



October 8, 2019

City of Portsmouth
Planning Department
1 Junkins Avenue
Portsmouth, NH 03801

**Re: Site Plan Review Application
Portsmouth Recreation Fields
680 Peverly Hill Road/254-8 Map-Lot
CMA #1119**

Portsmouth Planning Department:

Please find enclosed one set of full-size drawings of the Portsmouth Recreation Fields and supporting materials. These plans incorporate comments we received at the September 3, 2019 TAC meeting. The attached information includes:

- Multi-purpose Recreation Fields – Phase I, Agency Review Plans, Dated October 2019
- Multi-purpose Recreation Fields – Stormwater Management Report, Revised October 2019
- Bike Path to Rec Fields Figure
- Recreation Fields – Phase I Figure
- Recreation Fields – Phase II Figure
- Trip Generation Memorandum
- Ball Fields Photometric Plan
- Parking Area Photometric Plan

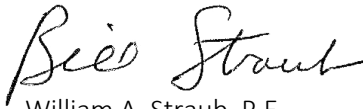
The project is located adjacent to the Portsmouth Public Works Facility at 680 Peverly Hill Road. In 2016, the City purchased 50 acres of land near the Community Campus property known as “Foundation Field.” This land was merged with the Public Works parcel and is now a single lot (254-8 Map-Lot). In the spring of 2018, City Council and Recreation Board voted to pursue development of new recreation playing fields at this site.

The recreation fields are planned to be constructed in two phases. Phase I includes construction of two new full-size turf fields with lighting, gravel parking areas, and connections to public water and sewer. Phase I also includes construction of regional stormwater treatment facilities for the upper Sagamore Creek watershed. Phase II includes design and construction of one additional field, paved parking areas, a concession stand, and other amenities.

The City also plans to construct a new transfer station on this parcel adjacent to the existing transfer station. The design and construction of this facility will be done subsequently to the Recreation Fields.

We respectfully request to be placed on the agenda for the **October 17, 2019 Planning Board Meeting**. Should you have any questions, please do not hesitate to call.

Very truly yours,
CMA ENGINEERS, INC.



William A. Straub, P.E.
Principal



Philip A. Corbett, P.E.
Project Manager

PAC:WAS:kao

Enc: Recreation Fields Figures and Plans
Cc: David Allen, City Project Manager, 1 Junkins Avenue, Portsmouth, NH 03801



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: City of Portsmouth Date Submitted: 08-19-2019

Phone Number: 603-428-1530 E-mail: dsallen@cityofportsmouth.com

Site Address: 680 Peverly Hill Road Map: 254 Lot: 8

Zoning District: Municipal Lot area: 2,625,754 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)		N/A
☐	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF). (2.5.2.8)		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)		
☐	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. (2.5.3.1B)		N/A
☐	Tax map and lot number, and current zoning of all parcels under Site Plan Review. (2.5.3.1C)		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)		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)		N/A
☐	Names, addresses and telephone numbers of all professionals involved in the site plan design. (2.5.3.1F)		N/A
☐	List of reference plans. (2.5.3.1G)		N/A
☐	List of names and contact information of all public or private utilities servicing the site. (2.5.3.1H)		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)		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)		N/A
☐	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. (2.5.4.1E)		N/A
☐	Title (name of development project), north point, scale, legend. (2.5.4.2A)		N/A
☐	Date plans first submitted, date and explanation of revisions. (2.5.4.2B)		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)		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)		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)		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)		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;		
☐	b. Zoning boundaries;		
☐	c. Dimensional Regulations;		
☐	d. Wetland delineation, wetland function and value assessment;		
☐	e. SFHA, 100-year flood elevation line and BFE data.		
	2. Buildings and Structures: (2.5.4.3B)		
☐	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;		
☐	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;		
☐	c. Total Floor Area;		
☐	d. Number of Usable Floors;		
☐	e. Gross floor area by floor and use.		
	3. Access and Circulation: (2.5.4.3C)		
☐	a. Location/width of access ways within site;		
☐	b. Location of curbing, right of ways, edge of pavement and sidewalks;		
☐	c. Location, type, size and design of traffic signing (pavement markings);		
☐	d. Names/layout of existing abutting streets;		
☐	e. Driveway curb cuts for abutting prop. and public roads;		
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;		
☐	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).		
	4. Parking and Loading: (2.5.4.3D)		
☐	a. Location of off street parking/loading areas, landscaped areas/buffers;		
☐	b. Parking Calculations (# required and the # provided).		
	5. Water Infrastructure: (2.5.4.3E)		
☐	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;		
☐	b. Location of wells and monitoring wells (include protective radii).		
	6. Sewer Infrastructure: (2.5.4.3F)		
☐	a. Size, type and location of sanitary sewage facilities & Engineering data.		
	7. Utilities: (2.5.4.3G)		
☐	a. The size, type and location of all above & below ground utilities;		
☐	b. Size type and location of generator pads, transformers and other fixtures.		

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.		
	9. Storm water Management: (2.5.4.3I)		
☐	a. The location, elevation and layout of all storm-water drainage.		
	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.		
☐	11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)		
	12. Landscaping: (2.5.4.3K)		
☐	a. Identify all undisturbed area, existing vegetation and that which is to be retained;		
☐	b. Location of any irrigation system and water source.		
	13. Contours and Elevation: (2.5.4.3L)		
☐	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.		
	14. Open Space: (2.5.4.3M)		
☐	a. Type, extent and location of all existing/proposed open space.		
☐	15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)		
☐	16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)		
☐	17. Character/Civic District (All following information shall be included): (2.5.4.3Q)		
	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. <i>(Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application) (3.2.1-2)</i>		
☐	Indicate where Low Impact Development Design practices have been incorporated. (7.1)		
☐	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)		
☐	Indicate where measures to minimize impervious surfaces have been implemented. (7.4.3)		
☐	Calculation of the maximum effective impervious surface as a percentage of the site. (7.4.3.2)		
☐	Stormwater Management and Erosion Control Plan. <i>(Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application) (7.4.4.1)</i>		

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)		
☐	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)		

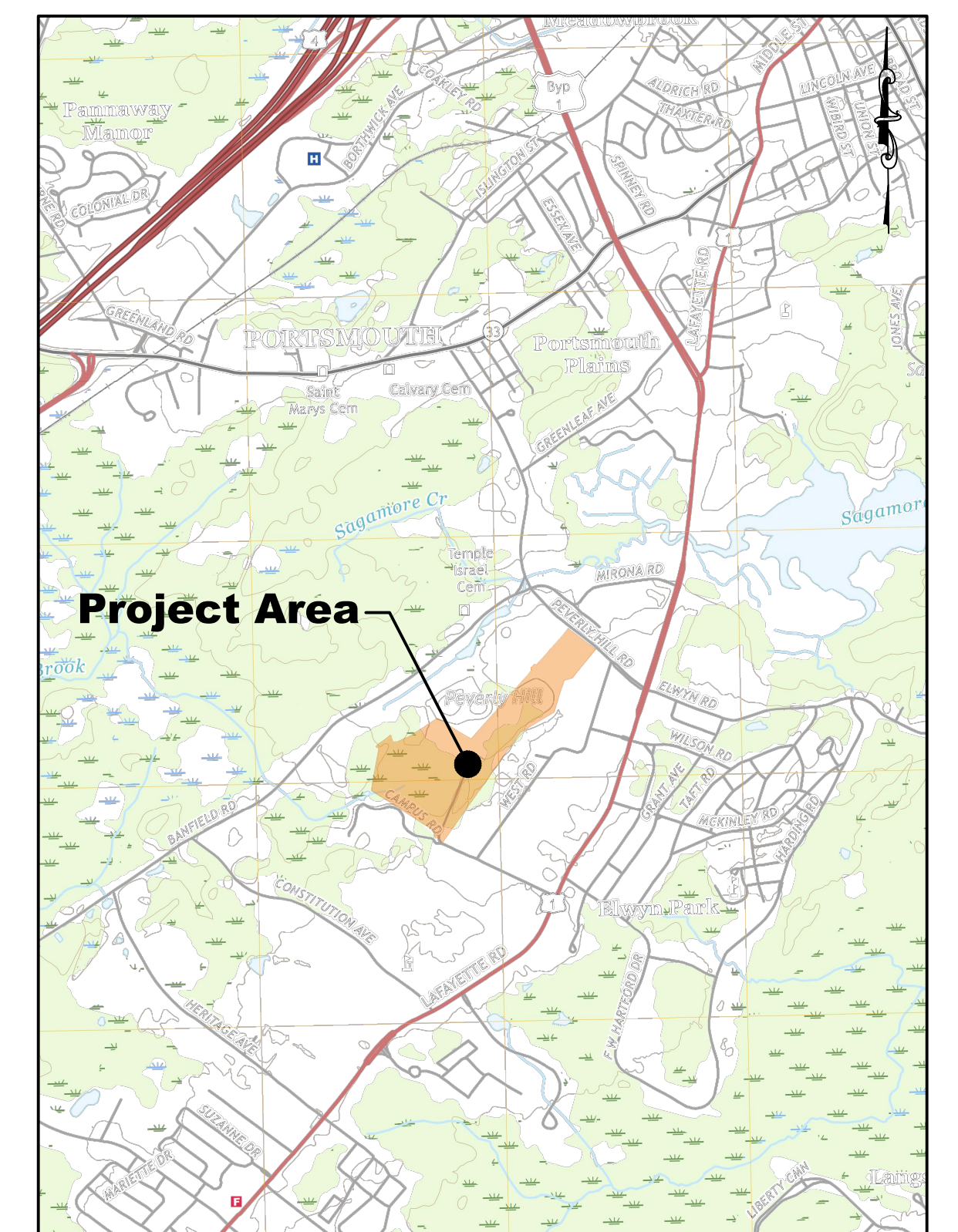
***Department of Public Works
Multi-purpose Recreation Fields-Phase I
680 Peverly Hill Road***

Sheet Index

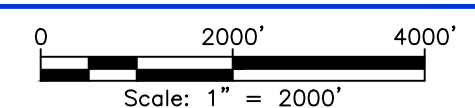
<u>Cover Sheet</u>	Cover Sheet
G101	General Notes
G102	Legend
G103	Sheet Index Plan
G104	Phasing Plan
V201-V206	Existing Conditions Plan
C101	Demolition Site Plan
C301	Site Plan Phase 1
C302	Site Plan Phase 1
C401	Grading & Drainage Plan Phase 1
C402	Grading & Drainage Plan Phase 1
C501	Utility Plan Phase 1
C601	Erosion Control Plan Phase 1
C602	Erosion Control Plan Phase 2
C603	Erosion Control Details & Notes
C604	Erosion Control Details
C801	Field Site Sections Phase 1
C802	Stormwater Plans & Sections
C803	Stormwater Plans & Sections
C804	Stormwater Plans & Sections

L1.01	Site Plan
L1.02	Drainage & Utilities
L1.03	Planting Plan
L2.00	Details
L2.01	Details
L2.02	Details

OWNER:	City of Portsmouth Department of Public Works 680 Peverly Hill Road Portsmouth, New Hampshire 03801
ZONE:	M (Municipal)
ZONING REQUIREMENTS:	LOTS AND BUILDINGS IN THE MUNICIPAL DISTRICT ARE EXEMPT FROM ALL DIMENSIONAL AND INTENSITY REGULATIONS. SEE SECTION 10.560 OF THE CITY OF PORTSMOUTH ZONING ORDINANCE.



Project Location



CIVIL/ENVIRONMENTAL/STRUCTURAL

Portsmouth, NH • Manchester, NH • Portland, ME
603/431-6196 • 603/627-0708 • 207/541-4223
c m a e n g i n e e r s . c o m

Weston & SampsonSM

427 Main Street, Suite 400, Worcester, MA
(978) 977-0110 (800) 726-7766 (Sampson)
www.westonandsampson.com

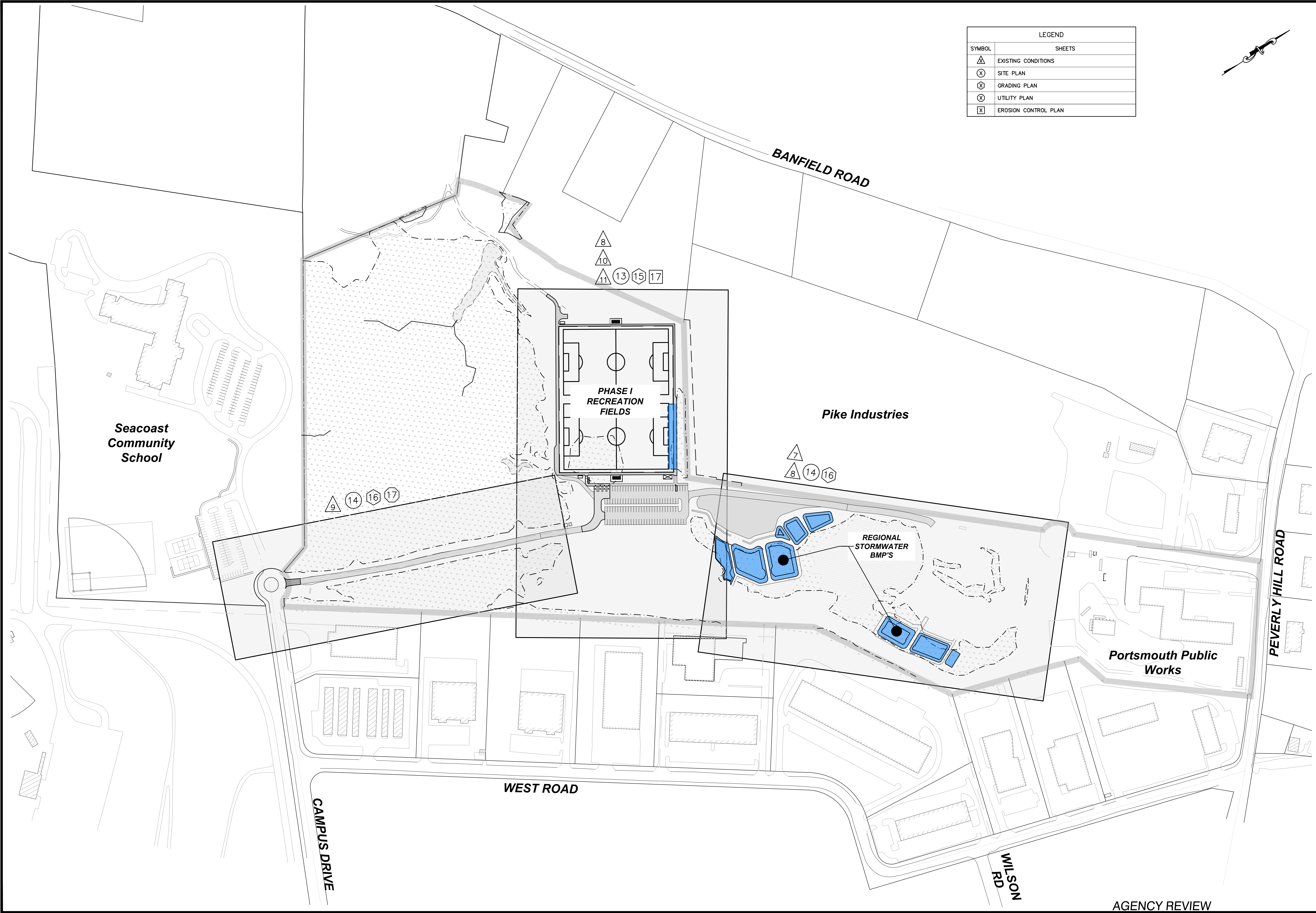
ABBREVIATIONS:

ABBREV.	MEANING	ABBREV.	MEANING
@	AT	SQ	SQUARE
ABD	ABANDONED	S	SANITARY SEWER
ABAN	ABANDON IN PLACE	ST	STEEL
ACP	ASBESTOS CEMENT PIPE	STD	SINGLE TILE DUCT
ADD'L	ADDITIONAL	STY	STORY
APPROX	APPROXIMATE	SW	SIDEWALK
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	T&B.	TOP AND BOTTOM
BTM	BOTTOM	TBC	TOP BACK OF CURB
BH	BRADLEY HEAD	TCC	TRAFFIC CONTROL CABINET
BIT	BITUMINOUS CONCRETE	TD	TELEDUCT
BLDG	BUILDING	TEL	TELEPHONE CONDUIT/DUCT BANK
BMP	BUILDING MONITORING POINT	TH	TOP OF HATCH
BOW	BOTTOM OF WALL	TL	TRAFFIC LIGHT CONDUIT
BR	BRICK	TOH	TOP OF HOOD
CB	CATCH BASIN	TOW	TOP OF WALL
C.B.	CONCRETE BOUND	TRAF	TRAFFIC CONDUIT
CBCI	CATCH BASIN WITH CURB INLET	TS	TRAFFIC SIGNAL
CC	CAST-IN-PLACE CONCRETE	TYP	TYPICAL
CEM	CEMENT	UMP	UTILITY MONITORING POINT
CL	CLEAR	UNK	UNKNOWN
C	CENTER LINE	UP	UTILITY POLE
CLF	CHAIN LINK FENCE	VC	VITRIFIED CLAY
CI	CAST IRON	VERT	VERTICAL
CICL	CAST IRON CEMENT-LINED	VCC	VERTICAL GRANITE CURB
CIP	CAST IN PLACE	W	WATER
C.O.	CLEAN OUT	W/	WITH
CONC	CONCRETE	WC	WYE CONNECTION
CONN	CONNECTION	WIP	WROUGHT IRON PIPE
COR	CORNER	WM	WATER METER
CP	CONCRETE PIPE	WMH	WATER MANHOLE
CMP	CORRUGATED METAL PIPE	WFLG	WETLAND FLAG
CSE	COBBLE STONE EDGE		
D	DRAIN		
DEPT	DEPARTMENT		
DH	DRILL HOLE		
DI	DUCTILE IRON		
DIA	DIAMETER		
DICL	DUCTILE IRON CEMENT-LINED		
DIA	DIAMETER		
DISCH	DISCHARGE		
DMH	DRAIN MANHOLE		
DLY	DOUBLE SOLID YELLOW LINE		
DT	DRAIN TILE		
DWG	DRAWING		
EA	EACH		
EF	EACH FACE		
EM	ELECTRIC METER		
E-VAULT	ELECTRIC-VAULT		
EL, ELEV	ELEVATION		
ELEC, E	ELECTRIC		
EOP	EDGE OF PAVEMENT		
EXIST	EXISTING		
ESHWL	EXIST. SEASONAL HIGH WATER TABLE		
F&C	FRAME AND COVER		
FA	FIRE ALARM		
FD	FLOOR DRAIN		
FED	FEDERAL		
FH	FIRE HYDRANT		
FM	FORCE MAIN		
FND	FOUND		
FP	FLAG POLE		
FT	FOOT		
GM	GAS METER		
GRAN	GRANITE		
HDPE	HIGH DENSITY POLYETHYLENE		
HH	HAND HOLE		
HORIZ	HORIZONTAL		
HYD	HYDRANT		
H/C	HANDICAP		
INV	INVERT		
IN	INCHES		
IP	IRON PIPE		
L	LEAVE		
MBOX	MAIL BOX		
MHB	MASS HIGHWAY BOUND		
MHW	MEAN HIGH WATER		
MIN	MINIMUM		
MON	MONUMENT		
NIC	NOT IN CONTRACT		
NO, #	NUMBER		
NTS	NOT TO SCALE		
PB	PULL BOX		
PC	PRECAST CONCRETE		
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE		
PCI	PIT CAST IRON		
PCB	PROPOSED CATCH BASIN		
PD MH	PROPOSED DRAINAGE MANHOLE		
PERF	PERFORATED		
PM	PARKING METER		
PNS	PIPE NOT SEEN		
POCS	PROPOSED OUTLET CONTROL STRUCTURE		
PROP	PROPOSE		
PSI	POUNDS PER SQUARE INCH		
PVC	POLYVINYL CHLORIDE		
R	REMOVE/RELOCATE		
REC	RECORD INFORMATION		
REINF	REINFORCEMENT		
RES	REVERSE EXTENSION SEWER		
RET	RETAIN		
RCP	REINFORCED CONCRETE PIPE		
RS	RECEIVING SHAFT		
ROW	RIGHT-OF-WAY		
SB	STREET LIGHT BASE		
S.B.	STONE BOUND		
SD	STORM DRAIN		
SF	FIRE SERVICE		
SGC	SLOPED GRANITE CURB		
SLCC	STREET LIGHT CONTROL CABINET		
SMH	SEWER MANHOLE		
SPEC	SPECIFICATION		
SWL	SINGLE WHITE LINE		

GENERAL SYMBOLS:

EXISTING		PROPOSED
	UTILITY POLE & GUY WIRE	
	UTILITY POLE W/ LIGHT	
	MAILBOX	
	VENT PIPE	
	SIGNS (TWO POSTS)	
	GRANITE BOUND FOUND	
	DRILL HOLE FOUND	
	IRON PIPE/ROD FOUND	
	METAL POST	
	GRANITE OR CONC. POST	
	FIRE HYDRANT	
	GAS GATE VALVE	
	WATER GATE VALVE	
	WATER CURB STOP	
	VALVE ELECTRIC BOX	
	CATCH BASIN	
	DRAIN MANHOLE	
	ELECTRIC MANHOLE	
	TELEPHONE MANHOLE	
	WATER MANHOLE	
	SEWER MANHOLE	
	MANHOLE	
	BUSH/SHRUB	
	TREE STUMP	
	CONIFEROUS TREE	
	DECIDUOUS TREE	
	ROCK	
	BORING	
	WETLAND	
	WETLAND FLAG	
	SPOT LIGHT	
	GUY WIRE	
	EDGE OF PAVEMENT	
	STOCKADE FENCE	
	EROSION CONTROL FIBER ROLL	
	SPOT ELEVATION	
	CITY LAYOUT LINE	
	OVERHEAD WIRES	
	SEWER LINE	
	FORCEMAIN	
	DRAIN LINE	
	GAS LINE	
	WATER SERVICE UNDERGROUND	
	UNDERGROUND ELECTRIC LINE	
	APPROX. ABUTTERS	
	LOT LINE	
	SHRUB LINE	
	TREE LINE	
	STONE WALL	
	GUARDRAIL	
	MAJOR CONTOUR LINE	
	MINOR CONTOUR LINE	
	EASEMENT LINE	
	WETLAND LINE	
	STATE HIGHWAY LAYOUT LINE	
	WATER MAIN	
	BOLLARD	
	SLOPE LINE	
	CONSTRUCTION BASELINE	
	LIMITS OF WORK	
	THRUST BLOCK	
	ELECTRICAL MANHOLE	
	ELECTRICAL TRANSFORMER	
	OUTLET CONTROL STRUCTURE WITH GRATE	
	OUTLET CONTROL STRUCTURE WITH COVER	
	HEADWALL	

City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Recreation Fields Legends			date: October 2019	designed by: JHK	  CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 603/627-0708 207/541-4223 c m a e n g i n e e r s . c o m					
			project no: 1119	drawn by: AGL						
			file name: 1119 NOTES.dwg	approved by: PAC						
			scale:							
drawing no. G-102										
sheet:	3	of	42							

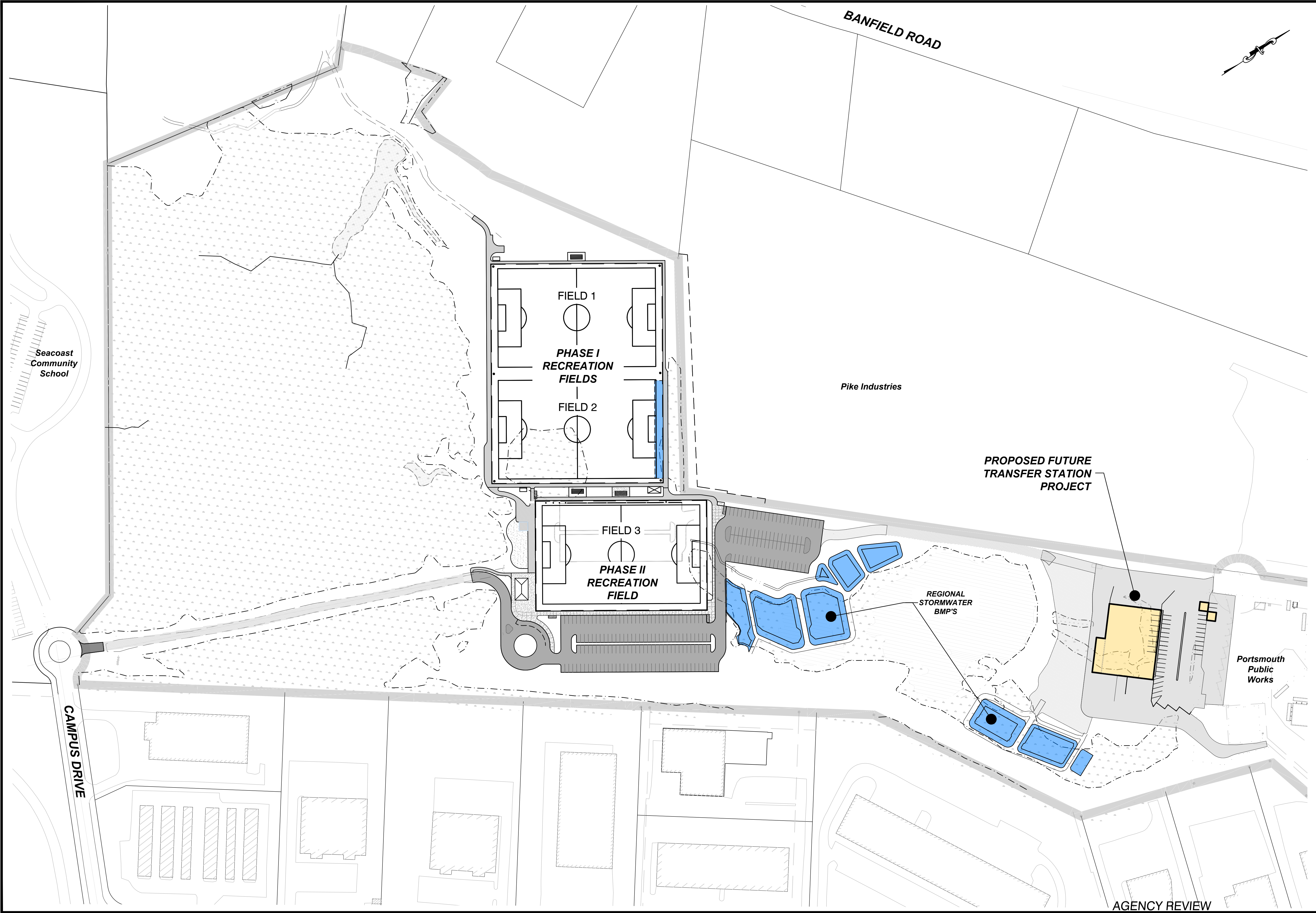


LEGEND	
SYMBOL	SHEETS
	EXISTING CONDITIONS
	SITE PLAN
	GRADING PLAN
	UTILITY PLAN
	EROSION CONTROL PLAN

City of Portsmouth, New Hampshire Department of Public Works		designed by: JHK	date: October 2019	CMA ENGINEERS Civil/Environmental/Structural Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a e n g i n e e r s . c o m		no.	revision	by	date
Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road		drawn by: AGL	project no: 1119	Professional Engineer JOSEPH H. KIEFFNER No. 2517 LICENSED		1	TAC WORK SESSION SUBMISSION	JHK	07/09/2019
Recreation Fields Sheet Index Plan		approved by: PAC	file name: 1119 Overall Plan.dwg	Scale: 1" = 150'		2	CONSERVATION COMMISSION SUBMISSION	JHK	07/24/2019
				Scale: 1" = 300'		3	TAC PUBLIC HEARING	JHK	8/19/2019
						4	PLANNING BOARD PUBLIC HEARING	JHK	10/8/2019

drawing no.
G-103

sheet: 4 of 42



AGENCY REVIEW

City of Portsmouth, New Hampshire Department of Public Works		drawing no. G-104		sheet: 5 of 42	
Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road		Phasing Plan			
date: October 2019	designed by: JHK	project no: 1119	drawn by: AGL	approved by: PAC	scale: 0 100' 200' Scale: 1" = 100'
file name: 1119 Overall Plan.dwg					
Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a e n g i n e e r s . c o m					
4	PLANNING BOARD PUBLIC HEARING	10/8/2019	JHK	no.	by
3	TAC PUBLIC HEARING	8/19/2019	JHK	revision	date
2	CONSERVATION COMMISSION SUBMISSION	07/24/2019	JHK		
1	TAC WORK SESSION SUBMISSION	07/09/2019	JHK		

OWNER OF RECORD

MAP-LOT

252-2-10	JMK REALTY LLC PO BOX 971, PORTSMOUTH, NH 03802	3656/744
252-2-11	HEG WEST ROAD LLC, 2 INTERNATIONAL WAY, LAWRENCE, MA 01843 60 WEST RD, PORTSMOUTH, NH 03801	5835/67
252-2-12	ONE HUNDRED WEST LLC, 100 WEST RD, PORTSMOUTH, NH 03801	3589/1427
252-2-14	LITCHFIELD PORTSMOUTH LLC C/O EATON PARTNERS INC, 175 CANAL ST STE 401, MANCHESTER, NH 03101	4800/1185
252-3	LIGHTHOUSE MANUFACTURING LLC, 25 SOUTH SATELLITE RD, SOUTH WINDSOR, CT 06074	N/A
252-4 & 252-5	4 AMIGOS LLC, 321 LAFAYETTE RD, HAMPTON, NH 03842	N/A
253-4	DPH REALTY LLC, 30 MIRONA RD EXT, PORTSMOUTH, NH 03801	N/A
253-5	GERALD W. & TERESA M. REYNOLDS, 164 MASON RD, MILTON, NH 03851	N/A
253-5-1	BOURAS GROUP LLC, 10 MIRONA RD, PORTSMOUTH, NH 03801	N/A
254-7	PIKE INDUSTRIES, INC., 3 EASTGATE PARK RD, BELMONT, NH 03220	3192/1085
254-8-1	MCM ACQUISITION 2017 LLC ATTN: TAX DEPT NH22094-A, 8051 CONGRESS AVE, BOCA RATON, FL 33487-1307	N/A
266-1	RICCI CONSTRUCTION CO., INC., 225 BANFIELD RD, PORTSMOUTH, NH 03801	2527/322
266-3	ANDREW R. & CAROL ANN CROTEAU, 285 BANFIELD RD, PORTSMOUTH, NH 03801	2274/1868
266-4	FOUNDATION FOR SEACOAST HEALTH, 100 CAMPUS DR SUITE 1, PORTSMOUTH, NH 03801	3276/2980 & 3259/2178
266-5	HOPE FOR TOMORROW FOUNDATION, 1 STONERIDGE DR, RYE, NH 03870	5783/602
267-17-1	300 WEST RD LLC, 300 WEST ROAD UNIT #1, PORTSMOUTH, NH 03801	4453/1140
267-17-2	GRAYWOLF PROPERTIES LLC, 1 LIBBEY LN, RYE, NH 03870	4397/2371
267-17-3	GRAYWOLF PROPERTIES LLC, 1 LIBBEY LN, RYE, NH 03870	4439/1934
267-17-4	GRAYWOLF PROPERTIES LLC, 1 LIBBEY LN, RYE, NH 03870	4397/2371
267-19-1	BBJ PROPERTIES, INC., 38 RAINBOW LN, SANFORD, ME 04073	3396/126
267-19-2	PETER PARADIS, 481 DENNETT ST, PORTSMOUTH, NH 03801	3090/1083
267-19-3	KEVIN J. DUPLISEA, 270 WEST RD #3, PORTSMOUTH, NH 03801	5564/2186
267-19-4	WEST ROAD EQUIPMENT LLC, 270 WEST RD UNIT 4A, PORTSMOUTH, NH 03801	5059/2202
267-20	HARVEY PROPCO LLC, 1400 MAIN ST, WALTHAM, MA 02451	5660/1693
267-21	P A M REALTY TRUST C/O CP MANAGEMENT, INC., 11 COURT ST. SUITE 100, EXETER, NH 03833	4438/828
267-21	STERLING REALTY, INC., 143 PINELOCH DR, PORTLAND, ME 04103	2762/2839
267-22	MICRONICS, INC., 200 WEST RD, PORTSMOUTH, NH 03801	5423/2254
267-23	ENGEL FAMILY TRUST, ROBERT ENGEL TRUSTEE, PO BOX 6070, MANCHESTER, NH 03108	3459/1842
273-5	BELLWOOD ASSOCIATES LTD PARTNERSHIP C/O FESTIVAL FUNK PROPERTY TAX SERVICES PO BOX 543185, DALLAS, TX 75354	3471/2972

NOTES:

1. OWNER OF RECORD.....CITY OF PORTSMOUTH, N.H.
ADDRESS.....1 JUNKINS AVE, PORTSMOUTH, NH 03801
DEED REFERENCE.....3276/2986 & 5819/2310
TAX SHEET / LOT.....254-8

ZONED:..... MUNICIPAL FRONT YARD SETBACKN/A
MINIMUM LOT AREA N/A SIDE YARD SETBACK.....N/A
FRONTAGE N/A REAR YARD SETBACK.....N/A
2. THE RELATIVE ERROR OF CLOSURE WAS LESS THAN 1 FOOT IN 15,000 FEET.
3. THIS PLAN IS BASED ON A FIELD SURVEY, INFORMATION FROM PLANS OF RECORD AND AERIAL MAPPING BY EASTERN TOPOGRAPHICS.
PRIMARY BM: CITY CONTROL POINT "INDU"
HORIZONTAL DATUM: NAD 1983 (1986 CONTROL ADJUSTMENT)
VERTICAL DATUM: NAVD 1988
4. 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.
5. THE SUBJECT TRACTS LIE IN ZONE X (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FLOOD INSURANCE MAP NO. 33015C0270E, EFFECTIVE DATE MAY 17, 2005, BY FEMA.
6. PARCEL 254-8 AND A PORTION OF PARCEL 266-4 ARE SUBJECT TO A RESTRICTIVE COVENANT AGREEMENT BETWEEN JOHN IAFOLLA CO., INC. & PIKE INDUSTRIES, INC., SEE RCRD BOOK 3192, PAGE 1088, BOOK 3193, PAGE 2059 AND BOOK 3198, PAGE 853.
7. WETLANDS DELINEATION 10/2018 BY GZA ENVIRONMENTAL.
8. ENGINEER OR CONTRACTOR TO VERIFY SITE BENCHMARKS BY LEVELING BETWEEN 2 BENCHMARKS PRIOR TO THE SETTING OR ESTABLISHMENT OF ANY GRADES/ELEVATIONS. DISCREPANCIES ARE TO BE REPORTED TO JAMES VERRA AND ASSOC., INC.

WETLAND DELINEATION NOTES:

1. JURISDICTIONAL WETLANDS WERE DELINEATED BY GZA GEOENVIRONMENTAL, INC. (GZA) ON OCTOBER 19 AND 22, 2018, AND APRIL 24, 2019, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' (ACOE) "WETLANDS DELINEATION MANUAL," TECHNICAL REPORT Y-87-1 AND THE "REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL, NORTHCENTRAL AND NORTHEAST REGION." JANUARY 2012.
2. GZA EVALUATED WETLANDS AS POTENTIAL VERNAL POOLS ON APRIL 24, 2019 IN ACCORDANCE WITH THE NH CODE OF ADMINISTRATIVE RULES (ENV-WT 101.75, 101.86, 101.106) AND THE MANUAL "IDENTIFICATION AND DOCUMENTATION OF VERNAL POOLS IN NEW HAMPSHIRE, NEW HAMPSHIRE FISH AND GAME DEPARTMENT, NONGAME AND ENDANGERED WILDLIFE PROGRAM. 2004.
3. GZA PERFORMED A WETLANDS FUNCTIONS AND VALUES ASSESSMENT ON OCTOBER 19 AND 22, 2018, AND APRIL 24, 2019, IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," (SEPTEMBER 1999, AND CLASSIFIED WETLANDS IN ACCORDANCE WITH THE "CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES"(FEDERAL GEOGRAPHIC DATA COMMITTEE, 2013).

WETLAND STANDARDS:

FEDERAL GEOGRAPHIC DATA COMMITTEE. 2013. CLASSIFICATION OF WETLANDS AND DEEPWATER HABITATS OF THE UNITED STATES. FGDC-STD-004-2013. SECOND EDITION. WETLANDS SUBCOMMITTEE, FEDERAL GEOGRAPHIC DATA COMMITTEE AND U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, DC.

LICHVAR, R.W., D.L. BANKS, W.N. KIRCHNER, AND N.C. MELVIN. 2016. THE NATIONAL WETLAND PLANT LIST: 2016 WETLAND RATINGS. PHYTONEURON 2016-30: 1-17. PUBLISHED 28 APRIL 2016. ISSN 2153 733X

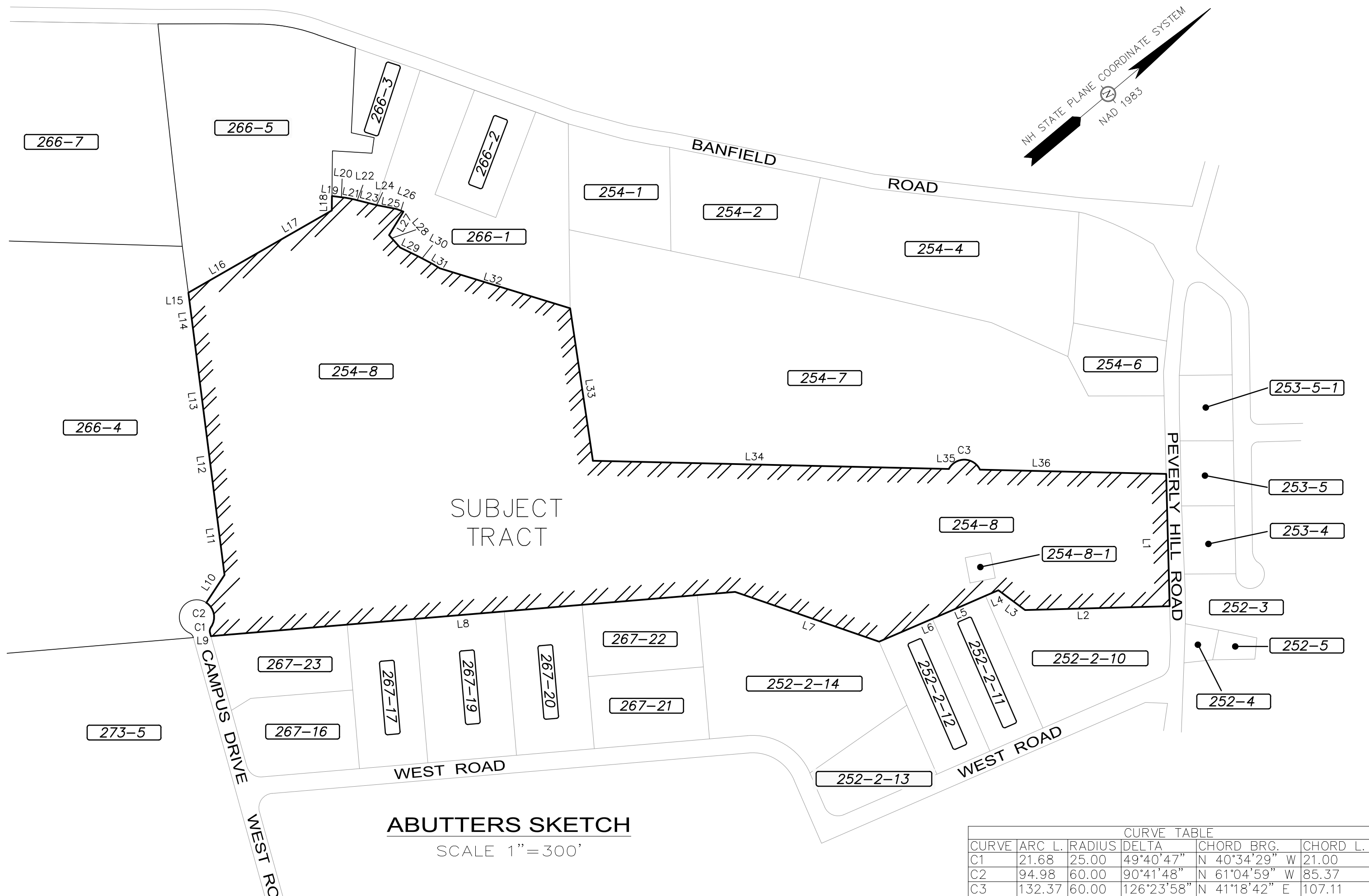
WETLAND STANDARDS (CONTINUED):

NEW ENGLAND HYDRIC SOILS TECHNICAL COMMITTEE. 2019. VERSION 4. FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, INTERSTATE WATER POLLUTION CONTROL COMMISSION, LOWELL, MASSACHUSETTS.

U.S. ARMY CORPS OF ENGINEERS, ENVIRONMENTAL LABORATORY. 1987. CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1, U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISSISSIPPI.

U.S. ARMY CORPS OF ENGINEERS. 2012. REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION, ED. J. S. WAKELY, R. W. LICHVAR, AND C. V. NOBLE. ERDC/EL TR-12-1. VICKSBURY, MS: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER.

U.S. DEPARTMENT OF AGRICULTURE, NATURAL RESOURCE CONSERVATION SERVICE, 2018. FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8.2. L.M. VASILAS, G.W. HURT, AND J.F. BERKOWITZ (EDS.). USDA, NRCS, IN COOPERATION WITH THE NATIONAL TECHNICAL COMMITTEE FOR HYDRIC SOILS.



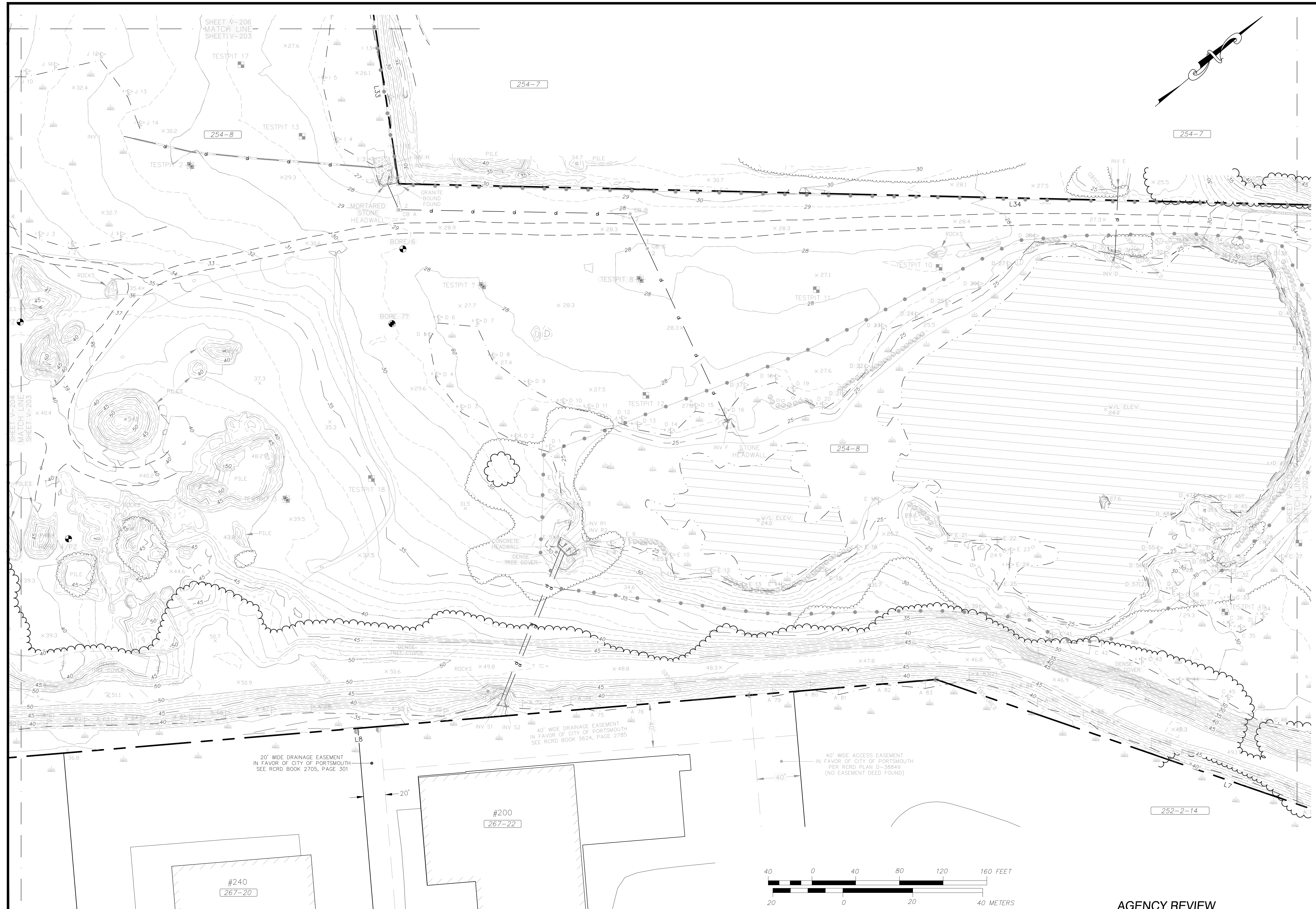
CURVE TABLE					
CURVE	ARC L.	RADIUS	DELTA	CHORD BRG.	CHORD L.
C1	21.68	25.00	49°40'47"	N 40°34'29" W	21.00
C2	94.98	60.00	90°41'48"	N 61°04'59" W	85.37
C3	132.37	60.00	126°23'58"	N 41°18'42" E	107.11

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S 51°30'32" E	457.64
L2	S 38°28'19" W	500.01
L3	S 76°35'13" W	114.96
L4	S 16°43'54" W	48.95
L5	S 16°31'44" W	132.02
L6	S 16°47' W	268.29
L7	S 59°02'50" W	526.73
L8	S 35°33'38" W	181.23
L9	N 65°24'52" W	111.22
L10	N 46°46'42" W	115.00
L11	N 57°17'20" W	270.98
L12	N 57°17'20" W	222.72
L13	N 57°17'20" W	287.56
L14	N 57°17'20" W	202.89
L15	N 10°10'42" E	4.72
L16	N 10°10'42" E	276.88
L17	N 10°10'42" E	290.00
L18	N 49°22'45" W	50.00
L19	N 47°59'56" E	21.12
L20	N 46°59'02" E	28.17
L21	N 51°03'35" E	28.56
L22	N 54°28'19" E	13.75
L23	N 54°07'57" E	64.55
L24	N 53°40'31" E	6.03
L25	N 50°59'41" E	66.28
L26	N 61°41'33" E	25.04
L27	N 34°34'23" E	97.09
L28	N 88°31'38" E	57.65
L29	N 65°49'31" E	50.30
L30	N 67°50'02" E	78.61
L31	N 71°47'07" E	26.13
L32	N 57°02'00" E	471.36
L33	N 58°29'19" E	533.10
L34	N 41°19'31" E	1223.68
L35	N 39°27'07" E	7.78
L36	N 41°18'42" E	644.30

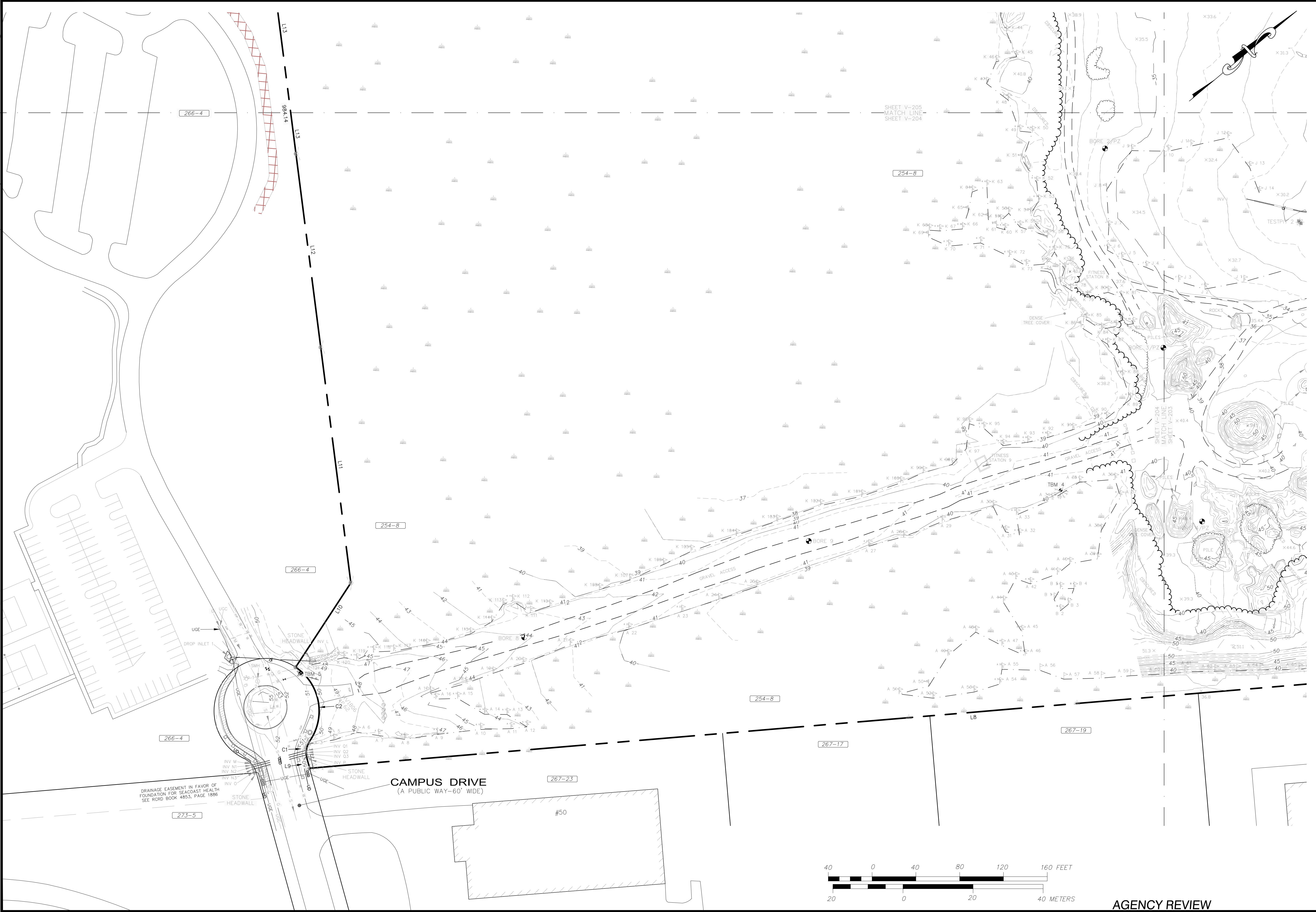
REFERENCE PLANS:

1. AMENDED SITE PLAN, PROPERTY OF MICRONICS INC, 200 WEST ROAD, PORTSMOUTH, N.H., DATED 12/30/2014, RCRD PLAN D-38846.
2. LOT LINE REVISION PLAN, 755 BANFIELD ROAD REALTY, LLC, CONSTITUTION AVENUE, PORTSMOUTH, N.H., REVISED TO 11/28/2011, RCRD PLAN D-37091.
3. DRAINAGE EASEMENT PLAN OVER LAND OF BELLWOOD ASSOCIATES LIMITED PARTNERSHIP, CAMPUS DRIVE, PORTSMOUTH, N.H., DATED 7/30/2007, RCRD PLAN D-35073.
4. ACTIVITY AND USE RESTRICTION EASEMENT PLAN FOR PORTSMOUTH DEPARTMENT OF PUBLIC WORKS, 680 PEVERLY HILL ROAD, PORTSMOUTH, N.H., REVISED TO 9/13/2006, RCRD PLAN D-34222.
5. LATTICE TOWER EASEMENT PLAN, PEVERLY HILL ROAD, PORTSMOUTH, N.H., FOR MESSAGE CENTER MANAGEMENT, REVISED TO 4/16/2002, RCRD PLAN D-30056.
6. FOUNDATION FOR SEACOAST HEALTH, PORTSMOUTH, N.H., LOT LINE ADJUSTMENT, JOHN IAFOLLA COMPANY, INC. AND CITY OF PORTSMOUTH, REVISED TO 4/14/1998, RCRD PLAN D-26202.
7. SUBDIVISION & LOT LINE RELOCATION PLAN FOR PIKE INDUSTRIES, INC. & JOHN IAFOLLA COMPANY, INC, PEVERLY HILL ROAD/ BANFIELD ROAD, PORTSMOUTH, N.H., REVISED TO 11/21/1997, RCRD PLAN D-26136.
8. SUBDIVISION PLAN FOR JOHN IAFOLLA COMPANY, INC., PEVERLY HILL ROAD/ BANFIELD ROAD, PORTSMOUTH, N.H., REVISED TO 11/20/1996, RCRD PLAN D-25124.
9. LOT LINE ELIMINATION PLAN FOR BELLWOOD ASSOCIATES LIMITED PARTNERSHIP, LAFAYETTE ROAD/ CONSTITUTION AVENUE, PORTSMOUTH, N.H., DATED 9/3/1991, RCRD PLAN D-21288.
10. PLAN OF DRAINAGE EASEMENT FOR LAFAYETTE WEST CORP & FFP INTERIM PARTNERS, WEST ROAD, PORTSMOUTH, N.H., REVISED TO 3/28/1989, RCRD PLAN D-22902.
11. SUBDIVISION PLAN, LINCOLN AND MARY HANSCOM, PORTSMOUTH, N.H., DATED 1/1983, RCRD PLAN D-11441.
12. LOT LINE REVISION PLAN, CAMPUS DRIVE, BANFIELD & PEVERLY HILL ROADS, PORTSMOUTH, N.H., FOR CITY OF PORTSMOUTH, N.H. & FOUNDATION FOR SEACOAST HEALTH, REVISED TO 12/14/2016, RCRD PLAN D-39897.

City of Portsmouth, New Hampshire Department of Public Works <i>Multi-purpose Recreation Fields-Phase I</i> 680 Peverly Hill Road <i>Existing Conditions Plan</i>	date: October 2019	designed by: JHK	Scale: 1" = 300'	Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a e n g i n e e r s . c o m				
	project no: 1119	drawn by: AGL						
	file name: 1119 ECP.dwg	approved by: PAC						
					4 PLANNING BOARD PUBLIC HEARING	10/8/2019	JHK	
					3 TAC PUBLIC HEARING	8/19/2019	JHK	
			2 CONSERVATION COMMISSION SUBMISSION	07/24/2019	JHK			
			1 TAC WORK SESSION SUBMISSION	07/09/2019	JHK			
					no.	revision	date	by



City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Existing Conditions Plan	date: October 2019	designed by: JHK	Scale: 1" = 40'	Scale: 1" = 40'	CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL	Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223	C m a e n g i n e e r s . c o m	no. revision date	by
	project no: 1119	drawn by: AGL							
	file name: 1119 ECP.dwg	approved by: PAC							
	scale: 40'								
drawing no. V-203									
sheet:	8	of	42						



City of Portsmouth, New Hampshire Department of Public Works		date: October 2019		designed by: JHK	
Multi-purpose Recreation Fields-Phase I		project no: 1119		drawn by: AGL	
680 Peverly Hill Road		file name: 1119 ECP.dwg		approved by: PAC	
Existing Conditions Plan		scale: 0 40' 80'		Scale: 1" = 40'	
drawing no: V-204		sheet: 9 of 42		no. 1	
revision		date		by	
1 TAC WORK SESSION SUBMISSION		07/09/2019		JHK	
2 CONSERVATION COMMISSION SUBMISSION		07/24/2019		JHK	
3 TAC PUBLIC HEARING		8/19/2019		JHK	
4 PLANNING BOARD PUBLIC HEARING		10/8/2019		JHK	

CMAENGINEERS

Civil/Environmental/Structural

Portsmouth, NH • Manchester, NH • Portland, ME
603/431-6196 • 603/627-0708 • 207/541-4223

c m a e n g i n e e r s . c o m

PIEZOMETER REFERENCE ELEVATIONS

(TOP OF PVC PIPE – MARK SET)

LOCATION	TOP OF PIPE	GROUND
BORE1/PZ	39.56	36.8
BORE2/PZ	39.26	36.0
BORE3/PZ	42.21	38.7
BORE4/PZ	43.32	40.7

CB 44
RIM EL= 45.55
(1) INV IN 15"HDPE= 42.40
(2) INV OUT 15"HDPE= 42.30

CB 52
RIM EL= 46.87
(1) INV IN 12"HDPE= 43.10
(2) INV IN 12"HDPE= 43.37
(3) INV OUT 15"HDPE= 43.67

CB 53
RIM EL= 46.69
(1) INV OUT 12"HDPE= 43.35

CB 54
RIM EL= 44.37
(1) INV IN 15"HDPE= 41.26
(2) INV IN 12"HDPE= 41.19
(3) INV OUT 18"HDPE= 41.10

CB 55
RIM EL= 49.67
(1) INV OUT 12"HDPE= 43.00

CB 56
RIM EL= 47.97
(1) INV OUT 12"HDPE= 44.05

CB A
RIM EL= 27.63
(1) INV IN 24"HDPE= 23.81
(2) INV OUT 24"HDPE= 23.73

CB B
RIM EL= 27.41
(1) INV IN 24"HDPE= 23.43
(2) INV OUT 24"HDPE= 23.41

CB C
RIM EL= 27.22
(1) INV IN 24"HDPE= 23.24
(2) INV OUT 24"HDPE= 23.26

SMH 5557
RIM EL= 52.36
(1) INV IN 4"PVC FM= 48.1±
(2) INV OUT 8"PVC= 47.7±

DRAIN & SEWER TABLE

DMH A
RIM EL= 49.52
(1) INV IN 18"HDPE= 40.39
(2) INV IN 15"HDPE= 39.73
(3) INV OUT 18"HDPE= 40.08
BRICK WEIR FLOW LINE
FOR (4) = 41.23
(4) INV OUT 18"HDPE= 40.24

DMH B & DMH C ARE VORTECHNICS
DRAINAGE TREATMENT STRUCTURES

DMH B
RIM EL= 48.99

DMH C
RIM EL= 49.03
TRAPEZOIDAL WEIR EL= 41.73
(1) INV OUT 18"HDPE= 39.88

DROP INLET 1
CONCRETE COVER EL= 51.58
2 SIDE INLETS 0.85 W X 0.70 H
INLET EL= 50.71
(1) INV OUT 18"HDPE= 46.26

INV A
INV OUT 18"HDPE= 40.0±
INV B
INV OUT 18"HDPE= 39.65
INV C1
INV OUT 24"RCP= 33.54
INV C2
INV OUT 24"RCP= 33.56
INV D
54"W X 42"H ARCHD CMP
INV IN= 22.31
INV E
54"W X 42"H ARCHD CMP
INV OUT= 21.90

INV F
INV OUT 24"HDPE= 23.06
INV G
INV IN 24"HDPE= 23.89
INV H (PERFORATED PIPE)
INV OUT 6"HDPE= 24.52
INV I (PERFORATED PIPE)
INV IN 6"HDPE= 30.63

INV J1
INV IN 15"HDPE= 31.83
INV J2
INV IN 15"HDPE= 31.78
INV K1
INV OUT 15"HDPE= 30.66
INV K2
INV OUT 15"HDPE= 30.90
INV L
INV OUT 18"HDPE= 45.80
INV M (UNDERDRAIN)
INV OUT 4"PVC= 46.63

INV N1
INV IN 18"HDPE= 45.26
INV N2
INV IN 18"HDPE= 45.23
INV N3
INV IN 18"HDPE= 45.23
INV O (UNDERDRAIN)
INV OUT 4"PVC= 46.05
INV P (UNDERDRAIN)
INV OUT 4"PVC= 46.15
INV Q1
INV OUT 18"HDPE= 44.90
INV Q2
INV OUT 18"HDPE= 44.92
INV Q3
INV OUT 18"HDPE= 44.84
INV R1
INV OUT 36"CMP= 27.33
INV R2
INV OUT 36"CMP= 27.32
INV S1
INV IN 36"CMP= 30.68
INV S2
INV IN 36"CMP= 30.64
INV T1
INV IN 24"RCP= 35.22
INV T2
INV IN 24"RCP= 35.47
INV U
INV IN 12"HDPE= 41.23

TBM TABLE

TBM 1
WESTERLY CORNER OF CONCRETE
TRANSFORMER PAD
EL= 49.68

TBM 2
BOLT W/ "X" CUT
HYDRANT TOP FLANGE
EL= 48.63

TBM 3
BOLT W/ "X" CUT
HYDRANT TOP FLANGE
EL= 53.92

TBM 4
SURVEY SPIKE SET
IN BASE 30" PINE
EL= 42.40
(0.5' ABOVE GROUND)

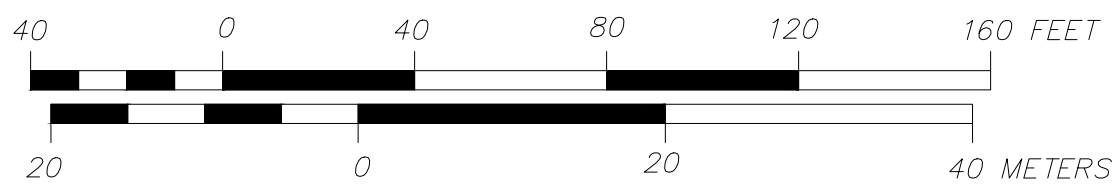
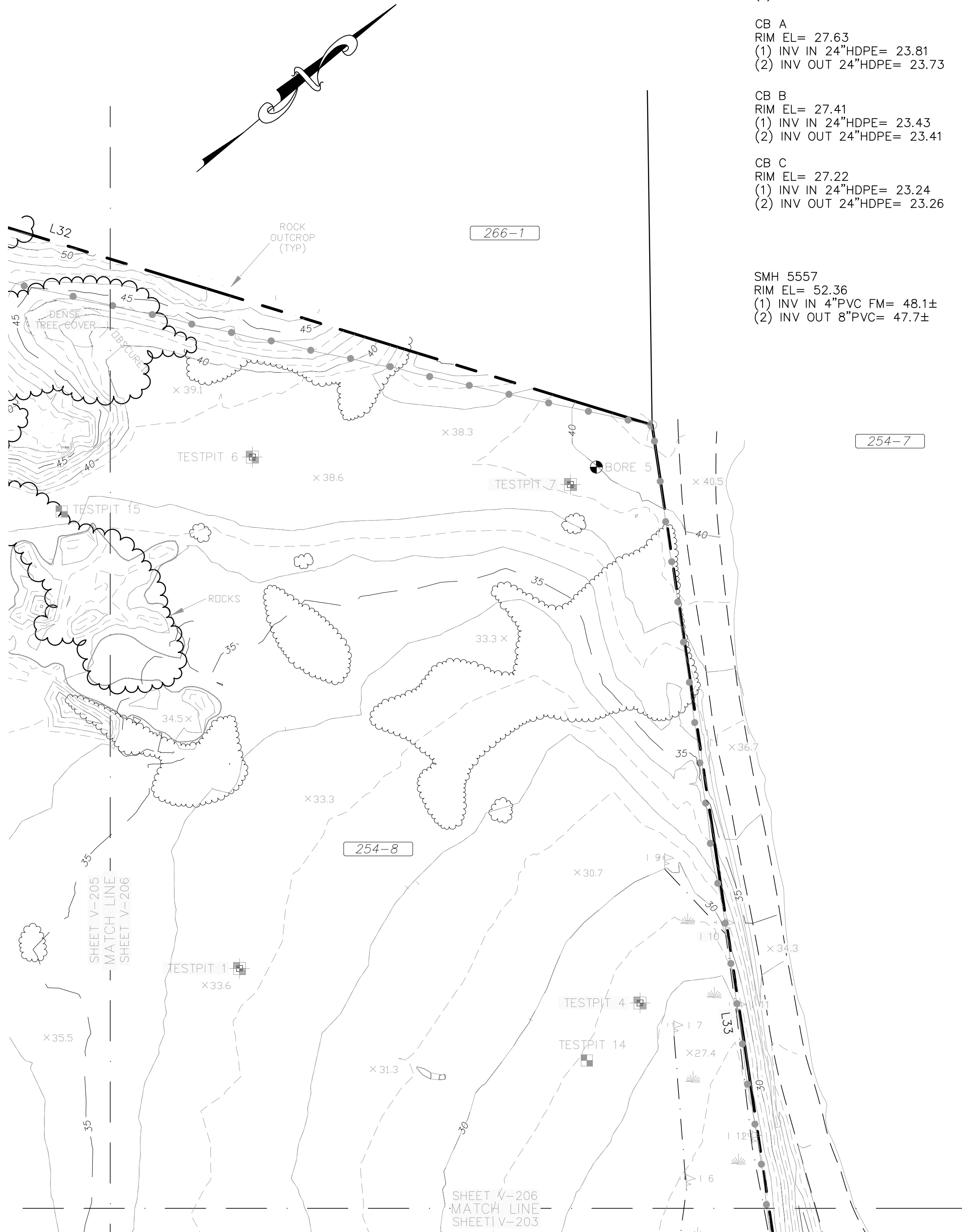
TBM 5
MARKED BOLT
HYDRANT LOWER FLANGE
EL= 52.07

TBM 6
CHISELLED SQUARE FOUND
IN LEDGE OUTCROP
EL= 40.09
(AT GROUND EL.)

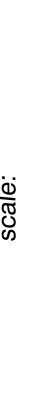
TBM 7
SPIKE FOUND
IN BASE 30" PINE
EL= 37.19
(0.5' ABOVE GROUND)

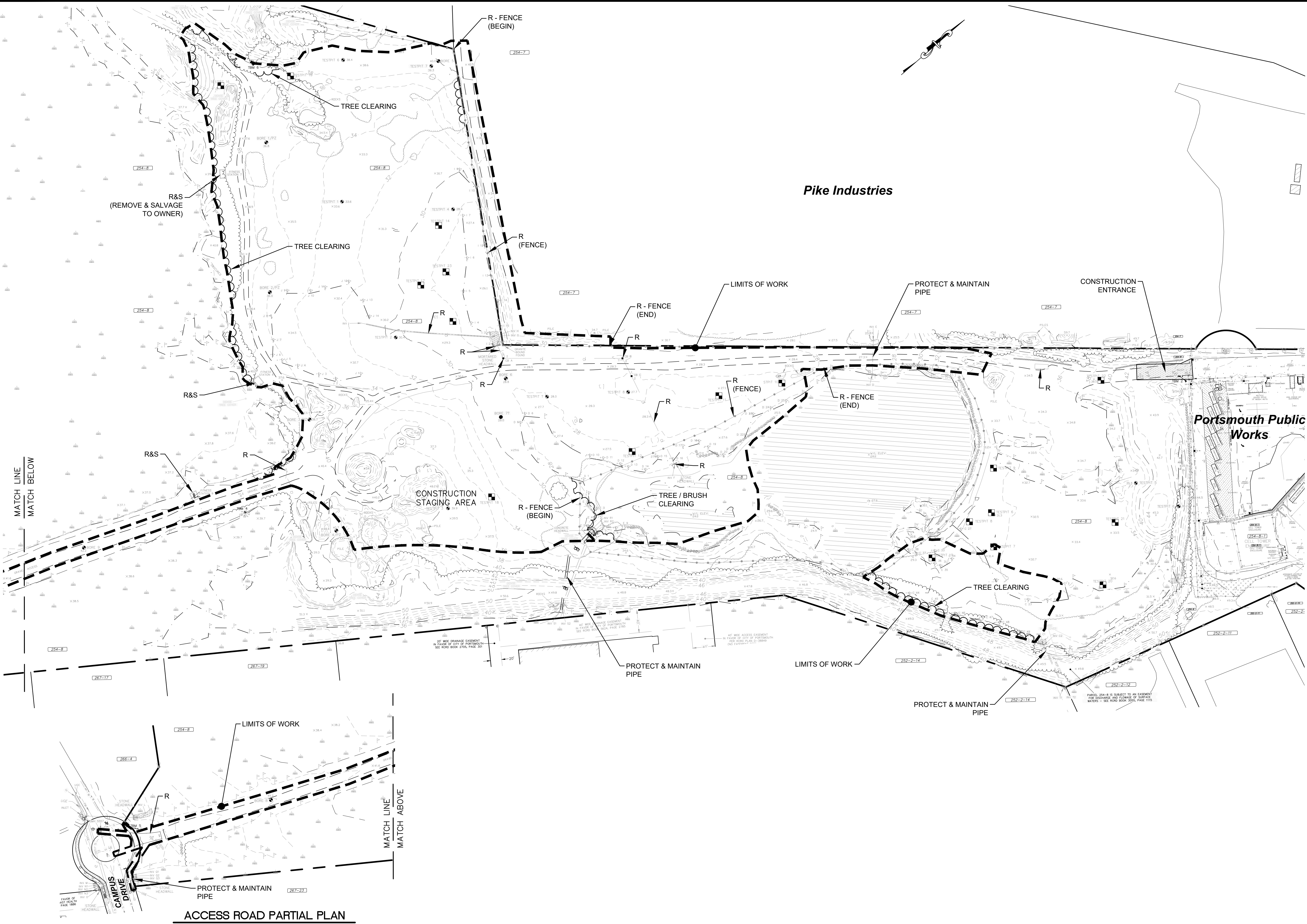
LEGEND:

- STONE WALL
..... IRON ROD
..... IRON PIPE
..... BOUND as DESCRIBED
..... WOOD HUB
..... DRILL HOLE
..... CHAIN LINK FENCE
..... WOOD FENCE
..... GUARD RAIL
..... WOOD FENCE POST
..... BARBED WIRE FENCE
..... TAX SHEET – LOT NUMBER
..... ROCKINGHAM COUNTY REGISTRY OF DEEDS
..... EOP..... EDGE OF PAVEMENT
..... SGC..... SLOPED FACED GRANITE CURB
..... VGC..... VERTICAL FACED GRANITE CURB
..... RWBL..... MODULAR BLOCK RETAINING WALL
..... RWC..... CONCRETE RETAINING WALL
..... RWM..... MORTARED RETAINING WALL
..... RWS..... STONE RETAINING WALL
..... BOLLARD
..... SIGN
..... DOUBLE POST SIGN
..... SIGNAL JUNCTION BOX
..... LIGHT POLE
..... ELECTRICAL CONDUIT
..... PAD MOUNTED TRANSFORMER
..... ELECTRICAL PANEL
..... ELECTRICAL BOX
..... ELECTRIC METER
..... TELEPHONE MANHOLE
..... GAS VALVE
..... WATER GATE VALVE
..... HYDRANT
..... CATCH BASIN
..... CATCH BASIN
..... DRAIN MANHOLE
..... SEWER MANHOLE
..... TREE LINE
..... BRUSH LINE
..... CONIFEROUS TREE
..... DECIDUOUS TREE
..... W - WATER LINE
..... S - SEWER LINE
..... D - DRAIN LINE
..... G - GAS LINE
..... FM - FORCE MAIN
..... UGC - UNDERGROUND COMMUNICATIONS
..... UGE - UNDERGROUND ELECTRIC
..... BORING
..... TEST PIT
..... CEMENT CONCRETE
..... CRUSHED STONE
..... RIP RAP
..... RETAINING WALL
..... LA - LANDSCAPED AREA
..... x12.5..... SPOT GRADE



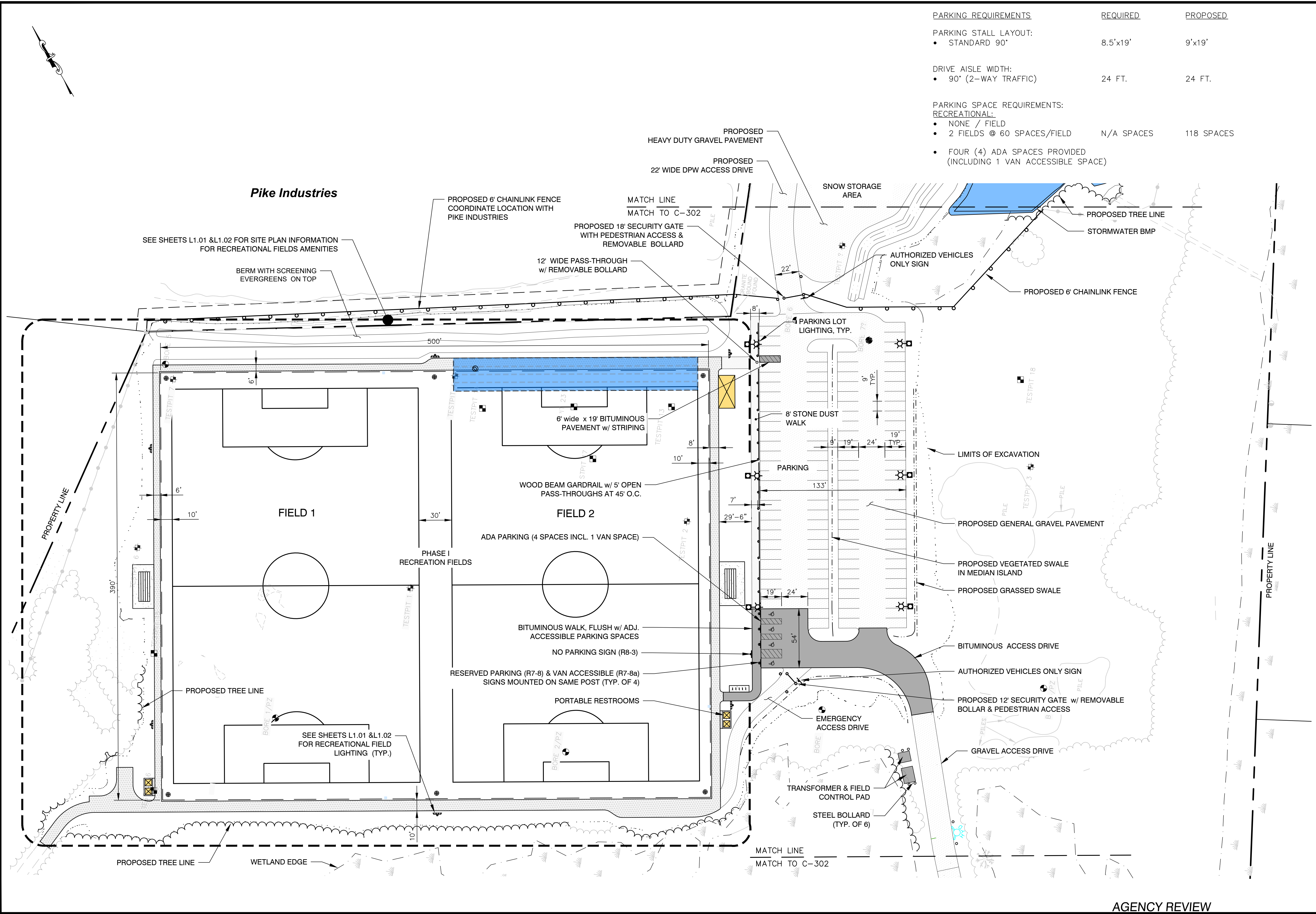
AGENCY REVIEW

City of Portsmouth, New Hampshire Department of Public Works		date: October 2019	designed by: JHK			CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL							
Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road		project no: 1119	drawn by: AGL			Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 603/627-0708 207/541-4223							
		file name: 1119 ECP.dwg	approved by: PAC										
Existing Conditions Plan		scale:  Scale: 1" = 40'											
		drawing no. V-206											
sheet:		11		of		42							



City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Demolition Plan		drawing no. C-101		sheet: 12 of 42	
date: October 2019	project no: 1119	file name: 1119 Demolition Plan.dwg	designed by: JHK	drawn by: AGL	approved by: PAC
scale: 0' 80' 160' 1" = 80'			scale: 0' 80' 160' 1" = 80'		
CMA ENGINEERS Civil/Environmental Engineers Portsmouth, NH Manchester, NH Portland, Maine			Weston & Sampson 427 Main Street, Suite 400, Worcester, MA (978) 977-0110 (800) 726-7766 (Sampson) www.westonandsampson.com		
4 PLANNING BOARD PUBLIC HEARING		3 TAC PUBLIC HEARING		2 CONSERVATION COMMISSION SUBMISSION	
1 TAC WORK SESSION SUBMISSION		no.		revision	
JHK 10/8/2019		JHK 8/19/2019		JHK 07/24/2019	
JHK 07/09/2019		JHK 07/09/2019		JHK 07/09/2019	
by		date		date	

AGENCY REVIEW



PARKING REQUIREMENTS	REQUIRED	PROPOSED
PARKING STALL LAYOUT: STANDARD 90°	8.5'x19'	9'x19'
DRIVE AISLE WIDTH: 90° (2-WAY TRAFFIC)	24 FT.	24 FT.
PARKING SPACE REQUIREMENTS: RECREATIONAL: - NONE / FIELD 2 FIELDS @ 60 SPACES/FIELD	N/A SPACES	118 SPACES
FOUR (4) ADA SPACES PROVIDED (INCLUDING 1 VAN ACCESSIBLE SPACE)		

CMA ENGINEERS Civil/Environmental Engineers Portsmouth, NH Manchester, NH Portland, Maine		4	PLANNING BOARD PUBLIC HEARING	10/8/2019	JHK	
Weston & Sampson 427 Main Street, Suite 400, Worcester, MA (978) 977-0110 (800) 726-7766 (Sampson) www.westonandsampson.com		3	TAC PUBLIC HEARING	8/19/2019	JHK	
		2	CONSERVATION COMMISSION SUBMISSION	07/24/2019	JHK	
		1	TAC WORK SESSION SUBMISSION	07/09/2019	JHK	
		no.	revision		date	by

JOSEPH H. KIEFFNER
No. 3171
LICENSED PROFESSIONAL ENGINEER

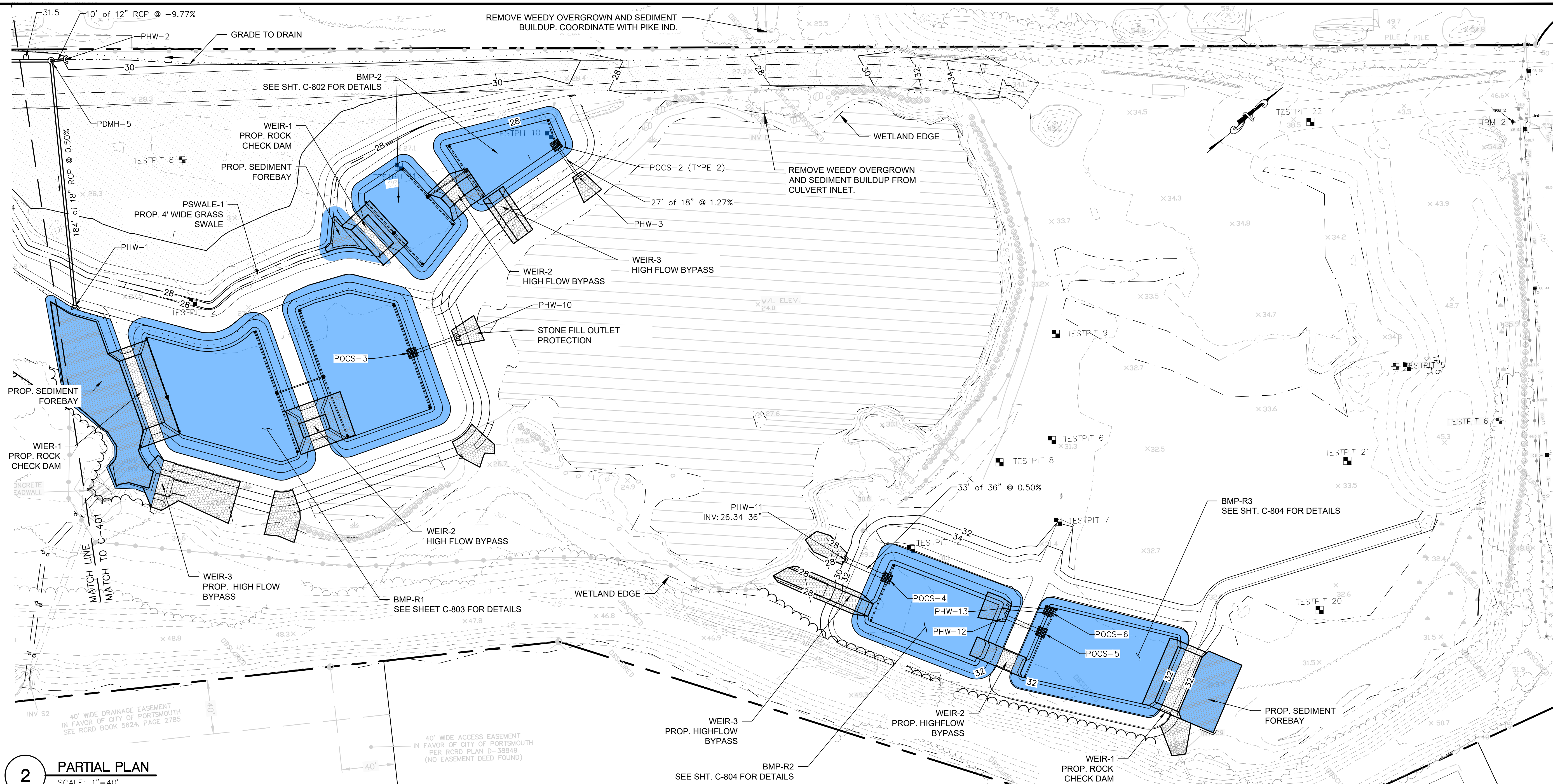
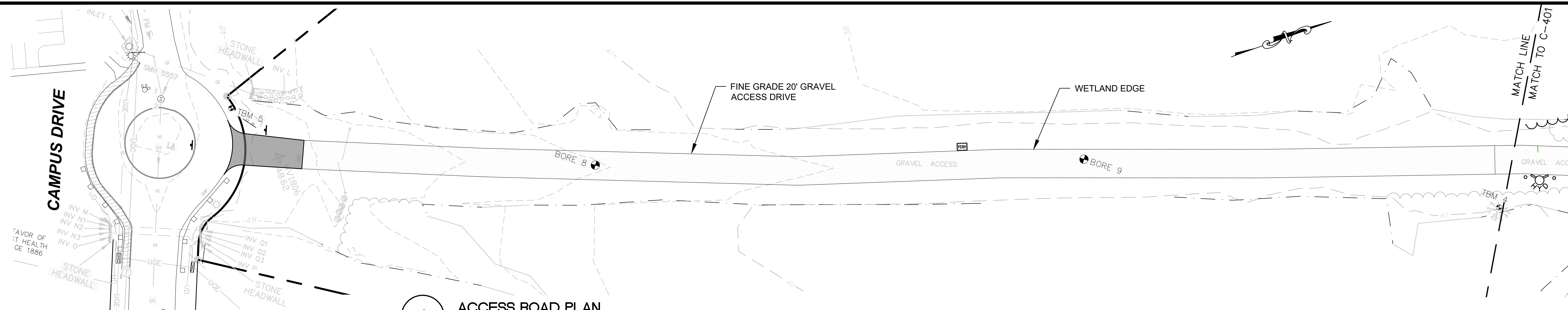
designed by: JHK
drawn by: AGL
approved by: PAC

date: October 2019
project no: 1119
file name: 1119 Site Plan-Phase 1.dwg

scale: 1" = 40'
0 40' 80'

City of Portsmouth, New Hampshire Department of Public Works	Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road	Recreation Fields Site Plan Phase 1
drawing no. C-301		
sheet: 13 of 42		

AGENCY REVIEW

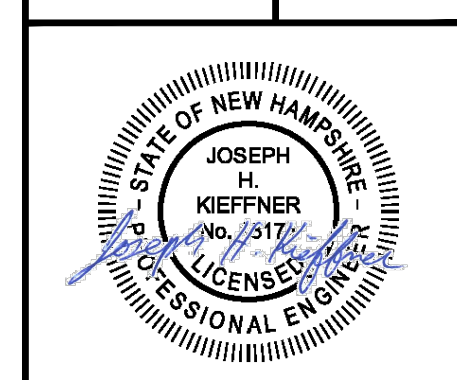


AGENCY REVIEW

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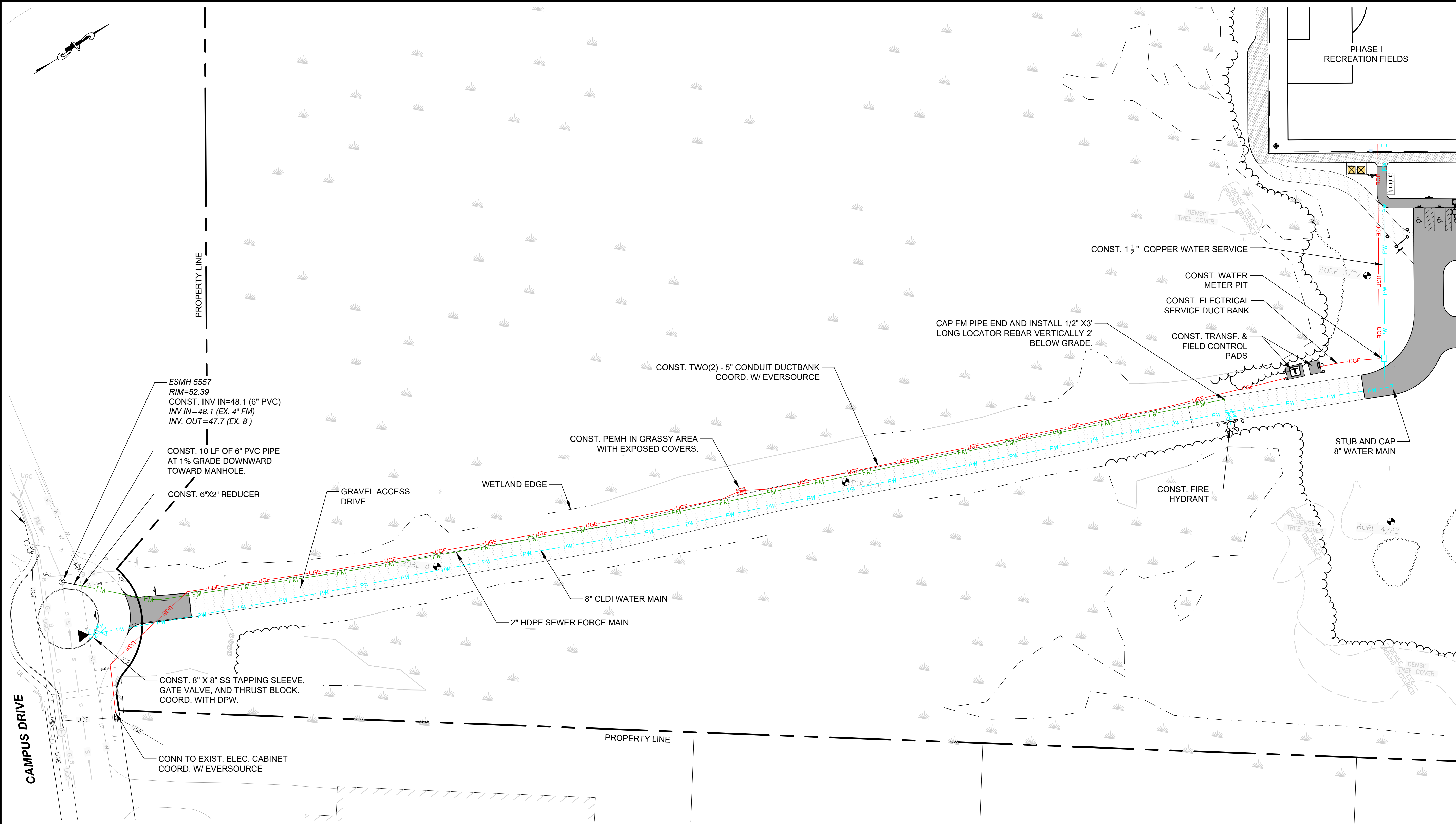
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date: October 2019	designed by: JHK
project no.: 1119	drawn by: AGL
file name: 1119 Grading Plan-Phase	approved by: PAC
dwg scale: Scale: 1" = 40'	

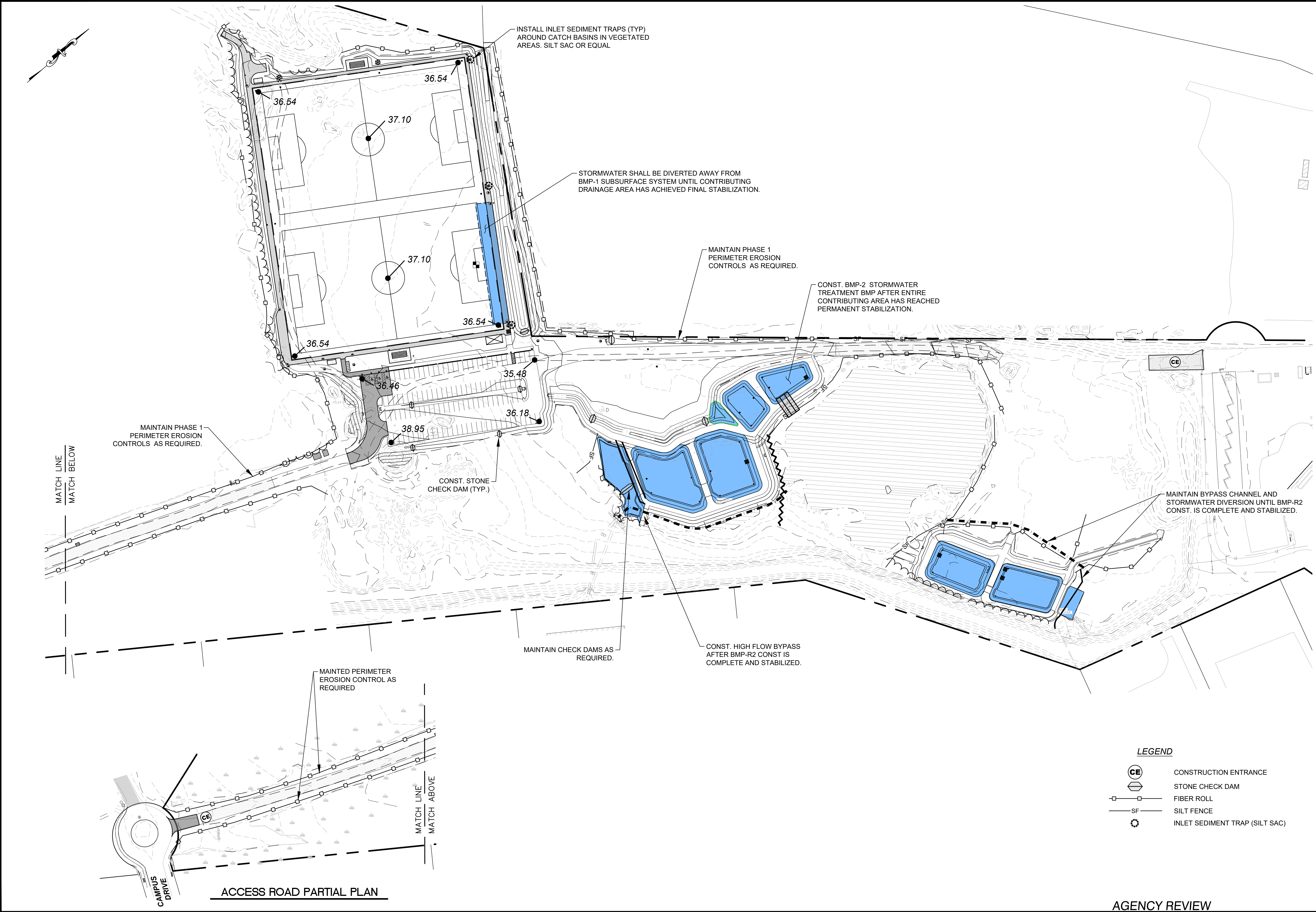
<i>City of Portsmouth, New Hampshire</i> <i>Department of Public Works</i> <i>Multi-purpose Recreation Fields-Phase I</i> <i>680 Peverly Hill Road</i> <i>Access Road & Partial Plan</i> <i>Grading & Drainage Plan Phase 1</i>	drawing no. C-402
sheet: 16 of 42	



CMA ENGINEERS CIVIL/ENVIRONMENTAL ENGINEERS Portsmouth, NH Manchester, NH Portland, Maine		10/8/2019 JHK	8/19/2019 JHK	07/24/2019 JHK	07/09/2019 JHK	date by		
PLANNING BOARD PUBLIC HEARING 4		TAC PUBLIC HEARING 3				CONSERVATION COMMISSION SUBMISSION 2	TAC WORK SESSION SUBMISSION 1	revision no.
City of Portsmouth, New Hampshire Department of Public Works		Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road				Recreation Fields Utility Plan Phase 1		drawing no. C-501
date: October 2019		designed by: JHK		drawn by: AGL		approved by: PAC		scale: 1" = 40'
project no.: 1119		file name: 1119 Utility Plan-Phase I.dwg		scale: 0 40' 80'		sheet: 17 of 42		

AGENCY REVIEW

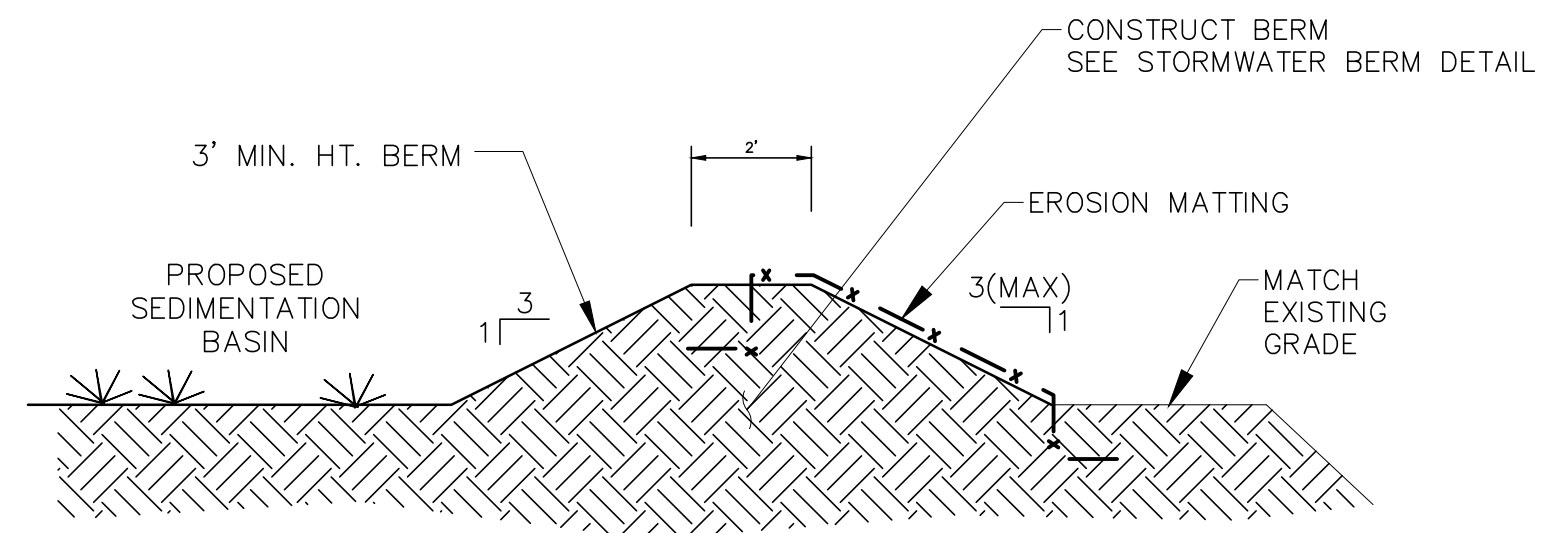




LEGEND

- CE CONSTRUCTION ENTRANCE
- STONE CHECK DAM
- FIBER ROLL
- SILT FENCE
- INLET SEDIMENT TRAP (SILT SAC)

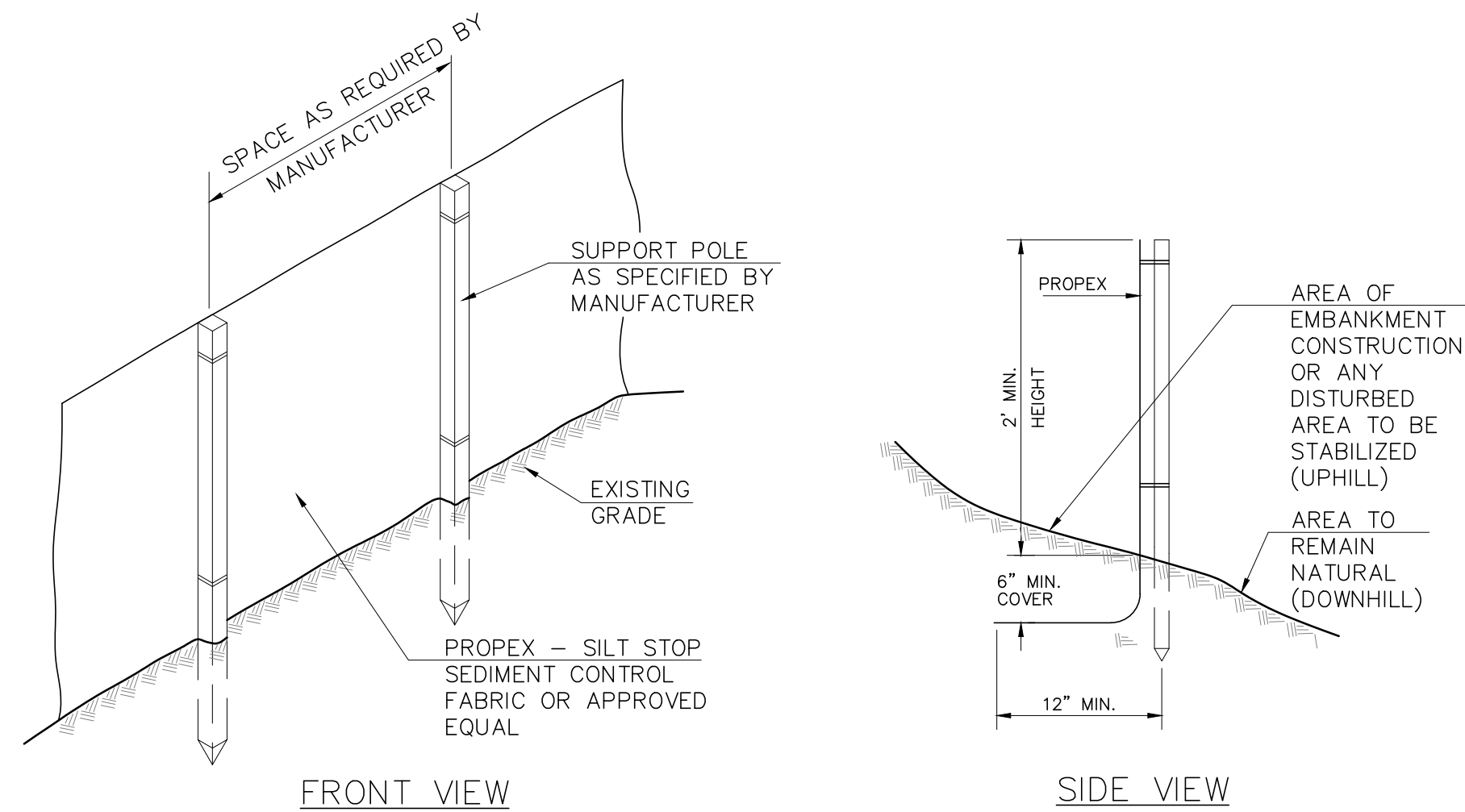
City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase 1 680 Peverly Hill Road Erosion Control Plan Phase 2		drawing no. C-602		
date: October 2019	project no: 1119	file name: 1119 ESC PLAN.dwg	designed by: JHK	
			drawn by: AGL	
			approved by: PAC	
scale: 0 80' 160'		Scale: 1" = 80'		
City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase 1 680 Peverly Hill Road Erosion Control Plan Phase 2		CMA ENGINEERS Civil/Environmental Engineers Portsmouth, NH Manchester, NH Portland, Maine Weston & Sampson 427 Main Street, Suite 400, Worcester, MA (978) 977-0110 (800) 726-7766 (Sampson) www.westonandsampson.com		
4		PLANNING BOARD PUBLIC HEARING	10/8/2019	JHK
3		TAC PUBLIC HEARING	8/19/2019	JHK
2		CONSERVATION COMMISSION SUBMISSION	07/24/2019	JHK
1		TAC WORK SESSION SUBMISSION	07/09/2019	JHK
no.	revision	date	by	



- NOTE:
1. SEDIMENTATION BASINS MUST BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
 2. BOTTOM OF SEDIMENT BASIN SHALL BE THE FG ELEV OF THE PERMANENT STORMWATER BMP.
 3. SEE SHEET C903 FOR STORMWATER BERM AND OUTLET DETAILS.

Sedimentation Basin (Matting)

Not to Scale

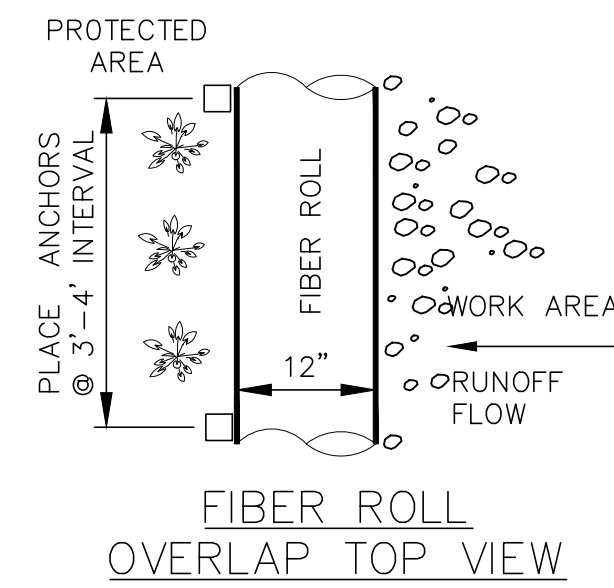
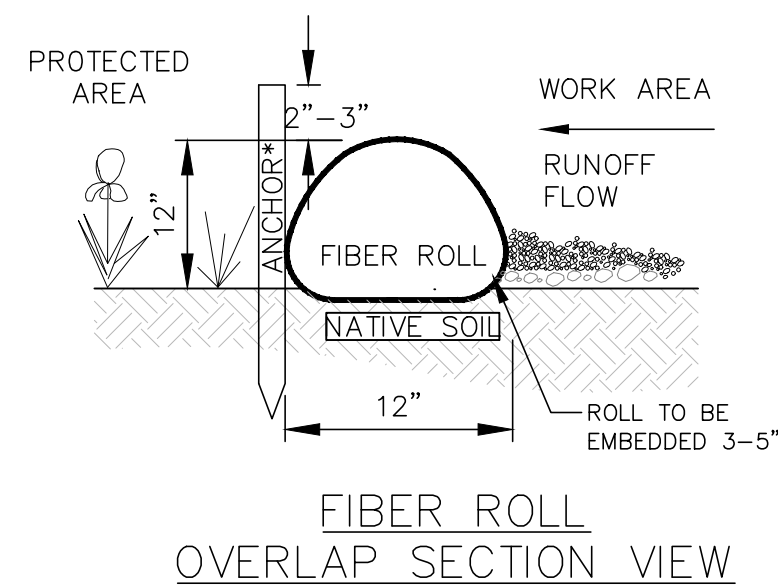
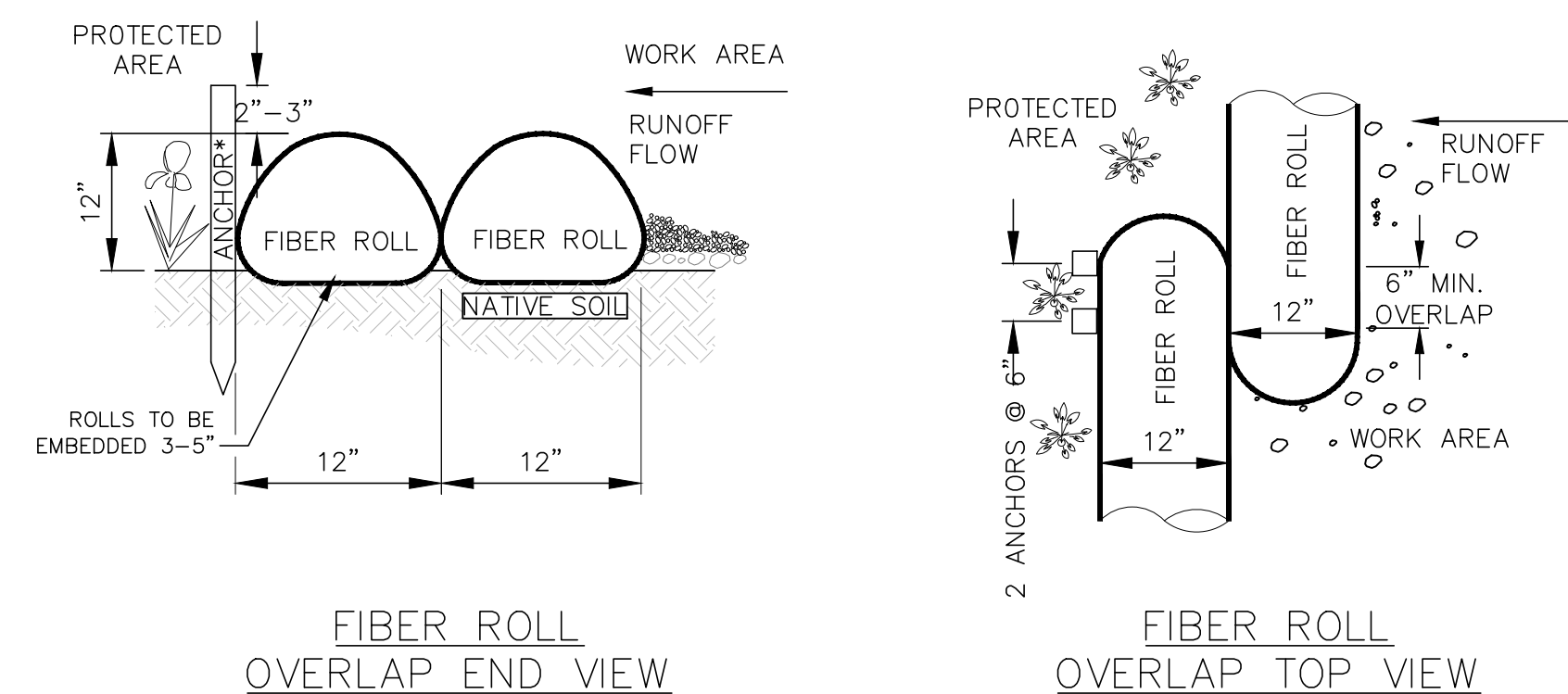


NOTE:

1. AT A MINIMUM, SILT FENCE IS TO BE INSTALLED TO PROTECT WETLAND AREAS, WATERWAYS, EXISTING AND PROPOSED DRAINAGE FEATURES, SLOPES, LAWNS AND PLANTINGS ADJACENT TO THE WORK.

Silt Fence

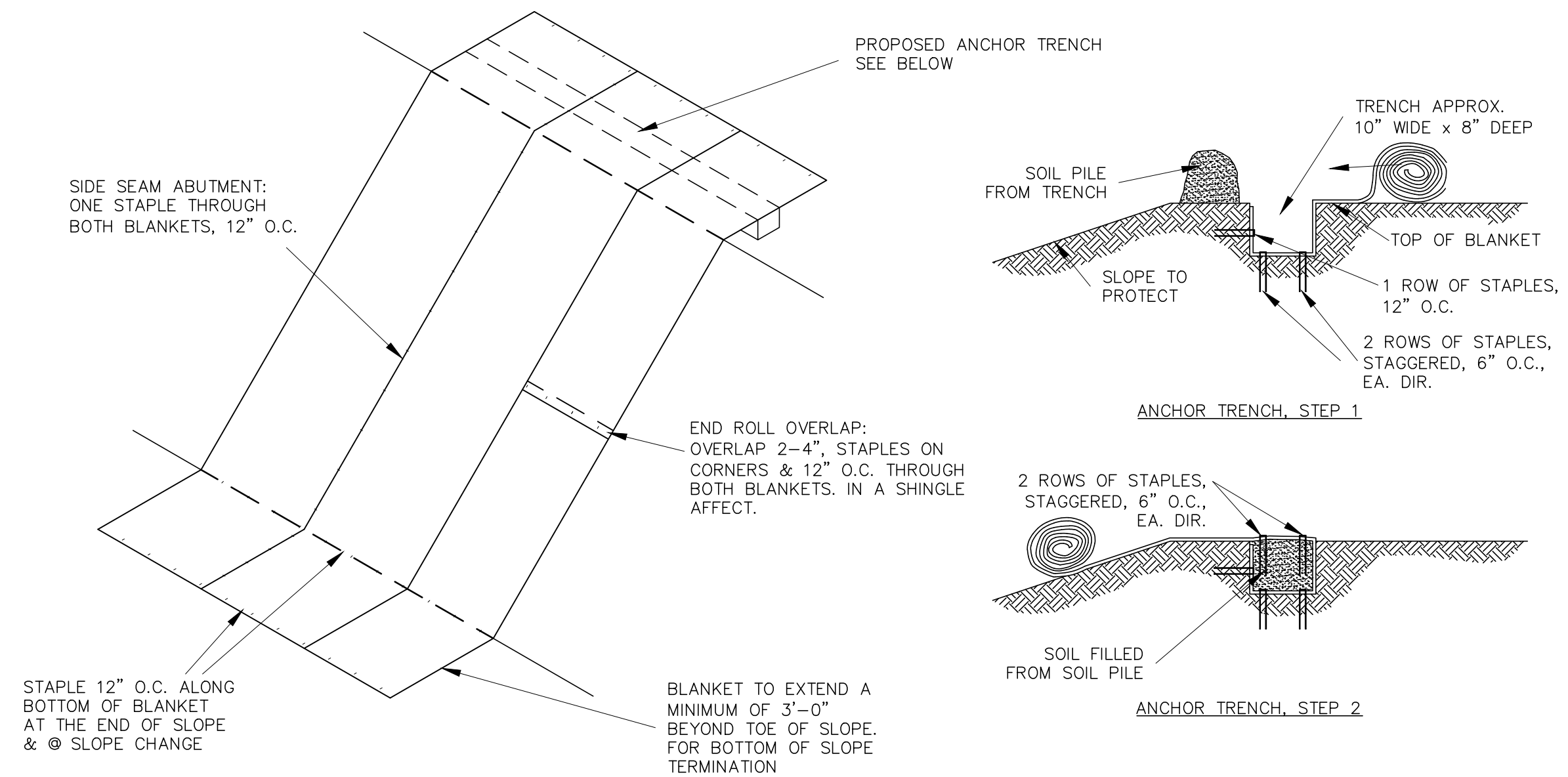
Not to Scale



Erosion Control Fiber Roll

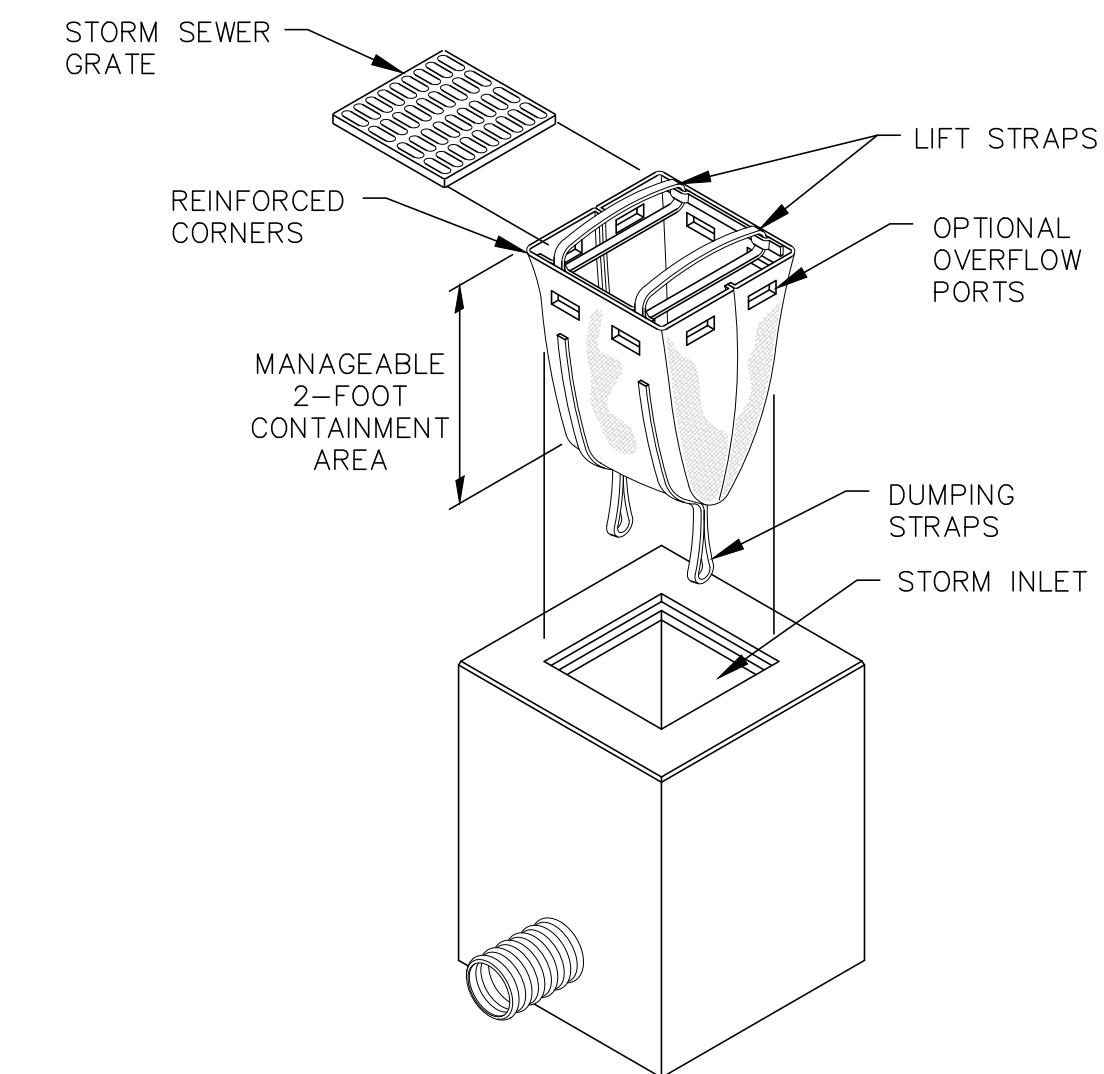
Not to Scale

* ANCHOR STAKES TO BE 1"x1"x24" WOOD, AND DRIVEN TO 2"-3" ABOVE THE TOP OF THE FIBER ROLL.



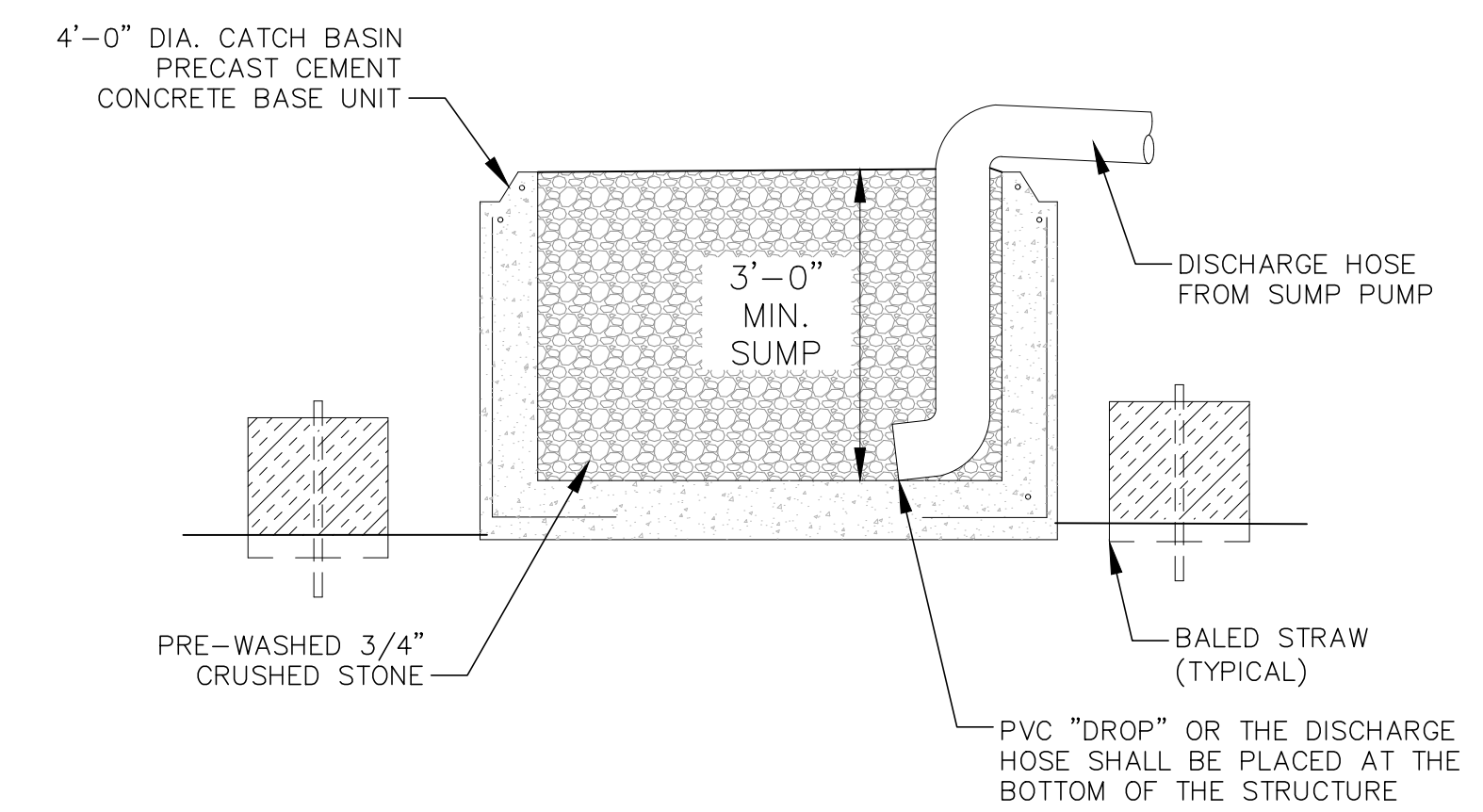
Erosion Control Blanket Slope

Not to Scale



"Silt Sack" Sediment Control Device for Inlet Protection

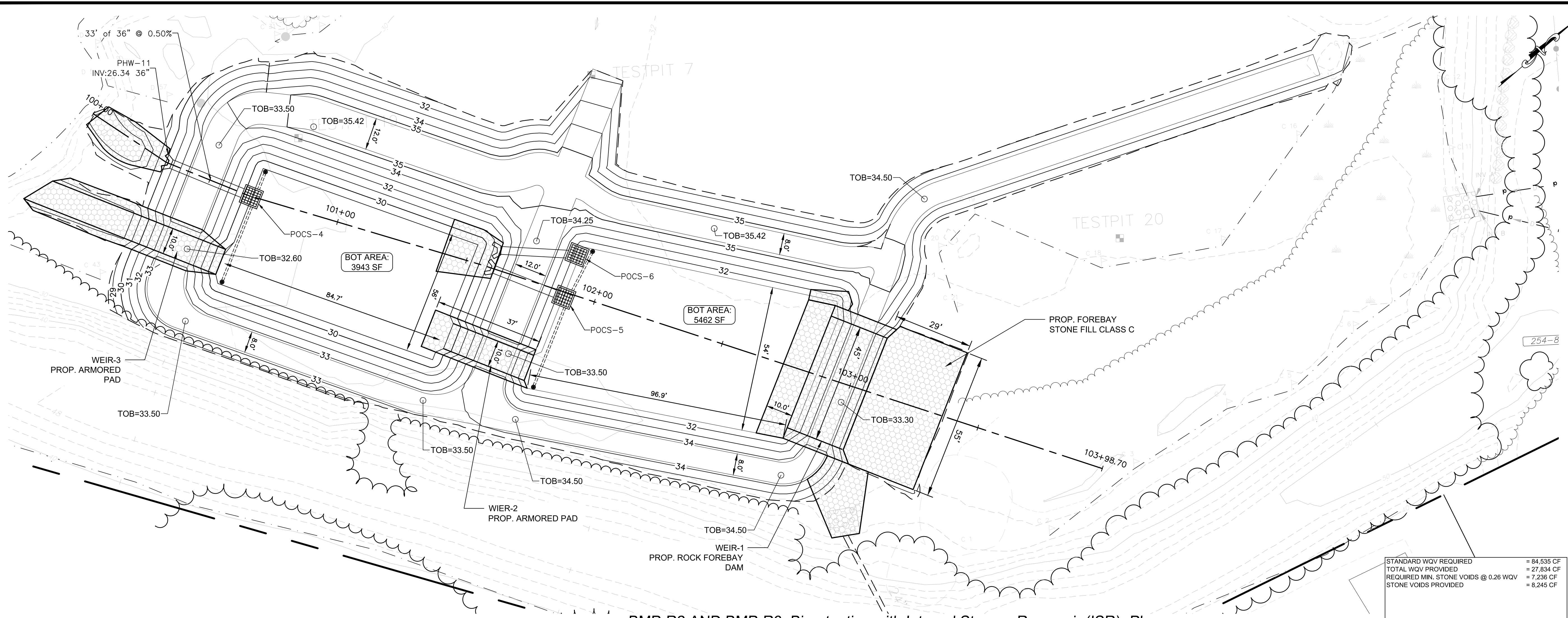
Not to Scale



Dewatering Basin (Section)

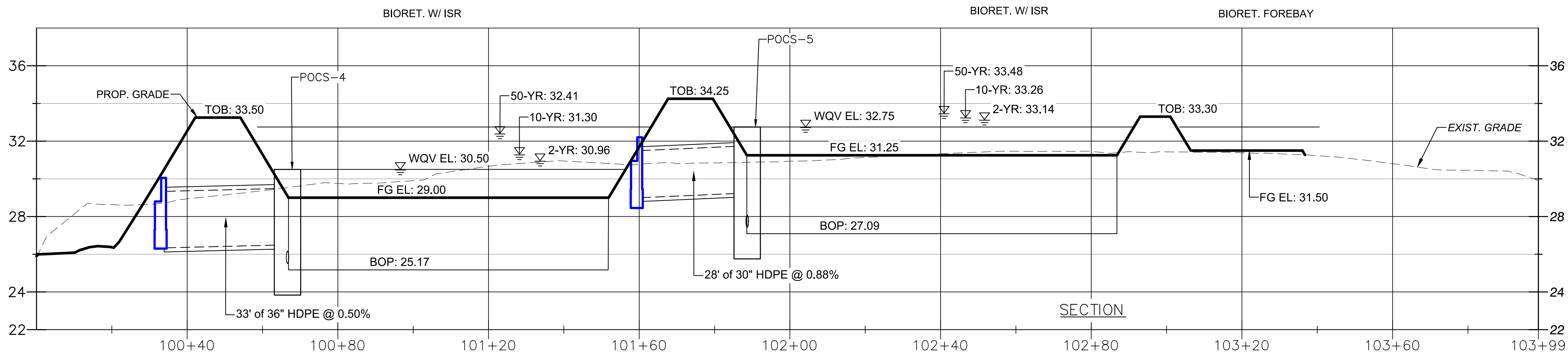
Not to Scale

AGENCY REVIEW



BMP-R2 AND BMP-R3: Bioretention with Internal Storage Reservoir (ISR)- Plan
Scale: 1"=20'

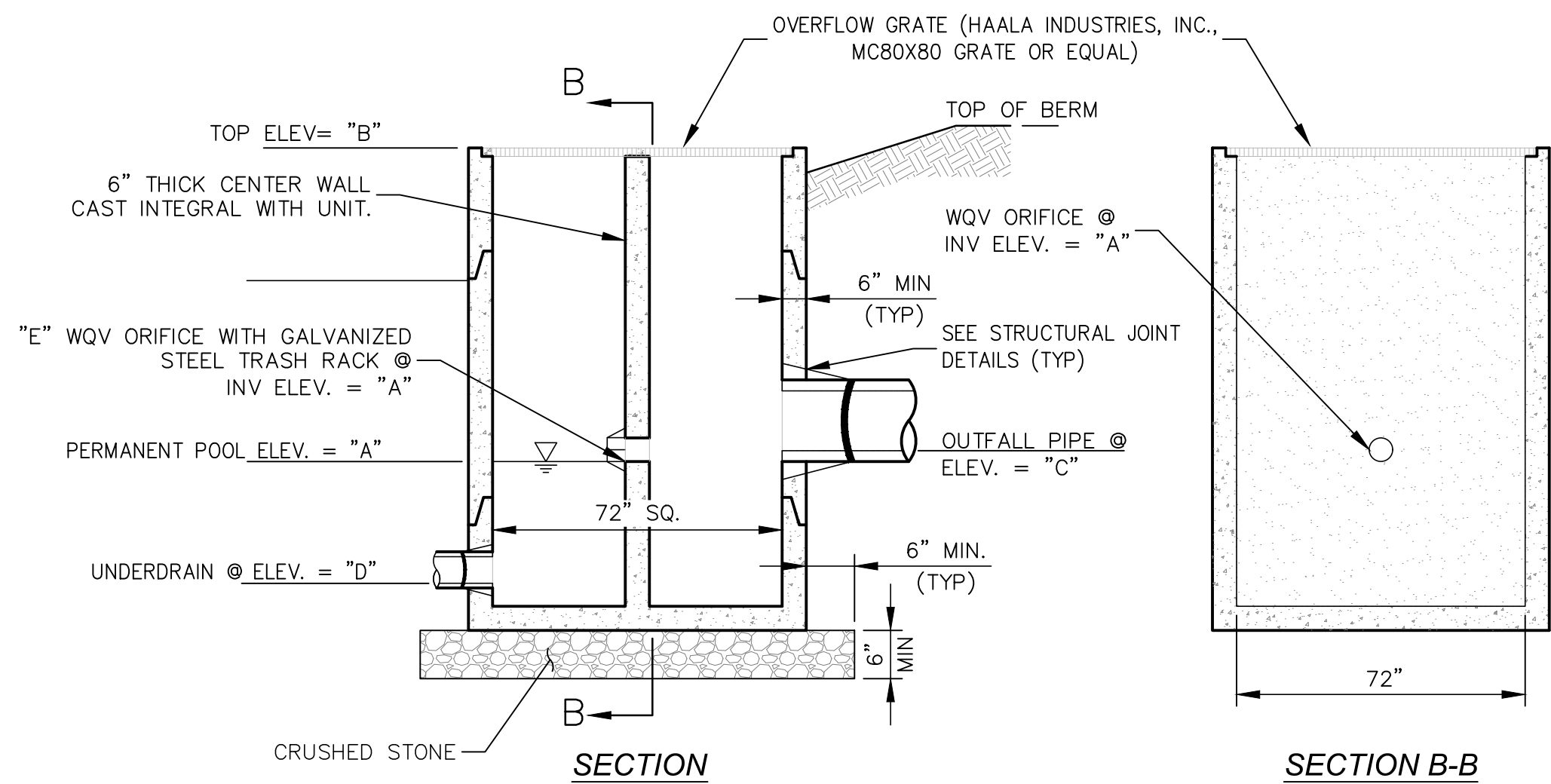
STANDARD WQV REQUIRED = 84,535 CF
TOTAL WQV PROVIDED = 27,834 CF
REQUIRED MIN. STONE VOIDS @ 0.26 WQV = 7,236 CF
STONE VOIDS PROVIDED = 8,245 CF



BMP-R2 AND BMP-R3: Bioretention with Internal Storage Reservoir (ISR)
1"=4' Vert & 1"=20' Horiz.

AGENCY REVIEW

City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Stormwater Plans & Sections		designed by: JHK	date: October 2019	project no: 1119	file name: 1119 DETAILS-Storm Water Sections	drawn by: AGL	approved by: JAC	scale: 0 20' 40'	Scale: 1" = 20'
drawing no: C-804		sheet: 25 of 42							
CMA ENGINEERS Civil/Environmental/Structural Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 cmaengineers.com		4		PLANNING BOARD PUBLIC HEARING		10/8/2019		JHK	by
		3		TAC PUBLIC HEARING		8/19/2019		JHK	date
		2		CONSERVATION COMMISSION SUBMISSION		07/24/2019		JHK	revision
		1		TAC WORK SESSION SUBMISSION		07/09/2019		JHK	no.



- NOTES:**
1. ALL SECTIONS SHALL BE 4,000 PSI CONCRETE (TYPE II CEMENT).
 2. PRECAST BOX STRUCTURE SHALL CONFORM TO ASTM C913 SPECIFICATIONS.
 3. SEE DETAIL TITLE PIPE CONNECTION TO PRECAST MANHOLE STRUCTURES.
 4. REINFORCEMENT:
 - 4.1. DEFORMED BARS SHALL CONFORM TO ASTM A-615 GRADE 60.
 - 4.2. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185—GRADE 70
 5. REIN. STEEL SHALL HAVE 1' MINIMUM COVER.
 6. THE STRUCTURE SHALL BE DESIGNED FOR HS 20-44 LOADING AND TO PREVENT FLotation IF FULLY SUBMERGED.
 7. CRUSHED STONE BEDDING SHALL CONFORM TO NHDOT 304.4.
 8. PIPE ELEVATIONS SHOWN SHALL BE FIELD VERIFIED PRIOR TO PRECASTING.
 9. OUTSIDE EDGES OF PIPES SHALL PROJECT NO MORE THAN 3" BEYOND INSIDE WALL OF STRUCTURE.
 10. OUTLET PIPE SHALL BE FLUSH WITH INNER WALL.
 11. OMIT CENTER WALL IN POCS-6

STRUCTURE DIMENSIONS					
	POCS STRUCTURE ID				
ELEV.	2	3	4	5	6
A	25.83	24.58	27.17	29.42	N/A
B	27.92	28.50	30.50	32.75	32.75
C	25.25	27.00	26.50	29.25	29.25
D	23.83	22.33	25.50	27.42	N/A
E WQV ORIFICE DIA (IN)	2.2	4.2	3.5	3.5	N/A



- NOTES:**
1. WETLAND SOIL SHALL BE A SANDY CLAY LOAM WITH A HYDRAULIC CONDUCTIVITY OF 0.1-0.01 FT/DAY. ORGANIC CONTENT SHALL BE GREATER THAN 15% BY VOLUME. CLAY CONTENT SHALL BE LESS THAN 15% BY VOLUME.
 2. PERFORATED PVC RISER WITHIN WETLAND SOIL LAYER SHALL BE WRAPPED WITH MIRAFI 160N OR EQUAL.
 3. INFILTRATION TESTING OF THE NATIVE SOILS AT THE SUBGRADE AND WITHIN THE VICINITY OF THE PROPOSED GRAVE WETLAND SHALL OCCUR PRIOR TO THE INSTALLATION OF THE GRAVES. WETLAND AND SHALL BE COORDINATED WITH THE ENGINEER. IF THE NATIVE SOILS EXCEED A PERMEABILITY RATE OF 0.03 FT/DAY OR IF EXCESSIVELY FRACTURED BEDROCK IS ENCOUNTERED THE SOILS SHOULD AMENDED OR LINER ADDED AS DETERMINED BY THE ENGINEER.
 4. PERFORATED PVC RISERS SHALL HAVE VERTICAL SLOTS CUT INTO PVC RISERS ABOVE GRADE MEASURING 3"x1/8".
 5. LOAM AND SEED ALL EARTH SLOPES AS SOON AS POSSIBLE. STABILIZE THE INLET AREA WITH REQUIRED EROSION CONTROL.
 6. BMP-2 WETLAND VEGETATION & FOREBAY SLOPES GRASSES SHALL BE SALT TOLERABLE.

