ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

June 13, 2025

Peter Stith, Planning Manager
City of Portsmouth Municipal Complex
1 Junkins Avenue
Portsmouth, New Hampshire 03801

Re: Application for Technical Advisory Committee Review
Tax Map 303, Lot 6
135 Corporate Drive
Altus Project No. 5336

Dear Peter,

On behalf of the City of Portsmouth Department of Public Works (DPW), AECOM Technical Services (AECOM) and Altus Engineering LLC (Altus) are pleased to submit an Application for Site Review and a Conditional Use Permit Application for the Pease Wastewater Treatment Facility (WWTF) Rehabilitation project. The City of Portsmouth DPW owns and operates the treatment facility and intends to improve the function of the existing WWTF that is under the jurisdiction of the Pease Development Authority (PDA).

The WWTF is a ±12.1-acre parcel identified on the Portsmouth Assessor Maps on Tax Map 303, Lot 6. The lot is bounded by the Spaulding Turnpike (U.S. Highway Route 16) to the northeast, Tony Rahn Park to the southeast, Corporate Drive to the southwest and the area to the northwest is undeveloped. The WWTF buildings are located in the center and eastern portion of the parcel. A section of Hodgson Brook is located along the southwest property boundary between the lot and Corporate Drive. The west boundary of the property is undeveloped and there is a mix of woods, maintained lawn and wetland. The parcel lies within the Airport Business Commercial (ABC) and Natural Resource Protection (NRP) zones.

The WWTF began operation in 1954 under the Air Force, since then several expansion and renovation projects have been completed on the site. The existing built above ground infrastructure includes a Lab/Administration Building, a Blower/Dewatering Building, a Control Operations Building, a Septage Receiving Building, a Headworks Building, a Sludge Storage tank, a Chlorine Contact Tank, two Sequencing Batch reactors, two Primary Clarifiers, and two Post Equalization Tanks. There is also an abandoned Digester and two abandoned Trickling Filter Bases on the property. The facility was originally part of the Pease Air Force Base.

The proposal includes construction of four new buildings on the parcel: a new Primary Sludge Pump Station (±480 S.F.), new Electrical/Control Building (±653 S.F.), new Chemical Storage Building (±1,956 S.F.) and an expansion of the existing Lab/Administration Building (±912 S.F.). It also includes razing the existing Control Operations Building. Other improvements to the site include new utilities to each of the buildings, new piping to support the facilities treatment operations, a new generator with concrete pad, a

new electrical transformer with concrete pad, new sidewalks, new parking and access ways, and stormwater infrastructure.

Wetland delineation was completed on the site by Michael Cuomo, Certified Wetlands Scientist, in October and November of 2022. The delineated wetland and the 100' wetland buffer are shown on applicable plans. No proposed work is planned within the delineated wetland, however some work is proposed within the 100' wetland buffer.

Wetlands identified on the site, are primarily in the western and southern corners of the lot; and small wetland has been identified along the northeast boundary. Portions of the existing WWTF lie within the 100-foot wetland buffer. The project proposes to limit disturbing the wetland buffer as much as possible, but based on the existing layout of the WWTF and the location of the wetlands, some impact to the wetland buffer is unavoidable. The wetlands and 100-foot wetlands buffer encompasses a significant portion of the lot, making improvements impossible without a Conditional Use Permit. The majority of the on-site wetland is undisturbed and allowed to grow naturally. The WWTF was constructed prior to City wetland buffer regulations and before most zoning ordinances were enacted; additionally the WWTF was constructed by the Air Force which is exempt from most permitting requirements.

Access to the site from Corporate Drive will remain the same. The access road within the WWTF perimeter will be widened a few feet to allow more space for large vehicles accessing the site. Pavement onsite will be expanded in the area where the existing operations/control building is to be removed to allow better circulation of vehicles around the site. The existing WWTF does not have any formalized parking spaces. Treatment facility staff and visitors park in paved & unpaved areas, as space allows. The proposed improvements include formalizing parking with six defined spots near the blower/dewatering building and one handicap spot near the admin building.

Tree removal as part of this project will be minimal. There are some trees to be removed from the greenspace near the proposed generator pad and some trees will need to be removed near the discharge area of Bioretention Cell #1. Vegetative buffers around the site will remain and are not anticipated to be affected as part of this project. Most of the proposed work will be in areas that were previously developed.

The site has an existing 36" drain pipe that traverses the site from the northeast to the southwest. The culvert opening in the northeast conveys offsite flows from the Spaulding Turnpike across the site. The existing stormwater system on the site connects into this 36" system at various points and there is no existing stormwater treatment on the site. The 36" system then discharges to Hodgeson Brook near the site entrance on Corporate Drive.

The proposed stormwater management design intercepts runoff from areas with proposed improvements. The project proposes to add two bioretention cell systems to the site to handle stormwater treatment of impervious surfaces. The systems will not treat all of the impervious surfaces on the site, but it is a significant improvement compared to the existing conditions. The stormwater design for this site will reduce the rate of runoff to Hodgeson Brook.

In summary, it is Altus' opinion that the rehabilitation of this site will enhance the function of the facility while reducing impacts to the existing site and area. It will improve stormwater quality, reduce the stormwater impacts to Hodgeson Brook, improve functionally of the facility, improve traffic and parking on the site and provide improved facilities for staff. This project will allow the treatment facility to operate more efficiently and support the users who rely on this facility

Enclosed please find the following for consideration at the July 1 TAC meeting:

Site Plan Application Package including:

- PDA Site Plan Review Application
- Site and Architectural Plans
- Drainage Study and Stormwater Inspection and Maintenance Manual
- Wetlands Report by Michael Cuomo, CWS
- Abutters List
- Waiver Requests
- Conditional Use Permit Application and supporting documents

As always, Altus looks forward to working with City staff. Please feel free to call or email me directly should you have any questions or need any additional information in advance of the meeting.

Sincerely,

ALTUS ENGINEERING, LLC

Enclosures

eCopy: Erich Fiedler, Portsmouth DPW
Erik Meserve, P.E., AECOM
Xiaojin (Jim) Li, PhD, AECOM
Patrick Journeay, Altus Engineering
Michael Mates, PE, PDA

pmj/5336.00 cvr ltr

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Conditional Use Permit Application

For PDA Use Only			
Date Submitted:	Municipal Review:	Fee:	
Application Complete:	Date Forwarded:	Paid:	Check #:

Applicant Information

Applicant: City of Portsmouth DPW	Agent: AECOM Technical Services, Inc.
Address: 680 Peverly Hill Road Portsmouth, NH 03801	Address: 250 Apollo Drive Chelmsford, MA 01824
Business Phone: (603) 427-1530	Business Phone: (978) 905-2100
Mobile Phone:	Mobile Phone:
Fax: (603) 427-1539	Fax:

Site Information

Portsmouth Tax Map: 303 | Lot #: 6 | Zone: Airport Buisiness Commercial Zone

Address / Location of Work: 135 Corporate Drive, Portsmouth, NH 03801

Proposed Activity (check all that apply)	Impacted Jurisdictional Area(s): Check all that apply
X New Structure	Wetland
X Expansion of Existing Structure	X Wetland Buffer
X Other site alteration (specify): NEW STORMWATER INFASTRUCTURE & WWTF RELATED UTILITY IMPROVEMENTS	

Total area of wetland on subject lot:	127,000 SF
Total area of wetland buffer on subject lot:	163,100 SF
Distance of proposed structure or activity to edge of wetland:	TBD LF

	On subject lot	Off subject lot
Area of wetland impacted:	0 SF	0 SF
Area of wetland buffer impacted:	19,200 SF	500 SF
Total area of wetland and wetland buffer impacted:	19,200 SF	500 SF

Provide complete description of site and work to be completed:

The Pease Wastewater Treatment Facility is proposing improvements to the existing site that includes: demo and rehabilitation of existing buildings, construction of new buildings, new piping to support the facility, new electrical utilities, new stormwater infrastructure, new parking and access ways and replacement of the water line.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for conditional use and acknowledge I will comply with all regulations and any conditions established by the PDA Committees and Board in the development and construction of this project.

Signature of Applicant — Date: 6/11/25

Peter Rice
Printed Name

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Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

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Date Submitted:	Municipal Review:	Fee:	
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Business Phone: (603) 427-1530	Business Phone: (978) 905-2100
Mobile Phone:	Mobile Phone:
Fax: (603) 427-1539	Fax:

Site Information

Portsmouth Tax Map: 303	Lot #: 6	Zone: Airport Buisiness Commercial Zone
Site Address / Location : 135 Corporate Drive, Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands: 127,000 SF

Activity Information

Change of Use: Yes [ ] No [X] Existing Use: Wastewater Treatment Facility

Proposed Use: Wastewater Treatment Facility

Description of Project: The Pease Wastewater Treatment Facility is proposing improvements to the existing site that includes: demo and rehabilitation of existing buildings, construction of new buildings, new piping to support the facility, new electrical utilities, new stormwater infrastructure, new parking and access ways and replacement of the water line.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Signature of Applicant — Date: 6/11/25

Peter Rice
Printed Name

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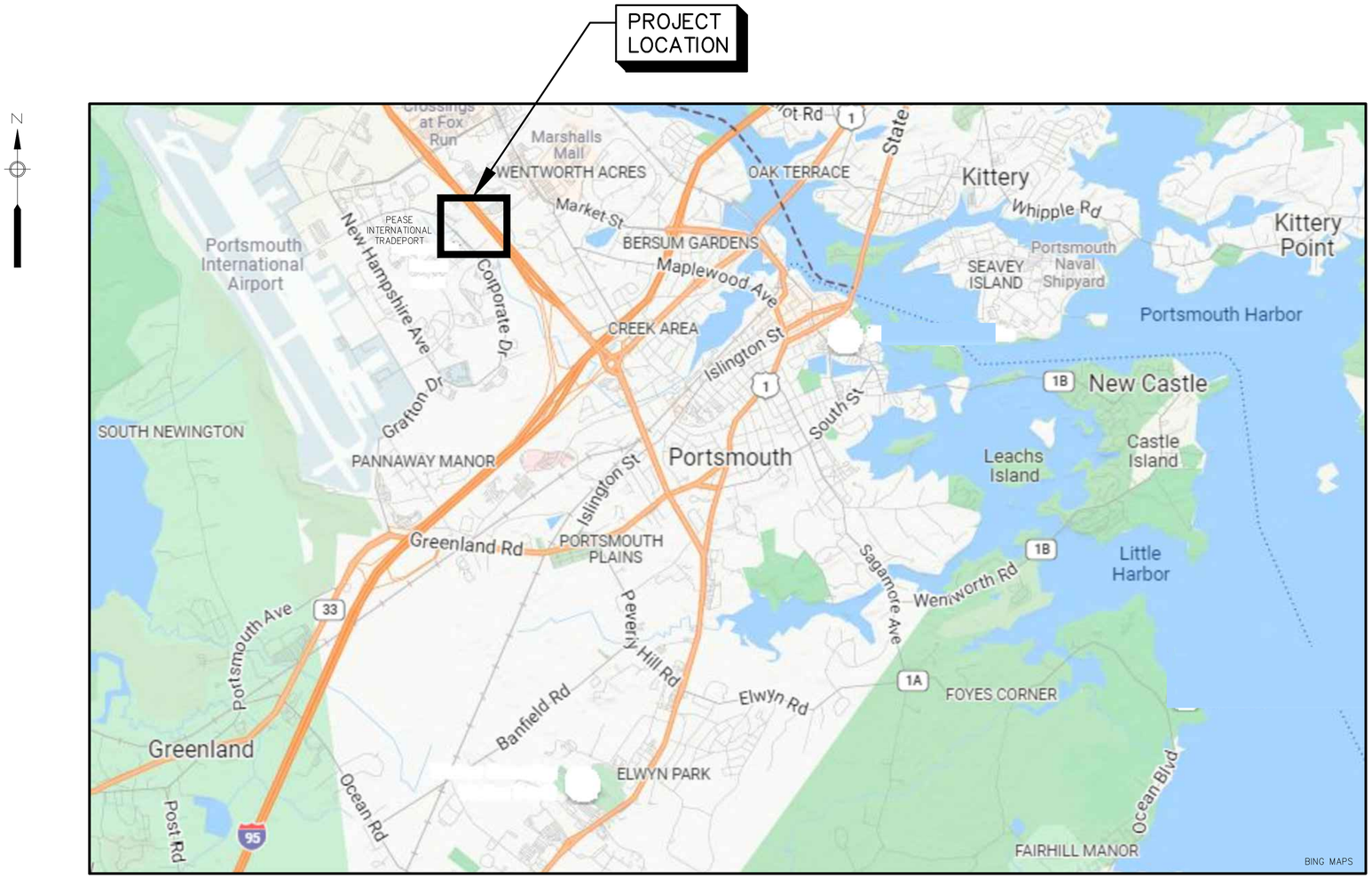
CITY OF PORTSMOUTH, NEW HAMPSHIRE

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

JUNE 2025

BID NO. 37-25

CWSRF CS-330106-18



LOCATION PLAN

APPROXIMATE SCALE: 1" = 2000'

0 2000 4000 6000

SCALE: 1"=2000'

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH
NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
Portsmouth, NH 03801
603-427-1530 tel 603-427-1539 fax
http://www.portsmouthnh.gov/publicworks

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

CONSULTANTS

HVAC, PLUMBING, FIRE PROTECTION
Petersen Engineering, Inc
PO Box 4516
Portsmouth, NH 03802
603-436-4233 tel
https://www.petersenengineering.com

STORMWATER DESIGN
Altus Engineering
133 Court Street
Portsmouth, NH 03801
603-433-2335 tel
https://www.altus-eng.com

FOR CITY PERMITTING
NOT FOR CONSTRUCTION

REGISTRATION

STATE OF NEW HAMPSHIRE
ERIK N. MESERVE
No. 13306
LICENSED
PROFESSIONAL ENGINEER
6-11-25

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	JL
Drawn By:	MT
Dept Check:	CB
Proj Check:	EM
Date:	JUNE 2025
Scale:	AS NOTED

DISCIPLINE

GENERAL

SHEET TITLE

COVER SHEET AND LOCATION PLAN

SHEET NUMBER

00 G-001

PATH/FILENAME: C:\USERS\THIRODM\DOCACCDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\G\00 G-001.DWG
LAST UPDATE: Thursday, June 5, 2025 11:29:03 AM
PLOT DATE: Tuesday, June 10, 2025 3:59:46 PM

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00 F-002A	FIRE PROTECTION BASIS OF DESIGN AND LEGEND II (BID ALT 1)
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99 F-501A	FIRE PROTECTION DETAILS (BID ALT 1)

INSTRUMENTATION

SHEET NO.	TITLE
00 DI-001	INSTRUMENTATION LEGEND AND GENERAL NOTES
00 DI-601	SYSTEM ARCHITECTURE
00 DI-601A	SYSTEM ARCHITECTURE (BID ALT 1&2)
30 DI-601	PRIMARY SLUDGE PUMP STATION P&ID
40 DI-601	SBR BLOWERS P&ID
40 DI-602	VOLUTE PRESS NO. 1 P&ID
40 DI-603	VOLUTE PRESS NO. 2 P&ID
40 DI-604	SLUDGE DEWATERING POLYMER P&ID
40 DI-605	SODIUM PERMANGANATE P&ID
40 DI-606	MISCELLANEOUS BLOWER-DEWATERING BLDG SIGNALS
60 DI-601A	SODIUM HYPOCHLORITE P&ID I (BID ALT 1)
60 DI-602A	SODIUM HYPOCHLORITE P&ID II (BID ALT 1)

STRUCTURE NUMBER LEGEND

00	GENERAL, LEGENDS, NOTES, SITE WIDE DRAWINGS
10	HEADWORKS BUILDING
15	SEPTAGE BUILDING
20	PRIMARY CLARIFIERS
25	INTERMEDIATE PUMP STATION
30	PRIMARY SLUDGE PUMP STATION
35	SBRs (SEQUENCING BATCH REACTOR)
40	BLOWER/DEWATERING BUILDING
45	POST EQUALIZATION TANKS
50	CHLORINE CONTACT TANKS AND PARSHALL FLUME
55	SLUDGE STORAGE TANK AND BUILDING
60	CHEMICAL STORAGE BUILDING
65	AMMONIA SHED AND STORAGE
70	ELECTRICAL/CONTROL BUILDING
75	STANDBY GENERATOR
80	LAB/ADMIN BUILDING
99	STANDARD DETAILS

INSTRUMENTATION (CONT.)

SHEET NO.	TITLE
60 DI-603A	SODIUM BISULFITE P&ID (BID ALT 1)
60 DI-604A	AMMONIUM HYDROXIDE P&ID (BID ALT 1)
99 DI-601	MISCELLANEOUS SIGNALS I P&ID
99 DI-602	MISCELLANEOUS SIGNALS II P&ID
99 DI-602A	MISCELLANEOUS SIGNALS II P&ID (BID ALT 1 & 2)
99 DI-603	INSTRUMENTATION INSTALLATION DETAILS

ELECTRICAL

SHEET NO.	TITLE
00 E-001	SYMBOLS, LEGEND AND GENERAL NOTES
00 ED-001A	ELECTRICAL SITE PLAN DEMO I (BID ALT 1)
00 ED-002	ELECTRICAL SITE PLAN DEMO II
00 ED-003	SINGLE LINE DIAGRAM DEMO
00 E-002	ELECTRICAL SITE PLAN I
00 E-002A	ELECTRICAL SITE PLAN I (BID ALT 1)
00 E-003	ELECTRICAL SITE PLAN II
00 E-003A	ELECTRICAL SITE PLAN II (BID ALT 1&2)
00 E-004	MAIN SWBD SINGLE LINE DIAGRAM
00 E-004A	MAIN SWBD SINGLE LINE DIAGRAM (BID ALT 1&2)
00 E-005	CONDUIT AND WIRE AND AREA CLASSIFICATION SCHEDULE
00 E-006	LIGHTING AND GROUNDING SCHEDULES
00 E-007	DUCTBANK SECTIONS
00 E-601	OVERALL SITE NETWORK RISER DIAGRAM
00 E-601A	OVERALL SITE NETWORK RISER DIAGRAM (BID ALT 1&2)
00 E-602	SITE RISER DIAGRAMS
10 E-101	HEADWORKS BUILDING - POWER PLAN GRADE LEVEL
15 E-101	SEPTAGE BUILDING - POWER PLAN GRADE LEVEL
25 E-101	INTERMEDIATE PUMP STATION - POWER PLAN GRADE LEVEL
30 E-101	PRIMARY SLUDGE PUMP STATION - PWR & SYS. PLAN GRADE LEVEL
30 E-601	PRIMARY SLUDGE PUMP STATION - RISER & WIRING DIAGRAM
35 E-101	SBR - POWER AND SYSTEMS PLAN UPPER LEVEL
40 E-001	BLOWER-DEWATERING BLDG - MCC SINGLE LINE DIAGRAM
40 E-001A	BLOWER-DEWATERING BLDG - MCC SINGLE LINE DIAGRAM (BID ALT 3)
40 ED-101	BLOWER/DEWATERING BLDG - DEMOLITION PLAN LOWER LEVEL
40 ED-102	BLOWER/DEWATERING BLDGG - DEMOLITION UPPER PLAN UPPER LEVEL
40 ED-101A	BLOWER/DEWATERING BLDG - DEMOLITION PLAN LOWER LEVEL (BID ALT 1)
40 E-101	BLOWER/DEWATERING BLDG - POWER PLAN LOWER LEVEL
40 E-102	BLOWER/DEWATERING BLDG - POWER PLAN UPPER LEVEL
40 E-103	BLOWER/DEWATERING BLDG - POWER PLAN ROOF LEVEL
40 E-104	BLOWER/DEWATERING BLDG - SYSTEMS PLAN LOWER PLAN
40 E-105	BLOWER/DEWATERING BLDG - SYSTEMS PLAN UPPER PLAN
40 E-106	BLOWER/DEWATERING BLDG - SYSTEMS PLAN ROOF LEVEL
40 E-201	MCC-D ELEVATION MODIFICATION
40 E-601	BLOWER/DEWATERING BLDG - PANELBOARD SCHEDULES
40 E-602	BLOWER/DEWATERING BLDG - RISER DIAGRAMS
40 E-603	BLOWER/DEWATERING BLDG - WIRING DIAGRAMS
40 E-604A	BLOWER/DEWATERING BLDG - WIRING DIAGRAMS (BID ALT 3)
50 E-101A	CHLORINE CONTACT TANK AND FLUME - POWER PLAN (BID ALT 1)
55 E-101	SLUDGE STORAGE BLDG - POWER PLANS LOWER LEVEL AND GRADE LEVEL
55 E-601	SLUDGE STORAGE BUILDING - PANELBOARD SCHEDULES
60 E-101A	CHEMICAL STORAGE BUILDING - POWER PLAN GRADE LEVEL (BID ALT 1)
60 E-102A	CHEMICAL STORAGE BUILDING - POWER PLAN ROOF LEVEL (BID ALT 1)
60 E-103A	CHEMICAL STORAGE BUILDING - SYSTEMS PLAN GRADE LEVEL (BID ALT 1)
60 E-104A	CHEMICAL STORAGE BUILDING - SYSTEMS PLAN ROOF LEVEL (BID ALT 1)
60 E-601A	CHEMICAL STORAGE BUILDING - PANELBOARD SCHEDULES (BID ALT 1)
60 E-602A	CHEMICAL STORAGE BUILDING - RISER DIAGRAMS (BID ALT 1)
60 E-603A	CHEMICAL STORAGE BUILDING - WIRING DIAGRAMS (BID ALT 1)
70 E-101	ELECTRICAL/CONTROL BLDG POWER PLAN
70 E-102	ELECTRICAL/CONTROL BLDG SYSTEMS PLAN
70 E-601	ELECTRICAL/CONTROL BLDG - PANELBOARD SCHEDULES
80 ED-101A	LAB ADMIN BUILDING - DEMO PLAN (BID ALT 2)
80 E-101	LAB ADMIN BUILDING POWER AND SYSTEMS PLAN
80 E-101A	LAB ADMIN BUILDING - POWER PLAN GRADE LEVEL (BID ALT 2)
80 E-102A	LAB ADMIN BUILDING - SYSTEMS PLAN GRADE LEVEL (BID ALT 2)
80 E-601A	LAB ADMIN BUILDING - PANELBOARD SCHEDULES (BID ALT 2)
99 E-501	DETAILS I
99 E-502	DETAILS II
99 E-503	DETAILS III

NOTE: BID ALT (A) SHEETS ONLY HIGHLIGHT THE ADDITIONAL WORK ASSOCIATED WITH THE BID ALTERNATES AND DO NOT REPLACE THE BASE BID SHEETS.

SHEET DESIGNATION LEGEND

STRUCTURE NUMBER
DISCIPLINE
SHEET NUMBER
00 G-001A — BID ALTERNATE

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
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603-427-1530 tel 603-427-1539 fax
http://www.portsmouthnh.gov/publicworks

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250 APOLLO DRIVE
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STORMWATER DESIGN
Altus Engineering
133 Court Street
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FOR CITY PERMITTING
NOT FOR CONSTRUCTION

REGISTRATION

STATE OF NEW HAMPSHIRE — ERIK N. MESERVE — No. 13306 — LICENSED PROFESSIONAL ENGINEER
6-11-25

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	JL
Drawn By:	MT
Dept Check:	CB
Proj Check:	EM
Date:	JUNE 2025
Scale:	NONE

DISCIPLINE

GENERAL

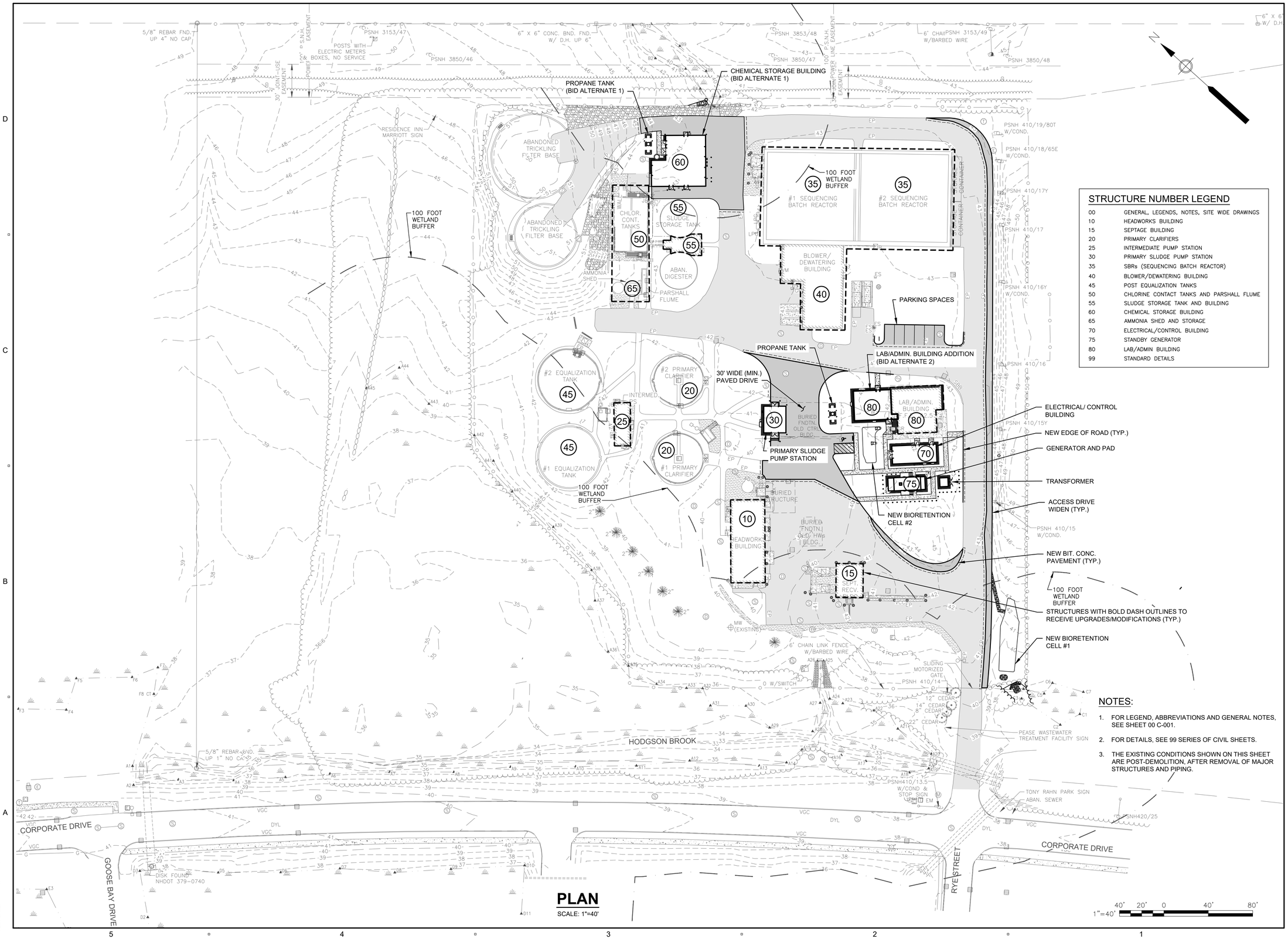
SHEET TITLE

INDEX OF DRAWINGS

SHEET NUMBER

00 G-002

PATH/FILENAME: C:\USERS\THIBODM\DOCACCDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\G\00 G-002.DWG
LAST UPDATE: Thursday, June 5, 2025 11:26:58 AM
PLOT DATE: Tuesday, June 10, 2025 4:06:15 PM



PLAN

SCALE: 1"=40'

40' 20' 0 40' 80'
1"=40'

STRUCTURE NUMBER LEGEND

00	GENERAL, LEGENDS, NOTES, SITE WIDE DRAWINGS
10	HEADWORKS BUILDING
15	SEPTAGE BUILDING
20	PRIMARY CLARIFIERS
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70	ELECTRICAL/CONTROL BUILDING
75	STANDBY GENERATOR
80	LAB/ADMIN BUILDING
99	STANDARD DETAILS

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.
3. THE EXISTING CONDITIONS SHOWN ON THIS SHEET ARE POST-DEMOLITION, AFTER REMOVAL OF MAJOR STRUCTURES AND PIPING.

PATH/FILENAME: C:\USERS\THIBODM\DOCACDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\G\00 G-003.DWG
LAST UPDATE: Thursday, June 5, 2025 2:01:09 PM
PLOT DATE: Tuesday, June 10, 2025 4:40:11 PM

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
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FOR CITY PERMITTING
NOT FOR CONSTRUCTION

REGISTRATION

STATE OF NEW HAMPSHIRE
ERIK N. MESERVE
No. 13306
LICENSED
PROFESSIONAL ENGINEER
6-11-25

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	JL
Drawn By:	MT
Dept Check:	CB
Proj Check:	EM
Date:	JUNE 2025
Scale:	NONE

DISCIPLINE

GENERAL

SHEET TITLE

OVERALL SITE AND STRUCTURE NUMBER PLAN

SHEET NUMBER

00 G-003

GENERAL NOTES

1. IT IS THE INTENT OF THE CONTRACT DOCUMENTS TO PRESCRIBE A COMPLETE WORK OR IMPROVEMENT. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND ANY REQUIREMENTS INDICATED IN ONE OF THE DOCUMENTS IS AS BINDING AS HAVING BEEN INDICATED IN ALL.
2. HORIZONTAL LOCATIONS SHOWN ARE REFERENCED TO THE NH STATE PLANE COORDINATE SYSTEM, NAD83.
3. VERTICAL DATUM IS BASED ON NAVD88 PER NHDOT DISK 379-0740 WITH A PUBLISHED ELEVATION OF 38.17'. REFER ALSO TO VERTICAL DATUM CONVERSION NOTE BELOW.
4. TOPOGRAPHIC INFORMATION SHOWN IS THE RESULT OF A SURVEY MADE IN OCTOBER/NOVEMBER 2022 AND JUNE 2025 BY DOUCET SURVEY, INC., 102 KENT PLACE, NEWMARKET, NH 03857. JURISDICTIONAL WETLANDS WERE DELINEATED BY MICHAEL COUMO, CWS #4, DURING OCTOBER 2022 AND JUNE 2025.
5. THE LOCATION OF ANY UNDERGROUND UTILITY INFORMATION SHOWN ON THIS PLAN IS BASED ON RECORD DRAWINGS AND IS APPROXIMATE. THE OWNER DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF UNDERGROUND UTILITIES SHOWN. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-888-344-7233.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING CONDITIONS AT THE SITE.
4. THE CONTRACTOR SHALL ERECT EROSION CONTROL MEASURES PRIOR TO COMMENCING ANY CLEARING, EXCAVATION OR STORAGE OF BACKFILL MATERIAL ON-SITE. REFER TO SPECIFICATION SECTION 01568 AND DETAILS.
5. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE PROPOSED WORK DURING CONSTRUCTION TO MEET EXISTING CONDITIONS.
6. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND SHALL PROVIDE ALL NECESSARY CONTINUOUS BARRIERS OF SUFFICIENT TYPE, SIZE AND STRENGTH TO PREVENT ACCESS TO ALL OPEN EXCAVATIONS AT THE COMPLETION OF EACH DAYS WORK. REFER TO SPECIFICATION SECTION 01046 FOR ADDITIONAL REQUIREMENTS.
7. INTERRUPTION TO WATER AND OTHER EXISTING UTILITIES SHALL BE REQUESTED IN WRITING BY THE CONTRACTOR 3 DAYS IN ADVANCE OF THE WORK AND REVIEWED BY THE ENGINEER.
8. CONTRACTOR SHALL MAINTAIN FLOW OF SEWAGE IN ACCORDANCE WITH SECTION 01046.
9. EXISTING UTILITIES INTERFERING WITH THE WORK SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
10. PIPE SHALL BE AS INDICATED IN THE PIPING SCHEDULE AND SPECIFICATIONS. PROVIDE RESTRAINED MECHANICAL JOINT FITTINGS FOR ALL PRESSURE PIPE BENDS.
11. PIPING WHICH IS EXPOSED DURING EXCAVATION, INCLUDING TEE'S, VALVES, AND FITTINGS, AND IS NOT TO BE DEMOLISHED, SHALL BE SUPPORTED, BRACED OR OTHERWISE PROTECTED DURING CONSTRUCTION ACTIVITIES.
12. ALL PIPING, EXCEPT FORCE MAINS, SHALL BE CONSTRUCTED WITH A MINIMUM OF 5 FEET OF COVER. FORCE MAINS SHALL BE CONSTRUCTED WITH A MINIMUM OF 5 FEET COVER IN CROSS-COUNTRY AREAS, 6 FEET OF COVER IN PAVED AREAS.
13. ALL PIPES SHALL SLOPE UNIFORMLY BETWEEN ELEVATIONS SHOWN UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR DIRECTED BY THE ENGINEER. NO SAGS OR CRESTS IN PIPING WILL BE PERMITTED.
14. WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING PIPING, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL ADAPTERS, FITTINGS, AND ADDITIONAL PIPE WHICH MAY NOT BE SHOWN IN DETAILS (REQUIRED AS A RESULT OF CUTTING THE EXISTING PIPE BACK) IN ORDER TO COMPLETE THE CONNECTION AS REQUIRED.
15. ALL WALL AND SLAB PENETRATIONS SHALL BE SEALED WATERTIGHT.
16. ALL WALL CASTINGS SHALL HAVE WATER STOPS.
17. JOINTS SHALL BE PROVIDED AT THE WALL OF STRUCTURES ON ALL PIPELINES, EXCEPT WHERE SLEEVES ARE INDICATED. THIS SHALL BE ACCOMPLISHED BY CASTING A BELL WALL FITTING, BELL END STUB, OR WALL CASTING INTO THE STRUCTURE.
18. ALL LAYOUT DIMENSIONS REFER TO OUTSIDE EDGE OF WALL AT GRADE LINE, UNLESS OTHERWISE INDICATED.
19. LOCATION COORDINATES TO PROPOSED STRUCTURES ARE TO EXTERIOR WALLS AND CENTER OF TANKS.
20. ALL SIGNAGE, HEADWALLS, GUARD RAILS, GUARD POSTS, FENCES, CURBS, ROADWAYS, SIDEWALKS AND ANY OTHER OBJECTS DISTURBED BY CONTRACTOR ACTIVITIES SHALL BE RETURNED TO PRE-CONSTRUCTION CONDITION OR BETTER AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
21. ALL AREAS OF EXCAVATION, BACKFILL, FILL AND GRADING SHALL BE RETURNED TO THE ORIGINAL GRADE UNLESS SHOWN ON THE DRAWINGS.
22. ALL UTILITY BOXES, FRAMES, GRATES, ETC. DISTURBED BY CONTRACTOR AND NOT TO BE ABANDONED SHALL BE RESET TO THE PROPER GRADE AT NO ADDITIONAL COST TO THE OWNER.
23. UNPAVED AREAS DISTURBED BY THE CONTRACTOR SHALL BE CLEARED AND GRUBBED IF REQUIRED, AND RESTORED WITH LOAM AND SEED.
28. FOR BURIED PIPE MATERIALS, SEE PIPING SCHEDULE ON SHEET 00 C-002.
29. ALL EXISTING PIPES TO BE ABANDONED SHALL BE PLUGGED AT OPEN ENDS. SEE PIPE PLUGGING DETAIL ON SHEET 99 C-506.
30. RECORD DRAWINGS FOR EXISTING FACILITIES CAN BE FOUND IN APPENDIX G OF THE SPECIFICATIONS.

VERTICAL DATUM CONVERSION NOTE

SURVEY BY DOUCET ASSOCIATES IS BASED ON NAVD 88 DATUM. EXISTING PLANT RECORD DRAWINGS ARE BASED ON NGVD 29 DATUM. TO CONVERT NAVD 88 ELEVATIONS TO NGVD 29, ADD 0.75 FEET. TO CONVERT NGVD ELEVATIONS TO NAVD 88 SUBTRACT 0.75 FEET.

STORMWATER MAINTENANCE SCHEDULE

1. CONTRACTOR SHALL CONDUCT INSPECTION AND MAINTENANCE OF ALL STORMWATER FACILITIES THROUGHOUT THE CONSTRUCTION PERIOD. REFER TO SEDIMENT AND EROSION CONTROL NOTES, AND LONG TERM INSPECTION AND MAINTENANCE SCHEDULE ON SHEET 99 C-501.
2. UPON COMPLETION OF CONSTRUCTION, THE OWNER WILL ASSUME RESPONSIBILITY FOR ACTIVITIES LISTED IN THE LONG TERM INSPECTION AND MAINTENANCE SCHEDULE, AND APPLICABLE REQUIREMENTS OF USEPA-NPDES MULTI-SECTOR GENERAL PERMIT (MSGP) FOR STORMWATER DISCHARGES WITH INDUSTRIAL ACTIVITY.

GEOTECHNICAL NOTES

1. FOR EARTH EXCAVATION, BACKFILL, FILL AND GRADING SEE SPECIFICATION 02210.
2. FOR DEWATERING SEE SPECIFICATION 02140.
3. FOR EXCAVATION SUPPORT SYSTEM SEE SPECIFICATION 02160.
4. BORING LOCATIONS ARE SHOWN ON THE PLANS AND BORING LOGS ARE BOUND IN THE SPECIFICATIONS.
5. BORINGS WERE TAKEN FOR PURPOSES OF DESIGN AND INDICATE SUBSURFACE CONDITIONS AT BORING LOCATION ONLY. SUBSURFACE CONDITIONS MAY VARY FROM THOSE SHOWN IN THE LOG.
6. IN ALL AREAS WHERE DEWATERING IS NECESSARY, MEASURES SHALL BE TAKEN TO ENSURE THE PRESERVATION OF WATERCOURSES AND COMPLIANCE WITH ALL REGULATIONS AND LAWS. ALL DEWATERING MUST BE DISCHARGED INTO SEDIMENT TRAPS AS INDICATED IN THE DETAILS AND AS SPECIFIED IN SPECIFICATION SECTION 01568.
7. FOR ROCK EXCAVATION AND DISPOSAL, SEE SPECIFICATION SECTION 02211.

ABBREVIATIONS

AC	AIR CONDITIONER	MHW	MEAN HIGH WATER
ACU	AIR CONDITIONER UNIT	MLW	MEAN LOW WATER
ALP	AIR LOW PRESSURE	MJ	MECHANICAL JOINT
APPROX.	APPROXIMATE	MSL	MEAN SEA LEVEL
B&B	BALL AND BURLAP	MW	MONITORING WELL
BF	BLIND FLANGE	N.C.	NORMALLY CLOSED
B.H.	BUILDING HEIGHT	PCW	PROTECTED CITY WATER
BLDG.	BUILDING	OC	ODOR CONTROL
BSL	BSL BLENDED SLUDGE	OV	OVERFLOW
BPF	BELT PRESS FEED	PB	PRIMARY BYPASS
BW	BACKWASH OR BARBED WIRE	PCE	PRIMARY CLARIFIER EFFLUENT
CA	COMPRESSED AIR	PCI	PRIMARY CLARIFIER INFLUENT
CB	CATCH BASIN	PCW	PROTECTED CITY WATER
CCB	CAPE COD BERM	PD	PLANT DRAIN
CD	CHEMICAL DRAIN	PERF	PERFORATED
CISD	CAST IRON SLUDGE DRAIN	POL	POLYMER
CONC.	CONCRETE	PP	POTASSIUM PERMANGANATE
C.I.	CAST IRON	PR	PRESSATE
CIWS	CAST IRON WATER SERVICE	PSL	PRIMARY SLUDGE
CLF	CHAIN LINK FENCE	PSNH	PUBLIC SERVICE OF NEW HAMPSHIRE
C.O. OR CO	CLEANOUT	PVC	POLYVINYL CHLORIDE
COV	CHEMICAL OVERFLOW	PVCL	PVC CHLORINE LINE (VACUUM TUBE CASING)
CL	CENTERLINE	PVCU	PVC UNDERDRAIN
CMP	CORRUGATED METAL PIPE	PW	PLANT WATER
CP	POST CHLORINE PIPE	RCP	REINFORCED CONCRETE PIPE
CV	CHEMICAL VENT	RED.	REDUCER
CW	CITY WATER OR CROSS WALK	RET.	RETAIN OR RETAINING
D	DRAIN	RU	ROLLUP (DOOR)
DCB	DRAINAGE CATCH BASIN	RWW	RAW WASTEWATER
DI	DUCTILE IRON	S	SLOPE
DIA.	DIAMETER	SAM	SAMPLE
DIM.	DIMENSION	SAN	SANITARY DRAIN
DMH	DRAIN MANHOLE	SB	SODIUM BISULFITE
DWGS	DRAWINGS	SBB	SLOPE BITUMIOUS BERM
DYL OR DYCL	DOUBLE YELLOW CENTER LINE	SC	SCUM
E	ELECTRICAL	SD	STORM DRAIN, SUMP DISCHARGE
ECC.	ECCENTRIC	SE	SECONDARY EFFLUENT
EL. OR ELEV.	ELEVATION	SH	SODIUM HYPOCHLORITE
EMERG.	EMERGENCY	SI	SECONDARY INFLUENT
EP	EDGE OF PAVEMENT	SL	SLUDGE OR STOP LINE
ES	ELECTRICAL SERVICE	SMH	SEWER MANHOLE
EXIST.	EXISTING	SPD	SUMP PUMP DISCHARGE
FE	FINAL EFFLUENT	SWL	SINGLE WHITE LINE
F.E.S.	FLARED END SECTION	SYL	SINGLE YELLOW LINE
FF OR F.F.E.	FINISHED FLOOR ELEVATION	TB	TELEPHONE BOX
FM	FORCE MAIN	TBM	TEMPORARY BENCHMARK
GAL.	GALLON	TP	TEST PIT
GHWC	GAS AND HOT WATER CONDUIT	TS&V	TAPPING SLEEVE AND VALVE
GP	GUARD POST	TRANS	TRANSFORMER
GRAN.	GRANITE	TYP.	TYPICAL
GR	GRIT OR GAS REGULATOR	U	PERF. UNDERDRAIN
GV	GATE VALVE	UD	UNDERDRAIN
HDPE	HIGH DENSITY POLYETHYLENE	UE	UNDERGROUND ELECTRIC
HOTL	HIGHEST OBSERVABLE TIDE LINE	V	VENT
HP	HIGH POINT	VCP	VITRIFIED CLAY PIPE
HWS/R	HOT WATER SUPPLY/RETURN	VERT.	VERTICAL
INV.	INVERT	VGC	VERTICAL GRANITE CURB
JB	JUNCTION BOX	VP	VENT PIPE
LF	LINEAR FOOT	W	CITY WATER
L.O.W.	LIMIT OF WORK	WSO	WATER SHUT OFF
LP	LOW POINT	WQI	WATER QUALITY INLET
LPG	LIQUEFIED PETROLEUM GAS (PROPANE)	WV	WATER VALVE
MECH.	MECHANICAL	YD	YARD DRAIN
MH	MANHOLE	YH	YARD HYDRANT

LEGEND

EXISTING

- EXISTING BUILDING OR STRUCTURE
- UTILITY POLE & GUY WIRE
- UTILITY POLE W/ LIGHT
- SIGN
- YARD HYDRANT
- UNIDENTIFIED PIPE
- WOODEN POST
- FIRE HYDRANT
- BURIED VALVES (SV)
- WATER METER (WM)
- WATER GATE VALVE (WV)
- VENT PIPE
- WATER SHUTOFF VALVE
- CLEANOUT (CO)
- TRAFFIC DIRECTION ARROW
- ELECTRIC BOX
- CATCH BASIN (ROUND)
- CATCH BASIN
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- CHEMICAL MANHOLE
- WATER MANHOLE
- SEWER MANHOLE
- UNIDENTIFIED MANHOLE
- JURISDICTIONAL WETLAND SYMBOL
- FLAG POLE
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB
- CONCRETE
- BOULDER
- ROW OF BOULDERS
- LANDSCAPED AREA
- GRAVEL
- LEDGE OUTCROP
- BOLLARD
- GUARDPOST
- DRAINAGE FLOW DIRECTION ARROW
- CHAINLINK FENCE
- OVERHEAD WIRES (OHW)
- DRAIN LINE (D)
- TREE LINE
- SHRUB LINE
- GUARDRAIL
- CONTOUR LINE (40; C1 C2 C3)
- EDGE OF JURISDICTIONAL WETLAND AND FLAG NUMBER
- B13-1 BORING
- MW-1 MONITORING WELL

PROPOSED

- LIMIT OF WORK
- SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
- SEDIMENTATION CONTROL MEASURES AT CATCH BASIN
- DEMOLITION (REMOVE AND LEGALLY DISPOSE OF)
- TREE REMOVAL
- NEW TREELINE
- PIPE PLUG OR CAP
- STRUCTURE
- CONTOUR (42)
- SPOT ELEVATION (× 42.50)
- STORM RUNOFF FLOW DIRECTION
- TEE
- REDUCER
- BEND
- GATE VALVE
- PIPE – ≤ 12" DIAM.
- PIPE – > 12" DIAM.
- DIRECTION OF FLOW
- MANHOLE
- CLEANOUT (CO)
- GUARD POST OR BOLLARD
- CHAIN LINK FENCE
- TEMPORARY FENCE
- RIPRAP
- CRUSHED STONE MOWING STRIP
- CONCRETE
- CURB
- SAWCUT
- EXISTING PAVEMENT AREA TO BE REPAVED (RECLAIMED BASE)
- NEW PAVEMENT AREA (RECLAIMED BASE)
- POINT OF CONNECTION, NEW WORK TO EXIST.
- DISCIPLINE INTERFACE

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
Portsmouth, NH 03801
603-427-1530 tel 603-427-1539 fax
http://www.portsmouthnh.gov/publicworks

ENGINEER

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250 APOLLO DRIVE
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PHONE: (978) 905-2100
www.aecom.com

CONSULTANTS

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PO Box 4516
Portsmouth, NH 03802
603-436-4233 tel
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STORMWATER DESIGN
Altus Engineering
133 Court Street
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https://www.altus-eng.com

FOR CITY PERMITTING
NOT FOR CONSTRUCTION

REGISTRATION

STATE OF NEW HAMPSHIRE
ERIK N. MESERVE
No. 13306
LICENSED
PROFESSIONAL ENGINEER
6-11-25

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	JL
Drawn By:	MT
Dept Check:	CB
Proj Check:	EM
Date:	JUNE 2025
Scale:	NONE

DISCIPLINE

CIVIL

SHEET TITLE

LEGEND, ABBREVIATIONS AND GENERAL NOTES

SHEET NUMBER

00 C-001

PATH/FILENAME: C:\USERS\THIBODMD\ACCDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\C00 C-001.DWG
LAST UPDATE: Thursday, June 5, 2025 10:50:35 PM
PLOT DATE: Tuesday, June 10, 2025 3:59:08 PM

MATCHLINE FOR CONTINUATION, SEE SHEET 00 C-102

SEWER STRUCTURES	DRAINAGE STRUCTURES
SMH 5098 RIM ELEV.=40.3' (9093) 24" RCP INV.=29.9' (5123) 24" RCP INV.=29.5' SMH 5121 RIM ELEV.=42.0' (B) 4" DIP INV.=37.0' (A) 4" PVC INV.=35.5' (5180) 8" PVC INV.=34.7' (5122) 8" PVC INV.=34.4' SMH 5122 RIM ELEV.=40.7' (A) 6" PVC INV.=35.3' (5678) 8" PVC INV.=33.9' (5121) 8" PVC INV.=33.8' SMH 5123 RIM ELEV.=40.1' (B) 6" UNK INV.=29.5' (C) 8" UNK INV.=28.9' (5098) 24" RCP INV.=27.9' (A) 24" RCP INV.=27.8' SMH 5768 RIM ELEV.=40.0' (A) 6" RCP INV.=29.2' (6409) 12" RCP INV.=28.8' (8150) 12" RCP INV.=28.6' SMH 6409 RIM ELEV.=42.6' (A) 6" PVC INV.=30.2' (5768) 12" PVC INV.=29.6' (6412) 12" PVC INV.=29.5' SMH 6412 RIM ELEV.= 43.0' (A) 6" PVC INV.=35.6' DROP INLET=29.9' (B) 8" UNK INV.=33.7' DROP INLET=30.0' (6935) 6" PVC INV.=33.6' DROP INLET=29.9' (C) 6" PVC INV.=33.5' DROP INLET=29.7' (6935) PVC T.O.P.=30.4' (6409) 12" RCP INV.=29.6' SMH 6935 RIM ELEV.=42.9' (A) 2" PVC INV.=40.3' (B) 6" VCP INV.=34.3' (C) 6" VCP INV.=34.2' (5923) 6" VCP INV.=34.2' (6412) 6" VCP INV.=34.2' SMH 7213 RIM ELEV.=42.8' (A) 6" DIP INV.=35.2' (B) 6" DIP INV.=35.1' (C) 2" PVC INV.=NM SMH 8150 RIM ELEV.=39.9' (5768) 12" PVC INV.=27.5' (8160) 12" PVC INV.=27.5' SMH 8160 RIM ELEV.=39.9' (8150) 12" PVC INV.=27.5' (A) 12" PVC INV.=26.5'	DMH 5099 RIM ELEV.=40.4' (5280) 12" HDPE INV.=36.3' (5677) 12" HDPE INV.=35.4' (8534) 36" HDPE INV.=34.9' (OFL) 36" HDPE INV.=34.9' DMH 5677 RIM ELEV.=39.6' (5099) 12" HDPE INV.=36.6' (5673) 12" HDPE INV.=35.6 DMH 6337 RIM ELEV.= 42.6' (5894) 12" CMP INV.= 38.0' (6943) 12" CMP INV.= 37.8' (A) 4" PVC INV.=37.8' DMH 6949 RIM ELEV.=41.6' (A) 4" PVC INV.=37.8' (6943) 36" HDPE INV.=36.7' (8521) 36" HDPE INV.=36.4' CB 5180 FOR SEWER DUMP STATION RIM ELEV.=41.9' (TD) 4" PVC INV.=35.9' (5121) 8" PVC INV.=35.7' CB 5238 RIM ELEV.=40.8' WATER ELEV.=36.6' SUMP ELEV.=33.1' (5280) 12" HDPE TOH=38.1' CB 5478 RIM ELEV.=42.2' (5937) 8" PVC INV.=39.2' CB 5669 RIM ELEV.=39.0' WATER ELEV.=35.9' SUMP ELEV.=32.1' (5673) 12" HDPE TOH=37.1' (A) 2" PVC INV.=36.7' (B) 6" PVC INV.=36.6' CB 5673 RIM ELEV.=38.7' WATER ELEV.=35.7' SUMP ELEV.=31.8' (5677) 12" HDPE TOH=36.6' (5669) 12" HDPE INV.=35.7' CB 5894 RIM ELEV.=41.3' (5937) 8" PVC INV.=38.6' (6025) 12" CMP INV.=38.6' (6337) 12" CMP INV.=38.3' CB 5937 RIM ELEV.=42.7' (5478) 8" PVC INV.=39.5' (5894) 8" PVC INV.=39.4' CB 6025 RIM ELEV.=41.9' (5894) 12" CMP INV.=39.0' CB 6943 RIM ELEV.=41.8' (6337) 12" CMP INV.=36.9' (INLET) 36" RCP INV.=36.8' (6949) 36" RCP INV.=36.7'

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.

PLAN

SCALE: 1"=20'

1"=20' 20' 10' 0 20' 40'

AECOM

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PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

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6-11-25

ISSUE/REVISION

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PROJECT NUMBER

60693508

Designed By:	JL
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Proj Check:	EM
Date:	JUNE 2025
Scale:	AS NOTED

DISCIPLINE

CIVIL

SHEET TITLE

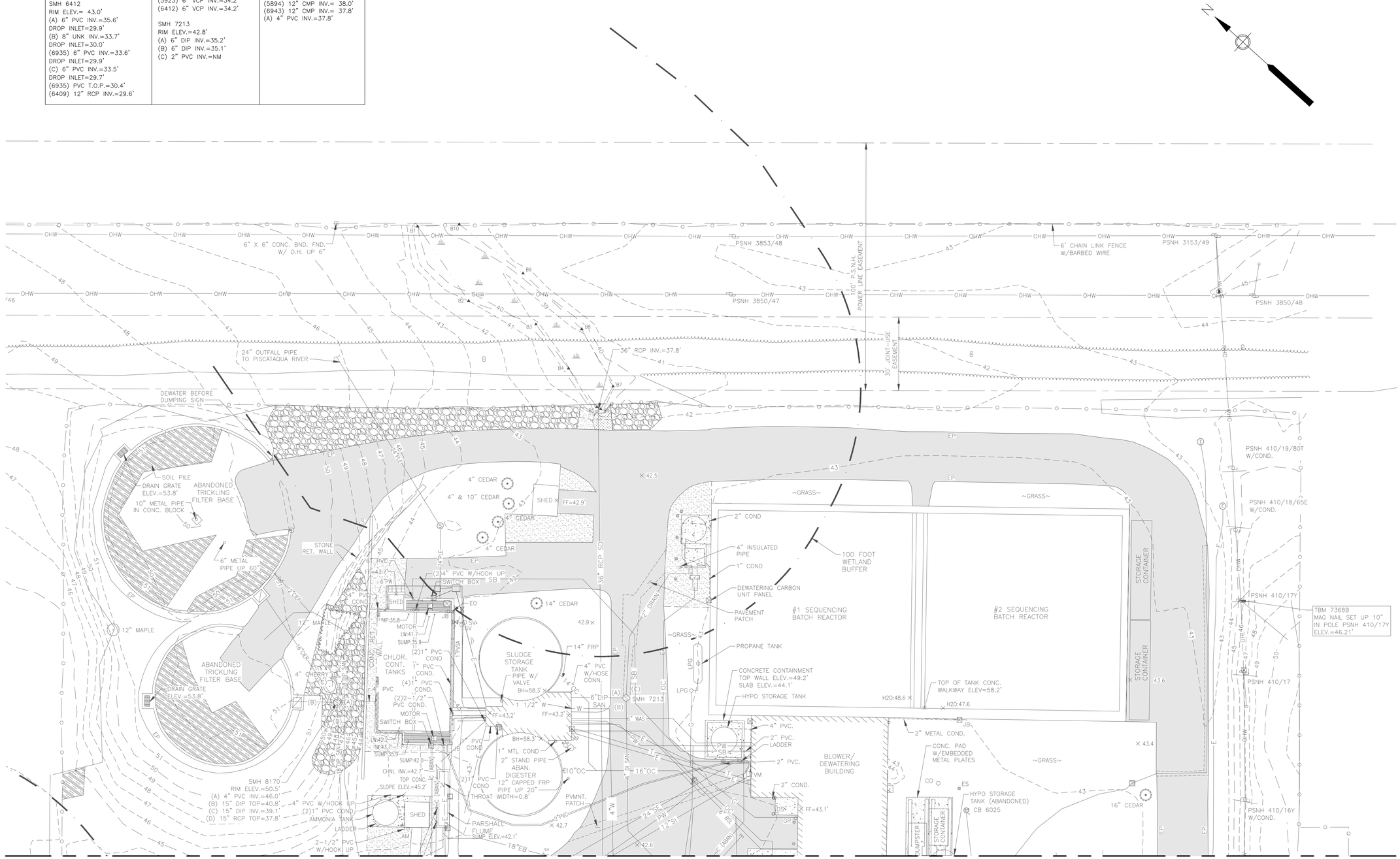
EXISTING CONDITIONS PLAN I

SHEET NUMBER

00 C-101

PATH/FILENAME: C:\USERS\THIBODM\DC\ACCDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\C\00 C-101.DWG
LAST UPDATE: Thursday, June 5, 2025 10:50:53 PM
PLOT DATE: Wednesday, June 11, 2025 8:30:03 AM

SEWER STRUCTURES	SEWER STRUCTURES	DRAINAGE STRUCTURES
SMH 6409 RIM ELEV.=42.6' (A) 6" PVC INV.=30.2' (5768) 12" PVC INV.=29.6' (6412) 12" PVC INV.=29.5' SMH 6412 RIM ELEV.= 43.0' (A) 6" PVC INV.=35.6' DROP INLET=29.9' (B) 8" UNK INV.=33.7' DROP INLET=30.0' (6935) 6" PVC INV.=33.6' DROP INLET=29.9' (C) 6" PVC INV.=33.5' DROP INLET=29.7' (6935) PVC T.O.P.=30.4' (6409) 12" RCP INV.=29.6'	SMH 6935 RIM ELEV.=42.9' (A) 2" PVC INV.=40.3' (B) 6" VCP INV.=34.3' (C) 6" VCP INV.=34.2' (5923) 6" VCP INV.=34.2' (6412) 6" VCP INV.=34.2' SMH 7213 RIM ELEV.=42.8' (A) 6" DIP INV.=35.2' (B) 6" DIP INV.=35.1' (C) 2" PVC INV.=NM	CB 6025 RIM ELEV.=41.9' (5894) 12" CMP INV.=39.0' DMH 6337 RIM ELEV.= 42.6' (5894) 12" CMP INV.= 38.0' (6943) 12" CMP INV.= 37.8' (A) 4" PVC INV.=37.8'



MATCHLINE FOR CONTINUATION, SEE SHEET 00 C-101

PLAN

SCALE: 1"=20'

NOTES:

1. FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES, SEE SHEET 00 C-001.
2. FOR DETAILS, SEE 99 SERIES OF CIVIL SHEETS.

1"=20' 20' 10' 0 20' 40'

PATH/FILENAME: C:\USERS\THIBODMD\CADCDOCS\AECOM\60693508-PEASE WWTF REHABILITATION\PROJECT FILES\910-CAD_BIM\20-SHEETS\C\00 C-102.DWG
LAST UPDATE: Thursday, June 5, 2025 10:51:03 PM
PLOT DATE: Wednesday, June 11, 2025 8:31:08 AM

AECOM

PROJECT

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Date:	JUNE 2025
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DISCIPLINE

CIVIL

SHEET TITLE

EXISTING CONDITIONS PLAN II

SHEET NUMBER

00 C-102

LEGEND

- EXISTING/PROPOSED CHAINLINK FENCE OR RAILING
- EXISTING/PROPOSED CONTOUR
- EXISTING/PROPOSED SPOT GRADE
- EXISTING SEWER/MANHOLE
- EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- EXISTING DRAINAGE/CB/DMH
- PROPOSED PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED CATCH BASIN INLET PROTECTION
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- LAYDOWN AREA/STOCKPILE AREA LIMITS
- PROPOSED LIMIT OF DISTURBANCE
- LIMIT OF NEW PAVEMENT
- PROPOSED SAWCUT
- EXISTING TREE/DRIP LINE
- PROPOSED TREE CLEARING LIMIT
- PROPOSED TREELINE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED RIPRAP
- PROPOSED BIORETENTION CELL

MATCHLINE FOR CONTINUATION, SEE SHEET C-2

SAWCUT EXISTING PAVEMENT 2' FROM EXISTING EDGE OF NEW PAVEMENT AND MEET AND MATCH EXISTING PAVEMENT (TYP.)

PROPOSED LAB/ADMIN BUILDING EXTENSION (BID ALTERNATIVE 2) ±912 S.F. FOOTPRINT F.F.E. = 42.50

EXISTING LAB/ADMIN BUILDING ±1,662 S.F. FOOTPRINT F.F.E. = 42.50

STONE DRIP EDGE (TYP.)

STONE DRIP EDGE WITH 6" PERF. PIPE INV.: 40.50

±43 LF 6" HDPE S: 0.005 '/'

12" YARD DRAIN RIM: 42.00 INV. OUT: 40.30

±14 LF 6" HDPE S: 0.02 '/'

6" HDPE PIPE OUTLET INV.: 40.10

±30 LF 6" PERF. U.D. INV.: 37.25

PRIMARY SLUDGE PUMP STATION ±480 S.F. FOOTPRINT PAD ELEV. = 42.00

PROPOSED ELECTRICAL CONTROL BUILDING ± 653 S.F. FOOTPRINT F.F.E. = 42.50

GENERATOR PAD ± 430 S.F. FOOTPRINT PAD ELEV. = 42.50

EXISTING CB 5669
RIM: 39.00
(A) 2" PVC INV.: 36.70 (DEMO)
(B) 6" PVC INV.: 36.60 (DEMO)
(5673) UNK T.O.H: 37.10
WATER ELEV.: 35.90
SUMP ELEV.: 32.10

CONNECT NEW 12" HDPE PIPE TO EXISTING DCB 5669 INV.: 36.70

±76 LF 12" HDPE S: 0.007 '/'

BIORETENTION CELL #2
SURFACE ELEV.: 40.00
BOTTOM AREA: 379 S.F.

12" YARD DRAIN
RIM: 40.80
INV. IN: 37.25
INV. OUT: 37.15

2% MIN SLOPE FOR PAVEMENT FOR NEW PARKING SPACES

RAISE EXISTING SMH 5923 FRAME AND COVER TO FINISHED GRADE

CAPE COD BERM (TYP.)

REGRADE SLOPE TO MAINTAIN A MAX. OF 2:1 SLOPE. SEE DETAIL.

BEGIN CAPE COD BERM (TYP.)

100 FOOT WETLAND BUFFER

SAWCUT EXISTING PAVEMENT 2' FROM EXISTING EDGE OF NEW PAVEMENT AND MEET AND MATCH EXISTING PAVEMENT (TYP.)

BIORETENTION CELL #1
SURFACE ELEV.: 39.50
BOTTOM AREA: 888 S.F.

±61 LF 6" PERF. U.D.
INV.: 37.10

2'-WIDE BERM
ELEV.: 41.00

12" YARD DRAIN
RIM: 40.30
INV. IN: 39.80 (2x 4" ORIFICE IN YD PIPE)
INV. IN: 37.00 (6" U.D.)
INV. OUT: 37.00

±14 LF 12" HDPE
S: 0.005 '/'

REMOVE AND REPLACE CHAIN LINK FENCE AS NEEDED

PROPOSED TREE LINE (TYP.)

HEADWALL
12" INV.: 37.10

MATCHLINE FOR CONTINUATION, SEE THIS SHEET

RE-GRADE UPLAND AREA TO PITCH SURFACE TO NEW YARD DRAIN

APPROXIMATE LIMIT OF PAVEMENT REMOVAL

YARD DRAIN
INSTALL YARD DRAIN AT LOWEST POINT BETWEEN WETLAND AND EOP

RECONSTRUCT ROAD TO SOFTBALL FIELDS, ±140'

±85 LF 8" HDPE S=0.005 (MIN.)

INSTALL 8" DIA. INSERTA TEE INTO EXISTING DRAIN PIPE

EXISTING 36" RCP DRAINAGE CULVERT L=±67' INV IN: 33.1 INV OUT: 32.9

PEASE WASTEWATER TREATMENT FACILITY SIGN

TONY RAHN PARK SIGN

ABAN. SEWER

CORPORATE DRIVE

TREET

TAX MAP 242 LOT 14

CONCEPTUAL OFF SITE IMPROVEMENTS, SEE NOTE 1.

MATCHLINE FOR CONTINUATION, SEE THIS SHEET

NOTES

1. CONCEPTUAL OFF-SITE IMPROVEMENTS DEPICTED ON THIS PLAN SHALL BE REVISED AND FINALIZED UPON RECEIPT OF ADDITIONAL TOPOGRAPHIC SURVEY OF THE AREA. DATA DEPICTED IN THIS OFF-SITE AREA IS A COMBINATION OF THE EXISTING SURVEY COMPLETED BY DOUCET SURVEY, LLC AND SUPPLEMENTAL INFORMATION FROM THE CITY OF PORTSMOUTH GIS DATABASE.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
No. 7634
LICENSED
PROFESSIONAL ENGINEER
5/29/25

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
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REGISTRATION

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/17/2025	INITIAL SUBMISSION
	1/24/2025	REV. PER AECOM
	2/12/2025	DRAINAGE ANALYSIS
	2/20/2025	REV. PER COMMENTS
	4/21/2025	90% COMMENTS
	5/29/2025	OFF-SITE CONCEPT

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	1" = 20'

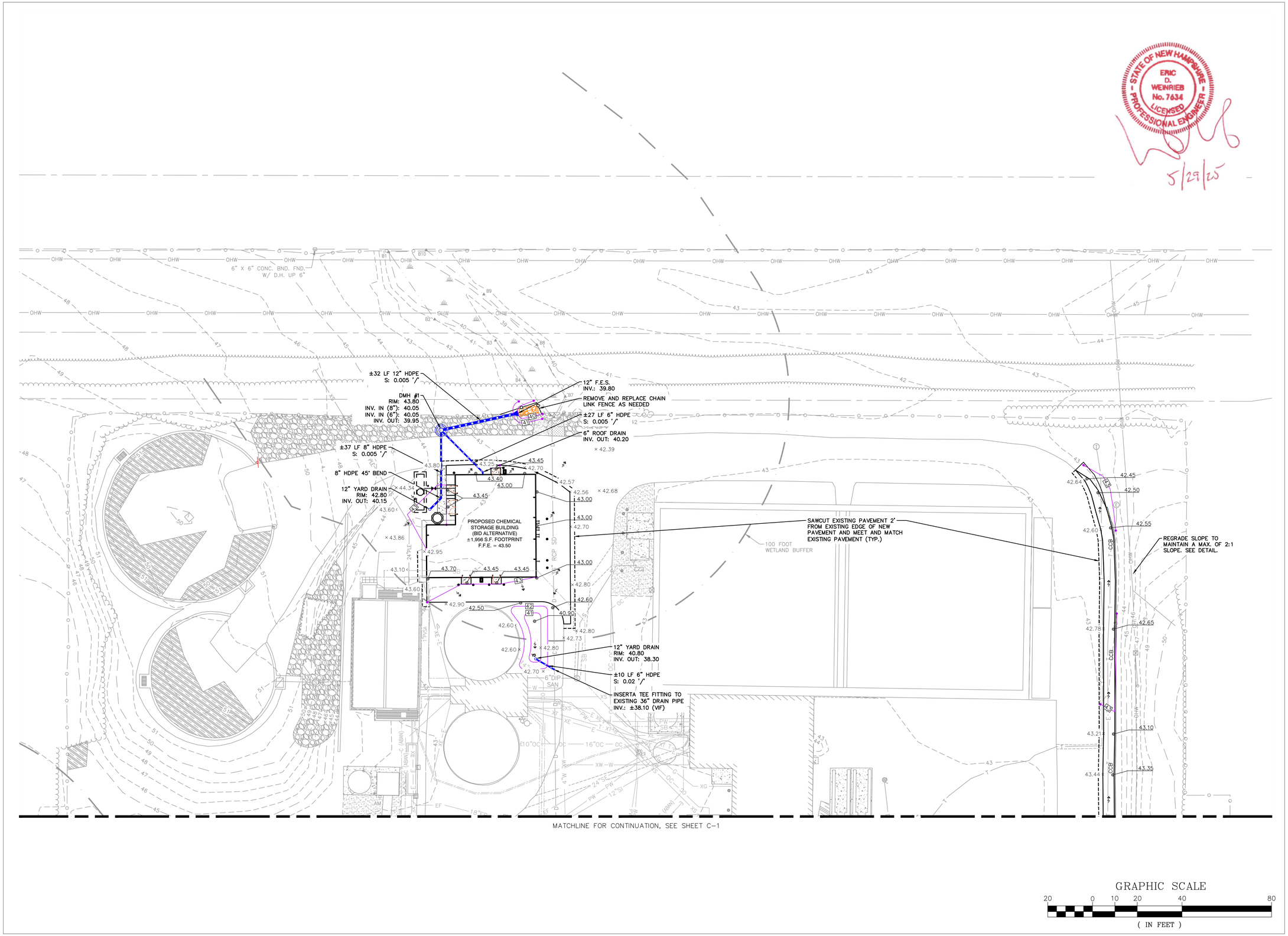
DISCIPLINE

SHEET TITLE

GRADING & DRAINAGE PLAN I

SHEET NUMBER

C-1



GRAPHIC SCALE

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(IN FEET)

STATE OF NEW HAMPSHIRE
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Scale:	1" = 20'

DISCIPLINE

SHEET TITLE

GRADING & DRAINAGE PLAN II

SHEET NUMBER

C-2

MATCHLINE FOR CONTINUATION, SEE SHEET C-4

6" SCH 80 PVC CONTAINMENT WITH SH TUBING SEE NOTE 2

6" BSL SEE NOTE 2

6" PSL SEE NOTE 2

2" WATER PIPE SEE NOTE 1

R7-8 ADA SIGN

RIP-RAP OUTLET PROTECTION W1: 1.5' W2: 3' L: 5' d50: 6" T: 14"

9.00'

100 FOOT WETLAND BUFFER

ELECTRIC DUCT AND HANDHOLE (TYP.) SEE NOTE 3

INSTALL INLET SEDIMENT FILTER (TYP. ALL DCB'S)

LIMIT OF PROJECT DISTURBANCE (TYP.)

8" WATER PIPE SEE NOTE 1

RIP-RAP SPILLWAY W: 3' L: ±36' S: 0.33'/' d50: 6" SEE DETAIL.

RIP-RAP EMERGENCY SPILLWAY INV: 40.5 W1: 4' W2: 7' L: 5' d50: 6" SEE DETAIL.

2'W X 3'L RIPRAP PLUNGE POOL. SEE DETAIL.

MATCHLINE FOR CONTINUATION, SEE THIS SHEET

8" 45° BEND

NEW WATERMAIN TO GO UNDER EXISTING CULVERT

APPROX. ELEV. OF ROAD=38.2

EXISTING CULVERT CROWN OF 36" PIPES= 36.2 INVERT OF 36" PIPES= 33.2

8" 22.5° BEND

INSTALL 45° BEND AFTER CROSSING EXISTING ELECTRICAL AND TELEPHONE LINES

8" 45° BENDS (x3)

8" WATERMAIN ACROSS CORPORATE DRIVE TO BE INSTALLED BY OTHERS

MATCHLINE FOR CONTINUATION, SEE THIS SHEET

NOTES

1. FOR DETAILS, SEE CIVIL SHEETS.
2. FOR DETAILS, SEE MECHANICAL SHEETS.
3. FOR DETAILS, SEE ELCTRICAL SHEETS.

GRAPHIC SCALE

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(IN FEET)

AECOM

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REGISTRATION

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

5/29/25

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Scale:	1" = 20'

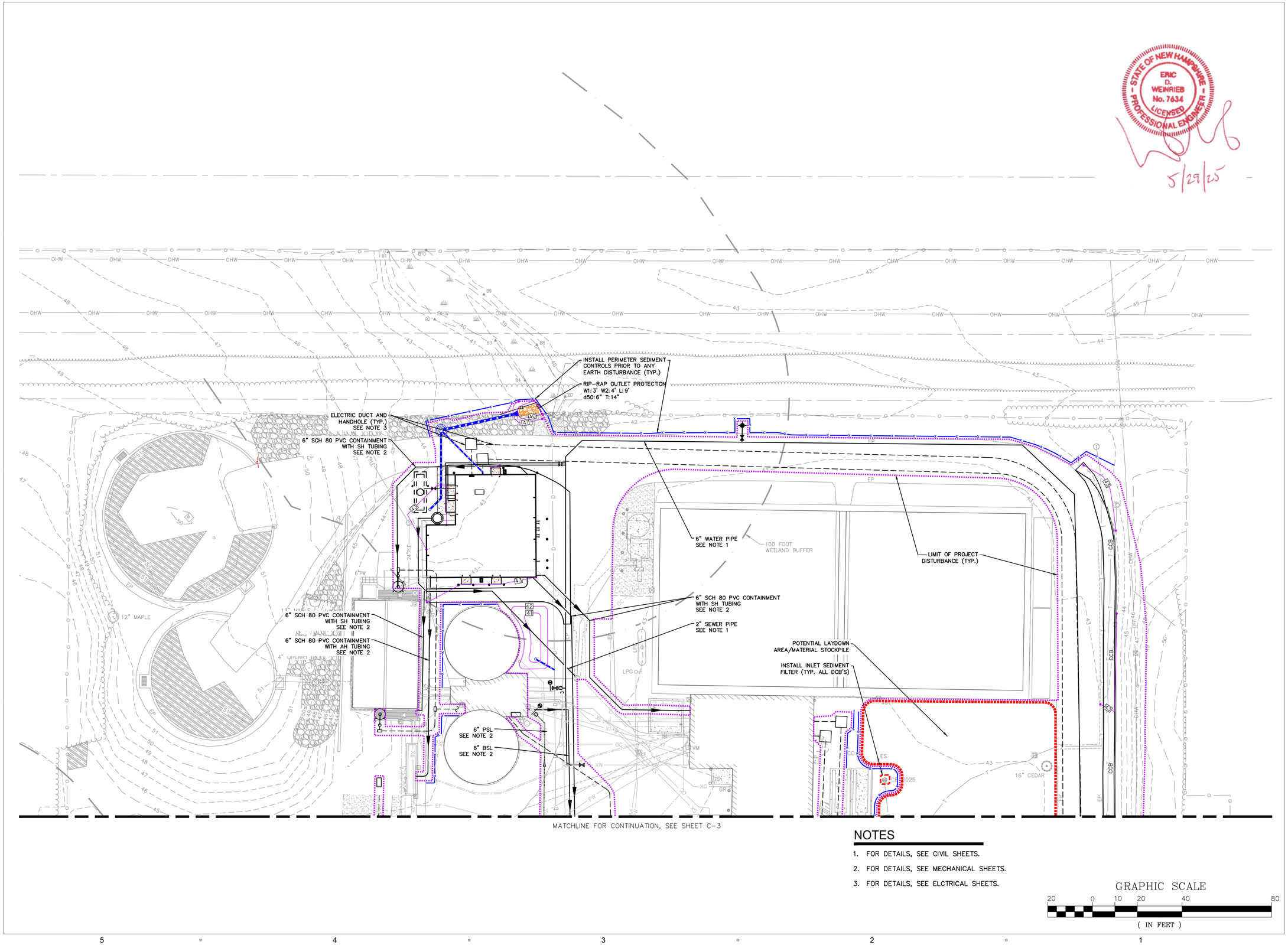
DISCIPLINE

SHEET TITLE

SEDIMENT & EROSION CONTROL PLAN I

SHEET NUMBER

C-3



NOTES

1. FOR DETAILS, SEE CIVIL SHEETS.
2. FOR DETAILS, SEE MECHANICAL SHEETS.
3. FOR DETAILS, SEE ELCTRICAL SHEETS.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -

5/29/25

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
Portsmouth, NH 03801
603-427-1530 tel 603-427-1539 fax
http://www.cityofportsmouth.com/publicworks

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

CONSULTANTS

HVAC, PLUMBING, FIRE PROTECTION
Petersen Engineering, INC
PO Box 4516
Portsmouth, NH 03802
603-436-4233 tel
https://www.petersenengineering.com

STORMWATER DESIGN
Altus Engineering
133 Court Street
Portsmouth, NH 03801
603-433-2335 tel
https://www.altus-eng.com

REGISTRATION

100% SUBMITTAL
PRELIMINARY COPY

NOTE: This document is preliminary only and is not intended for any purpose except review and comment by the owner and its agents.

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/17/2025	INITIAL SUBMISSION
	1/24/2025	REV. PER AECOM
	2/19/2025	REV. PER COMMENTS
	4/21/2025	90% COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	1" = 20'

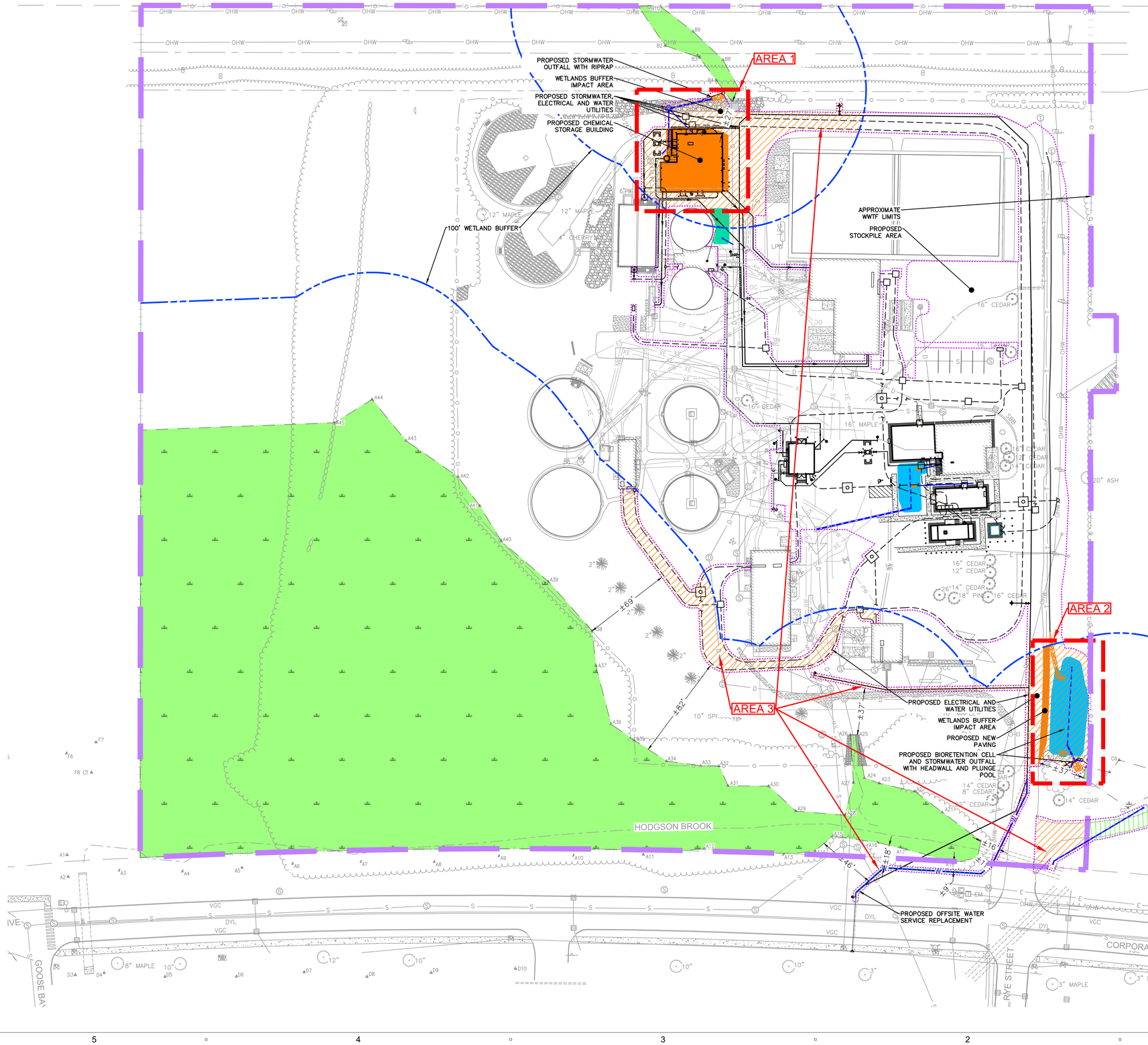
DISCIPLINE

SHEET TITLE

SEDIMENT & EROSION CONTROL PLAN II

SHEET NUMBER

C-4



LEGEND

- APPROX. WWTF LIMIT
- 60 EXISTING CONTOUR
- 60 PROPOSED CONTOUR
- WETLANDS
- LIMIT OF DISTURBANCE
- 100' WETLANDS BUFFER
- ONSITE WETLANDS BUFFER DISTURBANCE AREA
- PROPOSED NEW IMPERVIOUS IN BUFFER
- PROPOSED BIORETENTION CELL
- PROPOSED STORMWATER BASIN
- OFFSITE WETLANDS BUFFER DISTURBANCE AREA

WETLAND BUFFER SUMMARY

	AREA (S.F.)	% OF LOT
APPROX. WWTF AREA	±502,200	100
WETLAND AREA IN WWTF AREA	±125,900	25.1
WETLANDS BUFFER AREA IN WWTF AREA	±139,000	27.7
TOTAL WETLANDS BUFFER AREA (WETLAND + WETLANDS BUFFER)	±264,900	52.7
WWTF AREA NOT WITHIN TOTAL WETLANDS BUFFER AREA	±237,300	47.3
EXISTING IMPERVIOUS WITHIN TOTAL WETLANDS BUFFER AREA	±26,400	10.0
PROPOSED NEW IMPERVIOUS WITHIN TOTAL WETLANDS BUFFER AREA	±2,950	1.1
PROPOSED ONSITE IMPACTS WITHIN TOTAL WETLANDS BUFFER AREA (DISTURBANCE + NEW IMPERVIOUS)	±20,500	7.7
PROPOSED OFFSITE IMPACTS WITHIN WETLANDS BUFFER	±2,100	N/A

*AREAS BASED ON GENERAL LIMITS OF WWTF FENCED AREA AND PROPERTY BOUNDARIES

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

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Portsmouth, NH 03801

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STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –

5/29/25

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	3/26/2025	INITIAL SUBMISSION
	4/28/2025	REV. PER COMMENTS
	5/29/2025	OFF-SITE CONCEPT

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	1" = 40'

DISCIPLINE

SHEET TITLE

WETLANDS BUFFER CONDITIONAL USE PLAN

SHEET NUMBER

CU-1

SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
135 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE
TAX MAP 303, LOT 6
ZONE: AIRPORT BUSINESS COMMERCIAL (ABC) & NATURAL RESOURCE PROTECTION (NRP)
OVERLAY DISTRICT: HIGHWAY NOISE

LATITUDE: 043° 05' 10" N
LONGITUDE: 070° 48' 03" W

APPLICANT:
CITY OF PORTSMOUTH
DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, NEW HAMPSHIRE

UTILITIES CONTACT INFORMATION

WATER: PORTSMOUTH DPW WATER DIVISION, DOUG SPARKS, (603) 427–1409.

SEWER: PORTSMOUTH DPW SEWER DIVISION, DOUG SPARKS, (603) 427–1409.

TELECOMMUNICATIONS: CONSOLIDATED, JOE CONSIDINE, (603) 427–5525.

CABLE: COMCAST, MIKE COLLINS, (603) 679–5695, EXT. 1037.

ELECTRICAL: EVERSOURCE, JOSHUA LAHAIE, (603) 332–7551.

GAS: UNITIL, DAVID BEAULIEU, (603) 294–5144

DESCRIPTION

The project consists of improvements and updates to the Pease Wastewater Treatment Facility.

DISTURBED AREA

Temporary disturbance for the project will be approximately 85,500 S.F. (±1.963 acres). Permanent disturbance for the project will be approximately 37,400 S.F. (±0.861 acres). *Permanent disturbance is included as part of the total temporary disturbance.

PROJECT PHASING

The proposed project will be completed in a single phase.

NAME OF RECEIVING WATER

The site drains indirectly to the Hodgson Brook and eventually to the North Mill Pond (tidal).

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) is accordance with federal storm water permit requirements. The SWPPP must be prepared in a format acceptable to the Owner and three (3) copies provided to the City at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities.

The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHR120000, including NOI requirements, effluent limitations, standards and management for construction. The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required.

SEQUENCE OF MAJOR ACTIVITIES

9. Prepare SWPPP and file NPDES Notice of Intent, prior to any construction activities. The Contractor and Owner shall each file a Notice of Intent (N.O.I.) to U.S.E.P.A.
10. Hold a pre–construction meeting with all stakeholders.
11. Install temporary erosion control measures including silt fences, stabilized construction entrance and inlet sediment filters as noted on the plan. All temporary erosion control measures shall be maintained in good working condition for the duration of the project.
12. Upon completion of Items 1 through 2, clear and grub wooded areas (some stumps may require grinding). Dispose of stumps in an approved offsite location.
13. Strip and stockpile loam. Stockpiles shall be temporarily stabilized with hay bales, mulch and surrounded by a hay bale or silt fence barrier until material is removed and final grading is complete.
14. Reclaim/remove existing paved surfaces.
15. Perform all required demolition activities.
16. Construct ditches and swales early in construction sequence; stabilize them prior to directing flow to them.
17. Ditches and swales shall have sides and bottom reinforced with excelsior matting, Permanent turf reinforcement shall be installed at swale sloped greater than 5%.
18. Rough grade site including placement of borrow materials.
21. Construct drainage structures, parking area & road base materials. All roadways, parking lots, cut and fill slopes shall be stabilized within 72 hours of achieving finished grade
19. Install base course paving, pavers & curbing.
20. Loam (6" min) and seed all disturbed areas not paved or otherwise stabilized within 72 hours of achieving finished grade.
21. Install top course paving.
22. When all construction activity is complete and site is stabilized, remove all hay bales, storm check dams, silt fences and sediment that has been trapped by these devices.
23. File a Notice of Termination (N.O.T.) with U.S.E.P.A.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual", issued February 2025, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

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

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

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

A. GENERAL

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

1. The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
2. All control measures shall be inspected at least once each week and following any storm event of 0.25 inches or greater.
3. All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
4. Built–up sediment shall be removed from silt fence or other barriers when it has reached one–third the height of the fence or bale, or when "bulges" occur.
5. All diversion dikes shall be inspected and any breaches promptly repaired.
6. Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
7. The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the Plans.
8. All roadways and parking lots shall be stabilized within 72 hours of achieving finished grade.
9. All cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade.
10. An area shall be considered stable if one of the following has occurred:
    a. Base coarse gravels have been installed in areas to be paved;
    b. A minimum of 85% vegetated growth as been established;
    c. A minimum of 3 inches of non–erosive material such as stone of riprap has been installed;

    – or –

    d. Erosion control blankets have been properly installed.
11. The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

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

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

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application –

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or Bark Mulch	460 to 920 lbs.	Used mostly with trees and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket	As per manufacturer Specifications	Used in slope areas, water courses and other Control areas.
Crushed Stone 1/4" to 1–1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	* The organic matter content is between 80 and 100%, dry weight basis. * Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85% passing a 0.75" screen. * The organic portion needs to be fibrous and elongated. * Large portions of silts, clays or fine sands are not acceptable in the mix. * Soluble salts content is less than 4.0 mmhos/cm. * The pH should fall between 5.0 and 8.0.

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

C. TEMPORARY GRASS COVER

1. Seedbed Preparation –
   Apply fertilizer at the rate of 600 pounds per acre of 10–10–10. Apply limestone (equivalent to 50 percent calcium plus magnesium oxide) at a rate of three (3) tons per acre.

