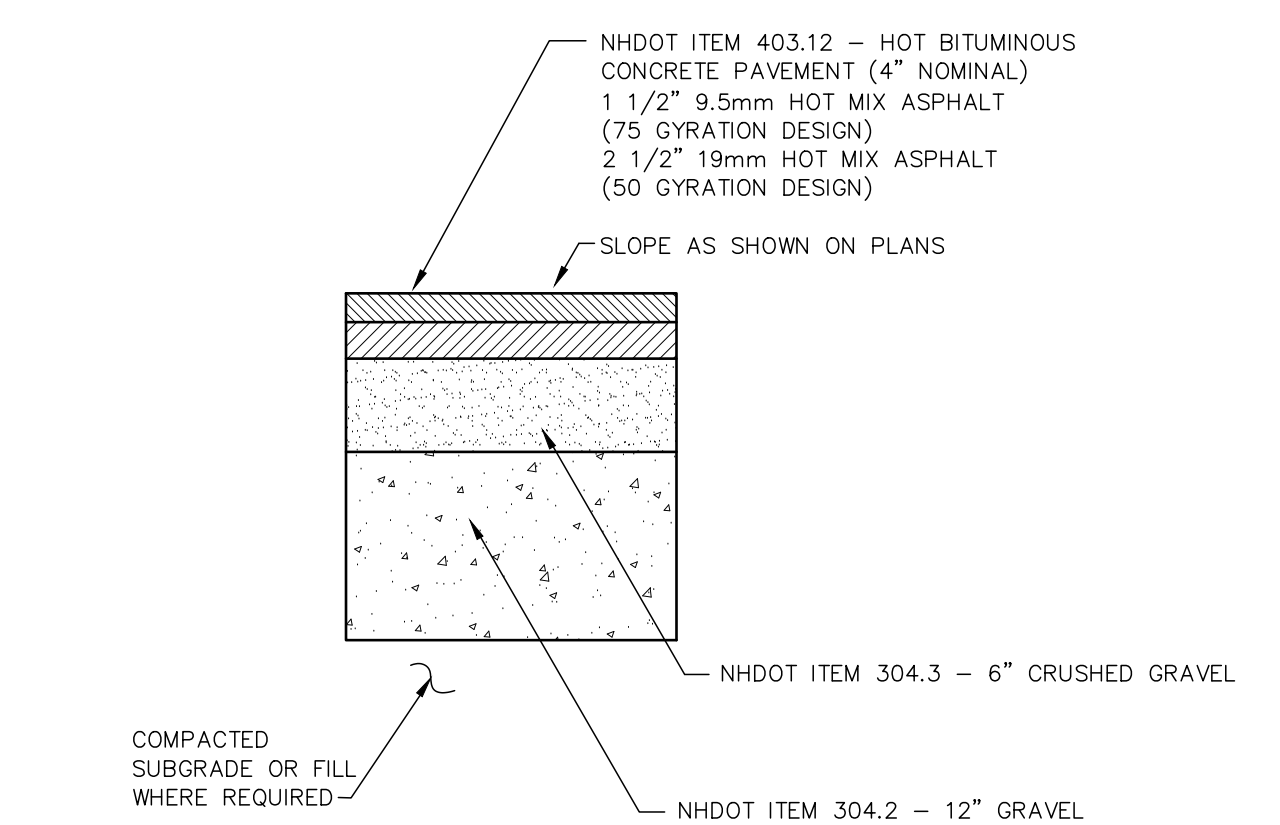
CONCRETE SIDEWALK OPTION NOT TO SCALE



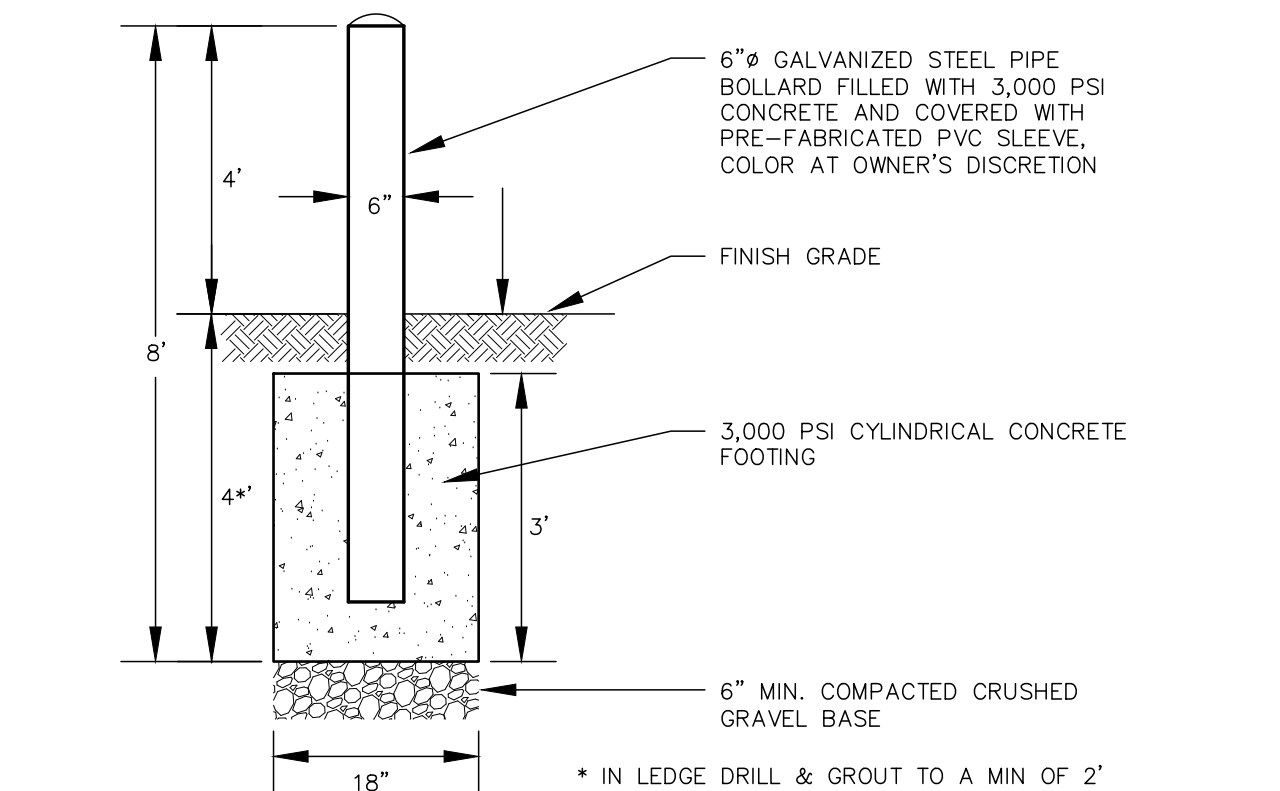
- NOTES**
1. SEE SITE PLAN FOR LIMITS OF CURBING
 2. ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH
 3. MINIMUM LENGTH OF STRAIGHT CURB STONES = 18"
 4. MAXIMUM LENGTH OF STRAIGHT CURB STONES = 8'
 5. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART

RADIUS FOR STONES WITH SQUARE JOINTS	MAXIMUM LENGTH
16'-28'	1'-6"
29'-41'	2'
42'-55'	3'
56'-68'	4'
69'-82'	5'
83'-96'	6'
97'-110'	7'
OVER 110'	8'

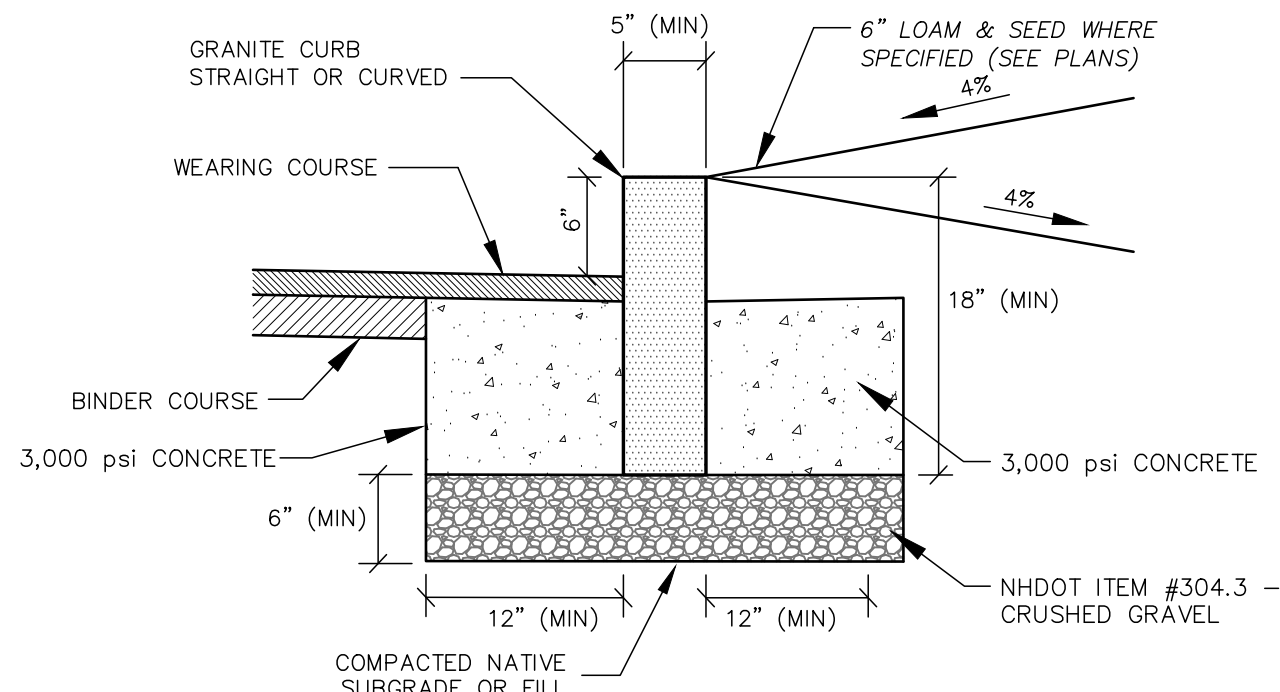
SLOPED GRANITE CURB NOT TO SCALE



PAVEMENT CROSS SECTION NOT TO SCALE



BOLLARD DETAIL NOT TO SCALE

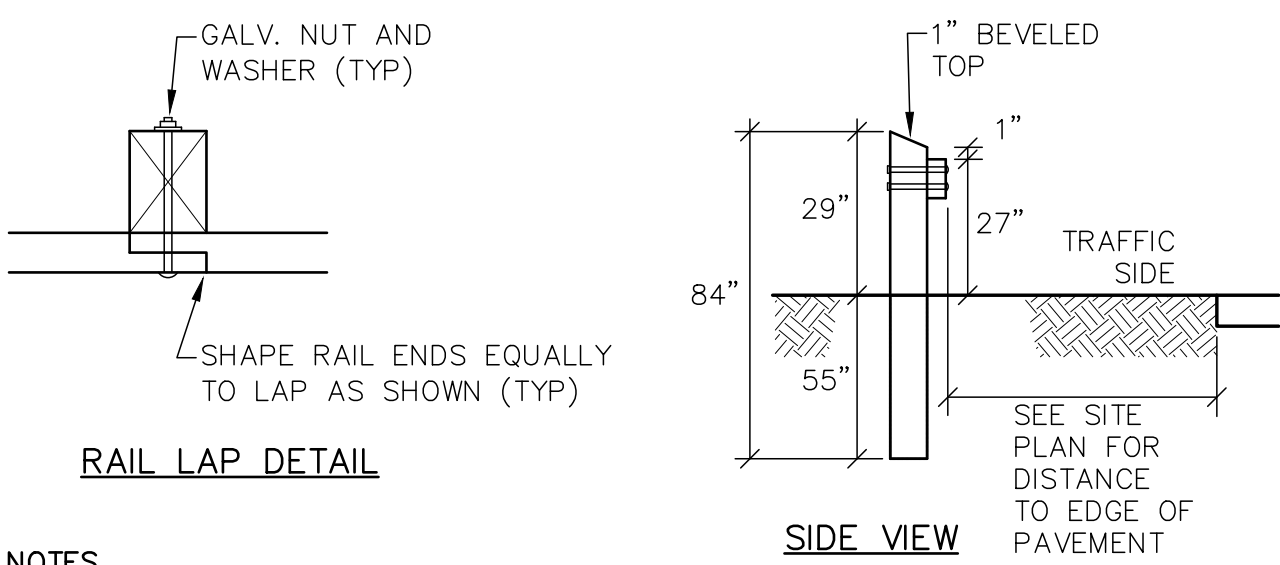
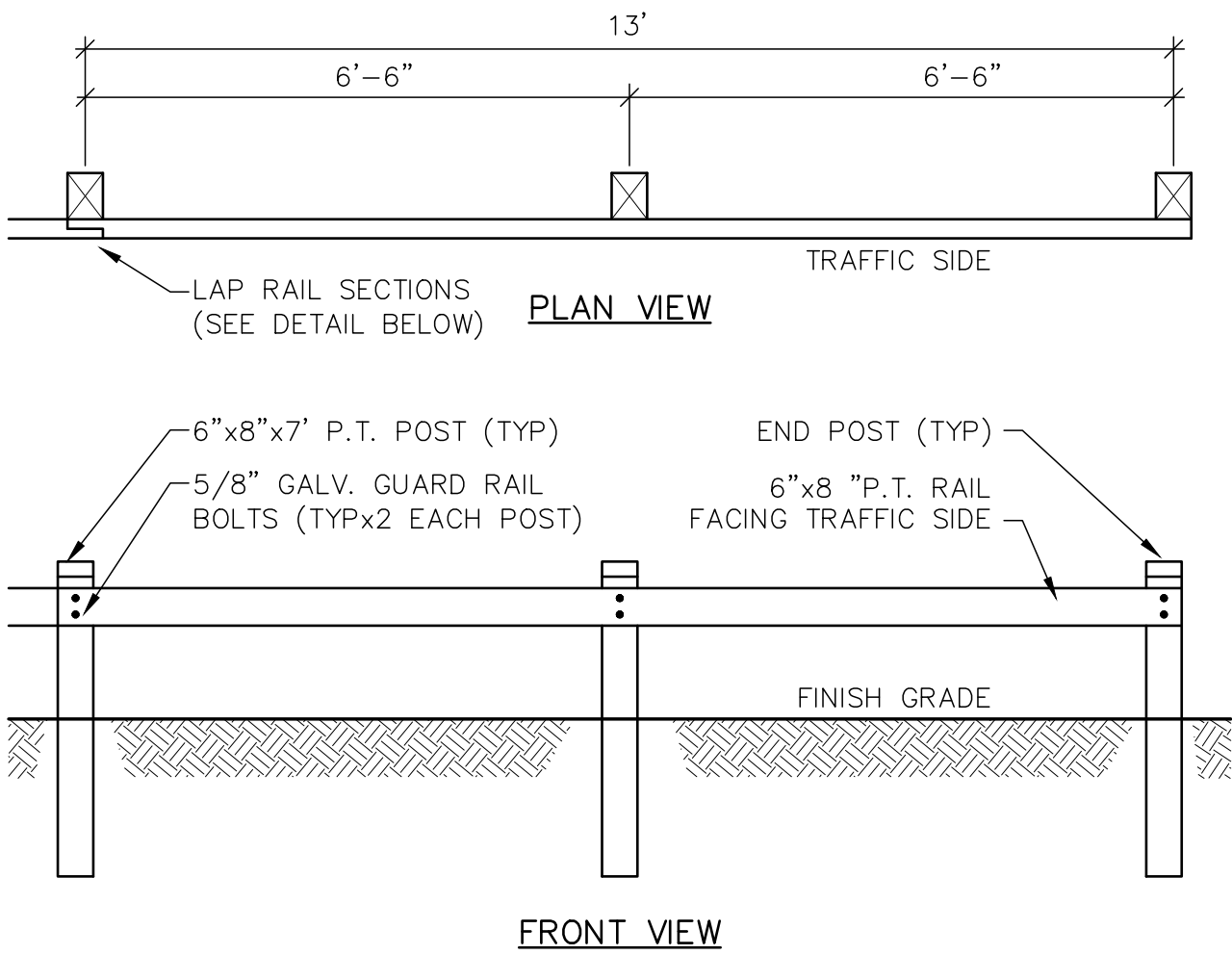


NOTES

1. SEE PLANS FOR CURB LOCATION.
2. SEE PLANS FOR PAVEMENT CROSS SECTION.
3. ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATELY THE SAME LENGTH.
4. MINIMUM LENGTH OF CURB STONES = 4'.
5. MAXIMUM LENGTH OF CURB STONES = 10'.
6. MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES – SEE CHART.
7. CURB ENDS TO ROUNDED AND BATTERED FACES TO BE CUT WHEN CALLED FOR ON THE PLANS.
8. CURB SHALL BE INSTALLED PRIOR TO PLACEMENT OF TOP PAVEMENT COURSE.
9. JOINTS BETWEEN CURB STONES SHALL BE MORTARED.

RADIUS	MAX. LENGTH
21'	3'
22'-28'	4'
29'-35'	5'
36'-42'	6'
43'-49'	7'
50'-56'	8'
57'-60'	9'
OVER 60'	10'

VERTICAL GRANITE CURB NOT TO SCALE



- NOTES**
1. ALL POST AND RAIL MATERIAL SHALL BE PRESSURE TREATED.
 2. BOLT LENGTH IS DETERMINED BY 8" POST AND RAIL THICKNESS PLUS 1 INCH FOR NUT AND WASHER.
 3. ALL MATERIAL TO MEET OR EXCEED NHDOT SECTION 606 – GUARDRAIL.

WOOD BEAM GUARDRAIL NOT TO SCALE

ALTUS
ENGINEERING, INC.

133 Court Street
(603) 433-2335

Portsmouth, NH 03801
www.altus-eng.com

STATE OF NEW HAMPSHIRE
ERIC D. WERNIES
No. 7634
LICENSED PROFESSIONAL ENGINEER
11/6/20

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TAX MAP 253, LOT 2A
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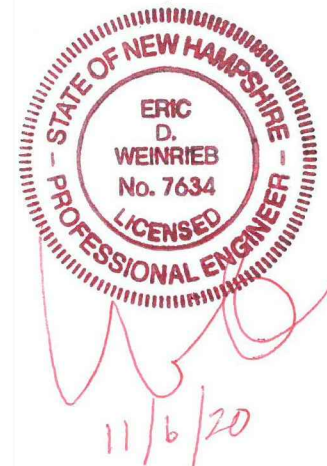
TITLE:

DETAIL SHEET

SHEET NUMBER:

C-11

PS107



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BY DATE

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TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

TITLE:

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SHEET NUMBER:

C-12



D-Series Size 0 LED Area Luminaire



Specifications

EPA: 0.95 ft²

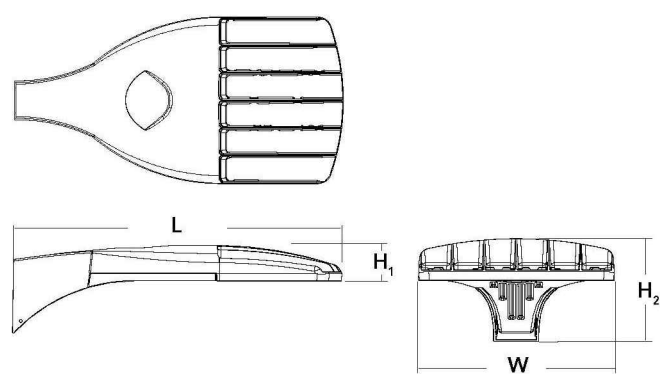
Length: 26" (660 mm)

Width: 13" (330 mm)

Height: 3" (76 mm)

Height: 7" (178 mm)

Weight (max): 16 lbs (7.3 kg)



Catalog Number
Notes
Type

All the following information is provided for informational purposes only.

Introduction

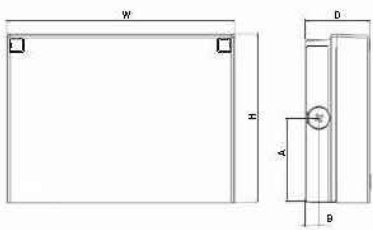
The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.



WPX LED Wall Packs



Specifications



Luminaire	Height (H)	Width (W)	Depth (D)	Side Conduit Location	Weight
WPX1	8.1" (20.6 cm)	11.1" (28.3 cm)	3.2" (8.1 cm)	4.0" (10.3 cm)	6.1 lbs (2.8 kg)
WPX2	8.1" (20.6 cm)	12.7" (32.1 cm)	4.1" (10.5 cm)	4.5" (11.5 cm)	8.2 lbs (3.7 kg)
WPX3	9.5" (24.1 cm)	13.0" (33.0 cm)	5.3" (13.2 cm)	4.7" (12.0 cm)	11.0 lbs (5.0 kg)

Catalog Number
Notes
Type

All the following information is provided for informational purposes only.

Introduction

The WPX LED wall packs are energy-efficient, cost-effective, and aesthetically appealing solutions for both HID wall pack replacement and new construction opportunities. Available in three sizes, the WPX family delivers 1,550 to 9,200 lumens with a wide, uniform distribution. The WPX full cut-off solutions fully cover the footprint of the HID glass wall packs that they replace, providing a neat installation and an upgraded appearance. Reliable IP66 construction and excellent LED lumen maintenance ensure a long service life. Photocell and emergency egress battery options make WPX ideal for every wall mounted lighting application.

Ordering Information

Series	Color Temperature	Voltage	Options	Finish
WPX1 LED P1	1,550 Lumens, 11W ¹	30K 3000K	MMVOLT 120V - 277V	Dark Bronze
WPX1 LED P2	2,900 Lumens, 24W	40K 4000K	347 347V ¹	White
WPX2 LED	6,000 Lumens, 47W	50K 5000K		Black
WPX3 LED	9,200 Lumens, 66W			Dark Bronze

Note: The lumen output and input power shown in the ordering tree are average representations of all configuration options. Specific values are available on request.

- NOTES
- All WPX wall packs come with 6V surge protection standard, except WPX1 LED P1 package which comes with 2.5kV surge protection standard. Add SPD6V option to get WPX1 LED P1 with 6V surge protection.
 - Battery pack options only available on WPX1 and WPX2.
 - Battery pack options not available with 347V and PE options.

FEATURES & SPECIFICATIONS

INTENDED USE
The WPX LED wall packs are designed to provide a cost-effective, energy-efficient solution for the one-for-one replacement of existing HID wall packs. The WPX1, WPX2 and WPX3 are ideal for replacing up to 150W, 250W, and 400W HID luminaires respectively. WPX luminaires deliver a uniform, wide distribution.

CONSTRUCTION
WPX features a die-cast aluminum main body with optimal thermal management that both enhances LED efficiency and extends component life. The luminaires are IP66 rated, and sealed against moisture or environmental contaminants.

ELECTRICAL
Light engine configurations consist of high-efficiency LEDs and LED lumen maintenance of 150,000 hours. Color temperature (CCT) options of 3000K, 4000K and 5000K with minimum CRI of 70. Electronic drivers ensure system power factor >90% and THD <25%. All luminaires have 6V surge protection (Note: WPX1 LED P1 package comes with a standard surge protection rating of 2.5kV. It can be ordered with an optional 6V surge protection). All photocell PES operate on MVOLT 120V - 277V input.

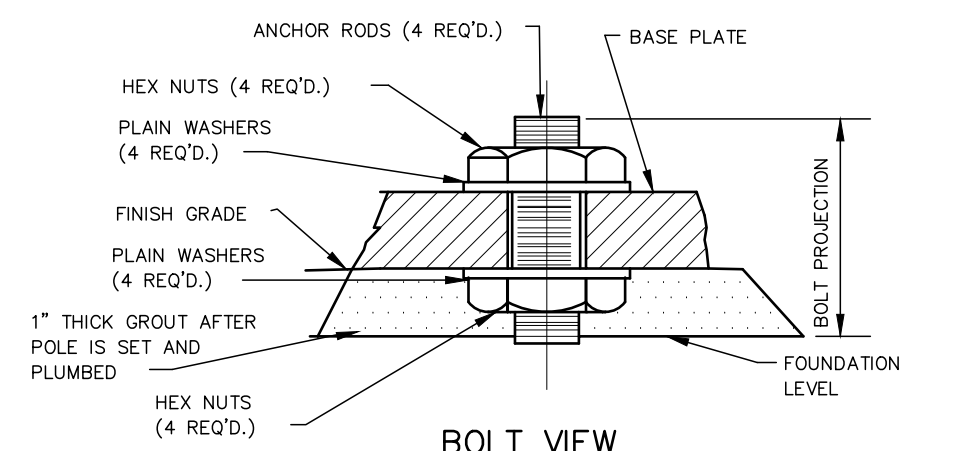
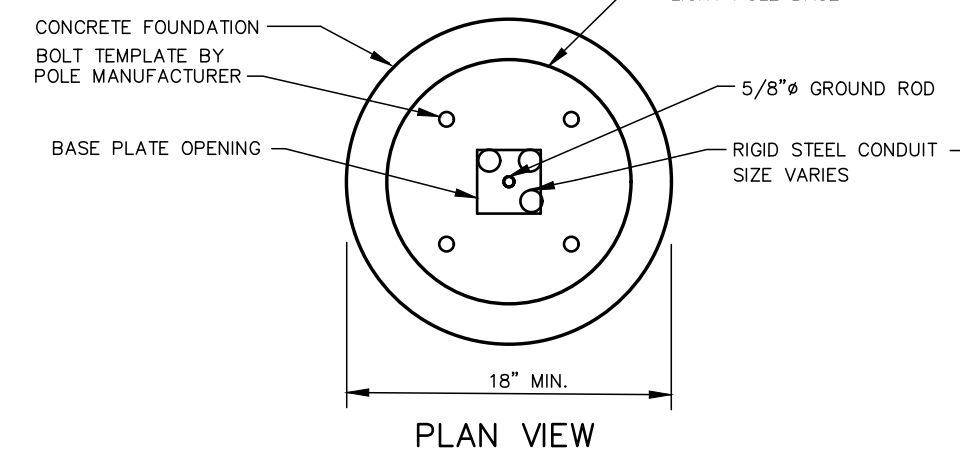
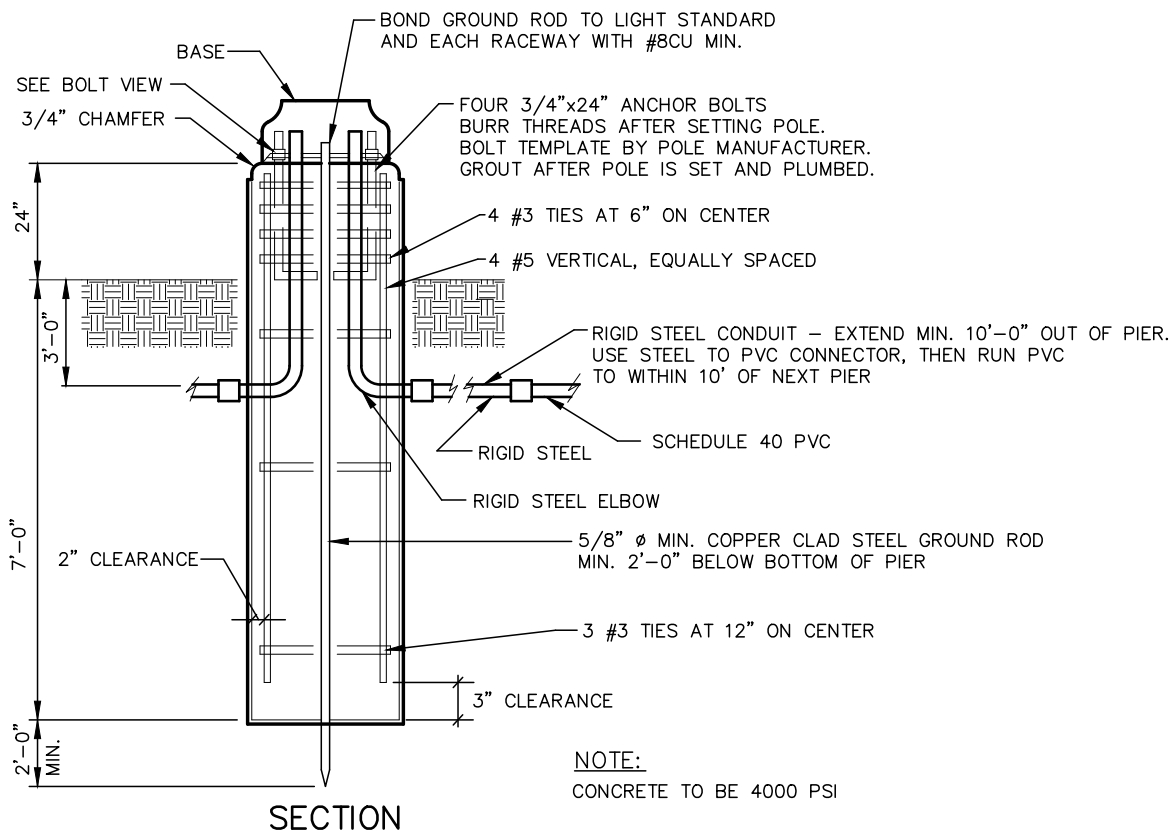
Note: The standard WPX LED wall pack luminaire comes with field-adjustable drive current feature. This feature allows tuning the output current of the LED drivers to adjust the lumen output to dim the luminaire.

INSTALLATION
WPX can be mounted directly over a standard electrical junction box. Three 1/2 inch conduit ports on three sides allow for surface conduit wiring. A port on the back surface allows poke-through conduit wiring on surfaces that don't have an electrical junction box. Wiring can be made in the integral wiring compartment in all cases. WPX is only recommended for installations with LEDs facing downwards.

LISTINGS
CSA Certified to meet U.S. and Canadian standards. Suitable for wet locations (IP66 Rated). DesignLight Consortium® DLC qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlightconsortium.org/DLC to confirm which versions are qualified. International Dark Sky Association (IDA) Fixture Seal of Approval (FSO) is available for all products on this page utilizing 3000K color temperature only.

WARRANTY
5-year limited warranty. Complete warranty terms located at: www.altuseng.com/Customersupport/terms_and_conditions.aspx.