AASHTO #5 STONE (1" TO 1/2")	
SIEVE SIZE	% PASSING
1-1/2"	100
1"	90-100
3/4"	20-55
1/2"	0-10
3/8"	0-5

AASHTO #8 STONE (3/8" TO #8)	
SIEVE SIZE	% PASSING
1/2"	100
3/8"	85-100
#4	10-30
#8	0-10
#16	0-5

STRUCTURE DIMENSIONS		
	SUBSURFACE GRAVEL WETLANDS	
DIMENSION/ELEVATION	BMP-2	BMP-R1
A	26.67	25.50
B	23.50	22.25
C	27.92	27.00
D	29.67	29.00
E	8	12

Not to Scale

AGENCY REVIEW

City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Stormwater Sections & Details	drawing no. C-902	date: October 2019 project no: 1119 file name: 1119 DETAILS-SW.dwg scale: designed by: JHK drawn by: AGL approved by: PAC		 CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a e n g i n e e r s . c o m	<table> <tr> <td></td> <td>date:</td> <td>by:</td> </tr> <tr> <td></td> <td></td> <td>revision</td> </tr> <tr> <td>no.</td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>TAC WORK SESSION SUBMISSION</td> <td>JHK</td> </tr> <tr> <td>2</td> <td>CONSERVATION COMMISSION SUBMISSION</td> <td>JHK</td> </tr> <tr> <td>3</td> <td>TAC PUBLIC HEARING</td> <td>JHK</td> </tr> <tr> <td>4</td> <td>PLANNING BOARD PUBLIC HEARING</td> <td>JHK</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>		date:	by:			revision	no.			1	TAC WORK SESSION SUBMISSION	JHK	2	CONSERVATION COMMISSION SUBMISSION	JHK	3	TAC PUBLIC HEARING	JHK	4	PLANNING BOARD PUBLIC HEARING	JHK									
		date:	by:																																
			revision																																
	no.																																		
	1	TAC WORK SESSION SUBMISSION	JHK																																
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3	TAC PUBLIC HEARING	JHK																																	
4	PLANNING BOARD PUBLIC HEARING	JHK																																	



Not to Scale

- Section C-C
GRATE & FRAME DETAIL

Not to Scale

- MIN. 12" LAYER OF 3/4" CRUSHED STONE

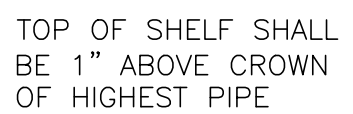
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- ### Plan

Section A-A



Section B-B



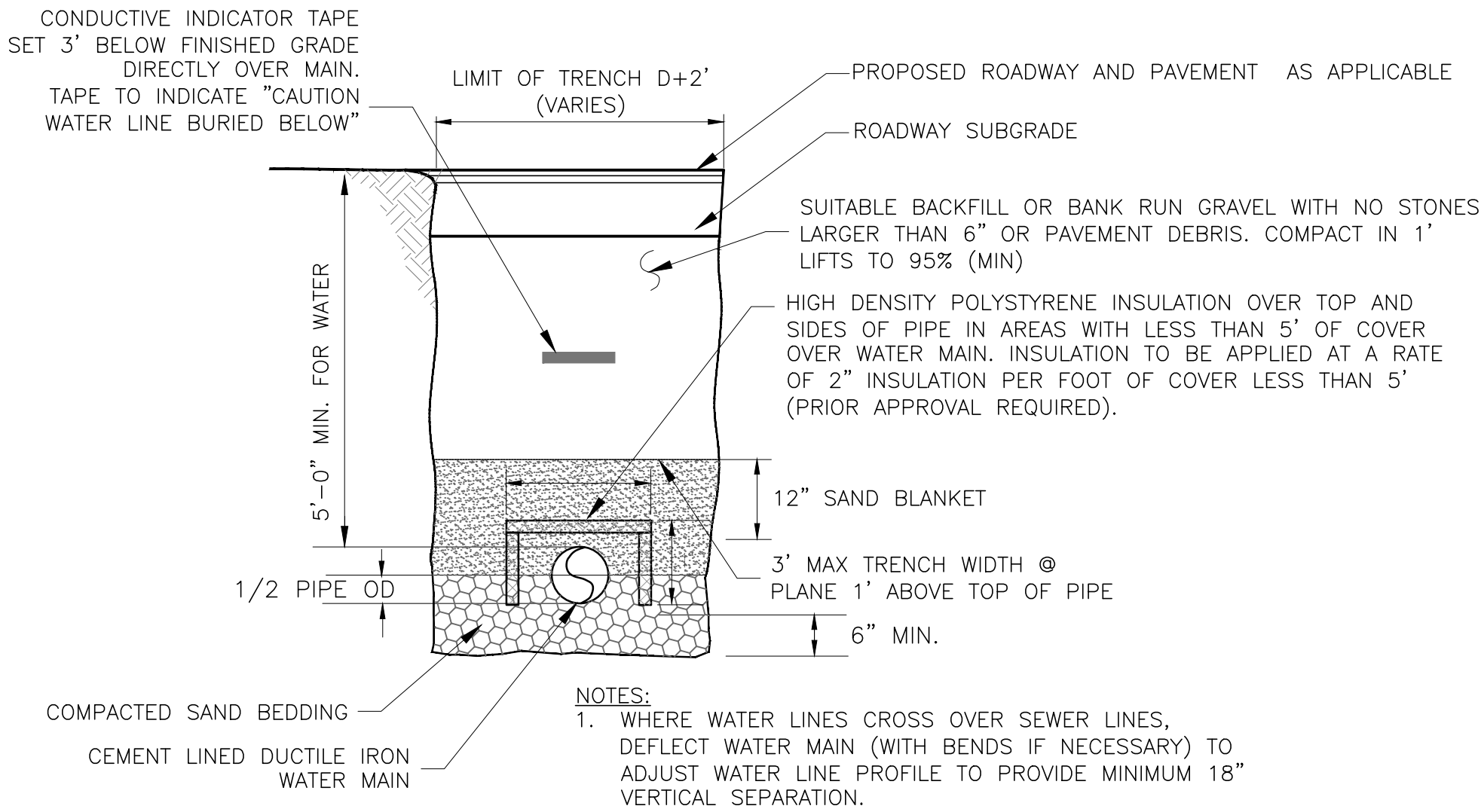
- NOTE: INVERT AND
SHELF TO BE PLACED
AFTER LEAKAGE TEST

- NOTE:** CARE SHALL BE TAKEN TO INSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT BRICKS SHALL BE LAID ON EDGE

- Not to Scale**

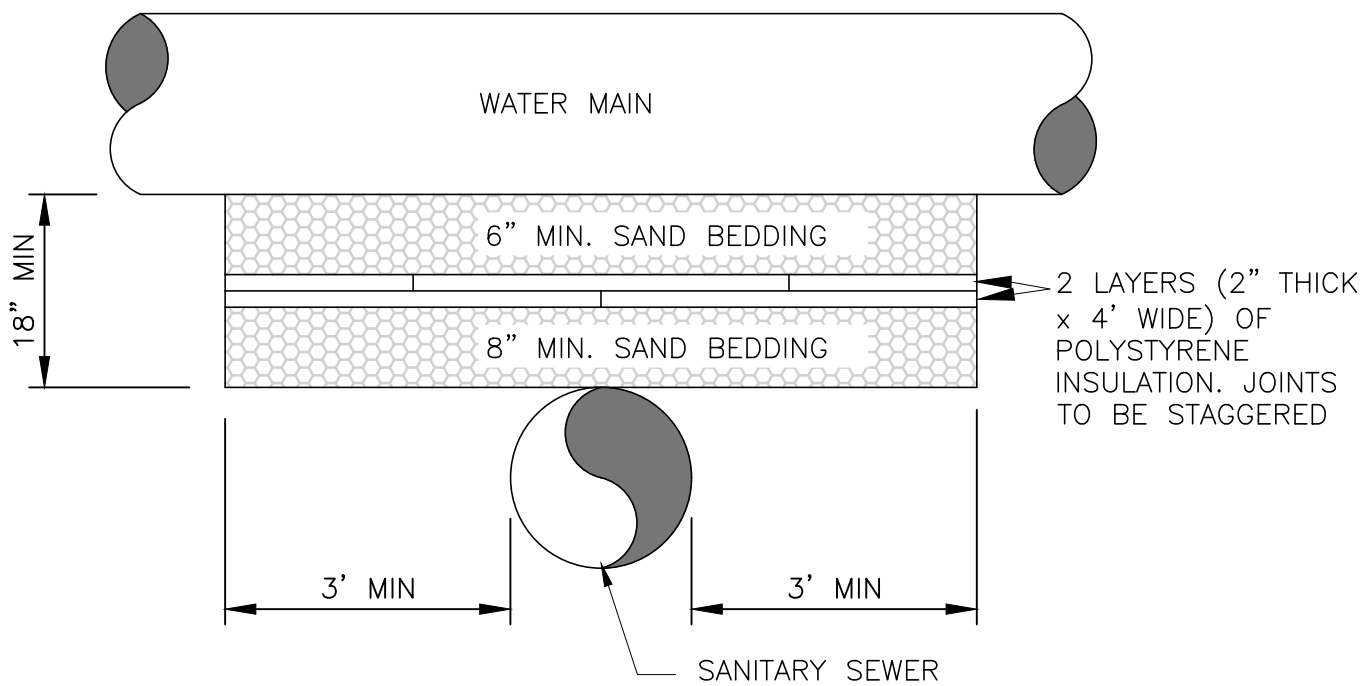
AGENCY REVIEW

City of Portsmouth, New Hampshire Department of Public Works			date: October 2019		designed by: JHK								CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a a e n g i n e e r s . c o m			no.		revision		date		by	
Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road			project no: 1119		drawn by: AGL																		
			file name: 1119 DETAILS.dwg		approved by: PAC																		
			scale:																				
drawing no. C-906																							
sheet:		31		of		42																	



Typical Water Main Trench

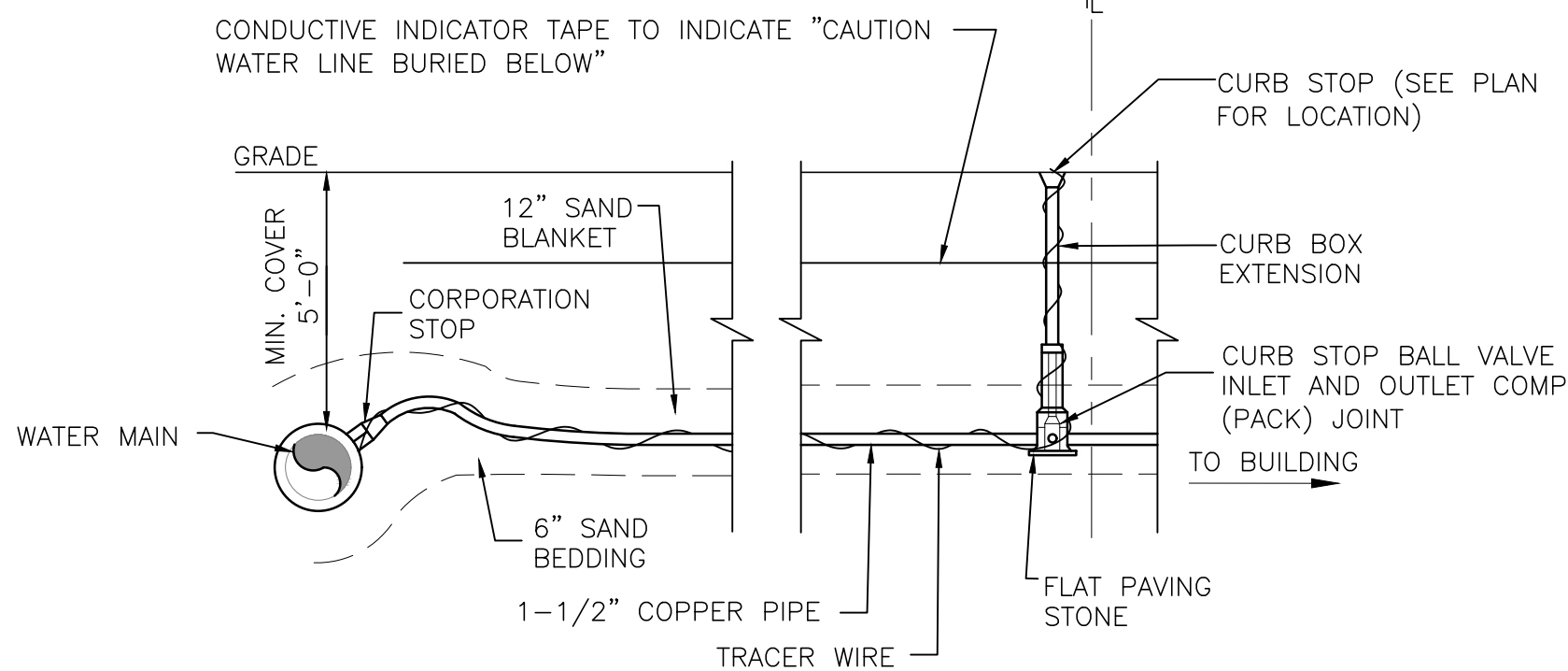
Not to Scale



- WATER MAIN INSTALLATION NOTES:
- INSULATION TO BE USED WHERE VERTICAL PIPE SEPARATION IS 24" OR LESS AND HORIZONTAL SEPARATION WITH A SEWER MANHOLE OR OTHER OPEN STRUCTURE IS 6' OR LESS.
 - INSTALL VERTICAL MJ BENDS WITH RESTRAINED JOINT FITTINGS OR SWEEP PIPE WITHIN THE SPECIFICATION LIMITS IF NECESSARY TO ADJUST WATER MAIN PROFILE TO GAIN MINIMUM VERTICAL SEPARATION ABOVE SEWER.
 - 2" OF INSULATION TO BE USED AROUND WATER SERVICE CONNECTIONS WHERE PIPE CROSSINGS OCCUR.
 - WHERE WATER MAIN CROSSES SEWER AT 45° TO 90° PROVIDE MAXIMUM SPACING OF PIPE JOINTS FROM CROSSING LOCATION FOR BOTH WATER MAIN AND SEWER PIPE.

Water/Utility Crossing

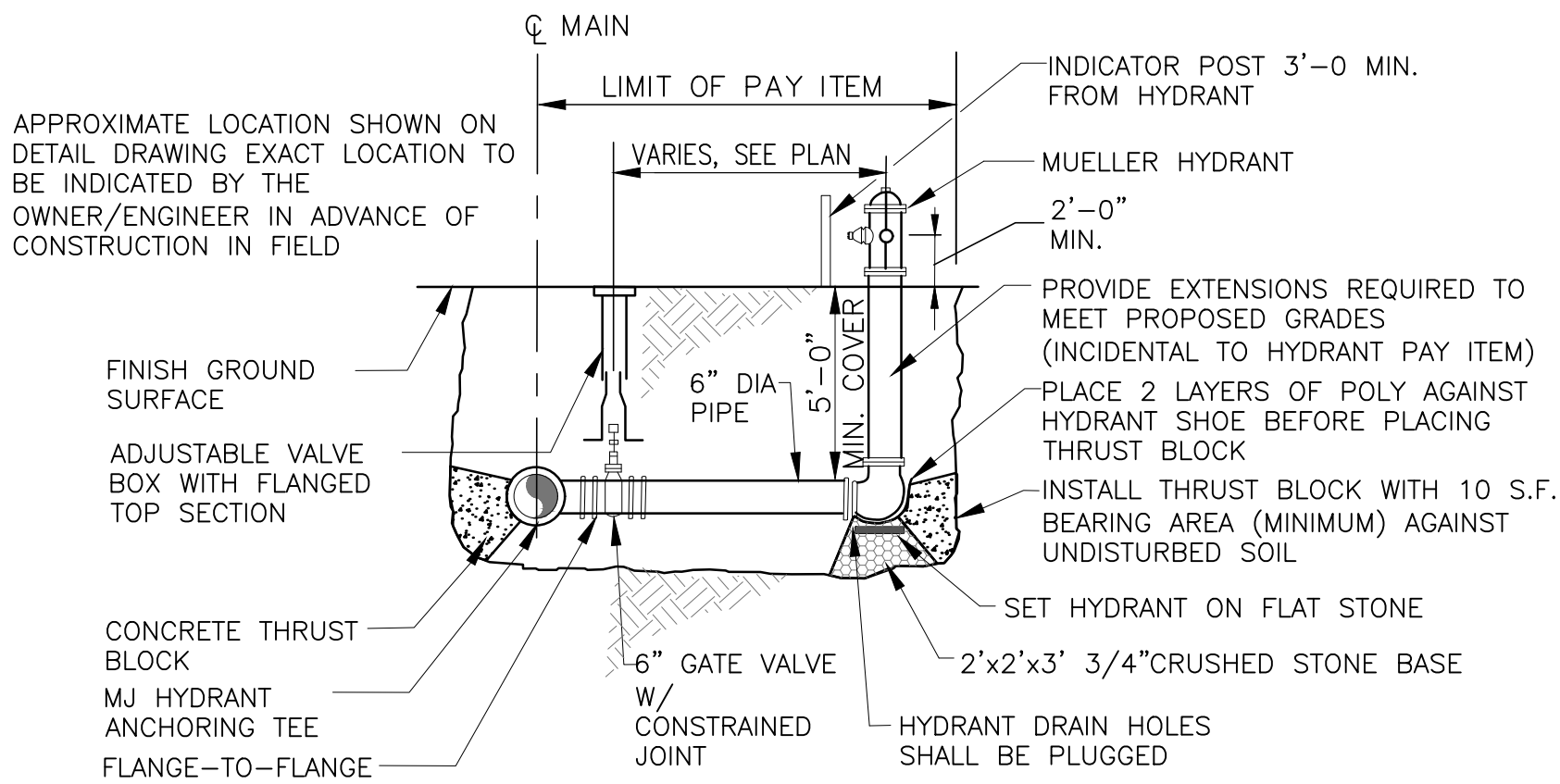
Not to Scale



- NOTES:
- PROVIDE NEW LINE USING CONTINUOUS LENGTHS OF POLYETHYLENE PIPE. NO COUPLING ALLOWED IN ROADWAY WITHOUT APPROVAL OF ENGINEER.
 - TAPS TO BE MADE AT APPROX. 10:00 AND 2:00
 - PROVIDE FOR SERVICE LINE CONTRACTION AND EXPANSION BY INSTALLING "S" IN SERVICE LINE NEAR MAIN.
 - IF SERVICE IS INSTALLED WITH LESS THAN 5'-0" COVER, INSULATE OVER LINE.
 - IF SERVICE HAS LESS THAN ADEQUATE SEPARATION (10' HORIZONTAL/18" VERTICAL-ABOVE) FROM SEWER MAINS/SERVICES, PROVIDE RIGID INSULATION ON TWO SIDES OF SERVICE PIPE.
 - TRACER WIRE (#10 INSULATED) SHALL BE PLACED ALONG THE SERVICE LINE AND SHALL BE A CONTINUOUS LENGTH (WITHOUT SPLICES), EXCEPT FOR THE SPLICE AT THE STOP BOX, WHICH SHALL BE MADE WITH A COPPER CRIMP OR SPLIT BOLT CONNECTOR.
 - INSERT STAINLESS STEEL STIFFENERS REQUIRES ON ALL FLEXIBLE PLASTIC CONNECTIONS.
 - PRESSURE TEST, DISINFECT, AND FLUSH ALL WATER SERVICE CONNECTIONS.
 - CONNECT CURB STOP TO EXISTING SERVICE AT PROPERTY LINE OR AT LOCATION APPROVED BY THE ENGINEER (NO COUPLING WITHOUT APPROVAL OF ENGINEER).

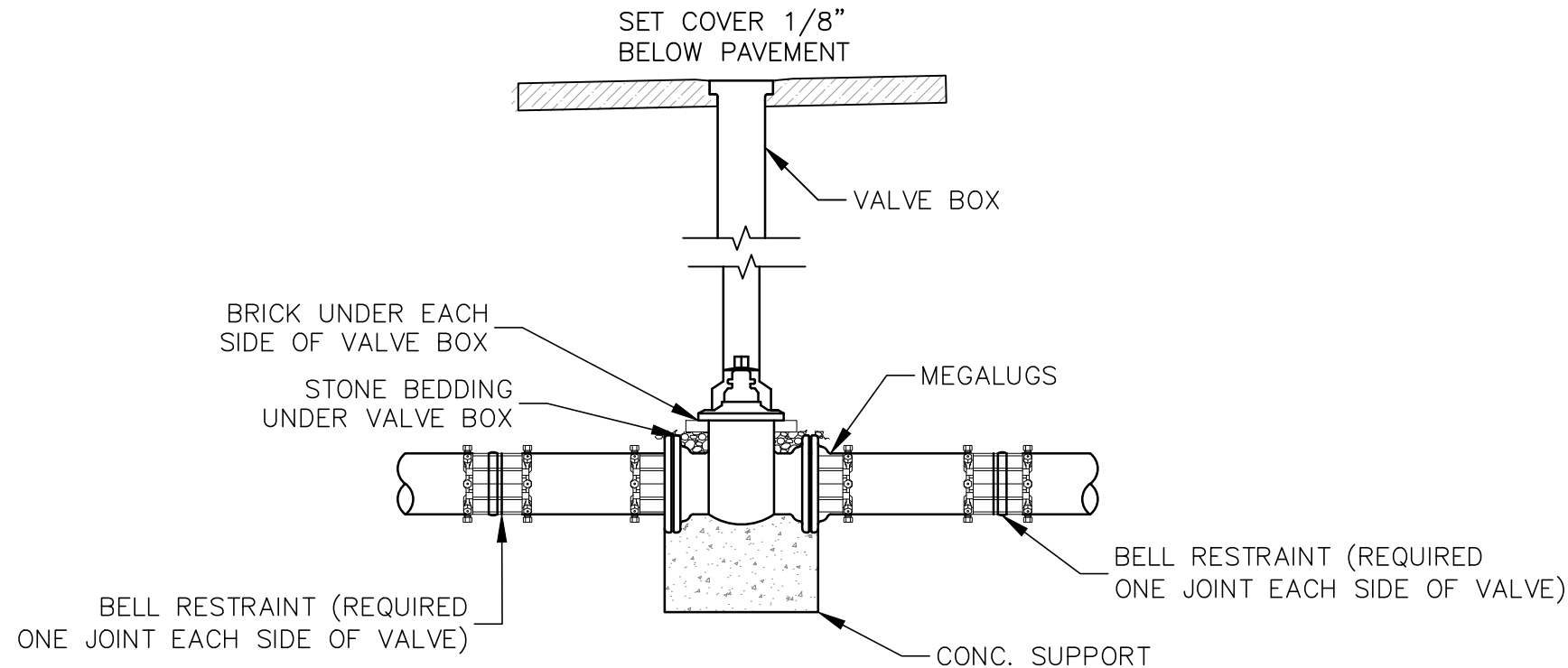
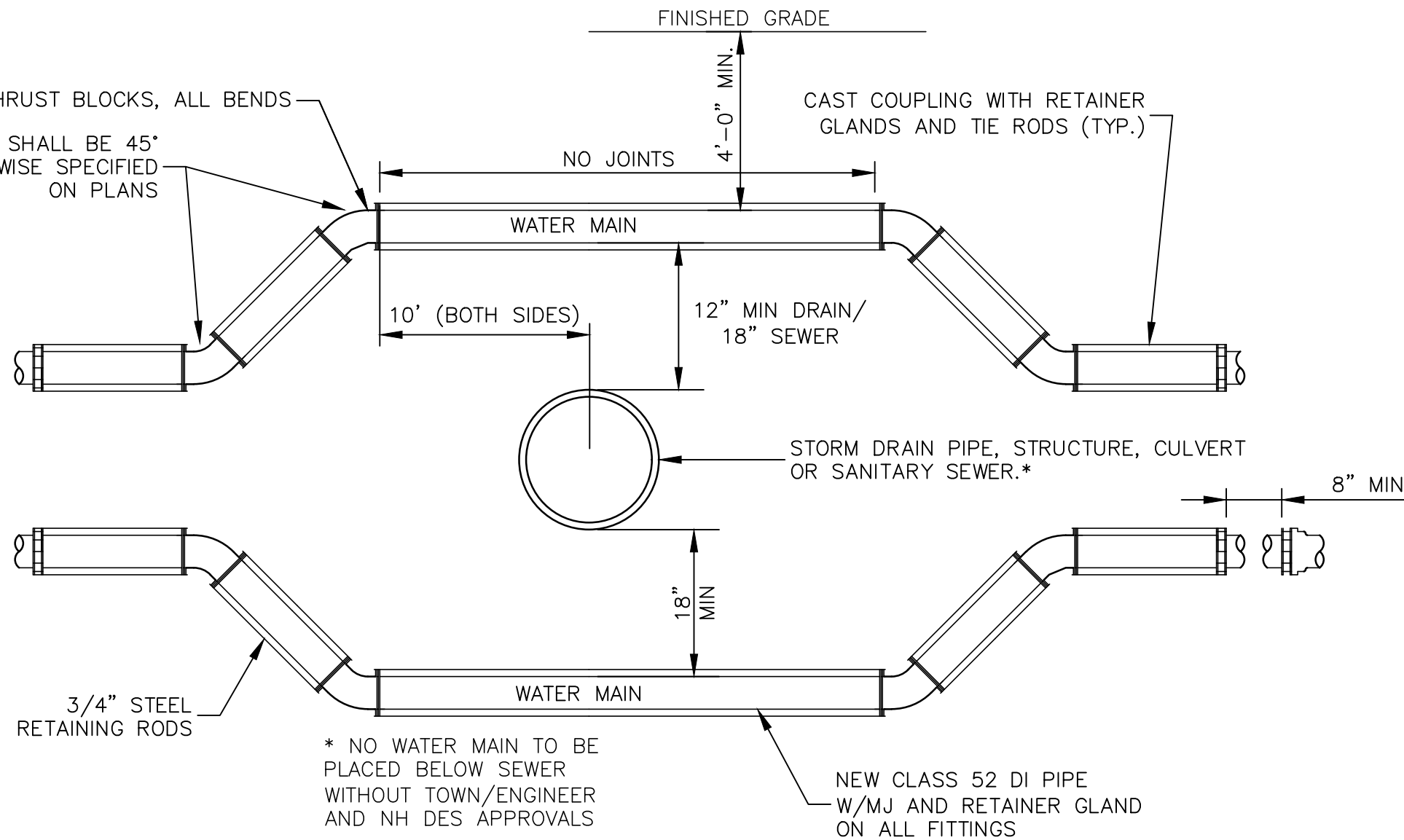
Water Service Installation

Not to Scale



Hydrant Assembly

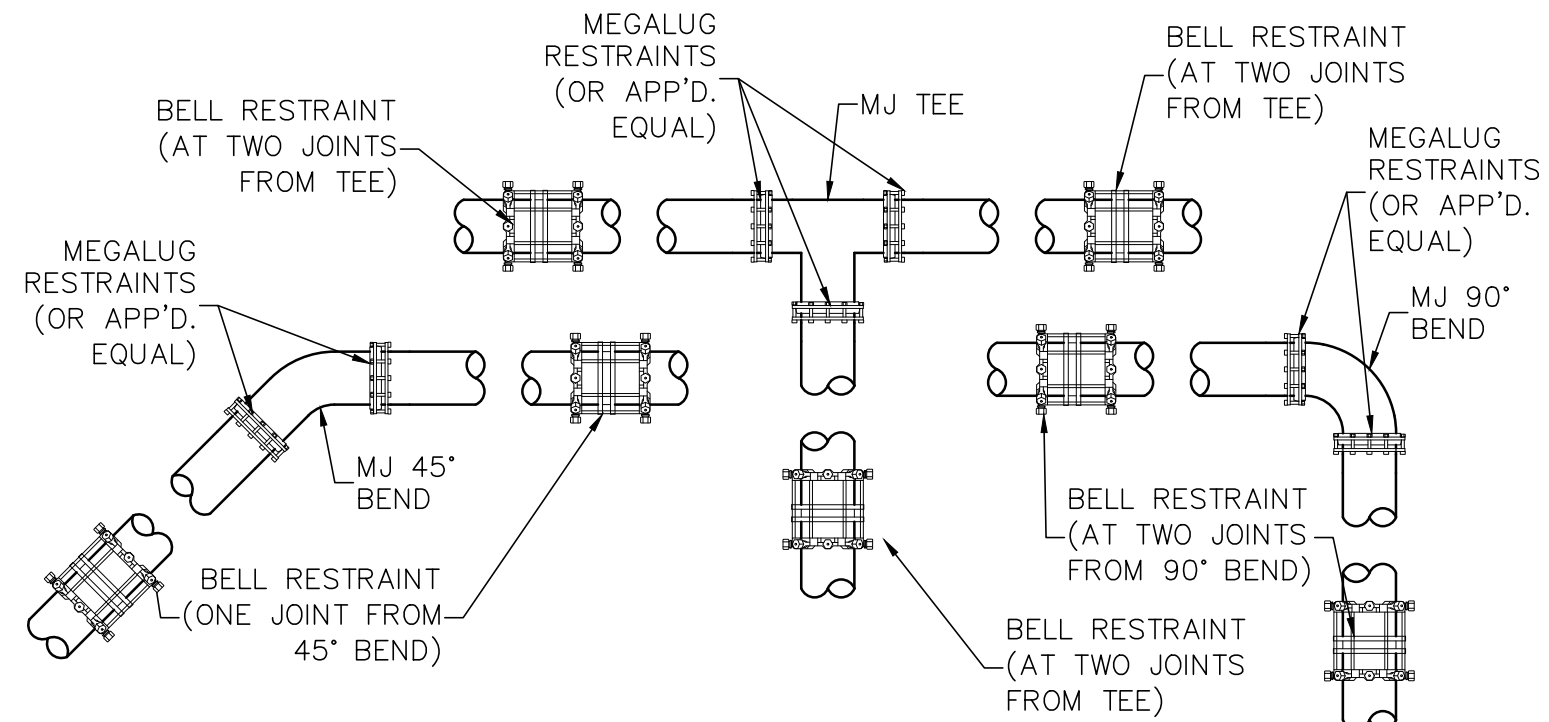
Not to Scale



- NOTES:
- VALVE BOXES SHALL BE HEAVY PATTERN CAST IRON, TWO PIECE, SLIP TYPE, 5-INCH DIAMETER SHAFT WITH EXTENSION PIECES TO ALLOW SUFFICIENT COVER.
 - THE UPPER SECTION OF THE BOX SHALL BE TOP-FLANGE TYPE TO PREVENT SETTLEMENT.
 - THE LOWER SECTION SHALL BE BELLED-TYPE TO ENCLOSE THE OPERATING NUT OF THE VALVE.
 - THE COVER SHALL BE CAST IRON WITH THE WORD "WATER" PLAINLY CAST THEREON.
 - GATE VALVES SHALL OPEN LEFT.

Valve & Valve Box Detail

Not to Scale

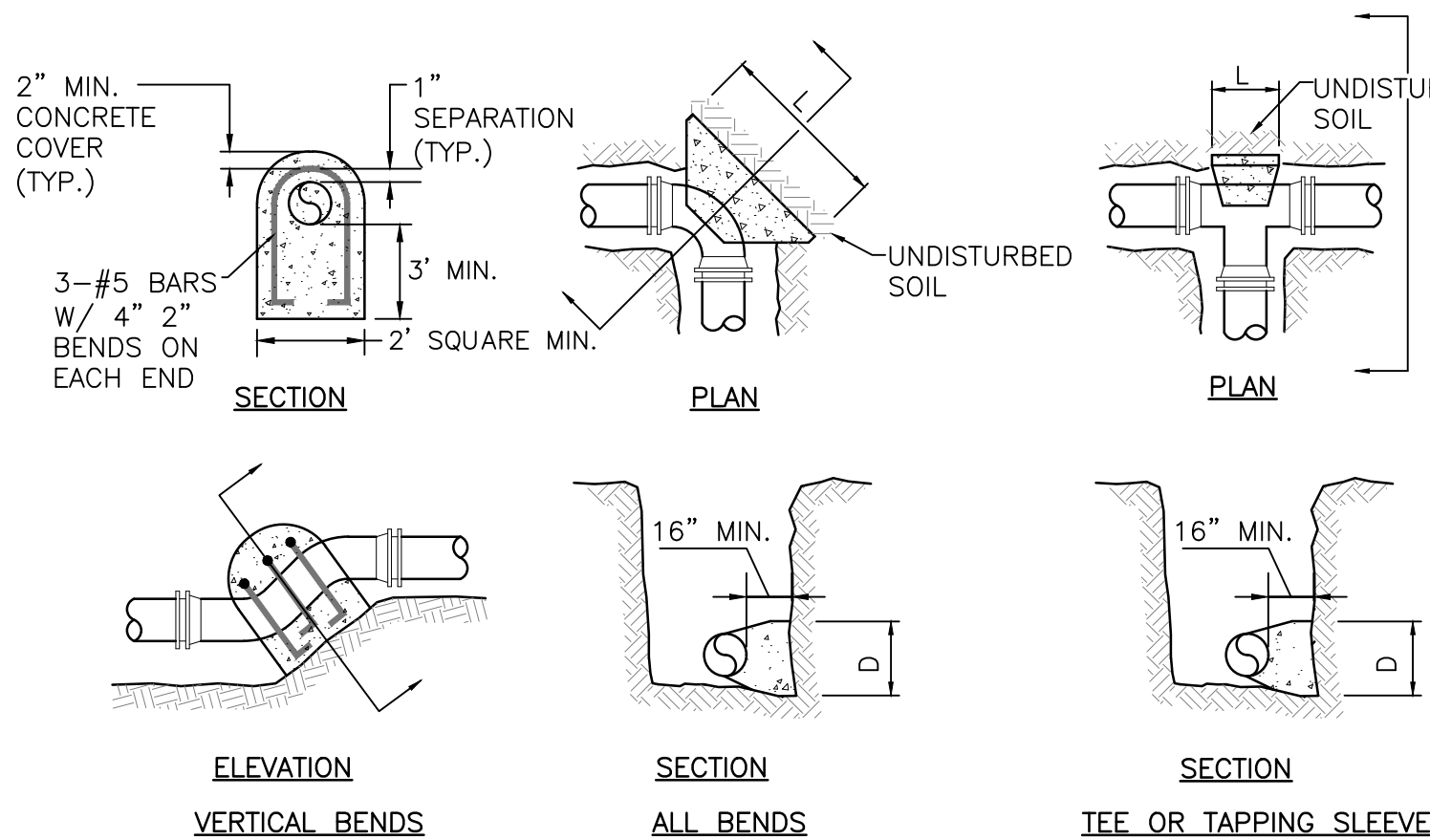


- NOTES:
- JOINT RESTRAINT IS REQUIRED AT ALL FITTINGS PER THE ABOVE TABLE.

VALVE	RESTRAINED JOINTS
IN LINE VALVES	BELL RESTRT'S REQUIRED 1 JOINT EACH SIDE/VALVE
FITTING	RESTRAINED JOINTS
22.5° BEND	1 EACH SIDE
45° BEND	1 EACH SIDE
90° BEND	2 EACH SIDE
TEE	1 EA SIDE/RUN 2 ON BRANCH

Joint Restraint Detail

Not to Scale



Thrust Blocks

Not to Scale

THRUST BLOCK SCHEDULE MINIMUM BEARING AREA (SQUARE FEET)		PIPE SIZE							
		4	6	8	10	12	16	20	24
Tees, Caps, Plugs, & Tapping Sleeves	1.05	2.32	4.15	6.37	9.15	16.23	25.44	36.58	
90 Degree Bends	1.48	3.29	5.86	9.01	12.93	22.96	35.97	51.73	
45 Degree Bends	0.80	1.78	3.17	4.88	7.00	12.42	19.47	28.00	
22-1/2 Degree Bends	0.41	0.91	1.62	2.49	3.57	6.33	9.92	14.27	
11-1/4 Degree Bends	0.21	0.46	0.81	1.25	1.79	3.18	4.99	7.17	
System Pressure: 100psi Safety Factor: 1.5 Soil Bearing Capacity: 2,000psf									

designed by:
JHK

drawn by:
AGL

approved by:
PAC

date:
October 2019

project no:
1119

file name:
1119 DETAILS.dwg

scale:

City of Portsmouth, New Hampshire
Department of Public Works

Multi-purpose Recreation Fields-Phase I
680 Peverly Hill Road

Water Details

drawing no:
C-907

sheet: 32 of 42

10/8/2019
JHK

8/19/2019
JHK

07/24/2019
JHK

07/09/2019
JHK

PLANNING BOARD PUBLIC HEARING

TAC PUBLIC HEARING

CONSERVATION COMMISSION SUBMISSION

TAC WORK SESSION SUBMISSION

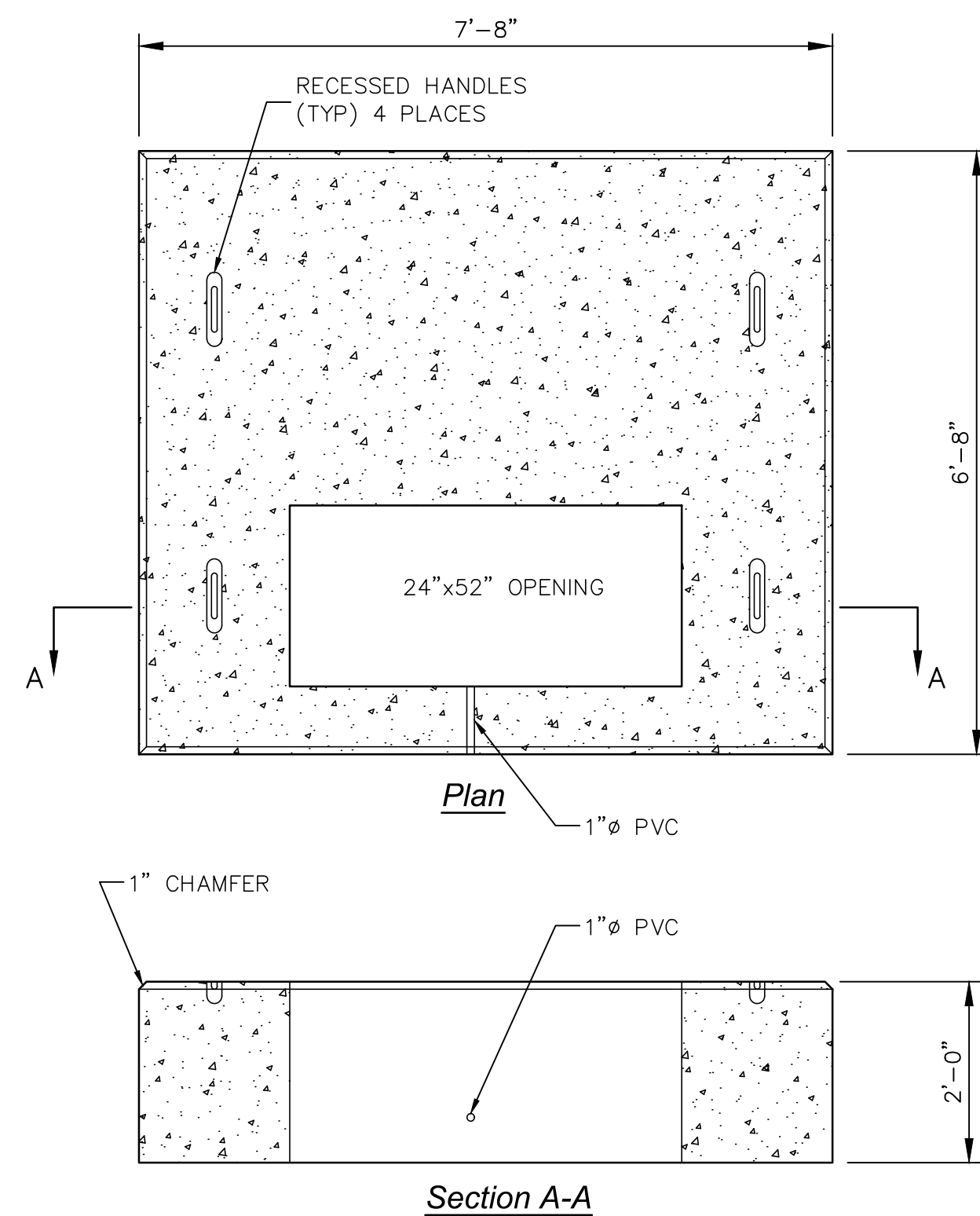
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revision

date

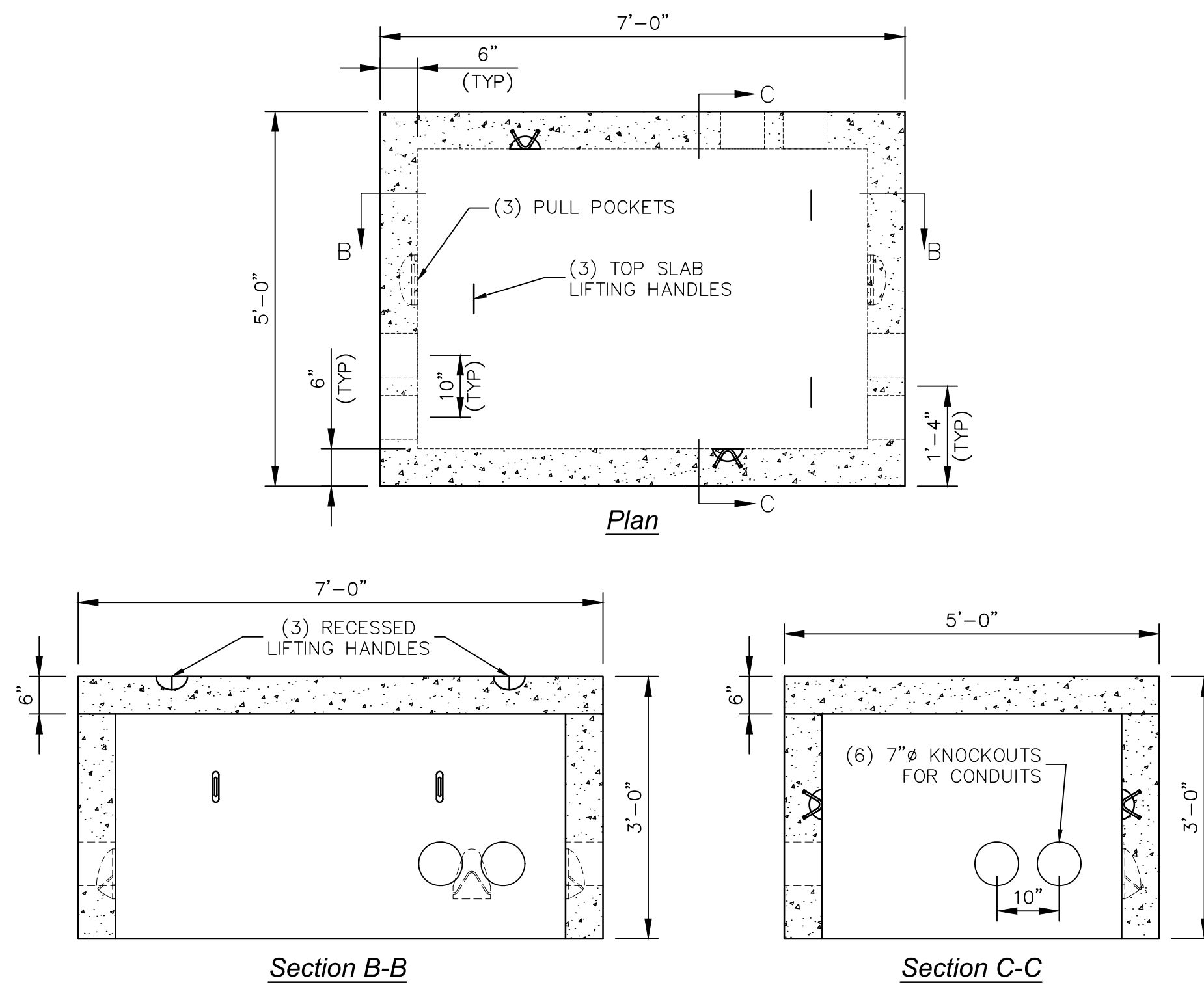
by

CMA
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Manchester, NH
Portsmouth, NH
603/431-6196 • 603/627-0708 • 207/541-4223
c m a e n g i n e e r s . c o m



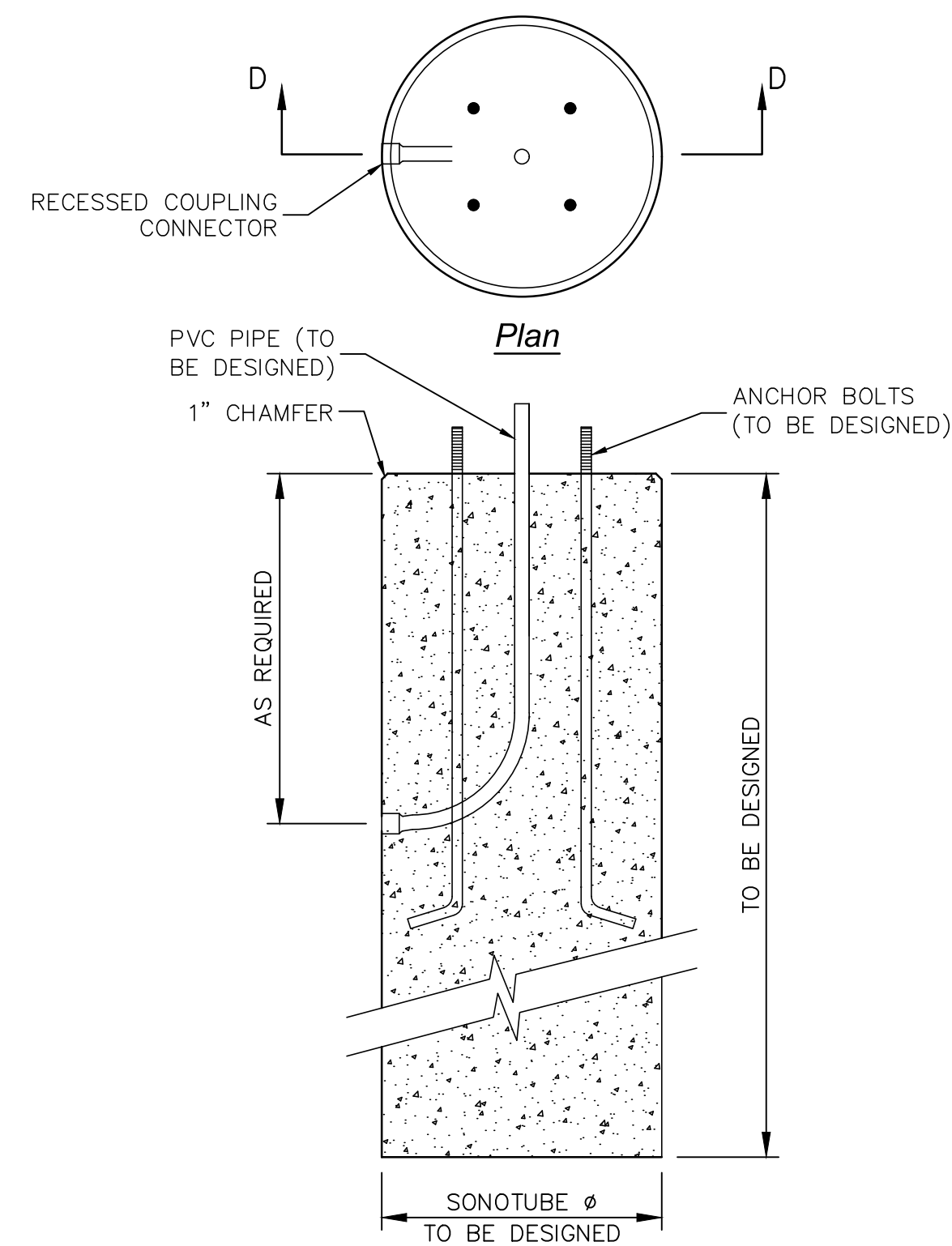
NOTES:

1. CONCRETE MINIMUM 4,000 PSI AFTER 28 DAYS.
2. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A615 GRADE 60.



NOTES:

1. CONCRETE MINIMUM 4,000 PSI AFTER 28 DAYS.
2. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A615 GRADE 60.
3. DESIGNED FOR H-10 LOADING



NOTES:

1. CONCRETE MINIMUM 5,000 PSI AFTER 28 DAYS.
2. LIGHT POLE BASE SIZE IS TO BE DESIGNED BY PROFESSIONAL ENGINEER.

3 Phase 500 KVA Transformer Pad Detail

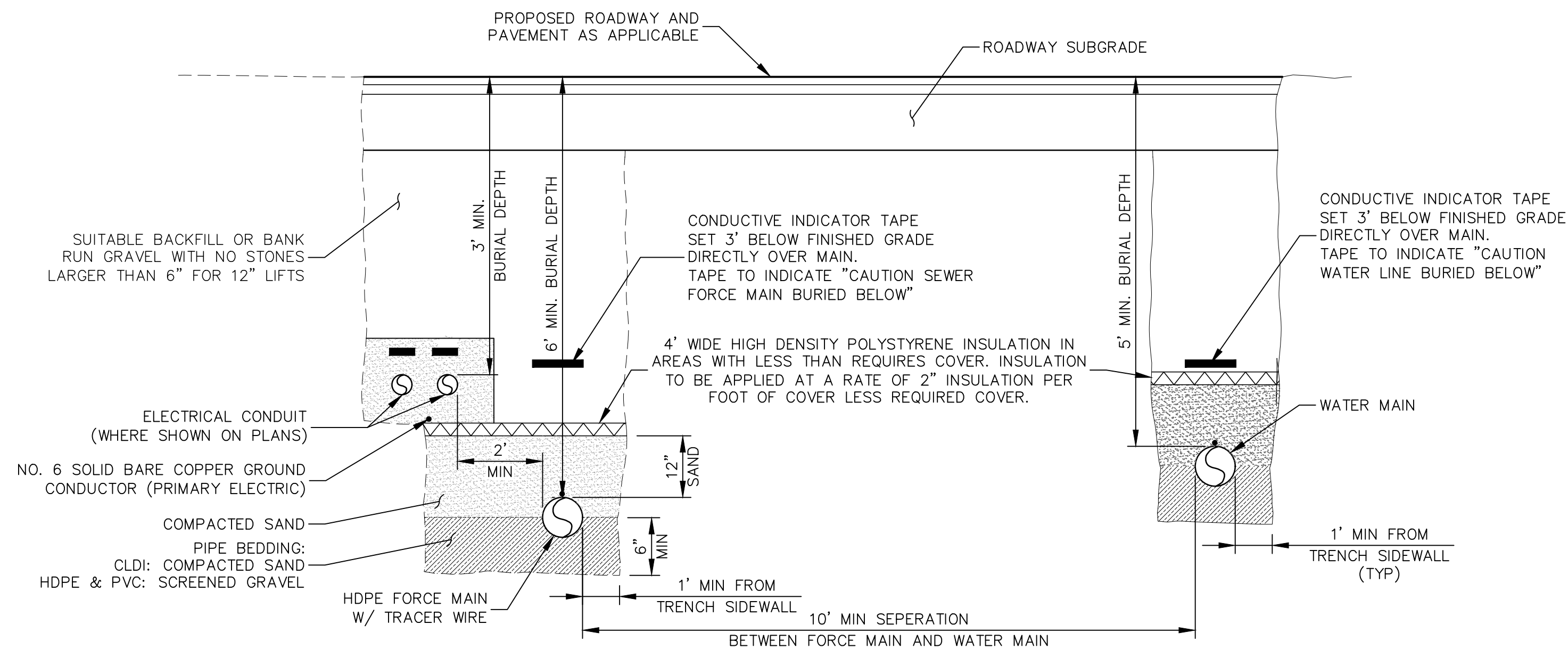
Not to Scale

Pull Box Detail

Not to Scale

Lightpole Base Detail

Not to Scale

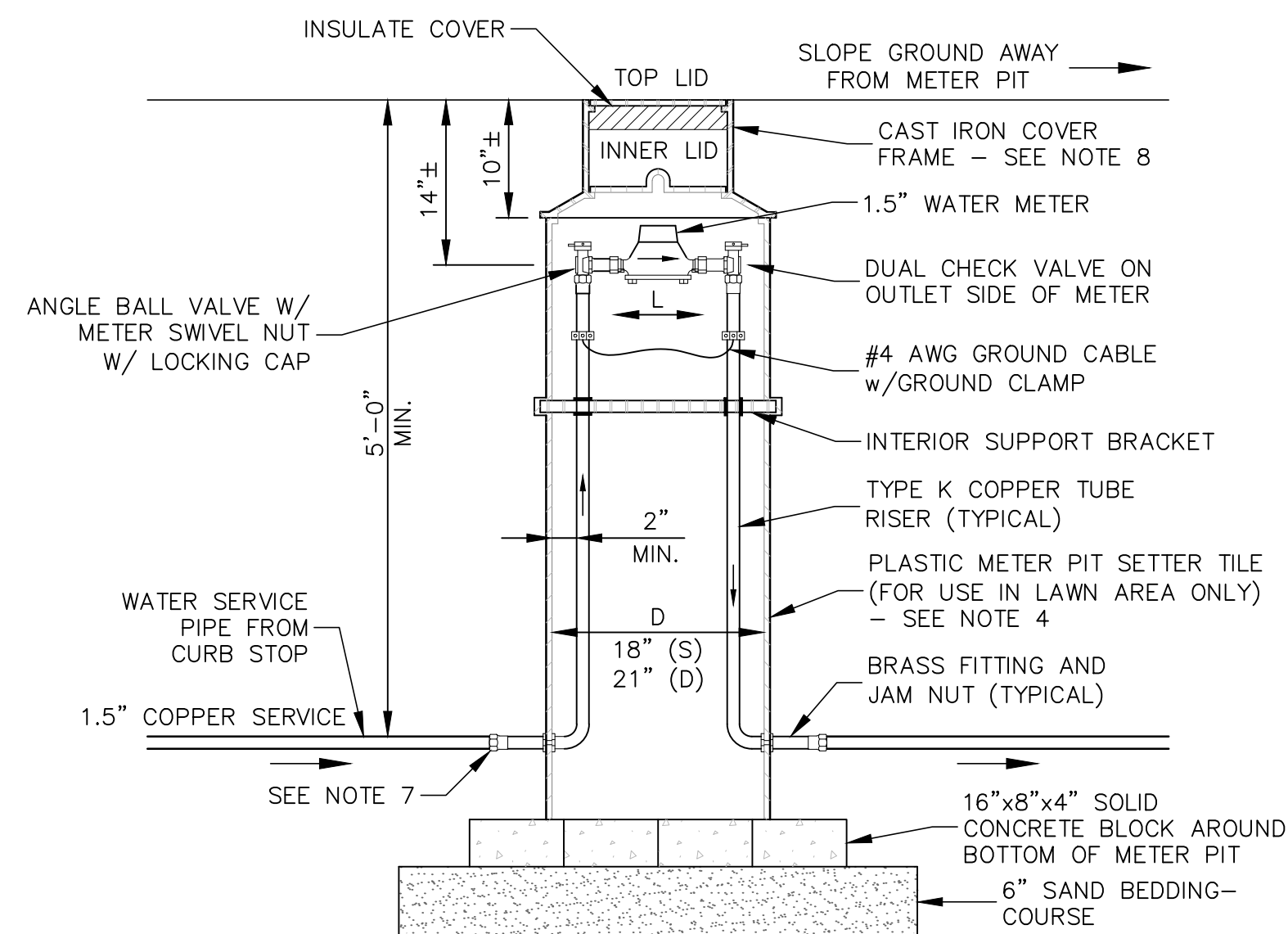


NOTES:

1. TRENCH WIDTH AS REQUIRED TO MAINTAIN 6 INCHES MINIMUM SPACING BETWEEN ALL CONDUITS AND TRENCH SIDEWALLS.
2. TRACER WIRE: PVC AND HDPE WATER MAINS SHALL HAVE TRACER WIRE PLACED ON TOP OF THE PIPE. PROVIDE TRACER WIRE ACCESS BOXES AT VALVES, HYDRANTS, AND MAINLINE WHERE NECESSARY TO ACHIEVE 500' MAX. INTERVALS, IN ADDITION TO THE BEGINNING AND END OF THE PIPE.

SCREENED GRAVEL BEDDING	
% PASSING	SIEVE SIZE
100%	1"
90-100%	3/4"
20-55%	3/8"

SCREENED GRAVEL BEDDING	
% PASSING	SIEVE SIZE
0-10%	#4
0-5%	#8



NOTES:

1. WATER METER WILL BE PROVIDED BY AND INSTALLED BY THE CITY DPW.
2. CONTRACTOR TO PROVIDE FITTINGS FROM SERVICE LINE TO 1.5" WATER METER.
3. WATER PIPE, VALVES AND FITTINGS (EXCLUDING WATER METER) ARE TO BE ASSEMBLED INSIDE METER PIT AT FACTORY.
4. METER PIT LOCATIONS ARE SUBJECT TO APPROVAL BY THE OWNER AND ENGINEER.
5. WHEN INSTALLED IN PAVED AREA, WATER METER PIT IS TO BE DESIGNED TO SUPPORT AASHTO HS-20-44 WHEEL LOADING. METER PITS SHALL BE FORD PLASTIC PIT SETTERS OF APPROVED EQUAL. SUBMIT SHOP DRAWINGS OF METER PIT FOR APPROVAL PRIOR TO FABRICATION.
6. SAND BACKFILL AROUND EXTERIOR WALLS OF METER PIT IS TO BE CAREFULLY PLACED AND COMPACTED IN 12 INCH LIFTS.
7. BOTTOM INLET AND OUTLET CONNECTIONS ARE TO ACCOMMODATE COPPER COMPRESSION JOINTS.
8. TOP LID IS TO BE 11½ INCH DIAMETER LOCKING CAST IRON WITH HOLE AND PLUG FOR ELECTRONIC METER READ MODULE. INNER LID IS TO BE PLASTIC. COVER FRAME IS TO BE SIZED TO FIT REQUIRED DIAMETER OF METER PIT SETTER TILE.
9. APPROVED NON-TESTABLE, DOUBLE-CHECK BACKFLOW PREVENTION DEVICES WILL BE REQUIRED.

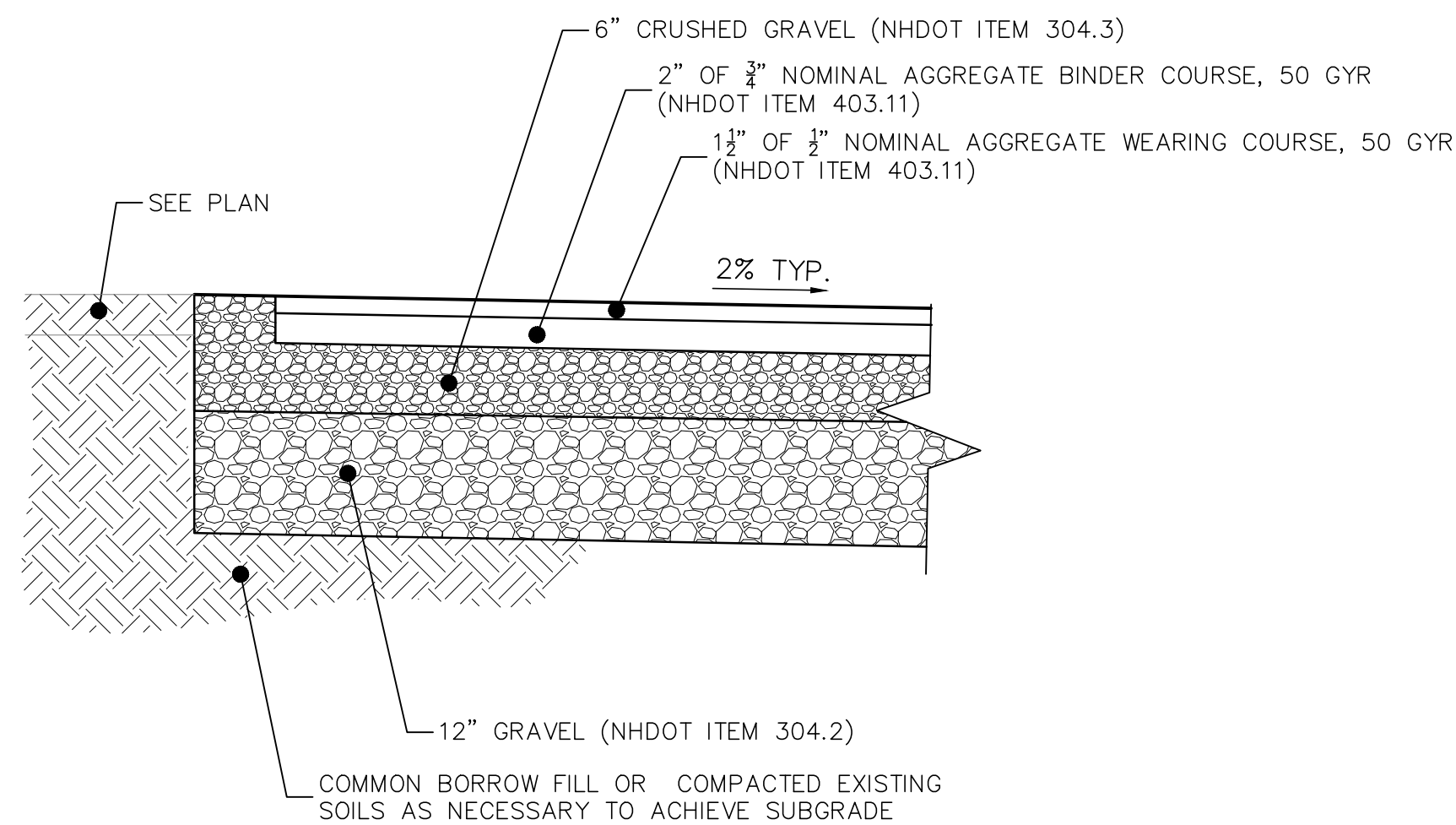
Water Main, Force Main and Electric/Communication Conduit Trench

Not to Scale

Meter Pit Detail

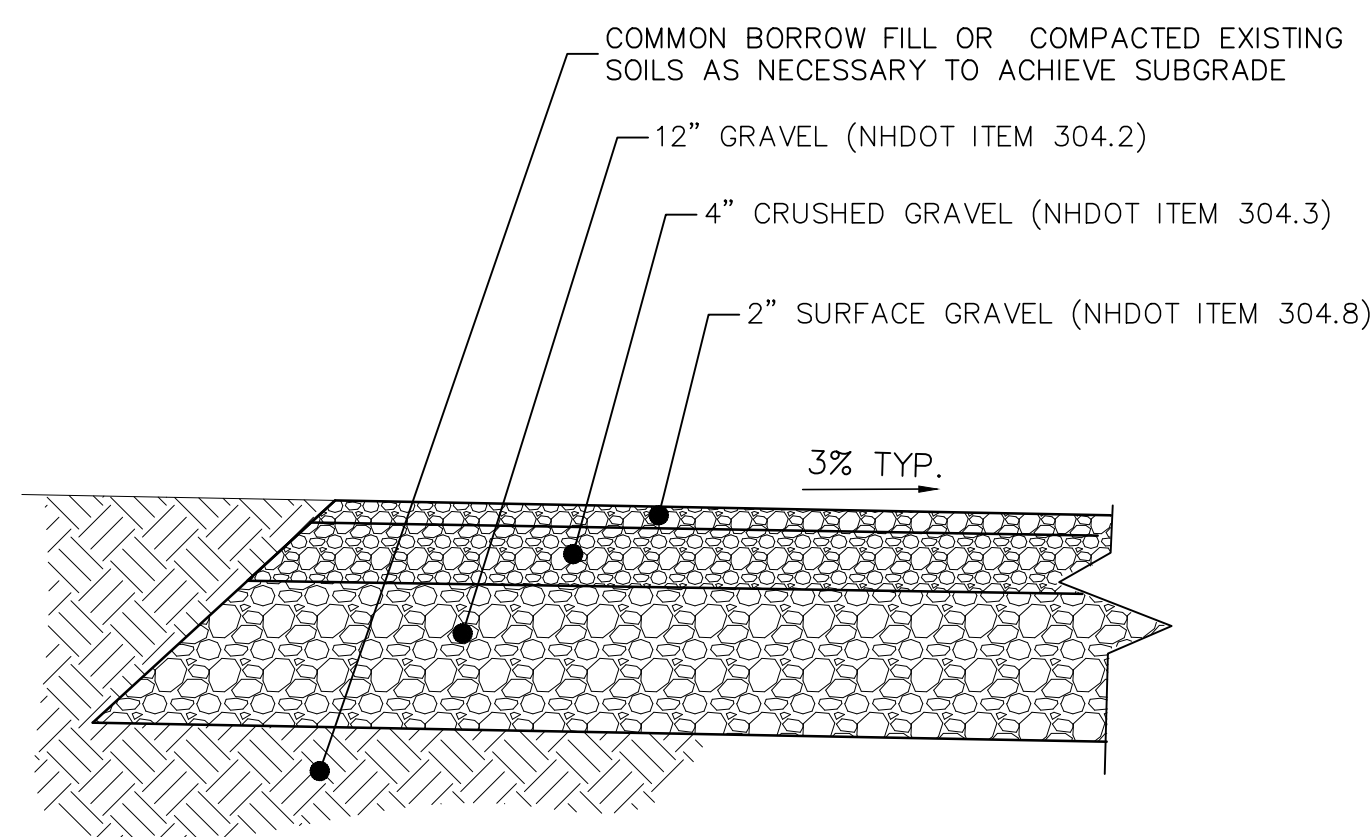
Not to Scale

AGENCY REVIEW



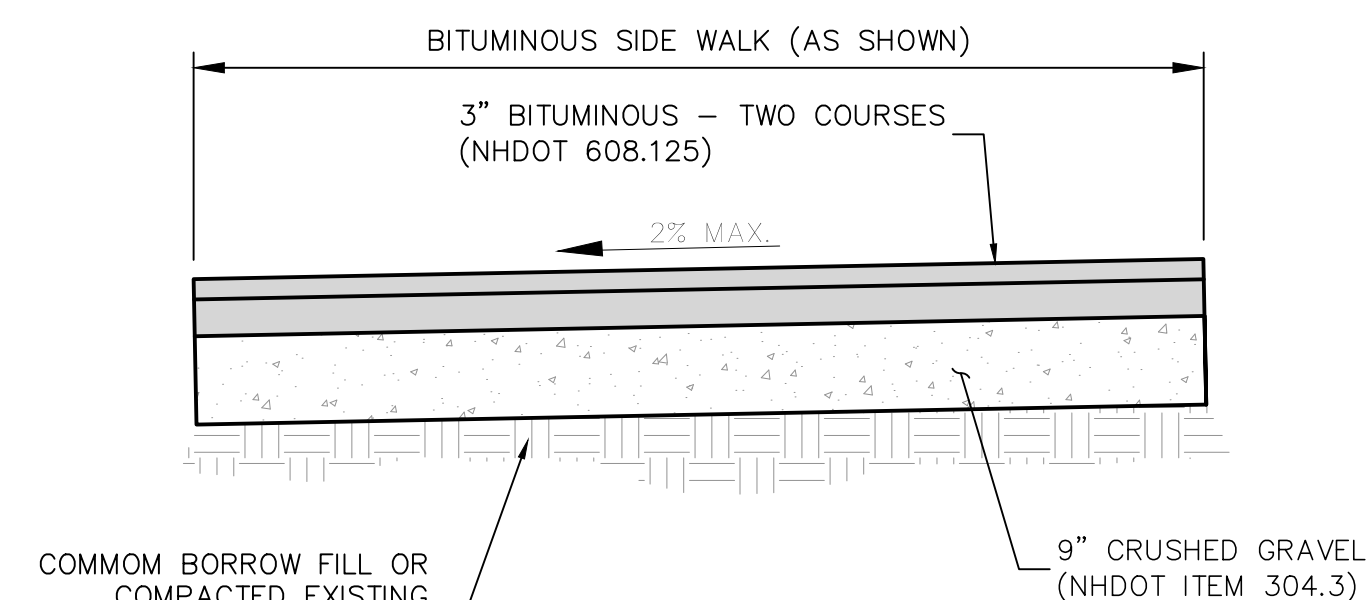
General Bituminous Pavement Section

Not to Scale



General Gravel Section

Not to Scale

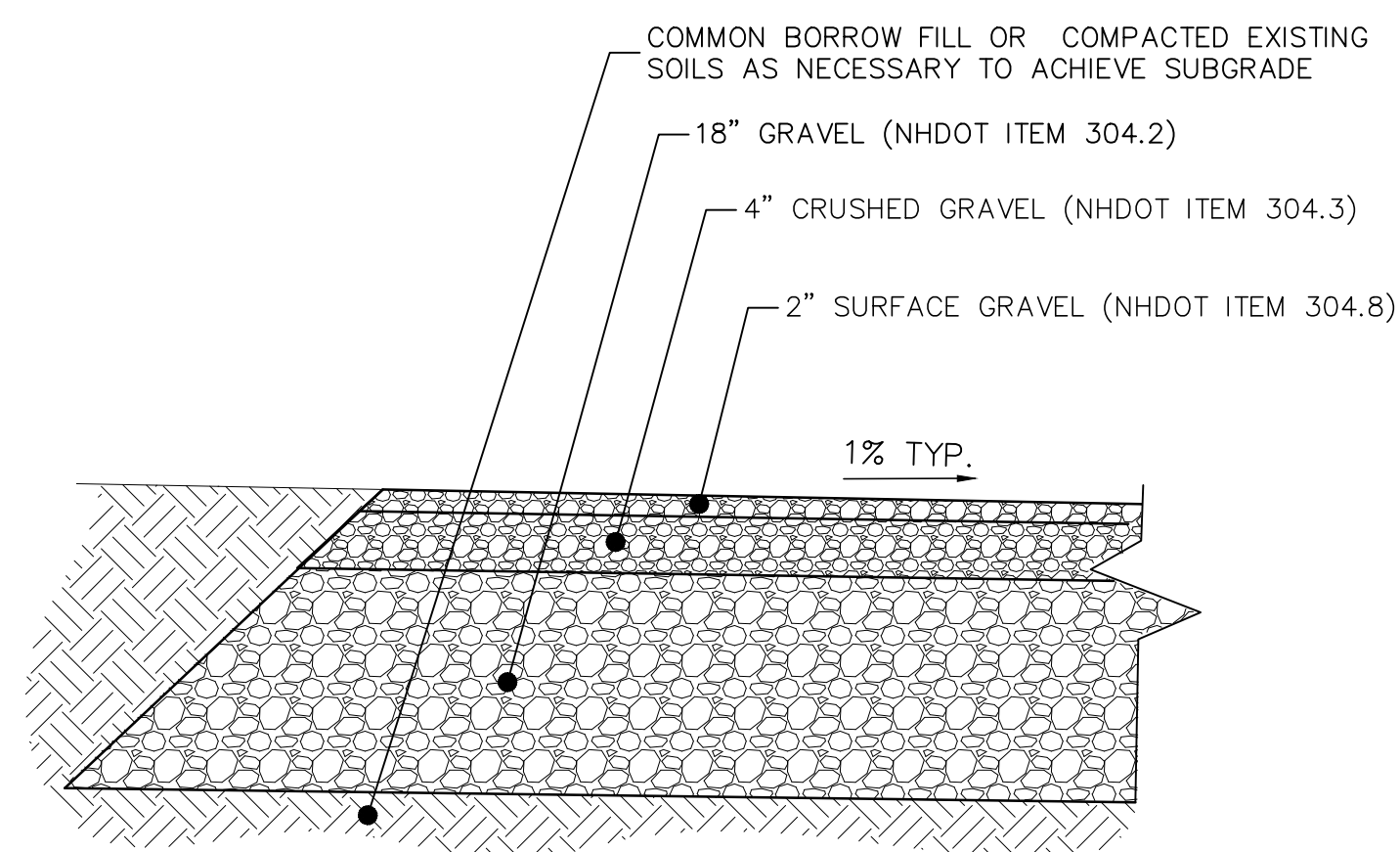


NOTES:

1. SIDEWALK SHALL BE CONSTRUCTED OF MATERIALS SPECIFIED AND INSTALLED IN ACCORDANCE WITH DOT SPECIFICATION 608 - SIDEWALKS.

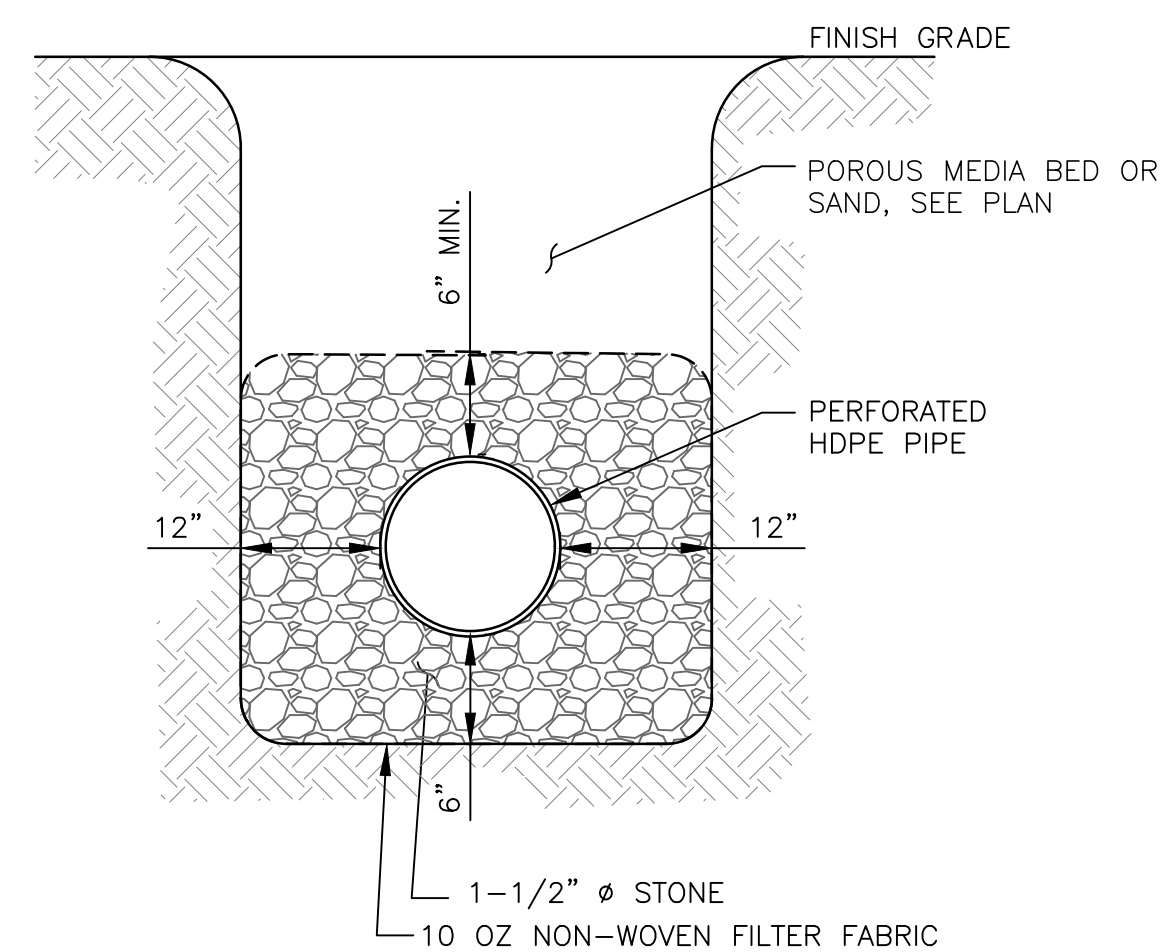
Typical Bituminous Sidewalk Section

Not to Scale



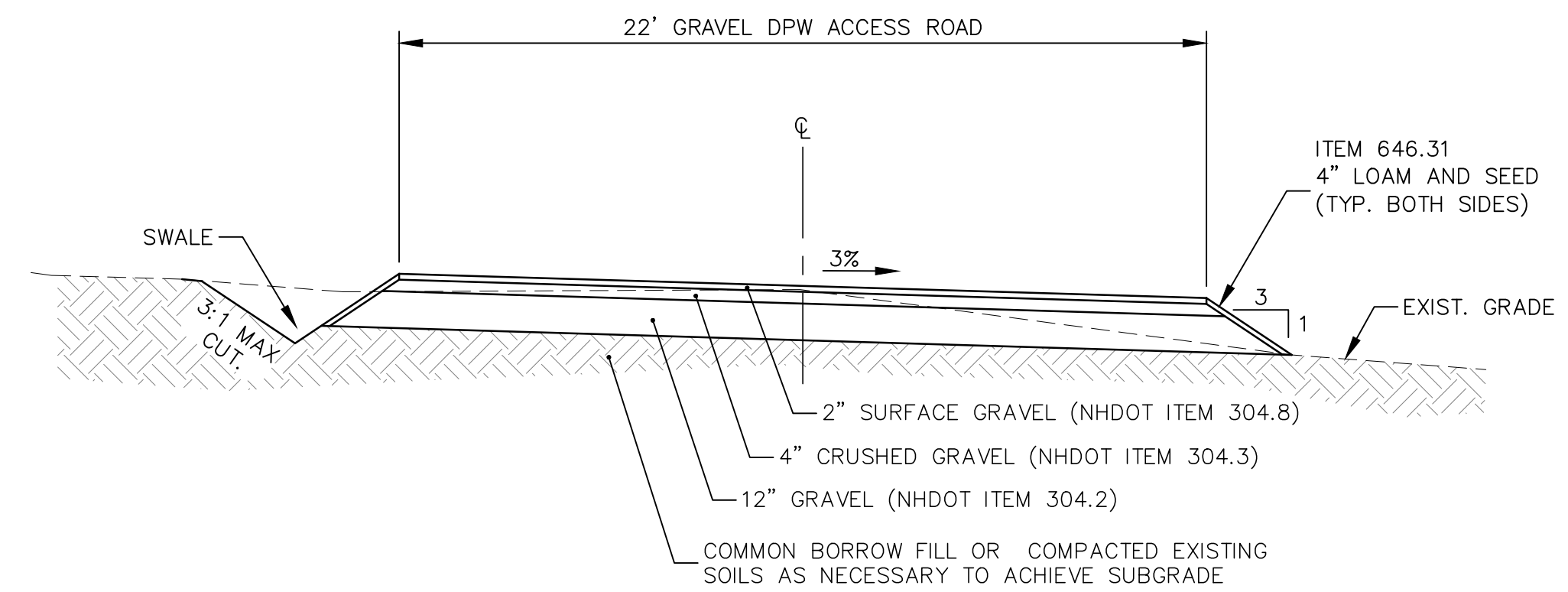
Heavy Duty Gravel Section

Not to Scale



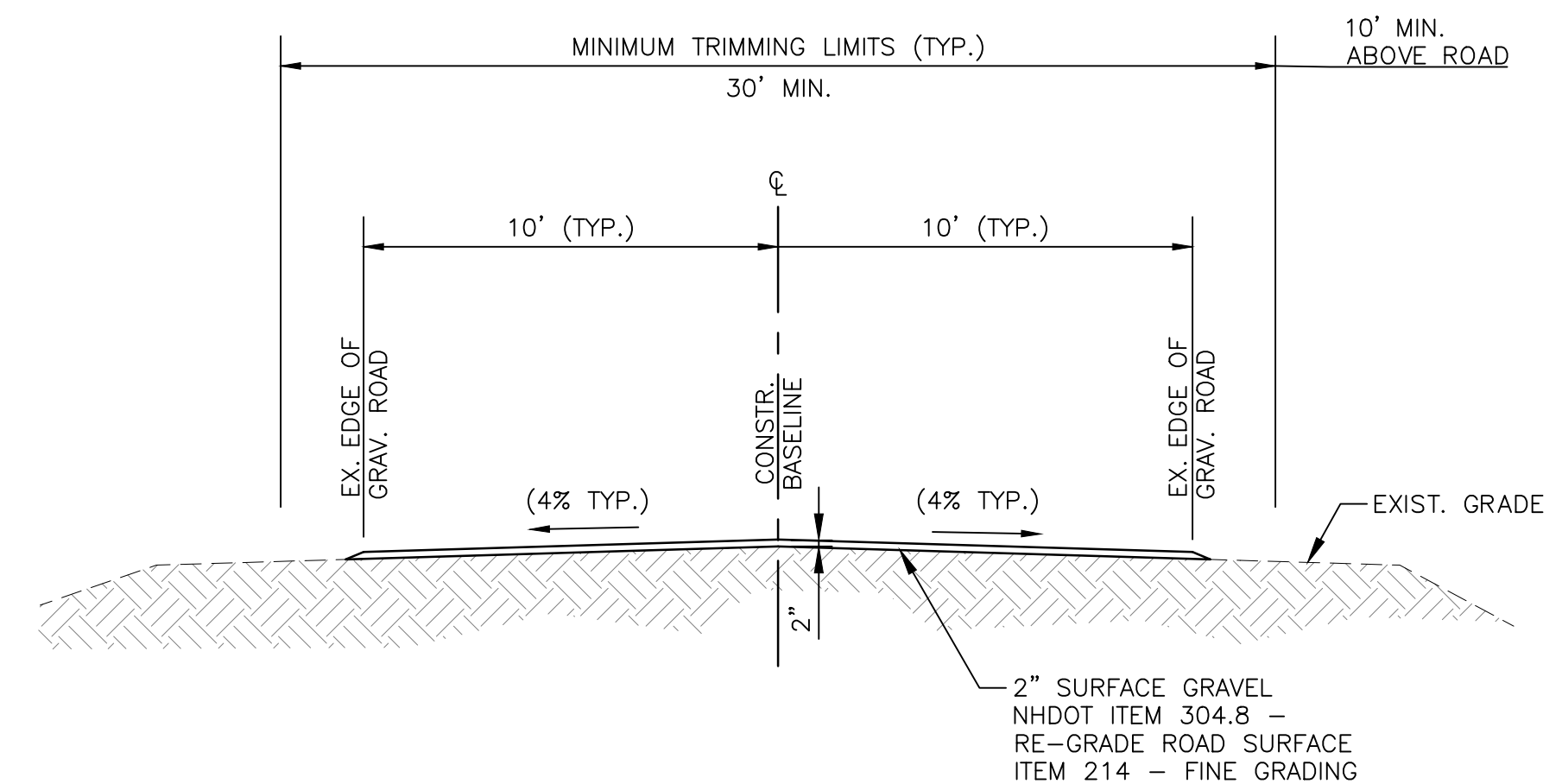
Perimeter Underdrain Pipe Trench

Not to Scale



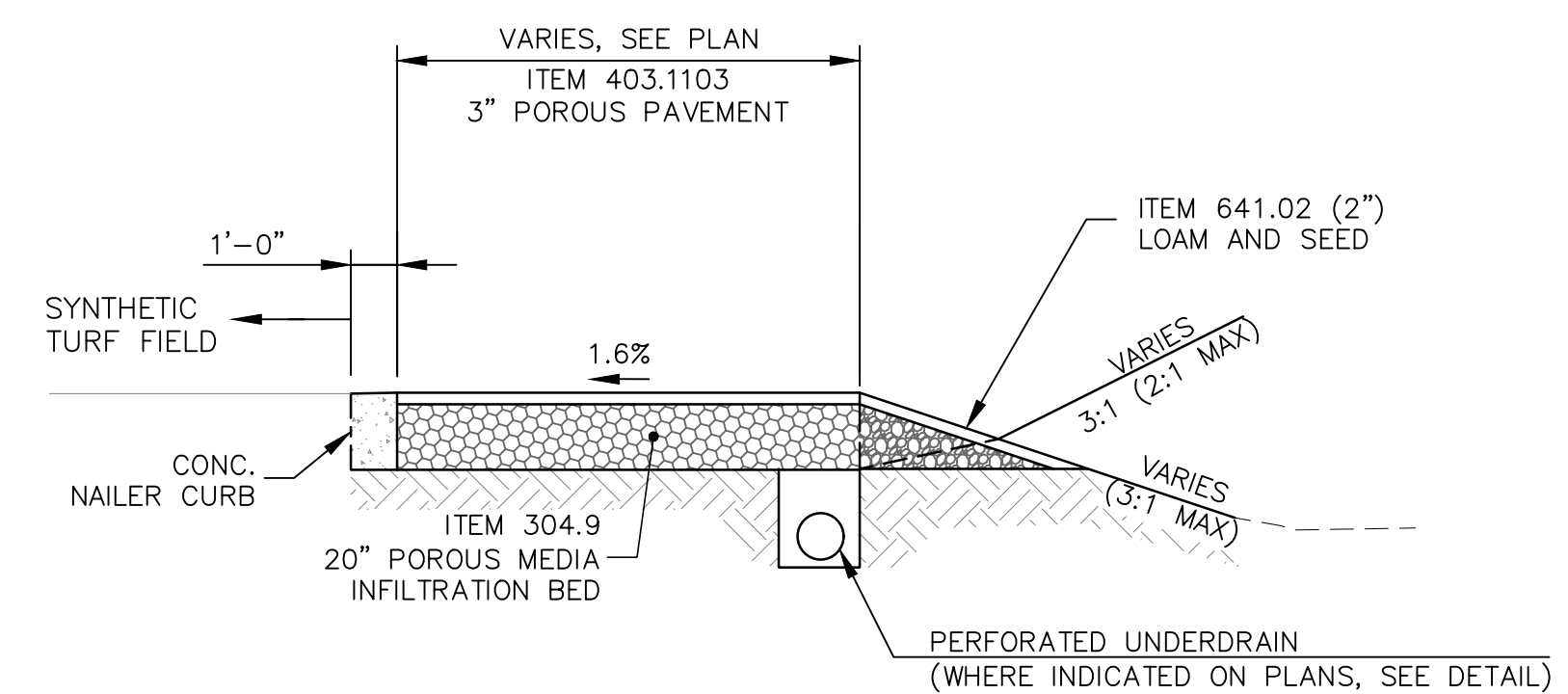
Typical DPW Access Road Section

Not to Scale



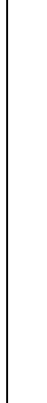
Typical Access Drive Section

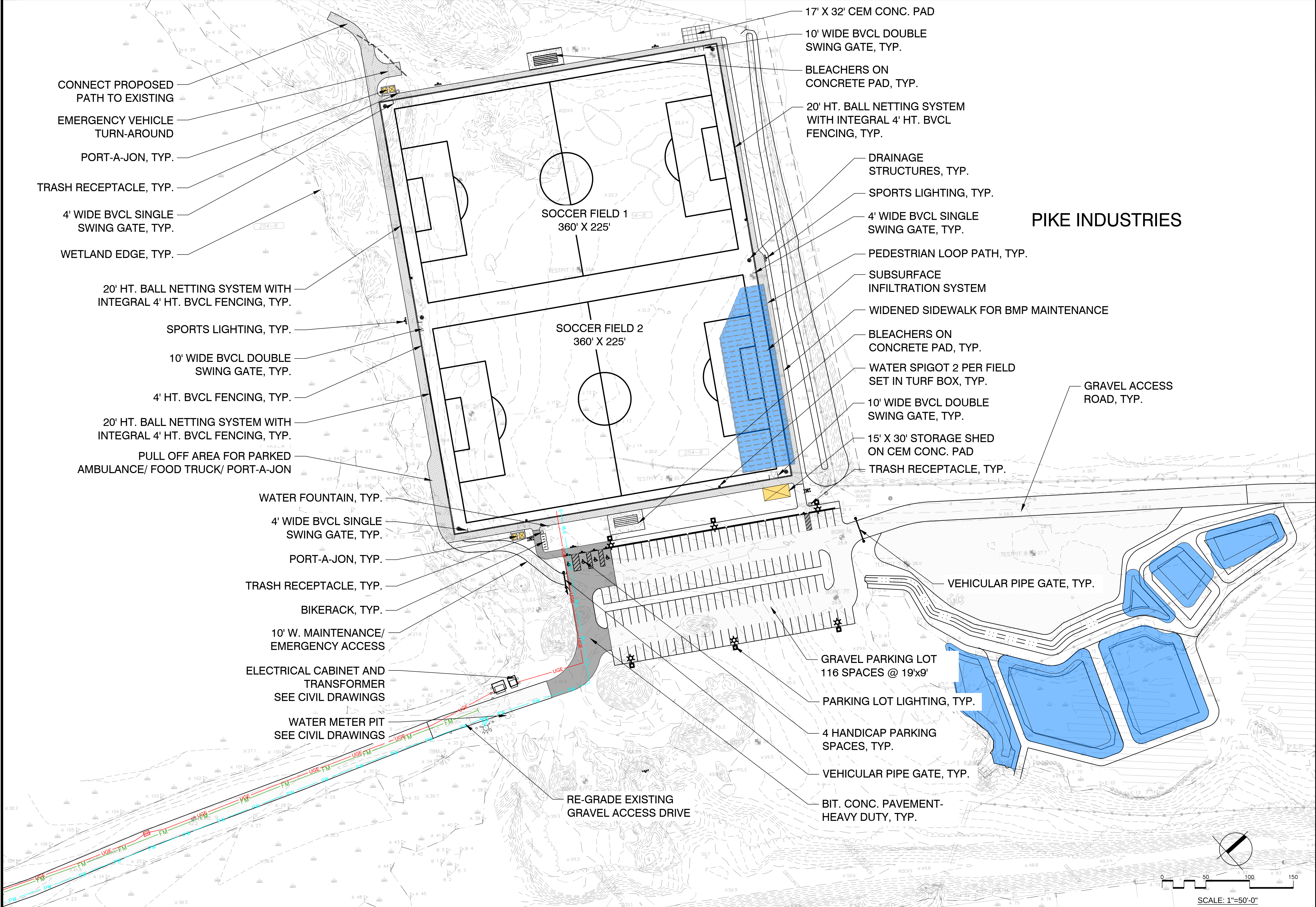
Not to Scale



Porous Pavement Path

Not to Scale

City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields-Phase I 680 Peverly Hill Road Miscellaneous Details	date: October 2019	designed by: JHK			CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 c m a e n g i n e e r s . c o m				
	project no: 1119	drawn by: AGL							
	file name: 1119 DETAILS.dwg	approved by: PAC							
	scales:								
drawing no. C-909									
sheet:	34	of	42						



CONNECT PROPOSED
PATH TO EXISTING

EMERGENCY VEHICLE
TURN-AROUND

PORT-A-JON, TYP.

TRASH RECEPTACLE, TYP.

4' WIDE BVCL SINGLE
SWING GATE, TYP.

WETLAND EDGE, TYP.

20' HT. BALL NETTING SYSTEM WITH
INTEGRAL 4' HT. BVCL FENCING, TYP.

SPORTS LIGHTING, TYP.

10' WIDE BVCL DOUBLE
SWING GATE, TYP.

4' HT. BVCL FENCING, TYP.

20' HT. BALL NETTING SYSTEM WITH
INTEGRAL 4' HT. BVCL FENCING, TYP.

PULL OFF AREA FOR PARKED
AMBULANCE/ FOOD TRUCK/ PORT-A-JON

WATER FOUNTAIN, TYP.

4' WIDE BVCL SINGLE
SWING GATE, TYP.

PORT-A-JON, TYP.

TRASH RECEPTACLE, TYP.

BIKERACK, TYP.

10' W. MAINTENANCE/
EMERGENCY ACCESS

ELECTRICAL CABINET AND
TRANSFORMER
SEE CIVIL DRAWINGS

WATER METER PIT
SEE CIVIL DRAWINGS

RE-GRADE EXISTING
GRAVEL ACCESS DRIVE

17' X 32' CEM CONC. PAD

10' WIDE BVCL DOUBLE
SWING GATE, TYP.

BLEACHERS ON
CONCRETE PAD, TYP.

20' HT. BALL NETTING SYSTEM
WITH INTEGRAL 4' HT. BVCL
FENCING, TYP.

DRAINAGE
STRUCTURES, TYP.

SPORTS LIGHTING, TYP.

4' WIDE BVCL SINGLE
SWING GATE, TYP.

PEDESTRIAN LOOP PATH, TYP.

SUBSURFACE
INFILTRATION SYSTEM

WIDENED SIDEWALK FOR BMP MAINTENANCE

BLEACHERS ON
CONCRETE PAD, TYP.

WATER SPIGOT 2 PER FIELD
SET IN TURF BOX, TYP.

10' WIDE BVCL DOUBLE
SWING GATE, TYP.

15' X 30' STORAGE SHED
ON CEM CONC. PAD

TRASH RECEPTACLE, TYP.

GRAVEL ACCESS
ROAD, TYP.

VEHICULAR PIPE GATE, TYP.

GRAVEL PARKING LOT
116 SPACES @ 19'x9'

PARKING LOT LIGHTING, TYP.

4 HANDICAP PARKING
SPACES, TYP.

VEHICULAR PIPE GATE, TYP.

BIT. CONC. PAVEMENT-
HEAVY DUTY, TYP.

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Portsmouth, NH Manchester, NH Portland, Maine

Weston & Sampson
427 Main Street, Suite 400, Worcester, MA
(978) 977-0110 (800) 726-7766
www.westonandsampson.com

designed by:

date:

drawn by:

project no:

approved by:

file name:

scale:

City of Portsmouth, New Hampshire
Department of Public Works

Multi-purpose Recreation Fields
680 Peverly Hill Road

Recreation Fields
SITE PLAN

drawing no.
L1.01

sheet:

of

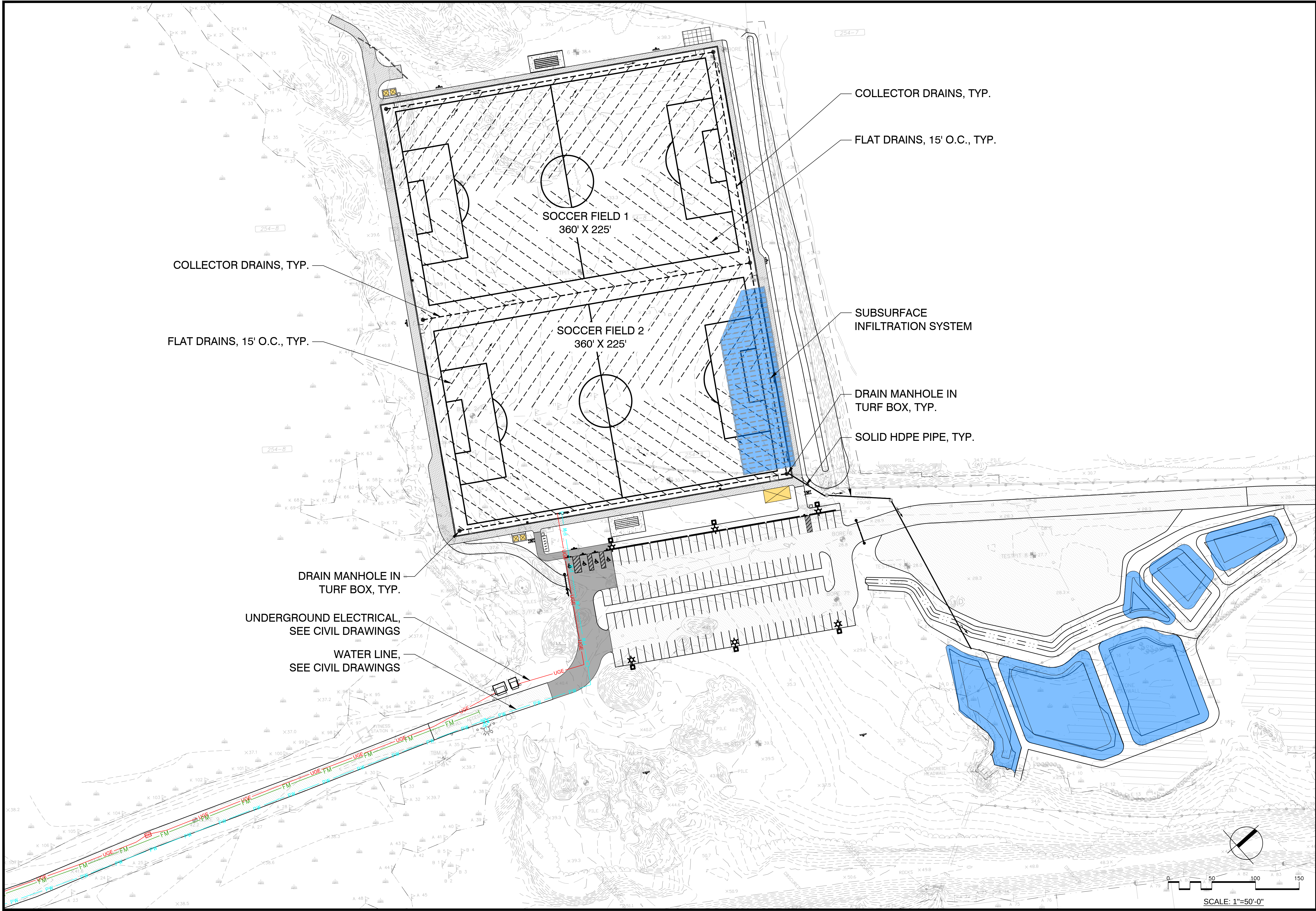
-

revision

no.

by

date



COLLECTOR DRAINS, TYP.

FLAT DRAINS, 15' O.C., TYP.

DRAIN MANHOLE IN
TURF BOX, TYP.

UNDERGROUND ELECTRICAL,
SEE CIVIL DRAWINGS

WATER LINE,
SEE CIVIL DRAWINGS

COLLECTOR DRAINS, TYP.

FLAT DRAINS, 15' O.C., TYP.

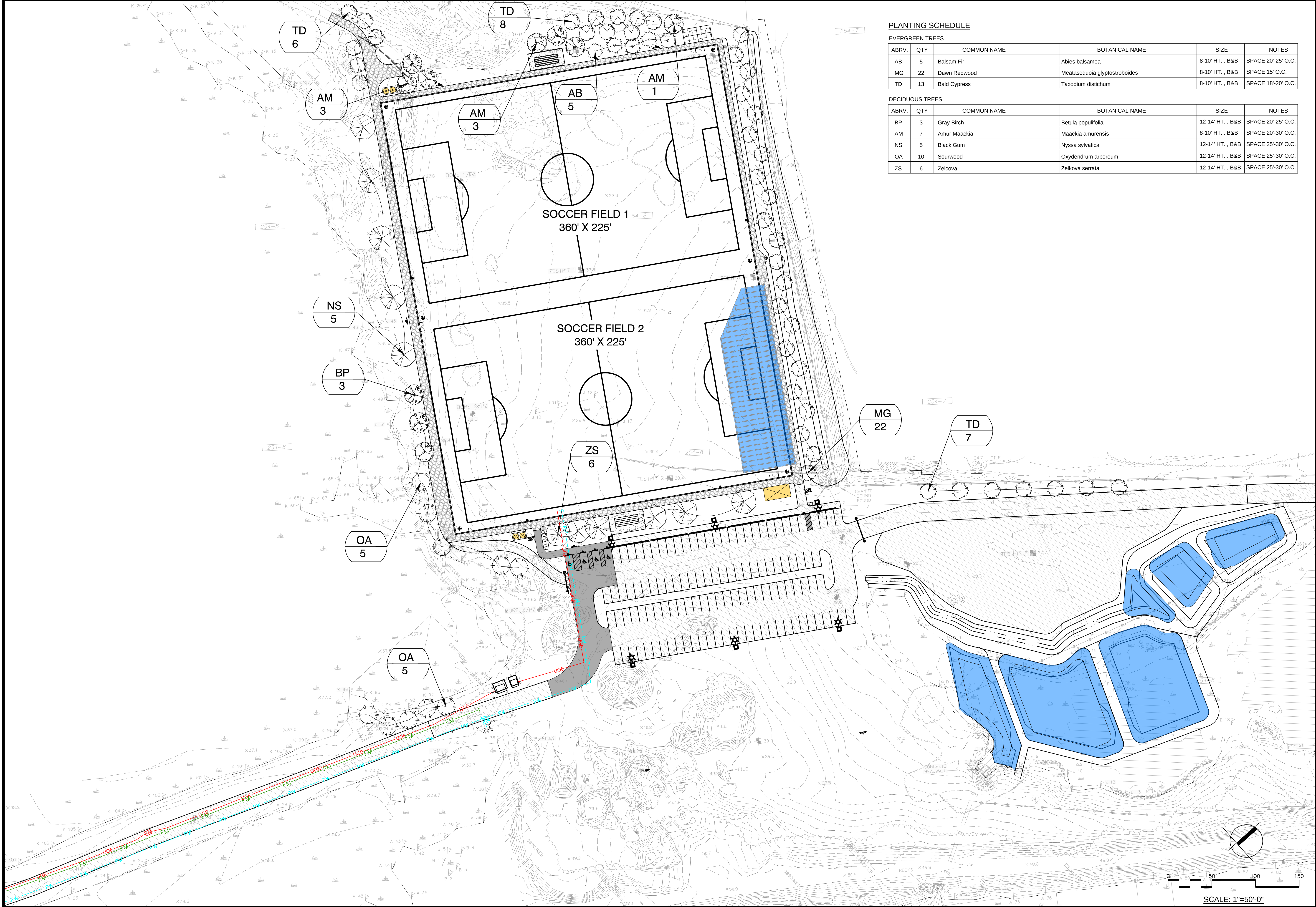
SUBSURFACE
INFILTRATION SYSTEM

DRAIN MANHOLE IN
TURF BOX, TYP.

SOLID HDPE PIPE, TYP.

City of Portsmouth, New Hampshire Department of Public Works		designed by:		date:		-	
		project no:		-			
Multi-purpose Recreation Fields 680 Peverly Hill Road		drawn by:		-			
		approved by:		-			
Recreation Fields DRAINAGE & UTILITIES		file name:		Phase 1.dwg			
		scale:		-			
drawing no.		L1.02					
sheet:		-		of		-	

CMA		ENGINEERS		CIVIL / ENVIRONMENTAL ENGINEERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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PLANTING SCHEDULE

EVERGREEN TREES

ABRV.	QTY	COMMON NAME	BOTANICAL NAME	SIZE	NOTES
AB	5	Balsam Fir	Abies balsamea	8-10' HT. , B&B	SPACE 20'-25' O.C.
MG	22	Dawn Redwood	Metasequoia glyptostroboides	8-10' HT. , B&B	SPACE 15' O.C.
TD	13	Bald Cypress	Taxodium distichum	8-10' HT. , B&B	SPACE 18'-20' O.C.

DECIDUOUS TREES

ABRV.	QTY	COMMON NAME	BOTANICAL NAME	SIZE	NOTES
BP	3	Gray Birch	Betula populifolia	12-14' HT. , B&B	SPACE 20'-25' O.C.
AM	7	Amur Maackia	Maackia amurensis	8-10' HT. , B&B	SPACE 20'-30' O.C.
NS	5	Black Gum	Nyssa sylvatica	12-14' HT. , B&B	SPACE 25'-30' O.C.
OA	10	Sourwood	Oxydendrum arboreum	12-14' HT. , B&B	SPACE 25'-30' O.C.
ZS	6	Zelkova	Zelkova serrata	12-14' HT. , B&B	SPACE 25'-30' O.C.

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Portsmouth, NH Manchester, NH Portland, Maine

Weston & Sampson
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(978) 977-0110 (800) 726-7766
www.westonandsampson.com

designed by:
-
date: -

project no:
-
project no:

file name:
Phase 1.dwg
scale:
-

approved by:
-
approved by:

City of Portsmouth, New Hampshire
Department of Public Works
Multi-purpose Recreation Fields
680 Peverly Hill Road

Recreation Fields
PLANTING PLAN

drawing no.
L1.03

sheet: - of -

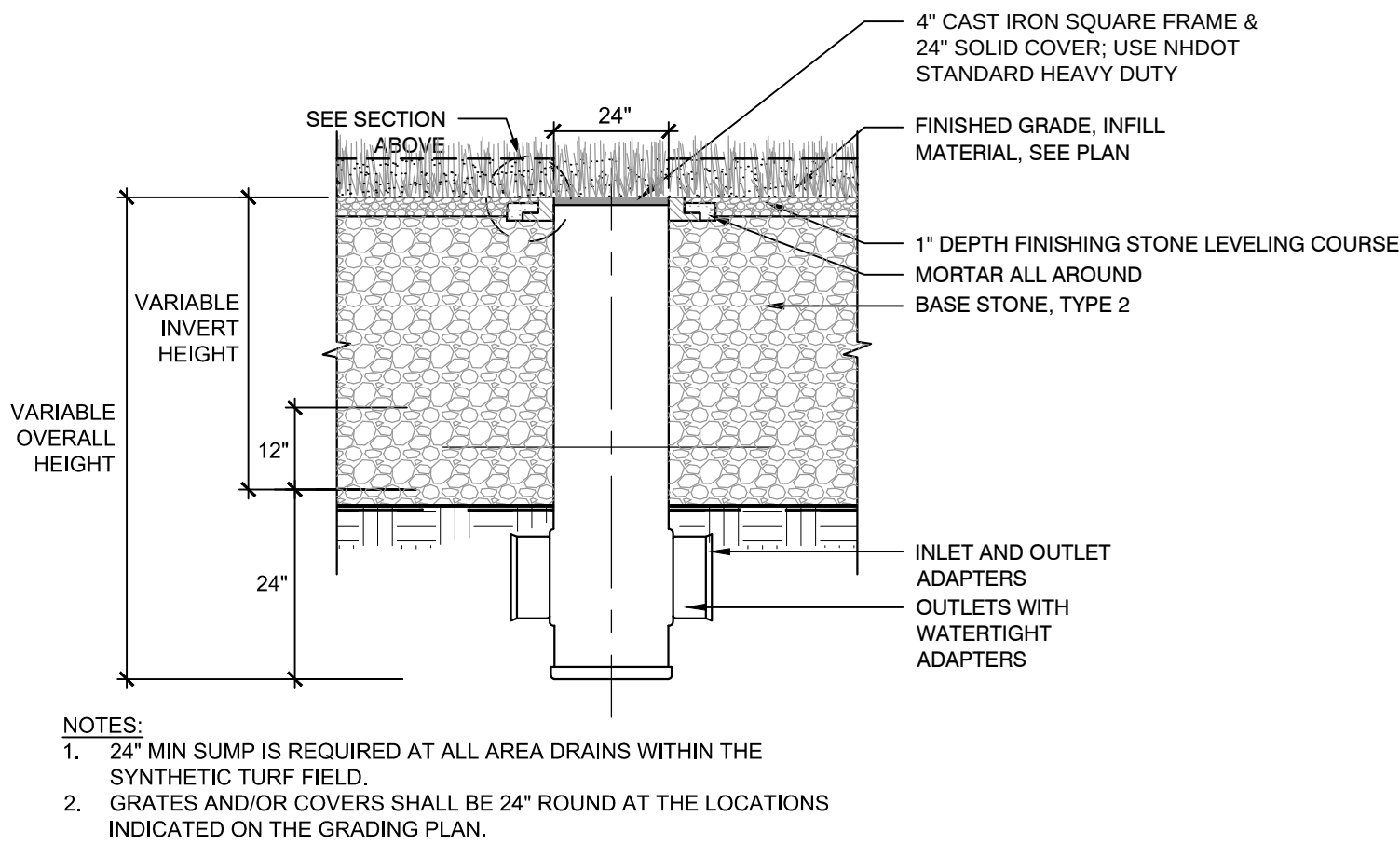
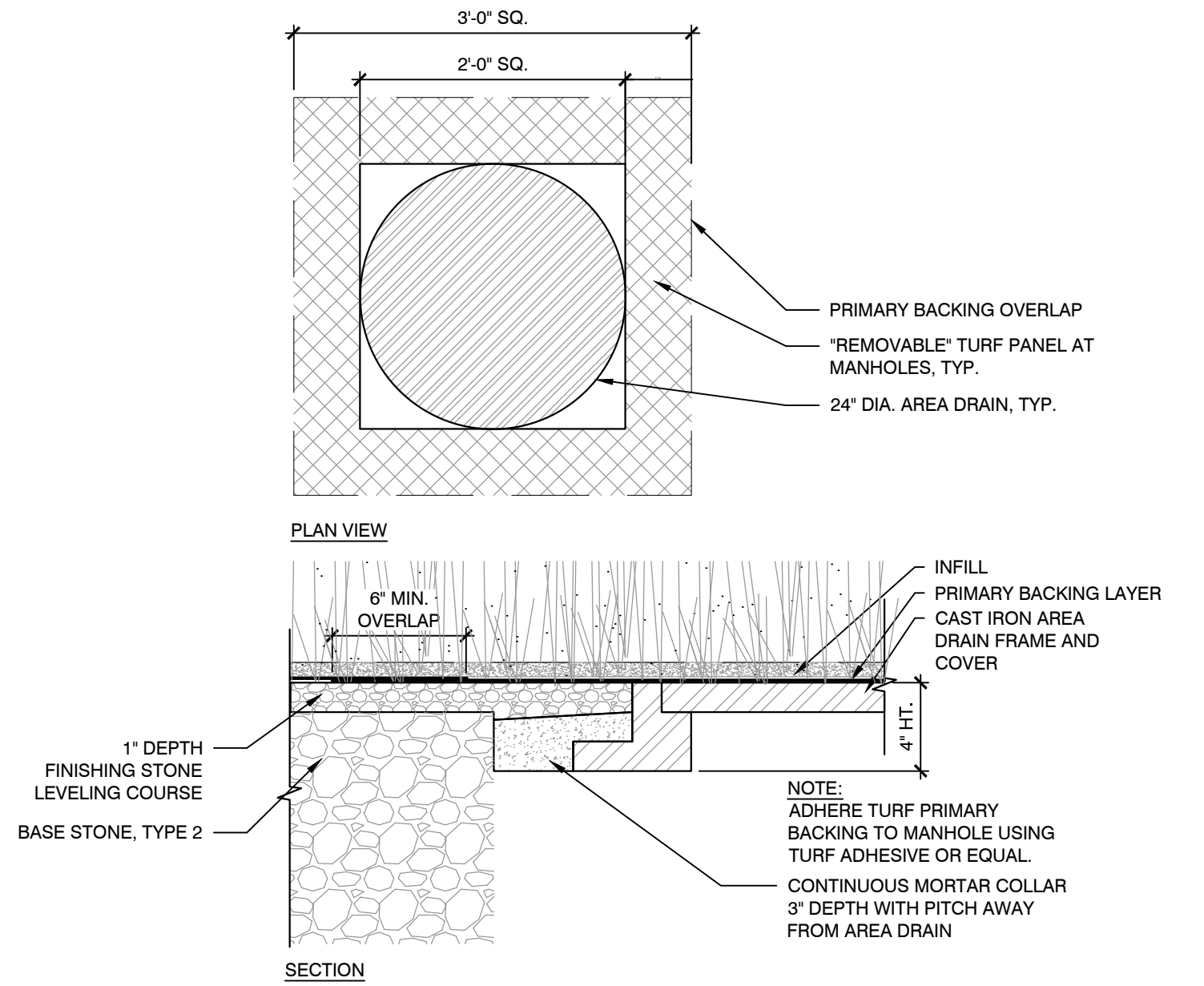
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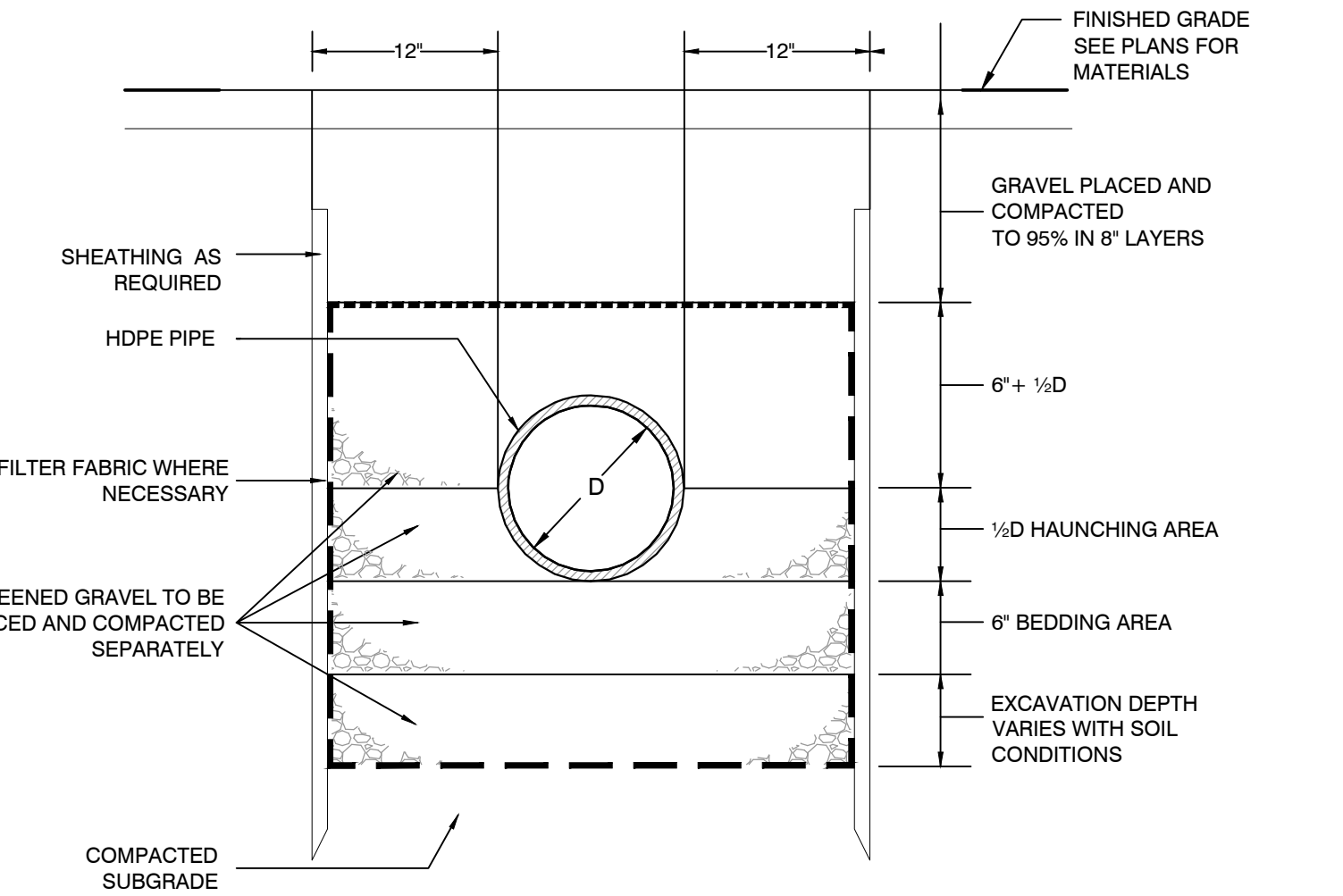
date

by

\\wse03.local\WSE\Projects\NH\Portsmouth, NH\Community Fields\CADART\Phase 1.dwg Date Plotted: Sep 24, 2019 - 9:45am Plotted By: ANDRIKOSE

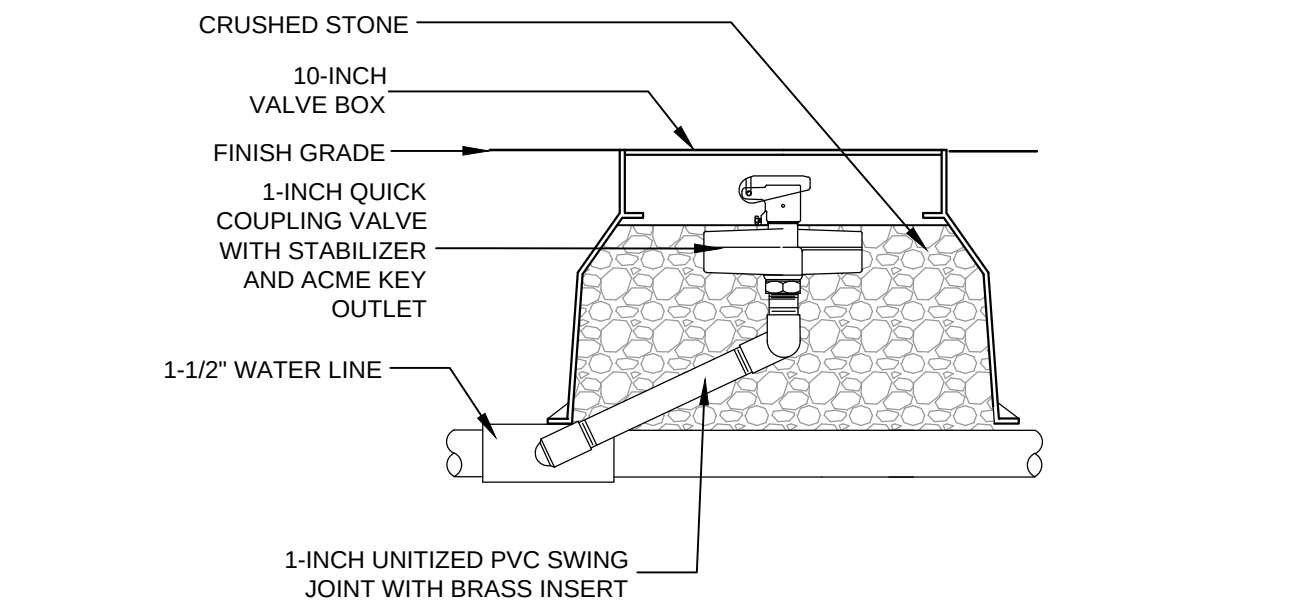


1 PVC DRAINAGE MANHOLE IN TURF FIELD
SCALE: N.T.S.

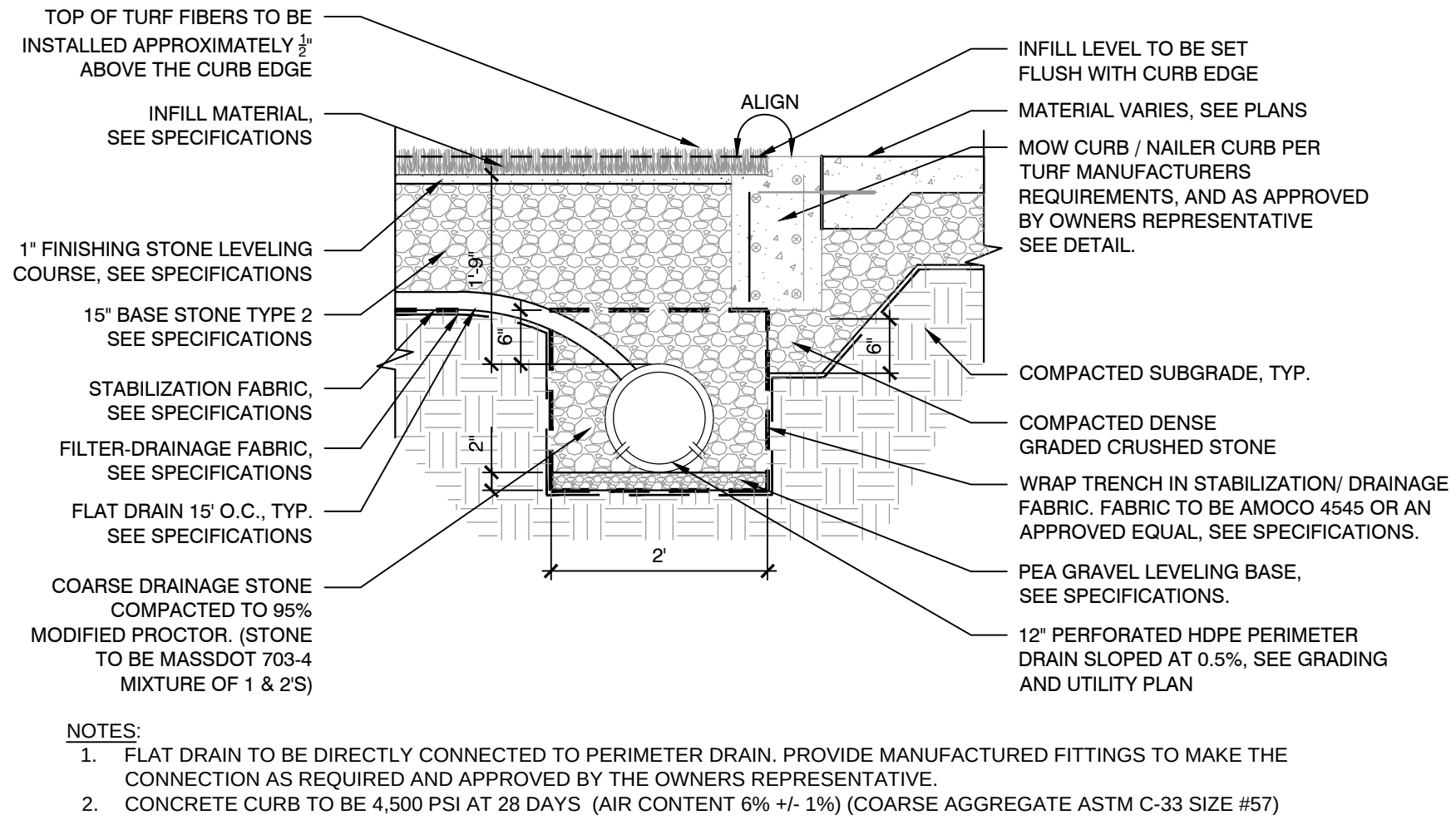


2 DRAIN PIPE TRENCH
SCALE: NTS

3 SYNTHETIC TURF FIELD
SCALE: NTS

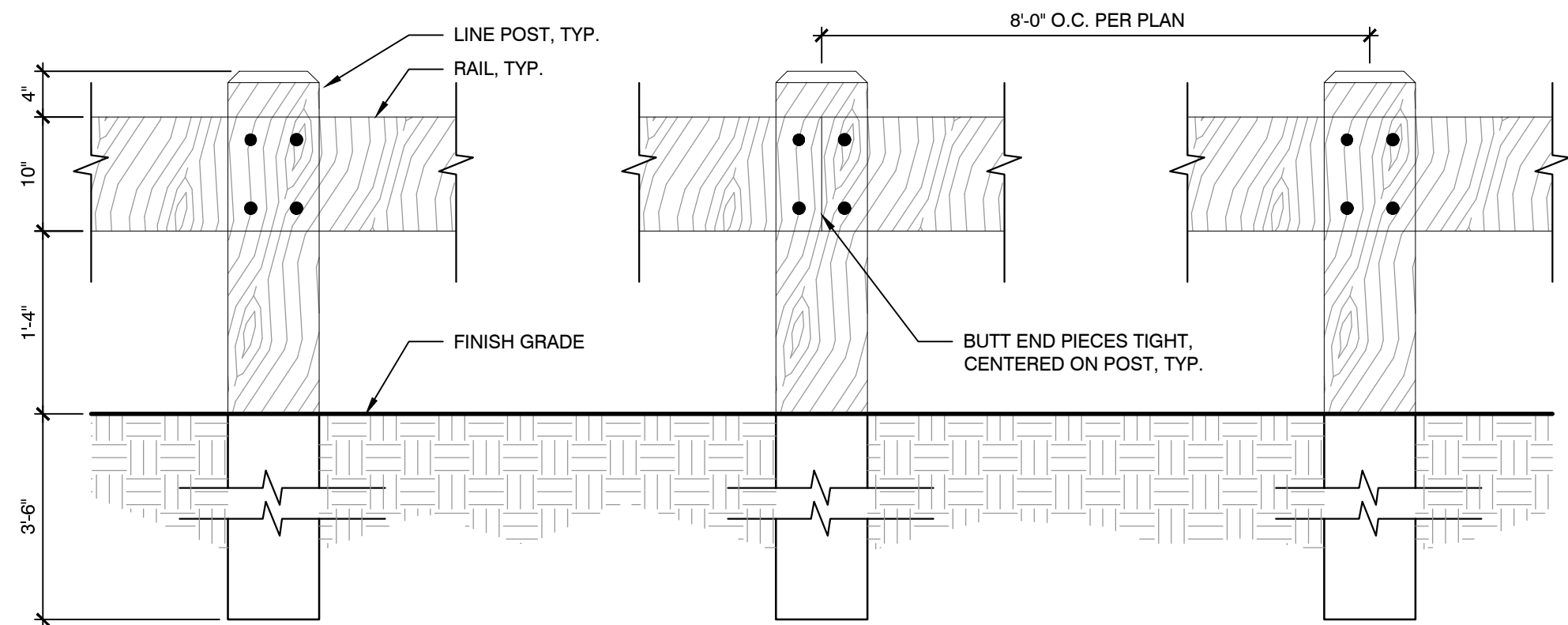
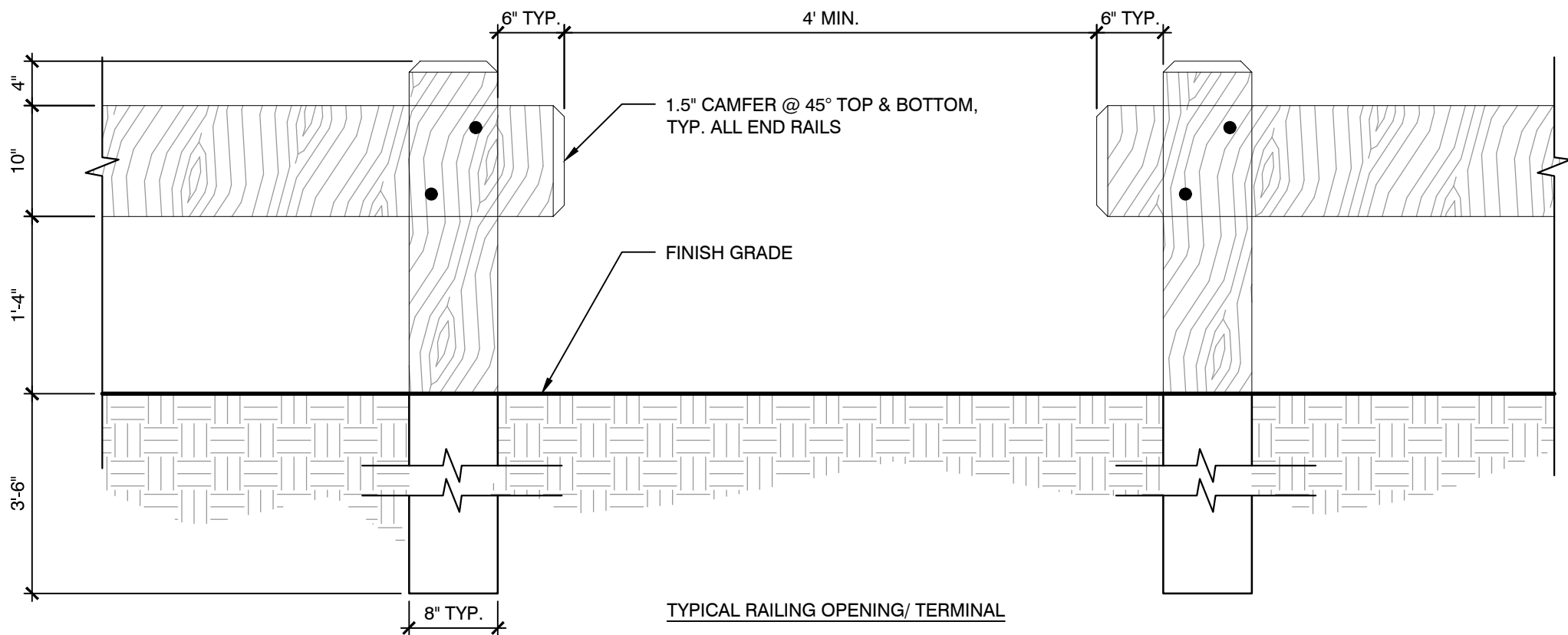


4 QUICK COUPLER HOSE CONNECTION, VALVE AND BOX
SCALE: NTS

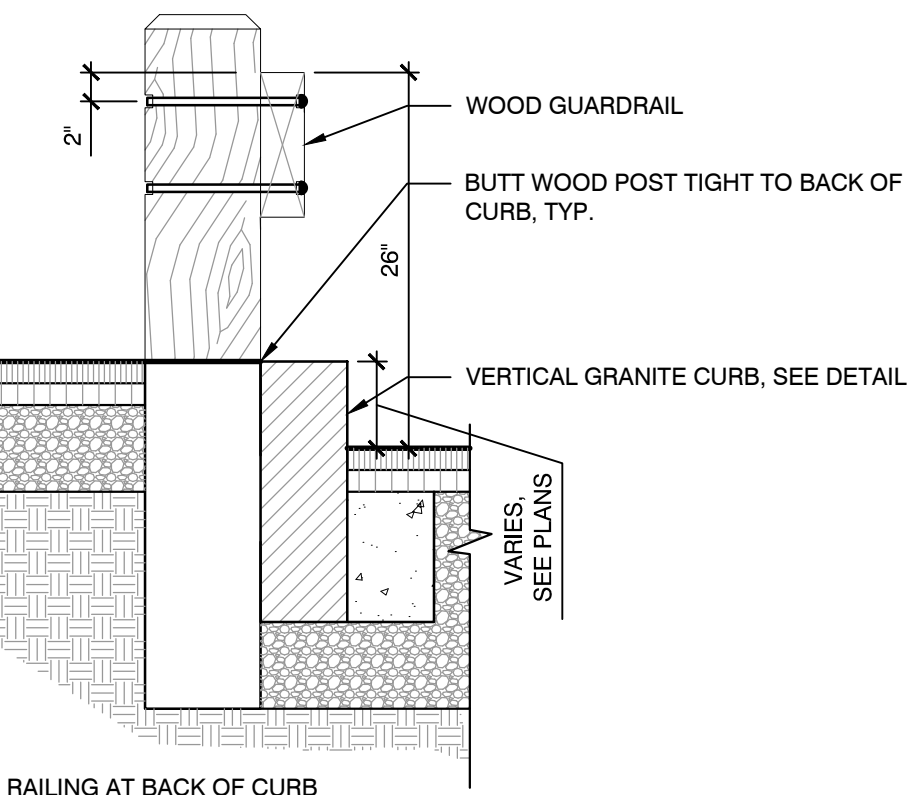
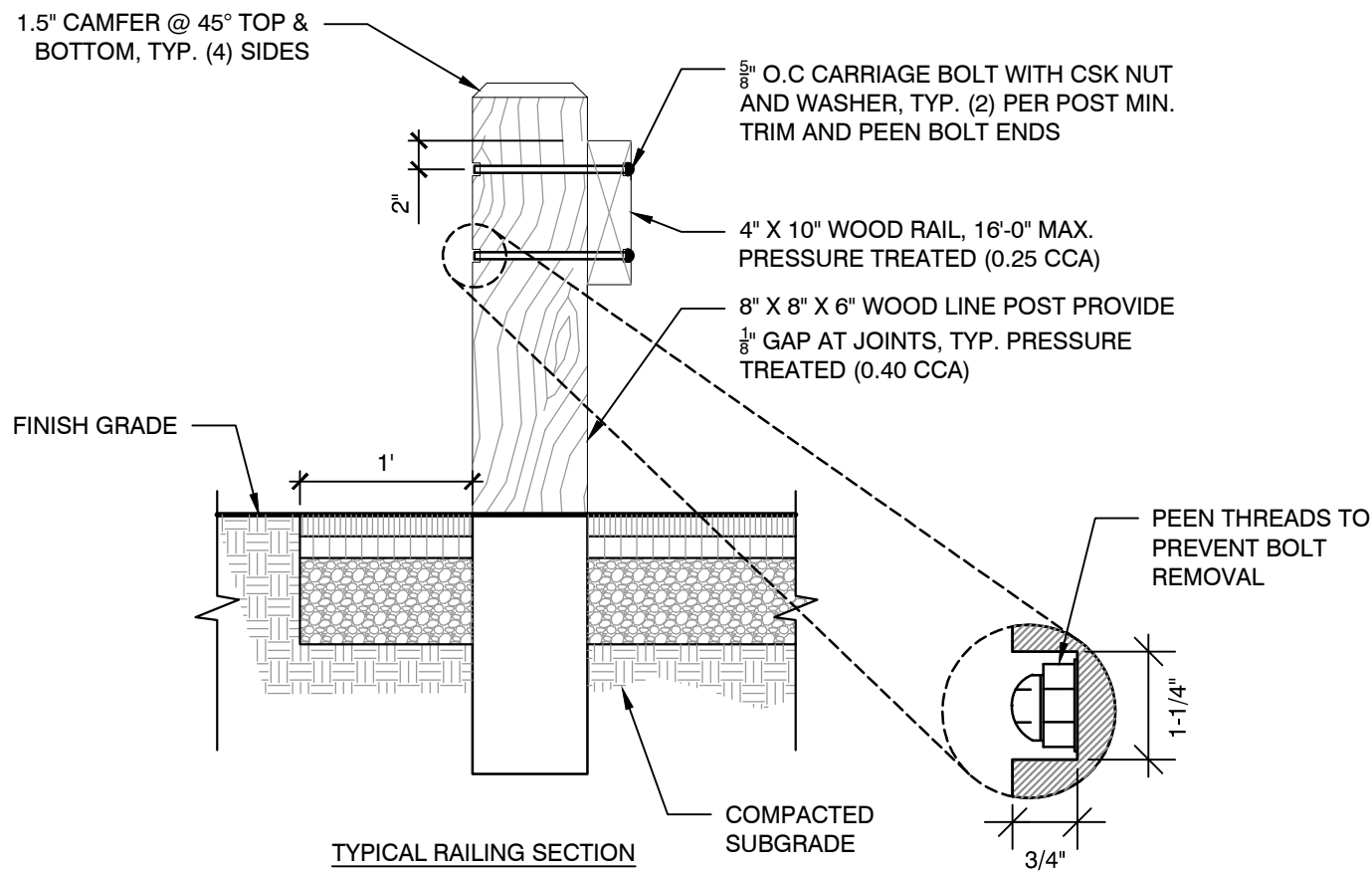


5 COLLECTOR DRAIN
SCALE: NTS

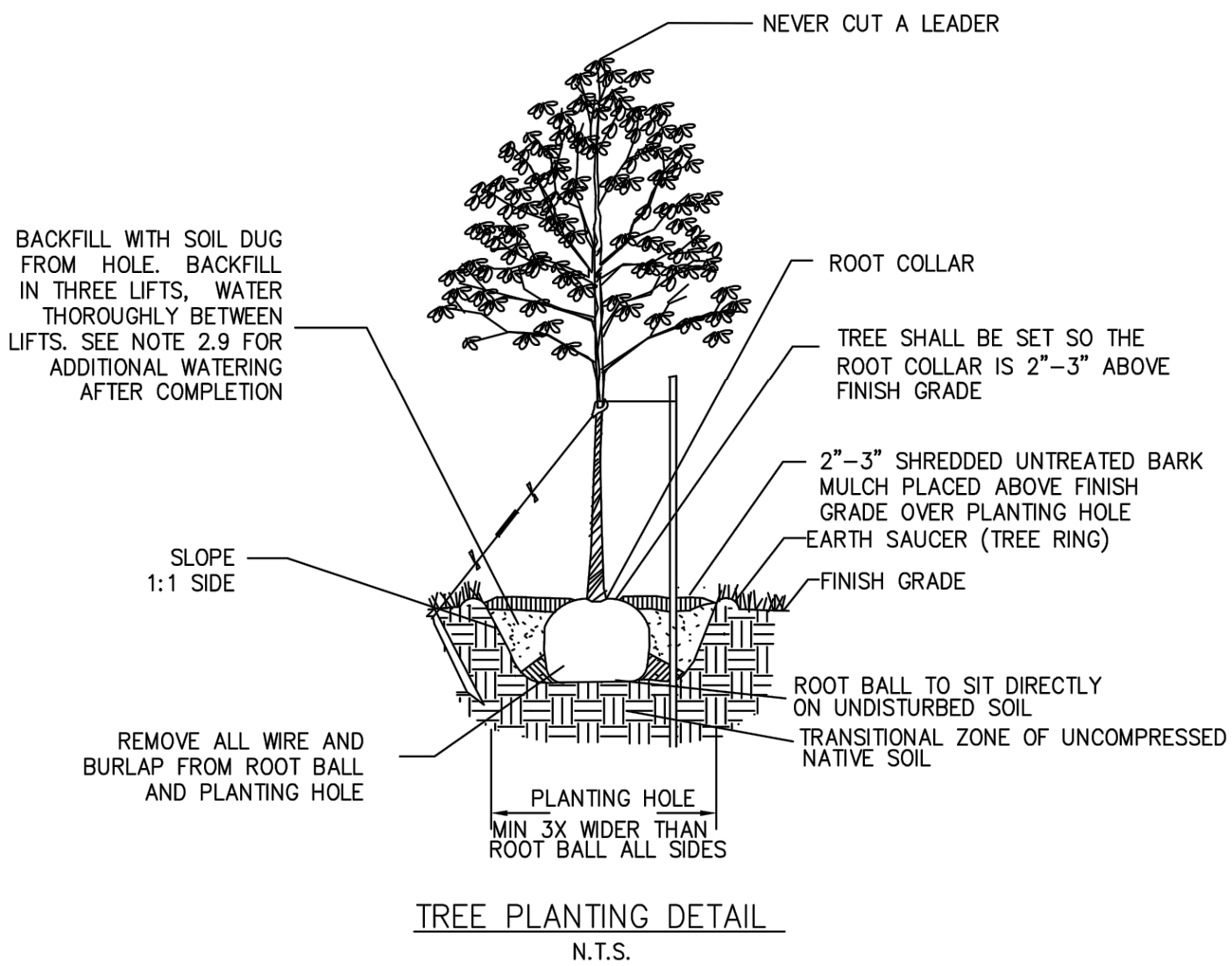
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TYPICAL RAILING ELEVATION

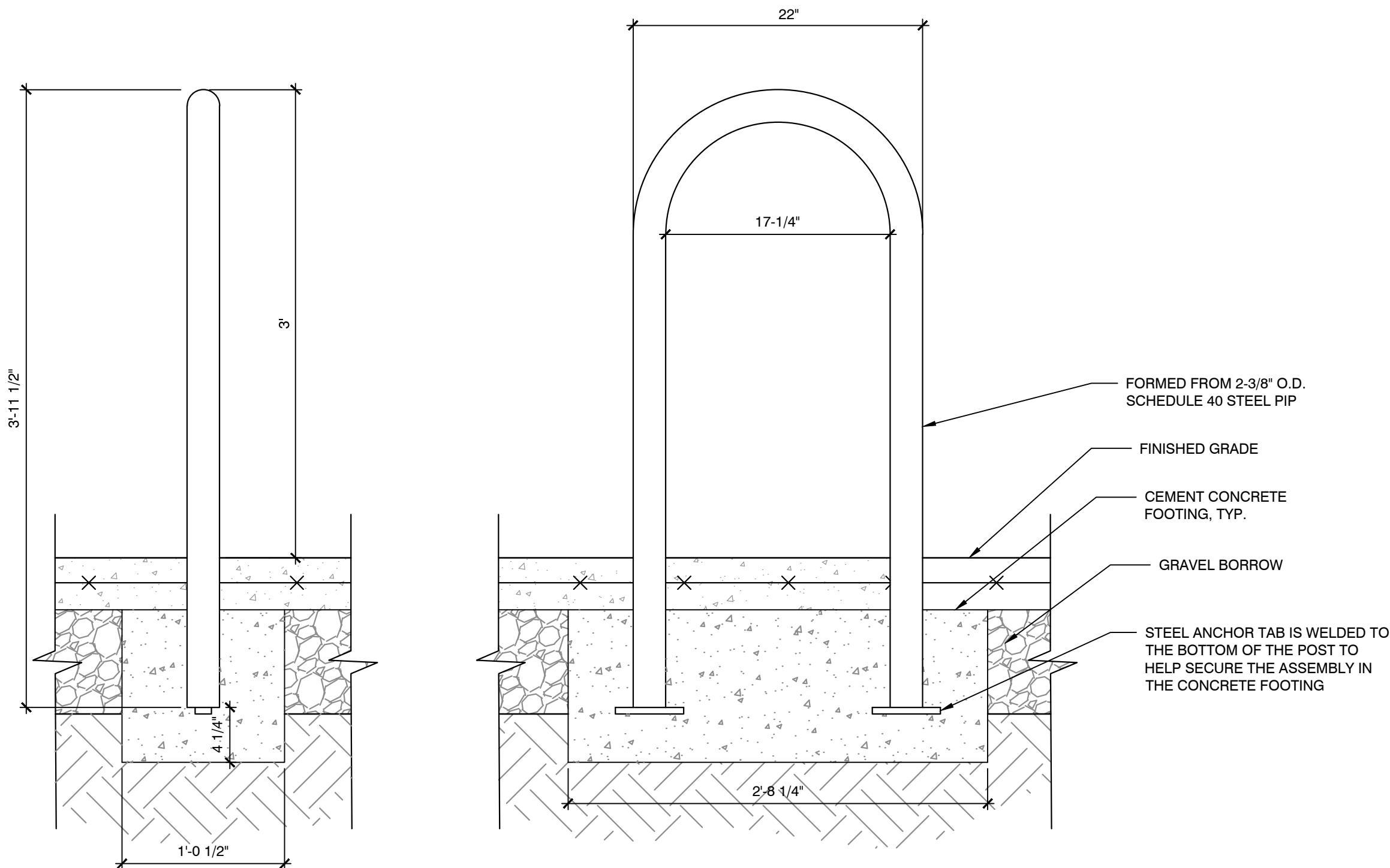


RAILING AT BACK OF CURB



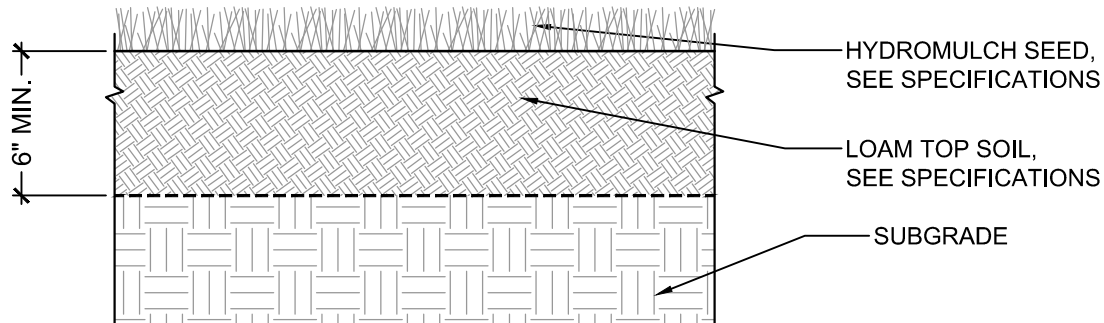
TREE PLANTING DETAIL
N.T.S.