2. Seeding –
   a. Utilize annual rye grass at a rate of 40 lbs/acre.
   b. Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
   c. Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.

3. Maintenance –
   Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

1. Tubular Sediment Barrier
   a. See detail.
   b. Install per manufacturer's requirements.

2. Silt Fence (if used)
   a. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM–51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM–52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM–51	0.3 gal/sf/min (min)

* Requirements reduced by 50 percent after six (6) months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

   b. Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

   c. A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.

   d. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.

   e. The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.

   f. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.

   g. The trench shall be backfilled and the soil compacted over the filter fabric.

   h. Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

3. Sequence of Installation –
   Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.

4. Maintenance –
   a. Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.

   b. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.

   c. Sediment deposits must be removed when deposits reach approximately one–third (1/3) the height of the barrier.

   d. Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.

   e. Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING –

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

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

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

3. Seed Mixture (See Landscape Drawings for additional information):

   3.1. Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
   3.2. Seed mixture shall consist of
      a. 1/3 Kentucky blue,
      b. 1/3 perennial rye, and
      c. 1/3 fine fescue.
   3.1. Turf type tall fescue is unacceptable.

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

WINTER CONSTRUCTION NOTES

1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;

2. All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and

3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

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1. All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;

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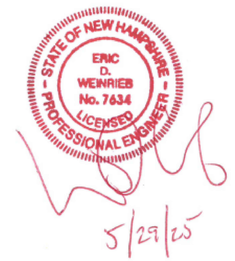
3. After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.



NOTE (OWNER'S RESPONSIBILTY UPON COMPLETION OF PROJECT):
ALL FACILITIES SHOULD BE INSPECTED BY A QUALIFIED INSPECTOR ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24–HOUR PERIOD OR 0.5 INCHES IN A ONE–HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.

Long Term Inspection & Maintenance Schedule

	Spring	Fall or Yearly	After Major Storm	Every 2 to 4 Years
Vegetated Areas				
Inspect all slopes and embankments	x		x	
Replant bare areas or areas with sparse growth	x		x	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x	
Stormwater Channels				
Inspect ditches, swales and other open stormwater channels	x	x	x	
Remove any obstructions and accumulated sediments or debris	x	x		
Control vegetated growth and woody vegetation		x		
Repair any erosion of the ditch lining		x		
Mow vegetated ditches		x		
Remove woody vegetation growing through riprap		x		
Repair any slumping side slopes		x		
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x		
Culverts				
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x	
Repair any erosion damage at the culvert's inlet and outlet	x	x	x	
Remove woody vegetation growing through riprap		x		
Roadways and Parking Surfaces				
Remove accumulated winter sand along roadways	x			
Sweep pavement to remove sediment	x			
Grade road shoulders and remove excess sand either manually or by a front-end loader	x			
Grade gravel roads and gravel shoulders	x			
Clean out sediment contained in water bars or open-top culverts	x			
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x			
Runoff Infiltration Facilities				
Remove dead vegetation and any accumulated sediment (normally at the entrance to the garden) to allow for new growth	x			
Weed; add additional hardwood mulch to suppress weeds	x	x		
Mow turf three (3) times a growing season				
Aerate area with deep tines, if water ponds on the surface for more than 24 hours during the first year or for a length of 72 hours		x		
Vegetative Swale				
Mow grass swales monthly				
Inspect swale following significant rainfall event	x	x	x	
Control vegetated growth and woody vegetation	x	x		
Repair any erosion of the ditch	x	x		
Remove debris and liter as necessary				

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE
DEPARTMENT OF PUBLIC WORKS
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	3/26/2025	REVISED
	4/21/2025	90% COMMENTS
	4/28/2025	REV. PER COMMENTS
	5/29/2025	TAC CHECKLIST REQ.

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	Not to Scale

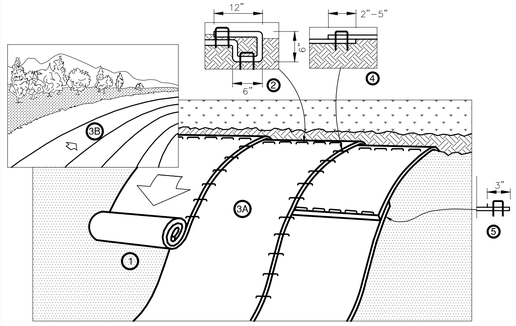
DISCIPLINE

SHEET TITLE

DETAILS I

SHEET NUMBER

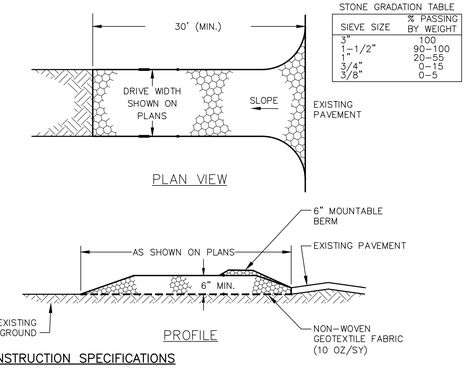
D-1



NOTES

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"–5" OVERLAP DEPENDING ON BLANKET TYPE. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH. NOTE: IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

EROSION CONTROL BLANKET - SLOPE NOT TO SCALE



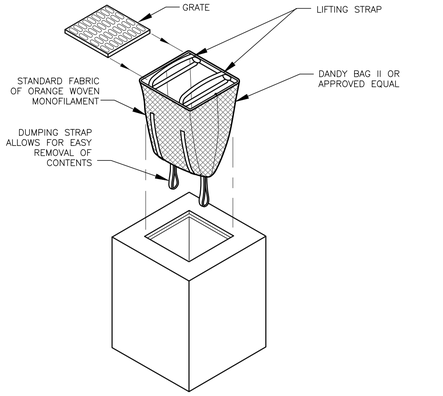
STONE GRADATION TABLE

SIEVE SIZE	% PASSING BY WEIGHT
3"	100
1–1/2"	90–100
1"	20–55
3/4"	0–15
3/8"	0–5

CONSTRUCTION SPECIFICATIONS

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

STABILIZED CONSTRUCTION EXIT NOT TO SCALE



INSTALLATION AND MAINTENANCE:

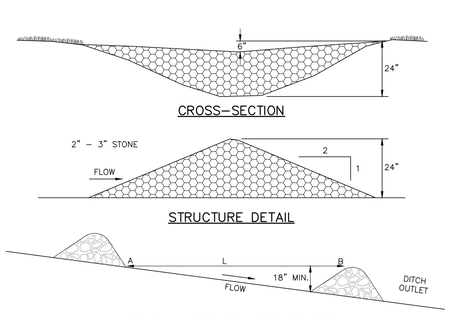
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING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

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

UNACCEPTABLE INLET PROTECTION METHOD:

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

STORM DRAIN INLET PROTECTION NOT TO SCALE



SPACING BETWEEN STRUCTURES

1. L = DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION
2. CHECK DAM SHALL BE CONSTRUCTED OF 2" TO 3" STONE WITH COMPLETE COVERAGE OF DITCH OR SWALE TO INSURE THAT THE CENTER OF THE STRUCTURE IS LOWER THAN THE EDGES.

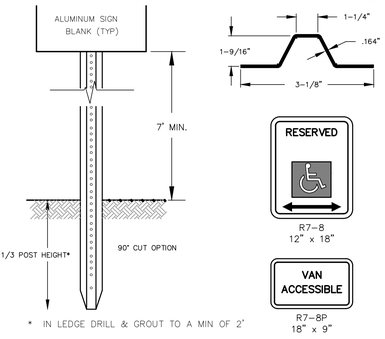
MAINTENANCE

TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED, THE DISTURBED PORTION SHOULD BE BROUGHT TO THE EXISTING CHANNEL GRADE AND THE AREAS PREPARED, SEEDED, AND MULCHED. WHILE THIS PRACTICE IS NOT INTENDED TO BE USED PRIMARILY FOR SEDIMENT TRAPPING, SOME SEDIMENT WILL ACCUMULATE BEHIND THE STRUCTURES. SEDIMENT SHALL BE REMOVED FROM BEHIND THE STRUCTURES WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE STRUCTURE.

CONSTRUCTION SPECIFICATIONS

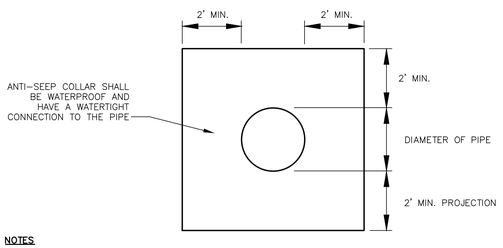
1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION AND AIR AND WATER POLLUTION WILL BE MINIMIZED.
3. SEEDING, FERTILIZING, AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE VEGETATIVE BMP.
4. STRUCTURES SHALL BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS BEEN COMPLETED.

TEMPORARY EROSION CONTROL CHECK DAM NOT TO SCALE



LENGTH: AS REQUIRED
WEIGHT PER LINEAR FOOT: 2.50 LBS (MIN.)
HOLES: 3/8" DIAMETER, 1" C–C FULL LENGTH
STEEL: HEAVY GAUGE (2.0LBS/FT) GALVANIZED STEEL
FINISH: SHALL BE PAINTED WITH TWO COATS OF AN APPROVED MEDIUM GREEN BAKED ON PAINT OF WEATHER RESISTANT QUALITY. ALL FABRICATION SHALL BE COMPLETE BEFORE PAINTING.

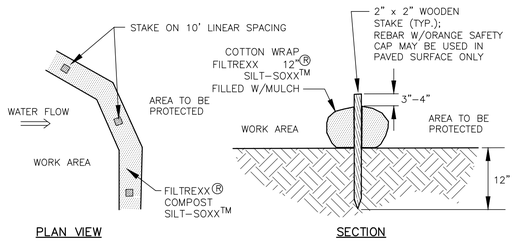
SIGN POST DETAIL NOT TO SCALE



NOTES

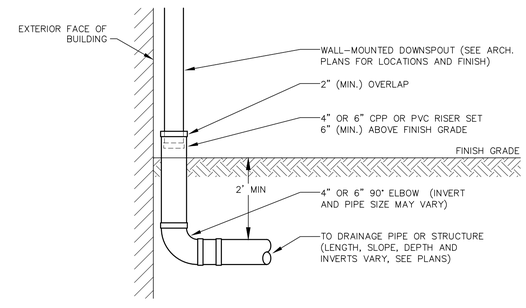
ANTI–SEEP COLLARS SHALL BE CLAY, CONCRETE, PLASTIC (AGRI–DRAIN), OR EQUAL APPROVED BY THE ENGINEER.

ANTI-SEEP COLLAR NOT TO SCALE

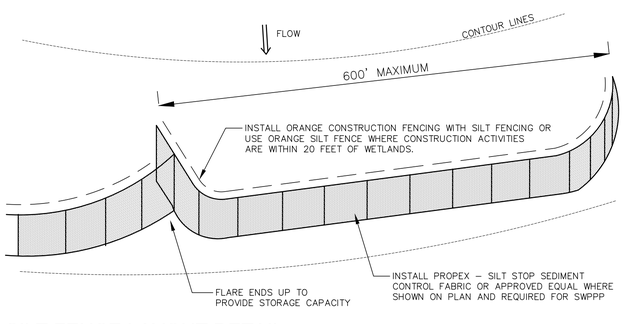


NOTES:
1. SILTSOXX MAY BY USED IN PLACE OF SILT FENCE OR OTHER SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
3. SILTSOXX COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY SILTSOXX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

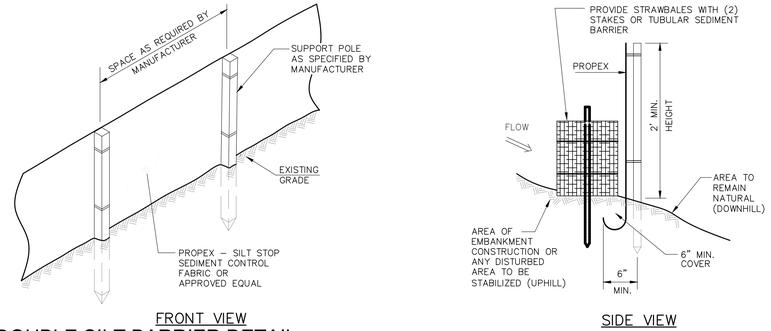
TUBULAR SEDIMENT BARRIER NOT TO SCALE



EXTERIOR ROOF DRAIN CONNECTION NOT TO SCALE



SILT FENCE LAYOUT DETAIL NOT TO SCALE



DOUBLE SILT BARRIER DETAIL NOT TO SCALE

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER
5/29/25

AECOM

PROJECT

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REGISTRATION

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/15/2025	INITIAL SUBMISSION
	3/26/2025	REVISED
	4/21/2025	90% COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	Not to Scale

DISCIPLINE

SHEET TITLE

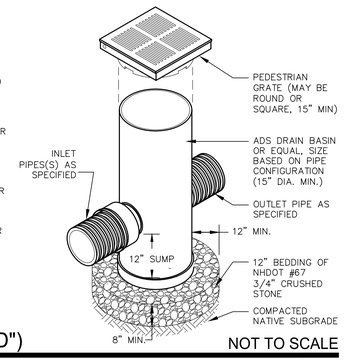
DETAILS II

SHEET NUMBER

D-2

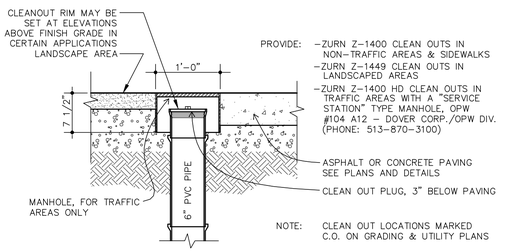
NOTES:

1. FRAMES AND GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN AND DETAILS.
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE, N-12HP AND PVC SEWER.
4. INLINE DRAIN TO BE PVC, DIAMETER AS SPECIFIED AND AS MANUFACTURED BY ADS OR APPROVED EQUAL.
5. THE CONTRACTOR SHALL INSTALL THE DRAIN BASIN PER THE MANUFACTURER'S RECOMMENDATIONS AND AS SHOWN ON THE DRAWINGS.
6. FOR INSTALLATION IN PEDESTRIAN AND LANDSCAPE AREAS ONLY.



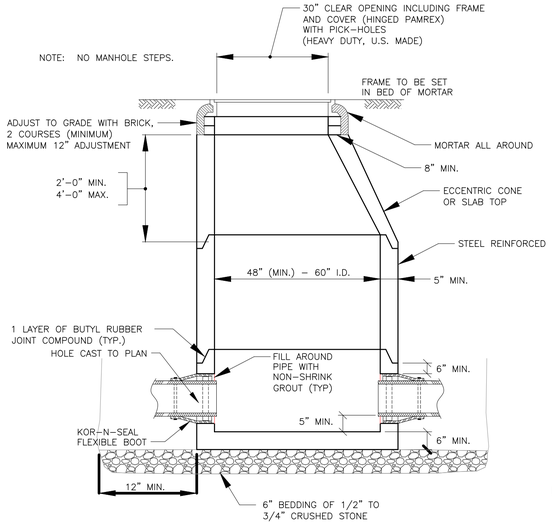
YARD DRAIN ("YD")

NOT TO SCALE



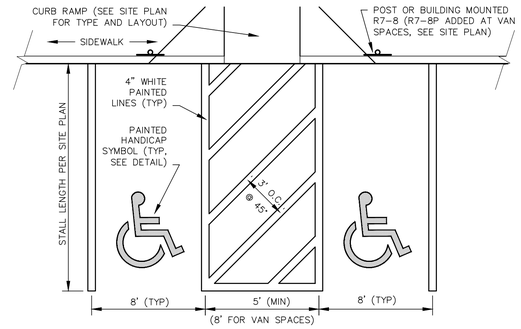
CLEANOUT

NOT TO SCALE



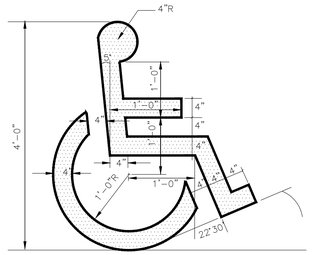
DRAIN MANHOLE DETAIL

NOT TO SCALE



HANDICAP PARKING STALL LAYOUT

NOT TO SCALE

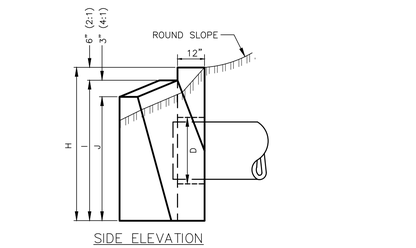


NOTES

1. SYMBOL TO BE PAINTED IN ALL HANDICAPPED ACCESSIBLE SPACES IN WHITE PAINT (BLUE-PAINTED SQUARE BACKGROUND OPTIONAL).

PAINTED HANDICAP SYMBOL

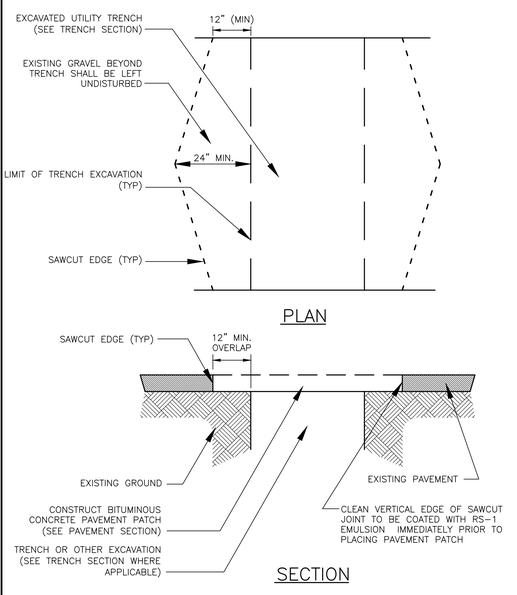
NOT TO SCALE



D (PIPE DIA.)	DIMENSIONS (2:1 SLOPE)									
	A	B	C	E	F	G	H	I	J	K
15"	2'-6"	5'-4"	6'-7"	3'-0"	1'-11"	2'-3"	5'-0"	4'-6"	3'-10"	1'-6"

CONCRETE HEADWALL w/WINGWALLS

NOT TO SCALE

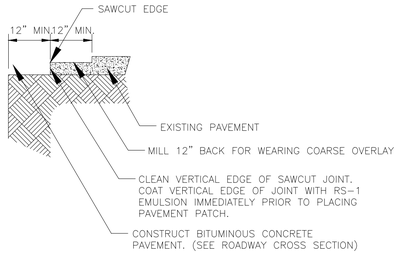


NOTES

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

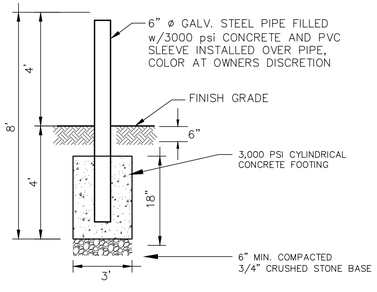
TYPICAL TRENCH PATCH

NOT TO SCALE



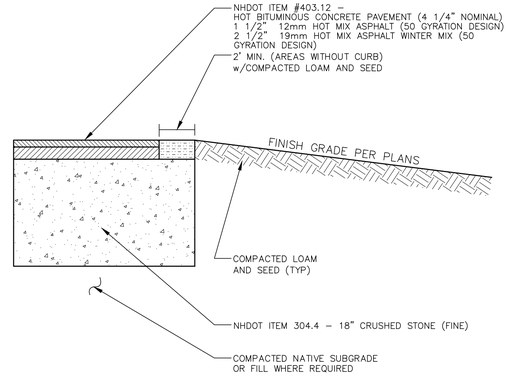
PAVEMENT SAWCUT

NOT TO SCALE



BOLLARD

NOT TO SCALE



NOTES

1. PROJECT GEOTECHNICAL REPORT MAY REQUIRE A DIFFERENT PAVEMENT CROSS SECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING AND FOLLOWING ALL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT. IN THE EVENT THAT THE REPORT AND CIVIL PLANS DIFFER, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. ALL EXISTING FILL, BURIED ORGANIC MATTER, CLAY, LOAM, MUCK, AND/OR OTHER QUESTIONABLE MATERIAL SHALL BE REMOVED FROM BELOW ALL PAVEMENT, SHOULDERS AND UNDERGROUND PIPING/UTILITIES TO DEPTHS RECOMMENDED IN GEOTECHNICAL REPORT.
3. SUBGRADE SHALL BE PROOFROLLED A MINIMUM OF 6 PASSES WITH A 10-TON VIBRATORY COMPACTOR OPERATING AT PEAK RATED FREQUENCY OR BY MEANS APPROVED BY THE ENGINEER.
4. FILL BELOW PAVEMENT GRADES SHALL BE GRANULAR BORROW COMPACTED PER NHDOT REQUIREMENTS.
5. SITEWORK CONTRACTOR SHALL COORDINATE GEOTECHNICAL ENGINEERING INSPECTIONS WITH THE CONSTRUCTION MANAGER PRIOR TO PLACING GRAVELS.
6. TACK COAT SHALL BE APPLIED BETWEEN SUCCESSIVE LIFTS OF ASPHALT.
7. THE BITUMINOUS PAVEMENT SHALL BE COMPACTED TO 92 TO 97 PERCENT OF ITS THEORETICAL MAXIMUM DENSITY AS DETERMINED BY ASTM D-2041. THE BASE AND SUBBASE MATERIALS SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THEIR MAXIMUM DRY DENSITIES AS DETERMINED BY ASTM D-1557.

PAVEMENT SECTION

NOT TO SCALE

AECOM

PROJECT

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Proj Check:	-
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Scale:	Not to Scale

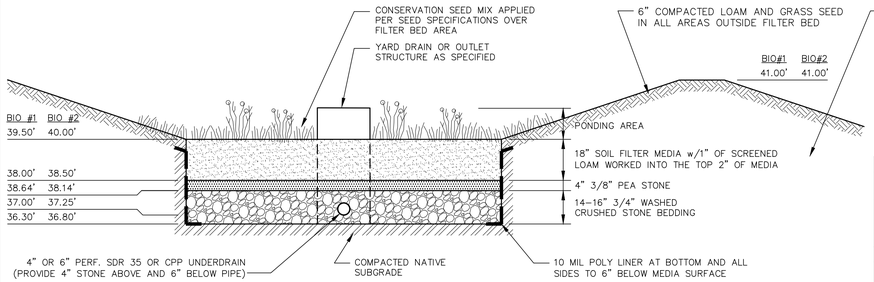
DISCIPLINE

SHEET TITLE

DETAILS III

SHEET NUMBER

D-3



BERM GRANULAR FILL GRADATION	
Sieve size	Embankment Material % Passing sieve
4	90 – 100%
40	50 – 80%
100	29 – 43%
200	15 – 30%
CRUSHED STONE BEDDING *	
Sieve size	% Passing by weight
1"	100%
3/4"	90 – 100%
3/8"	20 – 55%
#4	0 – 10%
#8	0 – 5%

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

NOTES

1. WHEN CONTRACTOR EXCAVATES BIORETENTION POND AREA TO SUBGRADE, DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL EITHER OPTION A OR OPTION B AT CONTRACTOR'S DISCRETION.
3. DO NOT PLACE BIORETENTION POND INTO SERVICE UNTIL ITS SIDE SLOPES AND CONTRIBUTING AREAS HAVE BEEN STABILIZED.
4. DO NOT DISCHARGE SEDIMENT–LADEN WATERS FROM CONSTRUCTION ACTIVITIES TO THE BIORETENTION POND DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SURFACES OF BIORETENTION POND WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATION ACTIVITIES WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
6. POND BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER POND BERM DETAIL.

MAINTENANCE REQUIREMENTS

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

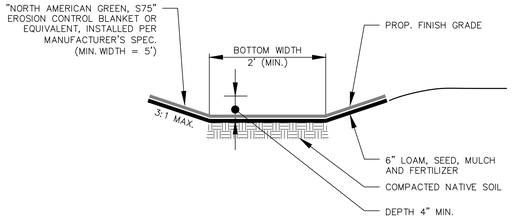
DESIGN REFERENCES

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

FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media Option A			
ASTM C–33 concrete sand	50 – 55%		
Loamy sand topsoil, with fines as indicated	20 – 30%	200	15 to 25%
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Filter Media Option B			
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 – 30%	200	< 5%
Loamy coarse sand	70 – 80%	10	85 – 100%
		20	70 – 100%
		60	15 – 40%
		200	8 – 15%

BIORETENTION POND (BIO #'S 1 AND 2)

NOT TO SCALE

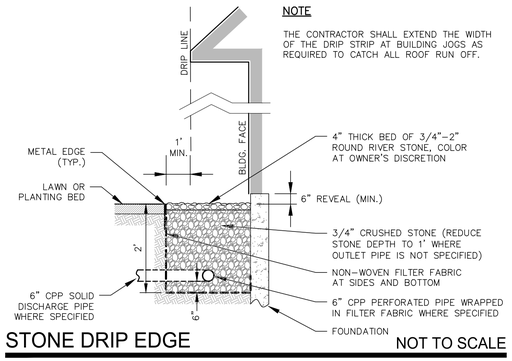


NOTES:

1. THE FOUNDATION AREA OF THE WATERWAY SHALL BE CLEARED AND GRUBBED OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. MATERIALS REMOVED SHALL BE DISPOSED OF SO THEY WILL NOT INTERFERE WITH THE CONSTRUCTION OR PROPER FUNCTIONING OF THE WATERWAY.
2. THE WATERWAY SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE DESIGN CRITERIA. THE WATERWAY SHALL BE FREE OF IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. EARTH FILLS REQUIRED TO MEET SUBGRADE REQUIREMENTS BECAUSE OF OVER EXCAVATION OR TOPOGRAPHY SHALL BE COMPACTED TO THE SAME DENSITY AS THE SURROUNDING SOIL TO PREVENT UNEQUAL SETTLEMENT THAT COULD CAUSE DAMAGE TO THE COMPLETED WATERWAY. EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER AS TO MINIMIZE EROSION AND AIR AND WATER POLLUTION. ALL APPROPRIATE STATE AND LOCAL LAWS AND REGULATIONS SHALL BE COMPLIED WITH FOR INSTALLATION.
5. VEGETATION SHALL BE ESTABLISHED IN THE SWALE OR AN EROSION CONTROL MATTING INSTALLED PRIOR TO ALLOWING STORMWATER RUNOFF TO FLOW THROUGH THE SWALE.
6. MAINTENANCE OF THE VEGETATION IN THE GRASSED WATERWAY IS EXTREMELY IMPORTANT IN ORDER TO PREVENT RILLING, EROSION, AND FAILURE OF THE WATERWAY. MOWING SHALL BE DONE FREQUENTLY ENOUGH TO CONTROL ENCROACHMENT OF WEEDS AND WOODY VEGETATION AND TO KEEP THE GRASSES IN A VIGOROUS CONDITION. THE VEGETATION SHALL NOT BE MOWED TOO CLOSELY SO AS TO REDUCE THE EROSION RESISTANCE IN THE WATERWAY.
7. THE WATERWAY SHOULD BE INSPECTED PERIODICALLY AND AFTER ANY STORM GREATER THAN 0.5" OF RAINFALL IN 24 HOURS TO DETERMINE THE CONDITION OF THE WATERWAY. RILLS AND DAMAGED AREAS SHOULD BE PROMPTLY REPAIRED AND REVEGETATED AS NECESSARY TO PREVENT FURTHER DETERIORATION.
8. APPLY LIME AND FERTILIZER AS NEEDED TO MAINTAIN VIGOROUS GROWTH.

GRASSED SWALE

NOT TO SCALE



STONE DRIP EDGE

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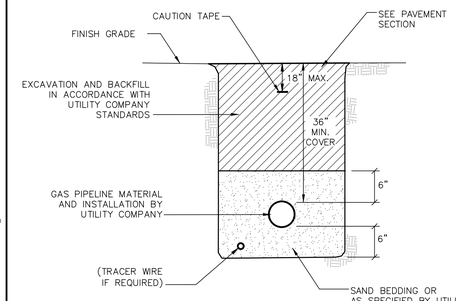


NOTES

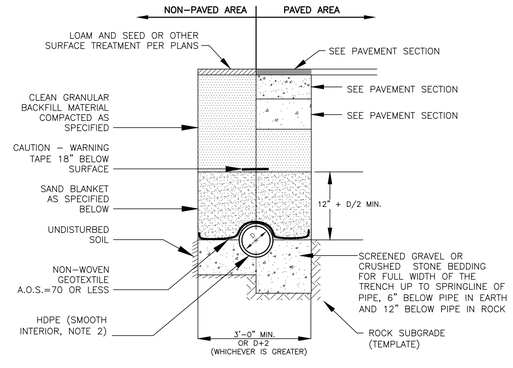
1. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY AND PROVIDE ALL EXCAVATION, COMPACTION AND BACKFILL REQUIRED FOR PIPE INSTALLATION.
2. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

GAS TRENCH

NOT TO SCALE



NOTES:

1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. ALL PIPE SHALL BE HDPE WITH SMOOTH INTERIOR AND CORRUGATED EXTERIOR, ADS TYPE N–12 OR APPROVED EQUAL.

SAND BLANKET/BARRIER

SIEVE SIZE	% FINER BY WEIGHT
1/2"	90 – 100
200	0 – 15

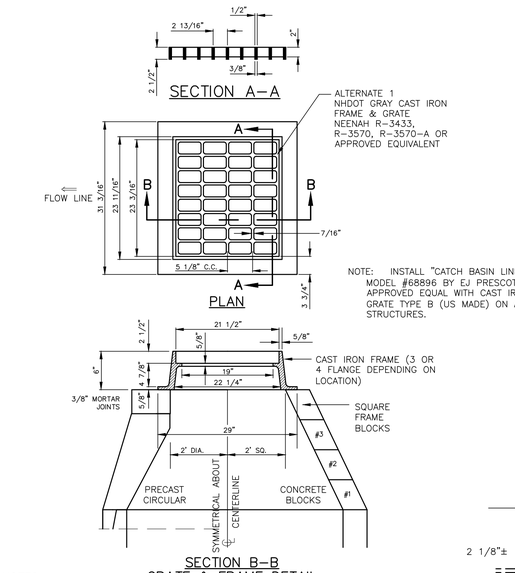
SCREENED GRAVEL OR CRUSHED STONE BEDDING*

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
3/4"	90 – 100
3/8"	20 – 55
# 4	0 – 10
# 8	0 – 5

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

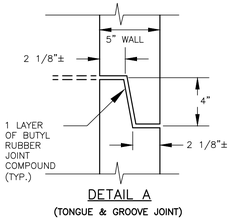
STORM DRAIN TRENCH

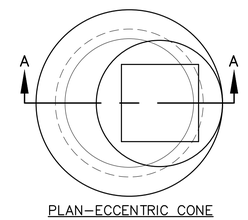
NOT TO SCALE



NOTES

1. ALL SECTIONS SHALL BE CONCRETE CLASS AA (4000 PSI).
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ.IN. PER LINEAR FT. IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FT.
4. RISERS OF 1', 2', 3' & 4' CAN BE USED TO REACH DESIRED DEPTH.
5. THE STRUCTURES SHALL BE DESIGNED FOR H20 LOADING.
6. USE H20 LOADING SLAB TOP SECTION IN LIEU OF ECCENTRIC TOP WHERE PIPE INVERT IS WITHIN 4' OF FINISH GRADE.
7. FRAME AND GRATE DIMENSIONS ARE TYPICAL BUT MAY VARY BASED ON PRODUCT SELECTED OR EQUIVALENT APPROVED BY THE ENGINEER.





DEEP SUMP CATCH BASIN

NOT TO SCALE

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION
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Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE
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ENGINEER

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250 APOLLO DRIVE
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PHONE: (978) 905-2100
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CONSULTANTS

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Portsmouth, NH 03802
603-436-4233 tel
https://www.petersenengineering.com

STORMWATER DESIGN
Altus Engineering
133 Court Street
Portsmouth, NH 03801
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REGISTRATION

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER –

5/29/25

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/15/2025	INITIAL SUBMISSION
	3/26/2025	REVISED
	4/21/2025	90% COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	Not to Scale

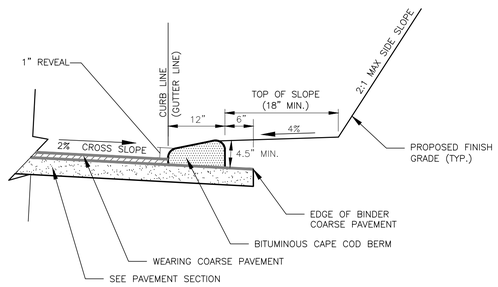
DISCIPLINE

SHEET TITLE

DETAILS IV

SHEET NUMBER

D-4



CAPE COD BERM

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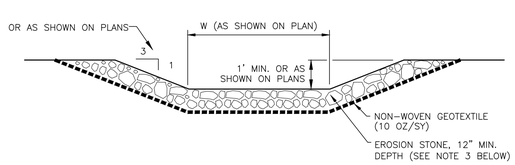


NOTES

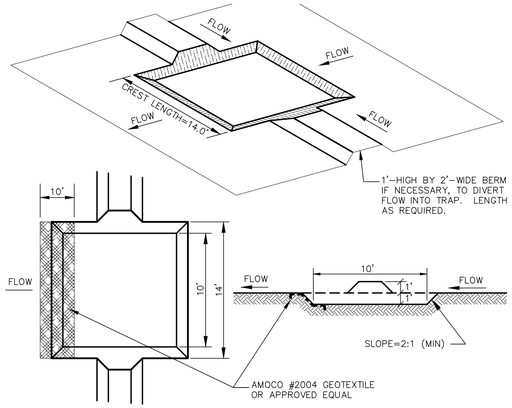
1. CONSTRUCT RIP RAP LINED SWALE TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE RIP RAP LINED SWALE SHALL MEET THE GRADATION SHOWN ON THE PLANS.
4. GEOTEXTILE FABRICS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

RIPRAP LINED SWALE

NOT TO SCALE

GRADING, DRAINAGE AND EROSION AND SEDIMENT CONTROL NOTES

1. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE AND LOCAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
2. CONTRACTOR SHALL OBTAIN A "DIGSAFE" NUMBER AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. AREA OF DISTURBANCE EXCEEDS 43,560 S.F., COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT REQUIRED, NOI(S) TO BE FILED BY CONTRACTOR. SWPPP AND RELATED INSPECTIONS REQUIRED. CONTRACTOR SHALL FILE NOI WITH EPA 2 WEEKS PRIOR TO CONSTRUCTION.
4. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
5. ALL BENCHMARKS AND TOPOGRAPHY SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO INITIATING CONSTRUCTION.
6. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
7. PRIOR TO CONSTRUCTION, FIELD VERIFY JUNCTIONS, LOCATIONS AND ELEVATIONS/INVERTS OF ALL EXISTING STORMWATER AND UTILITY LINES. PRESERVE AND PROTECT LINES TO BE RETAINED.
8. PERIMETER SEDIMENT CONTROLS AND CULVERT AND CATCH BASIN INLET PROTECTION MEASURES SHALL BE INSTALLED AFTER TREE CLEARING OPERATIONS HAVE CEASED AND BEFORE ANY STUMPING, GRUBBING OR OTHER EARTH DISTURBANCE.
9. GRIND STUMPS AND REUSE GRINDINGS FOR EROSION CONTROL WHERE POSSIBLE. NO STUMPS SHALL BE BURIED ON SITE.
10. TEMPORARY INLET PROTECTION MEASURES SHALL BE INSTALLED IN ALL CATCH BASINS WITHIN 100' OF THE PROJECT SITE WHEN SITE WORK WITHIN CONTRIBUTING AREAS IS ACTIVE OR SAID AREAS HAVE NOT BEEN STABILIZED.
11. NO EARTHWORK SHALL COMMENCE UNTIL ALL APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES HAVE BEEN INSTALLED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED IN GOOD WORKING ORDER FOR THE DURATION OF CONSTRUCTION AND THE SITE IS STABILIZED.
12. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DESIGN STANDARDS AND SPECIFICATIONS SET FORTH BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.
13. CONTRACTOR SHALL CONTROL DUST BY SPRAYING WATER, SWEEPING PAVED SURFACES, PROVIDING TEMPORARY VEGETATION, AND/OR MULCHING EXPOSED AREAS AND STOCKPILES.
14. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PREVENT EROSION, PREVENT SEDIMENT FROM LEAVING THE SITE AND/OR ENTERING WETLANDS AND ENSURE PERMANENT SOIL STABILIZATION.
15. SEE DETAIL SHEETS FOR PERTINENT SEDIMENT AND EROSION CONTROL DETAILS AND ADDITIONAL NOTES.
16. DRAINAGE PIPE SHALL BE CORRUGATED POLYETHYLENE PIPE (CPP), TYPE ADS N-12 OR HANCOR H1-Q, OR PVC SDR 35 WHERE SPECIFIED. ALL FLARED END SECTIONS SHALL BE METAL.
17. ALL ROOF DRAIN RISERS SHALL BE LOCATED IN COORDINATION WITH THE ARCHITECTURAL PLANS TO MATCH GUTTER DOWNSPOUTS. RISERS SHALL BE SET TO FINISH GRADE PLUS 1' (MIN.).
18. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
19. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
20. ALL CATCH BASIN, MANHOLE AND OTHER DRAINAGE RIMS SHALL BE SET FLUSH WITH OR NO LESS THAN 0.1' BELOW FINISH GRADE. ANY RIM ABOVE SURROUNDING FINISH GRADE SHALL NOT BE ACCEPTED.
21. ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
22. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
23. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. SYMBOLS MAY NOT BE INDICATIVE OF THE CENTER OF A STRUCTURE, PARTICULARLY WHEN SHOWN ADJACENT TO A CURB LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.
24. ALL SWALES, STORMWATER PONDS AND THEIR CONTRIBUTING AREAS SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
25. UPON COMPLETION OF CONSTRUCTION, ALL DRAINAGE INFRASTRUCTURE SHALL BE CLEANED OF ALL DEBRIS AND SEDIMENT.
26. UPON COMPLETION OF CONSTRUCTION, ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED AND ANY AREAS DISTURBED BY THE REMOVAL SMOOTHED AND REVEGETATED.
27. TOTAL AREA OF DISTURBANCE LESS THAN 100,000 S.F., NHDES ALTERATION OF TERRAIN PERMIT NOT REQUIRED.
28. AREAS OF ROOF THAT WILL NOT DRAIN DIRECTLY TO THE STONE DRIP EDGE DUE TO THE PRESENCE OF SIDEWALK AT GROUND LEVEL SHALL BE EQUIPPED WITH DIVERTERS OR GUTTERS WITH DOWNSPOUTS DIRECTED TO SAID DRIP EDGE.
29. RIGID INSULATION SHALL BE INSTALLED WHERE DRAIN PIPE COVER IS < 2'.
30. FOUNDATION DRAINS SHALL BE DIRECTED TO THE NEAREST DRAINAGE STRUCTURE OR SURFACE OUTLET OUTSIDE THE 100' WETLAND BUFFER. FINAL LOCATION TO BE DETERMINED BY THE ARCHITECT AND/OR CONTRACTOR.
31. THE APPLICANT SHALL SUBMIT A COPY OF A COMPLETED LAND USE DEVELOPMENT TRACKING FORM USING THE POLLUTANT TRACKING AND ACCOUNTABILITY PROGRAM (PTAP) ONLINE PORTAL CURRENTLY MANAGED BY THE UNH STORMWATER CENTER OR SIMILAR FORM APPROVED BY THE CITY.
32. THE ENGINEER OF RECORD SHALL SUBMIT A WRITTEN REPORT WITH PHOTOGRAPHS AND ENGINEERS STAMP CERTIFYING THAT THE STORMWATER INFRASTRUCTURE WAS CONSTRUCTED PER THE APPROVED PLANS AND SPECIFICATIONS AND SHOULD MEET THE EXPECTED DESIGN PERFORMANCE.

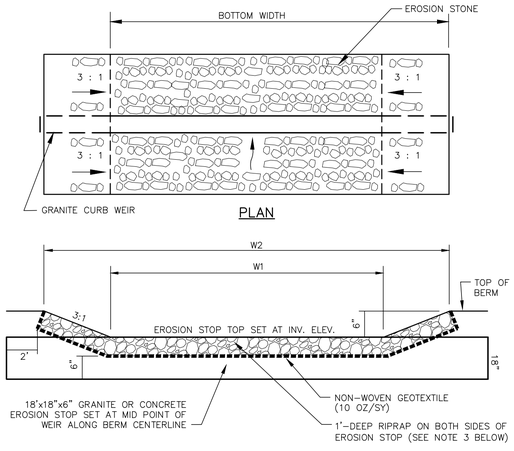


NOTES:

1. THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ALL VEGETATION, ROOTS, AND DEBRIS.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS, WOODY VEGETATION, STONES OVER 6" SIZE, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIALS. THE FILL SHALL BE COMPACTED BY ROUTING CONSTRUCTION EQUIPMENT OVER IT SO THAT THE ENTIRE AREA OF THE FILL IS TRAVERSED BY AT LEAST ONE WHEEL OR TREAD TRACK OF THE EQUIPMENT.
3. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
4. ALL CUT AND FILL SLOPES SHALL BE 2:1 (H:V) OR FLATTER.
5. OUTLET CREST ELEVATIONS SHALL BE AT LEAST ONE FOOT BELOW THE TOP OF THE EMBANKMENT.
6. OUTLET CREST IS TO BE STABILIZED WITH AMOCO #2004 GEOTEXTILE (OR APPROVED EQUAL), WHICH IS TO BE TOED INTO THE GROUND AT ITS ENDS AT LEAST SIX INCHES AND IS TO EXTEND AT LEAST ONE FOOT INTO THE TRAP AND ONE FOOT DOWNSTREAM FROM THE OUTLET EDGE FOR THE ENTIRE LENGTH OF THE CREST.
7. ALL DISTURBED AREAS SHALL BE VEGETATED USING THE APPROPRIATE VEGETATIVE BEST MANAGEMENT PRACTICE.
8. ALL TRAPS ARE TO HAVE SEDIMENT DEPOSITS REMOVED AND DISPOSED PROPERLY ONCE THEY REACH HALF THE CAPACITY OF THE TRAP.

TEMPORARY SEDIMENT TRAP

NOT TO SCALE



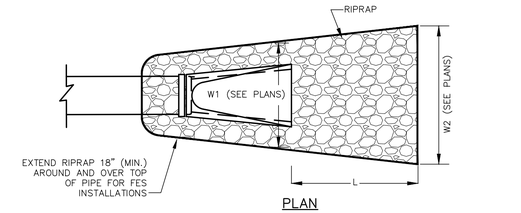
1. CONSTRUCT EMERGENCY OVERFLOW WEIR TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. UNLESS OTHERWISE SPECIFIED OR DIRECTED, RIPRAP USED FOR THE EMERGENCY OVERFLOW WEIR SHALL MEET THE FOLLOWING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

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

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

RIPRAP SPILLWAY / OVERFLOW WEIR

NOT TO SCALE



SECTION

MAINTENANCE

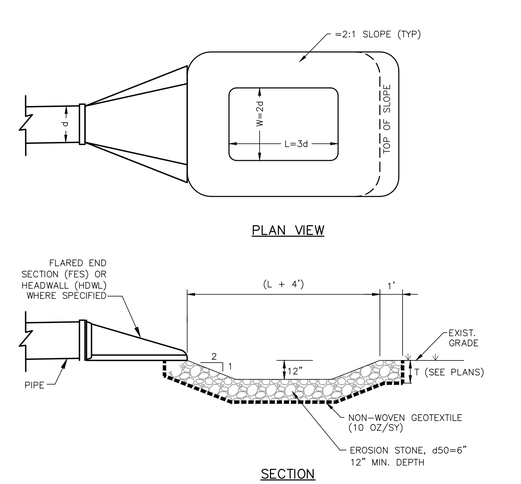
THE OUTLET PROTECTION SHOULD BE CHECKED AT LEAST ANNUALLY AND AFTER EVERY MAJOR STORM. IF THE RIPRAP HAS BEEN DISPLACED, UNDERMINED OR DAMAGED, IT SHOULD BE REPAIRED IMMEDIATELY. THE CHANNEL IMMEDIATELY BELOW THE OUTLET SHOULD BE CHECKED TO SEE THAT EROSION IS NOT OCCURRING. THE DOWNSTREAM CHANNEL SHOULD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

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, AND RIPRAP SHALL BE PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS.
2. THE ROCK OR GRAVEL USED FOR FILTER OR RIPRAP SHALL CONFORM TO THE SPECIFIED GRADATION.
3. GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING THE PLACEMENT OF THE ROCK RIPRAP. DAMAGED AREAS IN THE FABRIC SHALL BE REPAIRED BY PLACING A PIECE OF FABRIC OVER THE DAMAGED AREA OR BY COMPLETE REPLACEMENT OF THE FABRIC. ALL OVERLAPS REQUIRED FOR JOINING TWO PIECES OF FABRIC SHALL BE A MINIMUM OF 12 INCHES.
4. STONE FOR THE RIP RAP MAY BE PLACED BY EQUIPMENT AND SHALL BE CONSTRUCTED TO THE FULL LAYER THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO PREVENT SEGREGATION OF THE STONE SIZES.
5. FOR PIPES LESS THAN 12" IN DIAMETER NO FLARED END SECTION IS REQUIRED. BEVEL EXPOSED END OF PIPE FLUSH WITH GRADE.

RIPRAP OUTLET PROTECTION

NOT TO SCALE



SECTION

NOTES

1. CONSTRUCT PLUNGE POOL TO THE WIDTHS AND LENGTHS SHOWN ON THE PLAN.
2. THE SUBGRADE FOR THE GEOTEXTILE FABRIC AND RIPRAP SHALL BE PREPARED TO LINES AND GRADES SHOWN ON THE PLANS.
3. EROSION STONE USED FOR THE PLUNGE POOL SHALL MEET THE FOLLOWING GRADATION:

SIZE	PERCENT PASSING BY WEIGHT
18"	100
12"	90-100
4"	0-15

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

PLUNGE POOL

NOT TO SCALE

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

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REGISTRATION

100% SUBMITTAL
PRELIMINARY COPY

NOTE: This document is preliminary only and is not intended for any purpose except review and comment by the owner and its agents.

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/15/2025	INITIAL SUBMISSION
	3/26/2025	REVISED
	4/21/2025	90% COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	Not to Scale

DISCIPLINE

SHEET TITLE

DETAILS V

SHEET NUMBER

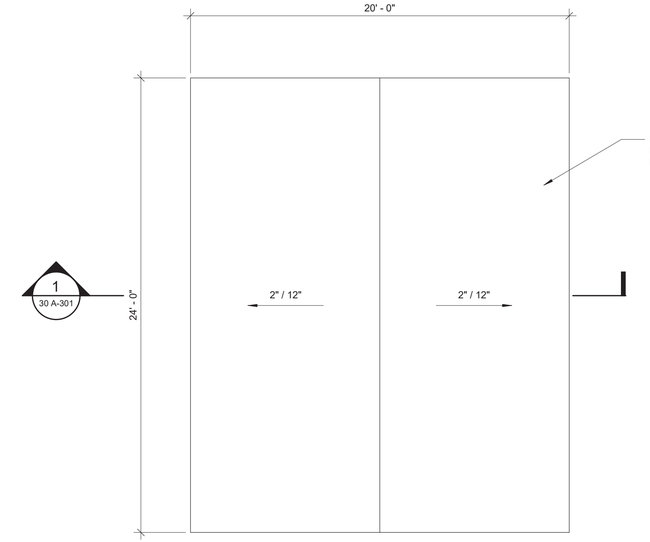
D-5

STATE OF NEW HAMPSHIRE - ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER -
5/29/25

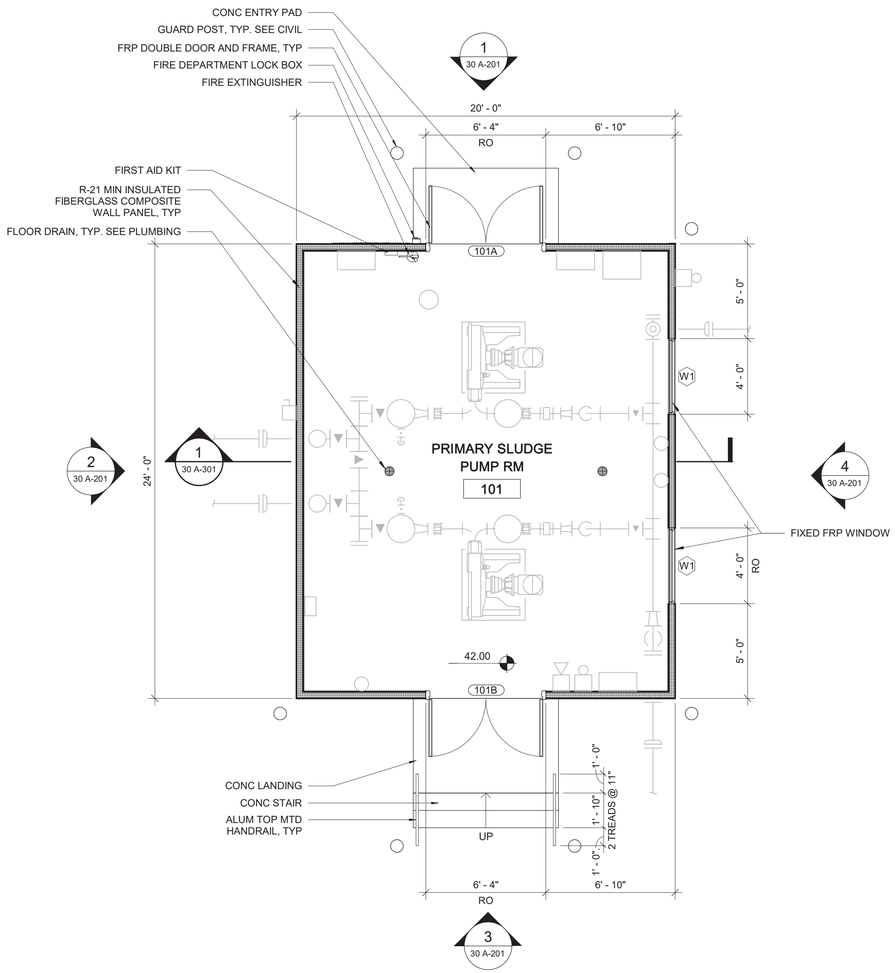
GENERAL NOTES:

1. PRIMARY SLUDGE PUMP STATION TO BE A PREFABRICATED FIBERGLASS SHELTER. SEE SPECIFICATION SECTION 13120.

2. SEE 99 SERIES SHEETS FOR STANDARD RAILING DETAILS.



2 30 A-101 **ROOF PLAN**
SCALE: 1/4" = 1'-0"



1 30 A-101 **GRADE LEVEL PLAN**
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/30-A-Primary Sludge Pump Station.rvt
LAST UPDATE: 4/30/2025 12:20:54 PM
PLOT DATE: 4/30/2025 12:20:54 PM

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PROJECT

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REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	SM
Drawn By:	SM
Dept Check:	KC
Proj Check:	EM
Date:	APRIL 2025
Scale:	1/4" = 1'-0"

DISCIPLINE

ARCHITECTURAL
SHEET TITLE

PRIMARY SLUDGE PUMP STATION - PLANS

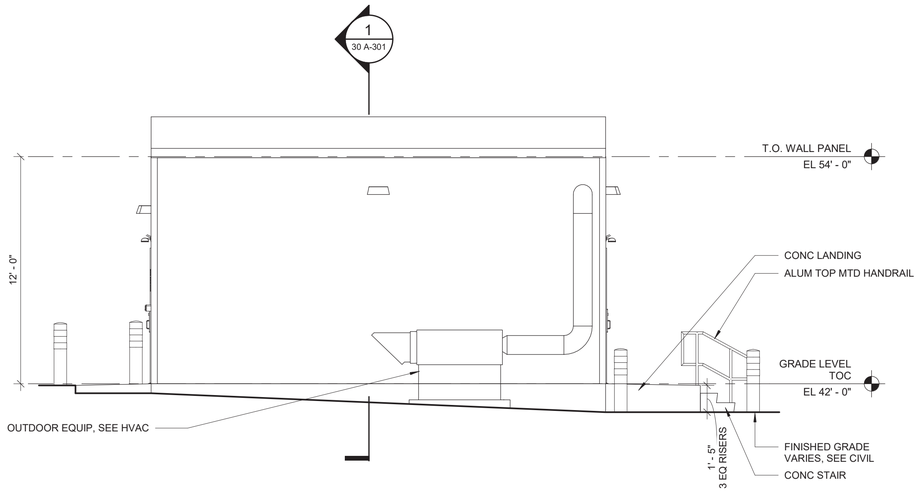
SHEET NUMBER

30 A-101

GENERAL NOTES:

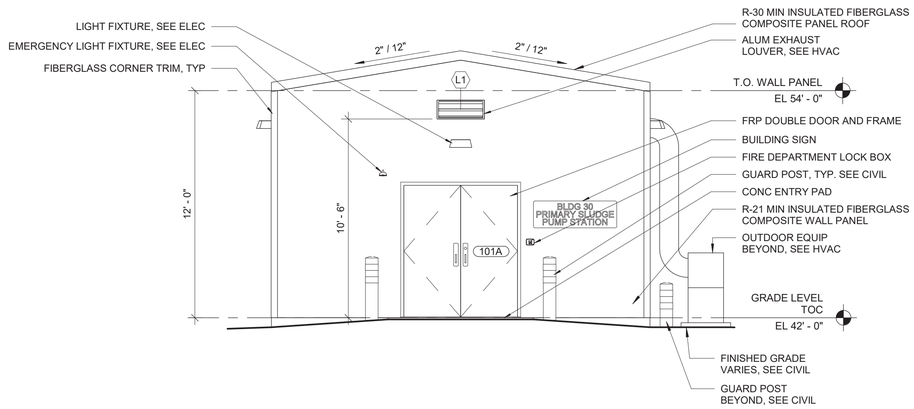
1. PRIMARY SLUDGE PUMP STATION TO BE A PREFABRICATED FIBERGLASS BUILDING.

2. SEE 99 SERIES SHEETS FOR STANDARD RAILING DETAILS.

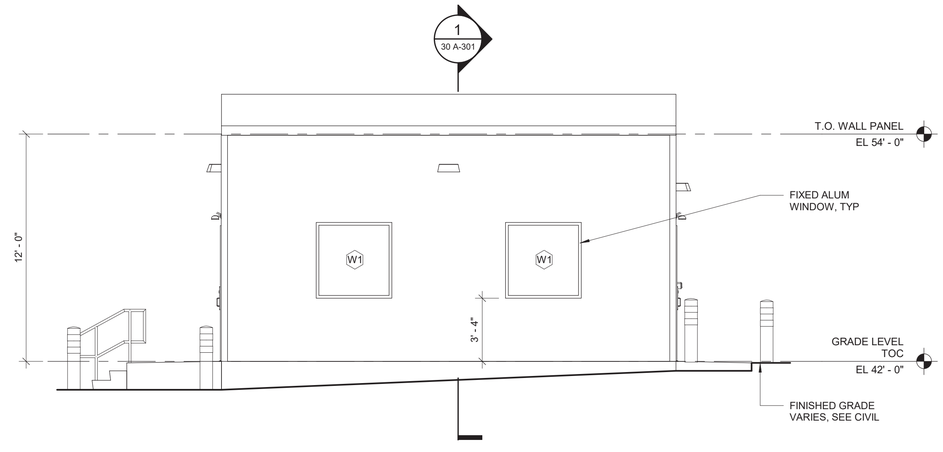


2 NORTHWEST ELEVATION
30 A-201 SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/30 A-201 U.N.O.

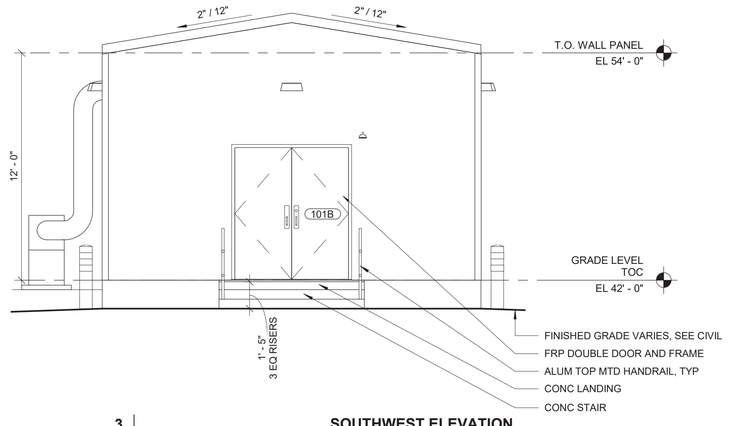


1 NORTHEAST ELEVATION
30 A-201 SCALE: 1/4" = 1'-0"



4 SOUTHEAST ELEVATION
30 A-201 SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/30 A-201 U.N.O.



3 SOUTHWEST ELEVATION
30 A-201 SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/30 A-201 U.N.O.

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/30-A-Primary Sludge Pump Station.rvt
LAST UPDATE: 4/30/2025 12:20:54 PM
PLOT DATE: 4/30/2025 12:20:54 PM

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PROJECT NUMBER

60693508

Designed By:	SM
Drawn By:	SM
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Proj Check:	EM
Date:	APRIL 2025
Scale:	1/4" = 1'-0"

DISCIPLINE

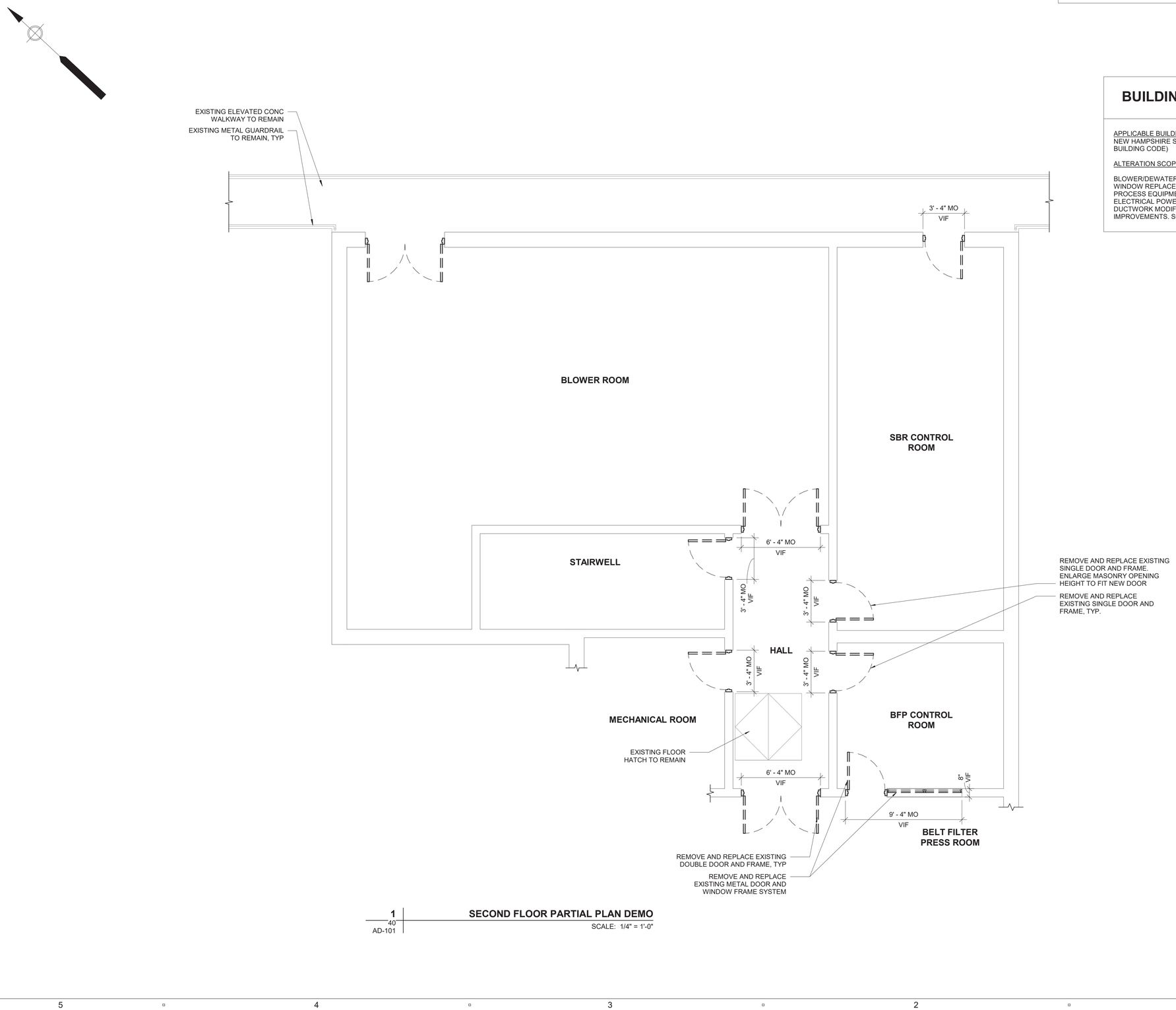
ARCHITECTURAL

SHEET TITLE

PRIMARY SLUDGE PUMP STATION - BUILDING ELEVATIONS

SHEET NUMBER

30 A-201



1 / 40 / AD-101 **SECOND FLOOR PARTIAL PLAN DEMO**

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

LEGEND

— — — — DEMOLISH U.N.O.

GENERAL NOTES:

1. DIMENSIONS PERTAINING TO RENOVATION WORK ARE TO BE VERIFIED IN THE FIELD.

BUILDING CODE ANALYSIS

APPLICABLE BUILDING CODE:
NEW HAMPSHIRE STATE BUILDING CODE (2021 INTERNATIONAL EXISTING BUILDING CODE)

ALTERATION SCOPE OF WORK DESCRIPTION:

BLOWER/DEWATERING BUILDING MODIFICATIONS INCLUDE DOOR AND WINDOW REPLACEMENT, WALL COVERING REMOVAL, MECHANICAL PROCESS EQUIPMENT/PIPING REPLACEMENT AND/OR REMOVAL, ELECTRICAL POWER EQUIPMENT ADDITION AND REPLACEMENT, DUCTWORK MODIFICATIONS, AND STRUCTURAL SUPPORT IMPROVEMENTS. SCOPE OF WORK IS CLASSIFIED AS ALTERATION LEVEL 2.

0 2' 4' 8'

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

AECOM

PROJECT

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DISCIPLINE

ARCHITECTURAL

SHEET TITLE

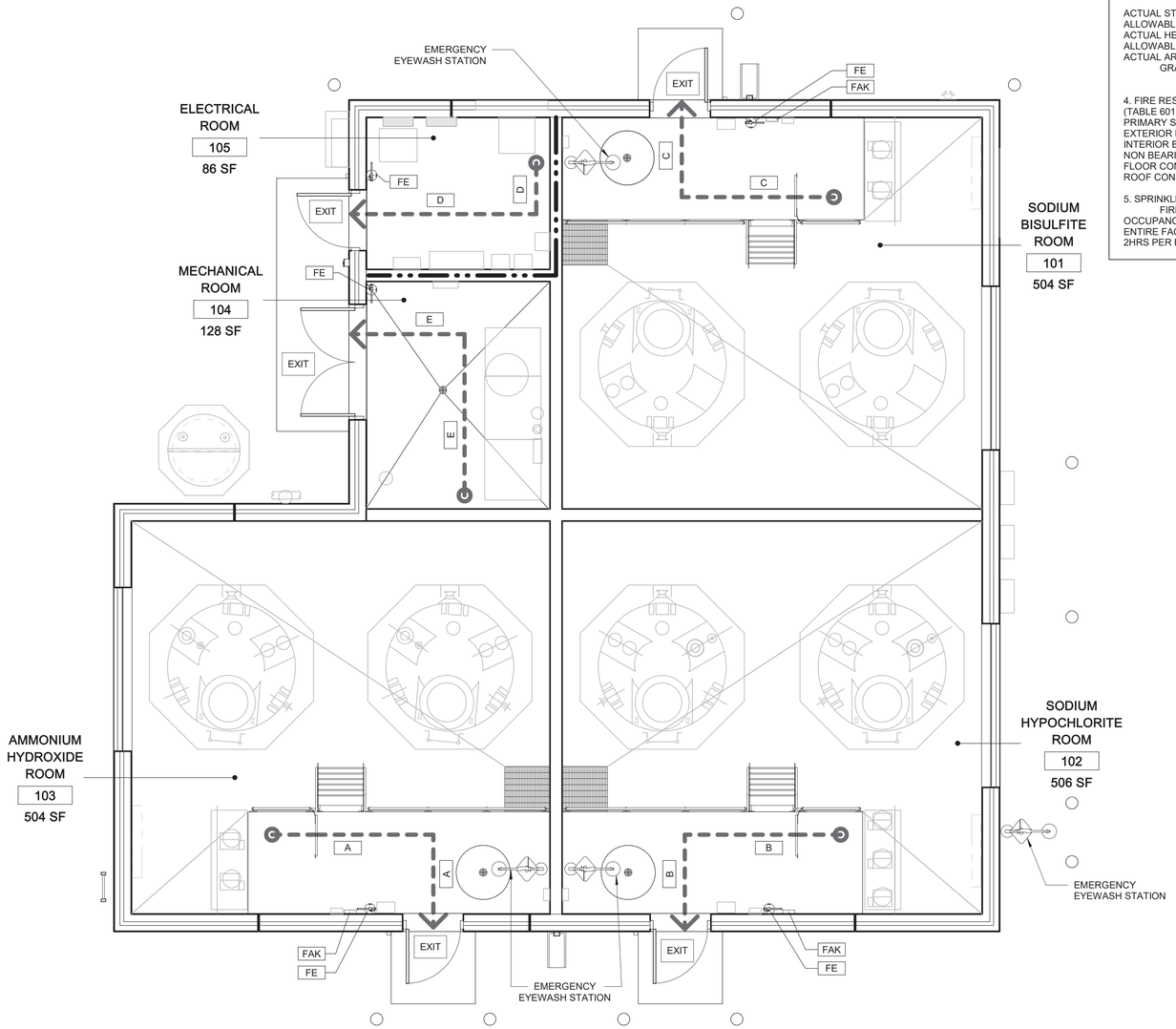
BLOWER/DEWATERING BUILDING - SECOND FLOOR PLAN - DEMO

SHEET NUMBER

40 AD-101

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/40-A-Existing Blower Dewatering Building.rvt
LAST UPDATE: 4/30/2025 12:21:34 PM
PLOT DATE: 4/30/2025 12:21:34 PM

EGRESS PATH/DISTANCES	
EGRESS PATH ID	EGRESS TRAVEL DISTANCE
A	14' - 1"
B	13' - 10"
C	13' - 8"
D	13' - 1"
E	15' - 2"



1 LIFE SAFETY PLAN - GRADE LEVEL
60 A-001A SCALE: 1/4" = 1'-0"

BUILDING CODE ANALYSIS

APPLICABLE BUILDING CODE:
BUILDING CODE:
NEW HAMPSHIRE STATE BUILDING CODE (2021 INTERNATIONAL BUILDING CODE)

FIRE/LIFE SAFETY CODE:
NEW HAMPSHIRE STATE FIRE CODE (NFPA 1, 2021), NFPA 101, 2021

ENERGY CODE:
2018 INTERNATIONAL ENERGY CONSERVATION CODE

BUILDING DESCRIPTION:
CHEMICAL STORAGE BUILDING:
ONE STORY BUILDING: INSULATED PRECAST CONCRETE BEARING WALL AND MEMBRANE ROOF ON PRECAST CONCRETE PLANK STRUCTURE.

BUILDING REVIEW:
1. OCCUPANCY USE GROUP (CHAPTER 3):
USE CLASSIFICATION
H-3 (HIGH-HAZARD, SECTION 307.5)

2. CONSTRUCTION TYPE: TYPE IIB - UNPROTECTED (SECTION 602)

3. BUILDING HEIGHTS AND AREAS:
ALLOWABLE STORIES ABOVE GRADE: H-3 2 (TABLE 504.4)

ACTUAL STORIES ABOVE GRADE:		1
ALLOWABLE HEIGHT:		55' (TABLE 504.3)
ACTUAL HEIGHT:		23'-2"
ALLOWABLE AREA	H-3:	14,000 SF (TABLE 506.2)
ACTUAL AREA		
GRADE LEVEL:		
	H-3:	1,934 SF

4. FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (TABLE 601):

PRIMARY STRUCTURAL FRAME:	0 HRS
EXTERIOR BEARING WALLS:	0 HRS
INTERIOR BEARING WALLS:	0 HRS
NON BEARING WALLS:	0 HRS
FLOOR CONSTRUCTION:	0 HRS
ROOF CONSTRUCTION:	0 HR

5. SPRINKLERED: YES (SECTION 903.2.5)
FIRE SUPPRESSION REQUIRED FOR HAZARDOUS TYPE OCCUPANCY USE GROUP. FULL FIRE SUPPRESSION PROVIDED FOR ENTIRE FACILITY, EXCEPT ELECTRICAL ROOM. (ELECTRICAL ROOMS = 2HRS PER EXCEPTION: IBC 2021 SECTION 903.3.1.1.1 ITEM 3)

6. MANUAL FIRE ALARM SYSTEM: YES (SECTION 907.2.5)

7. MEANS OF EGRESS:

MIN. DOOR CLEAR OPENING:	32" (SECTION 1008.1.1)
ACTUAL DOOR WIDTH:	36"

8. CALCULATED OCCUPANT LOAD AND TRAVEL DISTANCES (TABLE 1004.5)

ELECTRICAL RM: 85/100	1
MECHANICAL RM: 126/300	1
SODIUM HYPOCHLORITE RM: 504/300	1
SODIUM BISULFITE RM: 504/300	1
AMMONIUM HYDROXIDE RM: 506/300	1
GRADE LEVEL TOTAL:	5

MAX. COMMON PATH OF EGRESS (WITHOUT SPRINKLER, TABLE 1006.2.1):
F 75 FEET

MAX. COMMON PATH OF EGRESS (WITH SPRINKLER, TABLE 1006.2.1):
H-3 25 FEET

MAX. TRAVEL DISTANCE (WITHOUT SPRINKLER, TABLE 1017.2):
F-2 300 FEET

MAX. TRAVEL DISTANCE (WITH SPRINKLER, TABLE 1017.2):
F-2 400 FEET
H-3 150 FEET

NUMBER OF EXITS REQUIRED:	5 (TABLE 1006.3.4 (2))
NUMBER OF EXITS PROVIDED:	
ELECTRICAL RM:	1
MECHANICAL RM:	1
SODIUM HYPOCHLORITE RM:	1
SODIUM BISULFITE RM:	1
AMMONIUM HYDROXIDE RM:	1
GRADE LEVEL ROOMS:	5

9. EXTERIOR WALL OPENINGS: NO LIMIT (TABLE 705.8)

10. CHEMICALS STORED: YES
SODIUM BISULFITE - 2,550 GALLON CAPACITY (TWO TANKS)
AMMONIUM HYDROXIDE - 2,000 GALLON CAPACITY (TWO TANKS)
SODIUM HYPOCHLORITE - 3,000 GALLON CAPACITY (TWO TANKS)

11. ACCESSIBILITY:

CHEMICAL STORAGE BUILDING WILL NOT BE ACCESSIBLE TO THE GENERAL PUBLIC (CHAPTER 11). ABLE BODIED PERSONNEL ONLY ARE INTENDED TO BE IN THE FACILITY.

ENERGY CODE ANALYSIS

APPLICABLE ENERGY CODE:
ENERGY CODE: 2018 INTERNATIONAL ENERGY CONSERVATION CODE

CLIMATE ZONE: 5A (SECTION C301)

BUILDING ENVELOPE - (TABLE C402.2 & TABLE C402.3):

1. ROOF:	
- INSULATION ABOVE DECK	R-30 ci (REQUIRED)
2. WALLS ABOVE GRADE:	
- MASS WALLS (GRADE LEVEL)	R-11.4 ci (REQUIRED)
3. WALLS BELOW GRADE:	
- MASS WALLS (BELOW GRADE)	R-7.5 ci (REQUIRED)
4. OPAQUE DOORS:	
- SWINGING DOOR	U-0.37 (REQUIRED)
5. VERTICAL FENESTRATIONS:	
- FIXED FENESTRATION	U-0.38 (REQUIRED)

LIFE SAFETY LEGEND

2 - HOUR FIRE BARRIER	
TRAVEL PATH	
FIRST AID KIT	
FE	FIRE EXTINGUISHER
EXIT	LOCATION OF EXIT

AECOM

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Proj Check:	EM
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Scale:	1/4" = 1'-0"

DISCIPLINE

ARCHITECTURAL

SHEET TITLE

CHEMICAL STORAGE BUILDING - LIFE SAFETY PLAN (BID ALT 1)

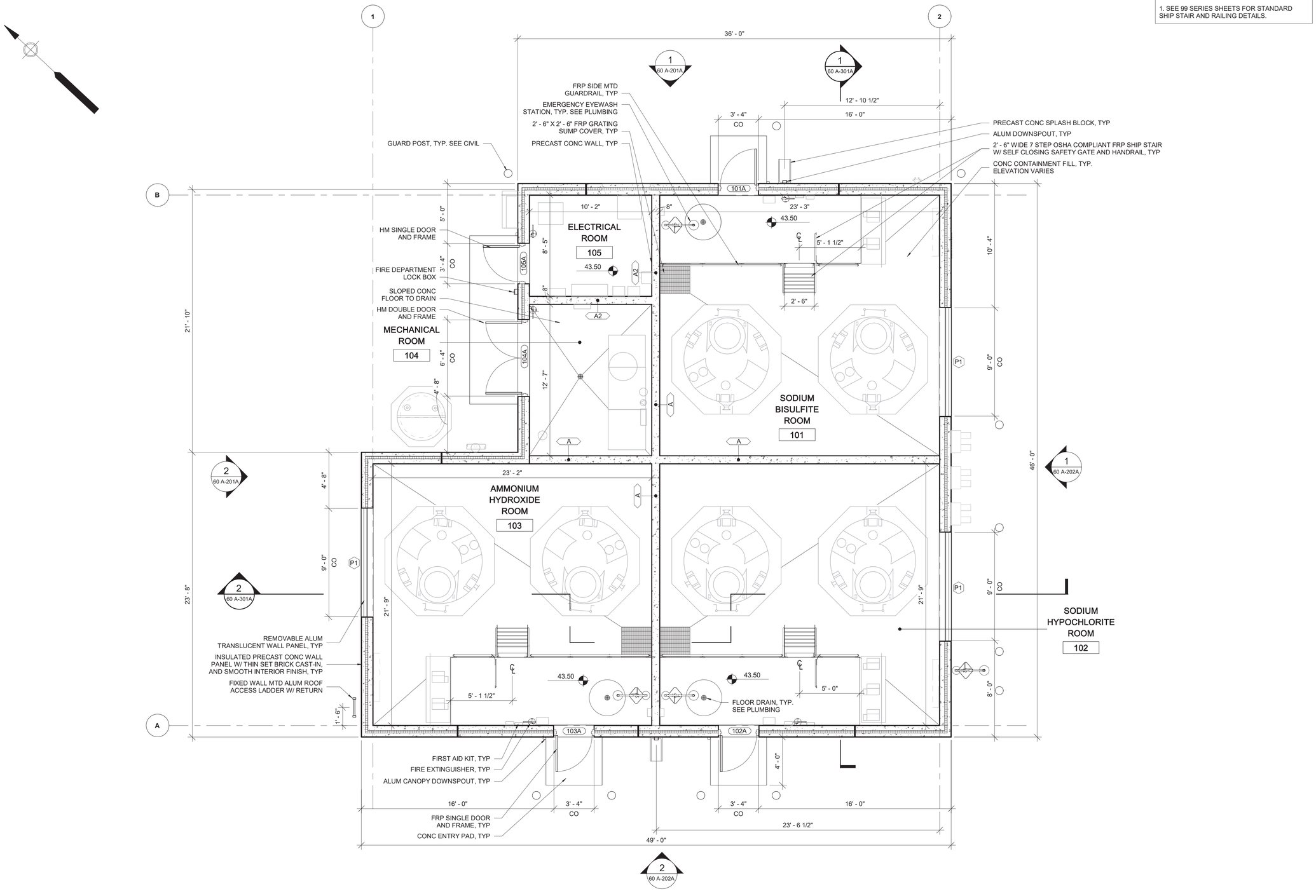
SHEET NUMBER

60 A-001A

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/60-A-Chemical Storage Building.rvt
LAST UPDATE: 4/30/2025 12:22:17 PM
PLOT DATE: 4/30/2025 12:22:17 PM

GENERAL NOTES:

1. SEE 99 SERIES SHEETS FOR STANDARD SHIP STAIR AND RAILING DETAILS.



1 | GRADE LEVEL PLAN
60 A-101A | SCALE: 1/4" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/60-A-Chemical Storage Building.rvt
LAST UPDATE: 4/30/2025 12:22:17 PM
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DISCIPLINE

ARCHITECTURAL
SHEET TITLE

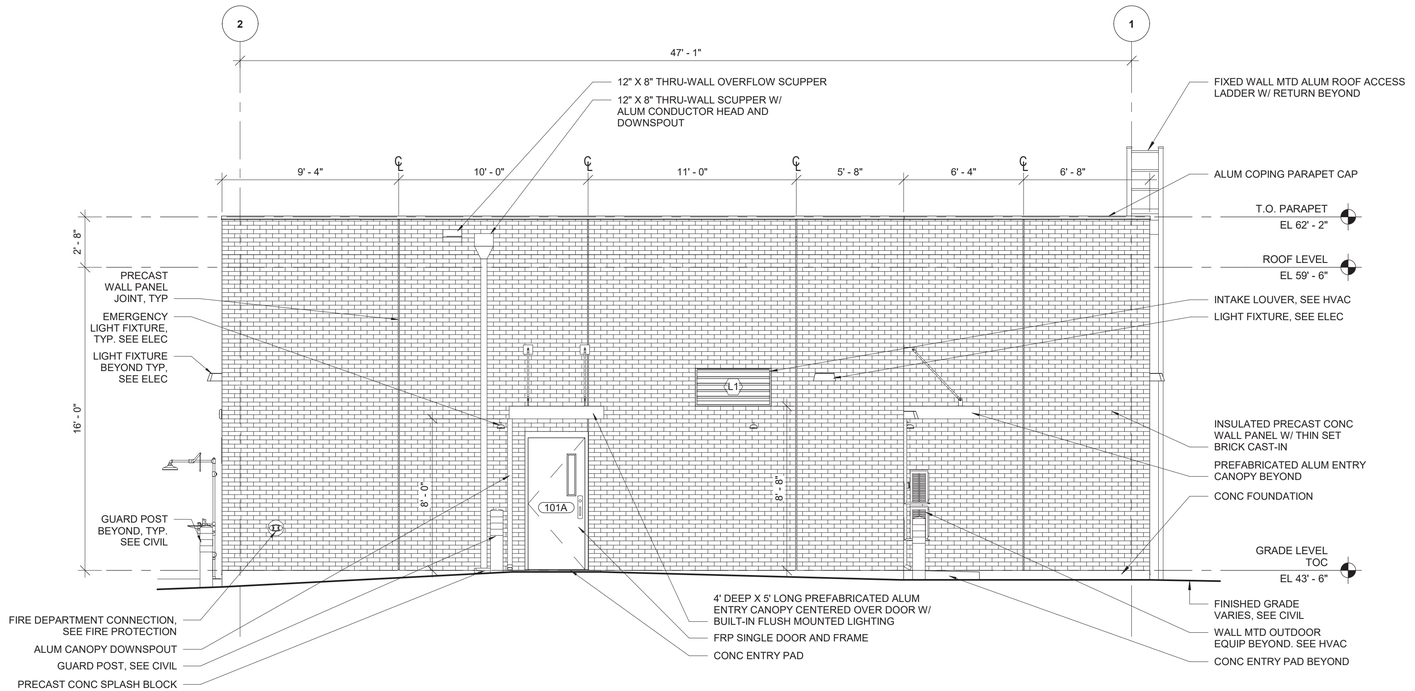
CHEMICAL STORAGE BUILDING - FLOOR PLAN (BID ALT 1)

SHEET NUMBER

60 A-101A

GENERAL NOTES:

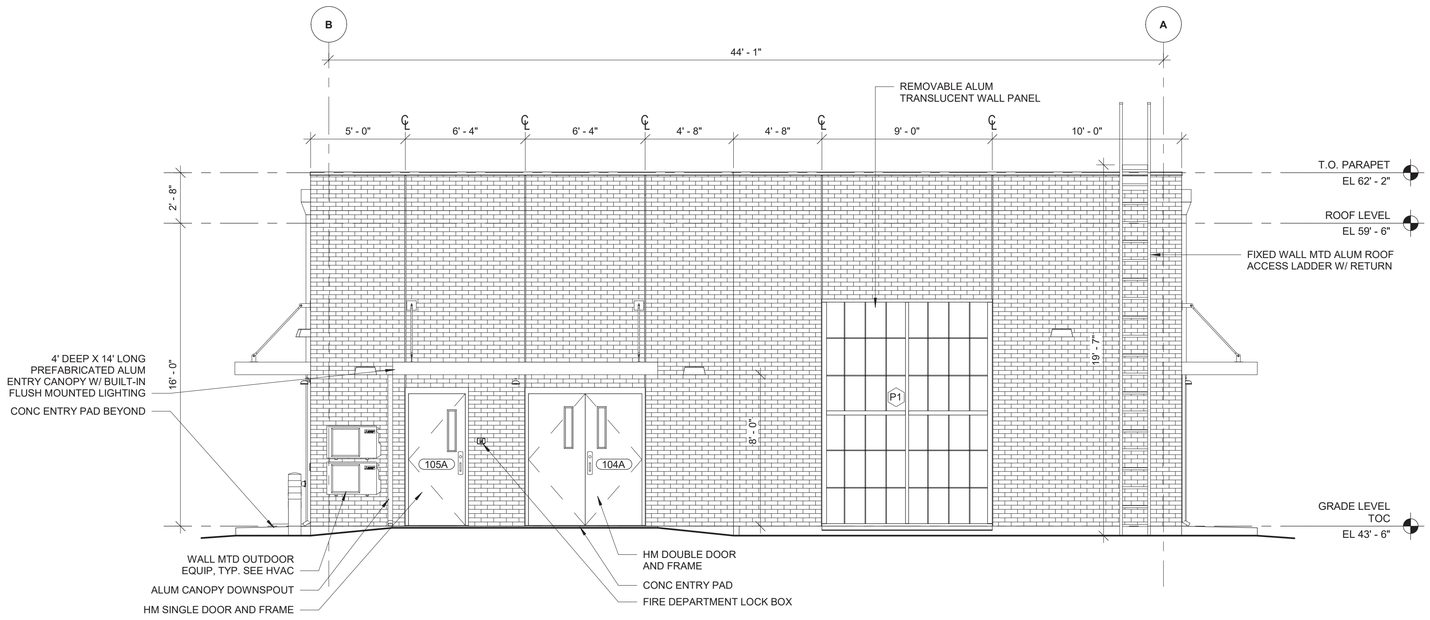
1. SEE 99 SERIES SHEETS FOR STANDARD SCUPPER AND CANOPY DETAILS.



1 NORTHEAST ELEVATION

60 A-201A

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



2 NORTHWEST ELEVATION

60 A-201A

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

SEE SIMILAR NOTES ON SHEET 1/60 A-201A U.N.O.