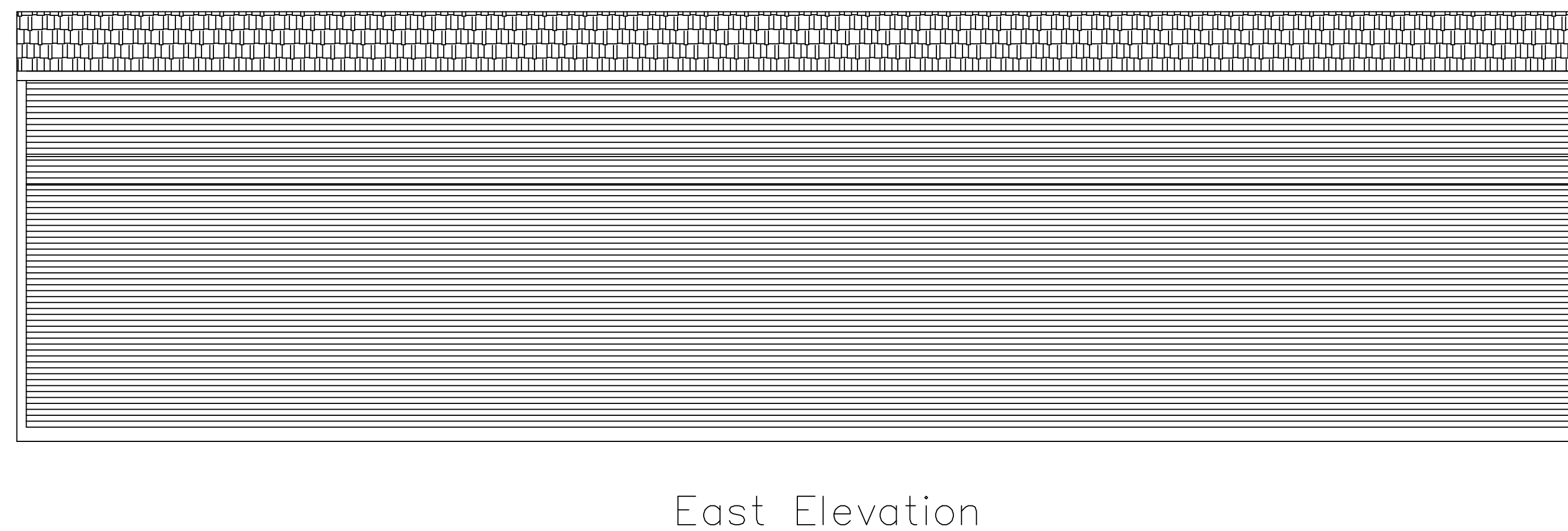
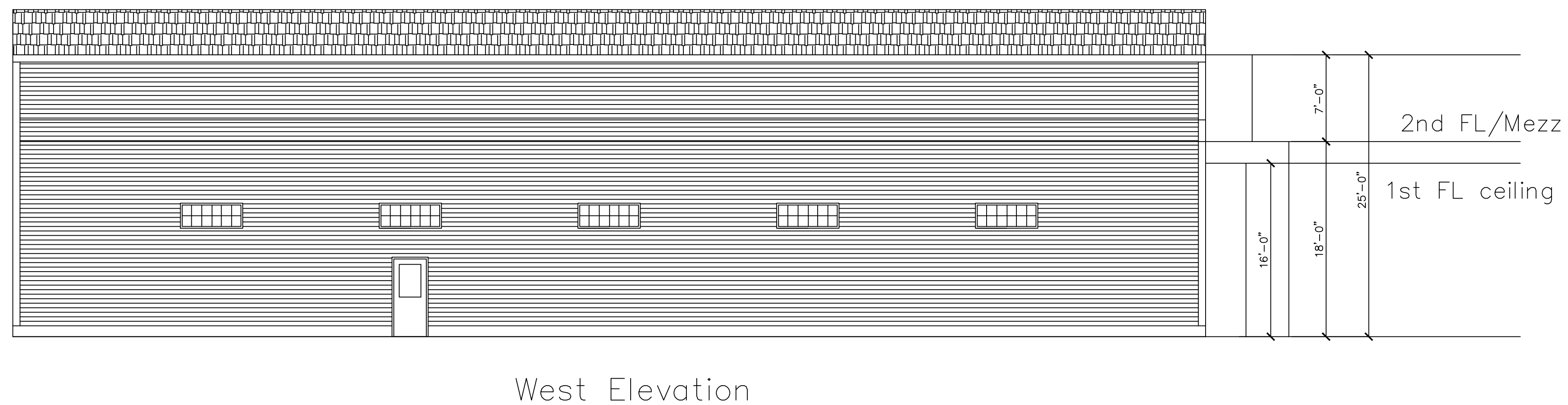
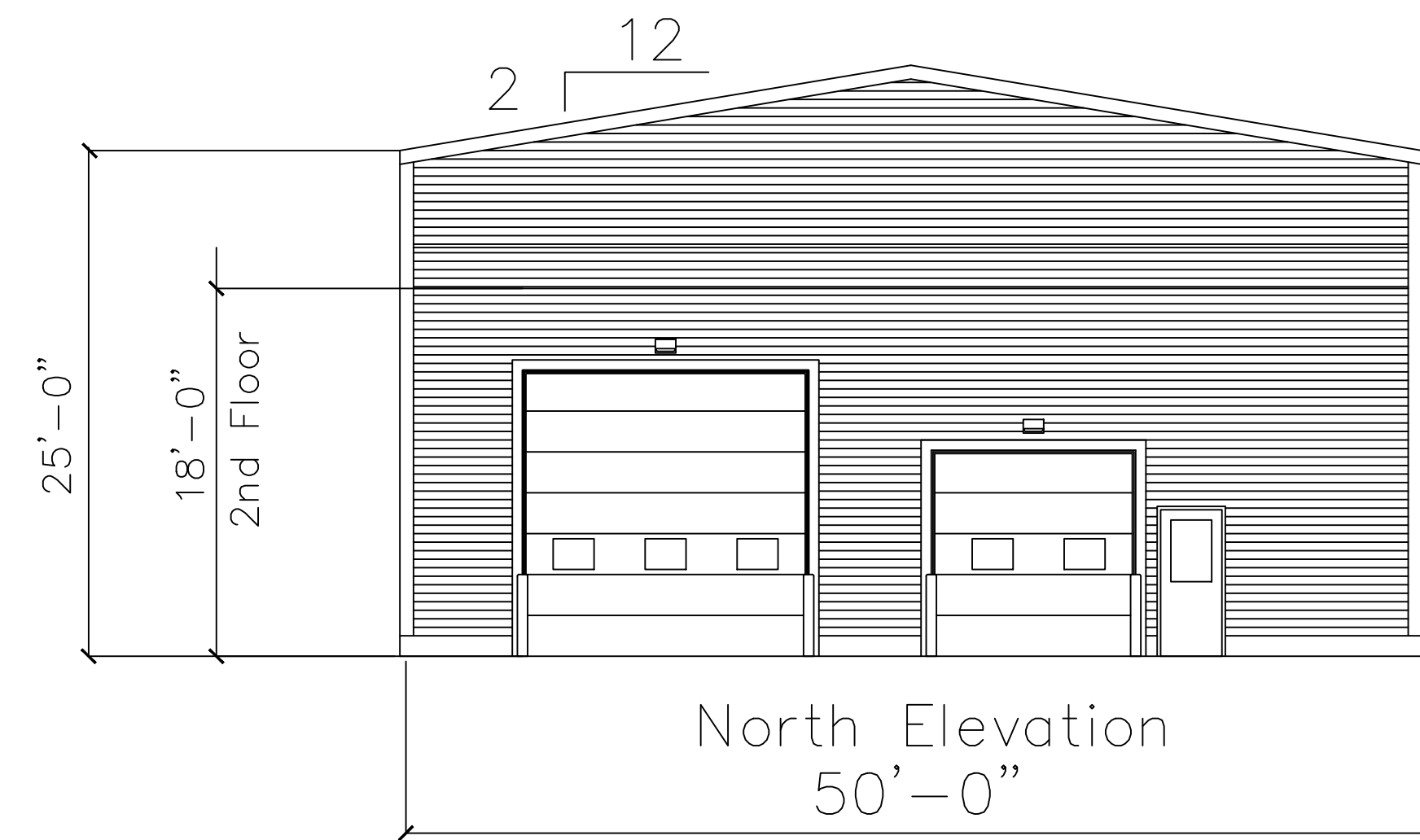
Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C. Specifications subject to change without notice.



LIGHT POLE BASE DETAIL

NOT TO SCALE

P5107



Accessory Storage Building
 PREPARED FOR
MADISON RESOURCES GROUP, LLC
 PORTSMOUTH, NEW HAMPSHIRE
 DATE: OCTOBER 23, 2020
 SCALE: 1/8" = 1'0"



RICCO
CONSTRUCTION
COMPANY, INC.
 225 BANFIELD ROAD
 PORTSMOUTH, NH 03801
 603-436-3112



City of Portsmouth, New Hampshire

Site Plan Application Checklist

This site plan application checklist is a tool designed to assist the applicant in the planning process and for preparing the application for Planning Board review. A pre-application conference with a member of the planning department is strongly encouraged as additional project information may be required depending on the size and scope. The applicant is cautioned that this checklist is only a guide and is not intended to be a complete list of all site plan review requirements. Please refer to the Site Plan review regulations for full details.

Applicant Responsibilities (Section 2.5.2): Applicable fees are due upon application submittal along with required attachments. The application shall be complete as submitted and provide adequate information for evaluation of the proposed site development. Waiver requests must be submitted in writing with appropriate justification.

Name of Owner/Applicant: Madison Commercial Group, LLC Date Submitted: 11/16/20

Phone Number: (603) 430-8339 E-mail: pwright@madisonresources.com

Site Address: 150 Mirona Road Map: 253 Lot: 2A

Zoning District: G2 Lot area: 60,621 sq. ft.

Application Requirements			
☒	Required Items for Submittal	Item Location (e.g. Page or Plan Sheet/Note #)	Waiver Requested
☒	Fully executed and signed Application form. (2.5.2.3)	Viewpoint	N/A
☒	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). (2.5.2.8)	Viewpoint	N/A

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Statement that lists and describes "green" building components and systems. (2.5.3.1A)	Viewpoint	
☒	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1B)	Sheet C3	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1C)	Cover Sheet	N/A
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. (2.5.3.1D)	Cover Sheet	N/A

Site Plan Review Application Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. (2.5.3.1E)	Sheet C3	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1F)	Cover Sheet	N/A
☒	List of reference plans. (2.5.3.1G)	Sheet C1	N/A
☒	List of names and contact information of all public or private utilities servicing the site. (2.5.3.1H)	Sheets C2 and C5	N/A

Site Plan Specifications			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. (2.5.4.1A)	Required on all plan sheets	N/A
☒	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. (2.5.4.1B)	Required on all plan sheets	N/A
☒	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. (2.5.4.1C)	Sheet C1	N/A
☒	Plans shall be drawn to scale. (2.5.4.1D)	Required on all plan sheets	N/A
☒	Plans shall be prepared and stamped by a NH licensed civil engineer. (2.5.4.1D)	All applicable sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)	Sheet C3	N/A
☒	Title (name of development project), north point, scale, legend. (2.5.4.2A)	All applicable sheets	N/A
☒	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)	All applicable sheets	N/A
☒	Individual plan sheet title that clearly describes the information that is displayed. (2.5.4.2C)	Required on all plan sheets	N/A
☒	Source and date of data displayed on the plan. (2.5.4.2D)	All applicable sheets	N/A

Site Plan Specifications			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	A note shall be provided on the Site Plan stating: "All conditions on this Plan shall remain in effect in perpetuity pursuant to the requirements of the Site Plan Review Regulations." (2.5.4.2E)	Sheet C3, Note 11	N/A
☒	Plan sheets submitted for recording shall include the following notes: a. "This Site Plan shall be recorded in the Rockingham County Registry of Deeds." b. "All improvements shown on this 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." (2.13.3)	Sheet C3, Notes 19 & 20	N/A
☐	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "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." c. "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." (2.13.4)	Waiver requested for landscaping	N/A

Site Plan Specifications – Required Exhibits and Data			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
	1. Existing Conditions: (2.5.4.3A)		
☒	a. Surveyed plan of site showing existing natural and built features;	Sheet C1	
☒	b. Zoning boundaries;	Cover Sheet	
☒	c. Dimensional Regulations;	Sheet C3, Note 5	
☒	d. Wetland delineation, wetland function and value assessment;	Sheet C3, Notes 7 & 8	
☒	e. SFHA, 100-year flood elevation line and BFE data.	Sheet C1, Note 5	
	2. Buildings and Structures: (2.5.4.3B)		
☒	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Sheet C3	
☐	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;		
☒	c. Total Floor Area;	Sheet C3	
☒	d. Number of Usable Floors;	Sheet C3	
☒	e. Gross floor area by floor and use.	Sheet C3	
	3. Access and Circulation: (2.5.4.3C)		
☒	a. Location/width of access ways within site;	Sheet C3	
☒	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Sheet C3	
☒	c. Location, type, size and design of traffic signing (pavement markings);	Sheet C3	
☒	d. Names/layout of existing abutting streets;	Sheet C3	
☒	e. Driveway curb cuts for abutting prop. and public roads;	Sheet C3	
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;	N/A	
☒	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Exhibits 1 & 2	
	4. Parking and Loading: (2.5.4.3D)		
☒	a. Location of off street parking/loading areas, landscaped areas/buffers;	Sheet C3	
☒	b. Parking Calculations (# required and the # provided).	Sheet C3	
	5. Water Infrastructure: (2.5.4.3E)		
☒	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Sheet C5	
☐	b. Location of wells and monitoring wells (include protective radii).	N/A	
	6. Sewer Infrastructure: (2.5.4.3F)		
☒	a. Size, type and location of sanitary sewage facilities & Engineering data.	Sheet C5	
	7. Utilities: (2.5.4.3G)		
☒	a. The size, type and location of all above & below ground utilities;	Sheet C5	
☐	b. Size type and location of generator pads, transformers and other fixtures.	N/A	

Site Plan Specifications – Required Exhibits and Data			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	8. Solid Waste Facilities: (2.5.4.3H)		
☐	a. The size, type and location of solid waste facilities.	N/A (none required)	
	9. Storm water Management: (2.5.4.3I)		
☒	a. The location, elevation and layout of all storm-water drainage.	Sheet C4	
	10. Outdoor Lighting: (2.5.4.3J)		
☒	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	Sheet C6	
☒	11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)	Sheet C6, Note 5	
	12. Landscaping: (2.5.4.3K)		
☐	a. Identify all undisturbed area, existing vegetation and that which is to be retained;		X
☐	b. Location of any irrigation system and water source.		X
	13. Contours and Elevation: (2.5.4.3L)		
☒	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet C1 & C4	
	14. Open Space: (2.5.4.3M)		
☒	a. Type, extent and location of all existing/proposed open space.	Sheet C3	
☒	15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)	Sheet C1 & C3	
☒	16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)	Sheet C3	
☐	17. Character/Civic District (All following information shall be included): (2.5.4.3Q)	N/A	
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	Traffic Impact Study or Trip Generation Report, as required. (Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application) (3.2.1-2)	N/A, not required by TAC	
☒	Indicate where Low Impact Development Design practices have been incorporated. (7.1)	Green Statement	
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. (7.3.1)	N/A	
☒	Indicate where measures to minimize impervious surfaces have been implemented. (7.4.3)	Sheet C3	
☒	Calculation of the maximum effective impervious surface as a percentage of the site. (7.4.3.2)	Sheet C4, Note 14	
☒	Stormwater Management and Erosion Control Plan. (Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application) (7.4.4.1)	Viewpoint	

Final Site Plan Approval Required Information			
☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☒	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. (2.5.3.2A)	Easements on Sheet C1	
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post- construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. (2.5.3.2B)	Viewpoint	

Final Site Plan Approval Required Information

☒	Required Items for Submittal	Item Location (e.g. Page/line or Plan Sheet/Note #)	Waiver Requested
☐	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. (2.5.3.2D)	Pending	
☐	A list of any required state and federal permit applications required for the project and the status of same. (2.5.3.2E)	None required	

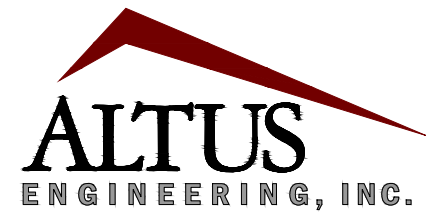
Applicant's Signature: 

Date: 11/05/20

“Green” Statement
Assessor’s Map 253 Lot 2A
Accessory Storage Building
150 Mirona Road
Altus Project 5107

Pursuant to Section 2.5.3.1(a) of the Site Plan Review Regulations, Altus Engineering, Inc. (Altus) respectfully submits the following list of the project’s “green” components for the accessory storage building proposed for 150 Mirona Road:

- The new building will meet or exceed all applicable current energy codes.
- New site lighting will be energy efficient, dark-sky compliant LED fixtures.
- Stormwater will be directed to a new raingarden in order to provide appropriate treatment.
- The existing stormwater pond adjacent to the site will be retrofitted with a new outlet structure that will reduce the potential for failure and promote efficiency in the existing drainage system.



133 Court Street Portsmouth, NH 03801
(603) 433-2335 www.altus-eng.com

SCALE: 11"x17" 1" = 30'

ISSUED FOR:
TAC WORK SESSION

ISSUE DATE:
NOVEMBER 3, 2020

REVISIONS:
NO. DESCRIPTION BY
0 TAC WORK SESSION EBS 11/03/20

OWNER/APPLICANT:

**MADISON COMMERCIAL
GROUP, LLC**

**72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801**

PROJECT:

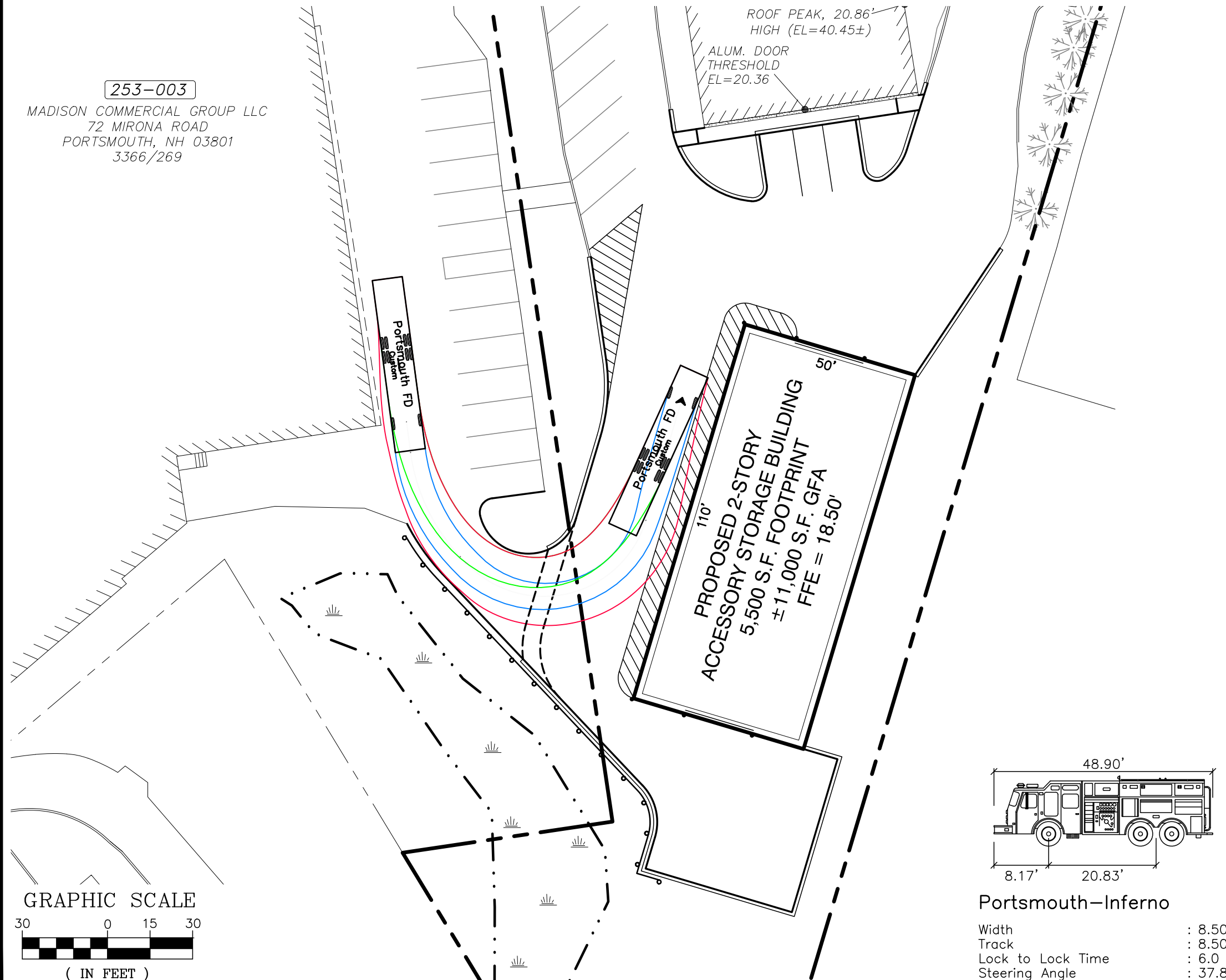
**PROPOSED ACCESSORY
STORAGE BUILDING**

**TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801**

TITLE:
**FIRE APPARATUS
TURNING EXHIBIT**

SHEET NUMBER:
EXH-1

P5042



DRAINAGE ANALYSIS
FOR
Site Development
of
Accessory Storage Building

150 Mirona Road
Portsmouth, NH

Tax Map 253, Lot 2A

November 3, 2020

Prepared For:

Madison Commercial Group, LLC
72 Mirona Road, Suite 4
Portsmouth, NH 03801

Prepared By:

ALTUS ENGINEERING, INC.
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335

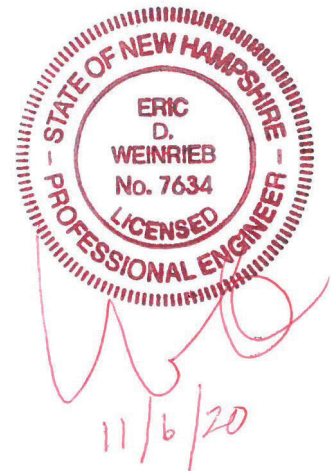


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Proposed Site Design
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Drainage Analysis
Conclusions

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Section 3: Drainage Analysis, Pre-Development

Section 4: Drainage Analysis, Post-Development

Section 5: NRCC Extreme Precipitation Table (Rainfall Data)

Section 6: NRCS Soils Report

Section 7: Stormwater Operations and Maintenance Plan

Section 8: Watershed Plans

Pre-Development Watershed Plan
Post-Development Watershed Plan

Section 1

Narrative

PROJECT DESCRIPTION

The Madison Commercial Group, LLC is proposing to re-develop the site located at 150 Mirona Road to construct an accessory storage building behind the existing commercial office building located on the property. The Property is identified as Assessor's Map 253, Lot 02A and is approximately 1.4 (+/-) acres in size and is located in the City's Gateway Neighborhood Mixed Use "G-2 District". The existing office building on the lot was built in 1990, originally developed as a bank with a drive thru and canopy in the rear of the building and has since been converted to office space.

The proposed project will remove the drive-thru and canopy on the rear of the existing building and construct a new 5,500 sf (footprint) two story storage building. The existing site was constructed prior to stormwater regulations and does not have treatment on site for the existing building and parking lot. There is an existing detention pond located in the rear of the property that collects storm water flows from the surrounding area, including the Quality Inn and Rite Aid developments on Lafayette Road. The detention pond was identified by the wetlands scientist (Joseph Noel) as a wetland approximately 3,192 square feet in size and has an existing 24-Inch diameter RCP outlet pipe that drains to the north, across Mirona Road, and outlets to the headwaters of Sagamore Creek. The site is located within the *Coastal and Great Bay Regional Communities*, so the rainfall precipitation results obtained from the Northeast Regional Climate Center (NRCC) have been increased by 15% for the hydrologic analysis. The stormwater management system proposed for the site will reduce peak flows and treat site runoff prior to discharging back to the municipal storm drain system and tidal marsh.

Site Soils

The NRCS indicates that the subject property consists of several primary soil classifications:

- 140B – Chatfield-Hollis-Canton Complex, 0 to 8% slopes, Hydrologic Soil Group (HSG) B
- 299 – Udorthents, HSG C/D
- 699 – Urban Land, HSG C/D

Pre-Development (Existing Conditions)

The pre-development site conditions reflect the existing conditions of the site, which include the existing office building and associated parking lot. The current site primarily discharges to the detention pond located to the south of the site, identified as the Points of Analysis #2 (POA2). There is a small portion of the development area that drains the east, identified as the Points of Analysis #1 (POA1) on the attached Drainage Area and Watershed plans. The Pre-Development analysis models the existing conditions and existing drain systems for the two points of analysis. Because the site is located within the *Coastal and Great Bay Regional Communities*, the rainfall precipitation results obtained from the Northeast Regional Climate Center (NRCC) have been increased by 15% for the hydrologic analysis.

The grades and elevations shown on the plans are based on the site survey completed by James Verra and Associates, Inc. and included in the plan set as Existing Conditions Plan, Sheet C-1. The study pre-development area was divided into two watersheds for the project site. The watersheds discharge to POA #1 and POA #2 as identified above. The points of analysis are the same for the pre and post development models for comparison of flows prior to construction and after the site is development as shown on the plans.

Post-Development (Proposed Site Design)

The proposed project will construct a new 5,500 square foot two-story storage building and associated site improvements. The existing drive-thru and canopy on the rear of the existing office building will be removed to provide better circulation and three additional parking spaces.

The proposed stormwater system is depicted on the attached Post-Development Drainage Area and Watershed Plan. For the post development analysis, the site was divided into eight (8) watershed areas to more accurately depict the post-development conditions. The same points of analysis that were used in the Pre-Development model were used for comparison of the Pre and Post development conditions.

The “Post-Development Drainage Plan” illustrates the proposed stormwater management system. The subcatchments from the Pre-Development conditions have been divided into smaller areas to emulate the proposed grading and stormwater management system proposed for construction. The post-development conditions were analyzed at the same primary discharge point examined in the pre-development modeling. Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the “*New Hampshire Stormwater Manual Volumes 1 through 3*” prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change.

Disclaimer

Altus Engineering, Inc. notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual storm events due to the number of variables and assumptions involved in the modeling effort. Surface roughness coefficients (n), entrance loss coefficients (ke), velocity factors (kv) and times of concentration (Tc) are based on subjective field observations and engineering judgment using available data. For design purposes, curve numbers (Cn) describe the average conditions. However, curve numbers will vary from storm to storm depending on the antecedent runoff conditions (ARC) including saturation and frozen ground. Also, higher water elevations than predicted by modeling could occur if drainage channels, closed drain systems or culverts are not maintained and/or become blocked by debris before and/or during a storm event as this will impact flow capacity of the structures. Structures should be re-evaluated if future changes occur within relevant drainage areas in order to assess any required design modifications.

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. The following table compares pre- and post-development peak rates at the two Points of Analysis identified on the plans for the 2, 10, 25, and 50-year storm events:

Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

*Rainfall Intensities Reflect 15% Increase per AoT	2-Yr Storm (3.71 inch)	10-Yr Storm (5.64 inch)	25-Yr Storm (7.14 inch)	50-Yr Storm (8.56 inch)
POA #1				
Pre	0.1	0.2	0.3	0.4
Post	0.1	0.2	0.3	0.3
Change	0.0	0.0	0.0	-0.1
POA #2				
Pre	17.2	28.1	36.5	44.4
Post	16.9	27.5	36.4	44.2
Change	-0.3	-0.6	-0.1	-0.2

As the above table demonstrates, the proposed peak rates of runoff will be the same as or decreased from the existing conditions for all analyzed storm events.

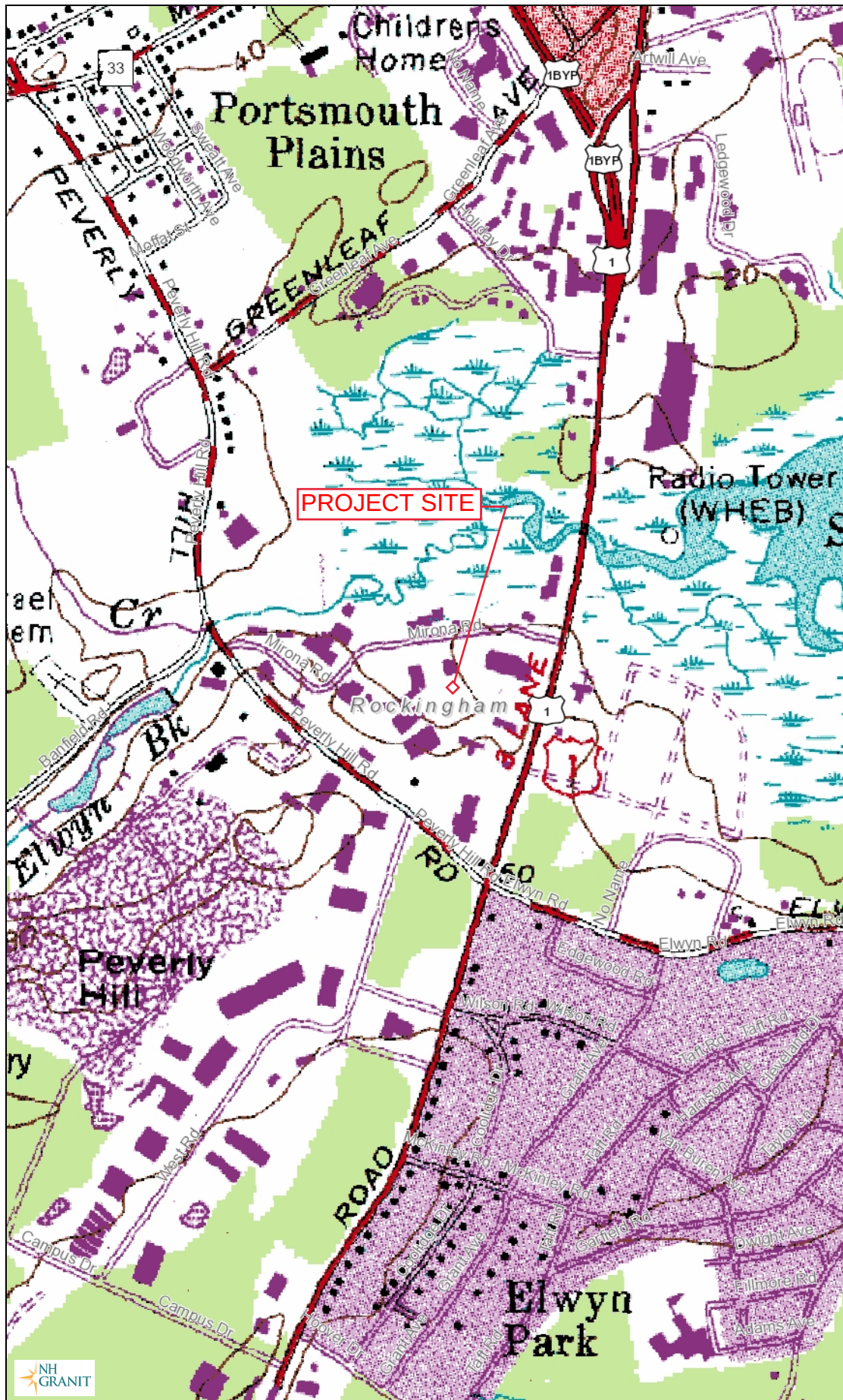
CONCLUSION

This proposed site development of 150 Mirona Road in Portsmouth, NH will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff and volume from the site will be lower than the existing conditions for all analyzed storm events. The new stormwater management system will also provide appropriate treatment to runoff to a portion of the site's existing impervious area where none currently exists. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the construction of a drainage system consisting of permeable pavers, vegetated swales, a small detention pond and the use of temporary and permanent Best Management Practices for sediment and erosion control.