1 WOOD GUARDRAIL
SCALE: NTS



2 BIKE RACK
SCALE: NTS

3 LOAM AND SEED
SCALE: NTS



4 TREE PLANTING- CITY STANDARD
SCALE: NTS

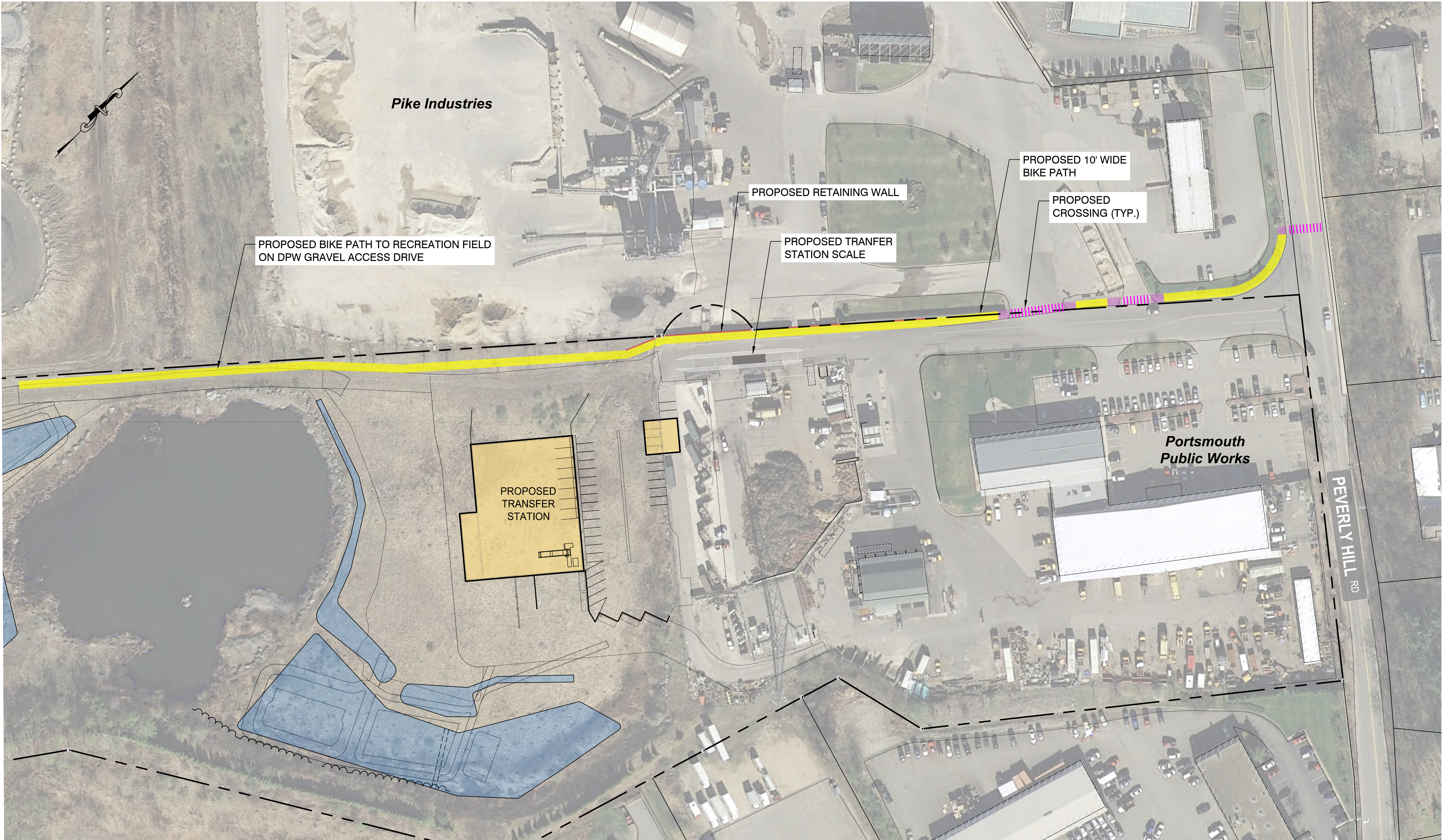
PART 1 - GENERAL:

- 1.1 THE BASE OF THE CITY OF PORTSMOUTH TREE PLANTING REQUIREMENTS IS THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPLANTING. ANSI A300 PART 6 LAYS OUT TERMS AND BASIC STANDARDS AS SET FORTH BY INDUSTRY BUT IT IS NOT THE "END ALL" FOR THE CITY OF PORTSMOUTH. THE FOLLOWING ARE THE CITY OF PORTSMOUTH, NH TREE PLANTING REQUIREMENTS THAT ARE IN ADDITION TO OR THAT GO BEYOND THE ANSI A300 PART 6.

PART 2 - EXECUTION:

- 2.1 ALL PLANTING HOLES SHALL BE DUG BY HAND - NO MACHINES. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE NEW PLANTING PITS, PLANTING BEDS WITH GRANITE CURBING, AND PLANTING SITES WITH SILVA CELLS ARE BEING CREATED. IF A MACHINE IS USED TO DIG IN ANY OF THESE SITUATIONS AND PLANTING DEPTH NEEDS TO BE RAISED THE MATERIAL IN THE BOTTOM OF THE PLANTING HOLE MUST BE FIRMED WITH MACHINE TO PREVENT SINKING OF THE ROOT BALL.
- 2.2 ALL WIRE AND BURLAP SHALL BE REMOVED FROM THE ROOT BALL AND PLANTING HOLE.
- 2.3 THE ROOT BALL OF THE TREE SHALL BE WORKED SO THAT THE ROOT COLLAR OF THE TREE IS VISIBLE AND NO GIRDLING ROOTS ARE PRESENT.
- 2.4 THE ROOT COLLAR OF THE TREE SHALL BE 2"-3" ABOVE GRADE OF PLANTING HOLE FOR FINISHING DEPTH.
- 2.5 ALL PLANTINGS SHALL BE BACKFILLED WITH SOIL FROM THE SITE AND AMENDED NO MORE THAN 20% WITH ORGANIC COMPOST. THE ONLY EXCEPTIONS ARE NEW CONSTRUCTION WHERE ENGINEERED SOIL IS BEING USED IN CONJUNCTION WITH SILVA CELLS AND WHERE NEW PLANTING BEDS ARE BEING CREATED.
- 2.6 ALL PLANTINGS SHALL BE BACKFILLED IN THREE LIFTS AND ALL LIFTS SHALL BE WATERED SO THE PLANTING WILL BE SET AND FREE OF AIR POCKETS - NO EXCEPTIONS.
- 2.7 AN EARTH BERM SHALL BE PLACED AROUND THE PERIMETER OF THE PLANTING HOLE EXCEPT WHERE CURBED PLANTING BEDS OR PITS ARE BEING USED.
- 2.8 2"-3" OF MULCH SHALL BE PLACED OVER THE PLANTING AREA.
- 2.9 AT THE TIME OF PLANTING IS COMPLETE THE PLANTING SHALL RECEIVE ADDITIONAL WATER TO ENSURE COMPLETE HYDRATION OF THE ROOTS, BACKFILL MATERIAL AND MULCH LAYER.
- 2.10 STAKES AND GUYS SHALL BE USED WHERE APPROPRIATE AND/OR NECESSARY. GUY MATERIAL SHALL BE NON-DAMAGING TO THE TREE.
- 2.11 ALL PLANTING STOCK SHALL BE SPECIMEN QUALITY, FREE OF DEFECTS, AND DISEASE OR INJURY. THE CITY OF PORTSMOUTH, NH RESERVES THE RIGHT TO REFUSE/REJECT ANY PLANT MATERIAL OR PLANTING ACTION THAT FAILS TO MEET THE STANDARDS SET FORTH IN THE ANSI A300 PART 6 STANDARD PRACTICES FOR PLANTING AND TRANSPORTATION AND/OR THE CITY OF PORTSMOUTH, NH PLANTING REQUIREMENTS.

City of Portsmouth, New Hampshire Department of Public Works Multi-purpose Recreation Fields 680 Peverly Hill Road Recreation Fields DETAILS		designed by: -	drawn by: -	approved by: -	scale: -
drawing no. L2.02		date: -	project no: -	file name: L2.01-Drainage Details.dwg	no. -
sheet: - of -		revision -		by -	
CMA ENGINEERS CIVIL/ENVIRONMENTAL ENGINEERS Portland, Maine Weston & Sampson 427 Main Street, Suite 400, Worcester, MA (978) 977-0110 (800) 726-7766 www.westonandsampson.com		no.		revision	



Pike Industries

PROPOSED BIKE PATH TO RECREATION FIELD
ON DPW GRAVEL ACCESS DRIVE

PROPOSED RETAINING WALL

PROPOSED TRANFER
STATION SCALE

PROPOSED 10' WIDE
BIKE PATH

PROPOSED
CROSSING (TYP.)

PROPOSED
TRANSFER
STATION

**Portsmouth
Public Works**

PEVERLY HILL RD

Portsmouth Multi-purpose Recreation Fields
Exhibit 1: Bike Path to Rec Fields

OCTOBER, 2019 0 50 100

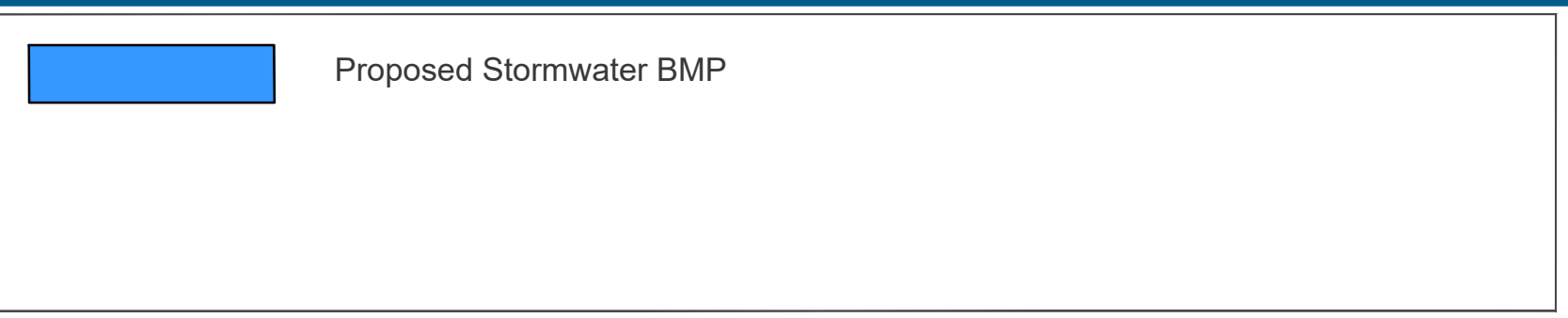
	Proposed Bike Path
	Proposed Crosswalk
	Proposed Ramp
	Proposed Retaining Wall





Portsmouth Multi-purpose Recreation Fields Phase 1

October 2019 0 100 200



CMA
ENGINEERS

Weston & SampsonSM



Portsmouth Multi-purpose Recreation Fields
Full Build-Out Plan (Conceptual)

October 2019 0 100 200

Proposed Stormwater BMP



MEMORANDUM

TO: Technical Advisory Committee
City of Portsmouth

FROM: Phil Corbett, P.E. CMA Engineers, Inc.

RE: Multi-purpose Recreation Fields – Phase I
Trip Generation
CMA #1119

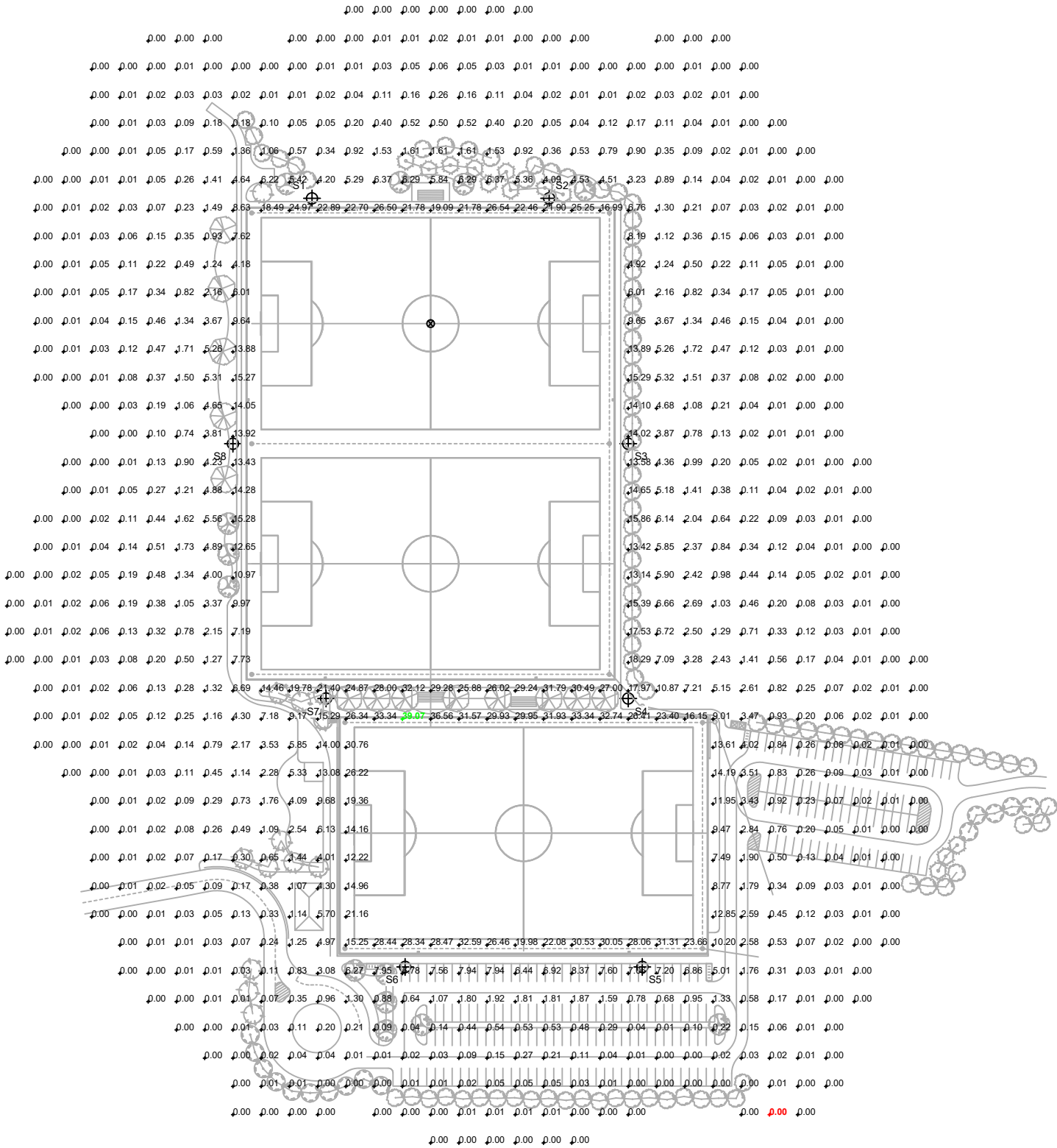
DATE: September 4, 2019

Trip generation for the project was estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, Land Use Code 488, Soccer Complex. The table below presents the estimated AM, PM and Saturday Peak Hour trips.

Number of Fields	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	Rate = 0.99/Field			Rate = 16.43/Field			Rate = 30.34/Field		
2	In	Out	Total	In	Out	Total	In	Out	Total
	61%	39%	100%	66%	34%	100%	48%	52%	100%
	1	1	2	22	11	33	29	32	61

EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S2 S5-S6	70'	-	70'	TLC-LED-1500	5	5	0
2	S3, S8	100'	-	100'	TLC-LED-1500	12	12	0
2	S4, S7	100'	-	100'	TLC-LED-1500	6/6*	12	0
8	TOTALS					68	68	0

* This structure utilizes a back-to-back mounting configuration



Portsmouth Multi Purpose Recreation Fields
Portsmouth, NH

GRID SUMMARY	
Name:	Zero Grid
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY			
MAINTAINED HORIZONTAL FOOTCANDLES			
	Entire Grid		
Scan Average:	3.28		
Maximum:	39		
Minimum:	0		
Avg / Min:	1989144.63		
Max / Min:	23679188.00		
UG (adjacent pts):	1216.11		
CU:	0.20		
No. of Points:	814		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	160,000 lumens		
No. of Luminaires:	68		
Total Load:	97.24 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1500	>81,000	>81,000	>81,000
Reported per TM-21-11. See luminaire datasheet for details.			

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

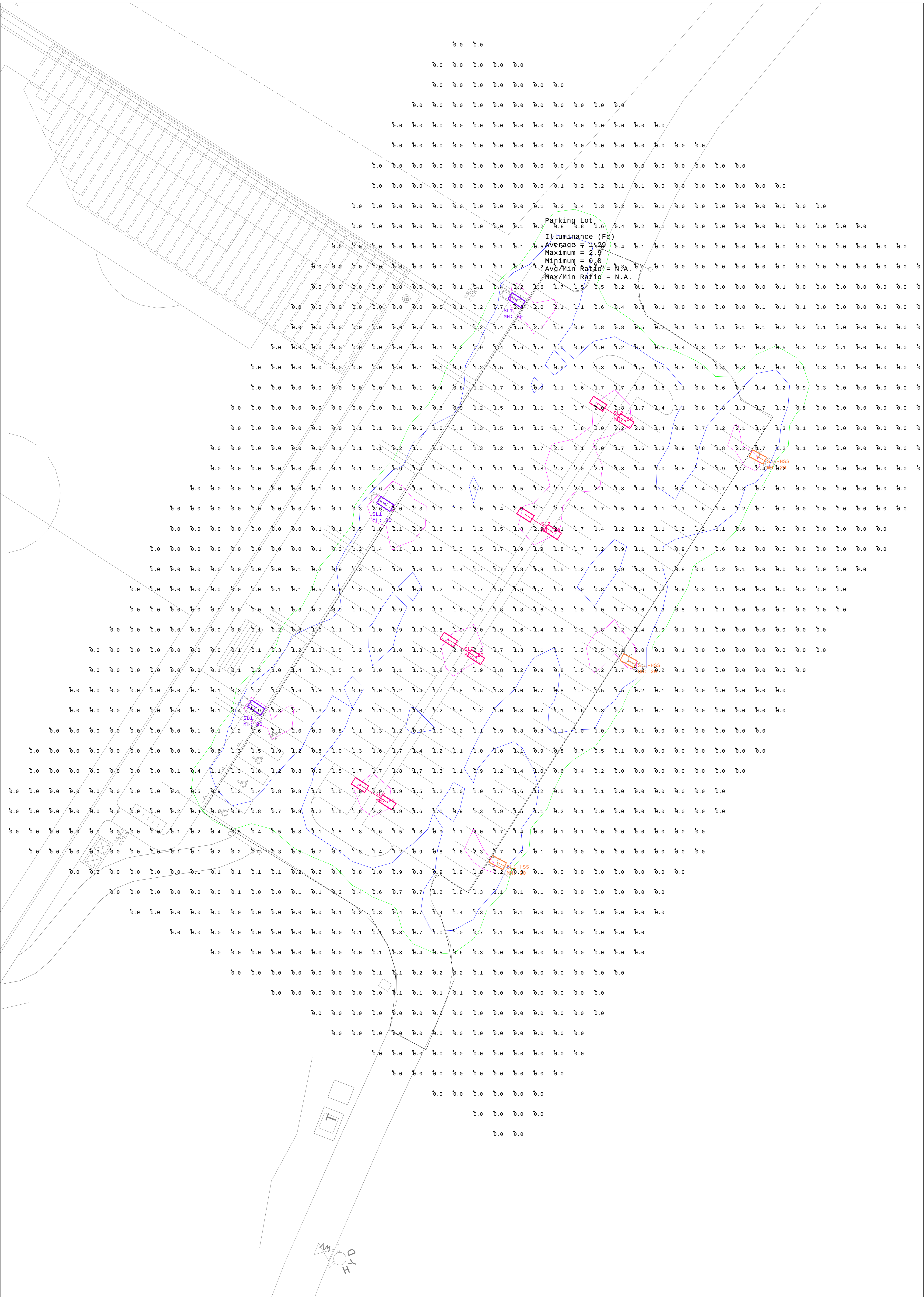
Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Lumens	LLF	Description
	3	SL1	SINGLE	N.A.	0.900	GLEON-AF-01-LED-E1-SL2
	3	SL1-HSS	SINGLE	N.A.	0.900	GLEON-AF-01-LED-E1-SL2-HSS
	4	SL2	BACK-BACK	N.A.	0.900	GLEON-AF-01-LED-E1-SL4

Calculation Summary						
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE Planar	Fc	0.49	2.9	0.0	N.A.	N.A.
Parking Lot	Fc	1.29	2.9	0.0	N.A.	N.A.



Portsmouth Rec Fields

Option 2

Drawn By: D.EDGE
Checked By:
Date: 8.21.19
Specifier:
Scale: NTS

REVISIONS	#	Date	Comments
	X	XX/XX	XXXXXXXXXX

ASA-64G1 and 80G1 Series

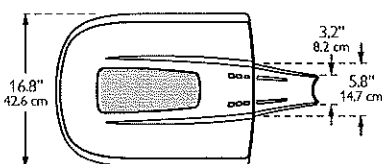
AeroScape LED Small Housing Area and Site Series

Type:		Job:								Approvals:	
Catalog Number:											
ASA		-	-	-	NW	-	-	-	-		
Series	# of LEDs	Driver	LED Color	Distribution	Voltage	Mounting	Options	Finish	Accessories	Date:	
										Page 1 of 10	

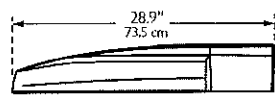
Overall Dimensions (for reference only)

Straight Arm Dimensions

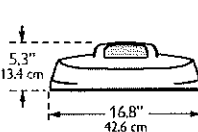
Top View



Side View



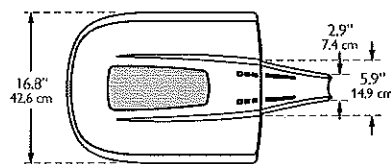
End View



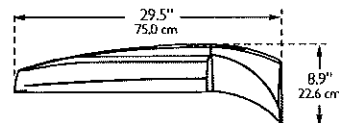
Weight: 34.7 lbs 15.7 kgs
EPA: 0.57 sq ft

Upswept Arm Dimensions

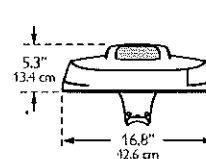
Top View



Side View



End View



Specifications

Rated System Life (LED life per L70)

Driver and LED life are rated up to 80,000 hrs @ 40°C (104°F).

Predicted LED life

See page for 7 for predicted L70 LED life.

Construction

Die-cast aluminum housing with corrosion resistant hardware. ASA-64G1 and 80G1 have 22" optical opening. Optic chamber and separate driver housing constructed to IP66. Die-cast aluminum heatsink allows for long life of LEDs up to 40°C ambient.

Thermal Management

IP66 rated thermal Pod frame management system creates a vortex of airflow with passthrough convective cooling system and heat extraction.

LED and Board Array

64 and 80 Rebel ES LEDs. Color temperature: Neutral White 4000 K +/- 250 K; CRI ≥ 60.
Metal core printed circuit board. RoHS compliant.

AeroScape Solar

AeroScape Luminaires are available as part of the Philips Solar Solution to provide a stand alone, energy efficient site and area lighting. Our Solar Solution efficiently harvests, stores and intelligently converts solar energy into high quality illumination. Visit the solar specification sheet on www.philips.com/luminaires for details.

Driver

High efficiency multi-volt driver (50 or 60 Hz), maintains constant current flow to LEDs to accommodate LED variations. High power factor (>90% standard). Constant current: 350, 530 or 700 mA. Voltage: 120-277, 347, 480. Temperature range: -40°C (-40°F) to 40°C (104°F). Exception: 700 mA unit: -40°C (-22°F) to 35°C (95°F). Open/short circuit protection. RoHS compliant. Surge protector standard. The surge protector is in accordance with IEEE / ANSI C62.41.2 guidelines, with a surge current rating of 10,000 amps.

LED Optical System

Factory set and field rotatable LED Pod optical assemblies. Type II, III, IV or V distribution. Meets IES Full Cutoff criteria. Fully gasketed Dust-Tite construction. Employs Philips LEDGINE technology & Luxeon R LEDs.

Mounting

Die-cast aluminum straight or upswept arm mount for mounting to 4" to 5" O.D. round poles. Square pole adapters included. Round pole adapter accessories required for mounting to 3.0-3.9" round poles. Wall mount also available.

Finish

Standard textured finish options available. TSA = textured satin aluminium, TDB = textured dark bronze, TBK = textured black, TWHT = textured white, TGR = textured gray, TPG = textured Philips gray, TGN = textured green, and RAL(*) = custom color (* = specify RAL #).

Listings

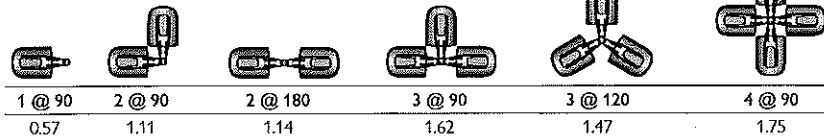
ETL/cETL listed to the UL 1598 standard, suitable for Wet Locations. Suitable for use in ambients from -40° to 40°C (-40° to 104°F). See exception in driver specifications for 700 mA units. The quality systems of this facility have been registered by UL to the ISO 9001 series standards. Optic chamber and separate driver housing constructed to IP66. AeroScape Site & Area Series 'ASA' is a DesignLights Consortium qualified product.

Warranty

Mechanical, finish, and LED engine & components shall be covered by a limited 5 Year Warranty.



AeroScape LED Small Housing Area and Site Series

Page 2 of 10

ASA-64G1 and 80G1 Series

AeroScape LED Small Housing Area and Site Series

Type:

Job:

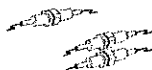
Page 3 of 10

Option Details

F1 Single Fusing (120, 277, 347V)

F2 Double Fusing (208, 240, 480V)

F3 Double Fusing (208, 240, 480V)
(Canadian double pull)



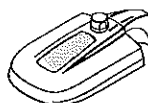
PCB Factory Installed Photocell Button
Not available with 480 V.



Note: Voltage must be specified with fusing and photocontrol options.

TLR Twist Lock Receptacle

TLRPC Twist Lock Receptacle with Photocontrol
Not available with 347 or 480 V.



HSS Factory Installed House Side Shield
Available with Type-II, III, and IV.

DD Dimming Driver (0-10V)

Continuous dimming down to 10% power.

0-10V leads supplied for connection to external controls (by others).

Dynadimmer Details

DCP Dynadimmer Custom Programming

The Dynadimmer programmer enables users to program the individual Dynadimmer either on or off-site. For factory programming, submittals required to set profile. For field programming, DYN-KIT1 or DYN-KIT2 required.

Dynadimmer - Safety Profile¹

This mode focuses on safety by dimming during a limited period of time. Decreases light levels to 25, 50, or 75% low during a four hour period.²

DS25 25% Low

DS50 50% Low

DS75 75% Low

Dynadimmer - Median Profile¹

This mode provides an ideal balance between illumination and energy savings. Decreases light levels to 25, 50, or 75% low during a six hour period.²

DM25 25% Low

DM50 50% Low

DM75 75% Low

Dynadimmer - Economy Profile¹

This mode maximizes energy savings by dimming during a longer period of time. Decreases light levels to 25, 50, or 75% low during an eight hour period.²

DE25 25% Low

DE50 50% Low

DE75 75% Low

1) Dynadimmer not available in 347 or 480 V.

2) Can be modified later by the end-user with optional USB cable and free programming software.

Accessory Details

F1-KIT Single Fusing Field Installed Kit (120, 277, 347V)

F2-KIT Double Fusing Field Installed Kit (208, 240, 480V)

F3-KIT Double Fusing Field Installed Kit (208, 240, 480V)
(Canadian double pull)

DYN-KIT1 Dynadimmer USB Cable Kit (for field programming)



The USB programming cable is used to directly link and program Dynadimmer 0-10V from a PC. When using this cable, no programmer tool is needed. Dynadimmer software has a special button to activate the USB feature. Software available for free download at www.philips.com/luminaires. Cable only.

DYN-KIT2 Dynadimmer Handheld Programmer Kit (for field programming)



The Dynadimmer programmer enables users to program the individual Dynadimmer either on or off-site. Powered by 4 AA or LR6 batteries. Handheld programmer with cables.

SG-ASA1 Field Installed Stone Guard



2LHSS-64 Type 2L Field Installed House Side Shield for 64G1 units

2LHSS-80 Type 2L Field Installed House Side Shield for 80G1 units

3LHSS-64 Type 3L Field Installed House Side Shield for 64G1 units

3LHSS-80 Type 3L Field Installed House Side Shield for 80G1 units

4LHSS-64 Type 4L Field Installed House Side Shield for 64G1 units

4LHSS-80 Type 4L Field Installed House Side Shield for 80G1 units

ASA-64G1 and 80G1 Series

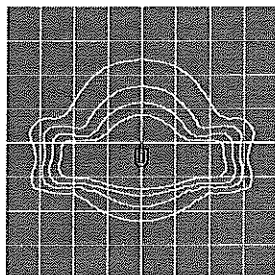
AeroScape LED Small Housing Area and Site Series

Type:

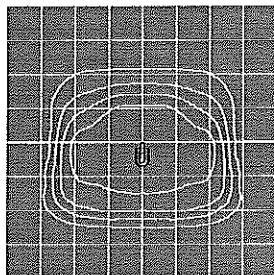
Job:

Page 4 of 10

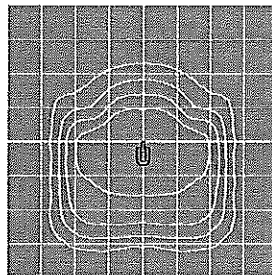
Distribution Patterns



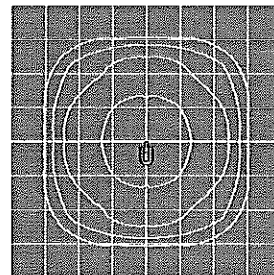
2L0
2L0 is designed to IES Type II.



3L0
3L0 is designed to IES Type III.

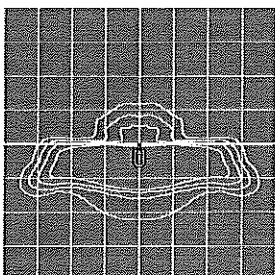


4L0
4L0 is designed to IES Type IV.

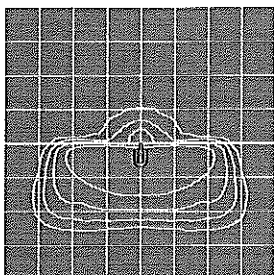


5L
5L is designed to IES Type V.

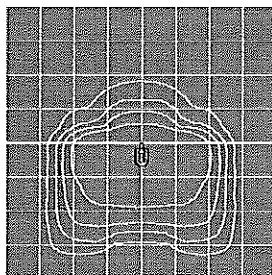
House side shield¹



2L - HSS¹



3L - HSS¹

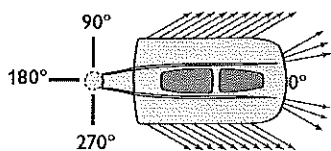


4L - HSS¹

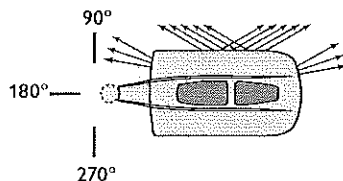
Notes:

1) 'HSS' factory installed options and field installed accessories will produce the same distribution results.

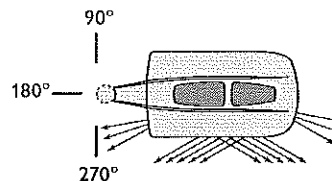
Factory Set Rotatable Optics



Type 2L0, Type 3L0, and Type 4L0¹



Type 2L90, Type 3L90, and Type 4L90²



Type 2L270, Type 3L270, and Type 4L270²

Notes:

1) Typical for single unit perimeter installation

2) Twin perimeter units typically require one 90° and one 270° optic.

3) Optics can be factory rotated.

ASA-64G1 and 80G1 Series

AeroScape LED Small Housing Area and Site Series

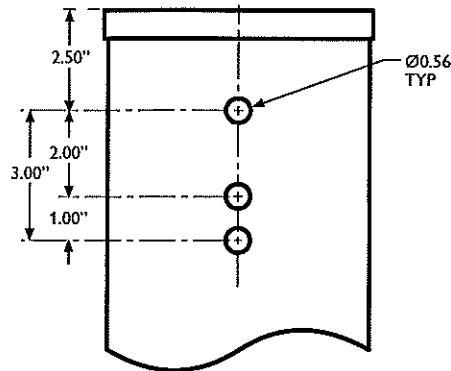
Type:

Job:

Page 5 of 10

Arm Mount Details

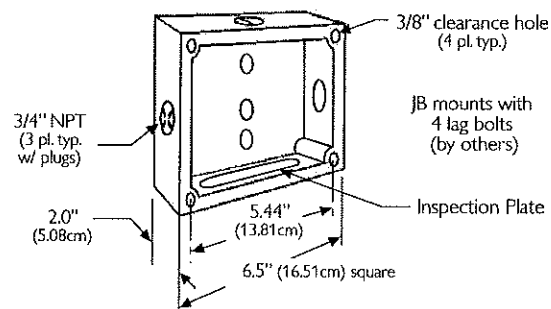
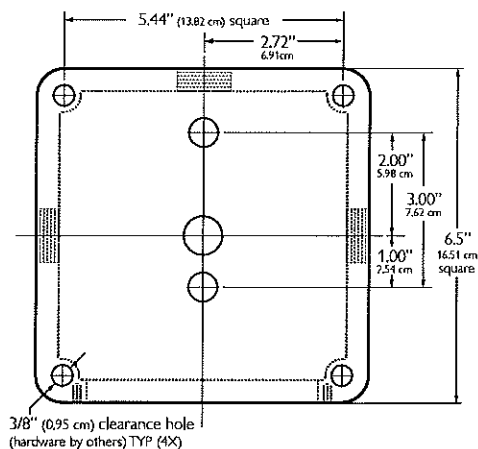
Straight and Upswept Arm Mount
Drill Template # 13 (NTS)



DRILL TEMPLATE NO. 13

Straight and Upswept Arm Mount to 4" - 5" round or square pole

Wall Mount Details (straight arm only)



Thru-Wire junction box allows wall mounting using standard surface arms.

Mounting Accessory Details

Round Pole Tenon Adapters

Round Pole Tenon adapter allows mounting of AeroScape with upswept and straight arm mount to round pole with 2-3/8" O.D. X 4" tall pole top tenon.

- RPTA-190-DT13 1 @ 90°
- RPTA-290-DT13 2 @ 90°
- RPTA-2180-DT13 2 @ 180°
- RPTA-390-DT13 3 @ 90°
- RPTA-3120-DT13 3 @ 120°
- RPTA-490-DT13 4 @ 90°



Round Pole Adapter

Required for mounting to 3.0-3.9" O.D. pole

RPA339-ASA

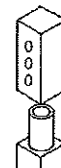
(one 'RPA339-ASA' required for each luminaire)



Square Pole Tenon Adapters

Square Pole Tenon adapter allows mounting of AeroScape with upswept and straight arm mount to round pole with 2-3/8" O.D. X 4" tall pole top tenon.

- SPTA-190-DT13 1 @ 90°
- SPTA-290-DT13 2 @ 90°
- SPTA-2180-DT13 2 @ 180°
- SPTA-390-DT13 3 @ 90°
- SPTA-490-DT13 4 @ 90°



ASA-64G1 and 80G1 Series

AeroScape LED Small Housing Area and Site Series

Type:	Job:	Page 6 of 10
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Photometric Data

Cat No.	Optic (distribution)	System Wattage	Fixture Lumens	Efficacy	B (backlight)	U (uplight)	G (glare)	CCT	IES File #
ASA-64G1-700	Type II (2L)*	140	13,294	95	3	0	3	4000 K +/- 250 K	ASA-64G1-700-2LIES
	Type III (3L)	136	13,380	98	3	0	3	4000 K +/- 250 K	ASA-64G1-700-3LIES
	Type IV (4L)	136	13,516	99	3	0	3	4000 K +/- 250 K	ASA-64G1-700-4LIES
	Type V (5L)	136	13,995	103	4	0	2	4000 K +/- 250 K	ASA-64G1-700-5LIES
ASA-80G1-350	Type II (2L)*	87	9,733	112	2	0	2	4000 K +/- 250 K	ASA-80G1-350-2LIES
	Type III (3L)	90	9,822	109	3	0	3	4000 K +/- 250 K	ASA-80G1-350-3LIES
	Type IV (4L)	90	9,974	111	2	0	2	4000 K +/- 250 K	ASA-80G1-350-4LIES
	Type V (5L)	90	9,824	109	3	0	2	4000 K +/- 250 K	ASA-80G1-350-5LIES
ASA-80G1-530	Type II (2L)	126	13,468	107	3	0	3	4000 K +/- 250 K	ASA-80G1-530-2LIES
	Type III (3L)	126	13,590	108	3	0	3	4000 K +/- 250 K	ASA-80G1-530-3LIES
	Type IV (4L)	126	13,800	110	3	0	3	4000 K +/- 250 K	ASA-80G1-530-4LIES
	Type V (5L)	126	13,593	108	4	0	2	4000 K +/- 250 K	ASA-80G1-530-5LIES

* LM-79 test report data was generated by a 3rd party independent lab - Luminaire Testing Laboratory (LTL).

Backlight - refers to light directed opposite the target area, which may create light trespass. Backlight is commonly behind the luminaire.

Uplight - is illumination directed above the horizontal plane of the luminaire (90°) which causes artificial sky glow.

Glare - is the amount of light from the luminaire emitted in directions or at angles that cause glare, which can be annoying or visually disabling.

ASA-64G1 and 80G1 Series

AeroScape LED Small Housing Area and Site Series

Type:

Job:

Page 7 of 10

LED Lumen Maintenance Data

		ASA-64G1 @ 700 mA								ASA-80 G1 @ 350 mA								ASA-80G1 @ 530 mA							
Outdoor Ambient Temp (°C) ¹		5	10	15	20	25	30	35	40	5	10	15	20	25	30	35	40	5	10	15	20	25	30	35	40
Junction Temperature ²		55.3	60.3	65.3	70.3	75.3	80.3	85.3	-	36.9	41.9	46.9	51.9	56.9	61.9	66.9	71.9	51.1	56.1	61.1	66.1	71.1	76.1	81.1	86.1
Thermal Factor ³		1.04	1.03	1.02	1.01	1.00	0.99	0.98	-	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97
Predicted Life Hours of operation / Years based on 10 hrs/day burn cycle	0	1.04	1.03	1.02	1.01	1.00	0.99	0.98	-	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97	1.04	1.03	1.02	1.01	1.00	0.99	0.98	0.97
	8,000 / 2.2	1.03	1.02	1.01	1.00	0.99	0.98	0.97	-	1.04	1.03	1.02	1.01	0.99	0.98	0.97	0.96	1.03	1.02	1.01	1.00	0.99	0.98	0.97	0.96
	16,000 / 4.4	1.02	1.01	1.00	0.99	0.98	0.96	0.95	-	1.03	1.02	1.01	1.00	0.99	0.97	0.96	0.95	1.03	1.01	1.00	0.99	0.98	0.97	0.96	0.94
	24,000 / 6.6	1.01	1.00	0.99	0.98	0.96	0.95	0.93	-	1.02	1.01	1.00	0.99	0.98	0.97	0.95	0.94	1.02	1.00	0.99	0.98	0.97	0.96	0.94	0.93
	32,000 / 8.8	1.00	0.99	0.98	0.96	0.95	0.93	0.92	-	1.01	1.00	0.99	0.98	0.97	0.96	0.94	0.93	1.01	0.99	0.98	0.97	0.96	0.94	0.93	0.91
	40,000 / 11.0	0.99	0.98	0.96	0.95	0.93	0.92	0.90	-	1.01	1.00	0.98	0.97	0.96	0.95	0.93	0.92	1.00	0.98	0.97	0.96	0.94	0.93	0.91	0.90
	48,000 / 13.2	0.98	0.97	0.95	0.94	0.92	0.90	0.88	-	1.00	0.99	0.98	0.96	0.95	0.94	0.92	0.91	0.99	0.97	0.96	0.95	0.93	0.92	0.90	0.88
	56,000 / 15.3	0.97	0.95	0.94	0.92	0.91	0.88	0.86	-	0.99	0.98	0.97	0.95	0.94	0.93	0.91	0.90	0.98	0.96	0.95	0.94	0.92	0.90	0.89	0.86
	64,000 / 17.5	0.96	0.94	0.93	0.91	0.89	0.86	0.84	-	0.98	0.97	0.96	0.95	0.93	0.92	0.90	0.89	0.97	0.95	0.94	0.92	0.91	0.89	0.87	0.84
	72,000 / 19.7	0.95	0.93	0.91	0.89	0.86	0.84	0.81	-	0.98	0.96	0.95	0.94	0.92	0.91	0.89	0.88	0.96	0.94	0.93	0.91	0.89	0.87	0.84	0.82
	80,000 / 21.9	0.94	0.91	0.89	0.87	0.84	0.82	0.79	-	0.97	0.96	0.94	0.93	0.91	0.90	0.88	0.86	0.95	0.93	0.92	0.90	0.87	0.85	0.82	0.80
	88,000 / 24.1	0.91	0.89	0.87	0.84	0.82	0.79	0.77	-	0.96	0.95	0.94	0.92	0.91	0.89	0.86	0.84	0.94	0.92	0.90	0.88	0.85	0.83	0.80	0.78
	96,000 / 26.3	0.89	0.87	0.85	0.82	0.79	0.77	0.74	-	0.96	0.94	0.93	0.91	0.89	0.87	0.85	0.82	0.93	0.90	0.88	0.86	0.83	0.81	0.78	0.76
	104,000 / 28.5	0.87	0.85	0.82	0.79	0.76	0.74	0.72	-	0.95	0.93	0.92	0.90	0.87	0.85	0.83	0.80	0.91	0.88	0.86	0.84	0.81	0.78	0.76	0.73
	112,000 / 30.7	0.85	0.83	0.79	0.76	0.74	0.71	0.69	-	0.94	0.93	0.90	0.88	0.86	0.83	0.81	0.79	0.89	0.86	0.84	0.82	0.79	0.76	0.73	0.71
	120,000 / 32.9	0.83	0.79	0.76	0.73	0.71	0.68	-	-	0.93	0.91	0.89	0.86	0.84	0.82	0.79	0.76	0.87	0.84	0.82	0.79	0.76	0.73	0.71	0.69
	128,000 / 35.1	0.78	0.75	0.72	0.70	0.68	-	-	-	0.91	0.89	0.87	0.85	0.82	0.80	0.77	0.74	0.85	0.83	0.79	0.76	0.73	0.71	0.68	-
	136,000 / 35.1	0.73	0.71	0.68	-	-	-	-	-	0.90	0.87	0.85	0.83	0.80	0.77	0.74	0.71	0.83	0.79	0.75	0.72	0.70	0.68	-	-
	144,000 / 39.5	0.69	0.67	-	-	-	-	-	-	0.88	0.86	0.83	0.81	0.77	0.74	0.71	0.69	0.78	0.74	0.72	0.69	-	-	-	-
	152,000 / 41.6	-	-	-	-	-	-	-	-	0.86	0.84	0.82	0.77	0.74	0.71	0.68	-	0.73	0.70	0.68	-	-	-	-	-
	160,000 / 43.8	-	-	-	-	-	-	-	-	0.85	0.82	0.77	0.73	0.70	0.68	-	-	0.69	-	-	-	-	-	-	-
	168,000 / 46.0	-	-	-	-	-	-	-	-	0.82	0.76	0.72	0.69	-	-	-	-	-	-	-	-	-	-	-	-
	176,000 / 48.2	-	-	-	-	-	-	-	-	0.75	0.71	0.67	-	-	-	-	-	-	-	-	-	-	-	-	-
	184,000 / 50.4	-	-	-	-	-	-	-	-	0.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. **Outdoor ambient temperature** is based on annual average operating air temperature as seen by the fixture within its environmental conditions.
2. **Junction temperature** is calculated from in-situ, solder point measurement per LED manufacturers recommendation, and will vary based on drive current and nominal forward voltage of the LED.
3. **Thermal factor** is a prorate or derate value based on the in-situ solder point measurement and the relative luminous flux provided by the LED manufacturer.
4. **LED Lumen Maintenance Data chart** is actual lumen adjustment per the operating ambient. No additional prorate or derate required.

Notes:



ISO 9001
Certified



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Philips Lighting
North America Corporation
200 Franklin Square Drive
Somerset, NJ 08873
Phone: 855-486-2216

Philips Lighting Company
281 Hillmount Road
Markham ON, Canada L6C 2S3
Phone: 800-668-9008

Model: Steelworx Square Porta Enclosure, 10'
Model # SQ-10-SW-ENC

Manufacturing Mission: To provide all prefabricated components and installation instructions for a 10' square (measured from eave to eave) free standing bolt together, tubular steel constructed shelter kit.

Design Criteria: Structure is typically designed for a 25 lb live load and a 90 mph wind load capacity, but can be designed based on specific site requirements upon request. All structural members are ASTM A-500 U.S. grade B steel. Welded connection plates shall be ASTM A-36 hot rolled steel. All fabrication performed to latest AISC standards by AWS Certified welders. All framing connections are done using A325 grade bolts within concealed access openings from above and will later be concealed by the roofing. All roof framing shall be flush against the roof decking to eliminate the possibility of bird nesting.

Tubular Steel Columns and Beams: Standard column dimension shall be 5" x 5" x 3/16" tubular steel welded to 5/8" base plates for surface mounting. Main support beams are 5" x 5" x 3/16" and purlins are 4" x 3" x 1/8". Steel sizes are preliminary and may change due to ongoing review and final engineering.

Roofing: 24 Ga. pre-cut steel Multi-Rib panels with Kynar 500 finish in a variety of colors with white underside. Standard roof slope is a 4/12 pitch with a eave height of 7'-6". Attached to structural framing with exposed self tapping screws painted to match roof color. Matching 24 Ga. trim included.

Screening: 20 Ga. steel panels with 50% perforation surrounded by a 1 1/2" x 1 1/2" steel tube frame with 2 1/2" x 1 1/2" steel tube support beams. Perforated panels and frame shall receive the same polyester powder coat finish as the main shelter frame. Various perforated screens styles are available.

Frame Finish: All steel framework will receive a corrosion protective TGIC Polyester powder coat, electro-statically applied and cured at 400°F. A large selection of standard colors are available.

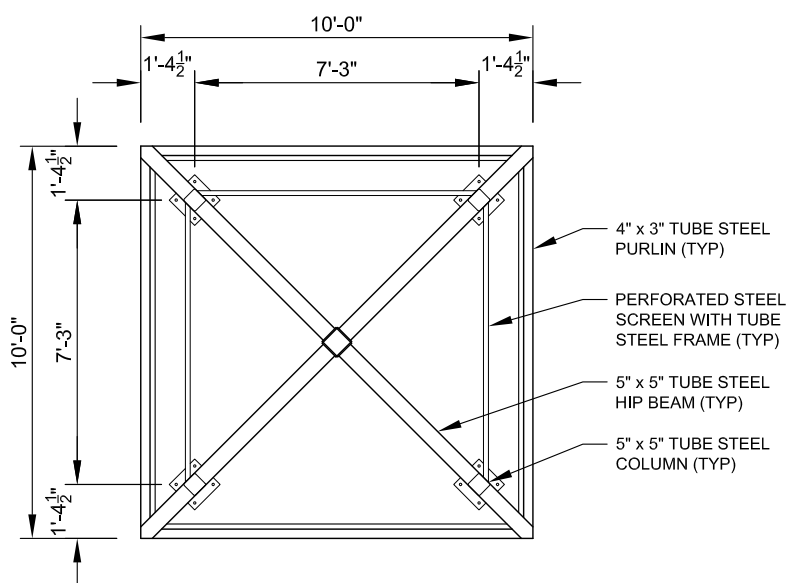
Foundation: All columns need to be anchored to concrete footings (footing design provided separately). Columns can be surface mounted to footings with anchor bolts at or below finish slab elevation or they can be embedded directly into the footing without base plates upon request. Anchor bolts and bracing templates are included. Optional base plate covers are available at an additional cost.

Hardware: All structural hardware and roofing fasteners shall be provided.

Warranty: 10 years against manufacturer defects.

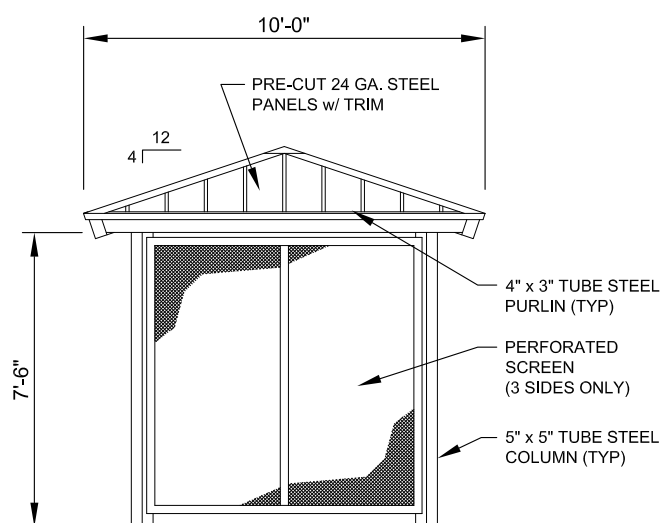
Not Included: Concrete work of any kind, unloading of product and installation.

Additional Options: Visit www.Coverworx.com for the latest available options and upgrades.



FRAMING PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"



11800 East 9 Mile Road
Warren, MI 48089
Office: (586) 486-1088
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Toll Free: (800) 657-6118
Email: info@coverworx.com
www.CoverWorx.com

Steelworx Square Porta Enclosure - 10'

Model: SQ-10-SW-ENC

DESIGN SPECIFICATIONS

City of Portsmouth
Application for Site Plan Review
City of Portsmouth, NH

Multi-purpose Recreational Fields
Stormwater Management Report

August 2019
(Revised October 2019)

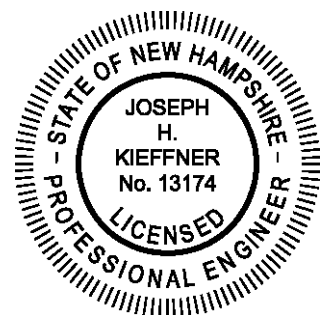
Submitted by:

City of Portsmouth
Department of Public Works
680 Peverly Road
Portsmouth, New Hampshire

Prepared by:



Civil and Environmental Engineers
35 Bow Street
Portsmouth, New Hampshire 03801



Joseph H. Kieffner

Application for Site Plan Review, City of Portsmouth, NH
Stormwater Management Report
City of Portsmouth
Portsmouth, New Hampshire

August 2019

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 - iv. NHDES AoT Gravel Wetland Sizing Sheet

PROJECT DESCRIPTION

The project is located adjacent to the Portsmouth Public Works Facility at 680 Peverly Hill Road. In 2016, the City purchased 50 acres of land near the Community Campus property known as “Foundation Field.” This land was merged with the Public Works parcel and is now a single lot (254-8 Map-Lot). In the spring of 2018, City Council and Recreation Board voted to pursue development of new recreation playing fields at this site.

The recreation fields are planned to be constructed in two phases. Phase I (The Project) includes construction of two new full-size turf fields with lighting, gravel parking areas, and a connection to public water. Phase I also includes construction of regional stormwater treatment facilities for Sagamore Creek Watershed. Phase II includes design and construction of one additional field, paved parking areas, a concession stand, and other amenities. Phase I is expected to be constructed during the 2020 construction season.

This report presents the design of the stormwater management system for Phase II which is sufficiently sized for the smaller Phase I development. This report and the supporting stormwater model include assumptions from a conceptual design of Phase II and will be revisited for the Phase II final design to incorporate any changes from the assumptions used in this analysis for this report. Phase I and Phase II stormwater model calculations are included in the Appendix.

The project is bounded by Industrial developments to the east and west, the Department of Public Works Transfer station and offices to the north, and Campus Drive to the south. Current access to the site is located off Campus Drive or off Peverly Road at the Portsmouth Department of Public Works transfer station. A gravel drive runs through the site to Campus Drive. Vehicular access is controlled by gates at Campus Drive and the transfer station. A large forested area on the property exists to the south of the project and contains high quality wetlands and two vernal pools but will not be impacted by the Project. Low quality wetlands that formed since the quarry was reclaimed will be impacted and a NHDES Wetlands permit will be obtained.

Because this project will disturb greater than 100,000 sf of land area, an Alteration of Terrain (AoT) permit will be obtained through the New Hampshire Department of Environmental Services (NHDES). As required by NHDES rules, the AoT permit application

will be for all phases of construction: Phase I and Phase II recreational fields and the future transfer station. Additionally, since the site will disturb greater than one acre of land, coverage will need to be obtained under the Environmental Protection Agency's (EPA) Construction General Permit (CGP). There are provisions for actively managing sediment and erosion during construction for both the AoT and CGP, which, for this site, will include silt fencing, stone check dams in channels, riprap pads for velocity dissipation, and erosion matting for any steep slopes or drainage ways. Proposed erosion control methods and locations are depicted on the enclosed plans.

CMA Engineers, City of Portsmouth representatives, and NHDES-AoT held a pre-application meeting on June 11, 2019 to discuss the AoT Rules requirements and to review draft plans of the site. NHDES-AoT requires onsite stormwater runoff from the proposed fields and new gravel paved areas to be treated separately from the regional stormwater facilities, and NHDES will not be reviewing the design and analysis of the regional treatment facilities since these are will only be treating stormwater flowing from offsite developed areas. Permanent and temporary construction stormwater facilities for the onsite project will be required to meet all applicable NHDES-AoT Rules and specifications.

This project proposes to replace existing gravel areas, grass areas, and some small diameter woods with the proposed fields, gravel parking, and stormwater BMPs within the reclaimed rock quarry site. The disturb perimeter areas will be landscaped with grass and tree plantings. Electrical, water, and sewer utilities will be installed underground from Campus Drive to serve the field amenities. A transformer pad will need to be constructed along the access road near the fields. Vehicular access to the Site will be controlled by entry gates at Campus Drive (public access) and at the DPW/ transfer station connection road (public works access only).

The project area is largely open, with mild uniform slopes (3% to 5%) across most of the western portion, medium slopes (4 to 8%) on the eastern portion south of the pond, and gentle slopes north of the pond excluded portions of fill soil piles. Stormwater runoff flows primarily towards the existing stormwater pond constructed as part of the quarry reclamation. Along most of eastern property line lies a large berm with very steep side slopes of 1.5:1 to 2:1. This berm was constructed as part of the former quarry and has become densely vegetated with brush and small trees. Approximately 34 acres of off-site area from the Public Works property to the north and commercial properties to the northeast of the site drain to the existing onsite pond via onsite treatment swales created

during the reclamation. Another 113 acres of offsite area east of the site flows through the large berm to the existing stormwater pond via twin 36-inch culverts.

The peak stormwater runoff flows were calculated for the 2-, 10-, 25-, and 50-year, Type III, 24-hour storm events. The method used for all analyses was SCS TR55: Urban Hydrology for Small Watersheds, performed with HydroCAD® modeling software. The Pre- and post-development drainage analysis results are presented in Appendix D and E, respectively.

The regional stormwater treatment facilities were sized based on available funds and site constraints. These facilities were analyzed to adequately convey stormwater flows for the 2-, 10-, 25-, and 50-Year, Type III, 24-hour storm events. The regional analysis results are presented in Appendix F.

Precipitation values for each 24-hour storm event were obtained from the Extreme Precipitation Estimates published by the Northeast Regional Climate Center (NRCC) (see Appendix B). Utilization of these tables to model storm events was required by NHDES-Alteration of Terrain (AoT) Program for all projects starting in 2013. To anticipate projected increases in rainfall events, AoT Rules were amended in 2017 to required new developments within “coastal communities” to increase the NRCC values by 15 percent if the projected service life is beyond the year 2050. The proposed facilities in this report are projected to serve beyond 2050, thus the 15 percent increase was applied for the analysis. The results of the analyses are summarized in the following sections.

Soils within the project area were classified by James H. Long, CSS, CWS (Certified Soil Scientist #15) with a large majority being Udorthents (fill) placed as part of the closure and reclamation of the former quarry (See Appendix A). These soils are mostly within Hydrologic Soil Group (HSG) C with a little being in Group D. Soils of off-site contributing drainage areas were classified using United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) mapping, which are similarly classified as Udorthents with small areas of HSG groups A, B, and C soils. The offsite Udorthents were assumed to be mainly HSG Type C with some being A, B, and D.

There are four analysis points in the stormwater model, the first (SP-1) is the area discharging from the existing pond to the Pike Industries property. The second point of analysis (SP-2) is offsite discharge onto 225 Banfield Road (Map-Lot 266-1). The third

point of analysis (SP-3) is for onsite runoff to south and west, towards the “SW Wetlands”. The fourth point of analysis is (SP-4) and is for onsite discharge towards the “SE Wetlands”. For analysis point locations and contributing areas see the Watershed Plans in Appendix D and E.

PRE-DEVELOPMENT CONDITIONS

The pre-development conditions include primarily grassy (“meadow”) areas and a little woods with both in “good” condition along with some gravel areas mostly over HSG C soils. A small amount of the reclaimed area contains “meadow” wetlands with an HSG D soil classification. Much of the area has been dormant since the reclamation of the quarry. Four pre-development sub-areas (B, C, D, and E) have been evaluated for peak flow and off-site stormwater volume prior to development and are summarized in the following table. The Pre-Development Watershed Plan and the pre-development stormwater modeling calculations are provided in Appendix D.

Drainage Area B (B1 and B2): 13.90 acres

Drainage Areas **B1** and **B2** are predominantly made up of meadow with a little woods and includes approximately 0.54 acres of gravel driveway and drains to the existing stormwater pond which discharges to SP-1.

Drainage Area C1: 0.19 acres

Drainage Area **C1** is comprised of meadow areas and approximately 0.06 acres of woods. This area drains offsite to SP-2.

Drainage Area D (D1 and D2): 0.97 acres

Drainage Area **D1** consist of mostly woods and some meadow areas. D2 consists mainly of the westward draining portion of the access drive and small portions of run-on from the Campus Drive cul-de-sac. The access drive was used as truck route for the quarry and consists of compacted gravel mostly overgrown with grass. Both Drainage Areas drain to SP-3.

Drainage Area E1: 0.87 acres

Drainage Area **E1** consists mainly of the eastward draining portion of the access drive and small portions of run-on from the Campus Drive cul-de-sac. This drains to SP-4.

Drainage Area F1: 0.93 acres

Drainage Area **F1** includes an area that discharges directly on the Pike property near the existing stormwater pond culvert. Cover consists of largely meadow with a little woods and gravel pavement. This area drains to SP-1

Drain Area G1: 0.22 acres

Drain Area **G1** consists of mostly meadow with some gravel pavement and a small amount of woods. This area discharges to the existing pond and SP-1.

A summary of peak off-site flows and volumes for the pre-development condition is presented in **Table 1** below.

Table 1: Pre-Development Peak Flows and Volumes

Analysis Point	Pre-Development Peak Flows (cfs)			
	2-year	10-year	25-year	50-year
SP-1	1.74	3.64	6.04	9.43
SP-2	0.25	0.57	0.85	1.12
SP-3	2.79	4.56	5.95	7.27
SP-4	2.66	4.41	5.75	7.02
TOTAL	7.45	13.23	18.61	24.86

Analysis Point	Pre-Development Volumes (acre-ft)			
	2-year	10-year	25-year	50-year
SP-1	1.45	3.277	4.859	6.433
SP-2	0.019	0.041	0.060	0.079
SP-3	0.214	0.359	0.475	0.585
SP-4	0.193	0.327	0.434	0.536
TOTAL	1.877	4.006	5.829	7.635

POST-DEVELOPMENT CONDITIONS

The post-development condition includes the construction of two fields, gravel parking and accessways, gravel snow dump, porous perimeter path, landscaped areas, and stormwater conveyance and treatment BMPs. The topography of the fields is relatively flat at 0.5% and the gravel parking grades range from 1% to 4%. Landscaped areas will be largely vegetated with grass or trees with grades ranging from flat 0.5% to 33% (3:1 slope).

Athletic Field CN values were classified as HSG C with CN of 71 in areas of fill (same as predevelopment) and HSG D with CN of 78 in areas of cut to an elevation of 35.00 where the bottom of field “daylights” to existing grade. since groundwater was estimated to be shallow. The area of field over the proposed subsurface system BMP was classified as 98 since the water does not flow over soil but vertically downward into the BMP. Proposed

gravels and non-porous pavements were considered impervious with CN values of 96 and 98, respectively.

Similar to the pre-development model, four post-development drainage areas, B, C, D, and E were created for analysis based on their discharge locations. Drainage Area B discharges to SP-1, Drainage Area C discharges to SP-2, Drainage Area D drains to SP-3, and Drain Area E discharges to SP-4. The Post-Development Watershed Plan and the post-development stormwater modeling calculations are provided in Appendix E.

The following is a summary of the post-development Drainage Areas:

Drainage Area B (B1, B1c, B2, B3, B4, B5): 13.07 acres

Drainage Area **B1** flows to SP-1. Area **B1** is predominantly made up Phase 1 of the athletic fields and surrounding paths. A relatively small amount of woods and meadow is located on the west and south portions of the area. B1 is mostly flat (0.5-2%) on the fields with steep (8% to 33%) cut and fill slopes along the perimeter to existing grades.

Drain Area **B1c** consists of meadow cover and is located the northeast corner of Field #2 on the Pike property. No impervious is proposed to be in this catchment area. Slopes are generally medium (5 to 15%) with steep slopes (3:1) on portions of the proposed berm. This area will drain to the pond via a closed drain system. This area drains to SP-1.

Drainage area **B2** and **B3** consist of the impervious parking lot and concession areas and will drain to SP-1 via the gravel wetland where the stormwater is treated before being discharged to the existing pond. Grades range from flat to mild in the parking areas with steep slopes (2:1 to 3:1) along the perimeter to existing grades.

Drain Area **B5** consists mainly of Field #3 and surrounding porous paths. Area **B1** is predominantly made up Phase 1 of the athletic fields and surrounding paths. B1 is mostly flat (0.5-2%).

Drainage Area C1: 0.15 acres,

Drainage Area **C1** is slightly reduced from the predevelopment condition and the cover is comprised of meadow areas and woods. This area drains offsite to SP-2.

Drainage Area D (D1 and D2): 0.85 acres

Drainage Area **D1** area is slightly reduced from the pre-development area and consists of woods cover. Drainage Area D2 is also slightly reduced and the cover will remain the same except that the gravel road surface will be fine graded. These areas drain to SP-3.

Drainage Area E1: 0.84 acres

Drainage Area **E1** area is slightly reduced from the pre-development area and the cover will remain the same except the gravel road surface will be fine graded. This area drains to SP-4.

Drain Area F (F1 and F2): 1.22 acres

Drain Areas **F1** and **F2** discharge directly to the Pike property (SP-1). **F1** is located on the east side of the Pike property near the existing pond outlet culvert and consists of meadow cover. The area was based on preliminary grades of the transfer station design. **F2** is located north of Fields 1 & 2 and consists of runoff from the proposed berm along the Pike property. This area is predominately covered with meadow with a small area of the gravel pavement.

Drain Area G (G1 and G2): 1.68 acres

These drainage areas discharge directly to the existing pond via overland flow. **G1** is approximately the same as in the existing condition except it consists more gravel cover due to the widening of the existing access road near the pond. Drain area **G2** includes onsite flow south of the pond that discharge directly to the pond and wetlands. This area is included since it was part of the larger contributing Drainage Area B2 in the predevelopment condition. The proposed grading of the regional BMPs was not considered since the regional facilities are not part of the onsite development analysis.

The proposed development of the site decreases total off-site stormwater peak flows when compared to the those in the pre-development conditions. The distribution of flow reduction between the four modeled offsite outfalls varies. A summary comparison of peak flows between pre- and post-development flows is located in **Table 2** below.

Table 2: Pre- and Post- Development Peak Flow Comparison

Analysis Point	Pre-Development Peak Flows (cfs)			
	2-year	10-year	25-year	50-year
SP-1	1.74	3.64	6.04	9.43
SP-2	0.25	0.57	0.85	1.12
SP-3	2.79	4.56	5.95	7.27
SP-4	2.66	4.41	5.75	7.02
TOTAL	7.45	13.23	18.61	24.86

Analysis Point	Post-Development Flows (cfs)			
	2-year	10-year	25-year	50-year
SP-1	1.49	3.39	5.74	7.21
SP-2	0.20	0.45	0.67	0.89
SP-3	2.56	4.14	5.38	6.56
SP-4	2.48	4.08	5.34	6.53
TOTAL	6.73	12.06	17.13	21.19

Offsite runoff volume for 3 of the 4 study points analyzed is reduced in the post-development condition except for SP-1. Volumes at SP-1 were slightly reduced in the 2-year storm event and slightly increased for the larger storm events. A summary of off-site flow volume for the pre-development and post-development conditions at the site is presented below in **Table 3**.

Table 3: Pre- and Post-Development Runoff Volume Comparison

Analysis Point	Pre-Development Volumes (ac-ft)			
	2-year	10-year	25-year	50-year
SP-1	1.448	3.277	4.859	6.433
SP-2	0.020	0.045	0.067	0.089
SP-3	0.214	0.359	0.475	0.585
SP-4	0.193	0.327	0.434	0.536
TOTAL	1.877	4.006	5.829	7.635

Analysis Point	Post-Development Volumes (ac-ft)			
	2-year	10-year	25-year	50-year
SP-1	1.456	3.481	5.212	6.913
SP-2	0.015	0.032	0.048	0.063
SP-3	0.199	0.328	0.431	0.529
SP-4	0.189	0.315	0.415	0.512
TOTAL	1.850	4.123	6.055	7.951

STORMWATER CONTROL PRACTICES

Proposed stormwater flow controls include two subsurface storage/infiltration facilities (BMP-1 and BMP-3) under the north side of the fields and a subsurface gravel wetland for treatment of impervious runoff. The subsurface facility consists of storage chambers and gravel and was sized to help provide peak flow attenuation and groundwater recharge for Phase I and Phase 2 of the recreation fields.

STORMWATER RECHARGE PRACTICES

The proposed construction of impervious covers in Phase I and future Phase II increase the impervious area above pre-development conditions requirement groundwater

recharge BMPs to be constructed. Most of the existing soil being covered with impervious pavement has an HSG C classification which NHDES AoT rules require a volume of 0.10-inch times the increase in impervious area to be infiltrated into the soil. Impervious areas over HSG D soils do not have a required recharge depth. Since these areas are very small relative to HSG C areas, HSG D soil were counted as HSG C, thus making the required minimum recharge volume calculated to be conservative. The following table is a summary of the recharge volume (Rv) calculations. As seen in the following **Table 4**, the actual recharge volume provided is much greater than the minimum required. This is due to large subsurface infiltration system under the field for peak flow attenuation.

Table 4: Summary of Recharge Volume, Rv,

Existing Impervious (sf)	Proposed Impervious (sf)	Net Impervious (sf)	Rv Required (0.10"/*12 x Net Impervious) (cf)	Rv Provided (cf)
84,219	297,275	213,056	1,768	11,475 (BMP-1) 10,973 (BMP-2)

STORMWATER TREATMENT PRACTICES

Stormwater treatment BMPs will be constructed to recharge ground water and to treat stormwater flowing off the impervious pavements in Phase I, future paved and roof surfaces in Phase II, and the proposed transfer station. NHDES AoT Rules require the first 1" of stormwater runoff from impervious areas to be treated before being discharged to wetlands or surface waters. For this project, a subsurface gravel wetland BMP is proposed to provide treatment of the proposed parking and other impervious areas for both Phase I and Phase II. This report only includes an analysis of impervious areas needed for support of the recreational fields and does not include treatment calculations of the future Transfer Station. Stormwater treatment proposed for the proposed transfer station will be submitted as part of the Site Plan Review process for that project.

The following **Table 5** summarizes the required minimum water quality volume by NHDES AoT Rules and provided by the proposed site subsurface gravel wetland. See Appendix E for NHDES AoT Calculation sheet

Table 5: Summary of Project Specific Water Quality Volume (WQV) Calculations:

Hardscape Impervious (acres)	WQV Required (cf)	WQV Provided (cf)
2.48	8,803	10,792

REGIONAL TREATMENT PRACTICES

Three regional stormwater facilities (BMPs) are proposed within the site to replace portions of the existing stormwater system with better systems that have shown to provide high pollutant removal efficiencies relative to existing systems. A subsurface gravel wetlands (BMP-R1) is proposed on the south side of the pond to replace the existing dilapidated forebay to the pond. To the North of the pond, two bioretention with Internal Storage Reservoir (BMP-R2 and BMP-R3) are proposed. These facilities will work in series with BMP-R3 discharging into BMP-R2. These are expected to have higher pollutant removal efficiencies than those for the overgrown treatment swales. **Table 6** below summarizes the estimated contributing impervious, total area, Standard WQV, and WQV provided, and **Table 7** presents the estimated pollutant load reduction for each of the three BMPs. In the event that construction bid costs are higher than allowable construction fund, BMP-R3 may not be constructed. This treatment scenario is included in the following summary tables for BMP-R2a.

Table 6: Regional Stormwater BMP WQV Calculations

BMP	Estimated Effective Impervious (acres)	Total Drainage Area (acres)	WQV @ 1" Impervious (cf)	WQV Provided (cf)	Percent of Standard WQV (%)	Depth of Runoff Treated (in.)
BMP-R1	51.633	112.5	189,106	34,434	18	0.18
BMP-R2	23.939	36.1	84,753	27,834	33	0.32

Table 7: Regional Stormwater BMP Pollutant Removal Efficiencies

BMP	Depth of Runoff Treated (in)	Estimated Pollutant Load Reduction/ Year lbs. (% ³)			
		TSS ²	Phosphorous ¹	Nitrogen ¹	Zinc ²
BMP-R1	0.18	16,642 (58)	46 (23)	523 (31)	45 (66)
BMP-R2&R3	0.32	8,558 (82)	22 (35 ⁴)	281 (52)	22 (92)

1. Values based on loading rates stated in the 2017 NH Small MS4 General Permit, Appendix F.
2. Values based on concentrations from Table A.1 in the New York State Stormwater Management Design Manual, Appendix A.
3. % values interpolated from EPA Region 1/UNHSC data tables at https://www.unh.edu/unhsc/sites/default/files/media/ms4_permit_nomographs_sheet_final_2019.pdf.
4. Adjusted by 0.75 based on BSM design depth of 75% of the control BSM depth in 1 above.

Offsite contributing drainage areas, effective impervious area, and stormwater discharge to each BMP was estimated using free and readily available ortho imagery, LiDar surface data, and GIS data from the City of Portsmouth GIS department data. For the runoff calculations, the Drainage area Time of Concentrations (Tc) were adjusted to estimate the effect of existing offsite stormwater facilities in slowing peak flows for each drainage area.

All three BMPs are design to allow high flows up to the 100-year storm to bypass the treatment components of the BMPs without overtopping the dam. Outfalls will be designed to NDHES AoT standards for outlet velocity discharge protection.

EROSION CONTROL DURING CONSTRUCTION

The proposed construction of the project will require the installation of temporary erosion control devices until the site is fully stabilized. The erosion control devices include a stabilized stone construction entrance, silt fencing, rock check dams. The proposed erosion control plan and notes and the erosion control and stormwater details are included in the Site Plan Review application (bound separately).

A Notice of Intent (NOI) for coverage under the Construction General Permit will be prepared and submitted prior to construction since greater than one acre of land will be disturbed. A copy of the document will be kept on-site for the duration of the project and all Stormwater Pollution Prevention Plan-related (SWPPP) inspections will be performed by qualified personnel.

CONCLUSIONS

Off-site peak flows are reduced with the proposed development of the site. These reductions are attributed primarily to the construction of the field subsurface systems for

peak attenuation and infiltration. Off-site volumes are reduced at three of the four analysis points for all storm events except for SP-1 where there were only slight increases in runoff volumes. The subsurface field BMP provided groundwater recharge for the increase in imperviousness for the full build-out of the fields and future transfer station. This same BMP also helped reduce the volume increase caused by the higher post-development CN values resulting from lowering the ground surface in the southern portion of the fields to reduce the volume of imported borrow.

Stormwater runoff from the proposed parking, gravel snow dump, and future hardscapes will be treated for water quality above the minimums required by NHDES AoT rules. The proposed porous paved walking path around the fields will reduce runoff as well as hold less heat than impervious asphalt.

The proposed regional BMP facilities will provide treatment of stormwater runoff from highly impervious offsite areas of industrial and commercial use. This treatment is expected to improve the water quality of Elwyn Brook which discharges into the impaired Sagamore Creek.

The proposed drainage system and erosion control measures depicted on the Design Drawings and described herein will provide adequate erosion and sedimentation control during construction. The project will require an EPA Construction General Permit, which will require frequent inspections of erosion control devices, including after major storm events.

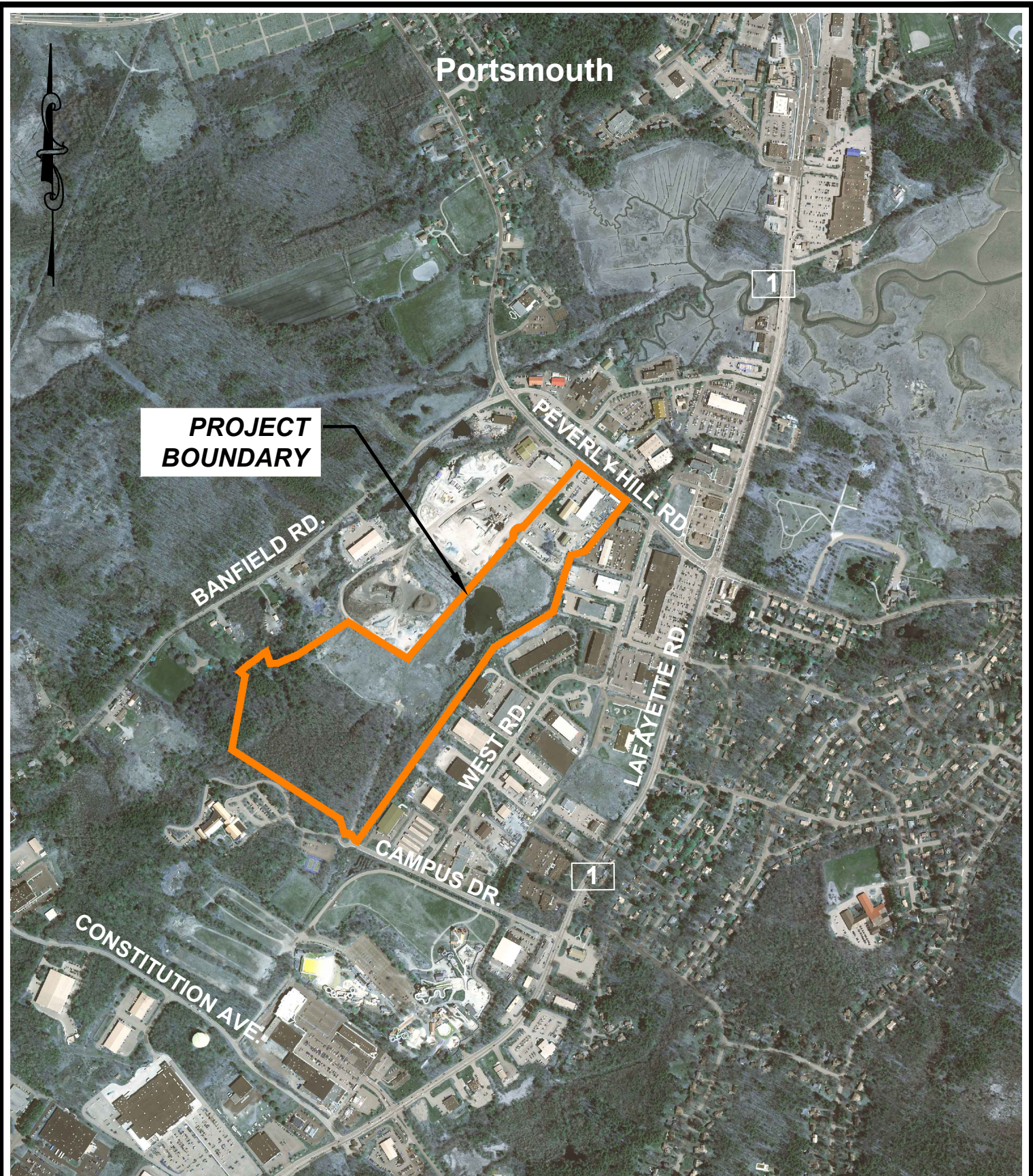
The content for the onsite stormwater calculations included in this report and the erosion and sediment control for the entire site including the stormwater BMPs will also be submitted to NHDES-Alteration of Terrain for review and approval prior to the start of construction. A copy of the permit is required to be posted at the job site.

Stormwater Management Report
Locus Maps

Figure 1: Locus Ortho Map

Figure 2: USGS Quad Map

FEMA FIRMette Map



CMA
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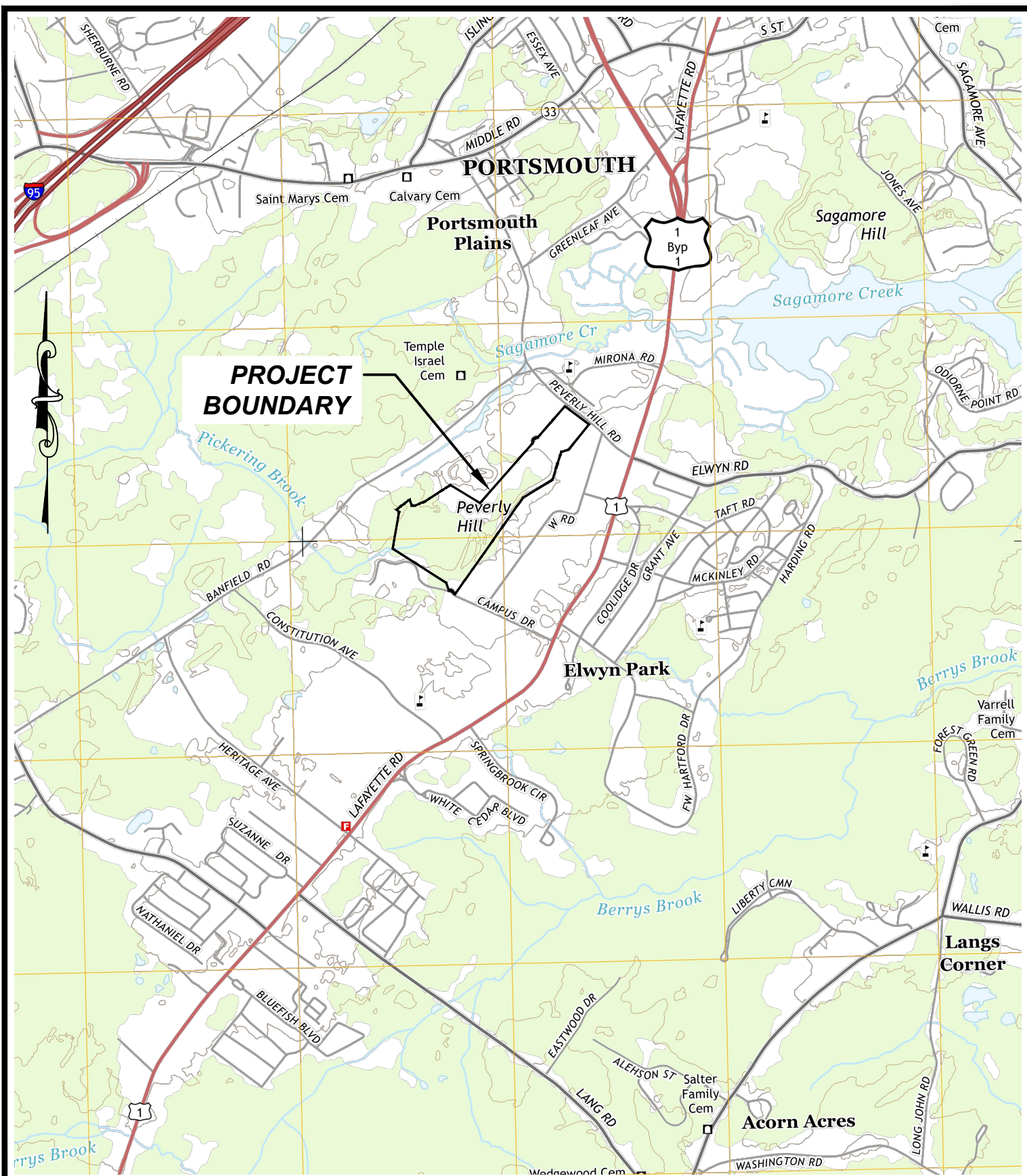
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cmaengineers.com

City of Portsmouth, NH
Multi-purpose Recreation Fields
Alteration of Terrain Permit Application

FIGURE 1: Locus Ortho Map

April, 2019

Scale: 1" = 1,000'



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City of Portsmouth, NH
Multi-purpose Recreation Fields
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FIGURE 2: USGS 7.5 Minute Quad Map

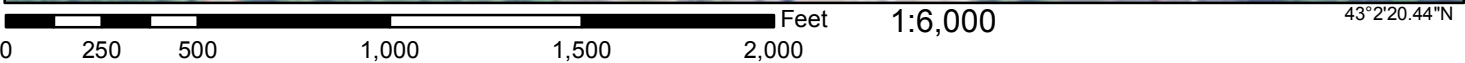
April, 2019

Scale: 1" = 2,000'

National Flood Hazard Layer FIRMette



43°2'46.73"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/15/2019 at 2:28:12 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Stormwater Management Report
Appendix A

Site Specific Soil Mapping

See Site Specific Soil Survey By GZA
Environmental with electronic file name
"final 04.0190892 SSSM Report
050619.pdf

Stormwater Management Report
Appendix B

NRCS Web Soil Survey

Hydrologic Soil Group—Rockingham County, New Hampshire
(Portsmouth Athletic Fields Pond Watershed)



Hydrologic Soil Group—Rockingham County, New Hampshire
(Portsmouth Athletic Fields Pond Watershed)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

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 20, Sep 7, 2018

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
134	Maybid silt loam	C/D	4.9	1.4%
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	B	54.3	15.1%
140C	Chatfield-Hollis-Canton complex, 8 to 15 percent slopes, rocky	B	10.0	2.8%
298	Pits, sand and gravel		49.9	13.9%
299	Udorthents, smoothed		100.8	28.1%
314A	Pipestone sand, 0 to 5 percent slopes	A/D	3.9	1.1%
447B	Scituate-Newfields complex, 3 to 8 percent slopes, very stony	C	8.8	2.4%
510A	Hoosic gravelly fine sandy loam, 0 to 3 percent slopes	A	11.5	3.2%
510B	Hoosic gravelly fine sandy loam, 3 to 8 percent slopes	A	4.6	1.3%
538A	Squamscott fine sandy loam, 0 to 5 percent slopes	C/D	15.4	4.3%
547B	Walpole very fine sandy loam, 3 to 8 percent slopes, very stony	A/D	5.9	1.7%
699	Urban land		46.4	12.9%
799	Urban land-Canton complex, 3 to 15 percent slopes		42.6	11.9%
Totals for Area of Interest			359.1	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Stormwater Management Report
Appendix C

Extreme Precipitation Tables

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	70.780 degrees West
Latitude	43.043 degrees North
Elevation	0 feet
Date/Time	Wed, 17 Apr 2019 17:13:31 -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	0.81	1.02	1.30	2yr	0.88	1.18	1.52	1.94	2.50	3.23	3.59	2yr	2.86	3.45	3.96	4.71	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	1.45	1.90	10yr	1.26	1.73	2.24	2.90	3.77	4.90	5.57	10yr	4.34	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	1.10	1.54	2.08	2.77	50yr	1.79	2.53	3.30	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	2.09	2.99	3.92	5.19	6.81	8.92	10.45	100yr	7.89	10.05	11.49	13.08	14.38	100yr
200yr	0.68	1.11	1.43	2.05	2.84	3.85	200yr	2.45	3.53	4.64	6.17	8.14	10.69	12.64	200yr	9.46	12.16	13.90	15.69	17.16	200yr
500yr	0.80	1.32	1.72	2.50	3.49	4.79	500yr	3.02	4.40	5.80	7.75	10.29	13.59	16.27	500yr	12.03	15.64	17.87	19.97	21.67	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	0.87	0.92	1.33	1.68	2.25	2.54	1yr	1.99	2.45	2.88	3.18	3.92	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	2.72	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	4.24	5yr	3.38	4.07	4.76	5.59	6.30	5yr
10yr	0.39	0.60	0.74	1.03	1.33	1.60	10yr	1.15	1.57	1.81	2.39	3.06	4.41	4.92	10yr	3.91	4.74	5.52	6.49	7.27	10yr
25yr	0.44	0.67	0.84	1.19	1.57	1.91	25yr	1.36	1.86	2.10	2.75	3.53	4.76	5.99	25yr	4.21	5.76	6.77	7.91	8.79	25yr
50yr	0.49	0.74	0.92	1.32	1.78	2.17	50yr	1.54	2.13	2.35	3.07	3.93	5.38	6.93	50yr	4.77	6.66	7.89	9.20	10.16	50yr
100yr	0.54	0.82	1.02	1.48	2.03	2.48	100yr	1.75	2.42	2.63	3.41	4.35	6.06	8.02	100yr	5.36	7.71	9.21	10.72	11.74	100yr
200yr	0.60	0.90	1.14	1.65	2.31	2.83	200yr	1.99	2.76	2.94	3.77	4.79	6.80	9.28	200yr	6.02	8.92	10.75	12.50	13.59	200yr
500yr	0.70	1.04	1.33	1.94	2.75	3.38	500yr	2.38	3.31	3.42	4.31	5.46	7.93	11.25	500yr	7.02	10.82	13.20	15.34	16.47	500yr

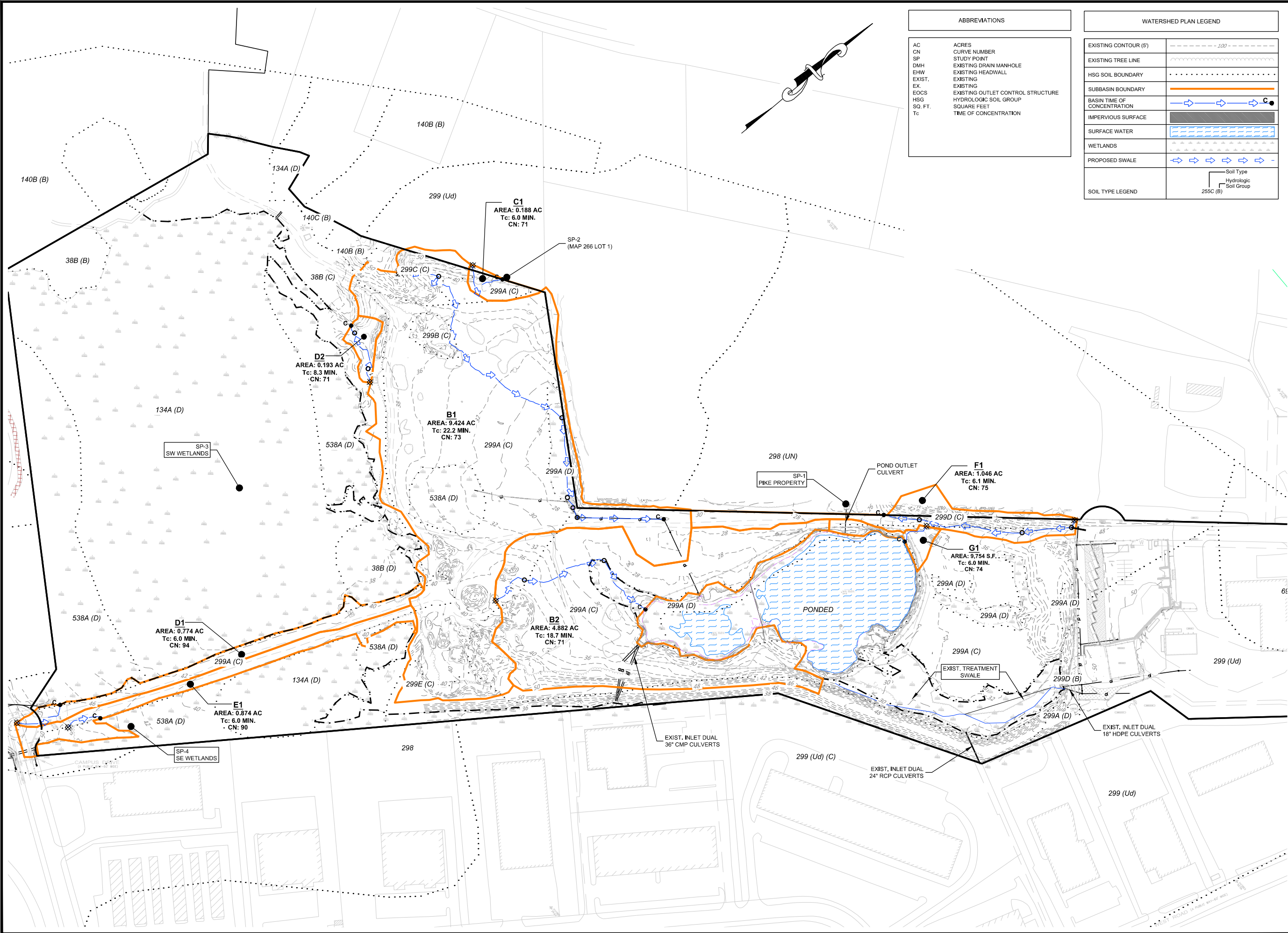
Upper Confidence Limits

	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	2.66	3.05	3.60	4.39	5.08	1yr
2yr	0.34	0.52	0.64	0.86	1.07	1.27	2yr	0.92	1.24	1.48	1.96	2.51	3.44	3.72	2yr	3.05	3.57	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	4.97	5yr	3.86	4.78	5.41	6.39	7.18	5yr
10yr	0.47	0.72	0.89	1.25	1.61	1.98	10yr	1.39	1.93	2.28	3.10	3.95	5.37	6.20	10yr	4.75	5.97	6.81	7.85	8.77	10yr
25yr	0.58	0.88	1.09	1.56	2.05	2.57	25yr	1.77	2.52	2.95	4.07	5.14	7.82	8.33	25yr	6.92	8.01	9.12	10.35	11.42	25yr
50yr	0.67	1.02	1.27	1.83	2.47	3.14	50yr	2.13	3.07	3.59	4.99	6.30	9.79	10.42	50yr	8.66	10.02	11.37	12.73	13.97	50yr
100yr	0.79	1.20	1.50	2.16	2.97	3.82	100yr	2.56	3.73	4.37	6.15	7.74	12.24	13.04	100yr	10.84	12.54	14.19	15.69	17.08	100yr
200yr	0.93	1.39	1.77	2.56	3.56	4.66	200yr	3.08	4.56	5.33	7.57	9.50	15.36	16.33	200yr	13.59	15.70	17.72	19.32	20.90	200yr
500yr	1.15	1.71	2.20	3.19	4.54	6.05	500yr	3.92	5.92	6.92	10.01	12.49	20.74	21.99	500yr	18.36	21.15	23.77	25.45	27.30	500yr

Appendix D

Pre-Development Drainage Analysis

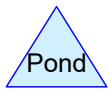
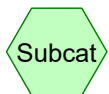
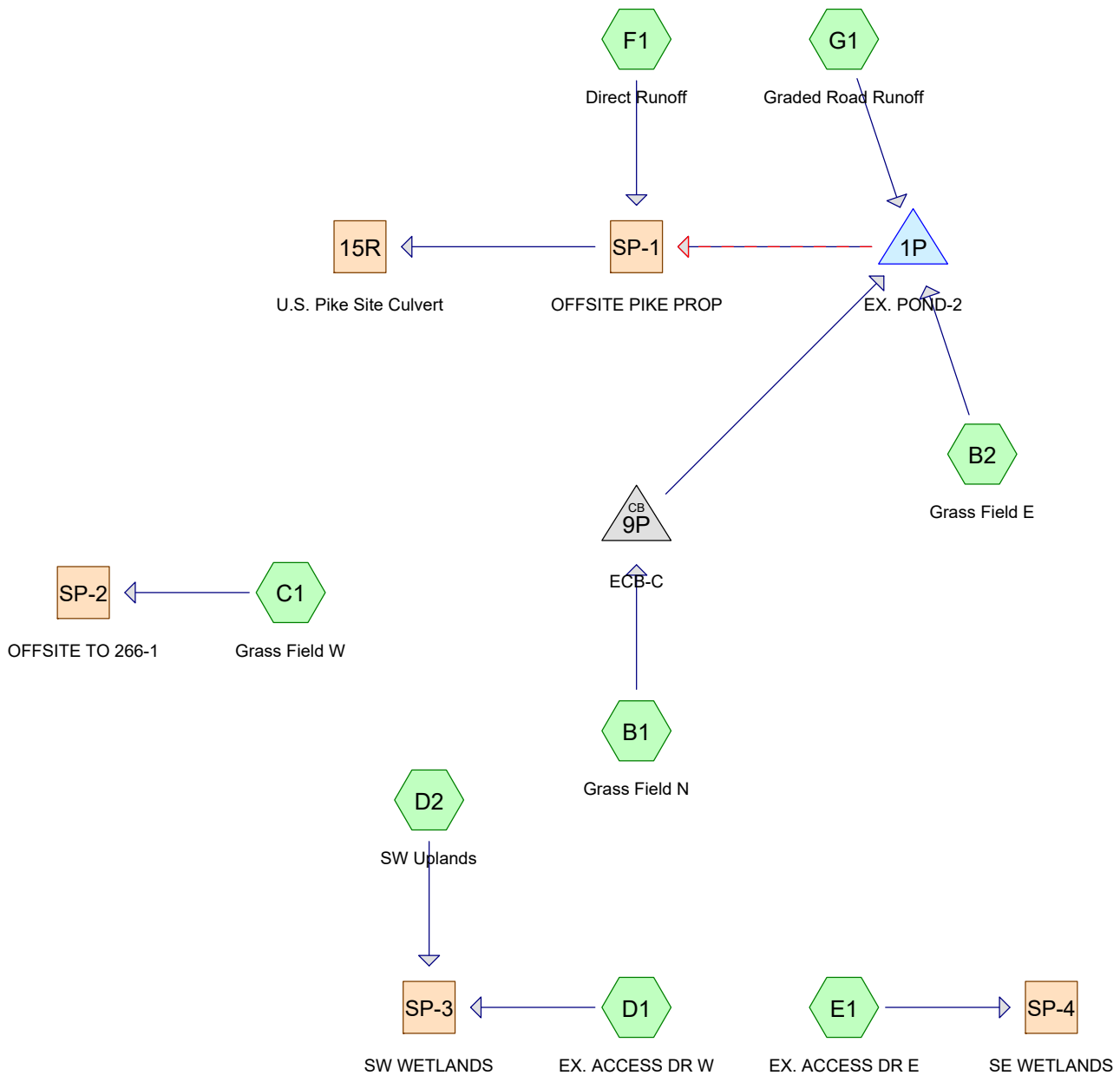
- i. Pre-Development Watershed Plan
- ii. 2-Year, 24-Hour HydroCad Report Calculations
- iii. 10-Year, 25-Year, and 50-Year Report Summary Calculations



ABBREVIATIONS	
AC	ACRES
CN	CURVE NUMBER
SP	STUDY POINT
DMH	EXISTING DRAIN MANHOLE
EHW	EXISTING HEADWALL
EXIST.	EXISTING
EX	EXISTING
EOCS	EXISTING OUTLET CONTROL STRUCTURE
HSG	HYDROLOGIC SOIL GROUP
SQ. FT.	SQUARE FEET
Tc	TIME OF CONCENTRATION

WATERSHED PLAN LEGEND	
EXISTING CONTOUR (5')	- - - - - 100'
EXISTING TREE LINE	~~~~~
HSG SOIL BOUNDARY	
SUBBASIN BOUNDARY	=====
BASIN TIME OF CONCENTRATION	→ → → → → C
IMPERVIOUS SURFACE	=====
SURFACE WATER	~~~~~
WETLANDS	~~~~~
PROPOSED SWALE	→ → → → →
SOIL TYPE LEGEND	Soil Type
	Hydrologic Soil Group
	255C (B)

City of Portsmouth Portsmouth, New Hampshire Site Plan Review Application Multi-purpose Recreation Fields Stormwater Analysis Pre-Development Watershed Plan		designed by: JHK	drawn by: AGL	approved by: PAC	scale: 0 100' 200'
date: August 2019	project no: 1122	checked by: PAC	Scale 1" = 100'		
drawing no. H1		sheet: 1 of 1			
CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223 cmaengineers.com		revision no. by date			



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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.088	96	Gravel surface, 100% imp, HSG C (B1, B2, D1, E1, F1)
0.021	96	Gravel surface, 100%, imp, HSG C (G1)
0.866	96	Gravel surface, grass ovrgrowth, 100% imp, HSG C (D1, E1)
10.545	71	Meadow, non-grazed, HSG C (B1, B2, C1, D1, D2, E1, F1, G1)
1.310	78	Meadow, non-grazed, HSG D (B1, B2, E1, G1)
0.080	98	Paved parking, HSG C (D1, E1)
2.971	70	Woods, Good, HSG C (B1, B2, C1, D2, E1, F1, G1)
0.320	77	Woods, Good, HSG D (B1, B2, D1, E1)
17.201	74	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
15.571	HSG C	B1, B2, C1, D1, D2, E1, F1, G1
1.630	HSG D	B1, B2, D1, E1, G1
0.000	Other	
17.201		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	Subo Num
0.000	0.000	1.088	0.000	0.000	1.088	Gravel surface, 100% imp	
0.000	0.000	0.021	0.000	0.000	0.021	Gravel surface, 100%, imp	
0.000	0.000	0.866	0.000	0.000	0.866	Gravel surface, grass overgrowth, 100% imp	
0.000	0.000	10.545	1.310	0.000	11.855	Meadow, non-grazed	
0.000	0.000	0.080	0.000	0.000	0.080	Paved parking	
0.000	0.000	2.971	0.320	0.000	3.291	Woods, Good	
0.000	0.000	15.571	1.630	0.000	17.201	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	1P	22.34	21.91	61.3	0.0070	0.022	53.0	41.0	19.0
2	9P	23.26	23.06	174.5	0.0011	0.013	24.0	0.0	0.0

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 4
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment B1: Grass Field N Runoff Area=9.424 ac 5.59% Impervious Runoff Depth=1.32"
 Flow Length=1,113' Tc=22.3 min CN=73 Runoff=9.03 cfs 1.039 af

Subcatchment B2: Grass Field E Runoff Area=4.478 ac 0.27% Impervious Runoff Depth=1.20"
 Flow Length=481' Tc=18.8 min CN=71 Runoff=4.09 cfs 0.448 af

Subcatchment C1: Grass Field W Runoff Area=0.188 ac 0.00% Impervious Runoff Depth=1.20"
 Flow Length=134' Tc=6.0 min CN=71 Runoff=0.25 cfs 0.019 af

Subcatchment D1: EX. ACCESS DR W Runoff Area=0.774 ac 87.73% Impervious Runoff Depth=3.04"
 Flow Length=133' Tc=6.0 min CN=94 Runoff=2.62 cfs 0.196 af

Subcatchment D2: SW Uplands Runoff Area=0.193 ac 0.00% Impervious Runoff Depth=1.14"
 Flow Length=162' Tc=9.7 min CN=70 Runoff=0.21 cfs 0.018 af

Subcatchment E1: EX. ACCESS DR E Runoff Area=0.874 ac 71.51% Impervious Runoff Depth=2.65"
 Flow Length=90' Tc=6.0 min CN=90 Runoff=2.66 cfs 0.193 af

Subcatchment F1: Direct Runoff Runoff Area=1.046 ac 18.26% Impervious Runoff Depth=1.45"
 Flow Length=489' Tc=6.1 min CN=75 Runoff=1.74 cfs 0.127 af

Subcatchment G1: Graded Road Runoff Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=1.39"
 Tc=6.0 min CN=74 Runoff=0.35 cfs 0.026 af

Reach 15R: U.S. Pike Site Culvert Inflow=0.96 cfs 1.446 af
 Outflow=0.96 cfs 1.446 af

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.30' Max Vel=0.30 fps Inflow=1.74 cfs 1.450 af
 n=0.120 L=490.0' S=0.0051 ' Capacity=139.53 cfs Outflow=0.96 cfs 1.446 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.25 cfs 0.019 af
 Outflow=0.25 cfs 0.019 af

Reach SP-3: SW WETLANDS Inflow=2.79 cfs 0.214 af
 Outflow=2.79 cfs 0.214 af

Reach SP-4: SE WETLANDS Inflow=2.66 cfs 0.193 af
 Outflow=2.66 cfs 0.193 af

Pond 1P: EX. POND-2 Peak Elev=24.34' Storage=489,621 cf Inflow=13.21 cfs 1.512 af
 Primary=0.89 cfs 1.323 af Secondary=0.00 cfs 0.000 af Outflow=0.89 cfs 1.323 af

Pond 9P: ECB-C Peak Elev=25.19' Inflow=9.03 cfs 1.039 af
 24.0" Round Culvert n=0.013 L=174.5' S=0.0011 ' Outflow=9.03 cfs 1.039 af

Total Runoff Area = 17.201 ac Runoff Volume = 2.065 af Average Runoff Depth = 1.44"
88.18% Pervious = 15.167 ac 11.82% Impervious = 2.034 ac

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

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Summary for Subcatchment B1: Grass Field N

Runoff = 9.03 cfs @ 12.32 hrs, Volume= 1.039 af, Depth= 1.32"

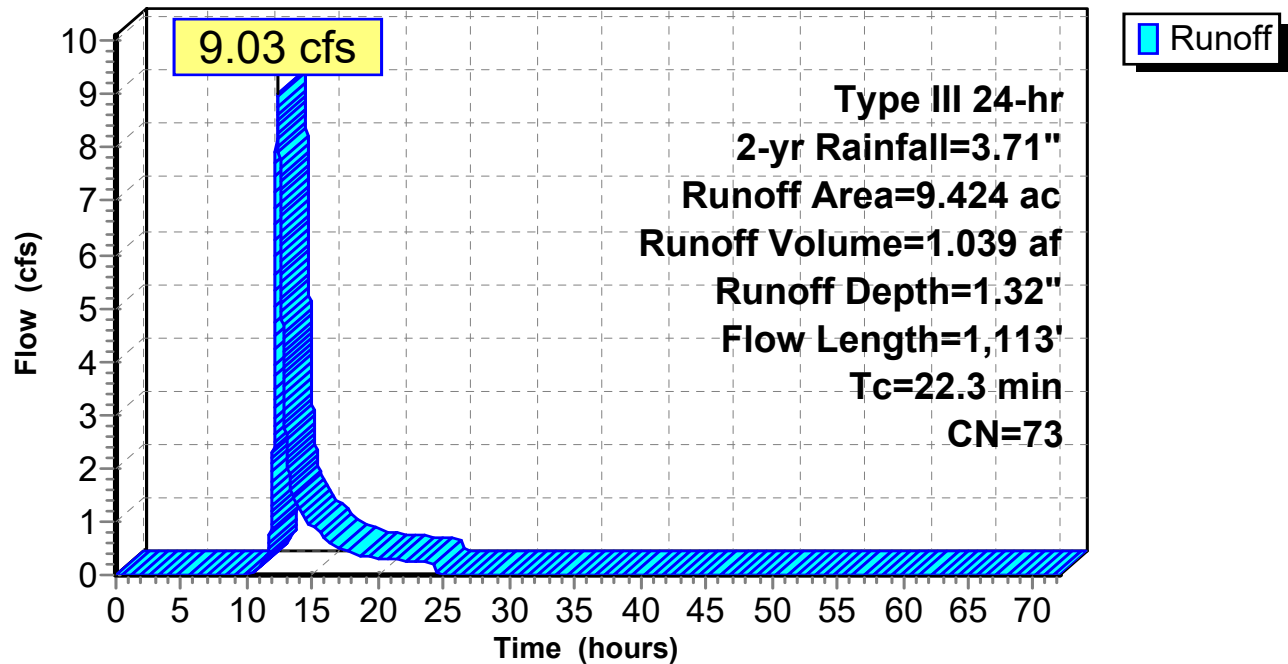
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
6.175	71	Meadow, non-grazed, HSG C
1.653	70	Woods, Good, HSG C
0.969	78	Meadow, non-grazed, HSG D
0.100	77	Woods, Good, HSG D
* 0.527	96	Gravel surface, 100% imp, HSG C
9.424	73	Weighted Average
8.897		94.41% Pervious Area
0.527		5.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	9	0.0611	0.12		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.3	12	0.6205	0.78		Sheet Flow, Ledge Slope n= 0.080 P2= 3.71"
1.8	84	0.0986	0.79		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
8.3	541	0.0241	1.09		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.1	198	0.0053	0.36		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.4	31	0.0644	1.35	4.31	Channel Flow, Area= 3.2 sf Perim= 15.0' r= 0.21' n= 0.100
0.1	26	0.0031	4.30	13.32	Channel Flow, Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.012
1.1	212	0.0018	3.27	10.15	Channel Flow, Area= 3.1 sf Perim= 6.3' r= 0.49' n= 0.012
22.3	1,113	Total			

Subcatchment B1: Grass Field N

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B1: Grass Field N

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.32	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.32	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.32	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.32	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.32	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.32	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.32	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.32	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.32	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.32	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.32	0.00
11.00	0.93	0.01	0.12	64.00	3.71	1.32	0.00
12.00	1.85	0.26	2.39	65.00	3.71	1.32	0.00
13.00	2.78	0.73	2.41	66.00	3.71	1.32	0.00
14.00	3.01	0.86	1.23	67.00	3.71	1.32	0.00
15.00	3.17	0.96	0.92	68.00	3.71	1.32	0.00
16.00	3.29	1.04	0.68	69.00	3.71	1.32	0.00
17.00	3.37	1.10	0.53	70.00	3.71	1.32	0.00
18.00	3.44	1.14	0.41	71.00	3.71	1.32	0.00
19.00	3.50	1.18	0.35	72.00	3.71	1.32	0.00
20.00	3.55	1.21	0.32				
21.00	3.60	1.25	0.29				
22.00	3.64	1.27	0.27				
23.00	3.68	1.30	0.24				
24.00	3.71	1.32	0.22				
25.00	3.71	1.32	0.00				
26.00	3.71	1.32	0.00				
27.00	3.71	1.32	0.00				
28.00	3.71	1.32	0.00				
29.00	3.71	1.32	0.00				
30.00	3.71	1.32	0.00				
31.00	3.71	1.32	0.00				
32.00	3.71	1.32	0.00				
33.00	3.71	1.32	0.00				
34.00	3.71	1.32	0.00				
35.00	3.71	1.32	0.00				
36.00	3.71	1.32	0.00				
37.00	3.71	1.32	0.00				
38.00	3.71	1.32	0.00				
39.00	3.71	1.32	0.00				
40.00	3.71	1.32	0.00				
41.00	3.71	1.32	0.00				
42.00	3.71	1.32	0.00				
43.00	3.71	1.32	0.00				
44.00	3.71	1.32	0.00				
45.00	3.71	1.32	0.00				
46.00	3.71	1.32	0.00				
47.00	3.71	1.32	0.00				
48.00	3.71	1.32	0.00				
49.00	3.71	1.32	0.00				
50.00	3.71	1.32	0.00				
51.00	3.71	1.32	0.00				
52.00	3.71	1.32	0.00				

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

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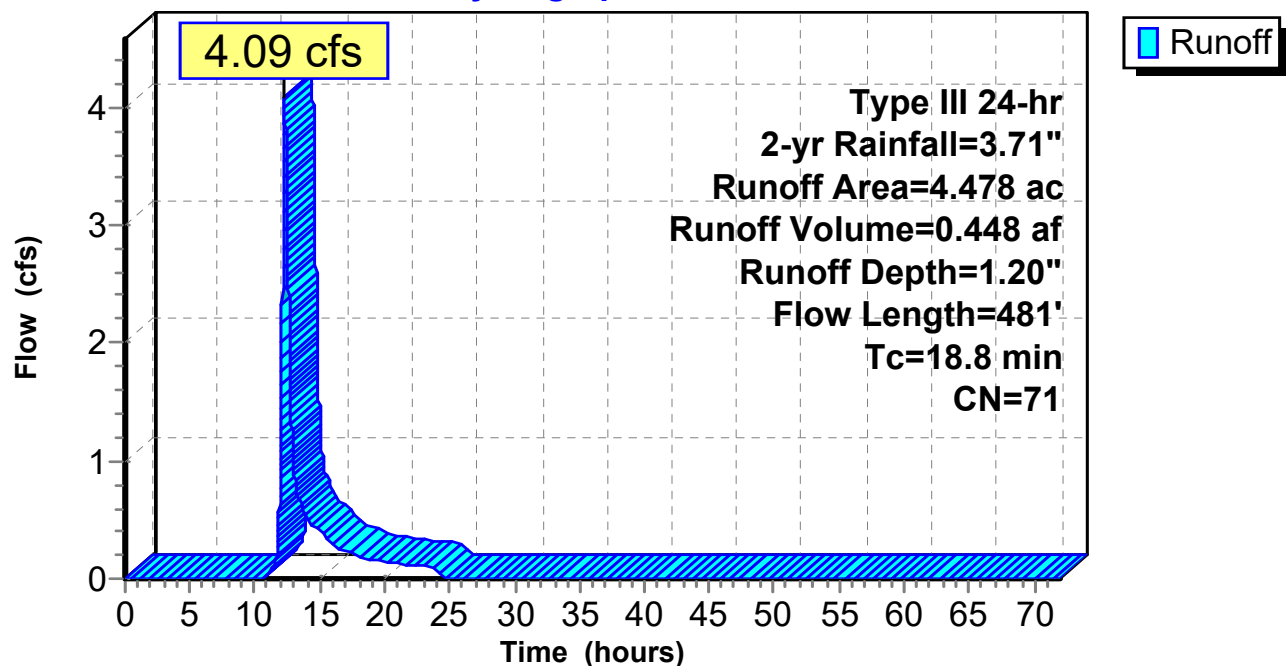
Summary for Subcatchment B2: Grass Field E

Runoff = 4.09 cfs @ 12.28 hrs, Volume= 0.448 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
3.259	71	Meadow, non-grazed, HSG C
0.904	70	Woods, Good, HSG C
0.296	78	Meadow, non-grazed, HSG D
0.007	77	Woods, Good, HSG D
* 0.012	96	Gravel surface, 100% imp, HSG C
4.478	71	Weighted Average
4.466		99.73% Pervious Area
0.012		0.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.6	100	0.0282	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
3.4	215	0.0457	1.07		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.8	166	0.0210	0.72		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.8	481	Total			

Subcatchment B2: Grass Field E**Hydrograph**

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Hydrograph for Subcatchment B2: Grass Field E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.20	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.20	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.20	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.20	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.20	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.20	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.20	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.20	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.20	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.20	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.20	0.00
11.00	0.93	0.00	0.02	64.00	3.71	1.20	0.00
12.00	1.85	0.21	1.14	65.00	3.71	1.20	0.00
13.00	2.78	0.64	0.95	66.00	3.71	1.20	0.00
14.00	3.01	0.77	0.53	67.00	3.71	1.20	0.00
15.00	3.17	0.86	0.40	68.00	3.71	1.20	0.00
16.00	3.29	0.93	0.30	69.00	3.71	1.20	0.00
17.00	3.37	0.98	0.23	70.00	3.71	1.20	0.00
18.00	3.44	1.03	0.18	71.00	3.71	1.20	0.00
19.00	3.50	1.06	0.16	72.00	3.71	1.20	0.00
20.00	3.55	1.10	0.14				
21.00	3.60	1.13	0.13				
22.00	3.64	1.15	0.12				
23.00	3.68	1.18	0.11				
24.00	3.71	1.20	0.10				
25.00	3.71	1.20	0.00				
26.00	3.71	1.20	0.00				
27.00	3.71	1.20	0.00				
28.00	3.71	1.20	0.00				
29.00	3.71	1.20	0.00				
30.00	3.71	1.20	0.00				
31.00	3.71	1.20	0.00				
32.00	3.71	1.20	0.00				
33.00	3.71	1.20	0.00				
34.00	3.71	1.20	0.00				
35.00	3.71	1.20	0.00				
36.00	3.71	1.20	0.00				
37.00	3.71	1.20	0.00				
38.00	3.71	1.20	0.00				
39.00	3.71	1.20	0.00				
40.00	3.71	1.20	0.00				
41.00	3.71	1.20	0.00				
42.00	3.71	1.20	0.00				
43.00	3.71	1.20	0.00				
44.00	3.71	1.20	0.00				
45.00	3.71	1.20	0.00				
46.00	3.71	1.20	0.00				
47.00	3.71	1.20	0.00				
48.00	3.71	1.20	0.00				
49.00	3.71	1.20	0.00				
50.00	3.71	1.20	0.00				
51.00	3.71	1.20	0.00				
52.00	3.71	1.20	0.00				

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

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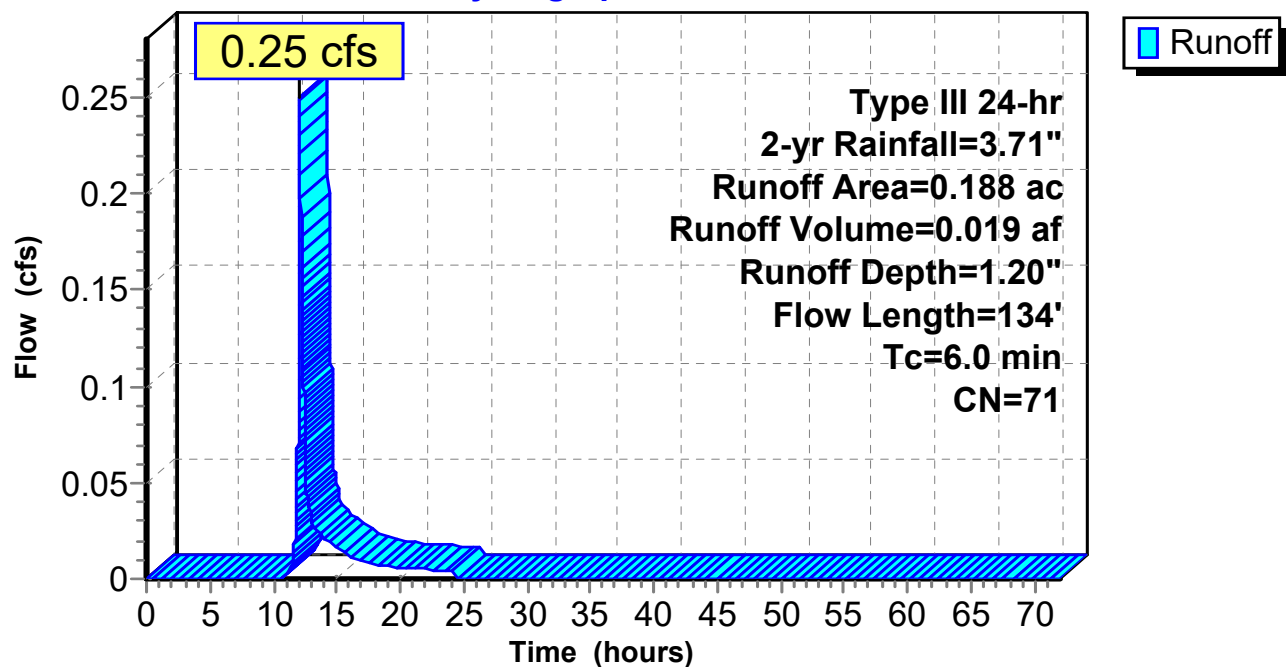
Summary for Subcatchment C1: Grass Field W

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.133	71	Meadow, non-grazed, HSG C
0.055	70	Woods, Good, HSG C
0.188	71	Weighted Average
0.188		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	13	0.2095	1.97		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
2.7	30	0.2753	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.9	50	0.0161	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	41	0.0835	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.0	134	Total, Increased to minimum Tc = 6.0 min			

Subcatchment C1: Grass Field W**Hydrograph**

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Hydrograph for Subcatchment C1: Grass Field W

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.20	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.20	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.20	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.20	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.20	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.20	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.20	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.20	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.20	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.20	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.20	0.00
11.00	0.93	0.00	0.00	64.00	3.71	1.20	0.00
12.00	1.85	0.21	0.13	65.00	3.71	1.20	0.00
13.00	2.78	0.64	0.03	66.00	3.71	1.20	0.00
14.00	3.01	0.77	0.02	67.00	3.71	1.20	0.00
15.00	3.17	0.86	0.02	68.00	3.71	1.20	0.00
16.00	3.29	0.93	0.01	69.00	3.71	1.20	0.00
17.00	3.37	0.98	0.01	70.00	3.71	1.20	0.00
18.00	3.44	1.03	0.01	71.00	3.71	1.20	0.00
19.00	3.50	1.06	0.01	72.00	3.71	1.20	0.00
20.00	3.55	1.10	0.01				
21.00	3.60	1.13	0.01				
22.00	3.64	1.15	0.00				
23.00	3.68	1.18	0.00				
24.00	3.71	1.20	0.00				
25.00	3.71	1.20	0.00				
26.00	3.71	1.20	0.00				
27.00	3.71	1.20	0.00				
28.00	3.71	1.20	0.00				
29.00	3.71	1.20	0.00				
30.00	3.71	1.20	0.00				
31.00	3.71	1.20	0.00				
32.00	3.71	1.20	0.00				
33.00	3.71	1.20	0.00				
34.00	3.71	1.20	0.00				
35.00	3.71	1.20	0.00				
36.00	3.71	1.20	0.00				
37.00	3.71	1.20	0.00				
38.00	3.71	1.20	0.00				
39.00	3.71	1.20	0.00				
40.00	3.71	1.20	0.00				
41.00	3.71	1.20	0.00				
42.00	3.71	1.20	0.00				
43.00	3.71	1.20	0.00				
44.00	3.71	1.20	0.00				
45.00	3.71	1.20	0.00				
46.00	3.71	1.20	0.00				
47.00	3.71	1.20	0.00				
48.00	3.71	1.20	0.00				
49.00	3.71	1.20	0.00				
50.00	3.71	1.20	0.00				
51.00	3.71	1.20	0.00				
52.00	3.71	1.20	0.00				

1119-Pre-Development-Fields

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

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Summary for Subcatchment D1: EX. ACCESS DR W

Runoff = 2.62 cfs @ 12.08 hrs, Volume= 0.196 af, Depth= 3.04"

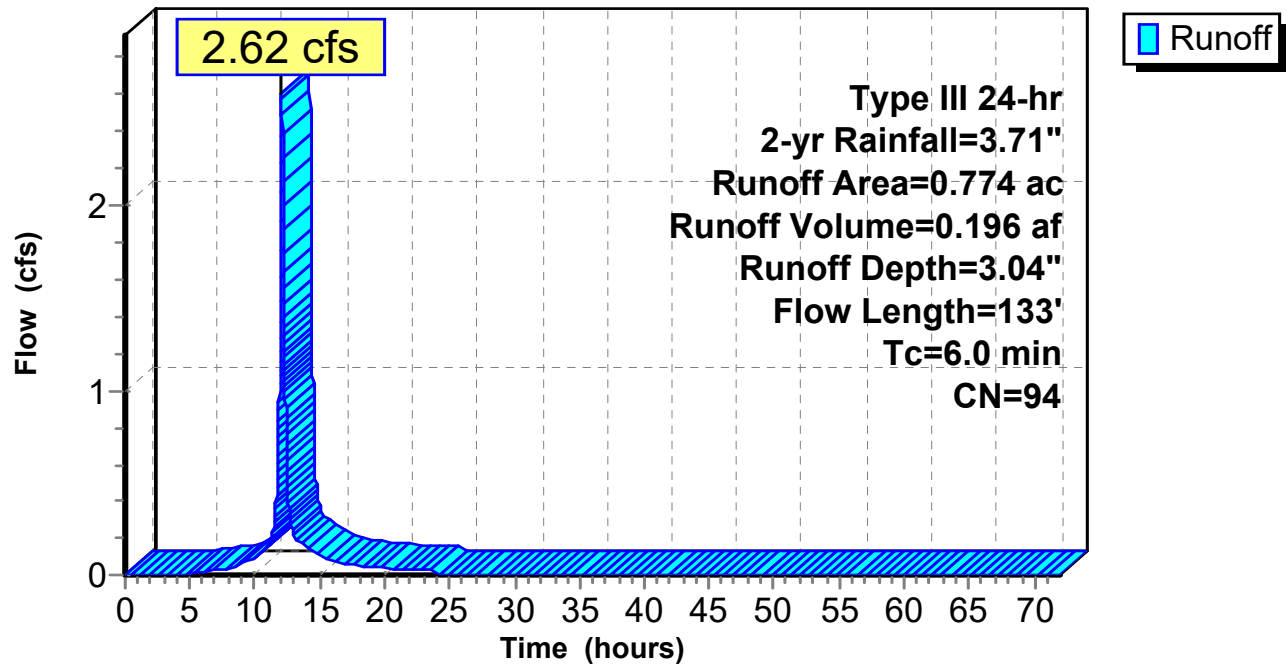
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 0.477	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.092	77	Woods, Good, HSG D
* 0.164	96	Gravel surface, 100% imp, HSG C
0.038	98	Paved parking, HSG C
0.003	71	Meadow, non-grazed, HSG C
0.774	94	Weighted Average
0.095		12.27% Pervious Area
0.679		87.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	21	0.1468	0.10		Sheet Flow, Woods: Medium Underbrush n= 0.600 P2= 3.71"
0.3	26	0.0532	1.31		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.4	34	0.0608	1.45		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.1	20	0.0417	3.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	32	0.0783	1.96		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	133	Total, Increased to minimum Tc = 6.0 min			

Subcatchment D1: EX. ACCESS DR W

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D1: EX. ACCESS DR W

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	3.04	0.00
1.00	0.04	0.00	0.00	54.00	3.71	3.04	0.00
2.00	0.07	0.00	0.00	55.00	3.71	3.04	0.00
3.00	0.11	0.00	0.00	56.00	3.71	3.04	0.00
4.00	0.16	0.00	0.00	57.00	3.71	3.04	0.00
5.00	0.21	0.01	0.01	58.00	3.71	3.04	0.00
6.00	0.27	0.03	0.01	59.00	3.71	3.04	0.00
7.00	0.34	0.05	0.03	60.00	3.71	3.04	0.00
8.00	0.42	0.09	0.04	61.00	3.71	3.04	0.00
9.00	0.54	0.16	0.07	62.00	3.71	3.04	0.00
10.00	0.70	0.27	0.10	63.00	3.71	3.04	0.00
11.00	0.93	0.44	0.16	64.00	3.71	3.04	0.00
12.00	1.85	1.26	1.62	65.00	3.71	3.04	0.00
13.00	2.78	2.14	0.23	66.00	3.71	3.04	0.00
14.00	3.01	2.36	0.14	67.00	3.71	3.04	0.00
15.00	3.17	2.51	0.11	68.00	3.71	3.04	0.00
16.00	3.29	2.63	0.08	69.00	3.71	3.04	0.00
17.00	3.37	2.71	0.06	70.00	3.71	3.04	0.00
18.00	3.44	2.78	0.05	71.00	3.71	3.04	0.00
19.00	3.50	2.84	0.04	72.00	3.71	3.04	0.00
20.00	3.55	2.88	0.04				
21.00	3.60	2.93	0.03				
22.00	3.64	2.97	0.03				
23.00	3.68	3.01	0.03				
24.00	3.71	3.04	0.02				
25.00	3.71	3.04	0.00				
26.00	3.71	3.04	0.00				
27.00	3.71	3.04	0.00				
28.00	3.71	3.04	0.00				
29.00	3.71	3.04	0.00				
30.00	3.71	3.04	0.00				
31.00	3.71	3.04	0.00				
32.00	3.71	3.04	0.00				
33.00	3.71	3.04	0.00				
34.00	3.71	3.04	0.00				
35.00	3.71	3.04	0.00				
36.00	3.71	3.04	0.00				
37.00	3.71	3.04	0.00				
38.00	3.71	3.04	0.00				
39.00	3.71	3.04	0.00				
40.00	3.71	3.04	0.00				
41.00	3.71	3.04	0.00				
42.00	3.71	3.04	0.00				
43.00	3.71	3.04	0.00				
44.00	3.71	3.04	0.00				
45.00	3.71	3.04	0.00				
46.00	3.71	3.04	0.00				
47.00	3.71	3.04	0.00				
48.00	3.71	3.04	0.00				
49.00	3.71	3.04	0.00				
50.00	3.71	3.04	0.00				
51.00	3.71	3.04	0.00				
52.00	3.71	3.04	0.00				

1119-Pre-Development-Fields

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

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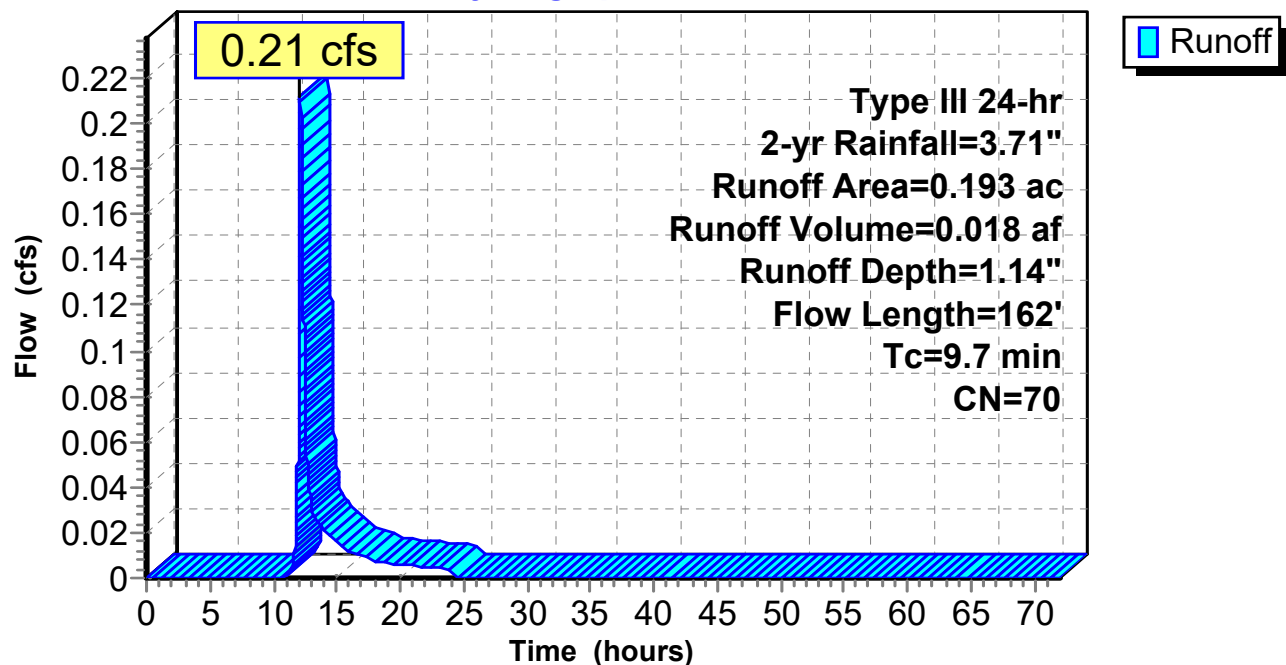
Summary for Subcatchment D2: SW Uplands

Runoff = 0.21 cfs @ 12.15 hrs, Volume= 0.018 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.163	70	Woods, Good, HSG C
0.030	71	Meadow, non-grazed, HSG C
0.193	70	Weighted Average
0.193		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	35	0.0270	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
4.3	105	0.0067	0.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	22	0.0798	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.7	162	Total			

Subcatchment D2: SW Uplands**Hydrograph**

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D2: SW Uplands

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.14	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.14	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.14	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.14	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.14	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.14	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.14	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.14	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.14	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.14	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.14	0.00
11.00	0.93	0.00	0.00	64.00	3.71	1.14	0.00
12.00	1.85	0.19	0.08	65.00	3.71	1.14	0.00
13.00	2.78	0.60	0.03	66.00	3.71	1.14	0.00
14.00	3.01	0.72	0.02	67.00	3.71	1.14	0.00
15.00	3.17	0.81	0.02	68.00	3.71	1.14	0.00
16.00	3.29	0.88	0.01	69.00	3.71	1.14	0.00
17.00	3.37	0.93	0.01	70.00	3.71	1.14	0.00
18.00	3.44	0.97	0.01	71.00	3.71	1.14	0.00
19.00	3.50	1.01	0.01	72.00	3.71	1.14	0.00
20.00	3.55	1.04	0.01				
21.00	3.60	1.07	0.01				
22.00	3.64	1.09	0.00				
23.00	3.68	1.12	0.00				
24.00	3.71	1.14	0.00				
25.00	3.71	1.14	0.00				
26.00	3.71	1.14	0.00				
27.00	3.71	1.14	0.00				
28.00	3.71	1.14	0.00				
29.00	3.71	1.14	0.00				
30.00	3.71	1.14	0.00				
31.00	3.71	1.14	0.00				
32.00	3.71	1.14	0.00				
33.00	3.71	1.14	0.00				
34.00	3.71	1.14	0.00				
35.00	3.71	1.14	0.00				
36.00	3.71	1.14	0.00				
37.00	3.71	1.14	0.00				
38.00	3.71	1.14	0.00				
39.00	3.71	1.14	0.00				
40.00	3.71	1.14	0.00				
41.00	3.71	1.14	0.00				
42.00	3.71	1.14	0.00				
43.00	3.71	1.14	0.00				
44.00	3.71	1.14	0.00				
45.00	3.71	1.14	0.00				
46.00	3.71	1.14	0.00				
47.00	3.71	1.14	0.00				
48.00	3.71	1.14	0.00				
49.00	3.71	1.14	0.00				
50.00	3.71	1.14	0.00				
51.00	3.71	1.14	0.00				
52.00	3.71	1.14	0.00				

1119-Pre-Development-Fields

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

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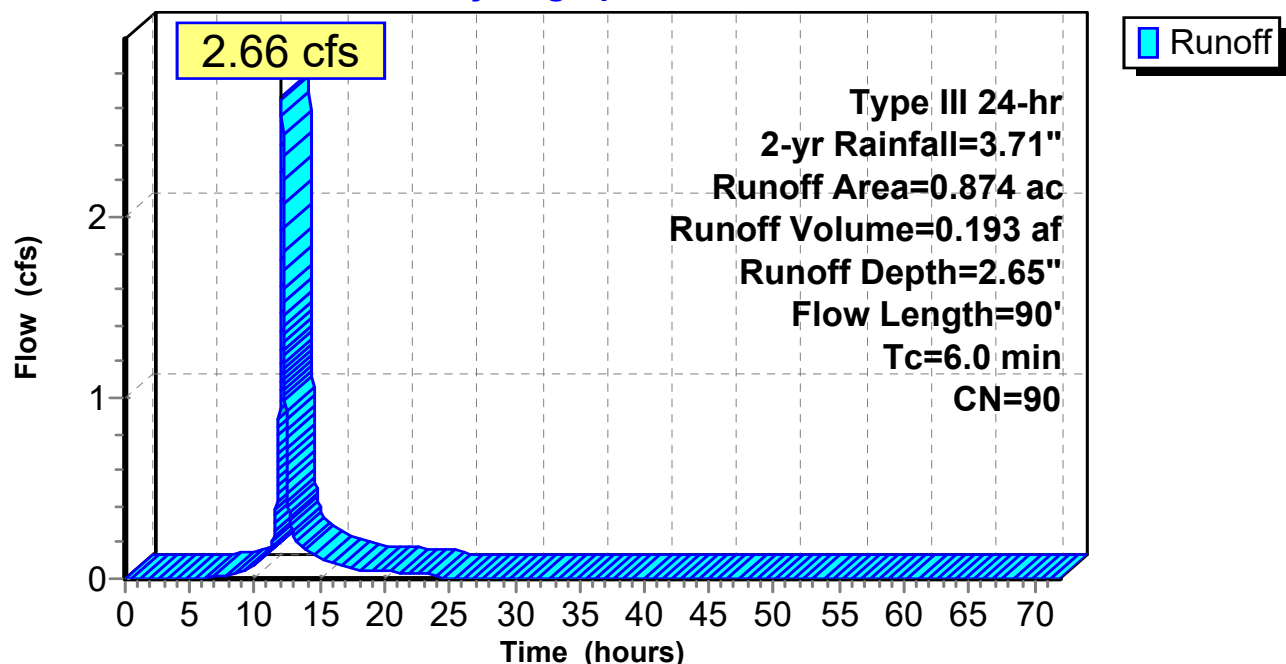
Summary for Subcatchment E1: EX. ACCESS DR E

Runoff = 2.66 cfs @ 12.09 hrs, Volume= 0.193 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 0.389	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.050	70	Woods, Good, HSG C
0.035	78	Meadow, non-grazed, HSG D
0.121	77	Woods, Good, HSG D
* 0.194	96	Gravel surface, 100% imp, HSG C
0.042	98	Paved parking, HSG C
0.043	71	Meadow, non-grazed, HSG C
0.874	90	Weighted Average
0.249		28.49% Pervious Area
0.625		71.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0305	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.4	40	0.0609	1.73		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.8	90	Total, Increased to minimum Tc = 6.0 min			

Subcatchment E1: EX. ACCESS DR E**Hydrograph**

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment E1: EX. ACCESS DR E

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	2.65	0.00
1.00	0.04	0.00	0.00	54.00	3.71	2.65	0.00
2.00	0.07	0.00	0.00	55.00	3.71	2.65	0.00
3.00	0.11	0.00	0.00	56.00	3.71	2.65	0.00
4.00	0.16	0.00	0.00	57.00	3.71	2.65	0.00
5.00	0.21	0.00	0.00	58.00	3.71	2.65	0.00
6.00	0.27	0.00	0.00	59.00	3.71	2.65	0.00
7.00	0.34	0.01	0.01	60.00	3.71	2.65	0.00
8.00	0.42	0.03	0.02	61.00	3.71	2.65	0.00
9.00	0.54	0.07	0.05	62.00	3.71	2.65	0.00
10.00	0.70	0.14	0.08	63.00	3.71	2.65	0.00
11.00	0.93	0.27	0.14	64.00	3.71	2.65	0.00
12.00	1.85	0.97	1.61	65.00	3.71	2.65	0.00
13.00	2.78	1.79	0.24	66.00	3.71	2.65	0.00
14.00	3.01	1.99	0.15	67.00	3.71	2.65	0.00
15.00	3.17	2.14	0.12	68.00	3.71	2.65	0.00
16.00	3.29	2.25	0.08	69.00	3.71	2.65	0.00
17.00	3.37	2.33	0.07	70.00	3.71	2.65	0.00
18.00	3.44	2.39	0.05	71.00	3.71	2.65	0.00
19.00	3.50	2.45	0.04	72.00	3.71	2.65	0.00
20.00	3.55	2.50	0.04				
21.00	3.60	2.54	0.04				
22.00	3.64	2.58	0.03				
23.00	3.68	2.61	0.03				
24.00	3.71	2.65	0.03				
25.00	3.71	2.65	0.00				
26.00	3.71	2.65	0.00				
27.00	3.71	2.65	0.00				
28.00	3.71	2.65	0.00				
29.00	3.71	2.65	0.00				
30.00	3.71	2.65	0.00				
31.00	3.71	2.65	0.00				
32.00	3.71	2.65	0.00				
33.00	3.71	2.65	0.00				
34.00	3.71	2.65	0.00				
35.00	3.71	2.65	0.00				
36.00	3.71	2.65	0.00				
37.00	3.71	2.65	0.00				
38.00	3.71	2.65	0.00				
39.00	3.71	2.65	0.00				
40.00	3.71	2.65	0.00				
41.00	3.71	2.65	0.00				
42.00	3.71	2.65	0.00				
43.00	3.71	2.65	0.00				
44.00	3.71	2.65	0.00				
45.00	3.71	2.65	0.00				
46.00	3.71	2.65	0.00				
47.00	3.71	2.65	0.00				
48.00	3.71	2.65	0.00				
49.00	3.71	2.65	0.00				
50.00	3.71	2.65	0.00				
51.00	3.71	2.65	0.00				
52.00	3.71	2.65	0.00				

1119-Pre-Development-Fields

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

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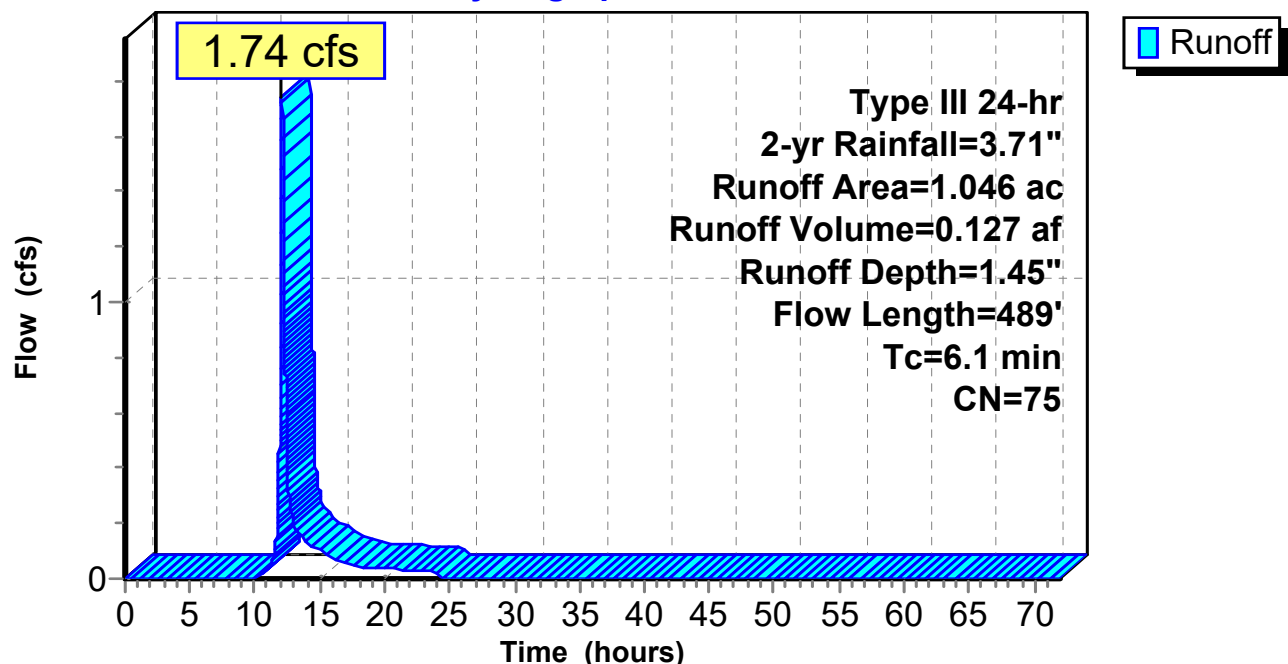
Summary for Subcatchment F1: Direct Runoff

Runoff = 1.74 cfs @ 12.09 hrs, Volume= 0.127 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.723	71	Meadow, non-grazed, HSG C
0.132	70	Woods, Good, HSG C
* 0.191	96	Gravel surface, 100% imp, HSG C
1.046	75	Weighted Average
0.855		81.74% Pervious Area
0.191		18.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.2607	0.17		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.9	122	0.0514	2.27		Shallow Concentrated Flow, Riprap swale Kv= 10.0 fps
2.8	259	0.0243	1.56		Shallow Concentrated Flow, Riprap swale Kv= 10.0 fps
0.4	88	0.0480	3.29		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
6.1	489	Total			