0 2' 4' 8'

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

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/60-A-Chemical Storage Building.rvt
LAST UPDATE: 4/30/2025 12:22:18 PM
PLOT DATE: 4/30/2025 12:22:18 PM

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DISCIPLINE

ARCHITECTURAL

SHEET TITLE

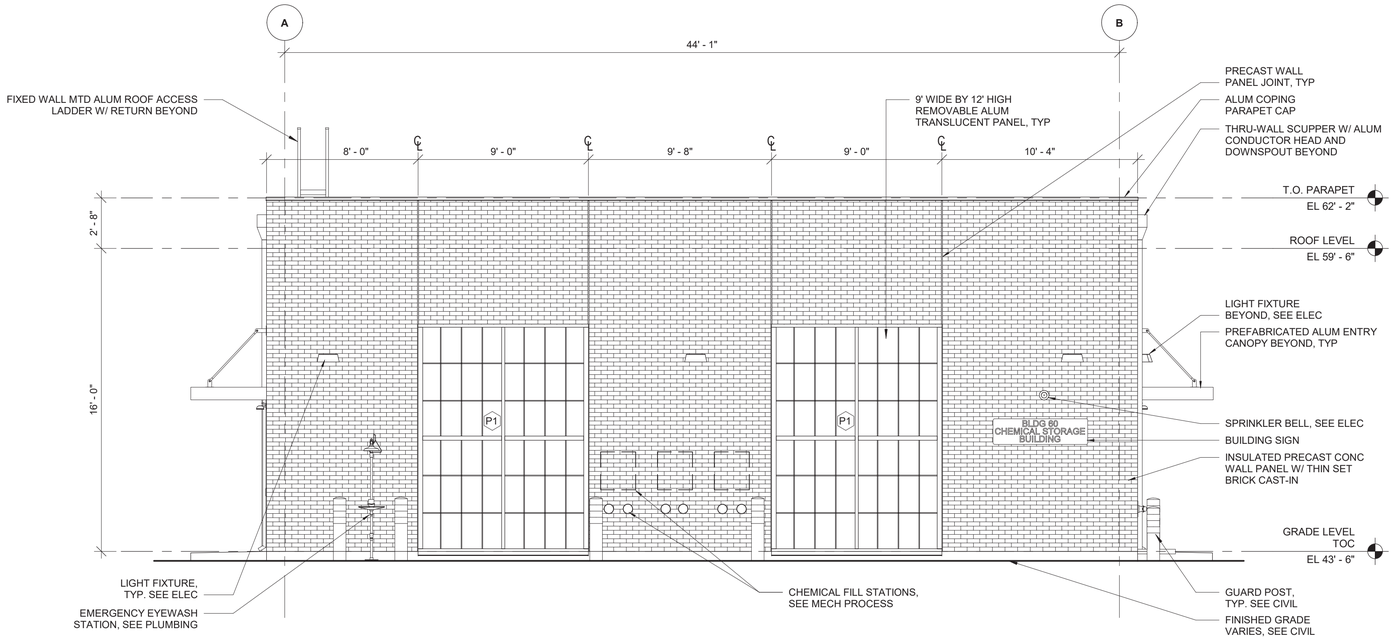
CHEMICAL STORAGE BUILDING - BUILDING ELEVATIONS I (BID ALT 1)

SHEET NUMBER

60 A-201A

GENERAL NOTES:

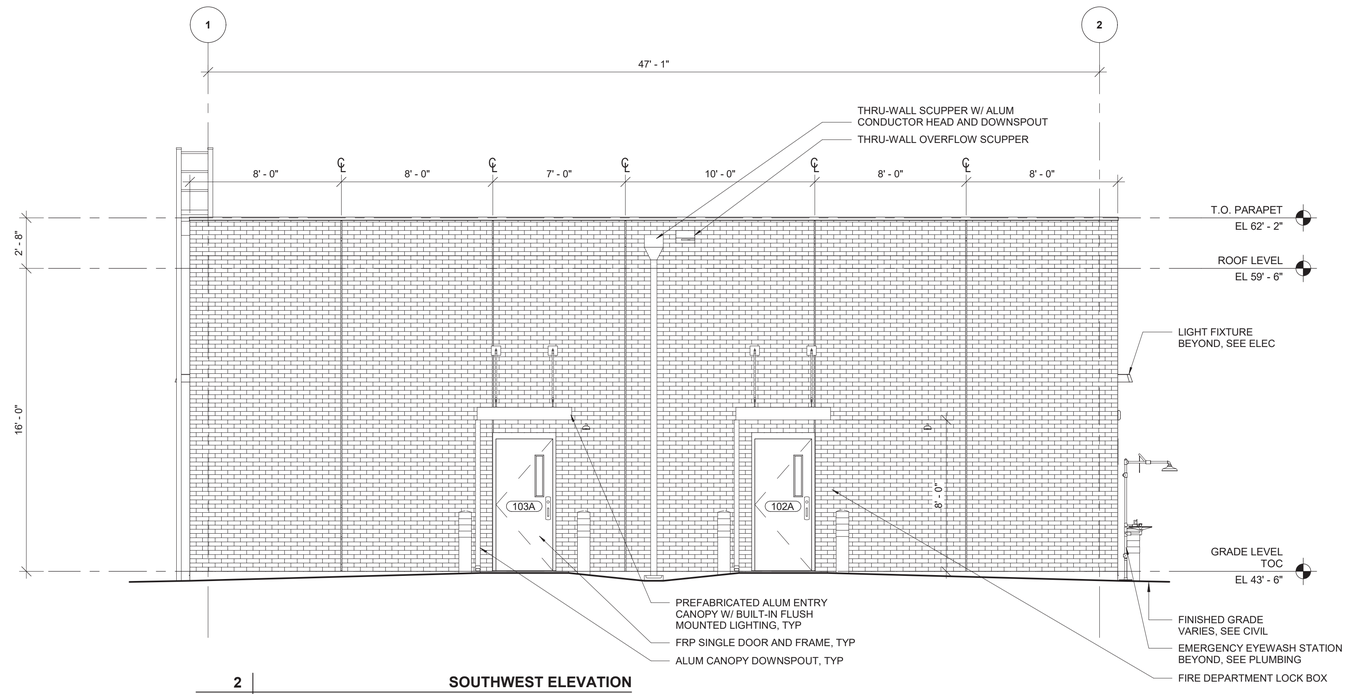
1. SEE 99 SERIES SHEETS FOR STANDARD SCUPPER AND CANOPY DETAILS.



1 — 60 A-202A

SOUTHEAST ELEVATION

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



2 — 60 A-202A

SOUTHWEST ELEVATION

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

SEE SIMILAR NOTES ON SHEET 1/60 A-202A U.N.O.

0 2' 4' 8'

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

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/60-A-Chemical Storage Building.rvt
LAST UPDATE: 4/30/2025 12:22:19 PM
PLOT DATE: 4/30/2025 12:22:19 PM

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PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
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REGISTRATION

ISSUE/REVISION

I/R	DATE	DESCRIPTION

PROJECT NUMBER

60693508

Designed By:	SM
Drawn By:	SM
Dept Check:	KC
Proj Check:	EM
Date:	APRIL 2025
Scale:	1/4" = 1'-0"

DISCIPLINE

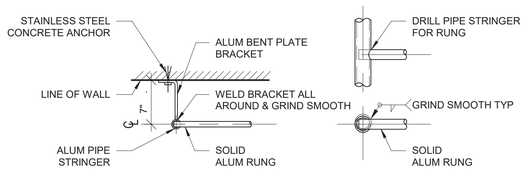
ARCHITECTURAL

SHEET TITLE

CHEMICAL STORAGE BUILDING - BUILDING ELEVATIONS II (BID ALT 1)

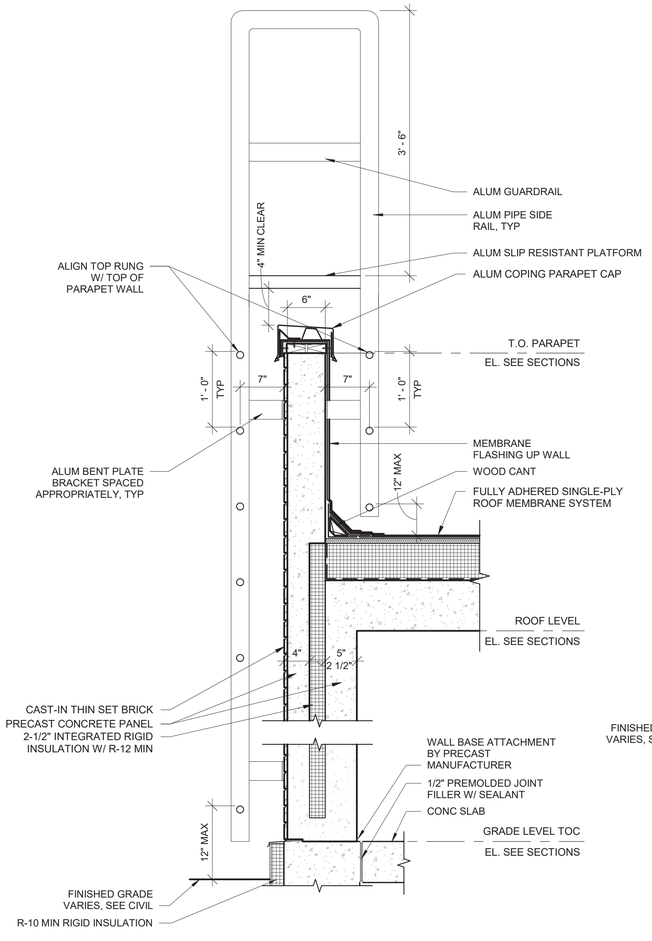
SHEET NUMBER

60 A-202A

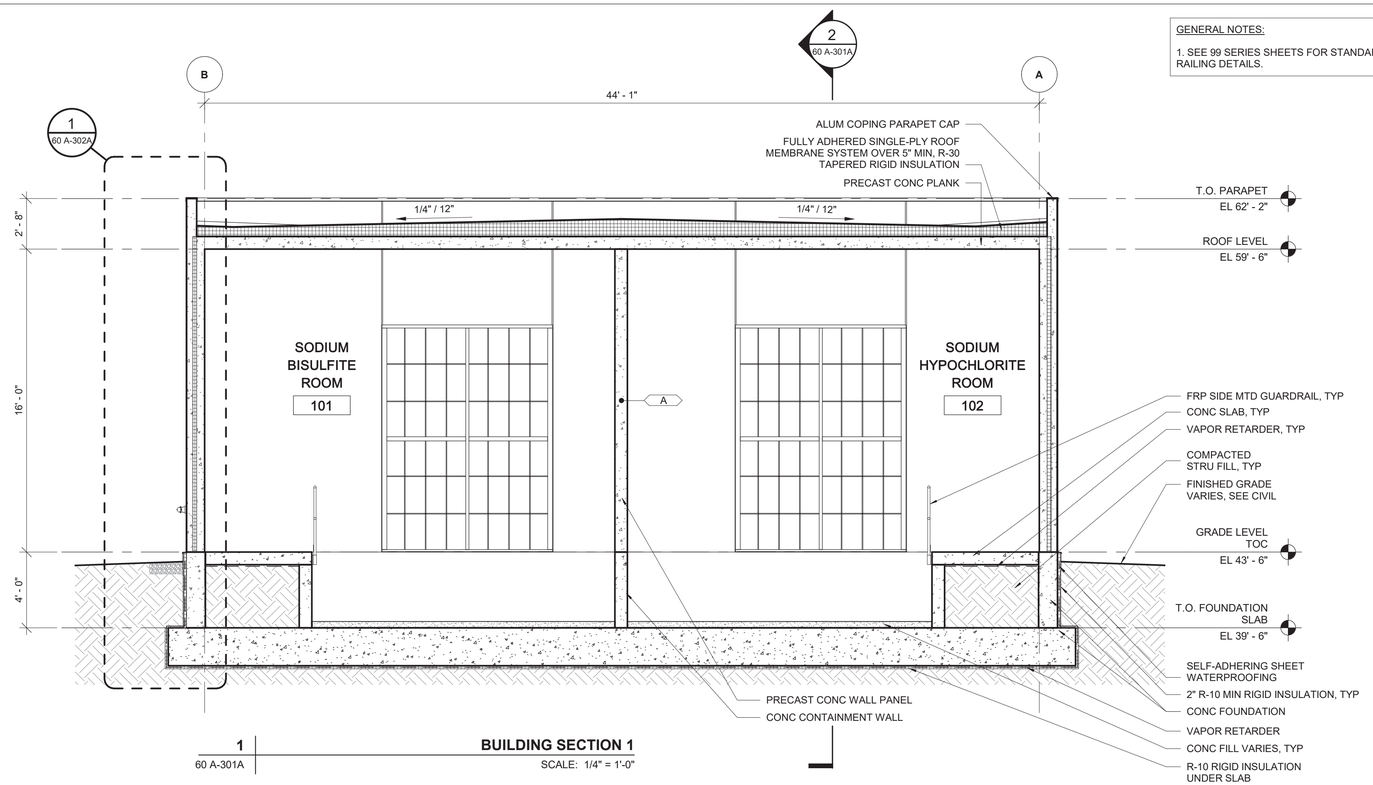


PLAN AT BRACKET
SCALE: 1" = 1'-0"

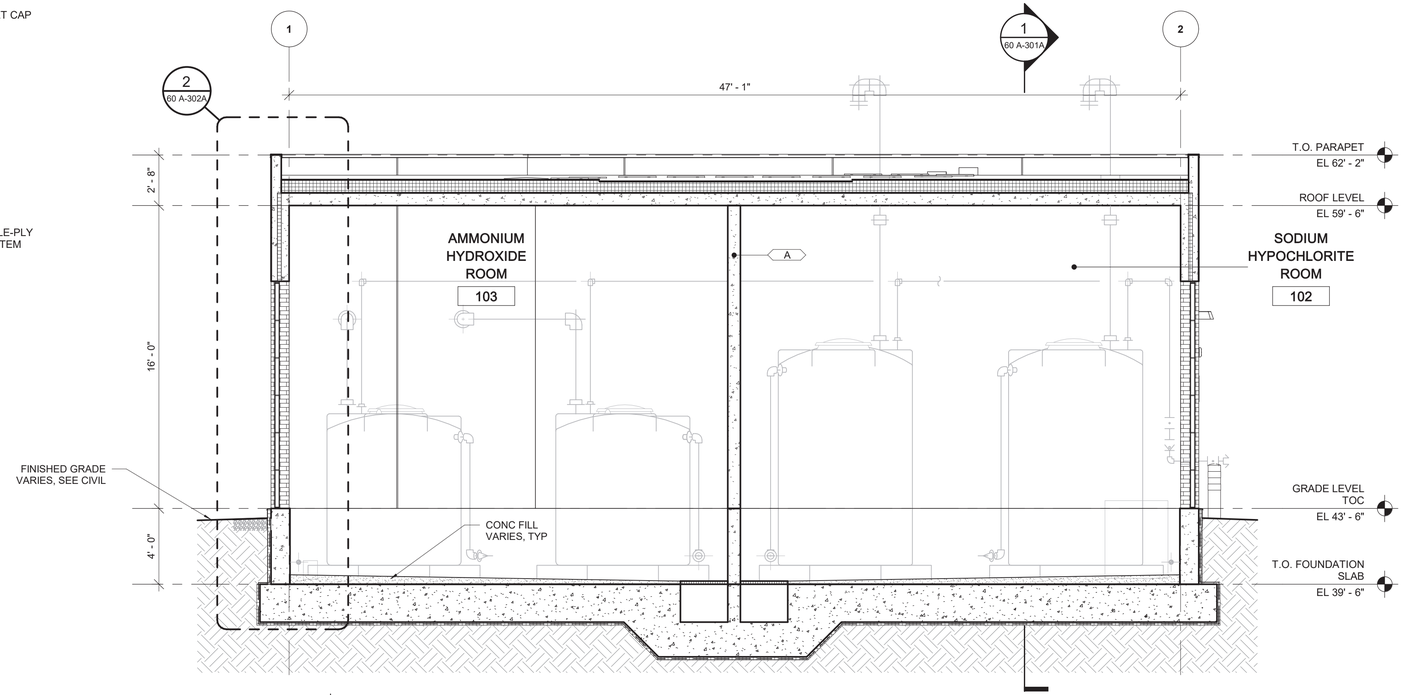
RUNG CONNECTION DETAILS
SCALE: 1 1/2" = 1'-0"



3 | 60 A-301A — **ALUM LADDER W/ RETURN AT PARAPET DETAIL**
SCALE: 1" = 1'-0"



1 | 60 A-301A — **BUILDING SECTION 1**
SCALE: 1/4" = 1'-0"



2 | 60 A-301A — **BUILDING SECTION 2**
SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/60 A-301A U.N.O.

GENERAL NOTES:

1. SEE 99 SERIES SHEETS FOR STANDARD RAILING DETAILS.

0 1' 2'
GRAPHIC SCALE: 1" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/60-A-Chemical Storage Building.rvt
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Scale:	As indicated

DISCIPLINE

ARCHITECTURAL
SHEET TITLE

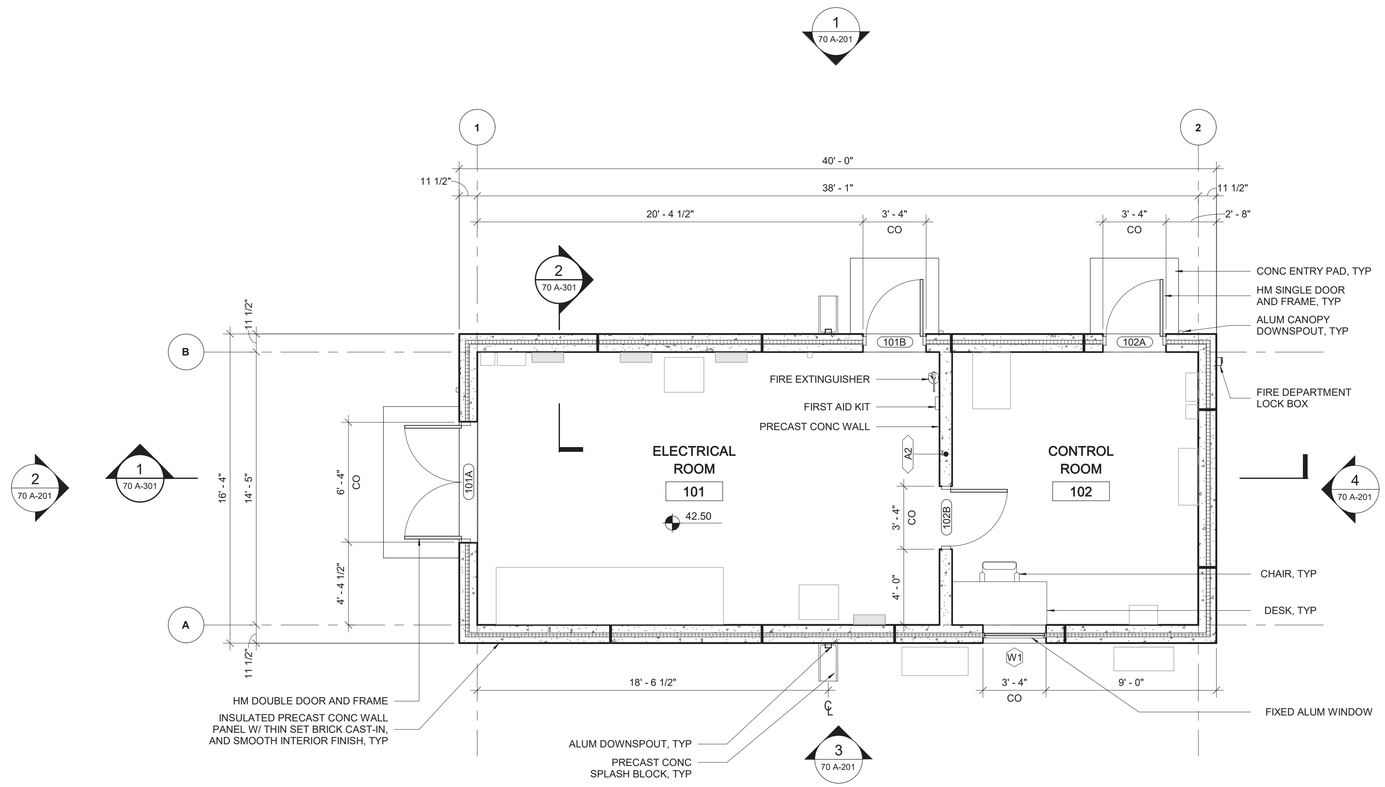
CHEMICAL STORAGE BUILDING - BUILDING SECTIONS (BID ALT 1)

SHEET NUMBER

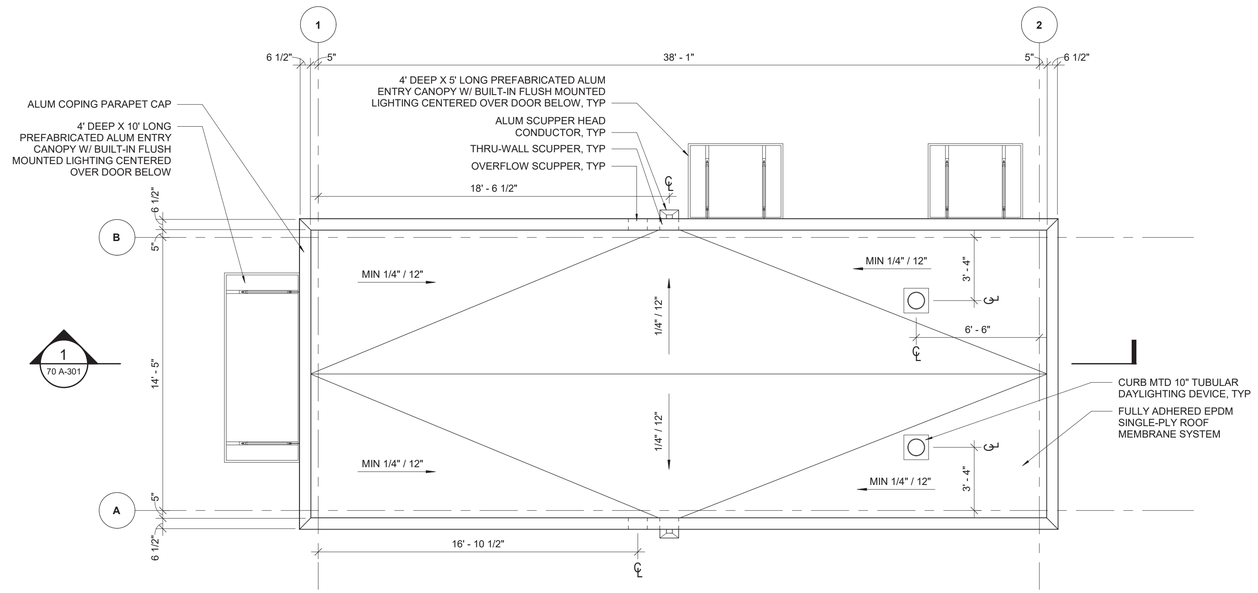
60 A-301A

GENERAL NOTES:

1. SEE 99 SERIES SHEETS FOR STANDARD ROOF CURB, SCUPPER, AND CANOPY DETAILS.



1 70 A-101 **GRADE LEVEL PLAN**
SCALE: 1/4" = 1'-0"



2 70 A-101 **ROOF PLAN**
SCALE: 1/4" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/70-A-Electric & Control Building.rvt
LAST UPDATE: 4/30/2025 12:23:30 PM
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Scale:	1/4" = 1'-0"

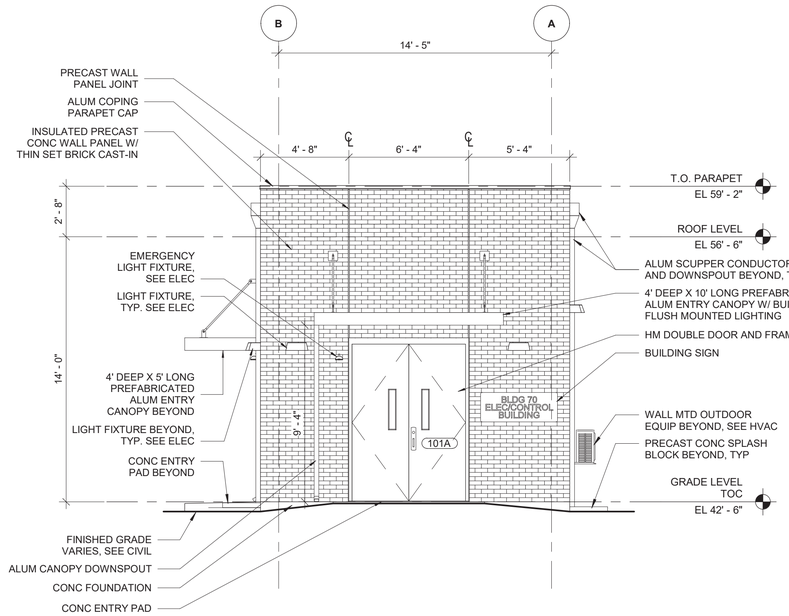
DISCIPLINE

ARCHITECTURAL
SHEET TITLE

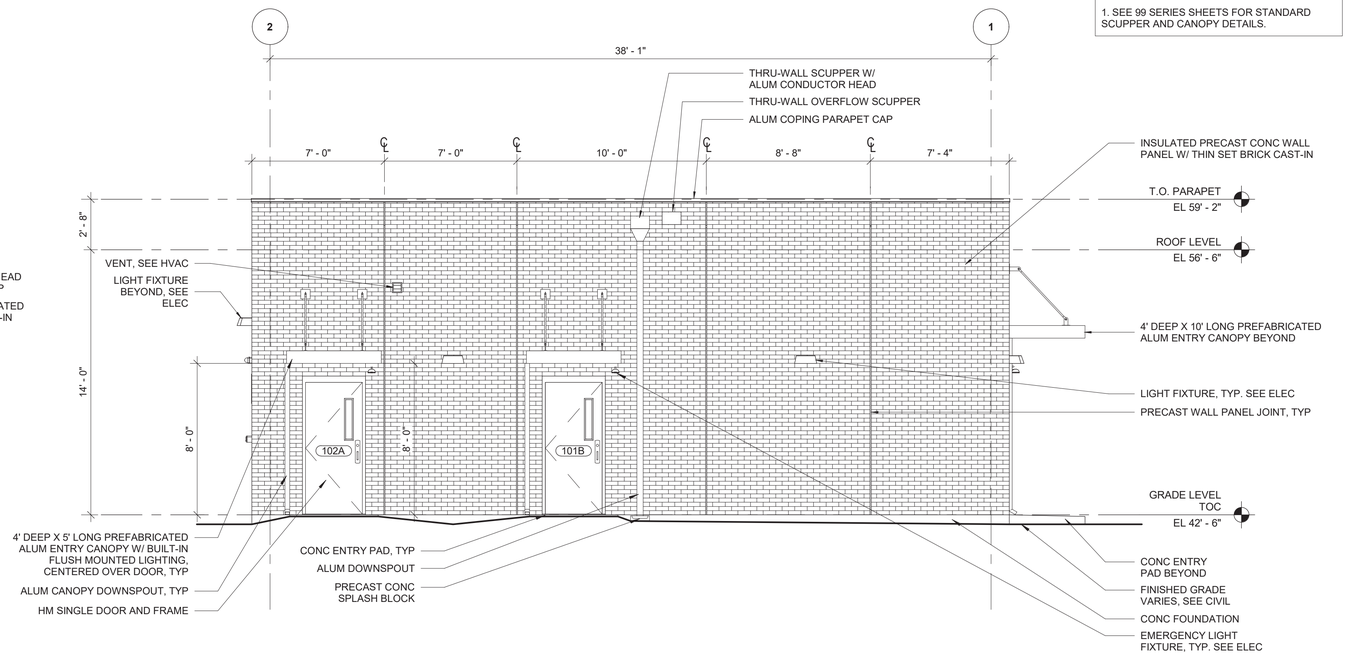
ELECTRICAL/CONTROL BUILDING - PLANS

SHEET NUMBER

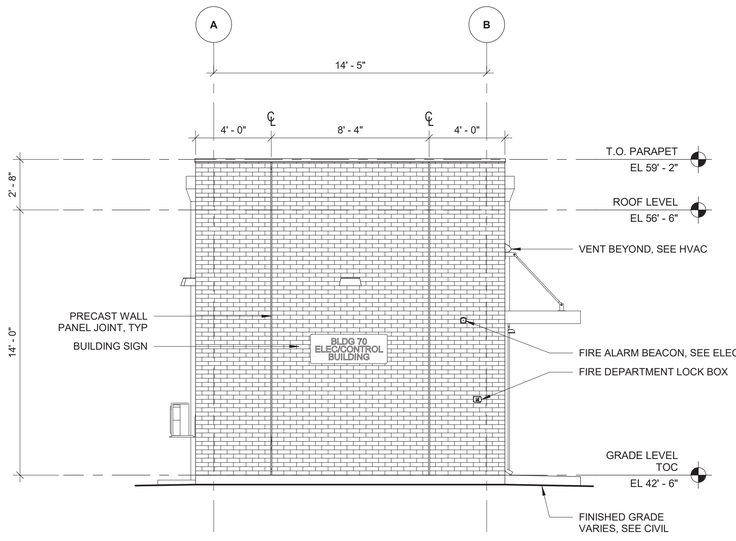
70 A-101



2 | 70 A-201 — **NORTHWEST ELEVATION**
SCALE: 1/4" = 1'-0"

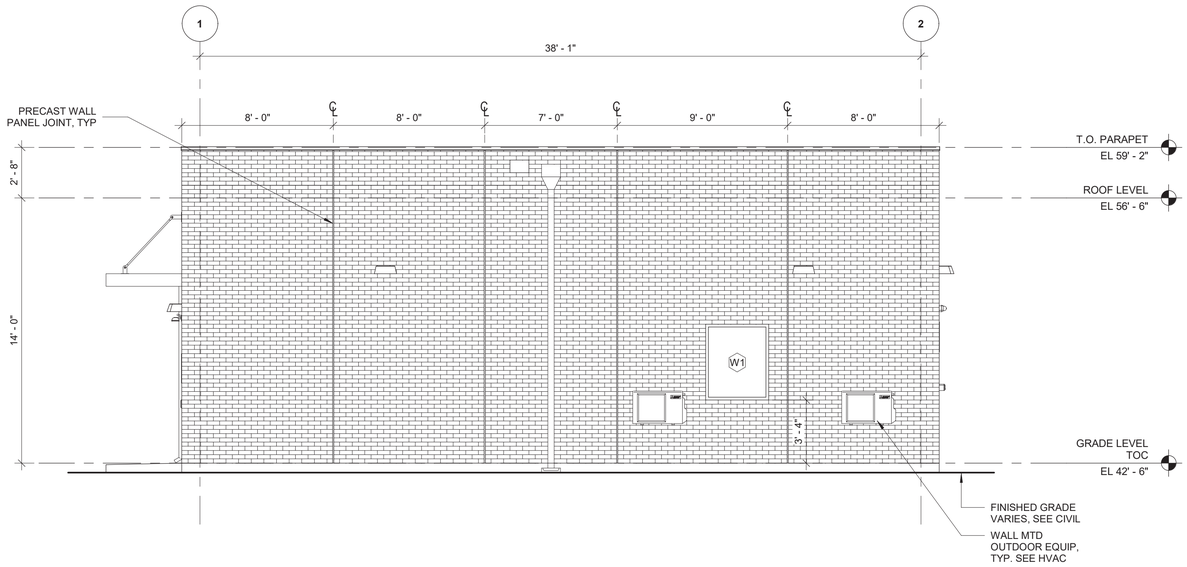


1 | 70 A-201 — **NORTHEAST ELEVATION**
SCALE: 1/4" = 1'-0"



4 | 70 A-201 — **SOUTHEAST ELEVATION**
SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 2/70 A-201 U.N.O.



3 | 70 A-201 — **SOUTHWEST ELEVATION**
SCALE: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/70 A-201 U.N.O.

GRAPHIC SCALE: 1/4" = 1'-0" (0, 2', 4', 8')

GENERAL NOTES:

1. SEE 99 SERIES SHEETS FOR STANDARD SCUPPER AND CANOPY DETAILS.

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ARCHITECTURAL

SHEET TITLE

ELECTRICAL/CONTROL BUILDING - BUILDING ELEVATIONS

SHEET NUMBER

70 A-201

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/70-A-Electric & Control Building.rvt
LAST UPDATE: 4/30/2025 12:23:31 PM
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LAUNDRY CLOSET APPLIANCES SCHEDULE

NO.	ITEM	COUNT	LENGTH	DEPTH	HEIGHT	REMARKS
1	GENERAL ELECTRIC WASHER MODEL #GFW550SSNWW	1	2' - 4"	2' - 8"	3' - 3"	NOTE 2, 3
2	GENERAL ELECTRIC DRYER MODEL #GFD55ESSNWW	1	2' - 4"	2' - 8"	3' - 3"	NOTE 2, 3

LAUNDRY CLOSET APPLIANCES SCHEDULE NOTES:

1. BASIS OF DESIGN PRODUCTS. SUBJECT TO COMPLIANCE WITH REQUIREMENTS OR APPROVED EQUAL.
2. MANUFACTURER TO PROVIDE WASHER/DRYER STACK BRACKET KIT.
3. STACKING ORDER PER MANUFACTURER'S RECOMMENDATIONS.

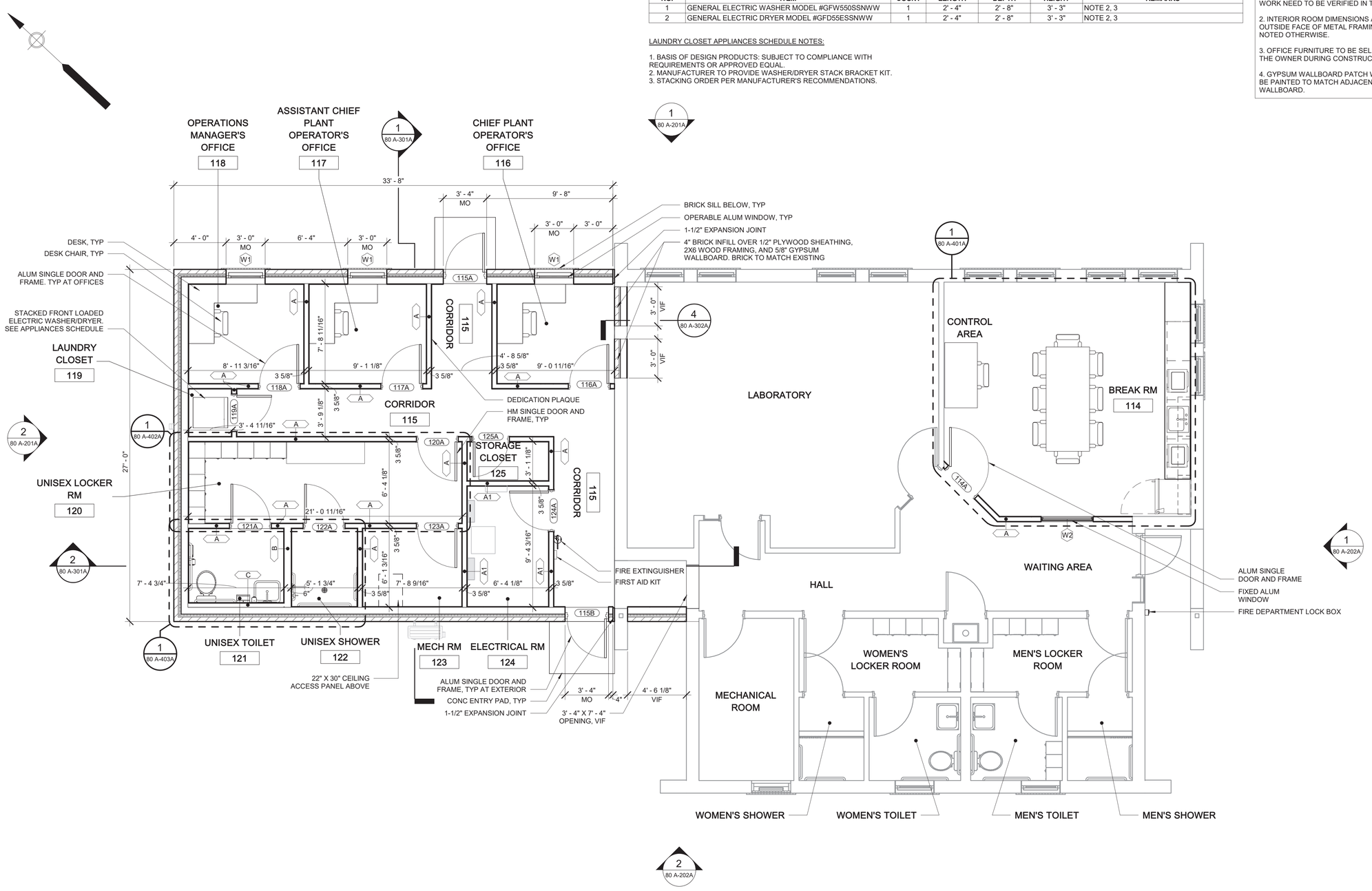
GENERAL NOTES:

1. DIMENSIONS PERTAINING TO RENOVATION WORK NEED TO BE VERIFIED IN THE FIELD.

2. INTERIOR ROOM DIMENSIONS ARE TO OUTSIDE FACE OF METAL FRAMING, UNLESS NOTED OTHERWISE.

3. OFFICE FURNITURE TO BE SELECTED BY THE OWNER DURING CONSTRUCTION.

4. GYPSUM WALLBOARD PATCH WORK SHALL BE PAINTED TO MATCH ADJACENT GYPSUM WALLBOARD.



1 GRADE LEVEL PLAN
80 A-201A — Scale: 1/4" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/80-A-Existing Admin Building.rvt
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DISCIPLINE

ARCHITECTURAL
SHEET TITLE

LAB/ADMIN BUILDING - FLOOR PLAN (BID ALT 2)

SHEET NUMBER

80 A-101A

1 / 80 AD-101A — **NORTHWEST ELEVATION - DEMO**

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

0 2' 4' 8'

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

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/80-A-Existing Admin Building.rvt
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DISCIPLINE

ARCHITECTURAL

SHEET TITLE

LAB/ADMIN BUILDING - EXTERIOR ELEVATIONS - DEMO (BID ALT 2)

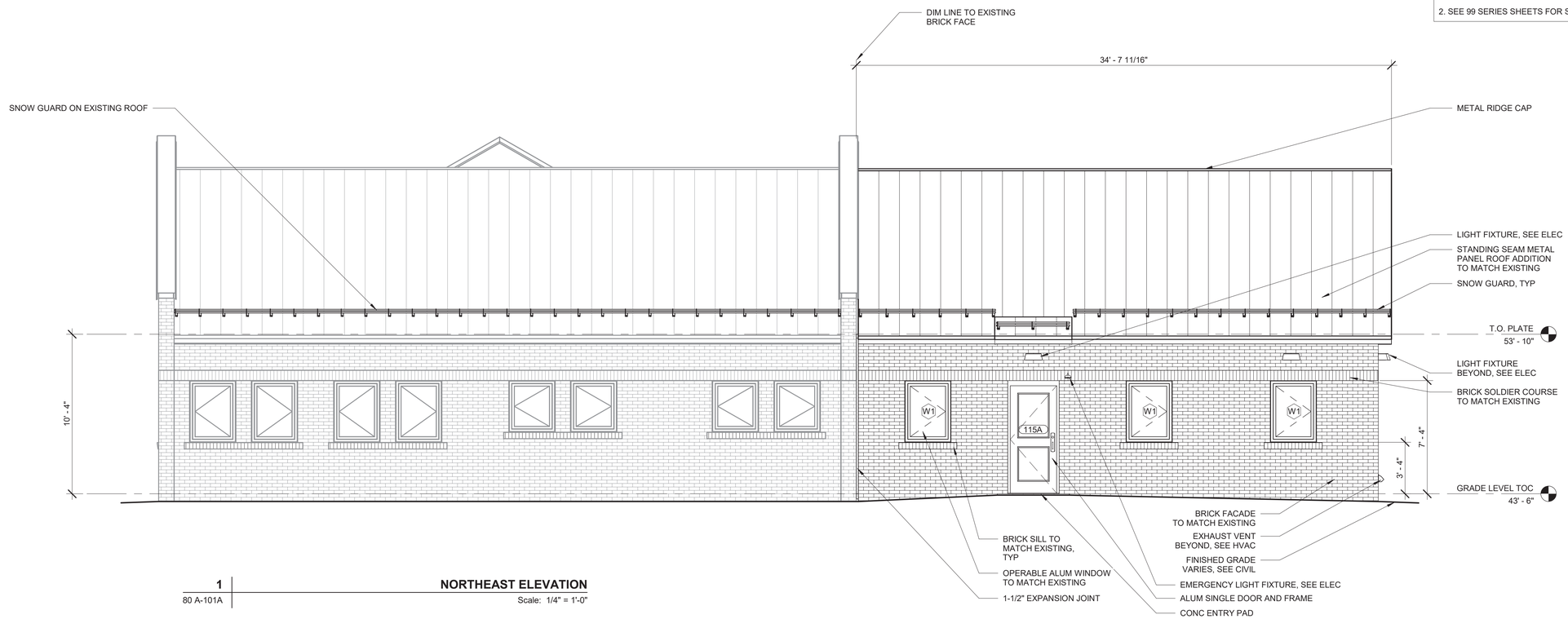
SHEET NUMBER

80 AD-201A

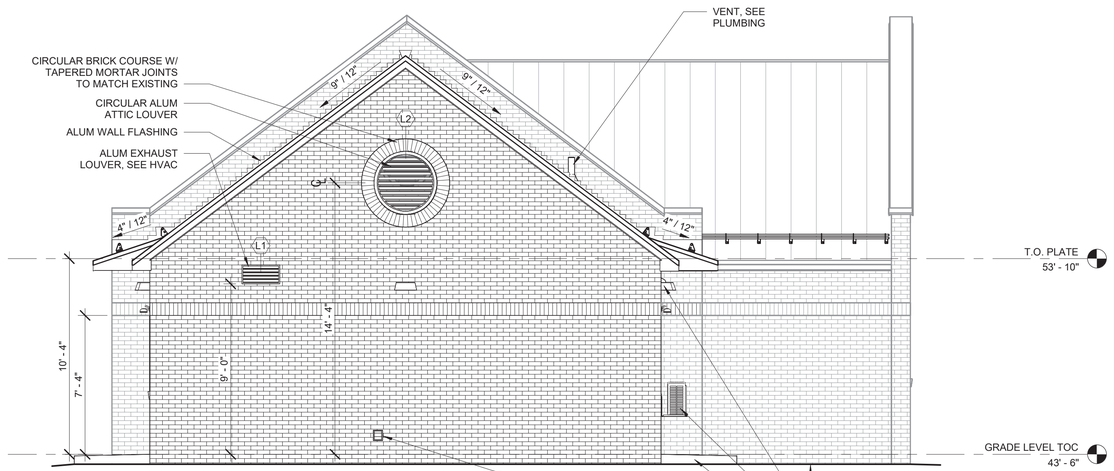
GENERAL NOTES:

1. SNOW GUARDS ARE TO BE PROVIDED FOR EXISTING ROOF, AND BUILDING ADDITION ROOF, AS INDICATED ON THE ROOF PLAN DRAWING.

2. SEE 99 SERIES SHEETS FOR STANDARD DETAILS.



1 NORTHEAST ELEVATION
80 A-101A — Scale: 1/4" = 1'-0"



2 NORTHWEST ELEVATION
80 A-101A — Scale: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 1/80 A-201A U.N.O.

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

PATH/FILENAME: Autodesk Docs://60693508-Pease WWTF Rehabilitation/80-A-Existing Admin Building.rvt
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DISCIPLINE

ARCHITECTURAL
SHEET TITLE

LAB/ADMIN BUILDING - EXTERIOR ELEVATIONS I (BID ALT 2)
SHEET NUMBER

80 A-201A

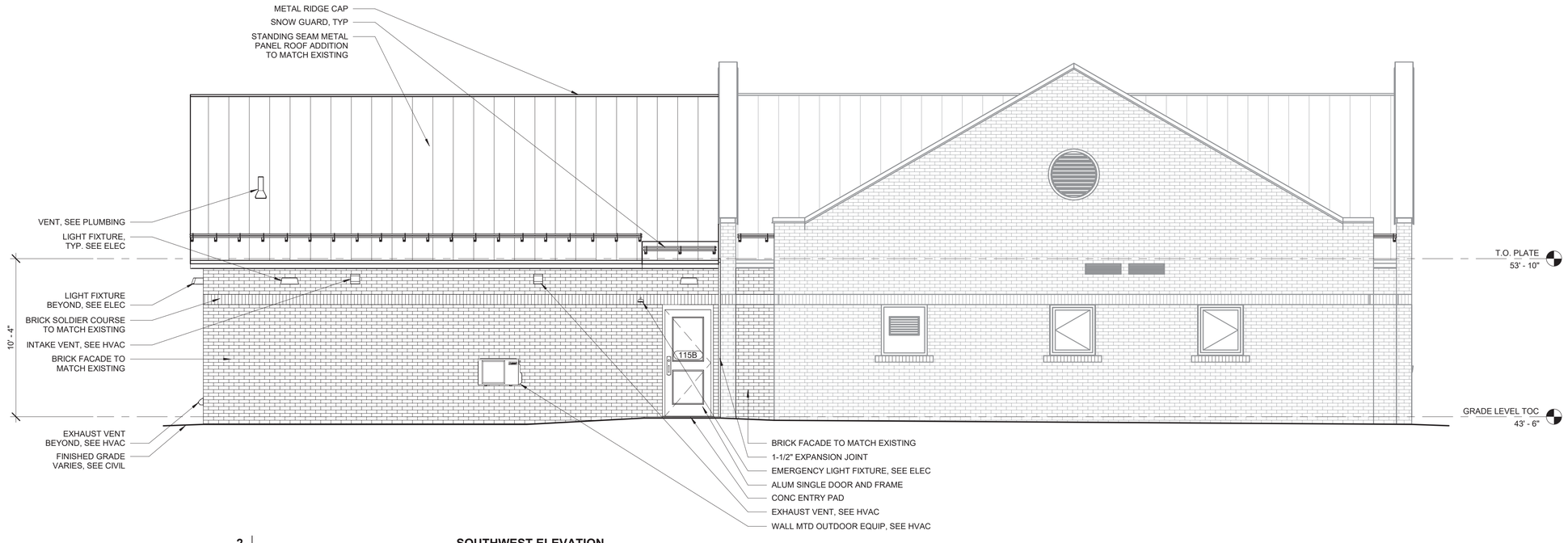
GENERAL NOTES:

1. SNOW GUARDS ARE TO BE PROVIDED FOR EXISTING ROOF, AND BUILDING ADDITION ROOF, AS INDICATED ON THE ROOF PLAN DRAWING.

2. SEE 99 SERIES SHEETS FOR STANDARD DETAILS.

1 — **SOUTHEAST ELEVATION**
80 A-101A — Scale: 1/4" = 1'-0"

SEE SIMILAR NOTES ON SHEET 2/80 A-202A U.N.O.



2 — **SOUTHWEST ELEVATION**
80 A-101A — Scale: 1/4" = 1'-0"

0 2' 4' 8'
GRAPHIC SCALE: 1/4" = 1'-0"

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ARCHITECTURAL
SHEET TITLE

LAB/ADMIN BUILDING - EXTERIOR ELEVATIONS II (BID ALT 2)

SHEET NUMBER

80 A-202A

DRAINAGE ANALYSIS

FOR

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH

February 20, 2025

Prepared For:

AECOM Technical Services, Inc.
250 Apollo Drive
Chelmsford, MA 01824

On Behalf Of:

City of Portsmouth New Hampshire
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

Prepared By:

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ALTUS ENGINEERING

Altus Project 5336

Table of Contents

ALTUS ENGINEERING

Section 1

Narrative

ALTUS ENGINEERING

PROJECT DESCRIPTION

The City of Portsmouth Department of Public Works is proposing to construct improvements at the Pease Wastewater Treatment Facility (WWTF). The ±12.1-acre parcel is identified as Tax Map 303, Lot 6 and is located in the Airport Business Commercial zone. The lot is located West of the Spaulding Turnpike (U.S. Highway Route 16, near exit 1) in the Pease International Tradeport industrial park. The access road to the property is located from Corporate Drive. The existing property consists of a Lab/Administration Building, a Blower/Dewatering Building, a Control Operations Building, a Septage Receiving Building, a Headworks Building, a Sludge Storage Tank, a Chlorine Contact Tank, two Sequencing Batch Reactors, two Primary Clarifiers, and two Post-Equalization Tanks. There is also an abandoned digester and two abandoned trickling filter bases located on the property. The West boundary of the property is undeveloped and there is a mix of woods and maintained lawn. The facility was originally part of the Pease Air Force Base and is under the jurisdiction of the Pease Development Authority (PDA). The City of Portsmouth operates and maintains the WWTF under an agreement with the PDA.

The proposal includes construction of four new buildings on the property: a new Primary Sludge Pump Station (±480 S.F.), new Electrical/Control Building (±653 S.F.), new Chemical Storage Building (±1,956 S.F.) and an expansion of the existing Lab/Administration Building (±912 S.F.). Other improvements to the site include new utilities to each of the buildings, new piping to support the facilities treatment operations, a new generator with concrete pad, a new electrical transformer with concrete pad, new sidewalks, new parking and access ways, and stormwater infrastructure.

The new stormwater infrastructure will include two new bioretention cells to provide treatment for the captured runoff from impervious surfaces. There is no existing stormwater treatment on the property, therefore the new bioretention cells will treat runoff equal to or greater than the amount of new impervious added as part of this proposed work. Pretreatment will be provided by catch basins with deep sump catch basins and hoods. This proposed stormwater management system will reduce peak flows and treat runoff from some of the impervious areas prior to leaving the site.

Site Soils

A site-specific soil survey (SSSS) was not required for the project. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey indicates that soil is uniformly urban-land across the entirety of the site.

Pre-Development (Existing Conditions)

Runoff from the property generally flows in a southerly direction. The property is bounded by two drainage ditches; the first is located along the northeast boundary between the property line and the Spaulding Turnpike; and the second is located along the southwest boundary between the property line and Corporate Drive, that is known as Hodgson Brook. There is a large existing 36-inch pipe that travels through the property and connects the two ditches. Existing offsite flows from the drainage ditch along the northeast boundary enter the stormwater system at a headwall structure and travels southwest across the property and discharges at another headwall located near the southern boundary of the property.

There is existing stormwater infrastructure located around the treatment facility that captures rainfall and discharges to the 36-inch RC pipe that traverses the site and conveys runoff from the East side of the Spaulding Turnpike. There is no existing stormwater infrastructure located in the undeveloped half of the site. The entirety of the site discharges to the drainage ditch along the southwest boundary. There is currently no pre-treatment of captured rainfall on the site.

Approximately half of the existing property is developed, and the other half is a mix of wooded and grass areas. The wastewater treatment facility is located in the center and eastern part of the property. The west side of the site is undeveloped and consists of a mix of wooded and grass areas. There is a small wetland area that was identified in the southern corner of the site to the east of the access road to the facility.

The site hydrology is characterized by sixteen sub-catchments as delineated on the accompanying "Pre-Development Watershed Plan". Site runoff was analyzed at three points of analysis (POA). POA 1 is the largest analysis point located at the southern boundary of the property at Hodgson Brook, consisting of sub-catchments one through ten, thirty, seventy, eighty and eighty-one. POA 2 analyzes flows from sub-catchment eleven also located at the southern boundary of the property. POA 3 analyzes flow from sub-catchment twelve located at the northern boundary of the property.

There are nine additional catchments identified as "non-contributing areas", these are areas where stormwater remains on the property and does not flow to one of the POA's previously referenced. Seven of these non-contributing areas are structures that are part of the treatment facility and rainfall in these areas will ultimately be part of the treatment process. Two of these areas are decommissioned trickling filter bases, rainfall in these areas flow to a drain that discharges back into the WWTF.

Post-Development (Proposed Conditions)

The post-development conditions were analyzed at the same discharge points as the pre-development conditions. The post-development watersheds are delineated on the accompanying "Post-Development Watershed Plan". Modifications to the delineated areas and associated ground cover were made to sub-catchments to account for the improvements to the property.

As shown on the attached Post-Development Watershed Plan, the site was divided into nineteen post-development sub-catchment areas. POA 1 was adjusted to remove sub-catchment 70 and include four additional sub-catchments: 1.1, 1.2, 1.3 and 7.1. POA 2 was adjusted to include sub-catchment 11.1. POA 3 was not affected by improvements to the site and thus did not change pre-to-post conditions.

Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plan set. Recommended erosion control measures are based upon the December 2008 edition of the "*New Hampshire Stormwater Manual Volumes 1 through 3*" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

CALCULATION METHODS

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method with automated calculation of tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10, 25 and 50 year - 24-hour storm events using rainfall data provided by the Northeast Regional Climate Center (NRCC). As the project site lies within a Coastal and Great Bay Community identified by NHDES Alteration of Terrain, all rainfall amounts were increased by 15% to account for potential future increases in rainfall due to climate change. A time span of 0 to 48 hours was analyzed at 0.01-hour increments. Design infiltration rates used in the analysis were calculated from the SSSNNE publication *Ksat for New Hampshire Soils* using the average of the lowest rates in the C-horizon of the soil subtypes comprising the in-situ material divided by two.

Disclaimer

Altus Engineering notes that stormwater modeling is limited in its capacity to precisely predict peak rates of runoff and flood elevations. Results should not be considered to represent actual

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

Drainage Analysis

A complete summary of the drainage model is included in the appendix of this report. **Table 1** below compares pre- and post-development peak rates at the Point of Analysis identified on the plans for the 2, 10, and 25-year storm events:

Table 1 - Stormwater Modeling Summary
Peak Q (cfs) for Type III 24-Hour Storm Events

	2-Year Storm	10-Year Storm	25-Year Storm
	(3.68 inch)	(5.58 inch)	(7.07 inch)
POA 1			
PRE	9.32	19.54	28.25
POST	9.22	19.12	28.08
CHANGE	-0.10	-0.42	-0.17
POA 2			
PRE	0.73	1.42	1.98
POST	0.47	1.12	1.85
CHANGE	-0.26	-0.30	-0.13
POA 3			
PRE	0.09	0.24	0.37
POST	0.09	0.24	0.37
CHANGE	0.00	0.00	0.00

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

The existing site does not have any stormwater treatment. As part of this project, two bioretention cells will be constructed to capture and treat runoff from impervious surfaces. These bioretention cells will be constructed to treat equal an area greater than the amount of impervious surface added to the site as part of this project. **Table 2** below identifies the amount of new impervious surface and the amount of treatment provided by the bioretention cells.

Table 2 – Impervious Surfaces Summary

Description	Square Feet	Acres
Existing Impervious Area	85,565	1.964
Proposed Impervious Area	89,571	2.056
Change in Impervious Area	4,006	0.092
Total Proposed Stormwater Treatment	6,844	0.157

POLLUTANT REMOVAL

Based on the New Hampshire Stormwater Manual (Volume 2), the following pollutant removal rates would be expected from the implementation of the proposed stormwater BMPs:

BMP	Pollutant	Removal Efficiency
Bioretention Pond		
	Total Suspended Solids (TSS)	90%
	Total Nitrogen (TN)	65%
	Total Phosphorus (TP)	65%

CONCLUSION

This proposed site development of property located at 135 Corporate Drive in Portsmouth, New Hampshire will have minimal adverse effect on abutting properties and infrastructure as a result of stormwater runoff or siltation. Post-construction peak rates of runoff from the site will be at or lower than the existing conditions for all analyzed storm events. The new stormwater management system will also provide appropriate treatment to runoff from the proposed on-site impervious surfaces. Appropriate steps will be taken to properly mitigate erosion and sedimentation through the use of temporary and permanent Best Management Practices for sediment and erosion control, including bioretention cells.

Section 2

Aerial Photo and USGS Map

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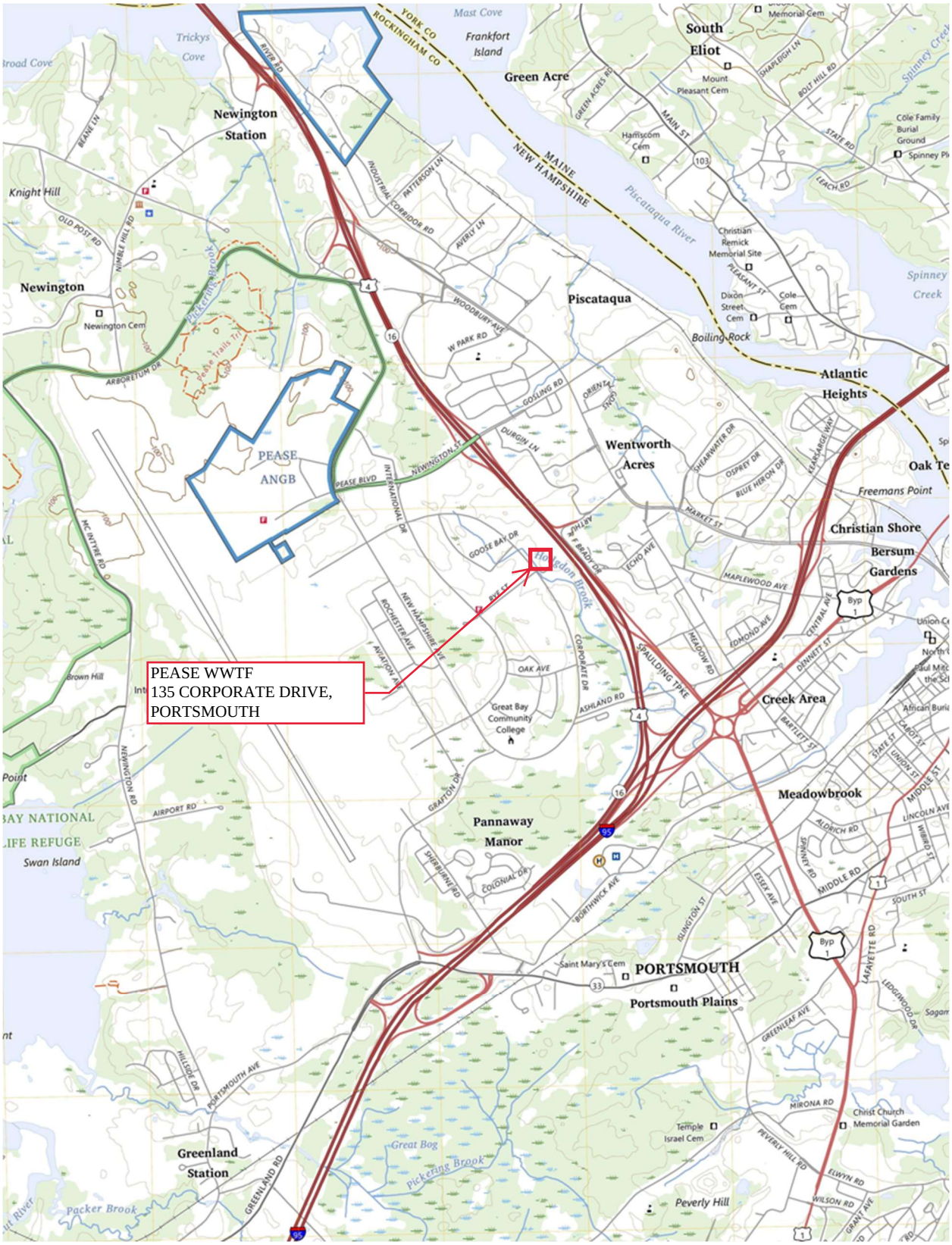
PEASE WWTF
135 CORPORATE DRIVE,
PORTSMOUTH


PEASE WWTF
135 CORPORATE DRIVE,
PORTSMOUTH
PEASE
ANGB
Newington
Station
Newington
Piscataqua
Pannaway
Manor
Meadowbrook
Creek Area
Wentworth
Acres
Atlantic
Heights
Christian Shore
Bersum
Gardens
Green Acre
South
Eliot
Freemans Point
Boiling Rock
Great Bay
Community
College
PORTSMOUTH
Portsmouth Plains
Greenland
Station
Peverly Hill
Swan Island
Knight Hill
Brown Hill
Great Bog
Pickering Brook
Packer Brook
Hodgdon Brook
Piscataqua River
Spinney
Creek
Mast Cove
Trickys
Cove
Frankfort
Island
MAINE
NEW HAMPSHIRE
YORK CO
ROCKINGHAM CO

Section 3

Drainage Calculations

Pre-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

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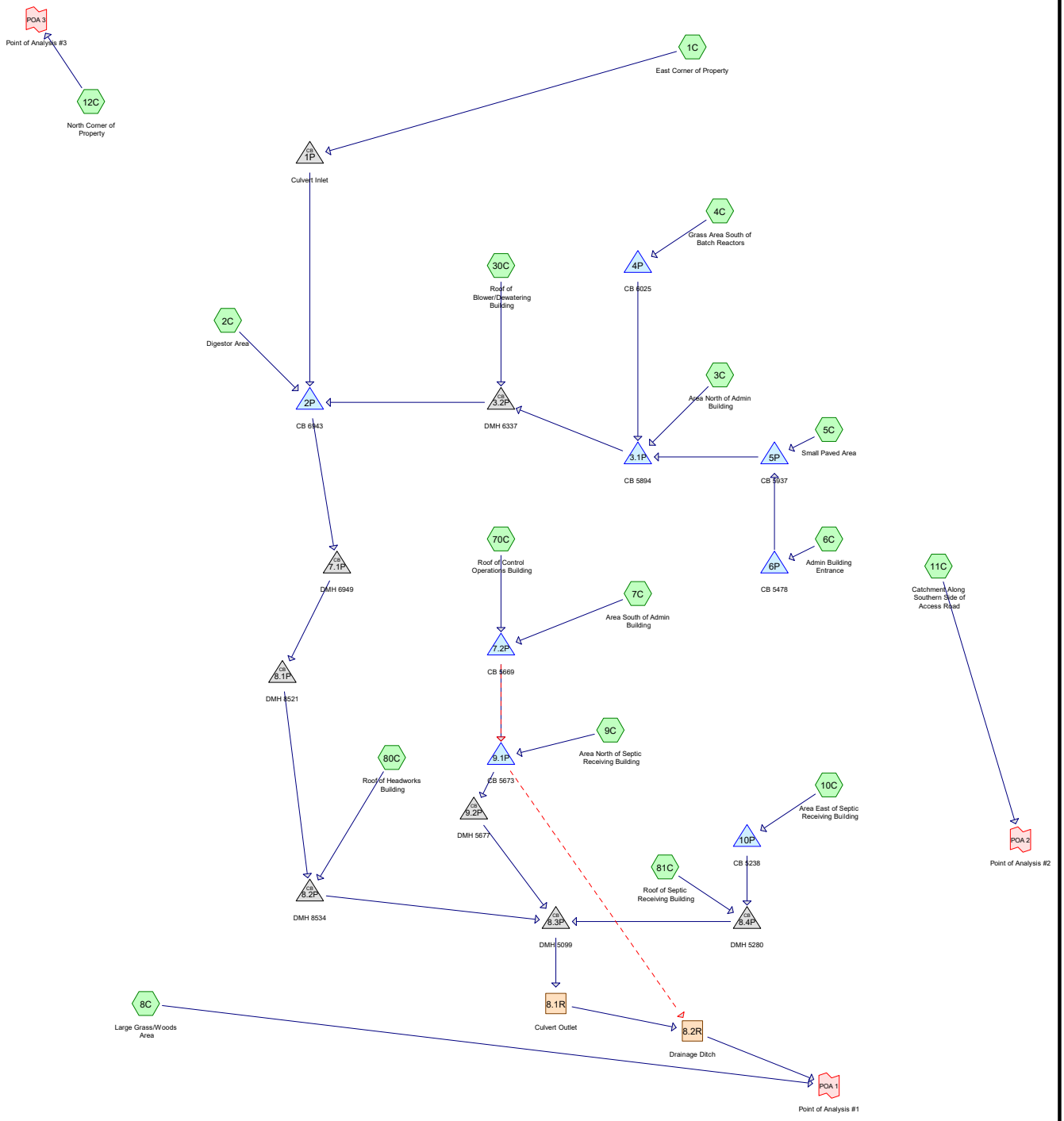


Routing Diagram for 5336-PRE
Prepared by Altus Engineering, Printed 2/11/2025

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1C: East Corner of Property Runoff Area=81,333 sf 22.49% Impervious Runoff Depth=1.43"
Flow Length=467' Tc=13.3 min CN=75 Runoff=2.39 cfs 0.223 af

Subcatchment 2C: Digestor Area Runoff Area=17,529 sf 58.94% Impervious Runoff Depth=2.43"
Flow Length=187' Tc=10.4 min CN=88 Runoff=0.97 cfs 0.082 af

Subcatchment 3C: Area North of Admin Runoff Area=11,771 sf 62.64% Impervious Runoff Depth=2.52"
Flow Length=102' Tc=10.2 min CN=89 Runoff=0.68 cfs 0.057 af

Subcatchment 4C: Grass Area South of Runoff Area=6,908 sf 9.06% Impervious Runoff Depth=1.50"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.29 cfs 0.020 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=3.45"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.07 cfs 0.005 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=2.43"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.12 cfs 0.009 af

Subcatchment 7C: Area South of Admin Runoff Area=22,163 sf 61.07% Impervious Runoff Depth=2.52"
Flow Length=197' Tc=5.1 min CN=89 Runoff=1.48 cfs 0.107 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.39% Impervious Runoff Depth=1.18"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=5.30 cfs 0.687 af

Subcatchment 9C: Area North of Septic Runoff Area=8,672 sf 79.15% Impervious Runoff Depth=2.91"
Flow Length=144' Tc=4.5 min CN=93 Runoff=0.67 cfs 0.048 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 69.68% Impervious Runoff Depth=2.71"
Flow Length=126' Tc=4.0 min CN=91 Runoff=0.38 cfs 0.026 af

Subcatchment 11C: Catchment Along Runoff Area=18,281 sf 22.29% Impervious Runoff Depth=1.71"
Flow Length=370' Tc=9.5 min CN=79 Runoff=0.73 cfs 0.060 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=60' Slope=0.0333 '/' Tc=10.9 min CN=65 Runoff=0.09 cfs 0.009 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af

Subcatchment 70C: Roof of Control Runoff Area=2,362 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.016 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment 81C: Roof of Septic Runoff Area=744 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=0.61' Max Vel=2.64 fps Inflow=6.86 cfs 0.634 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=6.88 cfs 0.634 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.55' Max Vel=2.40 fps Inflow=6.88 cfs 0.634 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=6.87 cfs 0.634 af

Pond 1P: Culvert Inlet Peak Elev=38.51' Inflow=2.39 cfs 0.223 af
36.0" Round Culvert n=0.011 L=211.0' S=0.0033 '/' Outflow=2.39 cfs 0.223 af

Pond 2P: CB 6943 Peak Elev=37.92' Storage=12 cf Inflow=4.45 cfs 0.417 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=4.45 cfs 0.417 af

Pond 3.1P: CB 5894 Peak Elev=39.23' Storage=7 cf Inflow=1.07 cfs 0.090 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=1.07 cfs 0.090 af

Pond 3.2P: DMH 6337 Peak Elev=38.63' Inflow=1.33 cfs 0.112 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=1.33 cfs 0.112 af

Pond 4P: CB 6025 Peak Elev=39.60' Storage=4 cf Inflow=0.29 cfs 0.020 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.29 cfs 0.020 af

Pond 5P: CB 5937 Peak Elev=39.54' Storage=3 cf Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.19 cfs 0.014 af

Pond 6P: CB 5478 Peak Elev=39.99' Storage=2 cf Inflow=0.12 cfs 0.009 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.12 cfs 0.009 af

Pond 7.1P: DMH 6949 Peak Elev=37.19' Inflow=4.45 cfs 0.417 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=4.45 cfs 0.417 af

Pond 7.2P: CB 5669 Peak Elev=37.09' Storage=12 cf Inflow=1.67 cfs 0.123 af
Primary=1.66 cfs 0.123 af Secondary=0.00 cfs 0.000 af Outflow=1.66 cfs 0.123 af

Pond 8.1P: DMH 8521 Peak Elev=36.42' Inflow=4.45 cfs 0.417 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=4.45 cfs 0.417 af

Pond 8.2P: DMH 8534 Peak Elev=36.24' Inflow=4.59 cfs 0.432 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=4.59 cfs 0.432 af

Pond 8.3P: DMH 5099 Peak Elev=35.97' Inflow=6.86 cfs 0.634 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=6.86 cfs 0.634 af

Pond 8.4P: DMH 5280 Peak Elev=37.03' Inflow=0.44 cfs 0.031 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.44 cfs 0.031 af

Pond 9.1P: CB 5673 Peak Elev=36.94' Storage=17 cf Inflow=2.33 cfs 0.171 af
Primary=2.32 cfs 0.171 af Secondary=0.00 cfs 0.000 af Outflow=2.32 cfs 0.171 af

Pond 9.2P: DMH 5677 Peak Elev=36.62' Inflow=2.32 cfs 0.171 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=2.32 cfs 0.171 af

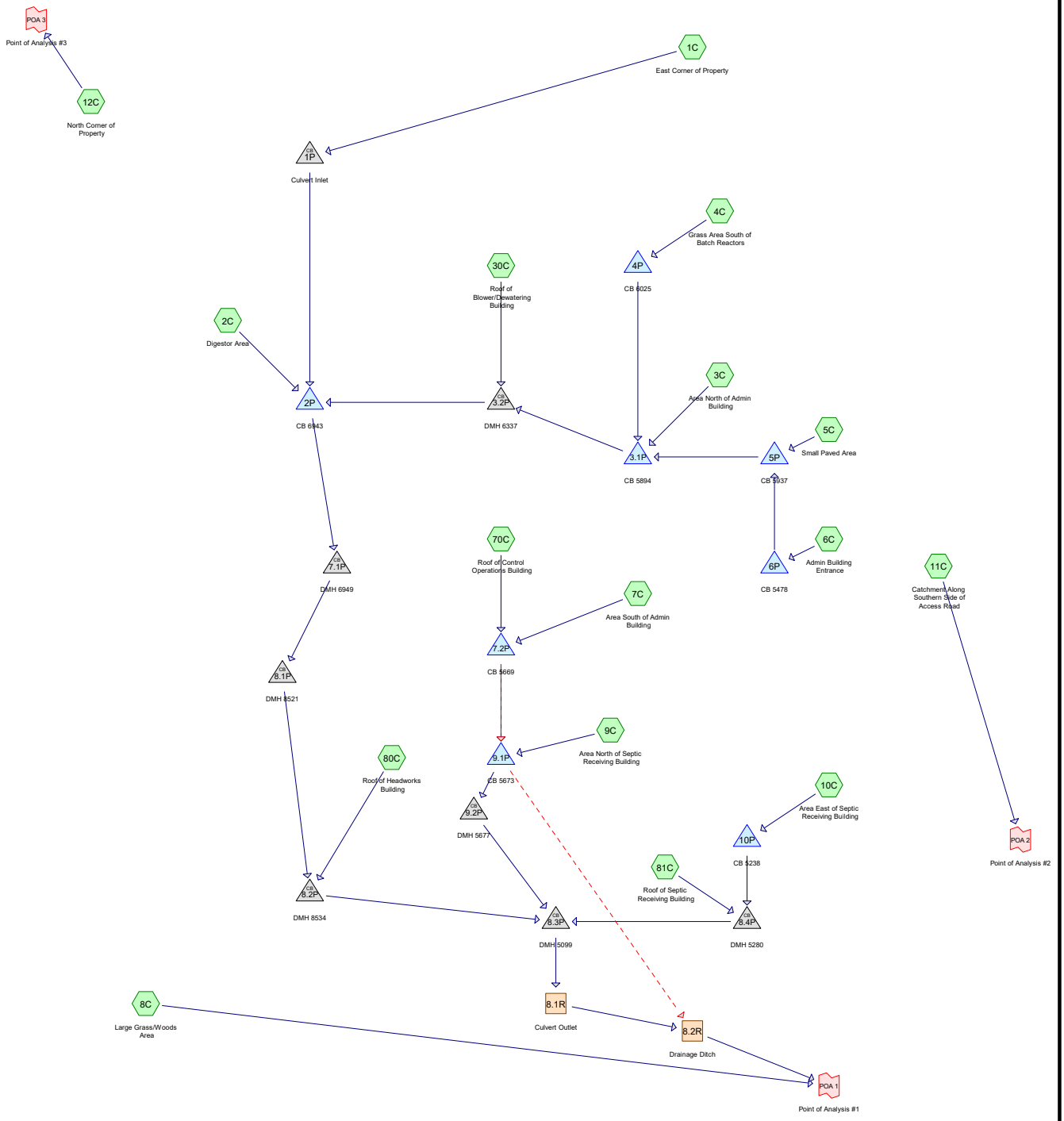
Pond 10P: CB 5238 Peak Elev=37.40' Storage=4 cf Inflow=0.38 cfs 0.026 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.38 cfs 0.026 af

Link POA 1: Point of Analysis #1 Inflow=9.32 cfs 1.321 af
Primary=9.32 cfs 1.321 af

Link POA 2: Point of Analysis #2 Inflow=0.73 cfs 0.060 af
Primary=0.73 cfs 0.060 af

Link POA 3: Point of Analysis #3 Inflow=0.09 cfs 0.009 af
Primary=0.09 cfs 0.009 af

Total Runoff Area = 11.312 ac Runoff Volume = 1.389 af Average Runoff Depth = 1.47"
82.63% Pervious = 9.347 ac 17.37% Impervious = 1.964 ac



Routing Diagram for 5336-PRE
Prepared by Altus Engineering, Printed 2/11/2025

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
11.312	HSG C	1C, 2C, 3C, 4C, 5C, 6C, 7C, 8C, 9C, 10C, 11C, 12C, 30C, 70C, 80C, 81C
0.000	HSG D	
0.000	Other	
11.312		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	3.352	0.000	0.000	3.352	>75% Grass cover, Good	1C, 2C, 3C, 4C, 6C, 7C, 8C, 9C, 10C, 11C
0.000	0.000	2.799	0.000	0.000	2.799	Brush, Good	1C, 8C, 12C
0.000	0.000	1.652	0.000	0.000	1.652	Paved parking	1C, 2C, 3C, 4C, 5C, 6C, 7C, 8C, 9C, 10C, 11C
0.000	0.000	0.313	0.000	0.000	0.313	Roofs	1C, 2C, 3C, 6C, 7C, 8C, 30C, 70C, 80C, 81C
0.000	0.000	3.197	0.000	0.000	3.197	Woods, Good	8C
0.000	**0.000**	**11.312**	**0.000**	**0.000**	**11.312**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1C: East Corner of Property Runoff Area=81,333 sf 22.49% Impervious Runoff Depth=2.93"
Flow Length=467' Tc=13.3 min CN=75 Runoff=5.02 cfs 0.455 af

Subcatchment 2C: Digestor Area Runoff Area=17,529 sf 58.94% Impervious Runoff Depth=4.22"
Flow Length=187' Tc=10.4 min CN=88 Runoff=1.65 cfs 0.142 af

Subcatchment 3C: Area North of Admin Runoff Area=11,771 sf 62.64% Impervious Runoff Depth=4.33"
Flow Length=102' Tc=10.2 min CN=89 Runoff=1.14 cfs 0.097 af

Subcatchment 4C: Grass Area South of Runoff Area=6,908 sf 9.06% Impervious Runoff Depth=3.02"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.59 cfs 0.040 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=5.34"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=4.22"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.21 cfs 0.015 af

Subcatchment 7C: Area South of Admin Runoff Area=22,163 sf 61.07% Impervious Runoff Depth=4.33"
Flow Length=197' Tc=5.1 min CN=89 Runoff=2.50 cfs 0.184 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.39% Impervious Runoff Depth=2.56"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=12.12 cfs 1.493 af

Subcatchment 9C: Area North of Septic Runoff Area=8,672 sf 79.15% Impervious Runoff Depth=4.77"
Flow Length=144' Tc=4.5 min CN=93 Runoff=1.07 cfs 0.079 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 69.68% Impervious Runoff Depth=4.55"
Flow Length=126' Tc=4.0 min CN=91 Runoff=0.62 cfs 0.044 af

Subcatchment 11C: Catchment Along Runoff Area=18,281 sf 22.29% Impervious Runoff Depth=3.31"
Flow Length=370' Tc=9.5 min CN=79 Runoff=1.42 cfs 0.116 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=60' Slope=0.0333 '/' Tc=10.9 min CN=65 Runoff=0.24 cfs 0.021 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.034 af

Subcatchment 70C: Roof of Control Runoff Area=2,362 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.29 cfs 0.024 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.024 af

Subcatchment 81C: Roof of Septic Runoff Area=744 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.008 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=0.84' Max Vel=3.12 fps Inflow=12.37 cfs 1.153 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=12.39 cfs 1.153 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.72' Max Vel=2.80 fps Inflow=12.39 cfs 1.153 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=12.26 cfs 1.153 af

Pond 1P: Culvert Inlet Peak Elev=38.88' Inflow=5.02 cfs 0.455 af
36.0" Round Culvert n=0.011 L=211.0' S=0.0033 '/' Outflow=5.02 cfs 0.455 af

Pond 2P: CB 6943 Peak Elev=38.31' Storage=16 cf Inflow=8.52 cfs 0.791 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=8.52 cfs 0.791 af

Pond 3.1P: CB 5894 Peak Elev=39.58' Storage=12 cf Inflow=1.87 cfs 0.160 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=1.87 cfs 0.160 af

Pond 3.2P: DMH 6337 Peak Elev=39.17' Inflow=2.27 cfs 0.194 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=2.27 cfs 0.194 af

Pond 4P: CB 6025 Peak Elev=39.76' Storage=6 cf Inflow=0.59 cfs 0.040 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.59 cfs 0.040 af

Pond 5P: CB 5937 Peak Elev=39.65' Storage=4 cf Inflow=0.31 cfs 0.023 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.31 cfs 0.023 af

Pond 6P: CB 5478 Peak Elev=40.06' Storage=3 cf Inflow=0.21 cfs 0.015 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.21 cfs 0.015 af

Pond 7.1P: DMH 6949 Peak Elev=37.58' Inflow=8.52 cfs 0.791 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=8.52 cfs 0.791 af

Pond 7.2P: CB 5669 Peak Elev=38.43' Storage=29 cf Inflow=2.77 cfs 0.208 af
Primary=2.73 cfs 0.208 af Secondary=0.00 cfs 0.000 af Outflow=2.73 cfs 0.208 af

Pond 8.1P: DMH 8521 Peak Elev=36.96' Inflow=8.52 cfs 0.791 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=8.52 cfs 0.791 af

Pond 8.2P: DMH 8534 Peak Elev=36.73' Inflow=8.74 cfs 0.815 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=8.74 cfs 0.815 af

Pond 8.3P: DMH 5099 Peak Elev=36.41' Inflow=12.37 cfs 1.153 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=12.37 cfs 1.153 af

Pond 8.4P: DMH 5280 Peak Elev=37.13' Inflow=0.71 cfs 0.052 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.71 cfs 0.052 af

Pond 9.1P: CB 5673 Peak Elev=38.14' Storage=32 cf Inflow=3.79 cfs 0.287 af
Primary=3.75 cfs 0.287 af Secondary=0.00 cfs 0.000 af Outflow=3.75 cfs 0.287 af

Pond 9.2P: DMH 5677 Peak Elev=37.29' Inflow=3.75 cfs 0.287 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=3.75 cfs 0.287 af

Pond 10P: CB 5238 Peak Elev=37.50' Storage=5 cf Inflow=0.62 cfs 0.044 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.62 cfs 0.044 af

Link POA 1: Point of Analysis #1 Inflow=19.54 cfs 2.647 af
Primary=19.54 cfs 2.647 af

Link POA 2: Point of Analysis #2 Inflow=1.42 cfs 0.116 af
Primary=1.42 cfs 0.116 af

Link POA 3: Point of Analysis #3 Inflow=0.24 cfs 0.021 af
Primary=0.24 cfs 0.021 af

Total Runoff Area = 11.312 ac Runoff Volume = 2.783 af Average Runoff Depth = 2.95"
82.63% Pervious = 9.347 ac 17.37% Impervious = 1.964 ac

Summary for Subcatchment 1C: East Corner of Property

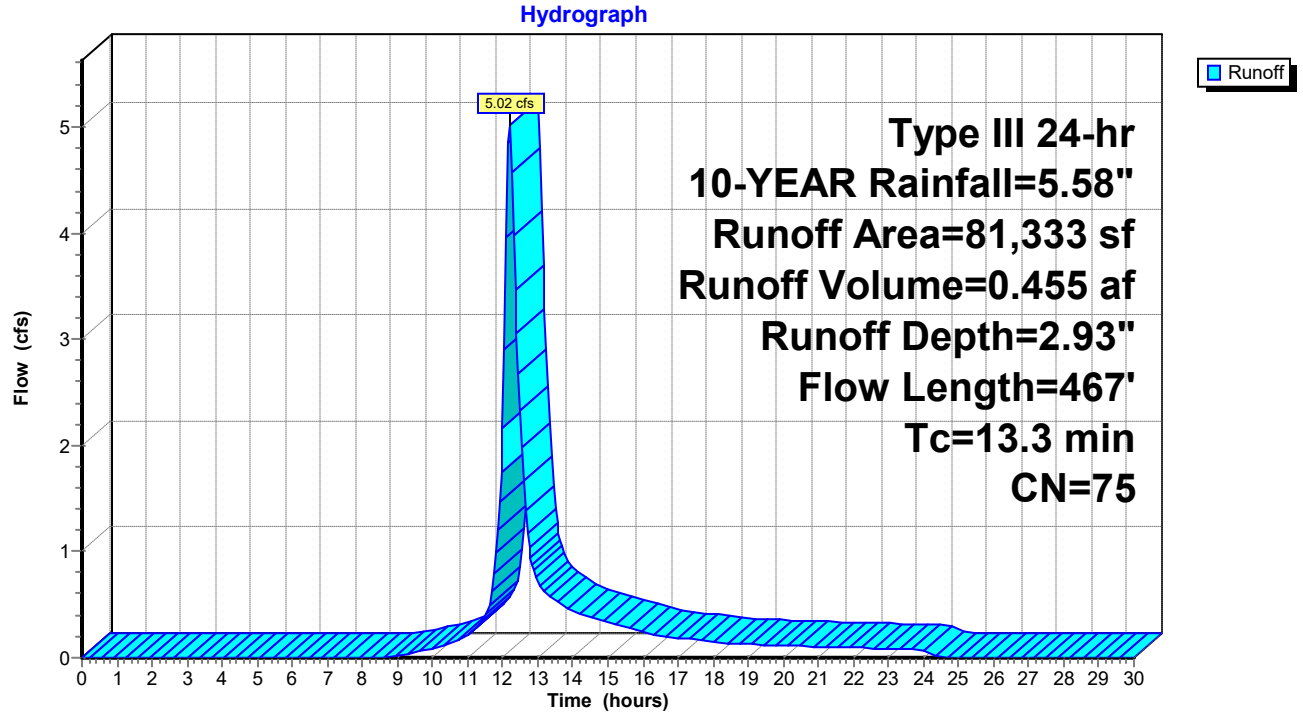
Runoff = 5.02 cfs @ 12.19 hrs, Volume= 0.455 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,281	98	Roofs, HSG C
17,014	98	Paved parking, HSG C
24,936	74	>75% Grass cover, Good, HSG C
38,102	65	Brush, Good, HSG C
81,333	75	Weighted Average
63,038		77.51% Pervious Area
18,295		22.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	49	0.1330	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
5.8	190	0.0060	0.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.1	228	0.0220	0.74		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
13.3	467	Total			

Subcatchment 1C: East Corner of Property



Summary for Subcatchment 2C: Digestor Area

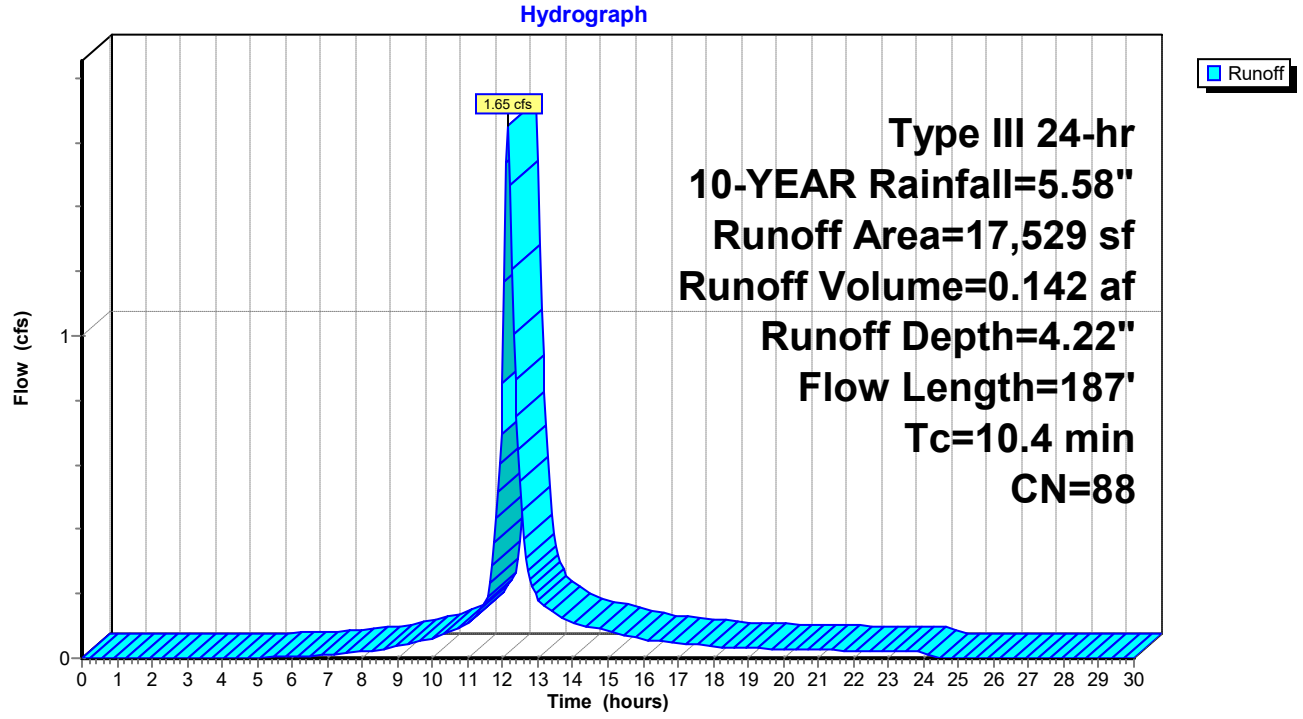
Runoff = 1.65 cfs @ 12.14 hrs, Volume= 0.142 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,172	98	Roofs, HSG C
9,160	98	Paved parking, HSG C
7,197	74	>75% Grass cover, Good, HSG C
17,529	88	Weighted Average
7,197		41.06% Pervious Area
10,332		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	59	0.0080	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.3	58	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	70	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.4	187	Total			

Subcatchment 2C: Digestor Area



Summary for Subcatchment 3C: Area North of Admin Building

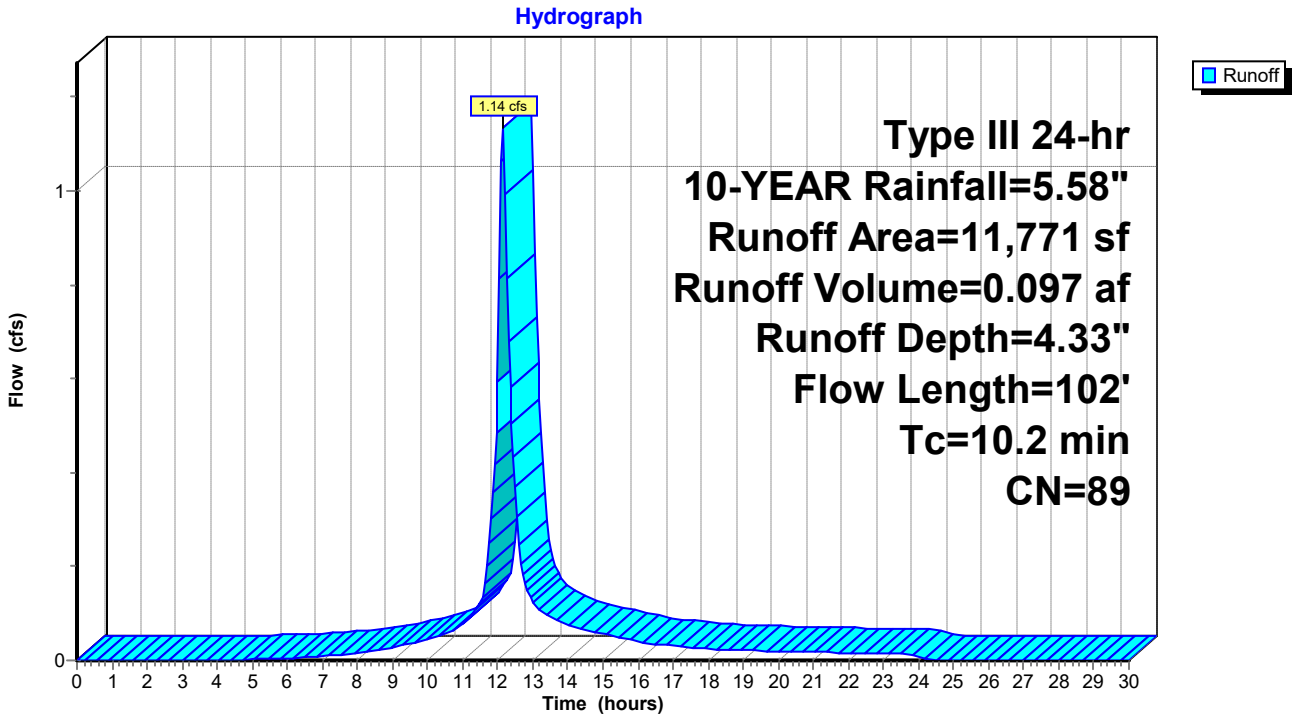
Runoff = 1.14 cfs @ 12.14 hrs, Volume= 0.097 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
471	98	Roofs, HSG C
6,902	98	Paved parking, HSG C
4,398	74	>75% Grass cover, Good, HSG C
11,771	89	Weighted Average
4,398		37.36% Pervious Area
7,373		62.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	56	0.0050	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.2	46	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.2	102	Total			