Section 2

USGS Map and Aerial Photo

Map by NH GRANIT



Legend

- State
- County
- City/Town

Map Scale

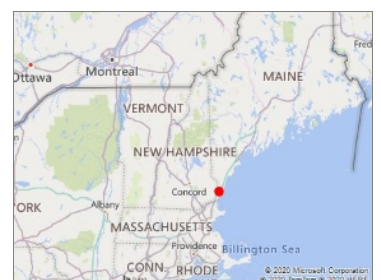
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Map Generated: 10/27/2020



Notes





Section 3

Drainage Calculations

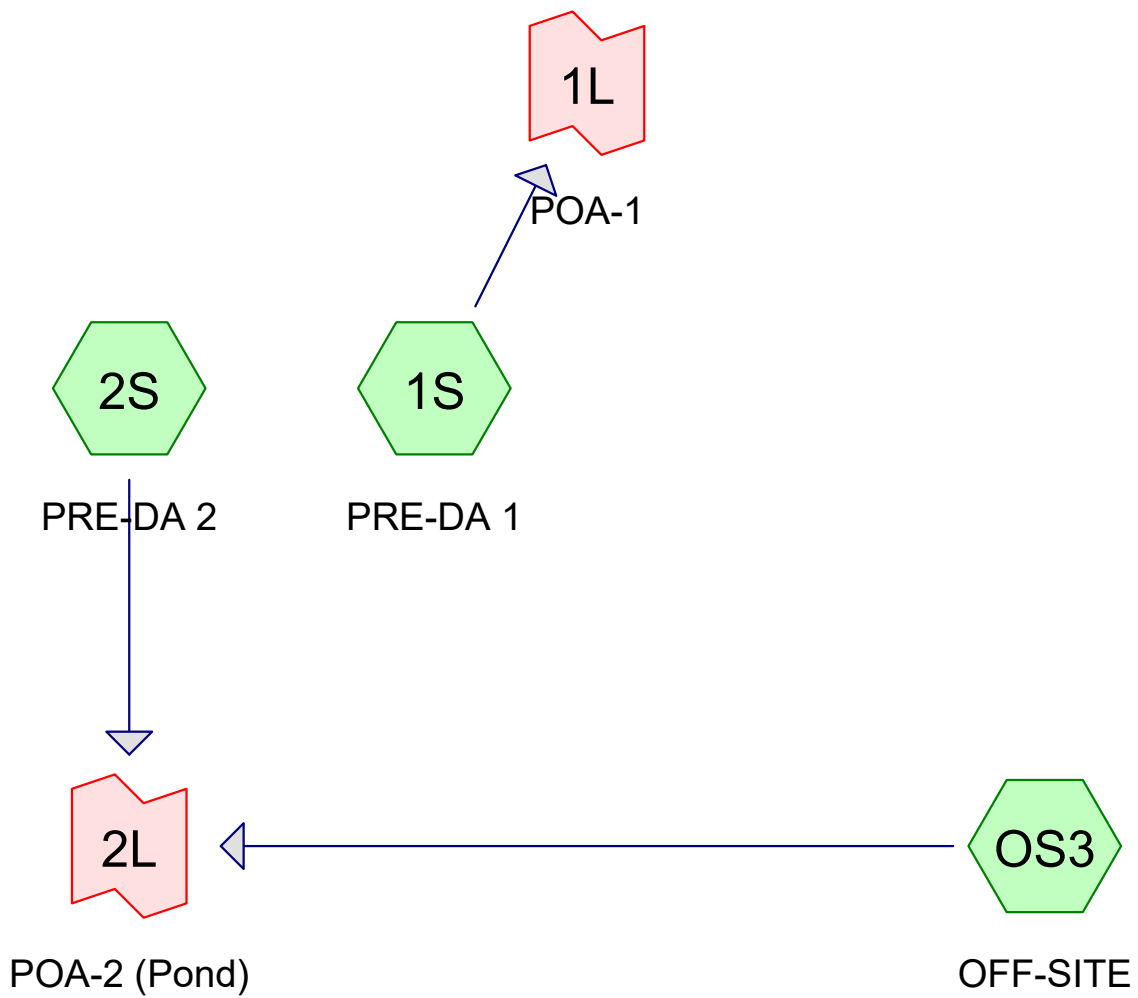
Pre-Development

2-Year, 24-Hour Summary

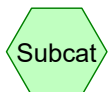
10-Year, 24-Hour Complete

25-Year, 24-Hour Summary

50-Year, 24-Hour Summary



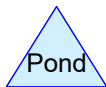
PRE-DEVELOPMENT



Subcat



Reach



Pond



Link

Routing Diagram for 5107-Pre-110320

Prepared by Altus Engineering, Inc., Printed 11/3/2020

HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

5107-Pre-110320*Type III 24-hr 2-Year Rainfall=3.71"*

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: PRE-DA 1

Runoff Area=2,855 sf 0.00% Impervious Runoff Depth>1.38"

Tc=6.0 min CN=74 Runoff=0.10 cfs 0.008 af

Subcatchment2S: PRE-DA 2

Runoff Area=41,875 sf 26.04% Impervious Runoff Depth>1.73"

Flow Length=292' Tc=6.0 min CN=79 Runoff=1.94 cfs 0.138 af

SubcatchmentOS3: OFF-SITE

Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>2.83"

Tc=25.0 min CN=92 Runoff=16.39 cfs 1.943 af

Link 1L: POA-1

Inflow=0.10 cfs 0.008 af

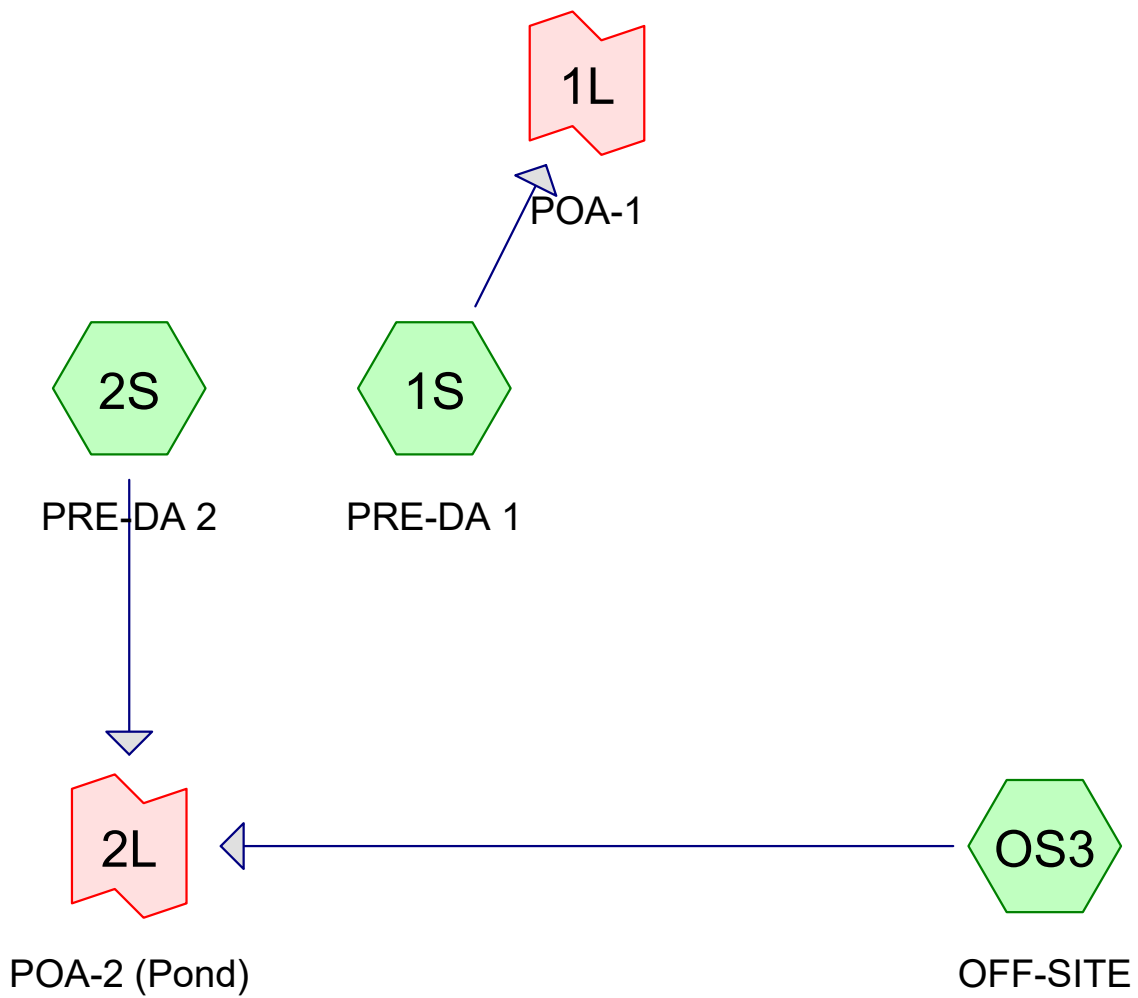
Primary=0.10 cfs 0.008 af

Link 2L: POA-2 (Pond)

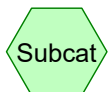
Inflow=17.21 cfs 2.082 af

Primary=17.21 cfs 2.082 af

Total Runoff Area = 9.277 ac Runoff Volume = 2.089 af Average Runoff Depth = 2.70"
21.71% Pervious = 2.014 ac 78.29% Impervious = 7.263 ac



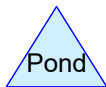
PRE-DEVELOPMENT



Subcat



Reach



Pond



Link

Routing Diagram for 5107-Pre-110320

Prepared by Altus Engineering, Inc., Printed 11/3/2020

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5107-Pre-110320

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.347	74	>75% Grass cover, Good, HSG C (1S, 2S)
0.200	98	Paved parking, HSG C (2S)
0.051	98	Roofs, HSG C (2S)
8.250	92	Urban commercial, 85% imp, HSG B (OS3)
0.356	70	Woods, Good, HSG C (2S)
0.073	77	Woods, Good, HSG D (2S)
9.277	91	TOTAL AREA

5107-Pre-110320

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.250	HSG B	OS3
0.954	HSG C	1S, 2S
0.073	HSG D	2S
0.000	Other	
9.277		TOTAL AREA

5107-Pre-110320

Prepared by Altus Engineering, Inc.

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.347	0.000	0.000	0.347	>75% Grass cover, Good	1S, 2S
0.000	0.000	0.200	0.000	0.000	0.200	Paved parking	2S
0.000	0.000	0.051	0.000	0.000	0.051	Roofs	2S
0.000	8.250	0.000	0.000	0.000	8.250	Urban commercial, 85% imp	OS3
0.000	0.000	0.356	0.073	0.000	0.429	Woods, Good	2S
0.000	8.250	0.954	0.073	0.000	9.277	TOTAL AREA	

5107-Pre-110320*Type III 24-hr 10-Year Rainfall=5.64"*

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

HydroCAD® 10.00-25 s/n 01222 © 2019 HydroCAD Software Solutions LLC

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: PRE-DA 1

Runoff Area=2,855 sf 0.00% Impervious Runoff Depth>2.88"

Tc=6.0 min CN=74 Runoff=0.22 cfs 0.016 af

Subcatchment2S: PRE-DA 2

Runoff Area=41,875 sf 26.04% Impervious Runoff Depth>3.36"

Flow Length=292' Tc=6.0 min CN=79 Runoff=3.78 cfs 0.269 af

SubcatchmentOS3: OFF-SITE

Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>4.70"

Tc=25.0 min CN=92 Runoff=26.56 cfs 3.229 af

Link 1L: POA-1

Inflow=0.22 cfs 0.016 af

Primary=0.22 cfs 0.016 af

Link 2L: POA-2 (Pond)

Inflow=28.12 cfs 3.498 af

Primary=28.12 cfs 3.498 af

Total Runoff Area = 9.277 ac Runoff Volume = 3.514 af Average Runoff Depth = 4.55"
21.71% Pervious = 2.014 ac 78.29% Impervious = 7.263 ac

5107-Pre-110320

Prepared by Altus Engineering, Inc.

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Type III 24-hr 10-Year Rainfall=5.64"

Printed 11/3/2020

Summary for Subcatchment 1S: PRE-DA 1

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Depth> 2.88"

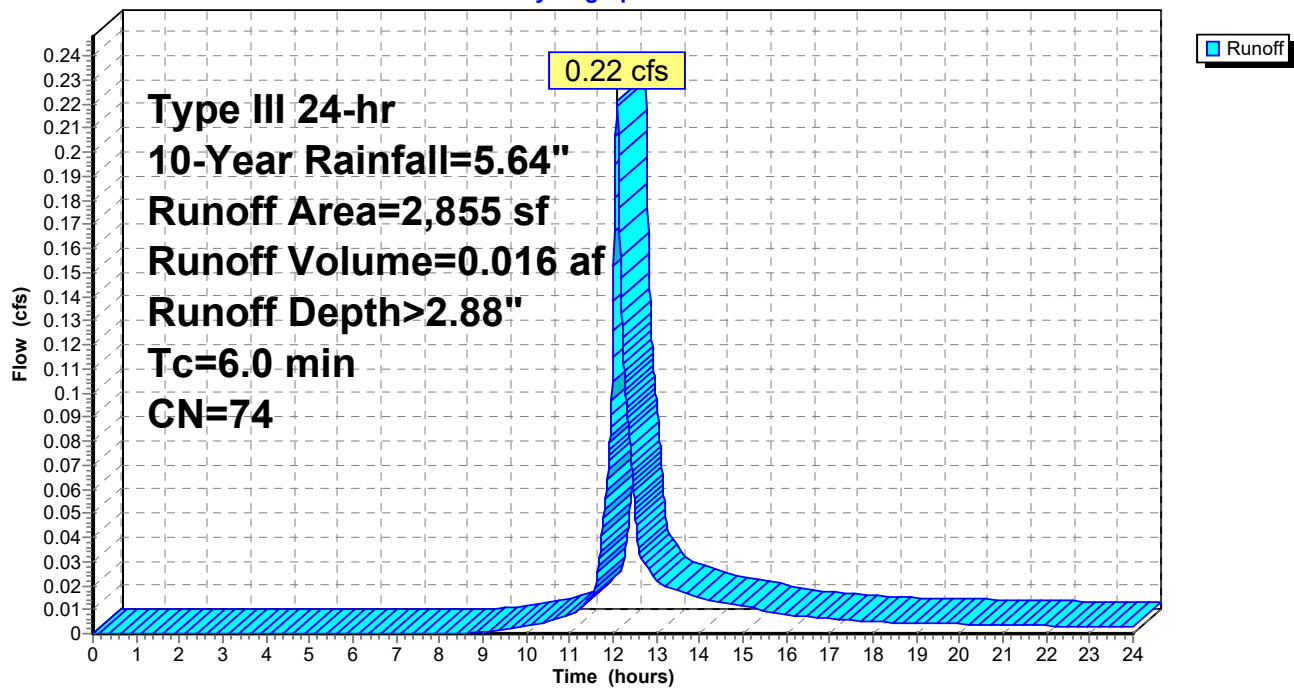
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,855	74	>75% Grass cover, Good, HSG C
2,855		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 1S: PRE-DA 1

Hydrograph



Summary for Subcatchment 2S: PRE-DA 2

Runoff = 3.78 cfs @ 12.09 hrs, Volume= 0.269 af, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,205	98	Roofs, HSG C
8,700	98	Paved parking, HSG C
12,262	74	>75% Grass cover, Good, HSG C
15,516	70	Woods, Good, HSG C
3,192	77	Woods, Good, HSG D
41,875	79	Weighted Average
30,970		73.96% Pervious Area
10,905		26.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	10	0.0100	0.08		Sheet Flow, Grass: Short n= 0.150 P2= 3.25"
0.5	32	0.0200	1.10		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.25"
1.2	100	0.0050	1.44		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.6	100	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.7	50	0.0500	1.12		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
5.0	292	Total, Increased to minimum Tc = 6.0 min			

5107-Pre-110320

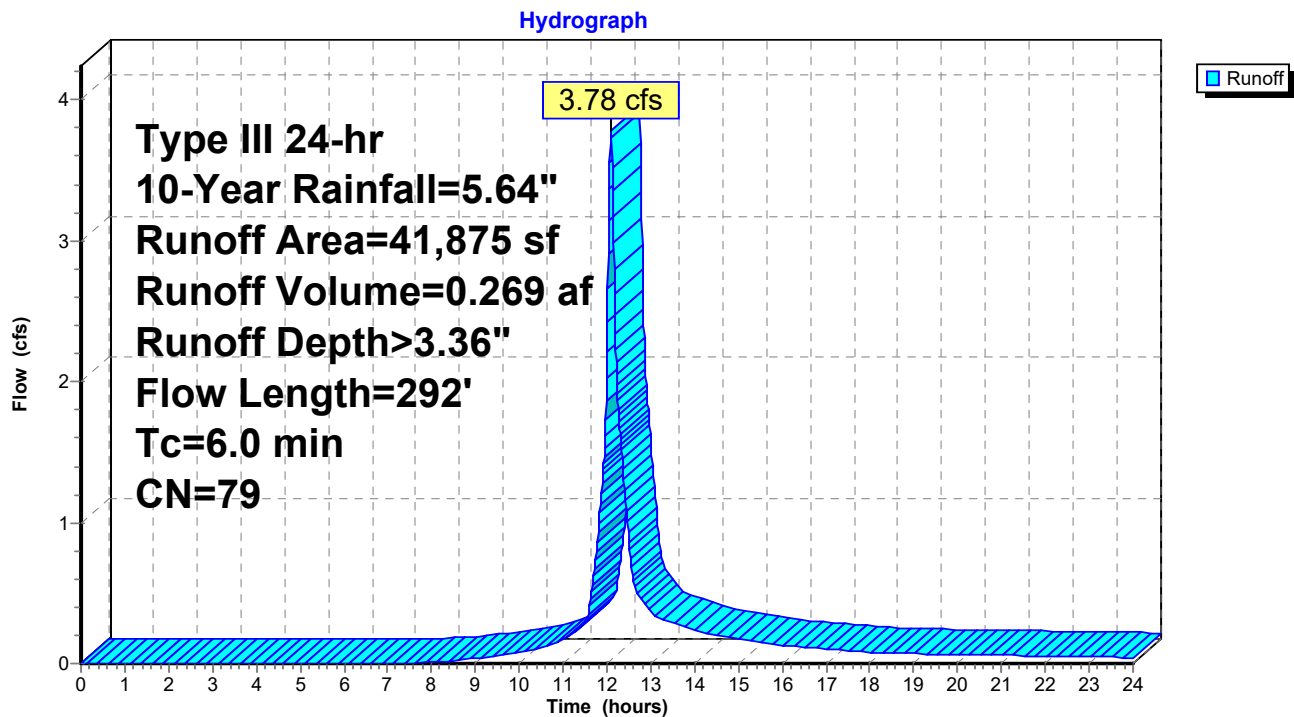
Prepared by Altus Engineering, Inc.

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Type III 24-hr 10-Year Rainfall=5.64"

Printed 11/3/2020

Subcatchment 2S: PRE-DA 2



5107-Pre-110320

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Type III 24-hr 10-Year Rainfall=5.64"

Printed 11/3/2020

Summary for Subcatchment OS3: OFF-SITE

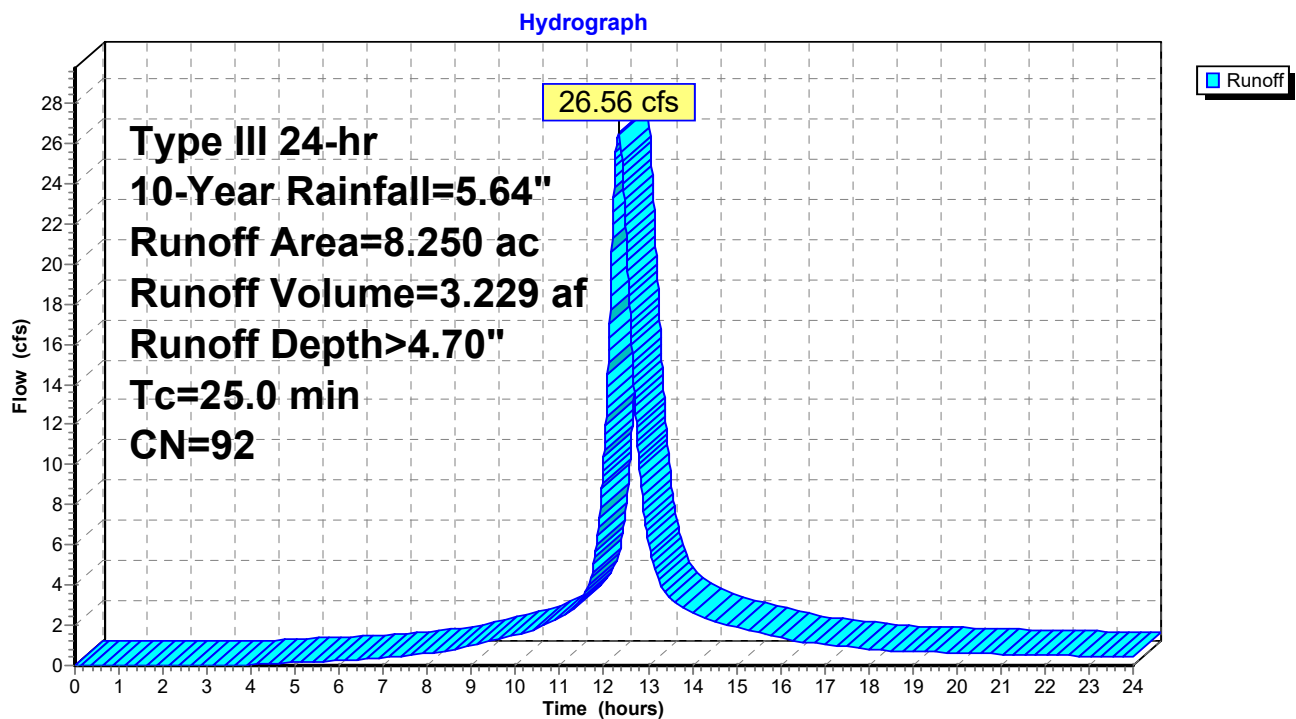
Runoff = 26.56 cfs @ 12.33 hrs, Volume= 3.229 af, Depth> 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (ac)	CN	Description
8.250	92	Urban commercial, 85% imp, HSG B
1.237		15.00% Pervious Area
7.012		85.00% Impervious Area

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

Subcatchment OS3: OFF-SITE



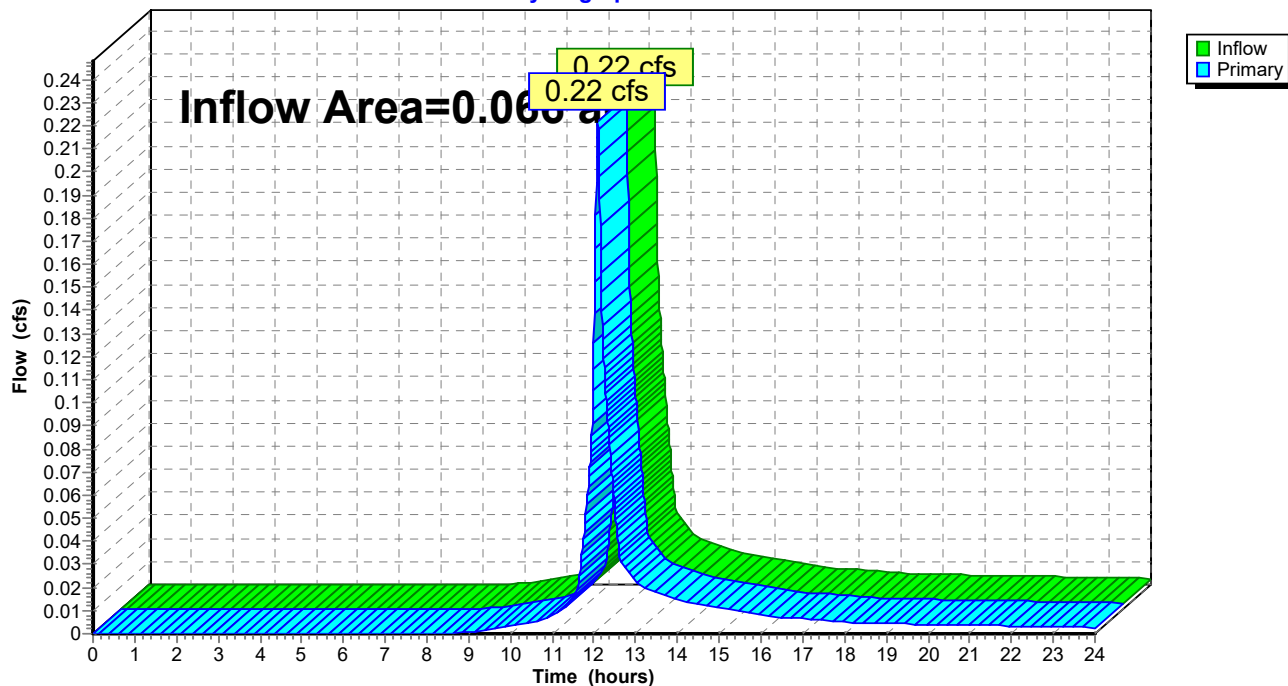
Summary for Link 1L: POA-1

Inflow Area = 0.066 ac, 0.00% Impervious, Inflow Depth > 2.88" for 10-Year event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 1L: POA-1

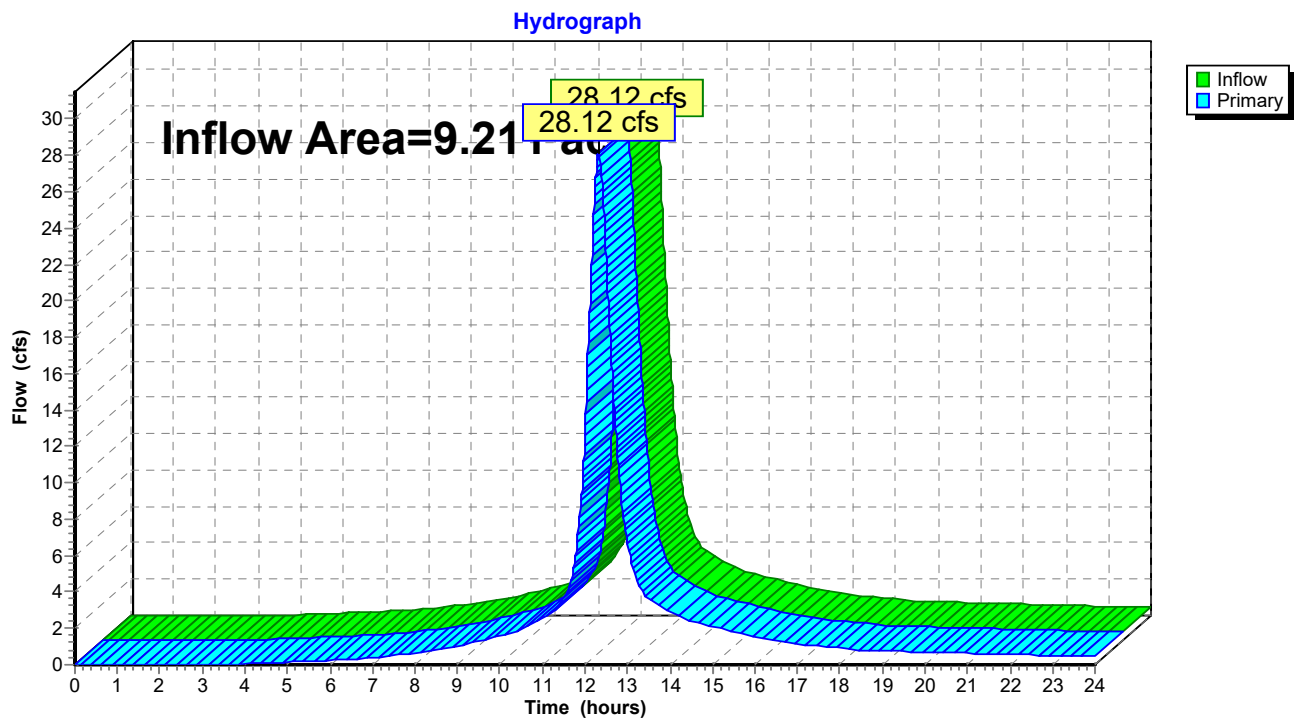
Hydrograph

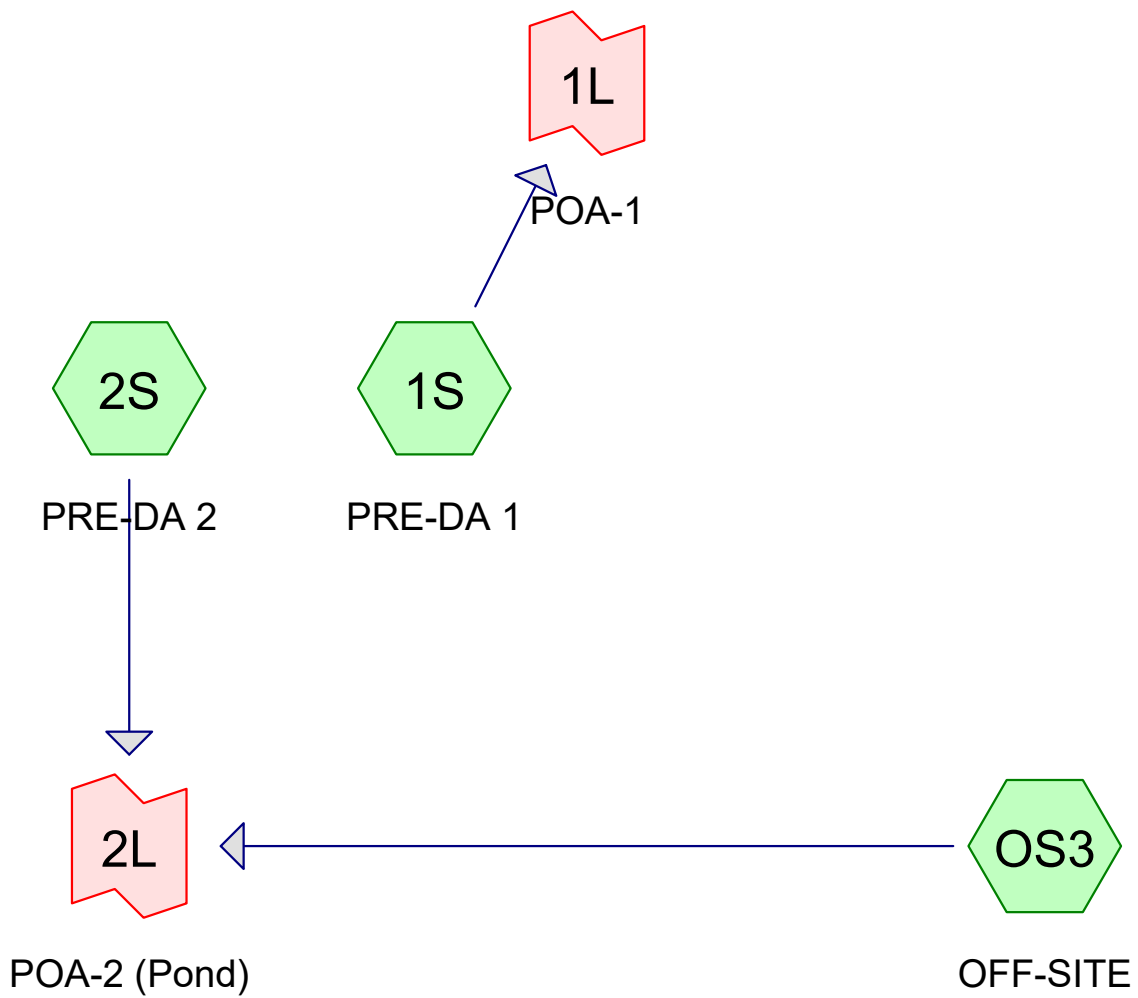


Summary for Link 2L: POA-2 (Pond)

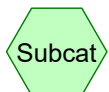
Inflow Area = 9.211 ac, 78.85% Impervious, Inflow Depth > 4.56" for 10-Year event
Inflow = 28.12 cfs @ 12.31 hrs, Volume= 3.498 af
Primary = 28.12 cfs @ 12.31 hrs, Volume= 3.498 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link 2L: POA-2 (Pond)