Subcatchment F1: Direct Runoff**Hydrograph**

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment F1: Direct Runoff

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.45	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.45	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.45	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.45	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.45	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.45	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.45	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.45	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.45	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.45	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.45	0.00
11.00	0.93	0.02	0.04	64.00	3.71	1.45	0.00
12.00	1.85	0.31	0.92	65.00	3.71	1.45	0.00
13.00	2.78	0.82	0.20	66.00	3.71	1.45	0.00
14.00	3.01	0.97	0.13	67.00	3.71	1.45	0.00
15.00	3.17	1.07	0.10	68.00	3.71	1.45	0.00
16.00	3.29	1.15	0.07	69.00	3.71	1.45	0.00
17.00	3.37	1.21	0.06	70.00	3.71	1.45	0.00
18.00	3.44	1.26	0.05	71.00	3.71	1.45	0.00
19.00	3.50	1.30	0.04	72.00	3.71	1.45	0.00
20.00	3.55	1.34	0.04				
21.00	3.60	1.37	0.03				
22.00	3.64	1.40	0.03				
23.00	3.68	1.43	0.03				
24.00	3.71	1.45	0.02				
25.00	3.71	1.45	0.00				
26.00	3.71	1.45	0.00				
27.00	3.71	1.45	0.00				
28.00	3.71	1.45	0.00				
29.00	3.71	1.45	0.00				
30.00	3.71	1.45	0.00				
31.00	3.71	1.45	0.00				
32.00	3.71	1.45	0.00				
33.00	3.71	1.45	0.00				
34.00	3.71	1.45	0.00				
35.00	3.71	1.45	0.00				
36.00	3.71	1.45	0.00				
37.00	3.71	1.45	0.00				
38.00	3.71	1.45	0.00				
39.00	3.71	1.45	0.00				
40.00	3.71	1.45	0.00				
41.00	3.71	1.45	0.00				
42.00	3.71	1.45	0.00				
43.00	3.71	1.45	0.00				
44.00	3.71	1.45	0.00				
45.00	3.71	1.45	0.00				
46.00	3.71	1.45	0.00				
47.00	3.71	1.45	0.00				
48.00	3.71	1.45	0.00				
49.00	3.71	1.45	0.00				
50.00	3.71	1.45	0.00				
51.00	3.71	1.45	0.00				
52.00	3.71	1.45	0.00				

1119-Pre-Development-Fields

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

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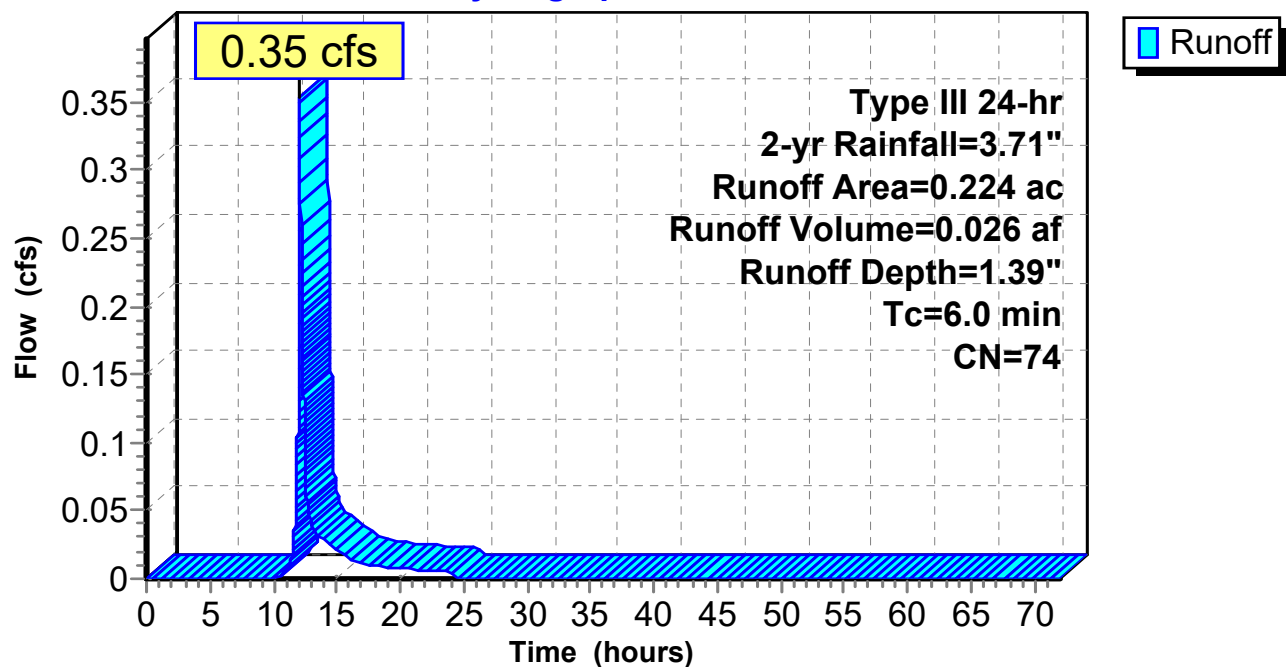
Summary for Subcatchment G1: Graded Road Runoff

Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.026 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 0.021	96	Gravel surface, 100%, imp, HSG C
0.010	78	Meadow, non-grazed, HSG D
0.179	71	Meadow, non-grazed, HSG C
0.014	70	Woods, Good, HSG C
0.224	74	Weighted Average
0.224		100.00% Pervious Area

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

Subcatchment G1: Graded Road Runoff**Hydrograph**

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G1: Graded Road Runoff

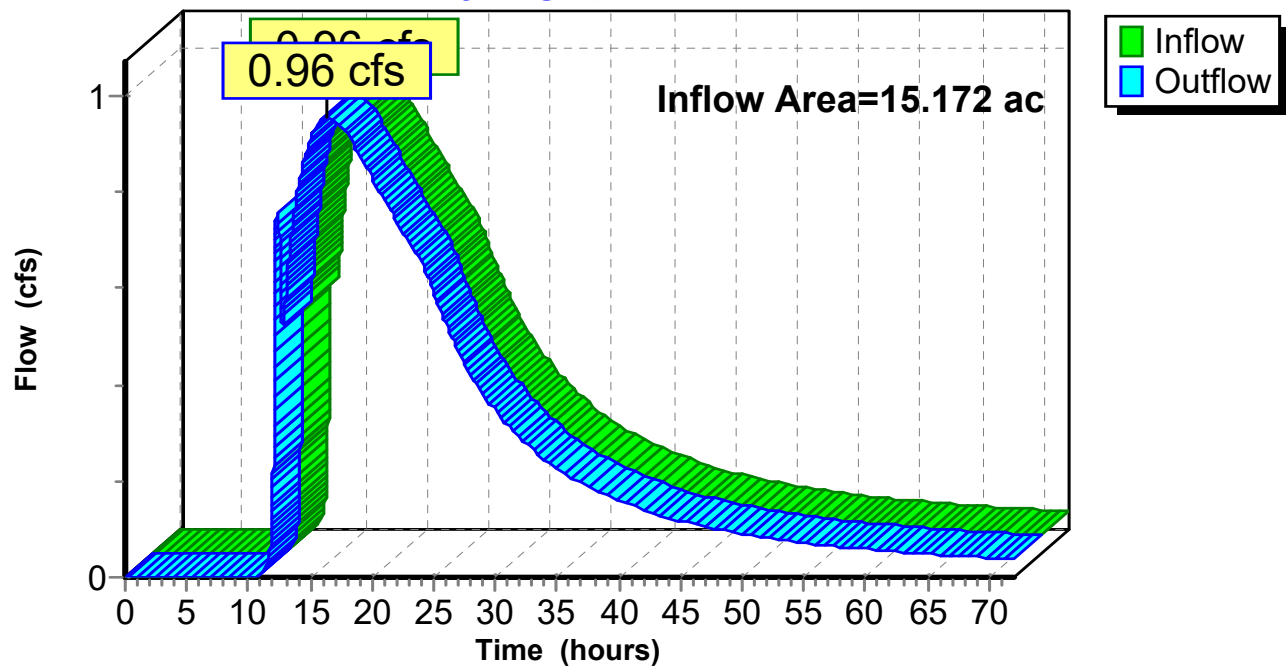
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	1.39	0.00
1.00	0.04	0.00	0.00	54.00	3.71	1.39	0.00
2.00	0.07	0.00	0.00	55.00	3.71	1.39	0.00
3.00	0.11	0.00	0.00	56.00	3.71	1.39	0.00
4.00	0.16	0.00	0.00	57.00	3.71	1.39	0.00
5.00	0.21	0.00	0.00	58.00	3.71	1.39	0.00
6.00	0.27	0.00	0.00	59.00	3.71	1.39	0.00
7.00	0.34	0.00	0.00	60.00	3.71	1.39	0.00
8.00	0.42	0.00	0.00	61.00	3.71	1.39	0.00
9.00	0.54	0.00	0.00	62.00	3.71	1.39	0.00
10.00	0.70	0.00	0.00	63.00	3.71	1.39	0.00
11.00	0.93	0.01	0.01	64.00	3.71	1.39	0.00
12.00	1.85	0.28	0.19	65.00	3.71	1.39	0.00
13.00	2.78	0.77	0.04	66.00	3.71	1.39	0.00
14.00	3.01	0.91	0.03	67.00	3.71	1.39	0.00
15.00	3.17	1.02	0.02	68.00	3.71	1.39	0.00
16.00	3.29	1.10	0.02	69.00	3.71	1.39	0.00
17.00	3.37	1.15	0.01	70.00	3.71	1.39	0.00
18.00	3.44	1.20	0.01	71.00	3.71	1.39	0.00
19.00	3.50	1.24	0.01	72.00	3.71	1.39	0.00
20.00	3.55	1.27	0.01				
21.00	3.60	1.31	0.01				
22.00	3.64	1.34	0.01				
23.00	3.68	1.36	0.01				
24.00	3.71	1.39	0.01				
25.00	3.71	1.39	0.00				
26.00	3.71	1.39	0.00				
27.00	3.71	1.39	0.00				
28.00	3.71	1.39	0.00				
29.00	3.71	1.39	0.00				
30.00	3.71	1.39	0.00				
31.00	3.71	1.39	0.00				
32.00	3.71	1.39	0.00				
33.00	3.71	1.39	0.00				
34.00	3.71	1.39	0.00				
35.00	3.71	1.39	0.00				
36.00	3.71	1.39	0.00				
37.00	3.71	1.39	0.00				
38.00	3.71	1.39	0.00				
39.00	3.71	1.39	0.00				
40.00	3.71	1.39	0.00				
41.00	3.71	1.39	0.00				
42.00	3.71	1.39	0.00				
43.00	3.71	1.39	0.00				
44.00	3.71	1.39	0.00				
45.00	3.71	1.39	0.00				
46.00	3.71	1.39	0.00				
47.00	3.71	1.39	0.00				
48.00	3.71	1.39	0.00				
49.00	3.71	1.39	0.00				
50.00	3.71	1.39	0.00				
51.00	3.71	1.39	0.00				
52.00	3.71	1.39	0.00				

Summary for Reach 15R: U.S. Pike Site Culvert

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

Inflow Area = 15.172 ac, 4.81% Impervious, Inflow Depth > 1.14" for 2-yr event
Inflow = 0.96 cfs @ 16.32 hrs, Volume= 1.446 af
Outflow = 0.96 cfs @ 16.32 hrs, Volume= 1.446 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Reach 15R: U.S. Pike Site Culvert**Hydrograph**

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 15R: U.S. Pike Site Culvert

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.08		0.08
1.00	0.00		0.00	54.00	0.07		0.07
2.00	0.00		0.00	55.00	0.07		0.07
3.00	0.00		0.00	56.00	0.07		0.07
4.00	0.00		0.00	57.00	0.07		0.07
5.00	0.00		0.00	58.00	0.06		0.06
6.00	0.00		0.00	59.00	0.06		0.06
7.00	0.00		0.00	60.00	0.06		0.06
8.00	0.00		0.00	61.00	0.06		0.06
9.00	0.00		0.00	62.00	0.05		0.05
10.00	0.00		0.00	63.00	0.05		0.05
11.00	0.01		0.01	64.00	0.05		0.05
12.00	0.22		0.22	65.00	0.05		0.05
13.00	0.58		0.58	66.00	0.05		0.05
14.00	0.80		0.80	67.00	0.05		0.05
15.00	0.91		0.91	68.00	0.04		0.04
16.00	0.96		0.96	69.00	0.04		0.04
17.00	0.95		0.95	70.00	0.04		0.04
18.00	0.92		0.92	71.00	0.04		0.04
19.00	0.88		0.88	72.00	0.04		0.04
20.00	0.83		0.83				
21.00	0.78		0.78				
22.00	0.74		0.74				
23.00	0.70		0.70				
24.00	0.66		0.66				
25.00	0.59		0.59				
26.00	0.52		0.52				
27.00	0.47		0.47				
28.00	0.42		0.42				
29.00	0.38		0.38				
30.00	0.35		0.35				
31.00	0.31		0.31				
32.00	0.29		0.29				
33.00	0.27		0.27				
34.00	0.25		0.25				
35.00	0.23		0.23				
36.00	0.21		0.21				
37.00	0.20		0.20				
38.00	0.18		0.18				
39.00	0.17		0.17				
40.00	0.16		0.16				
41.00	0.15		0.15				
42.00	0.14		0.14				
43.00	0.13		0.13				
44.00	0.12		0.12				
45.00	0.12		0.12				
46.00	0.11		0.11				
47.00	0.11		0.11				
48.00	0.10		0.10				
49.00	0.10		0.10				
50.00	0.09		0.09				
51.00	0.09		0.09				
52.00	0.08		0.08				

1119-Pre-Development-Fields

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

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Summary for Reach SP-1: OFFSITE PIKE PROP

[80] Warning: Exceeded Pond 1P by 0.19' @ 12.17 hrs (1.35 cfs 0.079 af)

Inflow Area = 15.172 ac, 4.81% Impervious, Inflow Depth > 1.15" for 2-yr event
Inflow = 1.74 cfs @ 12.09 hrs, Volume= 1.450 af
Outflow = 0.96 cfs @ 16.32 hrs, Volume= 1.446 af, Atten= 45%, Lag= 253.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Max. Velocity= 0.30 fps, Min. Travel Time= 27.0 min

Avg. Velocity= 0.19 fps, Avg. Travel Time= 44.1 min

Peak Storage= 1,551 cf @ 16.32 hrs

Average Depth at Peak Storage= 0.30'

Bank-Full Depth= 3.00' Flow Area= 100.0 sf, Capacity= 139.53 cfs

50.00' x 3.00' deep Parabolic Channel, n= 0.120

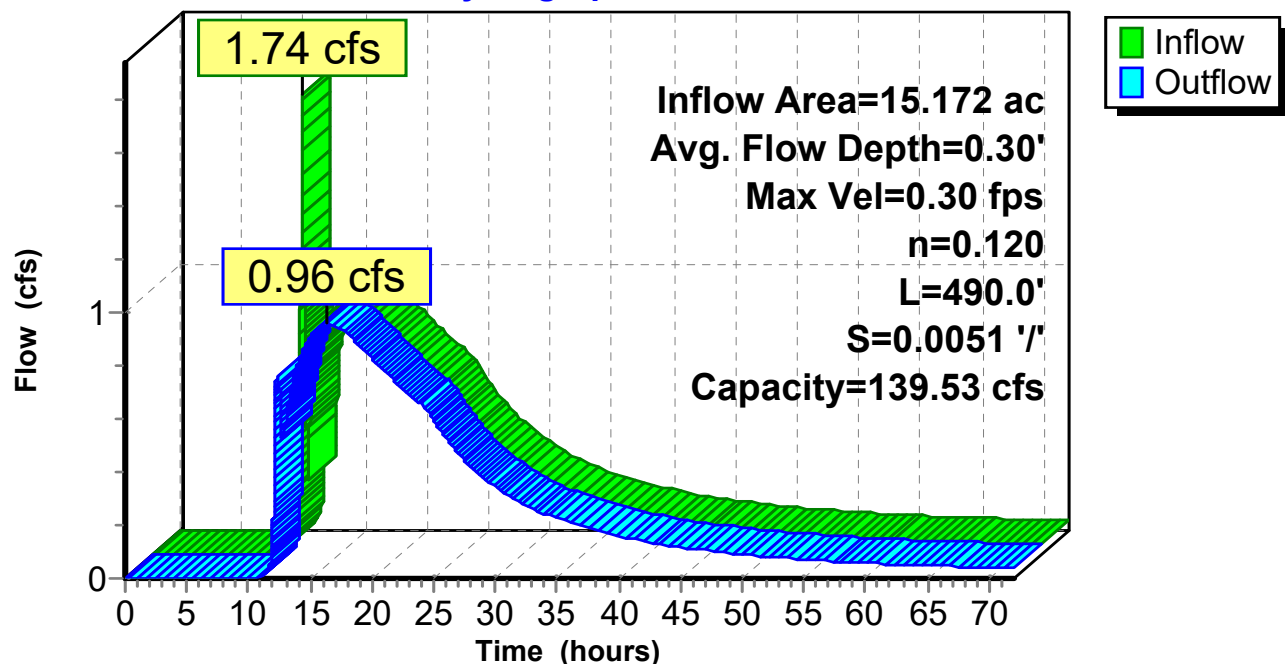
Length= 490.0' Slope= 0.0051 '/'

Inlet Invert= 24.00', Outlet Invert= 21.50'



Reach SP-1: OFFSITE PIKE PROP

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-1: OFFSITE PIKE PROP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	24.00	0.00
2.00	0.00	0	24.00	0.00
4.00	0.00	0	24.00	0.00
6.00	0.00	0	24.00	0.00
8.00	0.00	0	24.00	0.00
10.00	0.00	0	24.00	0.00
12.00	0.92	554	24.15	0.22
14.00	0.85	1,373	24.28	0.80
16.00	0.96	1,548	24.30	0.96
18.00	0.91	1,507	24.29	0.92
20.00	0.81	1,403	24.28	0.83
22.00	0.73	1,297	24.27	0.74
24.00	0.64	1,195	24.25	0.66
26.00	0.50	1,021	24.23	0.52
28.00	0.40	878	24.21	0.42
30.00	0.33	765	24.19	0.35
32.00	0.28	675	24.17	0.29
34.00	0.24	602	24.16	0.25
36.00	0.20	540	24.15	0.21
38.00	0.18	490	24.14	0.18
40.00	0.15	446	24.13	0.16
42.00	0.13	408	24.12	0.14
44.00	0.12	376	24.12	0.12
46.00	0.11	348	24.11	0.11
48.00	0.10	323	24.10	0.10
50.00	0.09	301	24.10	0.09
52.00	0.08	281	24.10	0.08
54.00	0.07	263	24.09	0.07
56.00	0.07	247	24.09	0.07
58.00	0.06	233	24.08	0.06
60.00	0.06	221	24.08	0.06
62.00	0.05	209	24.08	0.05
64.00	0.05	199	24.08	0.05
66.00	0.05	189	24.07	0.05
68.00	0.04	179	24.07	0.04
70.00	0.04	171	24.07	0.04
72.00	0.04	163	24.07	0.04

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Stage-Area-Storage for Reach SP-1: OFFSITE PIKE PROP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
24.00	0.0	0	26.65	83.0	40,681
24.05	0.2	109	26.70	85.4	41,837
24.10	0.6	300	26.75	87.8	43,005
24.15	1.1	548	26.80	90.2	44,183
24.20	1.7	845	26.85	92.6	45,371
24.25	2.4	1,180	26.90	95.0	46,571
24.30	3.2	1,550	26.95	97.5	47,781
24.35	4.0	1,954	27.00	100.0	49,000
24.40	4.9	2,387			
24.45	5.8	2,847			
24.50	6.8	3,335			
24.55	7.9	3,847			
24.60	8.9	4,383			
24.65	10.1	4,943			
24.70	11.3	5,524			
24.75	12.5	6,125			
24.80	13.8	6,748			
24.85	15.1	7,391			
24.90	16.4	8,052			
24.95	17.8	8,732			
25.00	19.2	9,431			
25.05	20.7	10,146			
25.10	22.2	10,880			
25.15	23.7	11,630			
25.20	25.3	12,396			
25.25	26.9	13,180			
25.30	28.5	13,978			
25.35	30.2	14,792			
25.40	31.9	15,622			
25.45	33.6	16,466			
25.50	35.4	17,324			
25.55	37.1	18,198			
25.60	39.0	19,086			
25.65	40.8	19,987			
25.70	42.7	20,903			
25.75	44.6	21,831			
25.80	46.5	22,773			
25.85	48.4	23,729			
25.90	50.4	24,698			
25.95	52.4	25,678			
26.00	54.4	26,673			
26.05	56.5	27,679			
26.10	58.6	28,697			
26.15	60.7	29,729			
26.20	62.8	30,772			
26.25	65.0	31,826			
26.30	67.1	32,894			
26.35	69.3	33,972			
26.40	71.6	35,062			
26.45	73.8	36,163			
26.50	76.1	37,276			
26.55	78.4	38,399			
26.60	80.7	39,535			

Summary for Reach SP-2: OFFSITE TO 266-1

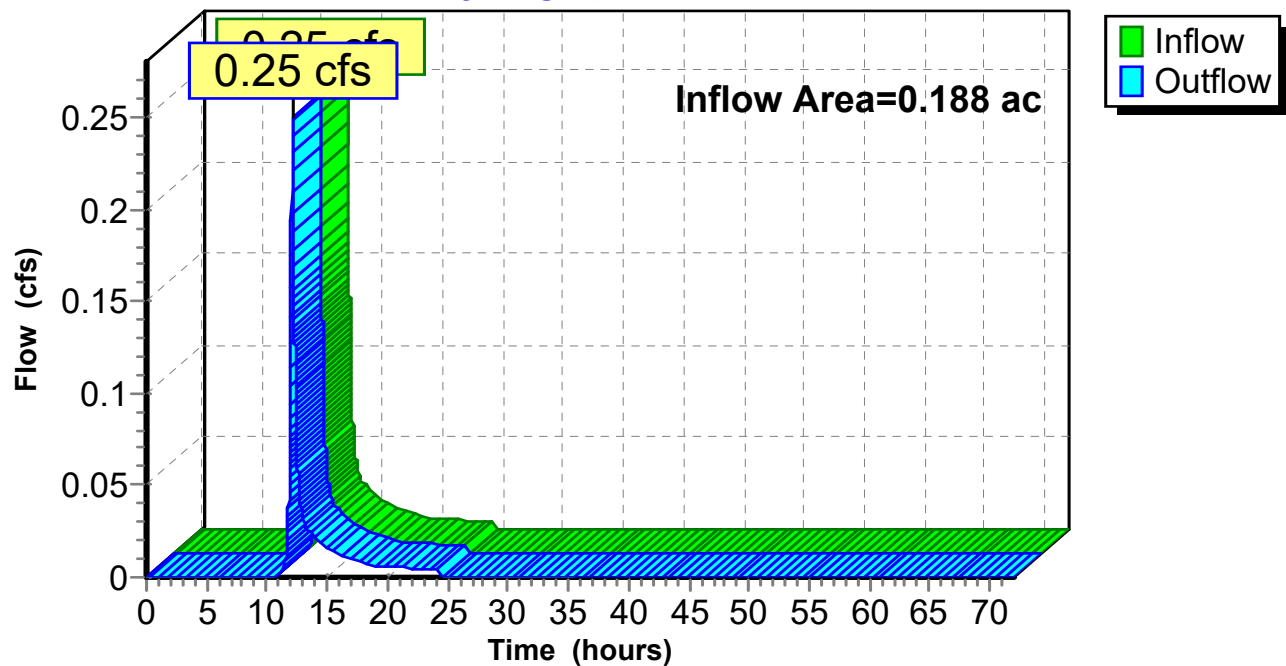
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.188 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-yr event
 Inflow = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af
 Outflow = 0.25 cfs @ 12.10 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Reach SP-2: OFFSITE TO 266-1

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-2: OFFSITE TO 266-1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.00		0.00	58.00	0.00		0.00
6.00	0.00		0.00	59.00	0.00		0.00
7.00	0.00		0.00	60.00	0.00		0.00
8.00	0.00		0.00	61.00	0.00		0.00
9.00	0.00		0.00	62.00	0.00		0.00
10.00	0.00		0.00	63.00	0.00		0.00
11.00	0.00		0.00	64.00	0.00		0.00
12.00	0.13		0.13	65.00	0.00		0.00
13.00	0.03		0.03	66.00	0.00		0.00
14.00	0.02		0.02	67.00	0.00		0.00
15.00	0.02		0.02	68.00	0.00		0.00
16.00	0.01		0.01	69.00	0.00		0.00
17.00	0.01		0.01	70.00	0.00		0.00
18.00	0.01		0.01	71.00	0.00		0.00
19.00	0.01		0.01	72.00	0.00		0.00
20.00	0.01		0.01				
21.00	0.01		0.01				
22.00	0.00		0.00				
23.00	0.00		0.00				
24.00	0.00		0.00				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

Summary for Reach SP-3: SW WETLANDS

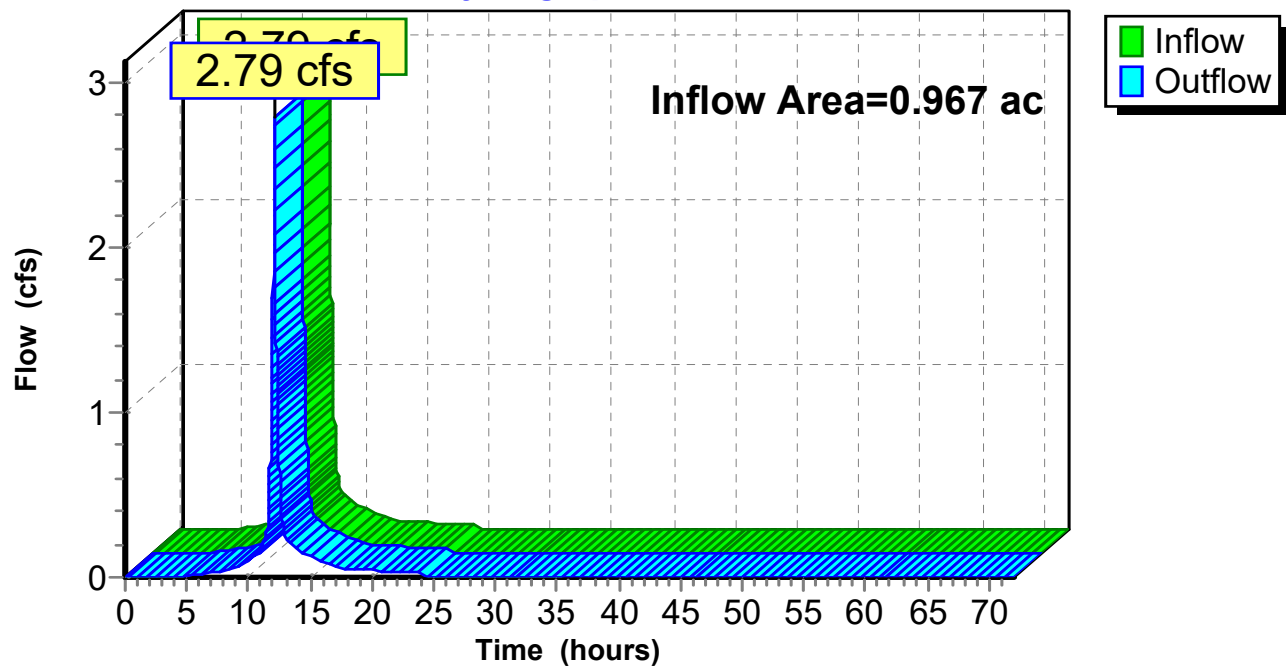
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.967 ac, 70.22% Impervious, Inflow Depth = 2.66" for 2-yr event
 Inflow = 2.79 cfs @ 12.09 hrs, Volume= 0.214 af
 Outflow = 2.79 cfs @ 12.09 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Reach SP-3: SW WETLANDS

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-3: SW WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.01		0.01	58.00	0.00		0.00
6.00	0.01		0.01	59.00	0.00		0.00
7.00	0.03		0.03	60.00	0.00		0.00
8.00	0.04		0.04	61.00	0.00		0.00
9.00	0.07		0.07	62.00	0.00		0.00
10.00	0.10		0.10	63.00	0.00		0.00
11.00	0.16		0.16	64.00	0.00		0.00
12.00	1.70		1.70	65.00	0.00		0.00
13.00	0.26		0.26	66.00	0.00		0.00
14.00	0.16		0.16	67.00	0.00		0.00
15.00	0.12		0.12	68.00	0.00		0.00
16.00	0.09		0.09	69.00	0.00		0.00
17.00	0.07		0.07	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.05		0.05	72.00	0.00		0.00
20.00	0.04		0.04				
21.00	0.04		0.04				
22.00	0.04		0.04				
23.00	0.03		0.03				
24.00	0.03		0.03				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

Summary for Reach SP-4: SE WETLANDS

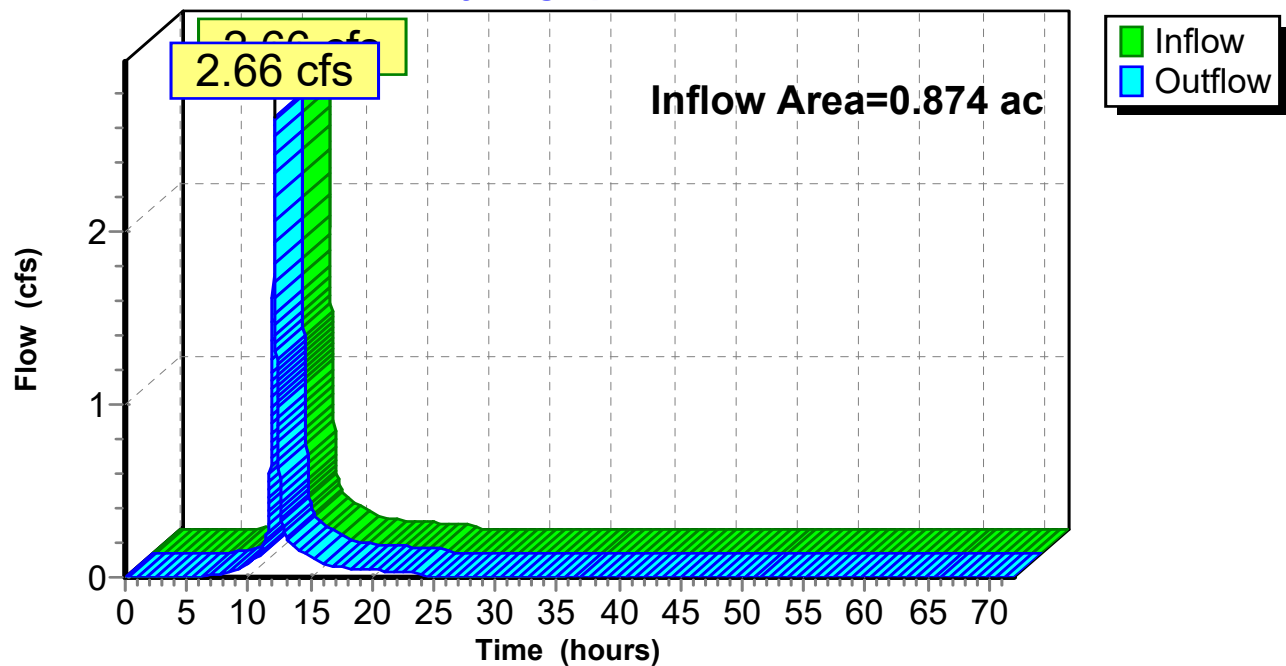
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.874 ac, 71.51% Impervious, Inflow Depth = 2.65" for 2-yr event
 Inflow = 2.66 cfs @ 12.09 hrs, Volume= 0.193 af
 Outflow = 2.66 cfs @ 12.09 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Reach SP-4: SE WETLANDS

Hydrograph



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Hydrograph for Reach SP-4: SE WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.00		0.00	58.00	0.00		0.00
6.00	0.00		0.00	59.00	0.00		0.00
7.00	0.01		0.01	60.00	0.00		0.00
8.00	0.02		0.02	61.00	0.00		0.00
9.00	0.05		0.05	62.00	0.00		0.00
10.00	0.08		0.08	63.00	0.00		0.00
11.00	0.14		0.14	64.00	0.00		0.00
12.00	1.61		1.61	65.00	0.00		0.00
13.00	0.24		0.24	66.00	0.00		0.00
14.00	0.15		0.15	67.00	0.00		0.00
15.00	0.12		0.12	68.00	0.00		0.00
16.00	0.08		0.08	69.00	0.00		0.00
17.00	0.07		0.07	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.04		0.04	72.00	0.00		0.00
20.00	0.04		0.04				
21.00	0.04		0.04				
22.00	0.03		0.03				
23.00	0.03		0.03				
24.00	0.03		0.03				
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

1119-Pre-Development-Fields

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

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Summary for Pond 1P: EX. POND-2

[80] Warning: Exceeded Pond 9P by 1.01' @ 24.77 hrs (2.85 cfs 0.998 af)

Inflow Area = 14.126 ac, 3.82% Impervious, Inflow Depth = 1.28" for 2-yr event
 Inflow = 13.21 cfs @ 12.31 hrs, Volume= 1.512 af
 Outflow = 0.89 cfs @ 16.33 hrs, Volume= 1.323 af, Atten= 93%, Lag= 240.9 min
 Primary = 0.89 cfs @ 16.33 hrs, Volume= 1.323 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Starting Elev= 24.00' Surf.Area= 120,600 sf Storage= 447,701 cf

Peak Elev= 24.34' @ 16.32 hrs Surf.Area= 124,668 sf Storage= 489,621 cf (41,920 cf above start)

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

Center-of-Mass det. time= 755.9 min (1,627.7 - 871.8)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	819,738 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
#2	22.33'	213,963 cf	Upper Pond (Prismatic) Listed below (Recalc)
		1,033,701 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	0	0	0
22.34	81,800	259,306	259,306
22.50	83,600	13,232	272,538
23.00	88,000	42,900	315,438
24.00	89,800	88,900	404,338
25.00	96,800	93,300	497,638
26.00	103,800	100,300	597,938
27.00	110,900	107,350	705,288
28.00	118,000	114,450	819,738

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.33	0	0	0
22.34	20,500	103	103
22.50	21,500	3,360	3,463
23.00	25,500	11,750	15,213
24.00	30,800	28,150	43,363
25.00	35,700	33,250	76,613
26.00	41,000	38,350	114,963
27.00	48,500	44,750	159,713
28.00	60,000	54,250	213,963

Device	Routing	Invert	Outlet Devices
#1	Primary	23.92'	53.0" W x 41.0" H, R=28.1"/73.4" Pipe Arch CMP_Arch_1 53x41 w/ 19.0" ins L= 61.3' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.34' / 21.91' S= 0.0070 ' / ' Cc= 0.900 n= 0.022, Flow Area= 6.21 sf
#2	Secondary	27.39'	Asymmetrical Weir, C= 2.63

1119-Pre-Development-Fields

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Offset (feet) 0.00 52.00 83.00 94.00 124.00

Elev. (feet) 28.00 27.50 27.39 27.50 28.00

Primary OutFlow Max=0.89 cfs @ 16.33 hrs HW=24.34' TW=24.30' (Dynamic Tailwater)

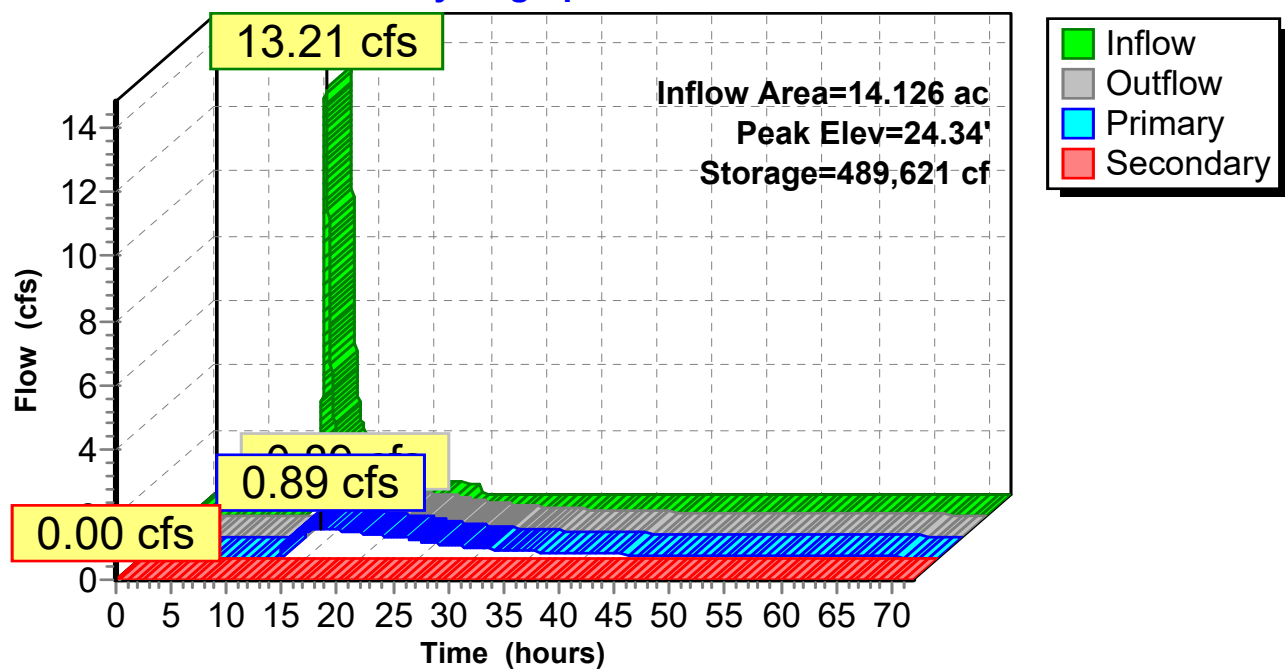
↑1=CMP_Arch_1 53x41 (Outlet Controls 0.89 cfs @ 0.65 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=24.00' TW=24.00' (Dynamic Tailwater)

↑2=Asymmetrical Weir (Controls 0.00 cfs)

Pond 1P: EX. POND-2

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 1P: EX. POND-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	447,701	24.00	0.00	0.00	0.00
2.00	0.00	447,701	24.00	0.00	0.00	0.00
4.00	0.00	447,701	24.00	0.00	0.00	0.00
6.00	0.00	447,701	24.00	0.00	0.00	0.00
8.00	0.00	447,701	24.00	0.00	0.00	0.00
10.00	0.00	447,701	24.00	0.00	0.00	0.00
12.00	3.72	450,949	24.03	0.00	0.00	0.00
14.00	1.79	485,763	24.31	0.72	0.72	0.00
16.00	1.00	489,562	24.34	0.89	0.89	0.00
18.00	0.61	488,803	24.34	0.86	0.86	0.00
20.00	0.48	486,681	24.32	0.78	0.78	0.00
22.00	0.40	484,501	24.30	0.70	0.70	0.00
24.00	0.32	482,341	24.28	0.62	0.62	0.00
26.00	0.00	478,639	24.25	0.50	0.50	0.00
28.00	0.00	475,397	24.23	0.40	0.40	0.00
30.00	0.00	472,755	24.21	0.33	0.33	0.00
32.00	0.00	470,571	24.19	0.28	0.28	0.00
34.00	0.00	468,725	24.17	0.24	0.24	0.00
36.00	0.00	467,157	24.16	0.20	0.20	0.00
38.00	0.00	465,801	24.15	0.18	0.18	0.00
40.00	0.00	464,615	24.14	0.15	0.15	0.00
42.00	0.00	463,578	24.13	0.13	0.13	0.00
44.00	0.00	462,665	24.12	0.12	0.12	0.00
46.00	0.00	461,845	24.12	0.11	0.11	0.00
48.00	0.00	461,106	24.11	0.10	0.10	0.00
50.00	0.00	460,439	24.11	0.09	0.09	0.00
52.00	0.00	459,838	24.10	0.08	0.08	0.00
54.00	0.00	459,295	24.10	0.07	0.07	0.00
56.00	0.00	458,803	24.09	0.07	0.07	0.00
58.00	0.00	458,346	24.09	0.06	0.06	0.00
60.00	0.00	457,922	24.08	0.06	0.06	0.00
62.00	0.00	457,527	24.08	0.05	0.05	0.00
64.00	0.00	457,161	24.08	0.05	0.05	0.00
66.00	0.00	456,820	24.08	0.05	0.05	0.00
68.00	0.00	456,503	24.07	0.04	0.04	0.00
70.00	0.00	456,208	24.07	0.04	0.04	0.00
72.00	0.00	455,934	24.07	0.04	0.04	0.00

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Stage-Area-Storage for Pond 1P: EX. POND-2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
16.00	0	23.95	441,679
16.15	145	24.10	459,820
16.30	581	24.25	478,222
16.45	1,306	24.40	496,892
16.60	2,322	24.55	515,830
16.75	3,629	24.70	535,036
16.90	5,225	24.85	554,509
17.05	7,112	25.00	574,251
17.20	9,290	25.15	594,264
17.35	11,757	25.30	614,554
17.50	14,515	25.45	635,121
17.65	17,563	25.60	655,965
17.80	20,902	25.75	677,085
17.95	24,530	25.90	698,482
18.10	28,449	26.05	720,159
18.25	32,659	26.20	742,152
18.40	37,158	26.35	764,475
18.55	41,948	26.50	787,126
18.70	47,029	26.65	810,105
18.85	52,399	26.80	833,413
19.00	58,060	26.95	857,049
19.15	64,011	27.10	881,033
19.30	70,253	27.25	905,432
19.45	76,784	27.40	930,248
19.60	83,606	27.55	955,484
19.75	90,719	27.70	981,137
19.90	98,121	27.85	1,007,210
20.05	105,814	28.00	1,033,701
20.20	113,797		
20.35	122,071		
20.50	130,635		
20.65	139,489		
20.80	148,633		
20.95	158,068		
21.10	167,793		
21.25	177,809		
21.40	188,114		
21.55	198,710		
21.70	209,596		
21.85	220,773		
22.00	232,240		
22.15	243,997		
22.30	256,044		
22.45	270,767		
22.60	286,595		
22.75	302,801		
22.90	319,384		
23.05	336,334		
23.20	353,492		
23.35	370,810		
23.50	388,288		
23.65	405,925		
23.80	423,723		

1119-Pre-Development-Fields

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Summary for Pond 9P: ECB-C

[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 9.424 ac, 5.59% Impervious, Inflow Depth = 1.32" for 2-yr event
Inflow = 9.03 cfs @ 12.32 hrs, Volume= 1.039 af
Outflow = 9.03 cfs @ 12.32 hrs, Volume= 1.039 af, Atten= 0%, Lag= 0.0 min
Primary = 9.03 cfs @ 12.32 hrs, Volume= 1.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 4

Peak Elev= 25.19' @ 12.32 hrs

Flood Elev= 27.22'

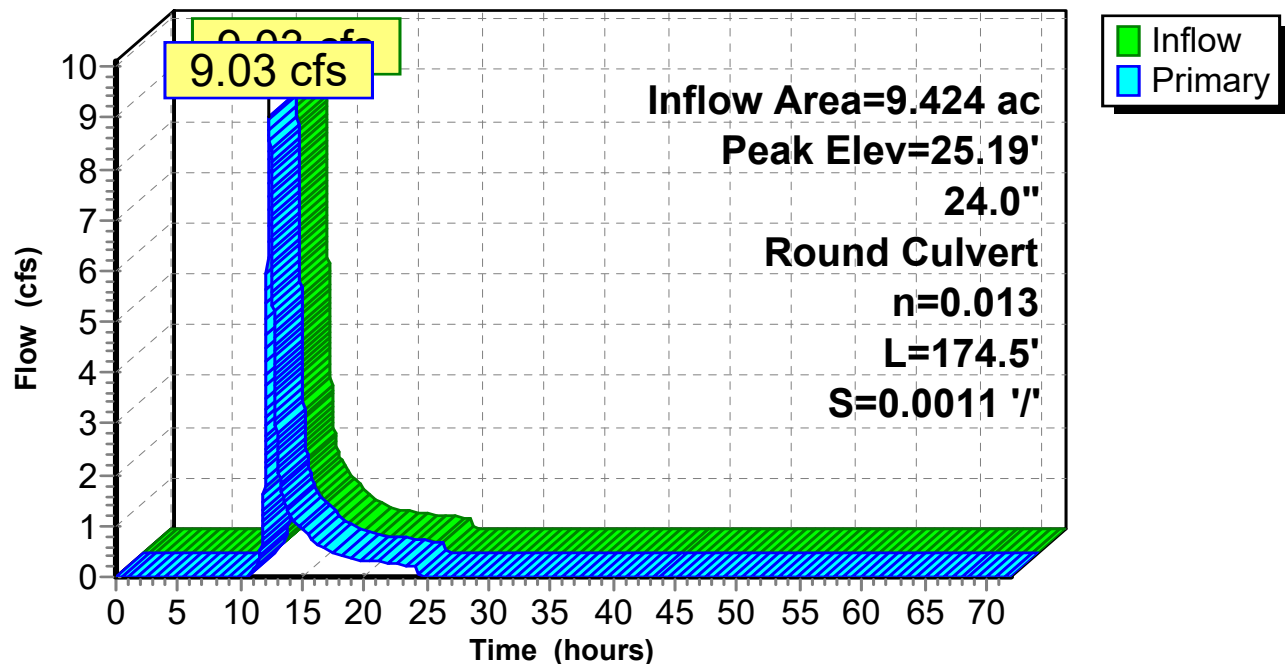
Device	Routing	Invert	Outlet Devices
#1	Primary	23.26'	24.0" Round 24" HDPE L= 174.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 23.26' / 23.06' S= 0.0011 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=9.03 cfs @ 12.32 hrs HW=25.19' TW=24.11' (Dynamic Tailwater)

1=24" HDPE (Barrel Controls 9.03 cfs @ 3.70 fps)

Pond 9P: ECB-C

Hydrograph



1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 9P: ECB-C

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	23.28	0.00	53.00	0.00	24.09	0.00
1.00	0.00	24.00	0.00	54.00	0.00	24.09	0.00
2.00	0.00	24.00	0.00	55.00	0.00	24.09	0.00
3.00	0.00	24.00	0.00	56.00	0.00	24.09	0.00
4.00	0.00	24.00	0.00	57.00	0.00	24.08	0.00
5.00	0.00	24.00	0.00	58.00	0.00	24.08	0.00
6.00	0.00	24.00	0.00	59.00	0.00	24.08	0.00
7.00	0.00	24.00	0.00	60.00	0.00	24.08	0.00
8.00	0.00	24.00	0.00	61.00	0.00	24.08	0.00
9.00	0.00	24.00	0.00	62.00	0.00	24.08	0.00
10.00	0.00	24.00	0.00	63.00	0.00	24.08	0.00
11.00	0.12	24.00	0.13	64.00	0.00	24.08	0.00
12.00	2.39	24.31	2.40	65.00	0.00	24.08	0.00
13.00	2.41	24.45	2.41	66.00	0.00	24.07	0.00
14.00	1.23	24.37	1.23	67.00	0.00	24.07	0.00
15.00	0.92	24.37	0.93	68.00	0.00	24.07	0.00
16.00	0.68	24.36	0.69	69.00	0.00	24.07	0.00
17.00	0.53	24.35	0.53	70.00	0.00	24.07	0.00
18.00	0.41	24.34	0.42	71.00	0.00	24.07	0.00
19.00	0.35	24.33	0.36	72.00	0.00	24.07	0.00
20.00	0.32	24.32	0.33				
21.00	0.29	24.31	0.30				
22.00	0.27	24.30	0.27				
23.00	0.24	24.30	0.25				
24.00	0.22	24.29	0.22				
25.00	0.00	24.27	0.00				
26.00	0.00	24.25	0.00				
27.00	0.00	24.23	0.00				
28.00	0.00	24.23	0.00				
29.00	0.00	24.21	0.00				
30.00	0.00	24.20	0.00				
31.00	0.00	24.19	0.00				
32.00	0.00	24.19	0.00				
33.00	0.00	24.18	0.00				
34.00	0.00	24.17	0.00				
35.00	0.00	24.16	0.00				
36.00	0.00	24.15	0.00				
37.00	0.00	24.15	0.00				
38.00	0.00	24.15	0.00				
39.00	0.00	24.14	0.00				
40.00	0.00	24.14	0.00				
41.00	0.00	24.13	0.00				
42.00	0.00	24.12	0.00				
43.00	0.00	24.12	0.00				
44.00	0.00	24.12	0.00				
45.00	0.00	24.12	0.00				
46.00	0.00	24.12	0.00				
47.00	0.00	24.11	0.00				
48.00	0.00	24.11	0.00				
49.00	0.00	24.11	0.00				
50.00	0.00	24.10	0.00				
51.00	0.00	24.10	0.00				
52.00	0.00	24.10	0.00				

1119-Pre-Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Stage-Area-Storage for Pond 9P: ECB-C

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
23.26	0	25.91	0
23.31	0	25.96	0
23.36	0	26.01	0
23.41	0	26.06	0
23.46	0	26.11	0
23.51	0	26.16	0
23.56	0	26.21	0
23.61	0	26.26	0
23.66	0	26.31	0
23.71	0	26.36	0
23.76	0	26.41	0
23.81	0	26.46	0
23.86	0	26.51	0
23.91	0	26.56	0
23.96	0	26.61	0
24.01	0	26.66	0
24.06	0	26.71	0
24.11	0	26.76	0
24.16	0	26.81	0
24.21	0	26.86	0
24.26	0	26.91	0
24.31	0	26.96	0
24.36	0	27.01	0
24.41	0	27.06	0
24.46	0	27.11	0
24.51	0	27.16	0
24.56	0	27.21	0
24.61	0		
24.66	0		
24.71	0		
24.76	0		
24.81	0		
24.86	0		
24.91	0		
24.96	0		
25.01	0		
25.06	0		
25.11	0		
25.16	0		
25.21	0		
25.26	0		
25.31	0		
25.36	0		
25.41	0		
25.46	0		
25.51	0		
25.56	0		
25.61	0		
25.66	0		
25.71	0		
25.76	0		
25.81	0		
25.86	0		

1119-Pre-Development-Fields

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 4
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment B1: Grass Field N

Runoff Area=9.424 ac 5.59% Impervious Runoff Depth=2.79"
 Flow Length=1,113' Tc=22.3 min CN=73 Runoff=19.81 cfs 2.193 af

Subcatchment B2: Grass Field E

Runoff Area=4.478 ac 0.27% Impervious Runoff Depth=2.61"
 Flow Length=481' Tc=18.8 min CN=71 Runoff=9.41 cfs 0.975 af

Subcatchment C1: Grass Field W

Runoff Area=0.188 ac 0.00% Impervious Runoff Depth=2.61"
 Flow Length=134' Tc=6.0 min CN=71 Runoff=0.57 cfs 0.041 af

Subcatchment D1: EX. ACCESS DR W

Runoff Area=0.774 ac 87.73% Impervious Runoff Depth=4.94"
 Flow Length=133' Tc=6.0 min CN=94 Runoff=4.14 cfs 0.319 af

Subcatchment D2: SW Uplands

Runoff Area=0.193 ac 0.00% Impervious Runoff Depth=2.52"
 Flow Length=162' Tc=9.7 min CN=70 Runoff=0.50 cfs 0.041 af

Subcatchment E1: EX. ACCESS DR E

Runoff Area=0.874 ac 71.51% Impervious Runoff Depth=4.50"
 Flow Length=90' Tc=6.0 min CN=90 Runoff=4.41 cfs 0.327 af

Subcatchment F1: Direct Runoff

Runoff Area=1.046 ac 18.26% Impervious Runoff Depth=2.98"
 Flow Length=489' Tc=6.1 min CN=75 Runoff=3.64 cfs 0.260 af

Subcatchment G1: Graded Road Runoff

Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=2.88"
 Tc=6.0 min CN=74 Runoff=0.76 cfs 0.054 af

Reach 15R: U.S. Pike Site Culvert

Inflow=3.23 cfs 3.273 af
 Outflow=3.23 cfs 3.273 af

Reach SP-1: OFFSITE PIKE PROP

Avg. Flow Depth=0.53' Max Vel=0.44 fps Inflow=3.64 cfs 3.277 af
 n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=3.23 cfs 3.273 af

Reach SP-2: OFFSITE TO 266-1

Inflow=0.57 cfs 0.041 af
 Outflow=0.57 cfs 0.041 af

Reach SP-3: SW WETLANDS

Inflow=4.56 cfs 0.359 af
 Outflow=4.56 cfs 0.359 af

Reach SP-4: SE WETLANDS

Inflow=4.41 cfs 0.327 af
 Outflow=4.41 cfs 0.327 af

Pond 1P: EX. POND-2

Peak Elev=24.64' Storage=527,048 cf Inflow=29.31 cfs 3.221 af
 Primary=3.02 cfs 3.017 af Secondary=0.00 cfs 0.000 af Outflow=3.02 cfs 3.017 af

Pond 9P: ECB-C

Peak Elev=27.33' Inflow=19.81 cfs 2.193 af
 24.0" Round Culvert n=0.013 L=174.5' S=0.0011 '/' Outflow=19.81 cfs 2.193 af

Total Runoff Area = 17.201 ac Runoff Volume = 4.209 af Average Runoff Depth = 2.94"
88.18% Pervious = 15.167 ac 11.82% Impervious = 2.034 ac

1119-Pre-Development-Fields*Type III 24-hr 25-yr Rainfall=7.14"*

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 4
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment B1: Grass Field N	Runoff Area=9.424 ac 5.59% Impervious Runoff Depth=4.06" Flow Length=1,113' Tc=22.3 min CN=73 Runoff=28.90 cfs 3.185 af
Subcatchment B2: Grass Field E	Runoff Area=4.478 ac 0.27% Impervious Runoff Depth=3.84" Flow Length=481' Tc=18.8 min CN=71 Runoff=13.96 cfs 1.434 af
Subcatchment C1: Grass Field W	Runoff Area=0.188 ac 0.00% Impervious Runoff Depth=3.84" Flow Length=134' Tc=6.0 min CN=71 Runoff=0.85 cfs 0.060 af
Subcatchment D1: EX. ACCESS DR W	Runoff Area=0.774 ac 87.73% Impervious Runoff Depth=6.43" Flow Length=133' Tc=6.0 min CN=94 Runoff=5.30 cfs 0.415 af
Subcatchment D2: SW Uplands	Runoff Area=0.193 ac 0.00% Impervious Runoff Depth=3.74" Flow Length=162' Tc=9.7 min CN=70 Runoff=0.74 cfs 0.060 af
Subcatchment E1: EX. ACCESS DR E	Runoff Area=0.874 ac 71.51% Impervious Runoff Depth=5.96" Flow Length=90' Tc=6.0 min CN=90 Runoff=5.75 cfs 0.434 af
Subcatchment F1: Direct Runoff	Runoff Area=1.046 ac 18.26% Impervious Runoff Depth=4.27" Flow Length=489' Tc=6.1 min CN=75 Runoff=5.22 cfs 0.372 af
Subcatchment G1: Graded Road Runoff	Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=4.16" Tc=6.0 min CN=74 Runoff=1.09 cfs 0.078 af
Reach 15R: U.S. Pike Site Culvert	Inflow=6.01 cfs 4.855 af Outflow=6.01 cfs 4.855 af
Reach SP-1: OFFSITE PIKE PROP	Avg. Flow Depth=0.70' Max Vel=0.53 fps Inflow=6.04 cfs 4.859 af n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=6.01 cfs 4.855 af
Reach SP-2: OFFSITE TO 266-1	Inflow=0.85 cfs 0.060 af Outflow=0.85 cfs 0.060 af
Reach SP-3: SW WETLANDS	Inflow=5.95 cfs 0.475 af Outflow=5.95 cfs 0.475 af
Reach SP-4: SE WETLANDS	Inflow=5.75 cfs 0.434 af Outflow=5.75 cfs 0.434 af
Pond 1P: EX. POND-2	Peak Elev=24.89' Storage=559,242 cf Inflow=42.99 cfs 4.697 af Primary=5.62 cfs 4.487 af Secondary=0.00 cfs 0.000 af Outflow=5.62 cfs 4.487 af
Pond 9P: ECB-C	Peak Elev=29.89' Inflow=28.90 cfs 3.185 af 24.0" Round Culvert n=0.013 L=174.5' S=0.0011 '/' Outflow=28.91 cfs 3.185 af

Total Runoff Area = 17.201 ac Runoff Volume = 6.038 af Average Runoff Depth = 4.21"
88.18% Pervious = 15.167 ac 11.82% Impervious = 2.034 ac

1119-Pre-Development-Fields*Type III 24-hr 50-yr Rainfall=8.56"*

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points x 4
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment B1: Grass Field N

Runoff Area=9.424 ac 5.59% Impervious Runoff Depth=5.31"
 Flow Length=1,113' Tc=22.3 min CN=73 Runoff=37.77 cfs 4.170 af

Subcatchment B2: Grass Field E

Runoff Area=4.478 ac 0.27% Impervious Runoff Depth=5.07"
 Flow Length=481' Tc=18.8 min CN=71 Runoff=18.43 cfs 1.892 af

Subcatchment C1: Grass Field W

Runoff Area=0.188 ac 0.00% Impervious Runoff Depth=5.07"
 Flow Length=134' Tc=6.0 min CN=71 Runoff=1.12 cfs 0.079 af

Subcatchment D1: EX. ACCESS DR W

Runoff Area=0.774 ac 87.73% Impervious Runoff Depth=7.84"
 Flow Length=133' Tc=6.0 min CN=94 Runoff=6.40 cfs 0.506 af

Subcatchment D2: SW Uplands

Runoff Area=0.193 ac 0.00% Impervious Runoff Depth=4.95"
 Flow Length=162' Tc=9.7 min CN=70 Runoff=0.99 cfs 0.080 af

Subcatchment E1: EX. ACCESS DR E

Runoff Area=0.874 ac 71.51% Impervious Runoff Depth=7.36"
 Flow Length=90' Tc=6.0 min CN=90 Runoff=7.02 cfs 0.536 af

Subcatchment F1: Direct Runoff

Runoff Area=1.046 ac 18.26% Impervious Runoff Depth=5.55"
 Flow Length=489' Tc=6.1 min CN=75 Runoff=6.74 cfs 0.484 af

Subcatchment G1: Graded Road Runoff

Runoff Area=0.224 ac 0.00% Impervious Runoff Depth=5.43"
 Tc=6.0 min CN=74 Runoff=1.42 cfs 0.101 af

Reach 15R: U.S. Pike Site Culvert

Inflow=9.36 cfs 6.428 af
 Outflow=9.36 cfs 6.428 af

Reach SP-1: OFFSITE PIKE PROP

Avg. Flow Depth=0.86' Max Vel=0.61 fps Inflow=9.43 cfs 6.433 af
 n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=9.36 cfs 6.428 af

Reach SP-2: OFFSITE TO 266-1

Inflow=1.12 cfs 0.079 af
 Outflow=1.12 cfs 0.079 af

Reach SP-3: SW WETLANDS

Inflow=7.27 cfs 0.585 af
 Outflow=7.27 cfs 0.585 af

Reach SP-4: SE WETLANDS

Inflow=7.02 cfs 0.536 af
 Outflow=7.02 cfs 0.536 af

Pond 1P: EX. POND-2

Peak Elev=25.13' Storage=591,916 cf Inflow=56.36 cfs 6.163 af
 Primary=8.85 cfs 5.949 af Secondary=0.00 cfs 0.000 af Outflow=8.85 cfs 5.949 af

Pond 9P: ECB-C

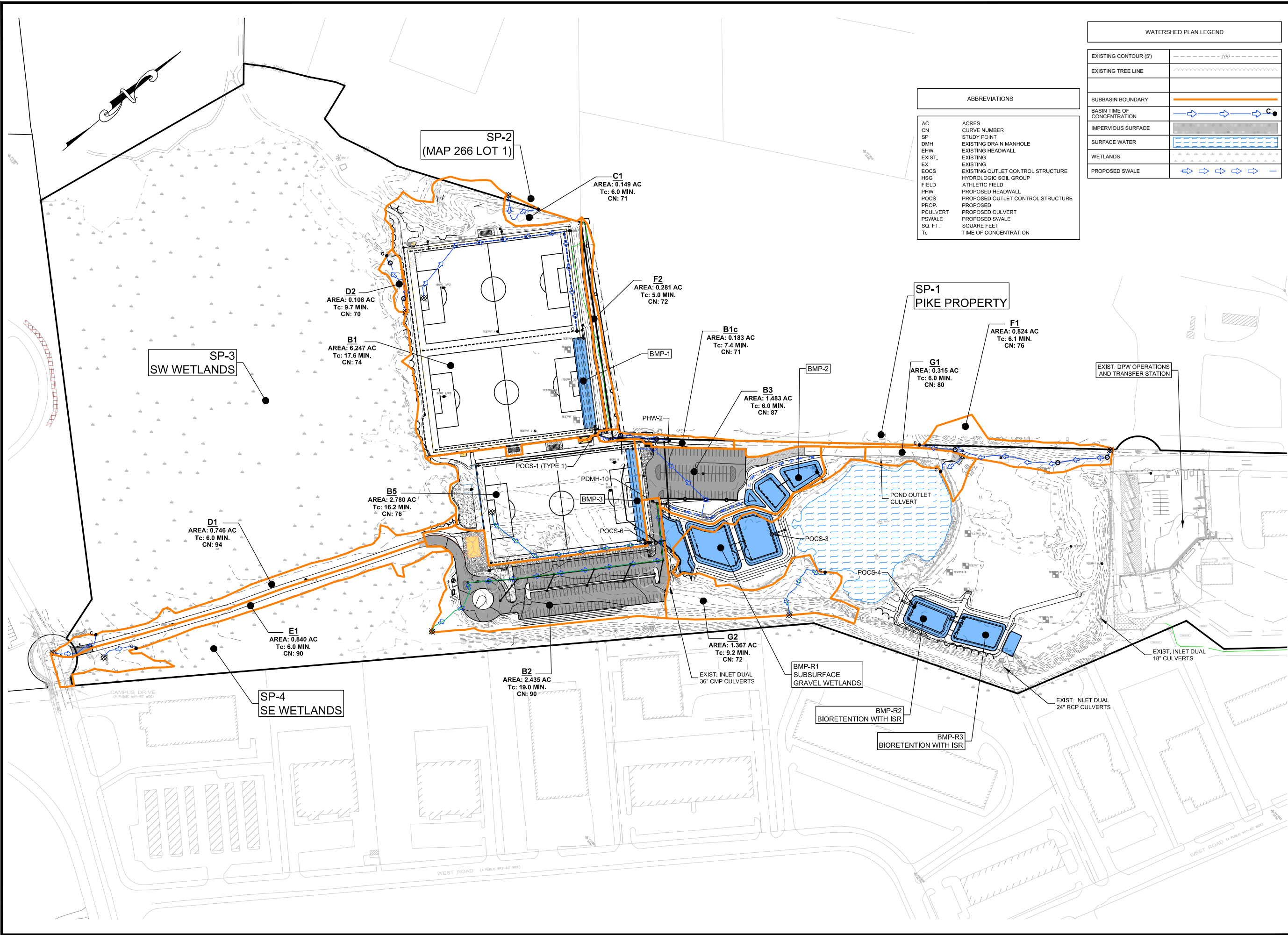
Peak Elev=33.31' Inflow=37.77 cfs 4.170 af
 24.0" Round Culvert n=0.013 L=174.5' S=0.0011 '/' Outflow=37.77 cfs 4.170 af

Total Runoff Area = 17.201 ac Runoff Volume = 7.847 af Average Runoff Depth = 5.47"
88.18% Pervious = 15.167 ac 11.82% Impervious = 2.034 ac

Stormwater Management Report
Appendix E

Post-Development Drainage Analysis

- i. Post-Development Watershed Plan
- ii. 2-Year, 24-Hour HydroCad Report Calculations
- iii. 10-Year, 25-Year, and 50-Year Report Summary Calculations
- iv. NHDES AoT Gravel Wetland Sizing Sheet



ABBREVIATIONS	
AC	ACRES
CN	CURVE NUMBER
SP	STUDY POINT
DMH	EXISTING DRAIN MANHOLE
EHW	EXISTING HEADWALL
EXIST.	EXISTING
EX	EXISTING
EOCS	EXISTING OUTLET CONTROL STRUCTURE
HSG	HYDROLOGIC SOIL GROUP
FIELD	ATHLETIC FIELD
PHW	PROPOSED HEADWALL
POCS	PROPOSED OUTLET CONTROL STRUCTURE
PROP.	PROPOSED
POCULVERT	PROPOSED CULVERT
PSWALE	PROPOSED SWALE
SQ. FT.	SQUARE FEET
Tc	TIME OF CONCENTRATION

WATERSHED PLAN LEGEND	
EXISTING CONTOUR (5')	---
EXISTING TREE LINE	~~~~~
SUBBASIN BOUNDARY	---
BASIN TIME OF CONCENTRATION	→→→→→
IMPERVIOUS SURFACE	▨
SURFACE WATER	~~~~~
WETLANDS	~~~~~
PROPOSED SWALE	→→→→→

City of Portsmouth
Portsmouth, New Hampshire
Site Plan Review Application
Multi-purpose Recreation Fields
Stormwater Analysis
Post-Development Watershed Plan

designed by: JHK
drawn by: AGL
approved by: PAC
checked by: PAC
date: August 2019
project no: 1119

drawing no.
H2
sheet: 1 of 1

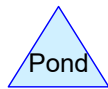
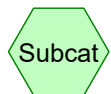
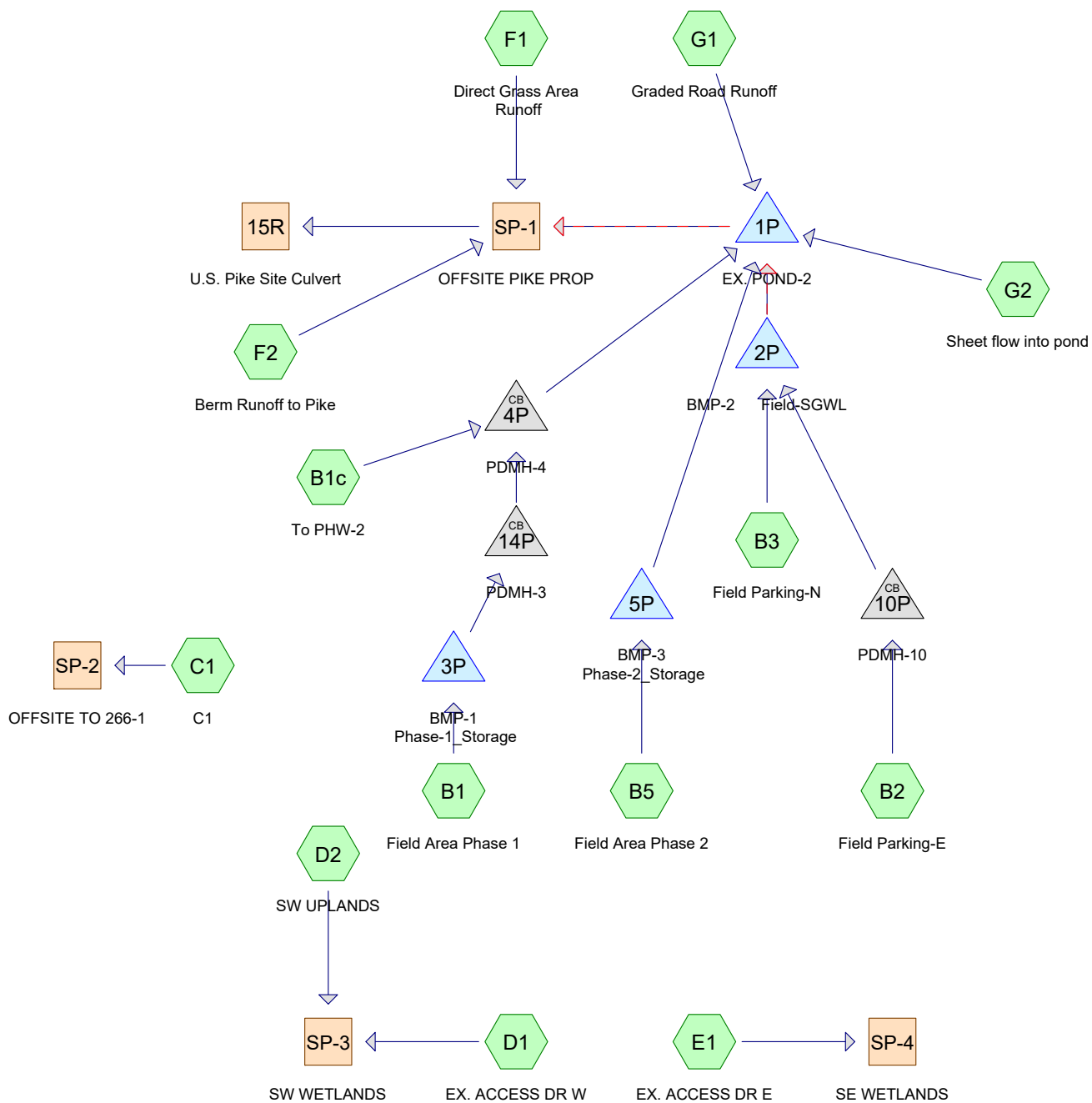
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scale:
0 100' 200'
Scale 1" = 100'

revision
no.
date
by

M:\CADD\PROJECTS\1119 Portsmouth Athletic Fields\Engineering\Stormwater\AOT\DWG\1119-AOT-POST-DEV-FIELDS.dwg Date Plotted: Oct 08, 2019 - 2:41pm Plotted By: JKEFFNER



Routing Diagram for 1119-Post Development-Fields
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1119-Post Development-Fields

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.103	74	>75% Grass cover, Good, HSG C (B5)
0.034	80	>75% Grass cover, Good, HSG D (B5)
3.823	71	Field Turf, HSG C (B1, B5)
2.750	78	Field Turf, HSG D (B1, B5)
0.218	97	Field turf over BMP, 0% imp, HSG C (B1, B5)
0.526	96	Gravel surface, 100% imp, HSG C (B3, D1, E1, G2)
0.010	96	Gravel surface, 100% imp., HSG C (F2)
0.115	96	Gravel surface, 100%, imp, HSG C (G1)
0.759	96	Gravel surface, grass overgrowth, 100% imp, HSG C (D1, E1)
4.010	71	Meadow, non-grazed, HSG C (B1, B1c, B2, B3, B5, C1, D1, E1, F1, F2, G1, G2)
0.237	78	Meadow, non-grazed, HSG D (E1, G1, G2)
0.784	98	Paved parking, HSG C (B3, D1, E1)
1.702	98	Paved parking, HSG D (B2)
0.082	71	Play Area, sand, HSG C (B5)
0.056	97	Porous Pave over BMP, 0% imp, HSG C (B1)
0.140	71	Porous Pavement, Phase 1, HSG C (B1)
0.262	78	Porous Pavement, Phase 1, HSG D (B1)
0.094	71	Porous Pavement, Phase 2, HSG C (B5)
0.106	78	Porous Pavement, Phase 2, HSG D (B5)
0.059	98	Unconnected pavement, Phase 1 (B1)
0.040	98	Unconnected pavement, Phase 2 (B5)
0.069	98	Water Surface, 0% imp, HSG C (B3)
1.613	70	Woods, Good, HSG C (B1, B2, C1, D2, E1, G1, G2)
0.217	77	Woods, Good, HSG D (D1, E1, G2)
17.809	79	TOTAL AREA

1119-Post Development-Fields

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Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
12.402	HSG C	B1, B1c, B2, B3, B5, C1, D1, D2, E1, F1, F2, G1, G2
5.308	HSG D	B1, B2, B5, D1, E1, G1, G2
0.099	Other	B1, B5
17.809		TOTAL AREA

1119-Post Development-Fields

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subo Num
0.000	0.000	0.103	0.034	0.000	0.137	>75% Grass cover, Good	
0.000	0.000	3.823	2.750	0.000	6.573	Field Turf	
0.000	0.000	0.218	0.000	0.000	0.218	Field turf over BMP, 0% imp	
0.000	0.000	0.526	0.000	0.000	0.526	Gravel surface, 100% imp	
0.000	0.000	0.010	0.000	0.000	0.010	Gravel surface, 100% imp.	
0.000	0.000	0.115	0.000	0.000	0.115	Gravel surface, 100%, imp	
0.000	0.000	0.759	0.000	0.000	0.759	Gravel surface, grass ovrgrowth, 100% imp	
0.000	0.000	4.010	0.237	0.000	4.247	Meadow, non-grazed	
0.000	0.000	0.784	1.702	0.000	2.486	Paved parking	
0.000	0.000	0.082	0.000	0.000	0.082	Play Area, sand	
0.000	0.000	0.056	0.000	0.000	0.056	Porous Pave over BMP, 0% imp	
0.000	0.000	0.140	0.262	0.000	0.402	Porous Pavement, Phase 1	
0.000	0.000	0.094	0.106	0.000	0.200	Porous Pavement, Phase 2	
0.000	0.000	0.000	0.000	0.059	0.059	Unconnected pavement, Phase 1	
0.000	0.000	0.000	0.000	0.040	0.040	Unconnected pavement, Phase 2	
0.000	0.000	0.069	0.000	0.000	0.069	Water Surface, 0% imp	
0.000	0.000	1.613	0.217	0.000	1.830	Woods, Good	
0.000	0.000	12.402	5.308	0.099	17.809	TOTAL AREA	

1119-Post Development-Fields

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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	B1	0.00	0.00	130.0	0.0035	0.022	12.0	0.5	0.0
2	B2	0.00	0.00	122.0	0.0246	0.012	12.0	0.0	0.0
3	B2	0.00	0.00	359.0	0.0050	0.012	18.0	0.0	0.0
4	B2	0.00	0.00	139.0	0.0050	0.012	24.0	0.0	0.0
5	B5	0.00	0.00	130.0	0.0035	0.022	12.0	0.5	0.0
6	1P	22.34	21.91	61.3	0.0070	0.022	53.0	41.0	19.0
7	2P	25.25	24.90	27.5	0.0127	0.012	24.0	0.0	0.0
8	3P	27.64	27.36	56.3	0.0050	0.012	18.0	0.0	0.0
9	4P	26.67	25.75	184.0	0.0050	0.013	18.0	0.0	0.0
10	5P	26.75	26.00	38.0	0.0197	0.012	15.0	0.0	0.0
11	10P	28.62	28.50	22.0	0.0055	0.013	24.0	0.0	0.0
12	14P	27.51	26.77	148.0	0.0050	0.013	18.0	0.0	0.0

1119-Post Development-Fields

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

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Page 6

Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field Area Phase 1 Runoff Area=6.247 ac 0.00% Impervious Runoff Depth=1.39"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=6.97 cfs 0.722 af

Subcatchment B1c: To PHW-2 Runoff Area=0.183 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=0.23 cfs 0.018 af

Subcatchment B2: Field Parking-E Runoff Area=2.435 ac 69.90% Impervious Runoff Depth=2.79"
Flow Length=783' Tc=19.0 min CN=71/98 Runoff=4.94 cfs 0.566 af

Subcatchment B3: Field Parking-N Runoff Area=1.424 ac 54.63% Impervious Runoff Depth=2.53"
Flow Length=261' Tc=6.0 min CN=74/98 Runoff=3.83 cfs 0.300 af

Subcatchment B5: Field Area Phase 2 Runoff Area=2.780 ac 0.00% Impervious Runoff Depth=1.52"
Flow Length=426' Tc=16.2 min CN=76/0 Runoff=3.56 cfs 0.352 af

Subcatchment C1: C1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.20 cfs 0.015 af

Subcatchment D1: EX. ACCESS DR W Runoff Area=0.746 ac 87.40% Impervious Runoff Depth=3.04"
Flow Length=133' Tc=6.0 min CN=77/96 Runoff=2.46 cfs 0.189 af

Subcatchment D2: SW UPLANDS Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=1.14"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.12 cfs 0.010 af

Subcatchment E1: EX. ACCESS DR E Runoff Area=0.840 ac 69.52% Impervious Runoff Depth=2.70"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=2.48 cfs 0.189 af

Subcatchment F1: Direct Grass Area Runoff Runoff Area=0.934 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=1.24 cfs 0.093 af

Subcatchment F2: Berm Runoff to Pike Runoff Area=0.281 ac 3.56% Impervious Runoff Depth=1.27"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=0.32 cfs 0.030 af

Subcatchment G1: Graded Road Runoff Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=1.80"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=0.66 cfs 0.047 af

Subcatchment G2: Sheet flow into pond Runoff Area=1.367 ac 4.02% Impervious Runoff Depth=1.28"
Flow Length=186' Tc=9.2 min CN=71/96 Runoff=1.73 cfs 0.146 af

Reach 15R: U.S. Pike Site Culvert Inflow=0.80 cfs 1.453 af
Outflow=0.80 cfs 1.453 af

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.28' Max Vel=0.29 fps Inflow=1.49 cfs 1.456 af
n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=0.80 cfs 1.453 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.20 cfs 0.015 af
Outflow=0.20 cfs 0.015 af

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Reach SP-3: SW WETLANDS

Inflow=2.56 cfs 0.199 af

Outflow=2.56 cfs 0.199 af

Reach SP-4: SE WETLANDS

Inflow=2.48 cfs 0.189 af

Outflow=2.48 cfs 0.189 af

Pond 1P: EX. POND-2

Peak Elev=24.31' Storage=432,667 cf Inflow=7.07 cfs 1.455 af

Primary=0.74 cfs 1.333 af Secondary=0.00 cfs 0.000 af Outflow=0.74 cfs 1.333 af

Pond 2P: BMP-2 Field-SGWL

Peak Elev=28.21' Storage=17,441 cf Inflow=7.13 cfs 0.866 af

Primary=5.71 cfs 0.865 af Secondary=0.00 cfs 0.000 af Outflow=5.71 cfs 0.865 af

Pond 3P: BMP-1 Phase-1_Storage

Peak Elev=30.99' Storage=18,235 cf Inflow=6.97 cfs 0.722 af

Discarded=0.08 cfs 0.389 af Primary=0.57 cfs 0.331 af Outflow=0.64 cfs 0.720 af

Pond 4P: PDMH-4

Peak Elev=27.05' Inflow=0.58 cfs 0.350 af

18.0" Round Culvert n=0.013 L=184.0' S=0.0050 ' Outflow=0.58 cfs 0.350 af

Pond 5P: BMP-3 Phase-2_Storage

Peak Elev=32.37' Storage=12,379 cf Inflow=3.56 cfs 0.352 af

Discarded=0.03 cfs 0.166 af Primary=0.06 cfs 0.048 af Outflow=0.09 cfs 0.213 af

Pond 10P: PDMH-10

Peak Elev=29.77' Inflow=4.94 cfs 0.566 af

24.0" Round Culvert n=0.013 L=22.0' S=0.0055 ' Outflow=4.94 cfs 0.566 af

Pond 14P: PDMH-3

Peak Elev=27.89' Inflow=0.57 cfs 0.331 af

18.0" Round Culvert n=0.013 L=148.0' S=0.0050 ' Outflow=0.57 cfs 0.331 af

Total Runoff Area = 17.809 ac Runoff Volume = 2.679 af Average Runoff Depth = 1.81"
78.77% Pervious = 14.028 ac 21.23% Impervious = 3.781 ac

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

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Summary for Subcatchment B1: Field Area Phase 1

Runoff = 6.97 cfs @ 12.26 hrs, Volume= 0.722 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 1.612	78	Field Turf, HSG D
* 2.810	71	Field Turf, HSG C
* 0.140	71	Porous Pavement, Phase 1, HSG C
* 0.262	78	Porous Pavement, Phase 1, HSG D
* 0.056	97	Porous Pave over BMP, 0% imp, HSG C
* 0.059	98	Unconnected pavement, Phase 1
0.664	70	Woods, Good, HSG C
0.545	71	Meadow, non-grazed, HSG C
* 0.099	97	Field turf over BMP, 0% imp, HSG C
6.247	74	Weighted Average
6.247	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, Vert. Flow Through Turf to subgrade
2.2	26	0.0050	0.19		Sheet Flow, Horizontal flow through stone base n= 0.050 P2= 3.71"
7.4	130	0.0035	0.29	0.01	Pipe Channel, Flat Pipe channels 12.0" x 0.5" Box Area= 0.0 sf Perim= 2.1' r= 0.02' n= 0.022
3.0	513	0.0050	2.84	2.27	Channel Flow, Perimeter Drain Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.015
17.6	669	Total			

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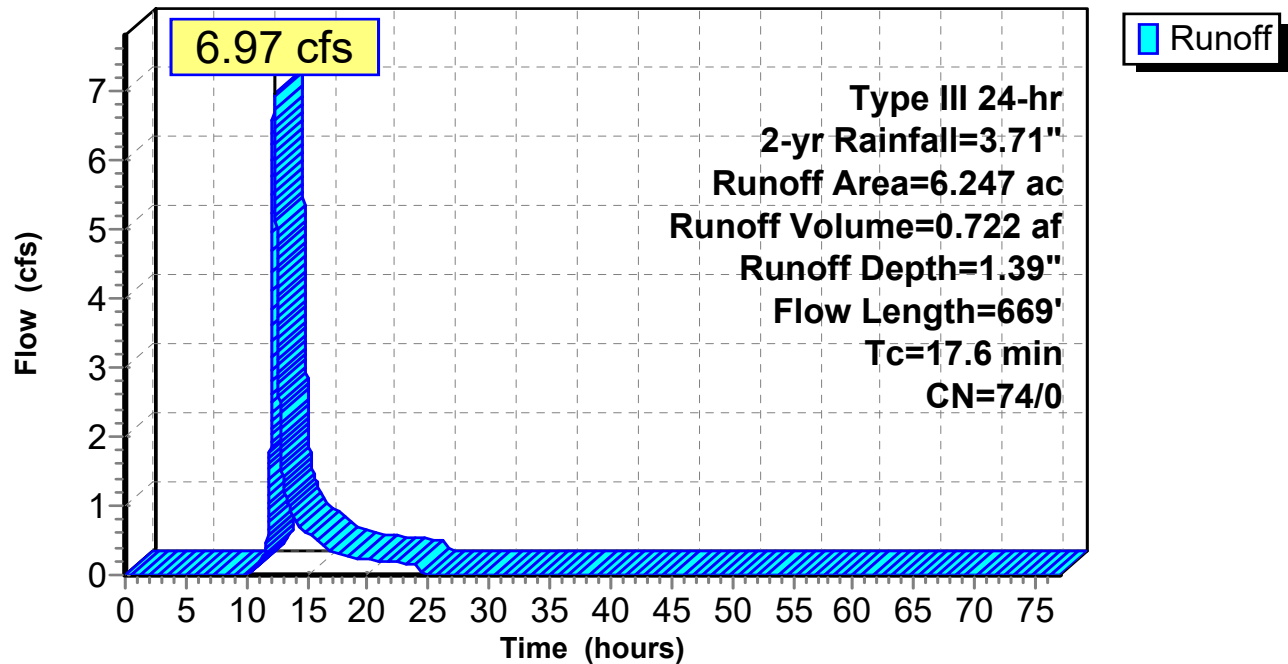
Type III 24-hr 2-yr Rainfall=3.71"

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Subcatchment B1: Field Area Phase 1

Hydrograph



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Hydrograph for Subcatchment B1: Field Area Phase 1

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.28	0.00	2.24
14.00	3.01	0.91	0.00	0.82
16.00	3.29	1.10	0.00	0.45
18.00	3.44	1.20	0.00	0.28
20.00	3.55	1.27	0.00	0.22
22.00	3.64	1.34	0.00	0.18
24.00	3.71	1.39	0.00	0.15
26.00	3.71	1.39	0.00	0.00
28.00	3.71	1.39	0.00	0.00
30.00	3.71	1.39	0.00	0.00
32.00	3.71	1.39	0.00	0.00
34.00	3.71	1.39	0.00	0.00
36.00	3.71	1.39	0.00	0.00
38.00	3.71	1.39	0.00	0.00
40.00	3.71	1.39	0.00	0.00
42.00	3.71	1.39	0.00	0.00
44.00	3.71	1.39	0.00	0.00
46.00	3.71	1.39	0.00	0.00
48.00	3.71	1.39	0.00	0.00
50.00	3.71	1.39	0.00	0.00
52.00	3.71	1.39	0.00	0.00
54.00	3.71	1.39	0.00	0.00
56.00	3.71	1.39	0.00	0.00
58.00	3.71	1.39	0.00	0.00
60.00	3.71	1.39	0.00	0.00
62.00	3.71	1.39	0.00	0.00
64.00	3.71	1.39	0.00	0.00
66.00	3.71	1.39	0.00	0.00
68.00	3.71	1.39	0.00	0.00
70.00	3.71	1.39	0.00	0.00
72.00	3.71	1.39	0.00	0.00
74.00	3.71	1.39	0.00	0.00
76.00	3.71	1.39	0.00	0.00

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

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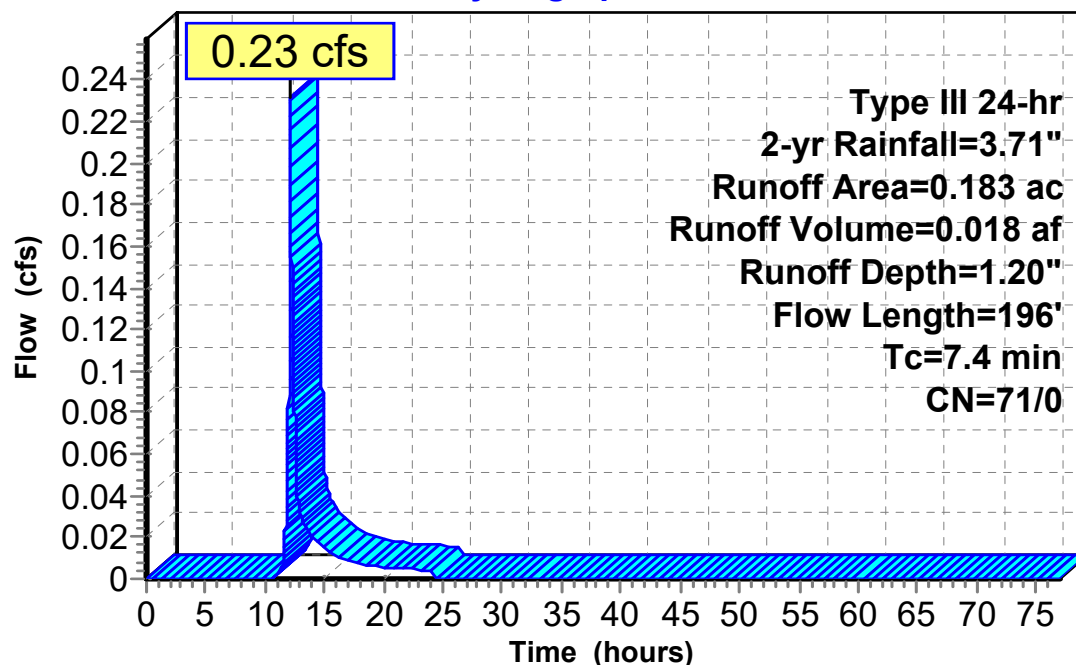
Summary for Subcatchment B1c: To PHW-2

Runoff = 0.23 cfs @ 12.11 hrs, Volume= 0.018 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.183	71	Meadow, non-grazed, HSG C
0.183	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	16	0.3333	0.27		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
3.9	34	0.0493	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.2	26	0.1210	2.43		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	88	0.0184	0.95		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.4	196	Total			

Subcatchment B1c: To PHW-2**Hydrograph**

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Hydrograph for Subcatchment B1c: To PHW-2

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.11
14.00	3.01	0.77	0.00	0.02
16.00	3.29	0.93	0.00	0.01
18.00	3.44	1.03	0.00	0.01
20.00	3.55	1.10	0.00	0.01
22.00	3.64	1.15	0.00	0.00
24.00	3.71	1.20	0.00	0.00
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

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

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Summary for Subcatchment B2: Field Parking-E

Runoff = 4.94 cfs @ 12.26 hrs, Volume= 0.566 af, Depth= 2.79"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
1.702	98	Paved parking, HSG D
0.141	70	Woods, Good, HSG C
0.592	71	Meadow, non-grazed, HSG C
2.435	90	Weighted Average
0.733	71	30.10% Pervious Area
1.702	98	69.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.5	81	0.0551	0.09		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
0.5	8	0.5000	0.27		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.8	8	0.1400	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.2	66	0.0518	4.62		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	122	0.0246	7.71	6.05	Pipe Channel, Closed storm Drain 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
1.3	359	0.0050	4.55	8.05	Pipe Channel, Closed system 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.4	139	0.0050	5.52	17.33	Pipe Channel, Closed system 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.012
19.0	783	Total			

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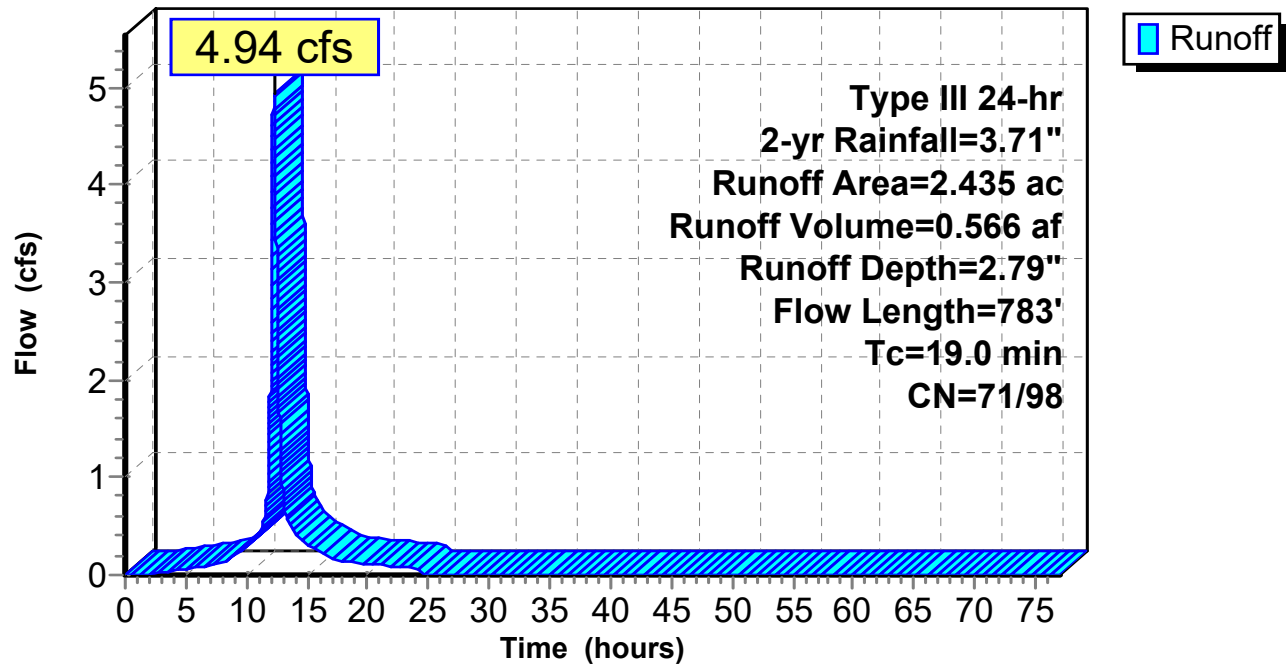
Type III 24-hr 2-yr Rainfall=3.71"

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Subcatchment B2: Field Parking-E

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B2: Field Parking-E

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.01
4.00	0.16	0.00	0.04	0.05
6.00	0.27	0.00	0.12	0.07
8.00	0.42	0.00	0.25	0.14
10.00	0.70	0.00	0.50	0.27
12.00	1.85	0.21	1.63	2.14
14.00	3.01	0.77	2.78	0.44
16.00	3.29	0.93	3.05	0.24
18.00	3.44	1.03	3.21	0.14
20.00	3.55	1.10	3.32	0.11
22.00	3.64	1.15	3.40	0.09
24.00	3.71	1.20	3.48	0.07
26.00	3.71	1.20	3.48	0.00
28.00	3.71	1.20	3.48	0.00
30.00	3.71	1.20	3.48	0.00
32.00	3.71	1.20	3.48	0.00
34.00	3.71	1.20	3.48	0.00
36.00	3.71	1.20	3.48	0.00
38.00	3.71	1.20	3.48	0.00
40.00	3.71	1.20	3.48	0.00
42.00	3.71	1.20	3.48	0.00
44.00	3.71	1.20	3.48	0.00
46.00	3.71	1.20	3.48	0.00
48.00	3.71	1.20	3.48	0.00
50.00	3.71	1.20	3.48	0.00
52.00	3.71	1.20	3.48	0.00
54.00	3.71	1.20	3.48	0.00
56.00	3.71	1.20	3.48	0.00
58.00	3.71	1.20	3.48	0.00
60.00	3.71	1.20	3.48	0.00
62.00	3.71	1.20	3.48	0.00
64.00	3.71	1.20	3.48	0.00
66.00	3.71	1.20	3.48	0.00
68.00	3.71	1.20	3.48	0.00
70.00	3.71	1.20	3.48	0.00
72.00	3.71	1.20	3.48	0.00
74.00	3.71	1.20	3.48	0.00
76.00	3.71	1.20	3.48	0.00

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Summary for Subcatchment B3: Field Parking-N

Runoff = 3.83 cfs @ 12.09 hrs, Volume= 0.300 af, Depth= 2.53"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.700	98	Paved parking, HSG C
0.577	71	Meadow, non-grazed, HSG C
* 0.078	96	Gravel surface, 100% imp, HSG C
* 0.069	98	Water Surface, 0% imp, HSG C
1.424	87	Weighted Average
0.646	74	45.37% Pervious Area
0.778	98	54.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	11	0.1000	0.15		Sheet Flow, landscape area Grass: Dense n= 0.240 P2= 3.71"
0.5	34	0.0160	1.09		Sheet Flow, Sidewalk Smooth surfaces n= 0.011 P2= 3.71"
0.8	58	0.0160	1.21		Sheet Flow, Parking lot Smooth surfaces n= 0.011 P2= 3.71"
0.8	118	0.0160	2.57		Shallow Concentrated Flow, Parking lot Paved Kv= 20.3 fps
0.7	40	0.0200	0.99		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.0	261	Total, Increased to minimum Tc = 6.0 min			

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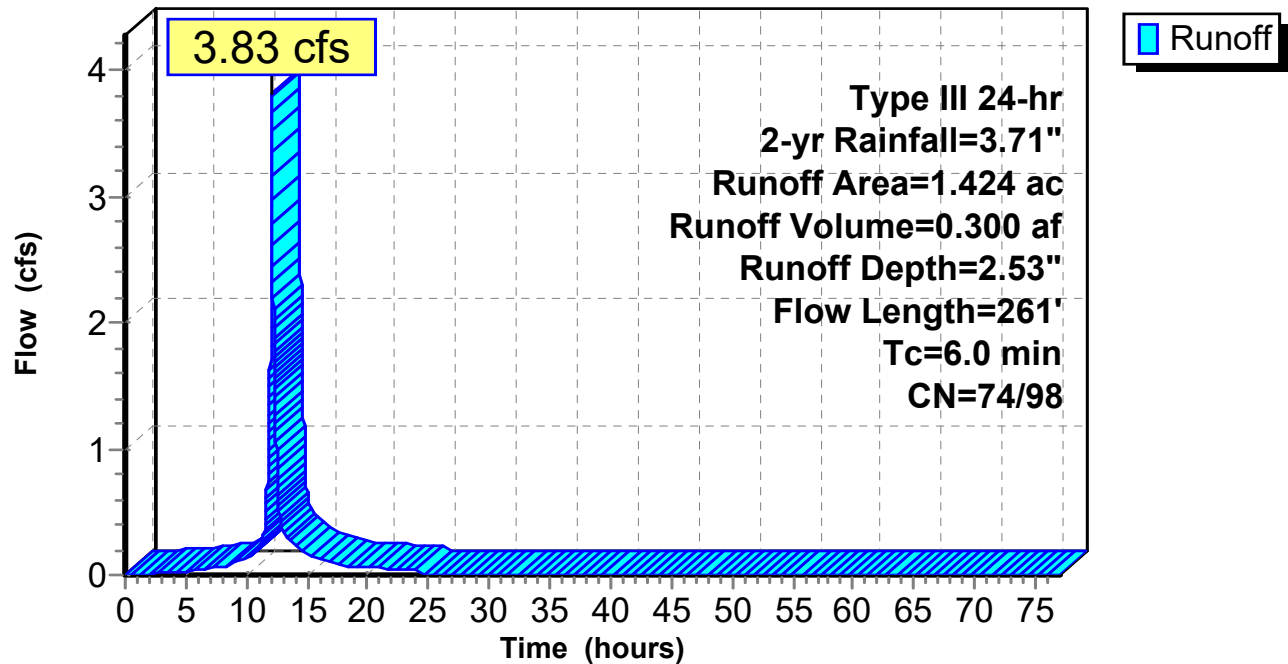
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Subcatchment B3: Field Parking-N

Hydrograph



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Hydrograph for Subcatchment B3: Field Parking-N

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.01
4.00	0.16	0.00	0.04	0.02
6.00	0.27	0.00	0.12	0.04
8.00	0.42	0.00	0.25	0.07
10.00	0.70	0.00	0.50	0.13
12.00	1.85	0.28	1.63	2.31
14.00	3.01	0.91	2.78	0.23
16.00	3.29	1.10	3.05	0.12
18.00	3.44	1.20	3.21	0.07
20.00	3.55	1.27	3.32	0.06
22.00	3.64	1.34	3.40	0.05
24.00	3.71	1.39	3.48	0.04
26.00	3.71	1.39	3.48	0.00
28.00	3.71	1.39	3.48	0.00
30.00	3.71	1.39	3.48	0.00
32.00	3.71	1.39	3.48	0.00
34.00	3.71	1.39	3.48	0.00
36.00	3.71	1.39	3.48	0.00
38.00	3.71	1.39	3.48	0.00
40.00	3.71	1.39	3.48	0.00
42.00	3.71	1.39	3.48	0.00
44.00	3.71	1.39	3.48	0.00
46.00	3.71	1.39	3.48	0.00
48.00	3.71	1.39	3.48	0.00
50.00	3.71	1.39	3.48	0.00
52.00	3.71	1.39	3.48	0.00
54.00	3.71	1.39	3.48	0.00
56.00	3.71	1.39	3.48	0.00
58.00	3.71	1.39	3.48	0.00
60.00	3.71	1.39	3.48	0.00
62.00	3.71	1.39	3.48	0.00
64.00	3.71	1.39	3.48	0.00
66.00	3.71	1.39	3.48	0.00
68.00	3.71	1.39	3.48	0.00
70.00	3.71	1.39	3.48	0.00
72.00	3.71	1.39	3.48	0.00
74.00	3.71	1.39	3.48	0.00
76.00	3.71	1.39	3.48	0.00

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Summary for Subcatchment B5: Field Area Phase 2

Runoff = 3.56 cfs @ 12.23 hrs, Volume= 0.352 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.103	74	>75% Grass cover, Good, HSG C
0.034	80	>75% Grass cover, Good, HSG D
* 1.138	78	Field Turf, HSG D
* 1.013	71	Field Turf, HSG C
* 0.094	71	Porous Pavement, Phase 2, HSG C
* 0.106	78	Porous Pavement, Phase 2, HSG D
* 0.040	98	Unconnected pavement, Phase 2
0.051	71	Meadow, non-grazed, HSG C
* 0.119	97	Field turf over BMP, 0% imp, HSG C
* 0.082	71	Play Area, sand, HSG C
2.780	76	Weighted Average
2.780	76	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, Vert. Flow Through Turf to subgrade
2.2	26	0.0050	0.19		Sheet Flow, Horizontal flow through stone base n= 0.050 P2= 3.71"
7.4	130	0.0035	0.29	0.01	Pipe Channel, Flat Pipe channels 12.0" x 0.5" Box Area= 0.0 sf Perim= 2.1' r= 0.02' n= 0.022
1.6	270	0.0050	2.84	2.27	Channel Flow, Perimeter Drain Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.015
16.2	426	Total			

1119-Post Development-Fields

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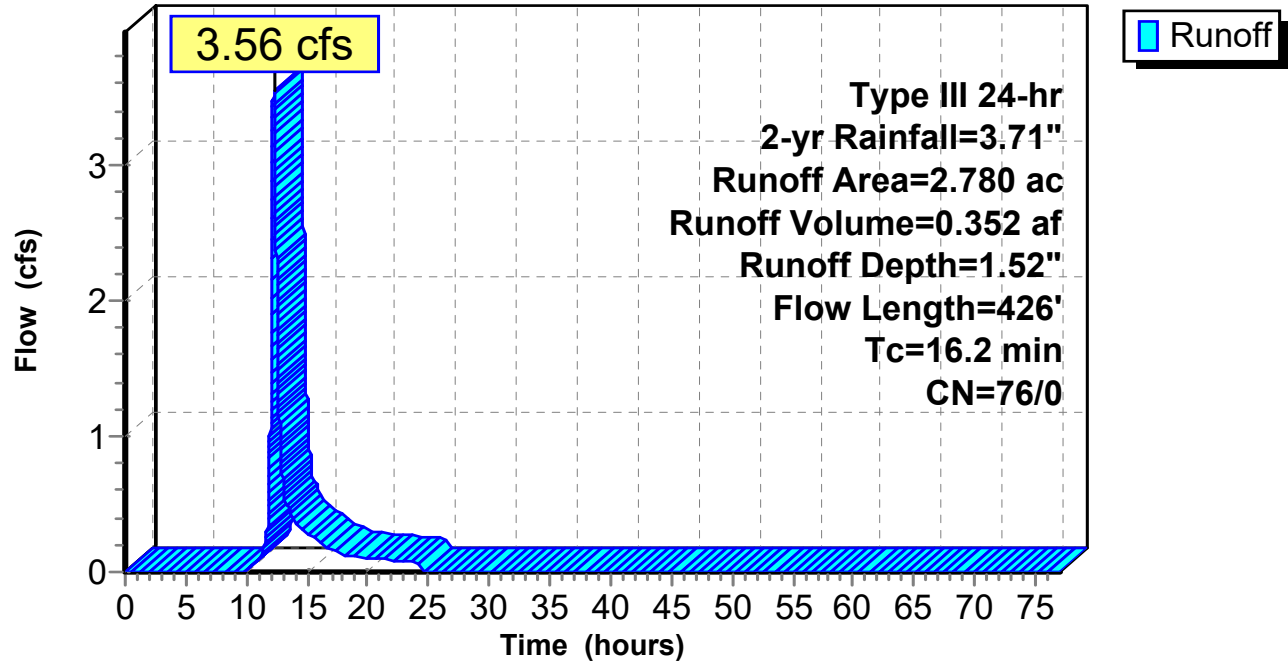
Type III 24-hr 2-yr Rainfall=3.71"

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Subcatchment B5: Field Area Phase 2

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B5: Field Area Phase 2

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.01
12.00	1.85	0.34	0.00	1.26
14.00	3.01	1.02	0.00	0.38
16.00	3.29	1.21	0.00	0.21
18.00	3.44	1.32	0.00	0.13
20.00	3.55	1.40	0.00	0.10
22.00	3.64	1.47	0.00	0.08
24.00	3.71	1.52	0.00	0.07
26.00	3.71	1.52	0.00	0.00
28.00	3.71	1.52	0.00	0.00
30.00	3.71	1.52	0.00	0.00
32.00	3.71	1.52	0.00	0.00
34.00	3.71	1.52	0.00	0.00
36.00	3.71	1.52	0.00	0.00
38.00	3.71	1.52	0.00	0.00
40.00	3.71	1.52	0.00	0.00
42.00	3.71	1.52	0.00	0.00
44.00	3.71	1.52	0.00	0.00
46.00	3.71	1.52	0.00	0.00
48.00	3.71	1.52	0.00	0.00
50.00	3.71	1.52	0.00	0.00
52.00	3.71	1.52	0.00	0.00
54.00	3.71	1.52	0.00	0.00
56.00	3.71	1.52	0.00	0.00
58.00	3.71	1.52	0.00	0.00
60.00	3.71	1.52	0.00	0.00
62.00	3.71	1.52	0.00	0.00
64.00	3.71	1.52	0.00	0.00
66.00	3.71	1.52	0.00	0.00
68.00	3.71	1.52	0.00	0.00
70.00	3.71	1.52	0.00	0.00
72.00	3.71	1.52	0.00	0.00
74.00	3.71	1.52	0.00	0.00
76.00	3.71	1.52	0.00	0.00

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

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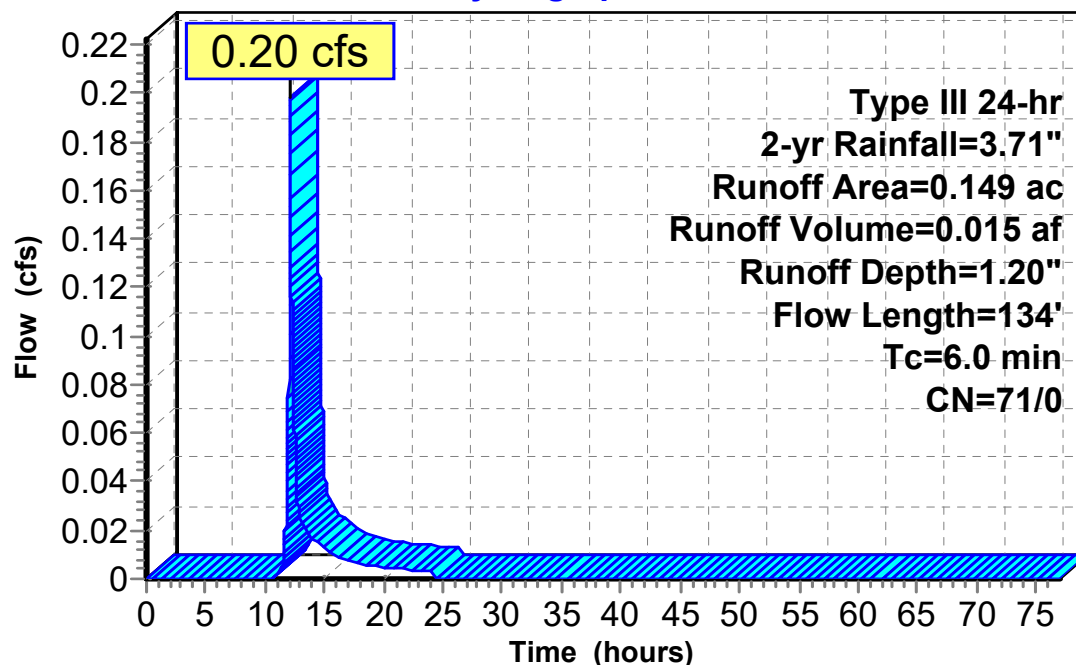
Summary for Subcatchment C1: C1

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.094	71	Meadow, non-grazed, HSG C
0.055	70	Woods, Good, HSG C
0.149	71	Weighted Average
0.149	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	13	0.2095	1.97		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
2.7	30	0.2753	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.9	50	0.0161	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	41	0.0835	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.0	134	Total, Increased to minimum Tc = 6.0 min			

Subcatchment C1: C1**Hydrograph**

Runoff

1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment C1: C1

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.10
14.00	3.01	0.77	0.00	0.02
16.00	3.29	0.93	0.00	0.01
18.00	3.44	1.03	0.00	0.01
20.00	3.55	1.10	0.00	0.00
22.00	3.64	1.15	0.00	0.00
24.00	3.71	1.20	0.00	0.00
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

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

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Summary for Subcatchment D1: EX. ACCESS DR W

Runoff = 2.46 cfs @ 12.08 hrs, Volume= 0.189 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.003	71	Meadow, non-grazed, HSG C
0.091	77	Woods, Good, HSG D
* 0.196	96	Gravel surface, 100% imp, HSG C
0.037	98	Paved parking, HSG C
* 0.419	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.746	94	Weighted Average
0.094	77	12.60% Pervious Area
0.652	96	87.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	21	0.1468	0.10		Sheet Flow, n= 0.600 P2= 3.71"
0.3	26	0.0532	1.31		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.4	34	0.0608	1.45		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.1	20	0.0417	3.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	32	0.0783	1.96		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	133	Total, Increased to minimum Tc = 6.0 min			

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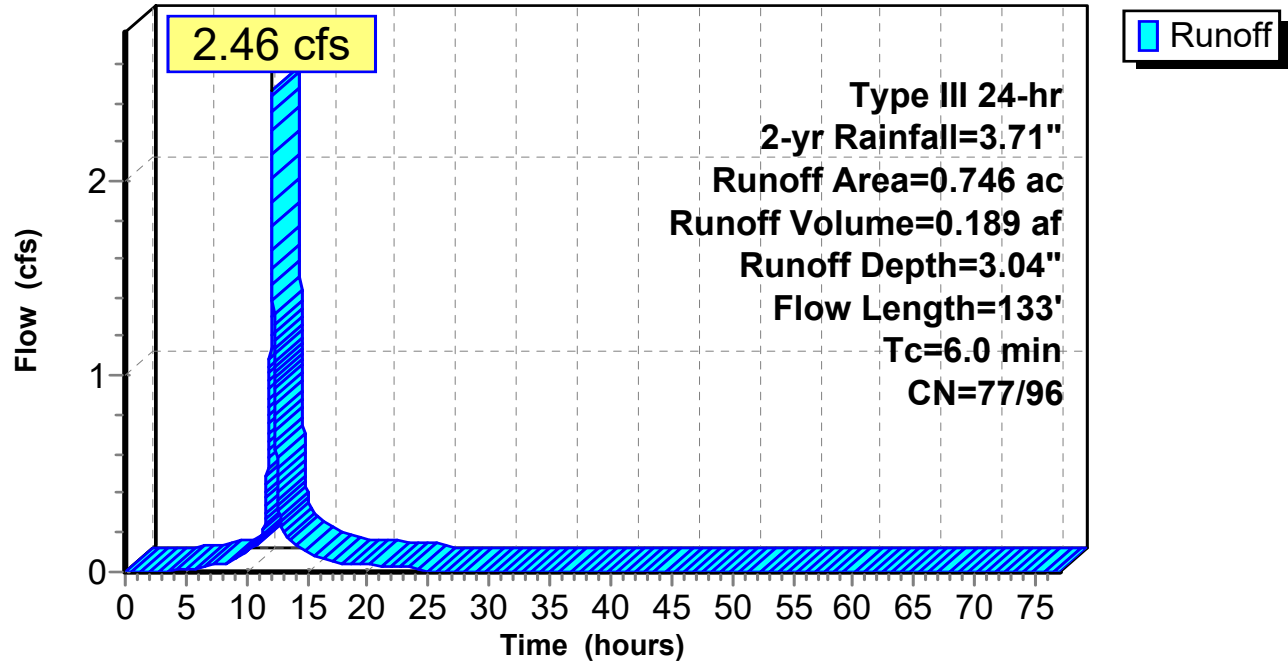
Type III 24-hr 2-yr Rainfall=3.71"

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Subcatchment D1: EX. ACCESS DR W

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D1: EX. ACCESS DR W

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.02
8.00	0.42	0.00	0.15	0.04
10.00	0.70	0.00	0.37	0.10
12.00	1.85	0.37	1.43	1.53
14.00	3.01	1.08	2.56	0.14
16.00	3.29	1.27	2.84	0.07
18.00	3.44	1.39	2.99	0.04
20.00	3.55	1.47	3.10	0.04
22.00	3.64	1.53	3.18	0.03
24.00	3.71	1.59	3.25	0.02
26.00	3.71	1.59	3.25	0.00
28.00	3.71	1.59	3.25	0.00
30.00	3.71	1.59	3.25	0.00
32.00	3.71	1.59	3.25	0.00
34.00	3.71	1.59	3.25	0.00
36.00	3.71	1.59	3.25	0.00
38.00	3.71	1.59	3.25	0.00
40.00	3.71	1.59	3.25	0.00
42.00	3.71	1.59	3.25	0.00
44.00	3.71	1.59	3.25	0.00
46.00	3.71	1.59	3.25	0.00
48.00	3.71	1.59	3.25	0.00
50.00	3.71	1.59	3.25	0.00
52.00	3.71	1.59	3.25	0.00
54.00	3.71	1.59	3.25	0.00
56.00	3.71	1.59	3.25	0.00
58.00	3.71	1.59	3.25	0.00
60.00	3.71	1.59	3.25	0.00
62.00	3.71	1.59	3.25	0.00
64.00	3.71	1.59	3.25	0.00
66.00	3.71	1.59	3.25	0.00
68.00	3.71	1.59	3.25	0.00
70.00	3.71	1.59	3.25	0.00
72.00	3.71	1.59	3.25	0.00
74.00	3.71	1.59	3.25	0.00
76.00	3.71	1.59	3.25	0.00

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

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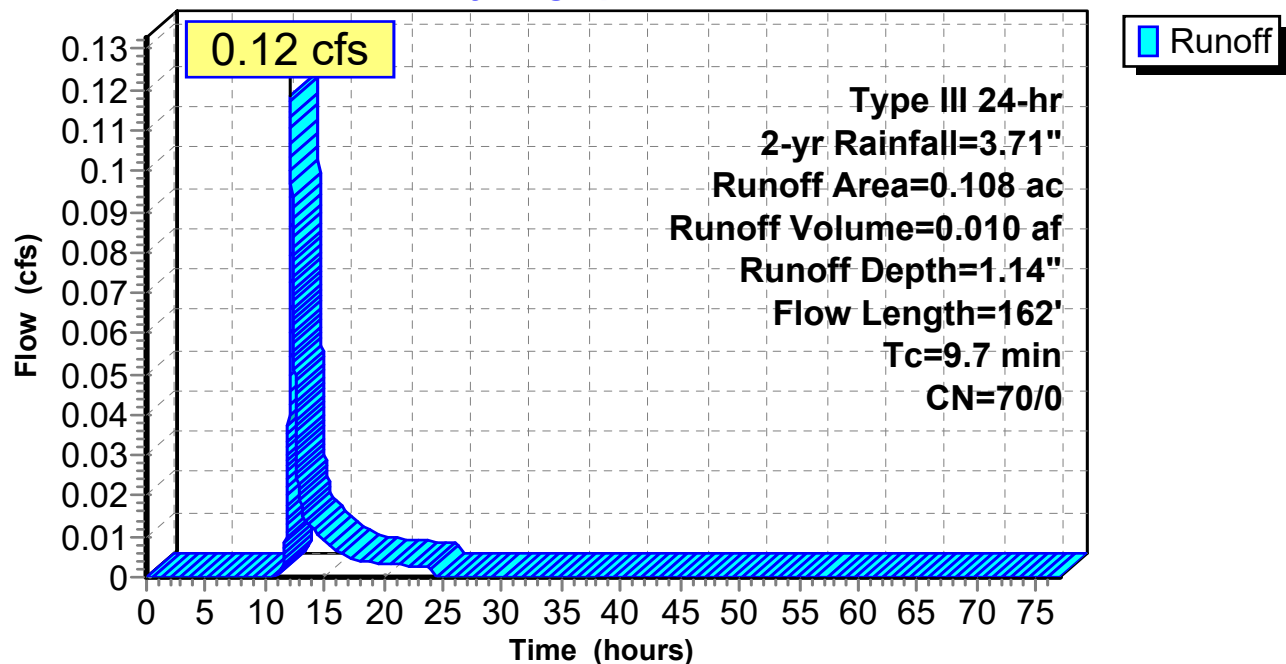
Summary for Subcatchment D2: SW UPLANDS

Runoff = 0.12 cfs @ 12.15 hrs, Volume= 0.010 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.108	70	Woods, Good, HSG C
0.108	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	35	0.0270	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
4.3	105	0.0067	0.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	22	0.0798	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.7	162	Total			

Subcatchment D2: SW UPLANDS**Hydrograph**

1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D2: SW UPLANDS

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.19	0.00	0.05
14.00	3.01	0.72	0.00	0.01
16.00	3.29	0.88	0.00	0.01
18.00	3.44	0.97	0.00	0.00
20.00	3.55	1.04	0.00	0.00
22.00	3.64	1.09	0.00	0.00
24.00	3.71	1.14	0.00	0.00
26.00	3.71	1.14	0.00	0.00
28.00	3.71	1.14	0.00	0.00
30.00	3.71	1.14	0.00	0.00
32.00	3.71	1.14	0.00	0.00
34.00	3.71	1.14	0.00	0.00
36.00	3.71	1.14	0.00	0.00
38.00	3.71	1.14	0.00	0.00
40.00	3.71	1.14	0.00	0.00
42.00	3.71	1.14	0.00	0.00
44.00	3.71	1.14	0.00	0.00
46.00	3.71	1.14	0.00	0.00
48.00	3.71	1.14	0.00	0.00
50.00	3.71	1.14	0.00	0.00
52.00	3.71	1.14	0.00	0.00
54.00	3.71	1.14	0.00	0.00
56.00	3.71	1.14	0.00	0.00
58.00	3.71	1.14	0.00	0.00
60.00	3.71	1.14	0.00	0.00
62.00	3.71	1.14	0.00	0.00
64.00	3.71	1.14	0.00	0.00
66.00	3.71	1.14	0.00	0.00
68.00	3.71	1.14	0.00	0.00
70.00	3.71	1.14	0.00	0.00
72.00	3.71	1.14	0.00	0.00
74.00	3.71	1.14	0.00	0.00
76.00	3.71	1.14	0.00	0.00

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

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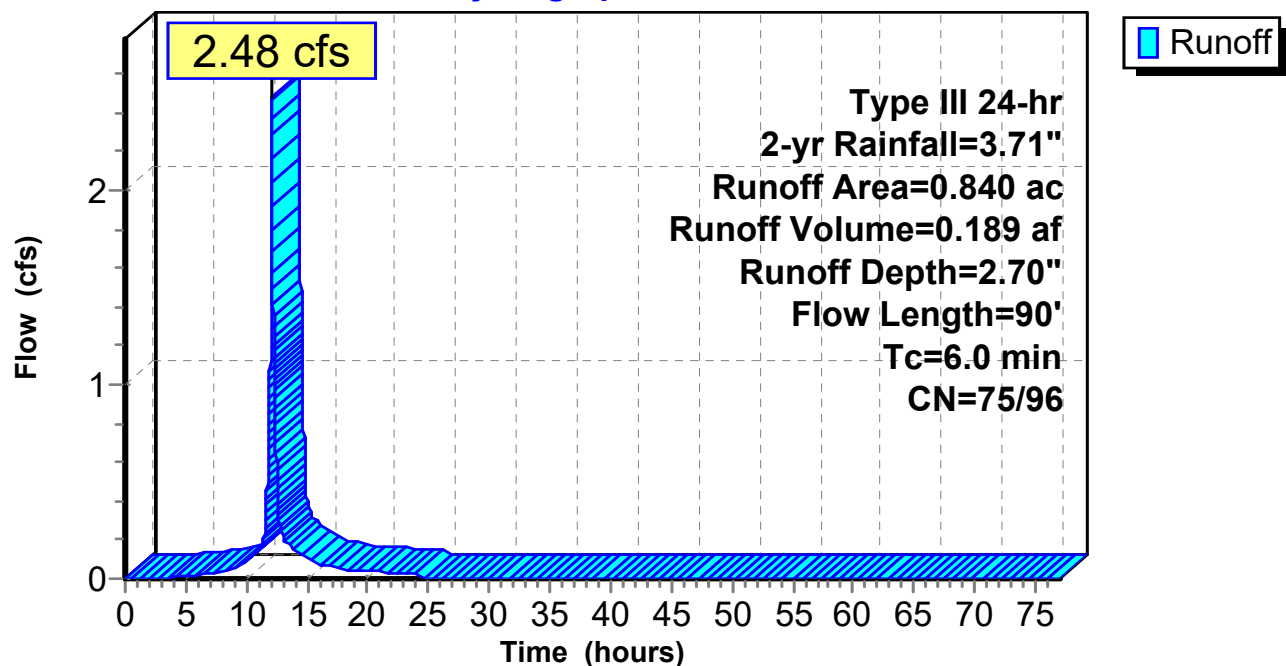
Summary for Subcatchment E1: EX. ACCESS DR E

Runoff = 2.48 cfs @ 12.09 hrs, Volume= 0.189 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.036	71	Meadow, non-grazed, HSG C
0.040	70	Woods, Good, HSG C
0.058	78	Meadow, non-grazed, HSG D
0.122	77	Woods, Good, HSG D
* 0.197	96	Gravel surface, 100% imp, HSG C
0.047	98	Paved parking, HSG C
0.340	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.840	90	Weighted Average
0.256	75	30.48% Pervious Area
0.584	96	69.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0305	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.4	40	0.0609	1.73		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.8	90	Total, Increased to minimum Tc = 6.0 min			

Subcatchment E1: EX. ACCESS DR E**Hydrograph**

1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment E1: EX. ACCESS DR E

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.02
8.00	0.42	0.00	0.15	0.04
10.00	0.70	0.00	0.37	0.09
12.00	1.85	0.31	1.43	1.51
14.00	3.01	0.97	2.56	0.14
16.00	3.29	1.15	2.84	0.08
18.00	3.44	1.26	2.99	0.05
20.00	3.55	1.34	3.10	0.04
22.00	3.64	1.40	3.18	0.03
24.00	3.71	1.45	3.25	0.02
26.00	3.71	1.45	3.25	0.00
28.00	3.71	1.45	3.25	0.00
30.00	3.71	1.45	3.25	0.00
32.00	3.71	1.45	3.25	0.00
34.00	3.71	1.45	3.25	0.00
36.00	3.71	1.45	3.25	0.00
38.00	3.71	1.45	3.25	0.00
40.00	3.71	1.45	3.25	0.00
42.00	3.71	1.45	3.25	0.00
44.00	3.71	1.45	3.25	0.00
46.00	3.71	1.45	3.25	0.00
48.00	3.71	1.45	3.25	0.00
50.00	3.71	1.45	3.25	0.00
52.00	3.71	1.45	3.25	0.00
54.00	3.71	1.45	3.25	0.00
56.00	3.71	1.45	3.25	0.00
58.00	3.71	1.45	3.25	0.00
60.00	3.71	1.45	3.25	0.00
62.00	3.71	1.45	3.25	0.00
64.00	3.71	1.45	3.25	0.00
66.00	3.71	1.45	3.25	0.00
68.00	3.71	1.45	3.25	0.00
70.00	3.71	1.45	3.25	0.00
72.00	3.71	1.45	3.25	0.00
74.00	3.71	1.45	3.25	0.00
76.00	3.71	1.45	3.25	0.00

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

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Summary for Subcatchment F1: Direct Grass Area Runoff

Area of grassed/lanscaped area on the proposed transfer station side (north of pond) was take from transfer station 30% design plans.