Subcatchment 3C: Area North of Admin Building



Summary for Subcatchment 4C: Grass Area South of Batch Reactors

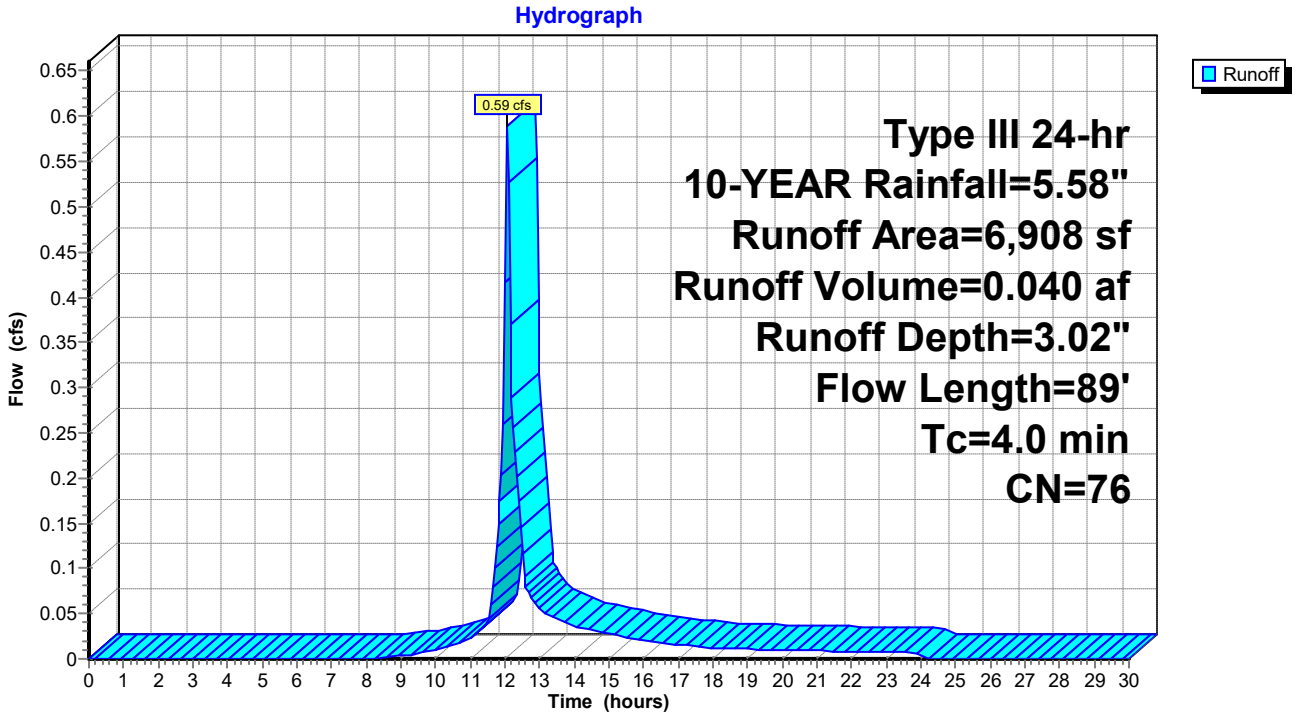
Runoff = 0.59 cfs @ 12.06 hrs, Volume= 0.040 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
626	98	Paved parking, HSG C
6,282	74	>75% Grass cover, Good, HSG C
6,908	76	Weighted Average
6,282		90.94% Pervious Area
626		9.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	9	0.0200	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.3	80	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	89	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 4C: Grass Area South of Batch Reactors



Summary for Subcatchment 5C: Small Paved Area

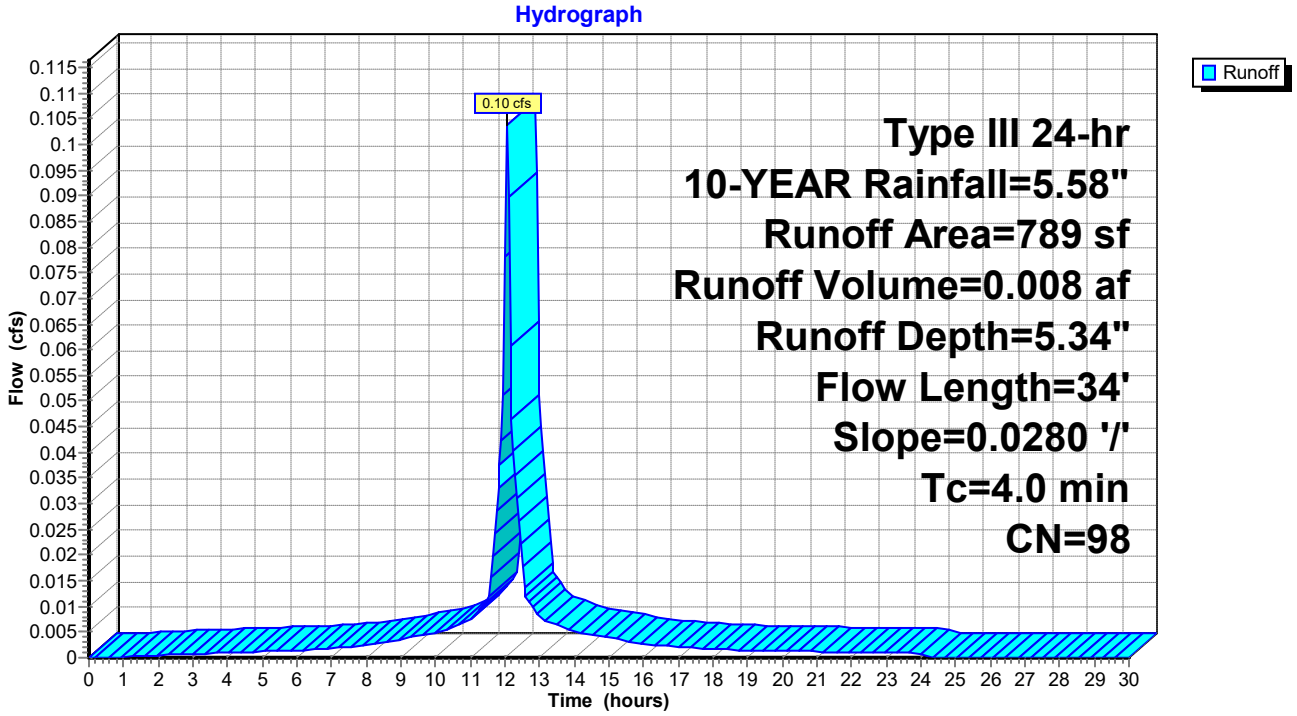
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 0.008 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
789	98	Paved parking, HSG C
789		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0280	1.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.4	34	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 5C: Small Paved Area



Summary for Subcatchment 6C: Admin Building Entrance

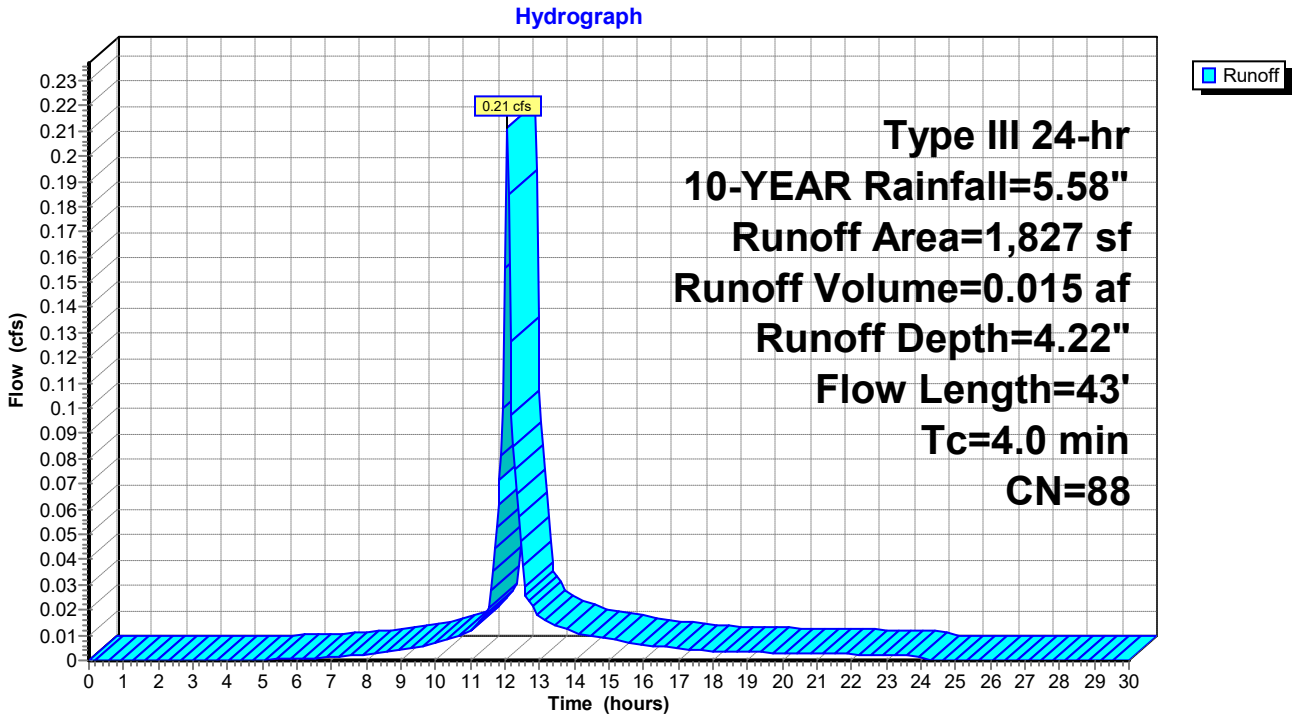
Runoff = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
567	98	Roofs, HSG C
506	98	Paved parking, HSG C
754	74	>75% Grass cover, Good, HSG C
1,827	88	Weighted Average
754		41.27% Pervious Area
1,073		58.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0140	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	29	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	43	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 6C: Admin Building Entrance



Summary for Subcatchment 7C: Area South of Admin Building

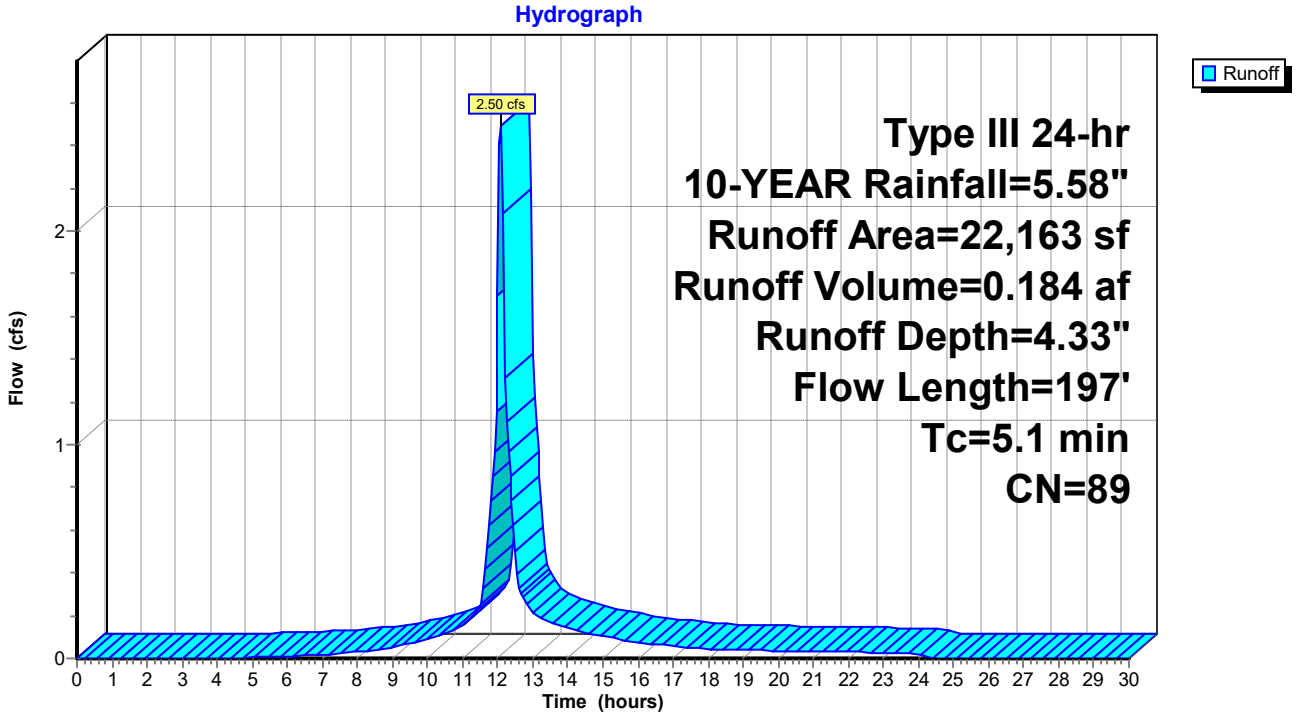
Runoff = 2.50 cfs @ 12.07 hrs, Volume= 0.184 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
838	98	Roofs, HSG C
12,697	98	Paved parking, HSG C
8,628	74	>75% Grass cover, Good, HSG C
22,163	89	Weighted Average
8,628		38.93% Pervious Area
13,535		61.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	60	0.0450	0.23		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.7	137	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
5.1	197	Total			

Subcatchment 7C: Area South of Admin Building



Summary for Subcatchment 8C: Large Grass/Woods Area

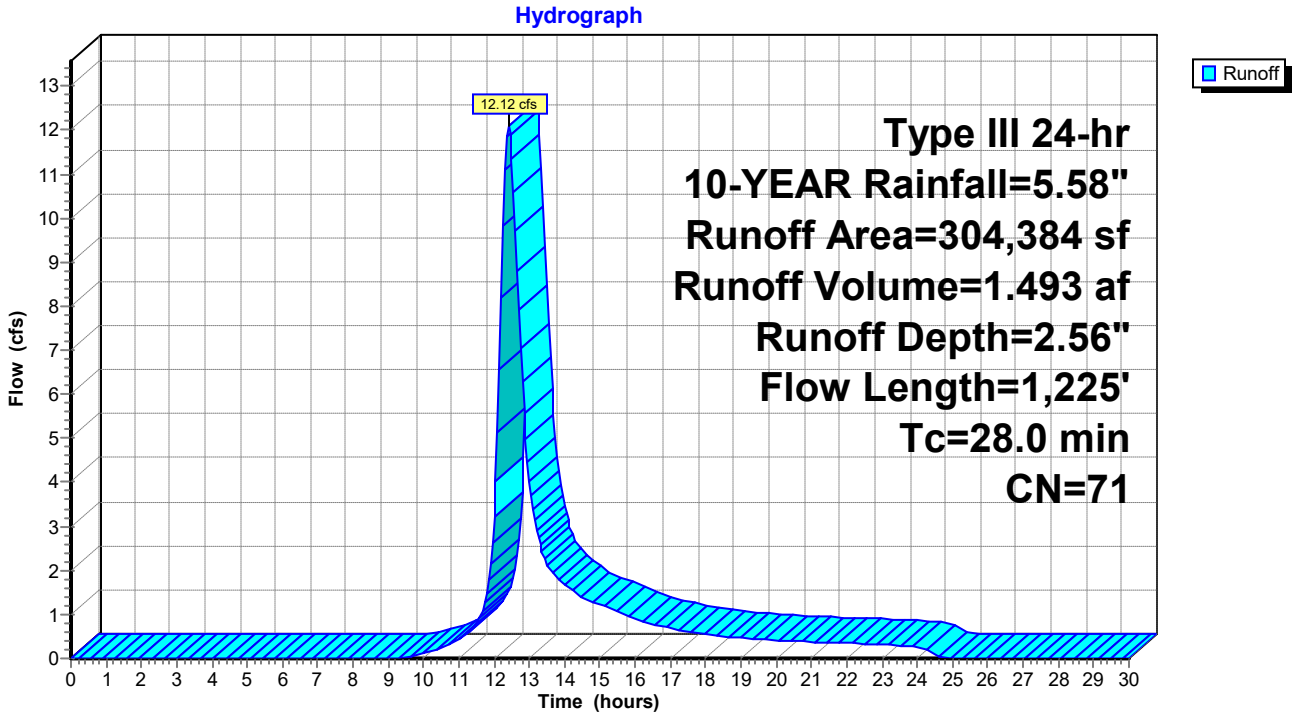
Runoff = 12.12 cfs @ 12.40 hrs, Volume= 1.493 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
544	98	Roofs, HSG C
9,780	98	Paved parking, HSG C
139,242	70	Woods, Good, HSG C
78,535	65	Brush, Good, HSG C
76,283	74	>75% Grass cover, Good, HSG C
304,384	71	Weighted Average
294,060		96.61% Pervious Area
10,324		3.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	51	0.0390	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"
2.6	144	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.3	233	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.5	237	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.7	560	0.0030	2.49	14.47	**Trap/Vee/Rect Channel Flow,** Bot.W=2.50' D=2.00' Z= 0.2 '/' Top.W=3.30' n= 0.030 Earth, grassed & winding
28.0	1,225	Total			

Subcatchment 8C: Large Grass/Woods Area



Summary for Subcatchment 9C: Area North of Septic Receiving Building

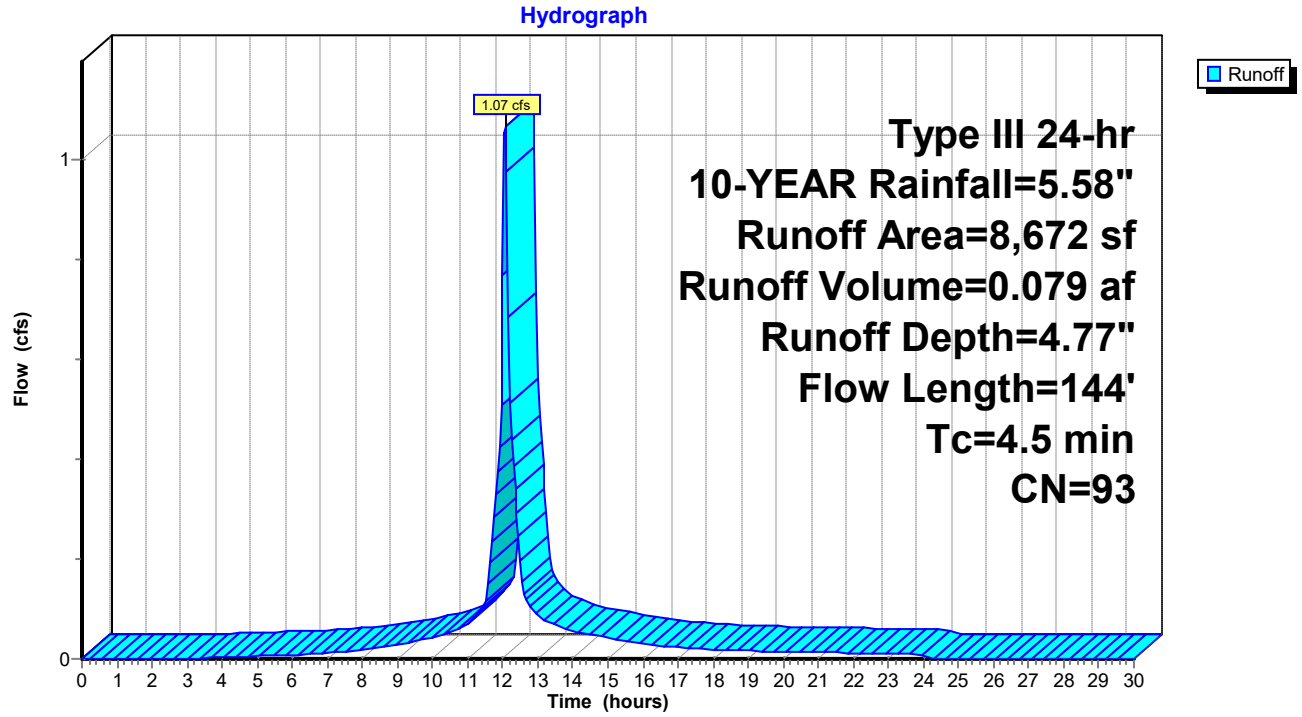
Runoff = 1.07 cfs @ 12.06 hrs, Volume= 0.079 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
6,864	98	Paved parking, HSG C
1,808	74	>75% Grass cover, Good, HSG C
8,672	93	Weighted Average
1,808		20.85% Pervious Area
6,864		79.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	65	0.0640	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	79	0.0270	3.34		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
4.5	144	Total			

Subcatchment 9C: Area North of Septic Receiving Building



Summary for Subcatchment 10C: Area East of Septic Receiving Building

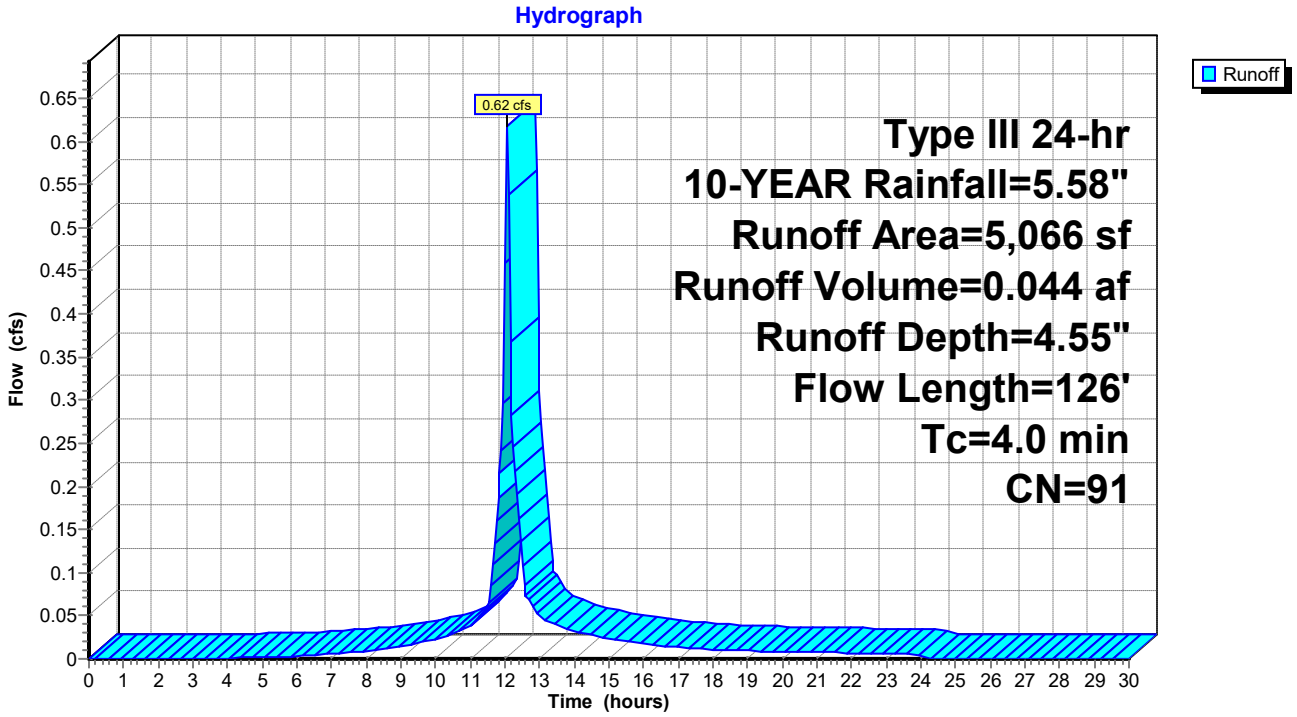
Runoff = 0.62 cfs @ 12.06 hrs, Volume= 0.044 af, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
3,530	98	Paved parking, HSG C
1,536	74	>75% Grass cover, Good, HSG C
5,066	91	Weighted Average
1,536		30.32% Pervious Area
3,530		69.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.6	109	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	126	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 10C: Area East of Septic Receiving Building



Summary for Subcatchment 11C: Catchment Along Southern Side of Access Road

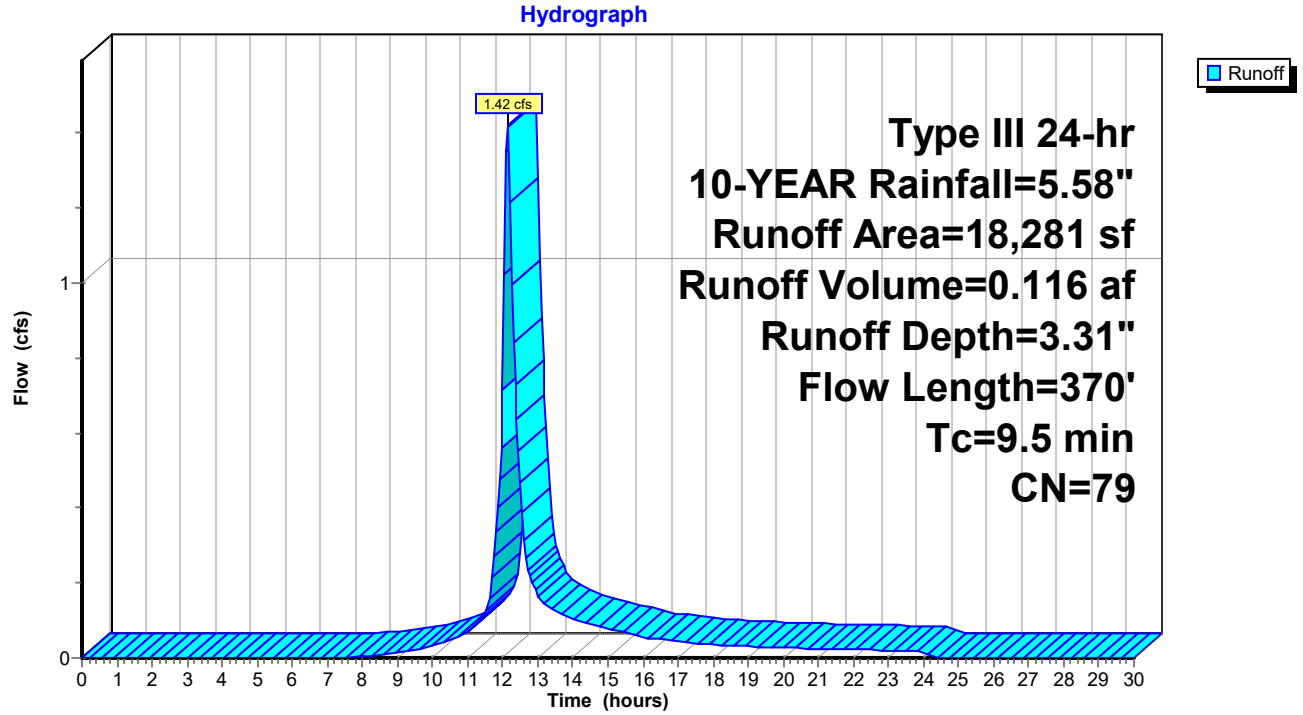
Runoff = 1.42 cfs @ 12.14 hrs, Volume= 0.116 af, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
4,075	98	Paved parking, HSG C
14,206	74	>75% Grass cover, Good, HSG C
18,281	79	Weighted Average
14,206		77.71% Pervious Area
4,075		22.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	64	0.1020	0.32		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
4.3	150	0.0070	0.59		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.9	156	0.0380	1.36		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.5	370	Total			

Subcatchment 11C: Catchment Along Southern Side of Access Road



Summary for Subcatchment 12C: North Corner of Property

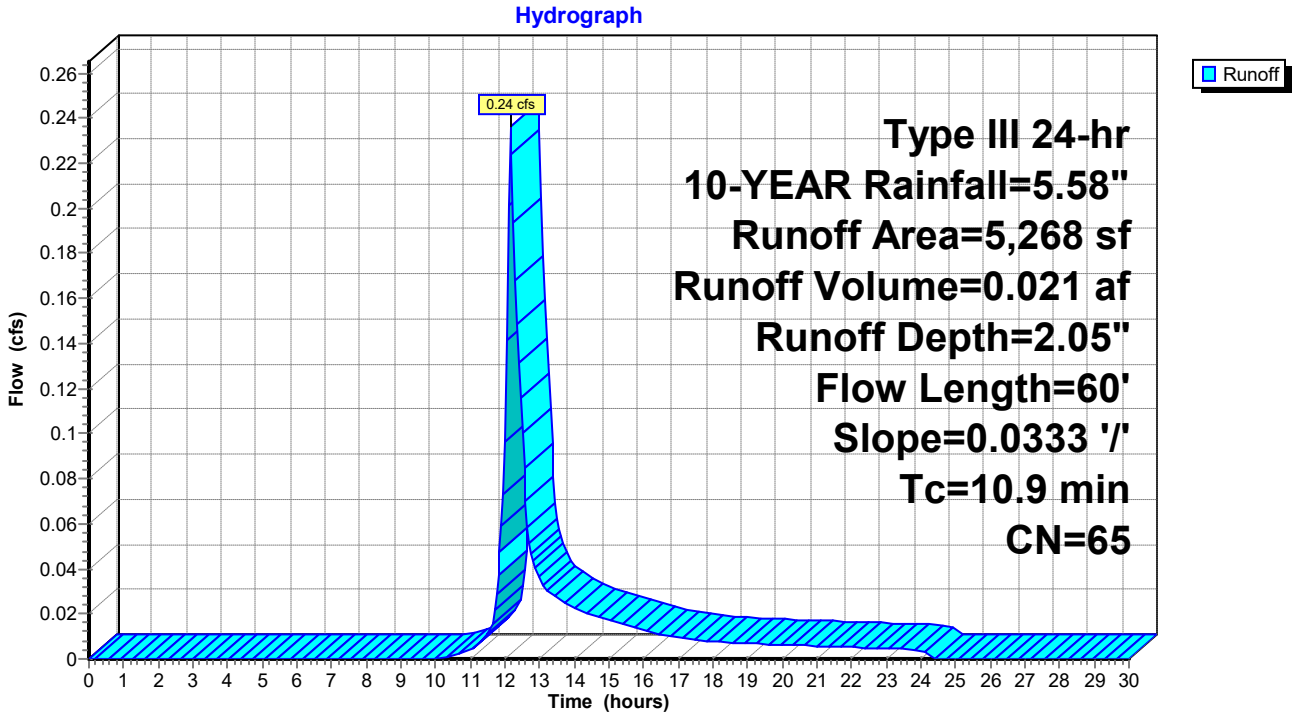
Runoff = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
5,268	65	Brush, Good, HSG C
5,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	60	0.0333	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"

Subcatchment 12C: North Corner of Property



Summary for Subcatchment 30C: Roof of Blower/Dewatering Building

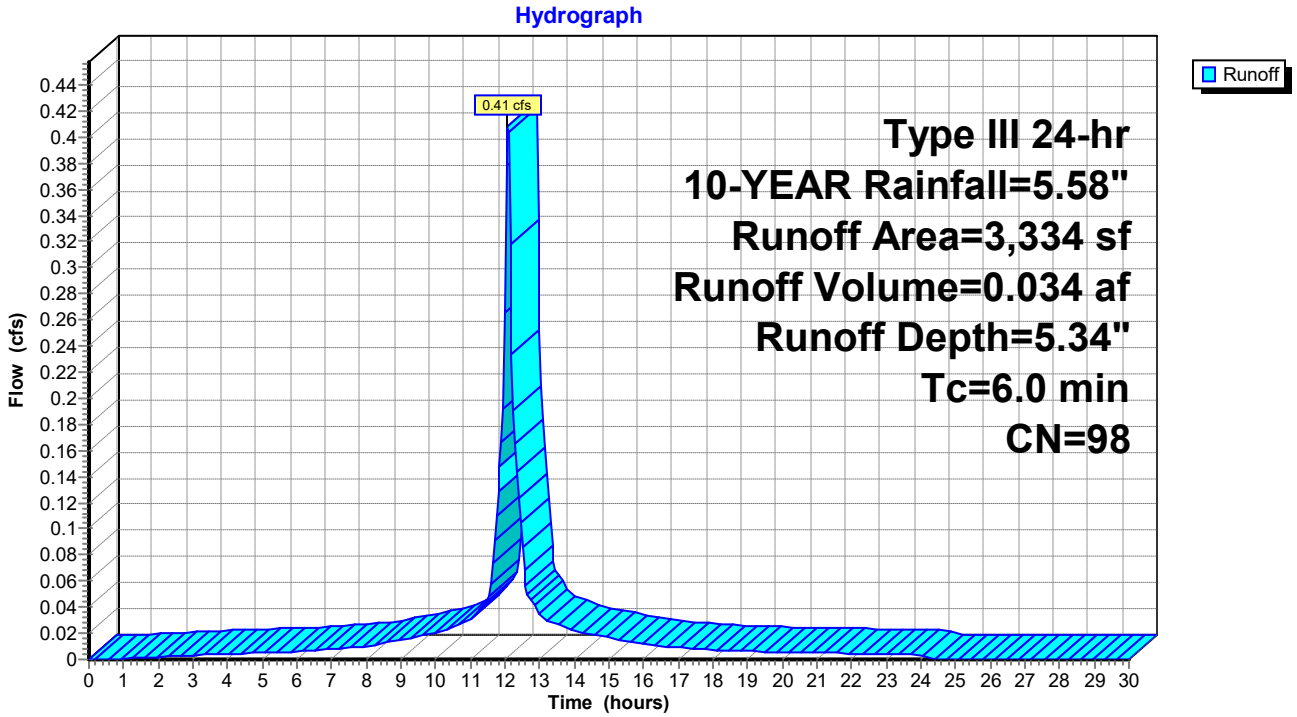
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.034 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
3,334	98	Roofs, HSG C
3,334		100.00% Impervious Area

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

Subcatchment 30C: Roof of Blower/Dewatering Building



Summary for Subcatchment 70C: Roof of Control Operations Building

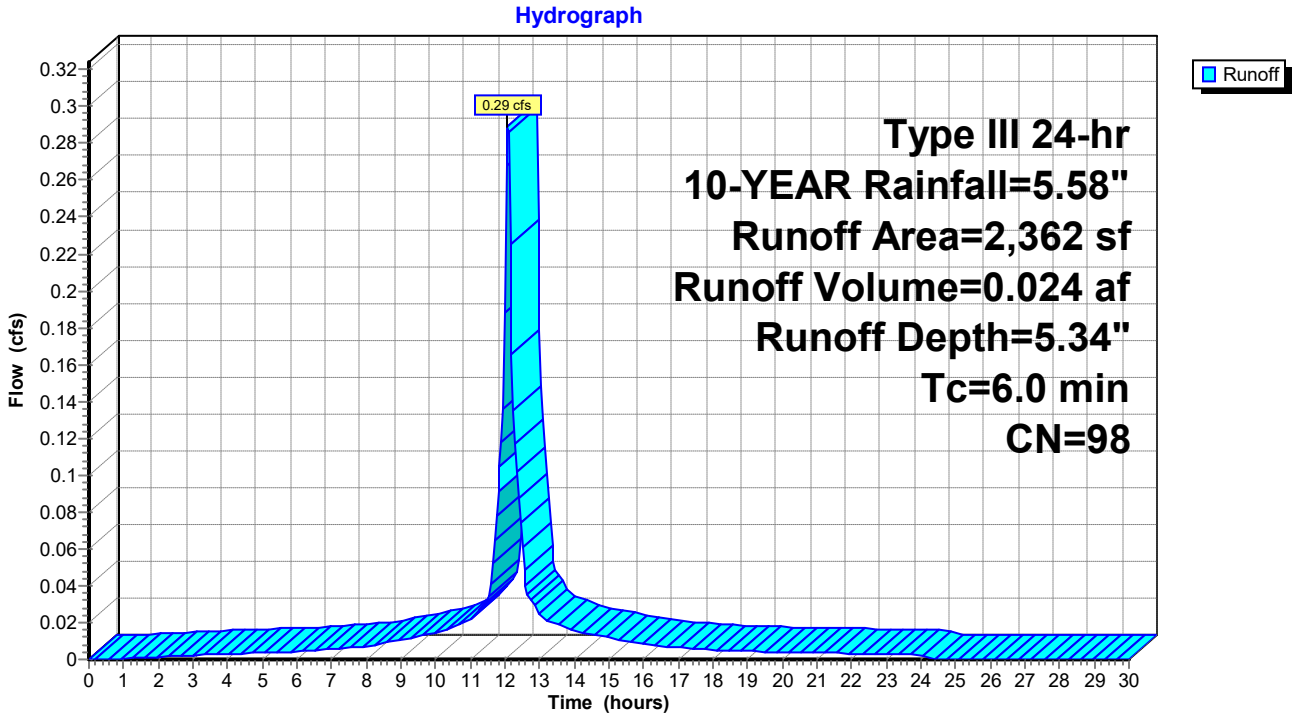
Runoff = 0.29 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
2,362	98	Roofs, HSG C
2,362		100.00% Impervious Area

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

Subcatchment 70C: Roof of Control Operations Building



Summary for Subcatchment 80C: Roof of Headworks Building

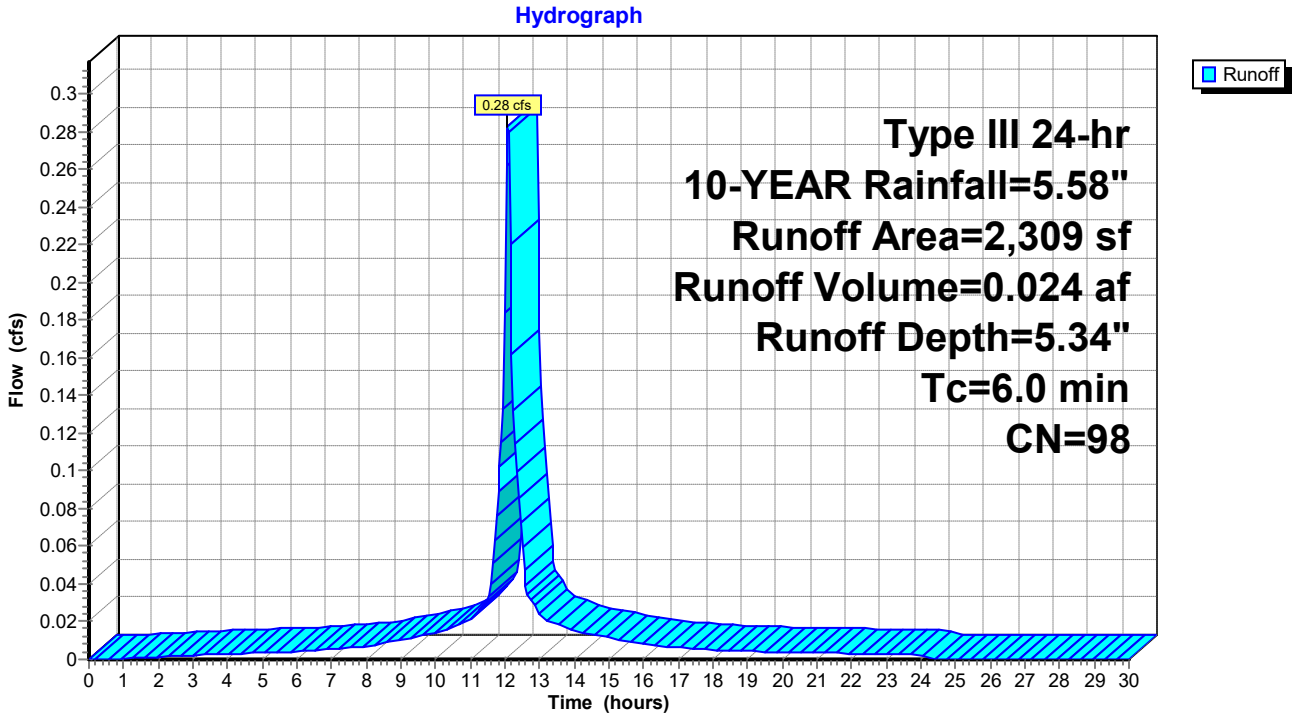
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
2,309	98	Roofs, HSG C
2,309		100.00% Impervious Area

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

Subcatchment 80C: Roof of Headworks Building



Summary for Subcatchment 81C: Roof of Septic Receiving Building

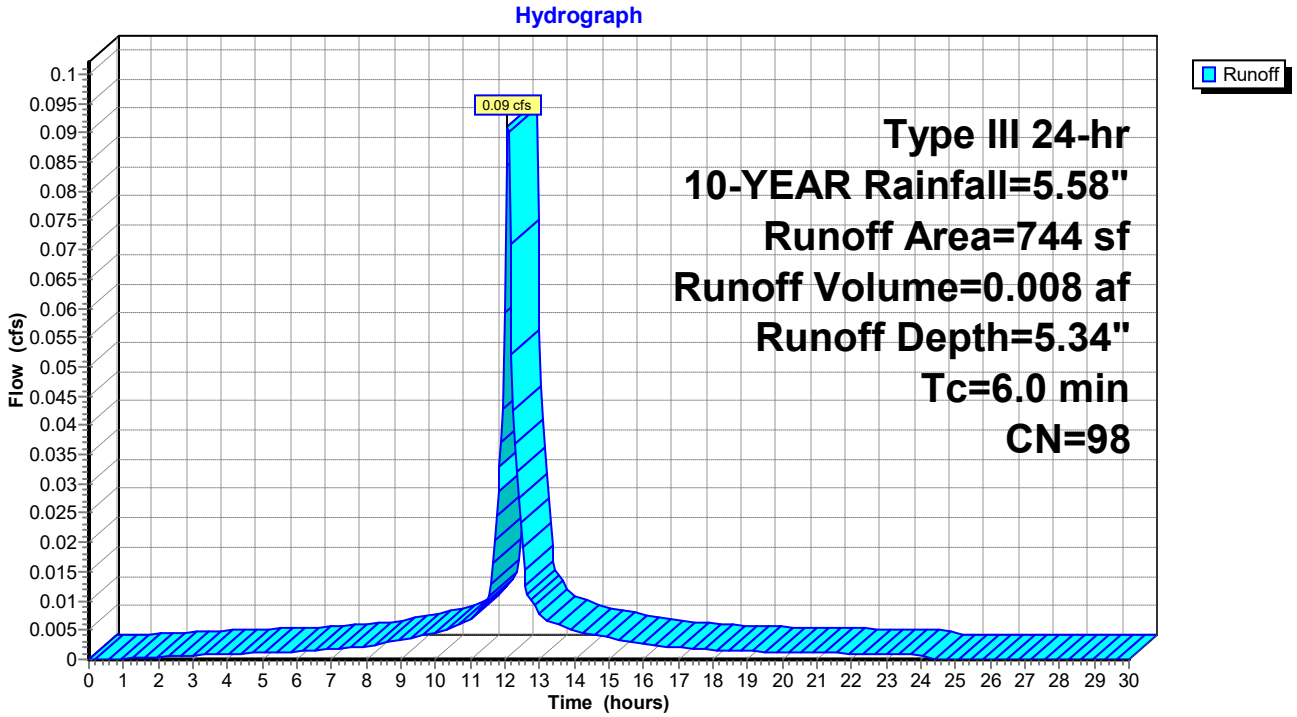
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
744	98	Roofs, HSG C
744		100.00% Impervious Area

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

Subcatchment 81C: Roof of Septic Receiving Building



Summary for Reach 8.1R: Culvert Outlet

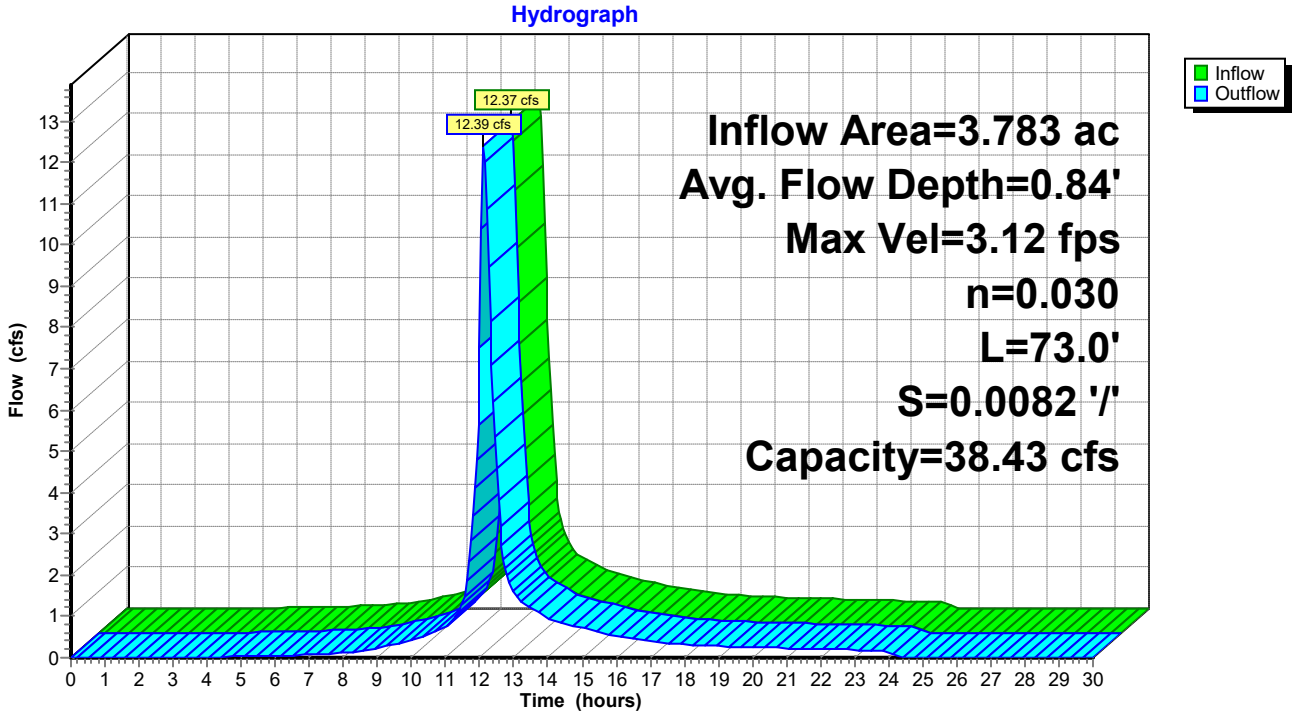
Inflow Area = 3.783 ac, 43.18% Impervious, Inflow Depth = 3.66" for 10-YEAR event
Inflow = 12.37 cfs @ 12.12 hrs, Volume= 1.153 af
Outflow = 12.39 cfs @ 12.12 hrs, Volume= 1.153 af, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 1.4 min

Peak Storage= 288 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 1.50' Flow Area= 9.0 sf, Capacity= 38.43 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 73.0' Slope= 0.0082 '/'
Inlet Invert= 34.60', Outlet Invert= 34.00'

Reach 8.1R: Culvert Outlet



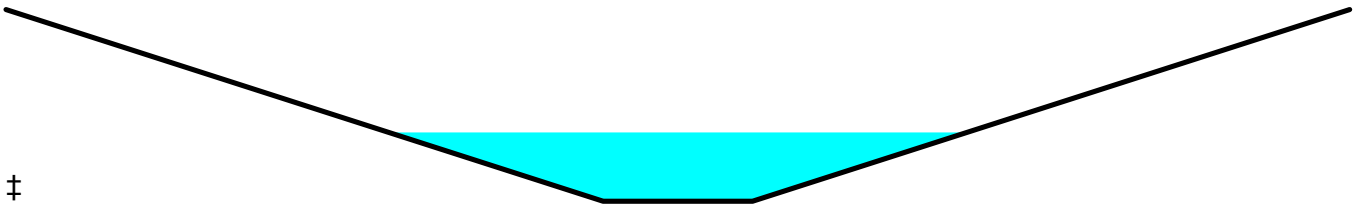
Summary for Reach 8.2R: Drainage Ditch

Inflow Area = 3.783 ac, 43.18% Impervious, Inflow Depth = 3.66" for 10-YEAR event
Inflow = 12.39 cfs @ 12.12 hrs, Volume= 1.153 af
Outflow = 12.26 cfs @ 12.13 hrs, Volume= 1.153 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.80 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.89 fps, Avg. Travel Time= 1.8 min

Peak Storage= 415 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 2.00' Flow Area= 25.0 sf, Capacity= 127.81 cfs

2.50' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.50'
Length= 95.0' Slope= 0.0095 '/'
Inlet Invert= 34.00', Outlet Invert= 33.10'



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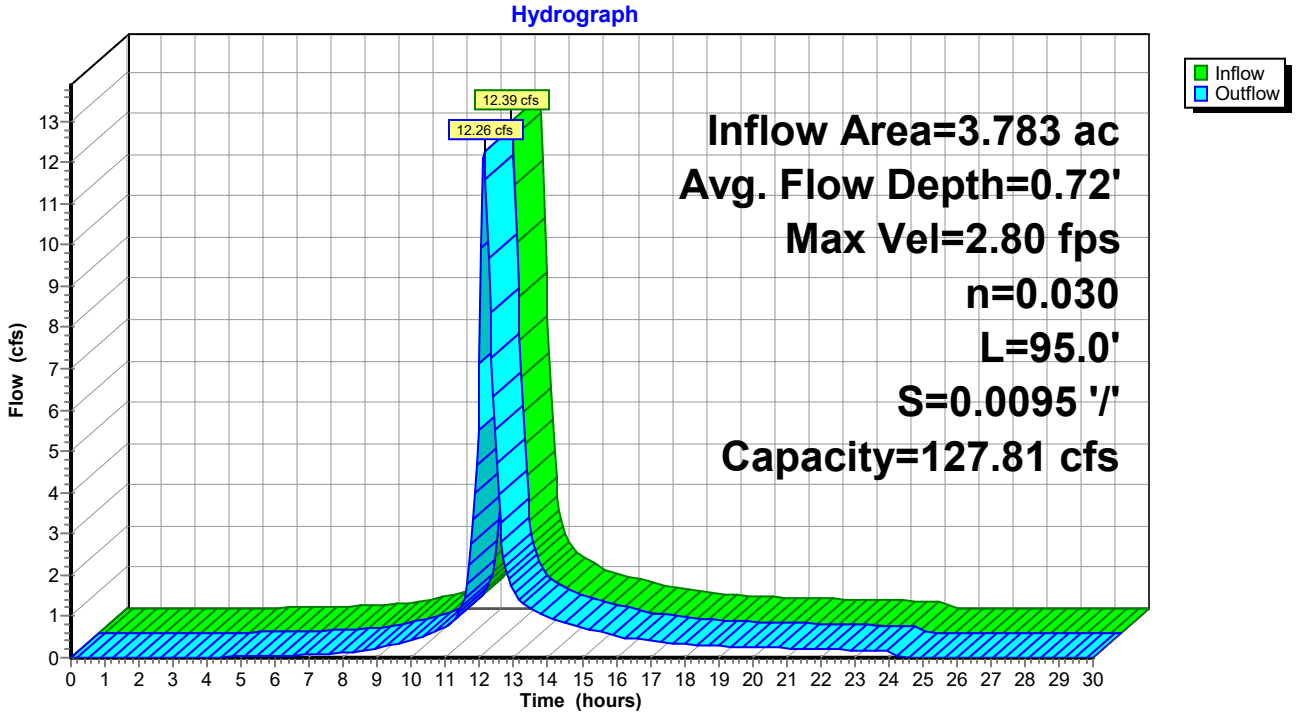
Reach 8.2R: Drainage Ditch



Summary for Pond 1P: Culvert Inlet

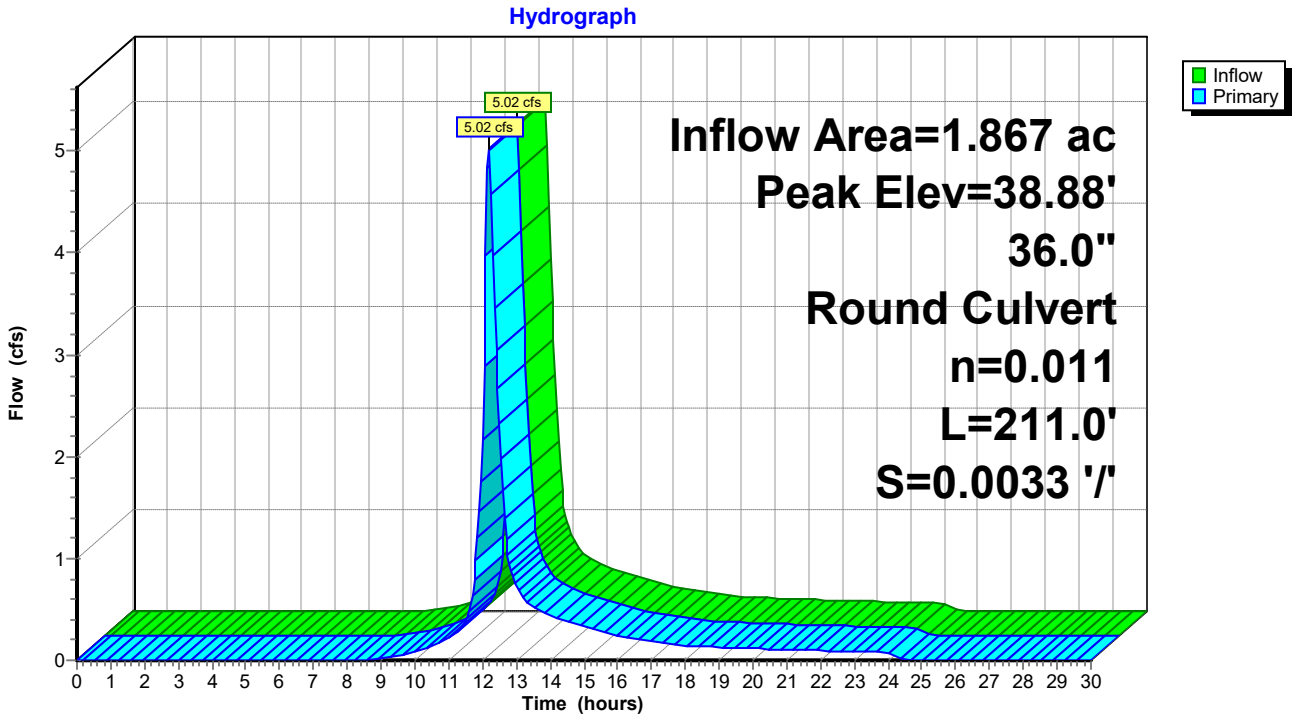
Inflow Area = 1.867 ac, 22.49% Impervious, Inflow Depth = 2.93" for 10-YEAR event
Inflow = 5.02 cfs @ 12.19 hrs, Volume= 0.455 af
Outflow = 5.02 cfs @ 12.19 hrs, Volume= 0.455 af, Atten= 0%, Lag= 0.0 min
Primary = 5.02 cfs @ 12.19 hrs, Volume= 0.455 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.88' @ 12.20 hrs
Flood Elev= 42.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.80'	**36.0" Round RCP_Round 36"** L= 211.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.80' / 37.10' S= 0.0033 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=5.00 cfs @ 12.19 hrs HW=38.87' TW=38.28' (Dynamic Tailwater)
1=RCP_Round 36" (Outlet Controls 5.00 cfs @ 3.27 fps)

Pond 1P: Culvert Inlet



Summary for Pond 2P: CB 6943

Inflow Area = 2.835 ac, 33.87% Impervious, Inflow Depth = 3.35" for 10-YEAR event
Inflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af
Outflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.0 min
Primary = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.31' @ 12.16 hrs Surf.Area= 13 sf Storage= 16 cf
Flood Elev= 41.80' Surf.Area= 13 sf Storage= 60 cf

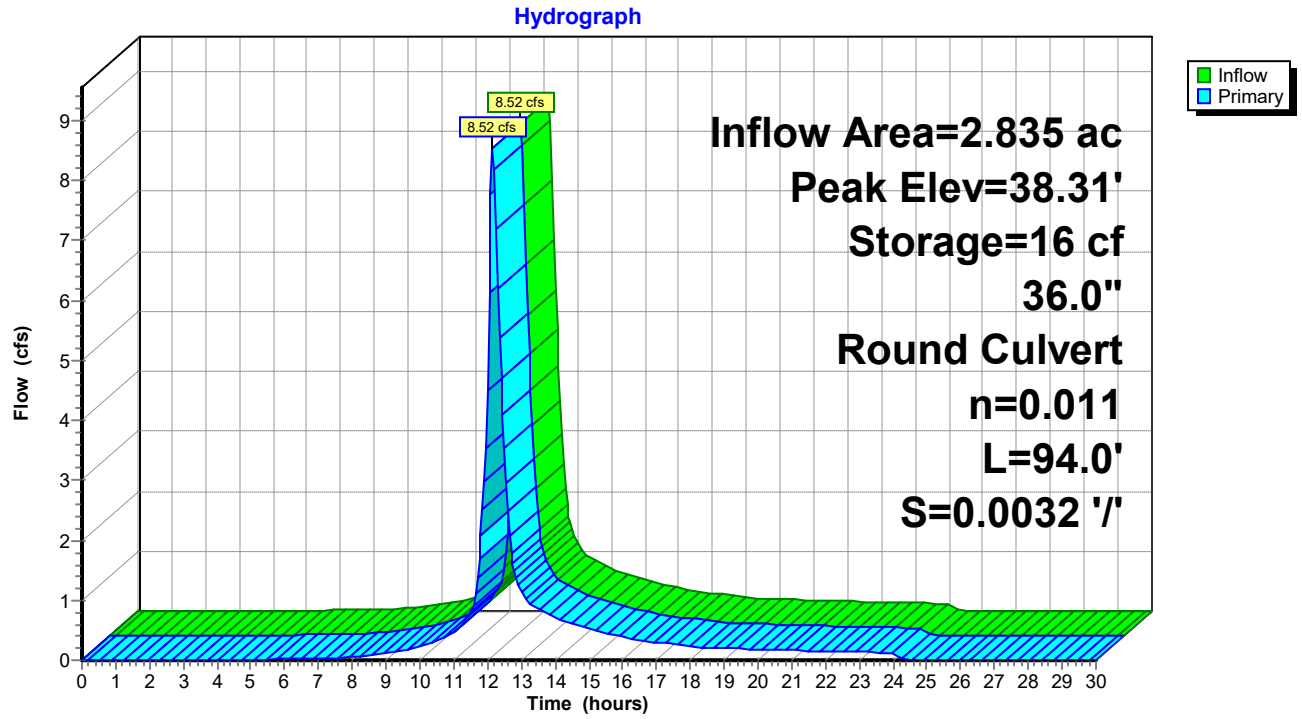
Plug-Flow detention time= 0.1 min calculated for 0.790 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (818.5 - 818.4)

Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	60 cf	**4.00'D x 4.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**36.0" Round RCP_Round 36"** L= 94.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 36.70' S= 0.0032 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=8.44 cfs @ 12.16 hrs HW=38.30' TW=37.54' (Dynamic Tailwater)
1=RCP_Round 36" (Barrel Controls 8.44 cfs @ 4.24 fps)

Pond 2P: CB 6943



Summary for Pond 3.1P: CB 5894

Inflow Area = 0.489 ac, 46.31% Impervious, Inflow Depth = 3.93" for 10-YEAR event
Inflow = 1.87 cfs @ 12.10 hrs, Volume= 0.160 af
Outflow = 1.87 cfs @ 12.10 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.0 min
Primary = 1.87 cfs @ 12.10 hrs, Volume= 0.160 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.58' @ 12.14 hrs Surf.Area= 13 sf Storage= 12 cf
Flood Elev= 41.30' Surf.Area= 13 sf Storage= 33 cf

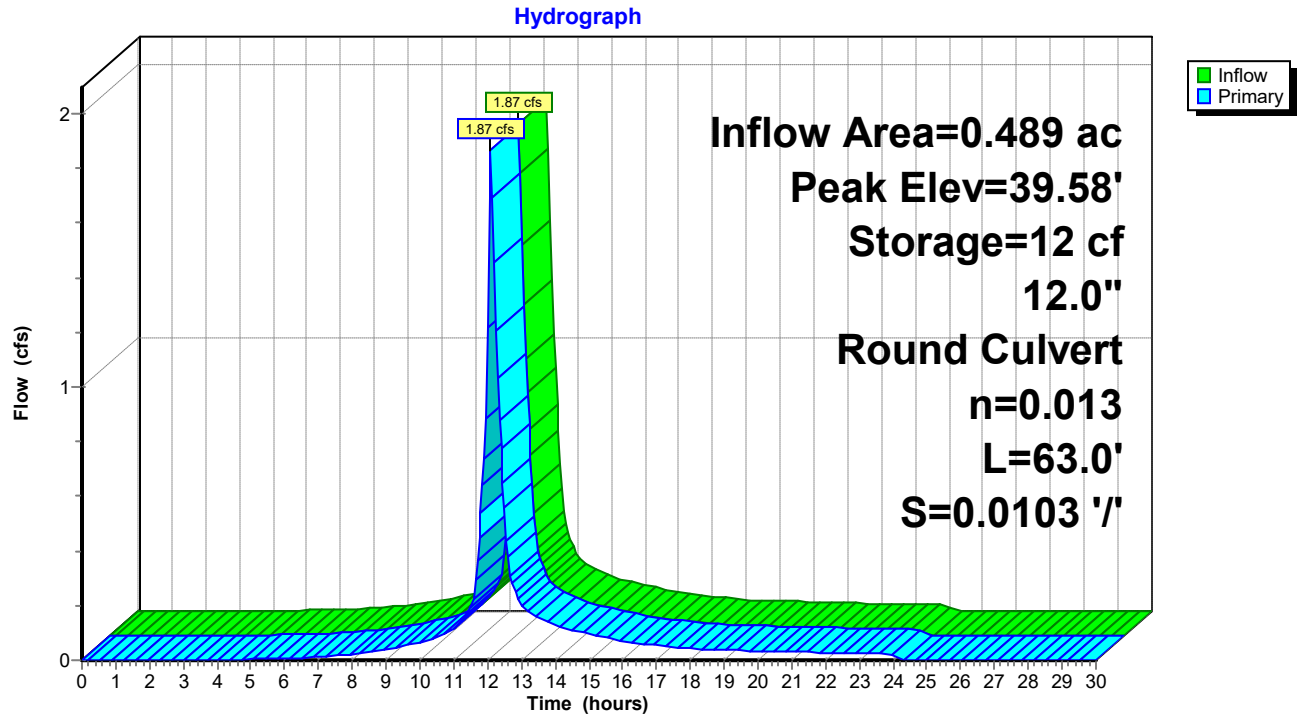
Plug-Flow detention time= 0.3 min calculated for 0.160 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (800.1 - 799.8)

Volume	Invert	Avail.Storage	Storage Description
#1	38.65'	33 cf	**4.00'D x 2.65'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	38.65'	**12.0" Round CMP_Round 12"** L= 63.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.65' / 38.00' S= 0.0103 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=1.45 cfs @ 12.10 hrs HW=39.52' TW=39.17' (Dynamic Tailwater)
1=CMP_Round 12" (Outlet Controls 1.45 cfs @ 2.68 fps)

Pond 3.1P: CB 5894



Summary for Pond 3.2P: DMH 6337

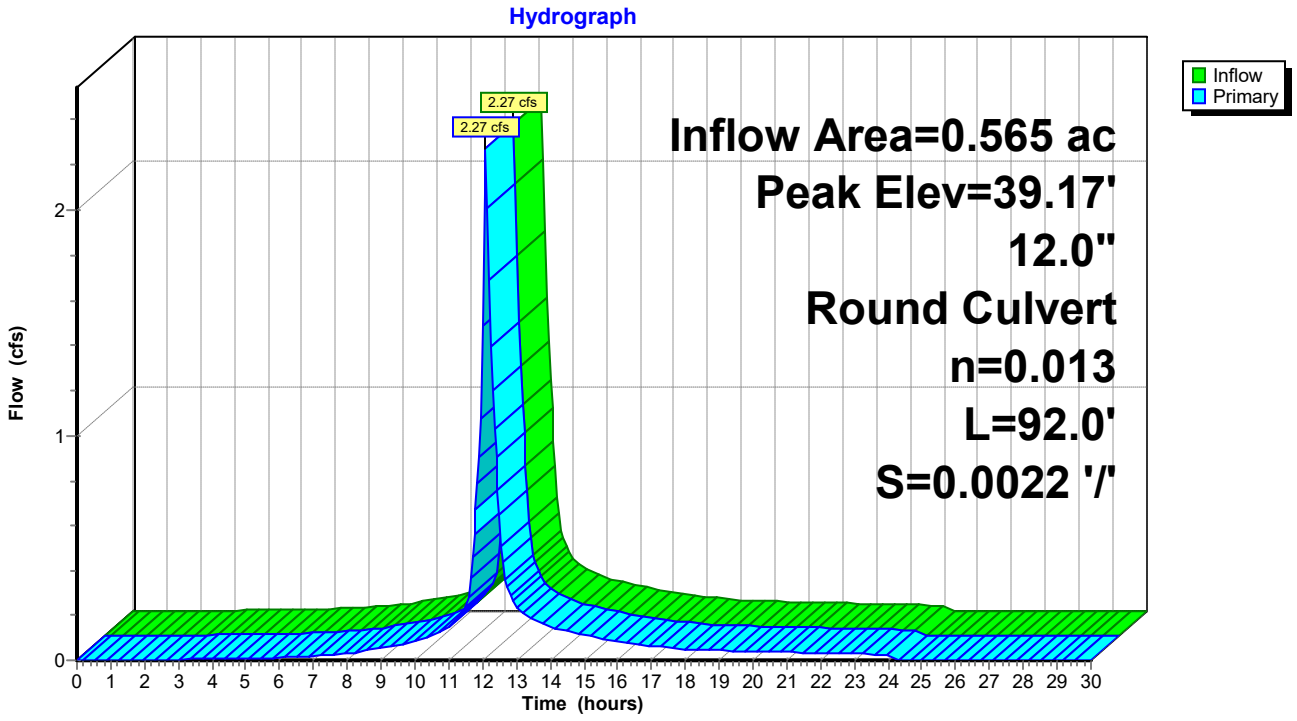
Inflow Area = 0.565 ac, 53.58% Impervious, Inflow Depth = 4.12" for 10-YEAR event
Inflow = 2.27 cfs @ 12.10 hrs, Volume= 0.194 af
Outflow = 2.27 cfs @ 12.10 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min
Primary = 2.27 cfs @ 12.10 hrs, Volume= 0.194 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.17' @ 12.10 hrs
Flood Elev= 42.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.80'	**12.0" Round CMP_Round 12"** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.80' / 37.60' S= 0.0022 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=2.24 cfs @ 12.10 hrs HW=39.16' TW=38.23' (Dynamic Tailwater)
1=CMP_Round 12" (Barrel Controls 2.24 cfs @ 2.86 fps)

Pond 3.2P: DMH 6337



Summary for Pond 4P: CB 6025

Inflow Area = 0.159 ac, 9.06% Impervious, Inflow Depth = 3.02" for 10-YEAR event
Inflow = 0.59 cfs @ 12.06 hrs, Volume= 0.040 af
Outflow = 0.59 cfs @ 12.06 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.1 min
Primary = 0.59 cfs @ 12.06 hrs, Volume= 0.040 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.76' @ 12.10 hrs Surf.Area= 13 sf Storage= 6 cf
Flood Elev= 41.90' Surf.Area= 13 sf Storage= 33 cf

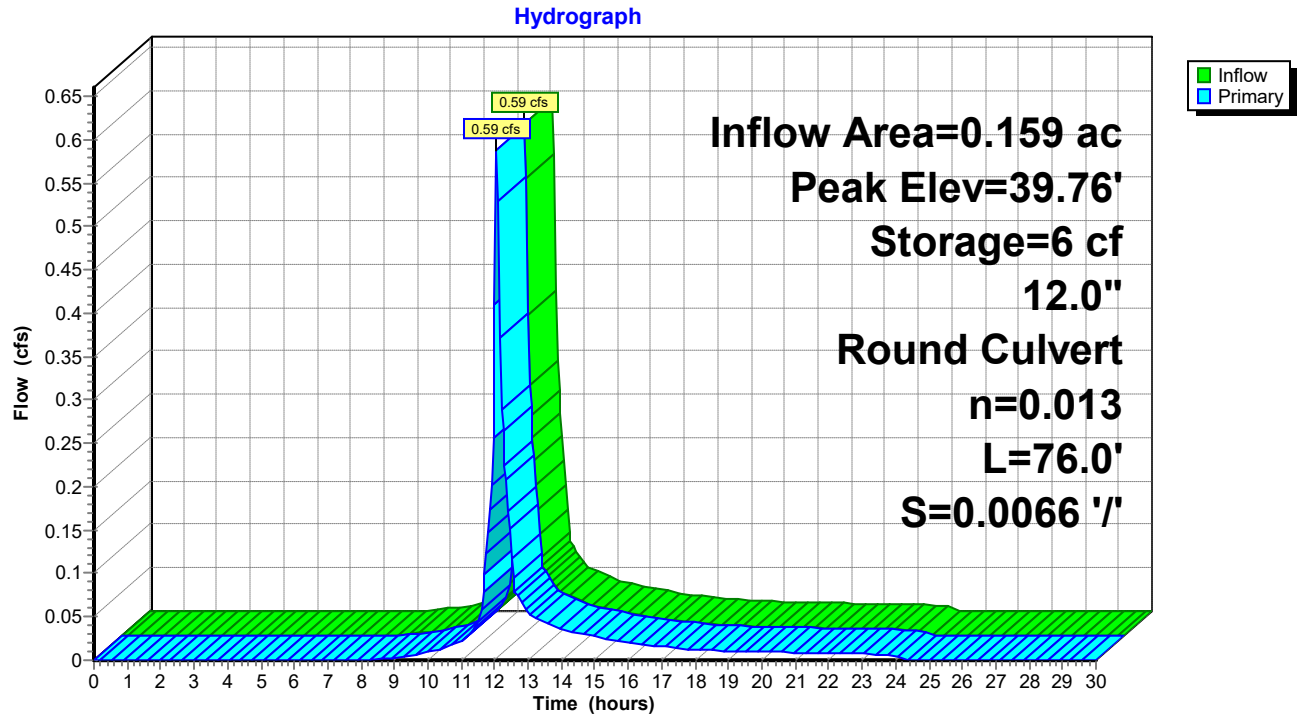
Plug-Flow detention time= 0.6 min calculated for 0.040 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (826.0 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	39.30'	33 cf	**4.00'D x 2.60'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.30'	**12.0" Round CMP_Round 12"** L= 76.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.30' / 38.80' S= 0.0066 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.06 hrs HW=39.75' TW=39.43' (Dynamic Tailwater)
1=CMP_Round 12" (Outlet Controls 0.47 cfs @ 2.02 fps)

Pond 4P: CB 6025



Summary for Pond 5P: CB 5937

Inflow Area = 0.060 ac, 71.18% Impervious, Inflow Depth = 4.56" for 10-YEAR event
Inflow = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af
Outflow = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af, Atten= 1%, Lag= 0.1 min
Primary = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.65' @ 12.11 hrs Surf.Area= 13 sf Storage= 4 cf
Flood Elev= 42.74' Surf.Area= 13 sf Storage= 43 cf

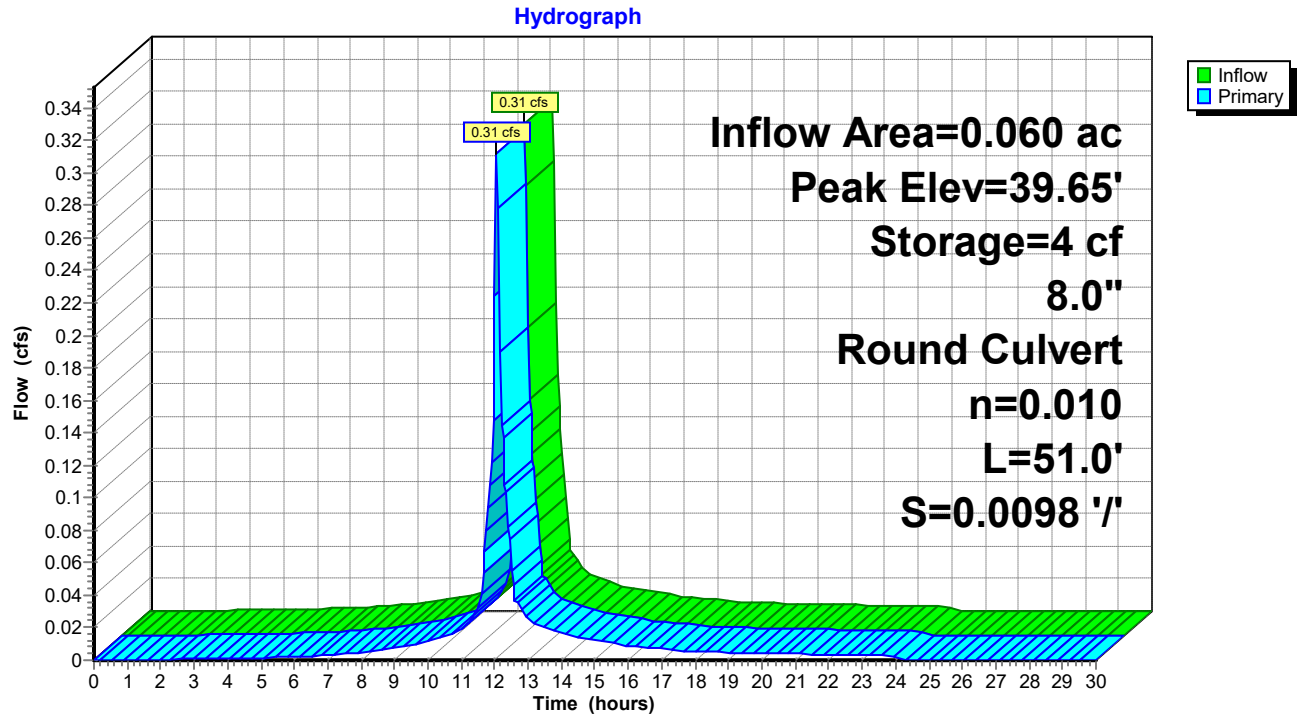
Plug-Flow detention time= 0.8 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (776.7 - 775.9)

Volume	Invert	Avail.Storage	Storage Description
#1	39.30'	43 cf	**4.00'D x 3.44'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.30'	**8.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.30' / 38.80' S= 0.0098 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.23 cfs @ 12.06 hrs HW=39.64' TW=39.43' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.23 cfs @ 1.93 fps)

Pond 5P: CB 5937



Summary for Pond 6P: CB 5478

Inflow Area = 0.042 ac, 58.73% Impervious, Inflow Depth = 4.22" for 10-YEAR event
Inflow = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.2 min
Primary = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.06' @ 12.06 hrs Surf.Area= 13 sf Storage= 3 cf
Flood Elev= 42.16' Surf.Area= 13 sf Storage= 30 cf

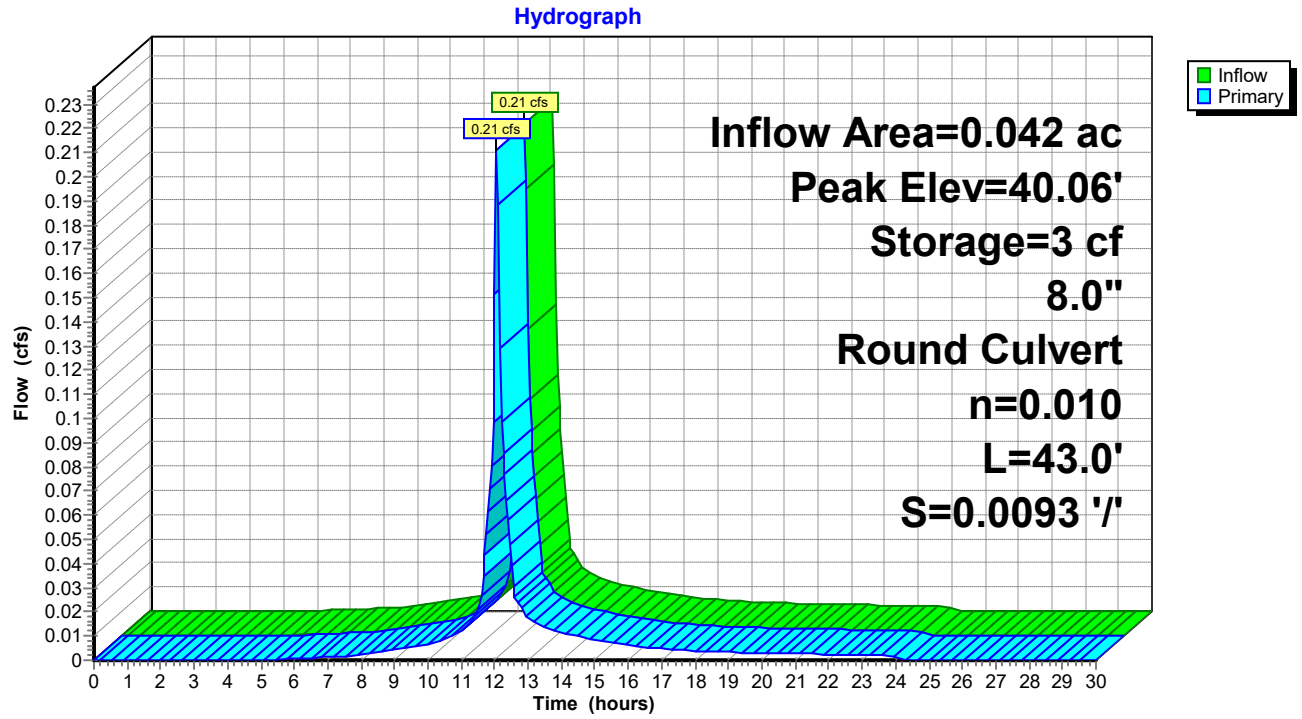
Plug-Flow detention time= 1.2 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (793.1 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	39.80'	30 cf	**4.00'D x 2.36'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.80'	**8.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.80' / 39.40' S= 0.0093 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.20 cfs @ 12.06 hrs HW=40.05' TW=39.64' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.20 cfs @ 1.70 fps)

Pond 6P: CB 5478



Summary for Pond 7.1P: DMH 6949

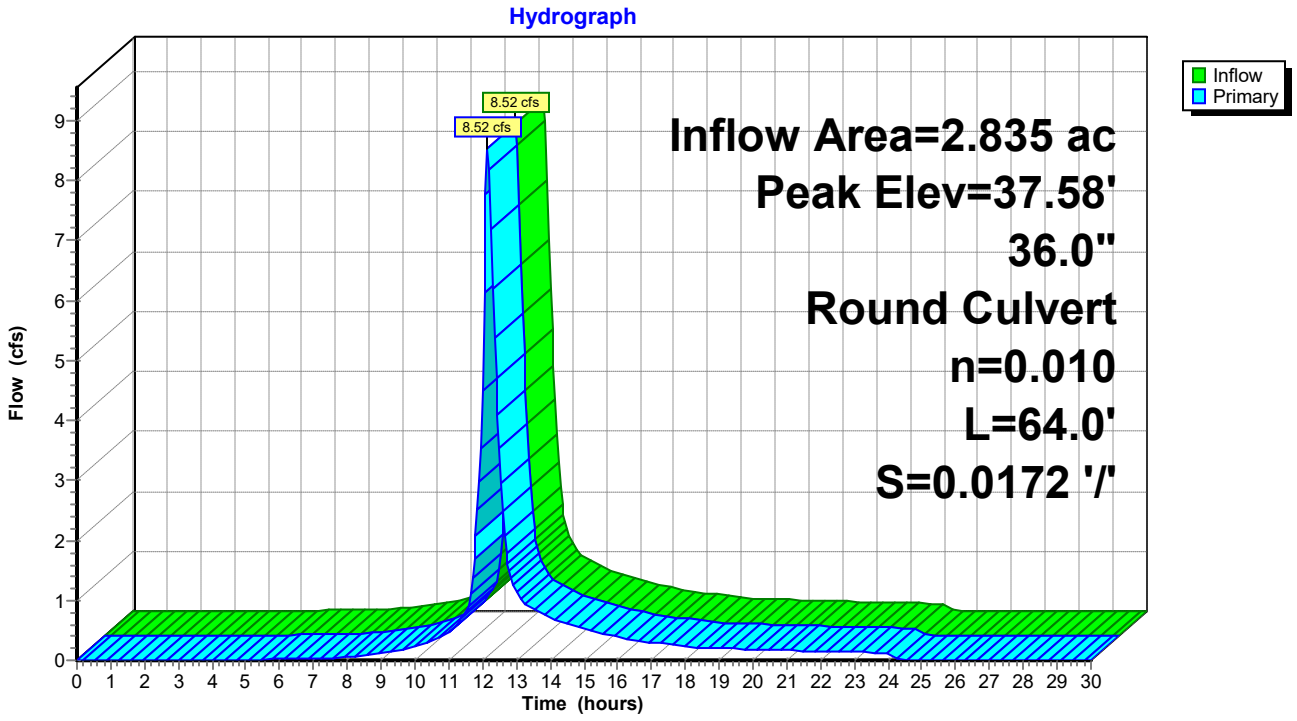
Inflow Area = 2.835 ac, 33.87% Impervious, Inflow Depth = 3.35" for 10-YEAR event
Inflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af
Outflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.0 min
Primary = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.58' @ 12.20 hrs
Flood Elev= 41.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.40'	**36.0" Round RCP_Round 36"** L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.40' / 35.30' S= 0.0172 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=7.56 cfs @ 12.16 hrs HW=37.54' TW=36.91' (Dynamic Tailwater)
1=RCP_Round 36" (Outlet Controls 7.56 cfs @ 4.54 fps)

Pond 7.1P: DMH 6949



Summary for Pond 7.2P: CB 5669

Inflow Area = 0.563 ac, 64.82% Impervious, Inflow Depth = 4.43" for 10-YEAR event
Inflow = 2.77 cfs @ 12.08 hrs, Volume= 0.208 af
Outflow = 2.73 cfs @ 12.07 hrs, Volume= 0.208 af, Atten= 1%, Lag= 0.0 min
Primary = 2.73 cfs @ 12.07 hrs, Volume= 0.208 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.43' @ 12.14 hrs Surf.Area= 13 sf Storage= 29 cf
Flood Elev= 39.00' Surf.Area= 38 sf Storage= 36 cf

Plug-Flow detention time= 0.6 min calculated for 0.208 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (785.0 - 784.7)

Volume	Invert	Avail.Storage	Storage Description
#1	36.10'	36 cf	**4.00'D x 2.90'H Vertical Cone/Cylinder**
#2	39.00'	2,791 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		2,828 cf	Total Available Storage

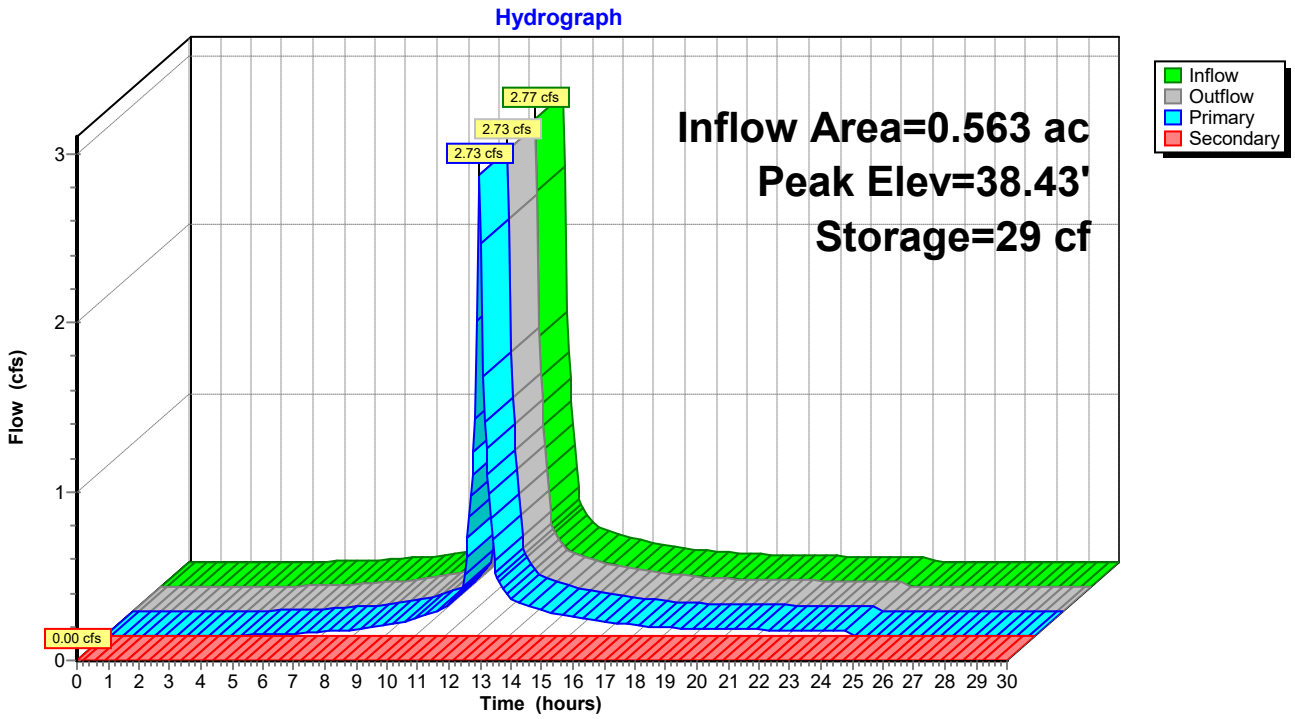
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	25	0	0	25
39.95	7,200	2,422	2,422	7,202
40.00	7,564	369	2,791	7,566