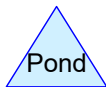
PRE-DEVELOPMENT



Subcat



Reach



Pond



Link

Routing Diagram for 5107-Pre-110320

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5107-Pre-110320*Type III 24-hr 25-Year Rainfall=7.14"*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: PRE-DA 1

Runoff Area=2,855 sf 0.00% Impervious Runoff Depth>4.16"

Tc=6.0 min CN=74 Runoff=0.32 cfs 0.023 af

Subcatchment2S: PRE-DA 2

Runoff Area=41,875 sf 26.04% Impervious Runoff Depth>4.71"

Flow Length=292' Tc=6.0 min CN=79 Runoff=5.27 cfs 0.377 af

SubcatchmentOS3: OFF-SITE

Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>6.17"

Tc=25.0 min CN=92 Runoff=34.38 cfs 4.241 af

Link 1L: POA-1

Inflow=0.32 cfs 0.023 af

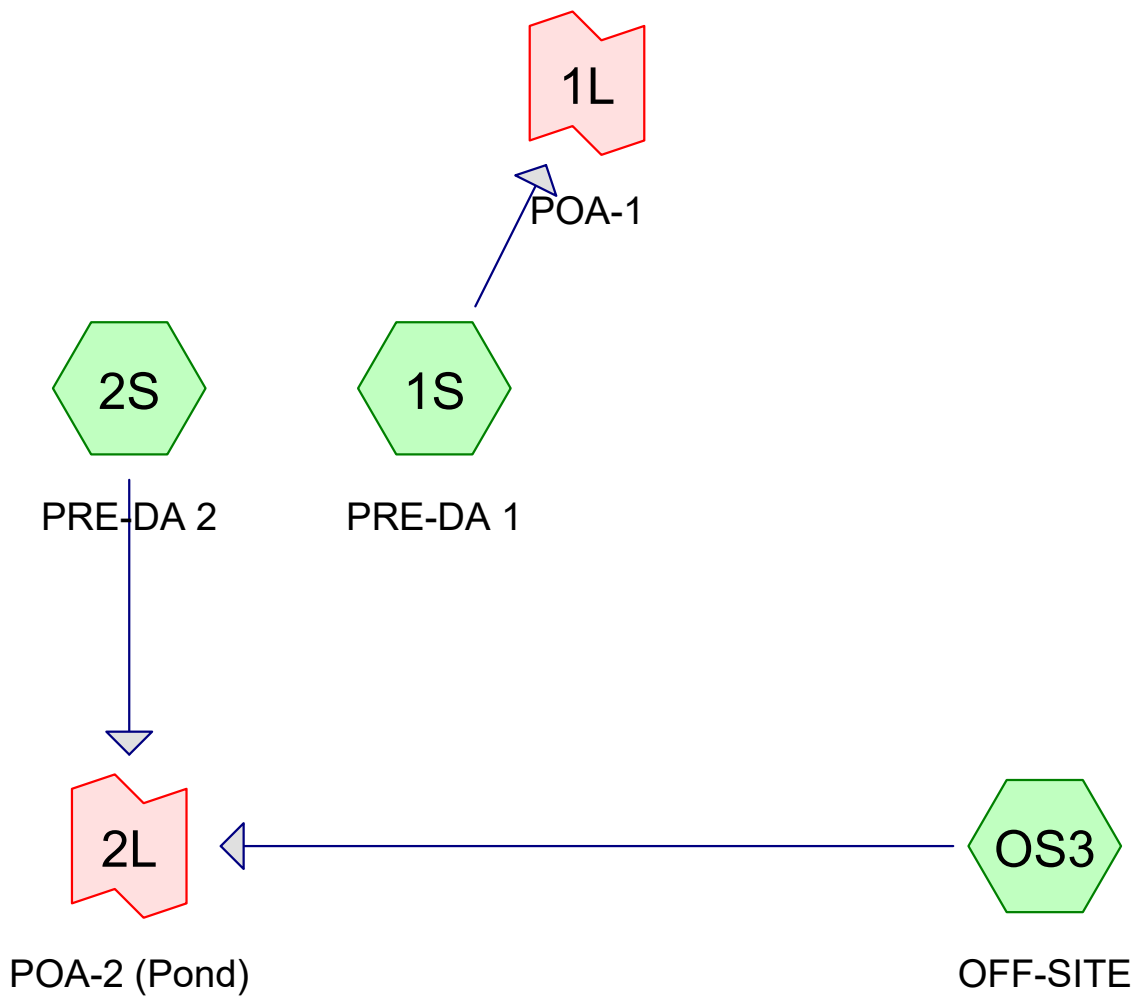
Primary=0.32 cfs 0.023 af

Link 2L: POA-2 (Pond)

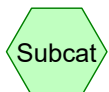
Inflow=36.51 cfs 4.619 af

Primary=36.51 cfs 4.619 af

Total Runoff Area = 9.277 ac Runoff Volume = 4.641 af Average Runoff Depth = 6.00"
21.71% Pervious = 2.014 ac 78.29% Impervious = 7.263 ac



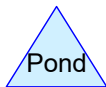
PRE-DEVELOPMENT



Subcat



Reach



Pond



Link

Routing Diagram for 5107-Pre-110320

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5107-Pre-110320*Type III 24-hr 50-Year Rainfall=8.56"*

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: PRE-DA 1

Runoff Area=2,855 sf 0.00% Impervious Runoff Depth>5.42"

Tc=6.0 min CN=74 Runoff=0.42 cfs 0.030 af

Subcatchment2S: PRE-DA 2

Runoff Area=41,875 sf 26.04% Impervious Runoff Depth>6.03"

Flow Length=292' Tc=6.0 min CN=79 Runoff=6.69 cfs 0.483 af

SubcatchmentOS3: OFF-SITE

Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>7.57"

Tc=25.0 min CN=92 Runoff=41.73 cfs 5.204 af

Link 1L: POA-1

Inflow=0.42 cfs 0.030 af

Primary=0.42 cfs 0.030 af

Link 2L: POA-2 (Pond)

Inflow=44.41 cfs 5.687 af

Primary=44.41 cfs 5.687 af

Total Runoff Area = 9.277 ac Runoff Volume = 5.717 af Average Runoff Depth = 7.39"
21.71% Pervious = 2.014 ac 78.29% Impervious = 7.263 ac

Section 4

Drainage Calculations

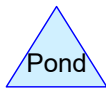
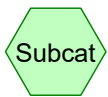
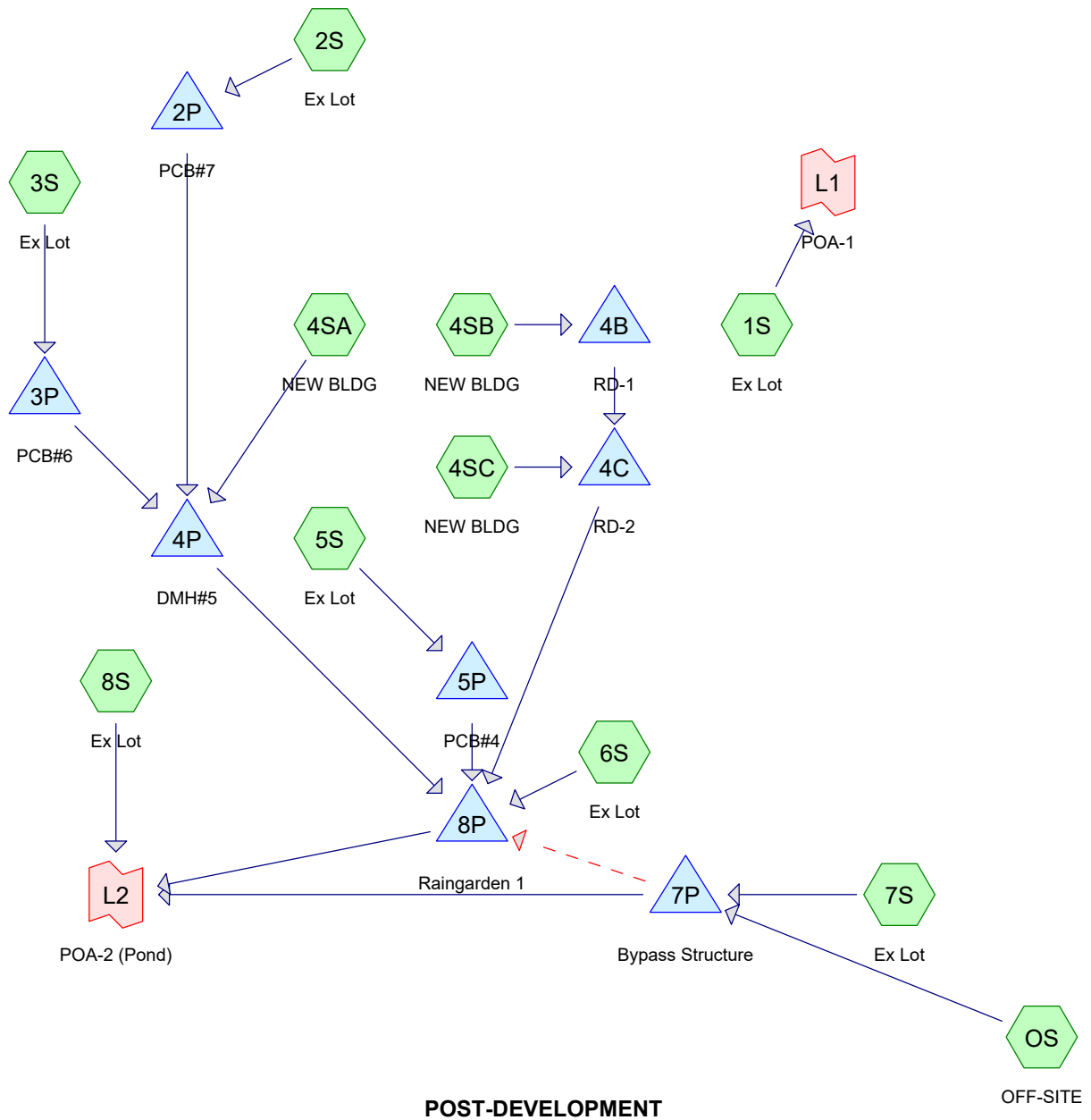
Post-Development

2-Year, 24-Hour Summary

10-Year, 24-Hour Complete

25-Year, 24-Hour Summary

50-Year, 24-Hour Summary



5107-Post-110320

Prepared by Altus Engineering, Inc.

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Type III 24-hr 2-Year Rainfall=3.71"

Printed 11/3/2020

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: Ex Lot	Runoff Area=2,270 sf 0.00% Impervious Runoff Depth>1.38" Tc=6.0 min CN=74 Runoff=0.08 cfs 0.006 af
Subcatchment2S: Ex Lot	Runoff Area=10,195 sf 94.70% Impervious Runoff Depth>3.36" Tc=6.0 min CN=97 Runoff=0.84 cfs 0.066 af
Subcatchment3S: Ex Lot	Runoff Area=3,880 sf 100.00% Impervious Runoff Depth>3.47" Tc=6.0 min CN=98 Runoff=0.32 cfs 0.026 af
Subcatchment4SA: NEW BLDG	Runoff Area=2,750 sf 100.00% Impervious Runoff Depth>3.47" Tc=6.0 min CN=98 Runoff=0.23 cfs 0.018 af
Subcatchment4SB: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>3.47" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment4SC: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>3.47" Tc=6.0 min CN=98 Runoff=0.11 cfs 0.009 af
Subcatchment5S: Ex Lot	Runoff Area=2,395 sf 100.00% Impervious Runoff Depth>3.47" Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af
Subcatchment6S: Ex Lot	Runoff Area=1,308 sf 0.00% Impervious Runoff Depth>1.38" Tc=6.0 min CN=74 Runoff=0.05 cfs 0.003 af
Subcatchment7S: Ex Lot	Runoff Area=4,145 sf 0.00% Impervious Runoff Depth>1.38" Tc=6.0 min CN=74 Runoff=0.15 cfs 0.011 af
Subcatchment8S: Ex Lot	Runoff Area=15,037 sf 20.72% Impervious Runoff Depth>1.80" Tc=6.0 min CN=80 Runoff=0.73 cfs 0.052 af
SubcatchmentOS: OFF-SITE	Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>2.83" Tc=25.0 min CN=92 Runoff=16.39 cfs 1.943 af
Pond 2P: PCB#7	Peak Elev=15.90' Storage=17 cf Inflow=0.84 cfs 0.066 af 12.0" Round Culvert n=0.012 L=134.0' S=0.0050 ' Outflow=0.83 cfs 0.066 af
Pond 3P: PCB#6	Peak Elev=15.90' Storage=24 cf Inflow=0.32 cfs 0.026 af 12.0" Round Culvert n=0.012 L=30.0' S=0.0050 ' Outflow=0.31 cfs 0.026 af
Pond 4B: RD-1	Peak Elev=15.90' Storage=0 cf Inflow=0.11 cfs 0.009 af 4.0" Round Culvert n=0.012 L=105.0' S=0.0095 ' Outflow=0.11 cfs 0.009 af
Pond 4C: RD-2	Peak Elev=15.90' Storage=0 cf Inflow=0.23 cfs 0.018 af 6.0" Round Culvert n=0.012 L=65.0' S=0.0077 ' Outflow=0.23 cfs 0.018 af
Pond 4P: DMH#5	Peak Elev=15.90' Storage=27 cf Inflow=1.36 cfs 0.109 af 12.0" Round Culvert n=0.012 L=65.0' S=0.0051 ' Outflow=1.34 cfs 0.109 af

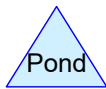
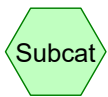
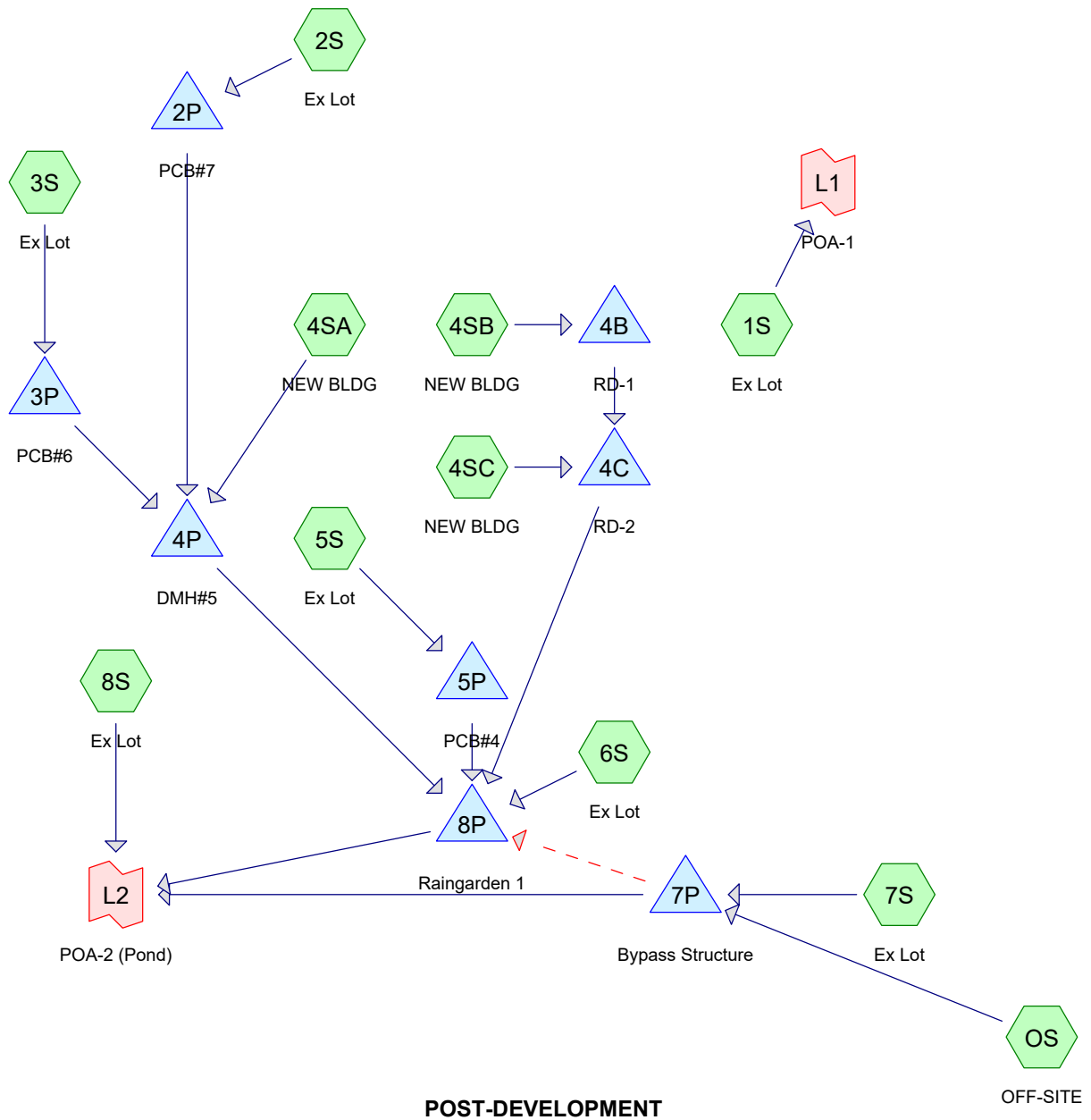
5107-Post-110320*Type III 24-hr 2-Year Rainfall=3.71"*

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Pond 5P: PCB#4Peak Elev=15.90' Storage=29 cf Inflow=0.20 cfs 0.016 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0049 '/ Outflow=0.19 cfs 0.016 af**Pond 7P: Bypass Structure**Peak Elev=14.00' Storage=32 cf Inflow=16.46 cfs 1.954 af
Primary=16.46 cfs 1.954 af Secondary=0.00 cfs 0.000 af Outflow=16.46 cfs 1.954 af**Pond 8P: Raingarden 1**Peak Elev=15.90' Storage=3,101 cf Inflow=1.81 cfs 0.146 af
Outflow=0.12 cfs 0.122 af**Link L1: POA-1**Inflow=0.08 cfs 0.006 af
Primary=0.08 cfs 0.006 af**Link L2: POA-2 (Pond)**Inflow=16.87 cfs 2.128 af
Primary=16.87 cfs 2.128 af**Total Runoff Area = 9.277 ac Runoff Volume = 2.159 af Average Runoff Depth = 2.79"**
18.33% Pervious = 1.701 ac 81.67% Impervious = 7.576 ac



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.284	74	>75% Grass cover, Good, HSG C (1S, 2S, 6S, 7S, 8S)
0.028	89	Gravel Slope (8S)
0.379	98	Paved parking, HSG C (2S, 3S, 5S, 8S)
0.177	98	Roofs, HSG C (2S, 4SA, 4SB, 4SC)
0.008	98	Unconnected pavement, HSG C (2S)
8.250	92	Urban commercial, 85% imp, HSG B (OS)
0.079	70	Woods, Good, HSG C (8S)
0.073	77	Woods, Good, HSG D (8S)
9.277	91	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
8.250	HSG B	OS
0.926	HSG C	1S, 2S, 3S, 4SA, 4SB, 4SC, 5S, 6S, 7S, 8S
0.073	HSG D	8S
0.028	Other	8S
9.277		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.284	0.000	0.000	0.284	>75% Grass cover, Good	1S, 2S, 6S, 7S, 8S
0.000	0.000	0.000	0.000	0.028	0.028	Gravel Slope	8S
0.000	0.000	0.379	0.000	0.000	0.379	Paved parking	2S, 3S, 5S, 8S
0.000	0.000	0.177	0.000	0.000	0.177	Roofs	2S, 4SA, 4SB, 4SC
0.000	0.000	0.008	0.000	0.000	0.008	Unconnected pavement	2S
0.000	8.250	0.000	0.000	0.000	8.250	Urban commercial, 85% imp	OS
0.000	0.000	0.079	0.073	0.000	0.152	Woods, Good	8S
0.000	8.250	0.926	0.073	0.028	9.277	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	14.60	13.93	134.0	0.0050	0.012	12.0	0.0	0.0
2	3P	14.08	13.93	30.0	0.0050	0.012	12.0	0.0	0.0
3	4B	15.00	14.00	105.0	0.0095	0.012	4.0	0.0	0.0
4	4C	14.00	13.50	65.0	0.0077	0.012	6.0	0.0	0.0
5	4P	13.83	13.50	65.0	0.0051	0.012	12.0	0.0	0.0
6	5P	14.60	13.95	134.0	0.0049	0.012	12.0	0.0	0.0
7	7P	11.53	11.24	57.0	0.0051	0.012	24.0	0.0	0.0
8	8P	11.35	11.25	20.0	0.0050	0.012	15.0	0.0	0.0

5107-Post-110320*Type III 24-hr 10-Year Rainfall=5.64"*

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: Ex Lot	Runoff Area=2,270 sf 0.00% Impervious Runoff Depth>2.88" Tc=6.0 min CN=74 Runoff=0.18 cfs 0.013 af
Subcatchment2S: Ex Lot	Runoff Area=10,195 sf 94.70% Impervious Runoff Depth>5.28" Tc=6.0 min CN=97 Runoff=1.29 cfs 0.103 af
Subcatchment3S: Ex Lot	Runoff Area=3,880 sf 100.00% Impervious Runoff Depth>5.40" Tc=6.0 min CN=98 Runoff=0.49 cfs 0.040 af
Subcatchment4SA: NEW BLDG	Runoff Area=2,750 sf 100.00% Impervious Runoff Depth>5.40" Tc=6.0 min CN=98 Runoff=0.35 cfs 0.028 af
Subcatchment4SB: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>5.40" Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af
Subcatchment4SC: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>5.40" Tc=6.0 min CN=98 Runoff=0.17 cfs 0.014 af
Subcatchment5S: Ex Lot	Runoff Area=2,395 sf 100.00% Impervious Runoff Depth>5.40" Tc=6.0 min CN=98 Runoff=0.30 cfs 0.025 af
Subcatchment6S: Ex Lot	Runoff Area=1,308 sf 0.00% Impervious Runoff Depth>2.88" Tc=6.0 min CN=74 Runoff=0.10 cfs 0.007 af
Subcatchment7S: Ex Lot	Runoff Area=4,145 sf 0.00% Impervious Runoff Depth>2.88" Tc=6.0 min CN=74 Runoff=0.32 cfs 0.023 af
Subcatchment8S: Ex Lot	Runoff Area=15,037 sf 20.72% Impervious Runoff Depth>3.45" Tc=6.0 min CN=80 Runoff=1.40 cfs 0.099 af
SubcatchmentOS: OFF-SITE	Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>4.70" Tc=25.0 min CN=92 Runoff=26.56 cfs 3.229 af
Pond 2P: PCB#7	Peak Elev=16.62' Storage=26 cf Inflow=1.29 cfs 0.103 af 12.0" Round Culvert n=0.012 L=134.0' S=0.0050 ' Outflow=1.27 cfs 0.103 af
Pond 3P: PCB#6	Peak Elev=16.60' Storage=32 cf Inflow=0.49 cfs 0.040 af 12.0" Round Culvert n=0.012 L=30.0' S=0.0050 ' Outflow=0.48 cfs 0.040 af
Pond 4B: RD-1	Peak Elev=16.95' Storage=0 cf Inflow=0.17 cfs 0.014 af 4.0" Round Culvert n=0.012 L=105.0' S=0.0095 ' Outflow=0.17 cfs 0.014 af
Pond 4C: RD-2	Peak Elev=16.60' Storage=1 cf Inflow=0.35 cfs 0.028 af 6.0" Round Culvert n=0.012 L=65.0' S=0.0077 ' Outflow=0.35 cfs 0.028 af
Pond 4P: DMH#5	Peak Elev=16.60' Storage=36 cf Inflow=2.09 cfs 0.171 af 12.0" Round Culvert n=0.012 L=65.0' S=0.0051 ' Outflow=2.07 cfs 0.170 af

5107-Post-110320*Type III 24-hr 10-Year Rainfall=5.64"*

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Pond 5P: PCB#4Peak Elev=16.58' Storage=34 cf Inflow=0.30 cfs 0.025 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0049 '/' Outflow=0.29 cfs 0.024 af**Pond 7P: Bypass Structure**Peak Elev=15.64' Storage=53 cf Inflow=26.70 cfs 3.252 af
Primary=26.69 cfs 3.252 af Secondary=0.00 cfs 0.000 af Outflow=26.69 cfs 3.252 af**Pond 8P: Raingarden 1**Peak Elev=16.58' Storage=4,622 cf Inflow=2.80 cfs 0.230 af
Outflow=0.70 cfs 0.180 af**Link L1: POA-1**Inflow=0.18 cfs 0.013 af
Primary=0.18 cfs 0.013 af**Link L2: POA-2 (Pond)**Inflow=27.45 cfs 3.532 af
Primary=27.45 cfs 3.532 af**Total Runoff Area = 9.277 ac Runoff Volume = 3.596 af Average Runoff Depth = 4.65"**
18.33% Pervious = 1.701 ac 81.67% Impervious = 7.576 ac

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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 1S: Ex Lot

Runoff = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af, Depth> 2.88"

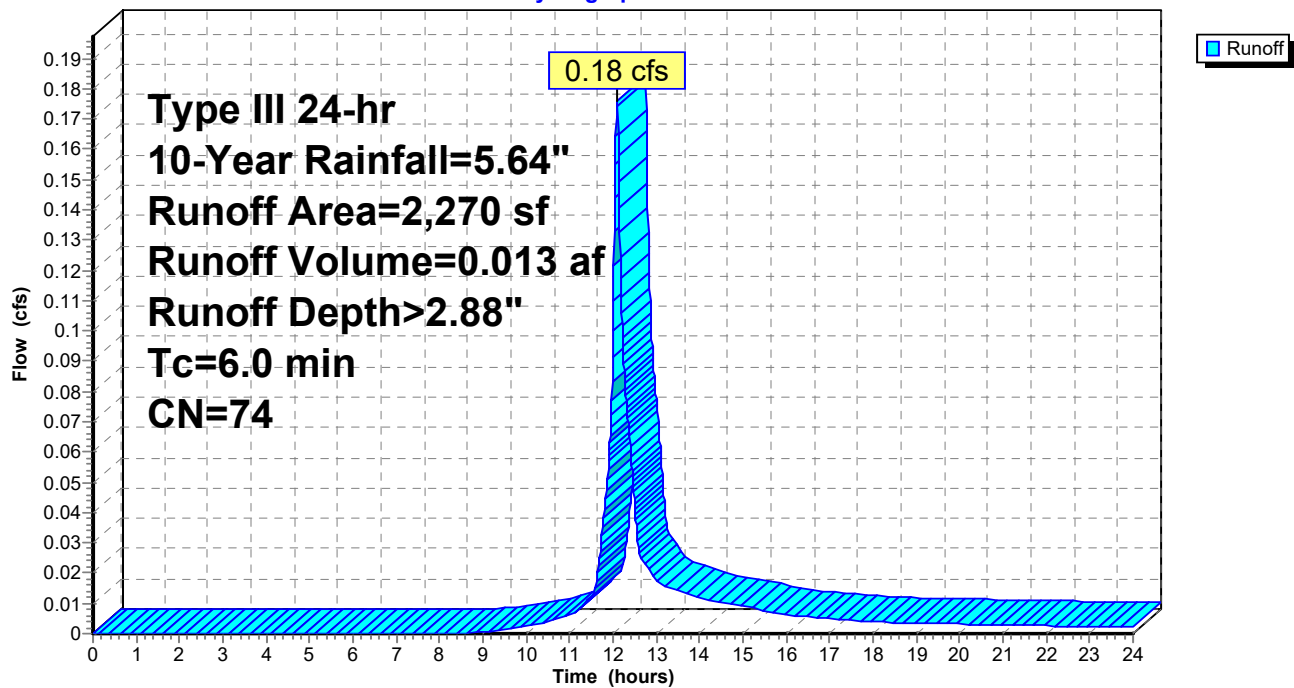
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,270	74	>75% Grass cover, Good, HSG C
2,270		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 1S: Ex Lot

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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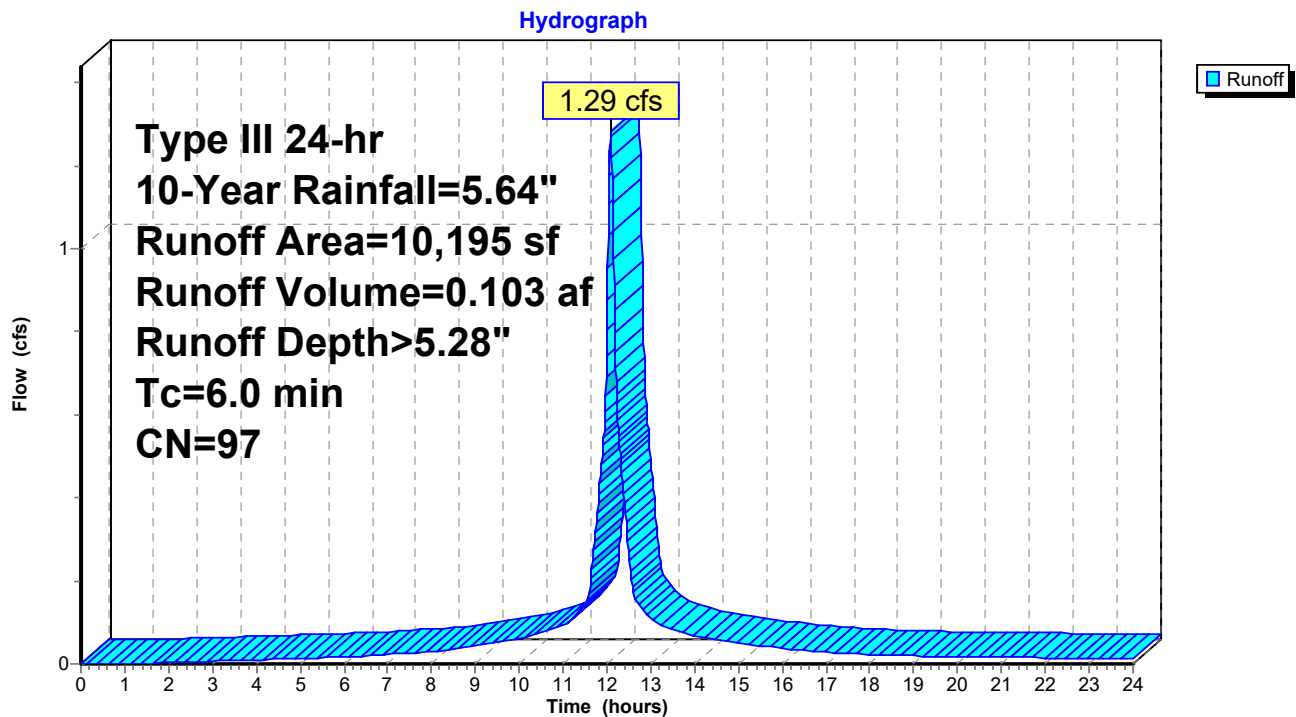
Summary for Subcatchment 2S: Ex Lot

Runoff = 1.29 cfs @ 12.08 hrs, Volume= 0.103 af, Depth> 5.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,205	98	Roofs, HSG C
7,110	98	Paved parking, HSG C
340	98	Unconnected pavement, HSG C
540	74	>75% Grass cover, Good, HSG C
10,195	97	Weighted Average
540		5.30% Pervious Area
9,655		94.70% Impervious Area
340		3.52% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 2S: Ex Lot