Runoff = 1.24 cfs @ 12.10 hrs, Volume= 0.093 af, Depth= 1.20"

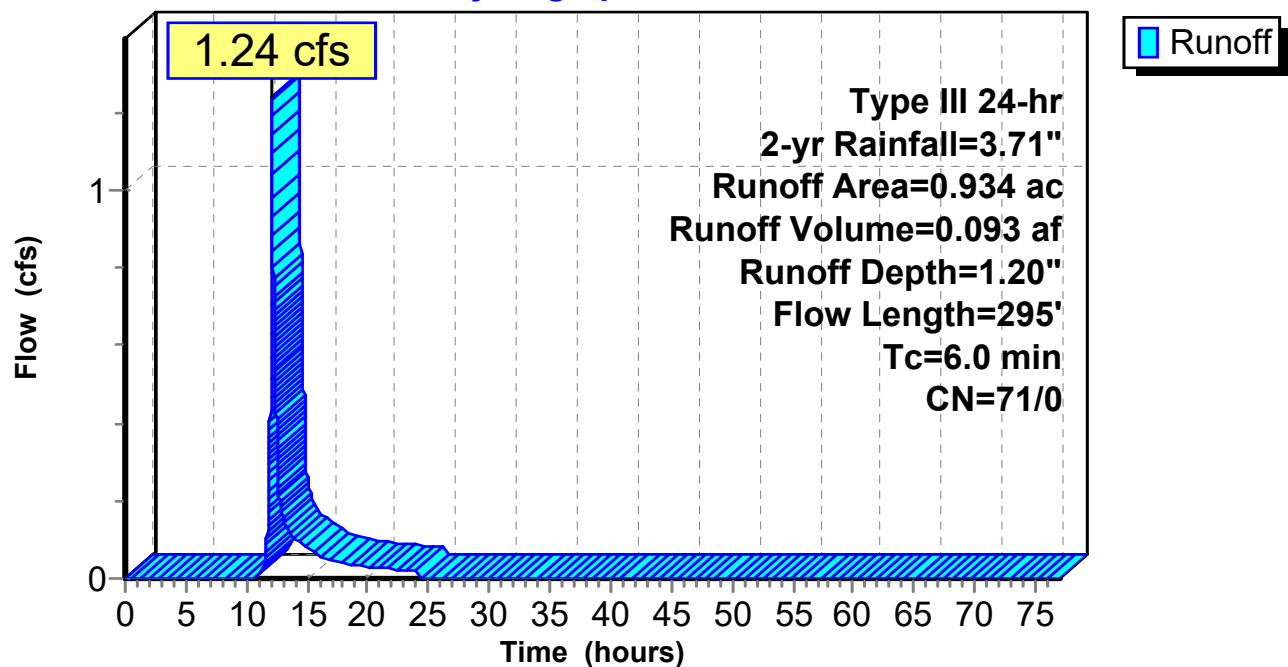
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.934	71	Meadow, non-grazed, HSG C
0.934	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.2607	0.17		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.71"
2.2	275	0.0438	2.09		Shallow Concentrated Flow, Riprap swale
					Kv= 10.0 fps
4.2	295	Total, Increased to minimum Tc = 6.0 min			

Subcatchment F1: Direct Grass Area Runoff

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment F1: Direct Grass Area Runoff

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.63
14.00	3.01	0.77	0.00	0.10
16.00	3.29	0.93	0.00	0.06
18.00	3.44	1.03	0.00	0.04
20.00	3.55	1.10	0.00	0.03
22.00	3.64	1.15	0.00	0.02
24.00	3.71	1.20	0.00	0.02
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields

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

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Summary for Subcatchment F2: Berm Runoff to Pike

Runoff = 0.32 cfs @ 12.19 hrs, Volume= 0.030 af, Depth= 1.27"

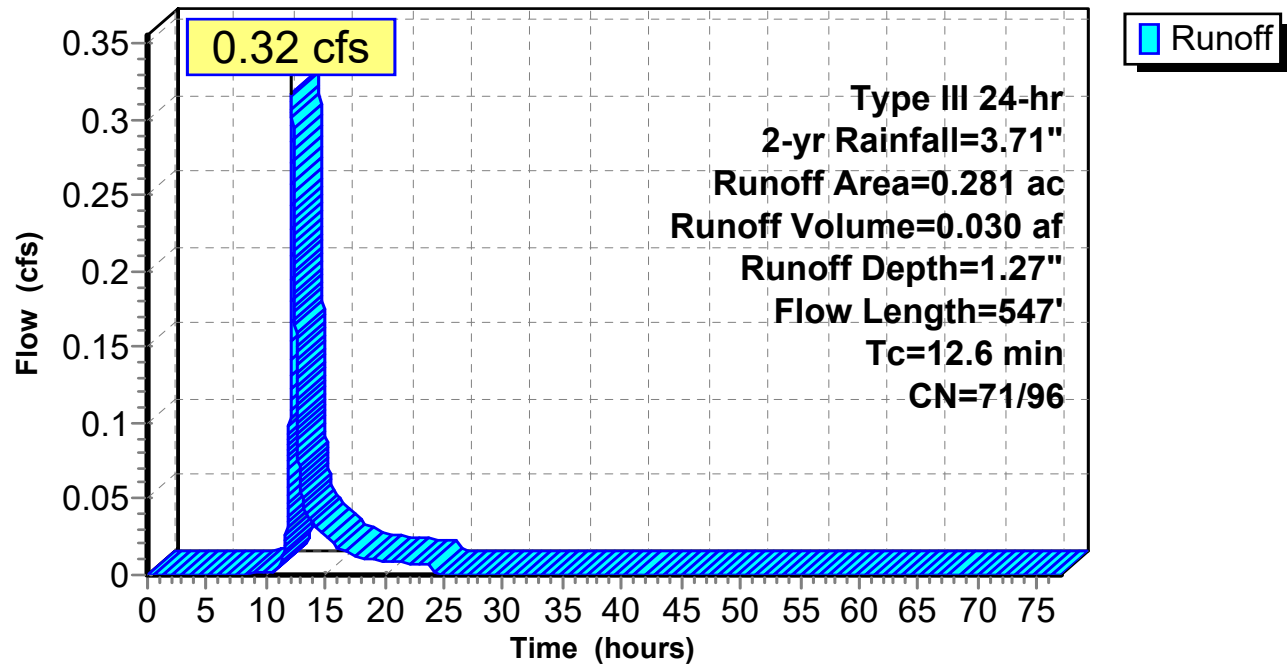
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.271	71	Meadow, non-grazed, HSG C
* 0.010	96	Gravel surface, 100% imp., HSG C
0.281	72	Weighted Average
0.271	71	96.44% Pervious Area
0.010	96	3.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	15	0.0088	0.06		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.5	30	0.0250	0.99		Sheet Flow, Gravel Drive n= 0.015 P2= 3.71"
0.3	35	0.0607	1.72		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	8	0.3798	4.31		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.8	459	0.0194	0.97		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.6	547	Total			

Subcatchment F2: Berm Runoff to Pike

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment F2: Berm Runoff to Pike

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.00
6.00	0.27	0.00	0.06	0.00
8.00	0.42	0.00	0.15	0.00
10.00	0.70	0.00	0.37	0.00
12.00	1.85	0.21	1.43	0.12
14.00	3.01	0.77	2.56	0.03
16.00	3.29	0.93	2.84	0.02
18.00	3.44	1.03	2.99	0.01
20.00	3.55	1.10	3.10	0.01
22.00	3.64	1.15	3.18	0.01
24.00	3.71	1.20	3.25	0.01
26.00	3.71	1.20	3.25	0.00
28.00	3.71	1.20	3.25	0.00
30.00	3.71	1.20	3.25	0.00
32.00	3.71	1.20	3.25	0.00
34.00	3.71	1.20	3.25	0.00
36.00	3.71	1.20	3.25	0.00
38.00	3.71	1.20	3.25	0.00
40.00	3.71	1.20	3.25	0.00
42.00	3.71	1.20	3.25	0.00
44.00	3.71	1.20	3.25	0.00
46.00	3.71	1.20	3.25	0.00
48.00	3.71	1.20	3.25	0.00
50.00	3.71	1.20	3.25	0.00
52.00	3.71	1.20	3.25	0.00
54.00	3.71	1.20	3.25	0.00
56.00	3.71	1.20	3.25	0.00
58.00	3.71	1.20	3.25	0.00
60.00	3.71	1.20	3.25	0.00
62.00	3.71	1.20	3.25	0.00
64.00	3.71	1.20	3.25	0.00
66.00	3.71	1.20	3.25	0.00
68.00	3.71	1.20	3.25	0.00
70.00	3.71	1.20	3.25	0.00
72.00	3.71	1.20	3.25	0.00
74.00	3.71	1.20	3.25	0.00
76.00	3.71	1.20	3.25	0.00

1119-Post Development-Fields

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

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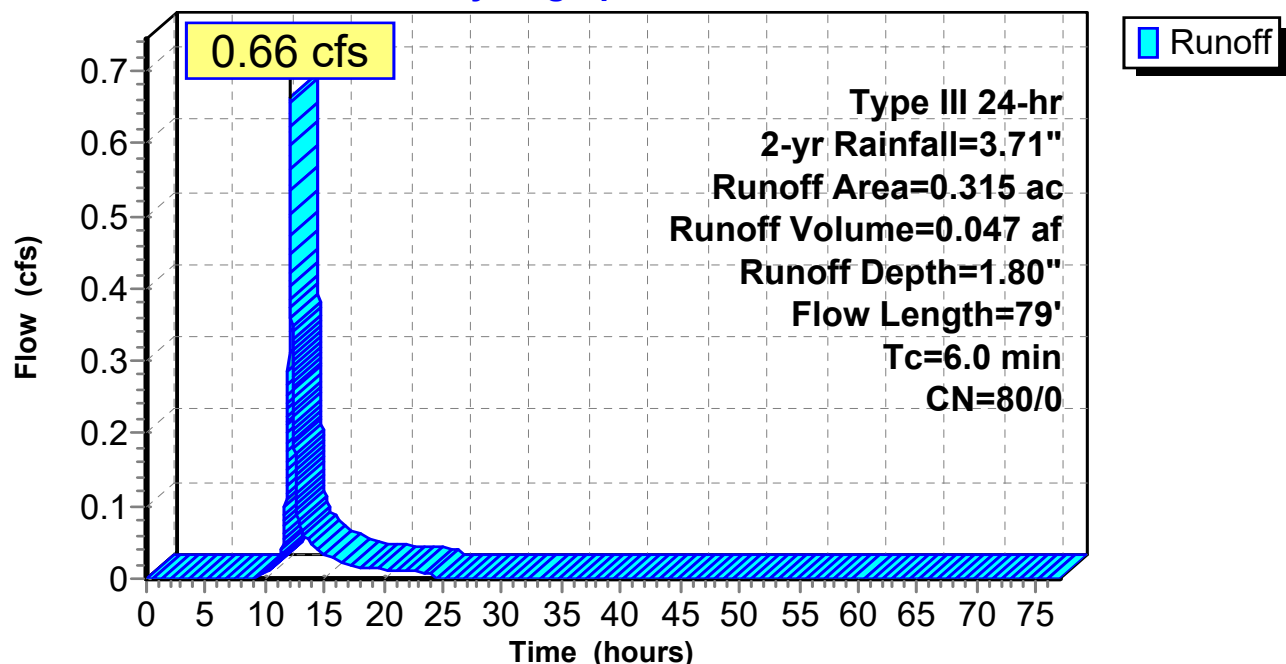
Summary for Subcatchment G1: Graded Road Runoff

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 0.115	96	Gravel surface, 100%, imp, HSG C
0.010	78	Meadow, non-grazed, HSG D
0.176	71	Meadow, non-grazed, HSG C
0.014	70	Woods, Good, HSG C
0.315	80	Weighted Average
0.315	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0166	0.73		Sheet Flow, gravel drive n= 0.015 P2= 3.71"
0.6	43	0.0323	1.26		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	15	0.0265	1.14		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	6	0.8794	6.56		Shallow Concentrated Flow, Weedy ledge pond bank Short Grass Pasture Kv= 7.0 fps
1.1	79	Total, Increased to minimum Tc = 6.0 min			

Subcatchment G1: Graded Road Runoff**Hydrograph**

1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G1: Graded Road Runoff

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.01	0.00	0.01
12.00	1.85	0.48	0.00	0.37
14.00	3.01	1.26	0.00	0.05
16.00	3.29	1.47	0.00	0.02
18.00	3.44	1.59	0.00	0.02
20.00	3.55	1.68	0.00	0.01
22.00	3.64	1.75	0.00	0.01
24.00	3.71	1.80	0.00	0.01
26.00	3.71	1.80	0.00	0.00
28.00	3.71	1.80	0.00	0.00
30.00	3.71	1.80	0.00	0.00
32.00	3.71	1.80	0.00	0.00
34.00	3.71	1.80	0.00	0.00
36.00	3.71	1.80	0.00	0.00
38.00	3.71	1.80	0.00	0.00
40.00	3.71	1.80	0.00	0.00
42.00	3.71	1.80	0.00	0.00
44.00	3.71	1.80	0.00	0.00
46.00	3.71	1.80	0.00	0.00
48.00	3.71	1.80	0.00	0.00
50.00	3.71	1.80	0.00	0.00
52.00	3.71	1.80	0.00	0.00
54.00	3.71	1.80	0.00	0.00
56.00	3.71	1.80	0.00	0.00
58.00	3.71	1.80	0.00	0.00
60.00	3.71	1.80	0.00	0.00
62.00	3.71	1.80	0.00	0.00
64.00	3.71	1.80	0.00	0.00
66.00	3.71	1.80	0.00	0.00
68.00	3.71	1.80	0.00	0.00
70.00	3.71	1.80	0.00	0.00
72.00	3.71	1.80	0.00	0.00
74.00	3.71	1.80	0.00	0.00
76.00	3.71	1.80	0.00	0.00

1119-Post Development-Fields

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

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Summary for Subcatchment G2: Sheet flow into pond

Runoff = 1.73 cfs @ 12.14 hrs, Volume= 0.146 af, Depth= 1.28"

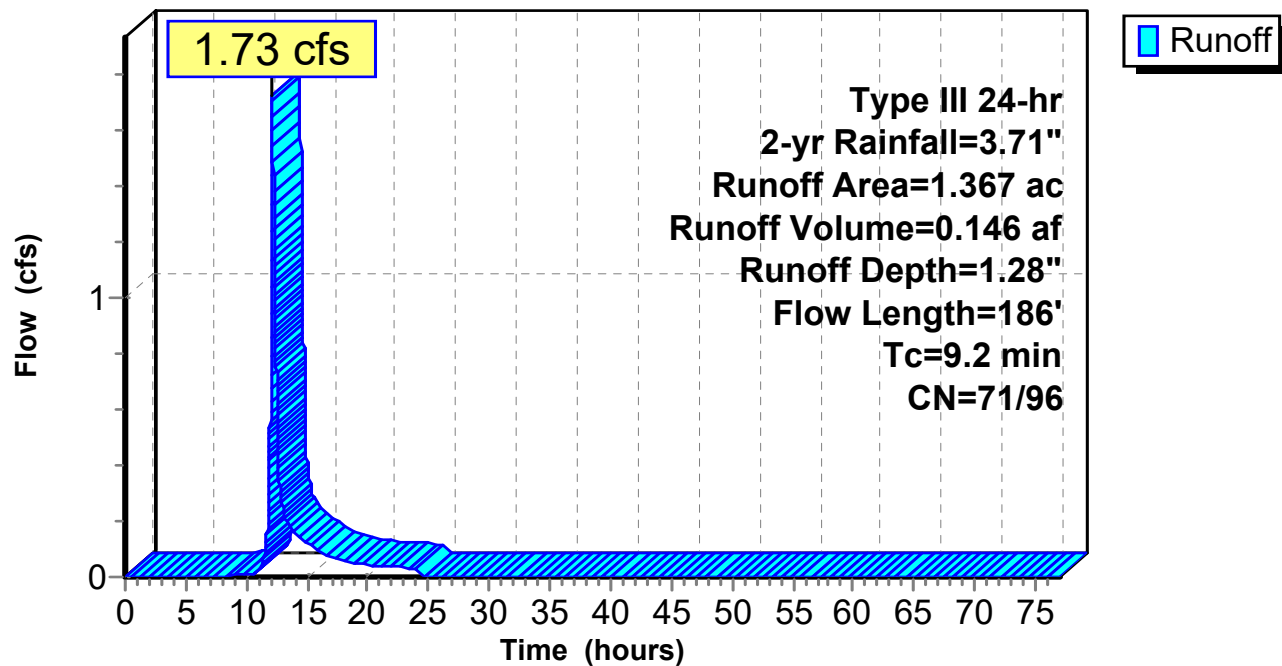
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.591	70	Woods, Good, HSG C
0.548	71	Meadow, non-grazed, HSG C
0.169	78	Meadow, non-grazed, HSG D
0.004	77	Woods, Good, HSG D
* 0.055	96	Gravel surface, 100% imp, HSG C
1.367	72	Weighted Average
1.312	71	95.98% Pervious Area
0.055	96	4.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	7	0.0400	0.05		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
1.9	18	0.5365	0.16		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
2.6	37	0.1569	0.23		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.9	40	0.0902	0.75		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.2	27	0.1333	2.56		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.1	57	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
9.2	186	Total			

Subcatchment G2: Sheet flow into pond

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G2: Sheet flow into pond

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.00
6.00	0.27	0.00	0.06	0.00
8.00	0.42	0.00	0.15	0.00
10.00	0.70	0.00	0.37	0.01
12.00	1.85	0.21	1.43	0.73
14.00	3.01	0.77	2.56	0.16
16.00	3.29	0.93	2.84	0.09
18.00	3.44	1.03	2.99	0.05
20.00	3.55	1.10	3.10	0.04
22.00	3.64	1.15	3.18	0.04
24.00	3.71	1.20	3.25	0.03
26.00	3.71	1.20	3.25	0.00
28.00	3.71	1.20	3.25	0.00
30.00	3.71	1.20	3.25	0.00
32.00	3.71	1.20	3.25	0.00
34.00	3.71	1.20	3.25	0.00
36.00	3.71	1.20	3.25	0.00
38.00	3.71	1.20	3.25	0.00
40.00	3.71	1.20	3.25	0.00
42.00	3.71	1.20	3.25	0.00
44.00	3.71	1.20	3.25	0.00
46.00	3.71	1.20	3.25	0.00
48.00	3.71	1.20	3.25	0.00
50.00	3.71	1.20	3.25	0.00
52.00	3.71	1.20	3.25	0.00
54.00	3.71	1.20	3.25	0.00
56.00	3.71	1.20	3.25	0.00
58.00	3.71	1.20	3.25	0.00
60.00	3.71	1.20	3.25	0.00
62.00	3.71	1.20	3.25	0.00
64.00	3.71	1.20	3.25	0.00
66.00	3.71	1.20	3.25	0.00
68.00	3.71	1.20	3.25	0.00
70.00	3.71	1.20	3.25	0.00
72.00	3.71	1.20	3.25	0.00
74.00	3.71	1.20	3.25	0.00
76.00	3.71	1.20	3.25	0.00

1119-Post Development-Fields

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

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Summary for Reach 15R: U.S. Pike Site Culvert

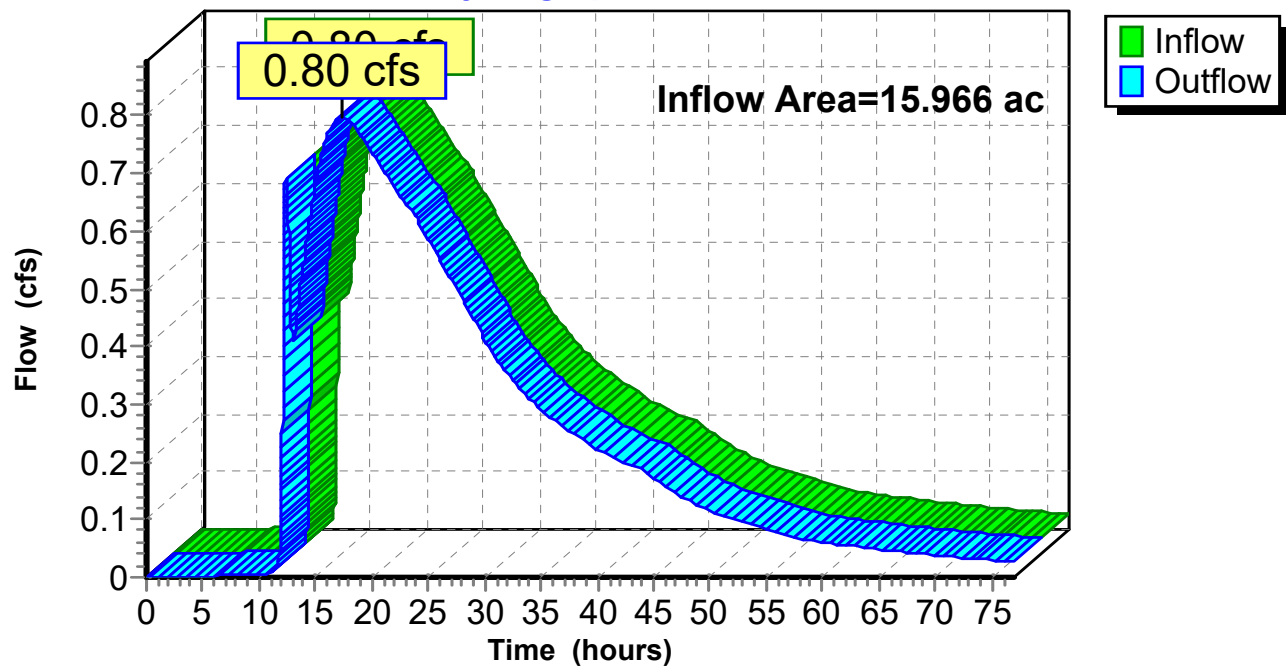
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 15.966 ac, 15.94% Impervious, Inflow Depth > 1.09" for 2-yr event
Inflow = 0.80 cfs @ 17.36 hrs, Volume= 1.453 af
Outflow = 0.80 cfs @ 17.36 hrs, Volume= 1.453 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach 15R: U.S. Pike Site Culvert

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 15R: U.S. Pike Site Culvert

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.09		0.09
1.00	0.00		0.00	54.00	0.09		0.09
2.00	0.00		0.00	55.00	0.08		0.08
3.00	0.00		0.00	56.00	0.08		0.08
4.00	0.00		0.00	57.00	0.07		0.07
5.00	0.00		0.00	58.00	0.07		0.07
6.00	0.00		0.00	59.00	0.06		0.06
7.00	0.00		0.00	60.00	0.06		0.06
8.00	0.00		0.00	61.00	0.06		0.06
9.00	0.00		0.00	62.00	0.06		0.06
10.00	0.01		0.01	63.00	0.05		0.05
11.00	0.01		0.01	64.00	0.05		0.05
12.00	0.15		0.15	65.00	0.05		0.05
13.00	0.41		0.41	66.00	0.05		0.05
14.00	0.55		0.55	67.00	0.04		0.04
15.00	0.68		0.68	68.00	0.04		0.04
16.00	0.76		0.76	69.00	0.04		0.04
17.00	0.80		0.80	70.00	0.04		0.04
18.00	0.79		0.79	71.00	0.04		0.04
19.00	0.77		0.77	72.00	0.03		0.03
20.00	0.74		0.74	73.00	0.03		0.03
21.00	0.70		0.70	74.00	0.03		0.03
22.00	0.68		0.68	75.00	0.03		0.03
23.00	0.65		0.65	76.00	0.03		0.03
24.00	0.62		0.62	77.00	0.03		0.03
25.00	0.58		0.58				
26.00	0.55		0.55				
27.00	0.52		0.52				
28.00	0.48		0.48				
29.00	0.45		0.45				
30.00	0.41		0.41				
31.00	0.38		0.38				
32.00	0.36		0.36				
33.00	0.33		0.33				
34.00	0.31		0.31				
35.00	0.29		0.29				
36.00	0.28		0.28				
37.00	0.26		0.26				
38.00	0.25		0.25				
39.00	0.23		0.23				
40.00	0.22		0.22				
41.00	0.21		0.21				
42.00	0.20		0.20				
43.00	0.19		0.19				
44.00	0.19		0.19				
45.00	0.17		0.17				
46.00	0.16		0.16				
47.00	0.15		0.15				
48.00	0.13		0.13				
49.00	0.12		0.12				
50.00	0.12		0.12				
51.00	0.11		0.11				
52.00	0.10		0.10				

1119-Post Development-Fields

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

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Summary for Reach SP-1: OFFSITE PIKE PROP

[80] Warning: Exceeded Pond 1P by 0.17' @ 12.23 hrs (1.21 cfs 0.071 af)

Inflow Area = 15.966 ac, 15.94% Impervious, Inflow Depth > 1.09" for 2-yr event
Inflow = 1.49 cfs @ 12.10 hrs, Volume= 1.456 af
Outflow = 0.80 cfs @ 17.36 hrs, Volume= 1.453 af, Atten= 46%, Lag= 315.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.29 fps, Min. Travel Time= 28.5 min

Avg. Velocity= 0.17 fps, Avg. Travel Time= 47.7 min

Peak Storage= 1,366 cf @ 17.36 hrs

Average Depth at Peak Storage= 0.28'

Bank-Full Depth= 3.00' Flow Area= 100.0 sf, Capacity= 139.53 cfs

50.00' x 3.00' deep Parabolic Channel, n= 0.120

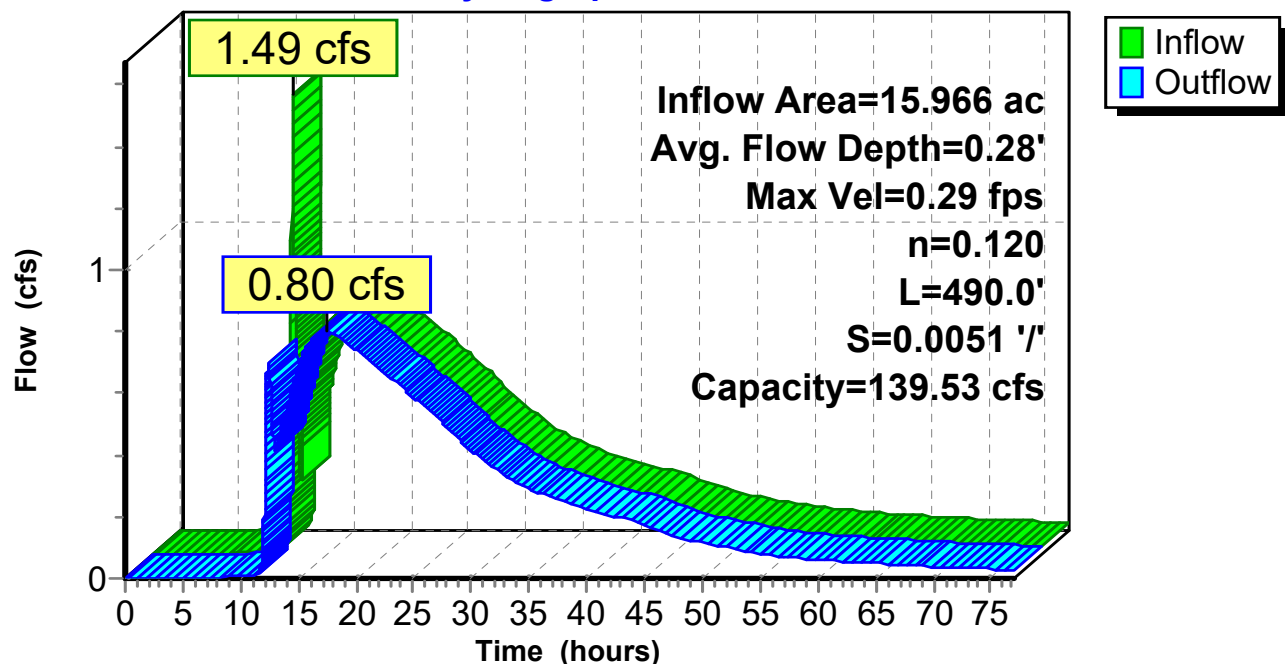
Length= 490.0' Slope= 0.0051 '/'

Inlet Invert= 24.00', Outlet Invert= 21.50'



Reach SP-1: OFFSITE PIKE PROP

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-1: OFFSITE PIKE PROP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	24.00	0.00
2.00	0.00	0	24.00	0.00
4.00	0.00	4	24.00	0.00
6.00	0.00	15	24.01	0.00
8.00	0.01	27	24.02	0.00
10.00	0.01	42	24.03	0.01
12.00	0.75	430	24.13	0.15
14.00	0.60	1,058	24.23	0.55
16.00	0.78	1,326	24.27	0.76
18.00	0.79	1,359	24.27	0.79
20.00	0.72	1,291	24.27	0.74
22.00	0.67	1,217	24.26	0.68
24.00	0.61	1,151	24.25	0.62
26.00	0.54	1,057	24.23	0.55
28.00	0.47	966	24.22	0.48
30.00	0.40	867	24.20	0.41
32.00	0.34	779	24.19	0.36
34.00	0.30	708	24.18	0.31
36.00	0.27	652	24.17	0.28
38.00	0.24	604	24.16	0.25
40.00	0.22	563	24.15	0.22
42.00	0.20	528	24.15	0.20
44.00	0.18	496	24.14	0.19
46.00	0.15	444	24.13	0.16
48.00	0.13	395	24.12	0.13
50.00	0.11	356	24.11	0.12
52.00	0.10	322	24.10	0.10
54.00	0.08	293	24.10	0.09
56.00	0.07	268	24.09	0.08
58.00	0.06	246	24.09	0.07
60.00	0.06	229	24.08	0.06
62.00	0.05	213	24.08	0.06
64.00	0.05	198	24.08	0.05
66.00	0.04	185	24.07	0.05
68.00	0.04	173	24.07	0.04
70.00	0.04	162	24.07	0.04
72.00	0.03	152	24.06	0.03
74.00	0.03	144	24.06	0.03
76.00	0.03	136	24.06	0.03

1119-Post Development-Fields

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

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Summary for Reach SP-2: OFFSITE TO 266-1

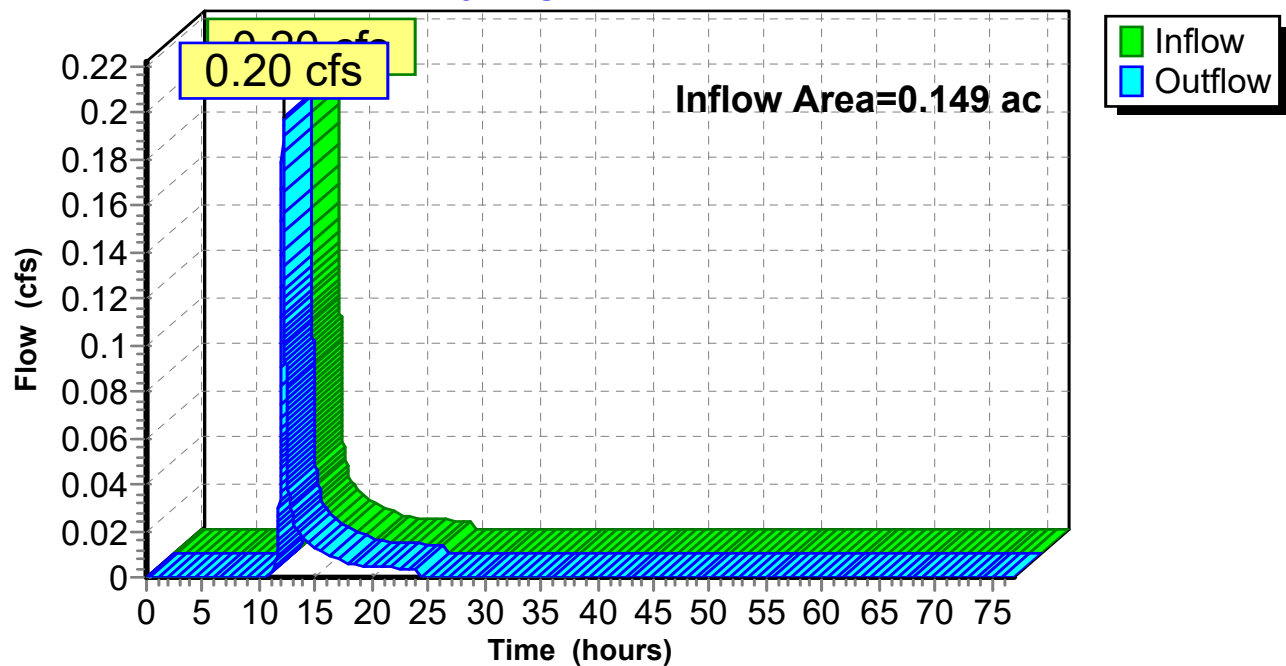
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.149 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-yr event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af
Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-2: OFFSITE TO 266-1

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-2: OFFSITE TO 266-1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.00		0.00	58.00	0.00		0.00
6.00	0.00		0.00	59.00	0.00		0.00
7.00	0.00		0.00	60.00	0.00		0.00
8.00	0.00		0.00	61.00	0.00		0.00
9.00	0.00		0.00	62.00	0.00		0.00
10.00	0.00		0.00	63.00	0.00		0.00
11.00	0.00		0.00	64.00	0.00		0.00
12.00	0.10		0.10	65.00	0.00		0.00
13.00	0.02		0.02	66.00	0.00		0.00
14.00	0.02		0.02	67.00	0.00		0.00
15.00	0.01		0.01	68.00	0.00		0.00
16.00	0.01		0.01	69.00	0.00		0.00
17.00	0.01		0.01	70.00	0.00		0.00
18.00	0.01		0.01	71.00	0.00		0.00
19.00	0.01		0.01	72.00	0.00		0.00
20.00	0.00		0.00	73.00	0.00		0.00
21.00	0.00		0.00	74.00	0.00		0.00
22.00	0.00		0.00	75.00	0.00		0.00
23.00	0.00		0.00	76.00	0.00		0.00
24.00	0.00		0.00	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

1119-Post Development-Fields

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

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Summary for Reach SP-3: SW WETLANDS

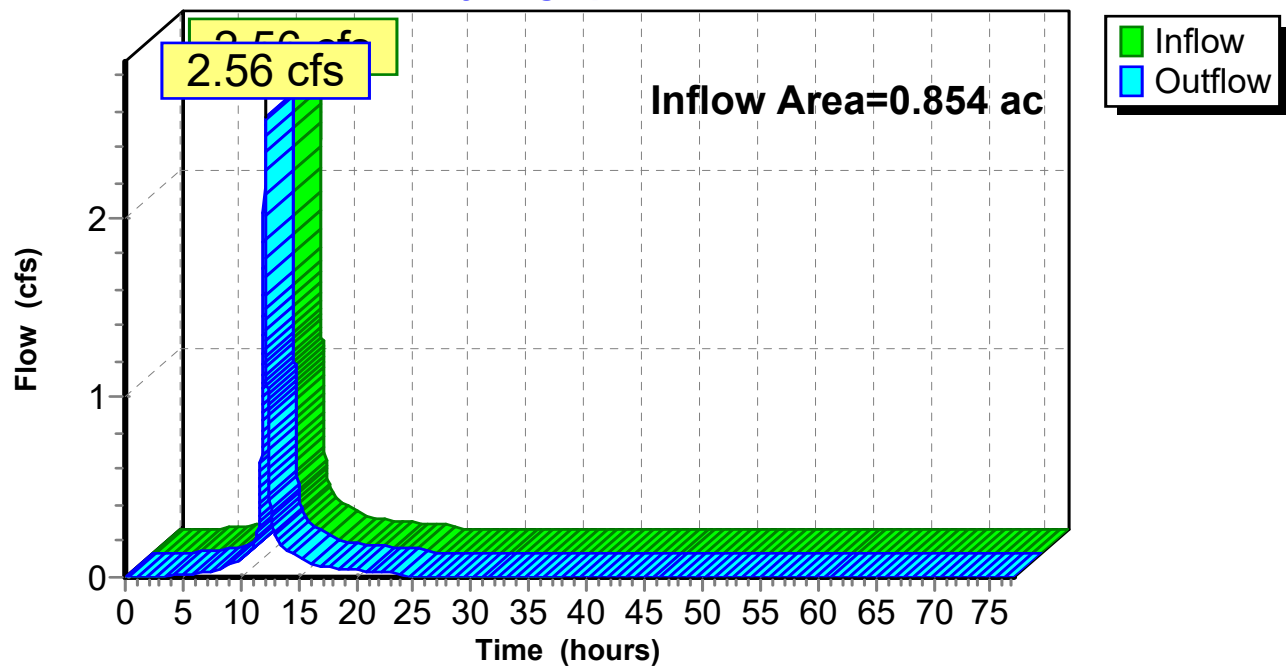
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.854 ac, 76.35% Impervious, Inflow Depth = 2.80" for 2-yr event
Inflow = 2.56 cfs @ 12.09 hrs, Volume= 0.199 af
Outflow = 2.56 cfs @ 12.09 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-3: SW WETLANDS

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-3: SW WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.01		0.01	57.00	0.00		0.00
5.00	0.01		0.01	58.00	0.00		0.00
6.00	0.02		0.02	59.00	0.00		0.00
7.00	0.03		0.03	60.00	0.00		0.00
8.00	0.04		0.04	61.00	0.00		0.00
9.00	0.07		0.07	62.00	0.00		0.00
10.00	0.10		0.10	63.00	0.00		0.00
11.00	0.16		0.16	64.00	0.00		0.00
12.00	1.57		1.57	65.00	0.00		0.00
13.00	0.23		0.23	66.00	0.00		0.00
14.00	0.15		0.15	67.00	0.00		0.00
15.00	0.11		0.11	68.00	0.00		0.00
16.00	0.08		0.08	69.00	0.00		0.00
17.00	0.06		0.06	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.04		0.04	72.00	0.00		0.00
20.00	0.04		0.04	73.00	0.00		0.00
21.00	0.04		0.04	74.00	0.00		0.00
22.00	0.03		0.03	75.00	0.00		0.00
23.00	0.03		0.03	76.00	0.00		0.00
24.00	0.03		0.03	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

1119-Post Development-Fields

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

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Summary for Reach SP-4: SE WETLANDS

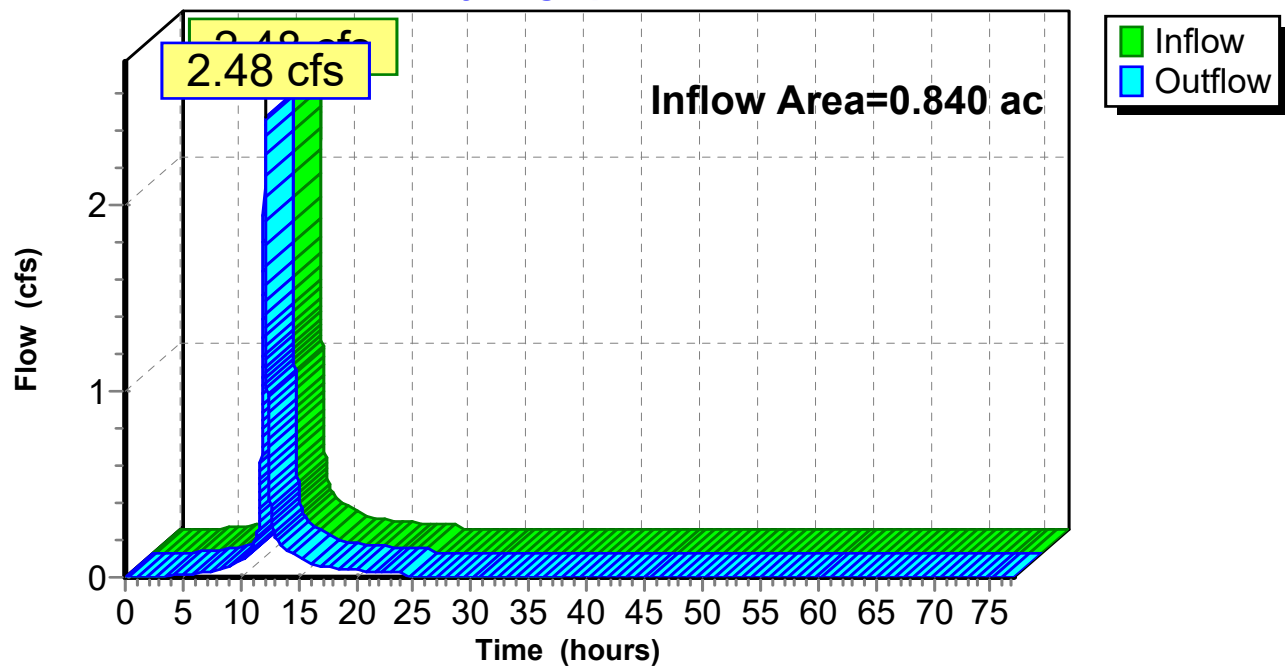
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.840 ac, 69.52% Impervious, Inflow Depth = 2.70" for 2-yr event
Inflow = 2.48 cfs @ 12.09 hrs, Volume= 0.189 af
Outflow = 2.48 cfs @ 12.09 hrs, Volume= 0.189 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-4: SE WETLANDS

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-4: SE WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.01		0.01	57.00	0.00		0.00
5.00	0.01		0.01	58.00	0.00		0.00
6.00	0.02		0.02	59.00	0.00		0.00
7.00	0.03		0.03	60.00	0.00		0.00
8.00	0.04		0.04	61.00	0.00		0.00
9.00	0.06		0.06	62.00	0.00		0.00
10.00	0.09		0.09	63.00	0.00		0.00
11.00	0.15		0.15	64.00	0.00		0.00
12.00	1.51		1.51	65.00	0.00		0.00
13.00	0.22		0.22	66.00	0.00		0.00
14.00	0.14		0.14	67.00	0.00		0.00
15.00	0.11		0.11	68.00	0.00		0.00
16.00	0.08		0.08	69.00	0.00		0.00
17.00	0.06		0.06	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.04		0.04	72.00	0.00		0.00
20.00	0.04		0.04	73.00	0.00		0.00
21.00	0.03		0.03	74.00	0.00		0.00
22.00	0.03		0.03	75.00	0.00		0.00
23.00	0.03		0.03	76.00	0.00		0.00
24.00	0.02		0.02	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

1119-Post Development-Fields

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

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Summary for Pond 1P: EX. POND-2

Inflow Area = 14.751 ac, 17.19% Impervious, Inflow Depth = 1.18" for 2-yr event
 Inflow = 7.07 cfs @ 12.34 hrs, Volume= 1.455 af
 Outflow = 0.74 cfs @ 17.47 hrs, Volume= 1.333 af, Atten= 90%, Lag= 308.1 min
 Primary = 0.74 cfs @ 17.47 hrs, Volume= 1.333 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Starting Elev= 24.00' Surf.Area= 89,800 sf Storage= 404,338 cf

Peak Elev= 24.31' @ 17.41 hrs Surf.Area= 91,982 sf Storage= 432,667 cf (28,329 cf above start)

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

Center-of-Mass det. time= 662.4 min (1,769.9 - 1,107.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	817,738 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	0	0	0
22.34	81,800	259,306	259,306
22.50	83,600	13,232	272,538
23.00	88,000	42,900	315,438
24.00	89,800	88,900	404,338
25.00	96,800	93,300	497,638
26.00	103,800	100,300	597,938
27.00	110,900	107,350	705,288
28.00	114,000	112,450	817,738

Device	Routing	Invert	Outlet Devices
#1	Primary	23.92'	53.0" W x 41.0" H, R=28.1"/73.4" Pipe Arch CMP_Arch_1 53x41 w/ 19.0" ins L= 61.3' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.34' / 21.91' S= 0.0070 '/' Cc= 0.900 n= 0.022, Flow Area= 6.21 sf
#2	Secondary	27.39'	Asymmetrical Weir, C= 2.63 Offset (feet) 0.00 52.00 83.00 94.00 134.00 Elev. (feet) 28.00 27.50 27.39 27.50 28.00

Primary OutFlow Max=0.74 cfs @ 17.47 hrs HW=24.31' TW=24.28' (Dynamic Tailwater)↑**1=CMP_Arch_1 53x41** (Outlet Controls 0.74 cfs @ 0.58 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=24.00' TW=24.00' (Dynamic Tailwater)↑**2=Asymmetrical Weir** (Controls 0.00 cfs)

1119-Post Development-Fields

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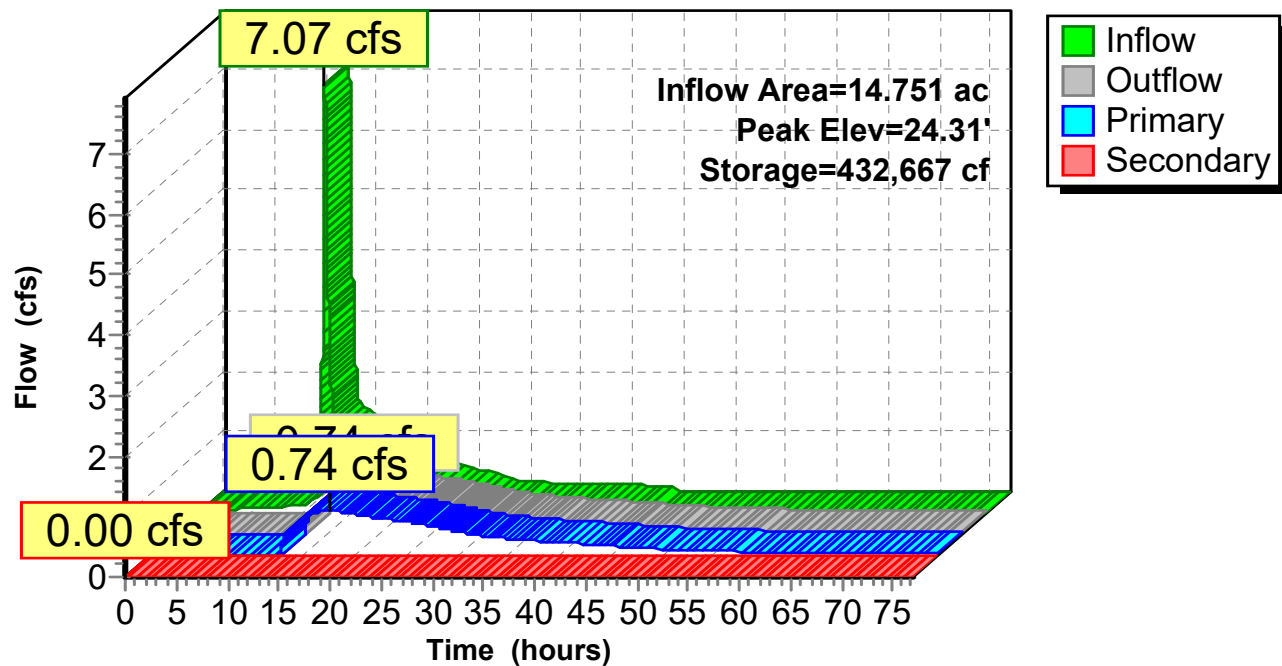
Type III 24-hr 2-yr Rainfall=3.71"

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Pond 1P: EX. POND-2

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 1P: EX. POND-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	404,338	24.00	0.00	0.00	0.00
2.00	0.00	404,338	24.00	0.00	0.00	0.00
4.00	0.06	404,563	24.00	0.00	0.00	0.00
6.00	0.10	405,148	24.01	0.00	0.00	0.00
8.00	0.11	405,848	24.02	0.00	0.00	0.00
10.00	0.13	406,647	24.03	0.01	0.01	0.00
12.00	1.37	408,620	24.05	0.00	0.00	0.00
14.00	1.41	427,439	24.25	0.47	0.47	0.00
16.00	1.01	432,003	24.30	0.70	0.70	0.00
18.00	0.66	432,575	24.31	0.74	0.74	0.00
20.00	0.52	431,531	24.30	0.69	0.69	0.00
22.00	0.49	430,390	24.29	0.63	0.63	0.00
24.00	0.45	429,379	24.28	0.59	0.59	0.00
26.00	0.34	428,013	24.26	0.54	0.54	0.00
28.00	0.24	426,473	24.24	0.47	0.47	0.00
30.00	0.17	424,766	24.23	0.40	0.40	0.00
32.00	0.15	423,224	24.21	0.34	0.34	0.00
34.00	0.14	421,978	24.19	0.30	0.30	0.00
36.00	0.14	420,939	24.18	0.27	0.27	0.00
38.00	0.13	420,048	24.17	0.24	0.24	0.00
40.00	0.12	419,274	24.17	0.22	0.22	0.00
42.00	0.11	418,587	24.16	0.20	0.20	0.00
44.00	0.10	417,956	24.15	0.18	0.18	0.00
46.00	0.00	416,872	24.14	0.15	0.15	0.00
48.00	0.00	415,875	24.13	0.13	0.13	0.00
50.00	0.00	415,023	24.12	0.11	0.11	0.00
52.00	0.00	414,282	24.11	0.10	0.10	0.00
54.00	0.00	413,636	24.10	0.08	0.08	0.00
56.00	0.00	413,073	24.10	0.07	0.07	0.00
58.00	0.00	412,580	24.09	0.06	0.06	0.00
60.00	0.00	412,134	24.09	0.06	0.06	0.00
62.00	0.00	411,730	24.08	0.05	0.05	0.00
64.00	0.00	411,363	24.08	0.05	0.05	0.00
66.00	0.00	411,031	24.07	0.04	0.04	0.00
68.00	0.00	410,729	24.07	0.04	0.04	0.00
70.00	0.00	410,455	24.07	0.04	0.04	0.00
72.00	0.00	410,206	24.07	0.03	0.03	0.00
74.00	0.00	409,980	24.06	0.03	0.03	0.00
76.00	0.00	409,774	24.06	0.03	0.03	0.00

1119-Post Development-Fields

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

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Summary for Pond 2P: BMP-2 Field-SGWL

Inflow Area = 3.859 ac, 64.27% Impervious, Inflow Depth = 2.69" for 2-yr event
 Inflow = 7.13 cfs @ 12.12 hrs, Volume= 0.866 af
 Outflow = 5.71 cfs @ 12.35 hrs, Volume= 0.865 af, Atten= 20%, Lag= 13.9 min
 Primary = 5.71 cfs @ 12.35 hrs, Volume= 0.865 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs
 Starting Elev= 25.75' Surf.Area= 2,520 sf Storage= 4,368 cf
 Peak Elev= 28.21' @ 12.35 hrs Surf.Area= 6,961 sf Storage= 17,441 cf (13,073 cf above start)
 Flood Elev= 29.42' Surf.Area= 10,957 sf Storage= 33,542 cf (29,174 cf above start)

Plug-Flow detention time= 513.7 min calculated for 0.764 af (88% of inflow)
 Center-of-Mass det. time= 377.3 min (1,156.4 - 779.1)

Volume	Invert	Avail.Storage	Storage Description
#1	26.50'	8,791 cf	Sed. Forebay & connecting swales (Prismatic) Listed below (Recalc)
#2	23.50'	14,506 cf	CELL #1 (Prismatic) Listed below
#3	23.50'	14,188 cf	CELL #2 Listed below
		37,485 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.50	279	0	0
27.17	500	261	261
27.50	970	243	504
27.92	1,910	605	1,108
28.00	2,130	162	1,270
28.22	3,100	575	1,845
28.50	3,550	931	2,776
29.00	4,900	2,113	4,889
29.67	6,750	3,903	8,791

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.50	2,520	0.0	0	0
25.50	2,520	40.0	2,016	2,016
25.75	2,520	35.0	221	2,237
26.50	2,520	2.0	38	2,274
26.51	2,730	100.0	26	2,301
27.17	3,150	100.0	1,940	4,241
27.75	3,530	100.0	1,937	6,178
27.92	3,650	100.0	610	6,788
28.00	3,707	100.0	294	7,083
28.17	3,824	100.0	640	7,723
28.18	3,880	100.0	39	7,761
28.42	4,065	100.0	953	8,715
28.50	4,260	100.0	333	9,048
29.67	5,070	100.0	5,458	14,506

1119-Post Development-Fields

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

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Elevation (feet)	Cum.Store (cubic-feet)
23.50	0
25.58	1,984
25.83	2,201
26.50	2,238
26.51	2,264
27.17	4,151
27.75	6,057
27.92	6,660
28.00	6,951
28.17	7,586
28.18	7,624
28.42	8,571
28.50	8,896
29.00	11,036
29.67	14,188

Device	Routing	Invert	Outlet Devices
#1	Primary	25.25'	24.0" Round Culvert L= 27.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.25' / 24.90' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	25.83'	2.2" Vert. WQV Orifice C= 0.600
#3	Device 1	28.00'	4.0" x 4.0" Horiz. High-flow Bypass-1-Orifice X 13.00 columns X 5 rows C= 0.600 in 72.0" x 33.0" Grate (44% open area) Limited to weir flow at low heads
#4	Secondary	28.60'	10.0' long x 8.0' breadth Emergency overflow-1-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
#5	Secondary	28.60'	152.0 deg Emergency overflow-2-Sharp-Crested Vee/Trap Weir Cv= 1.97 (C= 2.46)

Primary OutFlow Max=5.71 cfs @ 12.35 hrs HW=28.21' TW=24.11' (Dynamic Tailwater)

- 1=Culvert (Passes 5.71 cfs of 21.18 cfs potential flow)
- 2=WQV Orifice (Orifice Controls 0.19 cfs @ 7.28 fps)
- 3=High-flow Bypass-1-Orifice (Weir Controls 5.52 cfs @ 1.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.75' TW=24.00' (Dynamic Tailwater)

- 4=Emergency overflow-1-Broad-Crested Rectangular Weir (Controls 0.00 cfs)
- 5=Emergency overflow-2-Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

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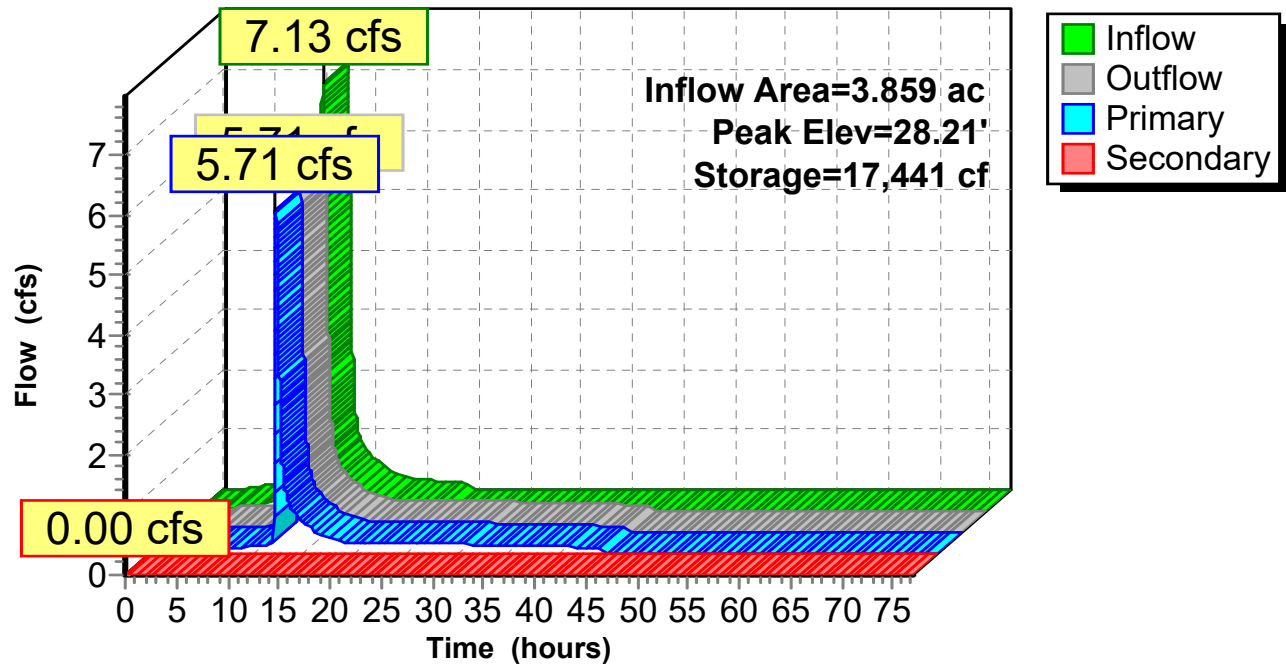
Type III 24-hr 2-yr Rainfall=3.71"

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Pond 2P: BMP-2 Field-SGWL

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 2P: BMP-2 Field-SGWL

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	4,368	25.75	0.00	0.00	0.00
2.00	0.02	4,393	25.78	0.00	0.00	0.00
4.00	0.07	4,477	26.16	0.06	0.06	0.00
6.00	0.11	4,525	26.50	0.10	0.10	0.00
8.00	0.20	4,908	26.57	0.10	0.10	0.00
10.00	0.40	6,251	26.78	0.12	0.12	0.00
12.00	4.45	12,114	27.63	0.17	0.17	0.00
14.00	0.67	15,732	28.04	0.71	0.71	0.00
16.00	0.36	15,528	28.02	0.39	0.39	0.00
18.00	0.22	15,393	28.01	0.23	0.23	0.00
20.00	0.17	15,303	28.00	0.18	0.18	0.00
22.00	0.14	15,096	27.98	0.18	0.18	0.00
24.00	0.11	14,696	27.94	0.18	0.18	0.00
26.00	0.00	13,506	27.80	0.17	0.17	0.00
28.00	0.00	12,276	27.65	0.17	0.17	0.00
30.00	0.00	11,098	27.50	0.16	0.16	0.00
32.00	0.00	9,975	27.35	0.15	0.15	0.00
34.00	0.00	8,909	27.21	0.14	0.14	0.00
36.00	0.00	7,904	27.05	0.14	0.14	0.00
38.00	0.00	6,965	26.90	0.13	0.13	0.00
40.00	0.00	6,094	26.76	0.12	0.12	0.00
42.00	0.00	5,290	26.63	0.11	0.11	0.00
44.00	0.00	4,555	26.51	0.10	0.10	0.00
46.00	0.00	4,442	25.84	0.00	0.00	0.00
48.00	0.00	4,442	25.83	0.00	0.00	0.00
50.00	0.00	4,442	25.83	0.00	0.00	0.00
52.00	0.00	4,442	25.83	0.00	0.00	0.00
54.00	0.00	4,442	25.83	0.00	0.00	0.00
56.00	0.00	4,442	25.83	0.00	0.00	0.00
58.00	0.00	4,442	25.83	0.00	0.00	0.00
60.00	0.00	4,442	25.83	0.00	0.00	0.00
62.00	0.00	4,442	25.83	0.00	0.00	0.00
64.00	0.00	4,442	25.83	0.00	0.00	0.00
66.00	0.00	4,442	25.83	0.00	0.00	0.00
68.00	0.00	4,442	25.83	0.00	0.00	0.00
70.00	0.00	4,442	25.83	0.00	0.00	0.00
72.00	0.00	4,442	25.83	0.00	0.00	0.00
74.00	0.00	4,442	25.83	0.00	0.00	0.00
76.00	0.00	4,442	25.83	0.00	0.00	0.00

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Summary for Pond 3P: BMP-1 Phase-1_Storage

Inflow Area = 6.247 ac, 0.00% Impervious, Inflow Depth = 1.39" for 2-yr event
 Inflow = 6.97 cfs @ 12.26 hrs, Volume= 0.722 af
 Outflow = 0.64 cfs @ 14.83 hrs, Volume= 0.720 af, Atten= 91%, Lag= 154.3 min
 Discarded = 0.08 cfs @ 12.09 hrs, Volume= 0.389 af
 Primary = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs
 Peak Elev= 30.99' @ 14.83 hrs Surf.Area= 6,462 sf Storage= 18,235 cf
 Flood Elev= 36.40' Surf.Area= 205,297 sf Storage= 77,169 cf

Plug-Flow detention time= 999.0 min calculated for 0.720 af (100% of inflow)
 Center-of-Mass det. time= 997.8 min (1,861.8 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	25.80'	2,894 cf	Chambers to 9" below EG (Prismatic) Listed below (Recalc) 7,235 cf Overall x 40.0% Voids
#2B	27.80'	11,438 cf	28.50'W x 224.47'L x 7.20'H Field B -Impervious 46,061 cf Overall - 17,466 cf Embedded = 28,595 cf x 40.0% Voids
#3B	28.55'	17,466 cf	ADS_StormTech MC-4500 +Cap x 162 Inside #2 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 162 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#4	35.00'	480 cf	Top of chamber to field base (Prismatic) Listed below (Recalc) 1,922 cf Overall x 25.0% Voids
#5	31.40'	298 cf	12.0" Round Pipe Storage, west-1, Phase 1 -Impervious L= 380.0' S= 0.0051 '/'
#6	28.62'	433 cf	18.0" Round Pipe Storage, north-1 L= 245.0' S= 0.0050 '/'
#7	31.71'	298 cf	12.0" Round Pipe Storage, center-1, Phase 1 -Impervious L= 380.0' S= 0.0050 '/'
#8	30.17'	298 cf	12.0" Round Pipe Storage, east-1, Phase 1 -Impervious L= 380.0' S= 0.0050 '/'
#9	34.90'	21,781 cf	Field #1 Base (1/2) (Prismatic) Listed below (Recalc) x 2 87,125 cf Overall x 25.0% Voids
#10	34.90'	21,781 cf	Field #2 Base (Prismatic) Listed below (Recalc) x 2 87,125 cf Overall x 25.0% Voids
		77,169 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
25.80	0	0	0
25.90	250	12	12
26.00	598	42	55
26.50	2,813	853	908
27.00	4,659	1,868	2,776
27.50	5,837	2,624	5,400
27.80	6,397	1,835	7,235

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	6,397	0	0
35.59	115	1,921	1,921
35.60	0	1	1,922

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	0	0	0
35.00	3,704	185	185
35.60	49,725	16,029	16,214
36.15	49,725	27,349	43,563

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	0	0	0
35.00	3,704	185	185
35.60	49,725	16,029	16,214
36.15	49,725	27,349	43,563

Device	Routing	Invert	Outlet Devices
#1	Primary	27.64'	18.0" Round HDPE 18" L= 56.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.64' / 27.36' S= 0.0050 1' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	29.75'	3.0" Vert. 3" Orifice/Grate C= 0.600
#3	Device 1	30.65'	7.0" Vert. 7" Orifice/Grate C= 0.600
#4	Device 1	34.25'	3.0" Vert. 3" Orifice/Grate C= 0.600
#5	Discarded	25.90'	0.550 in/hr Exfiltration over Surface area from 25.90' - 27.80' Excluded Surface area = 250 sf

Discarded OutFlow Max=0.08 cfs @ 12.09 hrs HW=27.81' (Free Discharge)↑ **5=Exfiltration** (Exfiltration Controls 0.08 cfs)**Primary OutFlow** Max=0.57 cfs @ 14.83 hrs HW=30.99' TW=27.89' (Dynamic Tailwater)↑ **1=HDPE 18"** (Passes 0.57 cfs of 13.41 cfs potential flow)↑ **2=3" Orifice/Grate** (Orifice Controls 0.25 cfs @ 5.08 fps)↑ **3=7" Orifice/Grate** (Orifice Controls 0.32 cfs @ 1.98 fps)↑ **4=3" Orifice/Grate** (Controls 0.00 cfs)

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

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Pond 3P: BMP-1 Phase-1_Storage - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

54 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 222.47' Row Length +12.0" End Stone x 2 = 224.47' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

9.0" Base + 60.0" Chamber Height + 17.4" Cover = 7.20' Field Height

162 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 3 Rows = 17,465.6 cf Chamber Storage

46,060.6 cf Field - 17,465.6 cf Chambers = 28,594.9 cf Stone x 40.0% Voids = 11,438.0 cf Stone Storage

Chamber Storage + Stone Storage = 28,903.6 cf = 0.664 af

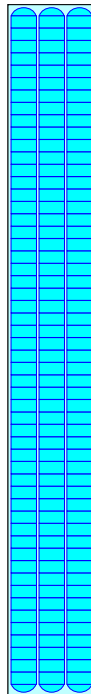
Overall Storage Efficiency = 62.8%

Overall System Size = 224.47' x 28.50' x 7.20'

162 Chambers

1,705.9 cy Field

1,059.1 cy Stone



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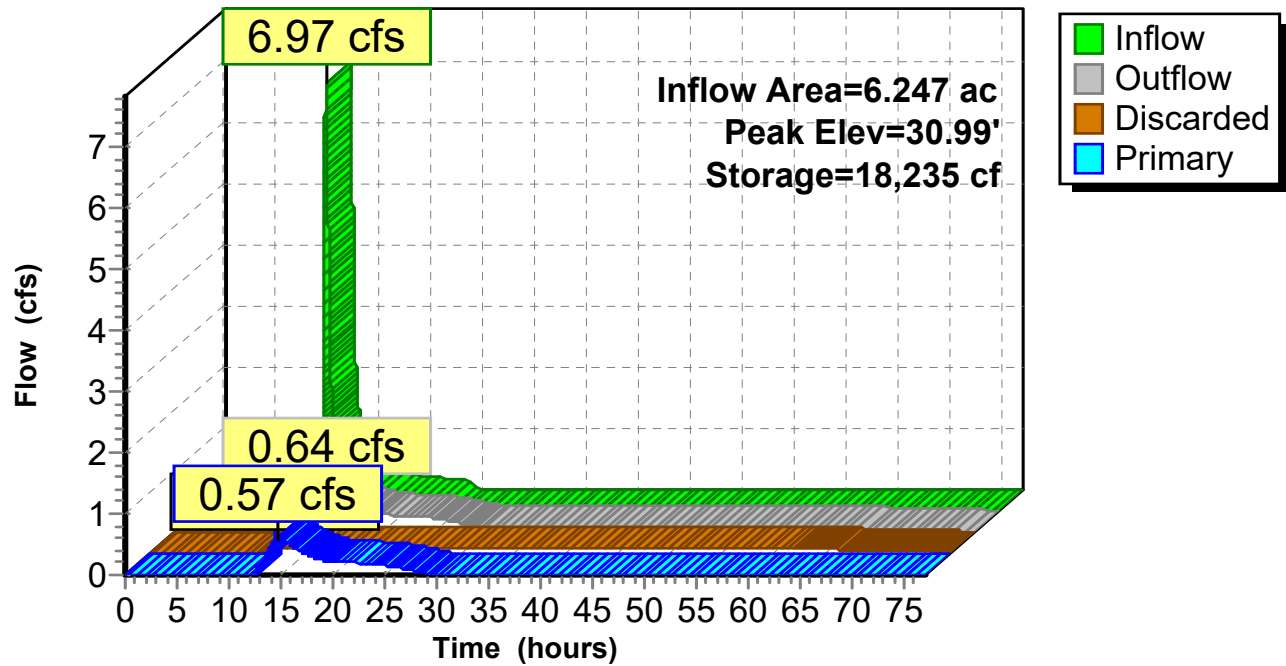
Type III 24-hr 2-yr Rainfall=3.71"

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Pond 3P: BMP-1 Phase-1_Storage

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 3P: BMP-1 Phase-1_Storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	25.80	0.00	0.00	0.00
2.00	0.00	0	25.80	0.00	0.00	0.00
4.00	0.00	0	25.80	0.00	0.00	0.00
6.00	0.00	0	25.80	0.00	0.00	0.00
8.00	0.00	0	25.80	0.00	0.00	0.00
10.00	0.00	0	25.80	0.00	0.00	0.00
12.00	2.24	1,987	27.42	0.07	0.07	0.00
14.00	0.82	17,934	30.93	0.55	0.08	0.47
16.00	0.45	17,970	30.94	0.56	0.08	0.48
18.00	0.28	17,241	30.80	0.37	0.08	0.30
20.00	0.22	16,635	30.68	0.29	0.08	0.22
22.00	0.18	16,026	30.57	0.27	0.08	0.20
24.00	0.15	15,296	30.43	0.25	0.08	0.18
26.00	0.00	13,773	30.15	0.20	0.08	0.12
28.00	0.00	12,540	29.93	0.13	0.08	0.06
30.00	0.00	11,792	29.80	0.08	0.08	0.01
32.00	0.00	11,222	29.70	0.08	0.08	0.00
34.00	0.00	10,658	29.60	0.08	0.08	0.00
36.00	0.00	10,095	29.50	0.08	0.08	0.00
38.00	0.00	9,531	29.40	0.08	0.08	0.00
40.00	0.00	8,968	29.30	0.08	0.08	0.00
42.00	0.00	8,404	29.20	0.08	0.08	0.00
44.00	0.00	7,841	29.10	0.08	0.08	0.00
46.00	0.00	7,277	28.99	0.08	0.08	0.00
48.00	0.00	6,714	28.89	0.08	0.08	0.00
50.00	0.00	6,150	28.79	0.08	0.08	0.00
52.00	0.00	5,587	28.69	0.08	0.08	0.00
54.00	0.00	5,023	28.59	0.08	0.08	0.00
56.00	0.00	4,460	28.41	0.08	0.08	0.00
58.00	0.00	3,896	28.19	0.08	0.08	0.00
60.00	0.00	3,333	27.97	0.08	0.08	0.00
62.00	0.00	2,770	27.75	0.08	0.08	0.00
64.00	0.00	2,234	27.53	0.07	0.07	0.00
66.00	0.00	1,739	27.31	0.07	0.07	0.00
68.00	0.00	1,291	27.09	0.06	0.06	0.00
70.00	0.00	894	26.88	0.05	0.05	0.00
72.00	0.00	567	26.66	0.04	0.04	0.00
74.00	0.00	313	26.45	0.03	0.03	0.00
76.00	0.00	138	26.25	0.02	0.02	0.00

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Summary for Pond 4P: PDMH-4

Inflow Area = 6.430 ac, 0.00% Impervious, Inflow Depth = 0.65" for 2-yr event
Inflow = 0.58 cfs @ 14.81 hrs, Volume= 0.350 af
Outflow = 0.58 cfs @ 14.81 hrs, Volume= 0.350 af, Atten= 0%, Lag= 0.0 min
Primary = 0.58 cfs @ 14.81 hrs, Volume= 0.350 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 27.05' @ 14.81 hrs

Flood Elev= 31.50'

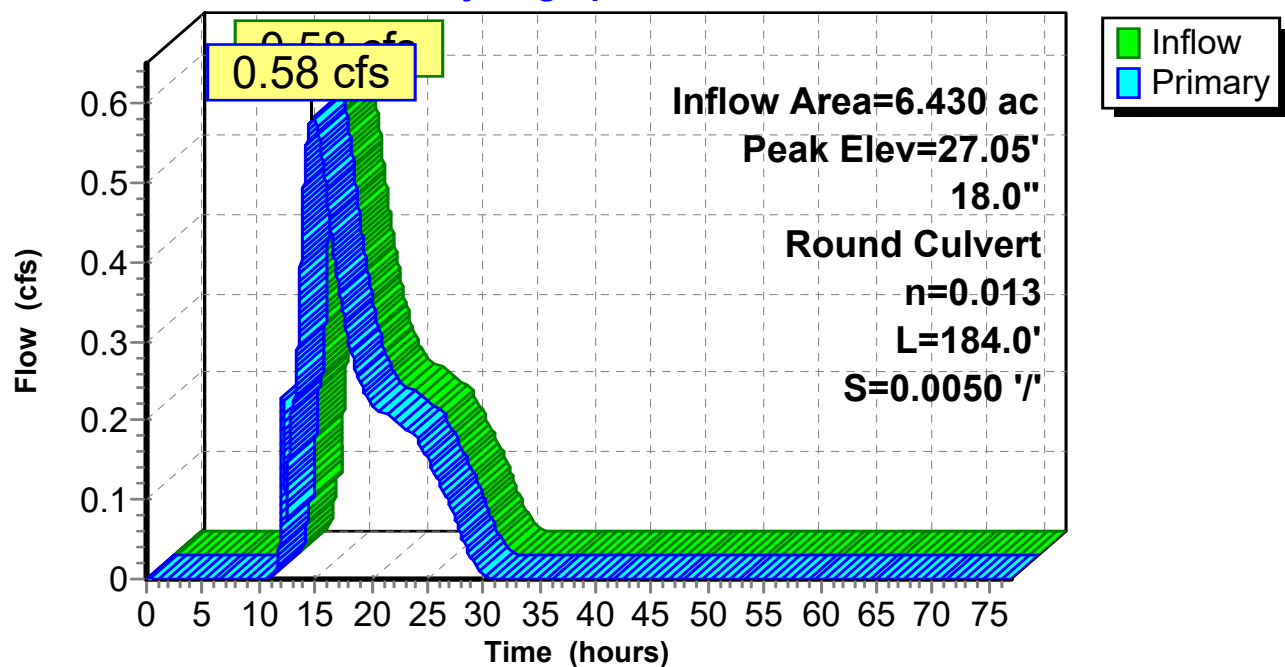
Device	Routing	Invert	Outlet Devices
#1	Primary	26.67'	18.0" Round RCP_Round 18" L= 184.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.67' / 25.75' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.58 cfs @ 14.81 hrs HW=27.05' TW=24.28' (Dynamic Tailwater)

↑1=RCP_Round 18" (Barrel Controls 0.58 cfs @ 2.46 fps)

Pond 4P: PDMH-4

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 4P: PDMH-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	26.67	0.00	53.00	0.00	26.67	0.00
1.00	0.00	26.67	0.00	54.00	0.00	26.67	0.00
2.00	0.00	26.67	0.00	55.00	0.00	26.67	0.00
3.00	0.00	26.67	0.00	56.00	0.00	26.67	0.00
4.00	0.00	26.67	0.00	57.00	0.00	26.67	0.00
5.00	0.00	26.67	0.00	58.00	0.00	26.67	0.00
6.00	0.00	26.67	0.00	59.00	0.00	26.67	0.00
7.00	0.00	26.67	0.00	60.00	0.00	26.67	0.00
8.00	0.00	26.67	0.00	61.00	0.00	26.67	0.00
9.00	0.00	26.67	0.00	62.00	0.00	26.67	0.00
10.00	0.00	26.67	0.00	63.00	0.00	26.67	0.00
11.00	0.00	26.70	0.00	64.00	0.00	26.67	0.00
12.00	0.11	26.84	0.11	65.00	0.00	26.67	0.00
13.00	0.22	26.91	0.22	66.00	0.00	26.67	0.00
14.00	0.49	27.02	0.49	67.00	0.00	26.67	0.00
15.00	0.58	27.05	0.58	68.00	0.00	26.67	0.00
16.00	0.49	27.02	0.49	69.00	0.00	26.67	0.00
17.00	0.38	26.98	0.38	70.00	0.00	26.67	0.00
18.00	0.30	26.95	0.30	71.00	0.00	26.67	0.00
19.00	0.25	26.92	0.25	72.00	0.00	26.67	0.00
20.00	0.22	26.91	0.22	73.00	0.00	26.67	0.00
21.00	0.21	26.90	0.21	74.00	0.00	26.67	0.00
22.00	0.20	26.90	0.20	75.00	0.00	26.67	0.00
23.00	0.19	26.89	0.19	76.00	0.00	26.67	0.00
24.00	0.18	26.89	0.18	77.00	0.00	26.67	0.00
25.00	0.15	26.87	0.15				
26.00	0.12	26.85	0.12				
27.00	0.09	26.83	0.09				
28.00	0.06	26.79	0.06				
29.00	0.02	26.75	0.02				
30.00	0.01	26.71	0.01				
31.00	0.00	26.67	0.00				
32.00	0.00	26.67	0.00				
33.00	0.00	26.67	0.00				
34.00	0.00	26.67	0.00				
35.00	0.00	26.67	0.00				
36.00	0.00	26.67	0.00				
37.00	0.00	26.67	0.00				
38.00	0.00	26.67	0.00				
39.00	0.00	26.67	0.00				
40.00	0.00	26.67	0.00				
41.00	0.00	26.67	0.00				
42.00	0.00	26.67	0.00				
43.00	0.00	26.67	0.00				
44.00	0.00	26.67	0.00				
45.00	0.00	26.67	0.00				
46.00	0.00	26.67	0.00				
47.00	0.00	26.67	0.00				
48.00	0.00	26.67	0.00				
49.00	0.00	26.67	0.00				
50.00	0.00	26.67	0.00				
51.00	0.00	26.67	0.00				
52.00	0.00	26.67	0.00				

1119-Post Development-Fields

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

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Summary for Pond 5P: BMP-3 Phase-2_Storage

Inflow Area = 2.780 ac, 0.00% Impervious, Inflow Depth = 1.52" for 2-yr event
 Inflow = 3.56 cfs @ 12.23 hrs, Volume= 0.352 af
 Outflow = 0.09 cfs @ 21.83 hrs, Volume= 0.213 af, Atten= 98%, Lag= 576.2 min
 Discarded = 0.03 cfs @ 11.28 hrs, Volume= 0.166 af
 Primary = 0.06 cfs @ 21.83 hrs, Volume= 0.048 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs
 Peak Elev= 32.37' @ 21.83 hrs Surf.Area= 5,186 sf Storage= 12,379 cf

Plug-Flow detention time= 1,582.5 min calculated for 0.213 af (61% of inflow)
 Center-of-Mass det. time= 1,468.0 min (2,324.8 - 856.7)

Volume	Invert	Avail.Storage	Storage Description
#1	34.90'	21,781 cf	Field #3 Base (Prismatic) Listed below (Recalc) x 2 -Impervious 87,125 cf Overall x 25.0% Voids
#2	34.90'	456 cf	Top of chambers to Field base (Prismatic) Listed below (Recalc) -Impervious 1,825 cf Overall x 25.0% Voids
#3	31.60'	298 cf	12.0" Round Field Pipe-W -Impervious L= 380.0' S= 0.0050 '/'
#4	31.60'	298 cf	12.0" Round Field Pipe-E -Impervious L= 380.0' S= 0.0050 '/'
#5A	29.75'	10,315 cf	ADS_StormTech MC-3500 d +Cap x 93 Inside #6 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 93 Chambers in 3 Rows Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf
#6A	29.00'	8,114 cf	22.75"W x 227.97"L x 5.90'H Field A 30,599 cf Overall - 10,315 cf Embedded = 20,284 cf x 40.0% Voids
		41,263 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	0	0	0
35.00	3,704	185	185
35.60	49,725	16,029	16,214
36.15	49,725	27,349	43,563

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	5,189	0	0
35.59	100	1,825	1,825
35.60	0	0	1,825

1119-Post Development-Fields

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

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Device	Routing	Invert	Outlet Devices
#1	Primary	26.75'	15.0" Round Culvert L= 38.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.75' / 26.00' S= 0.0197 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	32.00'	2.0" Vert. 2" Orifice/Grate C= 0.600
#3	Device 1	33.50'	3.3" Vert. 3.3" Orifice/Grate C= 0.600
#4	Device 1	34.62'	4.5" Vert. 4.5" Orifice/Grate C= 0.600
#5	Discarded	29.00'	0.250 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 11.28 hrs HW=29.07' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.06 cfs @ 21.83 hrs HW=32.37' TW=24.29' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.06 cfs of 13.20 cfs potential flow)

↑ **2=2" Orifice/Grate** (Orifice Controls 0.06 cfs @ 2.56 fps)

↑ **3=3.3" Orifice/Grate** (Controls 0.00 cfs)

↑ **4=4.5" Orifice/Grate** (Controls 0.00 cfs)

1119-Post Development-Fields

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

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Pond 5P: BMP-3 Phase-2_Storage - Chamber Wizard Field A

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)

Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf

Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap

Cap Storage= +14.9 cf x 2 x 3 rows = 89.4 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

31 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 225.97' Row Length +12.0" End Stone x 2 = 227.97' Base Length

3 Rows x 77.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 22.75' Base Width

9.0" Base + 45.0" Chamber Height + 16.8" Cover = 5.90' Field Height

93 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 3 Rows = 10,314.9 cf Chamber Storage

30,599.3 cf Field - 10,314.9 cf Chambers = 20,284.3 cf Stone x 40.0% Voids = 8,113.7 cf Stone Storage

Chamber Storage + Stone Storage = 18,428.7 cf = 0.423 af

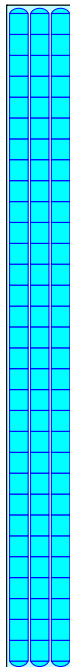
Overall Storage Efficiency = 60.2%

Overall System Size = 227.97' x 22.75' x 5.90'

93 Chambers

1,133.3 cy Field

751.3 cy Stone



1119-Post Development-Fields

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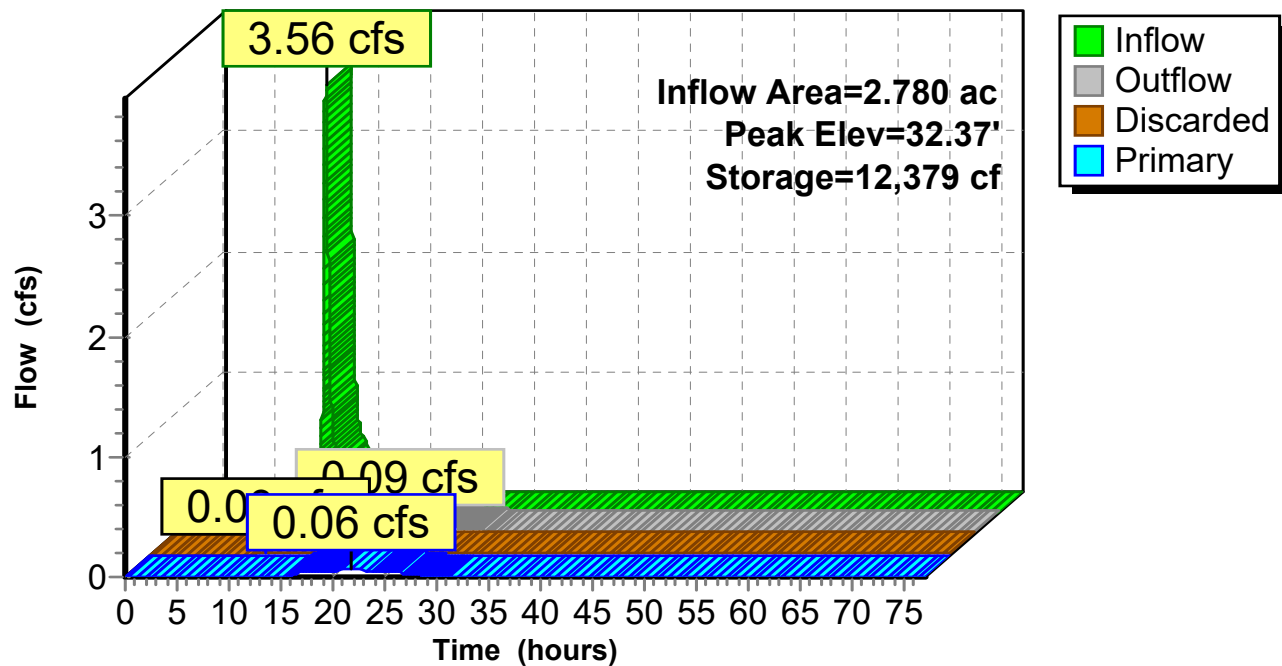
Type III 24-hr 2-yr Rainfall=3.71"

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Pond 5P: BMP-3 Phase-2_Storage

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 5P: BMP-3 Phase-2_Storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	29.00	0.00	0.00	0.00
2.00	0.00	0	29.00	0.00	0.00	0.00
4.00	0.00	0	29.00	0.00	0.00	0.00
6.00	0.00	0	29.00	0.00	0.00	0.00
8.00	0.00	0	29.00	0.00	0.00	0.00
10.00	0.01	0	29.00	0.01	0.01	0.00
12.00	1.26	1,138	29.55	0.03	0.03	0.00
14.00	0.38	9,551	31.64	0.03	0.03	0.00
16.00	0.21	11,406	32.11	0.05	0.03	0.02
18.00	0.13	12,108	32.30	0.08	0.03	0.05
20.00	0.10	12,327	32.35	0.08	0.03	0.05
22.00	0.08	12,379	32.37	0.09	0.03	0.06
24.00	0.07	12,314	32.35	0.08	0.03	0.05
26.00	0.00	11,817	32.22	0.07	0.03	0.04
28.00	0.00	11,396	32.11	0.05	0.03	0.02
30.00	0.00	11,119	32.04	0.03	0.03	0.00
32.00	0.00	10,899	31.98	0.03	0.03	0.00
34.00	0.00	10,683	31.93	0.03	0.03	0.00
36.00	0.00	10,467	31.87	0.03	0.03	0.00
38.00	0.00	10,250	31.81	0.03	0.03	0.00
40.00	0.00	10,034	31.76	0.03	0.03	0.00
42.00	0.00	9,818	31.70	0.03	0.03	0.00
44.00	0.00	9,602	31.65	0.03	0.03	0.00
46.00	0.00	9,386	31.59	0.03	0.03	0.00
48.00	0.00	9,170	31.54	0.03	0.03	0.00
50.00	0.00	8,954	31.49	0.03	0.03	0.00
52.00	0.00	8,738	31.43	0.03	0.03	0.00
54.00	0.00	8,522	31.38	0.03	0.03	0.00
56.00	0.00	8,306	31.33	0.03	0.03	0.00
58.00	0.00	8,090	31.27	0.03	0.03	0.00
60.00	0.00	7,873	31.22	0.03	0.03	0.00
62.00	0.00	7,657	31.17	0.03	0.03	0.00
64.00	0.00	7,441	31.11	0.03	0.03	0.00
66.00	0.00	7,225	31.06	0.03	0.03	0.00
68.00	0.00	7,009	31.01	0.03	0.03	0.00
70.00	0.00	6,793	30.96	0.03	0.03	0.00
72.00	0.00	6,577	30.91	0.03	0.03	0.00
74.00	0.00	6,361	30.86	0.03	0.03	0.00
76.00	0.00	6,145	30.81	0.03	0.03	0.00

1119-Post Development-Fields

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

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Summary for Pond 10P: PDMH-10

Inflow Area = 2.435 ac, 69.90% Impervious, Inflow Depth = 2.79" for 2-yr event
Inflow = 4.94 cfs @ 12.26 hrs, Volume= 0.566 af
Outflow = 4.94 cfs @ 12.26 hrs, Volume= 0.566 af, Atten= 0%, Lag= 0.0 min
Primary = 4.94 cfs @ 12.26 hrs, Volume= 0.566 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 29.77' @ 12.26 hrs

Flood Elev= 34.00'

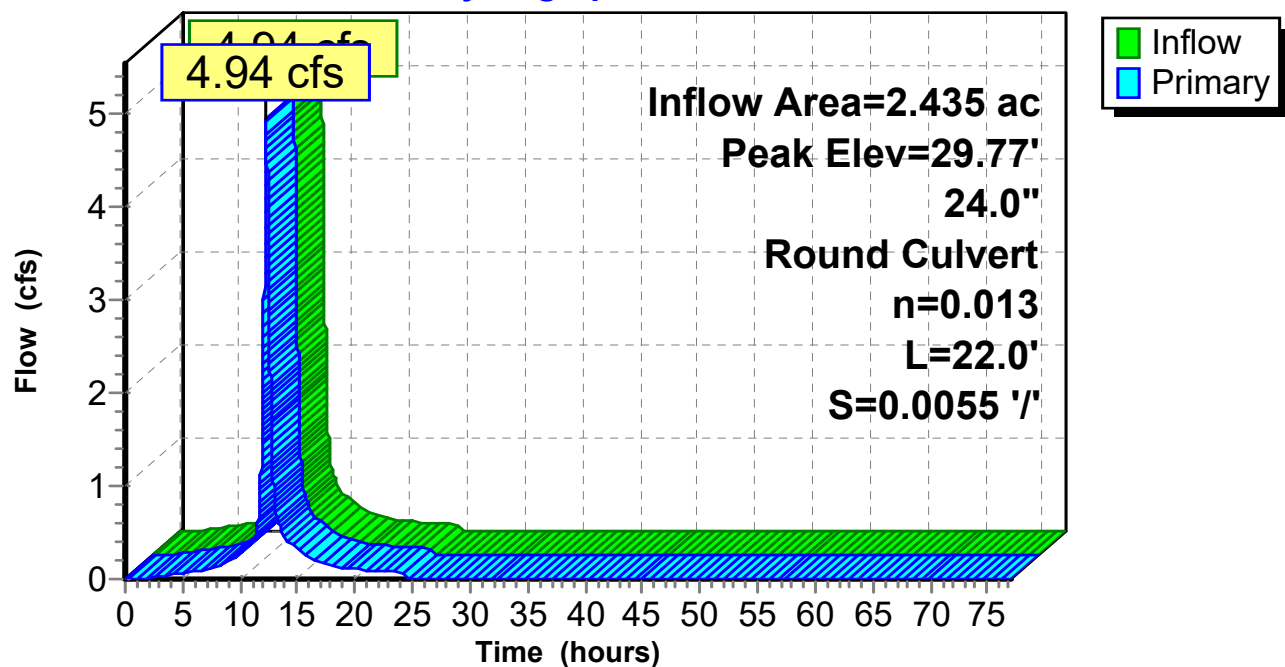
Device	Routing	Invert	Outlet Devices
#1	Primary	28.62'	24.0" Round RCP_Round 24" L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 28.62' / 28.50' S= 0.0055 '/ Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=4.94 cfs @ 12.26 hrs HW=29.77' TW=28.18' (Dynamic Tailwater)

↑1=RCP_Round 24" (Barrel Controls 4.94 cfs @ 3.81 fps)

Pond 10P: PDMH-10

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 10P: PDMH-10

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	28.62	0.00	53.00	0.00	28.62	0.00
1.00	0.00	28.62	0.00	54.00	0.00	28.62	0.00
2.00	0.01	28.67	0.01	55.00	0.00	28.62	0.00
3.00	0.03	28.70	0.03	56.00	0.00	28.62	0.00
4.00	0.05	28.72	0.05	57.00	0.00	28.62	0.00
5.00	0.06	28.74	0.06	58.00	0.00	28.62	0.00
6.00	0.07	28.75	0.07	59.00	0.00	28.62	0.00
7.00	0.10	28.77	0.10	60.00	0.00	28.62	0.00
8.00	0.14	28.79	0.14	61.00	0.00	28.62	0.00
9.00	0.20	28.83	0.20	62.00	0.00	28.62	0.00
10.00	0.27	28.87	0.27	63.00	0.00	28.62	0.00
11.00	0.41	28.92	0.41	64.00	0.00	28.62	0.00
12.00	2.14	29.34	2.14	65.00	0.00	28.62	0.00
13.00	0.84	29.06	0.84	66.00	0.00	28.62	0.00
14.00	0.44	28.94	0.44	67.00	0.00	28.62	0.00
15.00	0.33	28.89	0.33	68.00	0.00	28.62	0.00
16.00	0.24	28.85	0.24	69.00	0.00	28.62	0.00
17.00	0.18	28.82	0.18	70.00	0.00	28.62	0.00
18.00	0.14	28.80	0.14	71.00	0.00	28.62	0.00
19.00	0.12	28.79	0.12	72.00	0.00	28.62	0.00
20.00	0.11	28.78	0.11	73.00	0.00	28.62	0.00
21.00	0.10	28.77	0.10	74.00	0.00	28.62	0.00
22.00	0.09	28.76	0.09	75.00	0.00	28.62	0.00
23.00	0.08	28.76	0.08	76.00	0.00	28.62	0.00
24.00	0.07	28.75	0.07	77.00	0.00	28.62	0.00
25.00	0.00	28.62	0.00				
26.00	0.00	28.62	0.00				
27.00	0.00	28.62	0.00				
28.00	0.00	28.62	0.00				
29.00	0.00	28.62	0.00				
30.00	0.00	28.62	0.00				
31.00	0.00	28.62	0.00				
32.00	0.00	28.62	0.00				
33.00	0.00	28.62	0.00				
34.00	0.00	28.62	0.00				
35.00	0.00	28.62	0.00				
36.00	0.00	28.62	0.00				
37.00	0.00	28.62	0.00				
38.00	0.00	28.62	0.00				
39.00	0.00	28.62	0.00				
40.00	0.00	28.62	0.00				
41.00	0.00	28.62	0.00				
42.00	0.00	28.62	0.00				
43.00	0.00	28.62	0.00				
44.00	0.00	28.62	0.00				
45.00	0.00	28.62	0.00				
46.00	0.00	28.62	0.00				
47.00	0.00	28.62	0.00				
48.00	0.00	28.62	0.00				
49.00	0.00	28.62	0.00				
50.00	0.00	28.62	0.00				
51.00	0.00	28.62	0.00				
52.00	0.00	28.62	0.00				

1119-Post Development-Fields

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

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Summary for Pond 14P: PDMH-3

Inflow Area = 6.247 ac, 0.00% Impervious, Inflow Depth = 0.64" for 2-yr event
Inflow = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af
Outflow = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 27.89' @ 14.83 hrs

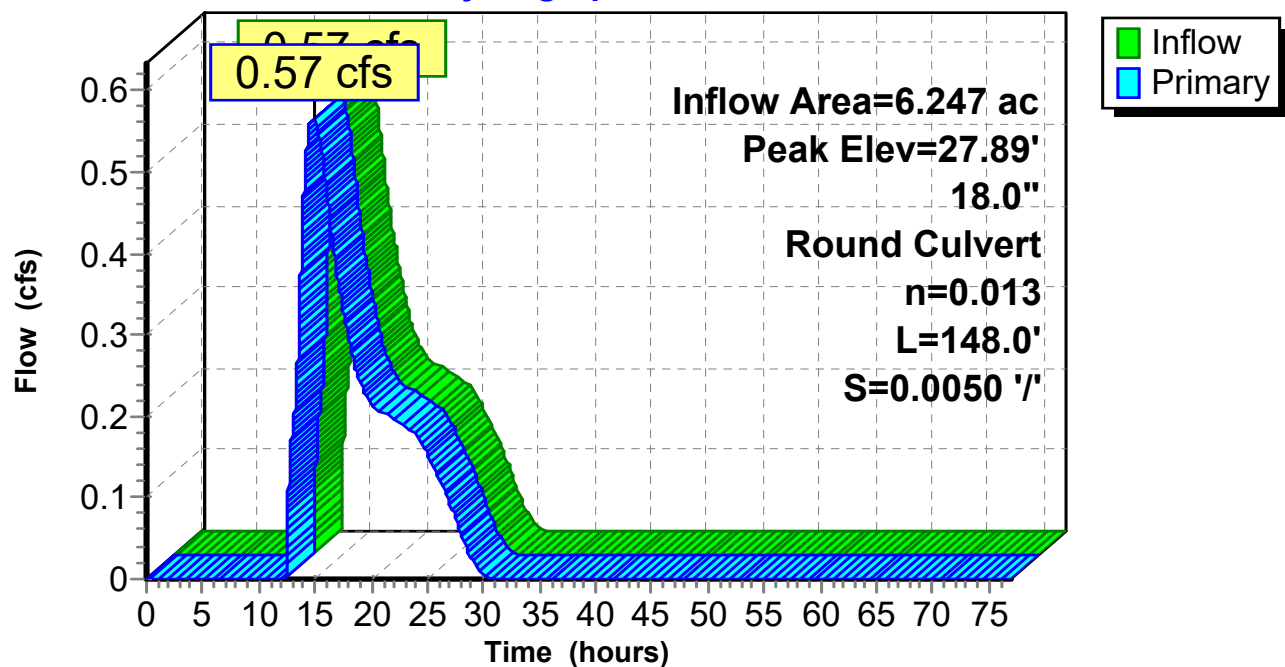
Flood Elev= 33.08'

Device	Routing	Invert	Outlet Devices
#1	Primary	27.51'	18.0" Round RCP_Round 18" L= 148.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.51' / 26.77' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.57 cfs @ 14.83 hrs HW=27.89' TW=27.05' (Dynamic Tailwater)
↑1=RCP_Round 18" (Barrel Controls 0.57 cfs @ 2.43 fps)

Pond 14P: PDMH-3

Hydrograph



1119-Post Development-Fields*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 14P: PDMH-3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	27.51	0.00	53.00	0.00	27.51	0.00
1.00	0.00	27.51	0.00	54.00	0.00	27.51	0.00
2.00	0.00	27.51	0.00	55.00	0.00	27.51	0.00
3.00	0.00	27.51	0.00	56.00	0.00	27.51	0.00
4.00	0.00	27.51	0.00	57.00	0.00	27.51	0.00
5.00	0.00	27.51	0.00	58.00	0.00	27.51	0.00
6.00	0.00	27.51	0.00	59.00	0.00	27.51	0.00
7.00	0.00	27.51	0.00	60.00	0.00	27.51	0.00
8.00	0.00	27.51	0.00	61.00	0.00	27.51	0.00
9.00	0.00	27.51	0.00	62.00	0.00	27.51	0.00
10.00	0.00	27.51	0.00	63.00	0.00	27.51	0.00
11.00	0.00	27.51	0.00	64.00	0.00	27.51	0.00
12.00	0.00	27.51	0.00	65.00	0.00	27.51	0.00
13.00	0.19	27.73	0.19	66.00	0.00	27.51	0.00
14.00	0.47	27.86	0.47	67.00	0.00	27.51	0.00
15.00	0.56	27.89	0.56	68.00	0.00	27.51	0.00
16.00	0.48	27.86	0.48	69.00	0.00	27.51	0.00
17.00	0.37	27.82	0.37	70.00	0.00	27.51	0.00
18.00	0.30	27.78	0.30	71.00	0.00	27.51	0.00
19.00	0.24	27.76	0.24	72.00	0.00	27.51	0.00
20.00	0.22	27.75	0.22	73.00	0.00	27.51	0.00
21.00	0.21	27.74	0.21	74.00	0.00	27.51	0.00
22.00	0.20	27.74	0.20	75.00	0.00	27.51	0.00
23.00	0.19	27.73	0.19	76.00	0.00	27.51	0.00
24.00	0.18	27.72	0.18	77.00	0.00	27.51	0.00
25.00	0.15	27.71	0.15				
26.00	0.12	27.69	0.12				
27.00	0.09	27.67	0.09				
28.00	0.06	27.63	0.06				
29.00	0.02	27.59	0.02				
30.00	0.01	27.55	0.01				
31.00	0.00	27.51	0.00				
32.00	0.00	27.51	0.00				
33.00	0.00	27.51	0.00				
34.00	0.00	27.51	0.00				
35.00	0.00	27.51	0.00				
36.00	0.00	27.51	0.00				
37.00	0.00	27.51	0.00				
38.00	0.00	27.51	0.00				
39.00	0.00	27.51	0.00				
40.00	0.00	27.51	0.00				
41.00	0.00	27.51	0.00				
42.00	0.00	27.51	0.00				
43.00	0.00	27.51	0.00				
44.00	0.00	27.51	0.00				
45.00	0.00	27.51	0.00				
46.00	0.00	27.51	0.00				
47.00	0.00	27.51	0.00				
48.00	0.00	27.51	0.00				
49.00	0.00	27.51	0.00				
50.00	0.00	27.51	0.00				
51.00	0.00	27.51	0.00				
52.00	0.00	27.51	0.00				

1119-Post Development-Fields

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

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field Area Phase 1 Runoff Area=6.247 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=14.96 cfs 1.502 af

Subcatchment B1c: To PHW-2 Runoff Area=0.183 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=0.53 cfs 0.040 af

Subcatchment B2: Field Parking-E Runoff Area=2.435 ac 69.90% Impervious Runoff Depth=4.56"
Flow Length=783' Tc=19.0 min CN=71/98 Runoff=8.07 cfs 0.926 af

Subcatchment B3: Field Parking-N Runoff Area=1.424 ac 54.63% Impervious Runoff Depth=4.26"
Flow Length=261' Tc=6.0 min CN=74/98 Runoff=6.48 cfs 0.506 af

Subcatchment B5: Field Area Phase 2 Runoff Area=2.780 ac 0.00% Impervious Runoff Depth=3.07"
Flow Length=426' Tc=16.2 min CN=76/0 Runoff=7.36 cfs 0.712 af

Subcatchment C1: C1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.45 cfs 0.032 af

Subcatchment D1: EX. ACCESS DR W Runoff Area=0.746 ac 87.40% Impervious Runoff Depth=4.92"
Flow Length=133' Tc=6.0 min CN=77/96 Runoff=3.90 cfs 0.306 af

Subcatchment D2: SW UPLANDS Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=2.52"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.28 cfs 0.023 af

Subcatchment E1: EX. ACCESS DR E Runoff Area=0.840 ac 69.52% Impervious Runoff Depth=4.50"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=4.08 cfs 0.315 af

Subcatchment F1: Direct Grass Area Runoff Runoff Area=0.934 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=2.84 cfs 0.203 af

Subcatchment F2: Berm Runoff to Pike Runoff Area=0.281 ac 3.56% Impervious Runoff Depth=2.70"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=0.71 cfs 0.063 af

Subcatchment G1: Graded Road Runoff Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=3.46"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=1.27 cfs 0.091 af

Subcatchment G2: Sheet flow into pond Runoff Area=1.367 ac 4.02% Impervious Runoff Depth=2.71"
Flow Length=186' Tc=9.2 min CN=71/96 Runoff=3.84 cfs 0.309 af

Reach 15R: U.S. Pike Site Culvert Inflow=3.33 cfs 3.478 af
Outflow=3.33 cfs 3.478 af

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.53' Max Vel=0.44 fps Inflow=3.39 cfs 3.481 af
n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=3.33 cfs 3.478 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.45 cfs 0.032 af
Outflow=0.45 cfs 0.032 af

1119-Post Development-Fields*Type III 24-hr 10-yr Rainfall=5.64"*

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Reach SP-3: SW WETLANDSInflow=4.14 cfs 0.328 af
Outflow=4.14 cfs 0.328 af**Reach SP-4: SE WETLANDS**Inflow=4.08 cfs 0.315 af
Outflow=4.08 cfs 0.315 af**Pond 1P: EX. POND-2**Peak Elev=24.65' Storage=464,230 cf Inflow=15.90 cfs 3.343 af
Primary=3.16 cfs 3.215 af Secondary=0.00 cfs 0.000 af Outflow=3.16 cfs 3.215 af**Pond 2P: BMP-2 Field-SGWL**Peak Elev=28.33' Storage=18,805 cf Inflow=11.87 cfs 1.431 af
Primary=11.20 cfs 1.430 af Secondary=0.00 cfs 0.000 af Outflow=11.20 cfs 1.430 af**Pond 3P: BMP-1 Phase-1_Storage**Peak Elev=34.11' Storage=30,825 cf Inflow=14.96 cfs 1.502 af
Discarded=0.08 cfs 0.406 af Primary=2.78 cfs 1.092 af Outflow=2.85 cfs 1.497 af**Pond 4P: PDMH-4**Peak Elev=27.56' Inflow=2.84 cfs 1.132 af
18.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=2.84 cfs 1.132 af**Pond 5P: BMP-3 Phase-2_Storage**Peak Elev=34.83' Storage=18,881 cf Inflow=7.36 cfs 0.712 af
Discarded=0.03 cfs 0.170 af Primary=0.59 cfs 0.382 af Outflow=0.62 cfs 0.552 af**Pond 10P: PDMH-10**Peak Elev=30.16' Inflow=8.07 cfs 0.926 af
24.0" Round Culvert n=0.013 L=22.0' S=0.0055 '/' Outflow=8.07 cfs 0.926 af**Pond 14P: PDMH-3**Peak Elev=28.42' Inflow=2.78 cfs 1.092 af
18.0" Round Culvert n=0.013 L=148.0' S=0.0050 '/' Outflow=2.78 cfs 1.092 af**Total Runoff Area = 17.809 ac Runoff Volume = 5.027 af Average Runoff Depth = 3.39"**
78.77% Pervious = 14.028 ac 21.23% Impervious = 3.781 ac

1119-Post Development-Fields

Type III 24-hr 25-yr Rainfall=7.14"

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field Area Phase 1 Runoff Area=6.247 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=21.66 cfs 2.168 af

Subcatchment B1c: To PHW-2 Runoff Area=0.183 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=0.79 cfs 0.059 af

Subcatchment B2: Field Parking-E Runoff Area=2.435 ac 69.90% Impervious Runoff Depth=5.98"
Flow Length=783' Tc=19.0 min CN=71/98 Runoff=10.57 cfs 1.213 af

Subcatchment B3: Field Parking-N Runoff Area=1.424 ac 54.63% Impervious Runoff Depth=5.66"
Flow Length=261' Tc=6.0 min CN=74/98 Runoff=8.60 cfs 0.672 af

Subcatchment B5: Field Area Phase 2 Runoff Area=2.780 ac 0.00% Impervious Runoff Depth=4.38"
Flow Length=426' Tc=16.2 min CN=76/0 Runoff=10.49 cfs 1.015 af

Subcatchment C1: C1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.67 cfs 0.048 af

Subcatchment D1: EX. ACCESS DR W Runoff Area=0.746 ac 87.40% Impervious Runoff Depth=6.39"
Flow Length=133' Tc=6.0 min CN=77/96 Runoff=5.02 cfs 0.397 af

Subcatchment D2: SW UPLANDS Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=3.74"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.42 cfs 0.034 af

Subcatchment E1: EX. ACCESS DR E Runoff Area=0.840 ac 69.52% Impervious Runoff Depth=5.93"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=5.34 cfs 0.415 af

Subcatchment F1: Direct Grass Area Runoff Runoff Area=0.934 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=4.21 cfs 0.299 af

Subcatchment F2: Berm Runoff to Pike Runoff Area=0.281 ac 3.56% Impervious Runoff Depth=3.94"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=1.04 cfs 0.092 af

Subcatchment G1: Graded Road Runoff Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=4.82"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=1.76 cfs 0.127 af

Subcatchment G2: Sheet flow into pond Runoff Area=1.367 ac 4.02% Impervious Runoff Depth=3.96"
Flow Length=186' Tc=9.2 min CN=71/96 Runoff=5.64 cfs 0.451 af

Reach 15R: U.S. Pike Site Culvert Inflow=5.73 cfs 5.209 af
Outflow=5.73 cfs 5.209 af

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.69' Max Vel=0.52 fps Inflow=5.74 cfs 5.212 af
n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=5.73 cfs 5.209 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.67 cfs 0.048 af
Outflow=0.67 cfs 0.048 af

1119-Post Development-Fields*Type III 24-hr 25-yr Rainfall=7.14"*

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Reach SP-3: SW WETLANDSInflow=5.38 cfs 0.431 af
Outflow=5.38 cfs 0.431 af**Reach SP-4: SE WETLANDS**Inflow=5.34 cfs 0.415 af
Outflow=5.34 cfs 0.415 af**Pond 1P: EX. POND-2**Peak Elev=24.87' Storage=485,127 cf Inflow=23.10 cfs 4.950 af
Primary=5.50 cfs 4.821 af Secondary=0.00 cfs 0.000 af Outflow=5.50 cfs 4.821 af**Pond 2P: BMP-2 Field-SGWL**Peak Elev=28.40' Storage=19,591 cf Inflow=15.66 cfs 1.885 af
Primary=14.84 cfs 1.883 af Secondary=0.00 cfs 0.000 af Outflow=14.84 cfs 1.883 af**Pond 3P: BMP-1 Phase-1_Storage**Peak Elev=35.51' Storage=45,776 cf Inflow=21.66 cfs 2.168 af
Discarded=0.08 cfs 0.413 af Primary=3.56 cfs 1.750 af Outflow=3.64 cfs 2.163 af**Pond 4P: PDMH-4**Peak Elev=27.71' Inflow=3.72 cfs 1.808 af
18.0" Round Culvert n=0.013 L=184.0' S=0.0050 ' Outflow=3.72 cfs 1.808 af**Pond 5P: BMP-3 Phase-2_Storage**Peak Elev=35.48' Storage=24,961 cf Inflow=10.49 cfs 1.015 af
Discarded=0.03 cfs 0.172 af Primary=1.02 cfs 0.682 af Outflow=1.05 cfs 0.854 af**Pond 10P: PDMH-10**Peak Elev=30.44' Inflow=10.57 cfs 1.213 af
24.0" Round Culvert n=0.013 L=22.0' S=0.0055 ' Outflow=10.57 cfs 1.213 af**Pond 14P: PDMH-3**Peak Elev=28.58' Inflow=3.56 cfs 1.750 af
18.0" Round Culvert n=0.013 L=148.0' S=0.0050 ' Outflow=3.56 cfs 1.750 af**Total Runoff Area = 17.809 ac Runoff Volume = 6.989 af Average Runoff Depth = 4.71"**
78.77% Pervious = 14.028 ac 21.23% Impervious = 3.781 ac

1119-Post Development-Fields

Type III 24-hr 50-yr Rainfall=8.56"

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field Area Phase 1 Runoff Area=6.247 ac 0.00% Impervious Runoff Depth=5.43"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=28.17 cfs 2.826 af

Subcatchment B1c: To PHW-2 Runoff Area=0.183 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=1.04 cfs 0.077 af

Subcatchment B2: Field Parking-E Runoff Area=2.435 ac 69.90% Impervious Runoff Depth=7.34"
Flow Length=783' Tc=19.0 min CN=71/98 Runoff=12.96 cfs 1.490 af

Subcatchment B3: Field Parking-N Runoff Area=1.424 ac 54.63% Impervious Runoff Depth=7.01"
Flow Length=261' Tc=6.0 min CN=74/98 Runoff=10.63 cfs 0.832 af

Subcatchment B5: Field Area Phase 2 Runoff Area=2.780 ac 0.00% Impervious Runoff Depth=5.67"
Flow Length=426' Tc=16.2 min CN=76/0 Runoff=13.52 cfs 1.314 af

Subcatchment C1: C1 Runoff Area=0.149 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.89 cfs 0.063 af

Subcatchment D1: EX. ACCESS DR W Runoff Area=0.746 ac 87.40% Impervious Runoff Depth=7.79"
Flow Length=133' Tc=6.0 min CN=77/96 Runoff=6.08 cfs 0.484 af

Subcatchment D2: SW UPLANDS Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=4.95"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.55 cfs 0.045 af

Subcatchment E1: EX. ACCESS DR E Runoff Area=0.840 ac 69.52% Impervious Runoff Depth=7.31"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=6.53 cfs 0.512 af

Subcatchment F1: Direct Grass Area Runoff Runoff Area=0.934 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=5.55 cfs 0.395 af

Subcatchment F2: Berm Runoff to Pike Runoff Area=0.281 ac 3.56% Impervious Runoff Depth=5.18"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=1.37 cfs 0.121 af

Subcatchment G1: Graded Road Runoff Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=6.15"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=2.23 cfs 0.161 af

Subcatchment G2: Sheet flow into pond Runoff Area=1.367 ac 4.02% Impervious Runoff Depth=5.19"
Flow Length=186' Tc=9.2 min CN=71/96 Runoff=7.40 cfs 0.591 af

Reach 15R: U.S. Pike Site Culvert Inflow=7.21 cfs 6.909 af
Outflow=7.21 cfs 6.909 af

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.76' Max Vel=0.56 fps Inflow=7.21 cfs 6.913 af
n=0.120 L=490.0' S=0.0051 ' /' Capacity=139.53 cfs Outflow=7.21 cfs 6.909 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.89 cfs 0.063 af
Outflow=0.89 cfs 0.063 af

1119-Post Development-Fields*Type III 24-hr 50-yr Rainfall=8.56"*

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Reach SP-3: SW WETLANDSInflow=6.56 cfs 0.529 af
Outflow=6.56 cfs 0.529 af**Reach SP-4: SE WETLANDS**Inflow=6.53 cfs 0.512 af
Outflow=6.53 cfs 0.512 af**Pond 1P: EX. POND-2**Peak Elev=24.98' Storage=495,847 cf Inflow=30.14 cfs 6.528 af
Primary=6.83 cfs 6.397 af Secondary=0.00 cfs 0.000 af Outflow=6.83 cfs 6.397 af**Pond 2P: BMP-2 Field-SGWL**Peak Elev=28.46' Storage=20,300 cf Inflow=19.29 cfs 2.321 af
Primary=18.31 cfs 2.320 af Secondary=0.00 cfs 0.000 af Outflow=18.31 cfs 2.320 af**Pond 3P: BMP-1 Phase-1_Storage**Peak Elev=35.87' Storage=63,057 cf Inflow=28.17 cfs 2.826 af
Discarded=0.08 cfs 0.419 af Primary=3.72 cfs 2.402 af Outflow=3.80 cfs 2.821 af**Pond 4P: PDMH-4**Peak Elev=27.76' Inflow=4.02 cfs 2.479 af
18.0" Round Culvert n=0.013 L=184.0' S=0.0050 '/' Outflow=4.02 cfs 2.479 af**Pond 5P: BMP-3 Phase-2_Storage**Peak Elev=35.83' Storage=33,401 cf Inflow=13.52 cfs 1.314 af
Discarded=0.03 cfs 0.174 af Primary=1.17 cfs 0.976 af Outflow=1.20 cfs 1.151 af**Pond 10P: PDMH-10**Peak Elev=30.71' Inflow=12.96 cfs 1.490 af
24.0" Round Culvert n=0.013 L=22.0' S=0.0055 '/' Outflow=12.96 cfs 1.490 af**Pond 14P: PDMH-3**Peak Elev=28.61' Inflow=3.72 cfs 2.402 af
18.0" Round Culvert n=0.013 L=148.0' S=0.0050 '/' Outflow=3.72 cfs 2.402 af**Total Runoff Area = 17.809 ac Runoff Volume = 8.911 af Average Runoff Depth = 6.00"**
78.77% Pervious = 14.028 ac 21.23% Impervious = 3.781 ac



INFILTRATION PRACTICE CRITERIA (Env-Wq 1508.06)

Type/Node Name: **Node 5P - Subsurface Infiltration Phase II**

Enter the type of infiltration practice (e.g., basin, trench) and the node name in the drainage analysis, if applicable

Yes		Have you reviewed Env-Wq 1508.06(a) to ensure that infiltration is allowed?	
2.78	ac	A = Area draining to the practice	
-	ac	A _I = Impervious area draining to the practice	
-	decimal	I = percent impervious area draining to the practice, in decimal form	
0.05	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
0.14	ac-in	WQV = 1" x R _v x A	
505	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
126	cf	25% x WQV (check calc for sediment forebay volume)	
N/A		Method of pretreatment? (not required for clean or roof runoff)	
-	cf	V _{SED} = sediment forebay volume, if used for pretreatment	← ≥ 25%WQV
10,960	cf	V = volume ¹ (attach a stage-storage table)	← ≥ WQV
5,189	sf	A _{SA} = surface area of the bottom of the pond	
0.25	iph	K _{sat} _{DESIGN} = design infiltration rate ²	
4.7	hours	T _{DRAIN} = drain time = V / (A _{SA} * I _{DESIGN})	← ≤ 72-hrs
29.00	feet	E _{BTM} = elevation of the bottom of the basin	
28.00	feet	E _{SHWT} = elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
25.00	feet	E _{ROCK} = elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	D _{SHWT} = separation from SHWT	← ≥ * ³
4.0	feet	D _{ROCK} = separation from bedrock	← ≥ * ³
N/A	ft	D _{amend} = Depth of amended soil, if applicable due high infiltration rate	← ≥ 24"
N/A	ft	D _T = depth of trench, if trench proposed	← 4 - 10 ft
N/A	Yes/No	If a trench or underground system is proposed, observation well provided ⁴	
N/A		If a trench is proposed, material in trench	
N/A		If a basin is proposed, basin floor material	
N/A	Yes/No	If a basin is proposed, the perimeter should be curvilinear, basin floor shall be flat.	
N/A	:1	If a basin is proposed, pond side slopes	← ≥ 3:1
34.83	ft	Peak elevation of the 10-year storm event (infiltration can be used in analysis)	
35.83	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
36.15	ft	Elevation of the top of the practice (if a basin, this is the elevation of the berm)	
YES		10 peak elevation ≤ Elevation of the top of the trench? ⁵	← yes
YES		If a basin is proposed, 50-year peak elevation ≤ Elevation of berm?	← yes

1. Volume below the lowest invert of the outlet structure and excludes forebay volume
2. K_{sat}_{DESIGN} includes a factor of safety. See Env-Wq 1504.14 for requirements for determining the infiltr. rate
3. 1' separation if treatment not required; 4' for treatment in GPAs & WSIPAs; & 3' in all other areas.
4. Clean, washed well graded diameter of 1.5 to 3 inches above the in-situ soil.
5. If 50-year peak elevation exceeds top of trench, the overflow must be routed in HydroCAD as secondary discharge.

Designer's Notes: 0.25 infiltration rate assumed as lowest possible allowable rate. Nearby

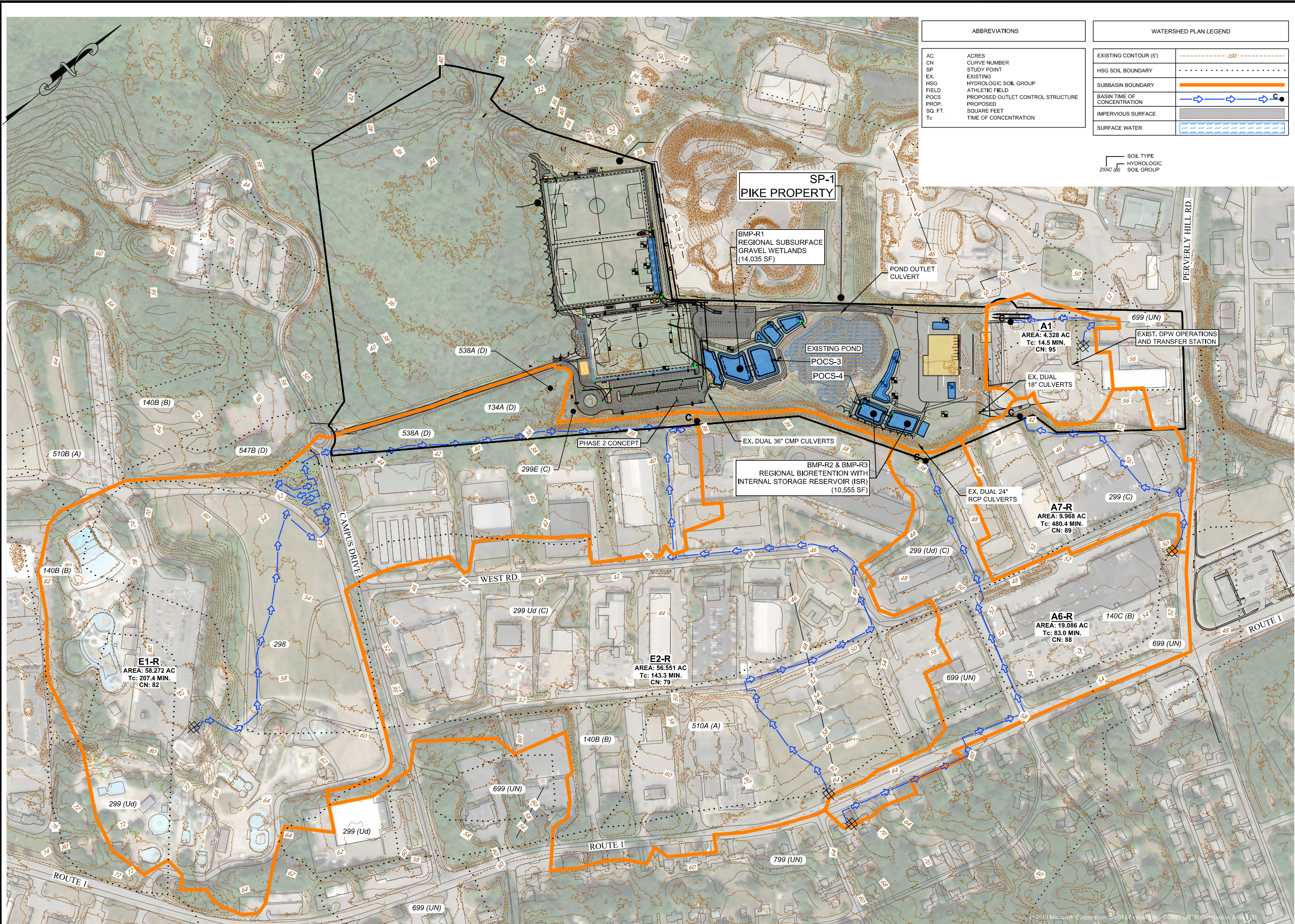
BMP-1 had an adjusted rate of 0.6 iph. Infiltration tests will be performed during the future

Phase II design. SHWT assumed to be 2 feet from existing ground based on the site specific soil survey classification.

Stormwater Management Report
Appendix F

Regional Watershed Drainage Analysis

- i. Regional Watershed Plan
- ii. 2-Year, 24-Hour HydroCad Report Calculations
- iii. 10-Year, 25-Year, and 50-Year Report Summary Calculations

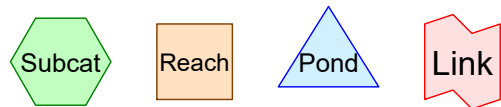


ABBREVIATIONS	
AC	ACRES
CN	CURVE NUMBER
SP	STUDY POINT
EX.	EXISTING
HSG	HYDROLOGIC SOIL GROUP
FIELD	ATHLETIC FIELD
POCS	PROPOSED OUTLET CONTROL STRUCTURE
PROP.	PROPOSED
SQ. FT.	SQUARE FEET
Tc	TIME OF CONCENTRATION

WATERSHED PLAN LEGEND	
EXISTING CONTOUR (5')	---
HSG SOIL BOUNDARY	---
SUBBASIN BOUNDARY	---
BASIN TIME OF CONCENTRATION	---
IMPERVIOUS SURFACE	---
SURFACE WATER	---

SOIL TYPE
HYDROLOGIC
SOIL GROUP
255C (B)

City of Portsmouth Portsmouth, New Hampshire Site Plan Review Application Multi-purpose Recreation Fields Regional Facilities Watershed Plan		drawing no. H3		sheet: 1 of 1	
date: August 2019	designed by: JHK	project no: 1119	drawn by: JHK	checked by: PAC	approved by: PAC
CMA ENGINEERS CIVIL/ENVIRONMENTAL/STRUCTURAL		Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223		cmaengineers.com	
no.		revision		date	
by					



Routing Diagram for 1119-Regional Stormwater-North
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1119-Regional Stormwater-North

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.167	58	Meadow, non-grazed, HSG B (A6R, A7R)
6.276	71	Meadow, non-grazed, HSG C (A1, A6R, A7R)
15.402	98	Paved parking, HSG C (A1, A6R, A7R)
8.537	98	Unconnected pavement, HSG C (A6R, A7R)
33.382	89	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
3.167	HSG B	A6R, A7R
30.215	HSG C	A1, A6R, A7R
0.000	HSG D	
0.000	Other	
33.382		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	3.167	6.276	0.000	0.000	9.443	Meadow, non-grazed	A1, A6R, A7R
0.000	0.000	15.402	0.000	0.000	15.402	Paved parking	A1, A6R, A7R
0.000	0.000	8.537	0.000	0.000	8.537	Unconnected pavement	A6R, A7R
0.000	3.167	30.215	0.000	0.000	33.382	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	A6R	0.00	0.00	777.0	0.0178	0.013	18.0	0.0	0.0
2	A6R	0.00	0.00	424.0	0.0090	0.013	24.0	0.0	0.0
3	A7R	0.00	0.00	159.0	0.0050	0.013	15.0	0.0	0.0
4	4P	40.08	39.98	20.0	0.0050	0.013	18.0	0.0	0.0
5	4P	40.24	40.00	40.9	0.0059	0.013	18.0	0.0	0.0
6	7P	39.88	39.66	42.6	0.0052	0.012	18.0	0.0	0.0
7	13P	35.47	33.57	80.9	0.0235	0.013	24.0	0.0	0.0
8	13P	35.19	33.51	84.0	0.0200	0.013	24.0	0.0	0.0
9	17P	41.21	39.98	115.5	0.0106	0.012	12.0	0.0	0.0
10	BMP-R2	26.50	26.34	32.8	0.0049	0.012	36.0	0.0	0.0
11	BMP-R3	29.25	29.00	32.0	0.0078	0.012	30.0	0.0	0.0
12	BMP-R3	29.25	29.00	29.0	0.0086	0.012	30.0	0.0	0.0

1119-Regional Stormwater-North

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

SubcatchmentA1: DPW OFFSITE

Runoff Area=4.328 ac 89.60% Impervious Runoff Depth=3.15"
 Flow Length=864' Tc=14.5 min CN=95 Runoff=11.54 cfs 1.134 af

SubcatchmentA6R: A6 Regional

Runoff Area=19.086 ac 70.04% Impervious Runoff Depth=2.46"
 Flow Length=2,013' Tc=83.0 min CN=88 Runoff=17.61 cfs 3.914 af

SubcatchmentA7R: A7 Regional

Runoff Area=9.968 ac 67.15% Impervious Runoff Depth=2.55"
 Flow Length=734' Tc=480.4 min CN=89 Runoff=2.75 cfs 2.120 af

Reach 1R: Primary Discharge Channel

Avg. Flow Depth=0.74' Max Vel=3.07 fps Inflow=18.67 cfs 6.472 af
 n=0.033 L=33.5' S=0.0099 '/' Capacity=71.19 cfs Outflow=18.67 cfs 6.472 af

Reach 2R: Over flow Channel

Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.033 L=35.6' S=0.0101 '/' Capacity=36.29 cfs Outflow=0.00 cfs 0.000 af

Reach 30R: Ex. Pond 2

Inflow=18.67 cfs 6.472 af
 Outflow=18.67 cfs 6.472 af

Pond 4P: EDMH-A

Peak Elev=41.79' Inflow=11.54 cfs 1.134 af
 Primary=5.84 cfs 0.990 af Secondary=5.71 cfs 0.144 af Outflow=11.54 cfs 1.134 af

Pond 7P: EDMH-C

Peak Elev=41.32' Inflow=5.84 cfs 0.990 af
 18.0" Round Culvert n=0.012 L=42.6' S=0.0052 '/' Outflow=5.84 cfs 0.990 af

Pond 13P: Ex. Dual 24" Culverts

Peak Elev=36.67' Storage=48 cf Inflow=17.61 cfs 3.914 af
 Discarded=0.00 cfs 0.001 af Primary=17.61 cfs 3.913 af Outflow=17.61 cfs 3.914 af

Pond 17P: INV U.

Peak Elev=42.14' Storage=5,435 cf Inflow=2.75 cfs 2.120 af
 Discarded=0.24 cfs 0.416 af Primary=2.49 cfs 1.704 af Outflow=2.72 cfs 2.120 af

Pond BMP-R2: BMP-R2

Peak Elev=30.96' Storage=14,625 cf Inflow=18.68 cfs 6.472 af
 Primary=18.67 cfs 6.472 af Secondary=0.00 cfs 0.000 af Outflow=18.67 cfs 6.472 af

Pond BMP-R3: BMP-R3

Peak Elev=33.14' Storage=45,206 cf Inflow=18.96 cfs 6.751 af
 0.279 af Primary=14.50 cfs 6.105 af Secondary=4.18 cfs 0.367 af Tertiary=0.00 cfs 0.000 af Outflow=18.80 cfs 6.751 af

Total Runoff Area = 33.382 ac Runoff Volume = 7.168 af Average Runoff Depth = 2.58"
28.29% Pervious = 9.443 ac 71.71% Impervious = 23.939 ac

1119-Regional Stormwater-North

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

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Summary for Subcatchment A1: DPW OFFSITE

Runoff = 11.54 cfs @ 12.19 hrs, Volume= 1.134 af, Depth= 3.15"

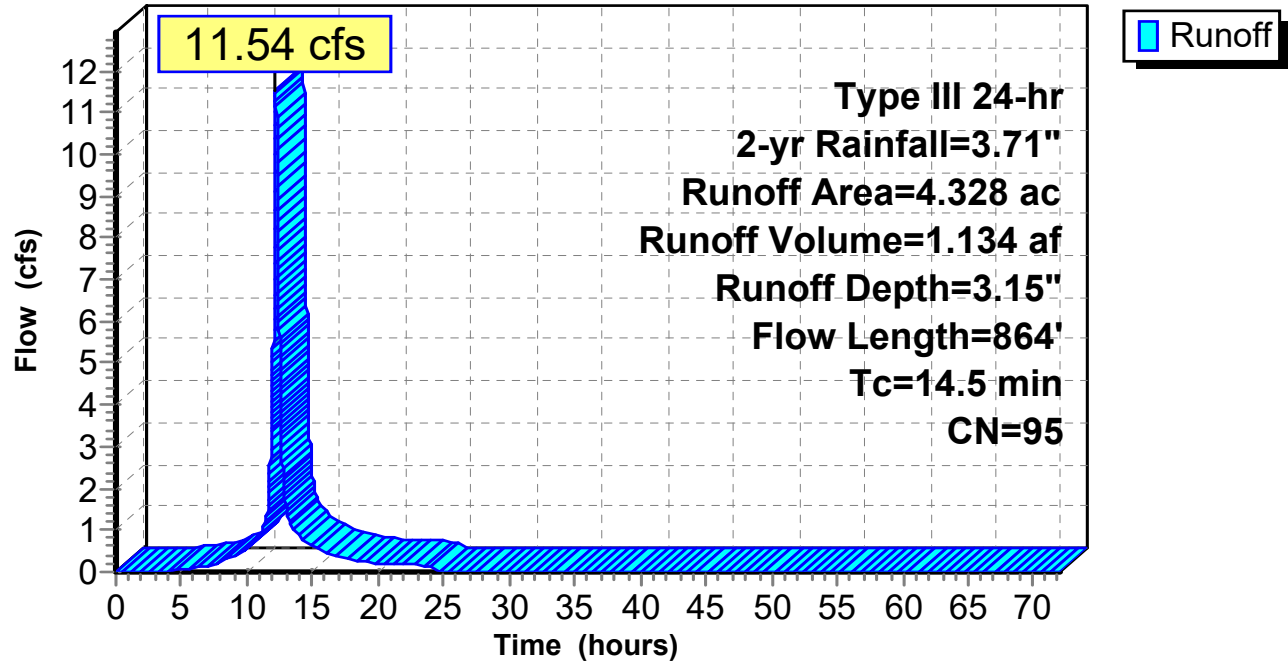
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.450	71	Meadow, non-grazed, HSG C
3.878	98	Paved parking, HSG C
4.328	95	Weighted Average
0.450	71	10.40% Pervious Area
3.878	98	89.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.8	105	0.0371	0.16		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.0	3	0.1550	7.99		Shallow Concentrated Flow, Paved Kv= 20.3 fps
2.2	322	0.0150	2.49		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.5	94	0.0040	3.17	2.54	Channel Flow, Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.012
0.7	244	0.0105	5.78	6.94	Channel Flow, Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
0.3	96	0.0074	5.62	10.11	Channel Flow, Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
14.5	864	Total			

Subcatchment A1: DPW OFFSITE

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment A1: DPW OFFSITE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	3.15	0.00
1.00	0.04	0.00	0.00	54.00	3.71	3.15	0.00
2.00	0.07	0.00	0.00	55.00	3.71	3.15	0.00
3.00	0.11	0.00	0.00	56.00	3.71	3.15	0.00
4.00	0.16	0.01	0.03	57.00	3.71	3.15	0.00
5.00	0.21	0.02	0.06	58.00	3.71	3.15	0.00
6.00	0.27	0.04	0.10	59.00	3.71	3.15	0.00
7.00	0.34	0.07	0.16	60.00	3.71	3.15	0.00
8.00	0.42	0.12	0.24	61.00	3.71	3.15	0.00
9.00	0.54	0.20	0.39	62.00	3.71	3.15	0.00
10.00	0.70	0.32	0.57	63.00	3.71	3.15	0.00
11.00	0.93	0.50	0.91	64.00	3.71	3.15	0.00
12.00	1.85	1.35	5.56	65.00	3.71	3.15	0.00
13.00	2.78	2.24	1.50	66.00	3.71	3.15	0.00
14.00	3.01	2.46	0.86	67.00	3.71	3.15	0.00
15.00	3.17	2.61	0.64	68.00	3.71	3.15	0.00
16.00	3.29	2.73	0.45	69.00	3.71	3.15	0.00
17.00	3.37	2.82	0.35	70.00	3.71	3.15	0.00
18.00	3.44	2.88	0.27	71.00	3.71	3.15	0.00
19.00	3.50	2.94	0.24	72.00	3.71	3.15	0.00
20.00	3.55	2.99	0.21				
21.00	3.60	3.03	0.19				
22.00	3.64	3.08	0.18				
23.00	3.68	3.11	0.16				
24.00	3.71	3.15	0.14				
25.00	3.71	3.15	0.00				
26.00	3.71	3.15	0.00				
27.00	3.71	3.15	0.00				
28.00	3.71	3.15	0.00				
29.00	3.71	3.15	0.00				
30.00	3.71	3.15	0.00				
31.00	3.71	3.15	0.00				
32.00	3.71	3.15	0.00				
33.00	3.71	3.15	0.00				
34.00	3.71	3.15	0.00				
35.00	3.71	3.15	0.00				
36.00	3.71	3.15	0.00				
37.00	3.71	3.15	0.00				
38.00	3.71	3.15	0.00				
39.00	3.71	3.15	0.00				
40.00	3.71	3.15	0.00				
41.00	3.71	3.15	0.00				
42.00	3.71	3.15	0.00				
43.00	3.71	3.15	0.00				
44.00	3.71	3.15	0.00				
45.00	3.71	3.15	0.00				
46.00	3.71	3.15	0.00				
47.00	3.71	3.15	0.00				
48.00	3.71	3.15	0.00				
49.00	3.71	3.15	0.00				
50.00	3.71	3.15	0.00				
51.00	3.71	3.15	0.00				
52.00	3.71	3.15	0.00				

1119-Regional Stormwater-North

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

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Summary for Subcatchment A6R: A6 Regional

Runoff = 17.61 cfs @ 13.10 hrs, Volume= 3.914 af, Depth= 2.46"

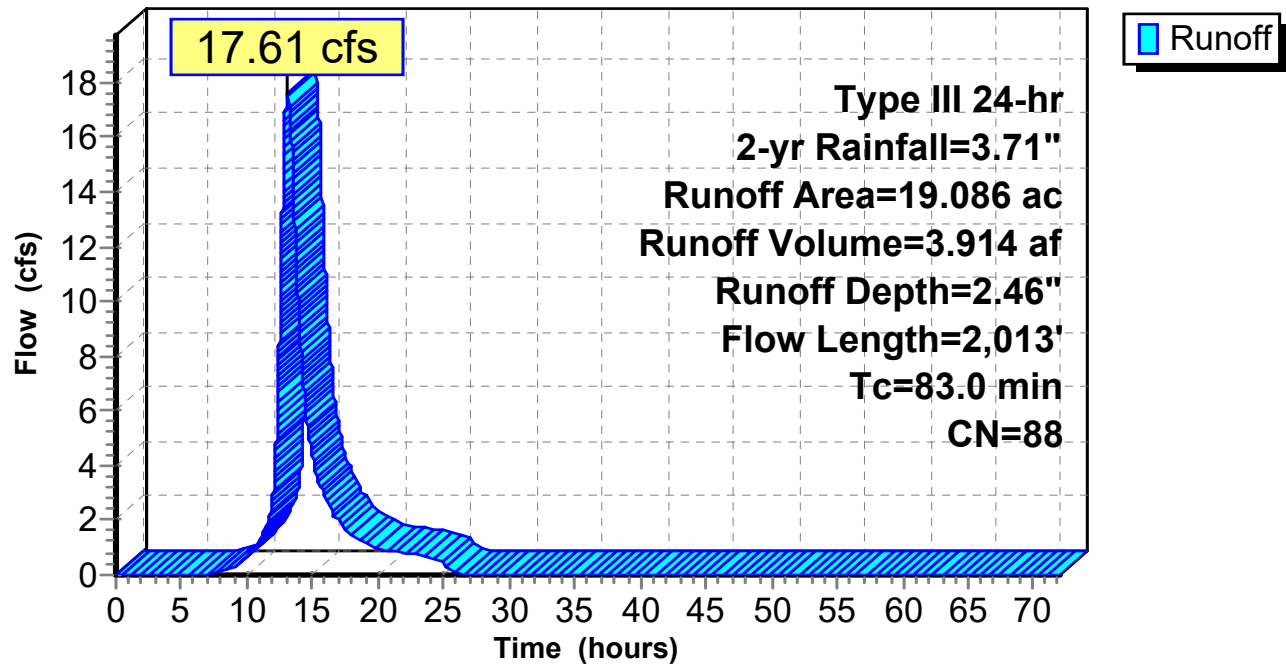
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
2.795	58	Meadow, non-grazed, HSG B
2.924	71	Meadow, non-grazed, HSG C
7.985	98	Unconnected pavement, HSG C
5.382	98	Paved parking, HSG C
19.086	88	Weighted Average
5.719	65	29.96% Pervious Area
13.367	98	70.04% Impervious Area
7.985		59.74% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	66	0.0527	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
11.9	543	0.0118	0.76		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.4	73	0.0200	2.87		Shallow Concentrated Flow, Lafayette Rd crossing pipe Paved Kv= 20.3 fps
1.6	777	0.0178	7.93	14.01	Pipe Channel, RCP_Round 18" (assumed avg.) 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
1.0	424	0.0090	6.83	21.46	Pipe Channel, RCP_Round 24" (assumed avg.) 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
1.6	130	0.0100	1.34	10.05	Trap/Vee/Rect Channel Flow, Grassed/Weedy channel Bot.W=3.00' D=1.00' Z= 6.0 & 3.0 ' Top.W=12.00' n= 0.080 Earth, long dense weeds
60.0					Direct Entry, Approximate Detention Pond Lag
83.0	2,013	Total			

Subcatchment A6R: A6 Regional

Hydrograph



1119-Regional Stormwater-North

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

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Hydrograph for Subcatchment A6R: A6 Regional

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	2.46	0.00
1.00	0.04	0.00	0.00	54.00	3.71	2.46	0.00
2.00	0.07	0.00	0.00	55.00	3.71	2.46	0.00
3.00	0.11	0.00	0.00	56.00	3.71	2.46	0.00
4.00	0.16	0.00	0.00	57.00	3.71	2.46	0.00
5.00	0.21	0.00	0.00	58.00	3.71	2.46	0.00
6.00	0.27	0.00	0.00	59.00	3.71	2.46	0.00
7.00	0.34	0.00	0.01	60.00	3.71	2.46	0.00
8.00	0.42	0.01	0.10	61.00	3.71	2.46	0.00
9.00	0.54	0.04	0.31	62.00	3.71	2.46	0.00
10.00	0.70	0.10	0.70	63.00	3.71	2.46	0.00
11.00	0.93	0.21	1.35	64.00	3.71	2.46	0.00
12.00	1.85	0.85	3.01	65.00	3.71	2.46	0.00
13.00	2.78	1.63	17.44	66.00	3.71	2.46	0.00
14.00	3.01	1.83	8.89	67.00	3.71	2.46	0.00
15.00	3.17	1.97	4.28	68.00	3.71	2.46	0.00
16.00	3.29	2.08	2.77	69.00	3.71	2.46	0.00
17.00	3.37	2.15	1.93	70.00	3.71	2.46	0.00
18.00	3.44	2.22	1.48	71.00	3.71	2.46	0.00
19.00	3.50	2.27	1.15	72.00	3.71	2.46	0.00
20.00	3.55	2.31	0.99				
21.00	3.60	2.36	0.88				
22.00	3.64	2.40	0.80				
23.00	3.68	2.43	0.72				
24.00	3.71	2.46	0.65				
25.00	3.71	2.46	0.38				
26.00	3.71	2.46	0.07				
27.00	3.71	2.46	0.01				
28.00	3.71	2.46	0.00				
29.00	3.71	2.46	0.00				
30.00	3.71	2.46	0.00				
31.00	3.71	2.46	0.00				
32.00	3.71	2.46	0.00				
33.00	3.71	2.46	0.00				
34.00	3.71	2.46	0.00				
35.00	3.71	2.46	0.00				
36.00	3.71	2.46	0.00				
37.00	3.71	2.46	0.00				
38.00	3.71	2.46	0.00				
39.00	3.71	2.46	0.00				
40.00	3.71	2.46	0.00				
41.00	3.71	2.46	0.00				
42.00	3.71	2.46	0.00				
43.00	3.71	2.46	0.00				
44.00	3.71	2.46	0.00				
45.00	3.71	2.46	0.00				
46.00	3.71	2.46	0.00				
47.00	3.71	2.46	0.00				
48.00	3.71	2.46	0.00				
49.00	3.71	2.46	0.00				
50.00	3.71	2.46	0.00				
51.00	3.71	2.46	0.00				
52.00	3.71	2.46	0.00				

1119-Regional Stormwater-North

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

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Summary for Subcatchment A7R: A7 Regional

Runoff = 2.75 cfs @ 18.68 hrs, Volume= 2.120 af, Depth= 2.55"

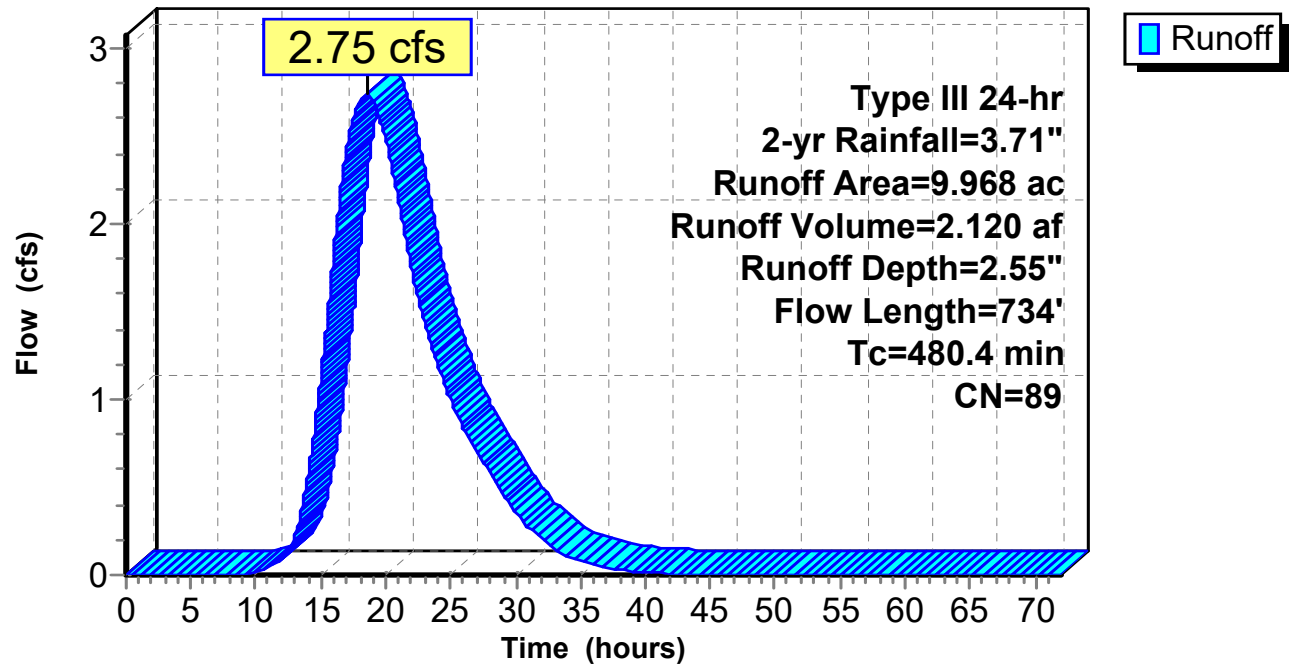
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.372	58	Meadow, non-grazed, HSG B
2.902	71	Meadow, non-grazed, HSG C
0.552	98	Unconnected pavement, HSG C
6.142	98	Paved parking, HSG C
9.968	89	Weighted Average
3.274	70	32.85% Pervious Area
6.694	98	67.15% Impervious Area
0.552		8.25% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	65	0.0323	0.14		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
2.2	113	0.0029	0.87		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.9	58	0.0029	1.09		Shallow Concentrated Flow, Pipe Segment across West Rd. Paved Kv= 20.3 fps
0.7	159	0.0050	3.72	4.57	Pipe Channel, RCP_Round 15" (assumed avg.) 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.3	159	0.0056	1.17	1.17	Trap/Vee/Rect Channel Flow, Riprap/grass/brush channel. Dims Bot.W=0.50' D=0.50' Z= 3.0 '/' Top.W=3.50' n= 0.040
1.5	180	0.0141	1.98	2.63	Parabolic Channel, Spread flow through open grass W=8.00' D=0.25' Area=1.3 sf Perim=8.0' n= 0.027
465.0					Direct Entry, To approximate Market Basket Infiltration and Det
480.4	734	Total			

Subcatchment A7R: A7 Regional

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment A7R: A7 Regional

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	53.00	3.71	2.55	0.00
1.00	0.04	0.00	0.00	54.00	3.71	2.55	0.00
2.00	0.07	0.00	0.00	55.00	3.71	2.55	0.00
3.00	0.11	0.00	0.00	56.00	3.71	2.55	0.00
4.00	0.16	0.00	0.00	57.00	3.71	2.55	0.00
5.00	0.21	0.00	0.00	58.00	3.71	2.55	0.00
6.00	0.27	0.00	0.00	59.00	3.71	2.55	0.00
7.00	0.34	0.01	0.00	60.00	3.71	2.55	0.00
8.00	0.42	0.02	0.00	61.00	3.71	2.55	0.00
9.00	0.54	0.06	0.00	62.00	3.71	2.55	0.00
10.00	0.70	0.12	0.02	63.00	3.71	2.55	0.00
11.00	0.93	0.24	0.04	64.00	3.71	2.55	0.00
12.00	1.85	0.91	0.10	65.00	3.71	2.55	0.00
13.00	2.78	1.70	0.23	66.00	3.71	2.55	0.00
14.00	3.01	1.91	0.57	67.00	3.71	2.55	0.00
15.00	3.17	2.05	1.11	68.00	3.71	2.55	0.00
16.00	3.29	2.16	1.84	69.00	3.71	2.55	0.00
17.00	3.37	2.24	2.43	70.00	3.71	2.55	0.00
18.00	3.44	2.30	2.70	71.00	3.71	2.55	0.00
19.00	3.50	2.36	2.70	72.00	3.71	2.55	0.00
20.00	3.55	2.40	2.48				
21.00	3.60	2.45	2.13				
22.00	3.64	2.49	1.73				
23.00	3.68	2.52	1.43				
24.00	3.71	2.55	1.19				
25.00	3.71	2.55	1.00				
26.00	3.71	2.55	0.84				
27.00	3.71	2.55	0.70				
28.00	3.71	2.55	0.58				
29.00	3.71	2.55	0.46				
30.00	3.71	2.55	0.36				
31.00	3.71	2.55	0.27				
32.00	3.71	2.55	0.20				
33.00	3.71	2.55	0.15				
34.00	3.71	2.55	0.11				
35.00	3.71	2.55	0.08				
36.00	3.71	2.55	0.06				
37.00	3.71	2.55	0.04				
38.00	3.71	2.55	0.03				
39.00	3.71	2.55	0.02				
40.00	3.71	2.55	0.01				
41.00	3.71	2.55	0.01				
42.00	3.71	2.55	0.01				
43.00	3.71	2.55	0.00				
44.00	3.71	2.55	0.00				
45.00	3.71	2.55	0.00				
46.00	3.71	2.55	0.00				
47.00	3.71	2.55	0.00				
48.00	3.71	2.55	0.00				
49.00	3.71	2.55	0.00				
50.00	3.71	2.55	0.00				
51.00	3.71	2.55	0.00				
52.00	3.71	2.55	0.00				

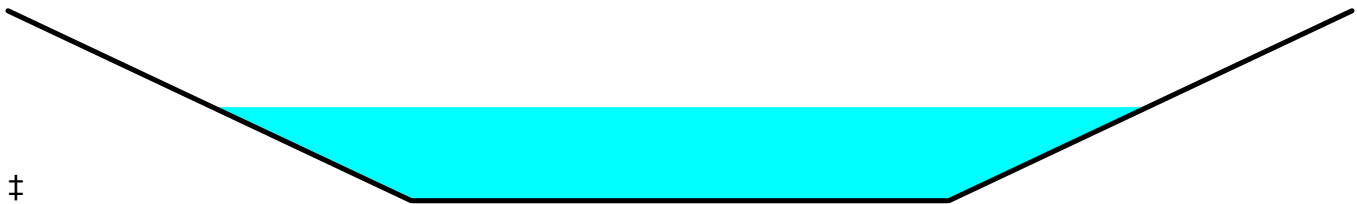
Summary for Reach 1R: Primary Discharge Channel

Inflow Area = 33.382 ac, 71.71% Impervious, Inflow Depth = 2.33" for 2-yr event
 Inflow = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af
 Outflow = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af, Atten= 0%, Lag= 0.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Max. Velocity= 3.07 fps, Min. Travel Time= 0.2 min
 Avg. Velocity = 0.83 fps, Avg. Travel Time= 0.7 min

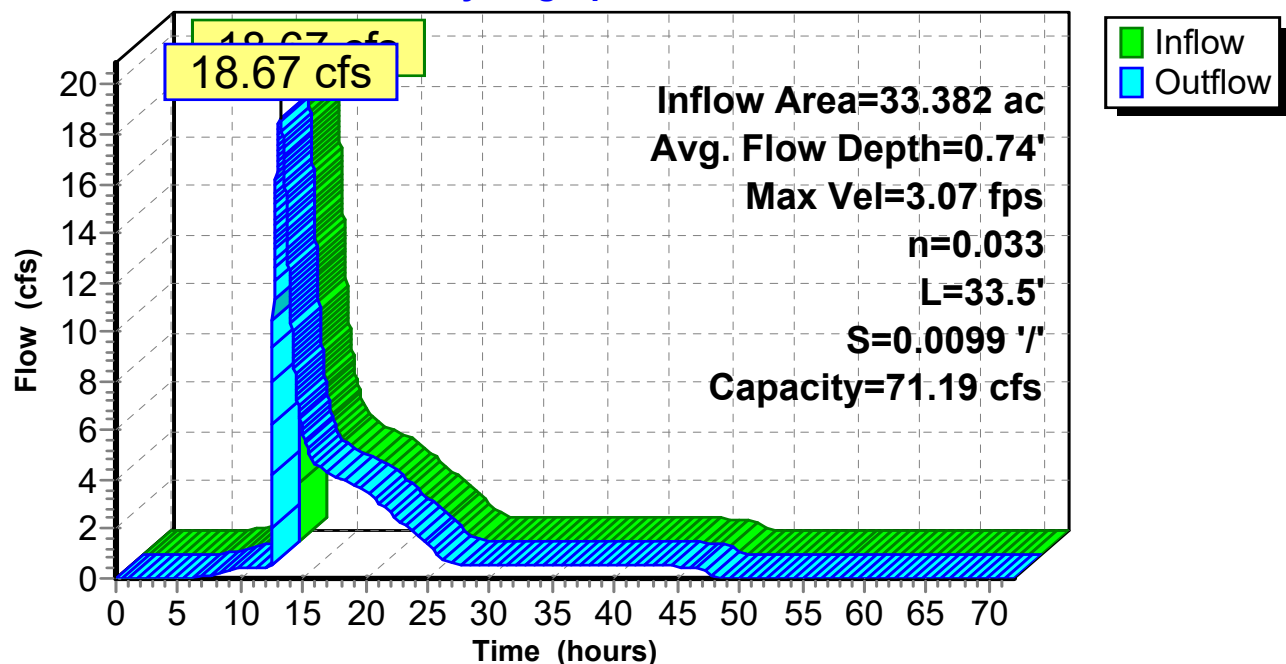
Peak Storage= 204 cf @ 13.18 hrs
 Average Depth at Peak Storage= 0.74'
 Bank-Full Depth= 1.50' Flow Area= 15.8 sf, Capacity= 71.19 cfs

6.00' x 1.50' deep channel, n= 0.033
 Side Slope Z-value= 3.0 '/' Top Width= 15.00'
 Length= 33.5' Slope= 0.0099 '/'
 Inlet Invert= 26.33', Outlet Invert= 26.00'



Reach 1R: Primary Discharge Channel

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 1R: Primary Discharge Channel

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	26.33	0.00
2.00	0.00	0	26.33	0.00
4.00	0.00	0	26.33	0.00
6.00	0.02	3	26.34	0.02
8.00	0.14	9	26.37	0.14
10.00	0.40	17	26.41	0.40
12.00	0.43	17	26.41	0.43
14.00	10.93	141	26.88	10.95
16.00	4.68	80	26.67	4.68
18.00	4.09	73	26.64	4.09
20.00	3.51	66	26.62	3.51
22.00	2.63	55	26.57	2.63
24.00	1.85	44	26.53	1.85
26.00	0.86	27	26.46	0.86
28.00	0.57	21	26.43	0.57
30.00	0.56	21	26.43	0.56
32.00	0.55	20	26.43	0.55
34.00	0.54	20	26.43	0.54
36.00	0.54	20	26.42	0.54
38.00	0.53	20	26.42	0.53
40.00	0.52	20	26.42	0.52
42.00	0.51	19	26.42	0.51
44.00	0.50	19	26.42	0.50
46.00	0.45	18	26.42	0.45
48.00	0.08	6	26.36	0.08
50.00	0.01	2	26.34	0.01
52.00	0.01	1	26.33	0.01
54.00	0.00	0	26.33	0.00
56.00	0.00	0	26.33	0.00
58.00	0.00	0	26.33	0.00
60.00	0.00	0	26.33	0.00
62.00	0.00	0	26.33	0.00
64.00	0.00	0	26.33	0.00
66.00	0.00	0	26.33	0.00
68.00	0.00	0	26.33	0.00
70.00	0.00	0	26.33	0.00
72.00	0.00	0	26.33	0.00

1119-Regional Stormwater-North

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

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Summary for Reach 2R: Over flow Channel

Existing man-made treatment swale constructed during the quarry reclamation.