Device	Routing	Invert	Outlet Devices
#1	Primary	36.10'	**12.0" Round Culvert** L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.10' / 35.70' S= 0.0065 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.00'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 12.07 hrs HW=37.76' TW=37.88' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=36.10' TW=35.60' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7.2P: CB 5669



Summary for Pond 8.1P: DMH 8521

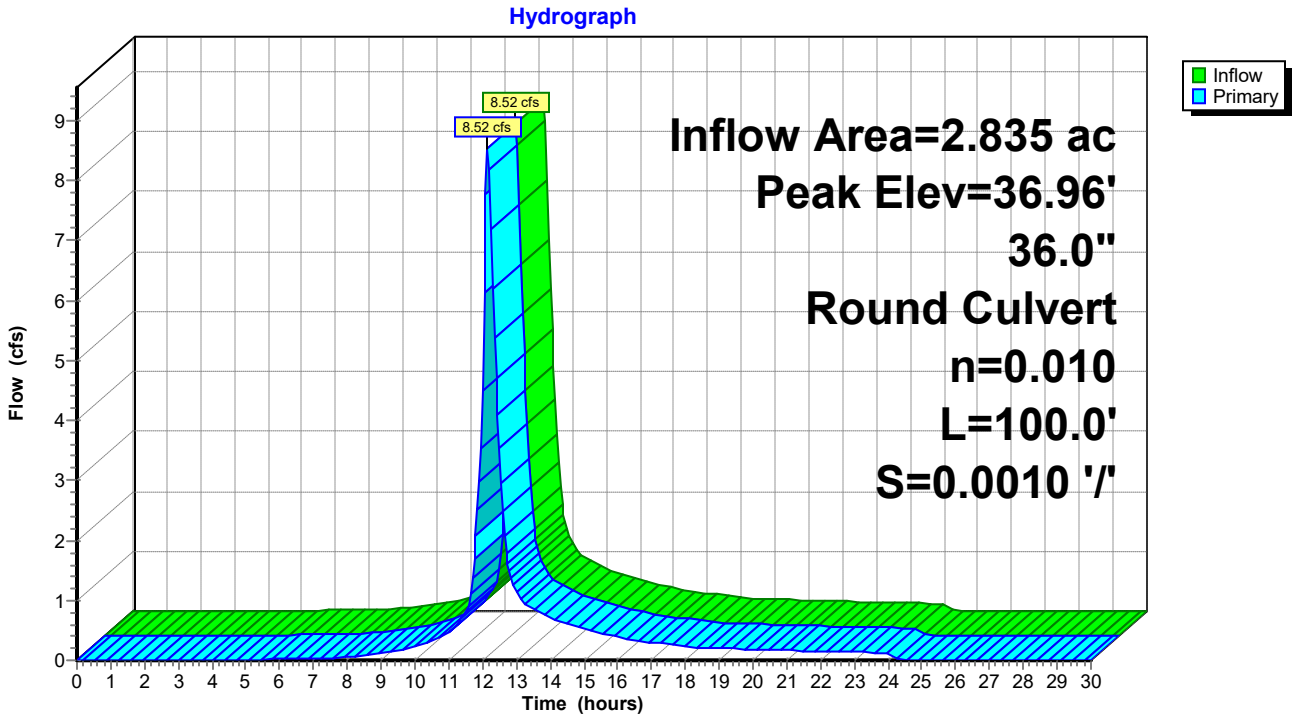
Inflow Area = 2.835 ac, 33.87% Impervious, Inflow Depth = 3.35" for 10-YEAR event
Inflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af
Outflow = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af, Atten= 0%, Lag= 0.0 min
Primary = 8.52 cfs @ 12.16 hrs, Volume= 0.791 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.96' @ 12.20 hrs
Flood Elev= 40.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.20'	**36.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.20' / 35.10' S= 0.0010 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=7.10 cfs @ 12.16 hrs HW=36.91' TW=36.72' (Dynamic Tailwater)
1=Culvert (Outlet Controls 7.10 cfs @ 2.46 fps)

Pond 8.1P: DMH 8521



Summary for Pond 8.2P: DMH 8534

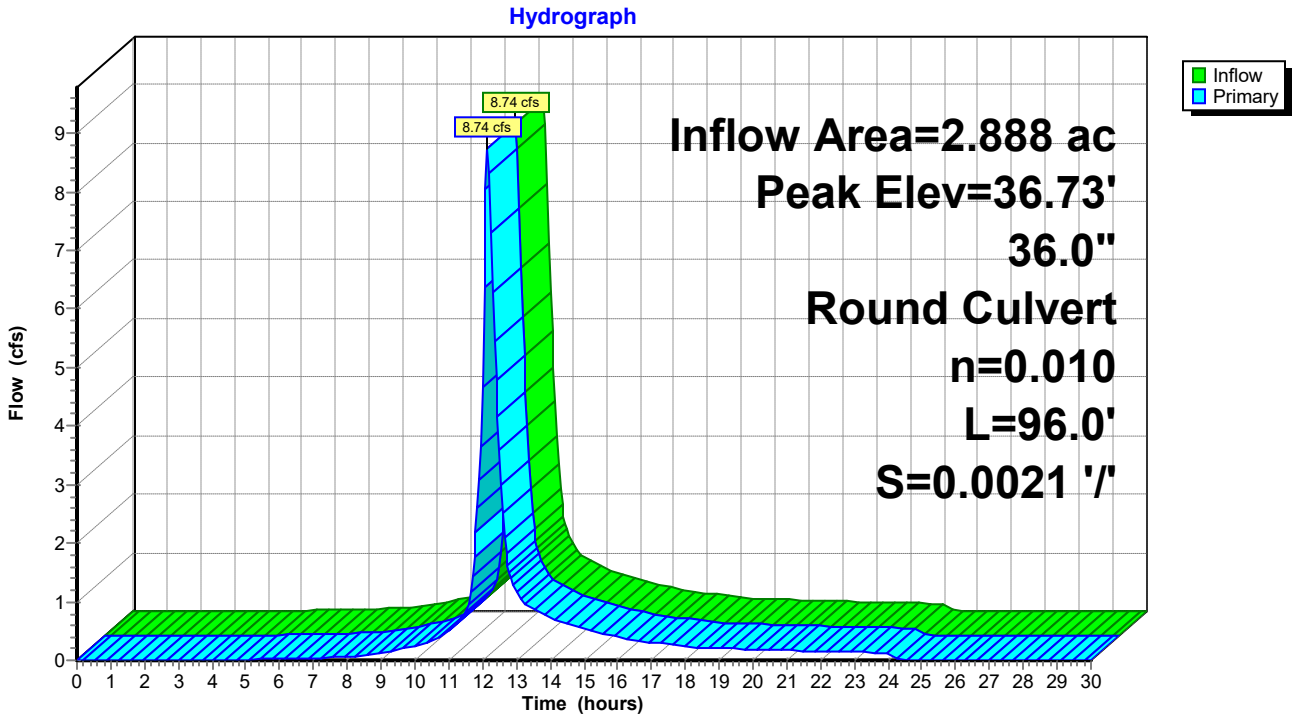
Inflow Area = 2.888 ac, 35.08% Impervious, Inflow Depth = 3.39" for 10-YEAR event
Inflow = 8.74 cfs @ 12.16 hrs, Volume= 0.815 af
Outflow = 8.74 cfs @ 12.16 hrs, Volume= 0.815 af, Atten= 0%, Lag= 0.0 min
Primary = 8.74 cfs @ 12.16 hrs, Volume= 0.815 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.73' @ 12.16 hrs
Flood Elev= 40.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.10'	**36.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.10' / 34.90' S= 0.0021 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=9.11 cfs @ 12.16 hrs HW=36.72' TW=36.37' (Dynamic Tailwater)
1=Culvert (Outlet Controls 9.11 cfs @ 3.39 fps)

Pond 8.2P: DMH 8534



Summary for Pond 8.3P: DMH 5099

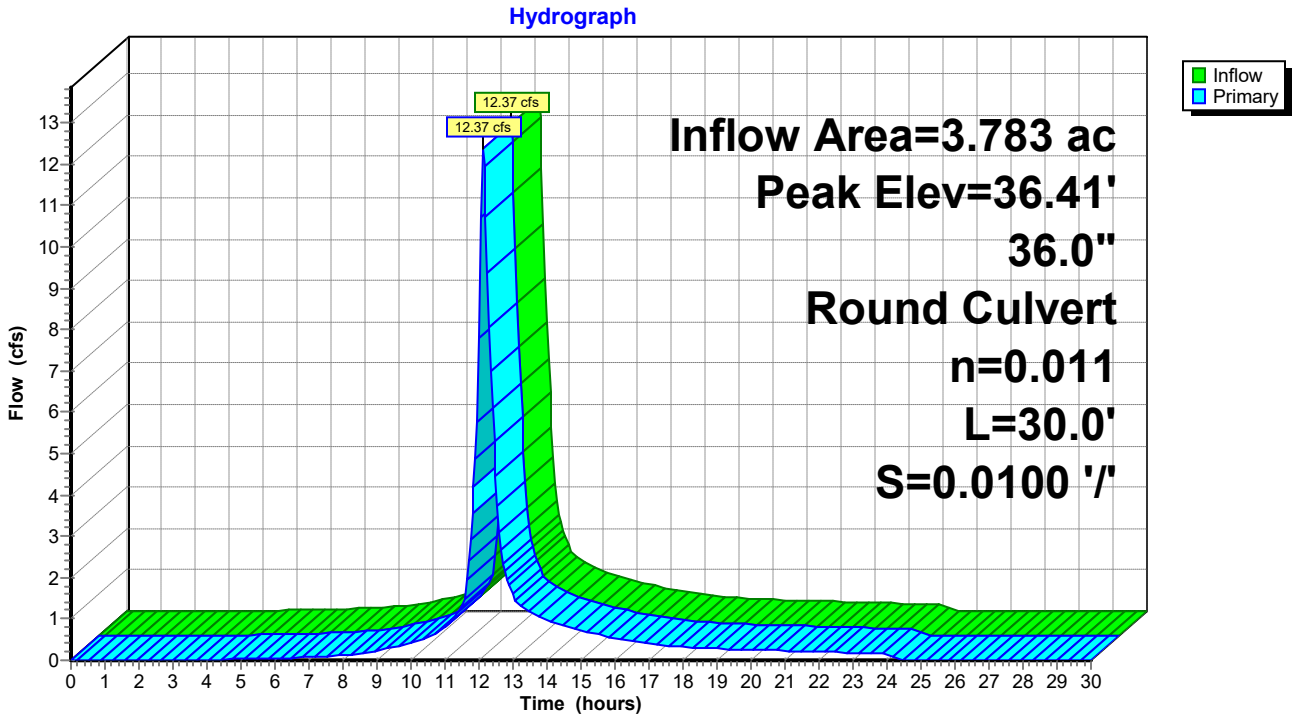
Inflow Area = 3.783 ac, 43.18% Impervious, Inflow Depth = 3.66" for 10-YEAR event
Inflow = 12.37 cfs @ 12.12 hrs, Volume= 1.153 af
Outflow = 12.37 cfs @ 12.12 hrs, Volume= 1.153 af, Atten= 0%, Lag= 0.0 min
Primary = 12.37 cfs @ 12.12 hrs, Volume= 1.153 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.41' @ 12.12 hrs
Flood Elev= 40.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.90'	**36.0" Round RCP_Round 36"** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.90' / 34.60' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=12.16 cfs @ 12.12 hrs HW=36.40' TW=35.43' (Dynamic Tailwater)
1=RCP_Round 36" (Barrel Controls 12.16 cfs @ 5.04 fps)

Pond 8.3P: DMH 5099



Summary for Pond 8.4P: DMH 5280

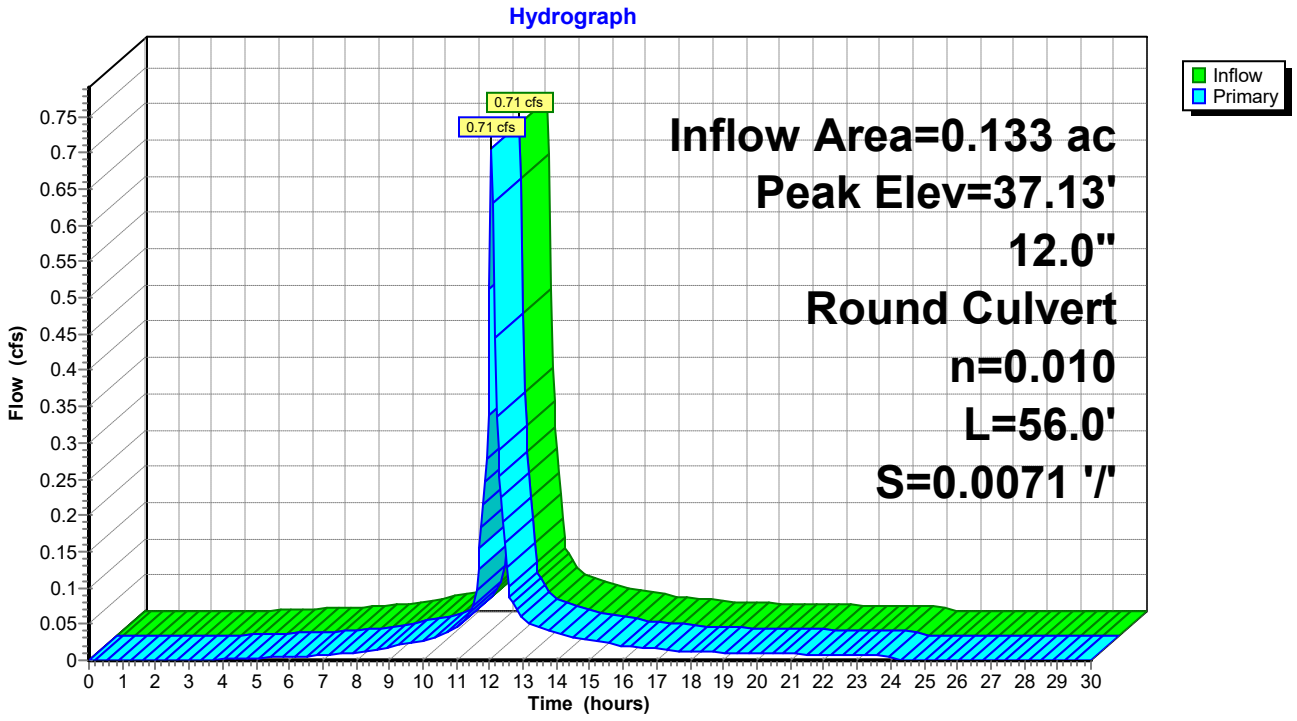
Inflow Area = 0.133 ac, 73.56% Impervious, Inflow Depth = 4.65" for 10-YEAR event
Inflow = 0.71 cfs @ 12.06 hrs, Volume= 0.052 af
Outflow = 0.71 cfs @ 12.06 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min
Primary = 0.71 cfs @ 12.06 hrs, Volume= 0.052 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.13' @ 12.06 hrs
Flood Elev= 41.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.70'	**12.0" Round Culvert** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.70' / 36.30' S= 0.0071 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.68 cfs @ 12.06 hrs HW=37.12' TW=36.31' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.68 cfs @ 3.22 fps)

Pond 8.4P: DMH 5280



Summary for Pond 9.1P: CB 5673

Inflow Area = 0.762 ac, 68.56% Impervious, Inflow Depth = 4.52" for 10-YEAR event
Inflow = 3.79 cfs @ 12.07 hrs, Volume= 0.287 af
Outflow = 3.75 cfs @ 12.07 hrs, Volume= 0.287 af, Atten= 1%, Lag= 0.1 min
Primary = 3.75 cfs @ 12.07 hrs, Volume= 0.287 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.14' @ 12.10 hrs Surf.Area= 13 sf Storage= 32 cf
Flood Elev= 38.70' Surf.Area= 38 sf Storage= 39 cf

Plug-Flow detention time= 0.6 min calculated for 0.287 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (782.2 - 781.9)

Volume	Invert	Avail.Storage	Storage Description
#1	35.60'	39 cf	**4.00'D x 3.10'H Vertical Cone/Cylinder**
#2	38.70'	3,149 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		3,188 cf	Total Available Storage

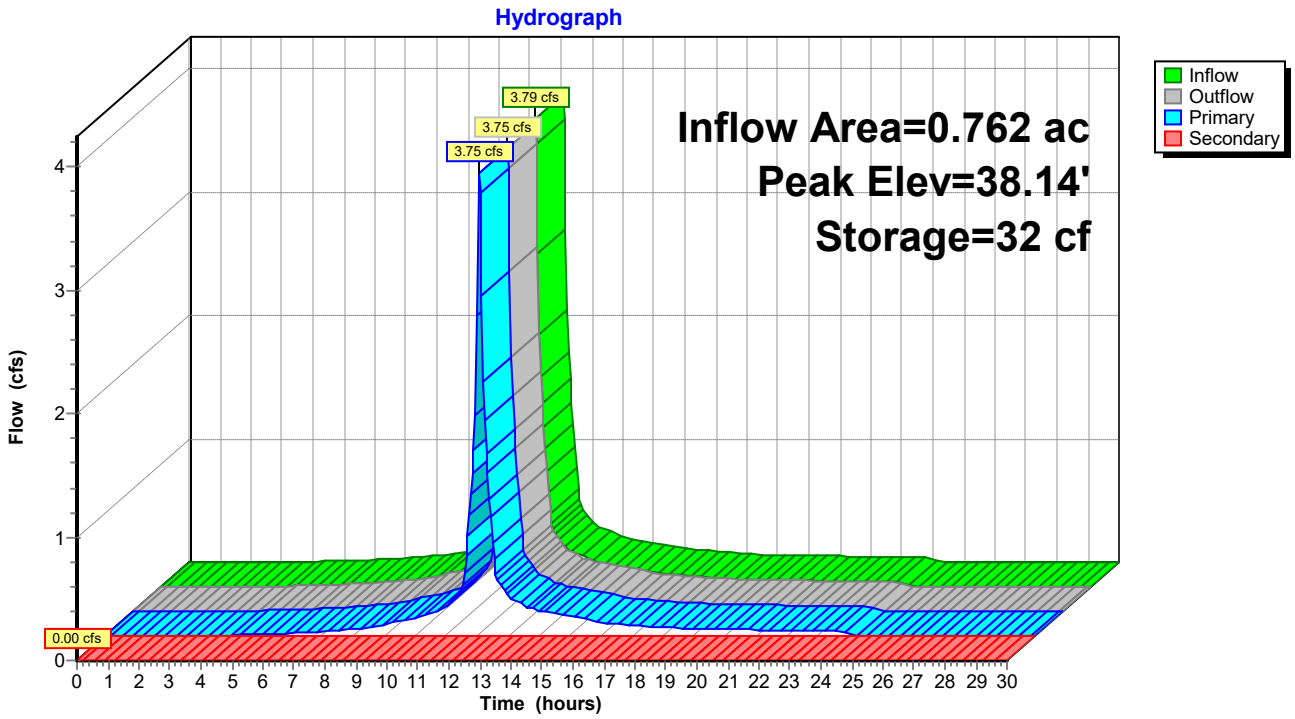
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.70	25	0.0	0	0	25
39.00	220	100.0	32	32	220
39.95	7,200	100.0	2,748	2,780	7,202
40.00	7,564	100.0	369	3,149	7,567

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.60' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.95'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.04 cfs @ 12.07 hrs HW=37.87' TW=37.23' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.04 cfs @ 3.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.60' TW=34.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9.1P: CB 5673



Summary for Pond 9.2P: DMH 5677

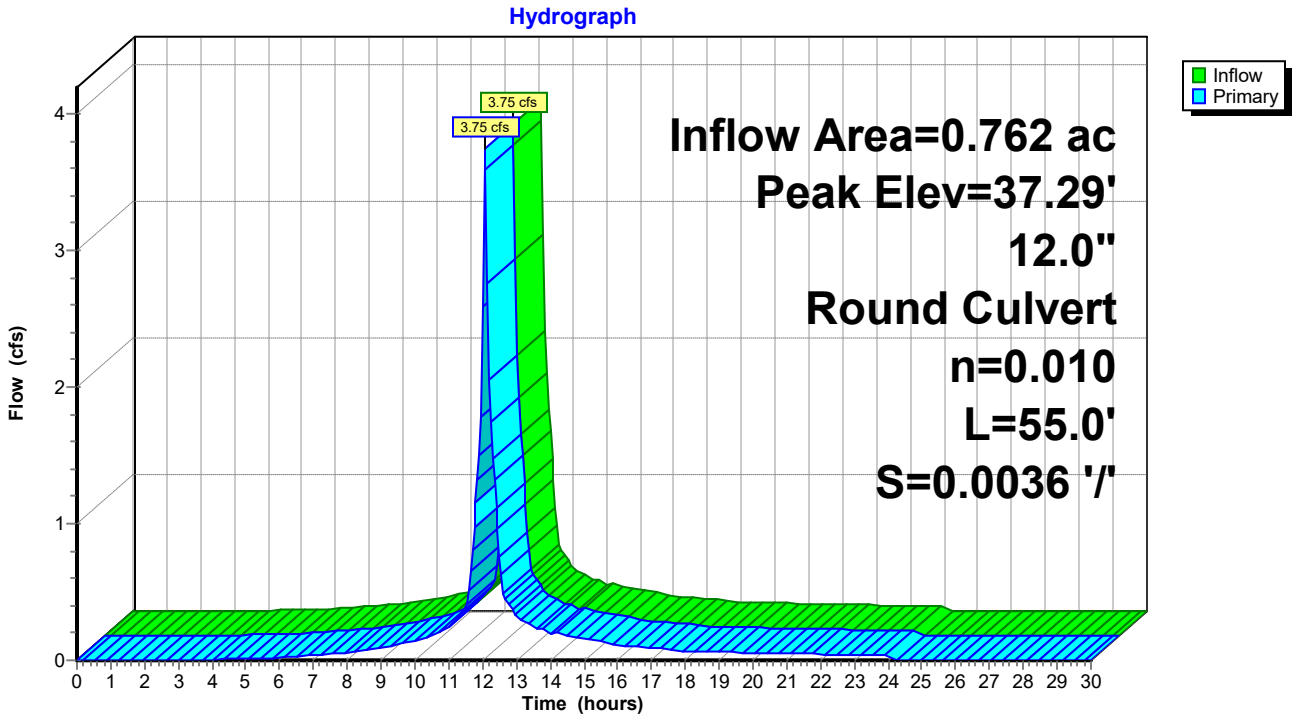
Inflow Area = 0.762 ac, 68.56% Impervious, Inflow Depth = 4.52" for 10-YEAR event
Inflow = 3.75 cfs @ 12.07 hrs, Volume= 0.287 af
Outflow = 3.75 cfs @ 12.07 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min
Primary = 3.75 cfs @ 12.07 hrs, Volume= 0.287 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.29' @ 12.07 hrs
Flood Elev= 39.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**12.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.40' S= 0.0036 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.56 cfs @ 12.07 hrs HW=37.23' TW=36.34' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.56 cfs @ 4.54 fps)

Pond 9.2P: DMH 5677



Summary for Pond 10P: CB 5238

Inflow Area = 0.116 ac, 69.68% Impervious, Inflow Depth = 4.55" for 10-YEAR event
Inflow = 0.62 cfs @ 12.06 hrs, Volume= 0.044 af
Outflow = 0.62 cfs @ 12.06 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.1 min
Primary = 0.62 cfs @ 12.06 hrs, Volume= 0.044 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.50' @ 12.07 hrs Surf.Area= 13 sf Storage= 5 cf
Flood Elev= 40.80' Surf.Area= 13 sf Storage= 46 cf

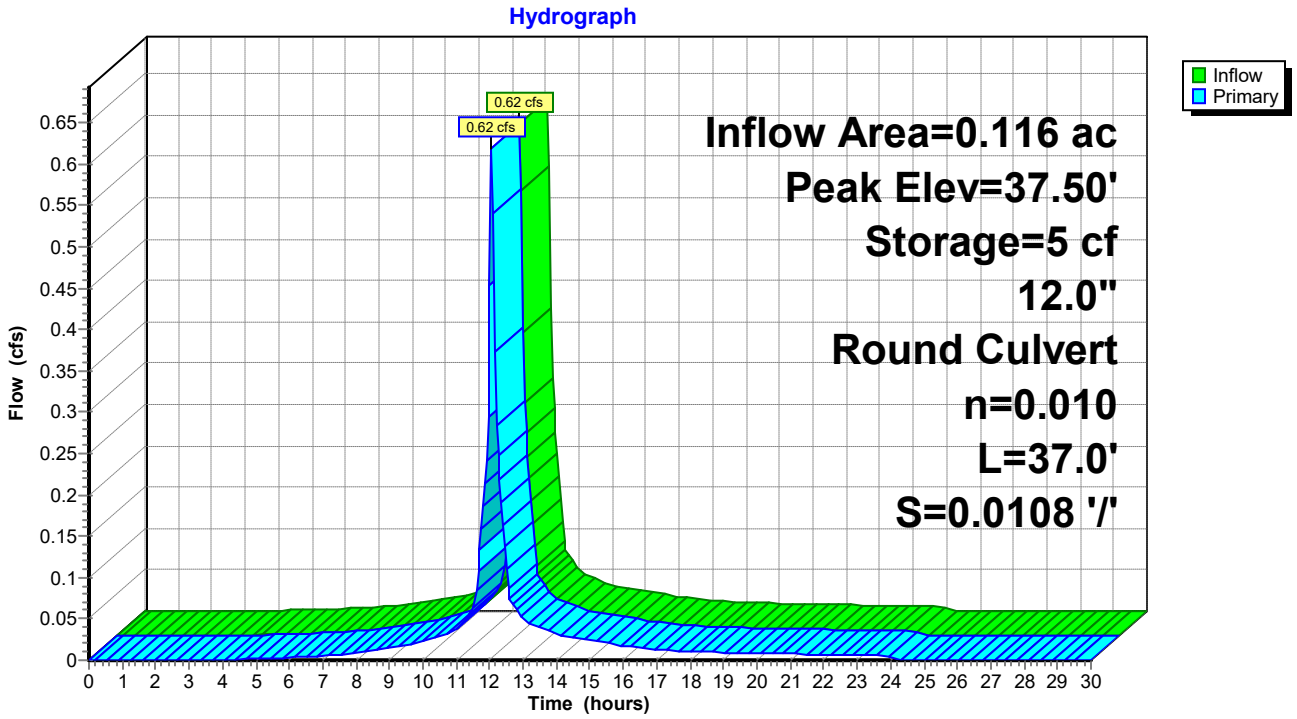
Plug-Flow detention time= 0.5 min calculated for 0.044 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (781.9 - 781.5)

Volume	Invert	Avail.Storage	Storage Description
#1	37.10'	46 cf	**4.00'D x 3.70'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	37.10'	**12.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.10' / 36.70' S= 0.0108 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.06 hrs HW=37.49' TW=37.12' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.58 cfs @ 2.99 fps)

Pond 10P: CB 5238

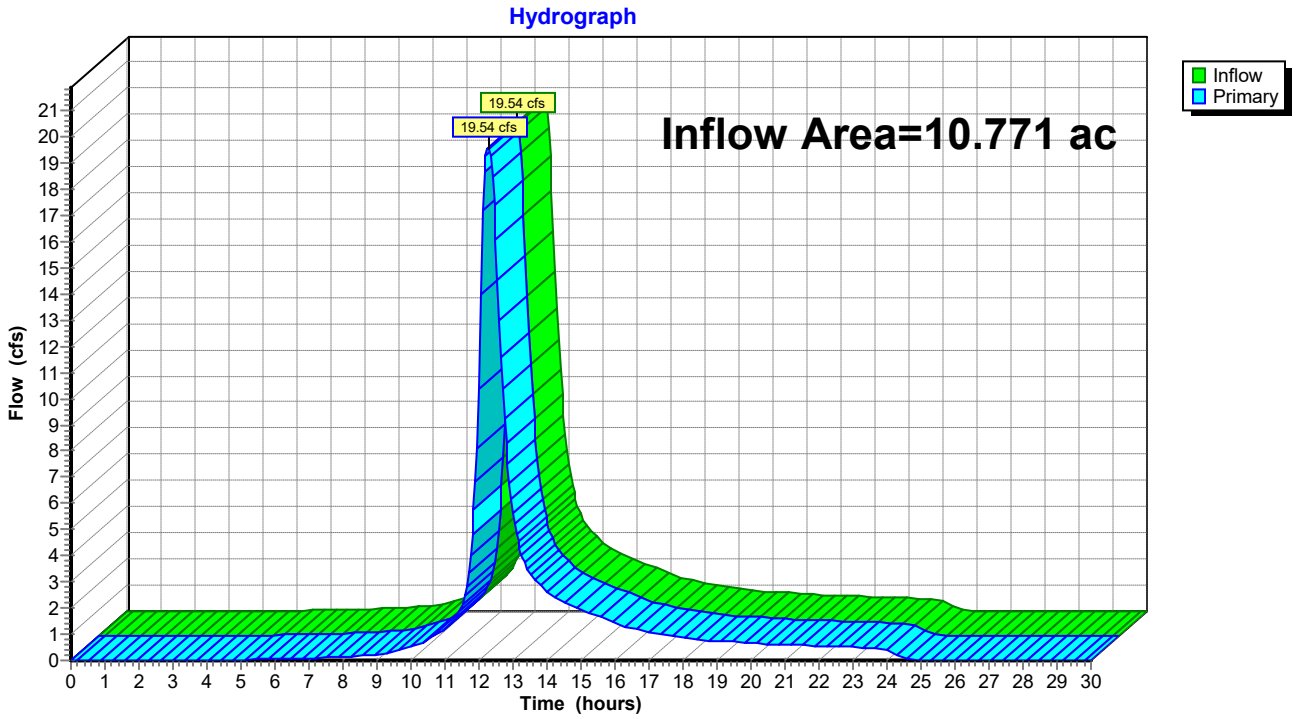


Summary for Link POA 1: Point of Analysis #1

Inflow Area = 10.771 ac, 17.37% Impervious, Inflow Depth = 2.95" for 10-YEAR event
Inflow = 19.54 cfs @ 12.27 hrs, Volume= 2.647 af
Primary = 19.54 cfs @ 12.27 hrs, Volume= 2.647 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 1: Point of Analysis #1

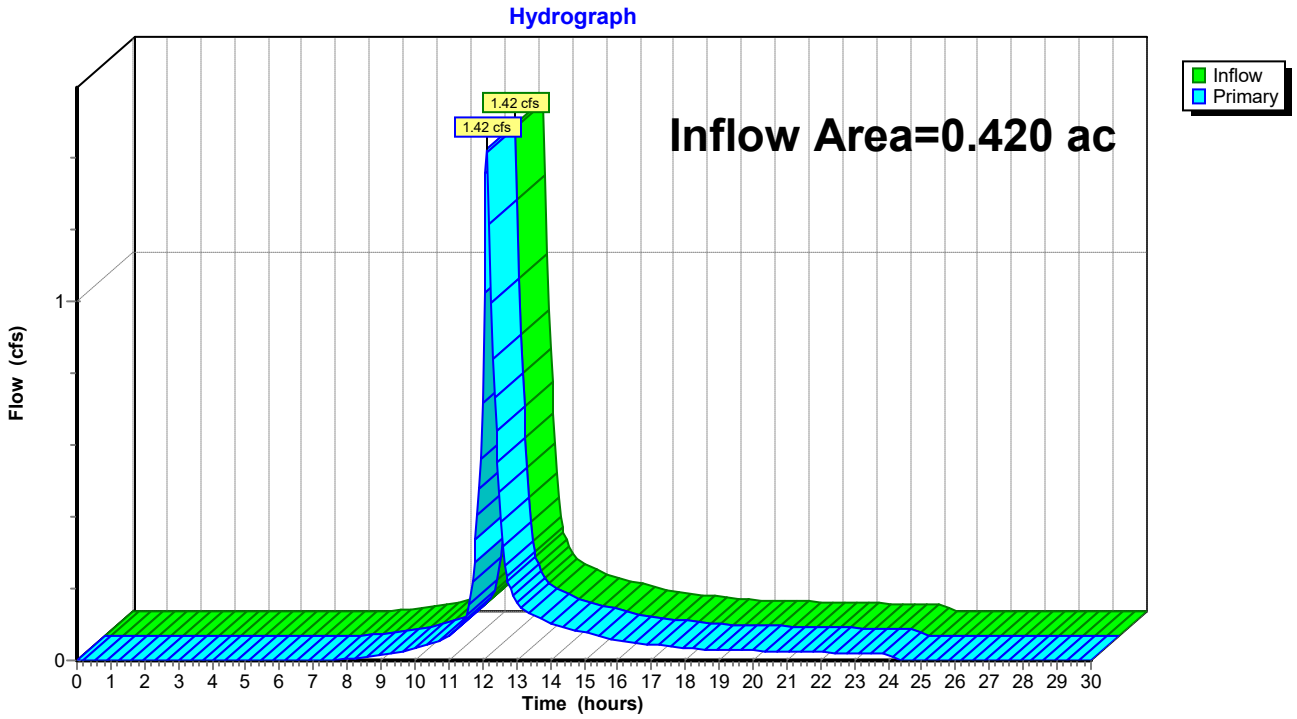


Summary for Link POA 2: Point of Analysis #2

Inflow Area = 0.420 ac, 22.29% Impervious, Inflow Depth = 3.31" for 10-YEAR event
Inflow = 1.42 cfs @ 12.14 hrs, Volume= 0.116 af
Primary = 1.42 cfs @ 12.14 hrs, Volume= 0.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 2: Point of Analysis #2

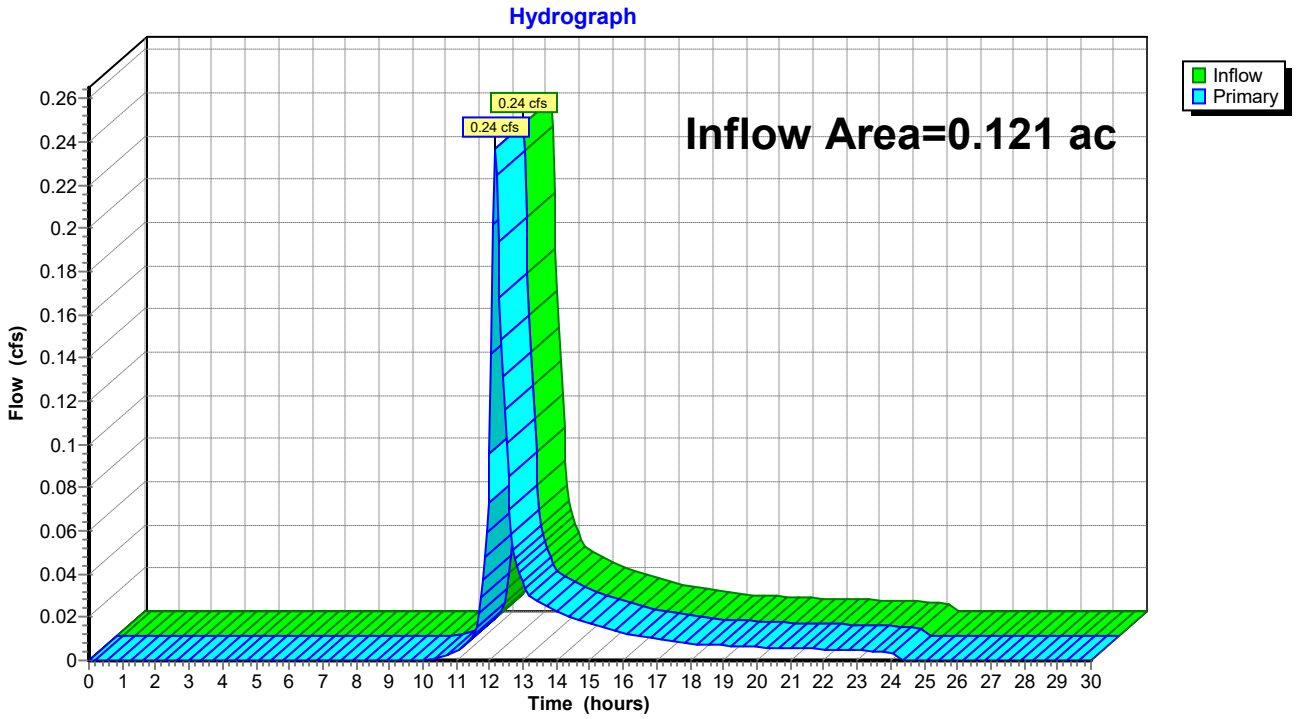


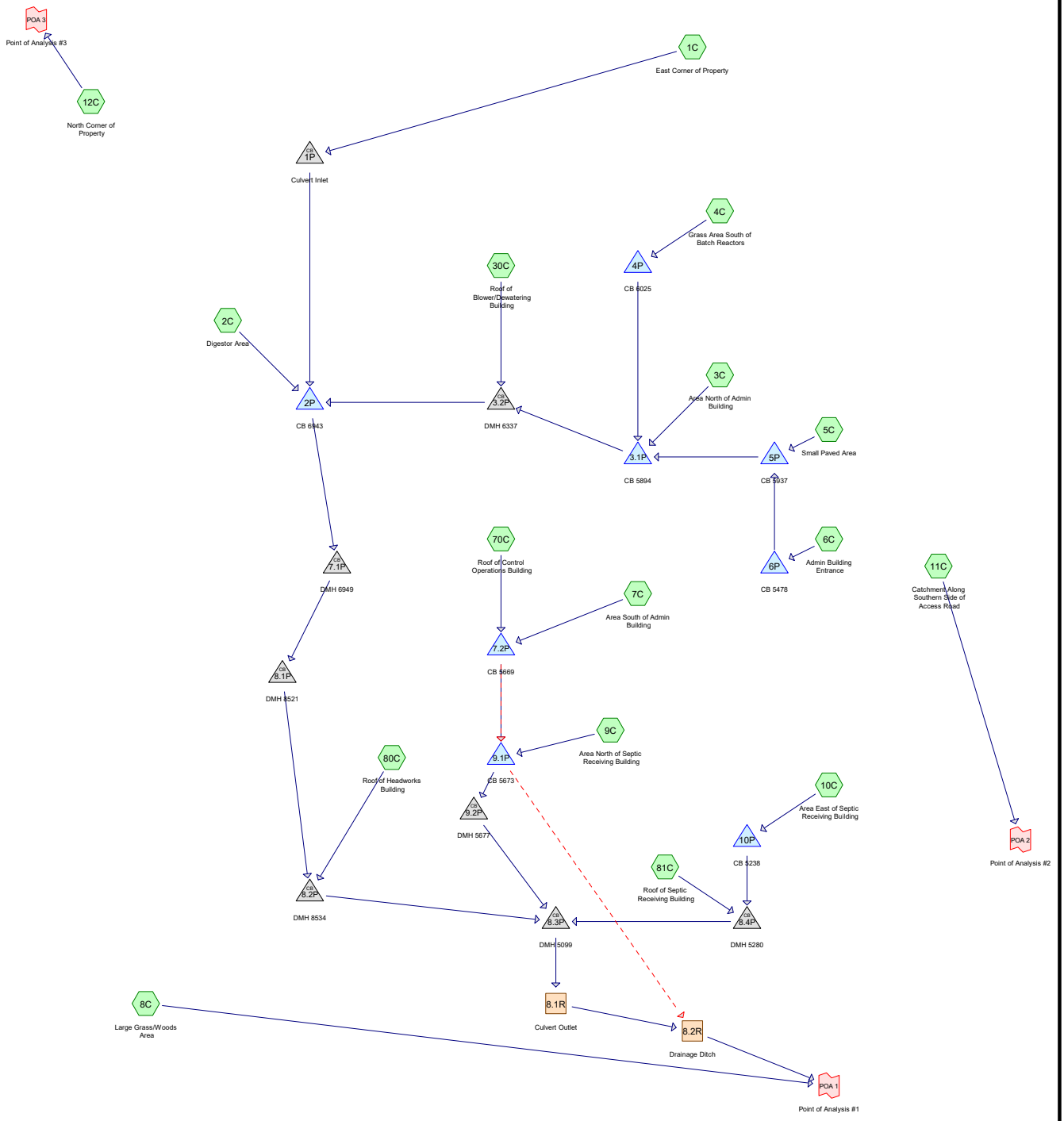
Summary for Link POA 3: Point of Analysis #3

Inflow Area = 0.121 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YEAR event
Inflow = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af
Primary = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 3: Point of Analysis #3





Routing Diagram for 5336-PRE
Prepared by Altus Engineering, Printed 2/11/2025

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1C: East Corner of Property Runoff Area=81,333 sf 22.49% Impervious Runoff Depth=4.21"
Flow Length=467' Tc=13.3 min CN=75 Runoff=7.23 cfs 0.655 af

Subcatchment 2C: Digestor Area Runoff Area=17,529 sf 58.94% Impervious Runoff Depth=5.66"
Flow Length=187' Tc=10.4 min CN=88 Runoff=2.19 cfs 0.190 af

Subcatchment 3C: Area North of Admin Runoff Area=11,771 sf 62.64% Impervious Runoff Depth=5.78"
Flow Length=102' Tc=10.2 min CN=89 Runoff=1.50 cfs 0.130 af

Subcatchment 4C: Grass Area South of Runoff Area=6,908 sf 9.06% Impervious Runoff Depth=4.32"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.84 cfs 0.057 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=6.83"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=5.66"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.28 cfs 0.020 af

Subcatchment 7C: Area South of Admin Runoff Area=22,163 sf 61.07% Impervious Runoff Depth=5.78"
Flow Length=197' Tc=5.1 min CN=89 Runoff=3.28 cfs 0.245 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.39% Impervious Runoff Depth=3.78"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=18.02 cfs 2.203 af

Subcatchment 9C: Area North of Septic Runoff Area=8,672 sf 79.15% Impervious Runoff Depth=6.24"
Flow Length=144' Tc=4.5 min CN=93 Runoff=1.38 cfs 0.104 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 69.68% Impervious Runoff Depth=6.01"
Flow Length=126' Tc=4.0 min CN=91 Runoff=0.80 cfs 0.058 af

Subcatchment 11C: Catchment Along Runoff Area=18,281 sf 22.29% Impervious Runoff Depth=4.65"
Flow Length=370' Tc=9.5 min CN=79 Runoff=1.98 cfs 0.163 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=3.16"
Flow Length=60' Slope=0.0333 '/' Tc=10.9 min CN=65 Runoff=0.37 cfs 0.032 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.044 af

Subcatchment 70C: Roof of Control Runoff Area=2,362 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.37 cfs 0.031 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.030 af

Subcatchment 81C: Roof of Septic Runoff Area=744 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=0.99' Max Vel=3.41 fps Inflow=16.89 cfs 1.583 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=16.77 cfs 1.583 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.83' Max Vel=3.04 fps Inflow=16.77 cfs 1.583 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=16.68 cfs 1.583 af

Pond 1P: Culvert Inlet Peak Elev=39.14' Inflow=7.23 cfs 0.655 af
36.0" Round Culvert n=0.011 L=211.0' S=0.0033 '/' Outflow=7.23 cfs 0.655 af

Pond 2P: CB 6943 Peak Elev=38.57' Storage=20 cf Inflow=11.86 cfs 1.106 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=11.86 cfs 1.106 af

Pond 3.1P: CB 5894 Peak Elev=40.04' Storage=17 cf Inflow=2.51 cfs 0.217 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=2.48 cfs 0.217 af

Pond 3.2P: DMH 6337 Peak Elev=39.59' Inflow=2.99 cfs 0.261 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=2.99 cfs 0.261 af

Pond 4P: CB 6025 Peak Elev=40.09' Storage=10 cf Inflow=0.84 cfs 0.057 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.84 cfs 0.057 af

Pond 5P: CB 5937 Peak Elev=40.06' Storage=10 cf Inflow=0.41 cfs 0.030 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.41 cfs 0.030 af

Pond 6P: CB 5478 Peak Elev=40.11' Storage=4 cf Inflow=0.28 cfs 0.020 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.28 cfs 0.020 af

Pond 7.1P: DMH 6949 Peak Elev=37.89' Inflow=11.86 cfs 1.106 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=11.86 cfs 1.106 af

Pond 7.2P: CB 5669 Peak Elev=39.17' Storage=64 cf Inflow=3.64 cfs 0.276 af
Primary=3.41 cfs 0.264 af Secondary=1.26 cfs 0.011 af Outflow=3.52 cfs 0.276 af

Pond 8.1P: DMH 8521 Peak Elev=37.32' Inflow=11.86 cfs 1.106 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=11.86 cfs 1.106 af

Pond 8.2P: DMH 8534 Peak Elev=37.07' Inflow=12.12 cfs 1.136 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=12.12 cfs 1.136 af

Pond 8.3P: DMH 5099 Peak Elev=36.72' Inflow=16.89 cfs 1.583 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=16.89 cfs 1.583 af

Pond 8.4P: DMH 5280 Peak Elev=37.20' Inflow=0.91 cfs 0.068 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.91 cfs 0.068 af

Pond 9.1P: CB 5673 Peak Elev=39.07' Storage=94 cf Inflow=4.89 cfs 0.379 af
Primary=4.71 cfs 0.379 af Secondary=0.00 cfs 0.000 af Outflow=4.71 cfs 0.379 af

Pond 9.2P: DMH 5677 Peak Elev=37.84' Inflow=4.71 cfs 0.379 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=4.71 cfs 0.379 af

Pond 10P: CB 5238 Peak Elev=37.56' Storage=6 cf Inflow=0.80 cfs 0.058 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.80 cfs 0.058 af

Link POA 1: Point of Analysis #1 Inflow=28.25 cfs 3.786 af
Primary=28.25 cfs 3.786 af

Link POA 2: Point of Analysis #2 Inflow=1.98 cfs 0.163 af
Primary=1.98 cfs 0.163 af

Link POA 3: Point of Analysis #3 Inflow=0.37 cfs 0.032 af
Primary=0.37 cfs 0.032 af

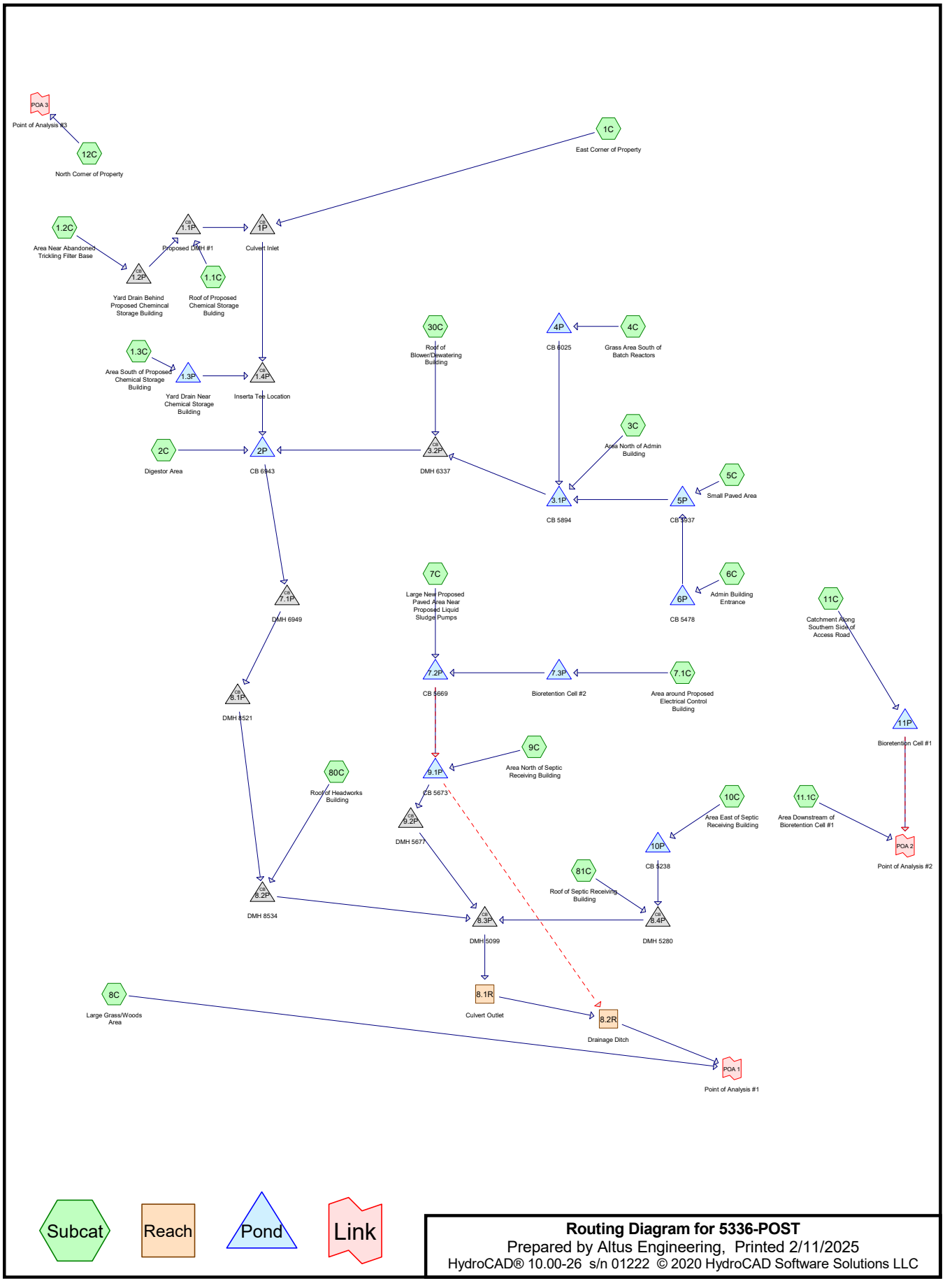
Total Runoff Area = 11.312 ac Runoff Volume = 3.980 af Average Runoff Depth = 4.22"
82.63% Pervious = 9.347 ac 17.37% Impervious = 1.964 ac

Section 4

Drainage Calculations

Post-Development
2-Year, 24-Hour Summary
10-Year, 24-Hour Complete
25-Year, 24-Hour Summary

ALTUS
ENGINEERING



Routing Diagram for 5336-POST
Prepared by Altus Engineering, Printed 2/11/2025

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1C: Roof of Proposed Runoff Area=1,956 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.16 cfs 0.013 af

Subcatchment 1.2C: Area Near Abandoned Runoff Area=5,039 sf 51.78% Impervious Runoff Depth=2.26"
Flow Length=132' Tc=4.0 min CN=86 Runoff=0.32 cfs 0.022 af

Subcatchment 1.3C: Area South of Runoff Area=3,746 sf 66.58% Impervious Runoff Depth=2.62"
Flow Length=70' Tc=4.0 min CN=90 Runoff=0.27 cfs 0.019 af

Subcatchment 1C: East Corner of Property Runoff Area=70,591 sf 20.00% Impervious Runoff Depth=1.37"
Flow Length=471' Tc=10.9 min CN=74 Runoff=2.12 cfs 0.184 af

Subcatchment 2C: Digestor Area Runoff Area=16,861 sf 58.94% Impervious Runoff Depth=2.43"
Flow Length=187' Tc=10.4 min CN=88 Runoff=0.94 cfs 0.078 af

Subcatchment 3C: Area North of Admin Runoff Area=8,816 sf 73.64% Impervious Runoff Depth=2.81"
Flow Length=102' Tc=10.2 min CN=92 Runoff=0.56 cfs 0.047 af

Subcatchment 4C: Grass Area South of Runoff Area=7,162 sf 8.74% Impervious Runoff Depth=1.50"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.30 cfs 0.021 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=3.45"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.07 cfs 0.005 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=2.43"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.12 cfs 0.009 af

Subcatchment 7.1C: Area around Proposed Runoff Area=4,903 sf 60.94% Impervious Runoff Depth=2.52"
Flow Length=67' Tc=4.0 min CN=89 Runoff=0.35 cfs 0.024 af

Subcatchment 7C: Large New Proposed Runoff Area=23,776 sf 56.78% Impervious Runoff Depth=2.43"
Flow Length=220' Tc=4.0 min CN=88 Runoff=1.62 cfs 0.111 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.40% Impervious Runoff Depth=1.18"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=5.30 cfs 0.687 af

Subcatchment 9C: Area North of Septic Runoff Area=7,887 sf 85.28% Impervious Runoff Depth=3.01"
Flow Length=134' Tc=4.0 min CN=94 Runoff=0.64 cfs 0.045 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 77.81% Impervious Runoff Depth=2.91"
Flow Length=126' Tc=4.0 min CN=93 Runoff=0.40 cfs 0.028 af

Subcatchment 11.1C: Area Downstream of Runoff Area=4,266 sf 40.74% Impervious Runoff Depth=2.09"
Flow Length=107' Tc=4.0 min CN=84 Runoff=0.25 cfs 0.017 af

Subcatchment 11C: Catchment Along Runoff Area=14,015 sf 27.51% Impervious Runoff Depth=1.86"
Flow Length=315' Tc=6.0 min CN=81 Runoff=0.69 cfs 0.050 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=0.85"
Flow Length=60' Slope=0.0330 '/' Tc=10.9 min CN=65 Runoff=0.09 cfs 0.009 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.27 cfs 0.022 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.19 cfs 0.015 af

Subcatchment 81C: Roof of Septic Runoff Area=745 sf 100.00% Impervious Runoff Depth=3.45"
Tc=6.0 min CN=98 Runoff=0.06 cfs 0.005 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=0.63' Max Vel=2.68 fps Inflow=7.16 cfs 0.646 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=7.20 cfs 0.646 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.56' Max Vel=2.44 fps Inflow=7.20 cfs 0.646 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=7.22 cfs 0.646 af

Pond 1.1P: Proposed DMH #1 Peak Elev=40.34' Inflow=0.47 cfs 0.035 af
12.0" Round Culvert n=0.010 L=32.0' S=0.0047 '/' Outflow=0.47 cfs 0.035 af

Pond 1.2P: Yard Drain Behind Proposed Chemincal Storage Peak Elev=42.90' Inflow=0.32 cfs 0.022 af
Outflow=0.32 cfs 0.022 af

Pond 1.3P: Yard Drain Near Chemical Storage Peak Elev=40.89' Storage=2 cf Inflow=0.27 cfs 0.019 af
Outflow=0.27 cfs 0.019 af

Pond 1.4P: Inserta Tee Location Peak Elev=38.21' Inflow=2.59 cfs 0.238 af
36.0" Round Culvert n=0.011 L=99.0' S=0.0030 '/' Outflow=2.59 cfs 0.238 af

Pond 1P: Culvert Inlet Peak Elev=38.54' Inflow=2.42 cfs 0.219 af
36.0" Round Culvert n=0.011 L=112.0' S=0.0062 '/' Outflow=2.42 cfs 0.219 af

Pond 2P: CB 6943 Peak Elev=37.94' Storage=12 cf Inflow=4.66 cfs 0.420 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=4.66 cfs 0.420 af

Pond 3.1P: CB 5894 Peak Elev=39.19' Storage=7 cf Inflow=0.97 cfs 0.082 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=0.97 cfs 0.082 af

Pond 3.2P: DMH 6337 Peak Elev=38.59' Inflow=1.23 cfs 0.104 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=1.23 cfs 0.104 af

Pond 4P: CB 6025 Peak Elev=39.60' Storage=4 cf Inflow=0.30 cfs 0.021 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.30 cfs 0.021 af

Pond 5P: CB 5937 Peak Elev=39.54' Storage=3 cf Inflow=0.19 cfs 0.014 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.19 cfs 0.014 af

Pond 6P: CB 5478 Peak Elev=39.99' Storage=2 cf Inflow=0.12 cfs 0.009 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.12 cfs 0.009 af

Pond 7.1P: DMH 6949 Peak Elev=37.21' Inflow=4.66 cfs 0.420 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=4.66 cfs 0.420 af

Pond 7.2P: CB 5669 Peak Elev=37.02' Storage=12 cf Inflow=1.63 cfs 0.132 af
Primary=1.62 cfs 0.132 af Secondary=0.00 cfs 0.000 af Outflow=1.62 cfs 0.132 af

Pond 7.3P: Bioretention Cell #2 Peak Elev=40.85' Storage=488 cf Inflow=0.35 cfs 0.024 af
Outflow=0.15 cfs 0.022 af

Pond 8.1P: DMH 8521 Peak Elev=36.45' Inflow=4.66 cfs 0.420 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=4.66 cfs 0.420 af

Pond 8.2P: DMH 8534 Peak Elev=36.27' Inflow=4.86 cfs 0.435 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=4.86 cfs 0.435 af

Pond 8.3P: DMH 5099 Peak Elev=36.00' Inflow=7.16 cfs 0.646 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=7.16 cfs 0.646 af

Pond 8.4P: DMH 5280 Peak Elev=37.04' Inflow=0.46 cfs 0.033 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.46 cfs 0.033 af

Pond 9.1P: CB 5673 Peak Elev=36.88' Storage=16 cf Inflow=2.26 cfs 0.178 af
Primary=2.25 cfs 0.178 af Secondary=0.00 cfs 0.000 af Outflow=2.25 cfs 0.178 af

Pond 9.2P: DMH 5677 Peak Elev=36.60' Inflow=2.25 cfs 0.178 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=2.25 cfs 0.178 af

Pond 10P: CB 5238 Peak Elev=37.41' Storage=4 cf Inflow=0.40 cfs 0.028 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.40 cfs 0.028 af

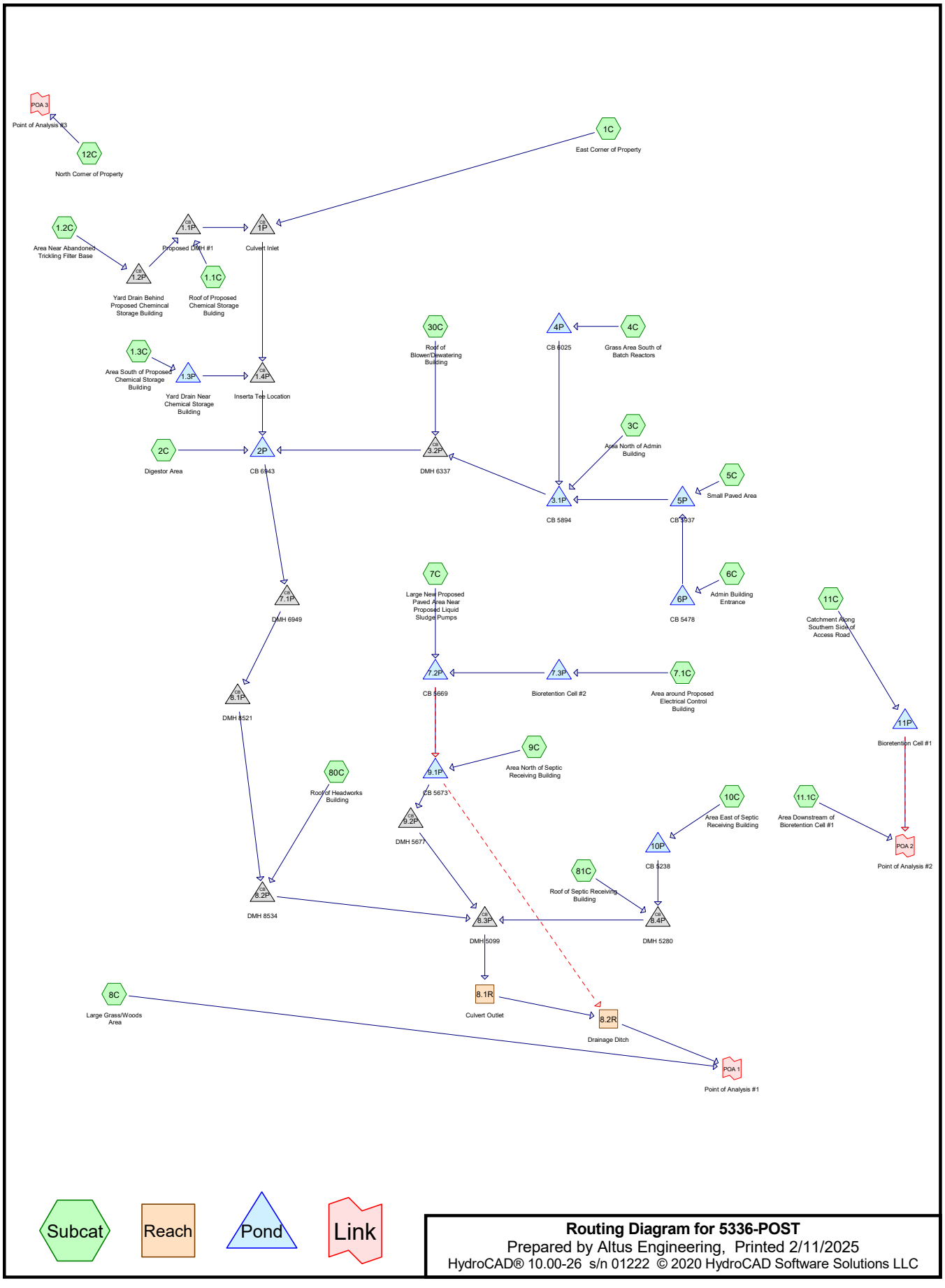
Pond 11P: Bioretention Cell #1 Peak Elev=40.12' Storage=775 cf Inflow=0.69 cfs 0.050 af
Primary=0.35 cfs 0.046 af Secondary=0.00 cfs 0.000 af Outflow=0.35 cfs 0.046 af

Link POA 1: Point of Analysis #1 Inflow=9.22 cfs 1.333 af
Primary=9.22 cfs 1.333 af

Link POA 2: Point of Analysis #2 Inflow=0.47 cfs 0.063 af
Primary=0.47 cfs 0.063 af

Link POA 3: Point of Analysis #3 Inflow=0.09 cfs 0.009 af
Primary=0.09 cfs 0.009 af

Total Runoff Area = 11.312 ac Runoff Volume = 1.410 af Average Runoff Depth = 1.50"
81.82% Pervious = 9.255 ac 18.18% Impervious = 2.056 ac



Routing Diagram for 5336-POST
Prepared by Altus Engineering, Printed 2/11/2025

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.260	74	>75% Grass cover, Good, HSG C (1.2C, 1.3C, 1C, 2C, 3C, 4C, 6C, 7.1C, 7C, 8C, 9C, 10C, 11.1C, 11C)
2.799	65	Brush, Good, HSG C (1C, 8C, 12C)
1.714	98	Paved parking, HSG C (1.2C, 1.3C, 1C, 2C, 3C, 4C, 5C, 6C, 7.1C, 7C, 8C, 9C, 10C, 11.1C, 11C)
0.342	98	Roofs, HSG C (1.1C, 1.3C, 2C, 3C, 6C, 7.1C, 7C, 8C, 30C, 80C, 81C)
3.197	70	Woods, Good, HSG C (8C)
11.312	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
11.312	HSG C	1.1C, 1.2C, 1.3C, 1C, 2C, 3C, 4C, 5C, 6C, 7.1C, 7C, 8C, 9C, 10C, 11.1C, 11C, 12C, 30C, 80C, 81C
0.000	HSG D	
0.000	Other	
11.312		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	3.260	0.000	0.000	3.260	>75% Grass cover, Good	1.2C, 1.3C, 1C, 2C, 3C, 4C, 6C, 7.1C, 7C, 8C, 9C, 10C, 11.1C, 11C
0.000	0.000	2.799	0.000	0.000	2.799	Brush, Good	1C, 8C, 12C
0.000	0.000	1.714	0.000	0.000	1.714	Paved parking	1.2C, 1.3C, 1C, 2C, 3C, 4C, 5C, 6C, 7.1C, 7C, 8C, 9C, 10C, 11.1C, 11C
0.000	0.000	0.342	0.000	0.000	0.342	Roofs	1.1C, 1.3C, 2C, 3C, 6C, 7.1C, 7C, 8C, 30C, 80C, 81C
0.000	0.000	3.197	0.000	0.000	3.197	Woods, Good	8C
0.000	**0.000**	**11.312**	**0.000**	**0.000**	**11.312**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1C: Roof of Proposed Runoff Area=1,956 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.24 cfs 0.020 af

Subcatchment 1.2C: Area Near Abandoned Runoff Area=5,039 sf 51.78% Impervious Runoff Depth=4.01"
Flow Length=132' Tc=4.0 min CN=86 Runoff=0.56 cfs 0.039 af

Subcatchment 1.3C: Area South of Runoff Area=3,746 sf 66.58% Impervious Runoff Depth=4.44"
Flow Length=70' Tc=4.0 min CN=90 Runoff=0.45 cfs 0.032 af

Subcatchment 1C: East Corner of Property Runoff Area=70,591 sf 20.00% Impervious Runoff Depth=2.84"
Flow Length=471' Tc=10.9 min CN=74 Runoff=4.53 cfs 0.383 af

Subcatchment 2C: Digestor Area Runoff Area=16,861 sf 58.94% Impervious Runoff Depth=4.22"
Flow Length=187' Tc=10.4 min CN=88 Runoff=1.59 cfs 0.136 af

Subcatchment 3C: Area North of Admin Runoff Area=8,816 sf 73.64% Impervious Runoff Depth=4.66"
Flow Length=102' Tc=10.2 min CN=92 Runoff=0.90 cfs 0.079 af

Subcatchment 4C: Grass Area South of Runoff Area=7,162 sf 8.74% Impervious Runoff Depth=3.02"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.61 cfs 0.041 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=5.34"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.10 cfs 0.008 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=4.22"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.21 cfs 0.015 af

Subcatchment 7.1C: Area around Proposed Runoff Area=4,903 sf 60.94% Impervious Runoff Depth=4.33"
Flow Length=67' Tc=4.0 min CN=89 Runoff=0.58 cfs 0.041 af

Subcatchment 7C: Large New Proposed Runoff Area=23,776 sf 56.78% Impervious Runoff Depth=4.22"
Flow Length=220' Tc=4.0 min CN=88 Runoff=2.75 cfs 0.192 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.40% Impervious Runoff Depth=2.56"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=12.12 cfs 1.493 af

Subcatchment 9C: Area North of Septic Runoff Area=7,887 sf 85.28% Impervious Runoff Depth=4.88"
Flow Length=134' Tc=4.0 min CN=94 Runoff=1.00 cfs 0.074 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 77.81% Impervious Runoff Depth=4.77"
Flow Length=126' Tc=4.0 min CN=93 Runoff=0.64 cfs 0.046 af

Subcatchment 11.1C: Area Downstream of Runoff Area=4,266 sf 40.74% Impervious Runoff Depth=3.81"
Flow Length=107' Tc=4.0 min CN=84 Runoff=0.45 cfs 0.031 af

Subcatchment 11C: Catchment Along Runoff Area=14,015 sf 27.51% Impervious Runoff Depth=3.50"
Flow Length=315' Tc=6.0 min CN=81 Runoff=1.29 cfs 0.094 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=60' Slope=0.0330 '/' Tc=10.9 min CN=65 Runoff=0.24 cfs 0.021 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.41 cfs 0.034 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.024 af

Subcatchment 81C: Roof of Septic Runoff Area=745 sf 100.00% Impervious Runoff Depth=5.34"
Tc=6.0 min CN=98 Runoff=0.09 cfs 0.008 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=0.88' Max Vel=3.21 fps Inflow=13.38 cfs 1.167 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=13.42 cfs 1.167 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.75' Max Vel=2.87 fps Inflow=13.42 cfs 1.167 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=13.43 cfs 1.167 af

Pond 1.1P: Proposed DMH #1 Peak Elev=40.47' Inflow=0.79 cfs 0.059 af
12.0" Round Culvert n=0.010 L=32.0' S=0.0047 '/' Outflow=0.79 cfs 0.059 af

Pond 1.2P: Yard Drain Behind Proposed Chemincal Storage Peak Elev=42.94' Inflow=0.56 cfs 0.039 af
Outflow=0.56 cfs 0.039 af

Pond 1.3P: Yard Drain Near Chemical Storage Peak Elev=40.92' Storage=3 cf Inflow=0.45 cfs 0.032 af
Outflow=0.45 cfs 0.032 af

Pond 1.4P: Inserta Tee Location Peak Elev=38.63' Inflow=5.34 cfs 0.473 af
36.0" Round Culvert n=0.011 L=99.0' S=0.0030 '/' Outflow=5.34 cfs 0.473 af

Pond 1P: Culvert Inlet Peak Elev=38.94' Inflow=5.05 cfs 0.442 af
36.0" Round Culvert n=0.011 L=112.0' S=0.0062 '/' Outflow=5.05 cfs 0.442 af

Pond 2P: CB 6943 Peak Elev=38.33' Storage=17 cf Inflow=8.82 cfs 0.786 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=8.82 cfs 0.786 af

Pond 3.1P: CB 5894 Peak Elev=39.45' Storage=10 cf Inflow=1.67 cfs 0.143 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=1.67 cfs 0.143 af

Pond 3.2P: DMH 6337 Peak Elev=38.94' Inflow=2.08 cfs 0.177 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=2.08 cfs 0.177 af

Pond 4P: CB 6025 Peak Elev=39.76' Storage=6 cf Inflow=0.61 cfs 0.041 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.61 cfs 0.041 af

Pond 5P: CB 5937 Peak Elev=39.64' Storage=4 cf Inflow=0.31 cfs 0.023 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.31 cfs 0.023 af

Pond 6P: CB 5478 Peak Elev=40.06' Storage=3 cf Inflow=0.21 cfs 0.015 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.21 cfs 0.015 af

Pond 7.1P: DMH 6949 Peak Elev=37.59' Inflow=8.82 cfs 0.786 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=8.82 cfs 0.786 af

Pond 7.2P: CB 5669 Peak Elev=38.82' Storage=34 cf Inflow=3.24 cfs 0.230 af
Primary=3.16 cfs 0.230 af Secondary=0.00 cfs 0.000 af Outflow=3.16 cfs 0.230 af

Pond 7.3P: Bioretention Cell #2 Peak Elev=40.94' Storage=541 cf Inflow=0.58 cfs 0.041 af
Outflow=0.53 cfs 0.038 af

Pond 8.1P: DMH 8521 Peak Elev=37.00' Inflow=8.82 cfs 0.786 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=8.82 cfs 0.786 af

Pond 8.2P: DMH 8534 Peak Elev=36.79' Inflow=9.13 cfs 0.810 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=9.13 cfs 0.810 af

Pond 8.3P: DMH 5099 Peak Elev=36.48' Inflow=13.38 cfs 1.167 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=13.38 cfs 1.167 af

Pond 8.4P: DMH 5280 Peak Elev=37.13' Inflow=0.72 cfs 0.054 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.72 cfs 0.054 af

Pond 9.1P: CB 5673 Peak Elev=38.45' Storage=36 cf Inflow=4.17 cfs 0.304 af
Primary=4.10 cfs 0.304 af Secondary=0.00 cfs 0.000 af Outflow=4.10 cfs 0.304 af

Pond 9.2P: DMH 5677 Peak Elev=37.48' Inflow=4.10 cfs 0.304 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=4.10 cfs 0.304 af

Pond 10P: CB 5238 Peak Elev=37.50' Storage=5 cf Inflow=0.64 cfs 0.046 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.64 cfs 0.046 af

Pond 11P: Bioretention Cell #1 Peak Elev=40.39' Storage=1,118 cf Inflow=1.29 cfs 0.094 af
Primary=0.87 cfs 0.090 af Secondary=0.00 cfs 0.000 af Outflow=0.87 cfs 0.090 af

Link POA 1: Point of Analysis #1 Inflow=19.12 cfs 2.660 af
Primary=19.12 cfs 2.660 af

Link POA 2: Point of Analysis #2 Inflow=1.12 cfs 0.121 af
Primary=1.12 cfs 0.121 af

Link POA 3: Point of Analysis #3 Inflow=0.24 cfs 0.021 af
Primary=0.24 cfs 0.021 af

Total Runoff Area = 11.312 ac Runoff Volume = 2.809 af Average Runoff Depth = 2.98"
81.82% Pervious = 9.255 ac 18.18% Impervious = 2.056 ac

Summary for Subcatchment 1.1C: Roof of Proposed Chemical Storage Bulding

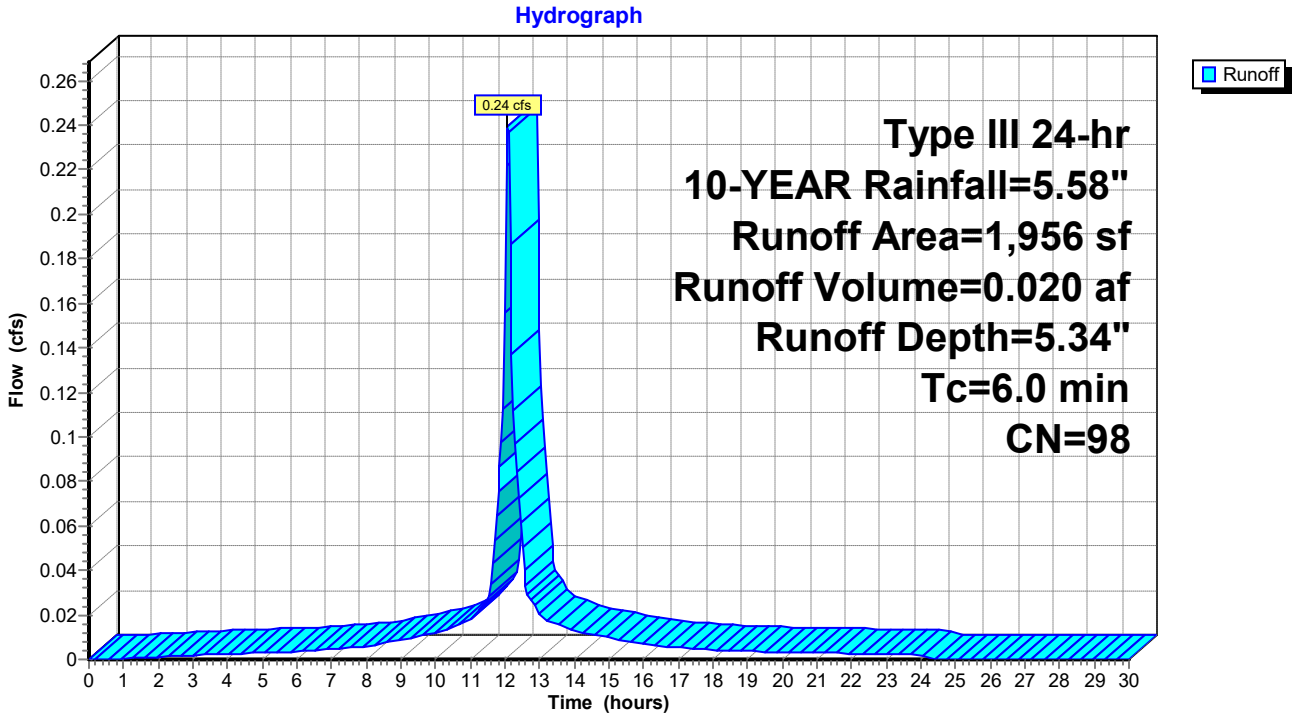
Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.020 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,956	98	Roofs, HSG C
1,956		100.00% Impervious Area

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

Subcatchment 1.1C: Roof of Proposed Chemical Storage Bulding



Summary for Subcatchment 1.2C: Area Near Abandoned Trickling Filter Base

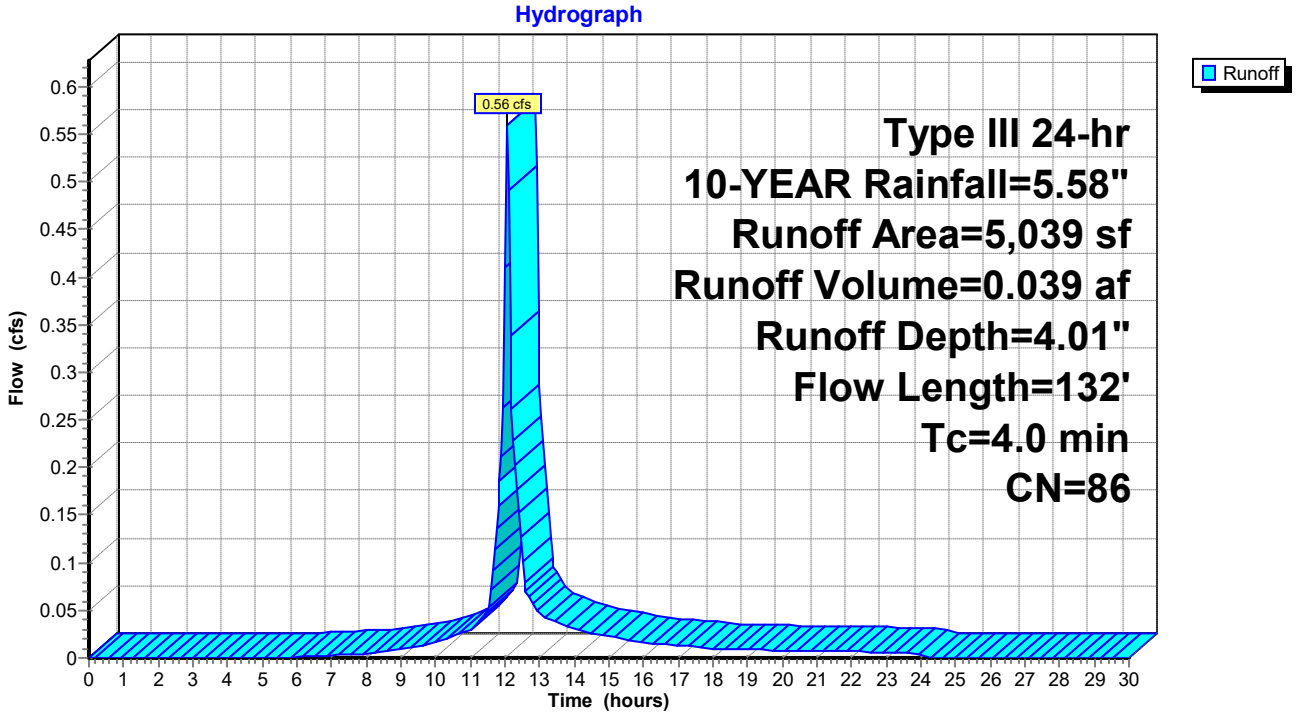
Runoff = 0.56 cfs @ 12.06 hrs, Volume= 0.039 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
2,609	98	Paved parking, HSG C
2,430	74	>75% Grass cover, Good, HSG C
5,039	86	Weighted Average
2,430		48.22% Pervious Area
2,609		51.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	48	0.0080	0.88		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.2	64	0.0940	4.94		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.1	20	0.1100	2.32		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	132	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 1.2C: Area Near Abandoned Trickling Filter Base



Summary for Subcatchment 1.3C: Area South of Proposed Chemical Storage Building

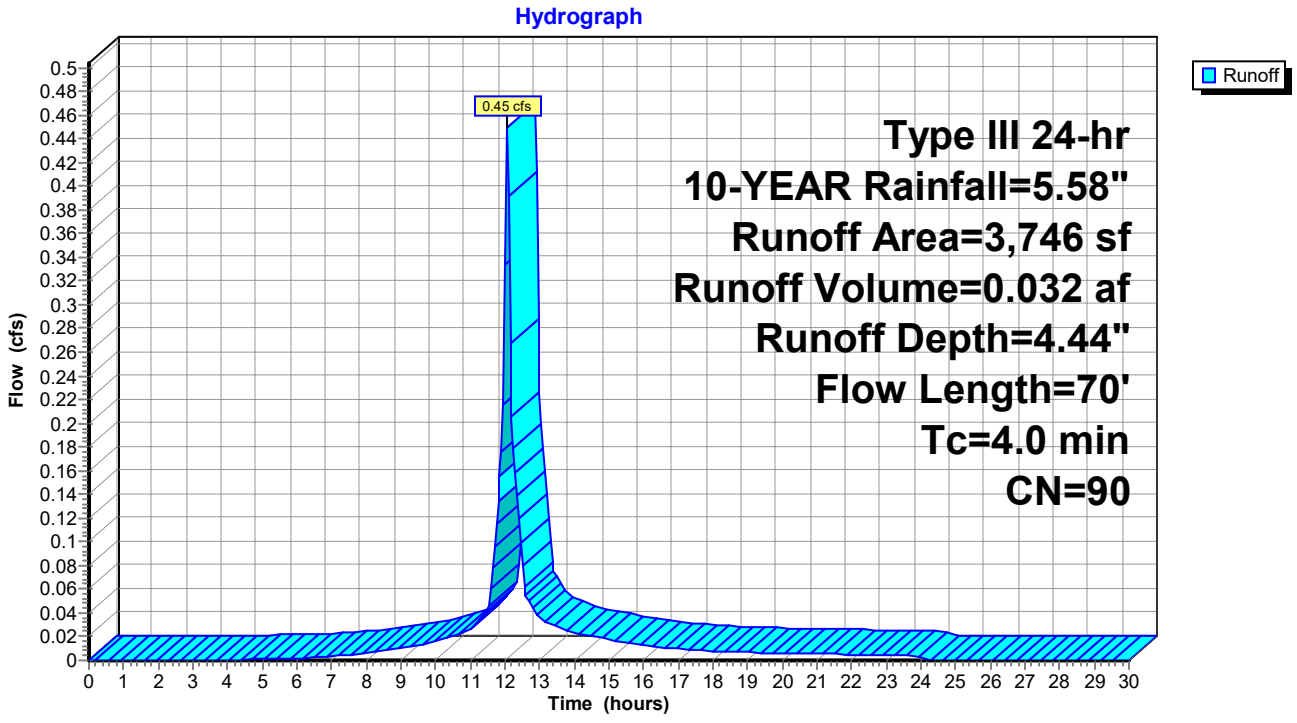
Runoff = 0.45 cfs @ 12.06 hrs, Volume= 0.032 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,148	98	Roofs, HSG C
1,346	98	Paved parking, HSG C
1,252	74	>75% Grass cover, Good, HSG C
3,746	90	Weighted Average
1,252		33.42% Pervious Area
2,494		66.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	16	0.0500	1.48		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.7	54	0.0390	1.38		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	70	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 1.3C: Area South of Proposed Chemical Storage Building



Summary for Subcatchment 1C: East Corner of Property

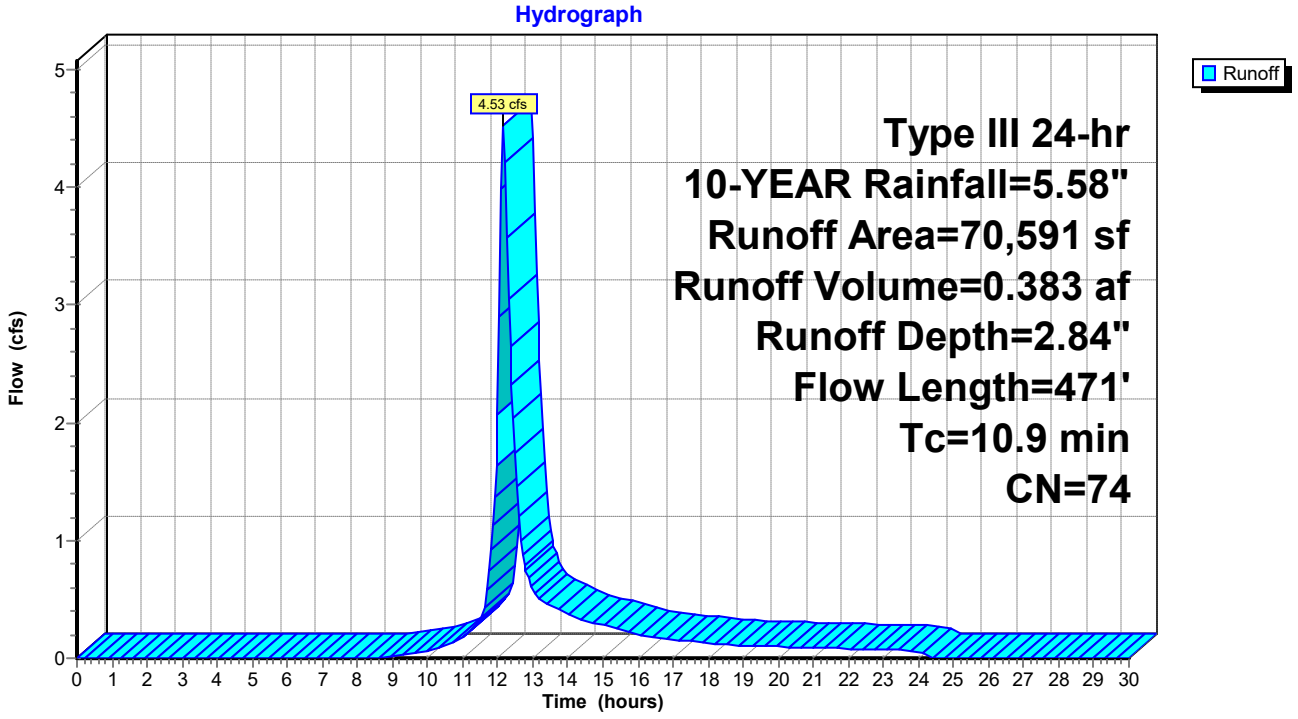
Runoff = 4.53 cfs @ 12.16 hrs, Volume= 0.383 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
14,118	98	Paved parking, HSG C
18,371	74	>75% Grass cover, Good, HSG C
38,102	65	Brush, Good, HSG C
70,591	74	Weighted Average
56,473		80.00% Pervious Area
14,118		20.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	53	0.1320	0.34		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.5	151	0.0070	1.70		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.8	267	0.0170	0.65		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.9	471	Total			