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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 3S: Ex Lot

Runoff = 0.49 cfs @ 12.08 hrs, Volume= 0.040 af, Depth> 5.40"

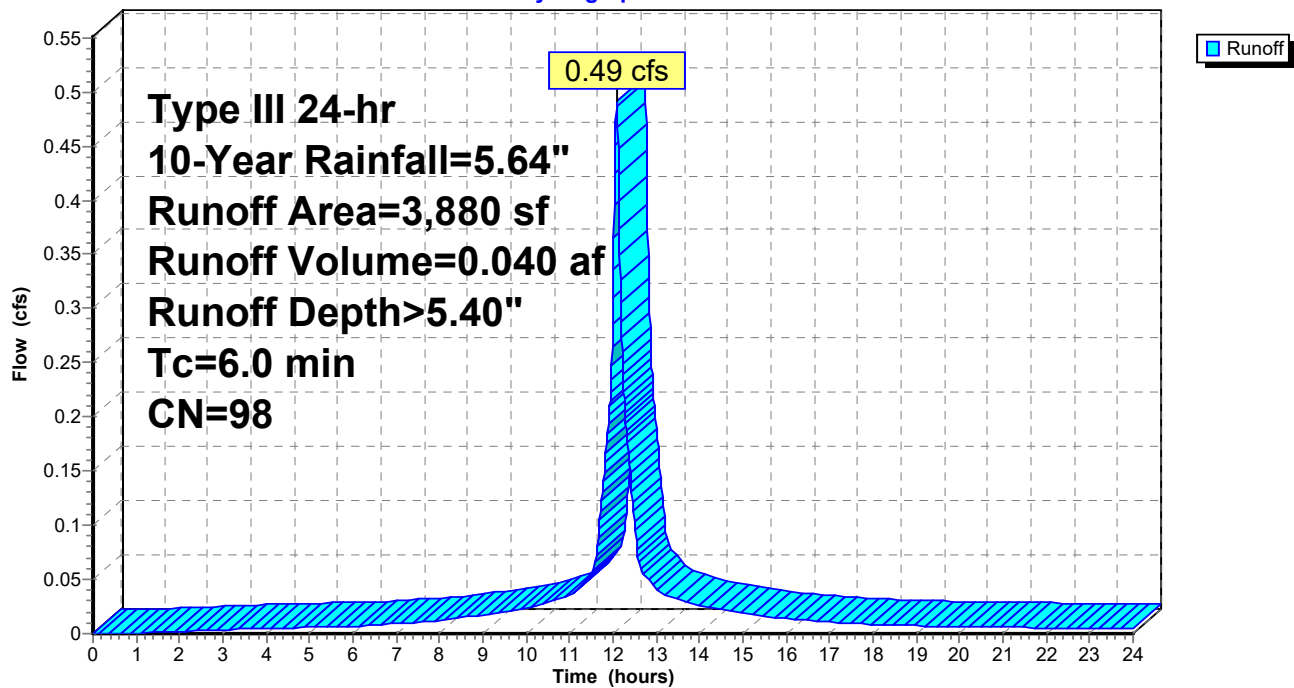
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
3,880	98	Paved parking, HSG C
3,880		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 3S: Ex Lot

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 4SA: NEW BLDG

Runoff = 0.35 cfs @ 12.08 hrs, Volume= 0.028 af, Depth> 5.40"

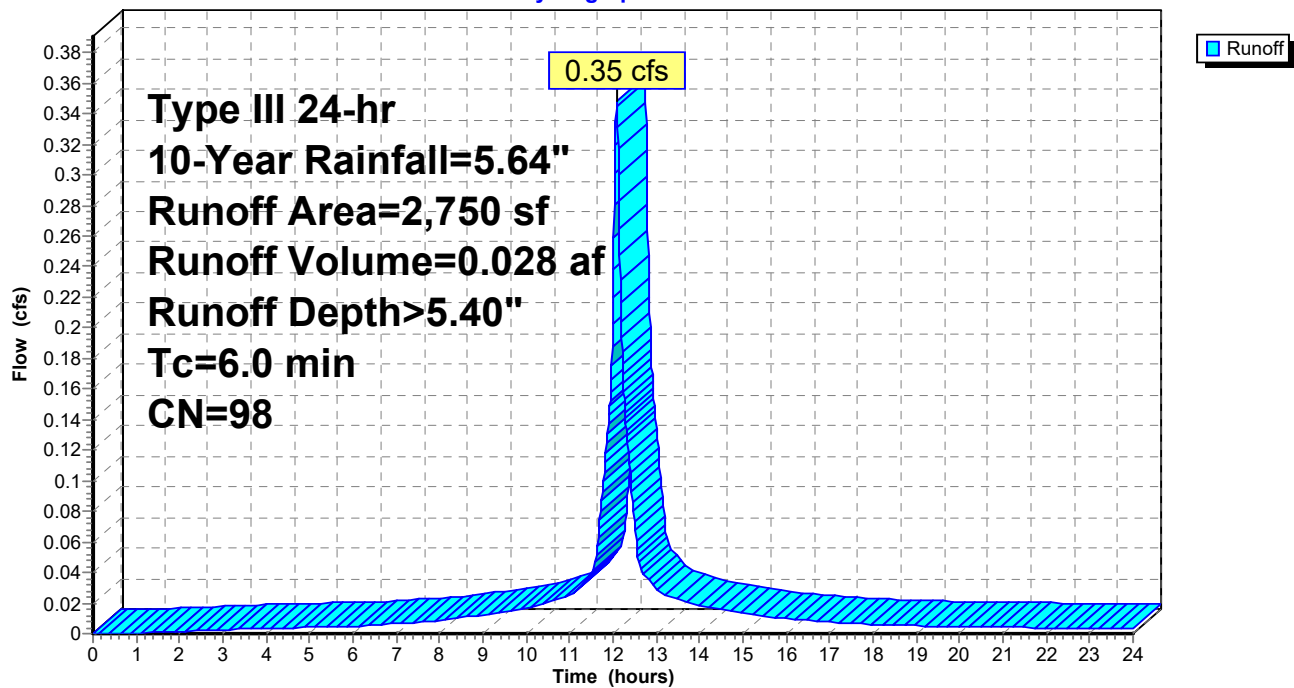
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,750	98	Roofs, HSG C
2,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 4SA: NEW BLDG

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 4SB: NEW BLDG

Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Depth> 5.40"

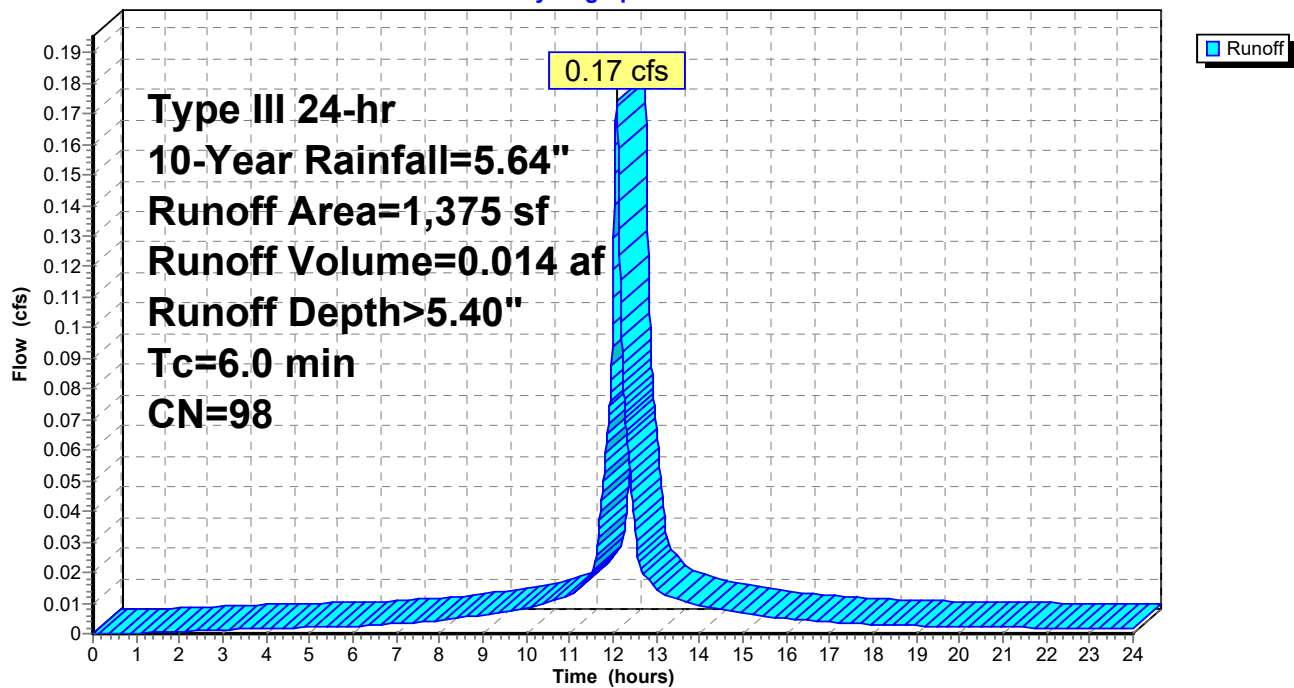
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
1,375	98	Roofs, HSG C
1,375		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 4SB: NEW BLDG

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 4SC: NEW BLDG

Runoff = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Depth> 5.40"

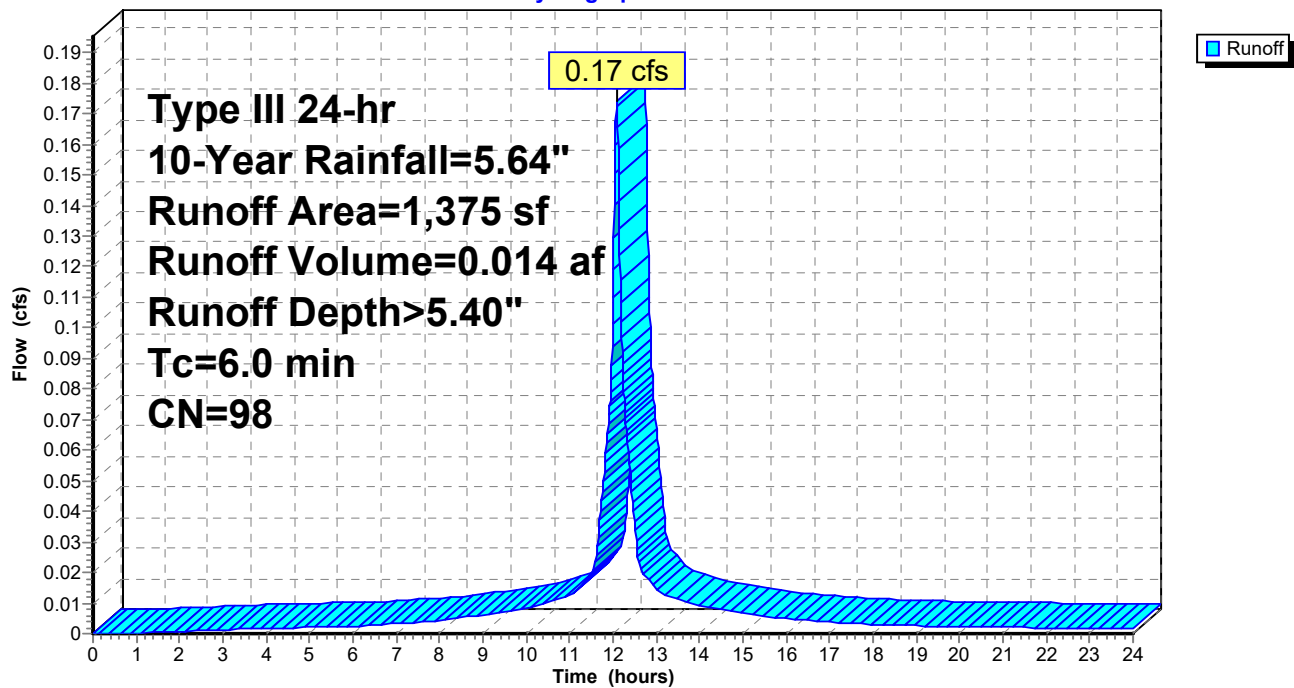
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
1,375	98	Roofs, HSG C
1,375		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 4SC: NEW BLDG

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 5S: Ex Lot

Runoff = 0.30 cfs @ 12.08 hrs, Volume= 0.025 af, Depth> 5.40"

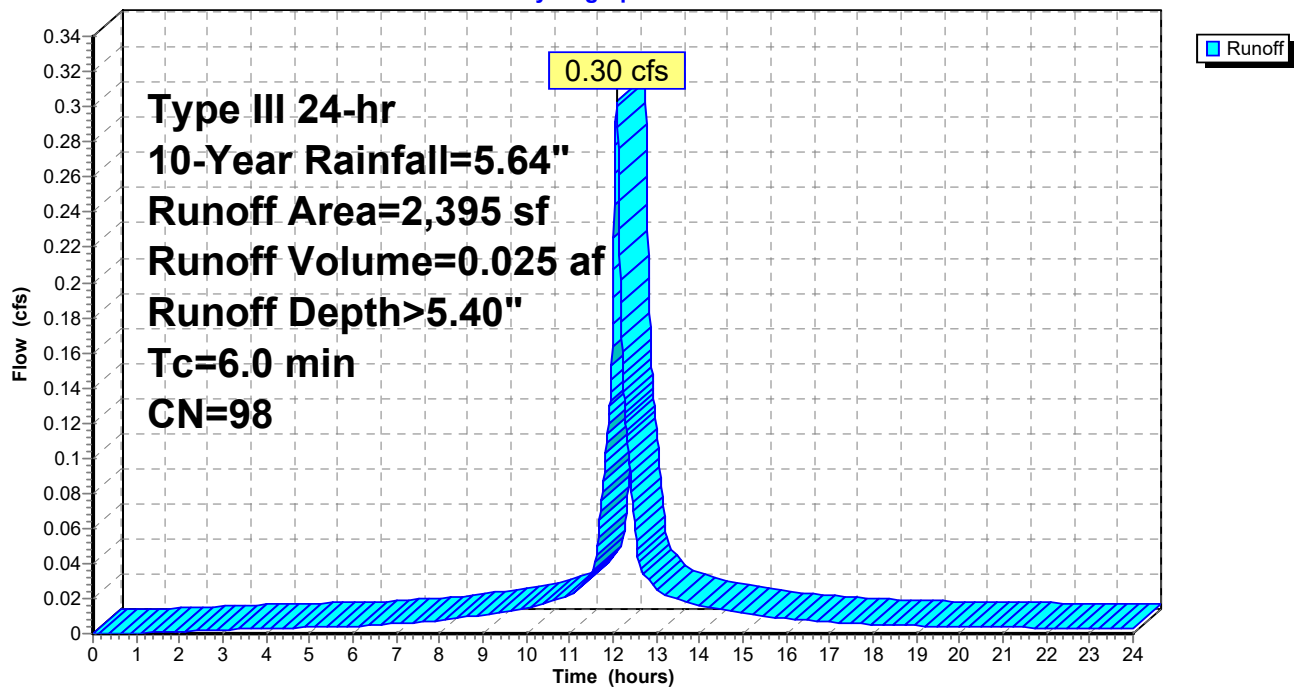
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
2,395	98	Paved parking, HSG C
2,395		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 5S: Ex Lot

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 6S: Ex Lot

Runoff = 0.10 cfs @ 12.09 hrs, Volume= 0.007 af, Depth> 2.88"

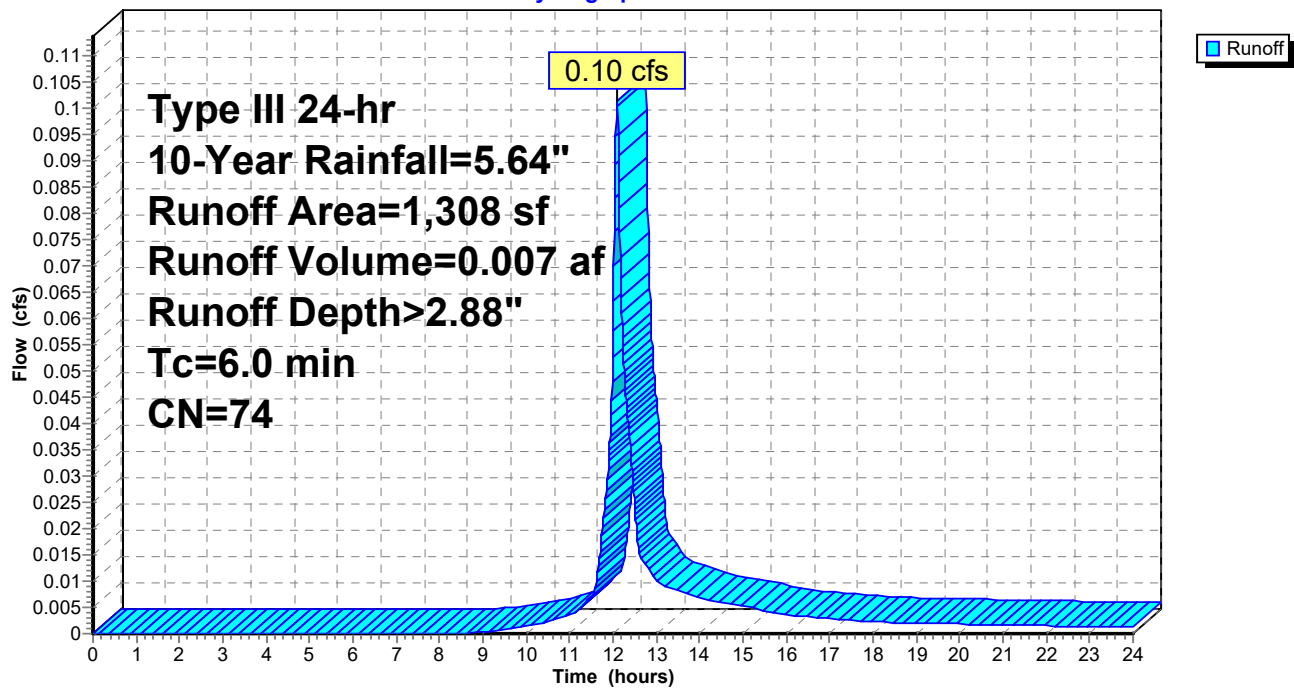
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
1,308	74	>75% Grass cover, Good, HSG C
1,308		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 6S: Ex Lot

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment 7S: Ex Lot

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af, Depth> 2.88"

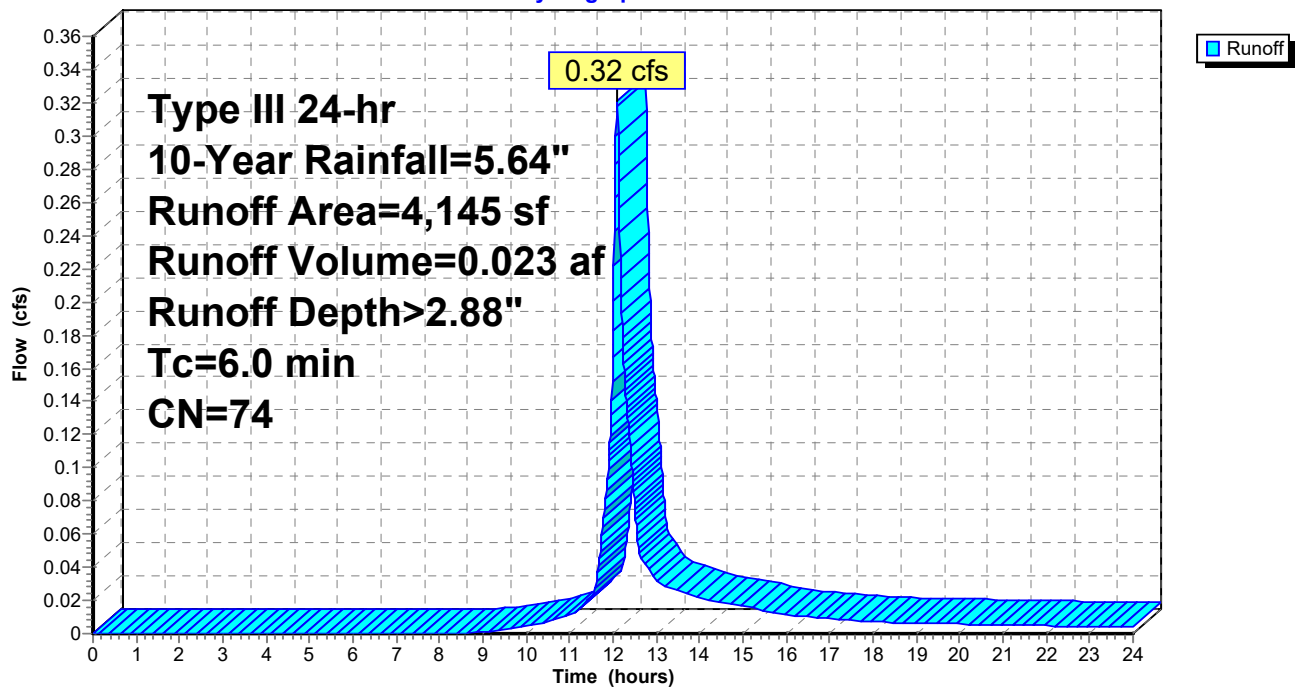
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
4,145	74	>75% Grass cover, Good, HSG C
4,145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 7S: Ex Lot

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.64"

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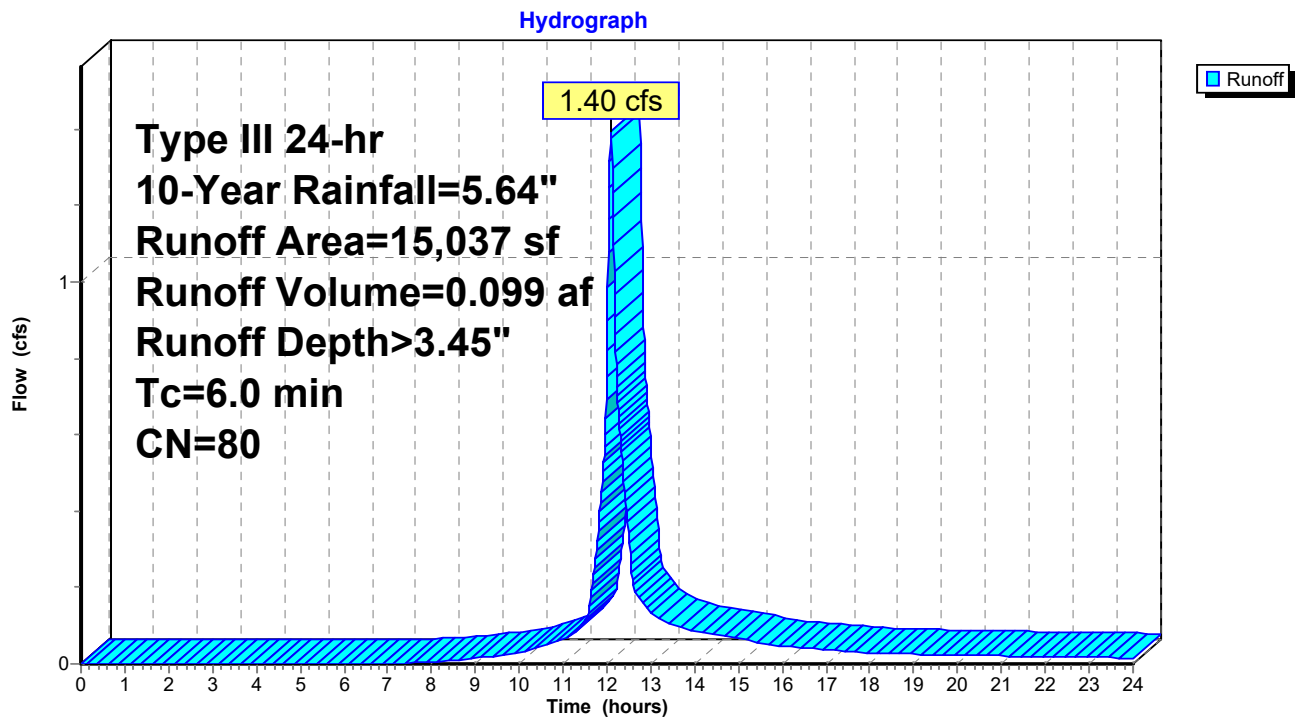
Summary for Subcatchment 8S: Ex Lot

Runoff = 1.40 cfs @ 12.09 hrs, Volume= 0.099 af, Depth> 3.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (sf)	CN	Description
3,115	98	Paved parking, HSG C
* 1,200	89	Gravel Slope
4,090	74	>75% Grass cover, Good, HSG C
3,440	70	Woods, Good, HSG C
3,192	77	Woods, Good, HSG D
15,037	80	Weighted Average
11,922		79.28% Pervious Area
3,115		20.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,
5.0	0				Total, Increased to minimum Tc = 6.0 min

Subcatchment 8S: Ex Lot

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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Subcatchment OS: OFF-SITE

Runoff = 26.56 cfs @ 12.33 hrs, Volume= 3.229 af, Depth> 4.70"

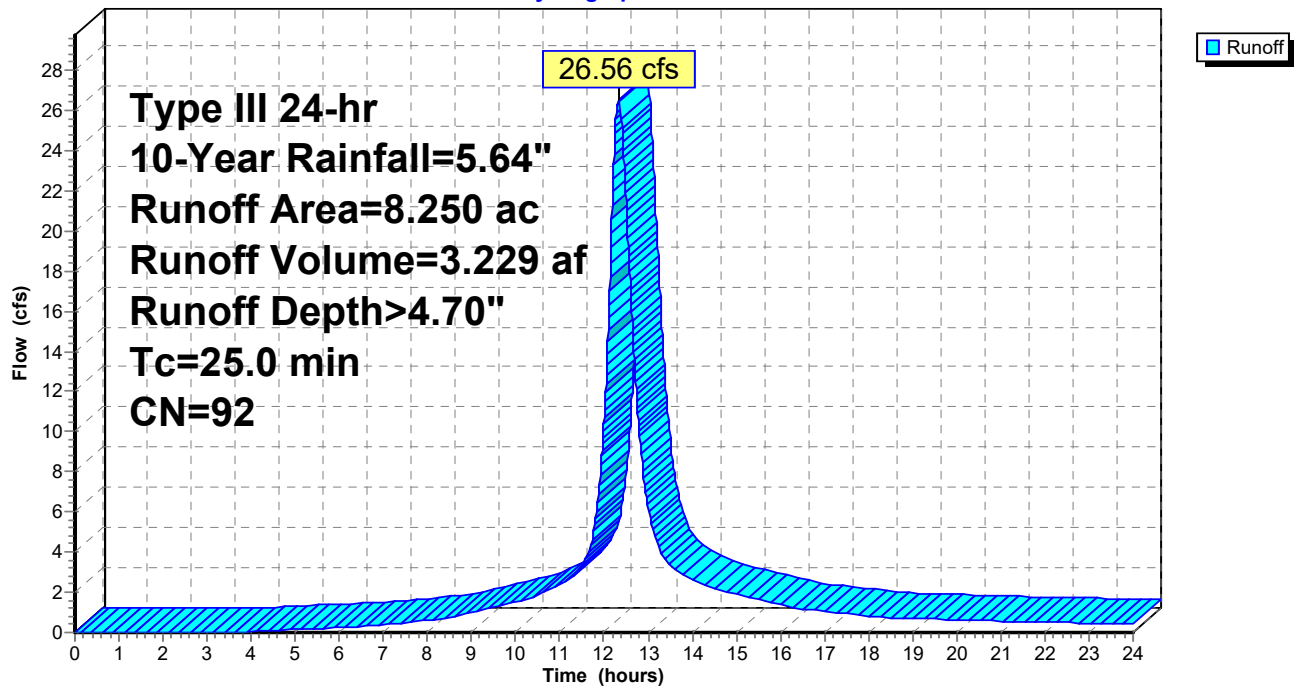
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.64"

Area (ac)	CN	Description
8.250	92	Urban commercial, 85% imp, HSG B
1.237		15.00% Pervious Area
7.012		85.00% Impervious Area

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

Subcatchment OS: OFF-SITE

Hydrograph



5107-Post-110320

Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Pond 2P: PCB#7

Inflow Area = 0.234 ac, 94.70% Impervious, Inflow Depth > 5.28" for 10-Year event
 Inflow = 1.29 cfs @ 12.08 hrs, Volume= 0.103 af
 Outflow = 1.27 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 1%, Lag= 0.3 min
 Primary = 1.27 cfs @ 12.09 hrs, Volume= 0.103 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.62' @ 12.44 hrs Surf.Area= 13 sf Storage= 26 cf

Plug-Flow detention time= 3.4 min calculated for 0.103 af (100% of inflow)
 Center-of-Mass det. time= 1.8 min (754.6 - 752.8)

Volume	Invert	Avail.Storage	Storage Description
#1	14.60'	64 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.60	13	0	0
16.80	13	29	29
17.80	4	9	37
18.00	263	27	64

Device	Routing	Invert	Outlet Devices
#1	Primary	14.60'	12.0" Round Culvert L= 134.0' Ke= 0.500 Inlet / Outlet Invert= 14.60' / 13.93' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.09 cfs @ 12.09 hrs HW=16.34' TW=16.19' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 1.09 cfs @ 1.38 fps)

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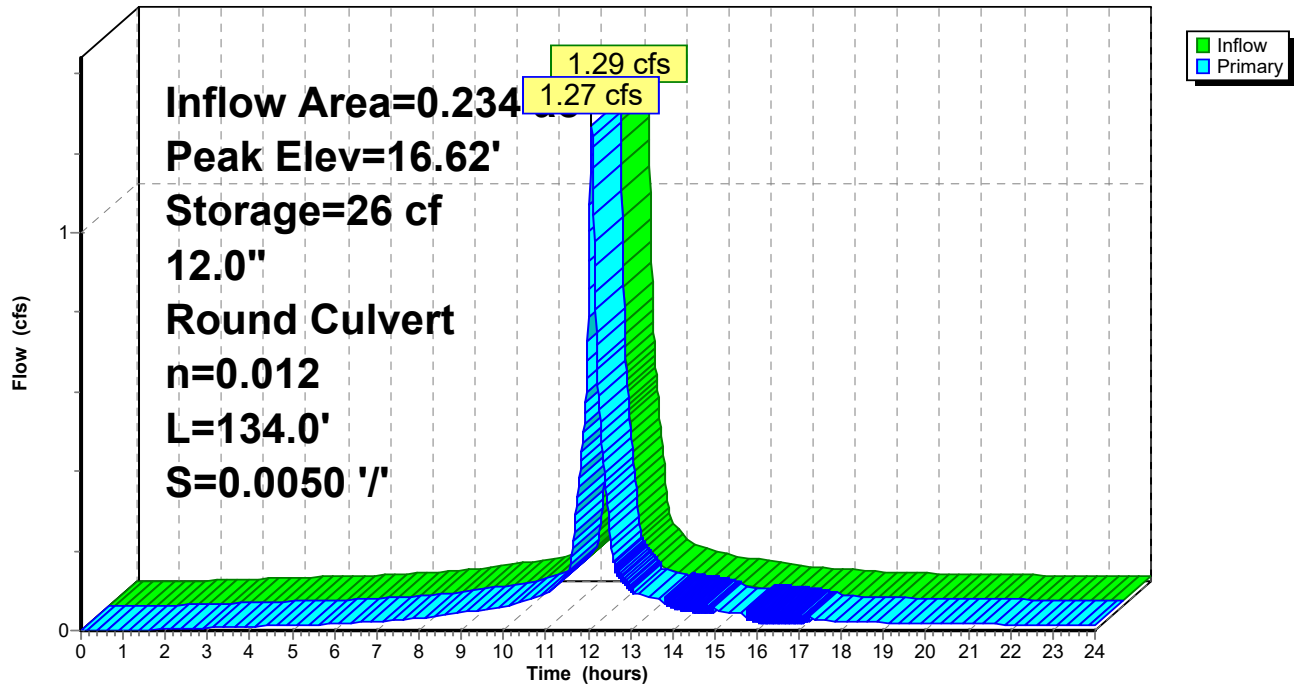
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Pond 2P: PCB#7