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min

Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs

Average Depth at Peak Storage= 0.00'

Bank-Full Depth= 0.83' Flow Area= 10.4 sf, Capacity= 36.29 cfs

10.00' x 0.83' deep channel, n= 0.033

Side Slope Z-value= 3.0 ' ' Top Width= 14.98'

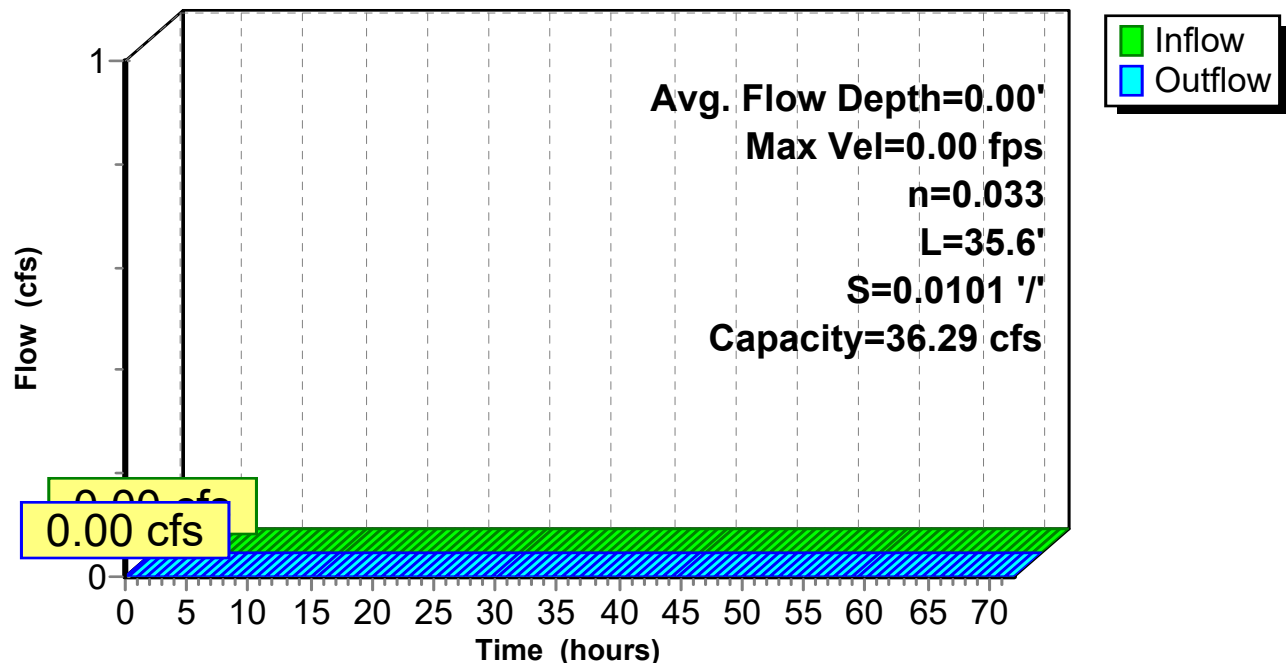
Length= 35.6' Slope= 0.0101 ' '

Inlet Invert= 27.81', Outlet Invert= 27.45'



Reach 2R: Over flow Channel

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 2R: Over flow Channel

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00	27.81	0.00	53.00	0.00	27.81	0.00
1.00	0.00	27.81	0.00	54.00	0.00	27.81	0.00
2.00	0.00	27.81	0.00	55.00	0.00	27.81	0.00
3.00	0.00	27.81	0.00	56.00	0.00	27.81	0.00
4.00	0.00	27.81	0.00	57.00	0.00	27.81	0.00
5.00	0.00	27.81	0.00	58.00	0.00	27.81	0.00
6.00	0.00	27.81	0.00	59.00	0.00	27.81	0.00
7.00	0.00	27.81	0.00	60.00	0.00	27.81	0.00
8.00	0.00	27.81	0.00	61.00	0.00	27.81	0.00
9.00	0.00	27.81	0.00	62.00	0.00	27.81	0.00
10.00	0.00	27.81	0.00	63.00	0.00	27.81	0.00
11.00	0.00	27.81	0.00	64.00	0.00	27.81	0.00
12.00	0.00	27.81	0.00	65.00	0.00	27.81	0.00
13.00	0.00	27.81	0.00	66.00	0.00	27.81	0.00
14.00	0.00	27.81	0.00	67.00	0.00	27.81	0.00
15.00	0.00	27.81	0.00	68.00	0.00	27.81	0.00
16.00	0.00	27.81	0.00	69.00	0.00	27.81	0.00
17.00	0.00	27.81	0.00	70.00	0.00	27.81	0.00
18.00	0.00	27.81	0.00	71.00	0.00	27.81	0.00
19.00	0.00	27.81	0.00	72.00	0.00	27.81	0.00
20.00	0.00	27.81	0.00				
21.00	0.00	27.81	0.00				
22.00	0.00	27.81	0.00				
23.00	0.00	27.81	0.00				
24.00	0.00	27.81	0.00				
25.00	0.00	27.81	0.00				
26.00	0.00	27.81	0.00				
27.00	0.00	27.81	0.00				
28.00	0.00	27.81	0.00				
29.00	0.00	27.81	0.00				
30.00	0.00	27.81	0.00				
31.00	0.00	27.81	0.00				
32.00	0.00	27.81	0.00				
33.00	0.00	27.81	0.00				
34.00	0.00	27.81	0.00				
35.00	0.00	27.81	0.00				
36.00	0.00	27.81	0.00				
37.00	0.00	27.81	0.00				
38.00	0.00	27.81	0.00				
39.00	0.00	27.81	0.00				
40.00	0.00	27.81	0.00				
41.00	0.00	27.81	0.00				
42.00	0.00	27.81	0.00				
43.00	0.00	27.81	0.00				
44.00	0.00	27.81	0.00				
45.00	0.00	27.81	0.00				
46.00	0.00	27.81	0.00				
47.00	0.00	27.81	0.00				
48.00	0.00	27.81	0.00				
49.00	0.00	27.81	0.00				
50.00	0.00	27.81	0.00				
51.00	0.00	27.81	0.00				
52.00	0.00	27.81	0.00				

Summary for Reach 30R: Ex. Pond 2

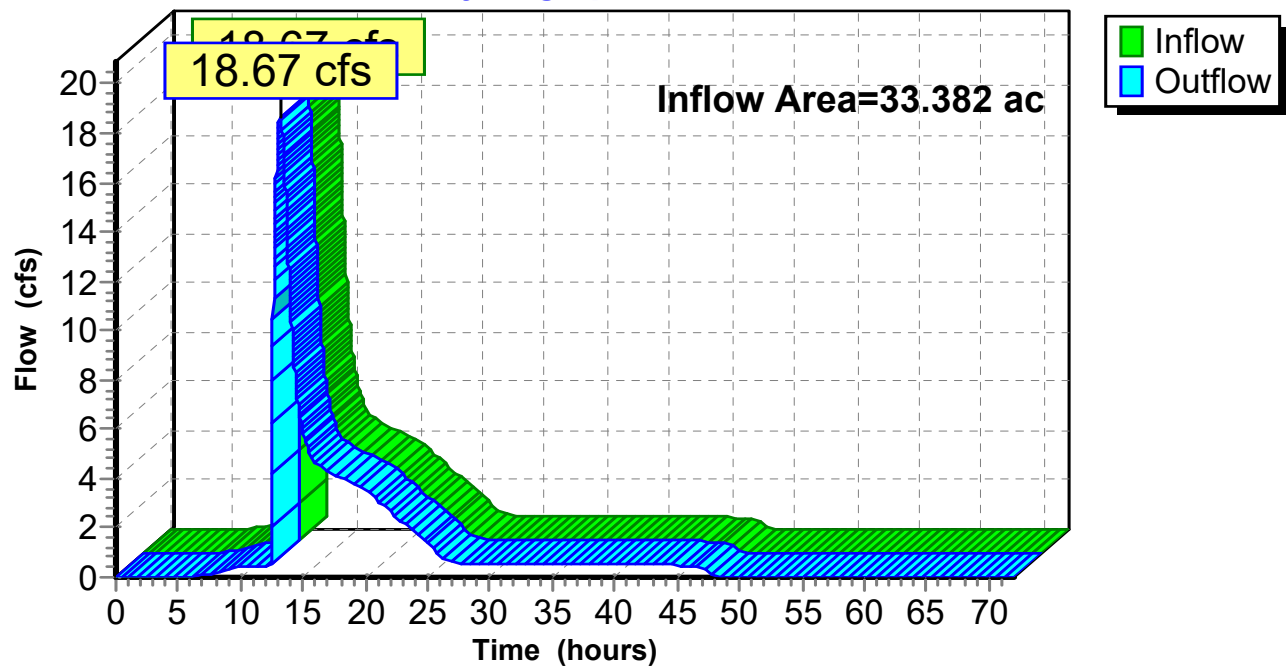
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 33.382 ac, 71.71% Impervious, Inflow Depth = 2.33" for 2-yr event
 Inflow = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af
 Outflow = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 30R: Ex. Pond 2

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 30R: Ex. Pond 2

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.00		0.00	58.00	0.00		0.00
6.00	0.02		0.02	59.00	0.00		0.00
7.00	0.07		0.07	60.00	0.00		0.00
8.00	0.14		0.14	61.00	0.00		0.00
9.00	0.31		0.31	62.00	0.00		0.00
10.00	0.40		0.40	63.00	0.00		0.00
11.00	0.42		0.42	64.00	0.00		0.00
12.00	0.43		0.43	65.00	0.00		0.00
13.00	17.90		17.90	66.00	0.00		0.00
14.00	10.95		10.95	67.00	0.00		0.00
15.00	5.88		5.88	68.00	0.00		0.00
16.00	4.68		4.68	69.00	0.00		0.00
17.00	4.28		4.28	70.00	0.00		0.00
18.00	4.09		4.09	71.00	0.00		0.00
19.00	3.83		3.83	72.00	0.00		0.00
20.00	3.51		3.51				
21.00	3.11		3.11				
22.00	2.63		2.63				
23.00	2.20		2.20				
24.00	1.85		1.85				
25.00	1.37		1.37				
26.00	0.86		0.86				
27.00	0.61		0.61				
28.00	0.57		0.57				
29.00	0.57		0.57				
30.00	0.56		0.56				
31.00	0.56		0.56				
32.00	0.55		0.55				
33.00	0.55		0.55				
34.00	0.54		0.54				
35.00	0.54		0.54				
36.00	0.54		0.54				
37.00	0.53		0.53				
38.00	0.53		0.53				
39.00	0.52		0.52				
40.00	0.52		0.52				
41.00	0.51		0.51				
42.00	0.51		0.51				
43.00	0.50		0.50				
44.00	0.50		0.50				
45.00	0.48		0.48				
46.00	0.45		0.45				
47.00	0.39		0.39				
48.00	0.08		0.08				
49.00	0.03		0.03				
50.00	0.01		0.01				
51.00	0.01		0.01				
52.00	0.01		0.01				

1119-Regional Stormwater-North

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

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Summary for Pond 4P: EDMH-A

Inflow Area = 4.328 ac, 89.60% Impervious, Inflow Depth = 3.15" for 2-yr event
 Inflow = 11.54 cfs @ 12.19 hrs, Volume= 1.134 af
 Outflow = 11.54 cfs @ 12.19 hrs, Volume= 1.134 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.84 cfs @ 12.19 hrs, Volume= 0.990 af
 Secondary = 5.71 cfs @ 12.19 hrs, Volume= 0.144 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 41.79' @ 12.19 hrs

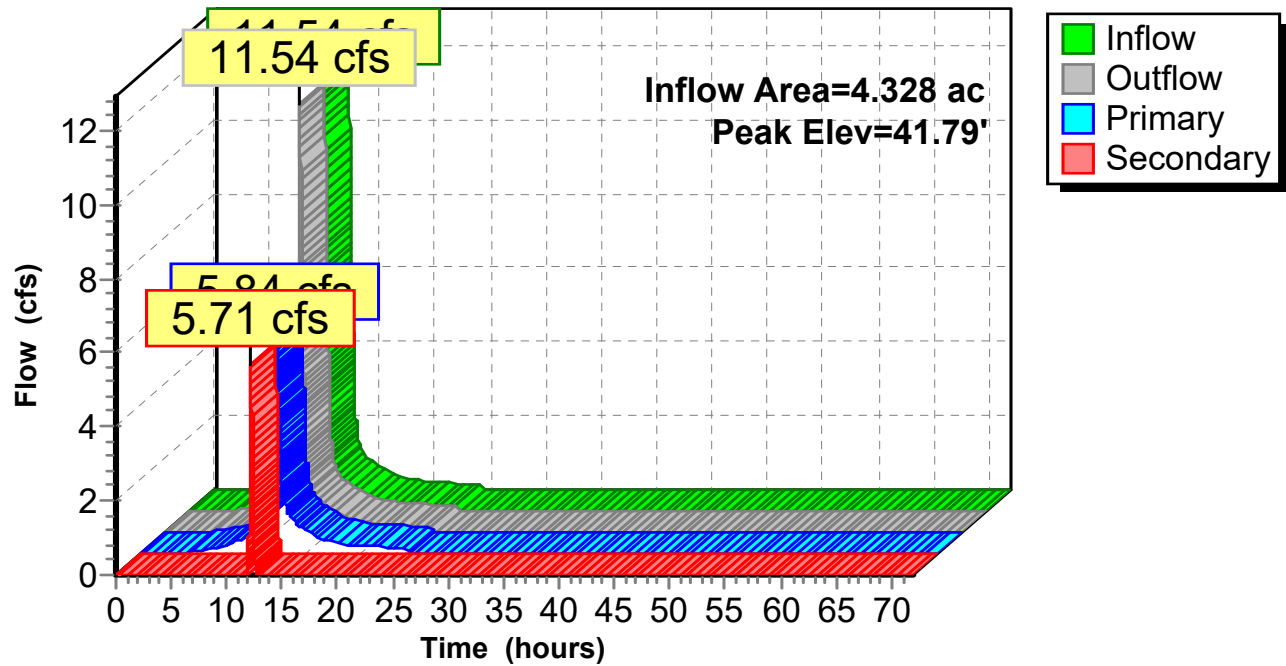
Flood Elev= 49.52'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.08'	18.0" Round EX. 18" HDPE L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.08' / 39.98' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Secondary	40.24'	18.0" Round EX. 18" HDPE L= 40.9' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.24' / 40.00' S= 0.0059 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	41.23'	4.0' long Sharp-Crested Rectangular Weir 0 End Contraction(s) 1.5' Crest Height

Primary OutFlow Max=5.83 cfs @ 12.19 hrs HW=41.79' TW=41.32' (Dynamic Tailwater)↑**1=EX. 18" HDPE** (Inlet Controls 5.83 cfs @ 3.30 fps)**Secondary OutFlow** Max=5.70 cfs @ 12.19 hrs HW=41.79' TW=32.69' (Dynamic Tailwater)↑**2=EX. 18" HDPE** (Passes 5.70 cfs of 6.47 cfs potential flow)↑**3=Sharp-Crested Rectangular Weir** (Weir Controls 5.70 cfs @ 2.55 fps)

Pond 4P: EDMH-A

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 4P: EDMH-A

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	40.08	0.00	0.00	0.00
2.00	0.00	40.08	0.00	0.00	0.00
4.00	0.03	40.17	0.03	0.03	0.00
6.00	0.10	40.24	0.10	0.10	0.00
8.00	0.24	40.33	0.24	0.24	0.00
10.00	0.57	40.48	0.57	0.57	0.00
12.00	5.56	41.42	5.56	4.46	1.10
14.00	0.86	40.57	0.86	0.86	0.00
16.00	0.45	40.43	0.45	0.45	0.00
18.00	0.27	40.35	0.27	0.27	0.00
20.00	0.21	40.32	0.21	0.21	0.00
22.00	0.18	40.30	0.18	0.18	0.00
24.00	0.14	40.27	0.14	0.14	0.00
26.00	0.00	40.08	0.00	0.00	0.00
28.00	0.00	40.08	0.00	0.00	0.00
30.00	0.00	40.08	0.00	0.00	0.00
32.00	0.00	40.08	0.00	0.00	0.00
34.00	0.00	40.08	0.00	0.00	0.00
36.00	0.00	40.08	0.00	0.00	0.00
38.00	0.00	40.08	0.00	0.00	0.00
40.00	0.00	40.08	0.00	0.00	0.00
42.00	0.00	40.08	0.00	0.00	0.00
44.00	0.00	40.08	0.00	0.00	0.00
46.00	0.00	40.08	0.00	0.00	0.00
48.00	0.00	40.08	0.00	0.00	0.00
50.00	0.00	40.08	0.00	0.00	0.00
52.00	0.00	40.08	0.00	0.00	0.00
54.00	0.00	40.08	0.00	0.00	0.00
56.00	0.00	40.08	0.00	0.00	0.00
58.00	0.00	40.08	0.00	0.00	0.00
60.00	0.00	40.08	0.00	0.00	0.00
62.00	0.00	40.08	0.00	0.00	0.00
64.00	0.00	40.08	0.00	0.00	0.00
66.00	0.00	40.08	0.00	0.00	0.00
68.00	0.00	40.08	0.00	0.00	0.00
70.00	0.00	40.08	0.00	0.00	0.00
72.00	0.00	40.08	0.00	0.00	0.00

Summary for Pond 7P: EDMH-C

Inflow Area = 4.328 ac, 89.60% Impervious, Inflow Depth = 2.75" for 2-yr event
 Inflow = 5.84 cfs @ 12.19 hrs, Volume= 0.990 af
 Outflow = 5.84 cfs @ 12.19 hrs, Volume= 0.990 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.84 cfs @ 12.19 hrs, Volume= 0.990 af

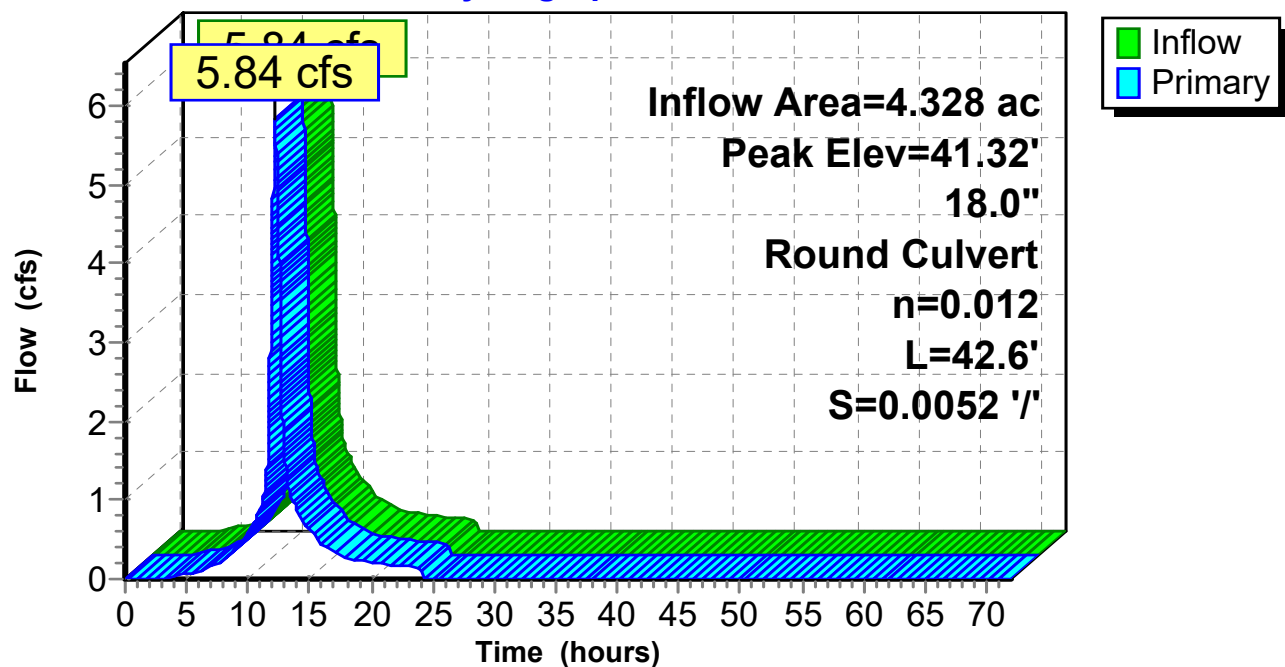
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 41.32' @ 12.19 hrs

Flood Elev= 49.03'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.88'	18.0" Round EX. 18" HDPE L= 42.6' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.88' / 39.66' S= 0.0052 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.84 cfs @ 12.19 hrs HW=41.32' TW=32.68' (Dynamic Tailwater)
 ↳ 1=EX. 18" HDPE (Barrel Controls 5.84 cfs @ 4.29 fps)

Pond 7P: EDMH-C**Hydrograph**

1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 7P: EDMH-C

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	39.88	0.00	53.00	0.00	39.88	0.00
1.00	0.00	39.88	0.00	54.00	0.00	39.88	0.00
2.00	0.00	39.88	0.00	55.00	0.00	39.88	0.00
3.00	0.00	39.90	0.00	56.00	0.00	39.88	0.00
4.00	0.03	39.97	0.03	57.00	0.00	39.88	0.00
5.00	0.06	40.01	0.06	58.00	0.00	39.88	0.00
6.00	0.10	40.04	0.10	59.00	0.00	39.88	0.00
7.00	0.16	40.08	0.16	60.00	0.00	39.88	0.00
8.00	0.24	40.12	0.24	61.00	0.00	39.88	0.00
9.00	0.39	40.19	0.39	62.00	0.00	39.88	0.00
10.00	0.57	40.26	0.57	63.00	0.00	39.88	0.00
11.00	0.91	40.37	0.91	64.00	0.00	39.88	0.00
12.00	4.46	41.08	4.46	65.00	0.00	39.88	0.00
13.00	1.50	40.52	1.50	66.00	0.00	39.88	0.00
14.00	0.86	40.35	0.86	67.00	0.00	39.88	0.00
15.00	0.64	40.28	0.64	68.00	0.00	39.88	0.00
16.00	0.45	40.22	0.45	69.00	0.00	39.88	0.00
17.00	0.35	40.18	0.35	70.00	0.00	39.88	0.00
18.00	0.27	40.14	0.27	71.00	0.00	39.88	0.00
19.00	0.24	40.12	0.24	72.00	0.00	39.88	0.00
20.00	0.21	40.11	0.21				
21.00	0.19	40.10	0.19				
22.00	0.18	40.09	0.18				
23.00	0.16	40.08	0.16				
24.00	0.14	40.07	0.14				
25.00	0.00	39.88	0.00				
26.00	0.00	39.88	0.00				
27.00	0.00	39.88	0.00				
28.00	0.00	39.88	0.00				
29.00	0.00	39.88	0.00				
30.00	0.00	39.88	0.00				
31.00	0.00	39.88	0.00				
32.00	0.00	39.88	0.00				
33.00	0.00	39.88	0.00				
34.00	0.00	39.88	0.00				
35.00	0.00	39.88	0.00				
36.00	0.00	39.88	0.00				
37.00	0.00	39.88	0.00				
38.00	0.00	39.88	0.00				
39.00	0.00	39.88	0.00				
40.00	0.00	39.88	0.00				
41.00	0.00	39.88	0.00				
42.00	0.00	39.88	0.00				
43.00	0.00	39.88	0.00				
44.00	0.00	39.88	0.00				
45.00	0.00	39.88	0.00				
46.00	0.00	39.88	0.00				
47.00	0.00	39.88	0.00				
48.00	0.00	39.88	0.00				
49.00	0.00	39.88	0.00				
50.00	0.00	39.88	0.00				
51.00	0.00	39.88	0.00				
52.00	0.00	39.88	0.00				

1119-Regional Stormwater-North

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

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Summary for Pond 13P: Ex. Dual 24" Culverts

Inflow Area = 19.086 ac, 70.04% Impervious, Inflow Depth = 2.46" for 2-yr event
 Inflow = 17.61 cfs @ 13.10 hrs, Volume= 3.914 af
 Outflow = 17.61 cfs @ 13.10 hrs, Volume= 3.914 af, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 13.10 hrs, Volume= 0.001 af
 Primary = 17.61 cfs @ 13.10 hrs, Volume= 3.913 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 36.67' @ 13.10 hrs Surf.Area= 65 sf Storage= 48 cf

Plug-Flow detention time= 0.0 min calculated for 3.914 af (100% of inflow)
 Center-of-Mass det. time= 0.0 min (880.6 - 880.6)

Volume	Invert	Avail.Storage	Storage Description
#1	35.19'	28,612 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.19	0	0	0
37.00	80	72	72
38.00	1,300	690	762
39.00	13,700	7,500	8,262
40.00	27,000	20,350	28,612

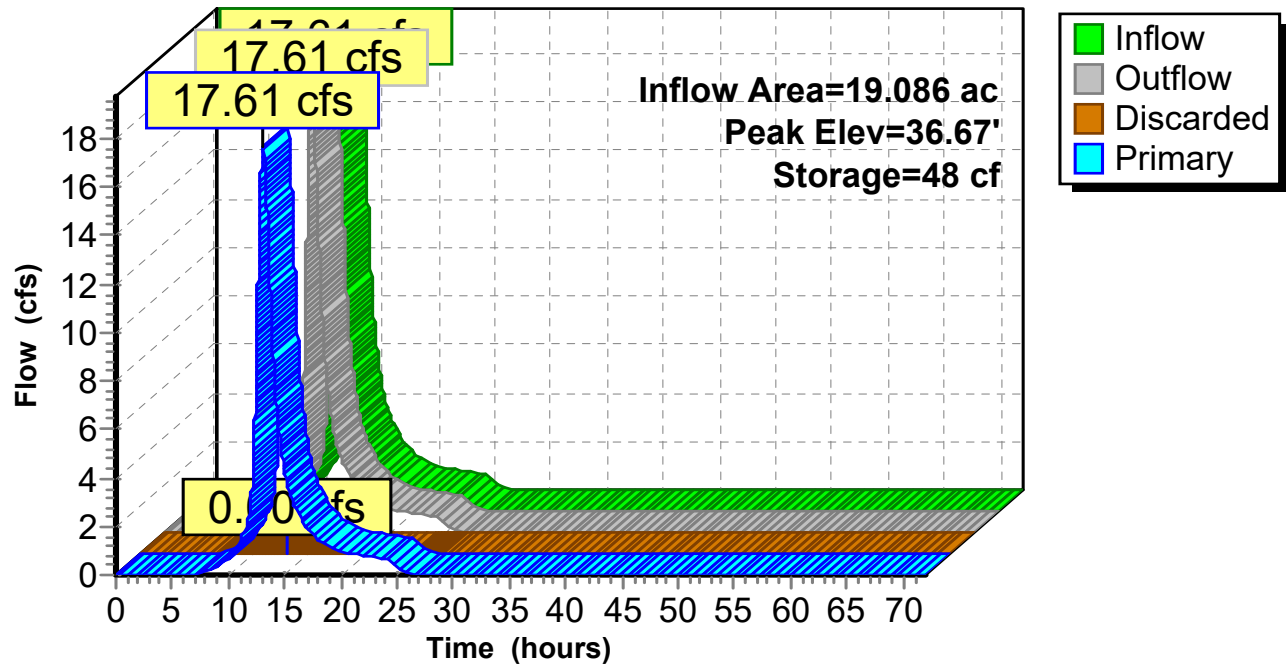
Device	Routing	Invert	Outlet Devices
#1	Primary	35.47'	24.0" Round RCP_Round 24" L= 80.9' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 35.47' / 33.57' S= 0.0235 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Primary	35.19'	24.0" Round RCP_Round 24" L= 84.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 35.19' / 33.51' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#3	Discarded	35.19'	1.270 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 13.10 hrs HW=36.67' (Free Discharge)
 ↳ **3=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=17.61 cfs @ 13.10 hrs HW=36.67' TW=33.14' (Dynamic Tailwater)
 ↳ **1=RCP_Round 24"** (Inlet Controls 7.31 cfs @ 3.73 fps)
 ↳ **2=RCP_Round 24"** (Inlet Controls 10.30 cfs @ 4.14 fps)

Pond 13P: Ex. Dual 24" Culverts

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 13P: Ex. Dual 24" Culverts

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	35.19	0.00	0.00	0.00
2.00	0.00	0	35.19	0.00	0.00	0.00
4.00	0.00	0	35.19	0.00	0.00	0.00
6.00	0.00	0	35.19	0.00	0.00	0.00
8.00	0.10	0	35.32	0.10	0.00	0.10
10.00	0.70	2	35.52	0.70	0.00	0.70
12.00	3.01	9	35.82	3.01	0.00	3.01
14.00	8.89	24	36.22	8.89	0.00	8.89
16.00	2.77	8	35.80	2.77	0.00	2.77
18.00	1.48	5	35.65	1.48	0.00	1.48
20.00	0.99	3	35.58	0.99	0.00	0.99
22.00	0.80	3	35.54	0.80	0.00	0.80
24.00	0.65	2	35.51	0.65	0.00	0.65
26.00	0.07	0	35.29	0.07	0.00	0.07
28.00	0.00	0	35.20	0.00	0.00	0.00
30.00	0.00	0	35.19	0.00	0.00	0.00
32.00	0.00	0	35.19	0.00	0.00	0.00
34.00	0.00	0	35.19	0.00	0.00	0.00
36.00	0.00	0	35.19	0.00	0.00	0.00
38.00	0.00	0	35.19	0.00	0.00	0.00
40.00	0.00	0	35.19	0.00	0.00	0.00
42.00	0.00	0	35.19	0.00	0.00	0.00
44.00	0.00	0	35.19	0.00	0.00	0.00
46.00	0.00	0	35.19	0.00	0.00	0.00
48.00	0.00	0	35.19	0.00	0.00	0.00
50.00	0.00	0	35.19	0.00	0.00	0.00
52.00	0.00	0	35.19	0.00	0.00	0.00
54.00	0.00	0	35.19	0.00	0.00	0.00
56.00	0.00	0	35.19	0.00	0.00	0.00
58.00	0.00	0	35.19	0.00	0.00	0.00
60.00	0.00	0	35.19	0.00	0.00	0.00
62.00	0.00	0	35.19	0.00	0.00	0.00
64.00	0.00	0	35.19	0.00	0.00	0.00
66.00	0.00	0	35.19	0.00	0.00	0.00
68.00	0.00	0	35.19	0.00	0.00	0.00
70.00	0.00	0	35.19	0.00	0.00	0.00
72.00	0.00	0	35.19	0.00	0.00	0.00

1119-Regional Stormwater-North

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

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Summary for Pond 17P: INV U.

Inflow Area = 9.968 ac, 67.15% Impervious, Inflow Depth = 2.55" for 2-yr event
 Inflow = 2.75 cfs @ 18.68 hrs, Volume= 2.120 af
 Outflow = 2.72 cfs @ 18.83 hrs, Volume= 2.120 af, Atten= 1%, Lag= 9.4 min
 Discarded = 0.24 cfs @ 18.83 hrs, Volume= 0.416 af
 Primary = 2.49 cfs @ 18.83 hrs, Volume= 1.704 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 42.14' @ 18.83 hrs Surf.Area= 4,271 sf Storage= 5,435 cf

Plug-Flow detention time= 57.8 min calculated for 2.120 af (100% of inflow)
 Center-of-Mass det. time= 57.7 min (1,306.4 - 1,248.7)

Volume	Invert	Avail.Storage	Storage Description
#1	39.50'	44,875 cf	Lidar Contours (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.50	0	0	0
40.00	900	225	225
41.00	2,200	1,550	1,775
42.00	4,000	3,100	4,875
43.00	6,000	5,000	9,875
44.00	9,000	7,500	17,375
45.00	15,000	12,000	29,375
46.00	16,000	15,500	44,875

Device	Routing	Invert	Outlet Devices
#1	Primary	41.21'	12.0" Round Ex 12" HDPE Pipe L= 115.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 41.21' / 39.98' S= 0.0106 '/ S= 0.0106 '/ Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	39.50'	2.410 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.24 cfs @ 18.83 hrs HW=42.14' (Free Discharge)

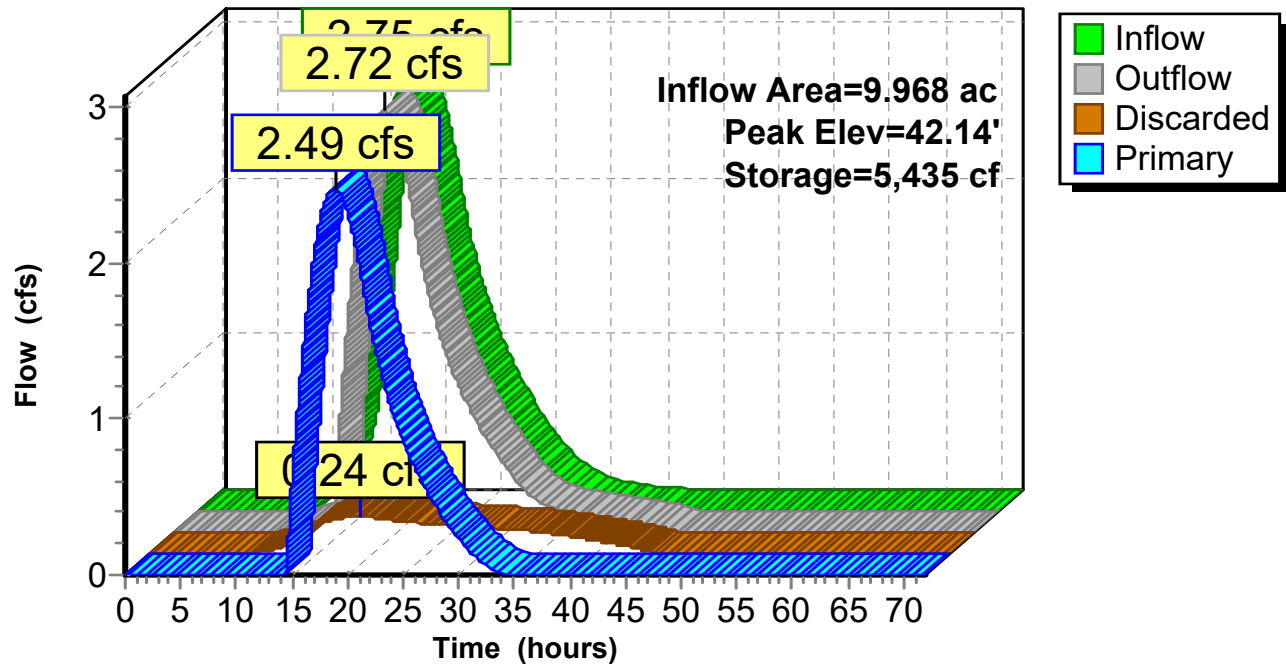
↑**2=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=2.49 cfs @ 18.83 hrs HW=42.14' TW=32.90' (Dynamic Tailwater)

↑**1=Ex 12" HDPE Pipe** (Inlet Controls 2.49 cfs @ 3.28 fps)

Pond 17P: INV U.

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 17P: INV U.

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	39.50	0.00	0.00	0.00
2.00	0.00	0	39.50	0.00	0.00	0.00
4.00	0.00	0	39.50	0.00	0.00	0.00
6.00	0.00	0	39.50	0.00	0.00	0.00
8.00	0.00	0	39.51	0.00	0.00	0.00
10.00	0.02	10	39.61	0.01	0.01	0.00
12.00	0.10	170	39.93	0.04	0.04	0.00
14.00	0.57	1,557	40.90	0.12	0.12	0.00
16.00	1.84	4,273	41.84	1.63	0.21	1.42
18.00	2.70	5,318	42.11	2.63	0.24	2.40
20.00	2.48	5,237	42.09	2.57	0.23	2.33
22.00	1.73	4,472	41.90	1.84	0.21	1.62
24.00	1.19	3,906	41.74	1.26	0.20	1.06
26.00	0.84	3,523	41.63	0.88	0.19	0.69
28.00	0.58	3,221	41.54	0.62	0.18	0.44
30.00	0.36	2,931	41.44	0.40	0.17	0.23
32.00	0.20	2,651	41.35	0.24	0.16	0.08
34.00	0.11	2,369	41.25	0.15	0.15	0.00
36.00	0.06	1,949	41.08	0.13	0.13	0.00
38.00	0.03	1,402	40.82	0.11	0.11	0.00
40.00	0.01	841	40.50	0.09	0.09	0.00
42.00	0.01	375	40.15	0.06	0.06	0.00
44.00	0.00	75	39.79	0.03	0.03	0.00
46.00	0.00	0	39.51	0.00	0.00	0.00
48.00	0.00	0	39.51	0.00	0.00	0.00
50.00	0.00	0	39.50	0.00	0.00	0.00
52.00	0.00	0	39.50	0.00	0.00	0.00
54.00	0.00	0	39.50	0.00	0.00	0.00
56.00	0.00	0	39.50	0.00	0.00	0.00
58.00	0.00	0	39.50	0.00	0.00	0.00
60.00	0.00	0	39.50	0.00	0.00	0.00
62.00	0.00	0	39.50	0.00	0.00	0.00
64.00	0.00	0	39.50	0.00	0.00	0.00
66.00	0.00	0	39.50	0.00	0.00	0.00
68.00	0.00	0	39.50	0.00	0.00	0.00
70.00	0.00	0	39.50	0.00	0.00	0.00
72.00	0.00	0	39.50	0.00	0.00	0.00

1119-Regional Stormwater-North

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

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Summary for Pond BMP-R2: BMP-R2

Inflow Area = 33.382 ac, 71.71% Impervious, Inflow Depth = 2.33" for 2-yr event
 Inflow = 18.68 cfs @ 13.15 hrs, Volume= 6.472 af
 Outflow = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af, Atten= 0%, Lag= 1.7 min
 Primary = 18.67 cfs @ 13.18 hrs, Volume= 6.472 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Starting Elev= 27.17' Surf.Area= 3,943 sf Storage= 3,154 cf
 Peak Elev= 30.96' @ 13.18 hrs Surf.Area= 5,731 sf Storage= 14,625 cf (11,471 cf above start)

Plug-Flow detention time= 83.3 min calculated for 6.399 af (99% of inflow)
 Center-of-Mass det. time= 58.7 min (1,162.7 - 1,104.0)

Volume	Invert	Avail.Storage	Storage Description	
#1	25.17'	29,193 cf	Bioretention w/ ISR Bay (Prismatic) Listed below	
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
25.17	3,943	0.0	0	0
27.17	3,943	40.0	3,154	3,154
27.50	3,943	35.0	455	3,610
29.00	3,943	10.0	591	4,201
32.00	6,675	100.0	15,927	20,128
33.00	7,578	100.0	7,127	27,255
33.25	7,928	100.0	1,938	29,193

Device	Routing	Invert	Outlet Devices
#1	Primary	26.50'	36.0" Round Culvert L= 32.8' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.50' / 26.34' S= 0.0049 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	27.17'	3.5" Vert. WQV Orifice C= 0.600
#3	Device 1	30.50'	4.0" x 4.0" Horiz. High flow Bypass X 13.00 columns X 5 rows C= 0.600 in 72.0" x 33.0" Grate (44% open area) Limited to weir flow at low heads
#4	Secondary	32.60'	10.0' long x 12.0' breadth Weir-3-Emergency Overflow-A Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#5	Secondary	32.60'	151.9 deg Weir-3-Emergency Overflow-B Cv= 1.97 (C= 2.46)

Primary OutFlow Max=18.67 cfs @ 13.18 hrs HW=30.96' TW=27.07' (Dynamic Tailwater)

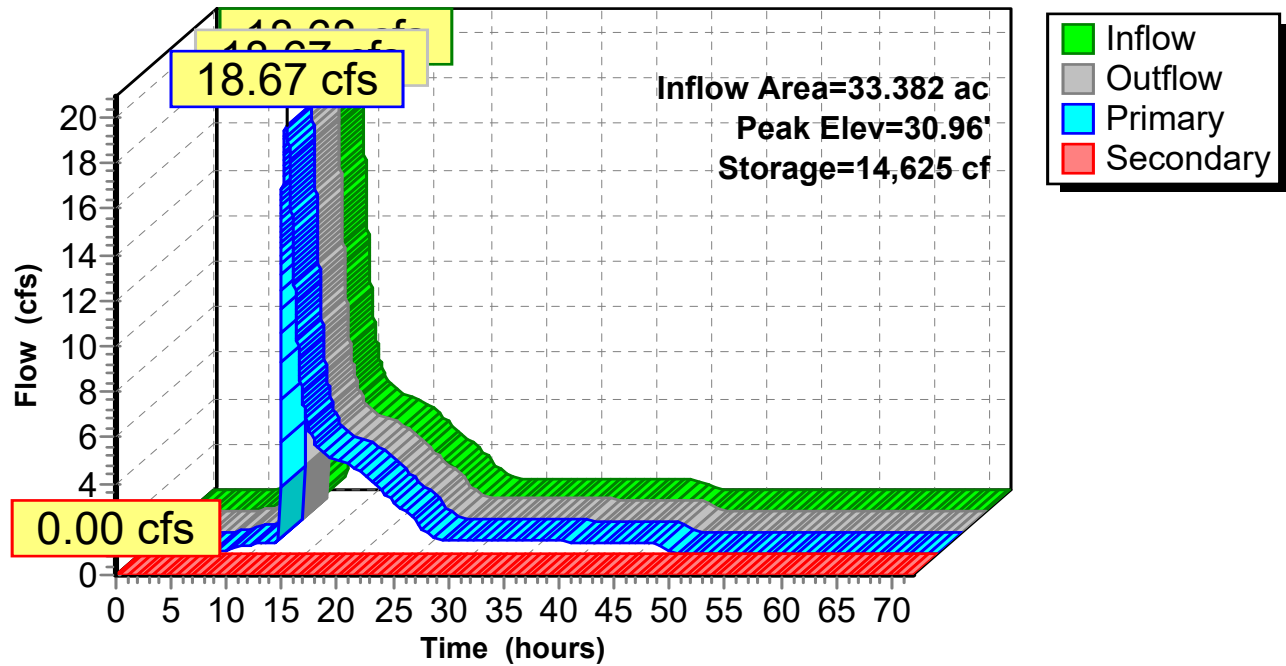
- 1=Culvert (Passes 18.67 cfs of 55.39 cfs potential flow)
- 2=WQV Orifice (Orifice Controls 0.61 cfs @ 9.20 fps)
- 3=High flow Bypass (Weir Controls 18.05 cfs @ 2.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.17' TW=27.81' (Dynamic Tailwater)

- 4=Weir-3-Emergency Overflow-A (Controls 0.00 cfs)
- 5=Weir-3-Emergency Overflow-B (Controls 0.00 cfs)

Pond BMP-R2: BMP-R2

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond BMP-R2: BMP-R2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	3,154	27.17	0.00	0.00	0.00
2.00	0.00	3,154	27.17	0.00	0.00	0.00
4.00	0.00	3,156	27.17	0.00	0.00	0.00
6.00	0.06	3,298	27.27	0.02	0.02	0.00
8.00	0.23	3,616	27.52	0.14	0.14	0.00
10.00	0.45	4,158	28.89	0.40	0.40	0.00
12.00	0.54	4,616	29.08	0.43	0.43	0.00
14.00	10.64	13,860	30.82	10.93	10.93	0.00
16.00	4.65	13,079	30.67	4.68	4.68	0.00
18.00	4.08	12,989	30.66	4.09	4.09	0.00
20.00	3.50	12,896	30.64	3.51	3.51	0.00
22.00	2.60	12,741	30.61	2.63	2.63	0.00
24.00	1.83	12,584	30.58	1.85	1.85	0.00
26.00	0.82	12,319	30.53	0.86	0.86	0.00
28.00	0.49	11,981	30.47	0.57	0.57	0.00
30.00	0.49	11,421	30.36	0.56	0.56	0.00
32.00	0.49	10,925	30.27	0.55	0.55	0.00
34.00	0.48	10,449	30.18	0.54	0.54	0.00
36.00	0.47	9,971	30.09	0.54	0.54	0.00
38.00	0.46	9,484	30.00	0.53	0.53	0.00
40.00	0.45	8,983	29.90	0.52	0.52	0.00
42.00	0.43	8,461	29.80	0.51	0.51	0.00
44.00	0.38	7,876	29.69	0.50	0.50	0.00
46.00	0.04	5,548	29.25	0.45	0.45	0.00
48.00	0.01	3,450	27.38	0.08	0.08	0.00
50.00	0.00	3,259	27.25	0.01	0.01	0.00
52.00	0.00	3,221	27.22	0.01	0.01	0.00
54.00	0.00	3,204	27.21	0.00	0.00	0.00
56.00	0.00	3,194	27.20	0.00	0.00	0.00
58.00	0.00	3,188	27.19	0.00	0.00	0.00
60.00	0.00	3,183	27.19	0.00	0.00	0.00
62.00	0.00	3,180	27.19	0.00	0.00	0.00
64.00	0.00	3,177	27.19	0.00	0.00	0.00
66.00	0.00	3,175	27.18	0.00	0.00	0.00
68.00	0.00	3,173	27.18	0.00	0.00	0.00
70.00	0.00	3,172	27.18	0.00	0.00	0.00
72.00	0.00	3,170	27.18	0.00	0.00	0.00

1119-Regional Stormwater-North

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

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Summary for Pond BMP-R3: BMP-R3

Inflow Area = 33.382 ac, 71.71% Impervious, Inflow Depth = 2.43" for 2-yr event
 Inflow = 18.96 cfs @ 13.09 hrs, Volume= 6.751 af
 Outflow = 18.80 cfs @ 13.15 hrs, Volume= 6.751 af, Atten= 1%, Lag= 3.7 min
 Discarded = 0.12 cfs @ 13.15 hrs, Volume= 0.279 af
 Primary = 14.50 cfs @ 13.15 hrs, Volume= 6.105 af
 Secondary = 4.18 cfs @ 13.15 hrs, Volume= 0.367 af
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 29.42' Surf.Area= 0 sf Storage= 5,091 cf

Peak Elev= 33.14' @ 13.15 hrs Surf.Area= 21,555 sf Storage= 45,206 cf (40,116 cf above start)

Plug-Flow detention time= 188.7 min calculated for 6.633 af (98% of inflow)

Center-of-Mass det. time= 164.6 min (1,121.4 - 956.7)

Volume	Invert	Avail.Storage	Storage Description
#1	27.09'	27,645 cf	Bioretention w/ ISR Bay (Prismatic) Listed below (Recalc) -Impervious
#2	31.50'	53,375 cf	Forebay Wetlands (Prismatic) Listed below (Recalc)
		81,020 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
27.09	5,462	0.0	0	0
29.42	5,462	40.0	5,091	5,091
29.75	5,462	35.0	631	5,721
31.25	5,462	10.0	819	6,541
33.00	7,200	100.0	11,079	17,620
33.30	7,750	100.0	2,242	19,862
33.50	7,940	100.0	1,569	21,431
34.25	8,630	100.0	6,214	27,645

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
31.50	9,000	0	0
32.00	14,000	5,750	5,750
32.50	18,200	8,050	13,800
33.00	20,800	9,750	23,550
33.30	22,400	6,480	30,030
33.50	26,372	4,877	34,907
34.00	23,600	12,493	47,400
34.25	24,200	5,975	53,375

1119-Regional Stormwater-North

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

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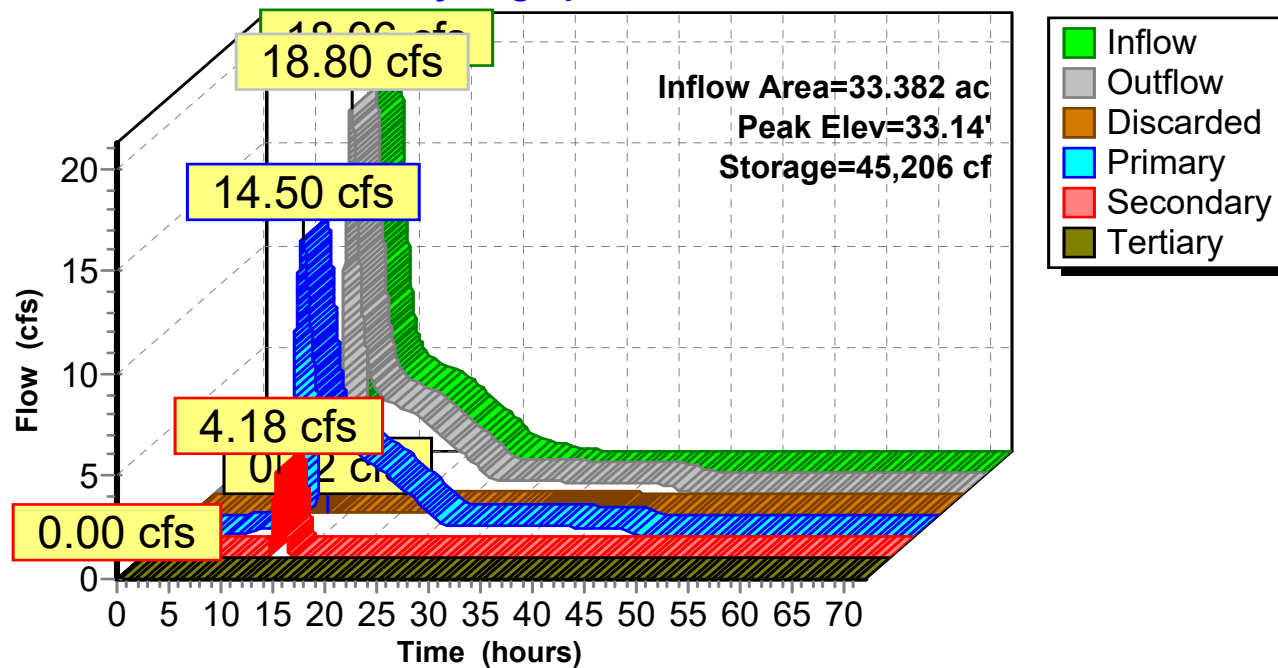
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Device	Routing	Invert	Outlet Devices
#1	Primary	29.25'	30.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 29.25' / 29.00' S= 0.0078 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Device 1	29.42'	3.5" Vert. WQV Orifice C= 0.600
#3	Device 1	32.75'	4.0" x 4.0" Horiz. High flow Bypass-A X 13.00 columns X 5 rows C= 0.600 in 72.0" x 33.0" Grate (44% open area) Limited to weir flow at low heads
#4	Secondary	29.25'	30.0" Round Culvert L= 29.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 29.25' / 29.00' S= 0.0086 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#5	Device 4	33.00'	4.0" x 4.0" Horiz. High flow Bypass-B X 13.00 columns X 13 rows C= 0.600 in 72.0" x 72.0" Grate (52% open area) Limited to weir flow at low heads
#6	Tertiary	33.50'	10.0' long x 12.0' breadth Weir-2-Emergency Overflow-A Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64
#7	Tertiary	33.50'	151.9 deg Weir-2-Emergency Overflow-B Cv= 1.97 (C= 2.46)
#8	Discarded	31.50'	0.250 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.12 cfs @ 13.15 hrs HW=33.14' (Free Discharge)↑**8=Exfiltration** (Exfiltration Controls 0.12 cfs)**Primary OutFlow** Max=14.50 cfs @ 13.15 hrs HW=33.14' TW=30.96' (Dynamic Tailwater)↑**1=Culvert** (Passes 14.50 cfs of 34.88 cfs potential flow)↑**2=WQV Orifice** (Orifice Controls 0.47 cfs @ 7.11 fps)↑**3=High flow Bypass-A** (Weir Controls 14.02 cfs @ 2.05 fps)**Secondary OutFlow** Max=4.18 cfs @ 13.15 hrs HW=33.14' TW=30.96' (Dynamic Tailwater)↑**4=Culvert** (Passes 4.18 cfs of 34.88 cfs potential flow)↑**5=High flow Bypass-B** (Weir Controls 4.18 cfs @ 1.23 fps)**Tertiary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=29.42' TW=27.17' (Dynamic Tailwater)↑**6=Weir-2-Emergency Overflow-A** (Controls 0.00 cfs)↑**7=Weir-2-Emergency Overflow-B** (Controls 0.00 cfs)

Pond BMP-R3: BMP-R3

Hydrograph



1119-Regional Stormwater-North*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond BMP-R3: BMP-R3

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
0.00	0.00	5,091	29.42	0.00	0.00	0.00	0.00	0.00
2.00	0.00	5,091	29.42	0.00	0.00	0.00	0.00	0.00
4.00	0.03	5,142	29.45	0.00	0.00	0.00	0.00	0.00
6.00	0.10	5,428	29.60	0.06	0.00	0.06	0.00	0.00
8.00	0.34	5,901	30.08	0.23	0.00	0.23	0.00	0.00
10.00	1.27	8,406	31.53	0.50	0.05	0.45	0.00	0.00
12.00	8.57	24,571	32.36	0.64	0.10	0.54	0.00	0.00
14.00	9.75	42,532	33.05	10.76	0.12	9.81	0.83	0.00
16.00	4.65	39,073	32.92	4.77	0.12	4.65	0.00	0.00
18.00	4.15	38,620	32.91	4.19	0.12	4.08	0.00	0.00
20.00	3.53	38,141	32.89	3.61	0.12	3.50	0.00	0.00
22.00	2.60	37,342	32.86	2.72	0.12	2.60	0.00	0.00
24.00	1.85	36,557	32.83	1.95	0.12	1.83	0.00	0.00
26.00	0.76	35,232	32.78	0.94	0.11	0.82	0.00	0.00
28.00	0.44	34,275	32.75	0.60	0.11	0.49	0.00	0.00
30.00	0.23	32,338	32.67	0.60	0.11	0.49	0.00	0.00
32.00	0.08	29,135	32.55	0.59	0.11	0.49	0.00	0.00
34.00	0.00	25,187	32.39	0.58	0.10	0.48	0.00	0.00
36.00	0.00	21,093	32.21	0.56	0.09	0.47	0.00	0.00
38.00	0.00	17,132	32.02	0.54	0.08	0.46	0.00	0.00
40.00	0.00	13,323	31.83	0.52	0.07	0.45	0.00	0.00
42.00	0.00	9,689	31.61	0.49	0.06	0.43	0.00	0.00
44.00	0.00	6,460	31.10	0.38	0.00	0.38	0.00	0.00
46.00	0.00	5,363	29.56	0.04	0.00	0.04	0.00	0.00
48.00	0.00	5,216	29.49	0.01	0.00	0.01	0.00	0.00
50.00	0.00	5,170	29.46	0.00	0.00	0.00	0.00	0.00
52.00	0.00	5,149	29.45	0.00	0.00	0.00	0.00	0.00
54.00	0.00	5,136	29.44	0.00	0.00	0.00	0.00	0.00
56.00	0.00	5,128	29.44	0.00	0.00	0.00	0.00	0.00
58.00	0.00	5,122	29.44	0.00	0.00	0.00	0.00	0.00
60.00	0.00	5,118	29.43	0.00	0.00	0.00	0.00	0.00
62.00	0.00	5,115	29.43	0.00	0.00	0.00	0.00	0.00
64.00	0.00	5,112	29.43	0.00	0.00	0.00	0.00	0.00
66.00	0.00	5,110	29.43	0.00	0.00	0.00	0.00	0.00
68.00	0.00	5,109	29.43	0.00	0.00	0.00	0.00	0.00
70.00	0.00	5,107	29.43	0.00	0.00	0.00	0.00	0.00
72.00	0.00	5,106	29.43	0.00	0.00	0.00	0.00	0.00

1119-Regional Stormwater-North

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

SubcatchmentA1: DPW OFFSITE

Runoff Area=4.328 ac 89.60% Impervious Runoff Depth=5.05"
 Flow Length=864' Tc=14.5 min CN=95 Runoff=18.08 cfs 1.823 af

SubcatchmentA6R: A6 Regional

Runoff Area=19.086 ac 70.04% Impervious Runoff Depth=4.28"
 Flow Length=2,013' Tc=83.0 min CN=88 Runoff=30.20 cfs 6.807 af

SubcatchmentA7R: A7 Regional

Runoff Area=9.968 ac 67.15% Impervious Runoff Depth=4.39"
 Flow Length=734' Tc=480.4 min CN=89 Runoff=4.69 cfs 3.644 af

Reach 1R: Primary Discharge Channel Avg. Flow Depth=0.99' Max Vel=3.60 fps Inflow=31.79 cfs 11.446 af
 n=0.033 L=33.5' S=0.0099 '/' Capacity=71.19 cfs Outflow=31.79 cfs 11.446 af

Reach 2R: Over flow Channel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.033 L=35.6' S=0.0101 '/' Capacity=36.29 cfs Outflow=0.00 cfs 0.000 af

Reach 30R: Ex. Pond 2

Inflow=31.79 cfs 11.446 af
 Outflow=31.79 cfs 11.446 af

Pond 4P: EDMH-A

Peak Elev=42.64' Inflow=18.08 cfs 1.823 af
 Primary=8.01 cfs 1.488 af Secondary=10.08 cfs 0.334 af Outflow=18.08 cfs 1.823 af

Pond 7P: EDMH-C

Peak Elev=41.75' Inflow=8.01 cfs 1.488 af
 18.0" Round Culvert n=0.012 L=42.6' S=0.0052 '/' Outflow=8.01 cfs 1.488 af

Pond 13P: Ex. Dual 24" Culverts

Peak Elev=37.32' Storage=162 cf Inflow=30.20 cfs 6.807 af
 Discarded=0.01 cfs 0.002 af Primary=30.18 cfs 6.805 af Outflow=30.19 cfs 6.807 af

Pond 17P: INV U.

Peak Elev=42.99' Storage=9,818 cf Inflow=4.69 cfs 3.644 af
 Discarded=0.33 cfs 0.512 af Primary=4.17 cfs 3.132 af Outflow=4.51 cfs 3.644 af

Pond BMP-R2: BMP-R2

Peak Elev=31.30' Storage=16,424 cf Inflow=31.99 cfs 11.446 af
 Primary=31.79 cfs 11.446 af Secondary=0.00 cfs 0.000 af Outflow=31.79 cfs 11.446 af

Pond BMP-R3: BMP-R3

Peak Elev=33.26' Storage=48,764 cf Inflow=32.33 cfs 11.761 af
 314 af Primary=21.44 cfs 10.065 af Secondary=10.55 cfs 1.381 af Tertiary=0.00 cfs 0.000 af Outflow=32.12 cfs 11.760 af

Total Runoff Area = 33.382 ac Runoff Volume = 12.274 af Average Runoff Depth = 4.41"
28.29% Pervious = 9.443 ac 71.71% Impervious = 23.939 ac

1119-Regional Stormwater-North*Type III 24-hr 25-yr Rainfall=7.14"*

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

SubcatchmentA1: DPW OFFSITERunoff Area=4.328 ac 89.60% Impervious Runoff Depth=6.55"
Flow Length=864' Tc=14.5 min CN=95 Runoff=23.11 cfs 2.361 af**SubcatchmentA6R: A6 Regional**Runoff Area=19.086 ac 70.04% Impervious Runoff Depth=5.73"
Flow Length=2,013' Tc=83.0 min CN=88 Runoff=39.97 cfs 9.113 af**SubcatchmentA7R: A7 Regional**Runoff Area=9.968 ac 67.15% Impervious Runoff Depth=5.84"
Flow Length=734' Tc=480.4 min CN=89 Runoff=6.20 cfs 4.855 af**Reach 1R: Primary Discharge Channel** Avg. Flow Depth=1.15' Max Vel=3.90 fps Inflow=42.18 cfs 15.364 af
n=0.033 L=33.5' S=0.0099 '/' Capacity=71.19 cfs Outflow=42.18 cfs 15.364 af**Reach 2R: Over flow Channel** Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.033 L=35.6' S=0.0101 '/' Capacity=36.29 cfs Outflow=0.00 cfs 0.000 af**Reach 30R: Ex. Pond 2**Inflow=42.18 cfs 15.364 af
Outflow=42.18 cfs 15.364 af**Pond 4P: EDMH-A**Peak Elev=43.49' Inflow=23.11 cfs 2.361 af
Primary=9.75 cfs 1.870 af Secondary=13.36 cfs 0.491 af Outflow=23.11 cfs 2.361 af**Pond 7P: EDMH-C**Peak Elev=42.18' Inflow=9.75 cfs 1.870 af
18.0" Round Culvert n=0.012 L=42.6' S=0.0052 '/' Outflow=9.75 cfs 1.870 af**Pond 13P: Ex. Dual 24" Culverts**Peak Elev=38.07' Storage=874 cf Inflow=39.97 cfs 9.113 af
Discarded=0.06 cfs 0.004 af Primary=39.82 cfs 9.109 af Outflow=39.89 cfs 9.113 af**Pond 17P: INV U.**Peak Elev=44.03' Storage=17,678 cf Inflow=6.20 cfs 4.855 af
Discarded=0.51 cfs 0.625 af Primary=5.14 cfs 4.230 af Outflow=5.65 cfs 4.855 af**Pond BMP-R2: BMP-R2**Peak Elev=31.92' Storage=19,727 cf Inflow=42.57 cfs 15.365 af
Primary=42.18 cfs 15.364 af Secondary=0.00 cfs 0.000 af Outflow=42.18 cfs 15.364 af**Pond BMP-R3: BMP-R3**Peak Elev=33.35' Storage=51,276 cf Inflow=42.89 cfs 15.699 af
334 af Primary=26.66 cfs 12.990 af Secondary=15.92 cfs 2.375 af Tertiary=0.00 cfs 0.000 af Outflow=42.71 cfs 15.699 af**Total Runoff Area = 33.382 ac Runoff Volume = 16.329 af Average Runoff Depth = 5.87"**
28.29% Pervious = 9.443 ac 71.71% Impervious = 23.939 ac

1119-Regional Stormwater-North

Type III 24-hr 50-yr Rainfall=8.56"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

SubcatchmentA1: DPW OFFSITE

Runoff Area=4.328 ac 89.60% Impervious Runoff Depth=7.96"
 Flow Length=864' Tc=14.5 min CN=95 Runoff=27.85 cfs 2.871 af

SubcatchmentA6R: A6 Regional

Runoff Area=19.086 ac 70.04% Impervious Runoff Depth=7.12"
 Flow Length=2,013' Tc=83.0 min CN=88 Runoff=49.17 cfs 11.318 af

SubcatchmentA7R: A7 Regional

Runoff Area=9.968 ac 67.15% Impervious Runoff Depth=7.24"
 Flow Length=734' Tc=480.4 min CN=89 Runoff=7.65 cfs 6.011 af

Reach 1R: Primary Discharge Channel Avg. Flow Depth=1.24' Max Vel=4.07 fps Inflow=48.79 cfs 19.036 af
 n=0.033 L=33.5' S=0.0099 '/' Capacity=71.19 cfs Outflow=48.79 cfs 19.036 af

Reach 2R: Over flow Channel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
 n=0.033 L=35.6' S=0.0101 '/' Capacity=36.29 cfs Outflow=0.00 cfs 0.000 af

Reach 30R: Ex. Pond 2

Inflow=48.79 cfs 19.036 af
 Outflow=48.79 cfs 19.036 af

Pond 4P: EDMH-A

Peak Elev=44.56' Inflow=27.85 cfs 2.871 af
 Primary=11.78 cfs 2.229 af Secondary=16.08 cfs 0.641 af Outflow=27.85 cfs 2.871 af

Pond 7P: EDMH-C

Peak Elev=42.65' Inflow=11.78 cfs 2.229 af
 18.0" Round Culvert n=0.012 L=42.6' S=0.0052 '/' Outflow=11.78 cfs 2.229 af

Pond 13P: Ex. Dual 24" Culverts

Peak Elev=38.75' Storage=5,255 cf Inflow=49.17 cfs 11.318 af
 Discarded=0.31 cfs 0.019 af Primary=47.07 cfs 11.300 af Outflow=47.38 cfs 11.318 af

Pond 17P: INV U.

Peak Elev=44.90' Storage=27,876 cf Inflow=7.65 cfs 6.011 af
 Discarded=0.80 cfs 0.795 af Primary=5.82 cfs 5.217 af Outflow=6.63 cfs 6.011 af

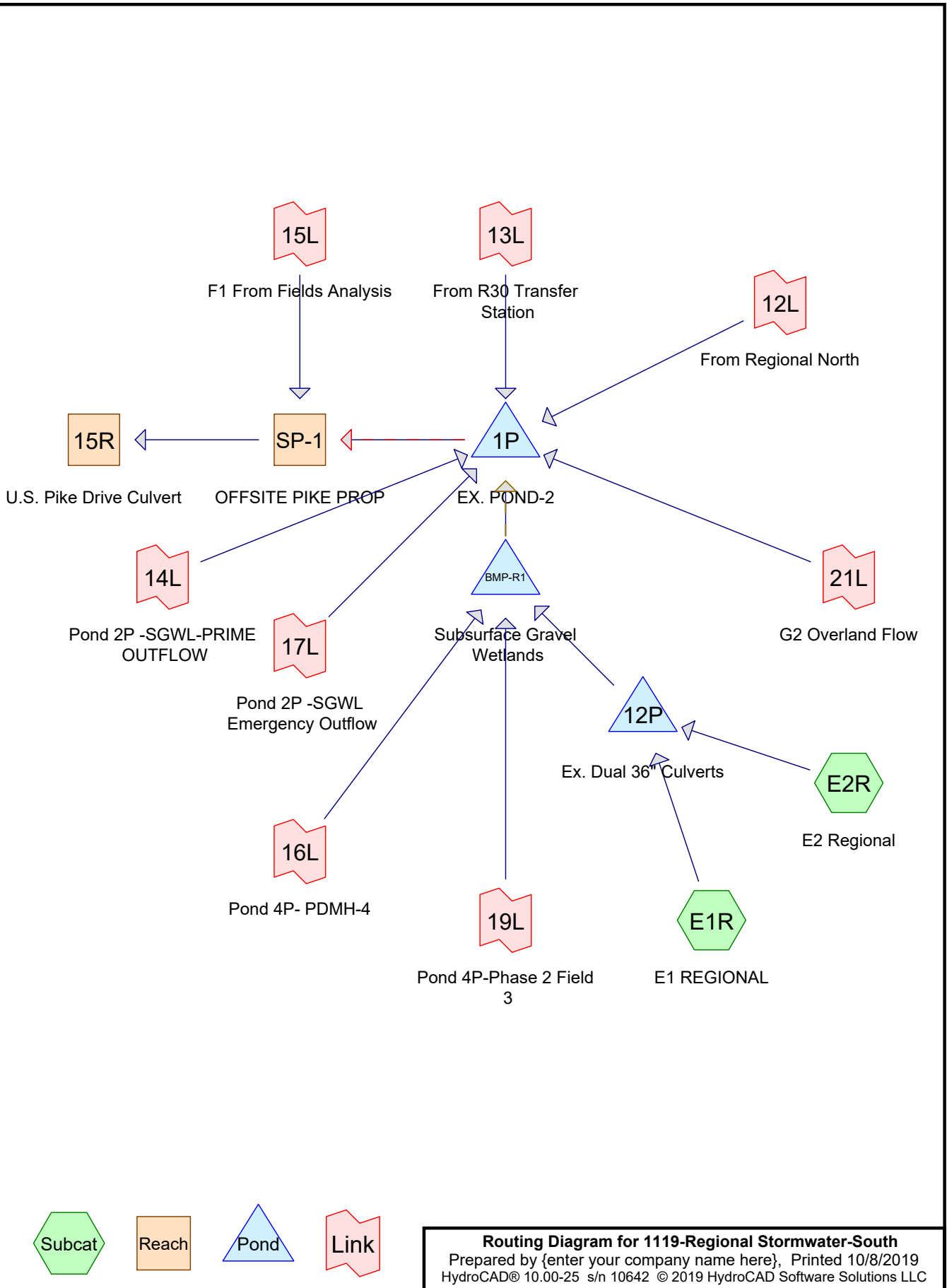
Pond BMP-R2: BMP-R2

Peak Elev=32.41' Storage=23,060 cf Inflow=49.47 cfs 19.036 af
 Primary=48.79 cfs 19.036 af Secondary=0.00 cfs 0.000 af Outflow=48.79 cfs 19.036 af

Pond BMP-R3: BMP-R3

Peak Elev=33.48' Storage=55,608 cf Inflow=50.78 cfs 19.387 af
 351 af Primary=27.68 cfs 15.279 af Secondary=24.71 cfs 3.757 af Tertiary=0.00 cfs 0.000 af Outflow=49.62 cfs 19.387 af

Total Runoff Area = 33.382 ac Runoff Volume = 20.201 af Average Runoff Depth = 7.26"
28.29% Pervious = 9.443 ac 71.71% Impervious = 23.939 ac



1119-Regional Stormwater-South

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
13,504	96	Gravel surface, 100% imp, HSG C (E1R)
292,113	30	Meadow, non-grazed, HSG A (E2R)
303,047	58	Meadow, non-grazed, HSG B (E1R, E2R)
1,146,020	71	Meadow, non-grazed, HSG C (E1R, E2R)
2,241,336	98	Paved parking, HSG C (E1R, E2R)
258,834	98	Unconnected pavement, HSG C (E2R)
1,481	30	Woods, Good, HSG A (E1R)
140,917	55	Woods, Good, HSG B (E1R, E2R)
503,859	70	Woods, Good, HSG C (E1R, E2R)
100,580	77	Woods, Good, HSG D (E1R)
5,001,690	81	TOTAL AREA

1119-Regional Stormwater-South

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
293,594	HSG A	E1R, E2R
443,964	HSG B	E1R, E2R
4,163,552	HSG C	E1R, E2R
100,580	HSG D	E1R
0	Other	
5,001,690		TOTAL AREA

1119-Regional Stormwater-South

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Nur
0	0	13,504	0	0	13,504	Gravel surface, 100% imp	
292,113	303,047	1,146,020	0	0	1,741,180	Meadow, non-grazed	
0	0	2,241,336	0	0	2,241,336	Paved parking	
0	0	258,834	0	0	258,834	Unconnected pavement	
1,481	140,917	503,859	100,580	0	746,836	Woods, Good	
293,594	443,964	4,163,552	100,580	0	5,001,690	TOTAL AREA	

1119-Regional Stormwater-South

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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	E1R	0.00	0.00	209.0	0.0050	0.013	24.0	0.0	0.0
2	E2R	0.00	0.00	38.0	0.0100	0.013	12.0	0.0	0.0
3	E2R	0.00	0.00	2,021.0	0.0068	0.013	24.0	0.0	0.0
4	1P	22.34	21.91	61.3	0.0070	0.022	53.0	41.0	18.0
5	12P	30.64	27.32	155.0	0.0214	0.024	36.0	0.0	0.0
6	BMP-R1	24.50	24.15	33.6	0.0104	0.012	24.0	0.0	0.0

1119-Regional Stormwater-South

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1R: E1 REGIONAL Runoff Area=58.272 ac 46.44% Impervious Runoff Depth=2.19"
 Flow Length=3,675' Tc=207.4 min CN=69/98 Runoff=23.46 cfs 464,024 cf

Subcatchment E2R: E2 Regional Runoff Area=56.551 ac 43.69% Impervious Runoff Depth=2.01"
 Flow Length=2,726' Tc=143.3 min CN=65/98 Runoff=26.54 cfs 411,675 cf

Reach 15R: U.S. Pike Drive Culvert Inflow=34.56 cfs 960,624 cf
 Outflow=34.56 cfs 960,624 cf

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=1.56' Max Vel=0.91 fps Inflow=34.59 cfs 960,858 cf
 n=0.120 L=490.0' S=0.0051 ' Capacity=198.28 cfs Outflow=34.56 cfs 960,624 cf

Pond 1P: EX. POND-2 Peak Elev=26.93' Storage=672,402 cf Inflow=48.97 cfs 964,828 cf
 Primary=34.52 cfs 956,791 cf Secondary=0.00 cfs 0 cf Outflow=34.52 cfs 956,791 cf

Pond 12P: Ex. Dual 36" Culverts Peak Elev=32.62' Storage=168 cf Inflow=47.03 cfs 875,699 cf
 Discarded=0.00 cfs 135 cf Primary=47.02 cfs 875,564 cf Outflow=47.02 cfs 875,699 cf

Pond BMP-R1: Subsurface Gravel Peak Elev=27.91' Storage=69,658 cf Inflow=47.55 cfs 892,868 cf
 Primary=0.75 cfs 89,936 cf Secondary=46.77 cfs 803,048 cf Outflow=47.41 cfs 892,984 cf

Link 12L: 2-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=5.32 cfs 17,091 cf
 Area= 133,294 sf 80.98% Imperv. Primary=5.32 cfs 17,091 cf

Link 13L: 2-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=5.32 cfs 17,091 cf
 Area= 133,294 sf 80.98% Imperv. Primary=5.32 cfs 17,091 cf

Link 2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=5.71 cfs 37,662 cf
 Area= 168,098 sf 64.27% Imperv. Primary=5.71 cfs 37,662 cf

Link 15L: 2-yr Runoff Imported from 1119-Post Development-Fields~Subcat F1.hce Inflow=1.24 cfs 4,067 cf
 Area= 40,685 sf Primary=1.24 cfs 4,067 cf

Link 2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 4P.hce Inflow=0.58 cfs 15,233 cf
 Area= 280,091 sf Primary=0.58 cfs 15,233 cf

Link 2-yr Secondary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=0.00 cfs 0 cf
 Primary=0.00 cfs 0 cf

Link 2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 5P.hce Inflow=0.06 cfs 2,071 cf
 Area= 121,097 sf Primary=0.06 cfs 2,071 cf

Link 21L: G2 Overland Flow 2-yr Inflow Imported from 1119-Post Development-Fields~Subcat G2.hce
 Primary=0.00 cfs 0 cf

Total Runoff Area = 5,001,690 sf Runoff Volume = 875,699 cf Average Runoff Depth = 2.10"
54.92% Pervious = 2,746,850 sf 45.08% Impervious = 2,254,840 sf

1119-Regional Stormwater-South

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

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Summary for Subcatchment E1R: E1 REGIONAL

Runoff = 23.46 cfs @ 14.75 hrs, Volume= 464,024 cf, Depth= 2.19"

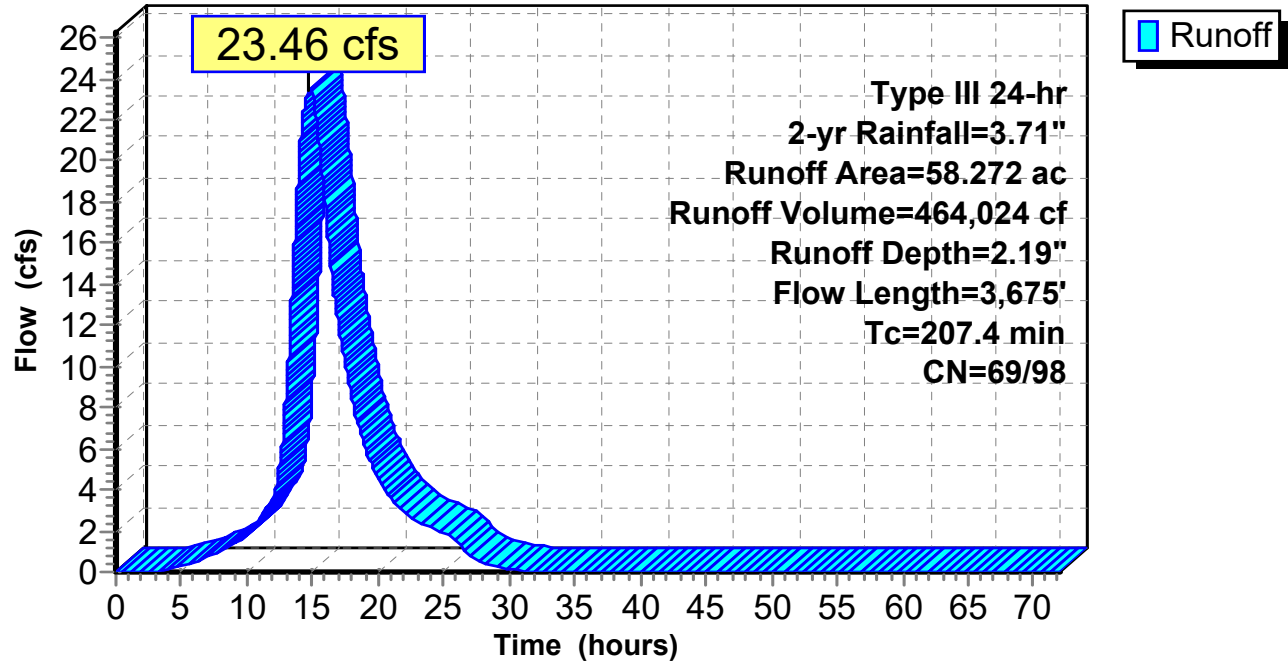
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.034	30	Woods, Good, HSG A
2.009	58	Meadow, non-grazed, HSG B
2.796	55	Woods, Good, HSG B
13.157	71	Meadow, non-grazed, HSG C
10.908	70	Woods, Good, HSG C
* 0.310	96	Gravel surface, 100% imp, HSG C
26.749	98	Paved parking, HSG C
2.309	77	Woods, Good, HSG D
58.272	82	Weighted Average
31.213	69	53.56% Pervious Area
27.059	98	46.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.4	56	0.1228	0.11		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
1.8	102	0.1499	0.97		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
3.0	378	0.0168	2.09		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.1	544	0.0084	0.64		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	209	0.0050	5.09	16.00	Pipe Channel, RCP_Round 24" 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
5.3	765	0.0025	2.39	16.72	Trap/Vee/Rect Channel Flow, Water Country Treatment Swale Bot.W=4.00' D=1.00' Z= 3.0 '/' Top.W=10.00' n= 0.024
0.4	191	0.0271	8.49	45.02	Channel Flow, From treatment BMP through Campus Dr. Culvert Area= 5.3 sf Perim= 14.1' r= 0.38' n= 0.015
23.7	1,430	0.0070	1.00	12.05	Trap/Vee/Rect Channel Flow, Flow through southeast wetlands Bot.W=1.00' D=1.00' Z= 11.0 '/' Top.W=23.00' n= 0.080 Earth, long dense weeds
150.0					Direct Entry, Estimate Detention affects
207.4	3,675	Total			

Subcatchment E1R: E1 REGIONAL

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment E1R: E1 REGIONAL

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.04	0.12
6.00	0.27	0.00	0.12	0.51
8.00	0.42	0.00	0.25	1.01
10.00	0.70	0.00	0.50	1.83
12.00	1.85	0.17	1.63	3.66
14.00	3.01	0.67	2.78	20.24
16.00	3.29	0.83	3.05	17.53
18.00	3.44	0.92	3.21	8.44
20.00	3.55	0.98	3.32	4.55
22.00	3.64	1.04	3.40	2.92
24.00	3.71	1.08	3.48	2.16
26.00	3.71	1.08	3.48	1.43
28.00	3.71	1.08	3.48	0.41
30.00	3.71	1.08	3.48	0.10
32.00	3.71	1.08	3.48	0.02
34.00	3.71	1.08	3.48	0.00
36.00	3.71	1.08	3.48	0.00
38.00	3.71	1.08	3.48	0.00
40.00	3.71	1.08	3.48	0.00
42.00	3.71	1.08	3.48	0.00
44.00	3.71	1.08	3.48	0.00
46.00	3.71	1.08	3.48	0.00
48.00	3.71	1.08	3.48	0.00
50.00	3.71	1.08	3.48	0.00
52.00	3.71	1.08	3.48	0.00
54.00	3.71	1.08	3.48	0.00
56.00	3.71	1.08	3.48	0.00
58.00	3.71	1.08	3.48	0.00
60.00	3.71	1.08	3.48	0.00
62.00	3.71	1.08	3.48	0.00
64.00	3.71	1.08	3.48	0.00
66.00	3.71	1.08	3.48	0.00
68.00	3.71	1.08	3.48	0.00
70.00	3.71	1.08	3.48	0.00
72.00	3.71	1.08	3.48	0.00

1119-Regional Stormwater-South

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

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Summary for Subcatchment E2R: E2 Regional

Runoff = 26.54 cfs @ 13.85 hrs, Volume= 411,675 cf, Depth= 2.01"

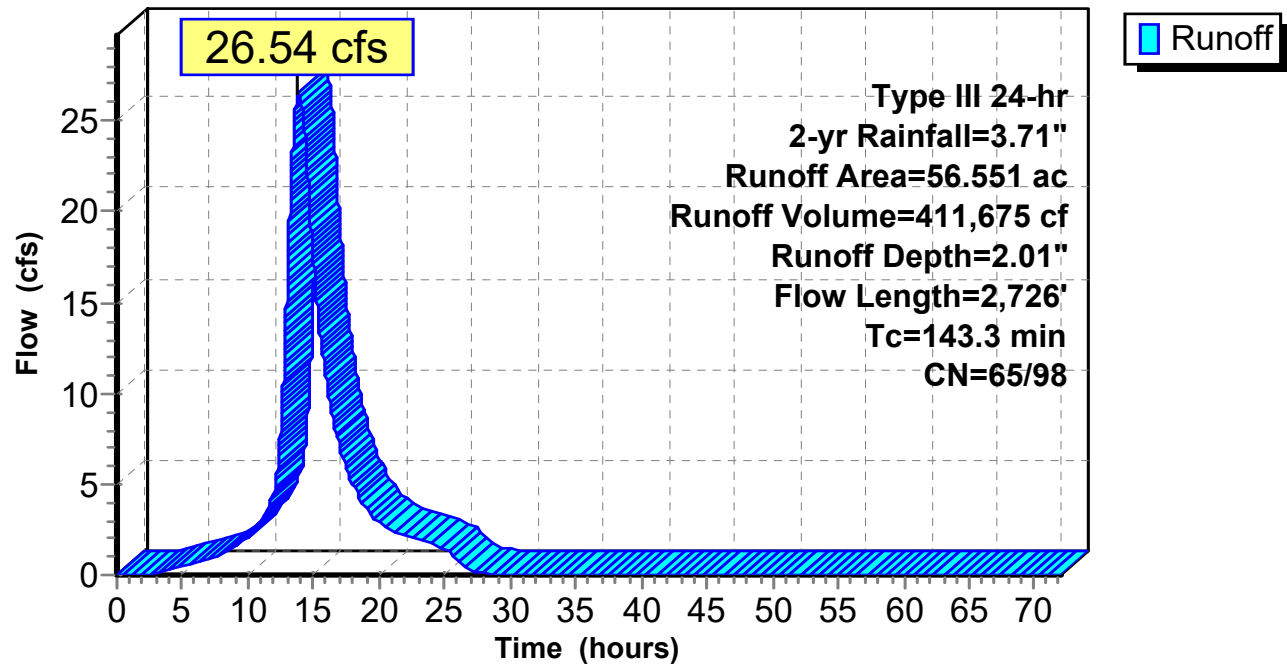
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-72.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
6.706	30	Meadow, non-grazed, HSG A
4.948	58	Meadow, non-grazed, HSG B
0.439	55	Woods, Good, HSG B
13.152	71	Meadow, non-grazed, HSG C
0.659	70	Woods, Good, HSG C
5.942	98	Unconnected pavement, HSG C
24.705	98	Paved parking, HSG C
56.551	79	Weighted Average
31.846	65	56.31% Pervious Area
24.705	98	43.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	105	0.0434	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
5.7	377	0.0249	1.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	30	0.1232	2.46		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.0	31	0.0050	0.49		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0100	4.54	3.56	Pipe Channel, RCP_Round 12" (assumed) 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
5.7	2,021	0.0068	5.94	18.65	Pipe Channel, RCP_Round 24" (assumed avg.) 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
0.5	124	0.0115	3.98	22.90	Trap/Vee/Rect Channel Flow, Riprap/grassed/weedy channel (d) Bot.W=3.00' D=1.00' Z= 2.5 & 3.0 ' Top.W=8.50' n= 0.030 Earth, grassed & winding
120.0					Direct Entry, estimate detention pond affects
143.3	2,726	Total			

Subcatchment E2R: E2 Regional

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment E2R: E2 Regional

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.04	0.23
6.00	0.27	0.00	0.12	0.67
8.00	0.42	0.00	0.25	1.17
10.00	0.70	0.00	0.50	2.19
12.00	1.85	0.10	1.63	4.60
14.00	3.01	0.51	2.78	26.18
16.00	3.29	0.64	3.05	10.51
18.00	3.44	0.72	3.21	4.95
20.00	3.55	0.78	3.32	2.85
22.00	3.64	0.83	3.40	2.12
24.00	3.71	0.86	3.48	1.73
26.00	3.71	0.86	3.48	0.77
28.00	3.71	0.86	3.48	0.10
30.00	3.71	0.86	3.48	0.01
32.00	3.71	0.86	3.48	0.00
34.00	3.71	0.86	3.48	0.00
36.00	3.71	0.86	3.48	0.00
38.00	3.71	0.86	3.48	0.00
40.00	3.71	0.86	3.48	0.00
42.00	3.71	0.86	3.48	0.00
44.00	3.71	0.86	3.48	0.00
46.00	3.71	0.86	3.48	0.00
48.00	3.71	0.86	3.48	0.00
50.00	3.71	0.86	3.48	0.00
52.00	3.71	0.86	3.48	0.00
54.00	3.71	0.86	3.48	0.00
56.00	3.71	0.86	3.48	0.00
58.00	3.71	0.86	3.48	0.00
60.00	3.71	0.86	3.48	0.00
62.00	3.71	0.86	3.48	0.00
64.00	3.71	0.86	3.48	0.00
66.00	3.71	0.86	3.48	0.00
68.00	3.71	0.86	3.48	0.00
70.00	3.71	0.86	3.48	0.00
72.00	3.71	0.86	3.48	0.00

Summary for Reach 15R: U.S. Pike Drive Culvert

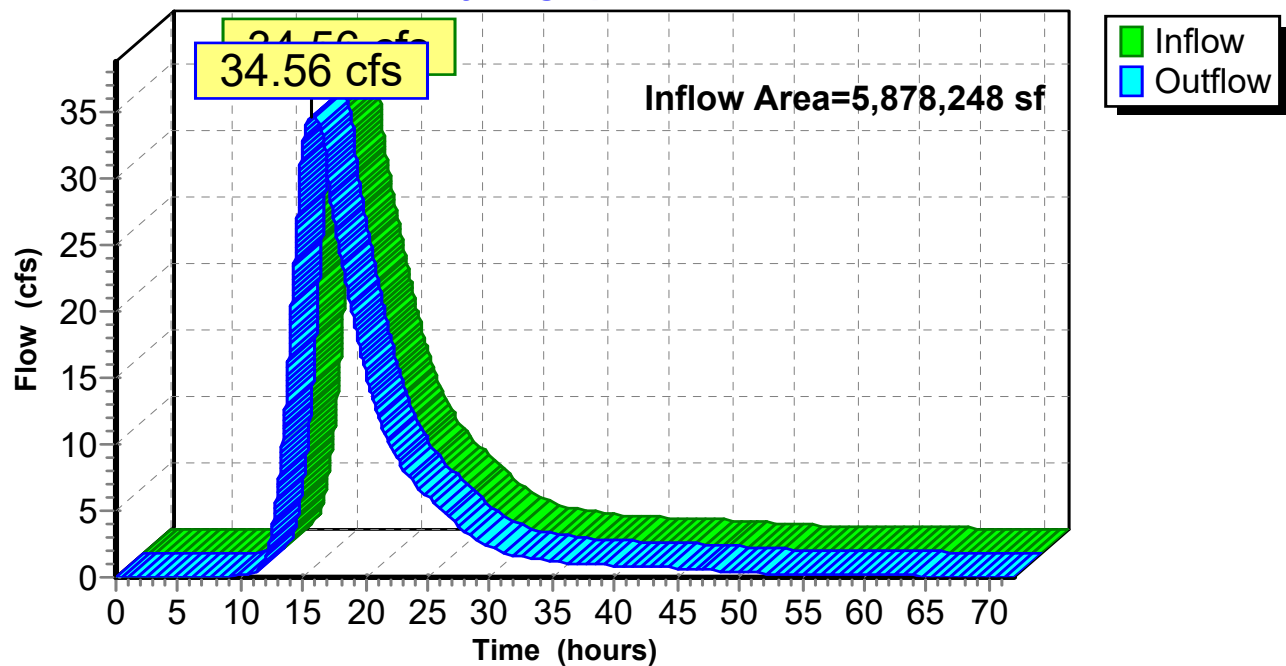
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5,878,248 sf, 43.87% Impervious, Inflow Depth > 1.96" for 2-yr event
 Inflow = 34.56 cfs @ 15.77 hrs, Volume= 960,624 cf
 Outflow = 34.56 cfs @ 15.77 hrs, Volume= 960,624 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Reach 15R: U.S. Pike Drive Culvert

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 15R: U.S. Pike Drive Culvert

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.27		0.27
1.00	0.00		0.00	54.00	0.24		0.24
2.00	0.00		0.00	55.00	0.22		0.22
3.00	0.00		0.00	56.00	0.20		0.20
4.00	0.00		0.00	57.00	0.18		0.18
5.00	0.01		0.01	58.00	0.17		0.17
6.00	0.01		0.01	59.00	0.15		0.15
7.00	0.03		0.03	60.00	0.14		0.14
8.00	0.05		0.05	61.00	0.13		0.13
9.00	0.09		0.09	62.00	0.12		0.12
10.00	0.13		0.13	63.00	0.11		0.11
11.00	0.29		0.29	64.00	0.10		0.10
12.00	1.38		1.38	65.00	0.10		0.10
13.00	6.70		6.70	66.00	0.09		0.09
14.00	19.05		19.05	67.00	0.08		0.08
15.00	32.79		32.79	68.00	0.08		0.08
16.00	34.45		34.45	69.00	0.07		0.07
17.00	29.81		29.81	70.00	0.07		0.07
18.00	24.20		24.20	71.00	0.07		0.07
19.00	19.56		19.56	72.00	0.06		0.06
20.00	15.43		15.43				
21.00	12.21		12.21				
22.00	9.87		9.87				
23.00	8.18		8.18				
24.00	6.95		6.95				
25.00	5.99		5.99				
26.00	5.15		5.15				
27.00	4.26		4.26				
28.00	3.41		3.41				
29.00	2.72		2.72				
30.00	2.24		2.24				
31.00	1.90		1.90				
32.00	1.65		1.65				
33.00	1.46		1.46				
34.00	1.32		1.32				
35.00	1.21		1.21				
36.00	1.11		1.11				
37.00	1.04		1.04				
38.00	0.97		0.97				
39.00	0.91		0.91				
40.00	0.86		0.86				
41.00	0.82		0.82				
42.00	0.78		0.78				
43.00	0.74		0.74				
44.00	0.71		0.71				
45.00	0.67		0.67				
46.00	0.62		0.62				
47.00	0.58		0.58				
48.00	0.53		0.53				
49.00	0.45		0.45				
50.00	0.40		0.40				
51.00	0.35		0.35				
52.00	0.31		0.31				

1119-Regional Stormwater-South

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

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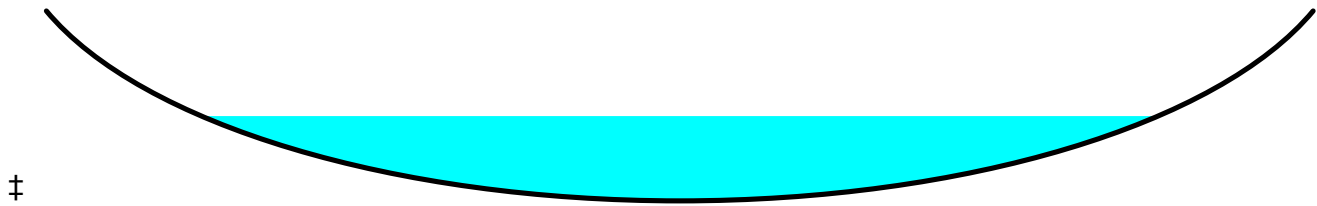
Summary for Reach SP-1: OFFSITE PIKE PROP

Inflow Area = 5,878,248 sf, 43.87% Impervious, Inflow Depth > 1.96" for 2-yr event
Inflow = 34.59 cfs @ 15.66 hrs, Volume= 960,858 cf
Outflow = 34.56 cfs @ 15.77 hrs, Volume= 960,624 cf, Atten= 0%, Lag= 6.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.91 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 26.5 min

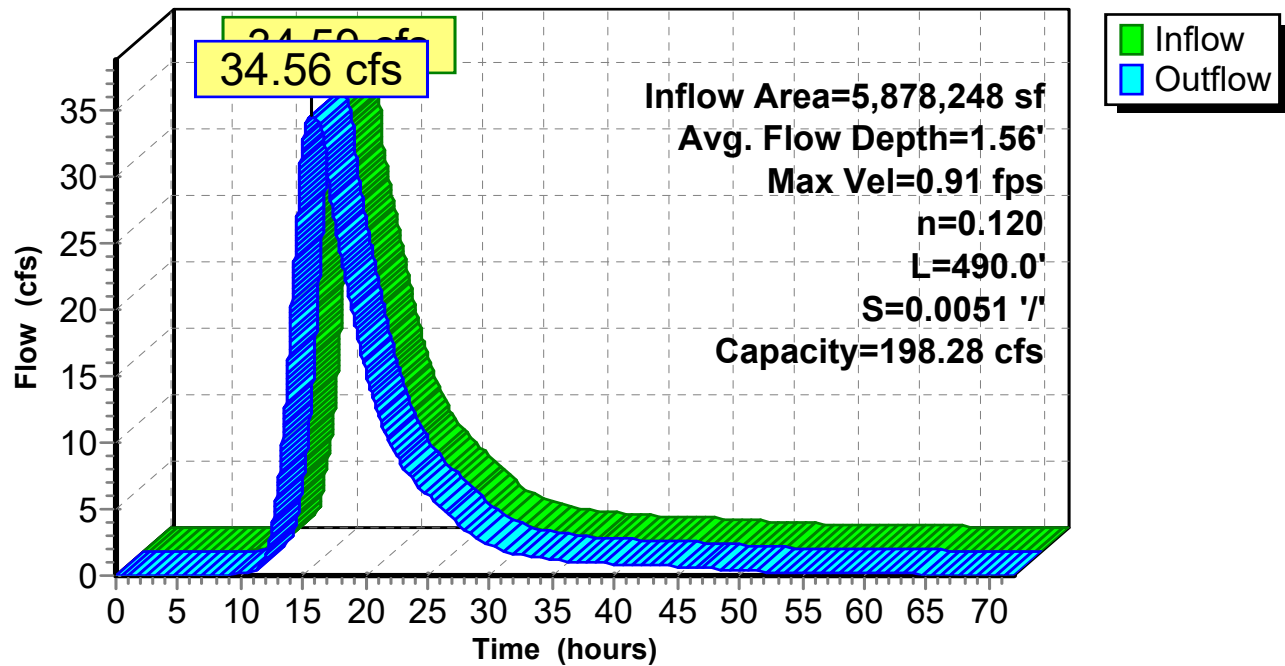
Peak Storage= 18,713 cf @ 15.77 hrs
Average Depth at Peak Storage= 1.56'
Bank-Full Depth= 3.50' Flow Area= 128.3 sf, Capacity= 198.28 cfs

55.00' x 3.50' deep Parabolic Channel, n= 0.120
Length= 490.0' Slope= 0.0051 '/' (500 Elevation Intervals)
Inlet Invert= 24.00', Outlet Invert= 21.50'



Reach SP-1: OFFSITE PIKE PROP

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-1: OFFSITE PIKE PROP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.01	0	24.00	0.00
2.00	0.00	1	24.00	0.00
4.00	0.00	12	24.01	0.00
6.00	0.03	84	24.04	0.01
8.00	0.08	214	24.08	0.05
10.00	0.17	396	24.12	0.13
12.00	2.13	2,009	24.35	1.38
14.00	20.96	12,384	25.18	19.05
16.00	34.35	18,670	25.56	34.45
18.00	23.66	14,614	25.32	24.20
20.00	14.94	10,698	25.07	15.43
22.00	9.57	7,849	24.87	9.87
24.00	6.77	6,157	24.74	6.95
26.00	4.99	5,001	24.65	5.15
28.00	3.24	3,758	24.54	3.41
30.00	2.14	2,809	24.44	2.24
32.00	1.60	2,276	24.38	1.65
34.00	1.28	1,948	24.35	1.32
36.00	1.09	1,730	24.32	1.11
38.00	0.95	1,574	24.30	0.97
40.00	0.85	1,454	24.28	0.86
42.00	0.77	1,355	24.27	0.78
44.00	0.70	1,269	24.26	0.71
46.00	0.61	1,159	24.24	0.62
48.00	0.50	1,031	24.23	0.53
50.00	0.37	846	24.20	0.40
52.00	0.29	710	24.18	0.31
54.00	0.24	605	24.16	0.24
56.00	0.19	526	24.14	0.20
58.00	0.16	462	24.13	0.17
60.00	0.13	410	24.12	0.14
62.00	0.11	367	24.11	0.12
64.00	0.10	331	24.11	0.10
66.00	0.09	301	24.10	0.09
68.00	0.07	275	24.09	0.08
70.00	0.07	253	24.09	0.07
72.00	0.06	234	24.08	0.06

1119-Regional Stormwater-South

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

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Summary for Pond 1P: EX. POND-2

Inflow Area = 5,837,563 sf, 44.18% Impervious, Inflow Depth = 1.98" for 2-yr event
 Inflow = 48.97 cfs @ 14.28 hrs, Volume= 964,828 cf
 Outflow = 34.52 cfs @ 15.67 hrs, Volume= 956,791 cf, Atten= 29%, Lag= 83.3 min
 Primary = 34.52 cfs @ 15.67 hrs, Volume= 956,791 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 24.00' Surf.Area= 94,200 sf Storage= 406,538 cf

Peak Elev= 26.93' @ 15.69 hrs Surf.Area= 105,876 sf Storage= 672,402 cf (265,864 cf above start)

Plug-Flow detention time= 596.4 min calculated for 550,172 cf (57% of inflow)

Center-of-Mass det. time= 184.4 min (1,206.9 - 1,022.5)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	936,238 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	0	0	0
22.34	81,800	259,306	259,306
22.50	83,600	13,232	272,538
23.00	88,000	42,900	315,438
24.00	94,200	91,100	406,538
24.50	100,000	48,550	455,088
25.00	105,000	51,250	506,338
26.00	114,000	109,500	615,838
26.50	11,800	31,450	647,288
27.00	122,000	33,450	680,738
27.50	125,000	61,750	742,488
28.00	130,000	63,750	806,238
29.00	130,000	130,000	936,238

Device	Routing	Invert	Outlet Devices
#1	Primary	23.84'	53.0" W x 41.0" H, R=28.1"/73.4" Pipe Arch CMP_Arch_1 53x41 w/ 18.0" ins L= 61.3' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.34' / 21.91' S= 0.0070 '/' Cc= 0.900 n= 0.022, Flow Area= 6.58 sf
#2	Secondary	27.64'	Asymmetrical Weir, C= 2.65 Offset (feet) 0.00 17.00 106.00 118.00 167.00 Elev. (feet) 29.00 27.64 27.64 28.13 29.00

Primary OutFlow Max=34.52 cfs @ 15.67 hrs HW=26.93' TW=25.56' (Dynamic Tailwater)

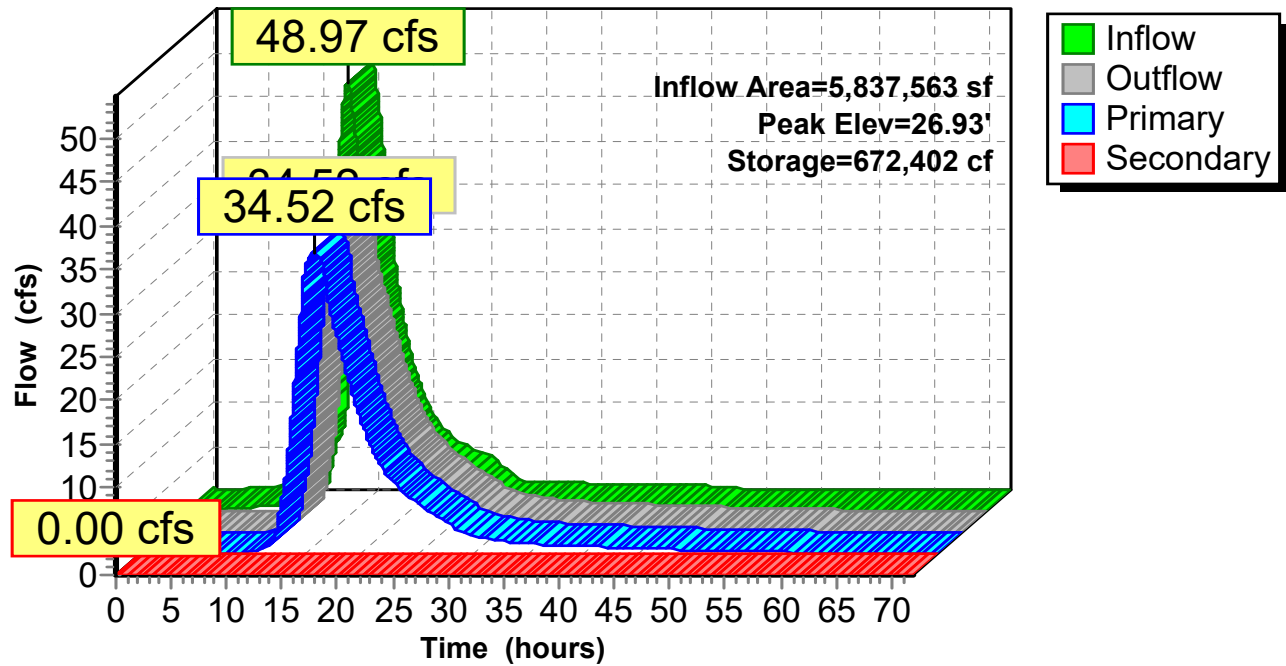
↑1=CMP_Arch_1 53x41 (Outlet Controls 34.52 cfs @ 5.25 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=24.00' TW=24.00' (Dynamic Tailwater)

↑2=Asymmetrical Weir (Controls 0.00 cfs)

Pond 1P: EX. POND-2

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 1P: EX. POND-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.23	406,542	24.00	0.01	0.01	0.00
2.00	0.00	406,649	24.00	0.00	0.00	0.00
4.00	0.36	407,596	24.01	0.00	0.00	0.00
6.00	0.49	410,577	24.04	0.03	0.03	0.00
8.00	0.61	414,152	24.08	0.08	0.08	0.00
10.00	0.79	418,283	24.12	0.17	0.17	0.00
12.00	9.61	445,238	24.40	1.50	1.50	0.00
14.00	47.80	590,231	25.77	20.86	20.86	0.00
16.00	30.66	670,325	26.91	34.29	34.29	0.00
18.00	14.88	614,296	25.99	23.63	23.63	0.00
20.00	8.36	557,410	25.48	14.91	14.91	0.00
22.00	5.73	520,786	25.14	9.54	9.54	0.00
24.00	4.45	499,525	24.93	6.75	6.75	0.00
26.00	2.87	484,780	24.79	4.99	4.99	0.00
28.00	1.04	468,399	24.63	3.24	3.24	0.00
30.00	0.84	455,788	24.51	2.14	2.14	0.00
32.00	0.80	448,429	24.43	1.60	1.60	0.00
34.00	0.76	443,763	24.39	1.28	1.28	0.00
36.00	0.71	440,569	24.35	1.09	1.09	0.00
38.00	0.67	438,224	24.33	0.95	0.95	0.00
40.00	0.62	436,388	24.31	0.85	0.85	0.00
42.00	0.57	434,855	24.30	0.77	0.77	0.00
44.00	0.52	433,493	24.28	0.70	0.70	0.00
46.00	0.36	431,726	24.26	0.61	0.61	0.00
48.00	0.01	429,534	24.24	0.50	0.50	0.00
50.00	0.00	426,442	24.21	0.37	0.37	0.00
52.00	0.00	424,070	24.18	0.29	0.29	0.00
54.00	0.00	422,203	24.16	0.24	0.24	0.00
56.00	0.00	420,690	24.15	0.19	0.19	0.00
58.00	0.00	419,448	24.14	0.16	0.16	0.00
60.00	0.00	418,408	24.13	0.13	0.13	0.00
62.00	0.00	417,526	24.12	0.11	0.11	0.00
64.00	0.00	416,769	24.11	0.10	0.10	0.00
66.00	0.00	416,111	24.10	0.09	0.09	0.00
68.00	0.00	415,536	24.09	0.07	0.07	0.00
70.00	0.00	415,028	24.09	0.07	0.07	0.00
72.00	0.00	414,576	24.08	0.06	0.06	0.00

1119-Regional Stormwater-South

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

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Summary for Pond 12P: Ex. Dual 36" Culverts

Inflow Area = 5,001,690 sf, 45.08% Impervious, Inflow Depth = 2.10" for 2-yr event
 Inflow = 47.03 cfs @ 14.17 hrs, Volume= 875,699 cf
 Outflow = 47.02 cfs @ 14.17 hrs, Volume= 875,699 cf, Atten= 0%, Lag= 0.1 min
 Discarded = 0.00 cfs @ 14.17 hrs, Volume= 135 cf
 Primary = 47.02 cfs @ 14.17 hrs, Volume= 875,564 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 32.62' @ 14.17 hrs Surf.Area= 168 sf Storage= 168 cf

Plug-Flow detention time= 0.1 min calculated for 875,699 cf (100% of inflow)
 Center-of-Mass det. time= 0.1 min (943.1 - 943.0)

Volume	Invert	Avail.Storage	Storage Description
#1	30.64'	92,238 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
30.64	2	0	0
33.00	200	238	238
34.00	1,100	650	888
35.00	3,900	2,500	3,388
36.00	11,900	7,900	11,288
37.00	50,000	30,950	42,238
38.00	50,000	50,000	92,238

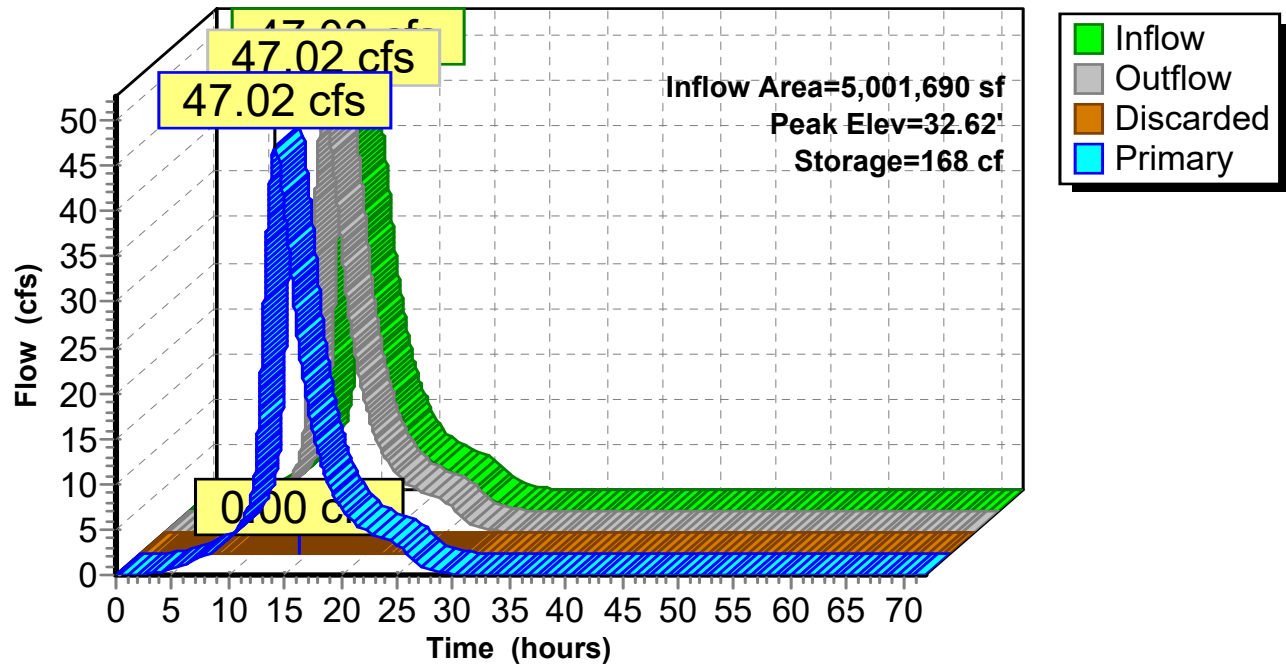
Device	Routing	Invert	Outlet Devices
#1	Primary	30.64'	36.0" Round Ex. CMP_Round 36" X 2.00 L= 155.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 30.64' / 27.32' S= 0.0214 '/' Cc= 0.900 n= 0.024, Flow Area= 7.07 sf
#2	Discarded	30.64'	1.000 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.00 cfs @ 14.17 hrs HW=32.62' (Free Discharge)
 ↑**2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=47.02 cfs @ 14.17 hrs HW=32.62' TW=27.91' (Dynamic Tailwater)
 ↑**1=Ex. CMP_Round 36"** (Barrel Controls 47.02 cfs @ 6.76 fps)

Pond 12P: Ex. Dual 36" Culverts

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 12P: Ex. Dual 36" Culverts

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	30.64	0.00	0.00	0.00
2.00	0.00	0	30.66	0.00	0.00	0.00
4.00	0.36	2	30.81	0.35	0.00	0.35
6.00	1.18	4	30.94	1.18	0.00	1.18
8.00	2.18	8	31.04	2.18	0.00	2.18
10.00	4.02	13	31.18	4.02	0.00	4.01
12.00	8.27	26	31.41	8.26	0.00	8.26
14.00	46.42	165	32.60	46.42	0.00	46.41
16.00	28.04	93	32.11	28.05	0.00	28.05
18.00	13.40	43	31.63	13.40	0.00	13.40
20.00	7.40	24	31.37	7.41	0.00	7.40
22.00	5.03	16	31.24	5.03	0.00	5.03
24.00	3.88	13	31.17	3.88	0.00	3.88
26.00	2.21	8	31.04	2.21	0.00	2.21
28.00	0.51	2	30.84	0.51	0.00	0.51
30.00	0.11	1	30.74	0.11	0.00	0.11
32.00	0.02	0	30.69	0.02	0.00	0.02
34.00	0.00	0	30.66	0.00	0.00	0.00
36.00	0.00	0	30.64	0.00	0.00	0.00
38.00	0.00	0	30.64	0.00	0.00	0.00
40.00	0.00	0	30.64	0.00	0.00	0.00
42.00	0.00	0	30.64	0.00	0.00	0.00
44.00	0.00	0	30.64	0.00	0.00	0.00
46.00	0.00	0	30.64	0.00	0.00	0.00
48.00	0.00	0	30.64	0.00	0.00	0.00
50.00	0.00	0	30.64	0.00	0.00	0.00
52.00	0.00	0	30.64	0.00	0.00	0.00
54.00	0.00	0	30.64	0.00	0.00	0.00
56.00	0.00	0	30.64	0.00	0.00	0.00
58.00	0.00	0	30.64	0.00	0.00	0.00
60.00	0.00	0	30.64	0.00	0.00	0.00
62.00	0.00	0	30.64	0.00	0.00	0.00
64.00	0.00	0	30.64	0.00	0.00	0.00
66.00	0.00	0	30.64	0.00	0.00	0.00
68.00	0.00	0	30.64	0.00	0.00	0.00
70.00	0.00	0	30.64	0.00	0.00	0.00
72.00	0.00	0	30.64	0.00	0.00	0.00

1119-Regional Stormwater-South

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

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Summary for Pond BMP-R1: Subsurface Gravel Wetlands

Inflow Area = 5,402,877 sf, 41.73% Impervious, Inflow Depth = 1.98" for 2-yr event
 Inflow = 47.55 cfs @ 14.18 hrs, Volume= 892,868 cf
 Outflow = 47.41 cfs @ 14.30 hrs, Volume= 892,984 cf, Atten= 0%, Lag= 7.3 min
 Primary = 0.75 cfs @ 12.62 hrs, Volume= 89,936 cf
 Secondary = 46.77 cfs @ 14.30 hrs, Volume= 803,048 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Starting Elev= 25.00' Surf.Area= 13,300 sf Storage= 12,003 cf

Peak Elev= 27.91' @ 14.30 hrs Surf.Area= 26,684 sf Storage= 69,658 cf (57,654 cf above start)

Plug-Flow detention time= 94.6 min calculated for 880,858 cf (99% of inflow)

Center-of-Mass det. time= 77.5 min (1,024.1 - 946.6)

Volume	Invert	Avail.Storage	Storage Description
#1	22.00'	50,746 cf	CELL#1 (Prismatic) Listed below (Recalc)
#2	22.00'	48,953 cf	CELL#2 (Prismatic) Listed below (Recalc)
#3	25.50'	25,973 cf	Forebay (Prismatic) Listed below (Recalc)
		125,672 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.00	6,600	0.0	0	0
24.00	6,600	40.0	5,280	5,280
24.25	6,600	35.0	578	5,858
25.25	6,600	2.0	132	5,990
25.51	7,450	100.0	1,827	7,816
26.00	8,000	100.0	3,785	11,601
27.00	9,100	100.0	8,550	20,151
27.50	9,900	100.0	4,750	24,901
29.00	11,500	100.0	16,050	40,951
29.50	12,500	100.0	6,000	46,951
29.80	12,800	100.0	3,795	50,746

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
22.00	6,700	0.0	0	0
24.00	6,700	40.0	5,360	5,360
24.25	6,700	35.0	586	5,946
25.25	6,700	2.0	134	6,080
25.51	7,200	100.0	1,807	7,887
27.00	8,700	100.0	11,845	19,733
27.50	9,400	100.0	4,525	24,258
29.00	11,000	100.0	15,300	39,558
29.50	12,000	100.0	5,750	45,308
29.80	12,300	100.0	3,645	48,953

1119-Regional Stormwater-South

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

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
25.50	0	0	0
25.85	4,300	753	753
26.00	4,800	682	1,435
26.50	5,200	2,500	3,935
27.00	5,800	2,750	6,685
27.50	6,400	3,050	9,735
28.00	6,530	3,233	12,967
29.00	7,300	6,915	19,882
29.50	7,700	3,750	23,632
29.80	7,900	2,340	25,973

Device	Routing	Invert	Outlet Devices
#1	Primary	24.50'	24.0" Round Culvert L= 33.6' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 24.50' / 24.15' S= 0.0104 ' S= 0.0104 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	24.58'	4.2" Vert. WQV Orifice C= 0.600
#3	Device 1	28.50'	4.0" x 4.0" Horiz. Orifice/Grate X 13.00 columns X 5 rows C= 0.600 in 72.0" x 33.0" Grate (44% open area) Limited to weir flow at low heads
#4	Secondary	27.00'	152.0 deg x 14.5' long High-flow-Bypass-Sharp-Crested Trap Weir Cv= 2.47 (C= 3.09)

Primary OutFlow Max=0.75 cfs @ 12.62 hrs HW=27.40' TW=24.76' (Dynamic Tailwater)

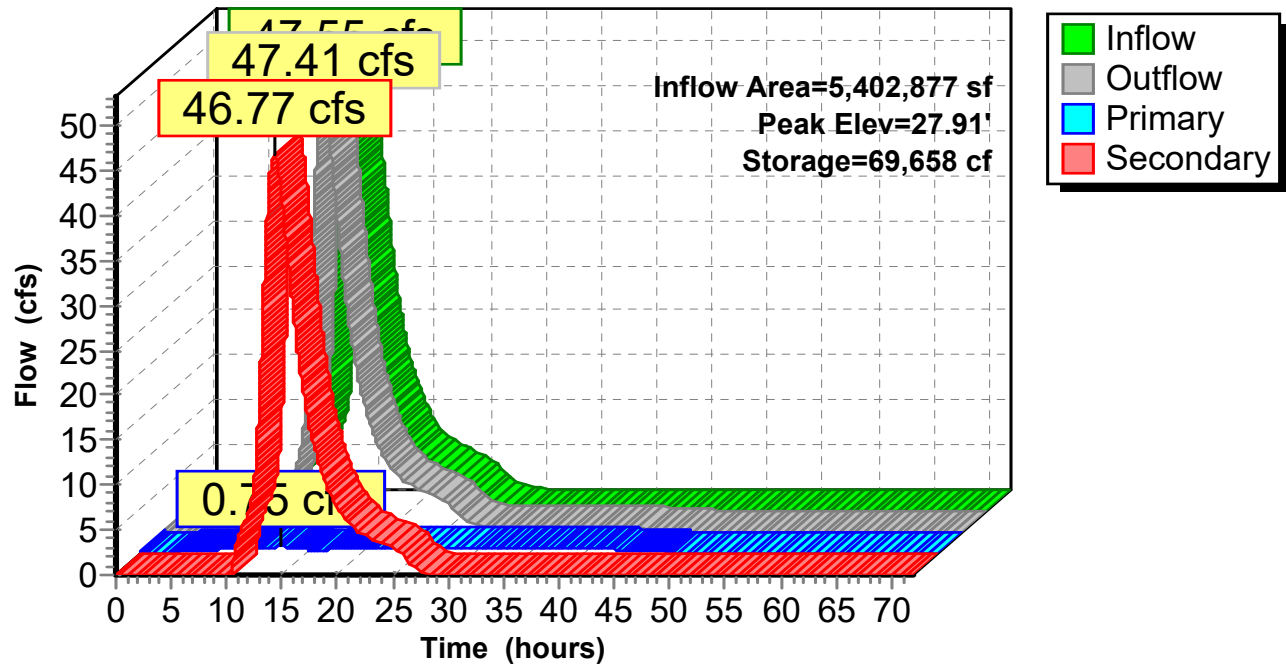
↑ **1=Culvert** (Passes 0.75 cfs of 20.68 cfs potential flow)
 ↑ **2=WQV Orifice** (Orifice Controls 0.75 cfs @ 7.82 fps)
 ↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=46.77 cfs @ 14.30 hrs HW=27.91' TW=26.02' (Dynamic Tailwater)

↑ **4=High-flow-Bypass-Sharp-Crested Trap Weir**(Weir Controls 46.77 cfs @ 2.83 fps)

Pond BMP-R1: Subsurface Gravel Wetlands

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond BMP-R1: Subsurface Gravel Wetlands

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	12,003	25.00	0.23	0.23	0.00
2.00	0.00	11,898	24.60	0.00	0.00	0.00
4.00	0.35	12,049	25.17	0.30	0.30	0.00
6.00	1.18	14,955	25.46	0.39	0.39	0.00
8.00	2.18	23,631	25.95	0.51	0.51	0.00
10.00	4.01	40,915	26.76	0.66	0.66	0.00
12.00	8.37	53,280	27.28	7.68	0.74	6.95
14.00	46.90	69,220	27.89	46.05	0.68	45.37
16.00	28.56	63,745	27.69	29.78	0.41	29.38
18.00	13.75	57,119	27.43	14.41	0.56	13.85
20.00	7.68	53,572	27.29	8.03	0.62	7.41
22.00	5.29	51,821	27.22	5.46	0.67	4.79
24.00	4.12	50,869	27.18	4.23	0.69	3.54
26.00	2.37	49,513	27.12	2.70	0.71	1.99
28.00	0.58	47,152	27.02	0.87	0.70	0.17
30.00	0.12	44,154	26.90	0.68	0.68	0.00
32.00	0.02	39,780	26.71	0.65	0.65	0.00
34.00	0.00	35,316	26.51	0.61	0.61	0.00
36.00	0.00	31,037	26.31	0.58	0.58	0.00
38.00	0.00	27,010	26.12	0.54	0.54	0.00
40.00	0.00	23,251	25.93	0.50	0.50	0.00
42.00	0.00	19,769	25.76	0.46	0.46	0.00
44.00	0.00	16,592	25.57	0.42	0.42	0.00
46.00	0.00	13,771	25.37	0.36	0.36	0.00
48.00	0.00	11,905	24.63	0.01	0.01	0.00
50.00	0.00	11,894	24.59	0.00	0.00	0.00
52.00	0.00	11,893	24.59	0.00	0.00	0.00
54.00	0.00	11,893	24.58	0.00	0.00	0.00
56.00	0.00	11,892	24.58	0.00	0.00	0.00
58.00	0.00	11,892	24.58	0.00	0.00	0.00
60.00	0.00	11,892	24.58	0.00	0.00	0.00
62.00	0.00	11,892	24.58	0.00	0.00	0.00
64.00	0.00	11,892	24.58	0.00	0.00	0.00
66.00	0.00	11,892	24.58	0.00	0.00	0.00
68.00	0.00	11,892	24.58	0.00	0.00	0.00
70.00	0.00	11,892	24.58	0.00	0.00	0.00
72.00	0.00	11,892	24.58	0.00	0.00	0.00

1119-Regional Stormwater-South

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

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Summary for Link 12L: From Regional North

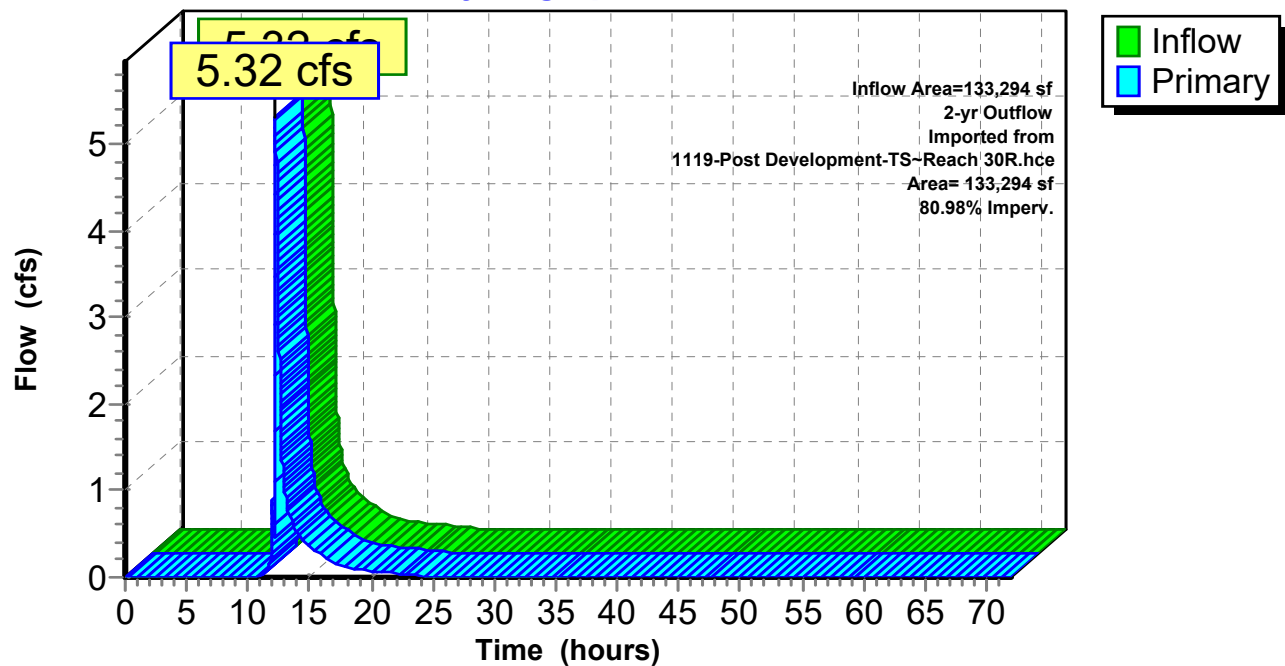
Inflow Area = 133,294 sf, 80.98% Impervious, Inflow Depth = 1.54" for 2-yr event
Inflow = 5.32 cfs @ 12.22 hrs, Volume= 17,091 cf
Primary = 5.32 cfs @ 12.22 hrs, Volume= 17,091 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce

Link 12L: From Regional North

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 12L: From Regional North

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	63.00	0.00	0.00	0.00
11.00	0.02	0.00	0.02	64.00	0.00	0.00	0.00
12.00	0.88	0.00	0.88	65.00	0.00	0.00	0.00
13.00	0.98	0.00	0.98	66.00	0.00	0.00	0.00
14.00	0.52	0.00	0.52	67.00	0.00	0.00	0.00
15.00	0.37	0.00	0.37	68.00	0.00	0.00	0.00
16.00	0.25	0.00	0.25	69.00	0.00	0.00	0.00
17.00	0.17	0.00	0.17	70.00	0.00	0.00	0.00
18.00	0.12	0.00	0.12	71.00	0.00	0.00	0.00
19.00	0.09	0.00	0.09	72.00	0.00	0.00	0.00
20.00	0.07	0.00	0.07				
21.00	0.06	0.00	0.06				
22.00	0.05	0.00	0.05				
23.00	0.04	0.00	0.04				
24.00	0.02	0.00	0.02				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 13L: From R30 Transfer Station

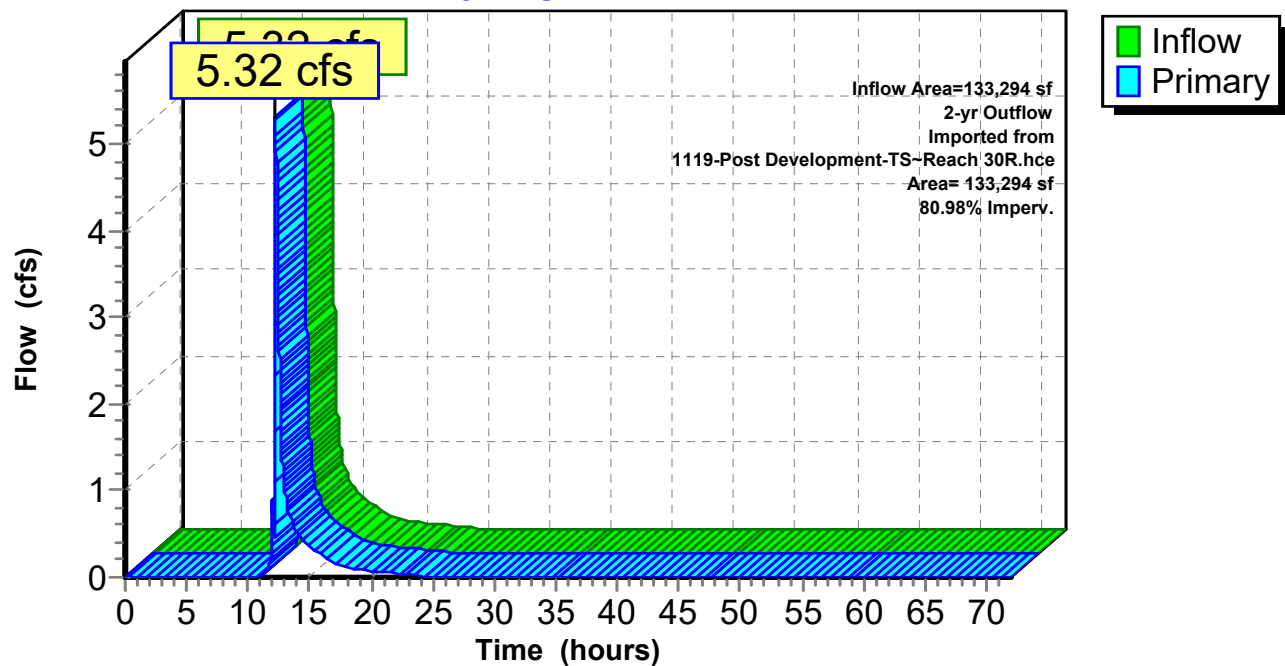
Inflow Area = 133,294 sf, 80.98% Impervious, Inflow Depth = 1.54" for 2-yr event
 Inflow = 5.32 cfs @ 12.22 hrs, Volume= 17,091 cf
 Primary = 5.32 cfs @ 12.22 hrs, Volume= 17,091 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce

Link 13L: From R30 Transfer Station

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 13L: From R30 Transfer Station

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.01	0.00	0.01	63.00	0.00	0.00	0.00
11.00	0.02	0.00	0.02	64.00	0.00	0.00	0.00
12.00	0.88	0.00	0.88	65.00	0.00	0.00	0.00
13.00	0.98	0.00	0.98	66.00	0.00	0.00	0.00
14.00	0.52	0.00	0.52	67.00	0.00	0.00	0.00
15.00	0.37	0.00	0.37	68.00	0.00	0.00	0.00
16.00	0.25	0.00	0.25	69.00	0.00	0.00	0.00
17.00	0.17	0.00	0.17	70.00	0.00	0.00	0.00
18.00	0.12	0.00	0.12	71.00	0.00	0.00	0.00
19.00	0.09	0.00	0.09	72.00	0.00	0.00	0.00
20.00	0.07	0.00	0.07				
21.00	0.06	0.00	0.06				
22.00	0.05	0.00	0.05				
23.00	0.04	0.00	0.04				
24.00	0.02	0.00	0.02				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 14L: Pond 2P -SGWL-PRIME OUTFLOW

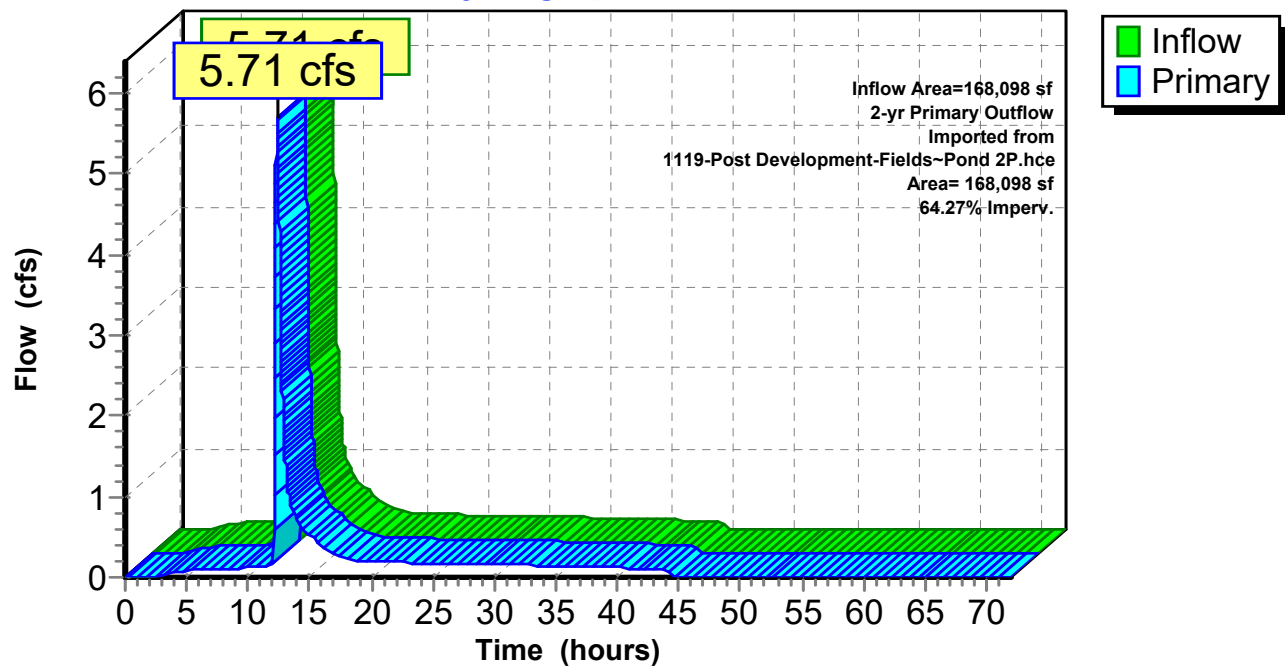
Inflow Area = 168,098 sf, 64.27% Impervious, Inflow Depth = 2.69" for 2-yr event
 Inflow = 5.71 cfs @ 12.35 hrs, Volume= 37,662 cf
 Primary = 5.71 cfs @ 12.35 hrs, Volume= 37,662 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce

Link 14L: Pond 2P -SGWL-PRIME OUTFLOW

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 14L: Pond 2P -SGWL-PRIME OUTFLOW

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.04	0.00	0.04	56.00	0.00	0.00	0.00
4.00	0.06	0.00	0.06	57.00	0.00	0.00	0.00
5.00	0.08	0.00	0.08	58.00	0.00	0.00	0.00
6.00	0.10	0.00	0.10	59.00	0.00	0.00	0.00
7.00	0.10	0.00	0.10	60.00	0.00	0.00	0.00
8.00	0.10	0.00	0.10	61.00	0.00	0.00	0.00
9.00	0.11	0.00	0.11	62.00	0.00	0.00	0.00
10.00	0.12	0.00	0.12	63.00	0.00	0.00	0.00
11.00	0.13	0.00	0.13	64.00	0.00	0.00	0.00
12.00	0.17	0.00	0.17	65.00	0.00	0.00	0.00
13.00	1.48	0.00	1.48	66.00	0.00	0.00	0.00
14.00	0.71	0.00	0.71	67.00	0.00	0.00	0.00
15.00	0.52	0.00	0.52	68.00	0.00	0.00	0.00
16.00	0.39	0.00	0.39	69.00	0.00	0.00	0.00
17.00	0.29	0.00	0.29	70.00	0.00	0.00	0.00
18.00	0.23	0.00	0.23	71.00	0.00	0.00	0.00
19.00	0.20	0.00	0.20	72.00	0.00	0.00	0.00
20.00	0.18	0.00	0.18				
21.00	0.18	0.00	0.18				
22.00	0.18	0.00	0.18				
23.00	0.18	0.00	0.18				
24.00	0.18	0.00	0.18				
25.00	0.18	0.00	0.18				
26.00	0.17	0.00	0.17				
27.00	0.17	0.00	0.17				
28.00	0.17	0.00	0.17				
29.00	0.16	0.00	0.16				
30.00	0.16	0.00	0.16				
31.00	0.16	0.00	0.16				
32.00	0.15	0.00	0.15				
33.00	0.15	0.00	0.15				
34.00	0.14	0.00	0.14				
35.00	0.14	0.00	0.14				
36.00	0.14	0.00	0.14				
37.00	0.13	0.00	0.13				
38.00	0.13	0.00	0.13				
39.00	0.12	0.00	0.12				
40.00	0.12	0.00	0.12				
41.00	0.11	0.00	0.11				
42.00	0.11	0.00	0.11				
43.00	0.10	0.00	0.10				
44.00	0.10	0.00	0.10				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 15L: F1 From Fields Analysis

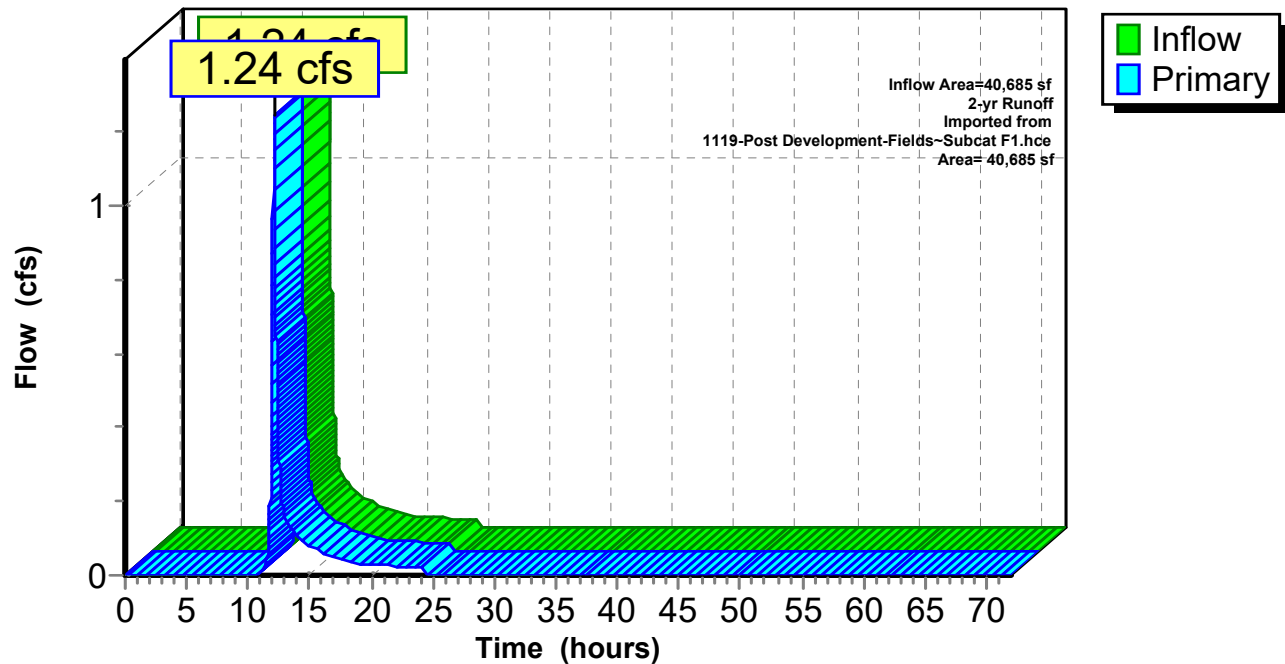
Inflow Area = 40,685 sf, 0.00% Impervious, Inflow Depth = 1.20" for 2-yr event
 Inflow = 1.24 cfs @ 12.10 hrs, Volume= 4,067 cf
 Primary = 1.24 cfs @ 12.10 hrs, Volume= 4,067 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Runoff Imported from 1119-Post Development-Fields~Subcat F1.hce

Link 15L: F1 From Fields Analysis

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 15L: F1 From Fields Analysis

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
11.00	0.01	0.00	0.01	64.00	0.00	0.00	0.00
12.00	0.63	0.00	0.63	65.00	0.00	0.00	0.00
13.00	0.15	0.00	0.15	66.00	0.00	0.00	0.00
14.00	0.10	0.00	0.10	67.00	0.00	0.00	0.00
15.00	0.08	0.00	0.08	68.00	0.00	0.00	0.00
16.00	0.06	0.00	0.06	69.00	0.00	0.00	0.00
17.00	0.05	0.00	0.05	70.00	0.00	0.00	0.00
18.00	0.04	0.00	0.04	71.00	0.00	0.00	0.00
19.00	0.03	0.00	0.03	72.00	0.00	0.00	0.00
20.00	0.03	0.00	0.03				
21.00	0.03	0.00	0.03				
22.00	0.02	0.00	0.02				
23.00	0.02	0.00	0.02				
24.00	0.02	0.00	0.02				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 16L: Pond 4P- PDMH-4