Subcatchment 1C: East Corner of Property



Summary for Subcatchment 2C: Digestor Area

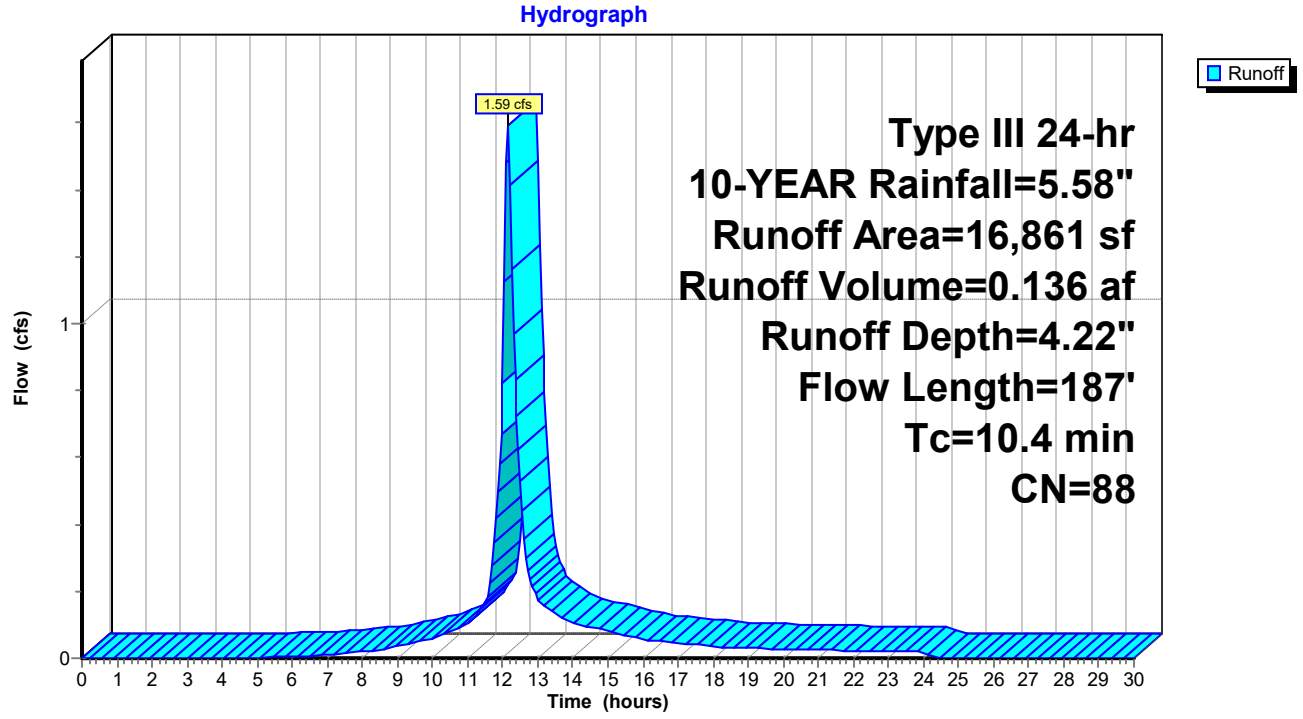
Runoff = 1.59 cfs @ 12.14 hrs, Volume= 0.136 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,172	98	Roofs, HSG C
8,766	98	Paved parking, HSG C
6,923	74	>75% Grass cover, Good, HSG C
16,861	88	Weighted Average
6,923		41.06% Pervious Area
9,938		58.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	59	0.0080	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
1.3	58	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.5	70	0.0140	2.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.4	187	Total			

Subcatchment 2C: Digestor Area



Summary for Subcatchment 3C: Area North of Admin Building

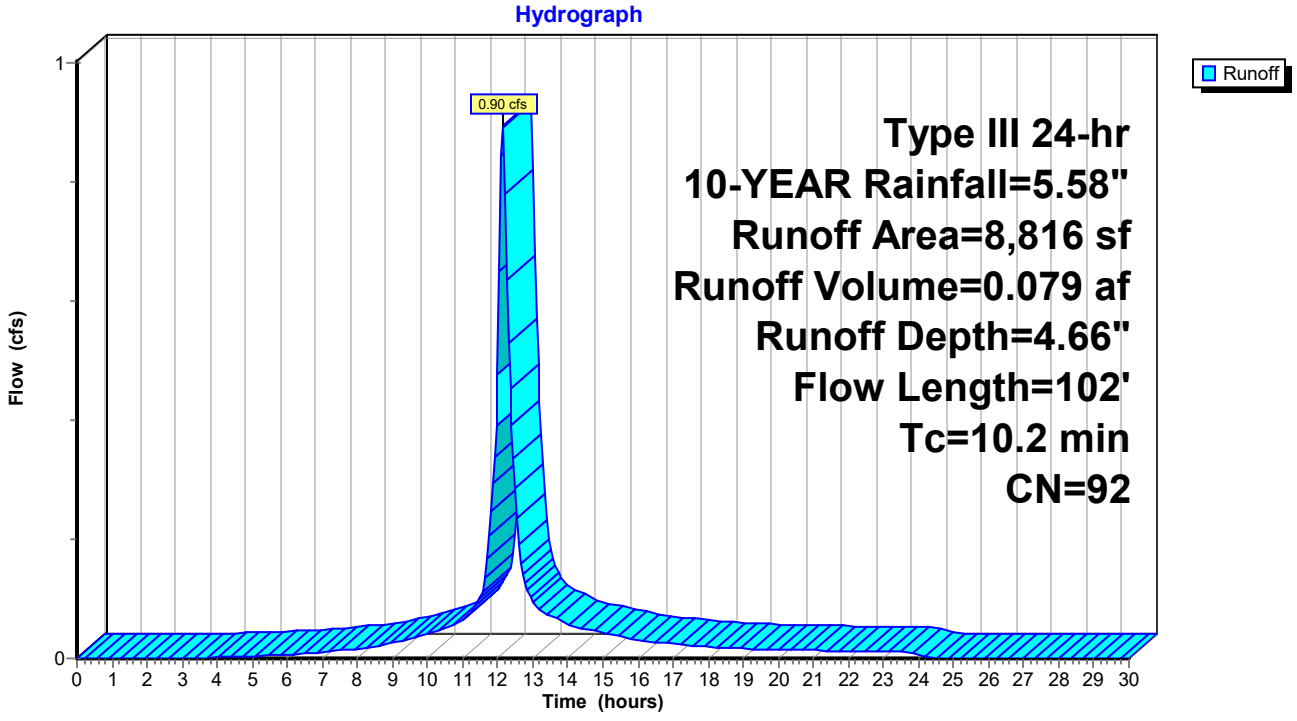
Runoff = 0.90 cfs @ 12.14 hrs, Volume= 0.079 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
824	98	Roofs, HSG C
5,668	98	Paved parking, HSG C
2,324	74	>75% Grass cover, Good, HSG C
8,816	92	Weighted Average
2,324		26.36% Pervious Area
6,492		73.64% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	56	0.0050	0.09		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.2	46	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
10.2	102	Total			

Subcatchment 3C: Area North of Admin Building



Summary for Subcatchment 4C: Grass Area South of Batch Reactors

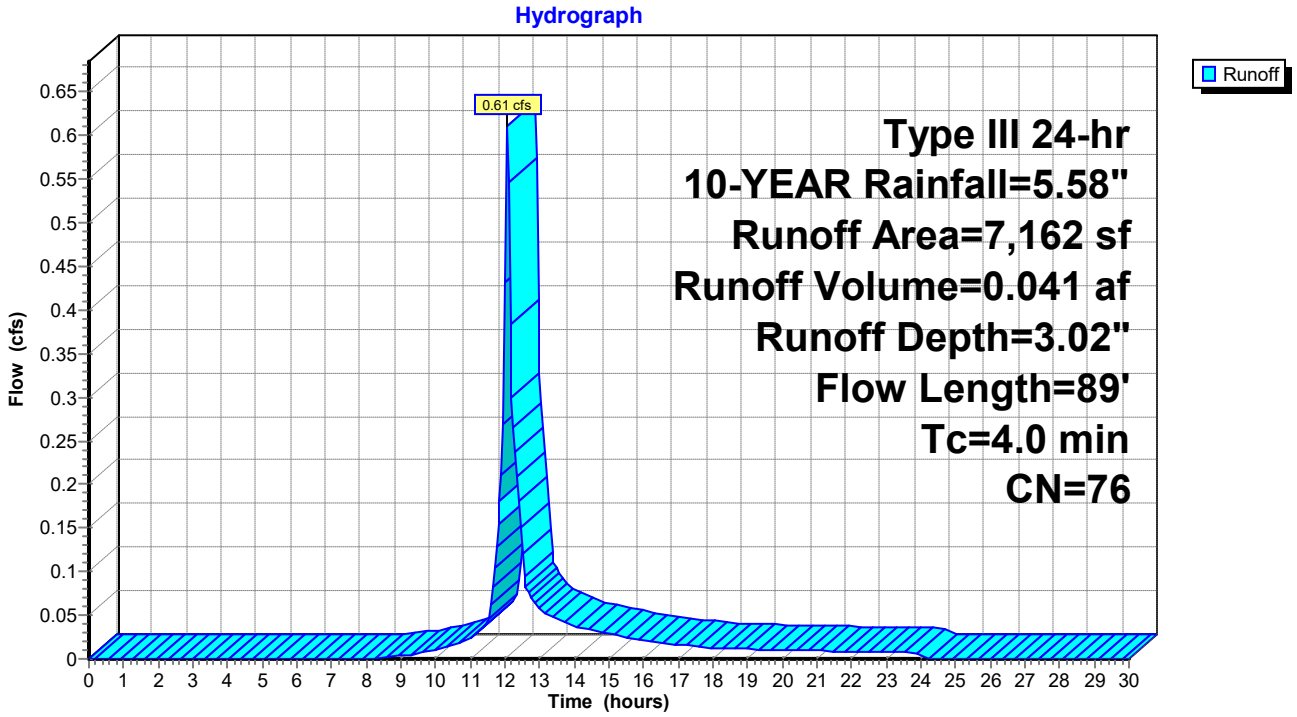
Runoff = 0.61 cfs @ 12.06 hrs, Volume= 0.041 af, Depth= 3.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
626	98	Paved parking, HSG C
6,536	74	>75% Grass cover, Good, HSG C
7,162	76	Weighted Average
6,536		91.26% Pervious Area
626		8.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	9	0.0200	0.91		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
1.3	80	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.5	89	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 4C: Grass Area South of Batch Reactors



Summary for Subcatchment 5C: Small Paved Area

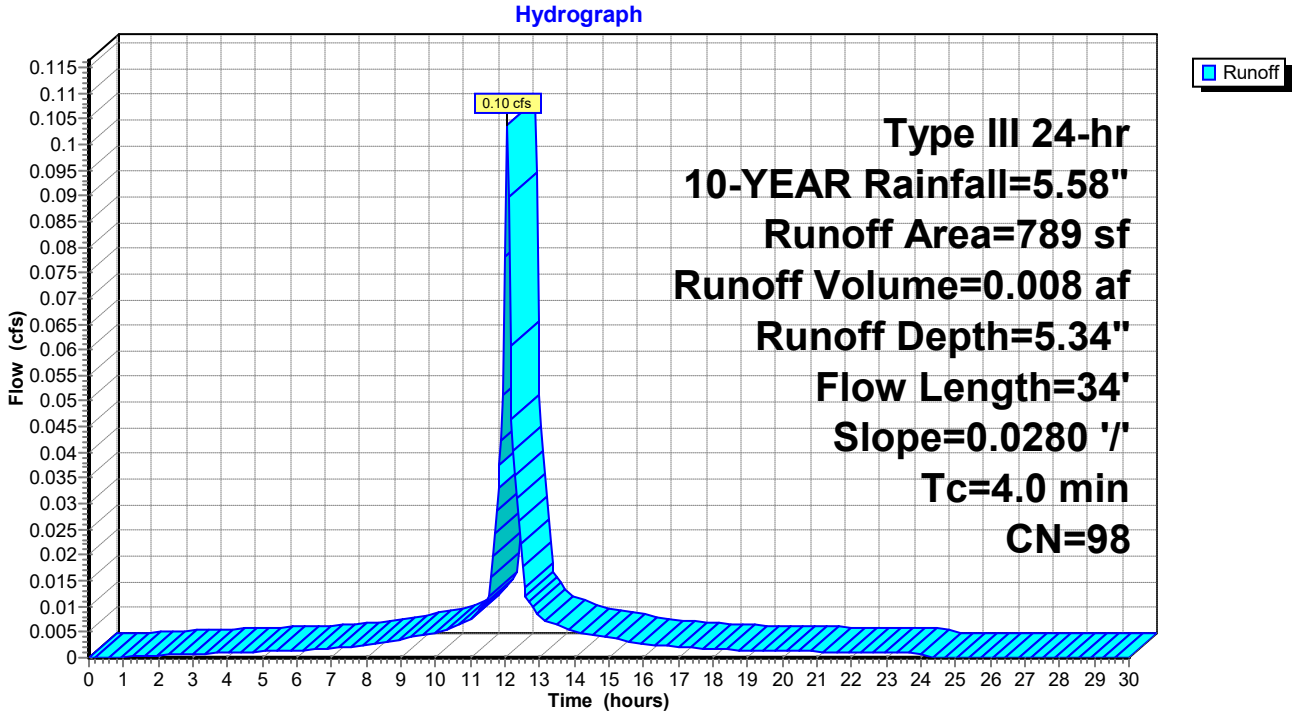
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 0.008 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
789	98	Paved parking, HSG C
789		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	34	0.0280	1.36		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.4	34	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 5C: Small Paved Area



Summary for Subcatchment 6C: Admin Building Entrance

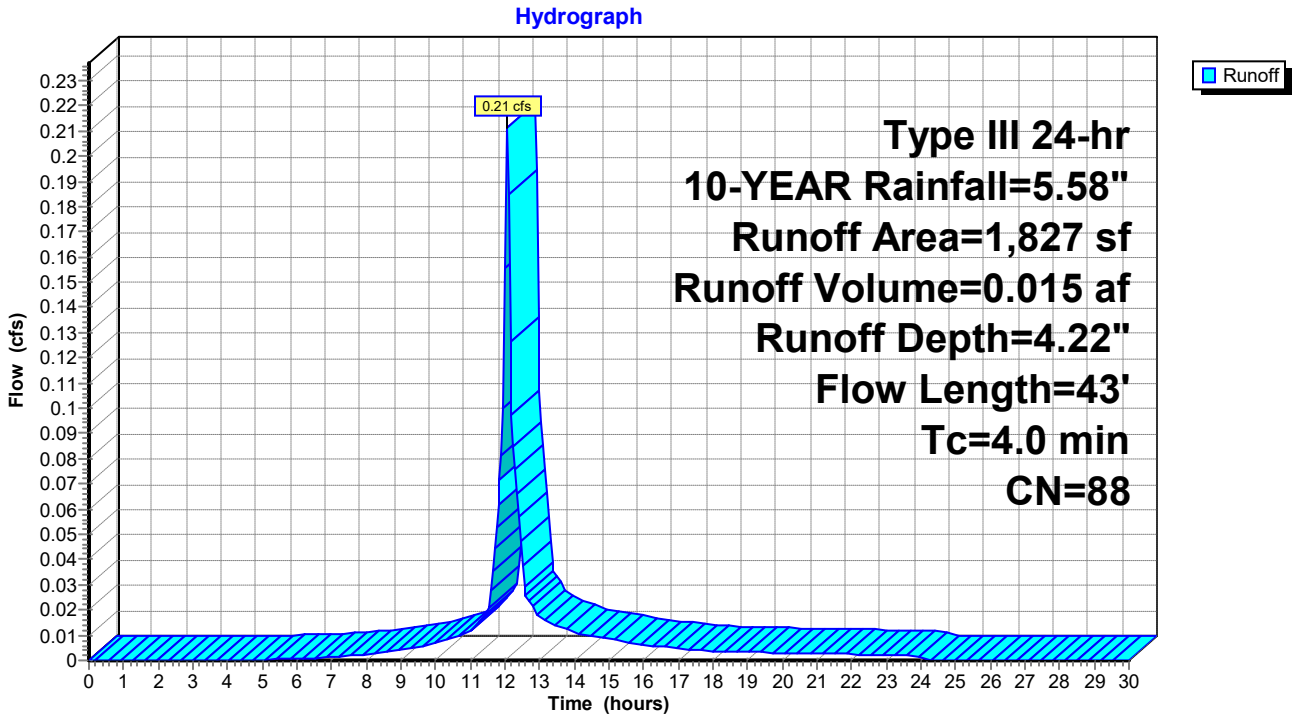
Runoff = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
567	98	Roofs, HSG C
506	98	Paved parking, HSG C
754	74	>75% Grass cover, Good, HSG C
1,827	88	Weighted Average
754		41.27% Pervious Area
1,073		58.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0140	0.86		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.3	29	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.6	43	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 6C: Admin Building Entrance



Summary for Subcatchment 7.1C: Area around Proposed Electrical Control Building

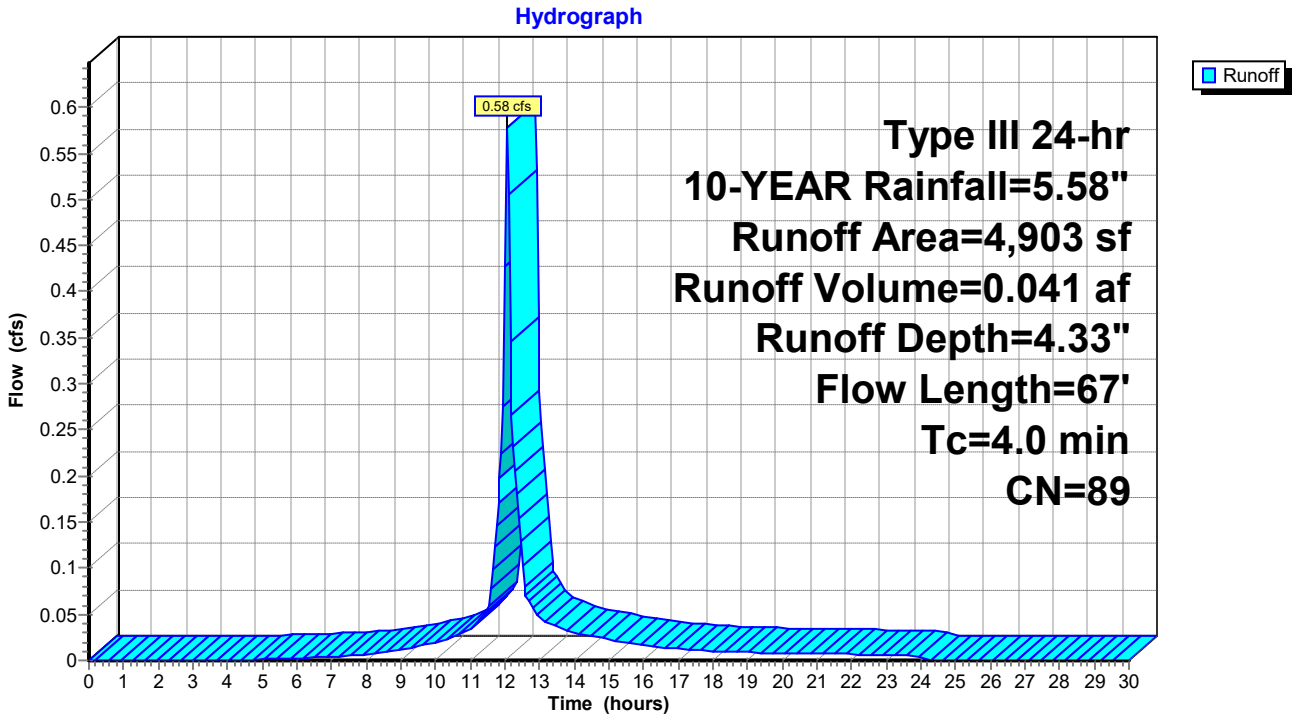
Runoff = 0.58 cfs @ 12.06 hrs, Volume= 0.041 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,821	98	Roofs, HSG C
1,167	98	Paved parking, HSG C
1,915	74	>75% Grass cover, Good, HSG C
4,903	89	Weighted Average
1,915		39.06% Pervious Area
2,988		60.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	6	0.0200	0.84		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.9	61	0.0280	1.17		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.0	67	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 7.1C: Area around Proposed Electrical Control Building



Summary for Subcatchment 7C: Large New Proposed Paved Area Near Proposed Liquid Sludge Pumps

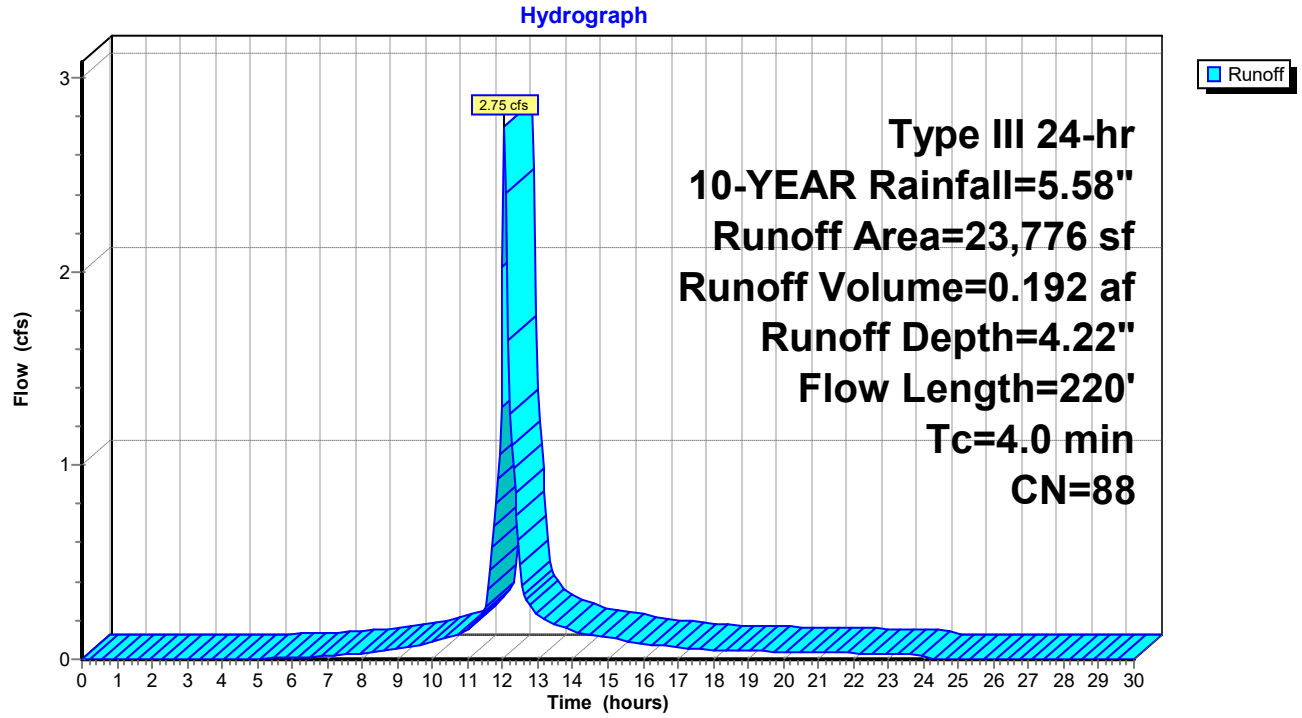
Runoff = 2.75 cfs @ 12.06 hrs, Volume= 0.192 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
480	98	Roofs, HSG C
13,021	98	Paved parking, HSG C
10,275	74	>75% Grass cover, Good, HSG C
23,776	88	Weighted Average
10,275		43.22% Pervious Area
13,501		56.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	14	0.0170	0.93		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.1	16	0.0930	2.13		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.3	123	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	67	0.0150	2.49		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.1	220	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 7C: Large New Proposed Paved Area Near Proposed Liquid Sludge Pumps



Summary for Subcatchment 8C: Large Grass/Woods Area

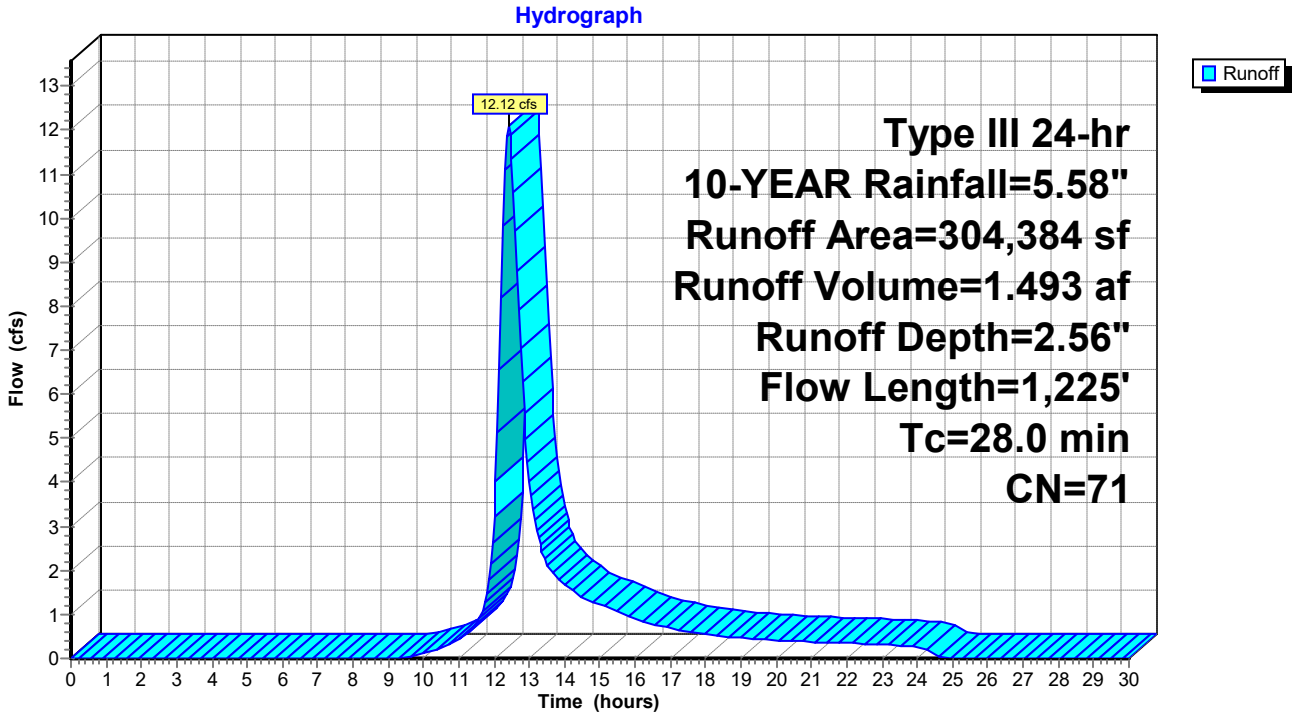
Runoff = 12.12 cfs @ 12.40 hrs, Volume= 1.493 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
544	98	Roofs, HSG C
9,793	98	Paved parking, HSG C
139,245	70	Woods, Good, HSG C
78,535	65	Brush, Good, HSG C
76,267	74	>75% Grass cover, Good, HSG C
304,384	71	Weighted Average
294,047		96.60% Pervious Area
10,337		3.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	51	0.0390	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"
2.6	144	0.0350	0.94		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.3	233	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.5	237	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
3.7	560	0.0030	2.49	14.47	**Trap/Vee/Rect Channel Flow,** Bot.W=2.50' D=2.00' Z= 0.2 '/' Top.W=3.30' n= 0.030 Earth, grassed & winding
28.0	1,225	Total			

Subcatchment 8C: Large Grass/Woods Area



Summary for Subcatchment 9C: Area North of Septic Receiving Building

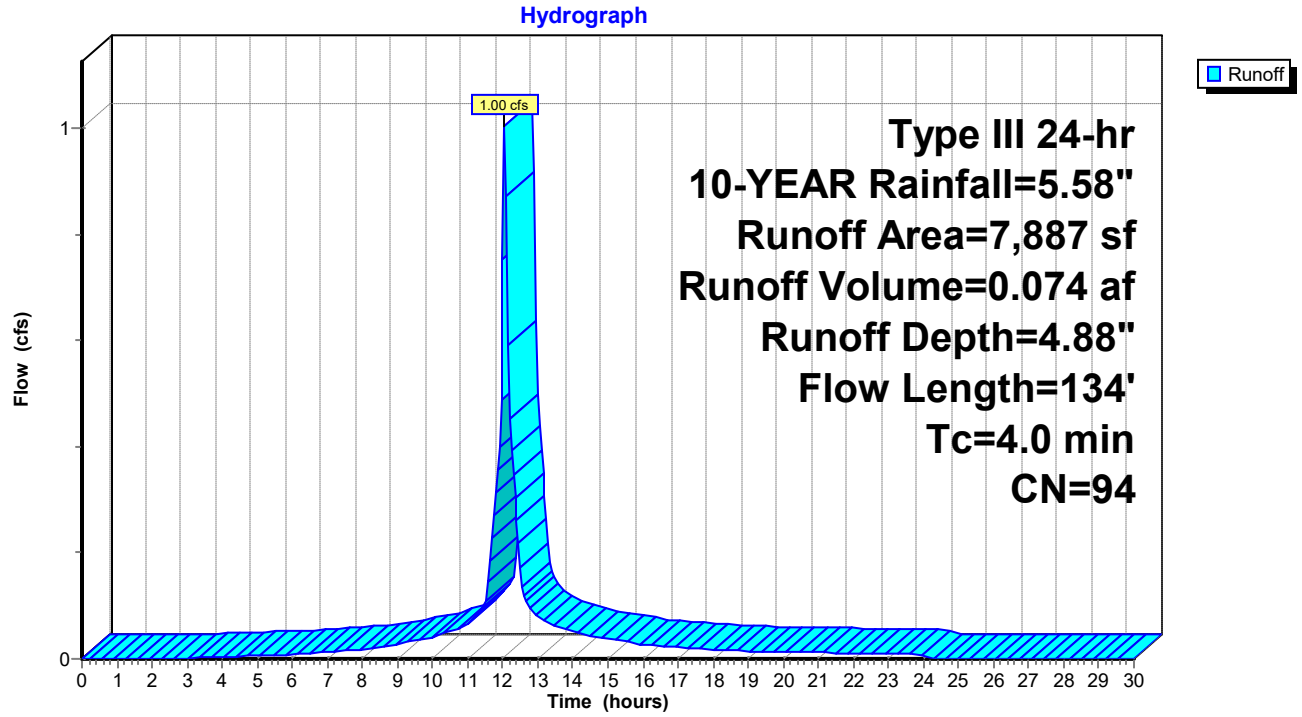
Runoff = 1.00 cfs @ 12.06 hrs, Volume= 0.074 af, Depth= 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
6,726	98	Paved parking, HSG C
1,161	74	>75% Grass cover, Good, HSG C
7,887	94	Weighted Average
1,161		14.72% Pervious Area
6,726		85.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.2	52	0.0770	0.27		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
0.4	82	0.0280	3.40		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
3.6	134	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 9C: Area North of Septic Receiving Building



Summary for Subcatchment 10C: Area East of Septic Receiving Building

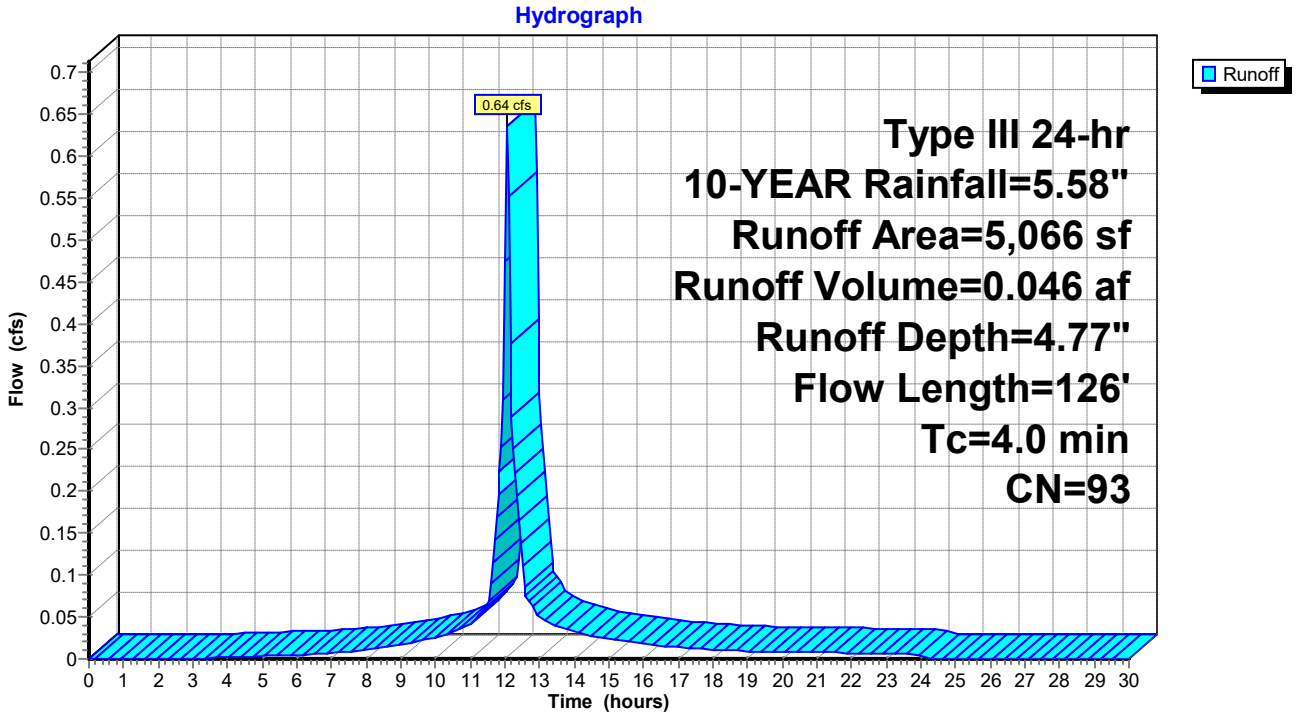
Runoff = 0.64 cfs @ 12.06 hrs, Volume= 0.046 af, Depth= 4.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
3,942	98	Paved parking, HSG C
1,124	74	>75% Grass cover, Good, HSG C
5,066	93	Weighted Average
1,124		22.19% Pervious Area
3,942		77.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	17	0.0200	1.03		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.6	109	0.0240	3.14		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.9	126	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 10C: Area East of Septic Receiving Building



Summary for Subcatchment 11.1C: Area Downstream of Bioretention Cell #1

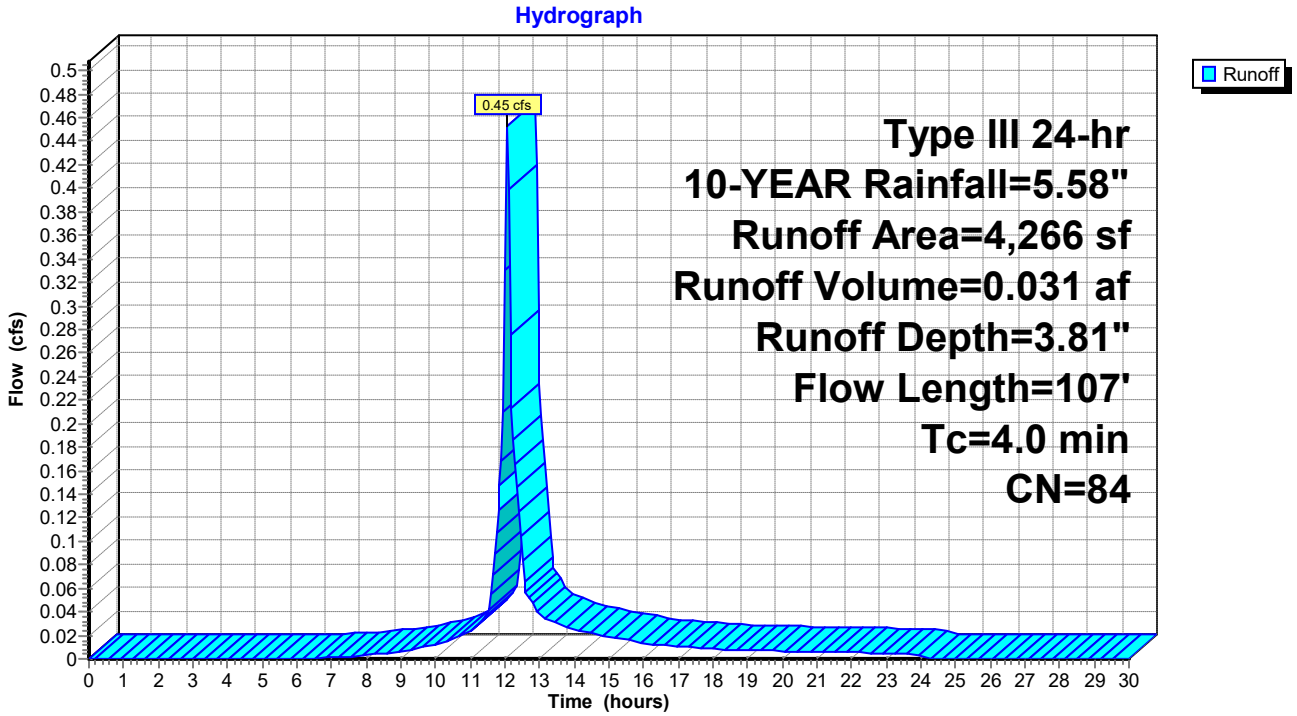
Runoff = 0.45 cfs @ 12.06 hrs, Volume= 0.031 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
1,738	98	Paved parking, HSG C
2,528	74	>75% Grass cover, Good, HSG C
4,266	84	Weighted Average
2,528		59.26% Pervious Area
1,738		40.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	24	0.0420	1.49		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.68"
0.9	83	0.0480	1.53		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
1.2	107	Total, Increased to minimum Tc = 4.0 min			

Subcatchment 11.1C: Area Downstream of Bioretention Cell #1



Summary for Subcatchment 11C: Catchment Along Southern Side of Access Road

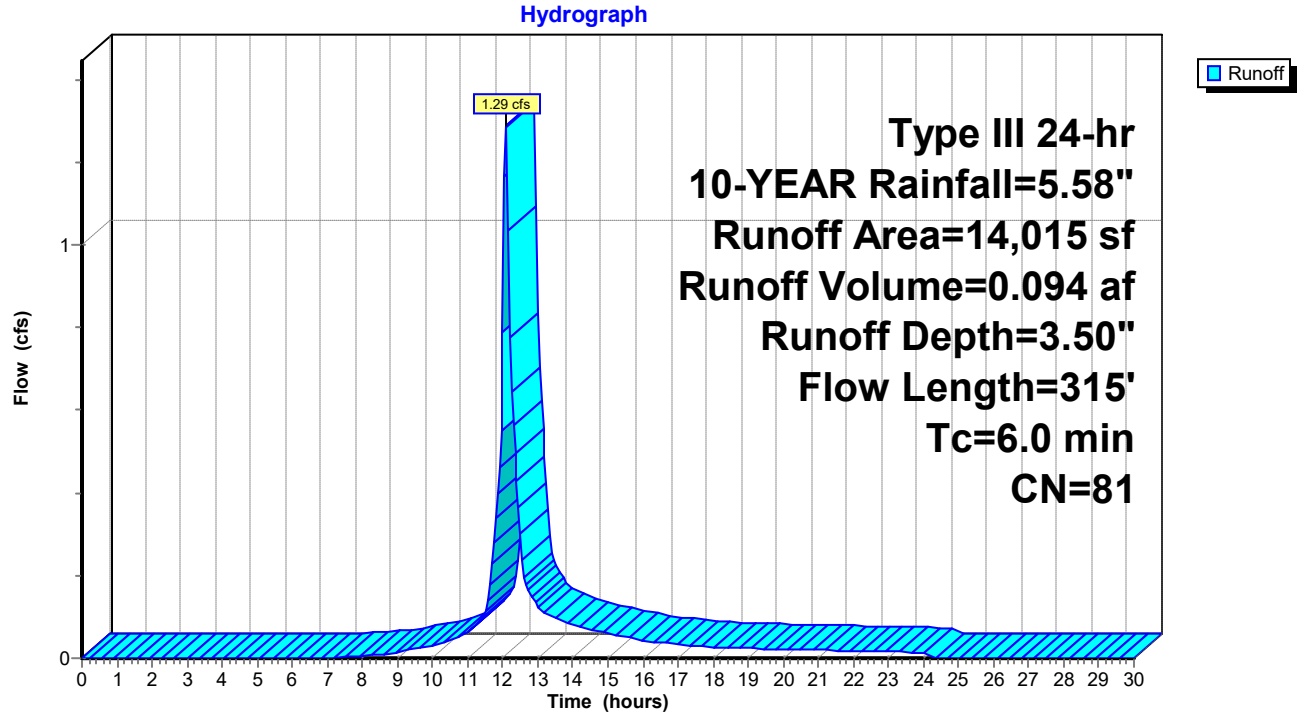
Runoff = 1.29 cfs @ 12.09 hrs, Volume= 0.094 af, Depth= 3.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
3,856	98	Paved parking, HSG C
10,159	74	>75% Grass cover, Good, HSG C
14,015	81	Weighted Average
10,159		72.49% Pervious Area
3,856		27.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	67	0.1040	0.33		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.68"
2.1	196	0.0060	1.57		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.5	52	0.0520	1.76	0.64	**Trap/Vee/Rect Channel Flow,** Bot.W=1.00' D=0.33' Z= 0.3 '/' Top.W=1.20' n= 0.069 Riprap, 6-inch
6.0	315	Total			

Subcatchment 11C: Catchment Along Southern Side of Access Road



Summary for Subcatchment 12C: North Corner of Property

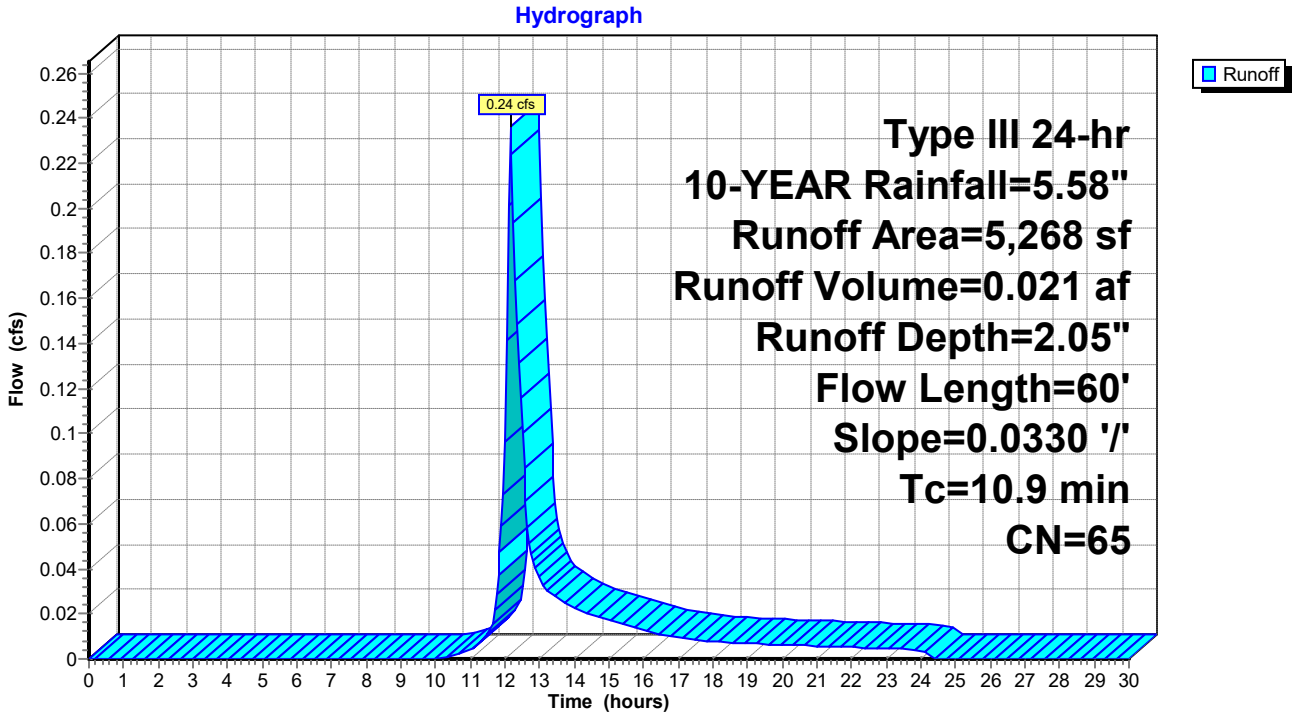
Runoff = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
5,268	65	Brush, Good, HSG C
5,268		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	60	0.0330	0.09		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.68"

Subcatchment 12C: North Corner of Property



Summary for Subcatchment 30C: Roof of Blower/Dewatering Building

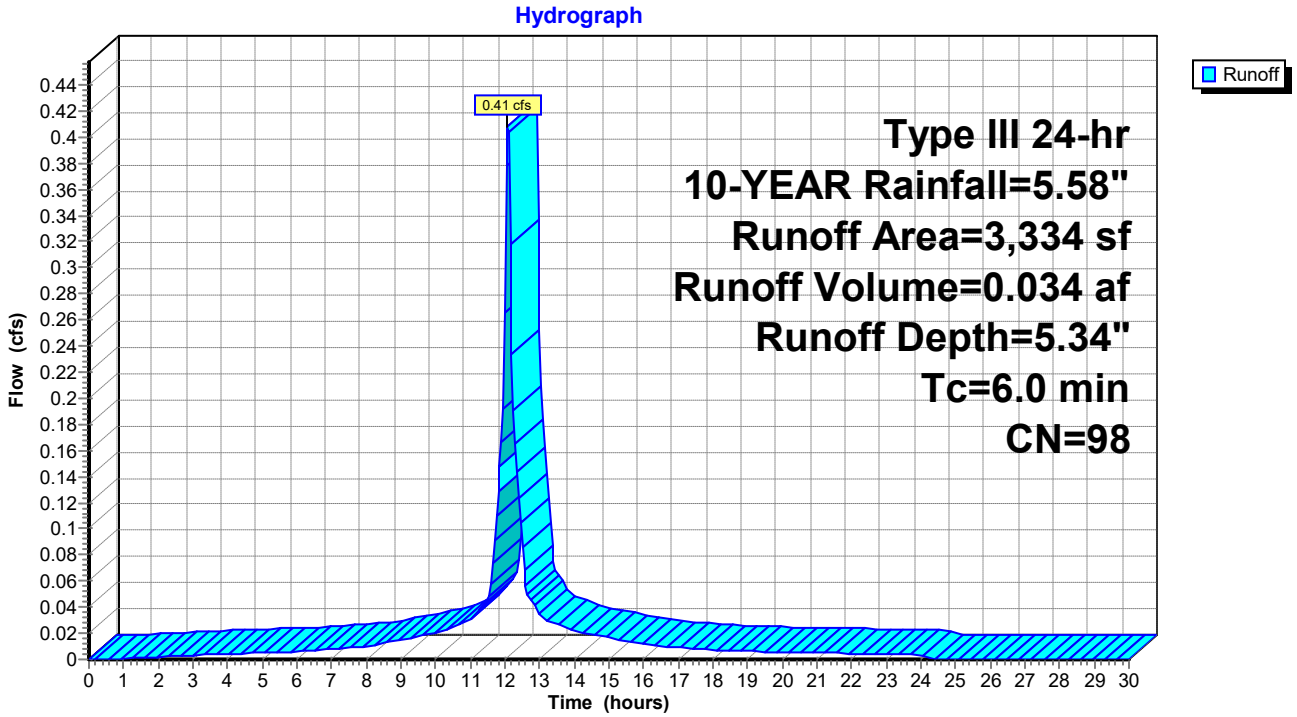
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 0.034 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
3,334	98	Roofs, HSG C
3,334		100.00% Impervious Area

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

Subcatchment 30C: Roof of Blower/Dewatering Building



Summary for Subcatchment 80C: Roof of Headworks Building

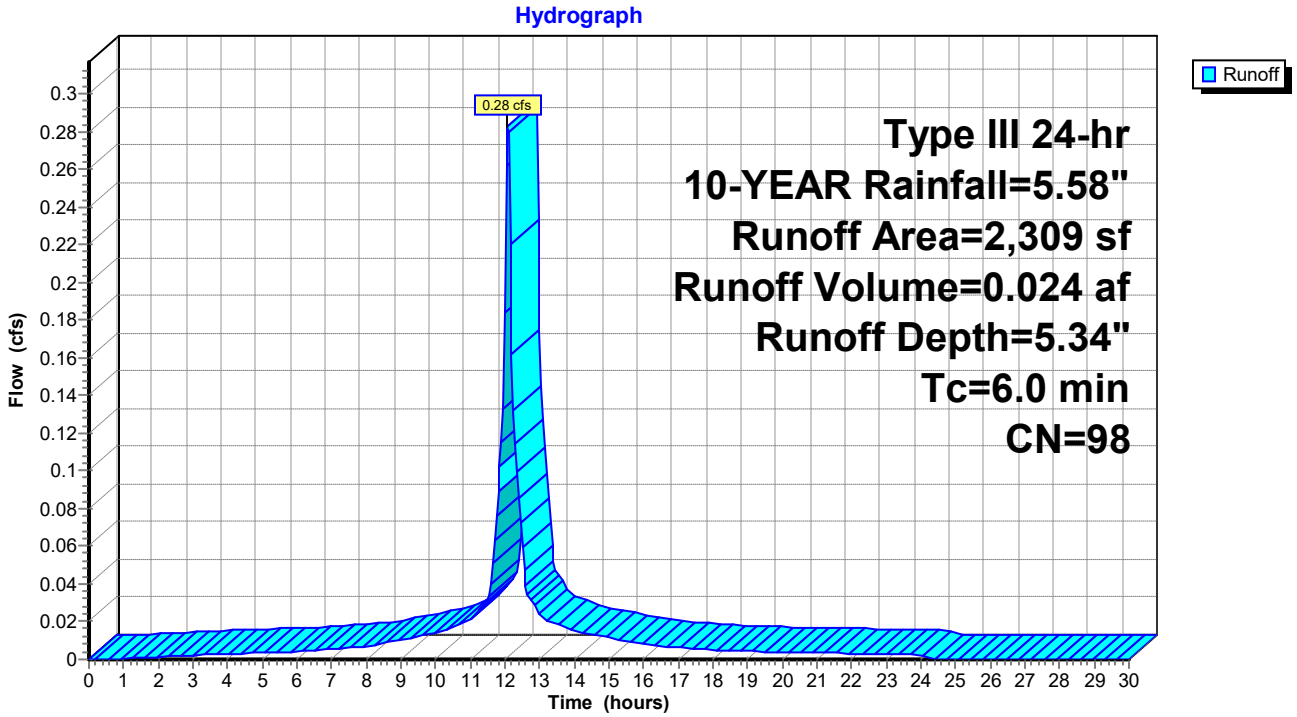
Runoff = 0.28 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
2,309	98	Roofs, HSG C
2,309		100.00% Impervious Area

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

Subcatchment 80C: Roof of Headworks Building



Summary for Subcatchment 81C: Roof of Septic Receiving Building

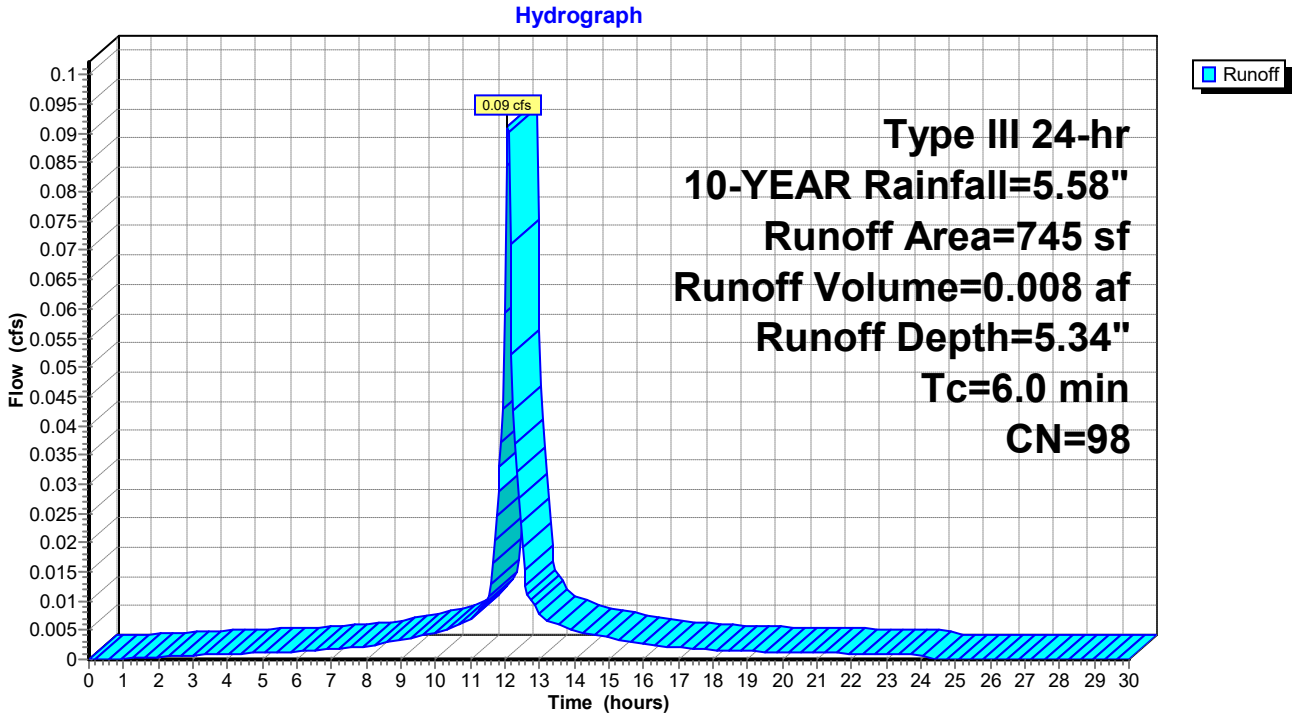
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 5.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=5.58"

Area (sf)	CN	Description
745	98	Roofs, HSG C
745		100.00% Impervious Area

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

Subcatchment 81C: Roof of Septic Receiving Building



Summary for Reach 8.1R: Culvert Outlet

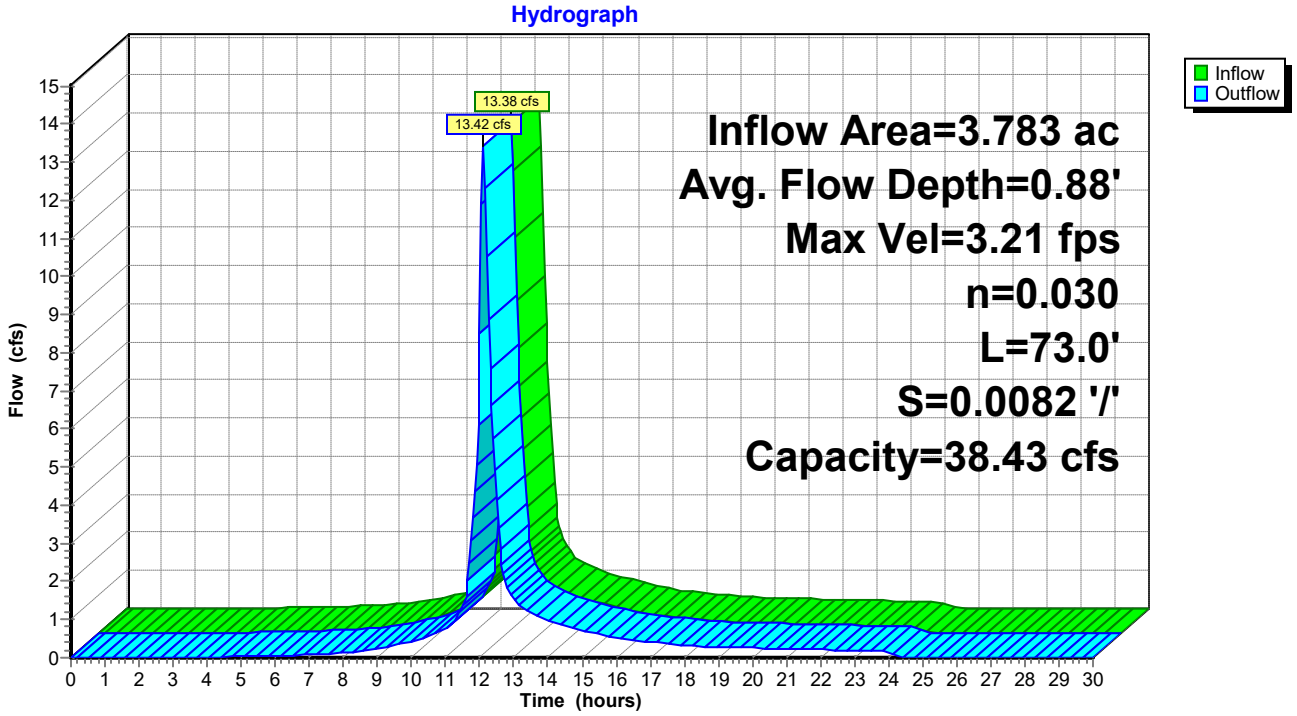
Inflow Area = 3.783 ac, 44.68% Impervious, Inflow Depth > 3.70" for 10-YEAR event
Inflow = 13.38 cfs @ 12.10 hrs, Volume= 1.167 af
Outflow = 13.42 cfs @ 12.10 hrs, Volume= 1.167 af, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.78 fps, Avg. Travel Time= 1.6 min

Peak Storage= 305 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.88'
Bank-Full Depth= 1.50' Flow Area= 9.0 sf, Capacity= 38.43 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 2.0 '/' Top Width= 9.00'
Length= 73.0' Slope= 0.0082 '/'
Inlet Invert= 34.60', Outlet Invert= 34.00'

Reach 8.1R: Culvert Outlet



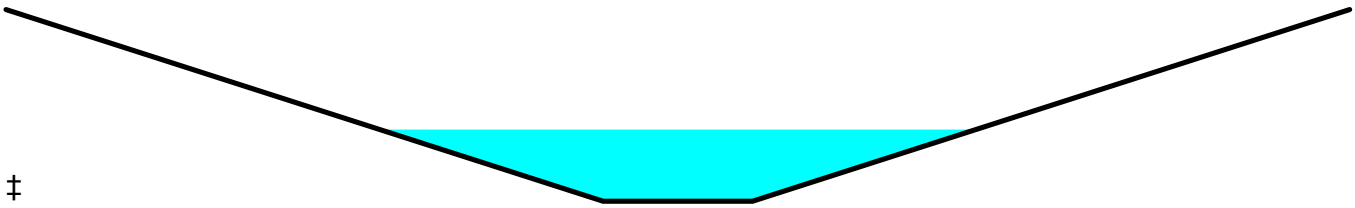
Summary for Reach 8.2R: Drainage Ditch

Inflow Area = 3.783 ac, 44.68% Impervious, Inflow Depth > 3.70" for 10-YEAR event
Inflow = 13.42 cfs @ 12.10 hrs, Volume= 1.167 af
Outflow = 13.43 cfs @ 12.11 hrs, Volume= 1.167 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.87 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 2.0 min

Peak Storage= 444 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.75'
Bank-Full Depth= 2.00' Flow Area= 25.0 sf, Capacity= 127.81 cfs

2.50' x 2.00' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 5.0 '/' Top Width= 22.50'
Length= 95.0' Slope= 0.0095 '/'
Inlet Invert= 34.00', Outlet Invert= 33.10'



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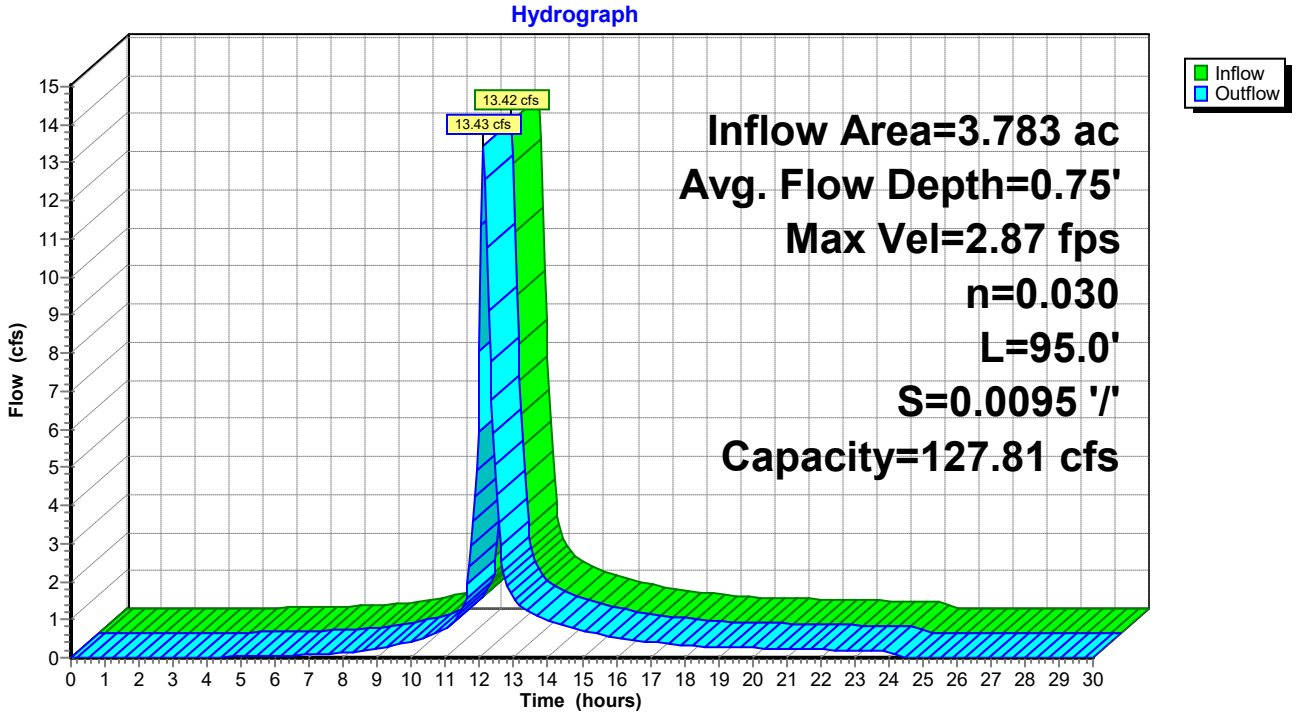
Reach 8.2R: Drainage Ditch



Summary for Pond 1.1P: Proposed DMH #1

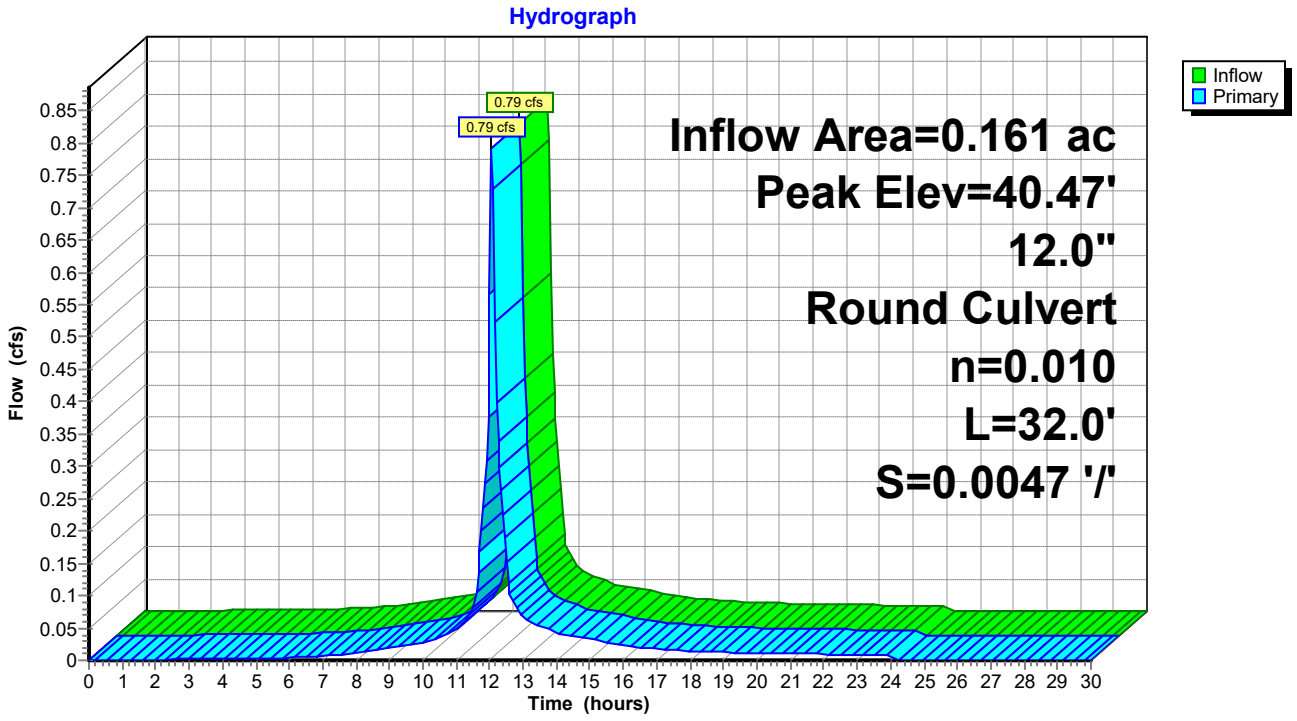
Inflow Area = 0.161 ac, 65.26% Impervious, Inflow Depth = 4.38" for 10-YEAR event
Inflow = 0.79 cfs @ 12.07 hrs, Volume= 0.059 af
Outflow = 0.79 cfs @ 12.07 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
Primary = 0.79 cfs @ 12.07 hrs, Volume= 0.059 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.47' @ 12.07 hrs
Flood Elev= 43.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	39.95'	**12.0" Round Culvert (Outlet)** L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.95' / 39.80' S= 0.0047 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 12.07 hrs HW=40.45' TW=38.72' (Dynamic Tailwater)
1=Culvert (Outlet) (Barrel Controls 0.76 cfs @ 2.80 fps)

Pond 1.1P: Proposed DMH #1



Summary for Pond 1.2P: Yard Drain Behind Proposed Chemincal Storage Building

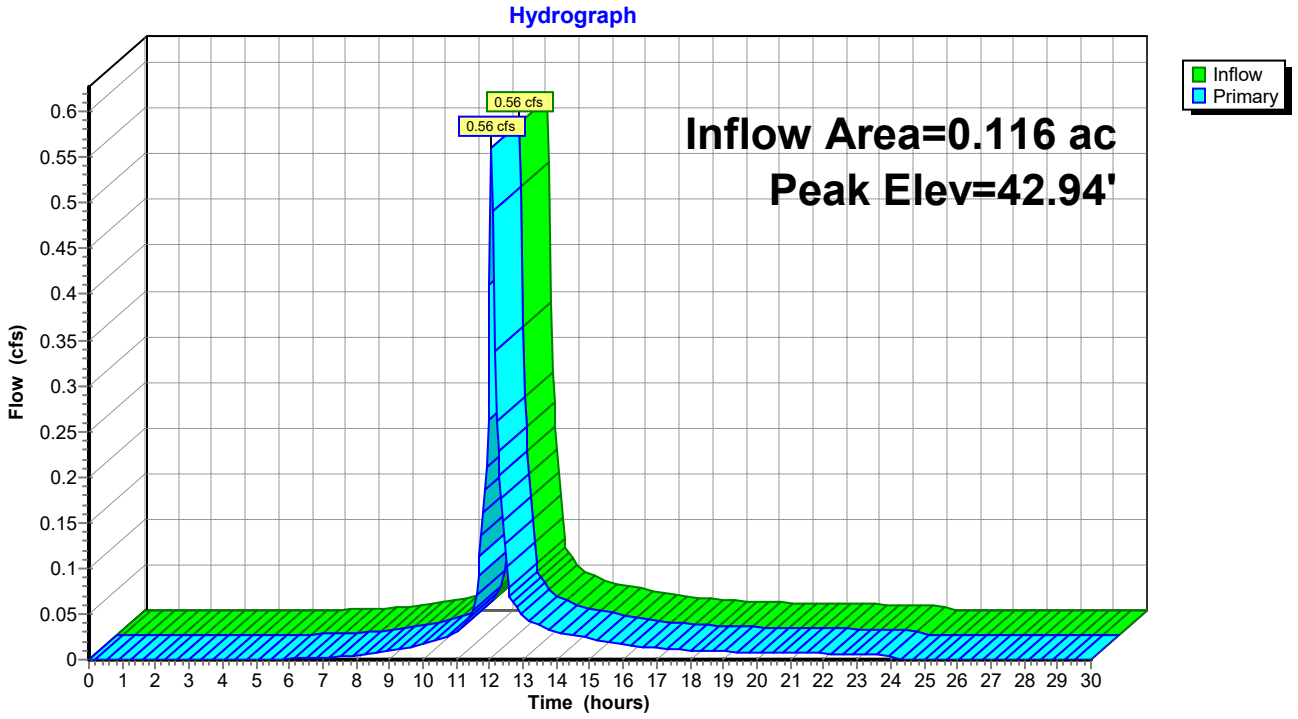
Inflow Area = 0.116 ac, 51.78% Impervious, Inflow Depth = 4.01" for 10-YEAR event
Inflow = 0.56 cfs @ 12.06 hrs, Volume= 0.039 af
Outflow = 0.56 cfs @ 12.06 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.06 hrs, Volume= 0.039 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 42.94' @ 12.06 hrs
Flood Elev= 43.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.15'	**8.0" Round Culvert (Outlet Pipe)** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.15' / 40.05' S= 0.0027 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	42.80'	**12.0" Horiz. Orifice/Grate (Yard Drain)** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.54 cfs @ 12.06 hrs HW=42.94' TW=40.46' (Dynamic Tailwater)
↑—**1=Culvert (Outlet Pipe)** (Passes 0.54 cfs of 2.55 cfs potential flow)
↑—**2=Orifice/Grate (Yard Drain)** (Weir Controls 0.54 cfs @ 1.23 fps)

Pond 1.2P: Yard Drain Behind Proposed Chemincal Storage Building



Summary for Pond 1.3P: Yard Drain Near Chemical Storage Building

Inflow Area = 0.086 ac, 66.58% Impervious, Inflow Depth = 4.44" for 10-YEAR event
Inflow = 0.45 cfs @ 12.06 hrs, Volume= 0.032 af
Outflow = 0.45 cfs @ 12.06 hrs, Volume= 0.032 af, Atten= 1%, Lag= 0.2 min
Primary = 0.45 cfs @ 12.06 hrs, Volume= 0.032 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.92' @ 12.06 hrs Surf.Area= 57 sf Storage= 3 cf
Flood Elev= 42.00' Surf.Area= 342 sf Storage= 229 cf

Plug-Flow detention time= 0.1 min calculated for 0.032 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (785.3 - 785.2)

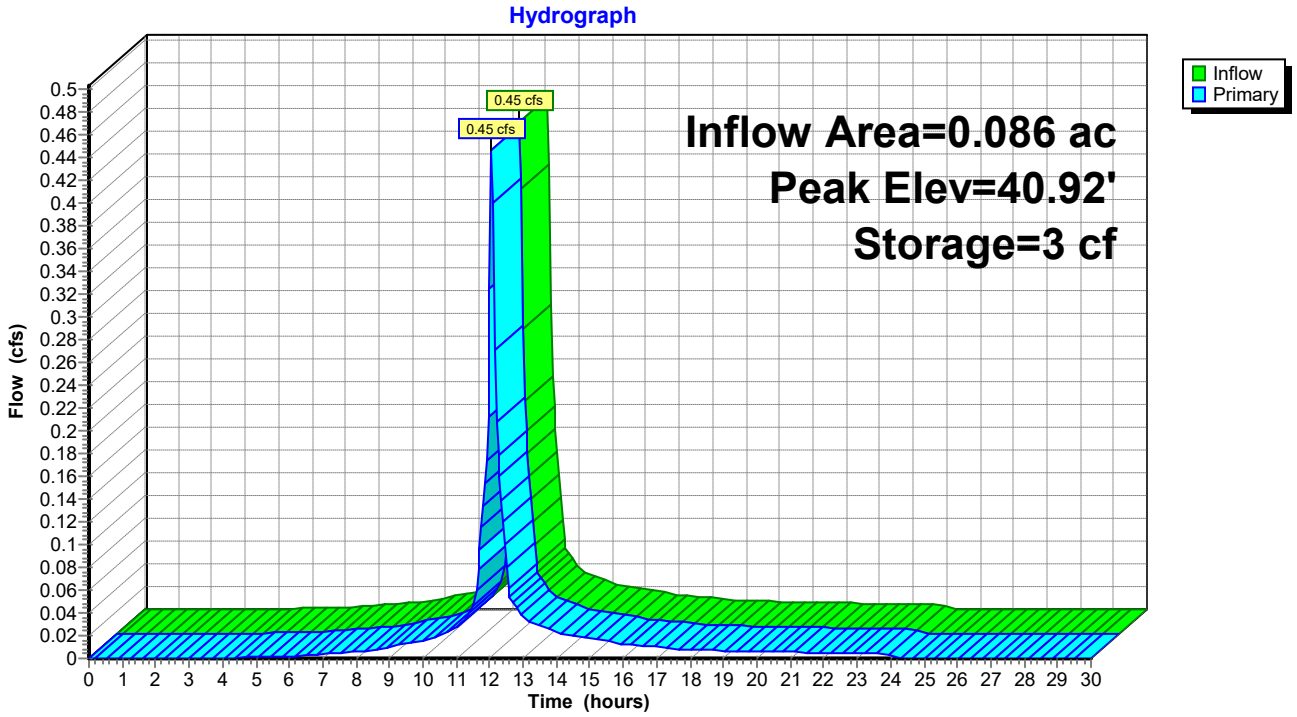
Volume	Invert	Avail.Storage	Storage Description
#1	40.80'	229 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
40.80	5	0.0	0	0	5
41.00	116	100.0	10	10	116
42.00	342	100.0	219	229	348

Device	Routing	Invert	Outlet Devices
#1	Primary	38.30'	**6.0" Round Culvert** L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.30' / 38.10' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf
#2	Device 1	40.80'	**12.0" Horiz. Orifice/Grate (YD Grate)** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.43 cfs @ 12.06 hrs HW=40.92' TW=38.42' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.43 cfs of 1.46 cfs potential flow)
↑—**2=Orifice/Grate (YD Grate)** (Weir Controls 0.43 cfs @ 1.14 fps)

Pond 1.3P: Yard Drain Near Chemical Storage Building



Summary for Pond 1.4P: Inserta Tee Location

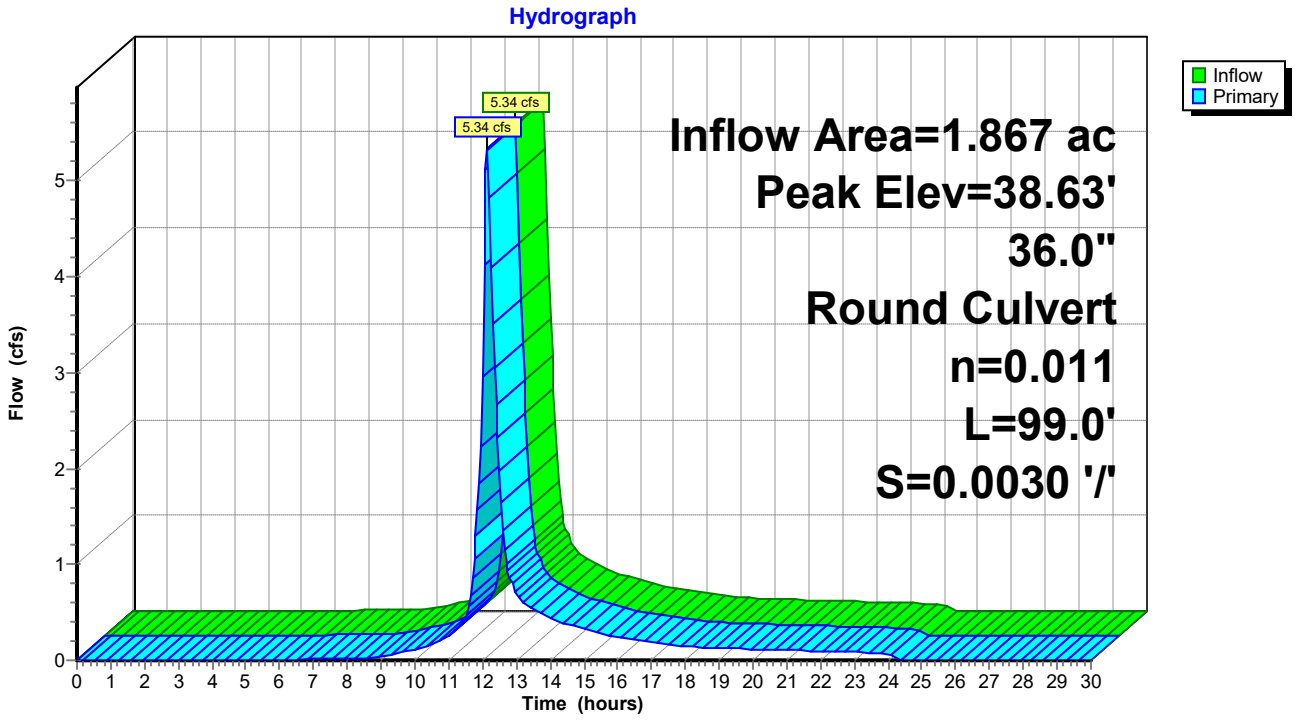
Inflow Area = 1.867 ac, 26.04% Impervious, Inflow Depth = 3.04" for 10-YEAR event
Inflow = 5.34 cfs @ 12.14 hrs, Volume= 0.473 af
Outflow = 5.34 cfs @ 12.14 hrs, Volume= 0.473 af, Atten= 0%, Lag= 0.0 min
Primary = 5.34 cfs @ 12.14 hrs, Volume= 0.473 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.63' @ 12.16 hrs
Flood Elev= 40.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.40'	**36.0" Round RCP_Round 36"** L= 99.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.40' / 37.10' S= 0.0030 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=5.02 cfs @ 12.14 hrs HW=38.61' TW=38.32' (Dynamic Tailwater)
1=RCP_Round 36" (Outlet Controls 5.02 cfs @ 2.79 fps)

Pond 1.4P: Inserta Tee Location



Summary for Pond 1P: Culvert Inlet

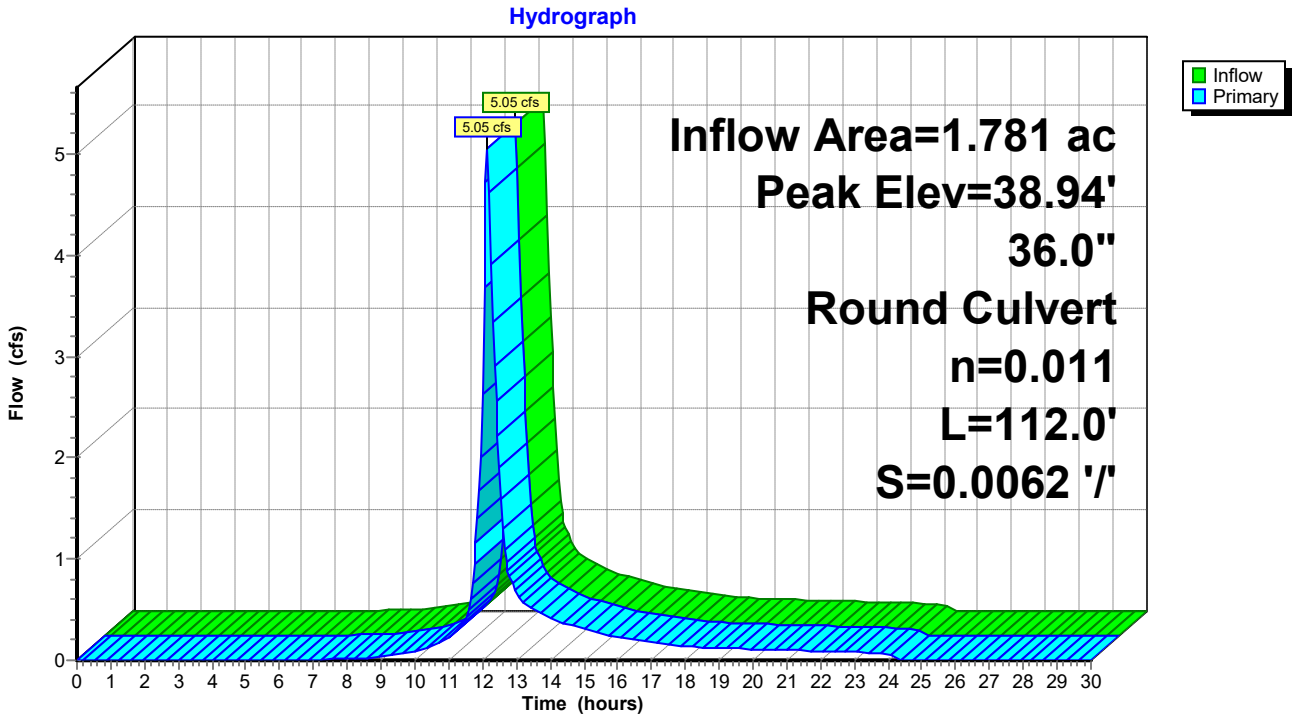
Inflow Area = 1.781 ac, 24.08% Impervious, Inflow Depth = 2.97" for 10-YEAR event
Inflow = 5.05 cfs @ 12.15 hrs, Volume= 0.442 af
Outflow = 5.05 cfs @ 12.15 hrs, Volume= 0.442 af, Atten= 0%, Lag= 0.0 min
Primary = 5.05 cfs @ 12.15 hrs, Volume= 0.442 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.94' @ 12.18 hrs
Flood Elev= 42.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.80'	**36.0" Round RCP_Round 36"** L= 112.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.80' / 37.10' S= 0.0062 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=4.42 cfs @ 12.15 hrs HW=38.92' TW=38.62' (Dynamic Tailwater)
1=RCP_Round 36" (Outlet Controls 4.42 cfs @ 2.74 fps)

Pond 1P: Culvert Inlet



Summary for Pond 2P: CB 6943

Inflow Area = 2.758 ac, 36.15% Impervious, Inflow Depth = 3.42" for 10-YEAR event
Inflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af
Outflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min
Primary = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.33' @ 12.13 hrs Surf.Area= 13 sf Storage= 17 cf
Flood Elev= 41.80' Surf.Area= 13 sf Storage= 60 cf

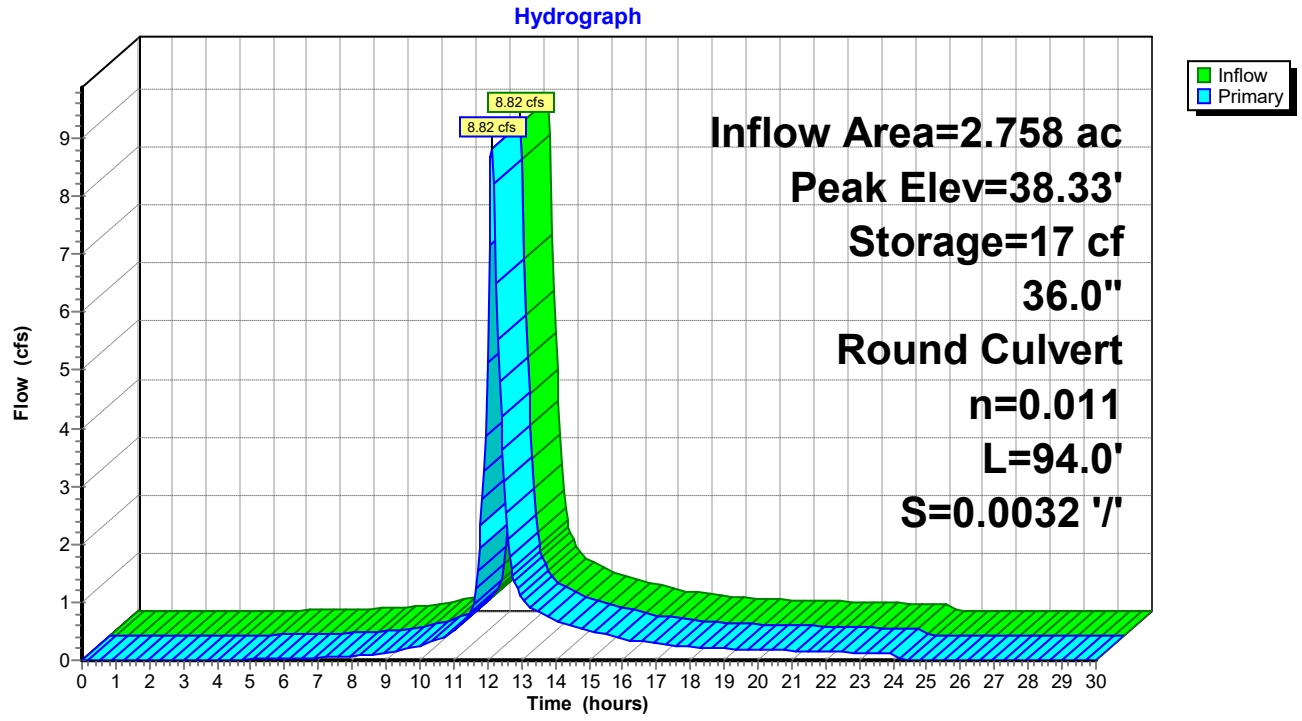
Plug-Flow detention time= 0.1 min calculated for 0.785 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (812.3 - 812.2)

Volume	Invert	Avail.Storage	Storage Description
#1	37.00'	60 cf	**4.00'D x 4.80'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**36.0" Round RCP_Round 36"** L= 94.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 36.70' S= 0.0032 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=8.69 cfs @ 12.13 hrs HW=38.32' TW=37.55' (Dynamic Tailwater)
1=RCP_Round 36" (Barrel Controls 8.69 cfs @ 4.27 fps)