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Type III 24-hr 10-Year Rainfall=5.64"

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Summary for Pond 3P: PCB#6

Inflow Area = 0.089 ac, 100.00% Impervious, Inflow Depth > 5.40" for 10-Year event
 Inflow = 0.49 cfs @ 12.08 hrs, Volume= 0.040 af
 Outflow = 0.48 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 3%, Lag= 0.4 min
 Primary = 0.48 cfs @ 12.09 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.60' @ 12.44 hrs Surf.Area= 10 sf Storage= 32 cf

Plug-Flow detention time= 11.9 min calculated for 0.040 af (99% of inflow)
 Center-of-Mass det. time= 4.1 min (749.7 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	14.08'	52 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.08	13	0	0
16.25	13	28	28
17.25	4	9	37
17.44	155	15	52

Device	Routing	Invert	Outlet Devices
#1	Primary	14.08'	12.0" Round Culvert L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 14.08' / 13.93' S= 0.0050 ' S Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.09 hrs HW=16.16' TW=16.19' (Dynamic Tailwater)
 ↑1=Culvert (Controls 0.00 cfs)

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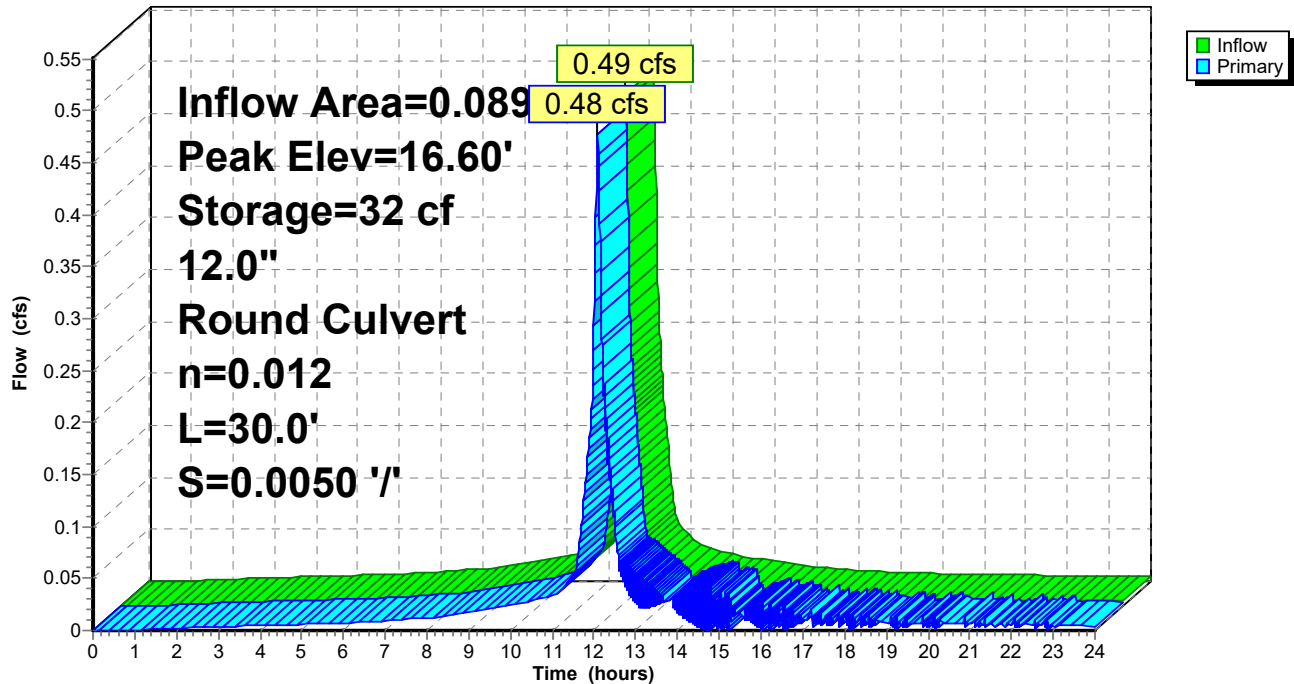
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Pond 3P: PCB#6

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Summary for Pond 4B: RD-1

Inflow Area = 0.032 ac, 100.00% Impervious, Inflow Depth > 5.40" for 10-Year event
 Inflow = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af
 Outflow = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.17 cfs @ 12.08 hrs, Volume= 0.014 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.95' @ 12.10 hrs Surf.Area= 0 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 0.014 af (100% of inflow)
 Center-of-Mass det. time= 0.1 min (745.6 - 745.5)

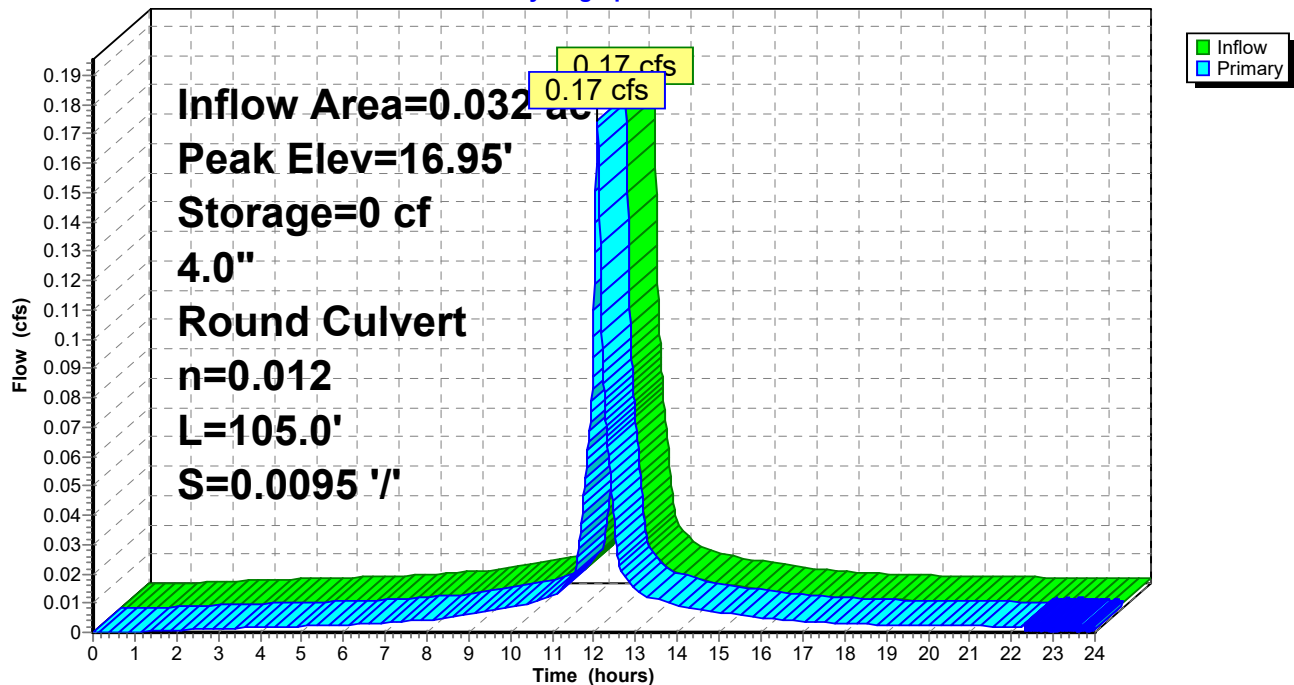
Volume	Invert	Avail.Storage	Storage Description
#1	15.00'	0 cf	0.33'D x 4.50'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	15.00'	4.0" Round Culvert L= 105.0' Ke= 0.500 Inlet / Outlet Invert= 15.00' / 14.00' S= 0.0095 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.17 cfs @ 12.08 hrs HW=16.89' TW=16.10' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.17 cfs @ 1.93 fps)

Pond 4B: RD-1

Hydrograph



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Summary for Pond 4C: RD-2

Inflow Area = 0.063 ac, 100.00% Impervious, Inflow Depth > 5.40" for 10-Year event
 Inflow = 0.35 cfs @ 12.08 hrs, Volume= 0.028 af
 Outflow = 0.35 cfs @ 12.08 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.35 cfs @ 12.08 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.60' @ 12.44 hrs Surf.Area= 0 sf Storage= 1 cf

Plug-Flow detention time= 0.3 min calculated for 0.028 af (100% of inflow)
 Center-of-Mass det. time= (not calculated: outflow precedes inflow)

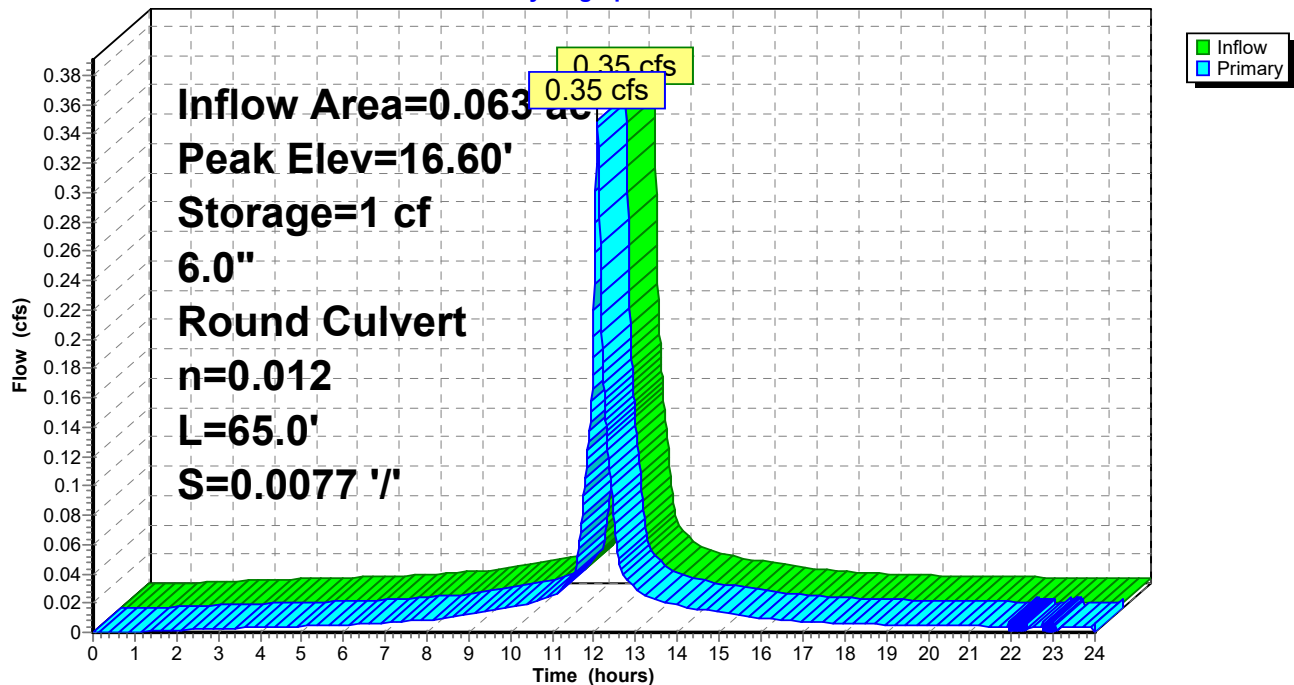
Volume	Invert	Avail.Storage	Storage Description
#1	14.00'	1 cf	0.50'D x 5.50'H Vertical Cone/Cylinder

Device	Routing	Invert	Outlet Devices
#1	Primary	14.00'	6.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 14.00' / 13.50' S= 0.0077 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf

Primary OutFlow Max=0.32 cfs @ 12.08 hrs HW=16.10' TW=15.86' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 0.32 cfs @ 1.61 fps)

Pond 4C: RD-2

Hydrograph



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Summary for Pond 4P: DMH#5

Inflow Area = 0.386 ac, 96.79% Impervious, Inflow Depth > 5.31" for 10-Year event
 Inflow = 2.09 cfs @ 12.09 hrs, Volume= 0.171 af
 Outflow = 2.07 cfs @ 12.09 hrs, Volume= 0.170 af, Atten= 1%, Lag= 0.0 min
 Primary = 2.07 cfs @ 12.09 hrs, Volume= 0.170 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.60' @ 12.43 hrs Surf.Area= 13 sf Storage= 36 cf

Plug-Flow detention time= 3.1 min calculated for 0.170 af (100% of inflow)
 Center-of-Mass det. time= 1.2 min (753.2 - 752.0)

Volume	Invert	Avail.Storage	Storage Description
#1	13.83'	48 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.83	13	0	0
16.85	13	39	39
17.85	4	9	48

Device	Routing	Invert	Outlet Devices
#1	Primary	13.83'	12.0" Round Culvert L= 65.0' Ke= 0.500 Inlet / Outlet Invert= 13.83' / 13.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.91 cfs @ 12.09 hrs HW=16.18' TW=15.89' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 1.91 cfs @ 2.44 fps)

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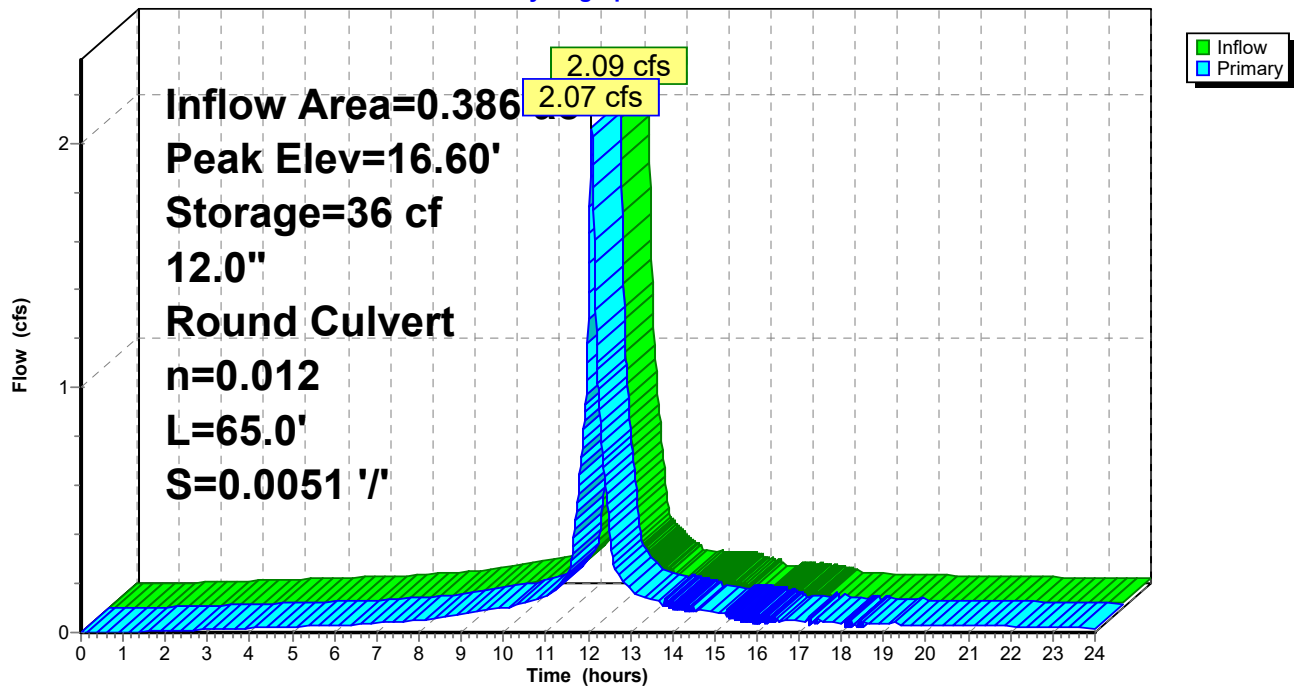
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Pond 4P: DMH#5

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Summary for Pond 5P: PCB#4

Inflow Area = 0.055 ac, 100.00% Impervious, Inflow Depth > 5.40" for 10-Year event
 Inflow = 0.30 cfs @ 12.08 hrs, Volume= 0.025 af
 Outflow = 0.29 cfs @ 12.08 hrs, Volume= 0.024 af, Atten= 5%, Lag= 0.1 min
 Primary = 0.29 cfs @ 12.08 hrs, Volume= 0.024 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.58' @ 12.47 hrs Surf.Area= 5 sf Storage= 34 cf

Plug-Flow detention time= 27.4 min calculated for 0.024 af (98% of inflow)
 Center-of-Mass det. time= 12.5 min (758.0 - 745.5)

Volume	Invert	Avail.Storage	Storage Description
#1	13.64'	51 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
13.64	13	0	0
15.65	13	26	26
16.65	4	8	35
17.00	33	6	41
17.15	95	10	51

Device	Routing	Invert	Outlet Devices
#1	Primary	14.60'	12.0" Round Culvert L= 134.0' Ke= 0.500 Inlet / Outlet Invert= 14.60' / 13.95' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.08 hrs HW=15.83' TW=15.87' (Dynamic Tailwater)

↑1=Culvert (Controls 0.00 cfs)

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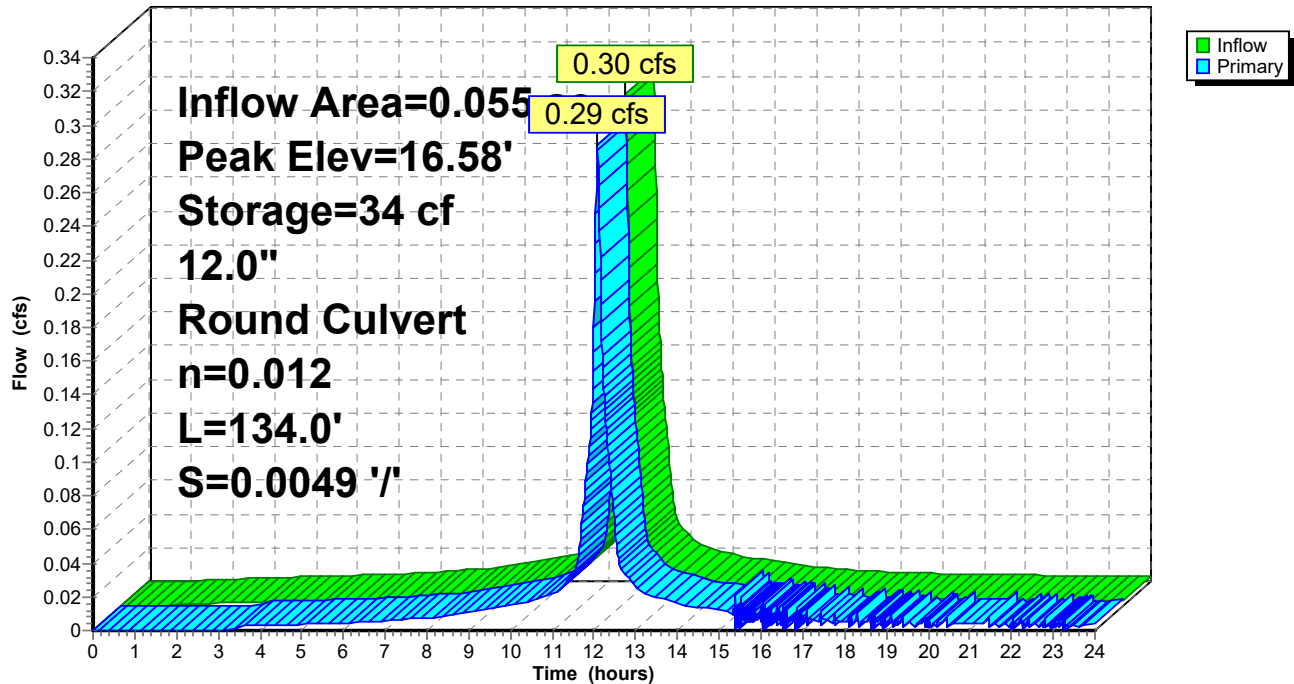
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Pond 5P: PCB#4

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Summary for Pond 7P: Bypass Structure

Inflow Area = 8.345 ac, 84.03% Impervious, Inflow Depth > 4.68" for 10-Year event
 Inflow = 26.70 cfs @ 12.33 hrs, Volume= 3.252 af
 Outflow = 26.69 cfs @ 12.33 hrs, Volume= 3.252 af, Atten= 0%, Lag= 0.0 min
 Primary = 26.69 cfs @ 12.33 hrs, Volume= 3.252 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 15.64' @ 12.33 hrs Surf.Area= 13 sf Storage= 53 cf

Plug-Flow detention time= 0.1 min calculated for 3.251 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (794.3 - 794.3)

Volume	Invert	Avail.Storage	Storage Description
#1	11.53'	420 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
11.53	13	0	0
16.50	13	65	65
18.00	461	356	420

Device	Routing	Invert	Outlet Devices
#1	Primary	11.53'	24.0" Round Culvert L= 57.0' Ke= 0.500 Inlet / Outlet Invert= 11.53' / 11.24' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Secondary	17.00'	4.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=26.69 cfs @ 12.33 hrs HW=15.64' TW=0.00' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 26.69 cfs @ 8.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=11.53' TW=11.36' (Dynamic Tailwater)

↑2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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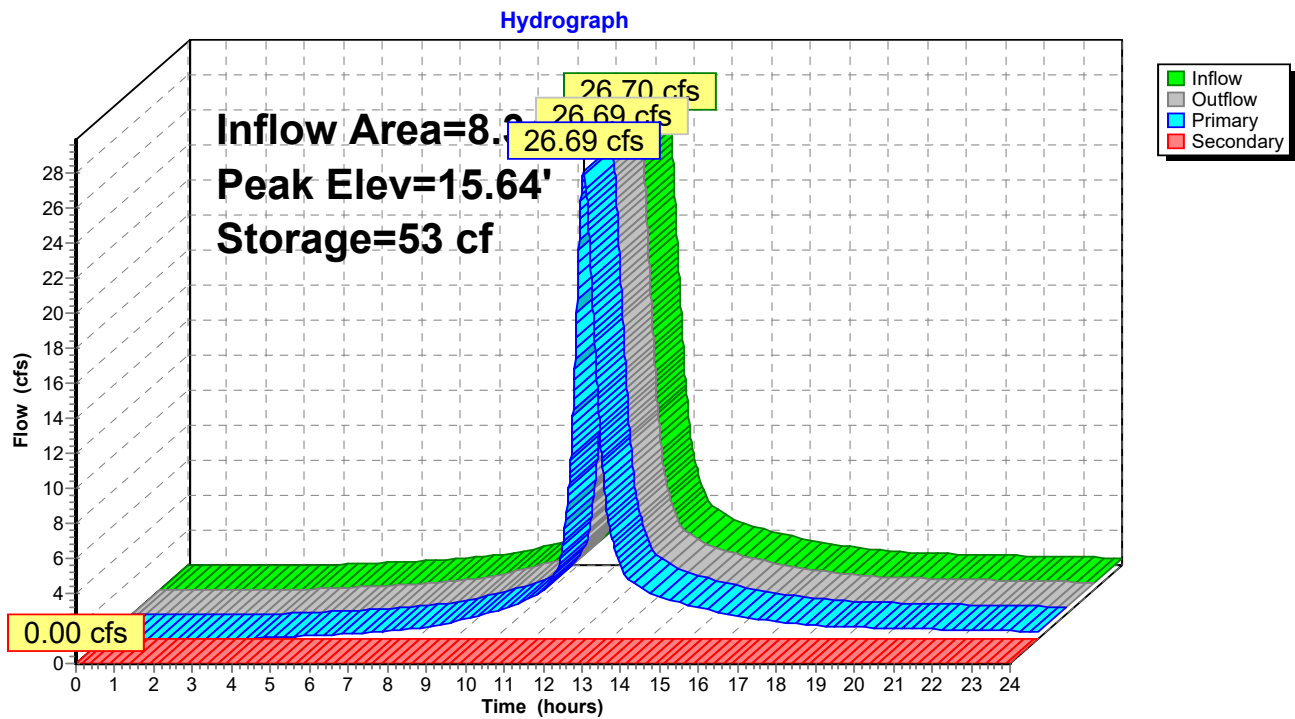
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Pond 7P: Bypass Structure



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Summary for Pond 8P: Raingarden 1

Inflow Area = 0.534 ac, 92.06% Impervious, Inflow Depth > 5.17" for 10-Year event
 Inflow = 2.80 cfs @ 12.09 hrs, Volume= 0.230 af
 Outflow = 0.70 cfs @ 12.46 hrs, Volume= 0.180 af, Atten= 75%, Lag= 22.4 min
 Primary = 0.70 cfs @ 12.46 hrs, Volume= 0.180 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.58' @ 12.46 hrs Surf.Area= 2,438 sf Storage= 4,622 cf

Plug-Flow detention time= 244.8 min calculated for 0.180 af (78% of inflow)
 Center-of-Mass det. time= 163.0 min (918.2 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1	11.36'	5,704 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
11.36	900	0.0	0	0
12.36	900	40.0	360	360
12.61	900	33.0	74	434
14.11	900	5.0	68	502
17.00	2,700	100.0	5,202	5,704

Device	Routing	Invert	Outlet Devices
#1	Primary	11.35'	15.0" Round Culvert L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 11.35' / 11.25' S= 0.0050 ' S Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	16.50'	18.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	11.45'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600
#4	Device 3	11.36'	2.500 in/hr Exfiltration over Surface area
#5	Primary	16.50'	4.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.70 cfs @ 12.46 hrs HW=16.58' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.48 cfs of 12.68 cfs potential flow)
 2=Orifice/Grate (Weir Controls 0.34 cfs @ 0.92 fps)
 3=Orifice/Grate (Passes 0.14 cfs of 1.87 cfs potential flow)
 4=Exfiltration (Exfiltration Controls 0.14 cfs)
 5=Broad-Crested Rectangular Weir (Weir Controls 0.22 cfs @ 0.70 fps)

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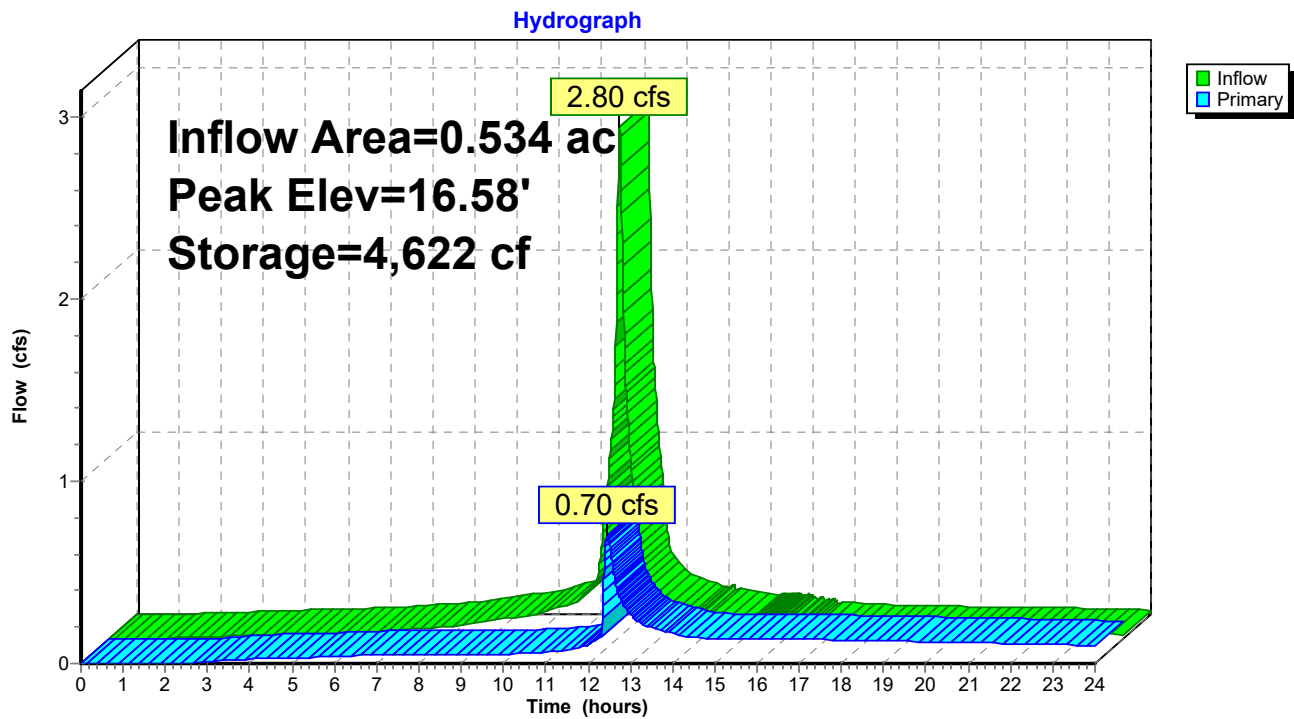
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Pond 8P: Raingarden 1



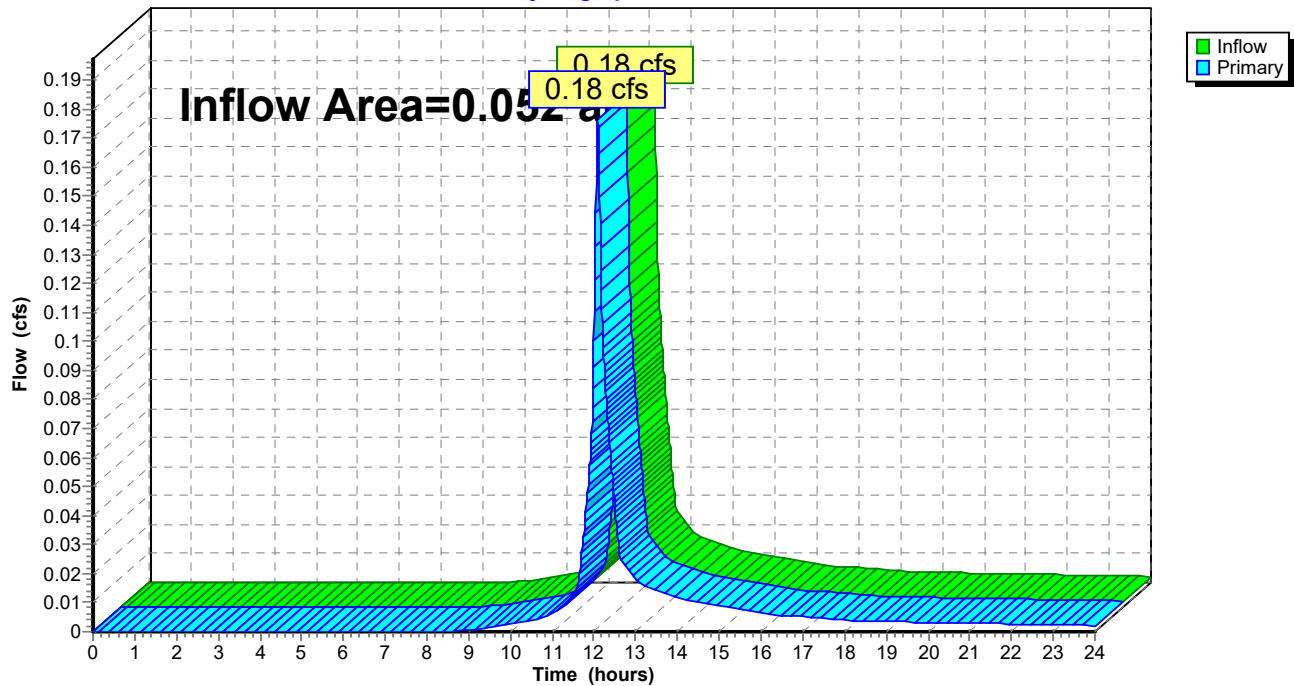
Summary for Link L1: POA-1

Inflow Area = 0.052 ac, 0.00% Impervious, Inflow Depth > 2.88" for 10-Year event
Inflow = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af
Primary = 0.18 cfs @ 12.09 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link L1: POA-1