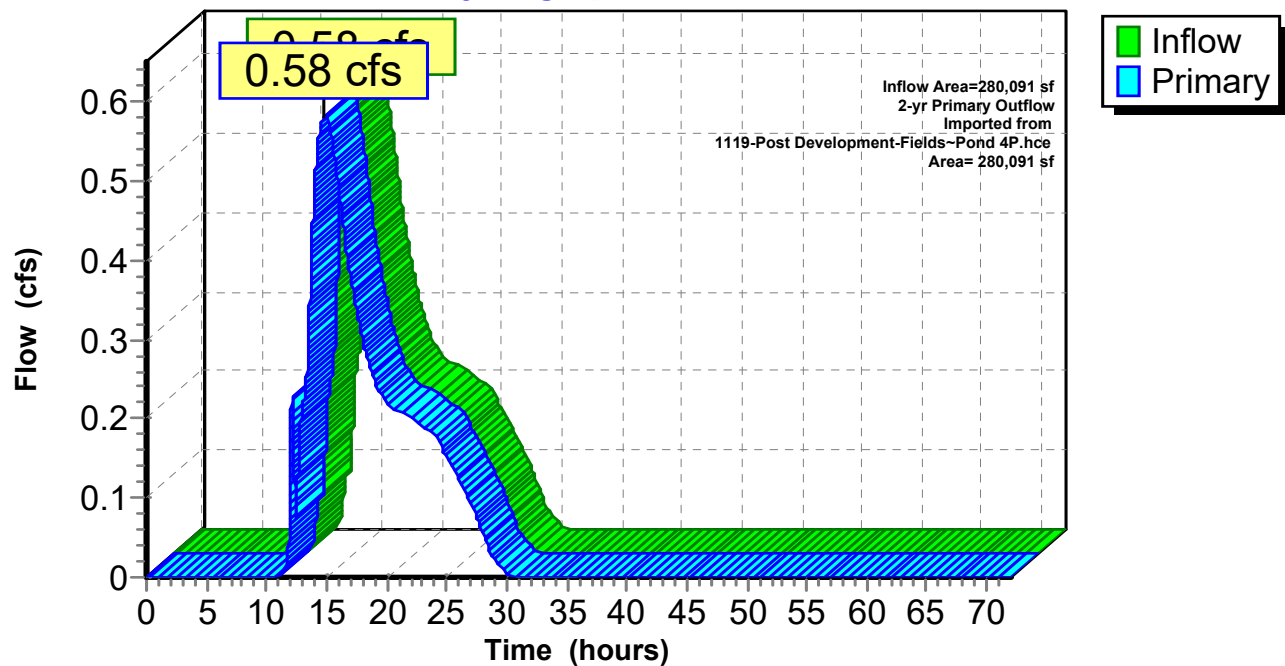
Inflow Area = 280,091 sf, 0.00% Impervious, Inflow Depth = 0.65" for 2-yr event
 Inflow = 0.58 cfs @ 14.81 hrs, Volume= 15,233 cf
 Primary = 0.58 cfs @ 14.81 hrs, Volume= 15,233 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 4P.hce

Link 16L: Pond 4P- PDMH-4

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 16L: Pond 4P- PDMH-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
12.00	0.11	0.00	0.11	65.00	0.00	0.00	0.00
13.00	0.22	0.00	0.22	66.00	0.00	0.00	0.00
14.00	0.49	0.00	0.49	67.00	0.00	0.00	0.00
15.00	0.58	0.00	0.58	68.00	0.00	0.00	0.00
16.00	0.49	0.00	0.49	69.00	0.00	0.00	0.00
17.00	0.38	0.00	0.38	70.00	0.00	0.00	0.00
18.00	0.30	0.00	0.30	71.00	0.00	0.00	0.00
19.00	0.25	0.00	0.25	72.00	0.00	0.00	0.00
20.00	0.22	0.00	0.22				
21.00	0.21	0.00	0.21				
22.00	0.20	0.00	0.20				
23.00	0.19	0.00	0.19				
24.00	0.18	0.00	0.18				
25.00	0.15	0.00	0.15				
26.00	0.12	0.00	0.12				
27.00	0.09	0.00	0.09				
28.00	0.06	0.00	0.06				
29.00	0.02	0.00	0.02				
30.00	0.01	0.00	0.01				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 17L: Pond 2P -SGWL Emergency Outflow

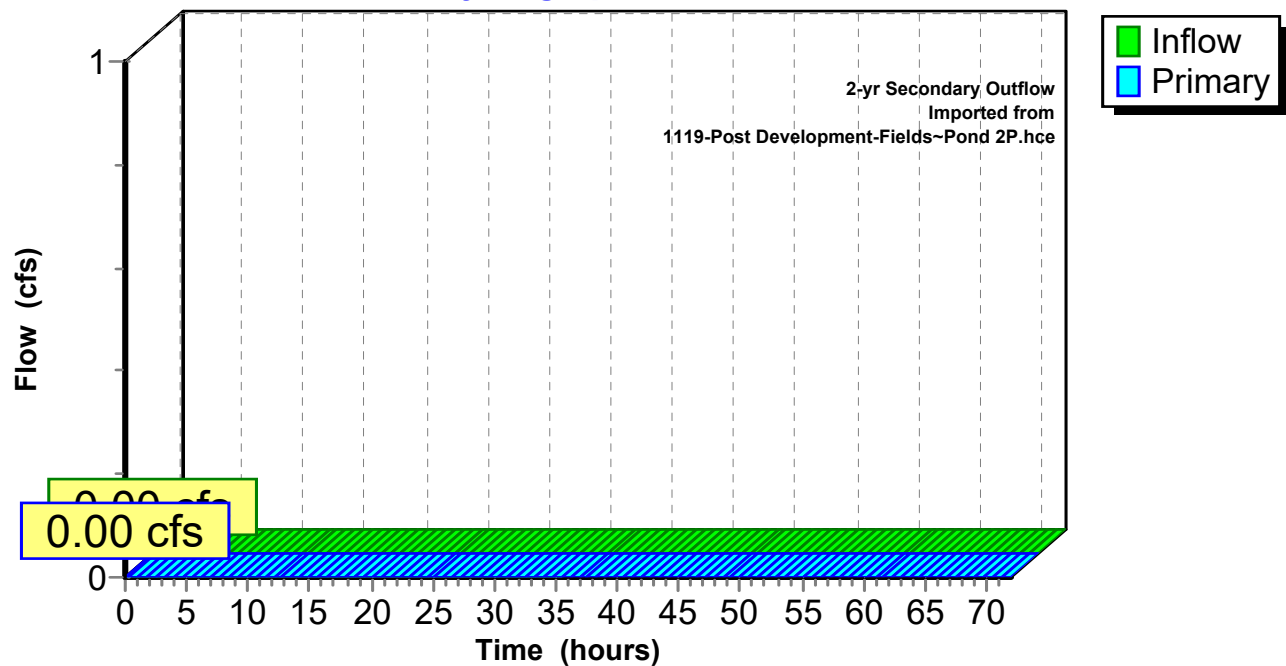
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Secondary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce

Link 17L: Pond 2P -SGWL Emergency Outflow

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 17L: Pond 2P -SGWL Emergency Outflow

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	66.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	67.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00
16.00	0.00	0.00	0.00	69.00	0.00	0.00	0.00
17.00	0.00	0.00	0.00	70.00	0.00	0.00	0.00
18.00	0.00	0.00	0.00	71.00	0.00	0.00	0.00
19.00	0.00	0.00	0.00	72.00	0.00	0.00	0.00
20.00	0.00	0.00	0.00				
21.00	0.00	0.00	0.00				
22.00	0.00	0.00	0.00				
23.00	0.00	0.00	0.00				
24.00	0.00	0.00	0.00				
25.00	0.00	0.00	0.00				
26.00	0.00	0.00	0.00				
27.00	0.00	0.00	0.00				
28.00	0.00	0.00	0.00				
29.00	0.00	0.00	0.00				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 19L: Pond 4P-Phase 2 Field 3

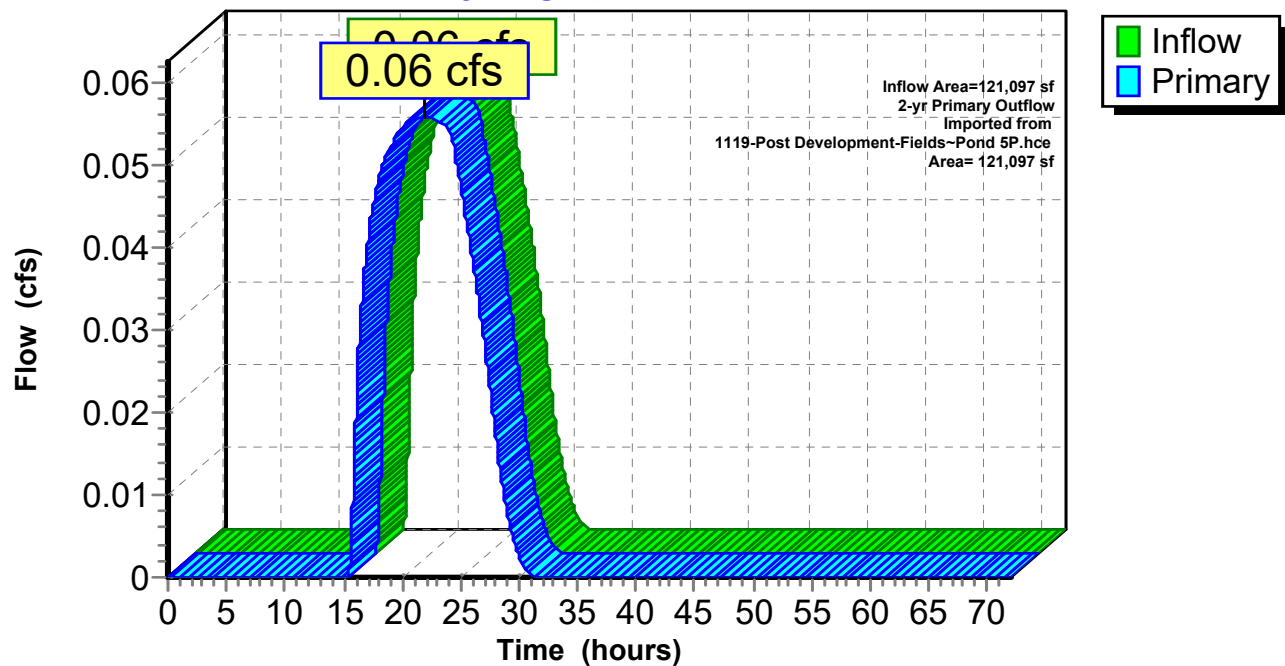
Inflow Area = 121,097 sf, 0.00% Impervious, Inflow Depth = 0.21" for 2-yr event
 Inflow = 0.06 cfs @ 21.83 hrs, Volume= 2,071 cf
 Primary = 0.06 cfs @ 21.83 hrs, Volume= 2,071 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 5P.hce

Link 19L: Pond 4P-Phase 2 Field 3

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 19L: Pond 4P-Phase 2 Field 3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	0.00	53.00	0.00	0.00	0.00
1.00	0.00	0.00	0.00	54.00	0.00	0.00	0.00
2.00	0.00	0.00	0.00	55.00	0.00	0.00	0.00
3.00	0.00	0.00	0.00	56.00	0.00	0.00	0.00
4.00	0.00	0.00	0.00	57.00	0.00	0.00	0.00
5.00	0.00	0.00	0.00	58.00	0.00	0.00	0.00
6.00	0.00	0.00	0.00	59.00	0.00	0.00	0.00
7.00	0.00	0.00	0.00	60.00	0.00	0.00	0.00
8.00	0.00	0.00	0.00	61.00	0.00	0.00	0.00
9.00	0.00	0.00	0.00	62.00	0.00	0.00	0.00
10.00	0.00	0.00	0.00	63.00	0.00	0.00	0.00
11.00	0.00	0.00	0.00	64.00	0.00	0.00	0.00
12.00	0.00	0.00	0.00	65.00	0.00	0.00	0.00
13.00	0.00	0.00	0.00	66.00	0.00	0.00	0.00
14.00	0.00	0.00	0.00	67.00	0.00	0.00	0.00
15.00	0.00	0.00	0.00	68.00	0.00	0.00	0.00
16.00	0.02	0.00	0.02	69.00	0.00	0.00	0.00
17.00	0.04	0.00	0.04	70.00	0.00	0.00	0.00
18.00	0.05	0.00	0.05	71.00	0.00	0.00	0.00
19.00	0.05	0.00	0.05	72.00	0.00	0.00	0.00
20.00	0.05	0.00	0.05				
21.00	0.06	0.00	0.06				
22.00	0.06	0.00	0.06				
23.00	0.06	0.00	0.06				
24.00	0.05	0.00	0.05				
25.00	0.05	0.00	0.05				
26.00	0.04	0.00	0.04				
27.00	0.03	0.00	0.03				
28.00	0.02	0.00	0.02				
29.00	0.01	0.00	0.01				
30.00	0.00	0.00	0.00				
31.00	0.00	0.00	0.00				
32.00	0.00	0.00	0.00				
33.00	0.00	0.00	0.00				
34.00	0.00	0.00	0.00				
35.00	0.00	0.00	0.00				
36.00	0.00	0.00	0.00				
37.00	0.00	0.00	0.00				
38.00	0.00	0.00	0.00				
39.00	0.00	0.00	0.00				
40.00	0.00	0.00	0.00				
41.00	0.00	0.00	0.00				
42.00	0.00	0.00	0.00				
43.00	0.00	0.00	0.00				
44.00	0.00	0.00	0.00				
45.00	0.00	0.00	0.00				
46.00	0.00	0.00	0.00				
47.00	0.00	0.00	0.00				
48.00	0.00	0.00	0.00				
49.00	0.00	0.00	0.00				
50.00	0.00	0.00	0.00				
51.00	0.00	0.00	0.00				
52.00	0.00	0.00	0.00				

Summary for Link 21L: G2 Overland Flow

[43] Hint: Has no inflow (Outflow=Zero)

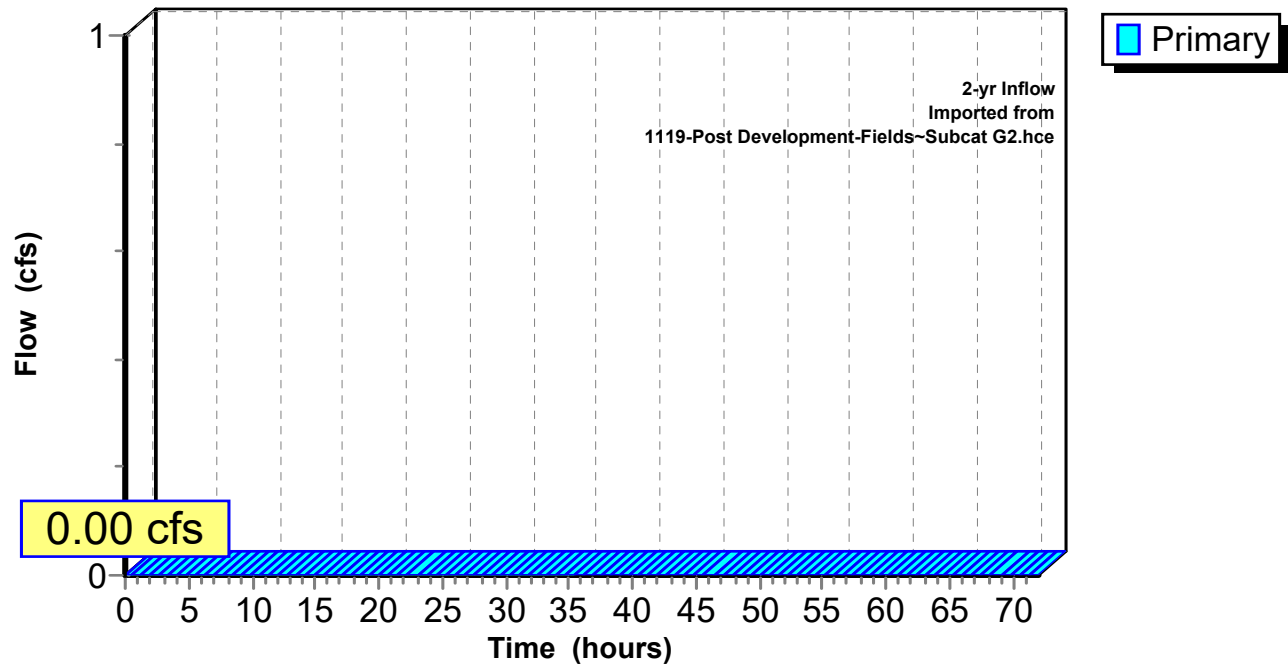
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

2-yr Inflow Imported from 1119-Post Development-Fields~Subcat G2.hce

Link 21L: G2 Overland Flow

Hydrograph



1119-Regional Stormwater-South*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Link 21L: G2 Overland Flow

Time (hours)	Elevation (feet)	Primary (cfs)	Time (hours)	Elevation (feet)	Primary (cfs)	Time (hours)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.00	26.50	0.00	0.00	53.00	0.00	0.00
0.50	0.00	0.00	27.00	0.00	0.00	53.50	0.00	0.00
1.00	0.00	0.00	27.50	0.00	0.00	54.00	0.00	0.00
1.50	0.00	0.00	28.00	0.00	0.00	54.50	0.00	0.00
2.00	0.00	0.00	28.50	0.00	0.00	55.00	0.00	0.00
2.50	0.00	0.00	29.00	0.00	0.00	55.50	0.00	0.00
3.00	0.00	0.00	29.50	0.00	0.00	56.00	0.00	0.00
3.50	0.00	0.00	30.00	0.00	0.00	56.50	0.00	0.00
4.00	0.00	0.00	30.50	0.00	0.00	57.00	0.00	0.00
4.50	0.00	0.00	31.00	0.00	0.00	57.50	0.00	0.00
5.00	0.00	0.00	31.50	0.00	0.00	58.00	0.00	0.00
5.50	0.00	0.00	32.00	0.00	0.00	58.50	0.00	0.00
6.00	0.00	0.00	32.50	0.00	0.00	59.00	0.00	0.00
6.50	0.00	0.00	33.00	0.00	0.00	59.50	0.00	0.00
7.00	0.00	0.00	33.50	0.00	0.00	60.00	0.00	0.00
7.50	0.00	0.00	34.00	0.00	0.00	60.50	0.00	0.00
8.00	0.00	0.00	34.50	0.00	0.00	61.00	0.00	0.00
8.50	0.00	0.00	35.00	0.00	0.00	61.50	0.00	0.00
9.00	0.00	0.00	35.50	0.00	0.00	62.00	0.00	0.00
9.50	0.00	0.00	36.00	0.00	0.00	62.50	0.00	0.00
10.00	0.00	0.00	36.50	0.00	0.00	63.00	0.00	0.00
10.50	0.00	0.00	37.00	0.00	0.00	63.50	0.00	0.00
11.00	0.00	0.00	37.50	0.00	0.00	64.00	0.00	0.00
11.50	0.00	0.00	38.00	0.00	0.00	64.50	0.00	0.00
12.00	0.00	0.00	38.50	0.00	0.00	65.00	0.00	0.00
12.50	0.00	0.00	39.00	0.00	0.00	65.50	0.00	0.00
13.00	0.00	0.00	39.50	0.00	0.00	66.00	0.00	0.00
13.50	0.00	0.00	40.00	0.00	0.00	66.50	0.00	0.00
14.00	0.00	0.00	40.50	0.00	0.00	67.00	0.00	0.00
14.50	0.00	0.00	41.00	0.00	0.00	67.50	0.00	0.00
15.00	0.00	0.00	41.50	0.00	0.00	68.00	0.00	0.00
15.50	0.00	0.00	42.00	0.00	0.00	68.50	0.00	0.00
16.00	0.00	0.00	42.50	0.00	0.00	69.00	0.00	0.00
16.50	0.00	0.00	43.00	0.00	0.00	69.50	0.00	0.00
17.00	0.00	0.00	43.50	0.00	0.00	70.00	0.00	0.00
17.50	0.00	0.00	44.00	0.00	0.00	70.50	0.00	0.00
18.00	0.00	0.00	44.50	0.00	0.00	71.00	0.00	0.00
18.50	0.00	0.00	45.00	0.00	0.00	71.50	0.00	0.00
19.00	0.00	0.00	45.50	0.00	0.00	72.00	0.00	0.00
19.50	0.00	0.00	46.00	0.00	0.00			
20.00	0.00	0.00	46.50	0.00	0.00			
20.50	0.00	0.00	47.00	0.00	0.00			
21.00	0.00	0.00	47.50	0.00	0.00			
21.50	0.00	0.00	48.00	0.00	0.00			
22.00	0.00	0.00	48.50	0.00	0.00			
22.50	0.00	0.00	49.00	0.00	0.00			
23.00	0.00	0.00	49.50	0.00	0.00			
23.50	0.00	0.00	50.00	0.00	0.00			
24.00	0.00	0.00	50.50	0.00	0.00			
24.50	0.00	0.00	51.00	0.00	0.00			
25.00	0.00	0.00	51.50	0.00	0.00			
25.50	0.00	0.00	52.00	0.00	0.00			
26.00	0.00	0.00	52.50	0.00	0.00			

1119-Regional Stormwater-South

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

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment E1R: E1 REGIONAL Runoff Area=58.272 ac 46.44% Impervious Runoff Depth=3.81"
Flow Length=3,675' Tc=207.4 min CN=69/98 Runoff=41.38 cfs 806,479 cf

Subcatchment E2R: E2 Regional Runoff Area=56.551 ac 43.69% Impervious Runoff Depth=3.54"
Flow Length=2,726' Tc=143.3 min CN=65/98 Runoff=47.96 cfs 726,438 cf

Reach 15R: U.S. Pike Drive Culvert Inflow=81.17 cfs 1,735,896 cf
Outflow=81.17 cfs 1,735,896 cf

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=2.32' Max Vel=1.18 fps Inflow=81.60 cfs 1,736,142 cf
n=0.120 L=490.0' S=0.0051 '/' Capacity=198.28 cfs Outflow=81.17 cfs 1,735,896 cf

Pond 1P: EX. POND-2 Peak Elev=27.95' Storage=800,204 cf Inflow=87.55 cfs 1,735,629 cf
Primary=41.94 cfs 1,478,623 cf Secondary=43.56 cfs 248,665 cf Outflow=81.43 cfs 1,727,288 cf

Pond 12P: Ex. Dual 36" Culverts Peak Elev=33.66' Storage=570 cf Inflow=84.08 cfs 1,532,917 cf
Discarded=0.02 cfs 236 cf Primary=84.05 cfs 1,532,681 cf Outflow=84.07 cfs 1,532,917 cf

Pond BMP-R1: Subsurface Gravel Peak Elev=28.41' Storage=83,293 cf Inflow=86.93 cfs 1,598,610 cf
Primary=0.75 cfs 89,968 cf Secondary=84.48 cfs 1,508,758 cf Outflow=84.87 cfs 1,598,726 cf

Link 12L: 10-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=13.40 cfs 37,315 cf
Area= 133,294 sf 80.98% Imperv. Primary=13.40 cfs 37,315 cf

Link 13L: 10-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=13.40 cfs 37,315 cf
Area= 133,294 sf 80.98% Imperv. Primary=13.40 cfs 37,315 cf

Link 14L: 10-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=11.20 cfs 62,273 cf
Area= 168,098 sf 64.27% Imperv. Primary=11.20 cfs 62,273 cf

Link 15L: 10-yr Runoff Imported from 1119-Post Development-Fields~Subcat F1.hce Inflow=2.84 cfs 8,854 cf
Area= 40,685 sf Primary=2.84 cfs 8,854 cf

Link 16L: 10-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 4P.hce Inflow=2.84 cfs 49,298 cf
Area= 280,091 sf Primary=2.84 cfs 49,298 cf

Link 17L: 10-yr Secondary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 18L: 10-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 5P.hce Inflow=0.59 cfs 16,631 cf
Area= 121,097 sf Primary=0.59 cfs 16,631 cf

Link 21L: G2 Overland Flow 10-yr Inflow Imported from 1119-Post Development-Fields~Subcat G2.hce
Primary=0.00 cfs 0 cf

Total Runoff Area = 5,001,690 sf Runoff Volume = 1,532,917 cf Average Runoff Depth = 3.68"
54.92% Pervious = 2,746,850 sf 45.08% Impervious = 2,254,840 sf

1119-Regional Stormwater-South

Type III 24-hr 25-yr Rainfall=7.14"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1R: E1 REGIONAL Runoff Area=58.272 ac 46.44% Impervious Runoff Depth=5.15"
Flow Length=3,675' Tc=207.4 min CN=69/98 Runoff=56.21 cfs 1,089,016 cf

Subcatchment E2R: E2 Regional Runoff Area=56.551 ac 43.69% Impervious Runoff Depth=4.82"
Flow Length=2,726' Tc=143.3 min CN=65/98 Runoff=66.05 cfs 990,077 cf

Reach 15R: U.S. Pike Drive Culvert Inflow=120.31 cfs 2,379,824 cf
Outflow=120.31 cfs 2,379,824 cf

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=2.78' Max Vel=1.33 fps Inflow=120.50 cfs 2,380,074 cf
n=0.120 L=490.0' S=0.0051 '/' Capacity=198.28 cfs Outflow=120.31 cfs 2,379,824 cf

Pond 1P: EX. POND-2 Peak Elev=28.12' Storage=822,430 cf Inflow=121.18 cfs 2,375,476 cf
Primary=42.13 cfs 1,678,015 cf Secondary=85.96 cfs 689,034 cf Outflow=120.26 cfs 2,367,049 cf

Pond 12P: Ex. Dual 36" Culverts Peak Elev=35.68' Storage=7,851 cf Inflow=115.11 cfs 2,079,093 cf
Discarded=0.22 cfs 980 cf Primary=113.67 cfs 2,078,113 cf Outflow=113.89 cfs 2,079,093 cf

Pond BMP-R1: Subsurface Gravel Peak Elev=28.68' Storage=91,145 cf Inflow=118.23 cfs 2,186,572 cf
Primary=4.90 cfs 107,344 cf Secondary=113.13 cfs 2,079,343 cf Outflow=118.01 cfs 2,186,687 cf

Link 12L: 25-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=17.70 cfs 53,376 cf
Area= 133,294 sf 80.98% Imperv. Primary=17.70 cfs 53,376 cf

Link 13L: 25-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=17.70 cfs 53,376 cf
Area= 133,294 sf 80.98% Imperv. Primary=17.70 cfs 53,376 cf

Link 14L: 25-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=14.84 cfs 82,037 cf
Area= 168,098 sf 64.27% Imperv. Primary=14.84 cfs 82,037 cf

Link 15L: 25-yr Runoff Imported from 1119-Post Development-Fields~Subcat F1.hce Inflow=4.21 cfs 13,025 cf
Area= 40,685 sf Primary=4.21 cfs 13,025 cf

Link 16L: 25-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 4P.hce Inflow=3.72 cfs 78,766 cf
Area= 280,091 sf Primary=3.72 cfs 78,766 cf

Link 17L: 25-yr Secondary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Link 18L: 25-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 5P.hce Inflow=1.02 cfs 29,693 cf
Area= 121,097 sf Primary=1.02 cfs 29,693 cf

Link 21L: G2 Overland Flow 25-yr Inflow Imported from 1119-Post Development-Fields~Subcat G2.hce
Primary=0.00 cfs 0 cf

Total Runoff Area = 5,001,690 sf Runoff Volume = 2,079,093 cf Average Runoff Depth = 4.99"
54.92% Pervious = 2,746,850 sf 45.08% Impervious = 2,254,840 sf

1119-Regional Stormwater-South*Type III 24-hr 50-yr Rainfall=8.56"*

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment E1R: E1 REGIONAL Runoff Area=58.272 ac 46.44% Impervious Runoff Depth=6.45"
 Flow Length=3,675' Tc=207.4 min CN=69/98 Runoff=70.62 cfs 1,364,402 cf

Subcatchment E2R: E2 Regional Runoff Area=56.551 ac 43.69% Impervious Runoff Depth=6.09"
 Flow Length=2,726' Tc=143.3 min CN=65/98 Runoff=83.83 cfs 1,249,181 cf

Reach 15R: U.S. Pike Drive Culvert Inflow=139.38 cfs 3,003,086 cf
 Outflow=139.38 cfs 3,003,086 cf

Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=2.97' Max Vel=1.39 fps Inflow=139.44 cfs 3,003,339 cf
 n=0.120 L=490.0' S=0.0051 '/' Capacity=198.28 cfs Outflow=139.38 cfs 3,003,086 cf

Pond 1P: EX. POND-2 Peak Elev=28.19' Storage=831,572 cf Inflow=139.39 cfs 2,994,650 cf
 Primary=42.09 cfs 1,834,324 cf Secondary=106.52 cfs 1,151,828 cf Outflow=139.16 cfs 2,986,153 cf

Pond 12P: Ex. Dual 36" Culverts Peak Elev=37.44' Storage=64,257 cf Inflow=145.47 cfs 2,613,583 cf
 Discarded=1.16 cfs 8,082 cf Primary=131.07 cfs 2,605,501 cf Outflow=132.22 cfs 2,613,583 cf

Pond BMP-R1: Subsurface Gravel Peak Elev=28.79' Storage=94,314 cf Inflow=135.95 cfs 2,756,026 cf
 Primary=9.48 cfs 155,875 cf Secondary=126.43 cfs 2,600,267 cf Outflow=135.90 cfs 2,756,142 cf

Link 12L: 50-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=21.65 cfs 68,732 cf
 Area= 133,294 sf 80.98% Imperv. Primary=21.65 cfs 68,732 cf

Link 13L: 50-yr Outflow Imported from 1119-Post Development-TS~Reach 30R.hce Inflow=21.65 cfs 68,732 cf
 Area= 133,294 sf 80.98% Imperv. Primary=21.65 cfs 68,732 cf

Link 14L: 50-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=18.31 cfs 101,045 cf
 Area= 168,098 sf 64.27% Imperv. Primary=18.31 cfs 101,045 cf

Link 15L: 50-yr Runoff Imported from 1119-Post Development-Fields~Subcat F1.hce Inflow=5.55 cfs 17,186 cf
 Area= 40,685 sf Primary=5.55 cfs 17,186 cf

Link 16L: 50-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 4P.hce Inflow=4.02 cfs 107,995 cf
 Area= 280,091 sf Primary=4.02 cfs 107,995 cf

Link 17L: 50-yr Secondary Outflow Imported from 1119-Post Development-Fields~Pond 2P.hce Inflow=0.00 cfs 0 cf
 Primary=0.00 cfs 0 cf

Link 18L: 50-yr Primary Outflow Imported from 1119-Post Development-Fields~Pond 5P.hce Inflow=1.17 cfs 42,530 cf
 Area= 121,097 sf Primary=1.17 cfs 42,530 cf

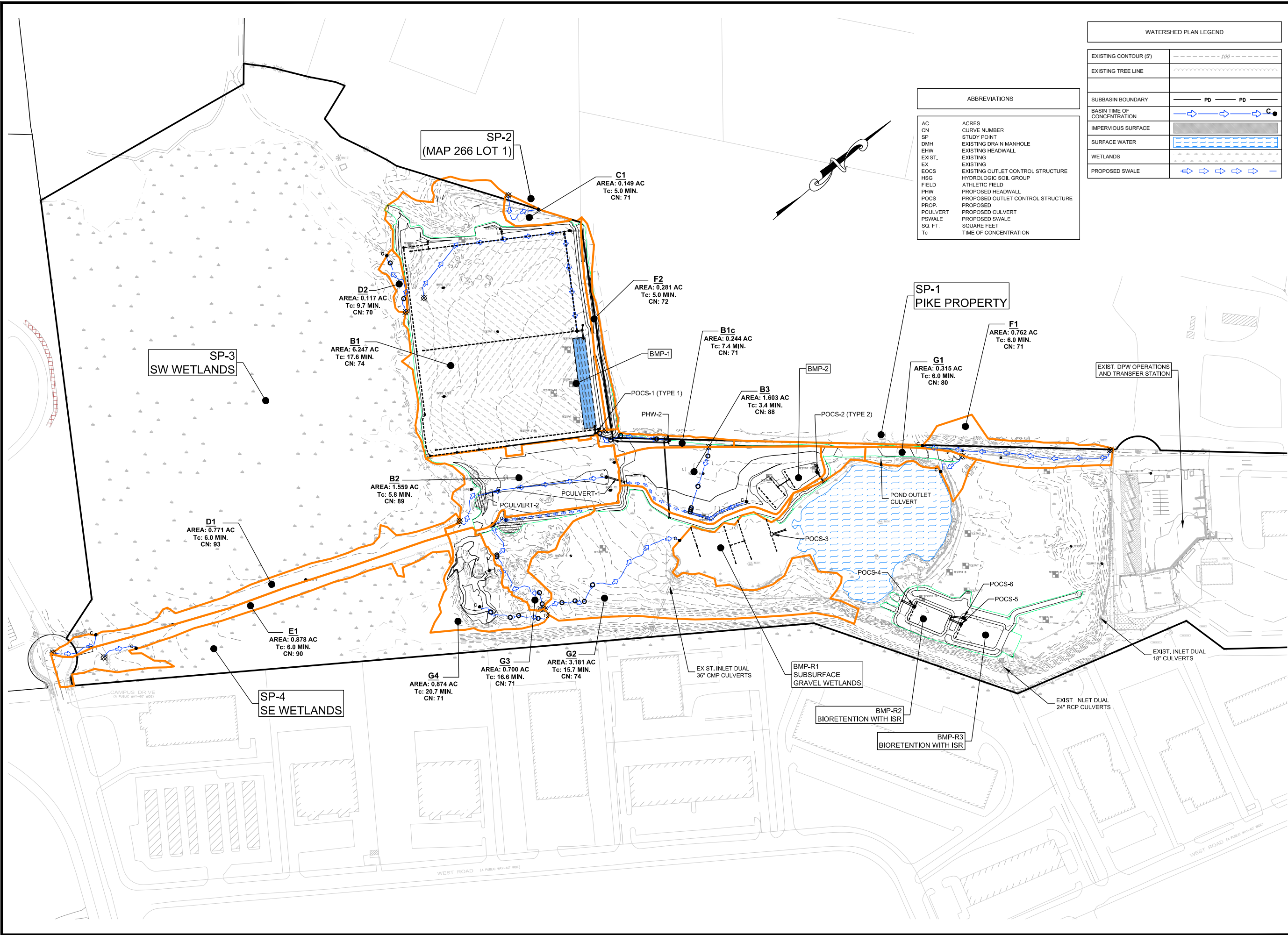
Link 21L: G2 Overland Flow 50-yr Inflow Imported from 1119-Post Development-Fields~Subcat G2.hce
 Primary=0.00 cfs 0 cf

Total Runoff Area = 5,001,690 sf Runoff Volume = 2,613,583 cf Average Runoff Depth = 6.27"
54.92% Pervious = 2,746,850 sf 45.08% Impervious = 2,254,840 sf

Stormwater Management Report
Appendix G

Post-Development Phase 1 Drainage Analysis

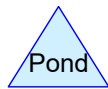
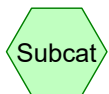
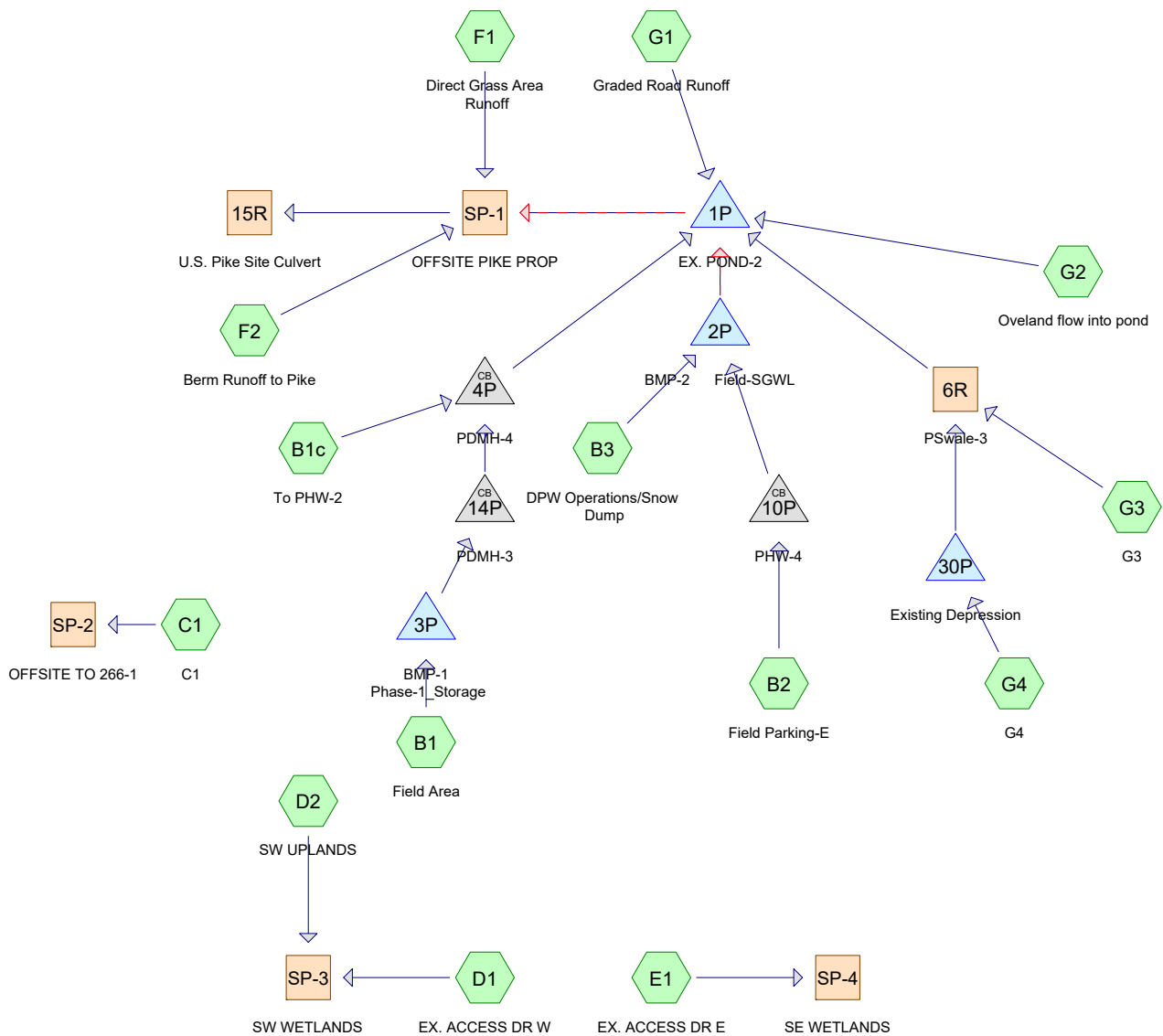
- i. Post-Development Phase I Watershed Plan
- ii. 2-Year, 24-Hour HydroCad Report Calculations
- iii. 10-Year, 25-Year, and 50-Year Report Summary Calculations
- iv. NHDES AoT Gravel Wetland Sizing Sheet



ABBREVIATIONS	
AC	ACRES
CN	CURVE NUMBER
SP	STUDY POINT
DMH	EXISTING DRAIN MANHOLE
EHW	EXISTING HEADWALL
EXIST.	EXISTING
EX	EXISTING
EOCS	EXISTING OUTLET CONTROL STRUCTURE
HSG	HYDROLOGIC SOIL GROUP
FIELD	ATHLETIC FIELD
PHW	PROPOSED HEADWALL
POCS	PROPOSED OUTLET CONTROL STRUCTURE
PROP.	PROPOSED
PCULVERT	PROPOSED CULVERT
PSWALE	PROPOSED SWALE
SQ. FT.	SQUARE FEET
Tc	TIME OF CONCENTRATION

WATERSHED PLAN LEGEND	
EXISTING CONTOUR (5')	---
EXISTING TREE LINE	~~~~~
SUBBASIN BOUNDARY	— PD — PD —
Basin Time of Concentration	→ → → → → C
IMPERVIOUS SURFACE	▨
SURFACE WATER	~~~~~
WETLANDS	▨
PROPOSED SWALE	→ → → → →

City of Portsmouth Portsmouth, New Hampshire Site Plan Review Application Multi-purpose Recreation Fields Stormwater Analysis Post-Development Watershed Plan		designed by: JHK	drawn by: AGL	approved by: PAC	checked by: PAC	date: August 2019	project no: 1119	scale: 1" = 100'	revision	no.	by
H2		CMA ENGINEERS Civil/Environmental/Structural		Portsmouth, NH • Manchester, NH • Portland, ME 603/431-6196 • 603/627-0708 • 207/541-4223		cmaengineers.com					



Routing Diagram for 1119-Post Development-Fields-Phase 1
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1119-Post Development-Fields-Phase 1

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.147	74	>75% Grass cover, Good, HSG C (B2)
0.050	80	>75% Grass cover, Good, HSG D (B2)
2.810	71	Field Turf, HSG C (B1)
1.612	78	Field Turf, HSG D (B1)
0.099	97	Field turf over BMP, 0% imp, HSG C (B1)
2.319	96	Gravel surface, 100% imp, HSG C (B2, B3, D1, E1, G2)
0.010	96	Gravel surface, 100% imp., HSG C (F2)
0.115	96	Gravel surface, 100%, imp, HSG C (G1)
0.015	96	Gravel surface, HSG C (G4)
0.775	96	Gravel surface, grass overgrowth, 100% imp, HSG C (D1, E1)
5.239	71	Meadow, non-grazed, HSG C (B1, B1c, B2, B3, C1, D1, E1, F1, F2, G1, G2, G3, G4)
0.416	78	Meadow, non-grazed, HSG D (B2, E1, G1, G2)
0.086	98	Paved parking, HSG C (D1, E1)
0.176	98	Paved parking, conc pads, HSG C (B2)
0.056	97	Porous Pave over BMP, 0% imp, HSG C (B1)
0.140	71	Porous Pavement, Phase 1, HSG C (B1)
0.262	78	Porous Pavement, Phase 1, HSG D (B1)
0.059	98	Unconnected pavement, Phase 1 (B1)
0.120	98	Water Surface, 0% imp, HSG C (B3)
2.024	70	Woods, Good, HSG C (B1, B2, C1, D1, D2, E1, G1, G2, G3, G4)
1.113	77	Woods, Good, HSG D (B2, D1, E1, G2)
17.643	78	TOTAL AREA

1119-Post Development-Fields-Phase 1

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
14.131	HSG C	B1, B1c, B2, B3, C1, D1, D2, E1, F1, F2, G1, G2, G3, G4
3.453	HSG D	B1, B2, D1, E1, G1, G2
0.059	Other	B1
17.643		TOTAL AREA

1119-Post Development-Fields-Phase 1

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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	Subo Num
0.000	0.000	0.147	0.050	0.000	0.197	>75% Grass cover, Good	
0.000	0.000	2.810	1.612	0.000	4.422	Field Turf	
0.000	0.000	0.099	0.000	0.000	0.099	Field turf over BMP, 0% imp	
0.000	0.000	0.015	0.000	0.000	0.015	Gravel surface	
0.000	0.000	2.319	0.000	0.000	2.319	Gravel surface, 100% imp	
0.000	0.000	0.010	0.000	0.000	0.010	Gravel surface, 100% imp.	
0.000	0.000	0.115	0.000	0.000	0.115	Gravel surface, 100%, imp	
0.000	0.000	0.775	0.000	0.000	0.775	Gravel surface, grass ovrgrowth, 100% imp	
0.000	0.000	5.239	0.416	0.000	5.655	Meadow, non-grazed	
0.000	0.000	0.086	0.000	0.000	0.086	Paved parking	
0.000	0.000	0.176	0.000	0.000	0.176	Paved parking, conc pads	
0.000	0.000	0.056	0.000	0.000	0.056	Porous Pave over BMP, 0% imp	
0.000	0.000	0.140	0.262	0.000	0.402	Porous Pavement, Phase 1	
0.000	0.000	0.000	0.000	0.059	0.059	Unconnected pavement, Phase 1	
0.000	0.000	0.120	0.000	0.000	0.120	Water Surface, 0% imp	
0.000	0.000	2.024	1.113	0.000	3.137	Woods, Good	
0.000	0.000	14.131	3.453	0.059	17.643	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	B1	0.00	0.00	130.0	0.0035	0.022	12.0	0.5	0.0
2	B2	0.00	0.00	38.0	0.0137	0.013	12.0	0.0	0.0
3	1P	22.34	21.91	61.3	0.0070	0.022	53.0	41.0	19.0
4	2P	25.25	24.90	27.5	0.0127	0.012	24.0	0.0	0.0
5	3P	27.64	27.36	56.3	0.0050	0.012	18.0	0.0	0.0
6	4P	26.59	25.67	183.7	0.0050	0.013	24.0	0.0	0.0
7	10P	29.60	28.89	40.7	0.0174	0.012	24.0	0.0	0.0
8	14P	27.26	26.69	114.0	0.0050	0.013	18.0	0.0	0.0

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field AreaRunoff Area=6.247 ac 0.00% Impervious Runoff Depth=1.39"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=6.97 cfs 0.722 af**Subcatchment B1c: To PHW-2**Runoff Area=0.244 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=0.31 cfs 0.024 af**Subcatchment B2: Field Parking-E**Runoff Area=1.559 ac 69.15% Impervious Runoff Depth=2.68"
Flow Length=418' Tc=6.0 min CN=74/96 Runoff=4.55 cfs 0.348 af**Subcatchment B3: DPW Operations/Snow**Runoff Area=1.604 ac 59.66% Impervious Runoff Depth=2.55"
Flow Length=315' Tc=6.0 min CN=76/96 Runoff=4.49 cfs 0.341 af**Subcatchment C1: C1**Runoff Area=6,500 sf 0.00% Impervious Runoff Depth=1.20"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.20 cfs 0.015 af**Subcatchment D1: EX. ACCESS DR W**Runoff Area=0.771 ac 85.99% Impervious Runoff Depth=3.01"
Flow Length=133' Tc=6.0 min CN=76/96 Runoff=2.52 cfs 0.193 af**Subcatchment D2: SW UPLANDS**Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=1.14"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.12 cfs 0.010 af**Subcatchment E1: EX. ACCESS DR E**Runoff Area=0.878 ac 68.68% Impervious Runoff Depth=2.69"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=2.58 cfs 0.197 af**Subcatchment F1: Direct Grass Area Runoff**Runoff Area=0.762 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=1.02 cfs 0.076 af**Subcatchment F2: Berm Runoff to Pike**Runoff Area=0.251 ac 3.98% Impervious Runoff Depth=1.28"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=0.29 cfs 0.027 af**Subcatchment G1: Graded Road Runoff**Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=1.80"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=0.66 cfs 0.047 af**Subcatchment G2: Oveland flow into pond**Runoff Area=3.181 ac 1.73% Impervious Runoff Depth=1.36"
Flow Length=415' Tc=15.7 min CN=73/96 Runoff=3.60 cfs 0.360 af**Subcatchment G3: G3**Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=340' Tc=16.6 min CN=71/0 Runoff=0.67 cfs 0.070 af**Subcatchment G4: G4**Runoff Area=0.874 ac 0.00% Impervious Runoff Depth=1.20"
Flow Length=189' Tc=20.7 min CN=71/0 Runoff=0.77 cfs 0.087 af**Reach 6R: PSwale-3**Avg. Flow Depth=0.16' Max Vel=1.67 fps Inflow=0.67 cfs 0.070 af
n=0.027 L=228.0' S=0.0137 '/' Capacity=109.43 cfs Outflow=0.66 cfs 0.070 af**Reach 15R: U.S. Pike Site Culvert**Inflow=0.89 cfs 1.499 af
Outflow=0.89 cfs 1.499 af

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.29' Max Vel=0.30 fps Inflow=1.23 cfs 1.502 af
n=0.120 L=490.0' S=0.0051 ' /' Capacity=139.53 cfs Outflow=0.89 cfs 1.499 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.20 cfs 0.015 af
Outflow=0.20 cfs 0.015 af

Reach SP-3: SW WETLANDS Inflow=2.62 cfs 0.204 af
Outflow=2.62 cfs 0.204 af

Reach SP-4: SE WETLANDS Inflow=2.58 cfs 0.197 af
Outflow=2.58 cfs 0.197 af

Pond 1P: EX. POND-2 Peak Elev=24.33' Storage=434,379 cf Inflow=7.98 cfs 1.520 af
Primary=0.84 cfs 1.399 af Secondary=0.00 cfs 0.000 af Outflow=0.84 cfs 1.399 af

Pond 2P: BMP-2 Field-SGWL Peak Elev=28.15' Storage=16,801 cf Inflow=9.04 cfs 0.689 af
Primary=3.53 cfs 0.687 af Secondary=0.00 cfs 0.000 af Outflow=3.53 cfs 0.687 af

Pond 3P: BMP-1 Phase-1_Storage Peak Elev=30.99' Storage=18,235 cf Inflow=6.97 cfs 0.722 af
Discarded=0.08 cfs 0.389 af Primary=0.57 cfs 0.331 af Outflow=0.64 cfs 0.720 af

Pond 4P: PDMH-4 Peak Elev=26.94' Inflow=0.59 cfs 0.356 af
24.0" Round Culvert n=0.013 L=183.7' S=0.0050 ' /' Outflow=0.59 cfs 0.356 af

Pond 10P: PHW-4 Peak Elev=30.51' Inflow=4.55 cfs 0.348 af
24.0" Round Culvert n=0.012 L=40.7' S=0.0174 ' /' Outflow=4.55 cfs 0.348 af

Pond 14P: PDMH-3 Peak Elev=27.64' Inflow=0.57 cfs 0.331 af
18.0" Round Culvert n=0.013 L=114.0' S=0.0050 ' /' Outflow=0.57 cfs 0.331 af

Pond 30P: Existing Depression Peak Elev=39.78' Storage=1,581 cf Inflow=0.77 cfs 0.087 af
Discarded=0.11 cfs 0.087 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.087 af

Total Runoff Area = 17.643 ac Runoff Volume = 2.518 af Average Runoff Depth = 1.71"
80.92% Pervious = 14.277 ac 19.08% Impervious = 3.366 ac

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment B1: Field Area

Runoff = 6.97 cfs @ 12.26 hrs, Volume= 0.722 af, Depth= 1.39"

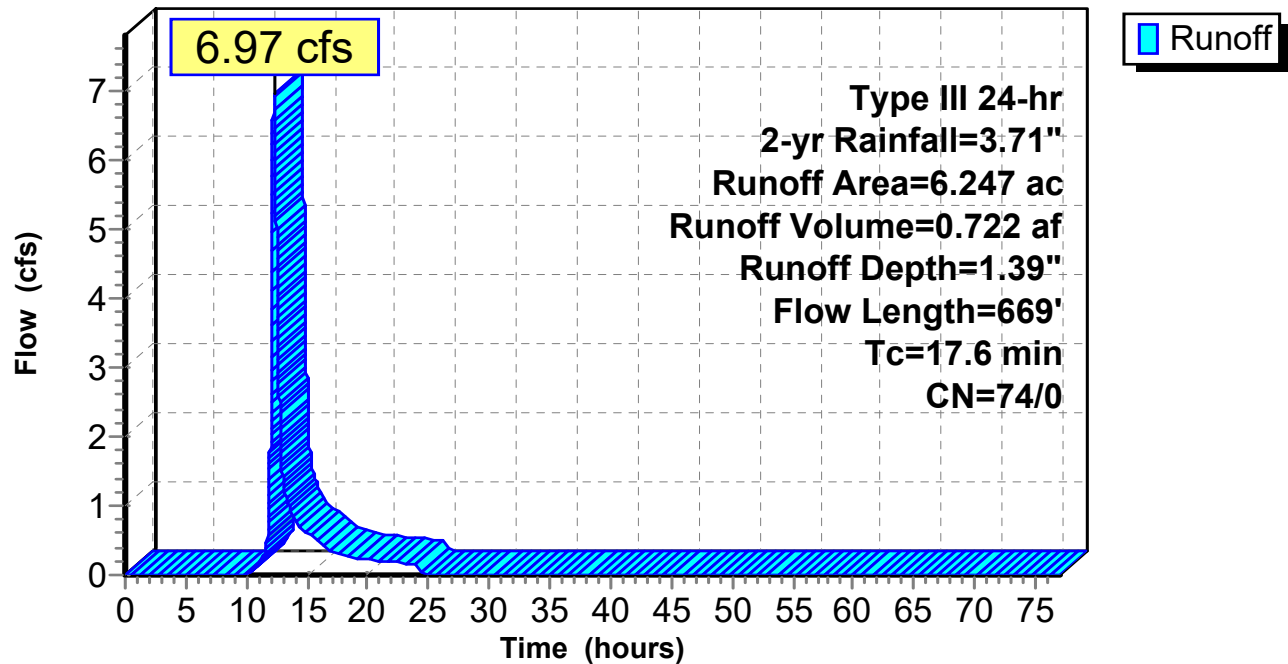
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 1.612	78	Field Turf, HSG D
* 2.810	71	Field Turf, HSG C
* 0.140	71	Porous Pavement, Phase 1, HSG C
* 0.262	78	Porous Pavement, Phase 1, HSG D
* 0.056	97	Porous Pave over BMP, 0% imp, HSG C
* 0.059	98	Unconnected pavement, Phase 1
0.664	70	Woods, Good, HSG C
0.545	71	Meadow, non-grazed, HSG C
* 0.099	97	Field turf over BMP, 0% imp, HSG C
6.247	74	Weighted Average
6.247	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry, Vert. Flow Through Turf to subgrade
2.2	26	0.0050	0.19		Sheet Flow, Horizontal flow through stone base n= 0.050 P2= 3.71"
7.4	130	0.0035	0.29	0.01	Pipe Channel, Flat Pipe channels 12.0" x 0.5" Box Area= 0.0 sf Perim= 2.1' r= 0.02' n= 0.022
3.0	513	0.0050	2.84	2.27	Channel Flow, Perimeter Drain Area= 0.8 sf Perim= 3.1' r= 0.26' n= 0.015
17.6	669	Total			

Subcatchment B1: Field Area

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B1: Field Area

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.28	0.00	2.24
14.00	3.01	0.91	0.00	0.82
16.00	3.29	1.10	0.00	0.45
18.00	3.44	1.20	0.00	0.28
20.00	3.55	1.27	0.00	0.22
22.00	3.64	1.34	0.00	0.18
24.00	3.71	1.39	0.00	0.15
26.00	3.71	1.39	0.00	0.00
28.00	3.71	1.39	0.00	0.00
30.00	3.71	1.39	0.00	0.00
32.00	3.71	1.39	0.00	0.00
34.00	3.71	1.39	0.00	0.00
36.00	3.71	1.39	0.00	0.00
38.00	3.71	1.39	0.00	0.00
40.00	3.71	1.39	0.00	0.00
42.00	3.71	1.39	0.00	0.00
44.00	3.71	1.39	0.00	0.00
46.00	3.71	1.39	0.00	0.00
48.00	3.71	1.39	0.00	0.00
50.00	3.71	1.39	0.00	0.00
52.00	3.71	1.39	0.00	0.00
54.00	3.71	1.39	0.00	0.00
56.00	3.71	1.39	0.00	0.00
58.00	3.71	1.39	0.00	0.00
60.00	3.71	1.39	0.00	0.00
62.00	3.71	1.39	0.00	0.00
64.00	3.71	1.39	0.00	0.00
66.00	3.71	1.39	0.00	0.00
68.00	3.71	1.39	0.00	0.00
70.00	3.71	1.39	0.00	0.00
72.00	3.71	1.39	0.00	0.00
74.00	3.71	1.39	0.00	0.00
76.00	3.71	1.39	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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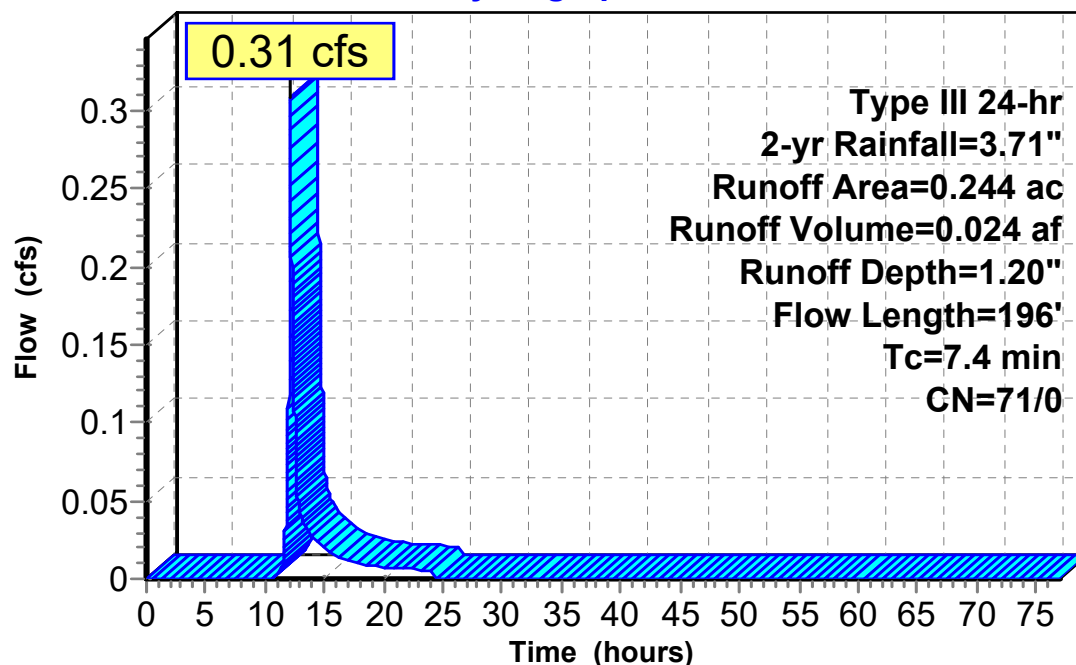
Summary for Subcatchment B1c: To PHW-2

Runoff = 0.31 cfs @ 12.11 hrs, Volume= 0.024 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.244	71	Meadow, non-grazed, HSG C
0.244	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	16	0.3333	0.27		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
3.9	34	0.0493	0.15		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.2	26	0.1210	2.43		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.5	88	0.0184	0.95		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.8	32	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.4	196	Total			

Subcatchment B1c: To PHW-2**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B1c: To PHW-2

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.14
14.00	3.01	0.77	0.00	0.03
16.00	3.29	0.93	0.00	0.02
18.00	3.44	1.03	0.00	0.01
20.00	3.55	1.10	0.00	0.01
22.00	3.64	1.15	0.00	0.01
24.00	3.71	1.20	0.00	0.01
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment B2: Field Parking-E

Runoff = 4.55 cfs @ 12.09 hrs, Volume= 0.348 af, Depth= 2.68"

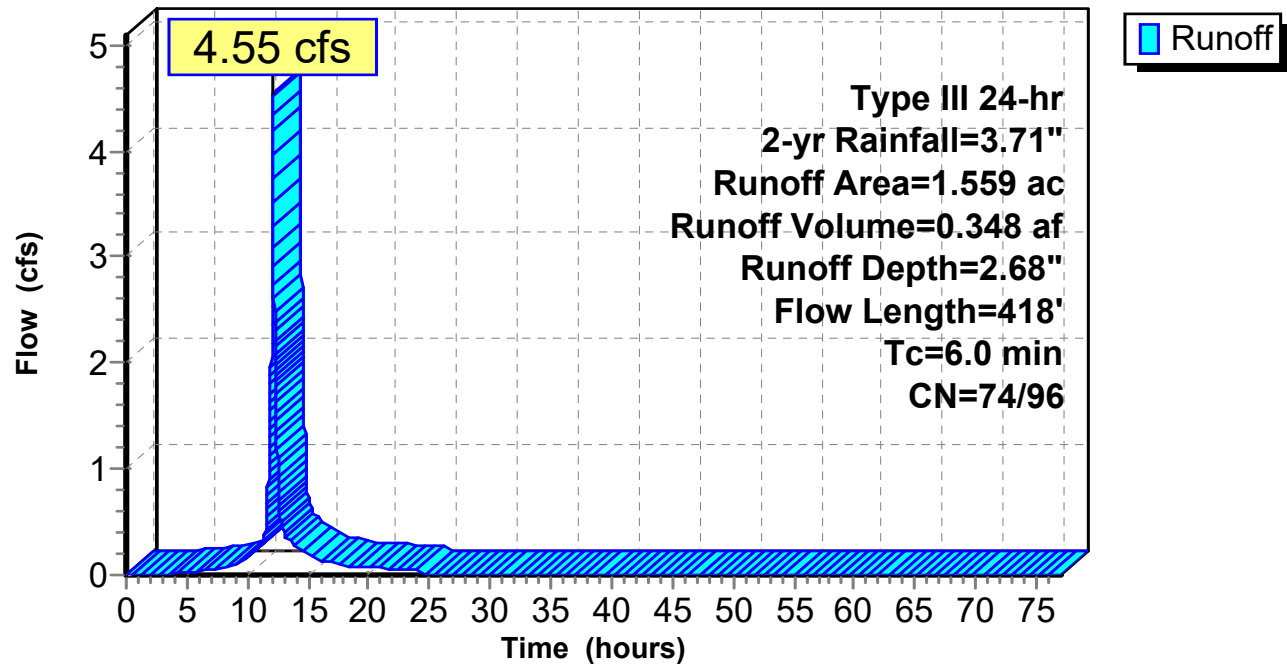
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.147	74	>75% Grass cover, Good, HSG C
0.050	80	>75% Grass cover, Good, HSG D
0.029	70	Woods, Good, HSG C
* 0.176	98	Paved parking, conc pads, HSG C
* 0.902	96	Gravel surface, 100% imp, HSG C
0.004	77	Woods, Good, HSG D
0.068	78	Meadow, non-grazed, HSG D
0.183	71	Meadow, non-grazed, HSG C
1.559	89	Weighted Average
0.481	74	30.85% Pervious Area
1.078	96	69.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.1	14	0.0148	0.08		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
1.3	73	0.0168	0.91		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	19	0.0370	1.35		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	14	0.3333	4.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0137	5.31	4.17	Pipe Channel, PCULVERT-1 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.0	260	0.0121	4.31	21.55	Trap/Vee/Rect Channel Flow, Grassed swale: PSwale-1 Bot.W=2.00' D=1.00' Z= 3.0 ' Top.W=8.00' n= 0.027
5.8	418	Total, Increased to minimum Tc = 6.0 min			

Subcatchment B2: Field Parking-E

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B2: Field Parking-E

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.03
8.00	0.42	0.00	0.15	0.07
10.00	0.70	0.00	0.37	0.16
12.00	1.85	0.28	1.43	2.77
14.00	3.01	0.91	2.56	0.26
16.00	3.29	1.10	2.84	0.14
18.00	3.44	1.20	2.99	0.09
20.00	3.55	1.27	3.10	0.07
22.00	3.64	1.34	3.18	0.06
24.00	3.71	1.39	3.25	0.05
26.00	3.71	1.39	3.25	0.00
28.00	3.71	1.39	3.25	0.00
30.00	3.71	1.39	3.25	0.00
32.00	3.71	1.39	3.25	0.00
34.00	3.71	1.39	3.25	0.00
36.00	3.71	1.39	3.25	0.00
38.00	3.71	1.39	3.25	0.00
40.00	3.71	1.39	3.25	0.00
42.00	3.71	1.39	3.25	0.00
44.00	3.71	1.39	3.25	0.00
46.00	3.71	1.39	3.25	0.00
48.00	3.71	1.39	3.25	0.00
50.00	3.71	1.39	3.25	0.00
52.00	3.71	1.39	3.25	0.00
54.00	3.71	1.39	3.25	0.00
56.00	3.71	1.39	3.25	0.00
58.00	3.71	1.39	3.25	0.00
60.00	3.71	1.39	3.25	0.00
62.00	3.71	1.39	3.25	0.00
64.00	3.71	1.39	3.25	0.00
66.00	3.71	1.39	3.25	0.00
68.00	3.71	1.39	3.25	0.00
70.00	3.71	1.39	3.25	0.00
72.00	3.71	1.39	3.25	0.00
74.00	3.71	1.39	3.25	0.00
76.00	3.71	1.39	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment B3: DPW Operations/Snow Dump

Runoff = 4.49 cfs @ 12.09 hrs, Volume= 0.341 af, Depth= 2.55"

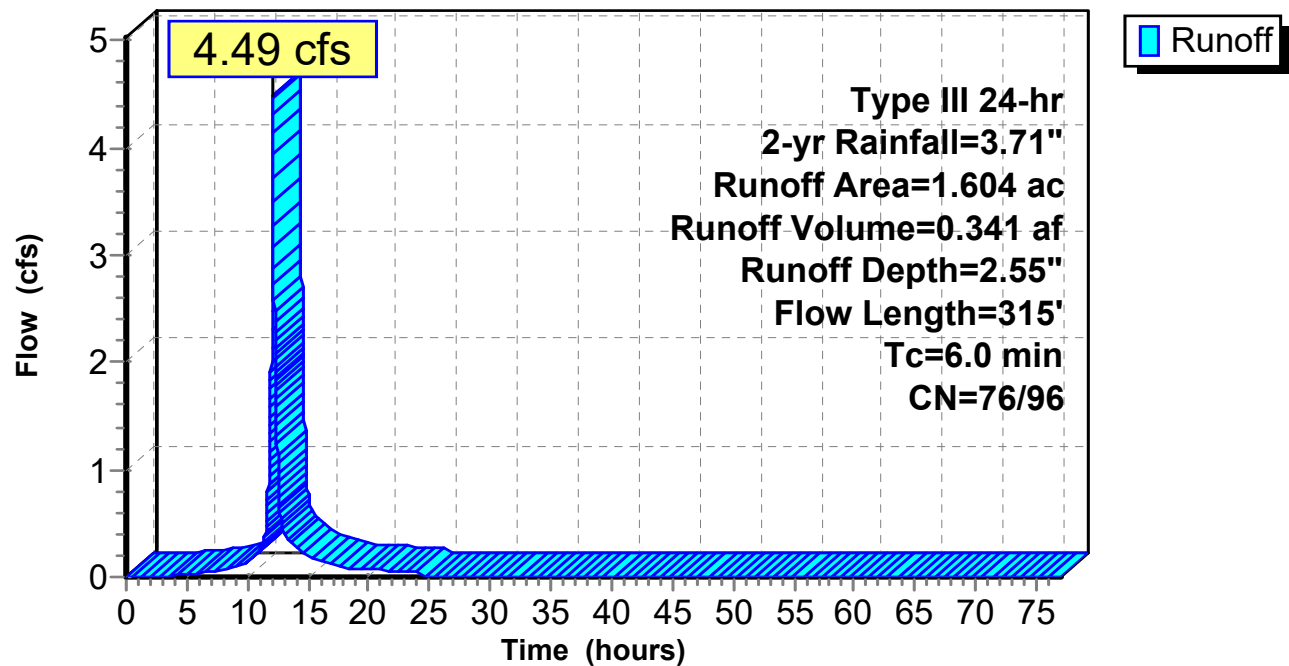
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.527	71	Meadow, non-grazed, HSG C
* 0.957	96	Gravel surface, 100% imp, HSG C
* 0.120	98	Water Surface, 0% imp, HSG C
1.604	88	Weighted Average
0.647	76	40.34% Pervious Area
0.957	96	59.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	22	0.0301	1.01		Sheet Flow, Gravel Road n= 0.015 P2= 3.71"
1.6	78	0.0090	0.80		Sheet Flow, Gravel pavement n= 0.015 P2= 3.71"
0.6	55	0.0090	1.53		Shallow Concentrated Flow, Gravel pavement Unpaved Kv= 16.1 fps
0.1	5	0.0090	0.66		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	5	0.3333	4.04		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.7	150	0.0050	3.75	47.80	Trap/Vee/Rect Channel Flow, PSwale-2 Bot.W=4.00' D=1.50' Z= 3.0 '/' Top.W=13.00' n= 0.027
3.4	315	Total, Increased to minimum Tc = 6.0 min			

Subcatchment B3: DPW Operations/Snow Dump

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment B3: DPW Operations/Snow Dump

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.03
8.00	0.42	0.00	0.15	0.06
10.00	0.70	0.00	0.37	0.15
12.00	1.85	0.34	1.43	2.71
14.00	3.01	1.02	2.56	0.26
16.00	3.29	1.21	2.84	0.14
18.00	3.44	1.32	2.99	0.09
20.00	3.55	1.40	3.10	0.07
22.00	3.64	1.47	3.18	0.06
24.00	3.71	1.52	3.25	0.05
26.00	3.71	1.52	3.25	0.00
28.00	3.71	1.52	3.25	0.00
30.00	3.71	1.52	3.25	0.00
32.00	3.71	1.52	3.25	0.00
34.00	3.71	1.52	3.25	0.00
36.00	3.71	1.52	3.25	0.00
38.00	3.71	1.52	3.25	0.00
40.00	3.71	1.52	3.25	0.00
42.00	3.71	1.52	3.25	0.00
44.00	3.71	1.52	3.25	0.00
46.00	3.71	1.52	3.25	0.00
48.00	3.71	1.52	3.25	0.00
50.00	3.71	1.52	3.25	0.00
52.00	3.71	1.52	3.25	0.00
54.00	3.71	1.52	3.25	0.00
56.00	3.71	1.52	3.25	0.00
58.00	3.71	1.52	3.25	0.00
60.00	3.71	1.52	3.25	0.00
62.00	3.71	1.52	3.25	0.00
64.00	3.71	1.52	3.25	0.00
66.00	3.71	1.52	3.25	0.00
68.00	3.71	1.52	3.25	0.00
70.00	3.71	1.52	3.25	0.00
72.00	3.71	1.52	3.25	0.00
74.00	3.71	1.52	3.25	0.00
76.00	3.71	1.52	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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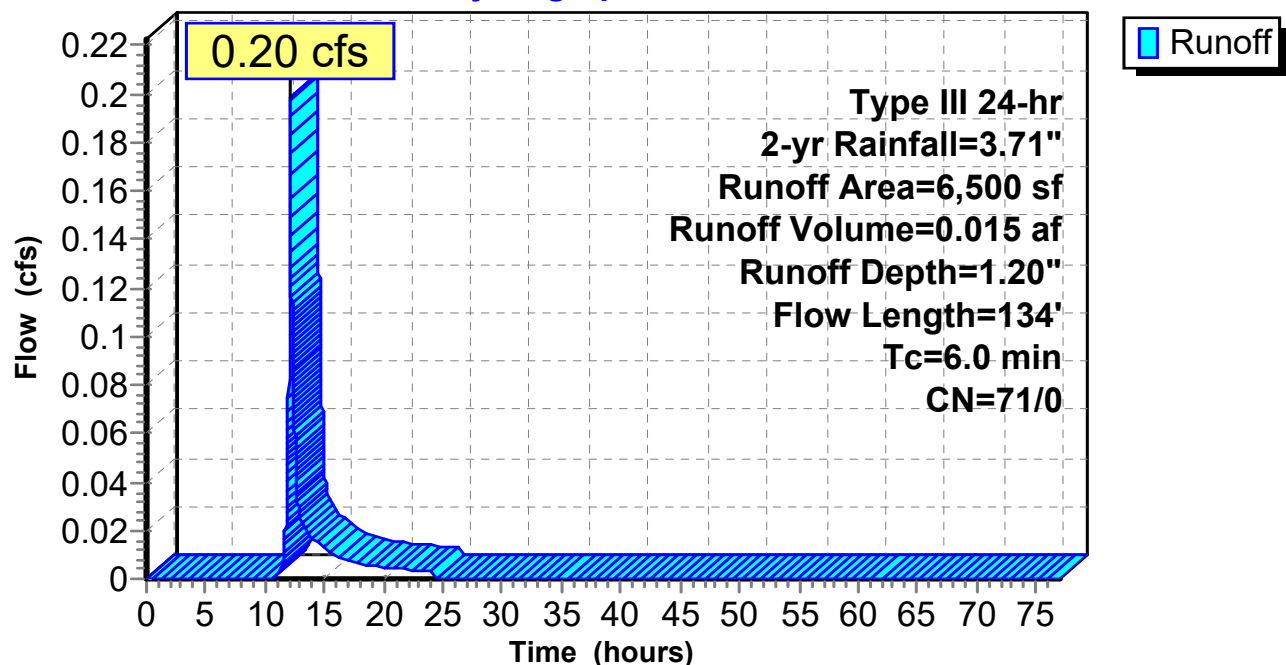
Summary for Subcatchment C1: C1

Runoff = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (sf)	CN	Description
4,104	71	Meadow, non-grazed, HSG C
2,396	70	Woods, Good, HSG C
6,500	71	Weighted Average
6,500	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	13	0.2095	1.97		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
2.7	30	0.2753	0.19		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.71"
0.9	50	0.0161	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	41	0.0835	2.02		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.0	134	Total, Increased to minimum Tc = 6.0 min			

Subcatchment C1: C1**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment C1: C1

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.10
14.00	3.01	0.77	0.00	0.02
16.00	3.29	0.93	0.00	0.01
18.00	3.44	1.03	0.00	0.01
20.00	3.55	1.10	0.00	0.00
22.00	3.64	1.15	0.00	0.00
24.00	3.71	1.20	0.00	0.00
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment D1: EX. ACCESS DR W

Runoff = 2.52 cfs @ 12.08 hrs, Volume= 0.193 af, Depth= 3.01"

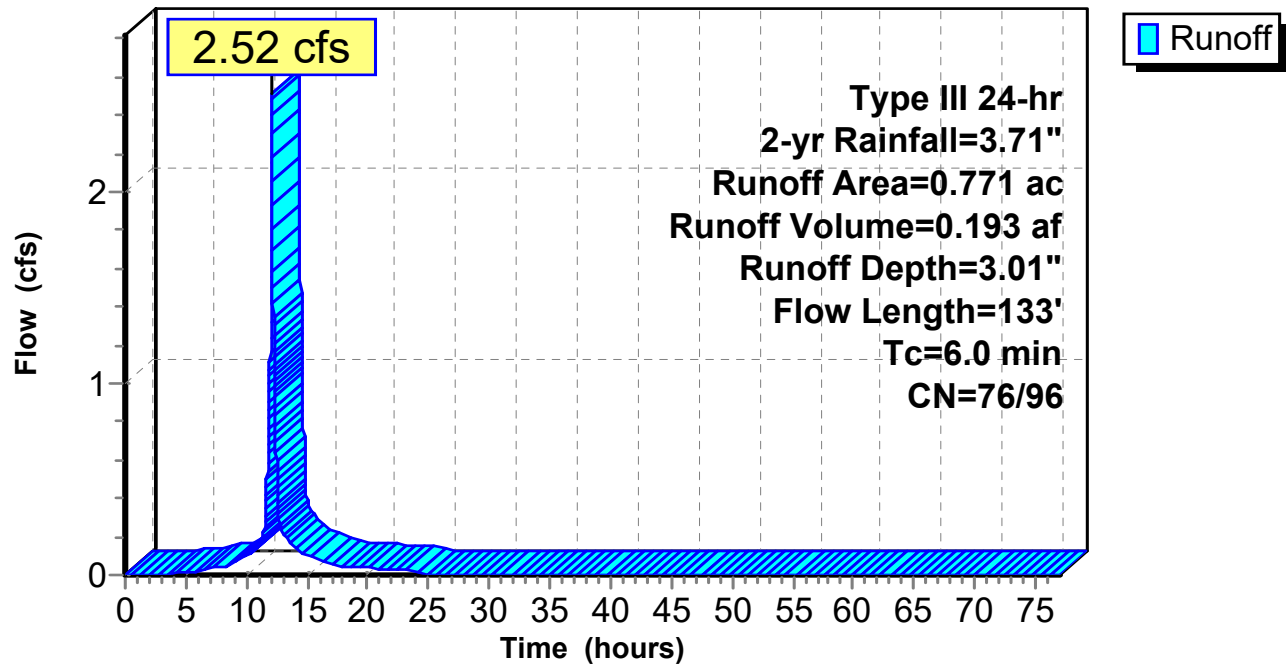
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.003	71	Meadow, non-grazed, HSG C
0.015	70	Woods, Good, HSG C
0.090	77	Woods, Good, HSG D
* 0.196	96	Gravel surface, 100% imp, HSG C
0.039	98	Paved parking, HSG C
* 0.428	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.771	93	Weighted Average
0.108	76	14.01% Pervious Area
0.663	96	85.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	21	0.1468	0.10		Sheet Flow, n= 0.600 P2= 3.71"
0.3	26	0.0532	1.31		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.4	34	0.0608	1.45		Sheet Flow, Gravel Pave n= 0.015 P2= 3.71"
0.1	20	0.0417	3.29		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	32	0.0783	1.96		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.7	133	Total, Increased to minimum Tc = 6.0 min			

Subcatchment D1: EX. ACCESS DR W

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D1: EX. ACCESS DR W

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.02
8.00	0.42	0.00	0.15	0.04
10.00	0.70	0.00	0.37	0.10
12.00	1.85	0.34	1.43	1.56
14.00	3.01	1.02	2.56	0.14
16.00	3.29	1.21	2.84	0.07
18.00	3.44	1.32	2.99	0.05
20.00	3.55	1.40	3.10	0.04
22.00	3.64	1.47	3.18	0.03
24.00	3.71	1.52	3.25	0.02
26.00	3.71	1.52	3.25	0.00
28.00	3.71	1.52	3.25	0.00
30.00	3.71	1.52	3.25	0.00
32.00	3.71	1.52	3.25	0.00
34.00	3.71	1.52	3.25	0.00
36.00	3.71	1.52	3.25	0.00
38.00	3.71	1.52	3.25	0.00
40.00	3.71	1.52	3.25	0.00
42.00	3.71	1.52	3.25	0.00
44.00	3.71	1.52	3.25	0.00
46.00	3.71	1.52	3.25	0.00
48.00	3.71	1.52	3.25	0.00
50.00	3.71	1.52	3.25	0.00
52.00	3.71	1.52	3.25	0.00
54.00	3.71	1.52	3.25	0.00
56.00	3.71	1.52	3.25	0.00
58.00	3.71	1.52	3.25	0.00
60.00	3.71	1.52	3.25	0.00
62.00	3.71	1.52	3.25	0.00
64.00	3.71	1.52	3.25	0.00
66.00	3.71	1.52	3.25	0.00
68.00	3.71	1.52	3.25	0.00
70.00	3.71	1.52	3.25	0.00
72.00	3.71	1.52	3.25	0.00
74.00	3.71	1.52	3.25	0.00
76.00	3.71	1.52	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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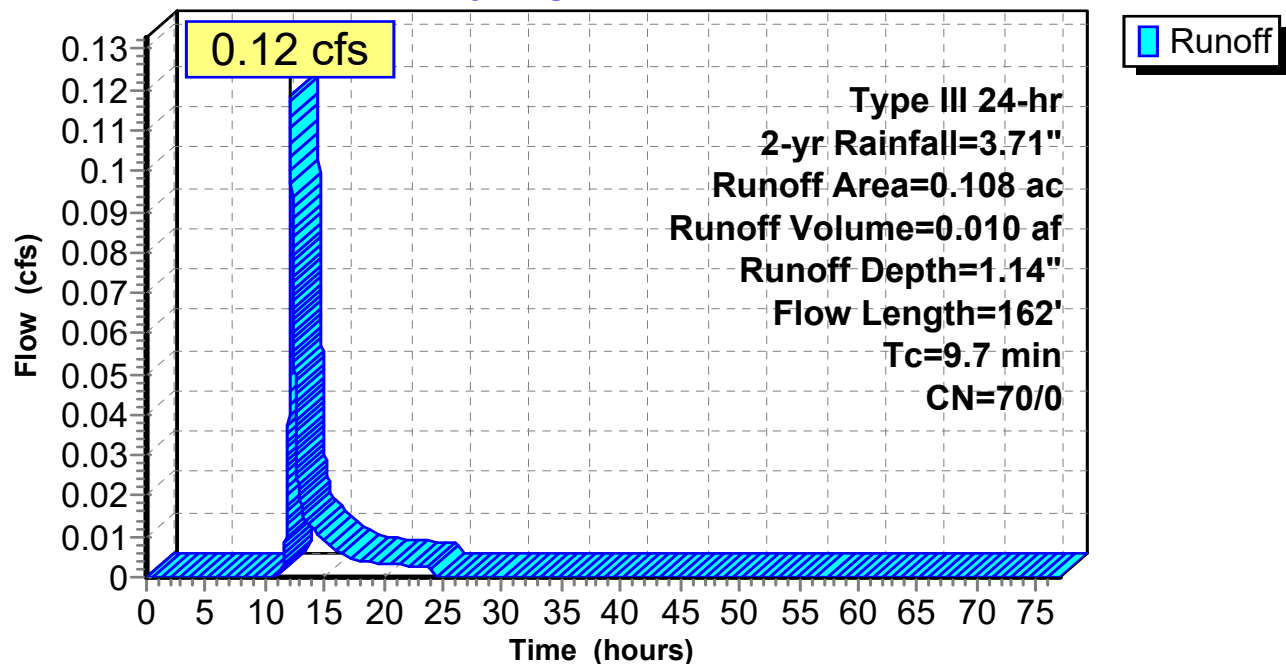
Summary for Subcatchment D2: SW UPLANDS

Runoff = 0.12 cfs @ 12.15 hrs, Volume= 0.010 af, Depth= 1.14"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.108	70	Woods, Good, HSG C
0.108	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	35	0.0270	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
4.3	105	0.0067	0.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	22	0.0798	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
9.7	162	Total			

Subcatchment D2: SW UPLANDS**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment D2: SW UPLANDS

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.19	0.00	0.05
14.00	3.01	0.72	0.00	0.01
16.00	3.29	0.88	0.00	0.01
18.00	3.44	0.97	0.00	0.00
20.00	3.55	1.04	0.00	0.00
22.00	3.64	1.09	0.00	0.00
24.00	3.71	1.14	0.00	0.00
26.00	3.71	1.14	0.00	0.00
28.00	3.71	1.14	0.00	0.00
30.00	3.71	1.14	0.00	0.00
32.00	3.71	1.14	0.00	0.00
34.00	3.71	1.14	0.00	0.00
36.00	3.71	1.14	0.00	0.00
38.00	3.71	1.14	0.00	0.00
40.00	3.71	1.14	0.00	0.00
42.00	3.71	1.14	0.00	0.00
44.00	3.71	1.14	0.00	0.00
46.00	3.71	1.14	0.00	0.00
48.00	3.71	1.14	0.00	0.00
50.00	3.71	1.14	0.00	0.00
52.00	3.71	1.14	0.00	0.00
54.00	3.71	1.14	0.00	0.00
56.00	3.71	1.14	0.00	0.00
58.00	3.71	1.14	0.00	0.00
60.00	3.71	1.14	0.00	0.00
62.00	3.71	1.14	0.00	0.00
64.00	3.71	1.14	0.00	0.00
66.00	3.71	1.14	0.00	0.00
68.00	3.71	1.14	0.00	0.00
70.00	3.71	1.14	0.00	0.00
72.00	3.71	1.14	0.00	0.00
74.00	3.71	1.14	0.00	0.00
76.00	3.71	1.14	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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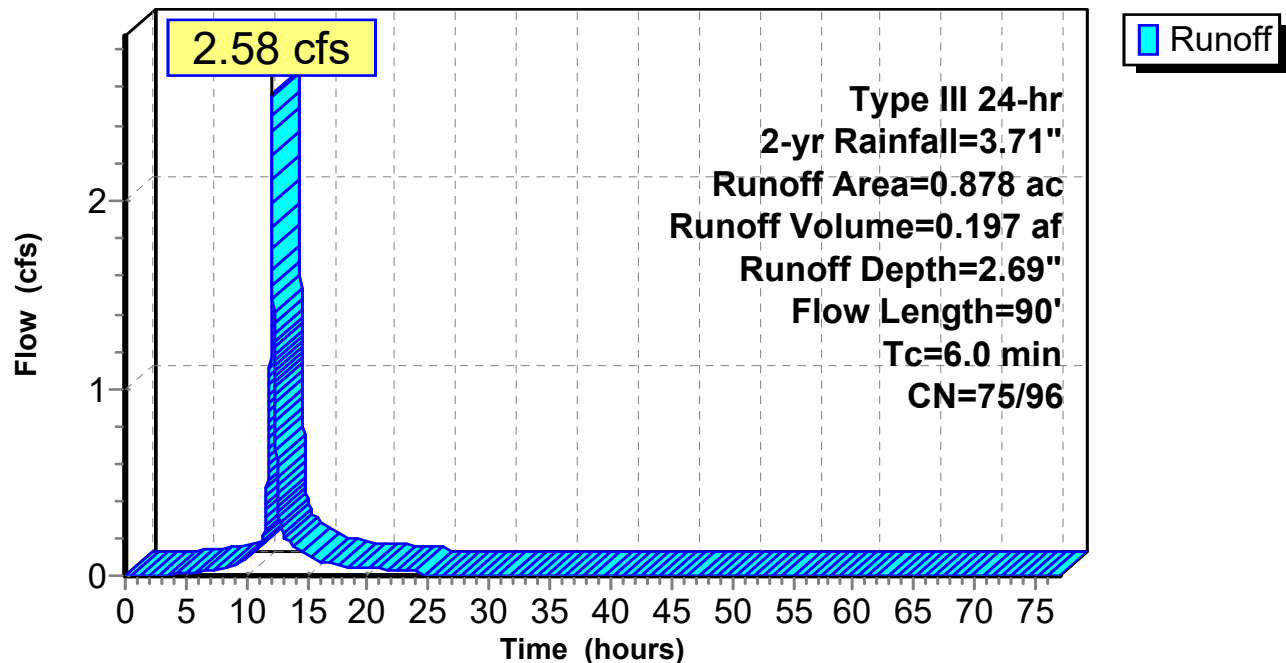
Summary for Subcatchment E1: EX. ACCESS DR E

Runoff = 2.58 cfs @ 12.09 hrs, Volume= 0.197 af, Depth= 2.69"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.044	71	Meadow, non-grazed, HSG C
0.051	70	Woods, Good, HSG C
0.058	78	Meadow, non-grazed, HSG D
0.122	77	Woods, Good, HSG D
* 0.209	96	Gravel surface, 100% imp, HSG C
0.047	98	Paved parking, HSG C
0.347	96	Gravel surface, grass overgrowth, 100% imp, HSG C
0.878	90	Weighted Average
0.275	75	31.32% Pervious Area
0.603	96	68.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0305	0.19		Sheet Flow, Grass: Short n= 0.150 P2= 3.71"
0.4	40	0.0609	1.73		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
4.8	90	Total, Increased to minimum Tc = 6.0 min			

Subcatchment E1: EX. ACCESS DR E**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment E1: EX. ACCESS DR E

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.01
6.00	0.27	0.00	0.06	0.02
8.00	0.42	0.00	0.15	0.04
10.00	0.70	0.00	0.37	0.09
12.00	1.85	0.31	1.43	1.57
14.00	3.01	0.97	2.56	0.15
16.00	3.29	1.15	2.84	0.08
18.00	3.44	1.26	2.99	0.05
20.00	3.55	1.34	3.10	0.04
22.00	3.64	1.40	3.18	0.03
24.00	3.71	1.45	3.25	0.03
26.00	3.71	1.45	3.25	0.00
28.00	3.71	1.45	3.25	0.00
30.00	3.71	1.45	3.25	0.00
32.00	3.71	1.45	3.25	0.00
34.00	3.71	1.45	3.25	0.00
36.00	3.71	1.45	3.25	0.00
38.00	3.71	1.45	3.25	0.00
40.00	3.71	1.45	3.25	0.00
42.00	3.71	1.45	3.25	0.00
44.00	3.71	1.45	3.25	0.00
46.00	3.71	1.45	3.25	0.00
48.00	3.71	1.45	3.25	0.00
50.00	3.71	1.45	3.25	0.00
52.00	3.71	1.45	3.25	0.00
54.00	3.71	1.45	3.25	0.00
56.00	3.71	1.45	3.25	0.00
58.00	3.71	1.45	3.25	0.00
60.00	3.71	1.45	3.25	0.00
62.00	3.71	1.45	3.25	0.00
64.00	3.71	1.45	3.25	0.00
66.00	3.71	1.45	3.25	0.00
68.00	3.71	1.45	3.25	0.00
70.00	3.71	1.45	3.25	0.00
72.00	3.71	1.45	3.25	0.00
74.00	3.71	1.45	3.25	0.00
76.00	3.71	1.45	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment F1: Direct Grass Area Runoff

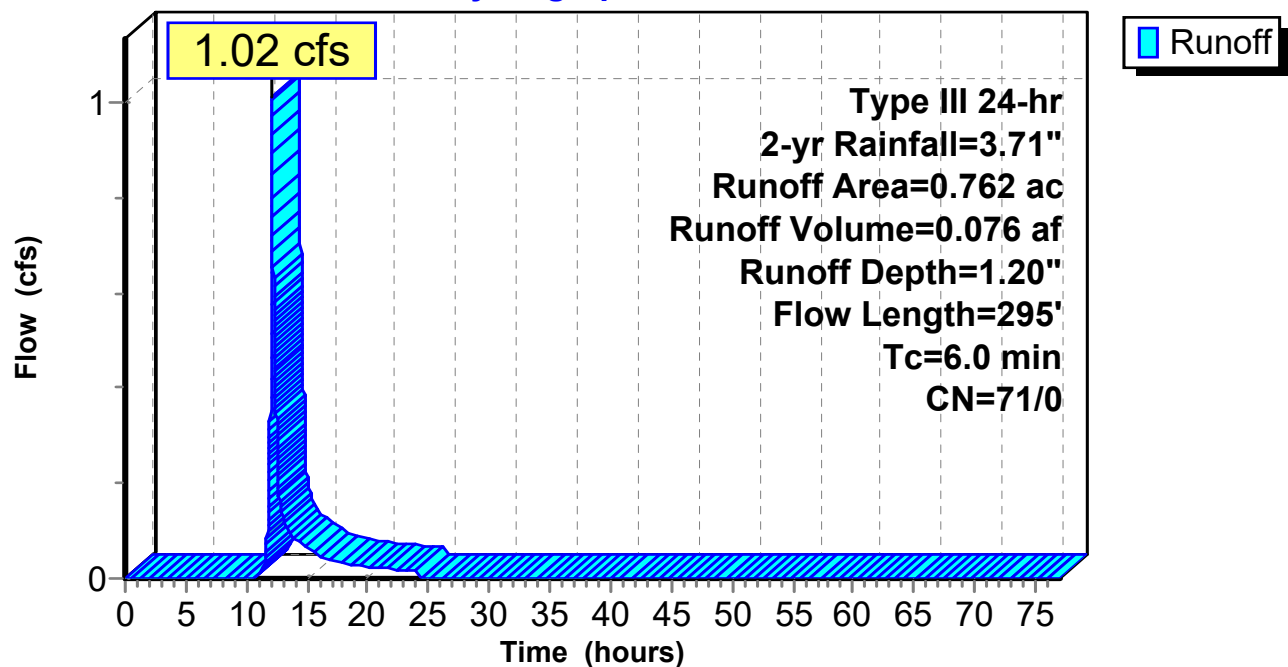
Area of grassed/lanscaped area on the proposed transfer station side (north of pond) was take from transfer station 30% design plans.

Runoff = 1.02 cfs @ 12.10 hrs, Volume= 0.076 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.762	71	Meadow, non-grazed, HSG C
0.762	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.0	20	0.2607	0.17		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.71"
2.2	275	0.0438	2.09		Shallow Concentrated Flow, Riprap swale
					Kv= 10.0 fps
4.2	295	Total, Increased to minimum Tc = 6.0 min			

Subcatchment F1: Direct Grass Area Runoff**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment F1: Direct Grass Area Runoff

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.52
14.00	3.01	0.77	0.00	0.08
16.00	3.29	0.93	0.00	0.05
18.00	3.44	1.03	0.00	0.03
20.00	3.55	1.10	0.00	0.02
22.00	3.64	1.15	0.00	0.02
24.00	3.71	1.20	0.00	0.02
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment F2: Berm Runoff to Pike

Runoff = 0.29 cfs @ 12.19 hrs, Volume= 0.027 af, Depth= 1.28"

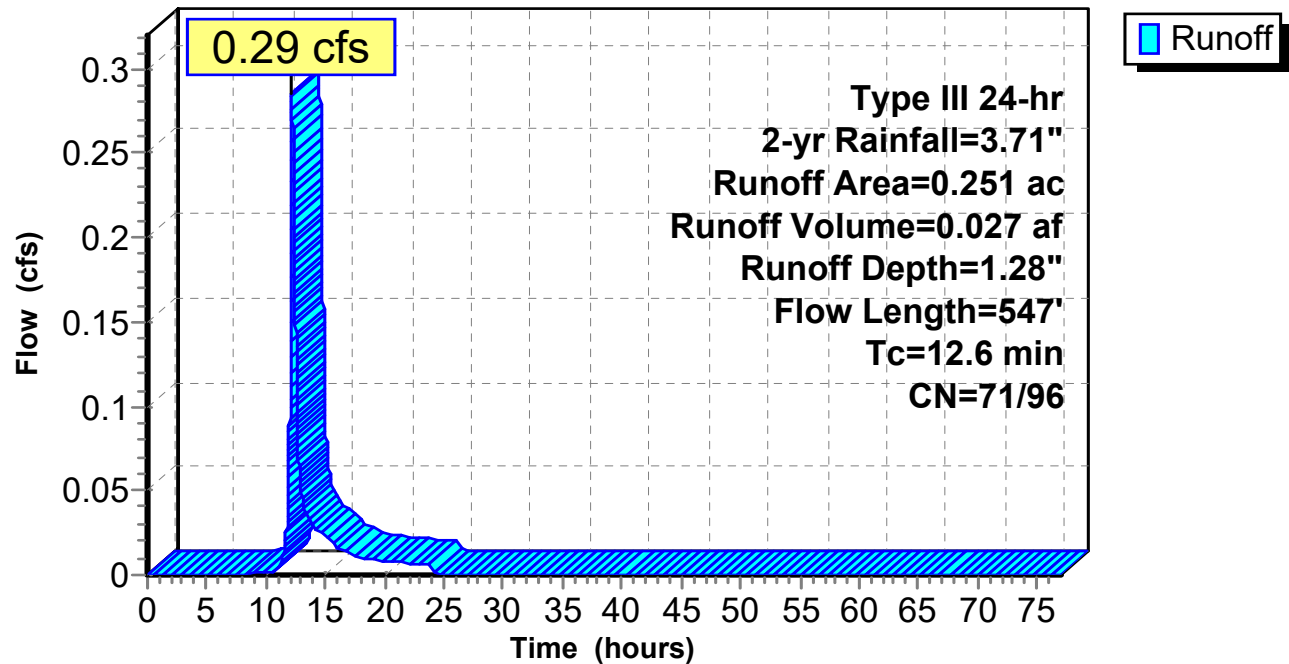
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.241	71	Meadow, non-grazed, HSG C
* 0.010	96	Gravel surface, 100% imp., HSG C
0.251	72	Weighted Average
0.241	71	96.02% Pervious Area
0.010	96	3.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	15	0.0088	0.06		Sheet Flow, Grass: Dense n= 0.240 P2= 3.71"
0.5	30	0.0250	0.99		Sheet Flow, Gravel Drive n= 0.015 P2= 3.71"
0.3	35	0.0607	1.72		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	8	0.3798	4.31		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
7.8	459	0.0194	0.97		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
12.6	547	Total			

Subcatchment F2: Berm Runoff to Pike

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment F2: Berm Runoff to Pike

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.00
6.00	0.27	0.00	0.06	0.00
8.00	0.42	0.00	0.15	0.00
10.00	0.70	0.00	0.37	0.00
12.00	1.85	0.21	1.43	0.10
14.00	3.01	0.77	2.56	0.03
16.00	3.29	0.93	2.84	0.02
18.00	3.44	1.03	2.99	0.01
20.00	3.55	1.10	3.10	0.01
22.00	3.64	1.15	3.18	0.01
24.00	3.71	1.20	3.25	0.01
26.00	3.71	1.20	3.25	0.00
28.00	3.71	1.20	3.25	0.00
30.00	3.71	1.20	3.25	0.00
32.00	3.71	1.20	3.25	0.00
34.00	3.71	1.20	3.25	0.00
36.00	3.71	1.20	3.25	0.00
38.00	3.71	1.20	3.25	0.00
40.00	3.71	1.20	3.25	0.00
42.00	3.71	1.20	3.25	0.00
44.00	3.71	1.20	3.25	0.00
46.00	3.71	1.20	3.25	0.00
48.00	3.71	1.20	3.25	0.00
50.00	3.71	1.20	3.25	0.00
52.00	3.71	1.20	3.25	0.00
54.00	3.71	1.20	3.25	0.00
56.00	3.71	1.20	3.25	0.00
58.00	3.71	1.20	3.25	0.00
60.00	3.71	1.20	3.25	0.00
62.00	3.71	1.20	3.25	0.00
64.00	3.71	1.20	3.25	0.00
66.00	3.71	1.20	3.25	0.00
68.00	3.71	1.20	3.25	0.00
70.00	3.71	1.20	3.25	0.00
72.00	3.71	1.20	3.25	0.00
74.00	3.71	1.20	3.25	0.00
76.00	3.71	1.20	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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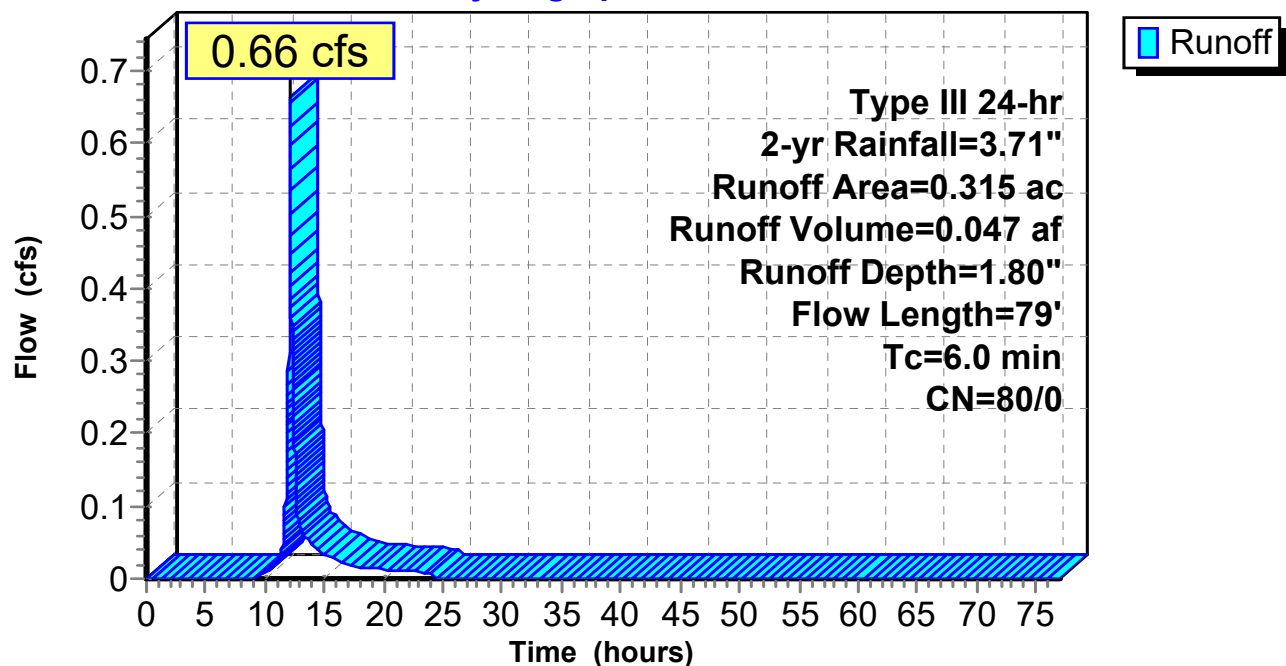
Summary for Subcatchment G1: Graded Road Runoff

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 1.80"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
* 0.115	96	Gravel surface, 100%, imp, HSG C
0.010	78	Meadow, non-grazed, HSG D
0.176	71	Meadow, non-grazed, HSG C
0.014	70	Woods, Good, HSG C
0.315	80	Weighted Average
0.315	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	15	0.0166	0.73		Sheet Flow, gravel drive n= 0.015 P2= 3.71"
0.6	43	0.0323	1.26		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	15	0.0265	1.14		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.0	6	0.8794	6.56		Shallow Concentrated Flow, Weedy ledge pond bank Short Grass Pasture Kv= 7.0 fps
1.1	79	Total, Increased to minimum Tc = 6.0 min			

Subcatchment G1: Graded Road Runoff**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G1: Graded Road Runoff

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.01	0.00	0.01
12.00	1.85	0.48	0.00	0.37
14.00	3.01	1.26	0.00	0.05
16.00	3.29	1.47	0.00	0.02
18.00	3.44	1.59	0.00	0.02
20.00	3.55	1.68	0.00	0.01
22.00	3.64	1.75	0.00	0.01
24.00	3.71	1.80	0.00	0.01
26.00	3.71	1.80	0.00	0.00
28.00	3.71	1.80	0.00	0.00
30.00	3.71	1.80	0.00	0.00
32.00	3.71	1.80	0.00	0.00
34.00	3.71	1.80	0.00	0.00
36.00	3.71	1.80	0.00	0.00
38.00	3.71	1.80	0.00	0.00
40.00	3.71	1.80	0.00	0.00
42.00	3.71	1.80	0.00	0.00
44.00	3.71	1.80	0.00	0.00
46.00	3.71	1.80	0.00	0.00
48.00	3.71	1.80	0.00	0.00
50.00	3.71	1.80	0.00	0.00
52.00	3.71	1.80	0.00	0.00
54.00	3.71	1.80	0.00	0.00
56.00	3.71	1.80	0.00	0.00
58.00	3.71	1.80	0.00	0.00
60.00	3.71	1.80	0.00	0.00
62.00	3.71	1.80	0.00	0.00
64.00	3.71	1.80	0.00	0.00
66.00	3.71	1.80	0.00	0.00
68.00	3.71	1.80	0.00	0.00
70.00	3.71	1.80	0.00	0.00
72.00	3.71	1.80	0.00	0.00
74.00	3.71	1.80	0.00	0.00
76.00	3.71	1.80	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment G2: Oveland flow into pond

Runoff = 3.60 cfs @ 12.23 hrs, Volume= 0.360 af, Depth= 1.36"

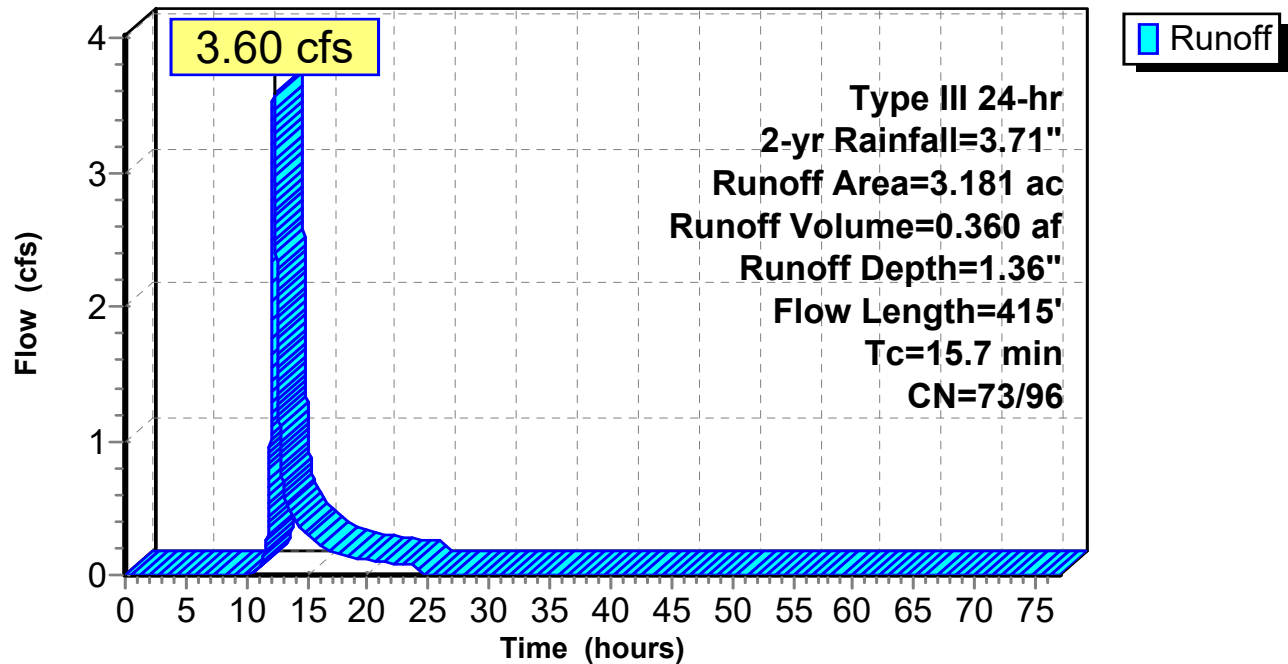
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.591	70	Woods, Good, HSG C
1.358	71	Meadow, non-grazed, HSG C
0.280	78	Meadow, non-grazed, HSG D
0.897	77	Woods, Good, HSG D
* 0.055	96	Gravel surface, 100% imp, HSG C
3.181	74	Weighted Average
3.126	73	98.27% Pervious Area
0.055	96	1.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	46	0.0621	0.08		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
2.9	34	0.1068	0.20		Sheet Flow, Woods: Medium underbrush Grass: Dense n= 0.240 P2= 3.71"
0.2	24	0.0555	1.65		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	45	0.1246	2.47		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.9	266	0.0493	1.55		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.7	415	Total			

Subcatchment G2: Oveland flow into pond

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G2: Oveland flow into pond

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.01	0.00
6.00	0.27	0.00	0.06	0.00
8.00	0.42	0.00	0.15	0.00
10.00	0.70	0.00	0.37	0.01
12.00	1.85	0.26	1.43	1.22
14.00	3.01	0.86	2.56	0.40
16.00	3.29	1.04	2.84	0.22
18.00	3.44	1.14	2.99	0.14
20.00	3.55	1.21	3.10	0.11
22.00	3.64	1.27	3.18	0.09
24.00	3.71	1.32	3.25	0.07
26.00	3.71	1.32	3.25	0.00
28.00	3.71	1.32	3.25	0.00
30.00	3.71	1.32	3.25	0.00
32.00	3.71	1.32	3.25	0.00
34.00	3.71	1.32	3.25	0.00
36.00	3.71	1.32	3.25	0.00
38.00	3.71	1.32	3.25	0.00
40.00	3.71	1.32	3.25	0.00
42.00	3.71	1.32	3.25	0.00
44.00	3.71	1.32	3.25	0.00
46.00	3.71	1.32	3.25	0.00
48.00	3.71	1.32	3.25	0.00
50.00	3.71	1.32	3.25	0.00
52.00	3.71	1.32	3.25	0.00
54.00	3.71	1.32	3.25	0.00
56.00	3.71	1.32	3.25	0.00
58.00	3.71	1.32	3.25	0.00
60.00	3.71	1.32	3.25	0.00
62.00	3.71	1.32	3.25	0.00
64.00	3.71	1.32	3.25	0.00
66.00	3.71	1.32	3.25	0.00
68.00	3.71	1.32	3.25	0.00
70.00	3.71	1.32	3.25	0.00
72.00	3.71	1.32	3.25	0.00
74.00	3.71	1.32	3.25	0.00
76.00	3.71	1.32	3.25	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment G3: G3

Runoff = 0.67 cfs @ 12.25 hrs, Volume= 0.070 af, Depth= 1.20"

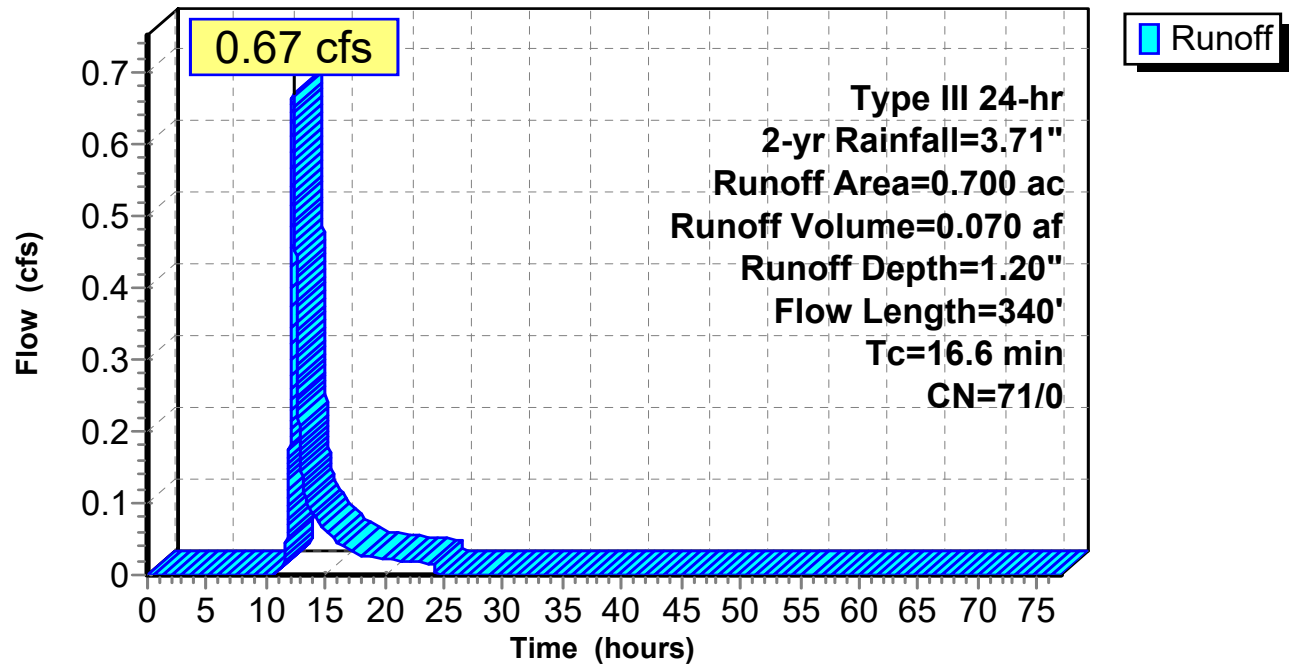
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.058	70	Woods, Good, HSG C
0.642	71	Meadow, non-grazed, HSG C
0.700	71	Weighted Average
0.700	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	14	0.0196	0.04		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
4.0	28	0.2018	0.12		Sheet Flow, Woods: Medium Underbrush n= 0.600 P2= 3.71"
5.4	166	0.0104	0.51		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.0	4	0.5047	4.97		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
1.3	90	0.0264	1.14		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.1	38	0.0895	6.31	4.73	Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=0.50' Z= 3.0 '/' Top.W=3.00' n= 0.027
16.6	340	Total			

Subcatchment G3: G3

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G3: G3

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.20
14.00	3.01	0.77	0.00	0.08
16.00	3.29	0.93	0.00	0.05
18.00	3.44	1.03	0.00	0.03
20.00	3.55	1.10	0.00	0.02
22.00	3.64	1.15	0.00	0.02
24.00	3.71	1.20	0.00	0.02
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Subcatchment G4: G4

Runoff = 0.77 cfs @ 12.31 hrs, Volume= 0.087 af, Depth= 1.20"

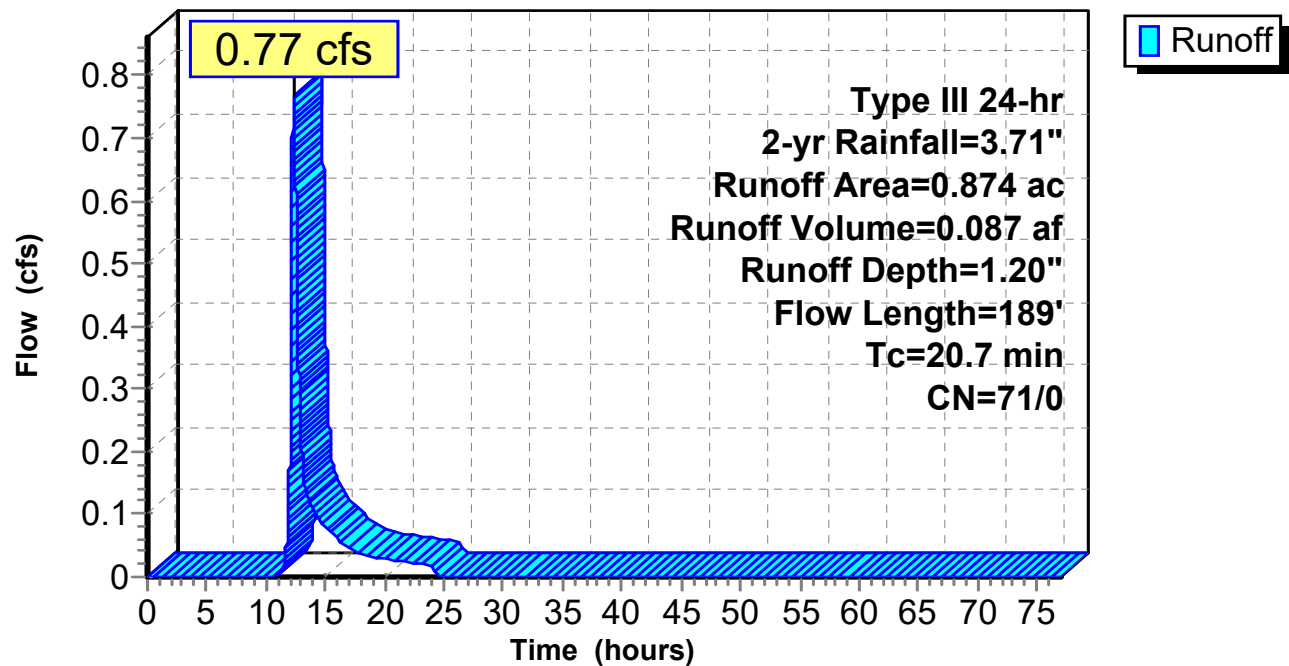
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious, Time Span= 0.00-77.00 hrs, dt= 0.01
Type III 24-hr 2-yr Rainfall=3.71"

Area (ac)	CN	Description
0.015	96	Gravel surface, HSG C
0.439	70	Woods, Good, HSG C
0.420	71	Meadow, non-grazed, HSG C
0.874	71	Weighted Average
0.874	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	27	0.0163	0.04		Sheet Flow, Woods: Medium underbrush n= 0.600 P2= 3.71"
7.2	49	0.1388	0.11		Sheet Flow, Woods: Medium Underbrush n= 0.600 P2= 3.71"
0.8	21	0.0338	0.46		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
1.5	56	0.0584	0.60		Shallow Concentrated Flow, Forest w/Heavy Litter Kv= 2.5 fps
0.7	36	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
20.7	189	Total			

Subcatchment G4: G4

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Subcatchment G4: G4

Time (hours)	Precip. (inches)	Perv.Excess (inches)	Imp.Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	0.00
2.00	0.07	0.00	0.00	0.00
4.00	0.16	0.00	0.00	0.00
6.00	0.27	0.00	0.00	0.00
8.00	0.42	0.00	0.00	0.00
10.00	0.70	0.00	0.00	0.00
12.00	1.85	0.21	0.00	0.20
14.00	3.01	0.77	0.00	0.11
16.00	3.29	0.93	0.00	0.06
18.00	3.44	1.03	0.00	0.04
20.00	3.55	1.10	0.00	0.03
22.00	3.64	1.15	0.00	0.02
24.00	3.71	1.20	0.00	0.02
26.00	3.71	1.20	0.00	0.00
28.00	3.71	1.20	0.00	0.00
30.00	3.71	1.20	0.00	0.00
32.00	3.71	1.20	0.00	0.00
34.00	3.71	1.20	0.00	0.00
36.00	3.71	1.20	0.00	0.00
38.00	3.71	1.20	0.00	0.00
40.00	3.71	1.20	0.00	0.00
42.00	3.71	1.20	0.00	0.00
44.00	3.71	1.20	0.00	0.00
46.00	3.71	1.20	0.00	0.00
48.00	3.71	1.20	0.00	0.00
50.00	3.71	1.20	0.00	0.00
52.00	3.71	1.20	0.00	0.00
54.00	3.71	1.20	0.00	0.00
56.00	3.71	1.20	0.00	0.00
58.00	3.71	1.20	0.00	0.00
60.00	3.71	1.20	0.00	0.00
62.00	3.71	1.20	0.00	0.00
64.00	3.71	1.20	0.00	0.00
66.00	3.71	1.20	0.00	0.00
68.00	3.71	1.20	0.00	0.00
70.00	3.71	1.20	0.00	0.00
72.00	3.71	1.20	0.00	0.00
74.00	3.71	1.20	0.00	0.00
76.00	3.71	1.20	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Reach 6R: PSwale-3

Inflow Area = 1.574 ac, 0.00% Impervious, Inflow Depth = 0.53" for 2-yr event
Inflow = 0.67 cfs @ 12.25 hrs, Volume= 0.070 af
Outflow = 0.66 cfs @ 12.27 hrs, Volume= 0.070 af, Atten= 1%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.67 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 6.0 min

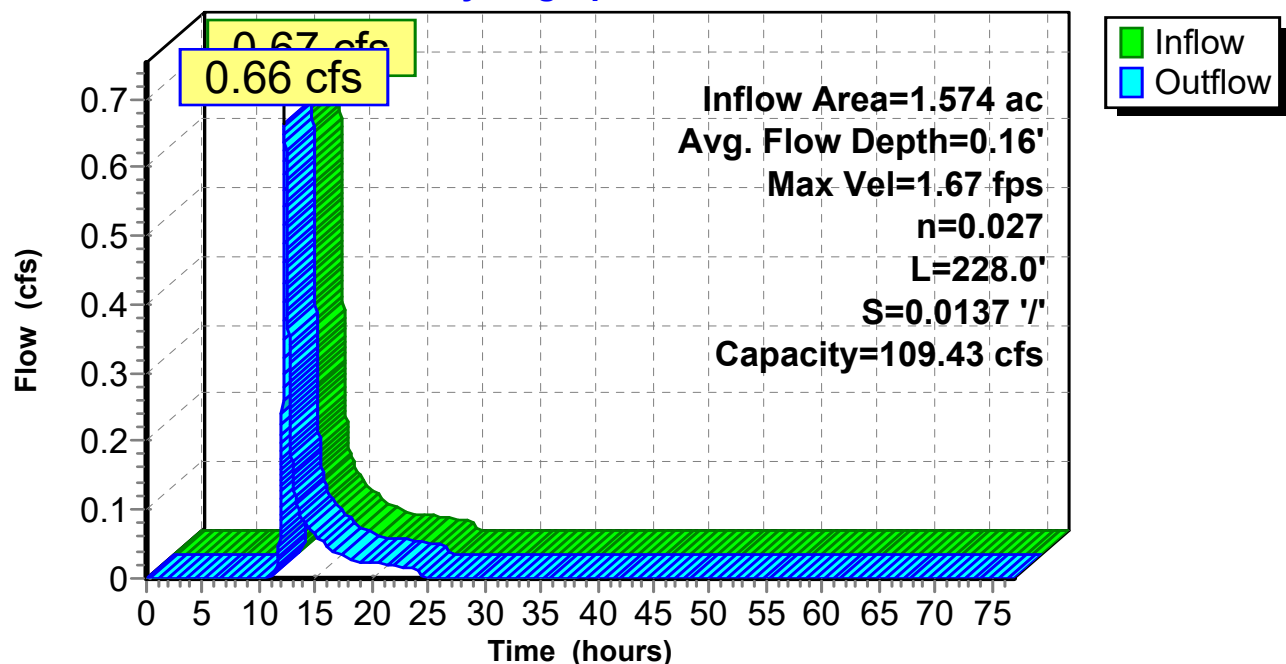
Peak Storage= 91 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 2.00' Flow Area= 16.0 sf, Capacity= 109.43 cfs

2.00' x 2.00' deep channel, n= 0.027
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 228.0' Slope= 0.0137 '/'
Inlet Invert= 35.05', Outlet Invert= 31.92'



Reach 6R: PSwale-3

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 6R: PSwale-3

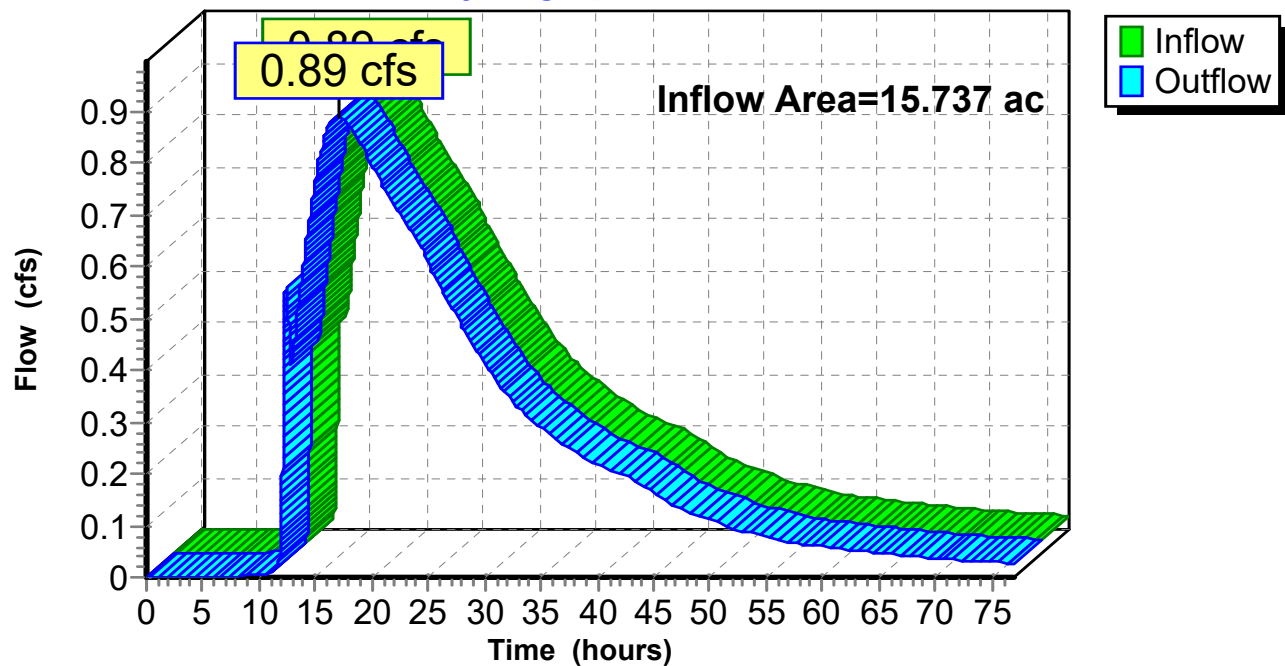
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	35.05	0.00
2.00	0.00	0	35.05	0.00
4.00	0.00	0	35.05	0.00
6.00	0.00	0	35.05	0.00
8.00	0.00	0	35.05	0.00
10.00	0.00	0	35.05	0.00
12.00	0.20	36	35.12	0.17
14.00	0.08	23	35.10	0.08
16.00	0.05	16	35.08	0.05
18.00	0.03	12	35.07	0.03
20.00	0.02	10	35.07	0.02
22.00	0.02	9	35.07	0.02
24.00	0.02	8	35.07	0.02
26.00	0.00	0	35.05	0.00
28.00	0.00	0	35.05	0.00
30.00	0.00	0	35.05	0.00
32.00	0.00	0	35.05	0.00
34.00	0.00	0	35.05	0.00
36.00	0.00	0	35.05	0.00
38.00	0.00	0	35.05	0.00
40.00	0.00	0	35.05	0.00
42.00	0.00	0	35.05	0.00
44.00	0.00	0	35.05	0.00
46.00	0.00	0	35.05	0.00
48.00	0.00	0	35.05	0.00
50.00	0.00	0	35.05	0.00
52.00	0.00	0	35.05	0.00
54.00	0.00	0	35.05	0.00
56.00	0.00	0	35.05	0.00
58.00	0.00	0	35.05	0.00
60.00	0.00	0	35.05	0.00
62.00	0.00	0	35.05	0.00
64.00	0.00	0	35.05	0.00
66.00	0.00	0	35.05	0.00
68.00	0.00	0	35.05	0.00
70.00	0.00	0	35.05	0.00
72.00	0.00	0	35.05	0.00
74.00	0.00	0	35.05	0.00
76.00	0.00	0	35.05	0.00

Summary for Reach 15R: U.S. Pike Site Culvert

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

Inflow Area = 15.737 ac, 13.34% Impervious, Inflow Depth > 1.14" for 2-yr event
Inflow = 0.89 cfs @ 17.09 hrs, Volume= 1.499 af
Outflow = 0.89 cfs @ 17.09 hrs, Volume= 1.499 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach 15R: U.S. Pike Site Culvert**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach 15R: U.S. Pike Site Culvert

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.09		0.09
1.00	0.00		0.00	54.00	0.08		0.08
2.00	0.00		0.00	55.00	0.08		0.08
3.00	0.00		0.00	56.00	0.07		0.07
4.00	0.00		0.00	57.00	0.07		0.07
5.00	0.00		0.00	58.00	0.07		0.07
6.00	0.00		0.00	59.00	0.06		0.06
7.00	0.00		0.00	60.00	0.06		0.06
8.00	0.00		0.00	61.00	0.06		0.06
9.00	0.00		0.00	62.00	0.05		0.05
10.00	0.00		0.00	63.00	0.05		0.05
11.00	0.01		0.01	64.00	0.05		0.05
12.00	0.12		0.12	65.00	0.05		0.05
13.00	0.43		0.43	66.00	0.04		0.04
14.00	0.62		0.62	67.00	0.04		0.04
15.00	0.77		0.77	68.00	0.04		0.04
16.00	0.86		0.86	69.00	0.04		0.04
17.00	0.89		0.89	70.00	0.04		0.04
18.00	0.88		0.88	71.00	0.03		0.03
19.00	0.84		0.84	72.00	0.03		0.03
20.00	0.80		0.80	73.00	0.03		0.03
21.00	0.76		0.76	74.00	0.03		0.03
22.00	0.72		0.72	75.00	0.03		0.03
23.00	0.69		0.69	76.00	0.03		0.03
24.00	0.66		0.66	77.00	0.03		0.03
25.00	0.61		0.61				
26.00	0.57		0.57				
27.00	0.53		0.53				
28.00	0.49		0.49				
29.00	0.45		0.45				
30.00	0.41		0.41				
31.00	0.38		0.38				
32.00	0.35		0.35				
33.00	0.33		0.33				
34.00	0.31		0.31				
35.00	0.29		0.29				
36.00	0.27		0.27				
37.00	0.26		0.26				
38.00	0.24		0.24				
39.00	0.23		0.23				
40.00	0.22		0.22				
41.00	0.21		0.21				
42.00	0.20		0.20				
43.00	0.19		0.19				
44.00	0.18		0.18				
45.00	0.16		0.16				
46.00	0.15		0.15				
47.00	0.14		0.14				
48.00	0.13		0.13				
49.00	0.12		0.12				
50.00	0.11		0.11				
51.00	0.10		0.10				
52.00	0.10		0.10				

1119-Post Development-Fields-Phase 1

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

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Summary for Reach SP-1: OFFSITE PIKE PROP

[80] Warning: Exceeded Pond 1P by 0.13' @ 12.20 hrs (0.92 cfs 0.051 af)

Inflow Area = 15.737 ac, 13.34% Impervious, Inflow Depth > 1.15" for 2-yr event
Inflow = 1.23 cfs @ 12.11 hrs, Volume= 1.502 af
Outflow = 0.89 cfs @ 17.09 hrs, Volume= 1.499 af, Atten= 28%, Lag= 299.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Max. Velocity= 0.30 fps, Min. Travel Time= 27.6 min

Avg. Velocity= 0.17 fps, Avg. Travel Time= 47.6 min

Peak Storage= 1,474 cf @ 17.09 hrs

Average Depth at Peak Storage= 0.29'

Bank-Full Depth= 3.00' Flow Area= 100.0 sf, Capacity= 139.53 cfs

50.00' x 3.00' deep Parabolic Channel, n= 0.120

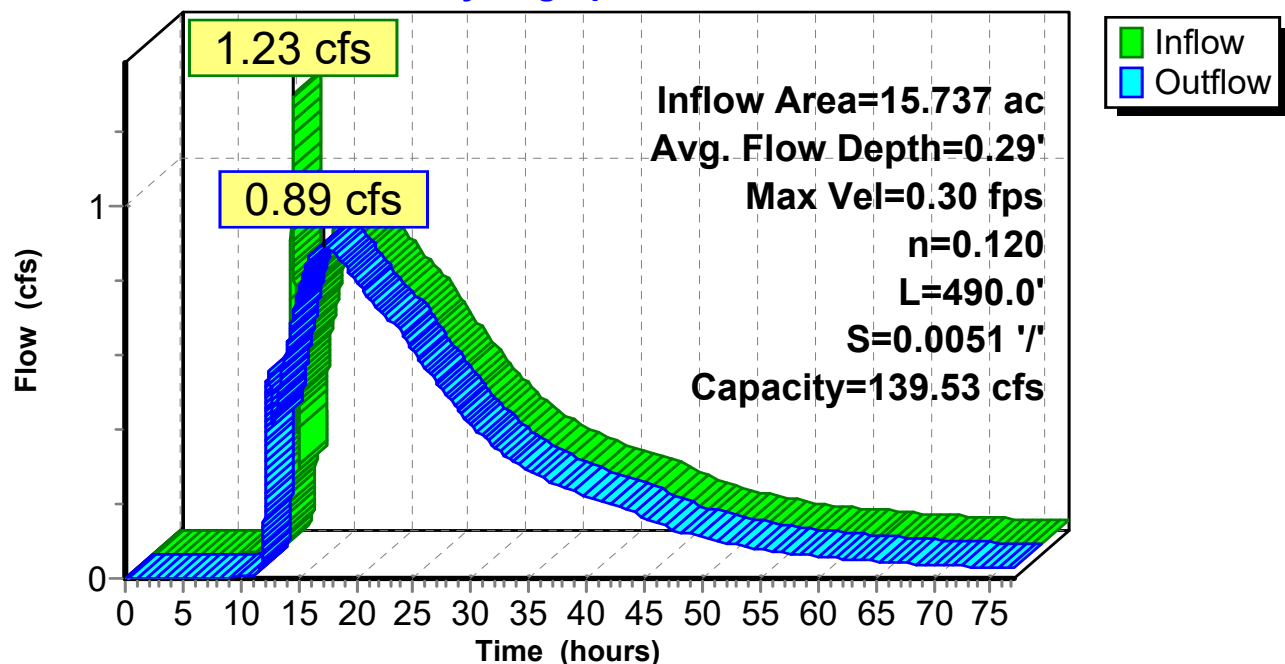
Length= 490.0' Slope= 0.0051 1'

Inlet Invert= 24.00', Outlet Invert= 21.50'



Reach SP-1: OFFSITE PIKE PROP

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-1: OFFSITE PIKE PROP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	24.00	0.00
2.00	0.00	0	24.00	0.00
4.00	0.00	0	24.00	0.00
6.00	0.00	5	24.00	0.00
8.00	0.00	16	24.01	0.00
10.00	0.01	30	24.02	0.00
12.00	0.62	362	24.11	0.12
14.00	0.68	1,142	24.24	0.62
16.00	0.88	1,442	24.29	0.86
18.00	0.87	1,457	24.29	0.88
20.00	0.78	1,366	24.28	0.80
22.00	0.71	1,275	24.26	0.72
24.00	0.65	1,194	24.25	0.66
26.00	0.55	1,075	24.24	0.57
28.00	0.47	968	24.22	0.49
30.00	0.40	864	24.20	0.41
32.00	0.34	775	24.19	0.35
34.00	0.30	704	24.18	0.31
36.00	0.27	648	24.17	0.27
38.00	0.24	599	24.16	0.24
40.00	0.21	558	24.15	0.22
42.00	0.20	522	24.15	0.20
44.00	0.17	483	24.14	0.18
46.00	0.14	427	24.13	0.15
48.00	0.12	381	24.12	0.13
50.00	0.11	344	24.11	0.11
52.00	0.09	312	24.10	0.10
54.00	0.08	284	24.10	0.08
56.00	0.07	260	24.09	0.07
58.00	0.06	241	24.09	0.07
60.00	0.06	223	24.08	0.06
62.00	0.05	208	24.08	0.05
64.00	0.05	194	24.07	0.05
66.00	0.04	181	24.07	0.04
68.00	0.04	169	24.07	0.04
70.00	0.04	159	24.07	0.04
72.00	0.03	150	24.06	0.03
74.00	0.03	141	24.06	0.03
76.00	0.03	134	24.06	0.03

1119-Post Development-Fields-Phase 1

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

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Summary for Reach SP-2: OFFSITE TO 266-1

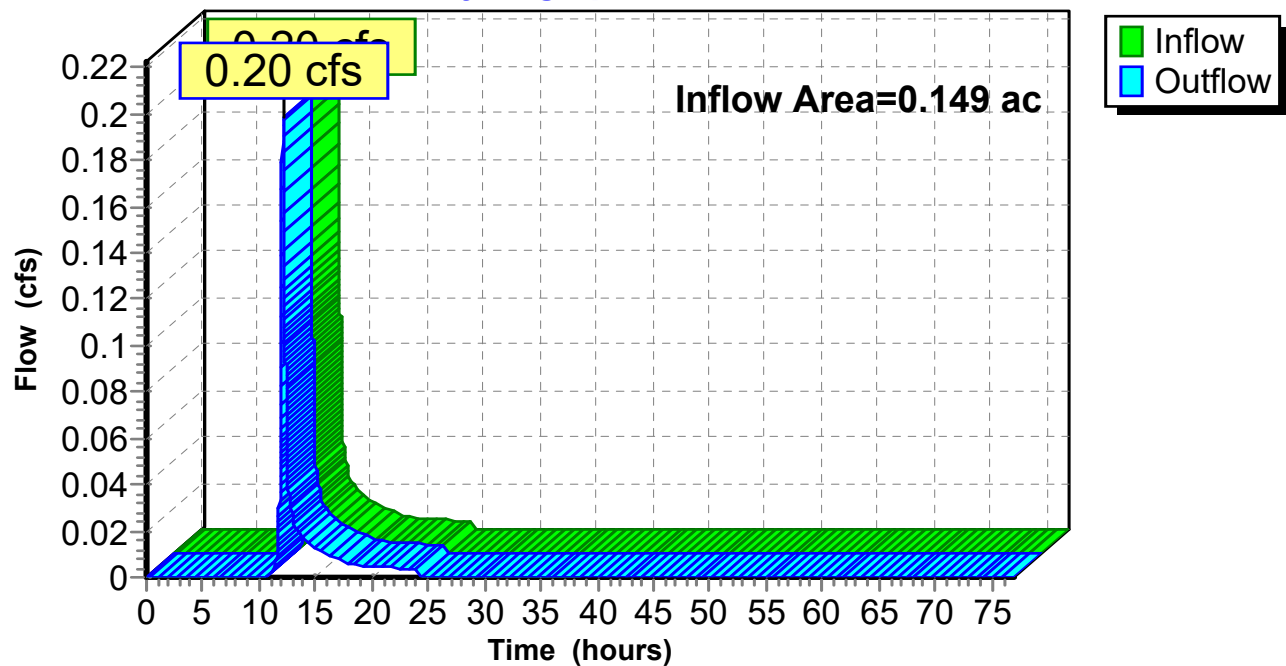
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.149 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-yr event
Inflow = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af
Outflow = 0.20 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-2: OFFSITE TO 266-1

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-2: OFFSITE TO 266-1

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.00		0.00	57.00	0.00		0.00
5.00	0.00		0.00	58.00	0.00		0.00
6.00	0.00		0.00	59.00	0.00		0.00
7.00	0.00		0.00	60.00	0.00		0.00
8.00	0.00		0.00	61.00	0.00		0.00
9.00	0.00		0.00	62.00	0.00		0.00
10.00	0.00		0.00	63.00	0.00		0.00
11.00	0.00		0.00	64.00	0.00		0.00
12.00	0.10		0.10	65.00	0.00		0.00
13.00	0.02		0.02	66.00	0.00		0.00
14.00	0.02		0.02	67.00	0.00		0.00
15.00	0.01		0.01	68.00	0.00		0.00
16.00	0.01		0.01	69.00	0.00		0.00
17.00	0.01		0.01	70.00	0.00		0.00
18.00	0.01		0.01	71.00	0.00		0.00
19.00	0.01		0.01	72.00	0.00		0.00
20.00	0.00		0.00	73.00	0.00		0.00
21.00	0.00		0.00	74.00	0.00		0.00
22.00	0.00		0.00	75.00	0.00		0.00
23.00	0.00		0.00	76.00	0.00		0.00
24.00	0.00		0.00	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