Pond 2P: CB 6943



Summary for Pond 3.1P: CB 5894

Inflow Area = 0.427 ac, 48.30% Impervious, Inflow Depth = 4.01" for 10-YEAR event
Inflow = 1.67 cfs @ 12.09 hrs, Volume= 0.143 af
Outflow = 1.67 cfs @ 12.09 hrs, Volume= 0.143 af, Atten= 0%, Lag= 0.1 min
Primary = 1.67 cfs @ 12.09 hrs, Volume= 0.143 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.45' @ 12.12 hrs Surf.Area= 13 sf Storage= 10 cf
Flood Elev= 41.30' Surf.Area= 13 sf Storage= 33 cf

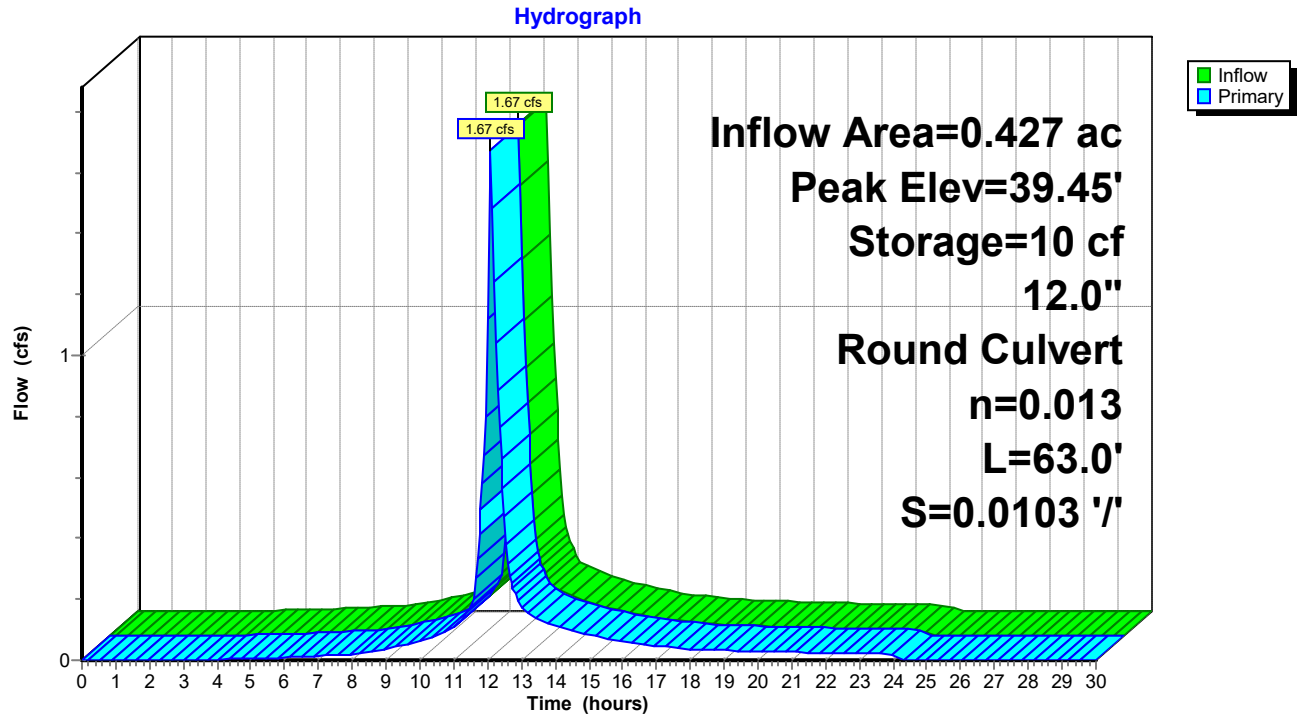
Plug-Flow detention time= 0.4 min calculated for 0.143 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (794.9 - 794.6)

Volume	Invert	Avail.Storage	Storage Description
#1	38.65'	33 cf	**4.00'D x 2.65'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	38.65'	**12.0" Round CMP_Round 12"** L= 63.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.65' / 38.00' S= 0.0103 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=1.53 cfs @ 12.09 hrs HW=39.44' TW=38.93' (Dynamic Tailwater)
1=CMP_Round 12" (Outlet Controls 1.53 cfs @ 3.17 fps)

Pond 3.1P: CB 5894



Summary for Pond 3.2P: DMH 6337

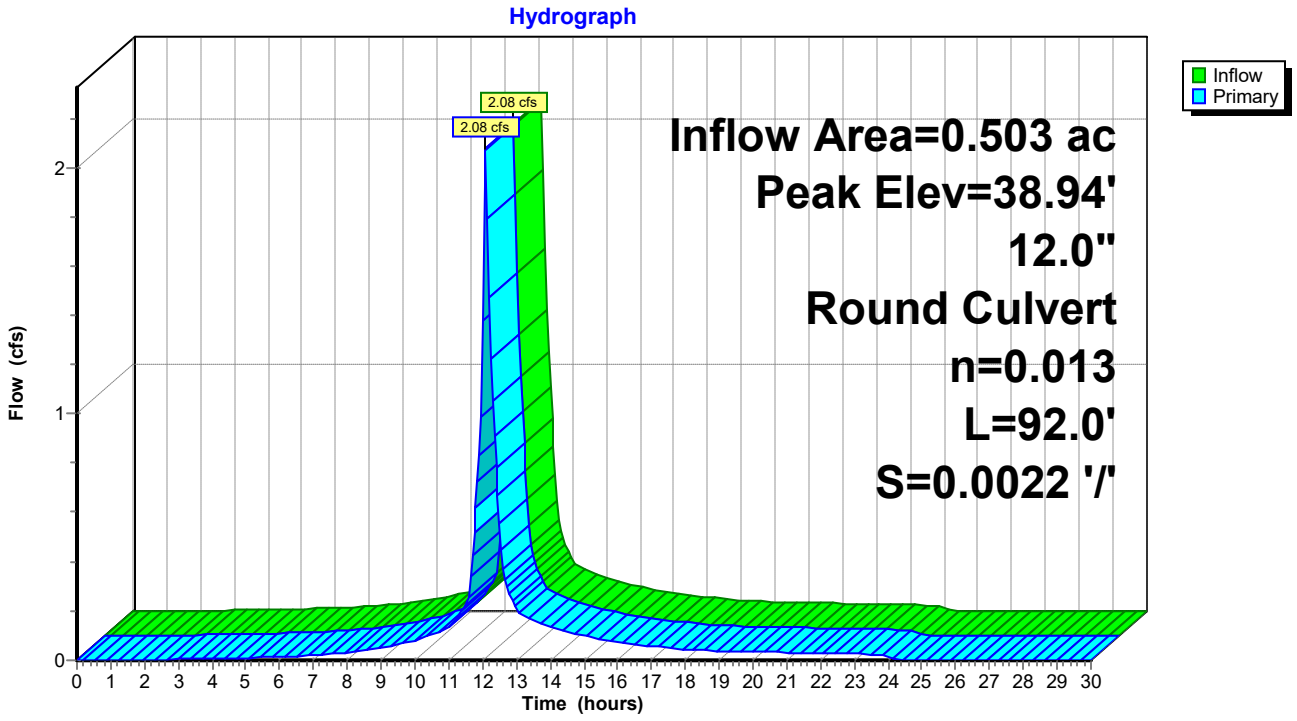
Inflow Area = 0.503 ac, 56.16% Impervious, Inflow Depth = 4.22" for 10-YEAR event
Inflow = 2.08 cfs @ 12.09 hrs, Volume= 0.177 af
Outflow = 2.08 cfs @ 12.09 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min
Primary = 2.08 cfs @ 12.09 hrs, Volume= 0.177 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.94' @ 12.09 hrs
Flood Elev= 42.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	37.80'	**12.0" Round CMP_Round 12"** L= 92.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.80' / 37.60' S= 0.0022 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=2.05 cfs @ 12.09 hrs HW=38.93' TW=38.30' (Dynamic Tailwater)
1=CMP_Round 12" (Barrel Controls 2.05 cfs @ 2.89 fps)

Pond 3.2P: DMH 6337



Summary for Pond 4P: CB 6025

Inflow Area = 0.164 ac, 8.74% Impervious, Inflow Depth = 3.02" for 10-YEAR event
Inflow = 0.61 cfs @ 12.06 hrs, Volume= 0.041 af
Outflow = 0.61 cfs @ 12.06 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.1 min
Primary = 0.61 cfs @ 12.06 hrs, Volume= 0.041 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.76' @ 12.09 hrs Surf.Area= 13 sf Storage= 6 cf
Flood Elev= 41.90' Surf.Area= 13 sf Storage= 33 cf

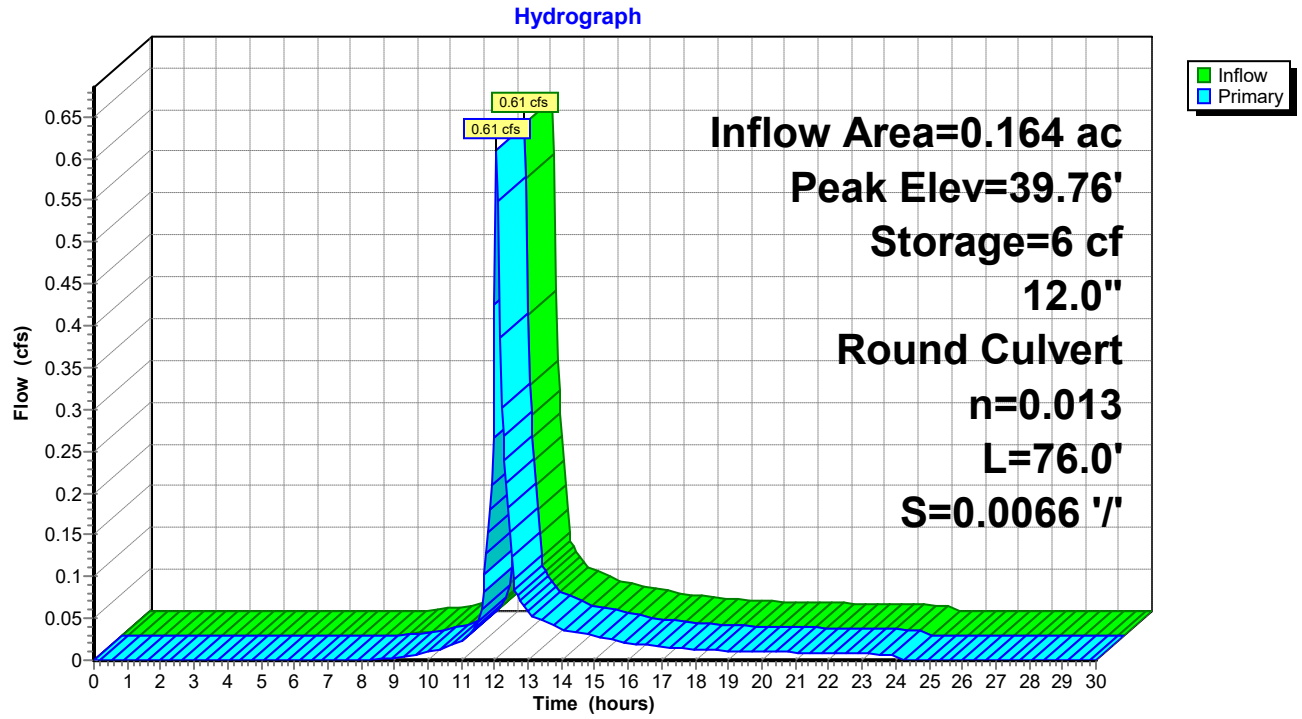
Plug-Flow detention time= 0.5 min calculated for 0.041 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (826.0 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	39.30'	33 cf	**4.00'D x 2.60'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.30'	**12.0" Round CMP_Round 12"** L= 76.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.30' / 38.80' S= 0.0066 '/' Cc= 0.900 n= 0.013 Cast iron, coated, Flow Area= 0.79 sf

Primary OutFlow Max=0.51 cfs @ 12.06 hrs HW=39.75' TW=39.38' (Dynamic Tailwater)
1=CMP_Round 12" (Outlet Controls 0.51 cfs @ 2.18 fps)

Pond 4P: CB 6025



Summary for Pond 5P: CB 5937

Inflow Area = 0.060 ac, 71.18% Impervious, Inflow Depth = 4.56" for 10-YEAR event
Inflow = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af
Outflow = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af, Atten= 1%, Lag= 0.1 min
Primary = 0.31 cfs @ 12.06 hrs, Volume= 0.023 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.64' @ 12.10 hrs Surf.Area= 13 sf Storage= 4 cf
Flood Elev= 42.74' Surf.Area= 13 sf Storage= 43 cf

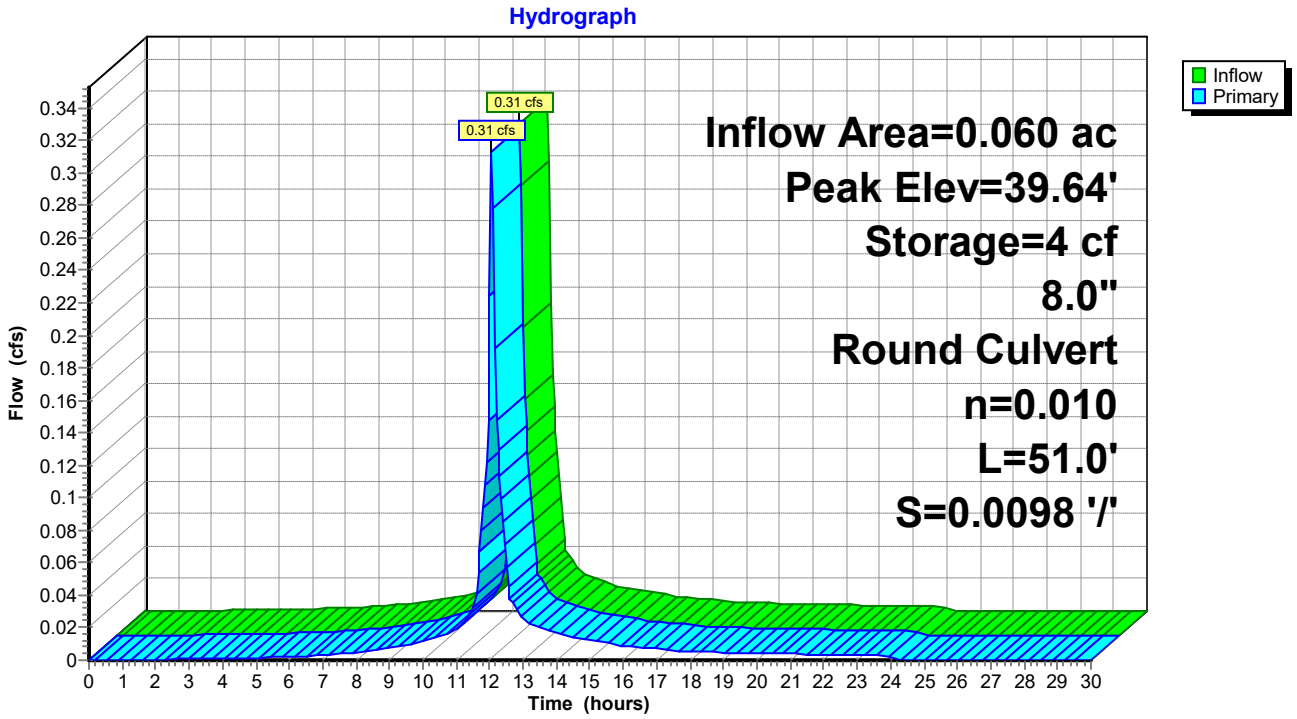
Plug-Flow detention time= 1.0 min calculated for 0.023 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (776.7 - 775.9)

Volume	Invert	Avail.Storage	Storage Description
#1	39.30'	43 cf	**4.00'D x 3.44'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.30'	**8.0" Round Culvert** L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.30' / 38.80' S= 0.0098 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.25 cfs @ 12.06 hrs HW=39.63' TW=39.38' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.25 cfs @ 2.10 fps)

Pond 5P: CB 5937



Summary for Pond 6P: CB 5478

Inflow Area = 0.042 ac, 58.73% Impervious, Inflow Depth = 4.22" for 10-YEAR event
Inflow = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.2 min
Primary = 0.21 cfs @ 12.06 hrs, Volume= 0.015 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.06' @ 12.06 hrs Surf.Area= 13 sf Storage= 3 cf
Flood Elev= 42.16' Surf.Area= 13 sf Storage= 30 cf

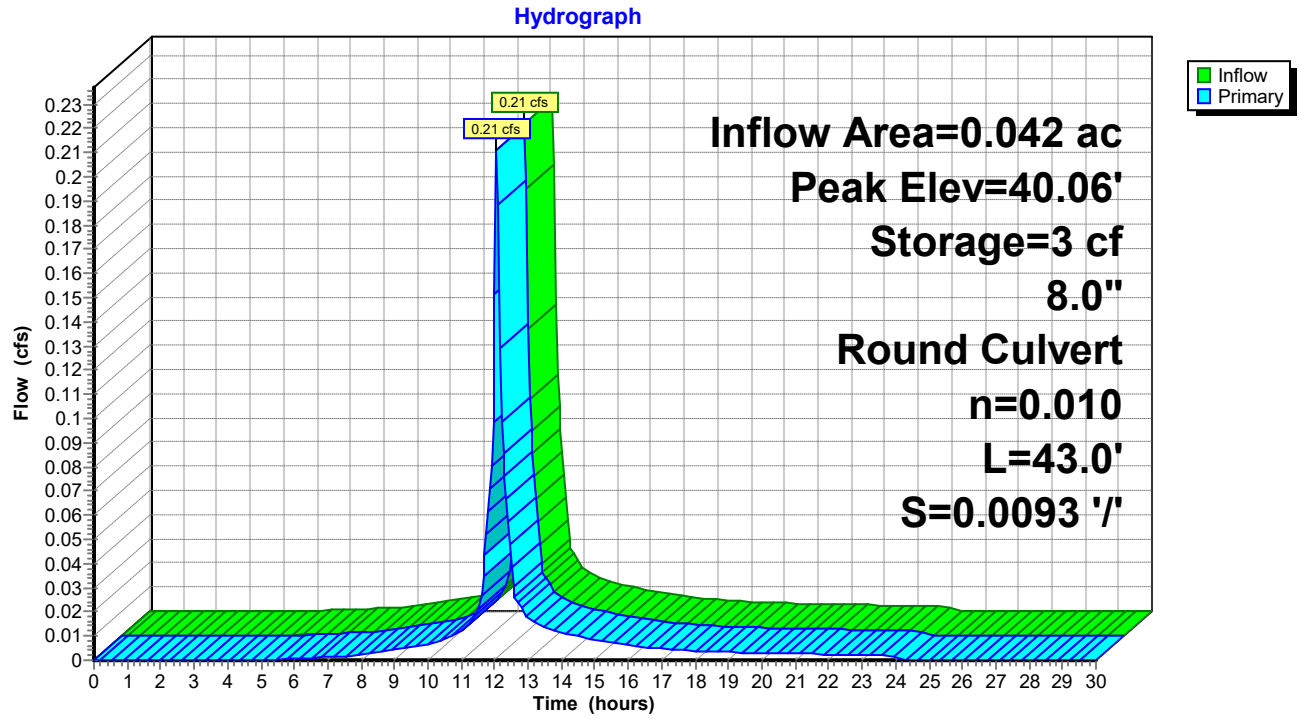
Plug-Flow detention time= 0.9 min calculated for 0.015 af (100% of inflow)
Center-of-Mass det. time= 0.9 min (793.1 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	39.80'	30 cf	**4.00'D x 2.36'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	39.80'	**8.0" Round Culvert** L= 43.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 39.80' / 39.40' S= 0.0093 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.20 cfs @ 12.06 hrs HW=40.05' TW=39.63' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.20 cfs @ 1.70 fps)

Pond 6P: CB 5478



Summary for Pond 7.1P: DMH 6949

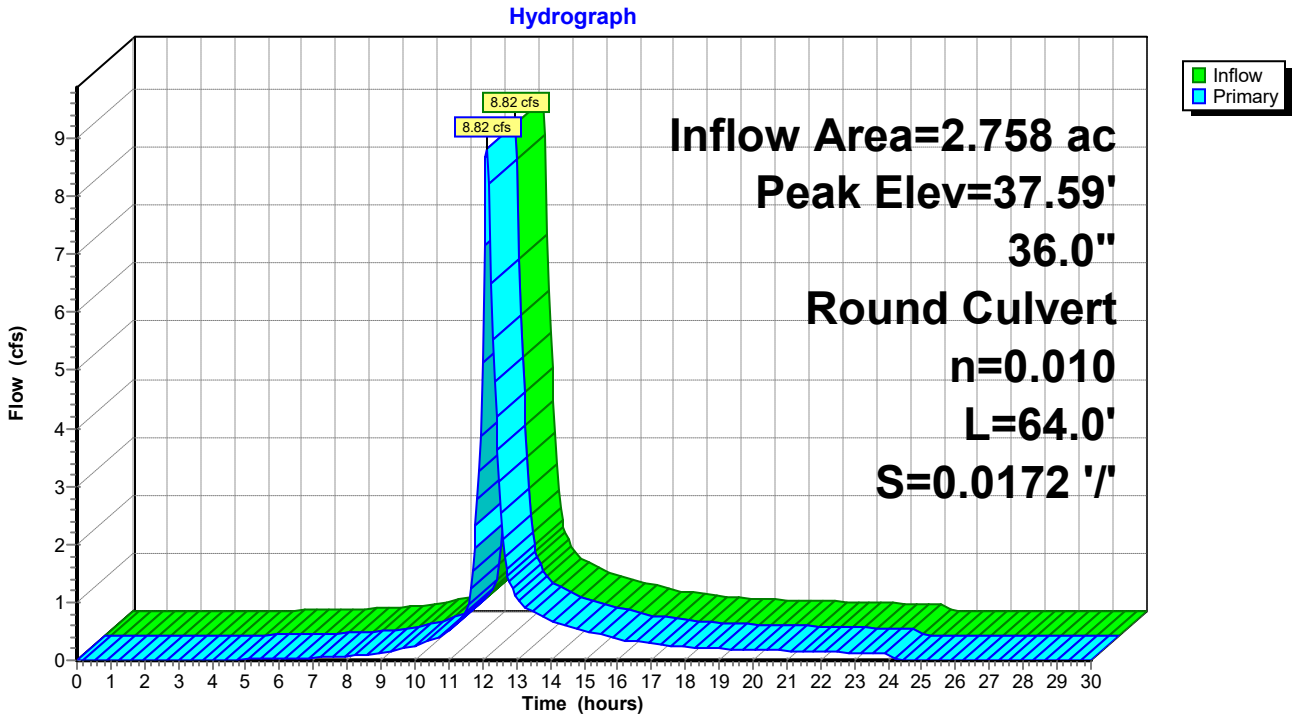
Inflow Area = 2.758 ac, 36.15% Impervious, Inflow Depth = 3.42" for 10-YEAR event
Inflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af
Outflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min
Primary = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.59' @ 12.17 hrs
Flood Elev= 41.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.40'	**36.0" Round Culvert** L= 64.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.40' / 35.30' S= 0.0172 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=7.73 cfs @ 12.13 hrs HW=37.55' TW=36.91' (Dynamic Tailwater)
1=Culvert (Outlet Controls 7.73 cfs @ 4.57 fps)

Pond 7.1P: DMH 6949



Summary for Pond 7.2P: CB 5669

Inflow Area = 0.658 ac, 57.50% Impervious, Inflow Depth > 4.19" for 10-YEAR event
Inflow = 3.24 cfs @ 12.06 hrs, Volume= 0.230 af
Outflow = 3.16 cfs @ 12.06 hrs, Volume= 0.230 af, Atten= 2%, Lag= 0.0 min
Primary = 3.16 cfs @ 12.06 hrs, Volume= 0.230 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.82' @ 12.13 hrs Surf.Area= 13 sf Storage= 34 cf
Flood Elev= 39.00' Surf.Area= 38 sf Storage= 36 cf

Plug-Flow detention time= 0.3 min calculated for 0.230 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (816.4 - 816.2)

Volume	Invert	Avail.Storage	Storage Description
#1	36.10'	36 cf	**4.00'D x 2.90'H Vertical Cone/Cylinder**
#2	39.00'	2,791 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		2,828 cf	Total Available Storage

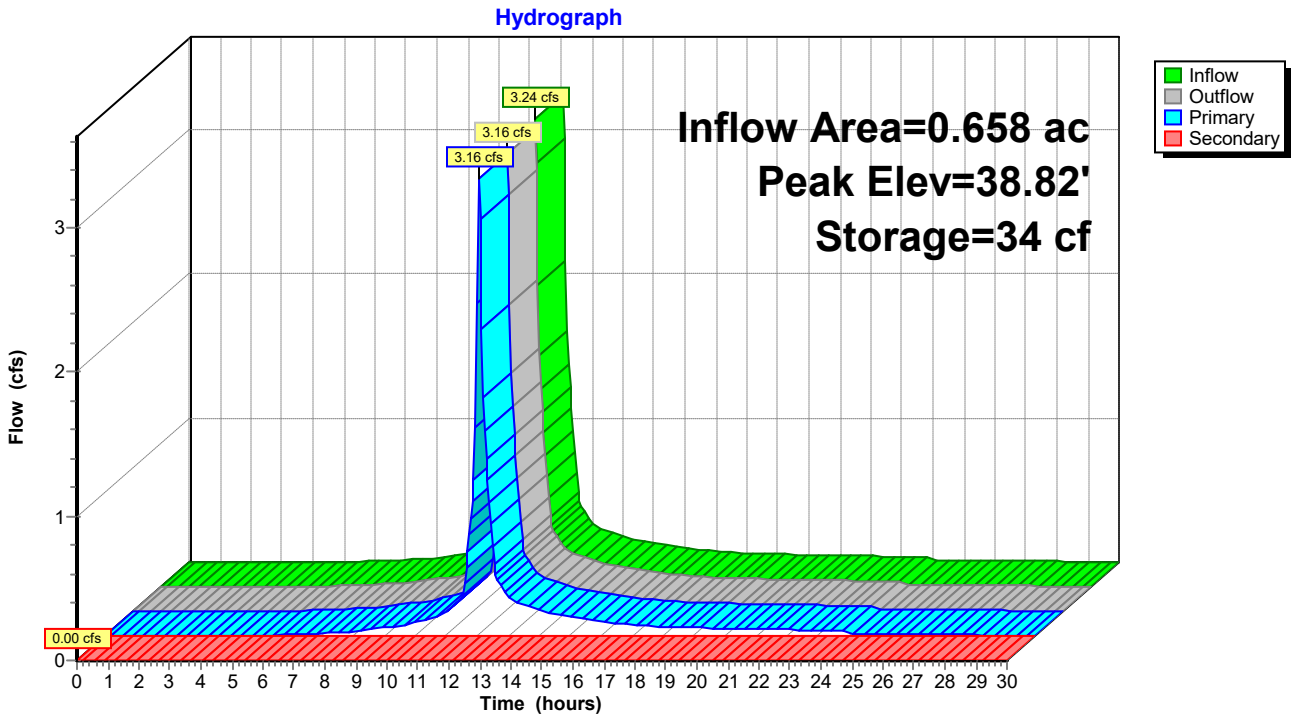
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
39.00	25	0	0	25
39.95	7,200	2,422	2,422	7,202
40.00	7,564	369	2,791	7,566

Device	Routing	Invert	Outlet Devices
#1	Primary	36.10'	**12.0" Round Culvert** L= 62.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.10' / 35.70' S= 0.0065 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 12.06 hrs HW=38.05' TW=38.20' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=36.10' TW=35.60' (Dynamic Tailwater)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7.2P: CB 5669



Summary for Pond 7.3P: Bioretention Cell #2

Inflow Area = 0.113 ac, 60.94% Impervious, Inflow Depth = 4.33" for 10-YEAR event
Inflow = 0.58 cfs @ 12.06 hrs, Volume= 0.041 af
Outflow = 0.53 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 8%, Lag= 2.2 min
Primary = 0.53 cfs @ 12.10 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 40.00' Surf.Area= 379 sf Storage= 57 cf
Peak Elev= 40.94' @ 12.10 hrs Surf.Area= 669 sf Storage= 541 cf (484 cf above start)
Flood Elev= 41.00' Surf.Area= 692 sf Storage= 585 cf (528 cf above start)

Plug-Flow detention time= 209.4 min calculated for 0.037 af (90% of inflow)
Center-of-Mass det. time= 149.5 min (938.2 - 788.8)

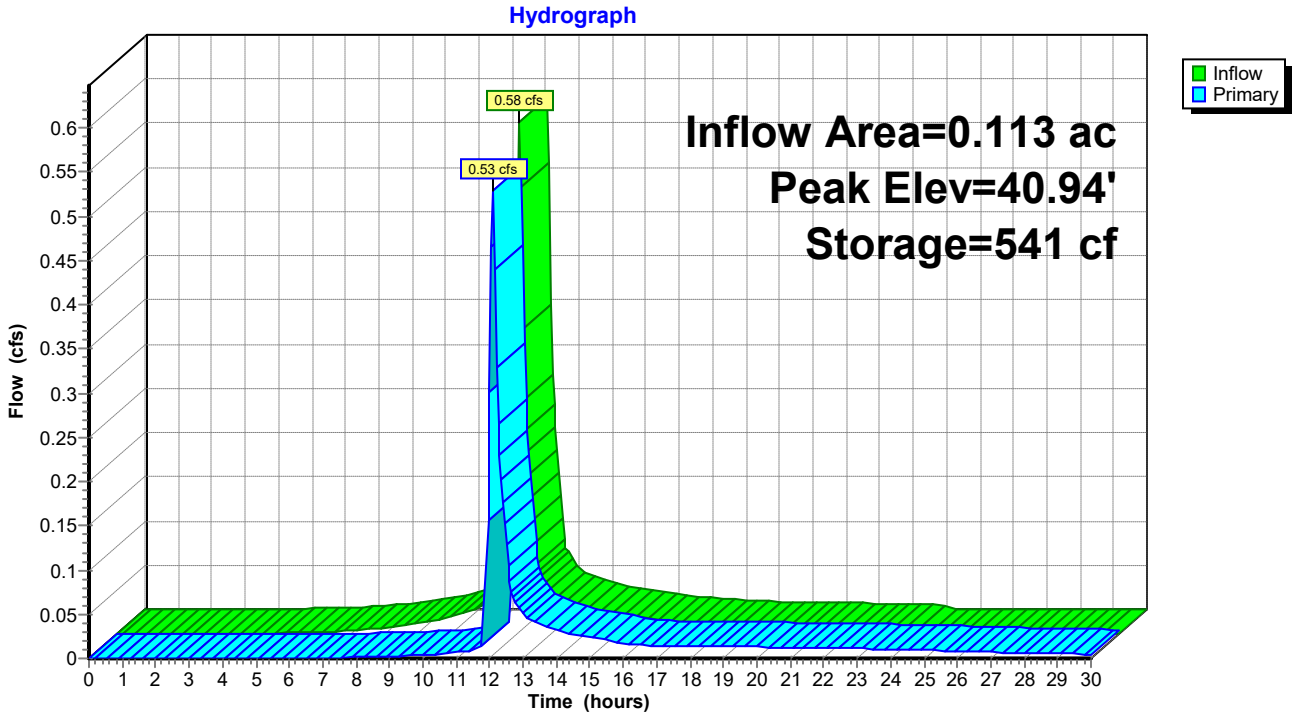
Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	585 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.50	379	0.0	0	0	379
40.00	379	10.0	57	57	483
41.00	692	100.0	528	585	806

Device	Routing	Invert	Outlet Devices
#1	Primary	37.15'	**12.0" Round Culvert** L= 76.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.15' / 36.70' S= 0.0059 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	37.25'	**6.0" Vert. Orifice/Grate (Underdrain)** C= 0.600
#3	Device 2	40.00'	**2.500 in/hr Exfiltration through Media over Wetted area above 40.00'** Excluded Wetted area = 483 sf Phase-In= 0.01'
#4	Device 1	40.80'	**12.0" Horiz. Orifice/Grate (Yard Drain)** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.52 cfs @ 12.10 hrs HW=40.93' TW=38.63' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.52 cfs of 5.61 cfs potential flow)
  - **2=Orifice/Grate (Underdrain)** (Passes 0.02 cfs of 1.44 cfs potential flow)
    - **3=Exfiltration through Media** (Exfiltration Controls 0.02 cfs)
  - **4=Orifice/Grate (Yard Drain)** (Weir Controls 0.51 cfs @ 1.20 fps)

Pond 7.3P: Bioretention Cell #2



Summary for Pond 8.1P: DMH 8521

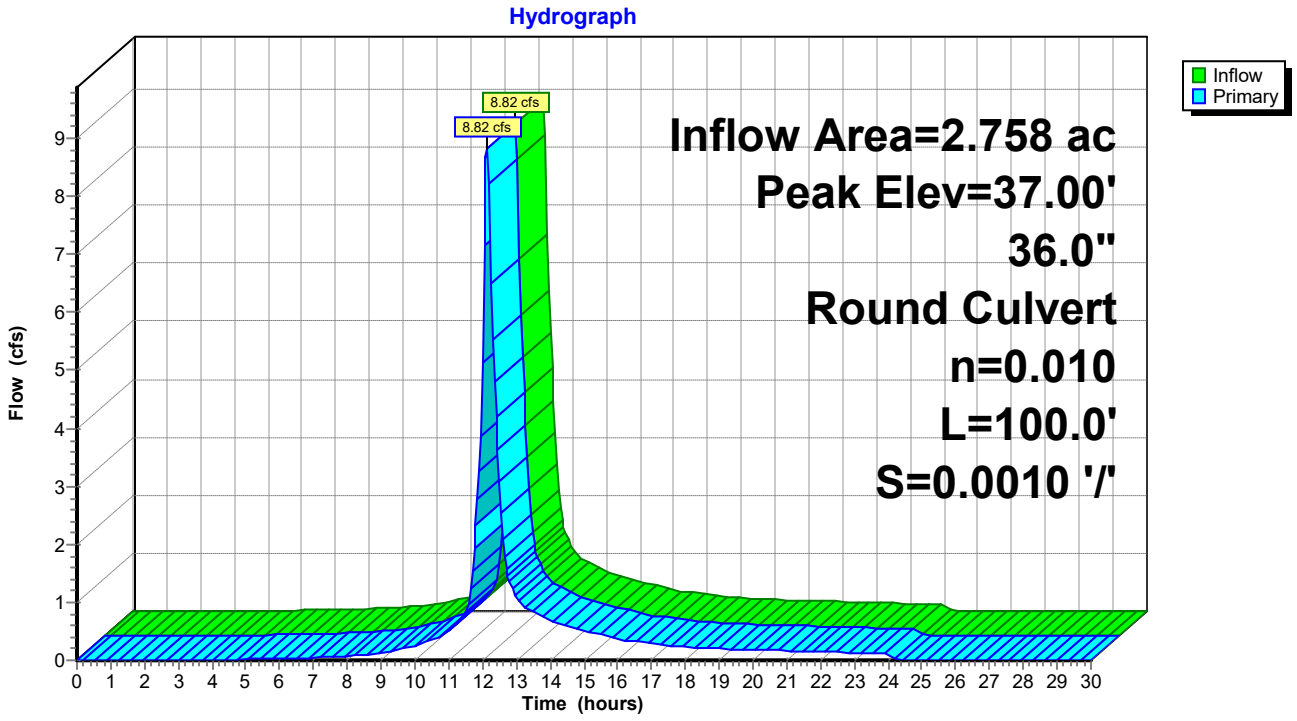
Inflow Area = 2.758 ac, 36.15% Impervious, Inflow Depth = 3.42" for 10-YEAR event
Inflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af
Outflow = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af, Atten= 0%, Lag= 0.0 min
Primary = 8.82 cfs @ 12.13 hrs, Volume= 0.786 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.00' @ 12.17 hrs
Flood Elev= 40.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.20'	**36.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.20' / 35.10' S= 0.0010 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=6.34 cfs @ 12.13 hrs HW=36.91' TW=36.76' (Dynamic Tailwater)
1=Culvert (Outlet Controls 6.34 cfs @ 2.19 fps)

Pond 8.1P: DMH 8521



Summary for Pond 8.2P: DMH 8534

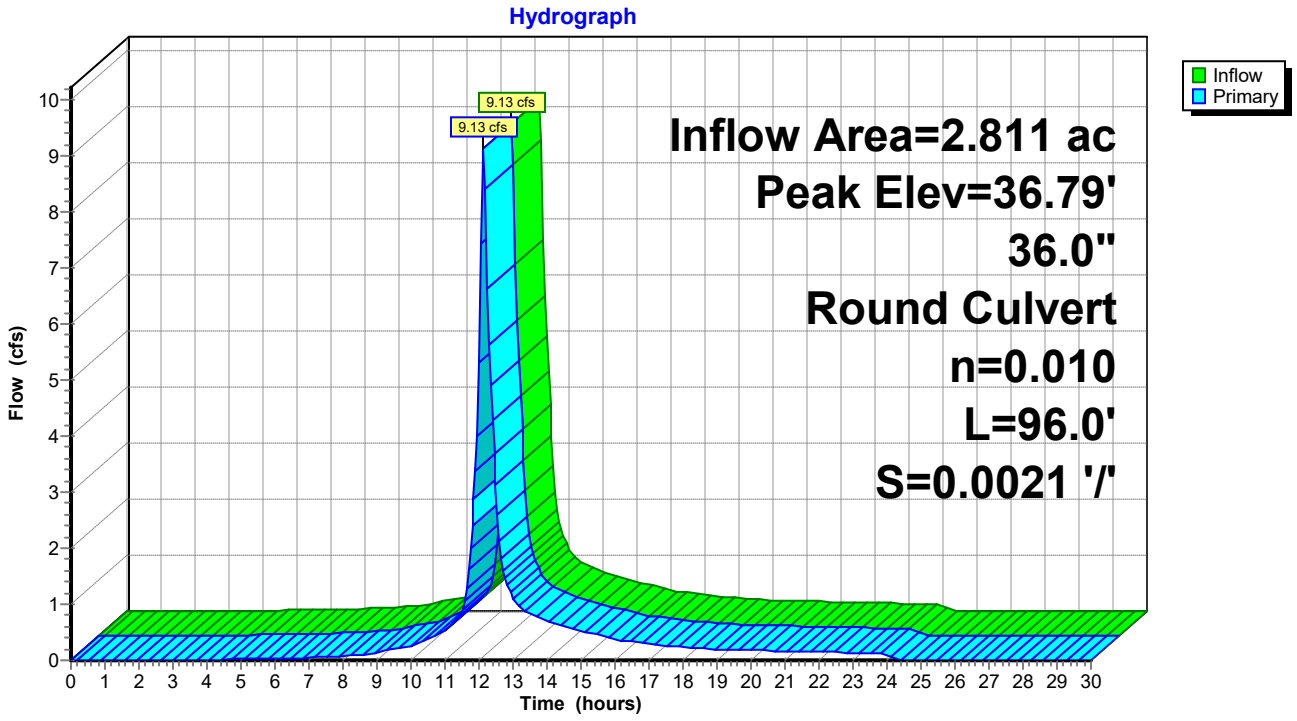
Inflow Area = 2.811 ac, 37.36% Impervious, Inflow Depth = 3.46" for 10-YEAR event
Inflow = 9.13 cfs @ 12.12 hrs, Volume= 0.810 af
Outflow = 9.13 cfs @ 12.12 hrs, Volume= 0.810 af, Atten= 0%, Lag= 0.0 min
Primary = 9.13 cfs @ 12.12 hrs, Volume= 0.810 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.79' @ 12.14 hrs
Flood Elev= 40.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.10'	**36.0" Round Culvert** L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.10' / 34.90' S= 0.0021 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf

Primary OutFlow Max=8.95 cfs @ 12.12 hrs HW=36.76' TW=36.44' (Dynamic Tailwater)
1=Culvert (Outlet Controls 8.95 cfs @ 3.23 fps)

Pond 8.2P: DMH 8534



Summary for Pond 8.3P: DMH 5099

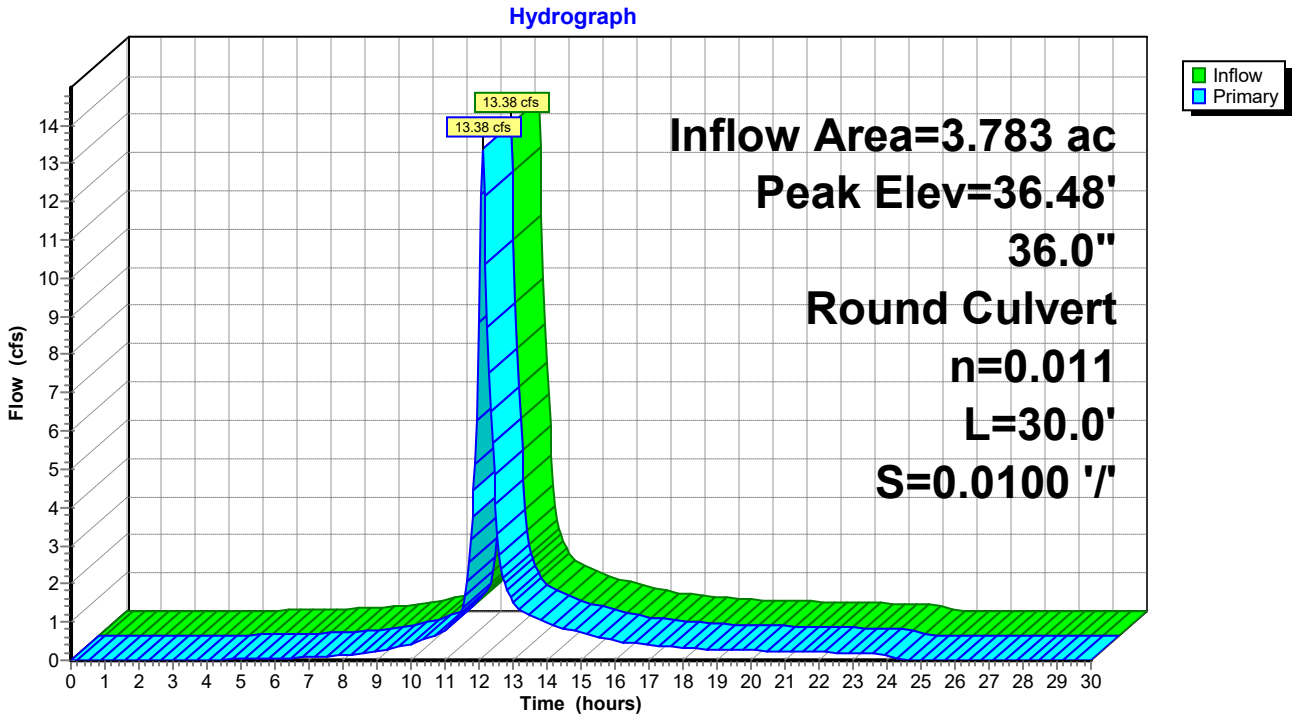
Inflow Area = 3.783 ac, 44.68% Impervious, Inflow Depth > 3.70" for 10-YEAR event
Inflow = 13.38 cfs @ 12.10 hrs, Volume= 1.167 af
Outflow = 13.38 cfs @ 12.10 hrs, Volume= 1.167 af, Atten= 0%, Lag= 0.0 min
Primary = 13.38 cfs @ 12.10 hrs, Volume= 1.167 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.48' @ 12.10 hrs
Flood Elev= 40.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	34.90'	**36.0" Round RCP_Round 36"** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 34.90' / 34.60' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 7.07 sf

Primary OutFlow Max=13.37 cfs @ 12.10 hrs HW=36.48' TW=35.48' (Dynamic Tailwater)
↑**1=RCP_Round 36"** (Barrel Controls 13.37 cfs @ 5.14 fps)

Pond 8.3P: DMH 5099



Summary for Pond 8.4P: DMH 5280

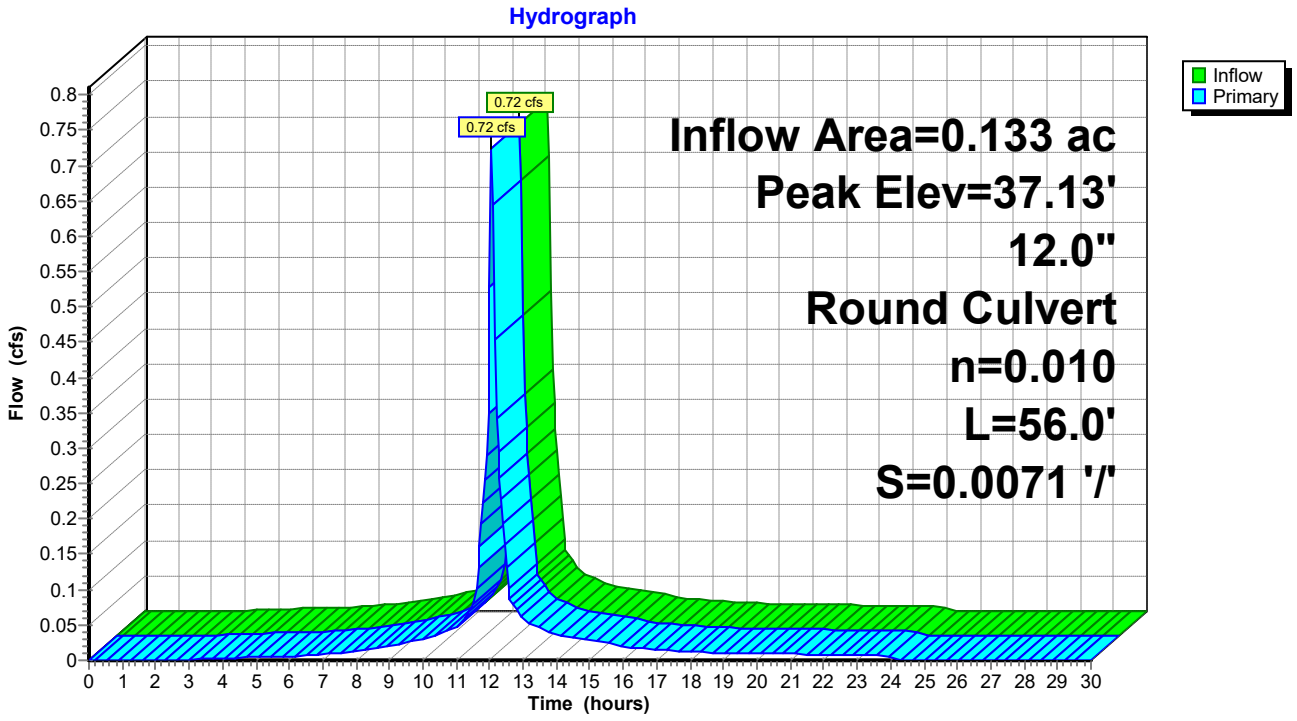
Inflow Area = 0.133 ac, 80.66% Impervious, Inflow Depth = 4.84" for 10-YEAR event
Inflow = 0.72 cfs @ 12.06 hrs, Volume= 0.054 af
Outflow = 0.72 cfs @ 12.06 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min
Primary = 0.72 cfs @ 12.06 hrs, Volume= 0.054 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.13' @ 12.06 hrs
Flood Elev= 41.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	36.70'	**12.0" Round Culvert** L= 56.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 36.70' / 36.30' S= 0.0071 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.70 cfs @ 12.06 hrs HW=37.13' TW=36.42' (Dynamic Tailwater)
1=Culvert (Barrel Controls 0.70 cfs @ 3.24 fps)

Pond 8.4P: DMH 5280



Summary for Pond 9.1P: CB 5673

Inflow Area = 0.839 ac, 63.49% Impervious, Inflow Depth > 4.34" for 10-YEAR event
Inflow = 4.17 cfs @ 12.06 hrs, Volume= 0.304 af
Outflow = 4.10 cfs @ 12.07 hrs, Volume= 0.304 af, Atten= 2%, Lag= 0.2 min
Primary = 4.10 cfs @ 12.07 hrs, Volume= 0.304 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.45' @ 12.09 hrs Surf.Area= 13 sf Storage= 36 cf
Flood Elev= 38.70' Surf.Area= 38 sf Storage= 39 cf

Plug-Flow detention time= 0.3 min calculated for 0.304 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (805.1 - 804.8)

Volume	Invert	Avail.Storage	Storage Description
#1	35.60'	39 cf	**4.00'D x 3.10'H Vertical Cone/Cylinder**
#2	38.70'	3,149 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		3,188 cf	Total Available Storage

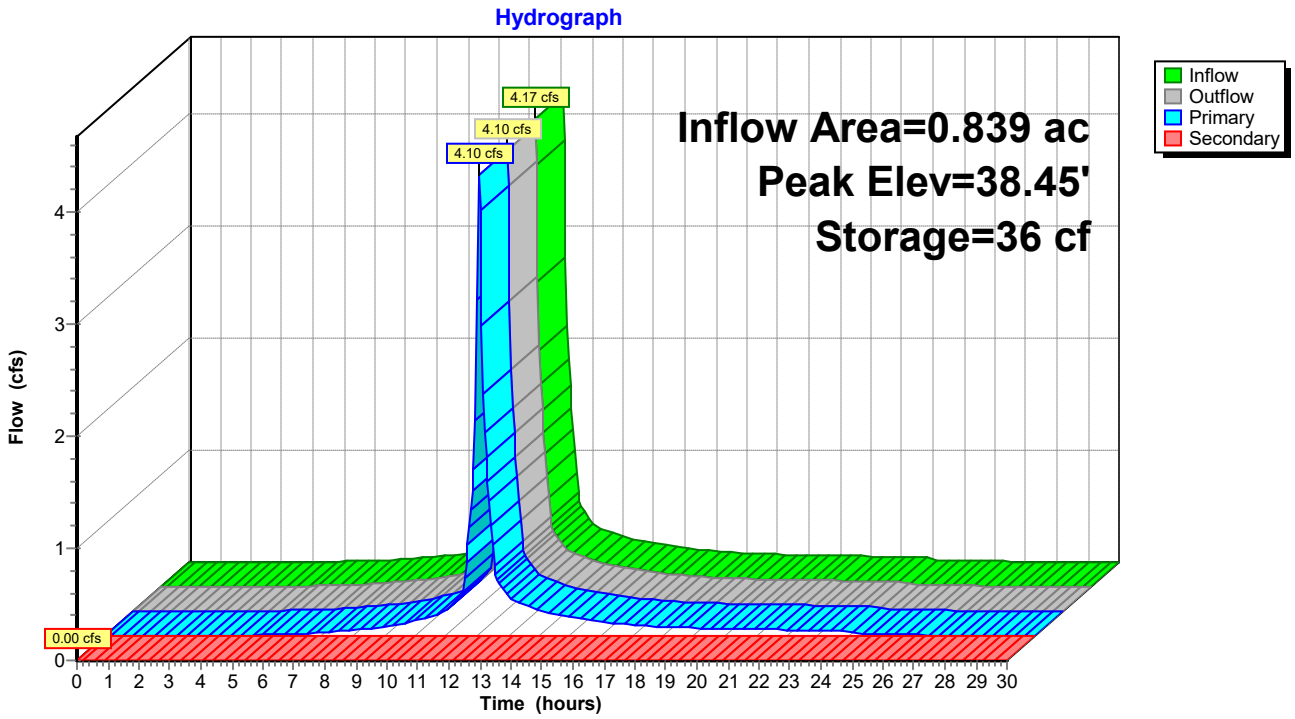
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.70	25	0.0	0	0	25
39.00	220	100.0	32	32	220
39.95	7,200	100.0	2,748	2,780	7,202
40.00	7,564	100.0	369	3,149	7,567

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**12.0" Round Culvert** L= 26.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.60' S= 0.0000 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	39.95'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.36 cfs @ 12.07 hrs HW=38.21' TW=37.43' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.36 cfs @ 4.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.60' TW=34.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9.1P: CB 5673



Summary for Pond 9.2P: DMH 5677

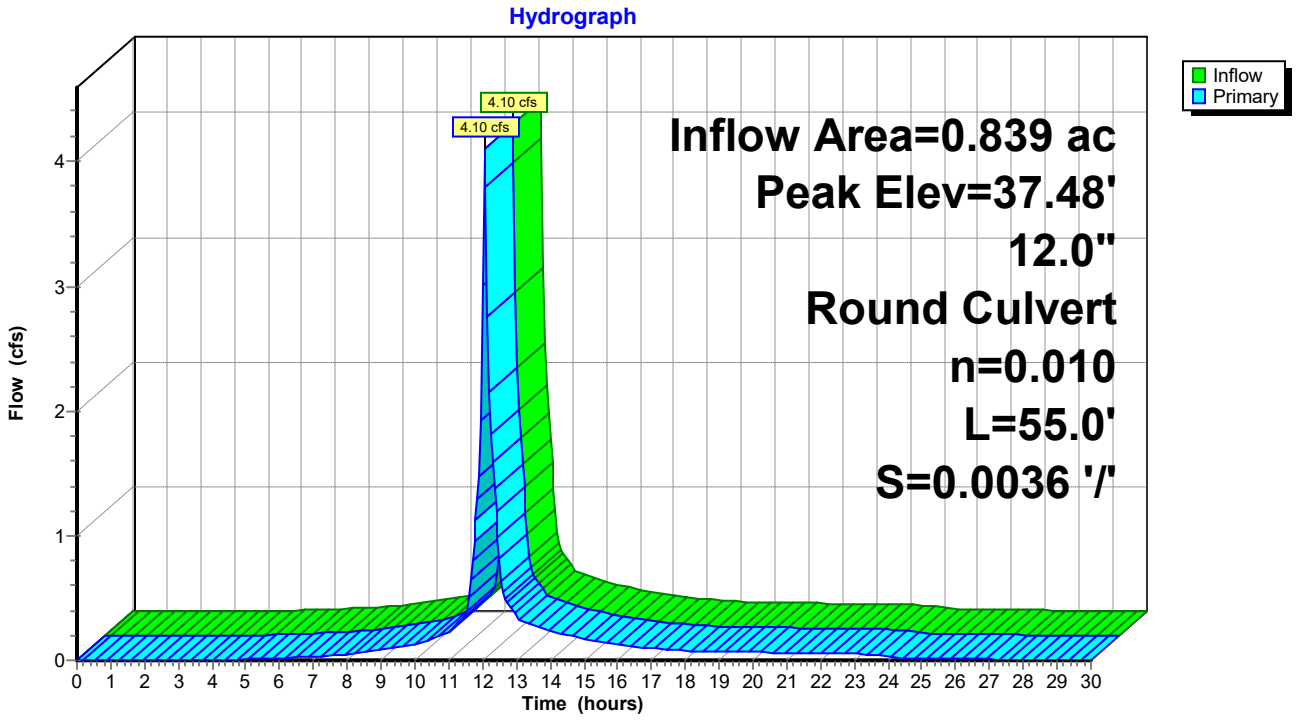
Inflow Area = 0.839 ac, 63.49% Impervious, Inflow Depth > 4.34" for 10-YEAR event
Inflow = 4.10 cfs @ 12.07 hrs, Volume= 0.304 af
Outflow = 4.10 cfs @ 12.07 hrs, Volume= 0.304 af, Atten= 0%, Lag= 0.0 min
Primary = 4.10 cfs @ 12.07 hrs, Volume= 0.304 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.48' @ 12.07 hrs
Flood Elev= 39.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	35.60'	**12.0" Round Culvert** L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 35.60' / 35.40' S= 0.0036 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.79 cfs @ 12.07 hrs HW=37.43' TW=36.42' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.79 cfs @ 4.82 fps)

Pond 9.2P: DMH 5677



Summary for Pond 10P: CB 5238

Inflow Area = 0.116 ac, 77.81% Impervious, Inflow Depth = 4.77" for 10-YEAR event
Inflow = 0.64 cfs @ 12.06 hrs, Volume= 0.046 af
Outflow = 0.64 cfs @ 12.06 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.1 min
Primary = 0.64 cfs @ 12.06 hrs, Volume= 0.046 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 37.50' @ 12.07 hrs Surf.Area= 13 sf Storage= 5 cf
Flood Elev= 40.80' Surf.Area= 13 sf Storage= 46 cf

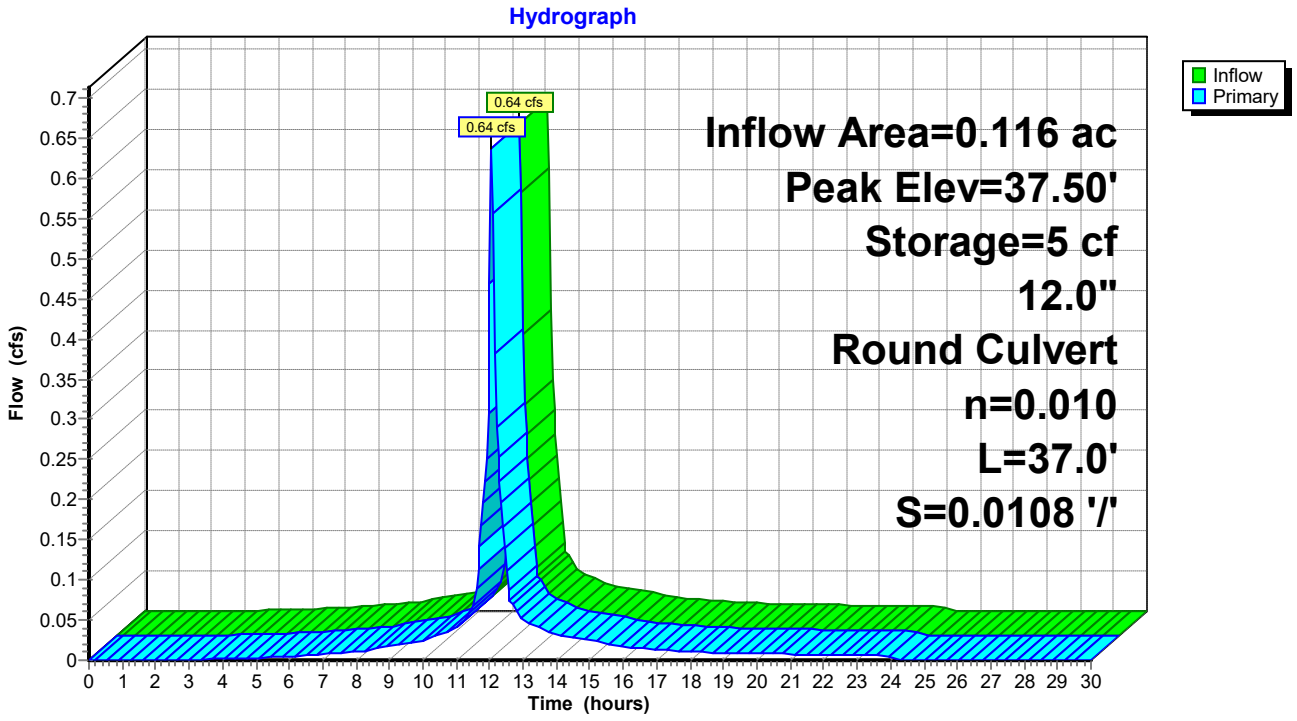
Plug-Flow detention time= 0.8 min calculated for 0.046 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (773.7 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1	37.10'	46 cf	**4.00'D x 3.70'H Vertical Cone/Cylinder**

Device	Routing	Invert	Outlet Devices
#1	Primary	37.10'	**12.0" Round Culvert** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.10' / 36.70' S= 0.0108 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.06 hrs HW=37.50' TW=37.13' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.59 cfs @ 3.00 fps)

Pond 10P: CB 5238



Summary for Pond 11P: Bioretention Cell #1

Inflow Area = 0.322 ac, 27.51% Impervious, Inflow Depth = 3.50" for 10-YEAR event
Inflow = 1.29 cfs @ 12.09 hrs, Volume= 0.094 af
Outflow = 0.87 cfs @ 12.19 hrs, Volume= 0.090 af, Atten= 32%, Lag= 6.0 min
Primary = 0.87 cfs @ 12.19 hrs, Volume= 0.090 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 39.50' Surf.Area= 888 sf Storage= 133 cf
Peak Elev= 40.39' @ 12.19 hrs Surf.Area= 1,333 sf Storage= 1,118 cf (985 cf above start)
Flood Elev= 41.00' Surf.Area= 1,690 sf Storage= 2,032 cf (1,898 cf above start)

Plug-Flow detention time= 108.4 min calculated for 0.087 af (93% of inflow)
Center-of-Mass det. time= 62.3 min (876.8 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1	38.00'	2,032 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

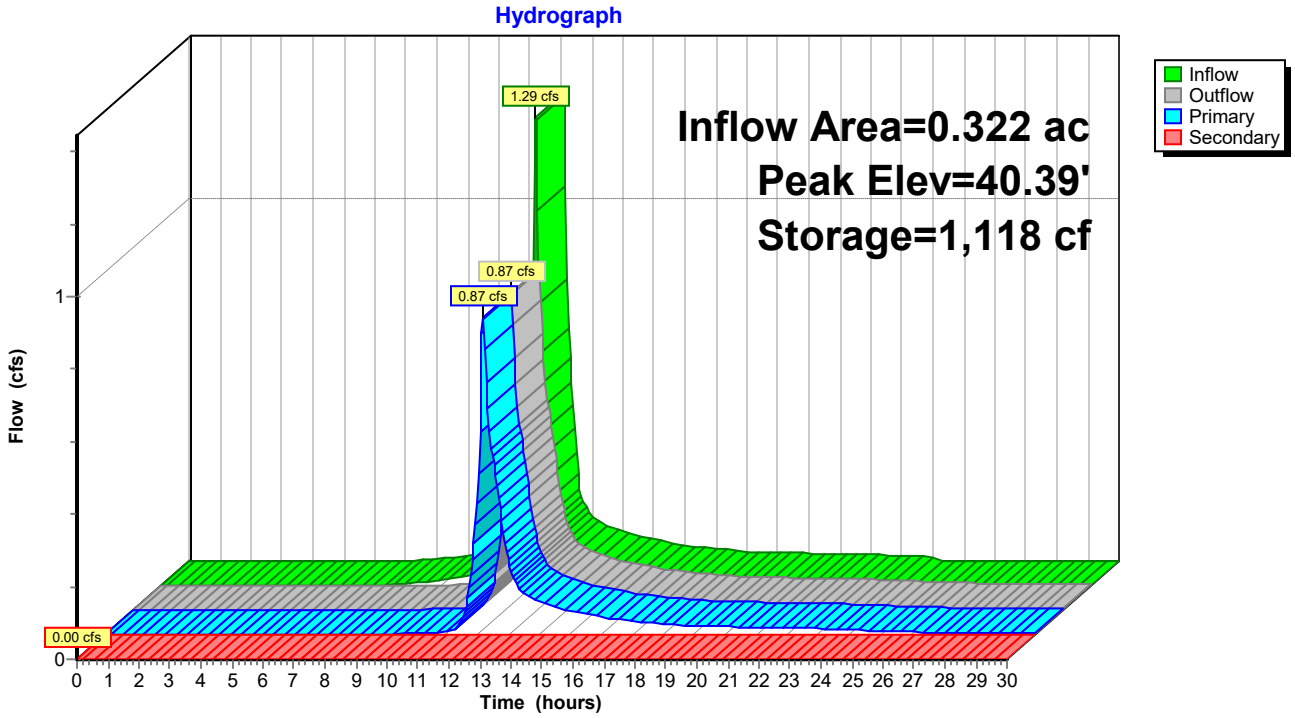
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.00	888	0.0	0	0	888
39.50	888	10.0	133	133	1,046
40.00	1,123	100.0	502	635	1,288
41.00	1,690	100.0	1,397	2,032	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 36.90' S= 0.0053 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	37.00'	**6.0" Vert. Orifice/Grate (Underdrain)** C= 0.600
#3	Device 2	39.50'	**2.500 in/hr Exfiltration through Media over Wetted area above 39.50'** Excluded Wetted area = 1,046 sf Phase-In= 0.01'
#4	Device 1	40.30'	**12.0" Horiz. Orifice/Grate (Yard Drain)** C= 0.600 Limited to weir flow at low heads
#5	Secondary	40.50'	**4.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Device 1	39.80'	**4.0" Vert. Orifice/Grate (Hole in Yard Drain) X 2.00** C= 0.600

Primary OutFlow Max=0.86 cfs @ 12.19 hrs HW=40.39' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.86 cfs of 6.43 cfs potential flow)
  - **2=Orifice/Grate (Underdrain)** (Passes 0.03 cfs of 1.68 cfs potential flow)
    - **3=Exfiltration through Media** (Exfiltration Controls 0.03 cfs)
  - **4=Orifice/Grate (Yard Drain)** (Weir Controls 0.29 cfs @ 0.99 fps)
  - **6=Orifice/Grate (Hole in Yard Drain)** (Orifice Controls 0.55 cfs @ 3.14 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=39.50' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: Bioretention Cell #1

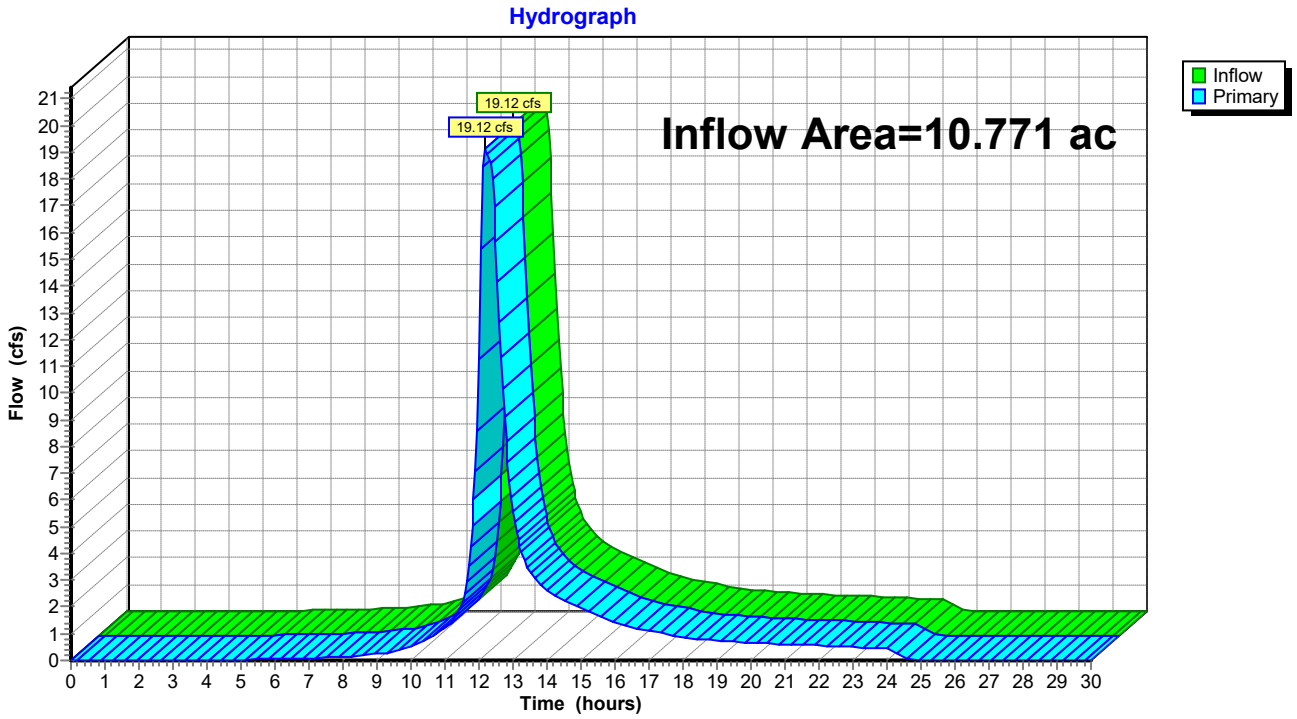


Summary for Link POA 1: Point of Analysis #1

Inflow Area = 10.771 ac, 17.90% Impervious, Inflow Depth > 2.96" for 10-YEAR event
Inflow = 19.12 cfs @ 12.15 hrs, Volume= 2.660 af
Primary = 19.12 cfs @ 12.15 hrs, Volume= 2.660 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 1: Point of Analysis #1

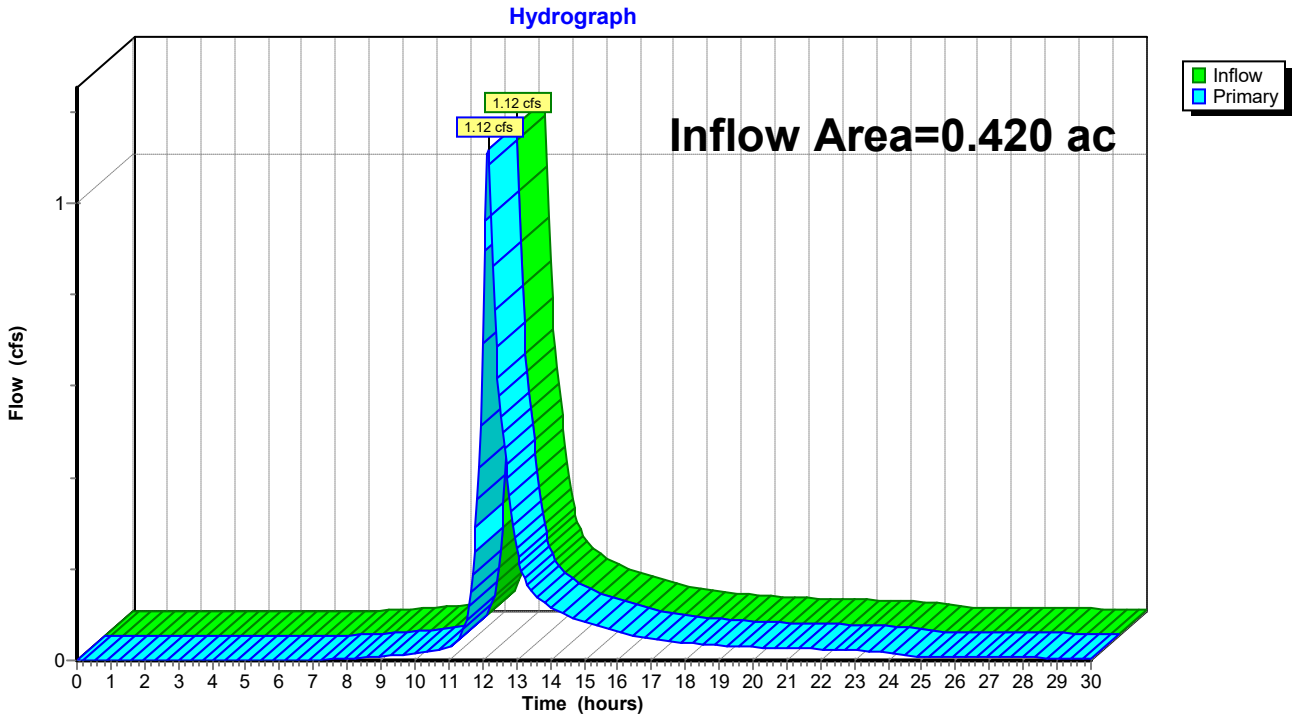


Summary for Link POA 2: Point of Analysis #2

Inflow Area = 0.420 ac, 30.60% Impervious, Inflow Depth > 3.46" for 10-YEAR event
Inflow = 1.12 cfs @ 12.17 hrs, Volume= 0.121 af
Primary = 1.12 cfs @ 12.17 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 2: Point of Analysis #2

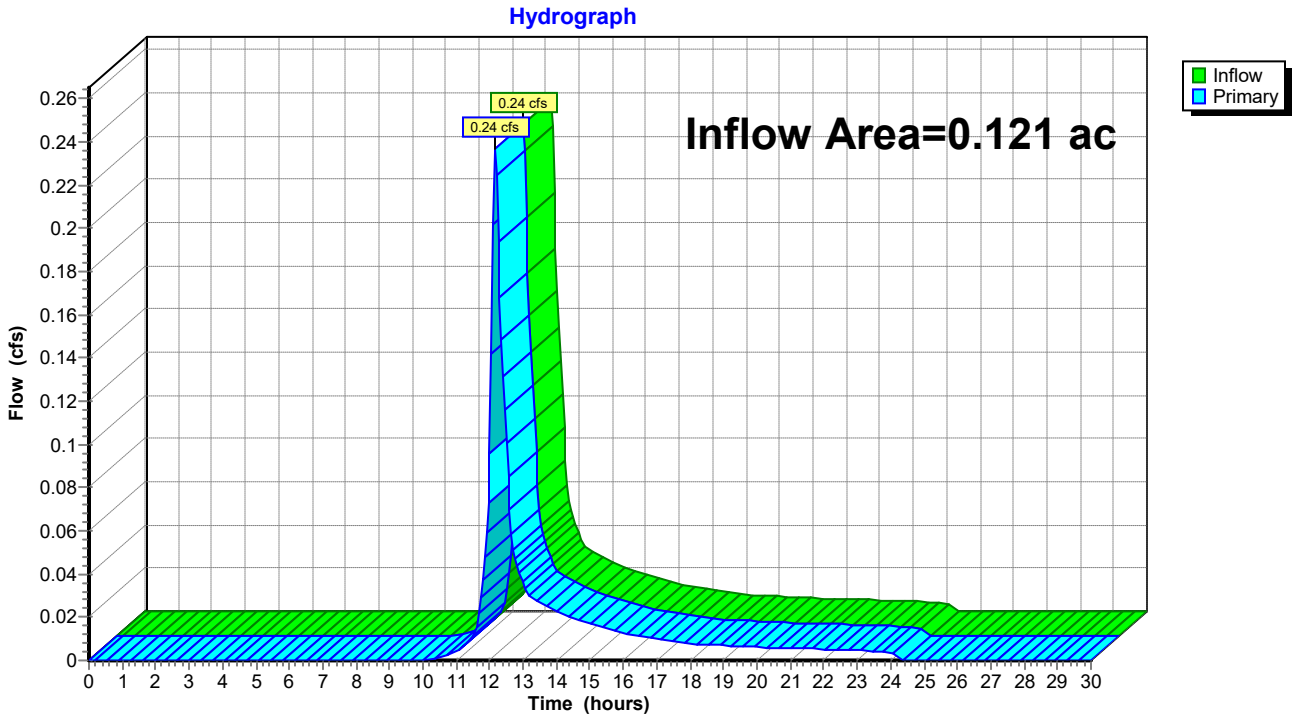


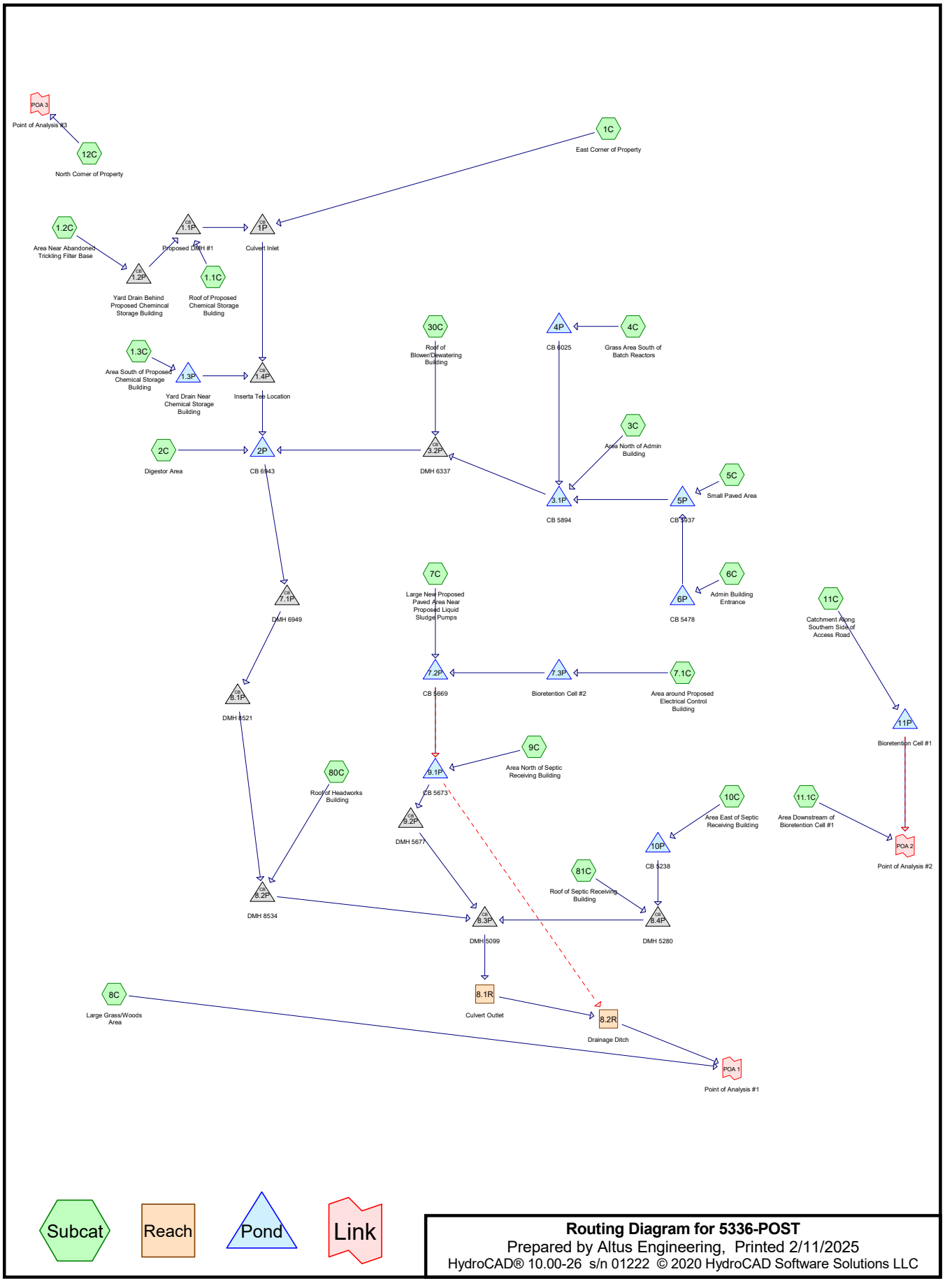
Summary for Link POA 3: Point of Analysis #3

Inflow Area = 0.121 ac, 0.00% Impervious, Inflow Depth = 2.05" for 10-YEAR event
Inflow = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af
Primary = 0.24 cfs @ 12.16 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link POA 3: Point of Analysis #3





Routing Diagram for 5336-POST
Prepared by Altus Engineering, Printed 2/11/2025

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1.1C: Roof of Proposed Runoff Area=1,956 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.30 cfs 0.026 af

Subcatchment 1.2C: Area Near Abandoned Runoff Area=5,039 sf 51.78% Impervious Runoff Depth=5.43"
Flow Length=132' Tc=4.0 min CN=86 Runoff=0.75 cfs 0.052 af

Subcatchment 1.3C: Area South of Runoff Area=3,746 sf 66.58% Impervious Runoff Depth=5.89"
Flow Length=70' Tc=4.0 min CN=90 Runoff=0.59 cfs 0.042 af

Subcatchment 1C: East Corner of Property Runoff Area=70,591 sf 20.00% Impervious Runoff Depth=4.10"
Flow Length=471' Tc=10.9 min CN=74 Runoff=6.57 cfs 0.554 af

Subcatchment 2C: Digestor Area Runoff Area=16,861 sf 58.94% Impervious Runoff Depth=5.66"
Flow Length=187' Tc=10.4 min CN=88 Runoff=2.10 cfs 0.183 af

Subcatchment 3C: Area North of Admin Runoff Area=8,816 sf 73.64% Impervious Runoff Depth=6.12"
Flow Length=102' Tc=10.2 min CN=92 Runoff=1.16 cfs 0.103 af

Subcatchment 4C: Grass Area South of Runoff Area=7,162 sf 8.74% Impervious Runoff Depth=4.32"
Flow Length=89' Tc=4.0 min CN=76 Runoff=0.87 cfs 0.059 af

Subcatchment 5C: Small Paved Area Runoff Area=789 sf 100.00% Impervious Runoff Depth=6.83"
Flow Length=34' Slope=0.0280 '/' Tc=4.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment 6C: Admin Building Entrance Runoff Area=1,827 sf 58.73% Impervious Runoff Depth=5.66"
Flow Length=43' Tc=4.0 min CN=88 Runoff=0.28 cfs 0.020 af

Subcatchment 7.1C: Area around Proposed Runoff Area=4,903 sf 60.94% Impervious Runoff Depth=5.78"
Flow Length=67' Tc=4.0 min CN=89 Runoff=0.76 cfs 0.054 af

Subcatchment 7C: Large New Proposed Runoff Area=23,776 sf 56.78% Impervious Runoff Depth=5.66"
Flow Length=220' Tc=4.0 min CN=88 Runoff=3.63 cfs 0.258 af

Subcatchment 8C: Large Grass/Woods Runoff Area=304,384 sf 3.40% Impervious Runoff Depth=3.78"
Flow Length=1,225' Tc=28.0 min CN=71 Runoff=18.02 cfs 2.203 af

Subcatchment 9C: Area North of Septic Runoff Area=7,887 sf 85.28% Impervious Runoff Depth=6.36"
Flow Length=134' Tc=4.0 min CN=94 Runoff=1.29 cfs 0.096 af

Subcatchment 10C: Area East of Septic Runoff Area=5,066 sf 77.81% Impervious Runoff Depth=6.24"
Flow Length=126' Tc=4.0 min CN=93 Runoff=0.82 cfs 0.060 af

Subcatchment 11.1C: Area Downstream of Runoff Area=4,266 sf 40.74% Impervious Runoff Depth=5.21"
Flow Length=107' Tc=4.0 min CN=84 Runoff=0.61 cfs 0.042 af

Subcatchment 11C: Catchment Along Runoff Area=14,015 sf 27.51% Impervious Runoff Depth=4.87"
Flow Length=315' Tc=6.0 min CN=81 Runoff=1.77 cfs 0.131 af

Subcatchment 12C: North Corner of Property Runoff Area=5,268 sf 0.00% Impervious Runoff Depth=3.16"
Flow Length=60' Slope=0.0330 '/' Tc=10.9 min CN=65 Runoff=0.37 cfs 0.032 af

Subcatchment 30C: Roof of Runoff Area=3,334 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.52 cfs 0.044 af

Subcatchment 80C: Roof of Headworks Runoff Area=2,309 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.36 cfs 0.030 af

Subcatchment 81C: Roof of Septic Runoff Area=745 sf 100.00% Impervious Runoff Depth=6.83"
Tc=6.0 min CN=98 Runoff=0.12 cfs 0.010 af

Reach 8.1R: Culvert Outlet Avg. Flow Depth=1.01' Max Vel=3.44 fps Inflow=17.50 cfs 1.598 af
n=0.030 L=73.0' S=0.0082 '/' Capacity=38.43 cfs Outflow=17.37 cfs 1.598 af

Reach 8.2R: Drainage Ditch Avg. Flow Depth=0.84' Max Vel=3.07 fps Inflow=17.37 cfs 1.598 af
n=0.030 L=95.0' S=0.0095 '/' Capacity=127.81 cfs Outflow=17.47 cfs 1.598 af

Pond 1.1P: Proposed DMH #1 Peak Elev=40.56' Inflow=1.04 cfs 0.078 af
12.0" Round Culvert n=0.010 L=32.0' S=0.0047 '/' Outflow=1.04 cfs 0.078 af

Pond 1.2P: Yard Drain Behind Proposed Chemincal Storage Peak Elev=42.97' Inflow=0.75 cfs 0.052 af
Outflow=0.75 cfs 0.052 af

Pond 1.3P: Yard Drain Near Chemical Storage Peak Elev=40.95' Storage=5 cf Inflow=0.59 cfs 0.042 af
Outflow=0.58 cfs 0.042 af

Pond 1.4P: Inserta Tee Location Peak Elev=38.91' Inflow=7.63 cfs 0.674 af
36.0" Round Culvert n=0.011 L=99.0' S=0.0030 '/' Outflow=7.63 cfs 0.674 af

Pond 1P: Culvert Inlet Peak Elev=39.22' Inflow=7.26 cfs 0.632 af
36.0" Round Culvert n=0.011 L=112.0' S=0.0062 '/' Outflow=7.26 cfs 0.632 af

Pond 2P: CB 6943 Peak Elev=38.59' Storage=20 cf Inflow=12.21 cfs 1.093 af
36.0" Round Culvert n=0.011 L=94.0' S=0.0032 '/' Outflow=12.21 cfs 1.093 af

Pond 3.1P: CB 5894 Peak Elev=39.81' Storage=15 cf Inflow=2.24 cfs 0.193 af
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=2.21 cfs 0.193 af

Pond 3.2P: DMH 6337 Peak Elev=39.42' Inflow=2.73 cfs 0.236 af
12.0" Round Culvert n=0.013 L=92.0' S=0.0022 '/' Outflow=2.73 cfs 0.236 af

Pond 4P: CB 6025 Peak Elev=39.92' Storage=8 cf Inflow=0.87 cfs 0.059 af
12.0" Round Culvert n=0.013 L=76.0' S=0.0066 '/' Outflow=0.87 cfs 0.059 af

Pond 5P: CB 5937 Peak Elev=39.84' Storage=7 cf Inflow=0.41 cfs 0.030 af
8.0" Round Culvert n=0.010 L=51.0' S=0.0098 '/' Outflow=0.41 cfs 0.030 af

Pond 6P: CB 5478 Peak Elev=40.10' Storage=4 cf Inflow=0.28 cfs 0.020 af
8.0" Round Culvert n=0.010 L=43.0' S=0.0093 '/' Outflow=0.28 cfs 0.020 af

Pond 7.1P: DMH 6949 Peak Elev=37.91' Inflow=12.21 cfs 1.093 af
36.0" Round Culvert n=0.010 L=64.0' S=0.0172 '/' Outflow=12.21 cfs 1.093 af

Pond 7.2P: CB 5669 Peak Elev=39.36' Storage=210 cf Inflow=4.29 cfs 0.309 af
Primary=4.16 cfs 0.295 af Secondary=1.21 cfs 0.013 af Outflow=4.13 cfs 0.309 af