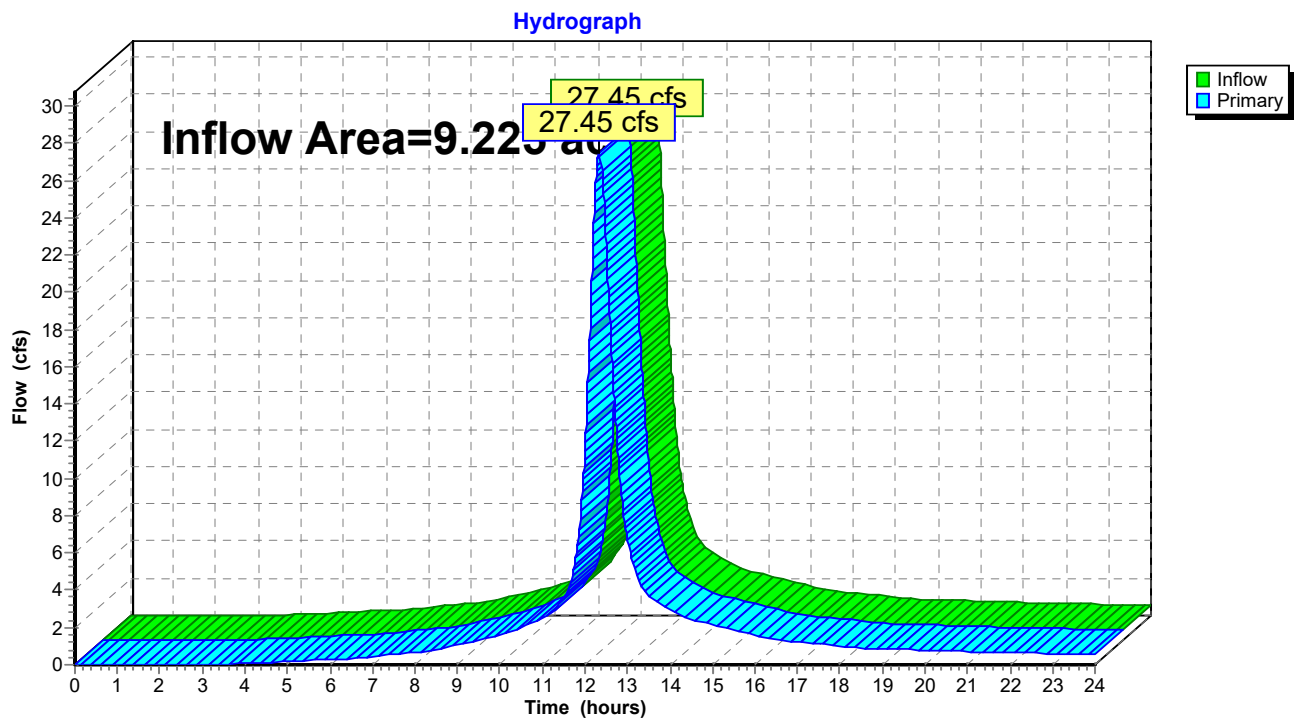
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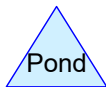
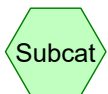
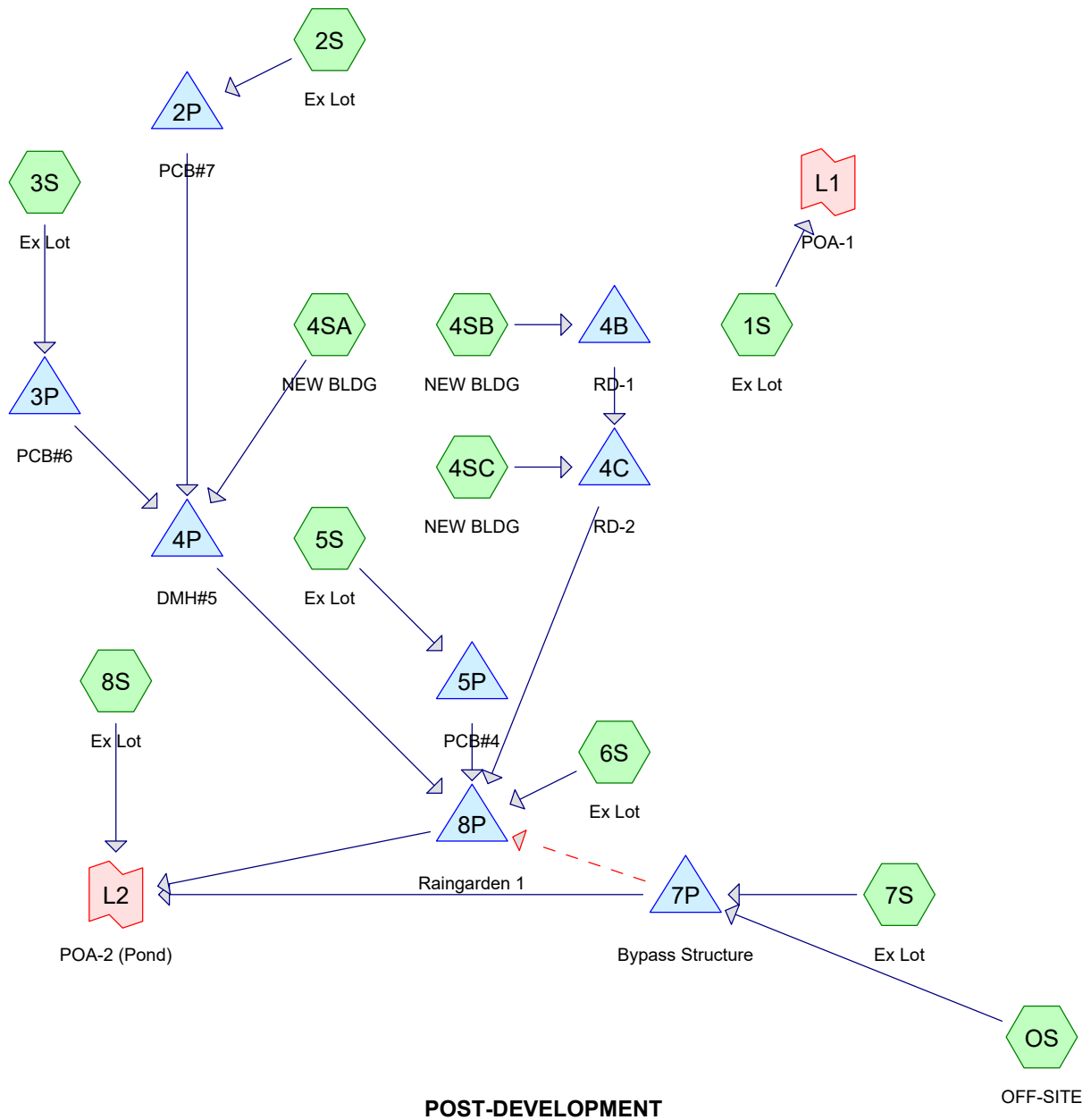


Summary for Link L2: POA-2 (Pond)

Inflow Area = 9.225 ac, 82.13% Impervious, Inflow Depth > 4.59" for 10-Year event
Inflow = 27.45 cfs @ 12.34 hrs, Volume= 3.532 af
Primary = 27.45 cfs @ 12.34 hrs, Volume= 3.532 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Link L2: POA-2 (Pond)



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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: Ex Lot	Runoff Area=2,270 sf 0.00% Impervious Runoff Depth>4.16" Tc=6.0 min CN=74 Runoff=0.25 cfs 0.018 af
Subcatchment2S: Ex Lot	Runoff Area=10,195 sf 94.70% Impervious Runoff Depth>6.78" Tc=6.0 min CN=97 Runoff=1.63 cfs 0.132 af
Subcatchment3S: Ex Lot	Runoff Area=3,880 sf 100.00% Impervious Runoff Depth>6.90" Tc=6.0 min CN=98 Runoff=0.62 cfs 0.051 af
Subcatchment4SA: NEW BLDG	Runoff Area=2,750 sf 100.00% Impervious Runoff Depth>6.90" Tc=6.0 min CN=98 Runoff=0.44 cfs 0.036 af
Subcatchment4SB: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>6.90" Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af
Subcatchment4SC: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>6.90" Tc=6.0 min CN=98 Runoff=0.22 cfs 0.018 af
Subcatchment5S: Ex Lot	Runoff Area=2,395 sf 100.00% Impervious Runoff Depth>6.90" Tc=6.0 min CN=98 Runoff=0.39 cfs 0.032 af
Subcatchment6S: Ex Lot	Runoff Area=1,308 sf 0.00% Impervious Runoff Depth>4.16" Tc=6.0 min CN=74 Runoff=0.15 cfs 0.010 af
Subcatchment7S: Ex Lot	Runoff Area=4,145 sf 0.00% Impervious Runoff Depth>4.16" Tc=6.0 min CN=74 Runoff=0.46 cfs 0.033 af
Subcatchment8S: Ex Lot	Runoff Area=15,037 sf 20.72% Impervious Runoff Depth>4.82" Tc=6.0 min CN=80 Runoff=1.93 cfs 0.139 af
SubcatchmentOS: OFF-SITE	Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>6.17" Tc=25.0 min CN=92 Runoff=34.38 cfs 4.241 af
Pond 2P: PCB#7	Peak Elev=17.26' Storage=34 cf Inflow=1.63 cfs 0.132 af 12.0" Round Culvert n=0.012 L=134.0' S=0.0050 ' Outflow=1.61 cfs 0.132 af
Pond 3P: PCB#6	Peak Elev=17.01' Storage=36 cf Inflow=0.62 cfs 0.051 af 12.0" Round Culvert n=0.012 L=30.0' S=0.0050 ' Outflow=0.61 cfs 0.051 af
Pond 4B: RD-1	Peak Elev=18.11' Storage=0 cf Inflow=0.22 cfs 0.018 af 4.0" Round Culvert n=0.012 L=105.0' S=0.0095 ' Outflow=0.22 cfs 0.018 af
Pond 4C: RD-2	Peak Elev=16.89' Storage=1 cf Inflow=0.44 cfs 0.036 af 6.0" Round Culvert n=0.012 L=65.0' S=0.0077 ' Outflow=0.44 cfs 0.036 af
Pond 4P: DMH#5	Peak Elev=16.99' Storage=41 cf Inflow=2.66 cfs 0.219 af 12.0" Round Culvert n=0.012 L=65.0' S=0.0051 ' Outflow=2.64 cfs 0.218 af

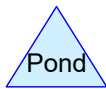
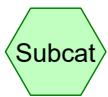
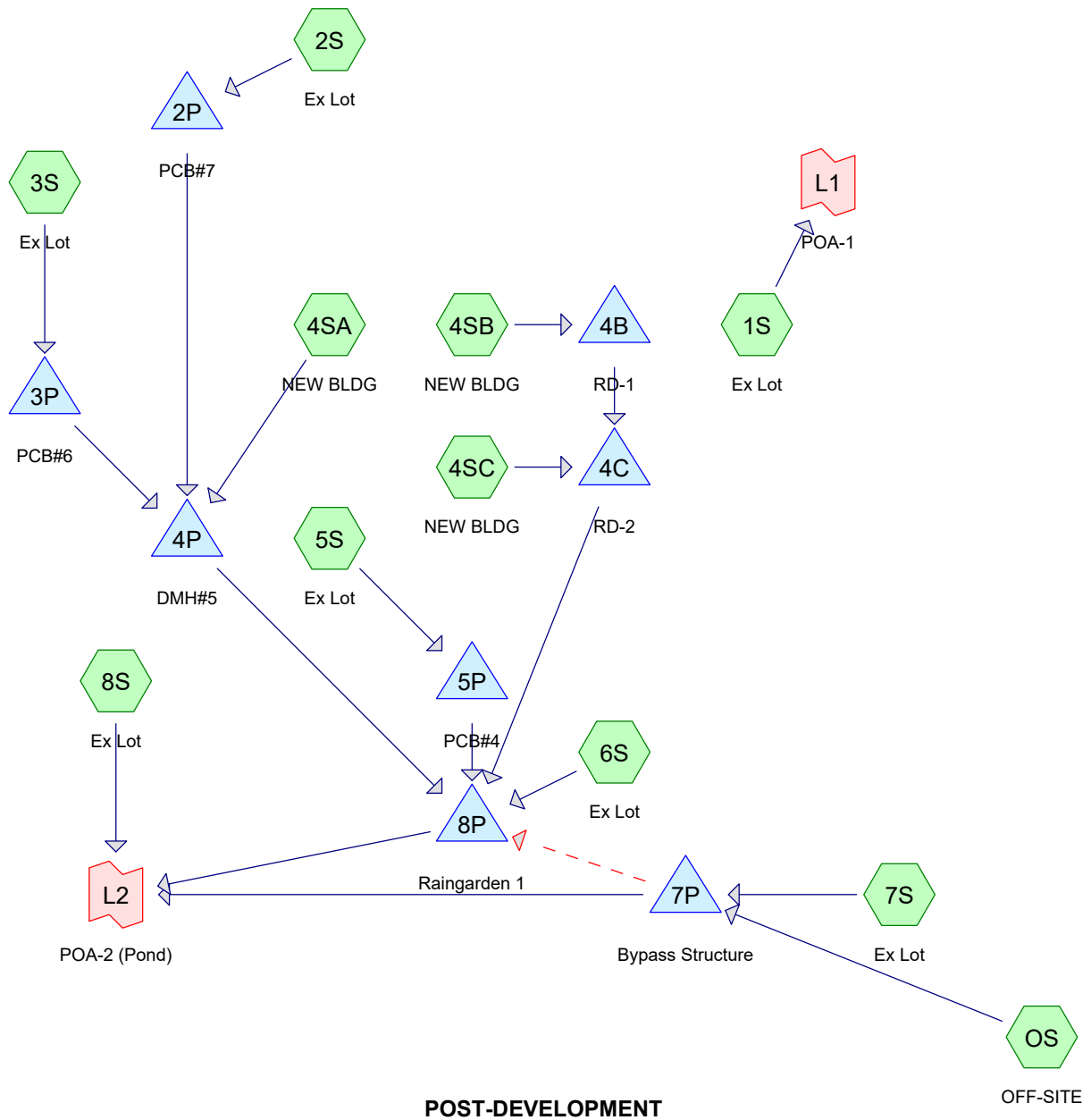
5107-Post-110320*Type III 24-hr 25-Year Rainfall=7.14"*

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Pond 5P: PCB#4Peak Elev=16.72' Storage=35 cf Inflow=0.39 cfs 0.032 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0049 '/' Outflow=0.37 cfs 0.031 af**Pond 7P: Bypass Structure**Peak Elev=17.29' Storage=168 cf Inflow=34.57 cfs 4.274 af
Primary=33.00 cfs 4.260 af Secondary=1.55 cfs 0.015 af Outflow=34.56 cfs 4.274 af**Pond 8P: Raingarden 1**Peak Elev=16.71' Storage=4,959 cf Inflow=3.60 cfs 0.311 af
Outflow=2.68 cfs 0.254 af**Link L1: POA-1**Inflow=0.25 cfs 0.018 af
Primary=0.25 cfs 0.018 af**Link L2: POA-2 (Pond)**Inflow=36.36 cfs 4.652 af
Primary=36.36 cfs 4.652 af**Total Runoff Area = 9.277 ac Runoff Volume = 4.729 af Average Runoff Depth = 6.12"**
18.33% Pervious = 1.701 ac 81.67% Impervious = 7.576 ac



5107-Post-110320*Type III 24-hr 50-Year Rainfall=8.56"*

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 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

Subcatchment1S: Ex Lot	Runoff Area=2,270 sf 0.00% Impervious Runoff Depth>5.42" Tc=6.0 min CN=74 Runoff=0.33 cfs 0.024 af
Subcatchment2S: Ex Lot	Runoff Area=10,195 sf 94.70% Impervious Runoff Depth>8.19" Tc=6.0 min CN=97 Runoff=1.96 cfs 0.160 af
Subcatchment3S: Ex Lot	Runoff Area=3,880 sf 100.00% Impervious Runoff Depth>8.31" Tc=6.0 min CN=98 Runoff=0.75 cfs 0.062 af
Subcatchment4SA: NEW BLDG	Runoff Area=2,750 sf 100.00% Impervious Runoff Depth>8.31" Tc=6.0 min CN=98 Runoff=0.53 cfs 0.044 af
Subcatchment4SB: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>8.31" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af
Subcatchment4SC: NEW BLDG	Runoff Area=1,375 sf 100.00% Impervious Runoff Depth>8.31" Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af
Subcatchment5S: Ex Lot	Runoff Area=2,395 sf 100.00% Impervious Runoff Depth>8.31" Tc=6.0 min CN=98 Runoff=0.46 cfs 0.038 af
Subcatchment6S: Ex Lot	Runoff Area=1,308 sf 0.00% Impervious Runoff Depth>5.42" Tc=6.0 min CN=74 Runoff=0.19 cfs 0.014 af
Subcatchment7S: Ex Lot	Runoff Area=4,145 sf 0.00% Impervious Runoff Depth>5.42" Tc=6.0 min CN=74 Runoff=0.60 cfs 0.043 af
Subcatchment8S: Ex Lot	Runoff Area=15,037 sf 20.72% Impervious Runoff Depth>6.15" Tc=6.0 min CN=80 Runoff=2.44 cfs 0.177 af
SubcatchmentOS: OFF-SITE	Runoff Area=8.250 ac 85.00% Impervious Runoff Depth>7.57" Tc=25.0 min CN=92 Runoff=41.73 cfs 5.204 af
Pond 2P: PCB#7	Peak Elev=18.02' Storage=64 cf Inflow=1.96 cfs 0.160 af 12.0" Round Culvert n=0.012 L=134.0' S=0.0050 ' Outflow=2.66 cfs 0.159 af
Pond 3P: PCB#6	Peak Elev=17.79' Storage=52 cf Inflow=0.75 cfs 0.062 af 12.0" Round Culvert n=0.012 L=30.0' S=0.0050 ' Outflow=1.79 cfs 0.061 af
Pond 4B: RD-1	Peak Elev=19.28' Storage=0 cf Inflow=0.27 cfs 0.022 af 4.0" Round Culvert n=0.012 L=105.0' S=0.0095 ' Outflow=0.27 cfs 0.022 af
Pond 4C: RD-2	Peak Elev=17.37' Storage=1 cf Inflow=0.53 cfs 0.044 af 6.0" Round Culvert n=0.012 L=65.0' S=0.0077 ' Outflow=0.53 cfs 0.044 af
Pond 4P: DMH#5	Peak Elev=18.27' Storage=48 cf Inflow=4.80 cfs 0.264 af 12.0" Round Culvert n=0.012 L=65.0' S=0.0051 ' Outflow=4.30 cfs 0.264 af

5107-Post-110320*Type III 24-hr 50-Year Rainfall=8.56"*

Prepared by Altus Engineering, Inc.

Printed 11/3/2020

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Pond 5P: PCB#4Peak Elev=16.98' Storage=40 cf Inflow=0.46 cfs 0.038 af
12.0" Round Culvert n=0.012 L=134.0' S=0.0049 '/' Outflow=0.45 cfs 0.037 af**Pond 7P: Bypass Structure**Peak Elev=17.77' Storage=323 cf Inflow=41.97 cfs 5.247 af
Primary=34.64 cfs 5.117 af Secondary=7.32 cfs 0.130 af Outflow=41.96 cfs 5.247 af**Pond 8P: Raingarden 1**Peak Elev=16.98' Storage=5,643 cf Inflow=9.35 cfs 0.489 af
Outflow=8.69 cfs 0.426 af**Link L1: POA-1**Inflow=0.33 cfs 0.024 af
Primary=0.33 cfs 0.024 af**Link L2: POA-2 (Pond)**Inflow=44.18 cfs 5.720 af
Primary=44.18 cfs 5.720 af**Total Runoff Area = 9.277 ac Runoff Volume = 5.808 af Average Runoff Depth = 7.51"**
18.33% Pervious = 1.701 ac 81.67% Impervious = 7.576 ac

Section 5

NRCC Extreme Precipitation Table

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.774 degrees West
Latitude	43.048 degrees North
Elevation	0 feet
Date/Time	Mon, 12 Oct 2020 17:37:38 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	1yr	0.71	0.98	1.22	1.57	2.04	2.67	2.94	1yr	2.37	2.83	3.24	3.96	4.58	1yr
2yr	0.32	0.50	0.62	0.82	1.03	1.30	2yr	0.89	1.18	1.52	1.94	2.50	3.23	3.59	2yr	2.86	3.45	3.96	4.71	5.36	2yr
5yr	0.37	0.58	0.73	0.98	1.25	1.61	5yr	1.08	1.47	1.89	2.44	3.15	4.09	4.61	5yr	3.62	4.43	5.08	5.97	6.74	5yr
10yr	0.41	0.65	0.82	1.12	1.46	1.90	10yr	1.26	1.73	2.24	2.91	3.77	4.90	5.57	10yr	4.33	5.35	6.13	7.16	8.03	10yr
25yr	0.48	0.76	0.97	1.34	1.78	2.35	25yr	1.54	2.15	2.79	3.65	4.77	6.21	7.15	25yr	5.50	6.87	7.87	9.09	10.12	25yr
50yr	0.54	0.86	1.11	1.55	2.08	2.77	50yr	1.80	2.54	3.31	4.35	5.70	7.44	8.64	50yr	6.59	8.31	9.51	10.90	12.06	50yr
100yr	0.60	0.97	1.25	1.78	2.43	3.27	100yr	2.10	2.99	3.93	5.19	6.81	8.92	10.45	100yr	7.89	10.05	11.50	13.08	14.38	100yr
200yr	0.68	1.11	1.44	2.06	2.84	3.86	200yr	2.45	3.53	4.65	6.17	8.14	10.69	12.64	200yr	9.46	12.16	13.90	15.69	17.15	200yr
500yr	0.81	1.33	1.73	2.50	3.50	4.80	500yr	3.02	4.40	5.81	7.76	10.29	13.58	16.26	500yr	12.02	15.64	17.88	19.97	21.66	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	1yr	0.63	0.86	0.92	1.33	1.68	2.26	2.54	1yr	2.00	2.44	2.89	3.19	3.93	1yr
2yr	0.32	0.49	0.60	0.81	1.00	1.19	2yr	0.86	1.16	1.37	1.82	2.33	3.08	3.48	2yr	2.73	3.35	3.85	4.58	5.11	2yr
5yr	0.35	0.54	0.67	0.92	1.17	1.41	5yr	1.01	1.38	1.61	2.12	2.73	3.82	4.23	5yr	3.38	4.07	4.76	5.58	6.29	5yr
10yr	0.39	0.60	0.74	1.03	1.33	1.60	10yr	1.15	1.57	1.81	2.38	3.05	4.41	4.92	10yr	3.90	4.73	5.51	6.48	7.27	10yr
25yr	0.44	0.67	0.84	1.19	1.57	1.90	25yr	1.36	1.86	2.10	2.75	3.53	4.77	5.97	25yr	4.22	5.74	6.76	7.90	8.78	25yr
50yr	0.49	0.74	0.92	1.32	1.78	2.17	50yr	1.54	2.13	2.35	3.06	3.92	5.40	6.91	50yr	4.78	6.65	7.88	9.19	10.15	50yr
100yr	0.54	0.82	1.02	1.48	2.03	2.48	100yr	1.75	2.42	2.63	3.40	4.34	6.08	7.99	100yr	5.38	7.69	9.19	10.70	11.72	100yr
200yr	0.60	0.90	1.14	1.65	2.30	2.82	200yr	1.99	2.76	2.94	3.77	4.78	6.83	9.24	200yr	6.04	8.89	10.71	12.47	13.57	200yr
500yr	0.69	1.03	1.33	1.93	2.75	3.38	500yr	2.37	3.30	3.42	4.29	5.44	7.96	11.20	500yr	7.05	10.77	13.13	15.30	16.45	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	1yr	0.77	1.06	1.26	1.74	2.20	3.00	3.17	1yr	2.65	3.05	3.60	4.39	5.07	1yr
2yr	0.34	0.52	0.64	0.87	1.07	1.27	2yr	0.92	1.24	1.48	1.96	2.51	3.44	3.72	2yr	3.05	3.58	4.10	4.86	5.66	2yr
5yr	0.40	0.62	0.77	1.05	1.34	1.62	5yr	1.16	1.59	1.88	2.53	3.25	4.36	4.98	5yr	3.86	4.79	5.41	6.40	7.18	5yr
10yr	0.47	0.72	0.89	1.25	1.61	1.98	10yr	1.39	1.94	2.28	3.11	3.95	5.37	6.21	10yr	4.75	5.97	6.83	7.86	8.78	10yr
25yr	0.58	0.88	1.09	1.56	2.05	2.58	25yr	1.77	2.52	2.96	4.07	5.15	7.80	8.34	25yr	6.91	8.02	9.14	10.36	11.43	25yr
50yr	0.67	1.03	1.28	1.84	2.47	3.14	50yr	2.13	3.07	3.60	5.00	6.32	9.76	10.44	50yr	8.64	10.04	11.41	12.75	13.98	50yr
100yr	0.79	1.20	1.50	2.17	2.97	3.82	100yr	2.57	3.74	4.38	6.16	7.76	12.21	13.07	100yr	10.81	12.56	14.24	15.71	17.10	100yr
200yr	0.93	1.40	1.77	2.56	3.57	4.67	200yr	3.08	4.57	5.34	7.59	9.54	15.31	16.37	200yr	13.55	15.74	17.80	19.35	20.92	200yr
500yr	1.15	1.72	2.21	3.21	4.56	6.07	500yr	3.93	5.93	6.94	10.03	12.55	20.67	22.06	500yr	18.29	21.21	23.90	25.49	27.33	500yr

Section 6

NRCS Soils Report



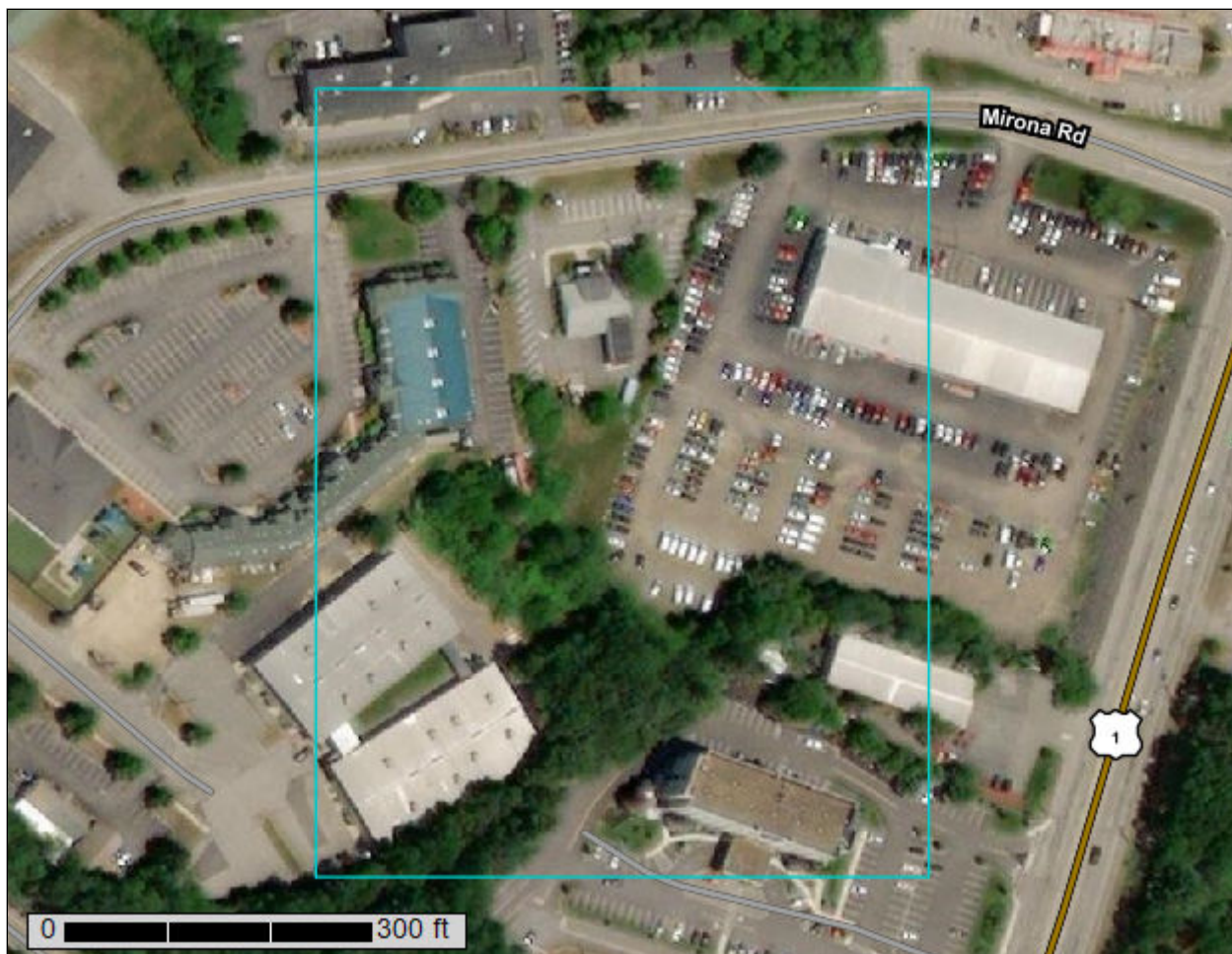
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Rockingham County, New Hampshire**