Summary for Reach SP-3: SW WETLANDS

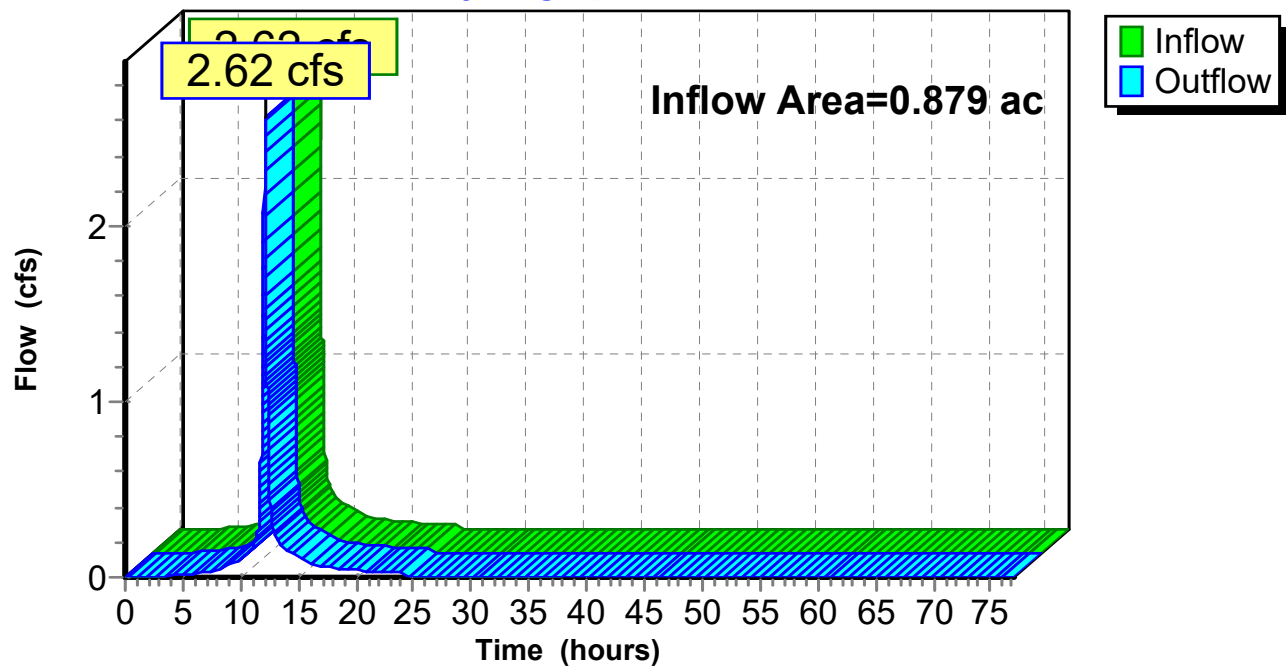
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.879 ac, 75.43% Impervious, Inflow Depth = 2.78" for 2-yr event
 Inflow = 2.62 cfs @ 12.09 hrs, Volume= 0.204 af
 Outflow = 2.62 cfs @ 12.09 hrs, Volume= 0.204 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-3: SW WETLANDS

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-3: SW WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.01		0.01	57.00	0.00		0.00
5.00	0.01		0.01	58.00	0.00		0.00
6.00	0.02		0.02	59.00	0.00		0.00
7.00	0.03		0.03	60.00	0.00		0.00
8.00	0.04		0.04	61.00	0.00		0.00
9.00	0.07		0.07	62.00	0.00		0.00
10.00	0.10		0.10	63.00	0.00		0.00
11.00	0.16		0.16	64.00	0.00		0.00
12.00	1.60		1.60	65.00	0.00		0.00
13.00	0.24		0.24	66.00	0.00		0.00
14.00	0.15		0.15	67.00	0.00		0.00
15.00	0.11		0.11	68.00	0.00		0.00
16.00	0.08		0.08	69.00	0.00		0.00
17.00	0.06		0.06	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.04		0.04	72.00	0.00		0.00
20.00	0.04		0.04	73.00	0.00		0.00
21.00	0.04		0.04	74.00	0.00		0.00
22.00	0.03		0.03	75.00	0.00		0.00
23.00	0.03		0.03	76.00	0.00		0.00
24.00	0.03		0.03	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

Summary for Reach SP-4: SE WETLANDS

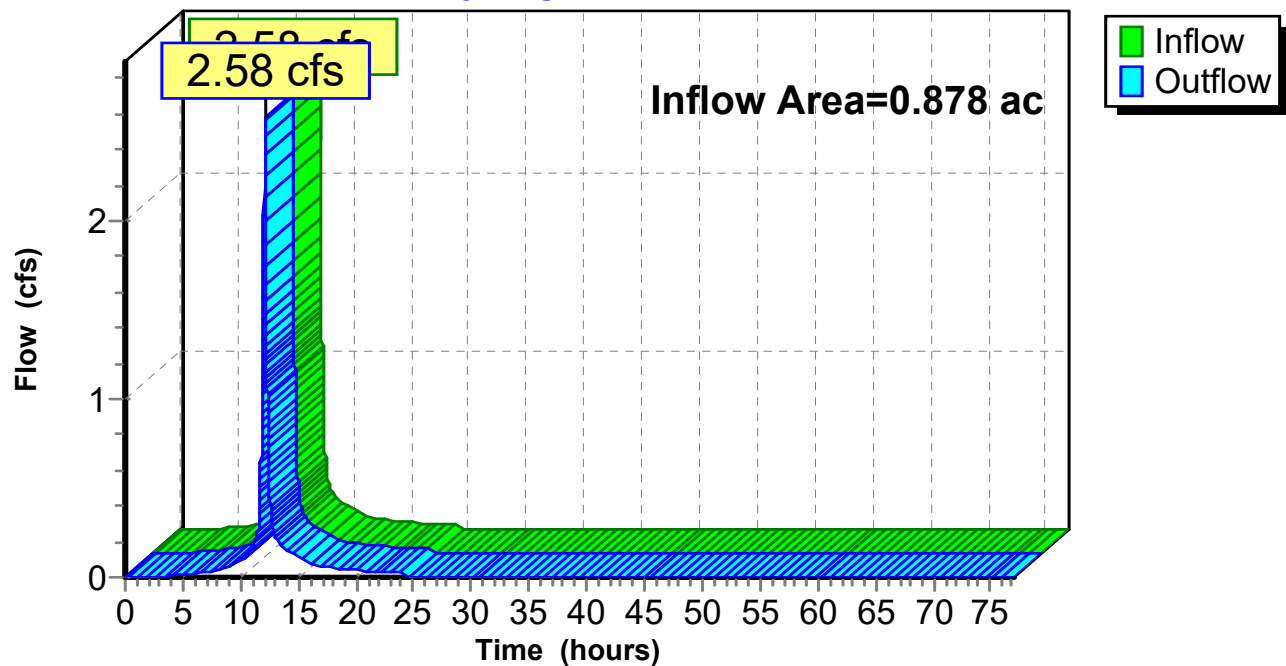
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.878 ac, 68.68% Impervious, Inflow Depth = 2.69" for 2-yr event
 Inflow = 2.58 cfs @ 12.09 hrs, Volume= 0.197 af
 Outflow = 2.58 cfs @ 12.09 hrs, Volume= 0.197 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Reach SP-4: SE WETLANDS

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Reach SP-4: SE WETLANDS

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)
0.00	0.00		0.00	53.00	0.00		0.00
1.00	0.00		0.00	54.00	0.00		0.00
2.00	0.00		0.00	55.00	0.00		0.00
3.00	0.00		0.00	56.00	0.00		0.00
4.00	0.01		0.01	57.00	0.00		0.00
5.00	0.01		0.01	58.00	0.00		0.00
6.00	0.02		0.02	59.00	0.00		0.00
7.00	0.03		0.03	60.00	0.00		0.00
8.00	0.04		0.04	61.00	0.00		0.00
9.00	0.06		0.06	62.00	0.00		0.00
10.00	0.09		0.09	63.00	0.00		0.00
11.00	0.15		0.15	64.00	0.00		0.00
12.00	1.57		1.57	65.00	0.00		0.00
13.00	0.23		0.23	66.00	0.00		0.00
14.00	0.15		0.15	67.00	0.00		0.00
15.00	0.11		0.11	68.00	0.00		0.00
16.00	0.08		0.08	69.00	0.00		0.00
17.00	0.06		0.06	70.00	0.00		0.00
18.00	0.05		0.05	71.00	0.00		0.00
19.00	0.04		0.04	72.00	0.00		0.00
20.00	0.04		0.04	73.00	0.00		0.00
21.00	0.04		0.04	74.00	0.00		0.00
22.00	0.03		0.03	75.00	0.00		0.00
23.00	0.03		0.03	76.00	0.00		0.00
24.00	0.03		0.03	77.00	0.00		0.00
25.00	0.00		0.00				
26.00	0.00		0.00				
27.00	0.00		0.00				
28.00	0.00		0.00				
29.00	0.00		0.00				
30.00	0.00		0.00				
31.00	0.00		0.00				
32.00	0.00		0.00				
33.00	0.00		0.00				
34.00	0.00		0.00				
35.00	0.00		0.00				
36.00	0.00		0.00				
37.00	0.00		0.00				
38.00	0.00		0.00				
39.00	0.00		0.00				
40.00	0.00		0.00				
41.00	0.00		0.00				
42.00	0.00		0.00				
43.00	0.00		0.00				
44.00	0.00		0.00				
45.00	0.00		0.00				
46.00	0.00		0.00				
47.00	0.00		0.00				
48.00	0.00		0.00				
49.00	0.00		0.00				
50.00	0.00		0.00				
51.00	0.00		0.00				
52.00	0.00		0.00				

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 1P: EX. POND-2

Inflow Area = 14.724 ac, 14.19% Impervious, Inflow Depth = 1.24" for 2-yr event
 Inflow = 7.98 cfs @ 12.28 hrs, Volume= 1.520 af
 Outflow = 0.84 cfs @ 17.04 hrs, Volume= 1.399 af, Atten= 89%, Lag= 286.1 min
 Primary = 0.84 cfs @ 17.04 hrs, Volume= 1.399 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Starting Elev= 24.00' Surf.Area= 89,800 sf Storage= 404,338 cf

Peak Elev= 24.33' @ 17.08 hrs Surf.Area= 92,112 sf Storage= 434,379 cf (30,041 cf above start)

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

Center-of-Mass det. time= 638.8 min (1,721.6 - 1,082.7)

Volume	Invert	Avail.Storage	Storage Description
#1	16.00'	817,738 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

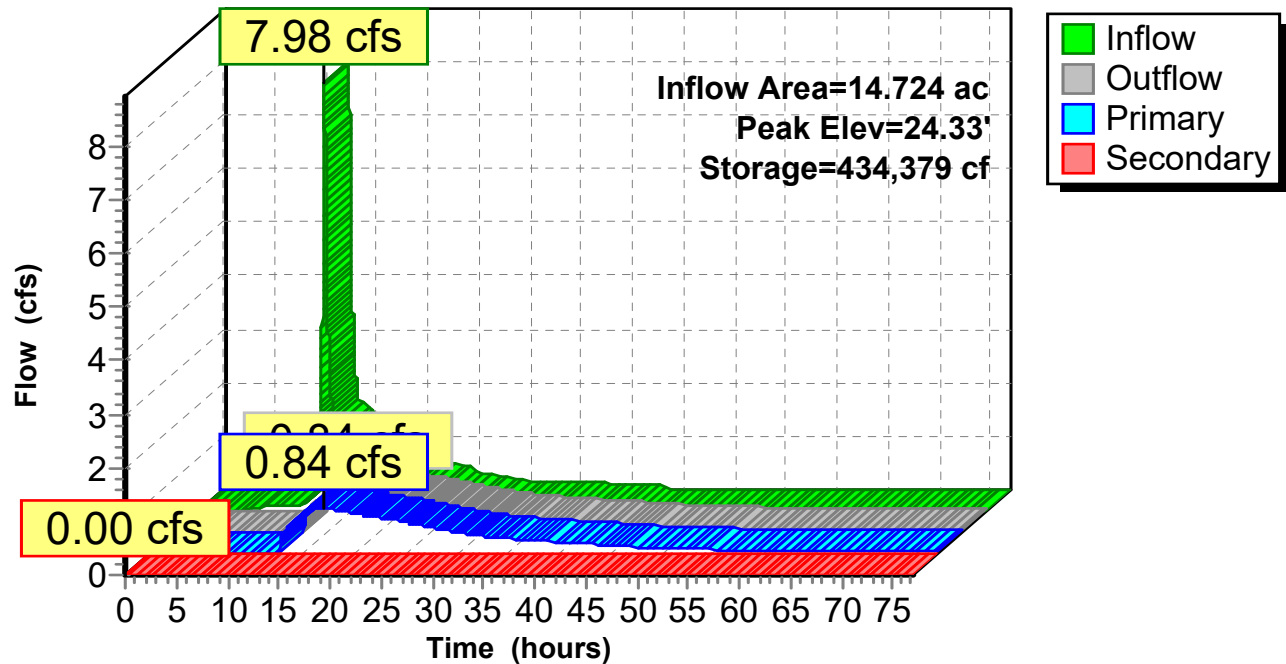
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
16.00	0	0	0
22.34	81,800	259,306	259,306
22.50	83,600	13,232	272,538
23.00	88,000	42,900	315,438
24.00	89,800	88,900	404,338
25.00	96,800	93,300	497,638
26.00	103,800	100,300	597,938
27.00	110,900	107,350	705,288
28.00	114,000	112,450	817,738

Device	Routing	Invert	Outlet Devices
#1	Primary	23.92'	53.0" W x 41.0" H, R=28.1"/73.4" Pipe Arch CMP_Arch_1 53x41 w/ 19.0" ins L= 61.3' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 22.34' / 21.91' S= 0.0070 ' / Cc= 0.900 n= 0.022, Flow Area= 6.21 sf
#2	Secondary	27.39'	Asymmetrical Weir, C= 2.63 Offset (feet) 0.00 52.00 83.00 94.00 134.00 Elev. (feet) 28.00 27.50 27.39 27.50 28.00

Primary OutFlow Max=0.84 cfs @ 17.04 hrs HW=24.33' TW=24.29' (Dynamic Tailwater)↑**1=CMP_Arch_1 53x41** (Outlet Controls 0.84 cfs @ 0.63 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=24.00' TW=24.00' (Dynamic Tailwater)↑**2=Asymmetrical Weir** (Controls 0.00 cfs)

Pond 1P: EX. POND-2

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 1P: EX. POND-2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	404,338	24.00	0.00	0.00	0.00
2.00	0.00	404,338	24.00	0.00	0.00	0.00
4.00	0.00	404,340	24.00	0.00	0.00	0.00
6.00	0.06	404,632	24.00	0.00	0.00	0.00
8.00	0.10	405,225	24.01	0.00	0.00	0.00
10.00	0.12	405,981	24.02	0.00	0.00	0.00
12.00	2.06	408,558	24.05	0.00	0.00	0.00
14.00	1.59	429,058	24.27	0.56	0.56	0.00
16.00	1.10	433,907	24.33	0.82	0.82	0.00
18.00	0.68	434,124	24.33	0.83	0.83	0.00
20.00	0.55	432,739	24.31	0.75	0.75	0.00
22.00	0.50	431,358	24.30	0.68	0.68	0.00
24.00	0.46	430,101	24.28	0.63	0.63	0.00
26.00	0.30	428,288	24.26	0.55	0.55	0.00
28.00	0.22	426,490	24.24	0.47	0.47	0.00
30.00	0.16	424,709	24.22	0.40	0.40	0.00
32.00	0.15	423,156	24.21	0.34	0.34	0.00
34.00	0.14	421,902	24.19	0.30	0.30	0.00
36.00	0.13	420,853	24.18	0.27	0.27	0.00
38.00	0.12	419,953	24.17	0.24	0.24	0.00
40.00	0.11	419,171	24.16	0.21	0.21	0.00
42.00	0.10	418,476	24.16	0.20	0.20	0.00
44.00	0.00	417,651	24.15	0.17	0.17	0.00
46.00	0.00	416,528	24.14	0.14	0.14	0.00
48.00	0.00	415,584	24.12	0.12	0.12	0.00
50.00	0.00	414,770	24.12	0.11	0.11	0.00
52.00	0.00	414,062	24.11	0.09	0.09	0.00
54.00	0.00	413,444	24.10	0.08	0.08	0.00
56.00	0.00	412,906	24.10	0.07	0.07	0.00
58.00	0.00	412,430	24.09	0.06	0.06	0.00
60.00	0.00	411,998	24.09	0.06	0.06	0.00
62.00	0.00	411,607	24.08	0.05	0.05	0.00
64.00	0.00	411,251	24.08	0.05	0.05	0.00
66.00	0.00	410,929	24.07	0.04	0.04	0.00
68.00	0.00	410,637	24.07	0.04	0.04	0.00
70.00	0.00	410,371	24.07	0.04	0.04	0.00
72.00	0.00	410,130	24.06	0.03	0.03	0.00
74.00	0.00	409,911	24.06	0.03	0.03	0.00
76.00	0.00	409,710	24.06	0.03	0.03	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 2P: BMP-2 Field-SGWL

Inflow Area = 3.163 ac, 64.34% Impervious, Inflow Depth = 2.61" for 2-yr event
 Inflow = 9.04 cfs @ 12.09 hrs, Volume= 0.689 af
 Outflow = 3.53 cfs @ 12.32 hrs, Volume= 0.687 af, Atten= 61%, Lag= 14.2 min
 Primary = 3.53 cfs @ 12.32 hrs, Volume= 0.687 af
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Starting Elev= 25.75' Surf.Area= 2,520 sf Storage= 4,368 cf

Peak Elev= 28.15' @ 12.32 hrs Surf.Area= 6,603 sf Storage= 16,801 cf (12,433 cf above start)

Flood Elev= 29.42' Surf.Area= 10,957 sf Storage= 33,542 cf (29,174 cf above start)

Plug-Flow detention time= 613.0 min calculated for 0.587 af (85% of inflow)

Center-of-Mass det. time= 443.7 min (1,229.5 - 785.9)

Volume	Invert	Avail.Storage	Storage Description
#1	26.50'	8,791 cf	Sed. Forebay & connecting swales (Prismatic) Listed below (Recalc)
#2	23.50'	14,506 cf	CELL #1 (Prismatic) Listed below
#3	23.50'	14,188 cf	CELL #2 Listed below
		37,485 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
26.50	279	0	0
27.17	500	261	261
27.50	970	243	504
27.92	1,910	605	1,108
28.00	2,130	162	1,270
28.22	3,100	575	1,845
28.50	3,550	931	2,776
29.00	4,900	2,113	4,889
29.67	6,750	3,903	8,791

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
23.50	2,520	0.0	0	0
25.50	2,520	40.0	2,016	2,016
25.75	2,520	35.0	221	2,237
26.50	2,520	2.0	38	2,274
26.51	2,730	100.0	26	2,301
27.17	3,150	100.0	1,940	4,241
27.75	3,530	100.0	1,937	6,178
27.92	3,650	100.0	610	6,788
28.00	3,707	100.0	294	7,083
28.17	3,824	100.0	640	7,723
28.18	3,880	100.0	39	7,761
28.42	4,065	100.0	953	8,715
28.50	4,260	100.0	333	9,048
29.67	5,070	100.0	5,458	14,506

1119-Post Development-Fields-Phase 1

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

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Elevation (feet)	Cum.Store (cubic-feet)
23.50	0
25.58	1,984
25.83	2,201
26.50	2,238
26.51	2,264
27.17	4,151
27.75	6,057
27.92	6,660
28.00	6,951
28.17	7,586
28.18	7,624
28.42	8,571
28.50	8,896
29.00	11,036
29.67	14,188

Device	Routing	Invert	Outlet Devices
#1	Primary	25.25'	24.0" Round Culvert L= 27.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 25.25' / 24.90' S= 0.0127 ' S= 0.0127 ' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Device 1	25.83'	2.2" Vert. WQV Orifice C= 0.600
#3	Device 1	28.00'	4.0" x 4.0" Horiz. High-flow Bypass-1-Orifice X 13.00 columns X 5 rows C= 0.600 in 72.0" x 33.0" Grate (44% open area) Limited to weir flow at low heads
#4	Secondary	28.60'	10.0' long x 8.0' breadth Emergency overflow-1-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
#5	Secondary	28.60'	152.0 deg Emergency overflow-2-Sharp-Crested Vee/Trap Weir Cv= 1.97 (C= 2.46)

Primary OutFlow Max=3.52 cfs @ 12.32 hrs HW=28.15' TW=24.12' (Dynamic Tailwater)

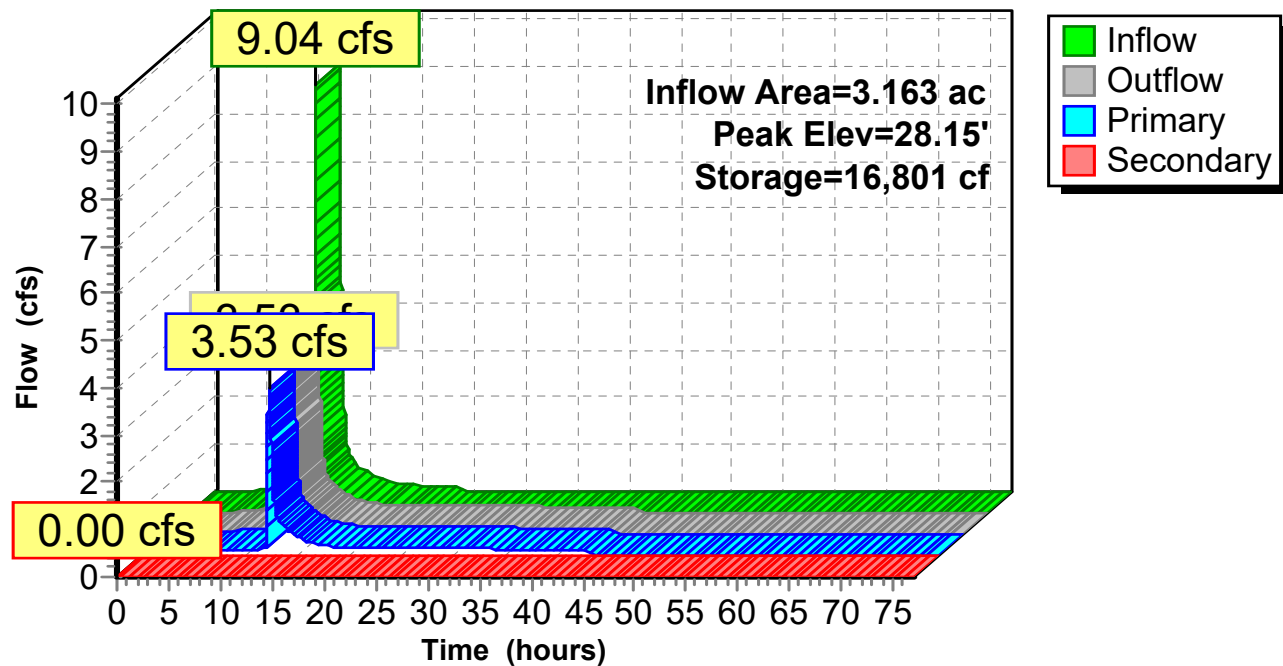
- ↑ **1=Culvert** (Passes 3.52 cfs of 20.85 cfs potential flow)
- ↑ **2=WQV Orifice** (Orifice Controls 0.19 cfs @ 7.19 fps)
- ↑ **3=High-flow Bypass-1-Orifice** (Weir Controls 3.33 cfs @ 1.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=25.75' TW=24.00' (Dynamic Tailwater)

- ↑ **4=Emergency overflow-1-Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- ↑ **5=Emergency overflow-2-Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 2P: BMP-2 Field-SGWL

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 2P: BMP-2 Field-SGWL

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	4,368	25.75	0.00	0.00	0.00
2.00	0.00	4,368	25.75	0.00	0.00	0.00
4.00	0.03	4,446	25.87	0.00	0.00	0.00
6.00	0.06	4,473	26.13	0.06	0.06	0.00
8.00	0.13	4,567	26.51	0.10	0.10	0.00
10.00	0.31	5,380	26.64	0.11	0.11	0.00
12.00	5.48	11,265	27.52	0.16	0.16	0.00
14.00	0.53	15,647	28.04	0.56	0.56	0.00
16.00	0.28	15,466	28.02	0.31	0.31	0.00
18.00	0.17	15,335	28.00	0.19	0.19	0.00
20.00	0.14	15,121	27.98	0.18	0.18	0.00
22.00	0.11	14,725	27.94	0.18	0.18	0.00
24.00	0.09	14,177	27.88	0.18	0.18	0.00
26.00	0.00	12,950	27.74	0.17	0.17	0.00
28.00	0.00	11,742	27.59	0.16	0.16	0.00
30.00	0.00	10,589	27.43	0.16	0.16	0.00
32.00	0.00	9,492	27.29	0.15	0.15	0.00
34.00	0.00	8,452	27.14	0.14	0.14	0.00
36.00	0.00	7,476	26.98	0.13	0.13	0.00
38.00	0.00	6,567	26.84	0.12	0.12	0.00
40.00	0.00	5,726	26.70	0.11	0.11	0.00
42.00	0.00	4,953	26.57	0.10	0.10	0.00
44.00	0.00	4,444	25.86	0.00	0.00	0.00
46.00	0.00	4,442	25.84	0.00	0.00	0.00
48.00	0.00	4,442	25.83	0.00	0.00	0.00
50.00	0.00	4,442	25.83	0.00	0.00	0.00
52.00	0.00	4,442	25.83	0.00	0.00	0.00
54.00	0.00	4,442	25.83	0.00	0.00	0.00
56.00	0.00	4,442	25.83	0.00	0.00	0.00
58.00	0.00	4,442	25.83	0.00	0.00	0.00
60.00	0.00	4,442	25.83	0.00	0.00	0.00
62.00	0.00	4,442	25.83	0.00	0.00	0.00
64.00	0.00	4,442	25.83	0.00	0.00	0.00
66.00	0.00	4,442	25.83	0.00	0.00	0.00
68.00	0.00	4,442	25.83	0.00	0.00	0.00
70.00	0.00	4,442	25.83	0.00	0.00	0.00
72.00	0.00	4,442	25.83	0.00	0.00	0.00
74.00	0.00	4,442	25.83	0.00	0.00	0.00
76.00	0.00	4,442	25.83	0.00	0.00	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 3P: BMP-1 Phase-1_Storage

Inflow Area = 6.247 ac, 0.00% Impervious, Inflow Depth = 1.39" for 2-yr event
 Inflow = 6.97 cfs @ 12.26 hrs, Volume= 0.722 af
 Outflow = 0.64 cfs @ 14.83 hrs, Volume= 0.720 af, Atten= 91%, Lag= 154.3 min
 Discarded = 0.08 cfs @ 12.09 hrs, Volume= 0.389 af
 Primary = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs
 Peak Elev= 30.99' @ 14.83 hrs Surf.Area= 6,462 sf Storage= 18,235 cf
 Flood Elev= 36.40' Surf.Area= 205,297 sf Storage= 77,169 cf

Plug-Flow detention time= 999.0 min calculated for 0.720 af (100% of inflow)
 Center-of-Mass det. time= 997.8 min (1,861.8 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	25.80'	2,894 cf	Chambers to 9" below EG (Prismatic) Listed below (Recalc) 7,235 cf Overall x 40.0% Voids
#2B	27.80'	11,438 cf	28.50'W x 224.47'L x 7.20'H Field B-Impervious 46,061 cf Overall - 17,466 cf Embedded = 28,595 cf x 40.0% Voids
#3B	28.55'	17,466 cf	ADS_StormTech MC-4500 +Cap x 162 Inside #2 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap 162 Chambers in 3 Rows Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf
#4	35.00'	480 cf	Top of chamber to field base (Prismatic) Listed below (Recalc) 1,922 cf Overall x 25.0% Voids
#5	31.40'	298 cf	12.0" Round Pipe Storage, west-1, Phase 1-Impervious L= 380.0' S= 0.0051 '/'
#6	28.62'	433 cf	18.0" Round Pipe Storage, north-1 L= 245.0' S= 0.0050 '/'
#7	31.71'	298 cf	12.0" Round Pipe Storage, center-1, Phase 1-Impervious L= 380.0' S= 0.0050 '/'
#8	30.17'	298 cf	12.0" Round Pipe Storage, east-1, Phase 1-Impervious L= 380.0' S= 0.0050 '/'
#9	34.90'	21,781 cf	Field #1 Base (1/2) (Prismatic) Listed below (Recalc) x 2 87,125 cf Overall x 25.0% Voids
#10	34.90'	21,781 cf	Field #2 Base (Prismatic) Listed below (Recalc) x 2 87,125 cf Overall x 25.0% Voids
		77,169 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
25.80	0	0	0
25.90	250	12	12
26.00	598	42	55
26.50	2,813	853	908
27.00	4,659	1,868	2,776
27.50	5,837	2,624	5,400
27.80	6,397	1,835	7,235

1119-Post Development-Fields-Phase 1

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

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	6,397	0	0
35.59	115	1,921	1,921
35.60	0	1	1,922

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	0	0	0
35.00	3,704	185	185
35.60	49,725	16,029	16,214
36.15	49,725	27,349	43,563

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
34.90	0	0	0
35.00	3,704	185	185
35.60	49,725	16,029	16,214
36.15	49,725	27,349	43,563

Device	Routing	Invert	Outlet Devices
#1	Primary	27.64'	18.0" Round HDPE 18" L= 56.3' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.64' / 27.36' S= 0.0050 1' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.77 sf
#2	Device 1	29.75'	3.0" Vert. 3" Orifice/Grate C= 0.600
#3	Device 1	30.65'	7.0" Vert. 7" Orifice/Grate C= 0.600
#4	Device 1	34.25'	3.0" Vert. 3" Orifice/Grate C= 0.600
#5	Discarded	25.90'	0.550 in/hr Exfiltration over Surface area from 25.90' - 27.80' Excluded Surface area = 250 sf

Discarded OutFlow Max=0.08 cfs @ 12.09 hrs HW=27.81' (Free Discharge)↑ **5=Exfiltration** (Exfiltration Controls 0.08 cfs)**Primary OutFlow** Max=0.57 cfs @ 14.83 hrs HW=30.99' TW=27.64' (Dynamic Tailwater)

↑ **1=HDPE 18"** (Passes 0.57 cfs of 13.41 cfs potential flow)

↑ **2=3" Orifice/Grate** (Orifice Controls 0.25 cfs @ 5.08 fps)

↑ **3=7" Orifice/Grate** (Orifice Controls 0.32 cfs @ 1.98 fps)

↑ **4=3" Orifice/Grate** (Controls 0.00 cfs)

1119-Post Development-Fields-Phase 1

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

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Pond 3P: BMP-1 Phase-1_Storage - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-4500 +Cap (ADS StormTech® MC-4500 with cap volume)

Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf

Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap

Cap Storage= +35.7 cf x 2 x 3 rows = 214.2 cf

100.0" Wide + 9.0" Spacing = 109.0" C-C Row Spacing

54 Chambers/Row x 4.02' Long +2.56' Cap Length x 2 = 222.47' Row Length +12.0" End Stone x 2 = 224.47' Base Length

3 Rows x 100.0" Wide + 9.0" Spacing x 2 + 12.0" Side Stone x 2 = 28.50' Base Width

9.0" Base + 60.0" Chamber Height + 17.4" Cover = 7.20' Field Height

162 Chambers x 106.5 cf + 35.7 cf Cap Volume x 2 x 3 Rows = 17,465.6 cf Chamber Storage

46,060.6 cf Field - 17,465.6 cf Chambers = 28,594.9 cf Stone x 40.0% Voids = 11,438.0 cf Stone Storage

Chamber Storage + Stone Storage = 28,903.6 cf = 0.664 af

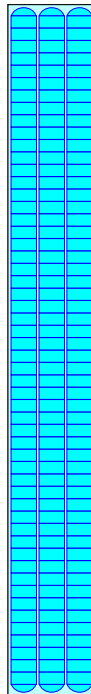
Overall Storage Efficiency = 62.8%

Overall System Size = 224.47' x 28.50' x 7.20'

162 Chambers

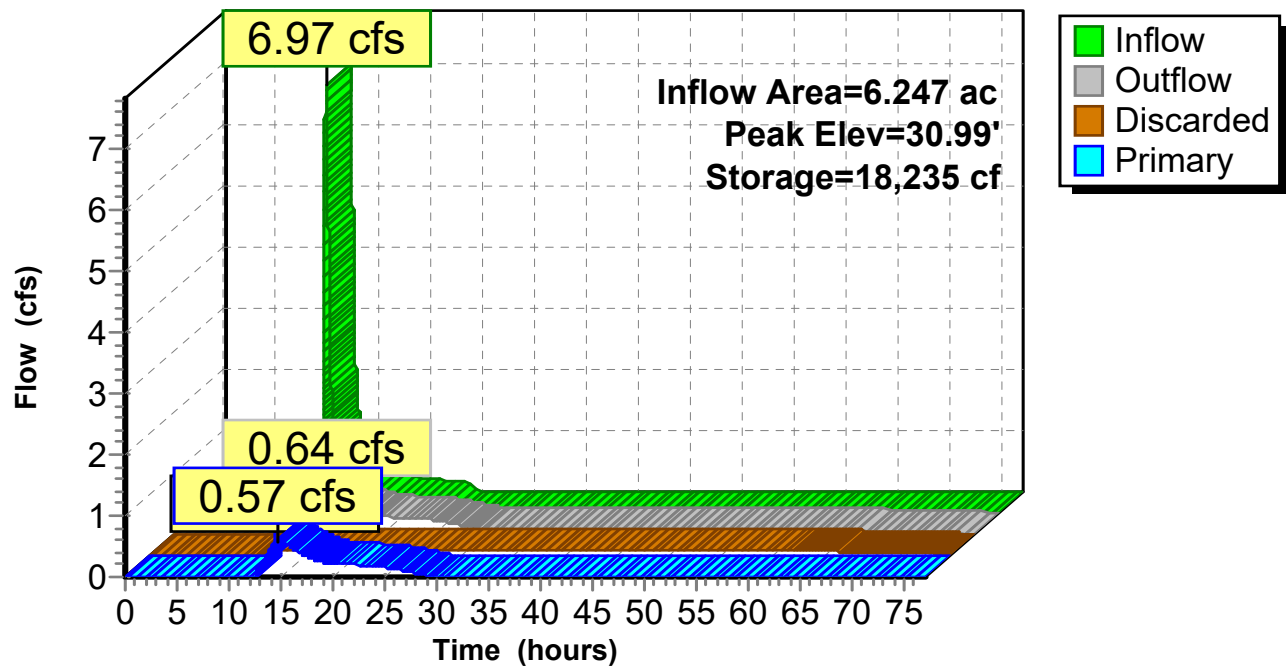
1,705.9 cy Field

1,059.1 cy Stone



Pond 3P: BMP-1 Phase-1_Storage

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 3P: BMP-1 Phase-1_Storage

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	25.80	0.00	0.00	0.00
2.00	0.00	0	25.80	0.00	0.00	0.00
4.00	0.00	0	25.80	0.00	0.00	0.00
6.00	0.00	0	25.80	0.00	0.00	0.00
8.00	0.00	0	25.80	0.00	0.00	0.00
10.00	0.00	0	25.80	0.00	0.00	0.00
12.00	2.24	1,987	27.42	0.07	0.07	0.00
14.00	0.82	17,934	30.93	0.55	0.08	0.47
16.00	0.45	17,970	30.94	0.56	0.08	0.48
18.00	0.28	17,241	30.80	0.37	0.08	0.30
20.00	0.22	16,635	30.68	0.29	0.08	0.22
22.00	0.18	16,026	30.57	0.27	0.08	0.20
24.00	0.15	15,296	30.43	0.25	0.08	0.18
26.00	0.00	13,773	30.15	0.20	0.08	0.12
28.00	0.00	12,540	29.93	0.13	0.08	0.06
30.00	0.00	11,792	29.80	0.08	0.08	0.01
32.00	0.00	11,222	29.70	0.08	0.08	0.00
34.00	0.00	10,658	29.60	0.08	0.08	0.00
36.00	0.00	10,095	29.50	0.08	0.08	0.00
38.00	0.00	9,531	29.40	0.08	0.08	0.00
40.00	0.00	8,968	29.30	0.08	0.08	0.00
42.00	0.00	8,404	29.20	0.08	0.08	0.00
44.00	0.00	7,841	29.10	0.08	0.08	0.00
46.00	0.00	7,277	28.99	0.08	0.08	0.00
48.00	0.00	6,714	28.89	0.08	0.08	0.00
50.00	0.00	6,150	28.79	0.08	0.08	0.00
52.00	0.00	5,587	28.69	0.08	0.08	0.00
54.00	0.00	5,023	28.59	0.08	0.08	0.00
56.00	0.00	4,460	28.41	0.08	0.08	0.00
58.00	0.00	3,896	28.19	0.08	0.08	0.00
60.00	0.00	3,333	27.97	0.08	0.08	0.00
62.00	0.00	2,770	27.75	0.08	0.08	0.00
64.00	0.00	2,234	27.53	0.07	0.07	0.00
66.00	0.00	1,739	27.31	0.07	0.07	0.00
68.00	0.00	1,291	27.09	0.06	0.06	0.00
70.00	0.00	894	26.88	0.05	0.05	0.00
72.00	0.00	567	26.66	0.04	0.04	0.00
74.00	0.00	313	26.45	0.03	0.03	0.00
76.00	0.00	138	26.25	0.02	0.02	0.00

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 4P: PDMH-4

[57] Hint: Peaked at 26.94' (Flood elevation advised)

Inflow Area = 6.491 ac, 0.00% Impervious, Inflow Depth = 0.66" for 2-yr event
Inflow = 0.59 cfs @ 14.81 hrs, Volume= 0.356 af
Outflow = 0.59 cfs @ 14.81 hrs, Volume= 0.356 af, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 14.81 hrs, Volume= 0.356 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 26.94' @ 14.81 hrs

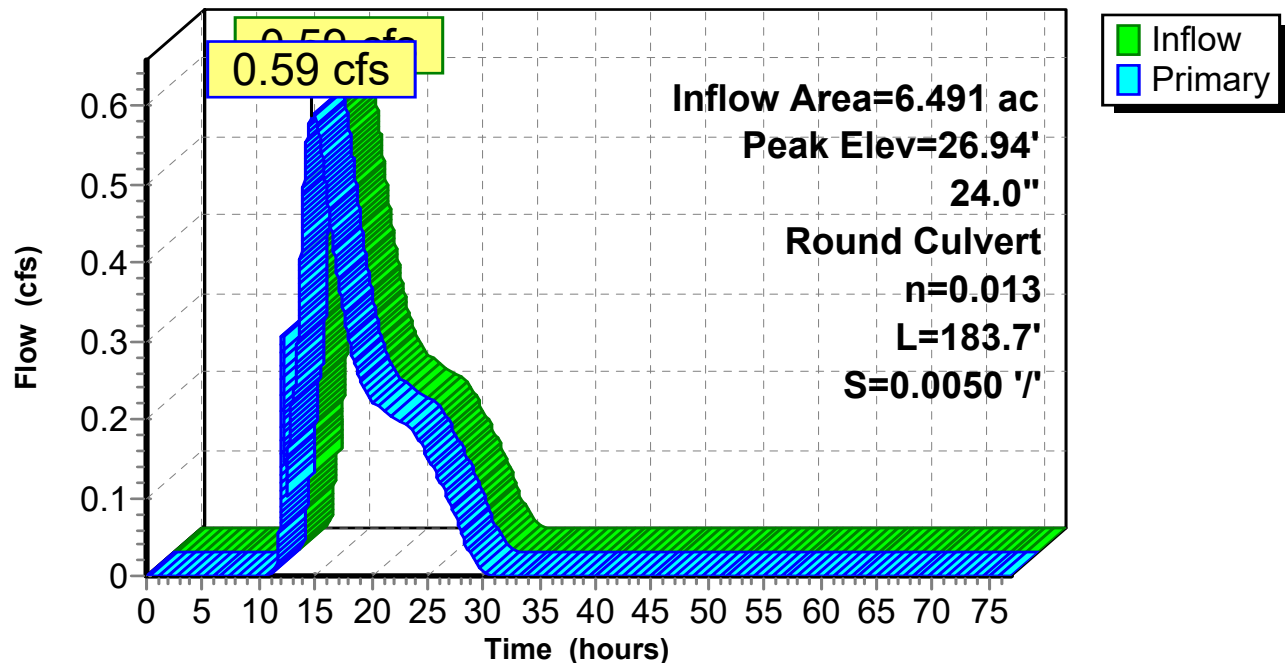
Device	Routing	Invert	Outlet Devices
#1	Primary	26.59'	24.0" Round RCP_Round 24" L= 183.7' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 26.59' / 25.67' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf

Primary OutFlow Max=0.59 cfs @ 14.81 hrs HW=26.94' TW=24.30' (Dynamic Tailwater)

↑1=RCP_Round 24" (Barrel Controls 0.59 cfs @ 2.38 fps)

Pond 4P: PDMH-4

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 4P: PDMH-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	26.59	0.00	53.00	0.00	26.59	0.00
1.00	0.00	26.59	0.00	54.00	0.00	26.59	0.00
2.00	0.00	26.59	0.00	55.00	0.00	26.59	0.00
3.00	0.00	26.59	0.00	56.00	0.00	26.59	0.00
4.00	0.00	26.59	0.00	57.00	0.00	26.59	0.00
5.00	0.00	26.59	0.00	58.00	0.00	26.59	0.00
6.00	0.00	26.59	0.00	59.00	0.00	26.59	0.00
7.00	0.00	26.59	0.00	60.00	0.00	26.59	0.00
8.00	0.00	26.59	0.00	61.00	0.00	26.59	0.00
9.00	0.00	26.59	0.00	62.00	0.00	26.59	0.00
10.00	0.00	26.59	0.00	63.00	0.00	26.59	0.00
11.00	0.00	26.62	0.00	64.00	0.00	26.59	0.00
12.00	0.14	26.77	0.14	65.00	0.00	26.59	0.00
13.00	0.23	26.81	0.23	66.00	0.00	26.59	0.00
14.00	0.50	26.92	0.50	67.00	0.00	26.59	0.00
15.00	0.58	26.94	0.58	68.00	0.00	26.59	0.00
16.00	0.50	26.92	0.50	69.00	0.00	26.59	0.00
17.00	0.38	26.88	0.38	70.00	0.00	26.59	0.00
18.00	0.30	26.85	0.30	71.00	0.00	26.59	0.00
19.00	0.25	26.82	0.25	72.00	0.00	26.59	0.00
20.00	0.22	26.81	0.22	73.00	0.00	26.59	0.00
21.00	0.21	26.81	0.21	74.00	0.00	26.59	0.00
22.00	0.20	26.80	0.20	75.00	0.00	26.59	0.00
23.00	0.19	26.80	0.19	76.00	0.00	26.59	0.00
24.00	0.18	26.79	0.18	77.00	0.00	26.59	0.00
25.00	0.15	26.78	0.15				
26.00	0.12	26.76	0.12				
27.00	0.09	26.74	0.09				
28.00	0.06	26.71	0.06				
29.00	0.02	26.67	0.02				
30.00	0.01	26.63	0.01				
31.00	0.00	26.59	0.00				
32.00	0.00	26.59	0.00				
33.00	0.00	26.59	0.00				
34.00	0.00	26.59	0.00				
35.00	0.00	26.59	0.00				
36.00	0.00	26.59	0.00				
37.00	0.00	26.59	0.00				
38.00	0.00	26.59	0.00				
39.00	0.00	26.59	0.00				
40.00	0.00	26.59	0.00				
41.00	0.00	26.59	0.00				
42.00	0.00	26.59	0.00				
43.00	0.00	26.59	0.00				
44.00	0.00	26.59	0.00				
45.00	0.00	26.59	0.00				
46.00	0.00	26.59	0.00				
47.00	0.00	26.59	0.00				
48.00	0.00	26.59	0.00				
49.00	0.00	26.59	0.00				
50.00	0.00	26.59	0.00				
51.00	0.00	26.59	0.00				
52.00	0.00	26.59	0.00				

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 10P: PHW-4

Inflow Area = 1.559 ac, 69.15% Impervious, Inflow Depth = 2.68" for 2-yr event
Inflow = 4.55 cfs @ 12.09 hrs, Volume= 0.348 af
Outflow = 4.55 cfs @ 12.09 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
Primary = 4.55 cfs @ 12.09 hrs, Volume= 0.348 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

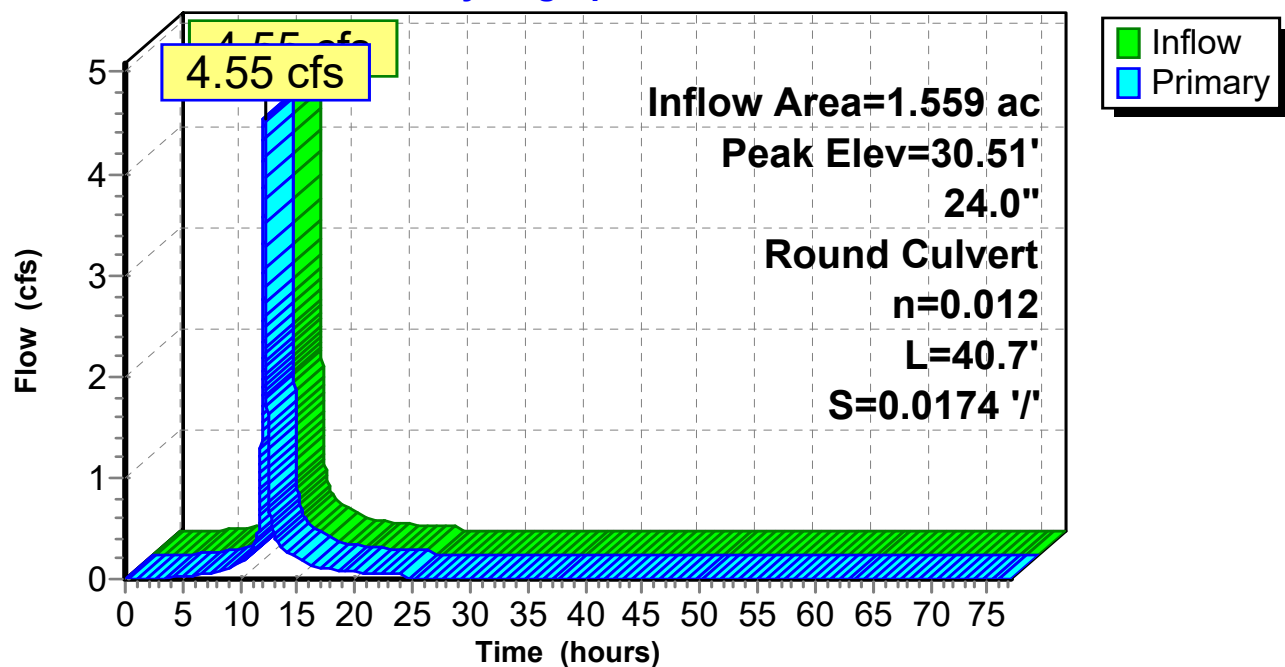
Peak Elev= 30.51' @ 12.09 hrs

Flood Elev= 34.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	29.60'	24.0" Round RCP_Round 24" L= 40.7' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 29.60' / 28.89' S= 0.0174 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf

Primary OutFlow Max=4.54 cfs @ 12.09 hrs HW=30.51' TW=27.81' (Dynamic Tailwater)

↑1=RCP_Round 24" (Inlet Controls 4.54 cfs @ 3.25 fps)

Pond 10P: PHW-4**Hydrograph**

1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 10P: PHW-4

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	29.60	0.00	53.00	0.00	29.60	0.00
1.00	0.00	29.60	0.00	54.00	0.00	29.60	0.00
2.00	0.00	29.60	0.00	55.00	0.00	29.60	0.00
3.00	0.01	29.63	0.01	56.00	0.00	29.60	0.00
4.00	0.01	29.65	0.01	57.00	0.00	29.60	0.00
5.00	0.02	29.66	0.02	58.00	0.00	29.60	0.00
6.00	0.03	29.67	0.03	59.00	0.00	29.60	0.00
7.00	0.05	29.69	0.05	60.00	0.00	29.60	0.00
8.00	0.07	29.71	0.07	61.00	0.00	29.60	0.00
9.00	0.11	29.73	0.11	62.00	0.00	29.60	0.00
10.00	0.16	29.76	0.16	63.00	0.00	29.60	0.00
11.00	0.27	29.81	0.27	64.00	0.00	29.60	0.00
12.00	2.77	30.30	2.77	65.00	0.00	29.60	0.00
13.00	0.41	29.86	0.41	66.00	0.00	29.60	0.00
14.00	0.26	29.81	0.26	67.00	0.00	29.60	0.00
15.00	0.20	29.78	0.20	68.00	0.00	29.60	0.00
16.00	0.14	29.75	0.14	69.00	0.00	29.60	0.00
17.00	0.11	29.73	0.11	70.00	0.00	29.60	0.00
18.00	0.09	29.72	0.09	71.00	0.00	29.60	0.00
19.00	0.08	29.71	0.08	72.00	0.00	29.60	0.00
20.00	0.07	29.70	0.07	73.00	0.00	29.60	0.00
21.00	0.06	29.70	0.06	74.00	0.00	29.60	0.00
22.00	0.06	29.69	0.06	75.00	0.00	29.60	0.00
23.00	0.05	29.69	0.05	76.00	0.00	29.60	0.00
24.00	0.05	29.68	0.05	77.00	0.00	29.60	0.00
25.00	0.00	29.60	0.00				
26.00	0.00	29.60	0.00				
27.00	0.00	29.60	0.00				
28.00	0.00	29.60	0.00				
29.00	0.00	29.60	0.00				
30.00	0.00	29.60	0.00				
31.00	0.00	29.60	0.00				
32.00	0.00	29.60	0.00				
33.00	0.00	29.60	0.00				
34.00	0.00	29.60	0.00				
35.00	0.00	29.60	0.00				
36.00	0.00	29.60	0.00				
37.00	0.00	29.60	0.00				
38.00	0.00	29.60	0.00				
39.00	0.00	29.60	0.00				
40.00	0.00	29.60	0.00				
41.00	0.00	29.60	0.00				
42.00	0.00	29.60	0.00				
43.00	0.00	29.60	0.00				
44.00	0.00	29.60	0.00				
45.00	0.00	29.60	0.00				
46.00	0.00	29.60	0.00				
47.00	0.00	29.60	0.00				
48.00	0.00	29.60	0.00				
49.00	0.00	29.60	0.00				
50.00	0.00	29.60	0.00				
51.00	0.00	29.60	0.00				
52.00	0.00	29.60	0.00				

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 14P: PDMH-3

[57] Hint: Peaked at 27.64' (Flood elevation advised)

Inflow Area = 6.247 ac, 0.00% Impervious, Inflow Depth = 0.64" for 2-yr event
Inflow = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af
Outflow = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af, Atten= 0%, Lag= 0.0 min
Primary = 0.57 cfs @ 14.83 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 27.64' @ 14.83 hrs

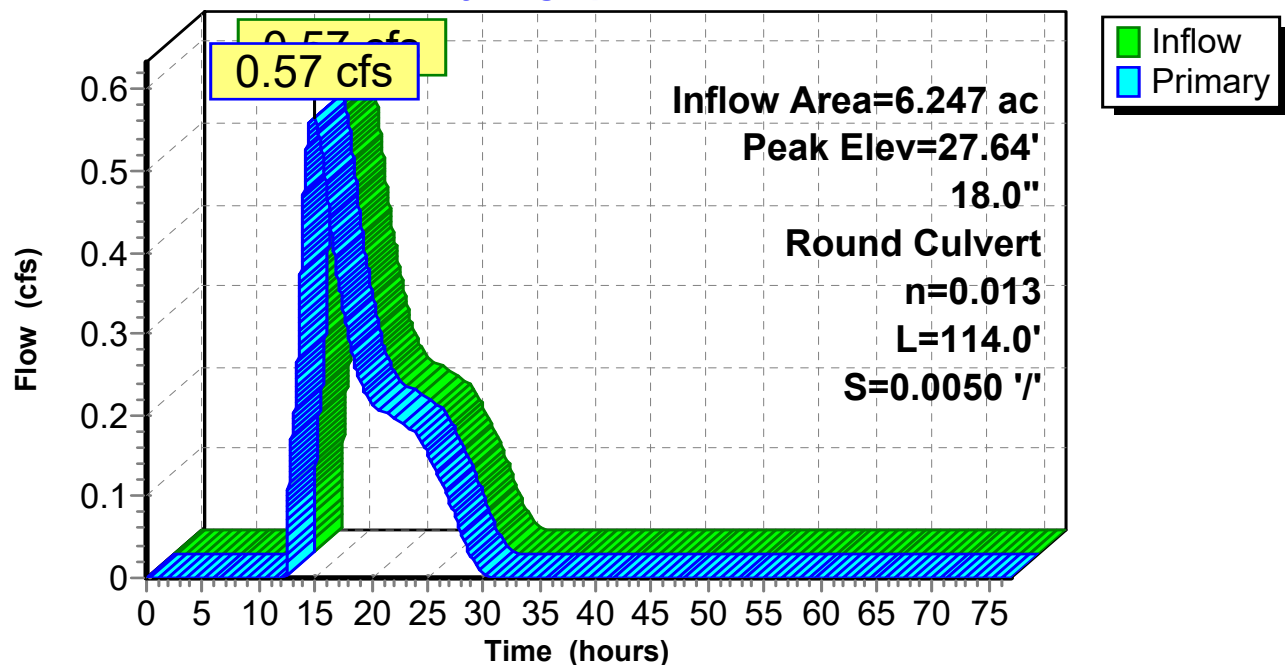
Device	Routing	Invert	Outlet Devices
#1	Primary	27.26'	18.0" Round RCP_Round 18" L= 114.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 27.26' / 26.69' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf

Primary OutFlow Max=0.57 cfs @ 14.83 hrs HW=27.64' TW=26.94' (Dynamic Tailwater)

↑1=RCP_Round 18" (Barrel Controls 0.57 cfs @ 2.41 fps)

Pond 14P: PDMH-3

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 14P: PDMH-3

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)	Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	27.26	0.00	53.00	0.00	27.26	0.00
1.00	0.00	27.26	0.00	54.00	0.00	27.26	0.00
2.00	0.00	27.26	0.00	55.00	0.00	27.26	0.00
3.00	0.00	27.26	0.00	56.00	0.00	27.26	0.00
4.00	0.00	27.26	0.00	57.00	0.00	27.26	0.00
5.00	0.00	27.26	0.00	58.00	0.00	27.26	0.00
6.00	0.00	27.26	0.00	59.00	0.00	27.26	0.00
7.00	0.00	27.26	0.00	60.00	0.00	27.26	0.00
8.00	0.00	27.26	0.00	61.00	0.00	27.26	0.00
9.00	0.00	27.26	0.00	62.00	0.00	27.26	0.00
10.00	0.00	27.26	0.00	63.00	0.00	27.26	0.00
11.00	0.00	27.26	0.00	64.00	0.00	27.26	0.00
12.00	0.00	27.26	0.00	65.00	0.00	27.26	0.00
13.00	0.19	27.48	0.19	66.00	0.00	27.26	0.00
14.00	0.47	27.61	0.47	67.00	0.00	27.26	0.00
15.00	0.56	27.64	0.56	68.00	0.00	27.26	0.00
16.00	0.48	27.61	0.48	69.00	0.00	27.26	0.00
17.00	0.37	27.57	0.37	70.00	0.00	27.26	0.00
18.00	0.30	27.54	0.30	71.00	0.00	27.26	0.00
19.00	0.24	27.51	0.24	72.00	0.00	27.26	0.00
20.00	0.22	27.50	0.22	73.00	0.00	27.26	0.00
21.00	0.21	27.49	0.21	74.00	0.00	27.26	0.00
22.00	0.20	27.49	0.20	75.00	0.00	27.26	0.00
23.00	0.19	27.48	0.19	76.00	0.00	27.26	0.00
24.00	0.18	27.47	0.18	77.00	0.00	27.26	0.00
25.00	0.15	27.46	0.15				
26.00	0.12	27.44	0.12				
27.00	0.09	27.42	0.09				
28.00	0.06	27.38	0.06				
29.00	0.02	27.34	0.02				
30.00	0.01	27.30	0.01				
31.00	0.00	27.26	0.00				
32.00	0.00	27.26	0.00				
33.00	0.00	27.26	0.00				
34.00	0.00	27.26	0.00				
35.00	0.00	27.26	0.00				
36.00	0.00	27.26	0.00				
37.00	0.00	27.26	0.00				
38.00	0.00	27.26	0.00				
39.00	0.00	27.26	0.00				
40.00	0.00	27.26	0.00				
41.00	0.00	27.26	0.00				
42.00	0.00	27.26	0.00				
43.00	0.00	27.26	0.00				
44.00	0.00	27.26	0.00				
45.00	0.00	27.26	0.00				
46.00	0.00	27.26	0.00				
47.00	0.00	27.26	0.00				
48.00	0.00	27.26	0.00				
49.00	0.00	27.26	0.00				
50.00	0.00	27.26	0.00				
51.00	0.00	27.26	0.00				
52.00	0.00	27.26	0.00				

1119-Post Development-Fields-Phase 1

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

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Summary for Pond 30P: Existing Depression

Inflow Area = 0.874 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-yr event
 Inflow = 0.77 cfs @ 12.31 hrs, Volume= 0.087 af
 Outflow = 0.11 cfs @ 13.83 hrs, Volume= 0.087 af, Atten= 85%, Lag= 91.1 min
 Discarded = 0.11 cfs @ 13.83 hrs, Volume= 0.087 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-77.00 hrs, dt= 0.01 hrs

Peak Elev= 39.78' @ 13.83 hrs Surf.Area= 6,202 sf Storage= 1,581 cf

Plug-Flow detention time= 179.8 min calculated for 0.087 af (100% of inflow)

Center-of-Mass det. time= 179.8 min (1,055.7 - 875.9)

Volume	Invert	Avail.Storage	Storage Description
#1	39.26'	9,337 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

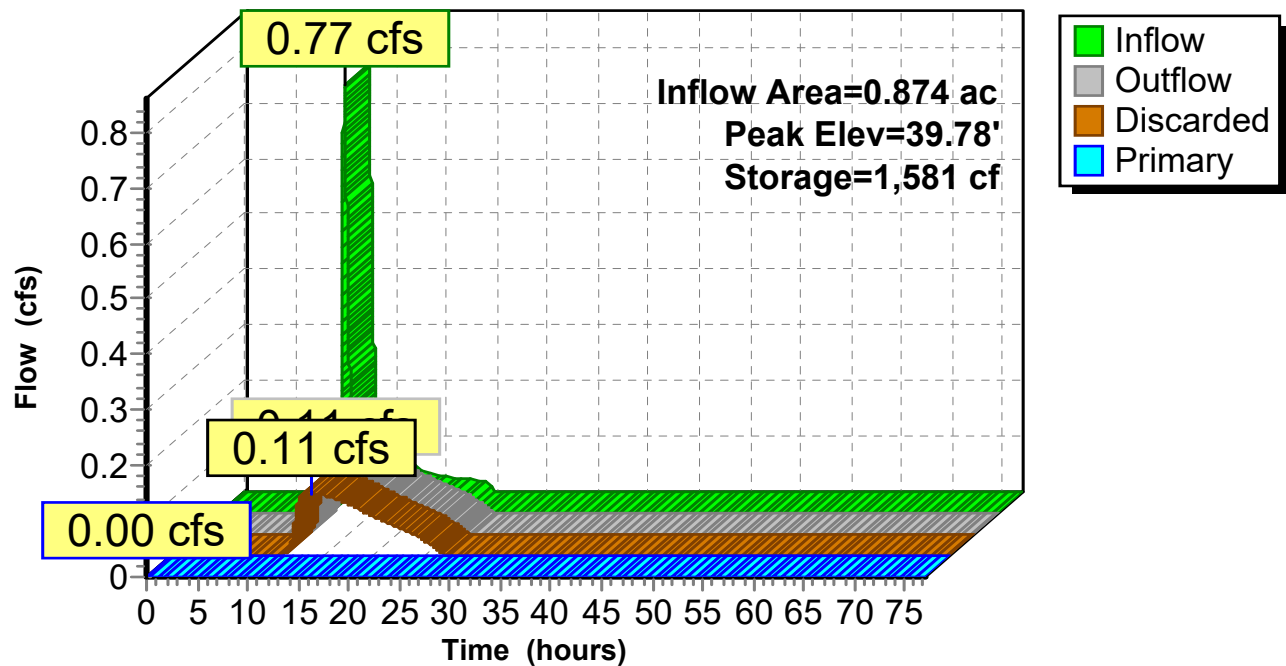
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
39.26	0	0	0
39.50	2,680	322	322
40.00	8,890	2,893	3,214
40.50	15,600	6,123	9,337

Device	Routing	Invert	Outlet Devices
#1	Primary	40.15'	Asymmetrical Broad-Crested Weir, C= 2.60 Offset (feet) 3.00 17.00 35.00 36.00 36.60 37.40 Elev. (feet) 40.56 40.31 40.20 40.20 40.15 40.56
#2	Discarded	39.26'	0.780 in/hr Exfiltration (avg of HSG C rates) over Surface area

Discarded OutFlow Max=0.11 cfs @ 13.83 hrs HW=39.78' (Free Discharge)↑**2=Exfiltration (avg of HSG C rates)** (Exfiltration Controls 0.11 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=39.26' TW=35.05' (Dynamic Tailwater)↑**1=Asymmetrical Broad-Crested Weir** (Controls 0.00 cfs)

Pond 30P: Existing Depression

Hydrograph



1119-Post Development-Fields-Phase 1*Type III 24-hr 2-yr Rainfall=3.71"*

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Hydrograph for Pond 30P: Existing Depression

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)
0.00	0.00	0	39.26	0.00	0.00	0.00
2.00	0.00	0	39.26	0.00	0.00	0.00
4.00	0.00	0	39.26	0.00	0.00	0.00
6.00	0.00	0	39.26	0.00	0.00	0.00
8.00	0.00	0	39.26	0.00	0.00	0.00
10.00	0.00	0	39.26	0.00	0.00	0.00
12.00	0.20	114	39.40	0.03	0.03	0.00
14.00	0.11	1,579	39.78	0.11	0.11	0.00
16.00	0.06	1,371	39.75	0.10	0.10	0.00
18.00	0.04	1,005	39.68	0.09	0.09	0.00
20.00	0.03	655	39.60	0.07	0.07	0.00
22.00	0.02	392	39.52	0.05	0.05	0.00
24.00	0.02	212	39.45	0.04	0.04	0.00
26.00	0.00	31	39.34	0.02	0.02	0.00
28.00	0.00	0	39.26	0.00	0.00	0.00
30.00	0.00	0	39.26	0.00	0.00	0.00
32.00	0.00	0	39.26	0.00	0.00	0.00
34.00	0.00	0	39.26	0.00	0.00	0.00
36.00	0.00	0	39.26	0.00	0.00	0.00
38.00	0.00	0	39.26	0.00	0.00	0.00
40.00	0.00	0	39.26	0.00	0.00	0.00
42.00	0.00	0	39.26	0.00	0.00	0.00
44.00	0.00	0	39.26	0.00	0.00	0.00
46.00	0.00	0	39.26	0.00	0.00	0.00
48.00	0.00	0	39.26	0.00	0.00	0.00
50.00	0.00	0	39.26	0.00	0.00	0.00
52.00	0.00	0	39.26	0.00	0.00	0.00
54.00	0.00	0	39.26	0.00	0.00	0.00
56.00	0.00	0	39.26	0.00	0.00	0.00
58.00	0.00	0	39.26	0.00	0.00	0.00
60.00	0.00	0	39.26	0.00	0.00	0.00
62.00	0.00	0	39.26	0.00	0.00	0.00
64.00	0.00	0	39.26	0.00	0.00	0.00
66.00	0.00	0	39.26	0.00	0.00	0.00
68.00	0.00	0	39.26	0.00	0.00	0.00
70.00	0.00	0	39.26	0.00	0.00	0.00
72.00	0.00	0	39.26	0.00	0.00	0.00
74.00	0.00	0	39.26	0.00	0.00	0.00
76.00	0.00	0	39.26	0.00	0.00	0.00

1119-Post Development-Fields-Phase 1*Type III 24-hr 10-yr Rainfall=5.64"*

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field AreaRunoff Area=6.247 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=14.96 cfs 1.502 af**Subcatchment B1c: To PHW-2**Runoff Area=0.244 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=0.71 cfs 0.053 af**Subcatchment B2: Field Parking-E**Runoff Area=1.559 ac 69.15% Impervious Runoff Depth=4.46"
Flow Length=418' Tc=6.0 min CN=74/96 Runoff=7.50 cfs 0.580 af**Subcatchment B3: DPW Operations/Snow**Runoff Area=1.604 ac 59.66% Impervious Runoff Depth=4.32"
Flow Length=315' Tc=6.0 min CN=76/96 Runoff=7.55 cfs 0.578 af**Subcatchment C1: C1**Runoff Area=6,500 sf 0.00% Impervious Runoff Depth=2.61"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.45 cfs 0.032 af**Subcatchment D1: EX. ACCESS DR W**Runoff Area=0.771 ac 85.99% Impervious Runoff Depth=4.88"
Flow Length=133' Tc=6.0 min CN=76/96 Runoff=4.00 cfs 0.313 af**Subcatchment D2: SW UPLANDS**Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=2.52"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.28 cfs 0.023 af**Subcatchment E1: EX. ACCESS DR E**Runoff Area=0.878 ac 68.68% Impervious Runoff Depth=4.48"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=4.25 cfs 0.328 af**Subcatchment F1: Direct Grass Area Runoff**Runoff Area=0.762 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=2.32 cfs 0.166 af**Subcatchment F2: Berm Runoff to Pike**Runoff Area=0.251 ac 3.98% Impervious Runoff Depth=2.71"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=0.63 cfs 0.057 af**Subcatchment G1: Graded Road Runoff**Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=3.46"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=1.27 cfs 0.091 af**Subcatchment G2: Oveland flow into pond**Runoff Area=3.181 ac 1.73% Impervious Runoff Depth=2.83"
Flow Length=415' Tc=15.7 min CN=73/96 Runoff=7.79 cfs 0.751 af**Subcatchment G3: G3**Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=340' Tc=16.6 min CN=71/0 Runoff=1.55 cfs 0.152 af**Subcatchment G4: G4**Runoff Area=0.874 ac 0.00% Impervious Runoff Depth=2.61"
Flow Length=189' Tc=20.7 min CN=71/0 Runoff=1.76 cfs 0.190 af**Reach 6R: PSwale-3**Avg. Flow Depth=0.25' Max Vel=2.17 fps Inflow=1.55 cfs 0.152 af
n=0.027 L=228.0' S=0.0137 '/' Capacity=109.43 cfs Outflow=1.53 cfs 0.152 af**Reach 15R: U.S. Pike Site Culvert**Inflow=3.47 cfs 3.389 af
Outflow=3.47 cfs 3.389 af

1119-Post Development-Fields-Phase 1*Type III 24-hr 10-yr Rainfall=5.64"*

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Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.54' Max Vel=0.45 fps Inflow=3.48 cfs 3.392 af
n=0.120 L=490.0' S=0.0051 '/ Outflow=3.47 cfs 3.389 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.45 cfs 0.032 af
Outflow=0.45 cfs 0.032 af

Reach SP-3: SW WETLANDS Inflow=4.24 cfs 0.336 af
Outflow=4.24 cfs 0.336 af

Reach SP-4: SE WETLANDS Inflow=4.25 cfs 0.328 af
Outflow=4.25 cfs 0.328 af

Pond 1P: EX. POND-2 Peak Elev=24.67' Storage=465,684 cf Inflow=22.30 cfs 3.295 af
Primary=3.31 cfs 3.169 af Secondary=0.00 cfs 0.000 af Outflow=3.31 cfs 3.169 af

Pond 2P: BMP-2 Field-SGWL Peak Elev=28.36' Storage=19,108 cf Inflow=15.04 cfs 1.158 af
Primary=12.57 cfs 1.156 af Secondary=0.00 cfs 0.000 af Outflow=12.57 cfs 1.156 af

Pond 3P: BMP-1 Phase-1_Storage Peak Elev=34.11' Storage=30,825 cf Inflow=14.96 cfs 1.502 af
Discarded=0.08 cfs 0.406 af Primary=2.78 cfs 1.092 af Outflow=2.85 cfs 1.497 af

Pond 4P: PDMH-4 Peak Elev=27.38' Inflow=2.86 cfs 1.145 af
24.0" Round Culvert n=0.013 L=183.7' S=0.0050 '/ Outflow=2.86 cfs 1.145 af

Pond 10P: PHW-4 Peak Elev=30.82' Inflow=7.50 cfs 0.580 af
24.0" Round Culvert n=0.012 L=40.7' S=0.0174 '/ Outflow=7.50 cfs 0.580 af

Pond 14P: PDMH-3 Peak Elev=28.16' Inflow=2.78 cfs 1.092 af
18.0" Round Culvert n=0.013 L=114.0' S=0.0050 '/ Outflow=2.78 cfs 1.092 af

Pond 30P: Existing Depression Peak Elev=40.10' Storage=4,137 cf Inflow=1.76 cfs 0.190 af
Discarded=0.18 cfs 0.190 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.190 af

Total Runoff Area = 17.643 ac Runoff Volume = 4.816 af Average Runoff Depth = 3.28"
80.92% Pervious = 14.277 ac 19.08% Impervious = 3.366 ac

1119-Post Development-Fields-Phase 1*Type III 24-hr 25-yr Rainfall=7.14"*

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field AreaRunoff Area=6.247 ac 0.00% Impervious Runoff Depth=4.16"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=21.66 cfs 2.168 af**Subcatchment B1c: To PHW-2**Runoff Area=0.244 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=1.05 cfs 0.078 af**Subcatchment B2: Field Parking-E**Runoff Area=1.559 ac 69.15% Impervious Runoff Depth=5.89"
Flow Length=418' Tc=6.0 min CN=74/96 Runoff=9.83 cfs 0.766 af**Subcatchment B3: DPW Operations/Snow**Runoff Area=1.604 ac 59.66% Impervious Runoff Depth=5.74"
Flow Length=315' Tc=6.0 min CN=76/96 Runoff=9.96 cfs 0.768 af**Subcatchment C1: C1**Runoff Area=6,500 sf 0.00% Impervious Runoff Depth=3.84"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.67 cfs 0.048 af**Subcatchment D1: EX. ACCESS DR W**Runoff Area=0.771 ac 85.99% Impervious Runoff Depth=6.34"
Flow Length=133' Tc=6.0 min CN=76/96 Runoff=5.16 cfs 0.408 af**Subcatchment D2: SW UPLANDS**Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=3.74"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.42 cfs 0.034 af**Subcatchment E1: EX. ACCESS DR E**Runoff Area=0.878 ac 68.68% Impervious Runoff Depth=5.91"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=5.56 cfs 0.433 af**Subcatchment F1: Direct Grass Area Runoff**Runoff Area=0.762 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=3.43 cfs 0.244 af**Subcatchment F2: Berm Runoff to Pike**Runoff Area=0.251 ac 3.98% Impervious Runoff Depth=3.95"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=0.93 cfs 0.083 af**Subcatchment G1: Graded Road Runoff**Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=4.82"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=1.76 cfs 0.127 af**Subcatchment G2: Oveland flow into pond**Runoff Area=3.181 ac 1.73% Impervious Runoff Depth=4.10"
Flow Length=415' Tc=15.7 min CN=73/96 Runoff=11.33 cfs 1.087 af**Subcatchment G3: G3**Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=340' Tc=16.6 min CN=71/0 Runoff=2.29 cfs 0.224 af**Subcatchment G4: G4**Runoff Area=0.874 ac 0.00% Impervious Runoff Depth=3.84"
Flow Length=189' Tc=20.7 min CN=71/0 Runoff=2.61 cfs 0.280 af**Reach 6R: PSwale-3**Avg. Flow Depth=0.32' Max Vel=2.44 fps Inflow=2.29 cfs 0.251 af
n=0.027 L=228.0' S=0.0137 '/' Capacity=109.43 cfs Outflow=2.28 cfs 0.251 af**Reach 15R: U.S. Pike Site Culvert**Inflow=5.88 cfs 5.020 af
Outflow=5.88 cfs 5.020 af

1119-Post Development-Fields-Phase 1*Type III 24-hr 25-yr Rainfall=7.14"*

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Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.69' Max Vel=0.53 fps Inflow=5.88 cfs 5.023 af
n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=5.88 cfs 5.020 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.67 cfs 0.048 af
Outflow=0.67 cfs 0.048 af

Reach SP-3: SW WETLANDS Inflow=5.52 cfs 0.441 af
Outflow=5.52 cfs 0.441 af

Reach SP-4: SE WETLANDS Inflow=5.56 cfs 0.433 af
Outflow=5.56 cfs 0.433 af

Pond 1P: EX. POND-2 Peak Elev=24.88' Storage=486,195 cf Inflow=32.43 cfs 4.824 af
Primary=5.63 cfs 4.696 af Secondary=0.00 cfs 0.000 af Outflow=5.63 cfs 4.696 af

Pond 2P: BMP-2 Field-SGWL Peak Elev=28.45' Storage=20,083 cf Inflow=19.79 cfs 1.533 af
Primary=17.23 cfs 1.531 af Secondary=0.00 cfs 0.000 af Outflow=17.23 cfs 1.531 af

Pond 3P: BMP-1 Phase-1_Storage Peak Elev=35.51' Storage=45,776 cf Inflow=21.66 cfs 2.168 af
Discarded=0.08 cfs 0.413 af Primary=3.56 cfs 1.750 af Outflow=3.64 cfs 2.163 af

Pond 4P: PDMH-4 Peak Elev=27.51' Inflow=3.81 cfs 1.828 af
24.0" Round Culvert n=0.013 L=183.7' S=0.0050 '/' Outflow=3.81 cfs 1.828 af

Pond 10P: PHW-4 Peak Elev=31.03' Inflow=9.83 cfs 0.766 af
24.0" Round Culvert n=0.012 L=40.7' S=0.0174 '/' Outflow=9.83 cfs 0.766 af

Pond 14P: PDMH-3 Peak Elev=28.30' Inflow=3.56 cfs 1.750 af
18.0" Round Culvert n=0.013 L=114.0' S=0.0050 '/' Outflow=3.56 cfs 1.750 af

Pond 30P: Existing Depression Peak Elev=40.26' Storage=5,933 cf Inflow=2.61 cfs 0.280 af
Discarded=0.22 cfs 0.253 af Primary=0.21 cfs 0.027 af Outflow=0.43 cfs 0.280 af

Total Runoff Area = 17.643 ac Runoff Volume = 6.745 af Average Runoff Depth = 4.59"
80.92% Pervious = 14.277 ac 19.08% Impervious = 3.366 ac

1119-Post Development-Fields-Phase 1

Type III 24-hr 50-yr Rainfall=8.56"

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Time span=0.00-77.00 hrs, dt=0.01 hrs, 7701 points

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv. UI as Pervious

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

Subcatchment B1: Field AreaRunoff Area=6.247 ac 0.00% Impervious Runoff Depth=5.43"
Flow Length=669' Tc=17.6 min CN=74/0 Runoff=28.17 cfs 2.826 af**Subcatchment B1c: To PHW-2**Runoff Area=0.244 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=196' Tc=7.4 min CN=71/0 Runoff=1.38 cfs 0.103 af**Subcatchment B2: Field Parking-E**Runoff Area=1.559 ac 69.15% Impervious Runoff Depth=7.26"
Flow Length=418' Tc=6.0 min CN=74/96 Runoff=12.05 cfs 0.943 af**Subcatchment B3: DPW Operations/Snow**Runoff Area=1.604 ac 59.66% Impervious Runoff Depth=7.11"
Flow Length=315' Tc=6.0 min CN=76/96 Runoff=12.26 cfs 0.950 af**Subcatchment C1: C1**Runoff Area=6,500 sf 0.00% Impervious Runoff Depth=5.07"
Flow Length=134' Tc=6.0 min CN=71/0 Runoff=0.89 cfs 0.063 af**Subcatchment D1: EX. ACCESS DR W**Runoff Area=0.771 ac 85.99% Impervious Runoff Depth=7.74"
Flow Length=133' Tc=6.0 min CN=76/96 Runoff=6.25 cfs 0.497 af**Subcatchment D2: SW UPLANDS**Runoff Area=0.108 ac 0.00% Impervious Runoff Depth=4.95"
Flow Length=162' Tc=9.7 min CN=70/0 Runoff=0.55 cfs 0.045 af**Subcatchment E1: EX. ACCESS DR E**Runoff Area=0.878 ac 68.68% Impervious Runoff Depth=7.29"
Flow Length=90' Tc=6.0 min CN=75/96 Runoff=6.81 cfs 0.533 af**Subcatchment F1: Direct Grass Area Runoff**Runoff Area=0.762 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=295' Tc=6.0 min CN=71/0 Runoff=4.53 cfs 0.322 af**Subcatchment F2: Berm Runoff to Pike**Runoff Area=0.251 ac 3.98% Impervious Runoff Depth=5.19"
Flow Length=547' Tc=12.6 min CN=71/96 Runoff=1.23 cfs 0.109 af**Subcatchment G1: Graded Road Runoff**Runoff Area=0.315 ac 0.00% Impervious Runoff Depth=6.15"
Flow Length=79' Tc=6.0 min CN=80/0 Runoff=2.23 cfs 0.161 af**Subcatchment G2: Oveland flow into pond**Runoff Area=3.181 ac 1.73% Impervious Runoff Depth=5.36"
Flow Length=415' Tc=15.7 min CN=73/96 Runoff=14.78 cfs 1.420 af**Subcatchment G3: G3**Runoff Area=0.700 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=340' Tc=16.6 min CN=71/0 Runoff=3.03 cfs 0.296 af**Subcatchment G4: G4**Runoff Area=0.874 ac 0.00% Impervious Runoff Depth=5.07"
Flow Length=189' Tc=20.7 min CN=71/0 Runoff=3.45 cfs 0.369 af**Reach 6R: PSwale-3**Avg. Flow Depth=0.37' Max Vel=2.65 fps Inflow=3.03 cfs 0.388 af
n=0.027 L=228.0' S=0.0137 '/' Capacity=109.43 cfs Outflow=3.01 cfs 0.388 af**Reach 15R: U.S. Pike Site Culvert**Inflow=8.17 cfs 6.665 af
Outflow=8.17 cfs 6.665 af

1119-Post Development-Fields-Phase 1*Type III 24-hr 50-yr Rainfall=8.56"*

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Reach SP-1: OFFSITE PIKE PROP Avg. Flow Depth=0.81' Max Vel=0.58 fps Inflow=8.19 cfs 6.669 af
n=0.120 L=490.0' S=0.0051 '/' Capacity=139.53 cfs Outflow=8.17 cfs 6.665 af

Reach SP-2: OFFSITE TO 266-1 Inflow=0.89 cfs 0.063 af
Outflow=0.89 cfs 0.063 af

Reach SP-3: SW WETLANDS Inflow=6.73 cfs 0.542 af
Outflow=6.73 cfs 0.542 af

Reach SP-4: SE WETLANDS Inflow=6.81 cfs 0.533 af
Outflow=6.81 cfs 0.533 af

Pond 1P: EX. POND-2 Peak Elev=25.05' Storage=502,578 cf Inflow=42.06 cfs 6.367 af
Primary=7.73 cfs 6.238 af Secondary=0.00 cfs 0.000 af Outflow=7.73 cfs 6.238 af

Pond 2P: BMP-2 Field-SGWL Peak Elev=28.51' Storage=20,904 cf Inflow=24.31 cfs 1.893 af
Primary=21.34 cfs 1.892 af Secondary=0.00 cfs 0.000 af Outflow=21.34 cfs 1.892 af

Pond 3P: BMP-1 Phase-1_Storage Peak Elev=35.87' Storage=63,057 cf Inflow=28.17 cfs 2.826 af
Discarded=0.08 cfs 0.419 af Primary=3.72 cfs 2.402 af Outflow=3.80 cfs 2.821 af

Pond 4P: PDMH-4 Peak Elev=27.57' Inflow=4.23 cfs 2.505 af
24.0" Round Culvert n=0.013 L=183.7' S=0.0050 '/' Outflow=4.23 cfs 2.505 af

Pond 10P: PHW-4 Peak Elev=31.24' Inflow=12.05 cfs 0.943 af
24.0" Round Culvert n=0.012 L=40.7' S=0.0174 '/' Outflow=12.05 cfs 0.943 af

Pond 14P: PDMH-3 Peak Elev=28.33' Inflow=3.72 cfs 2.402 af
18.0" Round Culvert n=0.013 L=114.0' S=0.0050 '/' Outflow=3.72 cfs 2.402 af

Pond 30P: Existing Depression Peak Elev=40.32' Storage=6,782 cf Inflow=3.45 cfs 0.369 af
Discarded=0.24 cfs 0.277 af Primary=1.12 cfs 0.093 af Outflow=1.36 cfs 0.369 af

Total Runoff Area = 17.643 ac Runoff Volume = 8.638 af Average Runoff Depth = 5.88"
80.92% Pervious = 14.277 ac 19.08% Impervious = 3.366 ac

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)		
☐	A list of any required state and federal permit applications required for the project and the status of same. (2.5.3.2E)		

Applicant's Signature: _____ **Date:** _____



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VIA EMAIL

September 17, 2019
File No. 04.0190892

Mr. Phillip A. Corbett, P.E.
CMA Engineers, Inc.
35 Bow Street
Portsmouth, New Hampshire 03801

Re: Proposal for Professional Services
Wetland Permitting and Air Assessment
City of Portsmouth – Proposed Athletic Fields
Campus Drive, Tax Map 254, Lot 8
Portsmouth, New Hampshire

Dear Mr. Corbett:

This letter report presents the findings of a Site-Specific Soil Mapping survey conducted by GZA GeoEnvironmental, Inc. (GZA) on Tax Map 254, Lot 8 in the City of Portsmouth, New Hampshire (i.e. the Site) on November 26, 2018. The Site is bounded to the northeast by Campus Drive and to the southwest of Peverly Hill Road. The majority of the cleared area of the site is a reclaimed sand and gravel pit. The Site is bordered by Pike Industries and other developed properties to the north, an Industrial Park to the east, and the Seacoast Community School to the south. The City of Portsmouth Public Works facility is located on the northeastern edge of the lot and developed portions of the Public Works facility were not mapped. Per your request, only the area shaded in yellow on the base plan titled "Portsmouth Multi-purpose Recreation Fields" provided by CMA Engineers, Inc. (approximately 60 acres) was included in the mapping. It is our understanding that the soil information is needed in support of Alteration of Terrain permit application being prepared by CMA Engineers, Inc. for the proposed multipurpose recreational fields. This report is subject to the limitations in **Appendix A**.

The Site-Specific Soil Mapping was conducted by New Hampshire Certified Soil Scientist, James H. Long, (CSS No. 15) in accordance with the *New Hampshire Supplement of the Site-Specific Soil Mapping Standard for New Hampshire and Vermont*, Version 5.0, February 2017, published by the Society of Soil Scientists of Northern New England. Soil map units identified on the Site were classified using the *New Hampshire State-Wide Numerical Soils Legend*, United States Department of Agriculture (USDA) Natural Resource Conservation Service, Issue No. 10, January 2011. The Site-Specific Standards are based on a universally recognized taxonomic system of soil classification and are supported by national soil mapping standards established by the USDA National Cooperative Soil Survey. The attached Site-Specific Soil Map (sketch provided as **Appendix B**) has been prepared to comply with soil mapping requirements of RSA 485 A:17 and New Hampshire Department of Environmental Services (DES) Env-Wq 1500, Alteration of Terrain (AoT) rules.

This report and the attached soil series descriptions (see **Appendix C**) provide soil information such as soil drainage classification, physical characteristics, and depth to

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bedrock (if encountered). Soil characteristics on the property were evaluated through the evaluation of test pits (used for soil mapping purposes), as well as by tile spade and hand-auger probe observations conducted on the Site. Slope phases were measured using a clinometer and augmented by the topography shown on the base plan prepared by CMA Engineers. Slope is depicted on the base plan at a contour interval of two feet. The accompanying *Site-Specific Soil Map* developed by GZA in November/December 2018 was developed using the Base Plan as the mapping base.

Soil parent materials encountered consist of glaciofluvial deposits (outwash sands and gravel), glacial till materials, marine organic soils, and anthropogenic soils. The Soil Map Units identified during the soil survey are briefly described below. Soil characteristics for each Soil Map Unit comply with the Range in Characteristics described in the Official Series Descriptions for each Soil Map Unit (see **Appendix C**).

The conditions that exist within the disturbed areas are the result of anthropogenic processes and consist of excavated, regraded and filled areas. Fill material has been added to the native site soils. Also, the soil material making up the map units appears to have come from near the immediate area, as the material excavated, filled, and regraded is similar in characteristics to the Scituate soils that were excavated on site. Scituate soils are classified as hydrologic soil Group C and have a saturated hydraulic conductivity (Ksat) value of 0.06 inches per hour in the lower C horizon. This value is in the lower end of the range based on the most limiting soil layer. With the mixing of the soils and a mineral restrictive feature, GZA has estimated a low Ksat value and assigned a hydrologic soil Group of C in the disturbed soil areas based on field observations and standards outlined in “Site Specific Soil Mapping Standards for New Hampshire and Vermont,” dated December 2017. The disturbed areas have been identified using the *Disturbed Soil Mapping Unit Supplement for DES AOT Site Specific Soil Maps* section of the standards (see **Appendix D**).

The following is a brief description of the soils mapped on site.

MAP UNIT NO.	SOIL TAXONOMIC NAME	DESCRIPTION
140C	Chatfield-Hollis - Canton Complex 8-15% slope	The Chatfield Hollis-Charlton –complex is mapped where depth to bedrock is so variable a single soil type cannot be applied and therefore, will be mapped as a complex of soil types. Hollis soils are well drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level through very steep upland soils on bedrock-controlled hills and ridges. Chatfield soils are well drained glacial till soils with a depth to bedrock 20-40”. Canton soils are well drained with a depth to bedrock greater than 40 inches. The soils are so intermingled that mapping them separately is not practical. Slopes range from 8 to 15 percent. Saturated hydraulic conductivity is moderately high or high.
38B	Scituate 3-8% slope	Moderately well drained soils formed in a loamy eolian influenced mantle of till underlain by sandy lodgement till. The soils are very deep to bedrock and moderately deep to densic contact. Saturated hydraulic conductivity is moderately high in the solum and moderately low in the substratum. Slopes range from 3-8%.
38C	Scituate 8-15% slope	Moderately well drained soils formed in a loamy eolian influenced mantle of till underlain by sandy lodgement till. The soils are very deep to bedrock and moderately deep to densic contact. Saturated hydraulic conductivity is moderately high in the solum and moderately low in the substratum. Slopes range from 8-15%.
38D	Scituate 15-25% slope	Moderately well drained soils formed in a loamy eolian influenced mantle of till underlain by sandy lodgement till. The soils are very deep to bedrock and moderately deep to densic contact. Saturated hydraulic conductivity is moderately high in the solum and moderately low in the substratum. Slopes range from 15-25%.
<u>538A</u> P	Squamscott 0-3% slope	Very deep poorly drained soils formed in sandy materials overlying loamy sediments on marine terraces. Permeability is rapid in the upper part of the soil and moderately slow in the lower part. Slopes range from 0-3%



MAP UNIT NO.	SOIL TAXONOMIC NAME	DESCRIPTION
<u>134A</u> VP	Maybid 0-3% slope	Very deep, very poorly drained soils formed in marine sediments. They are nearly level on lowlands. Saturated hydraulic conductivity is moderately high or high in the surface layer and very low to moderately high in the subsoil and substratum. Slopes range from 0-3%.
299A/caabb	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is well drained and there is no natural soil within 60". There is no restrictive layer. The Ksat value is moderate and the hydrologic soil group is B.
299C/ccdbc	Udorthents, smooth 8-15% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is well drained, and the parent material is glacial till with bedrock within 20 inches in the soil profile. The Ksat value is moderated and the hydrologic soil group is C.
299A/dcccc	Udorthents, Smooth 0-3% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till with a mineral restrictive feature. The Ksat value is low and the hydrologic soil group is C.
299A/dcccd	Udorthents, smooth 0-3% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till with a mineral restrictive feature. The Ksat value is low and the hydrologic soil group is D.
299A/dcacc	Udorthents, smooth 0-3% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till and there is no restrictive layer. The Ksat value is low and the hydrologic soil group is C.
299A/daccc	Udorthents, smooth 0-3% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained and there is no natural soil within 60". There is no restrictive layer. The Ksat value is moderate and the hydrologic soil group is C.
299B/dcccc	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till. There is a mineral restrictive layer. The Ksat value is low and the hydrologic soil group is C.
299C/dcccc	Udorthents, smooth 8-15% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till. There is a mineral restrictive layer. The Ksat value is low and the hydrologic soil group is C.
299D/dcccc	Udorthents, smooth 15-25% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till. There is a mineral restrictive layer. The Ksat value is low and the hydrologic soil group is C.



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MAP UNIT NO.	SOIL TAXONOMIC NAME	DESCRIPTION
299E/dcccc	Udorthents, smooth 15-25% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is moderately well drained, and the parent material is glacial till. There is a mineral restrictive layer. The Ksat value is low and the hydrologic soil group is C
299B/ccdbc	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is well drained, and the parent material is glacial till with bedrock within 20 inches in the soil profile. The Ksat value is moderated and the Hydraulic Soil group is C.
299B/ccdbc	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is well drained, and the parent material is glacial till with bedrock within 20 inches in the soil profile. The Ksat value is moderated and the hydrologic soil group is C.
299B/hahde	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. This area has fractured bedrock at the soil surface. The drainage class is not determinable, there is no natural soil within 60 inches, there are manmade impervious surfaces due to the fractured bedrock, the Ksat value cannot be determined and the hydrologic soil group cannot be determined.
<u>299A/ffccd</u> <u>P</u>	Udorthents, smooth 3-8% slope	This map unit represents areas that have been cut and filled to create a large level on nearly level area. Soil material making up the map units typically comes from the immediate area. The drainage class is poorly drained, and the parent material is marine silt and clay deposits with a mineral restrictive feature. The Ksat value is low and the hydrologic soil group is D.

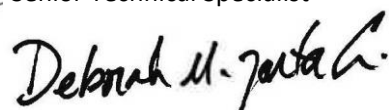
GZA trusts that this report and Site-Specific Soil map meet your current planning needs. Once you have reviewed the report and soils information, please let us know if you require additional information.

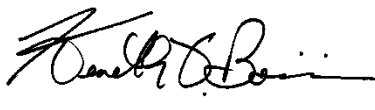
Please do not hesitate to contact Mr. James Long at 603-232-8756 if you have any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.


James H. Long, CSS, CWS
Senior Technical Specialist


Deborah M. Zarta Gier, CNRP
Principal


Kenneth Boivin, CHMM
Consultant / Reviewer

JHL/DMZ/DMZ:rl

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Attachments: Appendix A - Limitations
Appendix B - Site-Specific Soil Map



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Appendix C - Official Series Descriptions

Appendix D - Disturbed Soil Mapping Unit Supplement

Figure 1 – Site-Specific Soil Map



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APPENDIX A
NATURAL RESOURCE LIMITATIONS



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) has prepared this report on behalf of, and for the exclusive use of CMA Engineers, Inc. ("Client") for the stated purpose(s) and location(s) identified in the report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not identified in the agreement, for any use, without our prior written permission, shall be at that party's risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Report and/or proposal, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the data gathered and observations made during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

LIMITS TO OBSERVATIONS

4. Natural resource characteristics are inherently variable. Biological community composition and diversity can be affected by seasonal, annual or anthropogenic influences. In addition, soil conditions are reflective of subsurface geologic materials, the composition and distribution of which vary spatially.
5. The observations described in this report were made on the dates referenced and under the conditions stated therein. Conditions observed and reported by GZA reflect the conditions that could be reasonably observed based upon the visual observations of surface conditions and/or a limited observation of subsurface conditions at the specific time of observation. Such conditions are subject to environmental and circumstantial alteration and may not reflect conditions observable at another time.
6. The conclusions and recommendations contained in this report are based upon the data obtained from a limited number of surveys performed during the course of our work on the site, as described in the Report. There may be variations between these surveys and other past or future surveys due to inherent environmental and circumstantial variability.

RELIANCE ON INFORMATION FROM OTHERS

7. Preparation of this Report may have relied upon information made available by Federal, state and local authorities; and/or work products prepared by other professionals as specified in the report. Unless specifically stated, GZA did not attempt to independently verify the accuracy or completeness of that information.

COMPLIANCE WITH REGULATIONS AND CODES

8. GZA's services were performed to render an opinion on the presence and/or condition of natural resources as described in the Report. Standards used to identify or assess these resources as well as regulatory jurisdiction, if any, are stated in the Report. Standards for identification of jurisdictional resources and regulatory control over them may vary between governmental agencies at Federal, state and local levels and are subject to change over time which may affect the conclusions and findings of this report.



NEW INFORMATION

9. In the event that the Client or others authorized to use this report obtain information on environmental regulatory compliance issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this work, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

10. GZA recommends that we be retained to provide further investigation, if necessary, which would allow GZA to (1) observe compliance with the concepts and recommendations contained herein; (2) evaluate whether the manner of implementation creates a potential new finding; and (3) evaluate whether the manner of implementation affects or changes the conditions on which our opinions were made.



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APPENDIX B
SITE-SPECIFIC SOIL MAP



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APPENDIX C SOIL SERIES DESCRIPTIONS

LOCATION CHATFIELD

NH+CT MA NJ NY

Established Series

Rev. LWK-ERS-JTI

04/2017

CHATFIELD SERIES

The Chatfield series consists of well drained soils formed in loamy melt-out till. They are moderately deep to bedrock. They are nearly level to very steep soils on bedrock-controlled hills and ridges. Slope ranges from 0 to 70 percent. Crystalline bedrock is at depths of 50 to 100 cm. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Coarse-loamy, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Chatfield fine sandy loam, on a 13 percent slope in a wooded area. (Colors are for moist soil unless otherwise noted).

Oi -- 0 to 3 cm, slightly decomposed leaf, needle, and twig litter; extremely acid, pH 4.2. (0 to 15 cm thick.)

A -- 3 to 5 cm, very dark gray (10YR 3/1) fine sandy loam, gray (10YR 5/1), dry; weak fine subangular blocky structure; friable; many fine and medium roots throughout; 5 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt smooth boundary. (1 to 25 cm thick.)

Bw1 -- 5 to 33 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; weak fine subangular blocky structure; friable; common fine roots throughout and common medium roots throughout; 15 percent mixed gravel and cobbles; very strongly acid, pH 4.5; abrupt wavy boundary.

Bw2 -- 33 to 76 cm, strong brown (7.5YR 5/6) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few fine roots throughout; 20 percent mixed rock fragments; very strongly acid, pH 4.5; abrupt irregular boundary. (Combined thickness of the Bw horizons is 10 to 80 cm.)

2R -- 76 cm; fractured slightly-weathered schist bedrock.

TYPE LOCATION: Merrimack County, New Hampshire; Town of Epsom, 450 feet north-northwest from point 3,550 feet southwest along Old Mountain Road from intersection of Mountain Road and Tarlton Road. USGS Gossville, NH topographic quadrangle; Latitude 43 degrees, 11 minutes, 55.79 seconds N. and Longitude 71 degrees, 19 minutes, 22.31 seconds W., WGS 1984.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 40 to 97 cm. Depth to bedrock ranges from 50 to 100 cm from the mineral soil surface. Rock fragments range from 5 to 50 percent by volume in the A horizon and from 5 to 35 percent in the B and C horizons. Rock fragments are typically gravel or channers, but include cobbles, stones, boulders and flagstones, particularly just above the bedrock.

The O horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 2. It is slightly, intermediately, and/or highly decomposed plant material. Reaction ranges from extremely acid to moderately acid.

The A, or Ap horizon where present, has hue of 7.5YR to 2.5Y, value of 2 to 4, and chroma of 1 to 4. Dry value is 6 or higher. Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine-earth

fraction. Structure is granular. Consistence is friable or very friable. Reaction ranges from extremely acid to moderately acid, unless limed.

The AB or BA horizon, where present, has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. Texture is similar to the A horizon.

The Bw horizon commonly has hue of 10YR or 2.5Y, and includes 7.5YR when a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (greater than 0.15) exists, value of 3 to 6, and chroma of 4 to 6. Texture is similar to the A horizon. The Bw horizon has subangular blocky or granular structure and is friable or very friable. Reaction ranges from very strongly acid to moderately acid.

Some pedons have a BC horizon with color and texture similar to the C horizon.

The C horizon, where present, has hue of 7.5YR to 5Y, value of 4 or 5, and chroma of 2 to 4, and the 7.5YR hue is limited to horizons having a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (&&&> 0.15). Texture is sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam in the fine-earth fraction and may have lenses or pockets of loamy sand. It is massive and may have plate-like divisions. It is friable or firm. Reaction ranges from very strongly through moderately acid.

The 2R horizon is dominantly schist, granite, or gneiss bedrock. In places it is massive, but it dominantly has vertical and horizontal fractures in the upper 30 to 76 cm.

COMPETING SERIES: These are the [Chadakoin](#), [Charlton](#), [Maplecrest](#), [Riverhead](#), [Stinger](#), and [Valois](#) series. Chadakoin, Maplecrest, and Valois soils formed in till derived primary from sedimentary rock parent materials and are greater than 100 cm to bedrock. Charlton soils formed in similar parent material to that of Chatfield but are greater than 150 cm to bedrock. Riverhead soils formed in glacial outwash deposits and are greater than 100 cm to bedrock. Stinger soils are not from Region R and have a paralithic contact.

GEOGRAPHIC SETTING: Chatfield soils are nearly level through very steep, and are on bedrock-controlled glaciated upland landscapes. The soils formed in a moderately thick mantle of melt-out till overlying granite, gneiss, or schist bedrock. Slope ranges from 0 to 70 percent. Mean annual precipitation ranges from 660 to 1270 mm, mean annual temperature ranges from 7 to 13 degrees C, and the frost free season ranges from 130 to 180 days. Elevation ranges from 0 to 305 meters above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Brimfield](#), [Brookfield](#), [Cardigan](#), [Charlton](#), [Hollis](#), [Narragansett](#), [Nipmuck](#), and [Paxton](#) soils and their wetter associates on nearby landscapes where the soil mantle is deeper than 100 cm. Brimfield, Brookfield and Nipmuck soils formed in sulfur bearing parent materials and have a ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron less than 0.15 and have pedogenic iron contents greater than 1 percent throughout the pedon. Brookfield, Charlton, Narragansett, and Paxton soils are very deep soils. Cardigan soils are moderately deep soils that formed in till derived from phyllite, slate, shale, and schist. Hollis soils are shallow to bedrock and are on nearby ridge crests and areas adjacent to rock outcrops.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. Potential for surface runoff ranges from low to high. Saturated hydraulic conductivity is moderately high or high in the mineral soil.

USE AND VEGETATION: Most areas of Chatfield soils are in woodland. Major tree species include white and northern red oaks, sugar maple, beech, eastern hemlock, eastern white pine, eastern red cedar, and shagbark hickory. Some small cleared areas are used for pasture, are idle, or are sites for residential and recreational development.

DISTRIBUTION AND EXTENT: Connecticut, eastern New York, Massachusetts, New Jersey, and New Hampshire. MLRAs 142, 143, 144A and 145. The soils are of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Orange County, New York, 1940.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - the zone from 0 to 5 cm (Oi and A horizons).

Cambic horizon - the zone from 5 to 76 cm (Bw1 and Bw2 horizons).

Lithic contact - bedrock at 76 cm (2R horizon).

Particle-size control section - the zone from 28 to 76 cm (part of the Bw1 horizon and all of the Bw2 horizon).

Lithologic discontinuity - at a depth of 76 cm.

ADDITIONAL DATA: M.S. Thesis work by Shawn McVey, University of Connecticut, 2006. Full characterization data for pedons with User Pedon IDs of S1955NH015003, S1982CT007005, S1982CT007005, S1982NY061001, S1995NH013003, S1995NJ037003, S1998NY005001, S1999NY005004, S2000NY005002, S2000NY005004, S2000NY005008, S2000NY119002, S2000NY119003, S2002CT005007, and S2002CT005008. Pedons analyzed by the NSSL, Lincoln, NE. The laboratory characterization data for these pedons and similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: <http://ncsslabdatamart.sc.egov.usda.gov/>

National Cooperative Soil Survey
U.S.A.

LOCATION HOLLIS

CT+MA NH NJ NY

Established Series

Rev. MFF-SMF-SJM-DCP

05/2016

HOLLIS SERIES

The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland soils on bedrock-controlled hills and ridges. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Loamy, mixed, superactive, mesic Lithic Dystrudepts

TYPICAL PEDON: Hollis gravelly fine sandy loam, 3 to 15 percent slopes, forested. (Colors are for moist soil.)

Oi--0 to 3 cm; slightly decomposed plant material.

Oa--3 to 5 cm; black (10YR 2/1) highly decomposed plant material; moderate fine granular structure; very friable; many fine and very fine roots; abrupt smooth boundary. (Combined thickness of the O horizons is 0 to 10 cm.)

A--5 to 18 cm; very dark grayish brown (10YR 3/2) gravelly fine sandy loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; very friable; common fine, very fine, medium, and coarse roots; 10 percent gravel, 5 percent channers; very strongly acid; clear smooth boundary. (3 to 15 cm thick)

Bw1--18 to 25 cm; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate medium subangular blocky structure; friable; few very fine and fine roots, common medium roots; 10 percent gravel, 10 percent channers; strongly acid; clear wavy boundary.

Bw2--25 to 41 cm; yellowish brown (10YR 5/6) gravelly fine sandy loam; moderate medium and coarse subangular blocky structure; friable; few fine and very fine roots, common medium roots; 10 percent gravel, 5 percent channers; strongly acid; abrupt smooth boundary. (Combined thickness of the Bw horizons is 18 to 48 cm.)

2R--41 cm; schist bedrock.

TYPE LOCATION: Middlesex County, Connecticut, town of East Hampton, 1000 feet due west of Connecticut Route 196 and 3200 feet due north of Connecticut Route 151; USGS Moodus, CT topographic quadrangle, Latitude 41 degrees 31, minutes 28, seconds N., Longitude 72 degrees, 29 minutes, 48 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum and depth to bedrock range from 25 to 50 cm. Rock fragments commonly range from 5 through 35 percent by volume, but some pedons have less than 5 percent rock fragments. The fragments are mostly subrounded gravel, except where the surface is stony. The soil has 20 percent or more silt in the particle-size control section. Unless limed, reaction ranges from extremely acid through moderately acid in the organic horizons and very strongly acid through moderately acid in the mineral

horizons.

The O horizon, where present, ranges from slightly decomposed to highly decomposed plant material.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. Consistence is friable or very friable.

Some pedons have a BA horizon with colors similar to the A horizon and other properties similar to the Bw horizon.

The Bw horizon commonly has hue of 10YR or 2.5Y, and includes 7.5YR when a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (greater than 0.15) exists, value of 4 or 5, and chroma of 4 through 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. The Bw horizon has granular or subangular blocky structure. Consistence is friable or very friable.

Some pedons have a thin BC or C horizon with color like the Bw horizon, except it includes hue of 5Y. Texture, structure, and consistence are similar to the Bw horizon.

Some pedons have a thin 2Cr horizon that is typically weathered schist and moderately cemented.

COMPETING SERIES: This is the [Holyoke](#) series. Holyoke soils formed in a thin mantle of till derived mainly from basalt and red sandstone, conglomerate, and shale, and typically overly basalt, red sandstone, conglomerate, or shale bedrock.

The [Cleveland](#), [Kearsarge](#), and [Brimfield](#) series are in closely related families. Cleveland soils have less than 20 percent silt in the particle-size control section and lack a 2R horizon. Kearsarge soils lack a 2R horizon and have rock fragments of phyllite, slate, or schist. Brimfield soils formed in parent materials derived from sulfur bearing schist and have a ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron of less than 0.15. They have pedogenic iron contents of greater than 1 percent throughout the pedon.

GEOGRAPHIC SETTING: Hollis soils are nearly level to very steep soils on bedrock controlled hills, modified by glacial processes. Slope ranges from 0 to 60 percent. The soils formed in a thin mantle of till derived from local bedrock of schist, granite, and gneiss. Mean annual temperature ranges from 7 to 13 degrees C and mean annual precipitation ranges from 910 to 1295 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 115 through 185 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Brimfield](#), [Acton](#), [Broadbrook](#), [Brookfield](#), [Canton](#), [Charlton](#), [Chatfield](#), [Essex](#), [Gloucester](#), [Hibernia](#), [Leicester](#), [Montauk](#), [Narragansett](#), [Paxton](#), [Rainbow](#), [Ridgebury](#), [Rockaway](#), [Scituate](#), [Sutton](#), [Wapping](#), [Whitman](#), and [Woodbridge](#) soils on nearby landscapes. All are very deep upland soils formed in till except for the Brimfield and Chatfield soils. Acton, Rainbow, Rockaway, Scituate, Sutton, Wapping, and Woodbridge soils are moderately well drained. The Broadbrook, Brookfield, Canton, Charlton, Essex, Montauk, Narragansett, and Paxton soils are well drained. Chatfield soils have bedrock within a depth of 50 to 100 cm. Gloucester soils are somewhat excessively drained. Hibernia, Leicester, and Ridgebury soils are somewhat poorly drained or poorly drained soils in drainageways or low lying areas.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained and somewhat excessively drained. Surface runoff is negligible to very high. Saturated hydraulic conductivity is moderately high or high.

USE AND VEGETATION: Mostly forested. Small areas with few rock outcrops are cleared of stones and used for cultivated crops, but most cleared areas are in hay or pasture. Scattered areas are used for community development. Common trees are northern red, white, black, and chestnut oak, hickory, eastern white pine, eastern hemlock, and gray and black birch.

DISTRIBUTION AND EXTENT: Glaciated uplands in Connecticut, Massachusetts, New Jersey, New Hampshire, and eastern New York. MLRAs 101, 142, 144A, and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Nashua Area, New Hampshire, 1909.

REMARKS: Diagnostic horizons and features recognized in this pedon include:

1. Ochric epipedon - the zone from 0 to 18 cm (O and A horizons).
2. Cambic horizon - the zone from 18 to 41 cm (Bw1 and Bw2 horizons).
3. Lithic contact - hard bedrock at 41 cm (2R horizon).
4. Particle-size control section - the zone from 30 to 41 cm.
5. Loamy (coarse-loamy) particle-size class - the control section from 30 to 41 cm averages less than 35 percent clay in fine-earth fraction and the soil is in a Lithic subgroup.
6. Lithologic discontinuity - till with rock fragments from mixed sources overlying single kind of hard bedrock at 41 cm.

ADDITIONAL DATA: M.S. Thesis work by Shawn McVey, University of Connecticut, 2006. Full characterization data for sample no. 1999CT005001, 2000CT007004, S2002CT005001, S2002CT005004, S2002CT005005, S2002CT005006, S1998NY061001, S2000NY119001. Partial characterization data for sample no. S99NY061003 and S99NY061003A-3D. Analyzed by the NSSL, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

LOCATION CANTON

MA+CT NH NY RI

Established Series

Rev. DAS-DCP-MCT-DHZ

05/2016

CANTON SERIES

The Canton series consists of very deep, well drained soils formed in a loamy mantle underlain by sandy till. They are on nearly level to very steep moraines, hills, and ridges. Slope ranges from 0 to 45 percent. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum. The mean annual temperature is about 9 degrees C and the annual precipitation is about 1205 mm.

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Canton fine sandy loam on a west-facing, convex, 8 percent slope in an extremely stony forested area at an elevation of about 210 meters. (Colors are for moist soil unless otherwise noted.)

Oi-- 0 to 5 cm; slightly decomposed plant material; (0 to 13 cm thick.)

A-- 5 to 13 cm; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; friable; common fine roots; 5 percent gravel; very strongly acid (pH 4.6); abrupt smooth boundary. (3 to 10 cm thick.)

Bw1-- 13 to 30 cm; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; very strongly acid (pH 4.6); clear smooth boundary.

Bw2-- 30 to 41 cm; yellowish brown (10YR 5/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; strongly acid (pH 5.1); clear smooth boundary.

Bw3-- 41 to 56 cm; yellowish brown (10YR 5/4) gravelly fine sandy loam; weak medium subangular blocky; friable; common fine and medium roots; 15 percent gravel; strongly acid (pH 5.1); abrupt smooth boundary. (Combined thickness of the Bw horizons is 43 to 84 cm.)

2C-- 56 to 170 cm; grayish brown (2.5Y 5/2) gravelly loamy sand; massive; friable; 25 percent gravel; moderately acid (pH 5.6).

TYPE LOCATION: Worcester County, Massachusetts; Town of Douglas; 150 feet south on Wallum Lake Road from the junction of Cedar and South West Main Streets, and 165 feet southwest of Wallum Lake Road. USGS Oxford, MA quadrangle; Latitude 42 degrees, 2 minutes, 43.2 seconds N., and Longitude 71 degrees, 45 minutes, 44.8 seconds W., NAD 83.

RANGE IN CHARACTERISTICS: Solum thickness is commonly 46 to 91 cm, but ranges to 36 cm. It corresponds closely to the depth to the sandy till. Rock fragment content consists of 0 to 20 percent gravel and 0 to 5 percent cobbles in the solum. Stones and boulders are 0 to 15 percent of the surface and solum. Gravel content is 10 to 30 percent, cobbles 5 to 10 percent, and stones 0 to 10 percent in the substratum. Rock fragments are dominantly granite, gneiss, and quartzite. The soil ranges from extremely acid to moderately acid.

The O horizons, where present, consist of slightly, moderately, and/or highly decomposed organic material.

The A horizon has hue of 7.5YR or 10YR, value of 2 to 4, and chroma of 1 to 3. Texture is sandy loam, fine sandy loam, loam, or very fine sandy loam in the fine-earth fraction. Some pedons have an Ap horizon with properties similar to the A horizon. It is up to 20 cm thick.

Some pedons have a thin E or AE horizon that has hue of 7.5YR or 10YR, value of 3 to 5 and chroma of 1 or 2 with similar textures to the A horizon. It is up to 8cm thick.

The upper Bw horizons commonly have hue of 10YR, and includes 7.5YR when a high ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron (greater than 0.15) exists, value of 4 or 5, and chroma of 4 to 8. The lower Bw horizons have hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 4 to 8. Texture of the fine-earth fraction of the Bw horizons is commonly fine sandy loam and less commonly sandy loam, loam, and very fine sandy loam. Structure of the Bw horizons is granular or subangular blocky.

Some pedons have a Bs, Bh, or BC horizon with texture similar to the Bw horizons.

The 2C horizon typically has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 2 or 3. In some pedons hue is 10YR with chroma of 4 to 6. The texture of the fine-earth fraction is loamy fine sand or coarser. It is single grain or massive. Consistence is friable, very friable or loose. Thin lenses or small pockets of firm or very firm finer textured material are common below 91 cm.

COMPETING SERIES: There are no other soils currently in the same family.

The [Agawam](#), [Barnstable](#), [Branford](#), [Brookfield](#), [Charlton](#), [Haven](#), and [Narragansett](#) series are in closely related families. The Agawam, Branford, and Haven soils have stratified sand or sand and gravel in the series control section. In addition, the Branford soils have hues redder than 7.5YR throughout the B horizon. Barnstable soils formed in till over outwash and have less than 30 percent fine sand in the lower part of the Bw horizon. Brookfield soils formed in sulfur bearing parent materials and have a ratio of ammonium oxalate extractable iron to dithionite-citrate extractable iron less than 0.15 and have pedogenic iron contents greater than 1 percent throughout the pedon. Charlton soils lack a lithologic discontinuity of abrupt change in sand distribution. Narragansett soils have more than 55 percent silt and very fine sand in the solum.

GEOGRAPHIC SETTING: Canton soils are on moraines and glaciated upland hills and ridges. Slope ranges from 0 to 45 percent. The soils formed in an acid coarse loamy supraglacial melt out till over loose sandy till of Wisconsin age derived from gneiss, granite and schist along with some fine-grained sandstone in some pedons. The loamy mantle in some pedons is influenced or derived from eolian sources. The climate is humid temperate. The mean annual air temperature is 7 to 11 degrees C, and the mean annual precipitation ranges from 1016 to 1295 mm.

GEOGRAPHICALLY ASSOCIATED SOILS: The [Newfields](#) series is the moderately well drained member of the same toposequence. The [Agawam](#), [Haven](#), [Merrimac](#), and [Warwick](#) soils are on nearby glacial outwash kames and plains. The [Barnstable](#), [Brookfield](#), [Charlton](#), [Cheshire](#), [Dutchess](#), [Gloucester](#), [Hollis](#), [Montauk](#), [Narragansett](#), and [Paxton](#) soils are on nearby glaciated uplands. Brookfield, Charlton, Cheshire, Dutchess, Gloucester, Hollis, Montauk, and Paxton soils do not have a contrasting particle size in the control section.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained. Runoff is negligible to medium. Internal drainage is medium. Saturated hydraulic conductivity is moderately high or high in the solum and high or very high in the substratum.

USE AND VEGETATION: Mostly forested. Some areas have been cleared of surface stones and are used for crops and pasture. Native vegetation is forest composed of eastern white pine, northern red, white, and black oaks, hickory, red maple, sugar maple, gray birch, yellow birch, beech, eastern hemlock, and white ash.

DISTRIBUTION AND EXTENT: Glaciated uplands in Connecticut, Massachusetts, New Hampshire, eastern New York, and Rhode Island, also in the Massachusetts Coastal Islands; MLRAs 144A, 145, and 149B. The

series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Herkimer County, New York, 1969.

REMARKS:

Diagnostic horizons and features recognized in this pedon are:

- 1) Ochric epipedon - the zone from 0 to 13 cm (Oi and A horizons).
- 2) Cambic horizon - the zone from 13 to 56 cm (Bw1, Bw2, and Bw3 horizons).
- 3) Contrasting particle size - the coarse-loamy material contains less than 50 percent fine sand or coarser, and the transition zone between the two parts of the particle-size control section is less than 12 cm thick. (Coarse-loamy over sandy or sandy skeletal).
- 4) Lithologic discontinuity - abrupt change in sand distribution at 56 cm (2C horizon).
- 6) Particle-size control section - the zone from 30 to 105 cm (Bw1, Bw2, Bw3, and 2C horizons).

ADDITIONAL DATA: M.S. Thesis work by Shawn McVey, University of Connecticut, 2006. Full characterization data for sample no. S1982CT007001, S1999CT013001, S1999CT013004, S2000CT007003, S2004CT011003, and pedons of similar soils is available through the National Cooperative Soil Survey Soil Characterization Database: <http://ncsslabdatamart.sc.egov.usda.gov/>

National Cooperative Soil Survey
U.S.A.

LOCATION SCITUATE

MA+NH

Established Series
Rev. WHT-DAS
01/2013

SCITUATE SERIES

The Scituate series consists of moderately well drained soils formed in a loamy eolian influenced mantle of till underlain by sandy lodgement till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level through moderately steep soils on glaciated uplands. Saturated hydraulic conductivity is moderately high or high in the solum and moderately low or moderately high in the substratum. Mean annual precipitation is about 43 inches (1092 millimeters) and the mean annual temperature is about 48 degrees F. (9 degrees C.)

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Oxyaquic Dystrudepts

TYPICAL PEDON: Scituate fine sandy loam - woodland, in a stony area. (Colors are for moist soil unless otherwise indicated).

A -- 0 to 5 inches (0 to 13 centimeters); black (10YR 2/1) fine sandy loam, dark gray (10YR 4/1) dry; weak and moderate fine granular structure; very friable; many fine roots; 10 percent gravel; extremely acid; abrupt wavy boundary. (1 to 6 inches (3 to 15 centimeters) thick.)

Bw1 -- 5 to 21 inches (13 to 53 centimeters); strong brown (7.5YR 5/6) fine sandy loam; massive; very friable; common fine roots; 10 percent gravel; strongly acid; clear wavy boundary.

Bw2 -- 21 to 27 inches (53 to 69 centimeters); yellowish brown (10YR 5/6) sandy loam; massive; very friable; few fine roots; 10 percent gravel; common fine and medium distinct yellowish red (5YR 5/6) masses of iron accumulation; strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 6 to 40 inches (15 to 102 centimeters) thick.)

2Cd -- 27 to 65 inches (69 to 165 centimeters); yellowish brown (10YR 5/4) very gravelly loamy sand; massive; firm; 30 percent gravel and 5 percent cobbles; common medium distinct light brownish gray (2.5Y 6/2) iron depletions; moderately acid.

TYPE LOCATION: Hampshire County, Massachusetts; Town of Pelham, 3600 feet northwest of the junction of Shutesbury Road and Daniel Shays Highway, 50 feet west of Shutesbury Road, in woods. USGS Shutesbury, MA topographic quadrangle; Latitude 42 degrees, 24 minutes, 15 seconds N. and longitude 72 degrees, 24 minutes, 43 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: The loamy mantle is 18 through 34 inches (46 through 90 centimeters) thick and corresponds closely the depth to the dense substratum. Rock fragments are dominantly granite and gneiss. Gravel content ranges from 5 through 25 percent by volume in the solum and from 10 through 35 percent in the 2Cd horizon. Cobbles range from 0 through 15 percent throughout. The surface horizon has 0 through 20 percent stones and the B and 2C horizons have 0 through 10 percent stones. Boulders range from 0 through 5 percent throughout. Reaction ranges from extremely acid through moderately acid in the surface horizon and from very strongly acid through moderately acid in the subsoil and substratum.

Some pedons have an O horizon.

The A horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. In cultivated areas the Ap horizon has hue of 10YR, value of 2 through 4, and chroma of 1 through 4. Dry value of the Ap horizon is 6 or more. Texture is fine sandy loam, sandy loam, or loam in the fine-earth fraction. Some pedons have an incipient E horizon immediately below the A horizon.

The upper part of the Bw horizon has hue of 7.5YR through 2.5Y, value of 3 through 6, and chroma of 4 through 6. Texture is fine sandy loam, sandy loam, or loam in the fine-earth fraction.

The lower part of the Bw horizon has hue of 10YR through 5Y, value and chroma of 4 through 6. Redox features are few through many and are distinct or prominent. Texture is fine sandy loam, sandy loam, or loam in the fine-earth fraction.

Some pedons have a thin BC horizon that ranges from loamy sand through sandy loam. Color range is the same as the lower part of the Bw horizon but the range includes value of 7 in some pedons.

The 2Cd horizon has hue of 10YR through 5Y, value of 4 through 6, and chroma of 2 through 4. Redox features are common or many, medium and coarse, and are distinct or prominent. Texture is loamy sand, loamy fine sand, or loamy coarse sand in the fine-earth fraction. Some pedons have subhorizons of sandy loam or fine sandy loam below a depth of 40 inches. Consistence is firm or very firm.

COMPETING SERIES: These are the [Amostown](#), [Bernardston](#), [Broadbrook](#), [Horseneck](#), [Nantucket](#), [Paxton](#), and [Wethersfield](#) series. Amostown soils formed in lacustrine sediments that are silt or very fine sand the lower solum and substratum. Bernardston and Broadbrook soils have sola with more than 65 percent silt plus very fine sand. Horseneck soils are formed in glaciofluvial deposits. Paxton soils are well drained and have loamy substrata. Nantucket soils have a lithologic discontinuity and have loamy substrata. Wethersfield soils have 5YR or redder hue in the B and C horizons.

GEOGRAPHIC SETTING: Scituate soils are nearly level through moderately steep and are on glaciated uplands. Slope ranges from 0 through 25 percent. The soils are on nearly level to gently sloping tops of broad ridges and drumlins, and on gently sloping to moderately steep foot slopes and toe slopes. They formed in eolian influenced Wisconsin age loamy till underlain by dense sandy lodgement till. The mean annual temperature ranges from 45 through 50 degrees F. (7 through 10 degrees C.) The mean annual precipitation ranges from 40 through 45 inches (1016 through 1143 millimeters). The frost free season ranges from 100 through 120 days.

GEOGRAPHICALLY ASSOCIATED SOILS: The well drained [Montauk](#), somewhat poorly and poorly drained [Ridgebury](#), and the poorly drained [Norwell](#) soils, along with the very poorly drained [Whitman](#) and [Brockton](#) soils are in a drainage sequence with Scituate. [Deerfield](#), [Hinckley](#), [Merrimac](#), [Scarboro](#), [Sudbury](#), [Walpole](#), and [Wareham](#) soils are on nearby glacial outwash plains, kames, deltas, and eskers. [Hollis](#), [Paxton](#), and [Woodbridge](#) soils are on nearby loamy glacial till uplands.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. Saturated hydraulic conductivity is moderately high or high in the loamy surface and subsoil and moderately low or moderately high in the dense sandy substratum.

USE AND VEGETATION: Mostly forested. Some areas are used for hay, pasture, and silage corn. Common tree species in woodlands are northern red, white, and scarlet oak, gray, black, and yellow birch, white ash, red maple, elm, eastern white pine, and eastern hemlock. Many areas are used for urban development.

DISTRIBUTION AND EXTENT: Massachusetts and New Hampshire. MLRA's 144A and 145. The series is of large extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Providence County, Rhode Island; 1937.

REMARKS: This revision reflects changes to the range in characteristics as well as general updating to metric units.

Diagnostic horizons and features recognized in this pedon include:

- 1) Ochric epipedon - the zone from 0 to 5 inches (0 to 13 centimeters) (A horizon).
- 2) Cambic horizon - the zone from 5 to 27 inches (13 to 69 centimeters) (Bw horizons).
- 3) Densic material - the zone from 27 to 65 inches (69 to 165 centimeters) (2Cd horizon).
- d. Oxyaquic subgroup - redoximorphic features within 40 inches (100 centimeters) of the mineral surface.
- 4) Particle-size control section - the zone from 10 through 27 inches (25 through 69 centimeters) (Bw horizons).
- 5) Lithologic discontinuity - at a depth of 27 inches (69 centimeters).

ADDITIONAL DATA: SSIR20 New England states, contains some laboratory data for Scituate soils.

National Cooperative Soil Survey
U.S.A.

LOCATION SQUAMSCOTT

NH

Established Series

RJK-HRM-SHG

10/97

SQUAMSCOTT SERIES

The Squamscott series consists of very deep, poorly drained soils that formed in sandy materials overlying loamy sediments on marine or lacustrine plains or terraces. Permeability is rapid in the upper part of the soil and moderately slow in the lower part. Slope ranges from 0 to 5 percent. Mean annual precipitation is about 40 inches, and mean annual temperature is about 48 degrees F.

TAXONOMIC CLASS: Sandy over loamy, mixed, active, mesic Typic Epiaquods

TYPICAL PEDON: Squamscott fine sandy loam - on a nearly level area in woodland. The surface is covered by a one inch layer of loose needles, leaves, and twigs.(Colors are for moist soil.)

0e--0 to 2 inches; dark reddish brown (5YR 3/3) hemic material; 35 percent fibers, rubbed; many very fine and fine roots; extremely acid; abrupt wavy boundary.

0a--2 to 3 inches; black (5YR 2/1) sapric material; 10 percent fibers, rubbed; many fine and common medium roots; extremely acid; abrupt wavy boundary. (Combined thickness of the 0 horizon is 0 to 5 inches.)

A--3 to 4 inches; black (5YR 2/1) fine sandy loam; weak fine granular structure; friable; many fine, medium and coarse roots; extremely acid; abrupt wavy boundary. (1 to 4 inches thick)

Eg--4 to 6 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium platy structure; friable; common fine and medium roots; common coarse distinct grayish brown (2.5Y 5/2) and many medium distinct very dark grayish brown (10YR 3/2) iron depletions; very strongly acid; abrupt wavy boundary. (0 to 9 inches thick)

Bhs--6 to 8 inches; dark reddish brown (5YR 2/2) loamy sand; weak medium granular structure; very friable, weakly smeary; common fine and medium roots; weak random cementation; many fine faint black (5YR 2/1) iron depletions; strongly acid; abrupt broken boundary. (0 to 4 inches thick)

Bs1--8 to 10 inches; brown (7.5YR 4/4) loamy sand; weak fine granular structure; very friable; common very fine, fine and medium roots; weak random cementation; common medium prominent olive (5Y 4/4) and few coarse distinct brown (10YR 5/3) masses of iron accumulation; strongly acid; clear wavy boundary.

Bs2--10 to 14 inches; brownish yellow (10YR 6/6) loamy sand; weak fine granular structure; very friable; few fine and medium roots; common coarse prominent yellowish red (5YR 5/8) and common medium prominent light yellowish brown (2.5Y 6/4) masses of iron accumulation; strongly acid; clear wavy boundary.

Bs3--14 to 21 inches; light olive brown (2.5Y 5/4) fine sand; weak medium platy structure; friable; few fine and medium roots; light olive gray (5Y 6/2) bands of loamy fine sand; few medium prominent yellowish red (5YR 5/8) masses of iron accumulation and many coarse prominent light gray (5Y 7/2) iron depletions; slightly acid; abrupt wavy boundary. (Combined thickness of the Bs horizon is 4 to 20 inches).

2C1--21 to 38 inches; gray (5Y 5/1) silt loam; massive; firm; few fine vesicular pores; few fine prominent strong brown (7.5YR 4/6) and many medium prominent light olive brown (2.5Y 5/4) masses of iron accumulation; neutral; gradual wavy boundary.

2C2--38 to 67 inches; light olive brown (2.5Y 5/4) silt loam; moderate fine angular blocky structure; firm; dark reddish brown (5YR 3/2) stains on faces of peds; common medium prominent gray (5Y 5/1) iron depletions in the upper part; neutral.

TYPE LOCATION: Rockingham County, New Hampshire; Town of Brentwood, 1200 feet at 185 degrees from the intersection of NH Route 101 and North Road; latitude 43 degrees 00 minutes 49 seconds North, longitude 71 degrees, 01 minutes, 57 seconds West, NAD 83.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 14 to 27 inches. The clay content in the contrasting 2C horizon ranges from 22 to 35 percent. The soil ranges from extremely acid through neutral, with acidity generally decreasing with depth. Rock fragments range from 0 to 5 percent throughout the soil. Structure is granular or subangular blocky in the solum. The 2C horizon is massive or has angular blocky geologic structure.

The 0 horizon is neutral or has hue of 2.5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 3.

The A horizon has hue of 5YR to 10YR, value of 2 to 3, and chroma of 1 to 3. Texture is fine sandy loam, sandy loam, or very fine sandy loam. Some pedons have an Ap horizon that ranges from 4 to 10 inches thick.

The Eg horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. Texture is sandy loam, fine sandy loam, loamy sand, loamy fine sand, or loamy very fine sand.

The Bh horizon has hue of 2.5YR to 7.5YR, value of 2 to 3, and chroma of 1 to 3. Texture is loamy sand, loamy fine sand, or fine sand.

The Bs horizon has hue of 5YR to 2.5Y, value of 4 to 8, and chroma of 3 to 8. Texture is loamy sand, loamy fine sand, or fine sand.

Some pedons have a C horizon above the 2C horizon that has hue of 2.5Y or 5Y, value of 5 to 7, and chroma of 1 to 4. Texture is sand, fine sand, or loamy sand.

The 2C horizon has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 1 to 3. Texture is silt loam or silty clay loam, but many pedons have thin lenses or bands of loamy fine sand, loamy very fine sand, loamy sand, sand, or silty clay.

COMPETING SERIES: There are currently no other series in the same family. The [Avoca](#), [Coveytown](#), [Enosburg](#), [Rapson](#), [Shaker](#), and [Swanton](#) series in related families. Avoca and Rapson soils are from outside of Region R. They both have free carbonates in the 2C horizons. Coveytown, Enosburg, Shaker, and Swanton soils do not have spodic horizons. In addition, Coveytown and Swanton soils have frigid temperature regimes.

GEOGRAPHIC SETTING: Squamscott soils are in low-lying, concave positions on marine or lacustrine plains or terraces. They formed in marine or glaciolacustrine deposits. Slope ranges from 0 to 5 percent, but is predominantly less than 3 percent.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Boxford](#), [Eldridge](#), [Maybid](#), [Pipestone](#), [Raynham](#), [Saugatuck](#), [Scitico](#), and [Whately](#) soils. Pipestone and Saugatuck soils are sandy throughout and Scitico and Raynham soils are loamy throughout. These soils are on similar landscape position. Eldridge and Boxford soils are moderately well drained and are on adjacent, higher landscape positions. Maybid and Whately soils are very poorly drained and are in lower landscape positions.

DRAINAGE AND PERMEABILITY: Poorly drained. Permeability is rapid above the lithologic discontinuity and moderately slow below.

USE AND VEGETATION: Most areas are in woodland. Principle trees are white pine and red maple. Some areas that are drained are in cropland.

DISTRIBUTION AND EXTENT: New Hampshire and New York (MLRA 144A). The series is of small extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Rockingham County, New Hampshire, 1986.

REMARKS: This series has been classified to the 6th edition of Keys to Soil Taxonomy with this revision. The former classification was sandy over loamy, mixed, mesic Entic Haplaquods.

Diagnostic horizons and features recognized in this pedon are:

1. Ochric epipedon - the zone from 2 to 4 inches (A horizon).
2. Albic horizon - the zone from 4 to 6 inches (E horizon).
3. Spodic horizons - the zone from 6 to 10 inches (Bhs and Bs1 horizons).
4. Strongly contrasting particle-size classes - loamy sand and fine sand textures from 12 to 21 inches and silt loam textures from 21 to 40 inches.

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LOCATION MAYBID

MA +CT NH

Established Series
Rev. WHT-SMF-MFF
08/2004

MAYBID SERIES

The Maybid series consists of very deep, very poorly drained soils formed in lacustrine or marine sediments. They are nearly level or level soils on lowlands. Slope ranges from 0 to 3 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and very low to moderately high in the subsoil and substratum. Mean annual temperature is about 48 degrees F. and the mean annual precipitation is about 45 inches.

TAXONOMIC CLASS: Fine, mixed, semiactive, nonacid, mesic Typic Humaquepts

TYPICAL PEDON: Maybid silt loam forested, at an elevation of about 85 feet. (Colors are for moist soils.)

A--0 to 7 inches; very dark gray (10YR 3/1) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable, slightly sticky, nonplastic; many fine, medium and coarse woody roots; moderately acid; clear smooth boundary. (6 to 10 inches thick)

Bg1--7 to 11 inches; gray (5Y 5/1) silty clay loam; moderate medium and coarse blocky structure; friable, sticky, slightly plastic; common fine, medium and coarse woody roots; moderately acid; clear wavy boundary.

Bg2--11 to 19 inches; greenish gray (5GY 5/1) silty clay; massive; firm, sticky, plastic; very few fine woody roots; few fine prominent brown (7.5YR 4/4) masses of iron accumulation; neutral; gradual smooth boundary. (Combined thickness of the Bg horizons is 6 to 22 inches.).

Cg1--19 to 27 inches; greenish gray (5GY 5/1) silty clay; massive; firm, sticky, plastic; neutral; gradual smooth boundary. (0 to 30 inches thick)

Cg2--27 to 65 inches; dark greenish gray (5GY 4/1) silty clay; massive; firm, sticky, plastic; neutral.

TYPE LOCATION: Essex County, Massachusetts; Town of Amesbury, 100 yards east of Woodward Road at the Massachusetts - New Hampshire state line. USGS Exeter, NH-MASS 7 1/2 minute quadrangle; latitude 42 degrees 52 minutes 55 seconds N., longitude 70 degrees 56 minutes 11 seconds W., NAD 27.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 18 to 30 inches. Content of rock fragments is usually less than 1 percent by volume. The soil ranges from strongly acid to moderately acid in the A horizon and from strongly acid to neutral in the B and C horizons. At least one horizon within 40 inches is moderately acid to neutral.

The A horizon is neutral or has hue of 10YR to 5Y, value of 2 or 3, and chroma of 0 to 2. It is silt loam or silty clay loam. It is nonsticky or slightly sticky.

The upper part of the Bg horizon is neutral or has hue of 5Y, 5G, 5GY or 5BG, value of 3 to 6, and chroma of 0 to 2. Some redoximorphic features are present in some pedons. It is silt loam, silty clay loam, or silty clay. It has weak platy, weak to moderate subangular blocky or blocky, or moderate fine granular structure, or the horizon is massive. It is friable or firm and slightly sticky or sticky.

The lower part of the Bg horizon is neutral or has hue of 5Y or 5GY, value of 4 to 6, and chroma of 0 to 2. It has distinct to prominent high chroma iron accumulations that comprise less than 40 percent of the matrix. The Bg

horizon is silty clay, silty clay loam, or clay. It has weak to moderate prismatic or blocky structure, or the horizon is massive.

The Cg horizon is neutral or has hue of 5Y, 5GY, 5G, or 5BG, value of 4 to 6, and chroma of 0 or 1. It is silty clay loam, silty clay, or clay.

COMPETING SERIES: The Maybid series is the only known member of this family.

The [Alden](#), [Biddeford](#), [Birdsall](#), [Canandaigua](#), [Clatsop](#), [Defiance](#), [Dunning](#), [Fonda](#), [Livingston](#), [Madalin](#), [Papakating](#), [Toledo](#) and [Tughill](#) series are in related families. Alden, Birdsall, Canandaigua, and Tughill soils have less than 35 percent clay in the particle-size control section. Biddeford soils have histic epipedons. Madalin soils have an argillic horizon. Clatsop soils have acid reaction. Defiance, Dunning, and Papakating soils have irregular decrease in organic matter with depth. In addition, the Papakating soils have less than 35 percent clay. Fonda, Livingston, and Toledo soils have ochric epipedons; the Livingston soils, in addition, have more than 60 percent clay.

GEOGRAPHIC SETTING: Maybid soils are level or nearly level soils on lowlands of silty and clayey sediments. The soils formed in water deposited material of marine or lacustrine origin. Slope ranges from 0 to 3 percent. Mean annual temperature ranges from 45 to 50 degrees F.; mean annual precipitation ranges from 40 to 50 inches; and mean growing season ranges from 120 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the [Belgrade](#), [Birdsall](#), [Boxford](#), [Brancroft](#), [Elmwood](#), [Raynham](#), [Scitico](#), [Scio](#), [Suffield](#), [Swanton](#), [Unadilla](#), and [Whately](#) soils. Belgrade, Birdsall, Raynham, Scio, and Unadilla soils have coarse-silty particle-size control sections. Brancroft soils are fine-silty. The moderately well and somewhat poorly drained Boxford soils, the poorly drained Scitico soils, and well drained Suffield soils are members of a drainage sequence in the same landscape. Elmwood, Swanton, and Whately soils have coarse-loamy over clayey particle-size control sections.

DRAINAGE AND PERMEABILITY: Very poorly drained. Internal drainage is very slow. Permeability is slow or very slow. Saturated hydraulic conductivity is moderately high or high in the surface layer very low to moderately high in the subsoil and substratum. The soil is intermittently ponded or has very low runoff.

USE AND VEGETATION: Mostly brush land and woodland. Woodland consists of red maple, elm, tamarack, willow, alder, black spruce, and white pine. Cattails and sedges are common in nonwooded areas.

DISTRIBUTION AND EXTENT: Glaciolacustrine or marine lowlands in MLRA 144A in Massachusetts, Connecticut, New Hampshire, and possibly eastern New York. The series is of small extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Essex County, Massachusetts, 1977.

REMARKS: The Maybid soils were formerly included with the Biddeford series which has a histic epipedon. Mineralogy and cation exchange activity class are changed in this revision from illitic to mixed based upon a review of similar soils.

Diagnostic horizons and other features recognized in this pedon are:

1. Umbric epipedon - the zone from the surface of the soil to a depth of 10 inches, when mixed (A and part of the Bg1 horizon).
2. Cambic horizon - the zone from 7 inches to a depth of 19 inches (Bg horizon).
3. Particle size class - the zone from 10 to 40 inches averages about 55 percent clay (fine).

ADDITIONAL DATA: The A horizon of the typical pedon was sampled (RT77-MA173) for base saturation (B.S.- 44 percent).

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September 17, 2019

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APPENDIX D
DISTURBED SOIL MAPPING UNIT SUPPLEMENT

Map Symbol Denominators for Disturbed Unit Supplements

The map symbols for Site-Specific Soil Mapping of disturbed soils in New Hampshire is a two part symbol with parts separated by a forward slash (/).

The first part consists of the USDA-NRCS Disturbed Map Unit symbol from the NH State-Wide Numerical Soil Legend. The map symbol is composed of 1 to 3 digits followed by a capital letter designating slope.

The second part consists of symbols of the SSSNNE NH Disturbed Soil Supplement to the Site Specific Soil Survey Standards, as detailed below. The disturbed map symbol is composed of 5 lower case letters.

Thus a Site Specific map symbol for a map prepared for an AoT application would be formatted as follows:

400A/aaaaa

These SSSNNE NH Disturbed Soil Supplemental symbols can only be used in conjunction with the USDA-NRCS Disturbed Map Unit symbols for the NH Statewide Numerical Soil Legend.

Supplemental Symbols

Supplemental symbols may be used at the discretion of the Certified Soil Scientist who creates the Site Specific Soil Survey. The five components of the Disturbed Soil Mapping Unit Supplement are as follows:

Symbol 1: Drainage Class

- a-Excessively Drained
- b-Somewhat Excessively Drained
- c-Well Drained
- d-Moderately Well Drained
- e-Somewhat Poorly Drained
- f-Poorly Drained
- g-Very Poorly Drained
- h-Not Determined

Symbol 2: Parent Material (of naturally formed soil only, if present)

- a-No natural soil within 60"
- b-Glaciofluvial Deposits (outwash/terraces of sand or sand and gravel)
- c-Glacial Till Material (active ice)
- d-Glaciolacustrine very fine sand and silt deposits (glacial lakes)
- e-Loamy/sandy over Silt/Clay deposits
- f-Marine Silt and Clay deposits (ocean waters)
- g-Alluvial Deposits (floodplains)

h-Organic Materials-Fresh water wetlands

i- Organic Materials-Tidal wetlands

Symbol 3: Restrictive/Impervious Layers

a-None

b-Bouldery surface with more than 15% of the surface covered with boulders

c-Mineral restrictive layer(s) are present in the soil profile less than 40 inches below the soil surface such as hard pan, platy structure or clayey texture with consistence of at least firm (i.e. more than 20 newtons). For other examples of soil characteristics that qualify for restrictive layers, see "Soil Manual for Site evaluations in NH" 2nd Ed., (page 3-17, figure 3-14)

d-Bedrock in the soil profile; 0-20 inches

e-Bedrock in the soil profile; 20-60 inches

f-Areas where depth to bedrock is so variable that a single soil type cannot be applied, will be mapped as a complex of soil types

g-Subject to Flooding

h-Man-made impervious surface including pavement, concrete, or built-up surfaces (i.e. buildings) with no morphological restrictive layer within control section

Symbol 4: Estimated Ksat* (most limiting layer excluding symbol 3h above).

a- High.

b- Moderate

c- Low

d- Not determined *See "Guidelines for Ksat Class Placement" in Chapter 3 of the Soil Survey Manual, USDA

Symbol 5: Hydrologic Soil Group*

a-Group A

b-Group B

c-Group C

d-Group D

e-Not determined

*excluding man-made surface impervious/restrictive layers