October 12, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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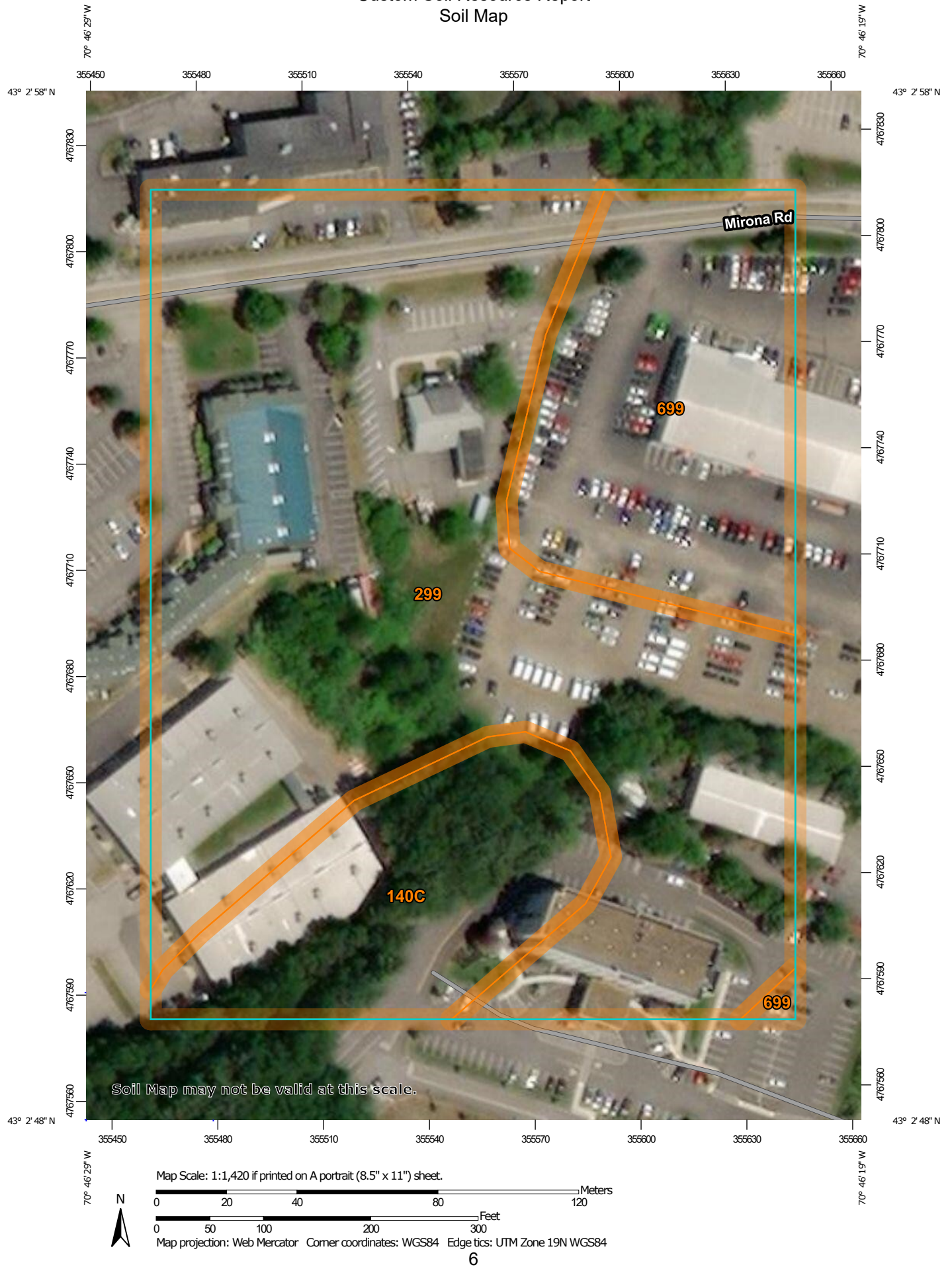
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 22, May 29, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 14, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	1.6	15.2%
299	Udorthents, smoothed	6.9	64.9%
699	Urban land	2.1	19.8%
Totals for Area of Interest		10.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

Custom Soil Resource Report

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

140C—Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82s

Elevation: 0 to 980 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent

Canton, very stony, and similar soils: 25 percent

Hollis, very stony, and similar soils: 25 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: fine sandy loam

Bw - 2 to 30 inches: gravelly fine sandy loam

2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 41 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Custom Soil Resource Report

Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Ridges, hills

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 7 inches: gravelly fine sandy loam

Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 8 to 23 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144AY033MA - Shallow Dry Till Uplands

Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Ridges, hills, moraines

Landform position (two-dimensional): Summit, backslope, shoulder

Landform position (three-dimensional): Side slope, crest, nose slope

Down-slope shape: Convex, linear

Across-slope shape: Convex

Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 5 inches: fine sandy loam

Bw1 - 5 to 16 inches: fine sandy loam

Bw2 - 16 to 22 inches: gravelly fine sandy loam

2C - 22 to 67 inches: gravelly loamy sand

Custom Soil Resource Report

Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Minor Components

Freetown

Percent of map unit: 5 percent

Landform: Bogs, marshes, depressions, kettles, swamps

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Newfields, very stony

Percent of map unit: 5 percent

Landform: Hills, ground moraines, moraines

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Concave

Hydric soil rating: No

Scarboro, very stony

Percent of map unit: 3 percent

Landform: Depressions, drainageways, outwash deltas, outwash terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Concave, linear

Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent

Landform: Ridges, hills

Hydric soil rating: Unranked

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt

Elevation: 0 to 840 feet

Mean annual precipitation: 44 to 49 inches

Mean annual air temperature: 48 degrees F

Frost-free period: 155 to 165 days

Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

699—Urban land

Map Unit Composition

Urban land: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent

Hydric soil rating: No

Section 7

Stormwater Operations & Maintenance Plan

STORMWATER INSPECTION AND MAINTENANCE MANUAL

150 Mirona Road Assessor's Map 253, Lot 2A

OWNER:
Madison Commercial Group, LLC
72 Mirona Road, Suite 4
Portsmouth, NH 03801

Proper inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on a developed property. Routine inspections ensure permit compliance and reduce the potential for deterioration of infrastructure or reduced water quality. The following responsible parties shall be in charge of managing the stormwater facilities:

RESPONSIBLE PARTIES:

Owner: _____
Name Company Phone

Inspection: _____
Name Company Phone

Maintenance: _____
Name Company Phone

NOTE: Inspection and maintenance responsibilities transfer to future property owners.

RAINGARDENS

Function – Raingardens and infiltration ponds provide treatment to runoff prior to directing it to stormwater systems by filtering sediment and suspended solids, trapping them in the bottom of the garden and in the filter media itself. Additional treatment is provided by the native water-tolerant vegetation which removes nutrients and other pollutants through bio-uptake. Stormwater detention and infiltration can also be provided as the filtering process slows runoff, decreases the peak rate of discharge and promotes groundwater recharge.

Detention ponds temporarily store runoff and allow for its controlled release during and after a storm event, decreasing peak rates of runoff and minimizing flooding.

Raingardens shall be managed (Per AGR 3800 and RSA 430:53) to: prevent and control the spread of invasive plant, insect, and fungal species; minimize the adverse environmental and economic effects invasive species cause to agriculture, forests, wetlands, wildlife, and other natural resources of the state; and protect the public from potential health problems attributed to certain invasive species.

Maintenance

- Inspect annually and after significant rainfall event.
- If a raingarden does not completely drain within 72-hours following a rainfall event, then a qualified professional should assess the condition of the facility to determine measures required to restore its filtration and/or infiltration function(s), including but not limited to removal of accumulated sediments and/or replacement or reconstruction of the filter media.
- Replace any riprap dislodged from spillways, inlets and outlets.
- Remove any obstructions, litter and accumulated sediment or debris as warranted but no less than once a year.
- Mowing of any grassed area in or adjacent to a raingarden shall be performed at least twice per year (when areas are not inundated) to keep the vegetation in vigorous condition. The cut grass shall be removed to prevent the decaying organic litter from clogging the filter media or choking other vegetation.
- Select vegetation should be maintained in healthy condition. This may include pruning, removal and replacement of dead or diseased vegetation.
- Remove any invasive species, Per AGR 3800 and RSA 430:53.
- Remove any hard wood growth from raingardens.

CULVERTS AND DRAINAGE PIPES

Function – Culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas and to surface waters or closed drainage systems.

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.
- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Permit and/or local permit.

CATCH BASINS

Function – Catch basins collect stormwater, primarily from paved surfaces and roofs. Stormwater from paved areas often contains sediment and contaminants. Catch basin sumps serve to trap sediment, trace metals, nutrients and debris. Hooded catch basins trap hydrocarbons and floating debris.

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned (as needed) on an annual basis to protect water quality and infiltration capacity. Catch basin debris shall be disposed of at a solid waste disposal facility.

LEVEL SPREADERS AND RIP RAP OUTLETS

Function – Level spreaders and rip rap outlets covert concentrated stormwater flows into less-erosive sheet flow, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect level spreaders and buffers at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Inspect level for signs of condensed flows. Level spreader and rip rap shall be maintained to disperse flows evenly over level spreader.
- If a meadow buffer, provide periodic mowing as needed to maintain a healthy stand of herbaceous vegetation.
- If a forested buffer, then the buffer should be maintained in an undisturbed condition, unless erosion occurs.
- If erosion of the buffer (forested or meadow) occurs, eroded areas should be repaired and replanted with vegetation similar to the remaining buffer. Corrective action should include eliminating the source of the erosion problem and may require retrofit or reconstruction of the level spreader.
- Remove debris and accumulated sediment and dispose of properly.

VEGETATIVE SWALES

Function – Vegetative swales filter sediment from stormwater, promote infiltration, and the uptake of contaminants. They are designed to treat runoff and dispose of it safely into the natural drainage system.

Maintenance

- Timely maintenance is important to keep a swale in good working condition. Mowing of grassed swales shall be monthly to keep the vegetation in vigorous condition. The cut vegetation shall be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.
- Fertilizing shall be bi-annual or as recommended from soil testing.
- Inspect swales following significant rainfall events.
- Woody vegetation shall not be allowed to become established in the swales or rock riprap outlet protection and if present shall be removed.

- Accumulated debris disrupts flow and leads to clogging and erosion. Remove debris and litter as necessary.
- Inspect for eroded areas. Determine cause of erosion and correct deficiency as required. Monitor repaired areas.

LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply fertilizer to frozen ground.
- Clean up any fertilizer spills.
- Do not allow fertilizer to be broadcast into water bodies.
- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminants that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

DE-ICING CHEMICAL USE AND STORAGE

Function – Sand and salt are used for de-icing of drives.

Maintenance

- Salt is highly water-soluble. Contamination of fresh water wetlands and other sensitive areas can occur when salt is stored in open areas. Salt piles shall be covered at all times if not stored in a shed. Runoff from stockpiles shall be contained to keep the runoff from entering the drainage system.
- When shared driveways and walks are free of snow and ice, they should be swept clean. Disposal shall be in a solid waste disposal facility.
- **Salt use shall be minimized.** Sand shall be used for de-icing activities when possible. Salt is highly water-soluble. Contamination of fresh water wetlands and other sensitive areas can occur when salt is stored in open areas. Owner shall not store salt piles on site.

CONTROL OF INVASIVE PLANTS

Function – Invasive plants are introduced, alien, or non-native plants, which have been moved by people from their native habitat to a new area. Some exotic plants are imported for human use such as landscaping, erosion control, or food crops. They also can arrive as "hitchhikers" among shipments of other plants, seeds, packing materials, or fresh produce. Some exotic plants become invasive and cause harm by:

- becoming weedy and overgrown;
- killing established shade trees;
- obstructing pipes and drainage systems;
- forming dense beds in water;
- lowering water levels in lakes, streams, and wetlands;
- destroying natural communities;
- promoting erosion on stream banks and hillsides; and
- resisting control except by hazardous chemical.

Maintenance

During maintenance activities, check for the presence of invasive plants and remove in a safe manner as described in the attached "Methods for Disposing Non-Native Invasive Plants" prepared by the UNH Cooperative Extension.

GENERAL CLEAN UP

Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet basket, etc.). Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drain pipes that may have accumulated during construction.

Once in operation, all paved areas of the site should be swept at least once annually, preferably at the end of winter prior to significant spring rains.

APPENDIX

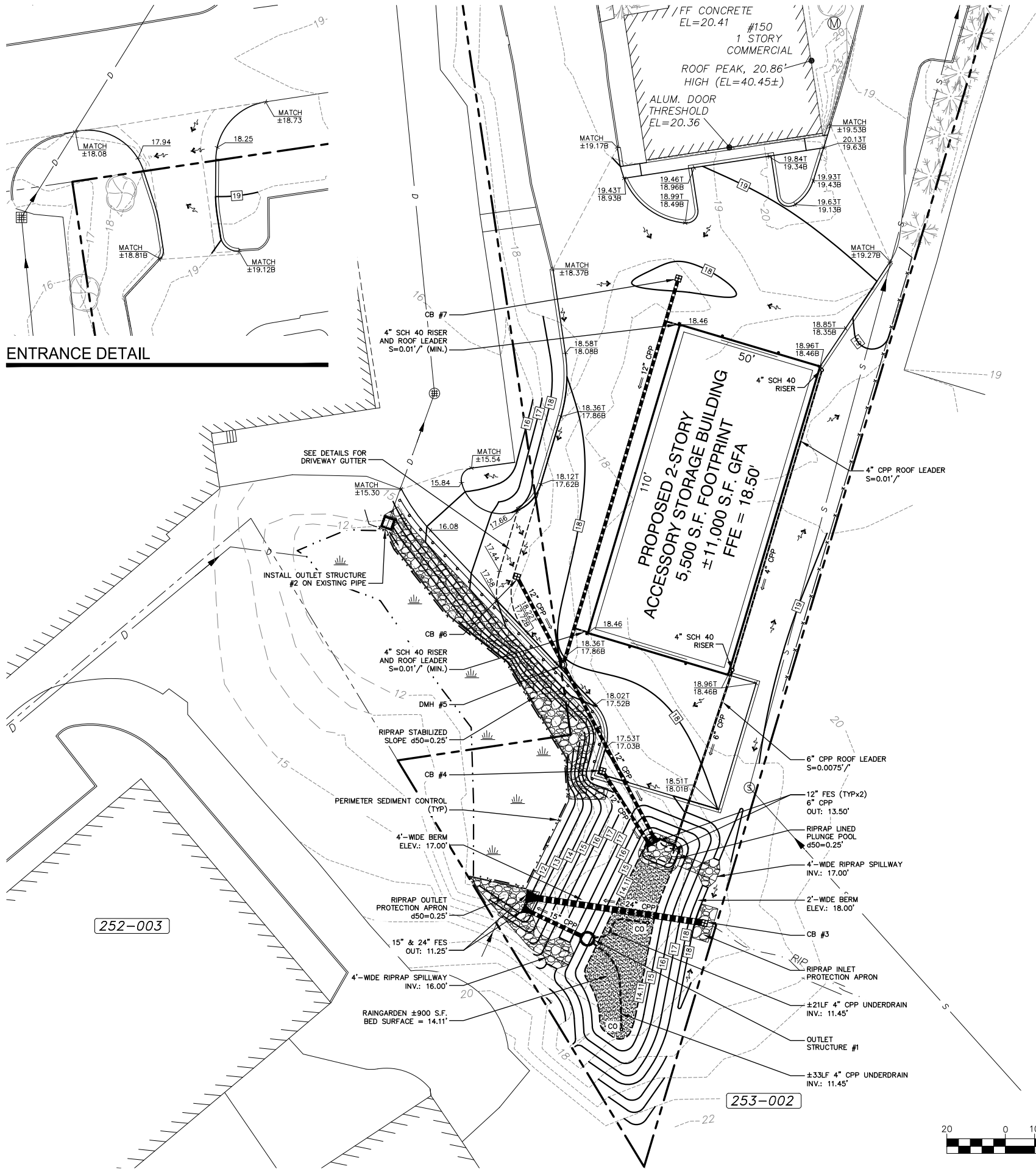
- A. Stormwater System Operations and Maintenance Report
- B. Site Grading and Drainage Plan

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

General Information		
Project Name		
Owner		
Inspector's Name(s)		
Inspector's Contact Information		
Date of Inspection	Start Time:	End Time:
Type of Inspection: ☐ Annual Report ☐ Post-storm event ☐ Due to a discharge of significant amounts of sediment		
Notes:		

General Site Questions and Discharges of Significant Amounts of Sediment			
Subject	Status	Notes	
<i>A discharge of significant amounts of sediment may be indicated by (but is not limited to) observations of the following. Note whether any are observed during this inspection:</i>			
<i>Notes/ Action taken:</i>			
1	Do the current site conditions reflect the attached site plan?	☐ Yes ☐ No	
2	Is the site permanently stabilized, temporary erosion and sediment controls are removed, and stormwater discharges from construction activity are eliminated?	☐ Yes ☐ No	
3	Is there evidence of the discharge of significant amounts of sediment to surface waters, or conveyance systems leading to surface waters?	☐ Yes ☐ No	

Permit Coverage and Plans				
#	BMP/Facility	Inspected	Corrective Action Needed and Notes	Date Corrected
	Permeable Pavers	☐ Yes ☐ No		
	Catch Basin	☐ Yes ☐ No		
	Drip Edge	☐ Yes ☐ No		
	Drainage Pipes	☐ Yes ☐ No		
	Riprap Aprons	☐ Yes ☐ No		
		☐ Yes ☐ No		



ENTRANCE DETAIL

DRAINAGE SCHEDULE

OUTLET STRUCTURE #1
RIM=16.25'
IN: 14.20' (3" ORIFICE)
IN: 11.45' (4" UNDERDRAIN)
IN: 11.45' (4" UNDERDRAIN)
IN: 11.45' (15" CB#3)
OUT: 11.35' (TO POND)
15" CPP w/FES
L=±20' S=0.005'/
PIPE TO BE INSTALLED w/ANTI-SEEP COLLAR

OUTLET STRUCTURE #2
RIM=14.10'
IN: 11.10' (24"x24" ORIFICE)
OUT: 11.10'
24" RCP (EXISTING)

CB #3
NO SUMP OR GREASE HOOD
RIM=16.50' (w/LDR 48 TRASH RACK)
OUT: 11.53' (TO POND)
24" CPP w/FES
L=±57' S=0.005'/
PIPE TO BE INSTALLED w/(2) ANTI-SEEP COLLARS, (1) EACH PER BERM CROSSING

CB #4
RIM=16.65'
OUT: ±13.64' (TO RAINGARDEN)
12" CPP w/FES
L=±27' S=0.005'/

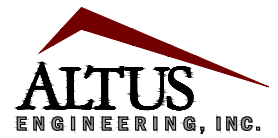
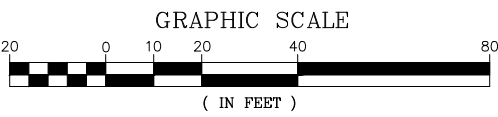
DMH #5
RIM=17.85'
IN: 13.93' (12" CB#5)
IN: 13.93' (12" CB#6)
OUT: 13.83' (TO RAINGARDEN)
12" CPP w/FES
L=±65' S=0.005'/

CB #6
RIM=17.25'
OUT: ±14.08' (TO DMH #4)
12" CPP
L=±30' S=0.005'/

CB #7
RIM=17.80'
OUT: 14.60 (TO DMH #4)
12" CPP
L=±134' S=0.005'/

GRADING AND DRAINAGE NOTES

- DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
- CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
- ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
- ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
- UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
- PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
- TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
- PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
- IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
- ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
- ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
- ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.)
- IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.



133 Court Street
(603) 433-2335
Portsmouth, NH 03801
www.altus-eng.com

NOT FOR CONSTRUCTION

ISSUED FOR:
TAC WORK SESSION

ISSUE DATE:
NOVEMBER 3, 2020

REVISIONS	
NO. DESCRIPTION	BY DATE
0 TAC WORK SESSION	EBS 10/06/20
0 TAC WORK SESSION	EBS 11/03/20

DRAWN BY: _____ EBS
APPROVED BY: _____ EBS
DRAWING FILE: 5107-SITE.dwg

SCALE: 22"x34" 1" = 20'
11"x17" 1" = 40'

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC
72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

PROJECT:
PROPOSED ACCESSORY STORAGE BUILDING
TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

TITLE:
STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-4

P5107

Section 8

Watershed Plans

Pre-Development Drainage Area Plan

Post-Development Drainage Area Plan

NOT FOR CONSTRUCTION

ISSUED FOR:
DRAINAGE REPORT

ISSUE DATE:
NOVEMBER 16, 2020

REVISIONS
NO. DESCRIPTION BY DATE
0 INITIAL SUBMITTAL CDB 11/16/20

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5107-DRAINAGE.dwg

SCALE: 22"x34" 1" = 30'
11"x17" 1" = 60'

OWNER/APPLICANT:

MADISON COMMERCIAL
GROUP, LLC

72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

PROJECT:
PROPOSED
ACCESSORY STORAGE
BUILDING

TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

TITLE:
PRE-DEVELOPMENT
DRAINAGE AREA AND
WATERSHED PLAN

SHEET NUMBER:

WS-1

LEGEND

- PROPERTY LINE
--- WETLAND/SOILS BOUNDARY
--- EXISTING CONTOUR
--- PROPOSED CONTOUR
--- WATERSHED BOUNDARY
--- Tc PATH
--- PROPOSED GROUND SLOPE DIRECTION
1 1 1 SUBCATCHMENT/POND/REACH
POA POINT OF ANALYSIS
--- WETLAND/SOILS BOUNDARY

SOIL MAP LEGEND

- SOILS - HSG C
SOILS - HSG D
SOILS - IMPERVIOUS / BUILDING

NUMERICAL SYMBOL	SOIL MAP UNIT NAME	HSG
140	CHATFIELD-HOLLIS-CANTON COMPLEX	C
299	UDORTHENTS, SMOOTHED	C
299	WETLAND (PER MAPPING)	D
699	URBAN LAND	C

ALPHA SLOPE SYMBOL RANGE

A	0-3%
B	3-8%
C	8-15%
D	15-25%

DISTURBED SOIL MAPPING UNIT SUPPLEMENT

THE FIVE COMPONENTS OF THE DISTURBED SOIL MAPPING UNIT SUPPLEMENT ON THIS MAP ARE AS FOLLOWS:

SYMBOL 1: DRAINAGE CLASS
d-MODERATELY WELL DRAINED

SYMBOL 2: PARENT MATERIAL (OF NATURALLY FORMED SOIL ONLY, IF PRESENT)
c-GLACIAL TILL MATERIAL

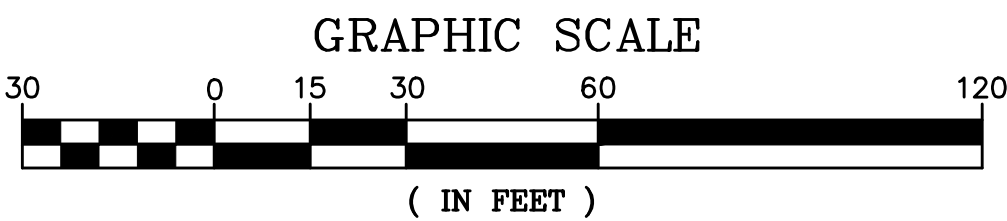
SYMBOL 3: RESTRICTIVE/IMPERVIOUS LAYERS
c-MINERAL RESTRICTIVE LAYER(S) ARE PRESENT IN THE SOIL PROFILE LESS THAN 40" BELOW THE SOIL SURFACE

SYMBOL 4: ESTIMATED KSAT* (MOST LIMITING LAYER EXCLUDING SYMBOL 3h ABOVE)
d-UNDETERMINED

SYMBOL 5: HYDROLOGIC SOIL GROUP*
c-GROUP C

*EXCLUDING MAN-MADE SURFACE IMPERVIOUS/RESTRICTIVE LAYERS

* WETLANDS MAPPING BY JOSEPH W. NOEL, CPSS/CS IN FEBRUARY 2010, IN ACCORDANCE WITH THE FEDERAL MANUAL.





LEGEND

- PROPERTY LINE
- WETLAND/SOILS BOUNDARY
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WATERSHED BOUNDARY
- Tc PATH
- PROPOSED GROUND SLOPE DIRECTION
- SUBCATCHMENT/POND/REACH
- POINT OF ANALYSIS

SOIL MAP LEGEND

	SOILS - HSG C
	SOILS - HSG D
	SOILS - IMPERVIOUS / BUILDING

NUMERICAL SYMBOL	SOIL MAP UNIT NAME	HSG
140	CHATFIELD-HOLLIS-CANTON COMPLEX	C
299	UDORTHENTS, SMOOTHED	C
299	WETLAND (PER MAPPING)	D
699	URBAN LAND	C

ALPHA SLOPE SYMBOL RANGE	
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d-MODERATELY WELL DRAINED

SYMBOL 2: PARENT MATERIAL (OF NATURALLY FORMED SOIL ONLY, IF PRESENT)
c-GLACIAL TILL MATERIAL

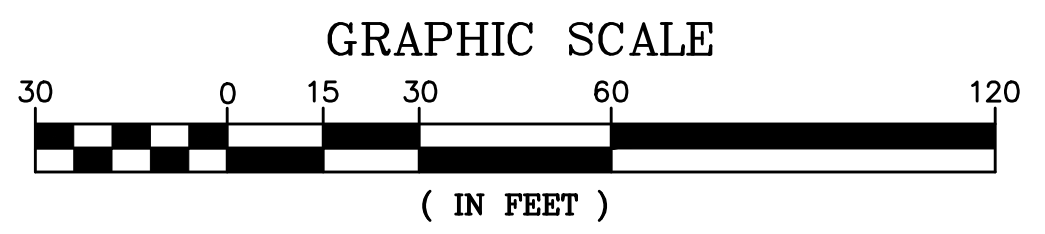
SYMBOL 3: RESTRICTIVE/IMPERVIOUS LAYERS
c-MINERAL RESTRICTIVE LAYER(S) ARE PRESENT IN THE SOIL PROFILE LESS THAN 40" BELOW THE SOIL SURFACE

SYMBOL 4: ESTIMATED KSAT* (MOST LIMITING LAYER EXCLUDING SYMBOL 3b ABOVE)
d-UNDETERMINED

SYMBOL 5: HYDROLOGIC SOIL GROUP*
c-GROUP C

*EXCLUDING MAN-MADE SURFACE IMPERVIOUS/RESTRICTIVE LAYERS

* WETLANDS MAPPING BY JOSEPH W. NOEL, CPSS/CS IN FEBRUARY 2010, IN ACCORDANCE WITH THE FEDERAL MANUAL.



ALTUS
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ISSUED FOR: DRAINAGE STUDY

ISSUE DATE: NOVEMBER 16, 2020

REVISIONS	NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMITTAL		CDB	11/16/20

DRAWN BY: CDB

APPROVED BY:

DRAWING FILE: 5107-DRAINAGE.dwg

SCALE: 22"x34" 1" = 30'
11"x17" 1" = 60'

OWNER/APPLICANT:

MADISON COMMERCIAL GROUP, LLC

72 MIRONA ROAD, SUITE 4
PORTSMOUTH, NH 03801

PROJECT:

PROPOSED ACCESSORY STORAGE BUILDING

TAX MAP 253, LOT 2A
150 MIRONA ROAD
PORTSMOUTH, NH 03801

TITLE:

POST-DEVELOPMENT DRAINAGE AREA AND WATERSHED PLAN

SHEET NUMBER:

WS-2

PS107



Civil | 133 Court Street
Site Planning | Portsmouth, NH
Environmental | 03801-4413 (603)
Engineering | 433-2335

Madison Commercial Group, LLC Accessory Storage Building

150 Mirona Road
Portsmouth, NH

Cost Estimate - Site Work

DATE: November 4, 2020
PROJECT: 5107

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL COST
SITework DEMOLITION				
DEMO SITE /BUILDING FEATURES	1	LS	\$10,000.00	\$10,000.00
REMOVAL AND DISPOSAL OF PAVEMENT		SY	\$10.00	\$0.00
REMOVAL OF LIGHT POLE	1	EA	\$1,500.00	\$1,500.00
PAVEMENT SAWCUT	464	LF	\$5.00	\$2,320.00
CLEARING AND GRUBBING				
VEGETATION REMOVAL AND LOAM STRIPPING	1	LS	\$5,000.00	\$5,000.00
SEDIMENT AND EROSION CONTROL				
TEMPORARY EROSION CONTROL	1	LS	\$1,000.00	\$1,000
WATER SUPPLY				
1" DOMESTIC WATER SERVICE	83	LF	\$25.00	\$2,075
6" DI CL 52 FIRE SERVICE	264	LF	\$85.00	\$22,440
HYDRANT ASSEMBLY	1	EA	\$4,000.00	\$4,000
ELECTRIC/PHONE/CABLE SERVICES				
SCH 40 CONDUIT (x4 PER TRENCH)	174	LF	\$60.00	\$10,440
SANITARY SEWER				
4" SDR 35 SEWER PIPE	260	LF	\$75.00	\$19,500
STORM DRAINAGE SYSTEM				
4" CPP PERFORATED DRAINAGE PIPE	54	LF	\$15.00	\$810
4" CPP DRAINAGE PIPE & TRENCH	122	LF	\$20.00	\$2,440
6" CPP DRAINAGE PIPE & TRENCH	64	LF	\$40.00	\$2,560
12" CPP DRAINAGE PIPE & TRENCH	256	LF	\$55.00	\$14,080
15" CPP DRAINAGE PIPE & TRENCH	20	LF	\$65.00	\$1,300
24" CPP DRAINAGE PIPE & TRENCH	57	LF	\$90.00	\$5,130
DEEP SUMP CATCH BASIN	4	EA	\$3,000.00	\$12,000
DRAIN MANHOLE	1	EA	\$2,500.00	\$2,500
OUTLET STRUCTURE	2	EA	\$3,500.00	\$7,000
RIP RAP	103	CY	\$60.00	\$6,180
FILTER MEDIA	50	CY	\$50.00	\$2,500
PEASTONE	11	CY	\$35.00	\$385
3/4" STONE	44	CY	\$30.00	\$1,320
SITE FEATURES				
LIGHT POLE BASE AND POLE	2	EA	\$2,000.00	\$4,000
SLOPED GRANITE CURBING	67	LF	\$55.00	\$3,685
VERTICAL GRANITE CURBING	435	LF	\$68.00	\$29,580
WOOD BEAM GUARDRAIL	129	LF	\$40.00	\$5,160
6" BOLLARD	6	EA	\$100.00	\$600
4" PAVEMENT MARKING	571	LF	\$0.20	\$114

CONCRETE FLATWORK					
4" CONCRETE SIDEWALK (INCL. SUBGRADE)	4	SY	\$105.00		\$420
AGGREGATE BASE COURSES					
GRAVEL (NHDOT 304.2)	304	CY	\$23.00		\$6,992
CRUSHED GRAVEL (NHDOT 304.3)	152	CY	\$29.00		\$4,408
HOT BITUMINOUS PAVEMENT					
2.5" BASE COURSE	62	TON	\$90.00		\$5,580
1.5" WEARING COURSE	37	TON	\$90.00		\$3,330
LANDSCAPING					
LOAM AND SEED	1	LS	\$1,000.00		\$1,000
LANDSCAPING (ALLOWANCE)	1	LS	\$5,000.00		\$5,000
SUBTOTAL					\$206,349

<i>TOTAL:</i>	<i>\$206,349</i>
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EXCLUSIONS:

ITEMS EXCLUDED FROM THIS ESTIMATE INCLUDE, BUT ARE NOT LIMITED TO, THOSE ITEMS SPECIFIED ABOVE AS BEING NOT INCLUDED IN THIS ESTIMATE AND THE FOLLOWING:

INSPECTION FEES, MONUMENTATION, HVAC PADS, TEMPORARY FENCING AND BARRICADES, TRAFFIC CONTROL, MATERIALS AND COMPACTION TESTING, BUILDING FOUNDATION, BUILDING FOUNDATION EXCAVATION, BUILDING MOUNTED EXTERIOR LIGHTING, BUILDINGS (INCLUDING MODIFICATIONS TO EXISTING BUILDINGS), TEMPORARY STABILIZATION, STAGING, MOBILIZATION, TEMPORARY CONSTRUCTION FACILITIES, SWPPP REQUIREMENTS, UNFORESEEN CONDITIONS, PRICE ESCALATION, ETC.

THIS ESTIMATE IS FOR PERMIT APPLICATION PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION, CONSTRUCTION BIDDING, CONTRACTING OR SUBCONTRACTING.