Pond 7.3P: Bioretention Cell #2 Peak Elev=40.96' Storage=560 cf Inflow=0.76 cfs 0.054 af
Outflow=0.70 cfs 0.051 af

Pond 8.1P: DMH 8521 Peak Elev=37.36' Inflow=12.21 cfs 1.093 af
36.0" Round Culvert n=0.010 L=100.0' S=0.0010 '/' Outflow=12.21 cfs 1.093 af

Pond 8.2P: DMH 8534 Peak Elev=37.10' Inflow=12.61 cfs 1.123 af
36.0" Round Culvert n=0.010 L=96.0' S=0.0021 '/' Outflow=12.61 cfs 1.123 af

Pond 8.3P: DMH 5099 Peak Elev=36.76' Inflow=17.50 cfs 1.598 af
36.0" Round Culvert n=0.011 L=30.0' S=0.0100 '/' Outflow=17.50 cfs 1.598 af

Pond 8.4P: DMH 5280 Peak Elev=37.20' Inflow=0.93 cfs 0.070 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0071 '/' Outflow=0.93 cfs 0.070 af

Pond 9.1P: CB 5673 Peak Elev=39.15' Storage=133 cf Inflow=5.41 cfs 0.404 af
Primary=4.87 cfs 0.404 af Secondary=0.00 cfs 0.000 af Outflow=4.87 cfs 0.404 af

Pond 9.2P: DMH 5677 Peak Elev=38.05' Inflow=4.87 cfs 0.404 af
12.0" Round Culvert n=0.010 L=55.0' S=0.0036 '/' Outflow=4.87 cfs 0.404 af

Pond 10P: CB 5238 Peak Elev=37.57' Storage=6 cf Inflow=0.82 cfs 0.060 af
12.0" Round Culvert n=0.010 L=37.0' S=0.0108 '/' Outflow=0.82 cfs 0.060 af

Pond 11P: Bioretention Cell #1 Peak Elev=40.49' Storage=1,245 cf Inflow=1.77 cfs 0.131 af
Primary=1.47 cfs 0.127 af Secondary=0.00 cfs 0.000 af Outflow=1.47 cfs 0.127 af

Link POA 1: Point of Analysis #1 Inflow=28.08 cfs 3.800 af
Primary=28.08 cfs 3.800 af

Link POA 2: Point of Analysis #2 Inflow=1.85 cfs 0.169 af
Primary=1.85 cfs 0.169 af

Link POA 3: Point of Analysis #3 Inflow=0.37 cfs 0.032 af
Primary=0.37 cfs 0.032 af

Total Runoff Area = 11.312 ac Runoff Volume = 4.008 af Average Runoff Depth = 4.25"
81.82% Pervious = 9.255 ac 18.18% Impervious = 2.056 ac

Section 5

Precipitation Table

ALTUS ENGINEERING

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Metadata for Point

Smoothing	Yes
State	New Hampshire
Location	New Hampshire, United States
Latitude	43.084 degrees North
Longitude	70.796 degrees West
Elevation	10 feet
Date/Time	Mon Jan 06 2025 17:34:56 GMT-0500 (Eastern Standard Time)

Add 15% to each storm
2 year - 3.68 inches
5 year - 4.66 inches
10 year - 5.58 inches
25 year - 7.07 inches
50 year - 8.46 inches
100 year - 10.14 inches

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	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.02	2.65	2.91	**1yr**	2.35	2.80	3.20	3.93	4.53	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.51	1.93	2.48	3.20	3.55	**2yr**	2.83	3.42	3.92	4.66	5.30	**2yr**
5yr	0.37	0.58	0.73	0.97	1.24	1.60	**5yr**	1.07	1.46	1.88	2.42	3.13	4.05	4.56	**5yr**	3.59	4.38	5.01	5.91	6.67	**5yr**
10yr	0.41	0.64	0.81	1.11	1.44	1.88	**10yr**	1.24	1.72	2.22	2.88	3.73	4.85	5.50	**10yr**	4.29	5.29	6.05	7.07	7.95	**10yr**
25yr	0.47	0.75	0.96	1.32	1.76	2.32	**25yr**	1.52	2.13	2.75	3.61	4.71	6.15	7.07	**25yr**	5.44	6.80	7.75	8.98	10.01	**25yr**
50yr	0.53	0.85	1.09	1.52	2.05	2.73	**50yr**	1.77	2.51	3.26	4.29	5.63	7.36	8.54	**50yr**	6.52	8.22	9.35	10.75	11.93	**50yr**
100yr	0.59	0.95	1.23	1.75	2.39	3.22	**100yr**	2.06	2.95	3.86	5.11	6.73	8.82	10.33	**100yr**	7.80	9.94	11.29	12.89	14.22	**100yr**
200yr	0.66	1.08	1.40	2.01	2.78	3.78	**200yr**	2.40	3.48	4.56	6.07	8.03	10.57	12.50	**200yr**	9.35	12.02	13.63	15.45	16.96	**200yr**
500yr	0.78	1.29	1.68	2.44	3.42	4.69	**500yr**	2.95	4.33	5.68	7.62	10.14	13.43	16.08	**500yr**	11.88	15.46	17.50	19.65	21.43	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.89	**1yr**	0.63	0.87	0.92	1.32	1.66	2.22	2.49	**1yr**	1.97	2.40	2.84	3.17	3.88	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.44	**2yr**	2.70	3.31	3.81	4.53	5.05	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.13	2.74	3.78	4.18	**5yr**	3.34	4.02	4.69	5.51	6.22	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.40	3.07	4.36	4.85	**10yr**	3.86	4.67	5.42	6.39	7.17	**10yr**
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.34	1.86	2.10	2.78	3.56	4.68	5.89	**25yr**	4.14	5.66	6.62	7.77	8.66	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.10	3.97	5.29	6.80	**50yr**	4.68	6.54	7.70	9.01	9.99	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.42	2.63	3.45	4.40	5.94	7.86	**100yr**	5.25	7.56	8.95	10.47	11.52	**100yr**
200yr	0.59	0.89	1.13	1.63	2.27	2.82	**200yr**	1.96	2.75	2.93	3.84	4.86	6.65	9.08	**200yr**	5.88	8.73	10.40	12.17	13.31	**200yr**
500yr	0.68	1.02	1.31	1.90	2.71	3.37	**500yr**	2.34	3.29	3.40	4.40	5.56	7.72	10.98	**500yr**	6.83	10.55	12.68	14.88	16.10	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.76	1.06	1.25	1.75	2.21	2.99	3.14	**1yr**	2.64	3.02	3.57	4.36	5.03	**1yr**
2yr	0.33	0.52	0.64	0.86	1.06	1.26	**2yr**	0.92	1.24	1.48	1.96	2.51	3.42	3.68	**2yr**	3.02	3.54	4.06	4.81	5.62	**2yr**
5yr	0.40	0.61	0.76	1.04	1.33	1.61	**5yr**	1.15	1.58	1.88	2.53	3.24	4.32	4.93	**5yr**	3.82	4.74	5.35	6.33	7.11	**5yr**
10yr	0.46	0.71	0.88	1.24	1.60	1.96	**10yr**	1.38	1.92	2.27	3.10	3.93	5.32	6.16	**10yr**	4.71	5.92	6.76	7.79	8.70	**10yr**
25yr	0.57	0.87	1.08	1.54	2.02	2.55	**25yr**	1.75	2.49	2.94	4.05	5.11	7.75	8.27	**25yr**	6.86	7.95	9.04	10.26	11.34	**25yr**
50yr	0.66	1.01	1.26	1.80	2.43	3.09	**50yr**	2.10	3.02	3.57	4.97	6.25	9.70	10.36	**50yr**	8.58	9.96	11.29	12.63	13.88	**50yr**
100yr	0.78	1.17	1.47	2.13	2.91	3.76	**100yr**	2.52	3.67	4.34	6.11	7.66	12.13	12.98	**100yr**	10.74	12.48	14.10	15.57	16.98	**100yr**
200yr	0.91	1.37	1.73	2.50	3.49	4.58	**200yr**	3.01	4.48	5.29	7.51	9.38	15.21	16.28	**200yr**	13.46	15.65	17.62	19.18	20.80	**200yr**
500yr	1.12	1.67	2.15	3.12	4.44	5.93	**500yr**	3.83	5.80	6.86	9.91	12.30	20.54	21.96	**500yr**	18.18	21.11	23.67	25.28	27.20	**500yr**

Powered by ACIS Northeast Regional Climate Center

Section 6

NRCS Soils Report

ALTUS ENGINEERING

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for Rockingham County, New Hampshire

February 11, 2025

Preface

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

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

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

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

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

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

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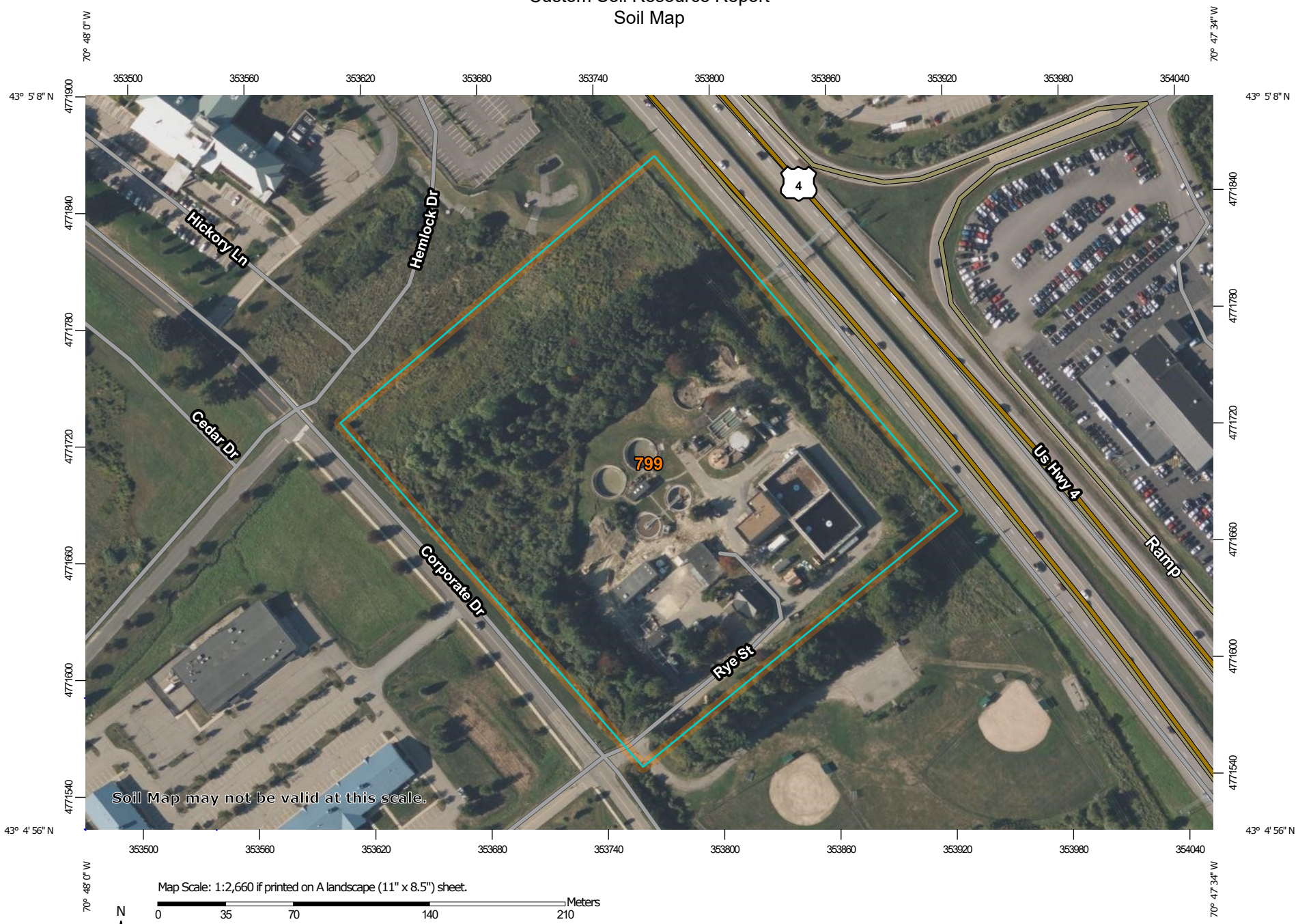
Contents

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,660 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Rockingham County, New Hampshire
Survey Area Data: Version 27, Sep 3, 2024

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
799	Urban land-Canton complex, 3 to 15 percent slopes	12.4	100.0%
Totals for Area of Interest		**12.4**	**100.0%**

Map Unit Descriptions

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

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

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

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

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

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

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

Rockingham County, New Hampshire

799—Urban land-Canton complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9cq0
Elevation: 0 to 1,000 feet
Mean annual precipitation: 42 to 46 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 120 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Canton and similar soils: 20 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canton

Setting

Parent material: Till

Typical profile

H1 - 0 to 5 inches: gravelly fine sandy loam
H2 - 5 to 21 inches: gravelly fine sandy loam
H3 - 21 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Udorthents

Percent of map unit: 5 percent
Hydric soil rating: No

Boxford and eldridge

Percent of map unit: 4 percent
Hydric soil rating: No

Squamscott and scitico

Percent of map unit: 4 percent
Landform: Marine terraces
Hydric soil rating: Yes

Scituate and newfields

Percent of map unit: 4 percent
Hydric soil rating: No

Chatfield

Percent of map unit: 4 percent
Hydric soil rating: No

Walpole

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Section 7

BMP and Riprap Sizing Calculations

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NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention Cell 1 - Near WWTP Entrance**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.32	ac	A = Area draining to the practice	
0.09	ac	A_I = Impervious area draining to the practice	
0.28	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.30	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.10	ac-in	WQV= 1" x Rv x A	
348	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
87	cf	25% x WQV (check calc for sediment forebay volume)	
261	cf	75% x WQV (check calc for surface sand filter volume)	
	-	Method of Pretreatment? (not required for clean or roof runoff)	
-	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
-	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
39.73	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.02	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
9.66	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
38.00	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
37.00	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.00	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
38.00	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
38.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
40.54	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
41.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
-	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
-	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
420	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	TBD	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	TBD	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
-	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
-	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Summary for Pond 11P: Bioretention Cell #1

Inflow Area = 0.322 ac, 27.51% Impervious, Inflow Depth = 6.18" for 50-YEAR event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.166 af
Outflow = 1.98 cfs @ 12.14 hrs, Volume= 0.162 af, Atten= 11%, Lag= 2.8 min
Primary = 1.90 cfs @ 12.14 hrs, Volume= 0.161 af
Secondary = 0.08 cfs @ 12.14 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 39.50' Surf.Area= 888 sf Storage= 133 cf
Peak Elev= 40.54' @ 12.14 hrs Surf.Area= 1,417 sf Storage= 1,323 cf (1,190 cf above start)
Flood Elev= 41.00' Surf.Area= 1,690 sf Storage= 2,032 cf (1,898 cf above start)

Plug-Flow detention time= 73.3 min calculated for 0.158 af (96% of inflow)
Center-of-Mass det. time= 44.3 min (842.8 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	38.00'	2,032 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.00	888	0.0	0	0	888
39.50	888	10.0	133	133	1,046
40.00	1,123	100.0	502	635	1,288
41.00	1,690	100.0	1,397	2,032	1,870

Device	Routing	Invert	Outlet Devices
#1	Primary	37.00'	**12.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.00' / 36.90' S= 0.0053 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	37.00'	**6.0" Vert. Orifice/Grate (Underdrain)** C= 0.600
#3	Device 2	39.50'	**2.500 in/hr Exfiltration through Media over Wetted area above 39.50'** Excluded Wetted area = 1,046 sf Phase-In= 0.01'
#4	Device 1	40.30'	**12.0" Horiz. Orifice/Grate (Yard Drain)** C= 0.600 Limited to weir flow at low heads
#5	Secondary	40.50'	**4.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#6	Device 1	39.80'	**4.0" Vert. Orifice/Grate (Hole in Yard Drain) X 2.00** C= 0.600

Primary OutFlow Max=1.87 cfs @ 12.14 hrs HW=40.54' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.87 cfs of 6.59 cfs potential flow)
  - **2=Orifice/Grate (Underdrain)** (Passes 0.03 cfs of 1.71 cfs potential flow)
    - **3=Exfiltration through Media** (Exfiltration Controls 0.03 cfs)
  - **4=Orifice/Grate (Yard Drain)** (Weir Controls 1.20 cfs @ 1.60 fps)
  - **6=Orifice/Grate (Hole in Yard Drain)** (Orifice Controls 0.64 cfs @ 3.64 fps)

Secondary OutFlow Max=0.07 cfs @ 12.14 hrs HW=40.54' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.46 fps)

Stage-Area-Storage for Pond 11P: Bioretention Cell #1

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
38.00	888	888	0
38.01	888	889	1
38.02	888	890	2
38.03	888	891	3
38.04	888	892	4
38.05	888	893	4
38.06	888	894	5
38.07	888	895	6
38.08	888	896	7
38.09	888	898	8
38.10	888	899	9
38.11	888	900	10
38.12	888	901	11
38.13	888	902	12
38.14	888	903	12
38.15	888	904	13
38.16	888	905	14
38.17	888	906	15
38.18	888	907	16
38.19	888	908	17
38.20	888	909	18
38.21	888	910	19
38.22	888	911	20
38.23	888	912	20
38.24	888	913	21
38.25	888	914	22
38.26	888	915	23
38.27	888	917	24
38.28	888	918	25
38.29	888	919	26
38.30	888	920	27
38.31	888	921	28
38.32	888	922	28
38.33	888	923	29
38.34	888	924	30
38.35	888	925	31
38.36	888	926	32
38.37	888	927	33
38.38	888	928	34
38.39	888	929	35
38.40	888	930	36
38.41	888	931	36
38.42	888	932	37
38.43	888	933	38
38.44	888	934	39
38.45	888	936	40
38.46	888	937	41
38.47	888	938	42
38.48	888	939	43
38.49	888	940	44
38.50	888	941	44
38.51	888	942	45

Stage-Area-Storage for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
38.52	888	943	46
38.53	888	944	47
38.54	888	945	48
38.55	888	946	49
38.56	888	947	50
38.57	888	948	51
38.58	888	949	52
38.59	888	950	52
38.60	888	951	53
38.61	888	952	54
38.62	888	953	55
38.63	888	955	56
38.64	888	956	57
38.65	888	957	58
38.66	888	958	59
38.67	888	959	59
38.68	888	960	60
38.69	888	961	61
38.70	888	962	62
38.71	888	963	63
38.72	888	964	64
38.73	888	965	65
38.74	888	966	66
38.75	888	967	67
38.76	888	968	67
38.77	888	969	68
38.78	888	970	69
38.79	888	971	70
38.80	888	973	71
38.81	888	974	72
38.82	888	975	73
38.83	888	976	74
38.84	888	977	75
38.85	888	978	75
38.86	888	979	76
38.87	888	980	77
38.88	888	981	78
38.89	888	982	79
38.90	888	983	80
38.91	888	984	81
38.92	888	985	82
38.93	888	986	83
38.94	888	987	83
38.95	888	988	84
38.96	888	989	85
38.97	888	990	86
38.98	888	992	87
38.99	888	993	88
39.00	888	994	89
39.01	888	995	90
39.02	888	996	91
39.03	888	997	91

Stage-Area-Storage for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
39.04	888	998	92
39.05	888	999	93
39.06	888	1,000	94
39.07	888	1,001	95
39.08	888	1,002	96
39.09	888	1,003	97
39.10	888	1,004	98
39.11	888	1,005	99
39.12	888	1,006	99
39.13	888	1,007	100
39.14	888	1,008	101
39.15	888	1,009	102
39.16	888	1,011	103
39.17	888	1,012	104
39.18	888	1,013	105
39.19	888	1,014	106
39.20	888	1,015	107
39.21	888	1,016	107
39.22	888	1,017	108
39.23	888	1,018	109
39.24	888	1,019	110
39.25	888	1,020	111
39.26	888	1,021	112
39.27	888	1,022	113
39.28	888	1,023	114
39.29	888	1,024	115
39.30	888	1,025	115
39.31	888	1,026	116
39.32	888	1,027	117
39.33	888	1,028	118
39.34	888	1,030	119
39.35	888	1,031	120
39.36	888	1,032	121
39.37	888	1,033	122
39.38	888	1,034	123
39.39	888	1,035	123
39.40	888	1,036	124
39.41	888	1,037	125
39.42	888	1,038	126
39.43	888	1,039	127
39.44	888	1,040	128
39.45	888	1,041	129
39.46	888	1,042	130
39.47	888	1,043	131
39.48	888	1,044	131
39.49	888	1,045	132
39.50	888	1,046	133
39.51	892	1,051	142
39.52	897	1,056	151
39.53	901	1,060	160
39.54	906	1,065	169
39.55	910	1,069	178

Stage-Area-Storage for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
39.56	915	1,074	187
39.57	919	1,079	196
39.58	924	1,083	206
39.59	928	1,088	215
39.60	933	1,093	224
39.61	937	1,097	234
39.62	942	1,102	243
39.63	946	1,107	252
39.64	951	1,111	262
39.65	956	1,116	271
39.66	960	1,121	281
39.67	965	1,125	291
39.68	969	1,130	300
39.69	974	1,135	310
39.70	979	1,140	320
39.71	983	1,144	330
39.72	988	1,149	339
39.73	993	1,154	349
39.74	997	1,159	359
39.75	1,002	1,164	369
39.76	1,007	1,169	379
39.77	1,011	1,173	389
39.78	1,016	1,178	400
39.79	1,021	1,183	410
39.80	1,026	1,188	420
39.81	1,030	1,193	430
39.82	1,035	1,198	441
39.83	1,040	1,203	451
39.84	1,045	1,208	461
39.85	1,050	1,213	472
39.86	1,054	1,218	482
39.87	1,059	1,223	493
39.88	1,064	1,227	504
39.89	1,069	1,232	514
39.90	1,074	1,237	525
39.91	1,079	1,242	536
39.92	1,084	1,247	547
39.93	1,088	1,253	557
39.94	1,093	1,258	568
39.95	1,098	1,263	579
39.96	1,103	1,268	590
39.97	1,108	1,273	601
39.98	1,113	1,278	612
39.99	1,118	1,283	624
40.00	1,123	1,288	635
40.01	1,128	1,293	646
40.02	1,133	1,299	657
40.03	1,138	1,304	669
40.04	1,143	1,309	680
40.05	1,149	1,314	692
40.06	1,154	1,320	703
40.07	1,159	1,325	715

Calculated WQV Required= 348 cf
Ewqv=39.73

Yard drain (first) outlet is at 39.80
Actual WQV= 420 cf

Stage-Area-Storage for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
40.08	1,164	1,330	726
40.09	1,169	1,336	738
40.10	1,175	1,341	750
40.11	1,180	1,346	761
40.12	1,185	1,352	773
40.13	1,190	1,357	785
40.14	1,195	1,362	797
40.15	1,201	1,368	809
40.16	1,206	1,373	821
40.17	1,211	1,379	833
40.18	1,217	1,384	845
40.19	1,222	1,390	857
40.20	1,227	1,395	870
40.21	1,232	1,400	882
40.22	1,238	1,406	894
40.23	1,243	1,411	907
40.24	1,249	1,417	919
40.25	1,254	1,422	932
40.26	1,259	1,428	944
40.27	1,265	1,434	957
40.28	1,270	1,439	970
40.29	1,276	1,445	982
40.30	1,281	1,450	995
40.31	1,286	1,456	1,008
40.32	1,292	1,461	1,021
40.33	1,297	1,467	1,034
40.34	1,303	1,473	1,047
40.35	1,308	1,478	1,060
40.36	1,314	1,484	1,073
40.37	1,319	1,490	1,086
40.38	1,325	1,495	1,099
40.39	1,330	1,501	1,113
40.40	1,336	1,507	1,126
40.41	1,342	1,512	1,139
40.42	1,347	1,518	1,153
40.43	1,353	1,524	1,166
40.44	1,358	1,530	1,180
40.45	1,364	1,535	1,193
40.46	1,369	1,541	1,207
40.47	1,375	1,547	1,221
40.48	1,381	1,553	1,235
40.49	1,386	1,559	1,248
40.50	1,392	1,564	1,262
40.51	1,398	1,570	1,276
40.52	1,403	1,576	1,290
40.53	1,409	1,582	1,304
40.54	1,415	1,588	1,319
40.55	1,421	1,594	1,333
40.56	1,426	1,599	1,347
40.57	1,432	1,605	1,361
40.58	1,438	1,611	1,376
40.59	1,444	1,617	1,390

Stage-Area-Storage for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
40.60	1,449	1,623	1,404
40.61	1,455	1,629	1,419
40.62	1,461	1,635	1,434
40.63	1,467	1,641	1,448
40.64	1,473	1,647	1,463
40.65	1,478	1,653	1,478
40.66	1,484	1,659	1,492
40.67	1,490	1,665	1,507
40.68	1,496	1,671	1,522
40.69	1,502	1,677	1,537
40.70	1,508	1,683	1,552
40.71	1,514	1,689	1,567
40.72	1,520	1,695	1,583
40.73	1,526	1,701	1,598
40.74	1,531	1,707	1,613
40.75	1,537	1,714	1,628
40.76	1,543	1,720	1,644
40.77	1,549	1,726	1,659
40.78	1,555	1,732	1,675
40.79	1,561	1,738	1,690
40.80	1,567	1,744	1,706
40.81	1,573	1,751	1,722
40.82	1,579	1,757	1,737
40.83	1,585	1,763	1,753
40.84	1,592	1,769	1,769
40.85	1,598	1,775	1,785
40.86	1,604	1,782	1,801
40.87	1,610	1,788	1,817
40.88	1,616	1,794	1,833
40.89	1,622	1,800	1,850
40.90	1,628	1,807	1,866
40.91	1,634	1,813	1,882
40.92	1,640	1,819	1,898
40.93	1,647	1,826	1,915
40.94	1,653	1,832	1,931
40.95	1,659	1,838	1,948
40.96	1,665	1,845	1,965
40.97	1,671	1,851	1,981
40.98	1,678	1,857	1,998
40.99	1,684	1,864	2,015
41.00	**1,690**	**1,870**	**2,032**

Stage-Discharge for Pond 11P: Bioretention Cell #1

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
38.00	0.00	0.00	0.00	38.52	0.00	0.00	0.00
38.01	0.00	0.00	0.00	38.53	0.00	0.00	0.00
38.02	0.00	0.00	0.00	38.54	0.00	0.00	0.00
38.03	0.00	0.00	0.00	38.55	0.00	0.00	0.00
38.04	0.00	0.00	0.00	38.56	0.00	0.00	0.00
38.05	0.00	0.00	0.00	38.57	0.00	0.00	0.00
38.06	0.00	0.00	0.00	38.58	0.00	0.00	0.00
38.07	0.00	0.00	0.00	38.59	0.00	0.00	0.00
38.08	0.00	0.00	0.00	38.60	0.00	0.00	0.00
38.09	0.00	0.00	0.00	38.61	0.00	0.00	0.00
38.10	0.00	0.00	0.00	38.62	0.00	0.00	0.00
38.11	0.00	0.00	0.00	38.63	0.00	0.00	0.00
38.12	0.00	0.00	0.00	38.64	0.00	0.00	0.00
38.13	0.00	0.00	0.00	38.65	0.00	0.00	0.00
38.14	0.00	0.00	0.00	38.66	0.00	0.00	0.00
38.15	0.00	0.00	0.00	38.67	0.00	0.00	0.00
38.16	0.00	0.00	0.00	38.68	0.00	0.00	0.00
38.17	0.00	0.00	0.00	38.69	0.00	0.00	0.00
38.18	0.00	0.00	0.00	38.70	0.00	0.00	0.00
38.19	0.00	0.00	0.00	38.71	0.00	0.00	0.00
38.20	0.00	0.00	0.00	38.72	0.00	0.00	0.00
38.21	0.00	0.00	0.00	38.73	0.00	0.00	0.00
38.22	0.00	0.00	0.00	38.74	0.00	0.00	0.00
38.23	0.00	0.00	0.00	38.75	0.00	0.00	0.00
38.24	0.00	0.00	0.00	38.76	0.00	0.00	0.00
38.25	0.00	0.00	0.00	38.77	0.00	0.00	0.00
38.26	0.00	0.00	0.00	38.78	0.00	0.00	0.00
38.27	0.00	0.00	0.00	38.79	0.00	0.00	0.00
38.28	0.00	0.00	0.00	38.80	0.00	0.00	0.00
38.29	0.00	0.00	0.00	38.81	0.00	0.00	0.00
38.30	0.00	0.00	0.00	38.82	0.00	0.00	0.00
38.31	0.00	0.00	0.00	38.83	0.00	0.00	0.00
38.32	0.00	0.00	0.00	38.84	0.00	0.00	0.00
38.33	0.00	0.00	0.00	38.85	0.00	0.00	0.00
38.34	0.00	0.00	0.00	38.86	0.00	0.00	0.00
38.35	0.00	0.00	0.00	38.87	0.00	0.00	0.00
38.36	0.00	0.00	0.00	38.88	0.00	0.00	0.00
38.37	0.00	0.00	0.00	38.89	0.00	0.00	0.00
38.38	0.00	0.00	0.00	38.90	0.00	0.00	0.00
38.39	0.00	0.00	0.00	38.91	0.00	0.00	0.00
38.40	0.00	0.00	0.00	38.92	0.00	0.00	0.00
38.41	0.00	0.00	0.00	38.93	0.00	0.00	0.00
38.42	0.00	0.00	0.00	38.94	0.00	0.00	0.00
38.43	0.00	0.00	0.00	38.95	0.00	0.00	0.00
38.44	0.00	0.00	0.00	38.96	0.00	0.00	0.00
38.45	0.00	0.00	0.00	38.97	0.00	0.00	0.00
38.46	0.00	0.00	0.00	38.98	0.00	0.00	0.00
38.47	0.00	0.00	0.00	38.99	0.00	0.00	0.00
38.48	0.00	0.00	0.00	39.00	0.00	0.00	0.00
38.49	0.00	0.00	0.00	39.01	0.00	0.00	0.00
38.50	0.00	0.00	0.00	39.02	0.00	0.00	0.00
38.51	0.00	0.00	0.00	39.03	0.00	0.00	0.00

Stage-Discharge for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
39.04	0.00	0.00	0.00
39.05	0.00	0.00	0.00
39.06	0.00	0.00	0.00
39.07	0.00	0.00	0.00
39.08	0.00	0.00	0.00
39.09	0.00	0.00	0.00
39.10	0.00	0.00	0.00
39.11	0.00	0.00	0.00
39.12	0.00	0.00	0.00
39.13	0.00	0.00	0.00
39.14	0.00	0.00	0.00
39.15	0.00	0.00	0.00
39.16	0.00	0.00	0.00
39.17	0.00	0.00	0.00
39.18	0.00	0.00	0.00
39.19	0.00	0.00	0.00
39.20	0.00	0.00	0.00
39.21	0.00	0.00	0.00
39.22	0.00	0.00	0.00
39.23	0.00	0.00	0.00
39.24	0.00	0.00	0.00
39.25	0.00	0.00	0.00
39.26	0.00	0.00	0.00
39.27	0.00	0.00	0.00
39.28	0.00	0.00	0.00
39.29	0.00	0.00	0.00
39.30	0.00	0.00	0.00
39.31	0.00	0.00	0.00
39.32	0.00	0.00	0.00
39.33	0.00	0.00	0.00
39.34	0.00	0.00	0.00
39.35	0.00	0.00	0.00
39.36	0.00	0.00	0.00
39.37	0.00	0.00	0.00
39.38	0.00	0.00	0.00
39.39	0.00	0.00	0.00
39.40	0.00	0.00	0.00
39.41	0.00	0.00	0.00
39.42	0.00	0.00	0.00
39.43	0.00	0.00	0.00
39.44	0.00	0.00	0.00
39.45	0.00	0.00	0.00
39.46	0.00	0.00	0.00
39.47	0.00	0.00	0.00
39.48	0.00	0.00	0.00
39.49	0.00	0.00	0.00
39.50	0.00	0.00	0.00
39.51	0.00	0.00	0.00
39.52	0.00	0.00	0.00
39.53	0.00	0.00	0.00
39.54	0.00	0.00	0.00
39.55	0.00	0.00	0.00
39.56	0.00	0.00	0.00
39.57	0.00	0.00	0.00
39.58	0.00	0.00	0.00
39.59	0.00	0.00	0.00
39.60	0.00	0.00	0.00
39.61	0.00	0.00	0.00
39.62	0.00	0.00	0.00
39.63	0.00	0.00	0.00
39.64	0.00	0.00	0.00
39.65	0.00	0.00	0.00
39.66	0.00	0.00	0.00
39.67	0.00	0.00	0.00
39.68	0.00	0.00	0.00
39.69	0.01	0.01	0.00
39.70	0.01	0.01	0.00
39.71	0.01	0.01	0.00
39.72	0.01	0.01	0.00
39.73	0.01	0.01	0.00
39.74	0.01	0.01	0.00
39.75	0.01	0.01	0.00
39.76	0.01	0.01	0.00
39.77	0.01	0.01	0.00
39.78	0.01	0.01	0.00
39.79	0.01	0.01	0.00
39.80	0.01	0.01	0.00
39.81	0.01	0.01	0.00
39.82	0.01	0.01	0.00
39.83	0.01	0.01	0.00
39.84	0.02	0.02	0.00
39.85	0.02	0.02	0.00
39.86	0.03	0.03	0.00
39.87	0.03	0.03	0.00
39.88	0.04	0.04	0.00
39.89	0.05	0.05	0.00
39.90	0.06	0.06	0.00
39.91	0.07	0.07	0.00
39.92	0.08	0.08	0.00
39.93	0.09	0.09	0.00
39.94	0.10	0.10	0.00
39.95	0.11	0.11	0.00
39.96	0.13	0.13	0.00
39.97	0.14	0.14	0.00
39.98	0.15	0.15	0.00
39.99	0.17	0.17	0.00
40.00	0.18	0.18	0.00
40.01	0.20	0.20	0.00
40.02	0.21	0.21	0.00
40.03	0.22	0.22	0.00
40.04	0.24	0.24	0.00
40.05	0.25	0.25	0.00
40.06	0.27	0.27	0.00
40.07	0.28	0.28	0.00

Calculated WQV Required= 348 cf
Calculated Ewqv=39.73
Qwqv= 0.01 cfs

Stage-Discharge for Pond 11P: Bioretention Cell #1 (continued)

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
40.08	0.30	0.30	0.00
40.09	0.31	0.31	0.00
40.10	0.33	0.33	0.00
40.11	0.34	0.34	0.00
40.12	0.35	0.35	0.00
40.13	0.36	0.36	0.00
40.14	0.37	0.37	0.00
40.15	0.38	0.38	0.00
40.16	0.39	0.39	0.00
40.17	0.40	0.40	0.00
40.18	0.41	0.41	0.00
40.19	0.42	0.42	0.00
40.20	0.43	0.43	0.00
40.21	0.44	0.44	0.00
40.22	0.44	0.44	0.00
40.23	0.45	0.45	0.00
40.24	0.46	0.46	0.00
40.25	0.47	0.47	0.00
40.26	0.48	0.48	0.00
40.27	0.49	0.49	0.00
40.28	0.49	0.49	0.00
40.29	0.50	0.50	0.00
40.30	0.51	0.51	0.00
40.31	0.53	0.53	0.00
40.32	0.55	0.55	0.00
40.33	0.58	0.58	0.00
40.34	0.62	0.62	0.00
40.35	0.66	0.66	0.00
40.36	0.70	0.70	0.00
40.37	0.75	0.75	0.00
40.38	0.80	0.80	0.00
40.39	0.85	0.85	0.00
40.40	0.90	0.90	0.00
40.41	0.96	0.96	0.00
40.42	1.02	1.02	0.00
40.43	1.08	1.08	0.00
40.44	1.14	1.14	0.00
40.45	1.21	1.21	0.00
40.46	1.28	1.28	0.00
40.47	1.35	1.35	0.00
40.48	1.42	1.42	0.00
40.49	1.49	1.49	0.00
40.50	1.56	1.56	0.00
40.51	1.65	1.64	0.01
40.52	1.74	1.72	0.03
40.53	1.84	1.79	0.05
40.54	1.95	1.88	0.07
40.55	2.06	1.96	0.10
40.56	2.18	2.04	0.14
40.57	2.30	2.13	0.17
40.58	2.42	2.21	0.21
40.59	2.55	2.30	0.25
40.60	2.69	2.39	0.30
40.61	2.82	2.48	0.34
40.62	2.96	2.57	0.39
40.63	3.11	2.67	0.44
40.64	3.25	2.76	0.49
40.65	3.40	2.86	0.54
40.66	3.55	2.95	0.60
40.67	3.70	3.04	0.66
40.68	3.79	3.08	0.71
40.69	3.89	3.11	0.78
40.70	3.99	3.15	0.84
40.71	4.09	3.18	0.90
40.72	4.19	3.22	0.97
40.73	4.29	3.25	1.04
40.74	4.40	3.29	1.12
40.75	4.51	3.32	1.19
40.76	4.62	3.35	1.27
40.77	4.73	3.39	1.34
40.78	4.84	3.42	1.42
40.79	4.96	3.45	1.51
40.80	5.07	3.48	1.59
40.81	5.19	3.51	1.68
40.82	5.31	3.54	1.76
40.83	5.43	3.58	1.85
40.84	5.55	3.61	1.94
40.85	5.67	3.64	2.04
40.86	5.80	3.67	2.13
40.87	5.93	3.70	2.23
40.88	6.05	3.73	2.33
40.89	6.18	3.76	2.43
40.90	6.31	3.79	2.53
40.91	6.45	3.81	2.64
40.92	6.59	3.84	2.74
40.93	6.73	3.87	2.85
40.94	6.87	3.90	2.97
40.95	7.01	3.93	3.08
40.96	7.15	3.96	3.19
40.97	7.30	3.98	3.31
40.98	7.44	4.01	3.43
40.99	7.59	4.04	3.55
41.00	**7.74**	**4.07**	**3.68**

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: **Bioretention Cell 2 - Near Admin Building**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
0.11	ac	A = Area draining to the practice	
0.07	ac	A_I = Impervious area draining to the practice	
0.61	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.60	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.07	ac-in	WQV= 1" x Rv x A	
245	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
61	cf	25% x WQV (check calc for sediment forebay volume)	
183	cf	75% x WQV (check calc for surface sand filter volume)	
	-	Method of Pretreatment? (not required for clean or roof runoff)	
-	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
-	sf	A_{SA} = Surface area of the practice	
-	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
-	Yes/No	(Use the calculations below)	
-	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
40.43	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
0.01	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
13.58	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
38.50	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
37.25	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
-	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
-	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
1.25	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
38.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
38.50	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
40.99	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
41.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
-	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
-	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
453	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
18.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
-	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
-	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

Summary for Pond 7.3P: Bioretention Cell #2

Inflow Area = 0.113 ac, 60.94% Impervious, Inflow Depth = 7.14" for 50-YEAR event
Inflow = 0.93 cfs @ 12.06 hrs, Volume= 0.067 af
Outflow = 0.86 cfs @ 12.09 hrs, Volume= 0.064 af, Atten= 7%, Lag= 2.0 min
Primary = 0.86 cfs @ 12.09 hrs, Volume= 0.064 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Starting Elev= 40.00' Surf.Area= 379 sf Storage= 57 cf
Peak Elev= 40.99' @ 12.09 hrs Surf.Area= 688 sf Storage= 577 cf (520 cf above start)
Flood Elev= 41.00' Surf.Area= 692 sf Storage= 585 cf (528 cf above start)

Plug-Flow detention time= 148.2 min calculated for 0.062 af (93% of inflow)
Center-of-Mass det. time= 102.3 min (877.9 - 775.5)

Volume	Invert	Avail.Storage	Storage Description
#1	38.50'	585 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
38.50	379	0.0	0	0	379
40.00	379	10.0	57	57	483
41.00	692	100.0	528	585	806

Device	Routing	Invert	Outlet Devices
#1	Primary	37.15'	**12.0" Round Culvert** L= 76.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.15' / 36.70' S= 0.0059 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Device 1	37.25'	**6.0" Vert. Orifice/Grate (Underdrain)** C= 0.600
#3	Device 2	40.00'	**2.500 in/hr Exfiltration through Media over Wetted area above 40.00'** Excluded Wetted area = 483 sf Phase-In= 0.01'
#4	Device 1	40.80'	**12.0" Horiz. Orifice/Grate (Yard Drain)** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.09 hrs HW=40.99' TW=39.42' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.84 cfs of 4.62 cfs potential flow)
  - **2=Orifice/Grate (Underdrain)** (Passes 0.02 cfs of 1.18 cfs potential flow)
    - **3=Exfiltration through Media** (Exfiltration Controls 0.02 cfs)
  - **4=Orifice/Grate (Yard Drain)** (Weir Controls 0.83 cfs @ 1.41 fps)

Stage-Area-Storage for Pond 7.3P: Bioretention Cell #2

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
38.50	379	379	0
38.51	379	380	0
38.52	379	380	1
38.53	379	381	1
38.54	379	382	2
38.55	379	382	2
38.56	379	383	2
38.57	379	384	3
38.58	379	385	3
38.59	379	385	3
38.60	379	386	4
38.61	379	387	4
38.62	379	387	5
38.63	379	388	5
38.64	379	389	5
38.65	379	389	6
38.66	379	390	6
38.67	379	391	6
38.68	379	391	7
38.69	379	392	7
38.70	379	393	8
38.71	379	393	8
38.72	379	394	8
38.73	379	395	9
38.74	379	396	9
38.75	379	396	9
38.76	379	397	10
38.77	379	398	10
38.78	379	398	11
38.79	379	399	11
38.80	379	400	11
38.81	379	400	12
38.82	379	401	12
38.83	379	402	13
38.84	379	402	13
38.85	379	403	13
38.86	379	404	14
38.87	379	405	14
38.88	379	405	14
38.89	379	406	15
38.90	379	407	15
38.91	379	407	16
38.92	379	408	16
38.93	379	409	16
38.94	379	409	17
38.95	379	410	17
38.96	379	411	17
38.97	379	411	18
38.98	379	412	18
38.99	379	413	19
39.00	379	414	19
39.01	379	414	19

Stage-Area-Storage for Pond 7.3P: Bioretention Cell #2 (continued)

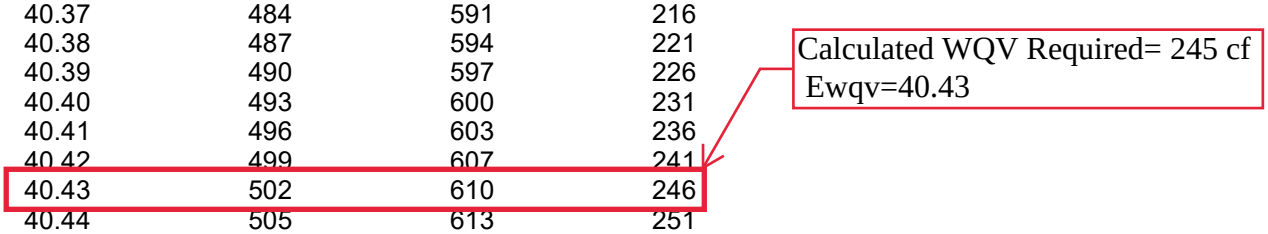
Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
39.02	379	415	20
39.03	379	416	20
39.04	379	416	20
39.05	379	417	21
39.06	379	418	21
39.07	379	418	22
39.08	379	419	22
39.09	379	420	22
39.10	379	420	23
39.11	379	421	23
39.12	379	422	23
39.13	379	422	24
39.14	379	423	24
39.15	379	424	25
39.16	379	425	25
39.17	379	425	25
39.18	379	426	26
39.19	379	427	26
39.20	379	427	27
39.21	379	428	27
39.22	379	429	27
39.23	379	429	28
39.24	379	430	28
39.25	379	431	28
39.26	379	431	29
39.27	379	432	29
39.28	379	433	30
39.29	379	434	30
39.30	379	434	30
39.31	379	435	31
39.32	379	436	31
39.33	379	436	31
39.34	379	437	32
39.35	379	438	32
39.36	379	438	33
39.37	379	439	33
39.38	379	440	33
39.39	379	440	34
39.40	379	441	34
39.41	379	442	34
39.42	379	442	35
39.43	379	443	35
39.44	379	444	36
39.45	379	445	36
39.46	379	445	36
39.47	379	446	37
39.48	379	447	37
39.49	379	447	38
39.50	379	448	38
39.51	379	449	38
39.52	379	449	39
39.53	379	450	39

Stage-Area-Storage for Pond 7.3P: Bioretention Cell #2 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
39.54	379	451	39
39.55	379	451	40
39.56	379	452	40
39.57	379	453	41
39.58	379	454	41
39.59	379	454	41
39.60	379	455	42
39.61	379	456	42
39.62	379	456	42
39.63	379	457	43
39.64	379	458	43
39.65	379	458	44
39.66	379	459	44
39.67	379	460	44
39.68	379	460	45
39.69	379	461	45
39.70	379	462	45
39.71	379	463	46
39.72	379	463	46
39.73	379	464	47
39.74	379	465	47
39.75	379	465	47
39.76	379	466	48
39.77	379	467	48
39.78	379	467	49
39.79	379	468	49
39.80	379	469	49
39.81	379	469	50
39.82	379	470	50
39.83	379	471	50
39.84	379	471	51
39.85	379	472	51
39.86	379	473	52
39.87	379	474	52
39.88	379	474	52
39.89	379	475	53
39.90	379	476	53
39.91	379	476	53
39.92	379	477	54
39.93	379	478	54
39.94	379	478	55
39.95	379	479	55
39.96	379	480	55
39.97	379	480	56
39.98	379	481	56
39.99	379	482	56
40.00	379	483	57
40.01	382	485	61
40.02	384	488	64
40.03	387	491	68
40.04	390	494	72
40.05	392	496	76

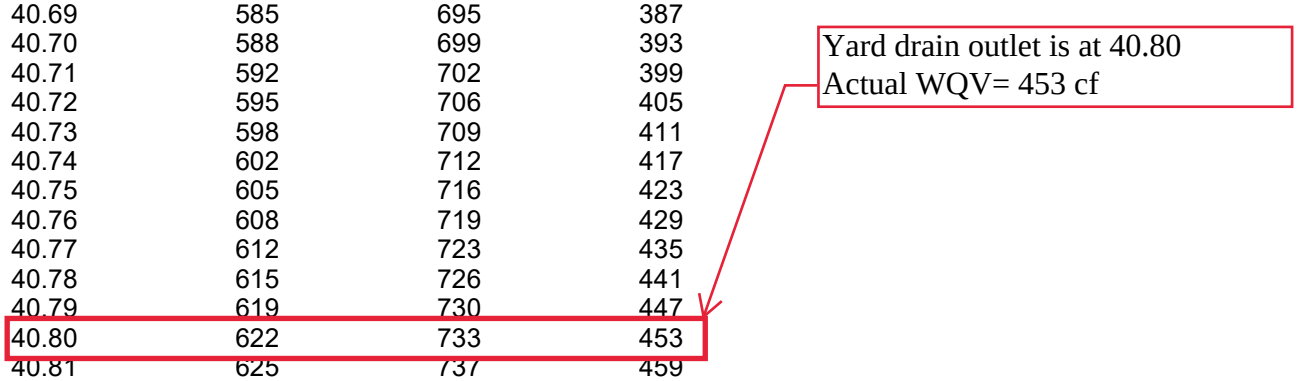
Stage-Area-Storage for Pond 7.3P: Bioretention Cell #2 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
40.06	395	499	80
40.07	398	502	84
40.08	401	505	88
40.09	403	508	92
40.10	406	511	96
40.11	409	513	100
40.12	412	516	104
40.13	414	519	108
40.14	417	522	113
40.15	420	525	117
40.16	423	528	121
40.17	426	531	125
40.18	428	534	129
40.19	431	537	134
40.20	434	539	138
40.21	437	542	142
40.22	440	545	147
40.23	443	548	151
40.24	446	551	156
40.25	448	554	160
40.26	451	557	165
40.27	454	560	169
40.28	457	563	174
40.29	460	566	178
40.30	463	569	183
40.31	466	572	188
40.32	469	575	192
40.33	472	579	197
40.34	475	582	202
40.35	478	585	206
40.36	481	588	211
40.37	484	591	216
40.38	487	594	221
40.39	490	597	226
40.40	493	600	231
40.41	496	603	236
40.42	499	607	241
40.43	502	610	246
40.44	505	613	251
40.45	508	616	256
40.46	511	619	261
40.47	514	622	266
40.48	518	626	271
40.49	521	629	276
40.50	524	632	282
40.51	527	635	287
40.52	530	639	292
40.53	533	642	297
40.54	536	645	303
40.55	540	648	308
40.56	543	652	314
40.57	546	655	319



Stage-Area-Storage for Pond 7.3P: Bioretention Cell #2 (continued)

Elevation (feet)	Surface (sq-ft)	Wetted (sq-ft)	Storage (cubic-feet)
40.58	549	658	324
40.59	552	662	330
40.60	556	665	336
40.61	559	668	341
40.62	562	672	347
40.63	565	675	352
40.64	569	678	358
40.65	572	682	364
40.66	575	685	369
40.67	578	688	375
40.68	582	692	381
40.69	585	695	387
40.70	588	699	393
40.71	592	702	399
40.72	595	706	405
40.73	598	709	411
40.74	602	712	417
40.75	605	716	423
40.76	608	719	429
40.77	612	723	435
40.78	615	726	441
40.79	619	730	447
40.80	622	733	453
40.81	625	737	459
40.82	629	741	466
40.83	632	744	472
40.84	636	748	478
40.85	639	751	485
40.86	643	755	491
40.87	646	758	498
40.88	650	762	504
40.89	653	766	511
40.90	656	769	517
40.91	660	773	524
40.92	664	776	530
40.93	667	780	537
40.94	671	784	544
40.95	674	787	550
40.96	678	791	557
40.97	681	795	564
40.98	685	798	571
40.99	688	802	578
41.00	**692**	**806**	**585**



Stage-Discharge for Pond 7.3P: Bioretention Cell #2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
38.50	0.00	39.02	0.00	39.54	0.00	40.06	0.00
38.51	0.00	39.03	0.00	39.55	0.00	40.07	0.00
38.52	0.00	39.04	0.00	39.56	0.00	40.08	0.00
38.53	0.00	39.05	0.00	39.57	0.00	40.09	0.00
38.54	0.00	39.06	0.00	39.58	0.00	40.10	0.00
38.55	0.00	39.07	0.00	39.59	0.00	40.11	0.00
38.56	0.00	39.08	0.00	39.60	0.00	40.12	0.00
38.57	0.00	39.09	0.00	39.61	0.00	40.13	0.00
38.58	0.00	39.10	0.00	39.62	0.00	40.14	0.00
38.59	0.00	39.11	0.00	39.63	0.00	40.15	0.00
38.60	0.00	39.12	0.00	39.64	0.00	40.16	0.00
38.61	0.00	39.13	0.00	39.65	0.00	40.17	0.00
38.62	0.00	39.14	0.00	39.66	0.00	40.18	0.00
38.63	0.00	39.15	0.00	39.67	0.00	40.19	0.00
38.64	0.00	39.16	0.00	39.68	0.00	40.20	0.00
38.65	0.00	39.17	0.00	39.69	0.00	40.21	0.00
38.66	0.00	39.18	0.00	39.70	0.00	40.22	0.00
38.67	0.00	39.19	0.00	39.71	0.00	40.23	0.00
38.68	0.00	39.20	0.00	39.72	0.00	40.24	0.00
38.69	0.00	39.21	0.00	39.73	0.00	40.25	0.00
38.70	0.00	39.22	0.00	39.74	0.00	40.26	0.00
38.71	0.00	39.23	0.00	39.75	0.00	40.27	0.00
38.72	0.00	39.24	0.00	39.76	0.00	40.28	0.00
38.73	0.00	39.25	0.00	39.77	0.00	40.29	0.00
38.74	0.00	39.26	0.00	39.78	0.00	40.30	0.01
38.75	0.00	39.27	0.00	39.79	0.00	40.31	0.01
38.76	0.00	39.28	0.00	39.80	0.00	40.32	0.01
38.77	0.00	39.29	0.00	39.81	0.00	40.33	0.01
38.78	0.00	39.30	0.00	39.82	0.00	40.34	0.01
38.79	0.00	39.31	0.00	39.83	0.00	40.35	0.01
38.80	0.00				0.00	40.36	0.01
38.81	0.00				0.00	40.37	0.01
38.82	0.00				0.00	40.38	0.01
38.83	0.00				0.00	40.39	0.01
38.84	0.00	39.36	0.00	39.88	0.00	40.40	0.01
38.85	0.00	39.37	0.00	39.89	0.00	40.41	0.01
38.86	0.00	39.38	0.00	39.90	0.00	40.42	0.01
38.87	0.00	39.39	0.00	39.91	0.00	40.43	0.01
38.88	0.00	39.40	0.00	39.92	0.00	40.44	0.01
38.89	0.00	39.41	0.00	39.93	0.00	40.45	0.01
38.90	0.00	39.42	0.00	39.94	0.00	40.46	0.01
38.91	0.00	39.43	0.00	39.95	0.00	40.47	0.01
38.92	0.00	39.44	0.00	39.96	0.00	40.48	0.01
38.93	0.00	39.45	0.00	39.97	0.00	40.49	0.01
38.94	0.00	39.46	0.00	39.98	0.00	40.50	0.01
38.95	0.00	39.47	0.00	39.99	0.00	40.51	0.01
38.96	0.00	39.48	0.00	40.00	0.00	40.52	0.01
38.97	0.00	39.49	0.00	40.01	0.00	40.53	0.01
38.98	0.00	39.50	0.00	40.02	0.00	40.54	0.01
38.99	0.00	39.51	0.00	40.03	0.00	40.55	0.01
39.00	0.00	39.52	0.00	40.04	0.00	40.56	0.01
39.01	0.00	39.53	0.00	40.05	0.00	40.57	0.01

Calculated WQV Required= 245 cf
Calculated Ewqv=40.43
Qwqv= 0.01 cfs

Stage-Discharge for Pond 7.3P: Bioretention Cell #2 (continued)

Elevation (feet)	Primary (cfs)
40.58	0.01
40.59	0.01
40.60	0.01
40.61	0.01
40.62	0.01
40.63	0.01
40.64	0.01
40.65	0.01
40.66	0.01
40.67	0.01
40.68	0.01
40.69	0.01
40.70	0.01
40.71	0.01
40.72	0.01
40.73	0.01
40.74	0.01
40.75	0.01
40.76	0.01
40.77	0.01
40.78	0.01
40.79	0.01
40.80	0.01
40.81	0.02
40.82	0.04
40.83	0.07
40.84	0.10
40.85	0.13
40.86	0.17
40.87	0.21
40.88	0.25
40.89	0.29
40.90	0.34
40.91	0.39
40.92	0.44
40.93	0.50
40.94	0.56
40.95	0.61
40.96	0.68
40.97	0.74
40.98	0.80
40.99	0.87
41.00	**0.94**

RIPRAP CALCULATIONS

Location: Bioretention Cell #1, 12" Culvert (HydroCAD Pond #11P)

Project: 5336 Date: 2/11/2025 By: PMJ

La	Apron Length, Ft.	Calculated
Tw	**Tailwater, Ft.**	**0.5**
Q	**Flow, 10 Yr Storm, CFS**	**0.87**
D50	Median Stone Dia., Ft.	Calculated
D	Depth of Stone, In	Calculated
Do	**Pipe Diameter, Ft**	**1.00**
W1	Width @ Start, Ft.	Calculated
W2	Width @ End, Ft	Calculated
W	**Width of Channel**	**4**

W1:

3(Do)= 3 Ft.

Width @ Start: 3 Ft.

D50: $\frac{0.02(Q)^{4/3}}{Tw(Do)}$

D50= 0.03 Ft.

or 0.4 In.

Median Stone Size: 6 In.

D: 2.25*D50

Depth of Riprap: 14 In.

La: If Tw<= Do/2:

Do/2= 0.5 Ft.

Tw= 0.5 Ft.

$La=1.8Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+La

If Tw>Do/2:

$La=3Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+0.4La

Length of Apron: 9 Ft.

Width @ End: 4 Ft.

ALTUS ENGINEERING

RIPRAP CALCULATIONS

Location: DMH #1, 12" Culvert (HydroCAD Pond #1.1P)

Project: 5336 Date: 2/11/2025 By: PMJ

La	Apron Length, Ft.	Calculated
Tw	**Tailwater, Ft.**	**0.5**
Q	**Flow, 10 Yr Storm, CFS**	**0.79**
D50	Median Stone Dia., Ft.	Calculated
D	Depth of Stone, In	Calculated
Do	**Pipe Diameter, Ft**	**1.00**
W1	Width @ Start, Ft.	Calculated
W2	Width @ End, Ft	Calculated
W	**Width of Channel**	**4**

W1:

3(Do)= 3 Ft.

Width @ Start: 3 Ft.

D50: $\frac{0.02(Q)^{4/3}}{Tw(Do)}$

D50= 0.03 Ft.

or 0.4 In.

Median Stone Size: 6 In.

D: 2.25*D50

Depth of Riprap: 14 In.

La: If Tw<= Do/2:

Do/2= 0.5 Ft.

Tw= 0.5 Ft.

$La=1.8Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+La

If Tw>Do/2:

$La=3Q/Do^{3/2} + 7Do$

and W2=width of channel

or

W2=3Do+0.4La

Length of Apron: 9 Ft.

Width @ End: 4 Ft.

ALTUS ENGINEERING

Section 8

Stormwater Operations & Maintenance Plan Inspection Form
Stormwater Management Plan

ALTUS
ENGINEERING

STORMWATER INSPECTION AND MAINTENANCE MANUAL

Pease Wastewater Treatment Facility
Tax Map 303, Lot 6

OWNER:
City of Portsmouth
Public Works Department
680 Peverly Hill Road
Portsmouth, NH 03801

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

RESPONSIBLE PARTIES:

Owner:	*City of Portsmouth Public Works Department*		*(603) 427-1530*
	Name	*Company*	*Phone*
Inspection:	*City of Portsmouth Public Works Department*		*(603) 427-1530*
	Name	*Company*	*Phone*
Maintenance:	*City of Portsmouth Public Works Department*		*(603) 427-1530*
	Name	*Company*	*Phone*

NOTES:

Written inspection forms and maintenance logs shall be completed yearly by a qualified inspector retained the owner or assigns. Reports shall be submitted to the Portsmouth Public Works Department on or before January 31st of each year and a copy retained at the site's administrative office.

Photographs of each stormwater BMP are to be taken at each inspection and submitted with the annual inspection reports.

Inspection and maintenance responsibilities shall transfer to any future property owner(s).

ALTUS ENGINEERING

This manual shall be updated as needed to reflect any changes related to any transfer of ownership and/or any delegation of inspection and maintenance responsibilities to another entity

BIORETENTION PONDS (AKA RAINGARDENS)

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

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

Maintenance

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

CULVERTS AND DRAINAGE PIPES

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

Maintenance

- Culverts and drainage pipes shall be inspected semi-annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures. Debris shall be disposed of on site where it will not concentrate back at the drainage structures or at a solid waste disposal facility.

- Riprap Areas - Culvert outlets and inlets shall be inspected during annual maintenance and operations for erosion and scour. If scour or creek erosion is identified, the outlet owner shall take appropriate means to prevent further erosion. Increased lengths of riprap may require a NHDES Permit and/or local permit.

DEEP SUMP CATCH BASINS

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

Maintenance

- Remove leaves and debris from structure grates on an as-needed basis.
- Sumps shall be inspected and cleaned annually and any removed sediment and debris shall be disposed of at a solid waste disposal facility.

RIP RAP OUTLETS AND SWALES

Function – Rip rap outlets slow the velocity of runoff, minimizing erosion and maximizing the treatment capabilities of associated buffers. Vegetated buffers, either forested or meadow, slow runoff which promotes and reduces peak rates of runoff. The reduced velocities and the presence of vegetation encourage the filtration of sediment and the limited bio-uptake of nutrients.

Maintenance

- Inspect riprap at least annually for signs of erosion, sediment buildup, or vegetation loss.
- Remove debris and accumulated sediment and dispose of properly.

LANDSCAPED AREAS - FERTILIZER MANAGEMENT

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

Maintenance

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

LANDSCAPED AREAS - LITTER CONTROL

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

Maintenance

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

CONTROL OF INVASIVE PLANTS

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

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

Maintenance

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

STREET/PARKING LOT SWEEPING (NON-POROUS PAVEMENT)

Function – Parking lots accumulate sand and debris. Street sweeping removes the sand and debris, which lowers transport of sediment and pollutants the stormwater systems and into the environment.

Maintenance

- A regular periodic cleaning schedule is recommended. The more frequent, the greater the sediment and pollutant removal. Regular cleaning of paved areas reduces the frequency of cleaning catch basins and drainage systems. It is recommended that the parking lots and access ways shall be swept at least once a month during winter months.

GENERAL CLEAN UP

- Upon completion of the project, the contractor shall remove all temporary stormwater structures (i.e., temporary stone check dams, silt fence, temporary diversion swales, catch basin inlet filter, etc.). Any sediment deposits remaining in place after the silt fence or filter

barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded. Remove any sediment in catch basins and clean drainpipes that may have accumulated during construction.

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

APPPENDIX

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

STORM WATER SYSTEM OPERATION AND MAINTENANCE REPORT

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

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

Permit Coverage and Plans				
#	**BMP/Facility**	**Inspected**	**Corrective Action Needed and Notes**	**Date Corrected**
	Catch Basins and Yard Drains	❑Yes ❑No		
	Drainage Pipes	❑Yes ❑No		
	Riprap Aprons	❑Yes ❑No		
	Site Vegetation	❑Yes ❑No		
	Bioretention Ponds	❑Yes ❑No		

MATCHLINE FOR CONTINUATION, SEE SHEET C-2

SAWCUT EXISTING PAVEMENT 2' FROM EXISTING EDGE OF NEW PAVEMENT AND MEET AND MATCH EXISTING PAVEMENT (TYP.)

2% MIN SLOPE FOR PAVEMENT FOR NEW PARKING SPACES

RAISE EXISTING SMH 5923 FRAME AND COVER TO FINISHED GRADE

CAPE COD BERM (TYP.)

REGRADE SLOPE TO MAINTAIN A MAX. OF 2:1 SLOPE. SEE DETAIL.

STONE DRIP EDGE (TYP.)

STONE DRIP EDGE WITH 6" PERF. PIPE INV.: 40.50

±43 LF 6" HDPE S: 0.005 '/'

12" YARD DRAIN RIM: 42.00 INV. OUT: 40.30

PROPOSED LAB/ADMIN BUILDING EXTENSION (BID ALTERNATIVE 2) ±912 S.F. FOOTPRINT F.F.E. = 42.50

EXISTING LAB/ADMIN BUILDING ±1,662 S.F. FOOTPRINT F.F.E. = 42.50

PRIMARY SLUDGE PUMP STATION ±480 S.F. FOOTPRINT PAD ELEV. = 42.00

±13 LF 6" HDPE S: 0.02 '/'

6" HDPE PIPE OUTLET INV.: 40.10

±30 LF 6" PERF. U.D. INV.: 37.25

PROPOSED ELECTRICAL CONTROL BUILDING ± 653 S.F. FOOTPRINT F.F.E. = 42.50

GENERATOR PAD ± 430 S.F. FOOTPRINT PAD ELEV. = 42.50

EXISTING CB 5669 RIM: 39.00
(A) 2" PVC INV.: 36.70 (DEMO)
(B) 6" PVC INV.: 36.60 (DEMO)
(5673) UNK T.O.H: 37.10
WATER ELEV.: 35.90
SUMP ELEV.: 32.10

CONNECT NEW 12" HDPE PIPE TO EXISTING DCB 5669 INV.: 36.70

±76 LF 12" HDPE S: 0.007 '/'

BIORETENTION CELL #2 SURFACE ELEV.: 40.00 BOTTOM AREA: 379 S.F.

12" YARD DRAIN RIM: 40.80 INV. IN: 37.25 INV. OUT: 37.15

100 FOOT WETLAND BUFFER

25' WETLAND BUFFER

MW (EXISTING)

BEGIN CAPE COD BERM (TYP.)

SAWCUT EXISTING PAVEMENT 2' FROM EXISTING EDGE OF NEW PAVEMENT AND MEET AND MATCH EXISTING PAVEMENT (TYP.)

BIORETENTION CELL #1 SURFACE ELEV.: 39.50 BOTTOM AREA: 888 S.F.

±61 LF 6" PERF. U.D. INV.: 37.10

2'-WIDE BERM ELEV.: 41.00

12" YARD DRAIN RIM: 40.30 INV. IN: 39.80 (2x 4" ORIFICE IN YD PIPE) INV. IN: 37.20 (6" U.D.) INV. OUT: 37.20

±14 LF 12" HDPE S: 0.005 '/'

REMOVE AND REPLACE CHAIN LINK FENCE AS NEEDED

PROPOSED TREE LINE (TYP.)

HEADWALL 12" INV.: 37.10

12" CEDAR

14" CEDAR

LEGEND

- EXISTING/PROPOSED CHAINLINK FENCE OR RAILING
- EXISTING/PROPOSED CONTOUR
- EXISTING/PROPOSED SPOT GRADE
- EXISTING SEWER/MANHOLE
- EXIST. OVERHEAD/UNDERGROUND UTILITIES/POLE
- EXISTING DRAINAGE/CB/DMH
- PROPOSED PAVEMENT/VERTICAL OR SLOPED GRANITE CURB
- PROPOSED DRAINAGE (HARD PIPE)/CB/DCB/DMH/FES
- PROPOSED CATCH BASIN INLET PROTECTION
- PROPOSED DRAINAGE (PERFORATED PIPE)/CLEANOUT
- PROPOSED GROUND SLOPE/APPROX. GRADE/STONE CHECK DAM
- SILTFENCE/SEDIMENT BARRIER/CONST. FENCE
- LAYDOWN AREA/STOCKPILE AREA LIMITS
- PROPOSED LIMIT OF DISTURBANCE
- LIMIT OF NEW PAVEMENT
- PROPOSED SAWCUT
- EXISTING TREE/DRIP LINE
- PROPOSED TREE CLEARING LIMIT
- PROPOSED TREELINE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED RIPRAP
- PROPOSED BIORETENTION CELL

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
Portsmouth, NH 03801
603-427-1530 tel 603-427-1539 fax
http://www.cityofportsmouth.com/publicworks

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

CONSULTANTS

HVAC, PLUMBING, FIRE PROTECTION
Petersen Engineering, INC
PO Box 4516
Portsmouth, NH 03802
603-436-4233 tel
https://www.petersenengineering.com

STORMWATER DESIGN
Altus Engineering
133 Court Street
Portsmouth, NH 03801
603-433-2335 tel
https://www.altus-eng.com

REGISTRATION

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	1/17/2025	INITIAL SUBMISSION
	1/24/2025	REV. PER AECOM
	2/12/2025	DRAINAGE ANALYSIS
	2/20/2025	REV. PER COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	FEBRUARY 20, 2025
Scale:	1" = 20'

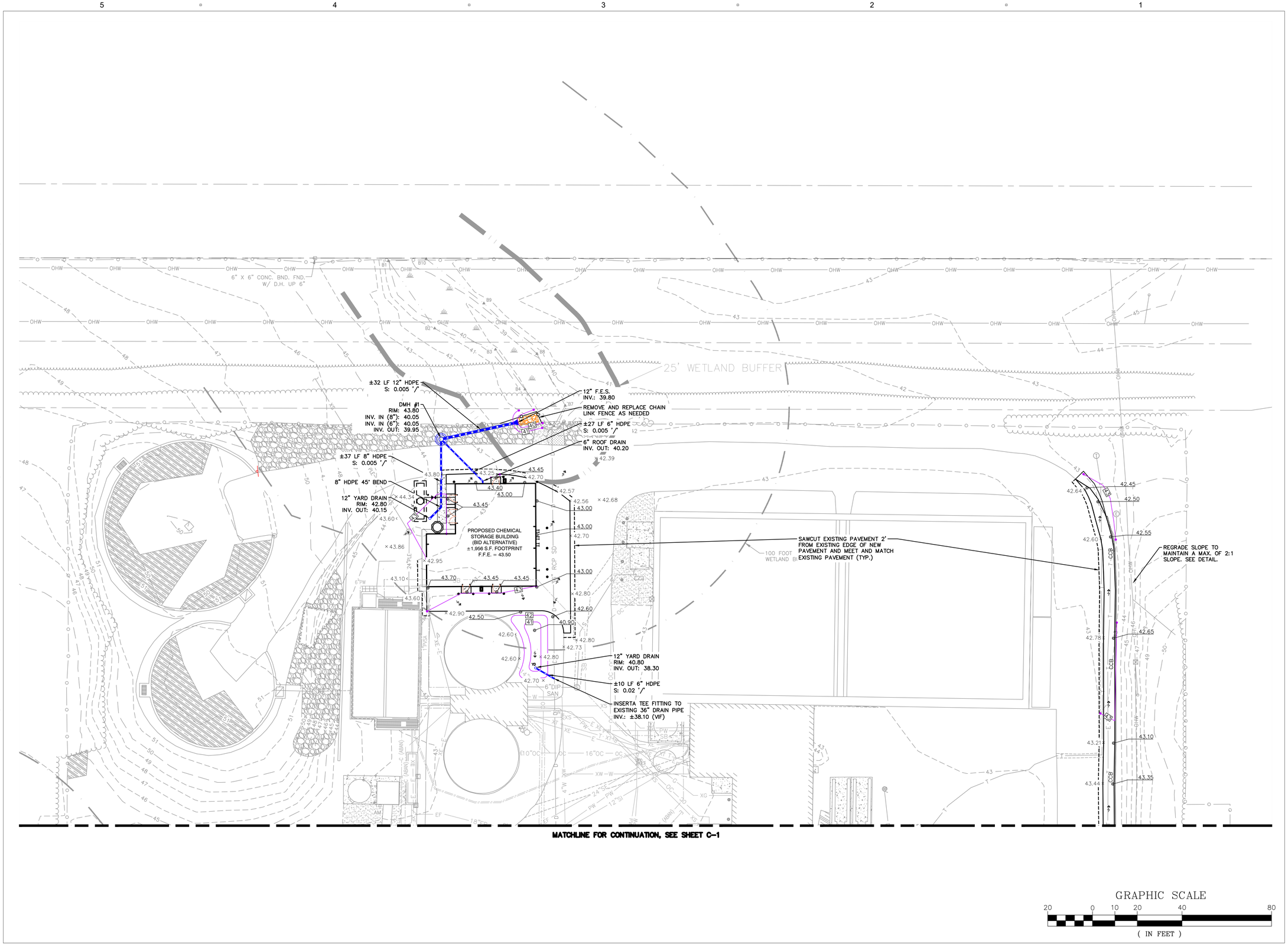
DISCIPLINE

SHEET TITLE

GRADING & DRAINAGE PLAN I

SHEET NUMBER

C-1



AECOM

PROJECT

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Portsmouth, NH 03801

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	2/19/2025	REV. PER COMMENTS

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	FEBRUARY 19, 2025
Scale:	1" = 20'

DISCIPLINE

SHEET TITLE

GRADING & DRAINAGE PLAN II

SHEET NUMBER

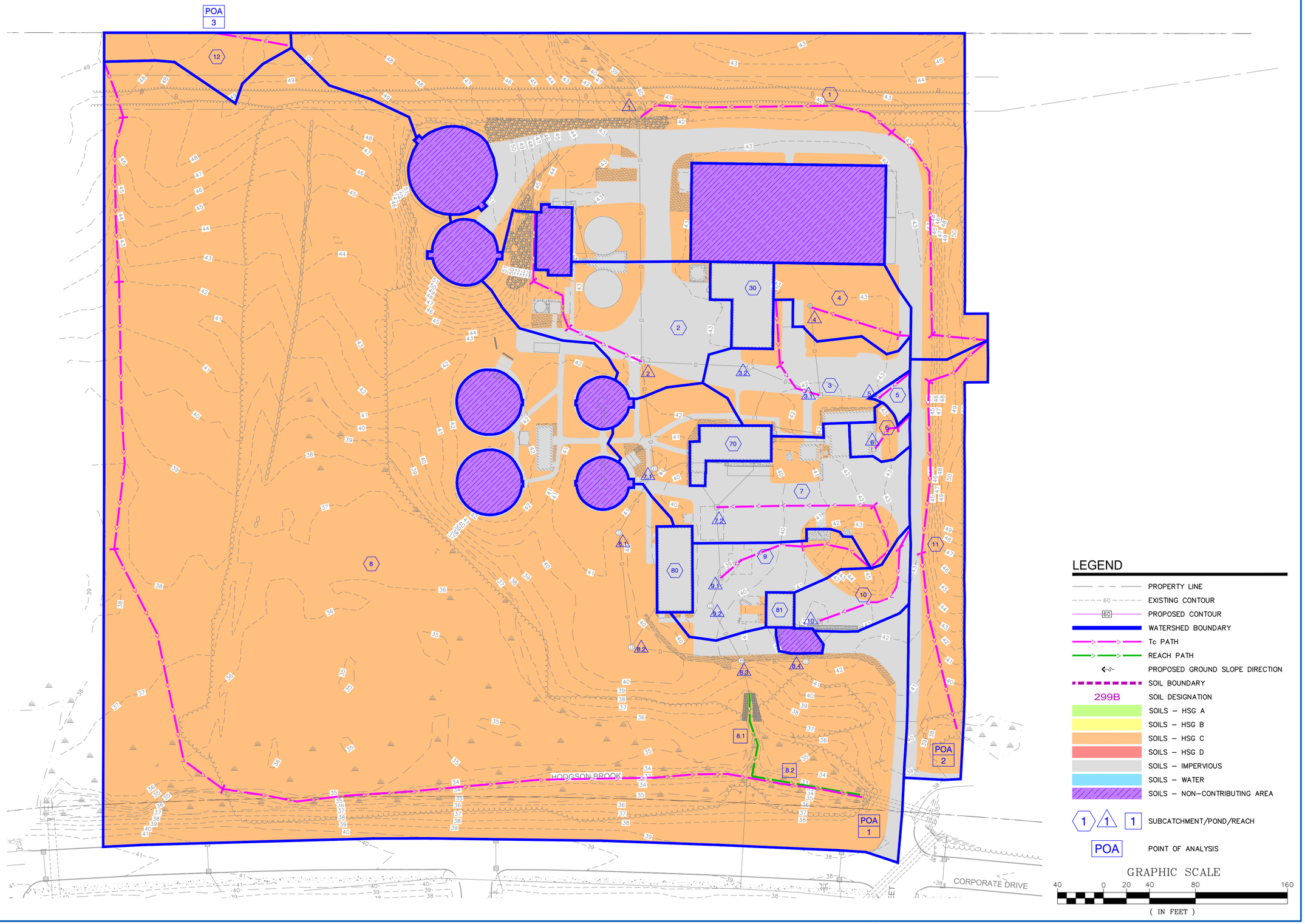
C-2

Section 9

Watershed Plans

Pre-Development Drainage Plan
Post-Development Drainage Plan

ALTUS
ENGINEERING



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WATERSHED BOUNDARY
- Tc PATH
- REACH PATH
- PROPOSED GROUND SLOPE DIRECTION
- SOIL BOUNDARY
- 299B — SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- SOILS – NON–CONTRIBUTING AREA
- SUBCATCHMENT/POND/REACH
- POA — POINT OF ANALYSIS

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

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	2/12/2025	INITIAL SUBMISSION

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	FEBRUARY 12, 2025
Scale:	1" = 40'

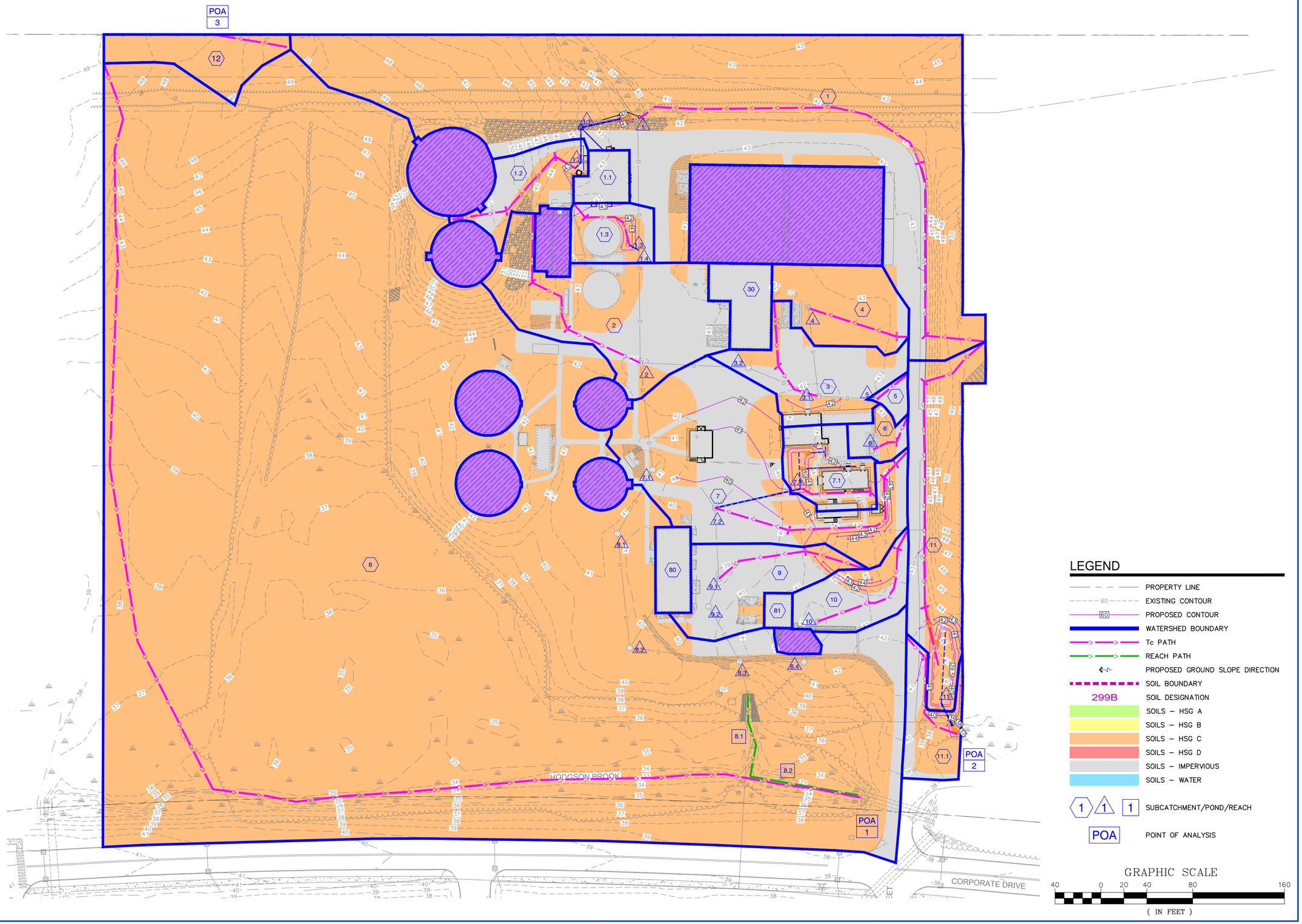
DISCIPLINE

SHEET TITLE

PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER

WS-1



LEGEND

- PROPERTY LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WATERSHED BOUNDARY
- Tc PATH
- REACH PATH
- PROPOSED GROUND SLOPE DIRECTION
- SOIL BOUNDARY
- 299B — SOIL DESIGNATION
- SOILS – HSG A
- SOILS – HSG B
- SOILS – HSG C
- SOILS – HSG D
- SOILS – IMPERVIOUS
- SOILS – WATER
- 1 1 1 — SUBCATCHMENT/POND/REACH
- POA — POINT OF ANALYSIS

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

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Portsmouth, NH 03801

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	2/12/2025	INITIAL SUBMISSION

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	FEBRUARY 12, 2025
Scale:	1" = 40'

DISCIPLINE

SHEET TITLE

POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER

WS-2

Michael Cuomo, Soil Scientist
6 York Pond Road, York, Maine 03909
207 363 4532
mcuomosoil@gmail.com

Eric Weinrieb, P.E.
Altus Engineering, LLC
133 Court Street
Portsmouth, NH 03801-4413

21 April 2025

Dear Mr. Weinrieb;

This letter is in reference to the proposed Pease Wastewater Treatment Facility Rehabilitation, located at 135 Corporate Drive on Pease Tradeport in Portsmouth, NH. In October and November of 2022 I conducted a wetland delineation and functional assessment of the wetlands on this site to assist you in permitting.

Pease Development Authority Zoning Ordinance defines wetlands as follows:
304-A.02 Wetlands Defined (a) "Wetlands" means an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include, but are not limited to swamps, streams, ponds, vernal pools, marshes, bogs, tidal wetlands and similar areas. Man-made storm water treatment areas as shown on site plans approved by the Pease Development Authority after January 1, 1992 shall not be construed as wetlands; nor shall roadside drainage ditches whose principal purpose is to facilitate the drainage of surface water from the adjacent roadway.

(b) Delineation Requirements: The precise location of a wetland boundary in any particular case must be determined by on-site inspection of soils, vegetation, and hydrology by a New Hampshire Certified wetland scientist using the Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1 (January 1987) and Field Indicators for Identifying Hydric Soils in New Hampshire (Version 3) published by the New Hampshire Department of Environmental Services or other agency with applicable jurisdiction. (c) Wetlands shown on proposed development plans shall have been delineated no earlier than three years before the date of any application.

(c) The reviewing Board shall evaluate an application in accordance with The Highway Methodology Workbook Supplement - Wetland Functions and Values: A Descriptive Approach.

Portsmouth Zoning 10.1017.22 (3) requires "More than 250 sq. ft. of alteration to the wetland buffer (regardless of the amount of alteration to the wetland): a description of the 100-foot buffer including vegetation type, the percent of the buffer with invasive species, and the percent of the buffer that is paved or developed. "

Three wetland segments on or closest to the property were identified with sequentially numbered blue flagging. All wetlands meeting the State of New Hampshire and federal definitions are also included within the flag lines.

WETLAND A

Blue flags A1 to A45 begin at the north west of the project site along Corporate Drive, extend to the access road, reverse direction and end north of the site. This is a shrub wetland (PSS1E using the Cowardin classification system) underlain by silty poorly and very poorly drained glacio-marine soils. Hodgson Brook flows through this wetland in a man-made channel parallel to Corporate Drive. Dominant shrubs are autumn olive, speckled alder, and rugosa rose. Dominant herbs are purple loose-strife, broad leaved cattail, and goldenrods. The entire wetland buffer contains invasive plant species intermixed with native plants and about 75% of the buffer is already developed. This wetland continues off the project site and is part of a larger wetland complex.

WETLAND B

Blue flags B1 to B10 identify a channelized intermittent stream at the outlet of existing drainage. This lies north east of the site, in the direction of the Spaulding Turnpike. This is a shrub wetland (PSS1E using the Cowardin classification system) underlain by silty poorly drained glacio-marine soils. Dominant shrubs are red-oiser dogwood and raspberries. Dominant herbs are purple loose-strife, bittersweet night shade, and goldenrods. There are climbing bittersweet vines. The entire wetland buffer contains invasive plant species intermixed with native plants and about 50% of the buffer is already developed. This wetland connects the constructed drainage systems at the wastewater treatment plant with the Spaulding Turnpike road-side swales.

WETLAND C

Blue flags C1 to C7 identify a wetland in the south west corner of the project site, near the access road. This is a shrub wetland (PSS1E using the Cowardin classification system) underlain by silty poorly drained glacio-marine soils. Dominant shrubs are silky dogwood and raspberries. Dominant herbs are purple loose-strife, bittersweet night shade, and goldenrods. There are climbing bittersweet vines. The entire wetland buffer contains invasive plant species intermixed with native plants and about 50% of the buffer is already developed.

The site and surrounding area are significantly disturbed by human occupation. The wetland buffers contain structures, pavement, and landscaping.

WETLAND FUNCTIONAL ASSESSMENT

The wetlands have been evaluated using *The Highway Methodology Workbook Supplement - Wetland Functions and Values: A Descriptive Approach*, as required. The evaluation focused on wetland A as it is the largest wetland present and the more significant because it contains the channelized Hodgson Brook. The worksheet, photographs, flood map, and locus map are attached. The results are briefly summarized and interpreted in the following paragraphs.

There are three Principle Valuable Functions: Floodflow Alteration, Sediment/Toxicant Retention, and Nutrient Removal. These are elevated at this site because of dense vegetation, flat topography, fine grained sediments, and a constricted outlet for the channelized Hogdson Brook. Floodflow Alteration is also elevated because of considerable high value infrastructure in the immediate area and down-stream.

The wetland performs the following functions to a moderate degree.

Sediment/Shoreline Stabilization: dense vegetation borders Hogdson Brook, but this function is limited by Corporate Drive along the westerly side.

Production Export (Nutrient): flowering plants supporting pollinators and seed bearing plants are present, but this function is limited by the density of invasive plant species.

Wildlife Habitat: The wetland serves as a wildlife 'refuge' in a developed environment, but human disturbance surrounding the wetland limits this function.

Visual Quality/Aesthetics: The dense wetland vegetation acts as an visual buffer between the wastewater treatment facility and surrounding uses, but this function is limited by odor, invasive plants, and lack of vegetative diversity.

The wetland performs the following functions to a limited degree.

Groundwater Recharge/Discharge: The wetland is underlain by soils high in silt and clay.

Fish and Shellfish Habitat: The watercourse is not deep and oxygenated enough for fisheries.

Educational and Scientific Value: The wetland exhibits characteristics of past human disturbance and altered plant community structure.

Non-Consumptive Recreation: The wetland is difficult to access due to dense vegetation and lack of trails.

Uniqueness and Heritage: The wetland type is common and widespread, resulting from agricultural clearing followed by abandonment. Invasive species are common and there is limited native species diversity.

In response to NH Natural Heritage Bureau database search, the site will be investigated for smooth black sedge by a qualified botanist when the season is appropriate. If found in a wetland on-site, that alone would elevate the wetland's ecological importance.

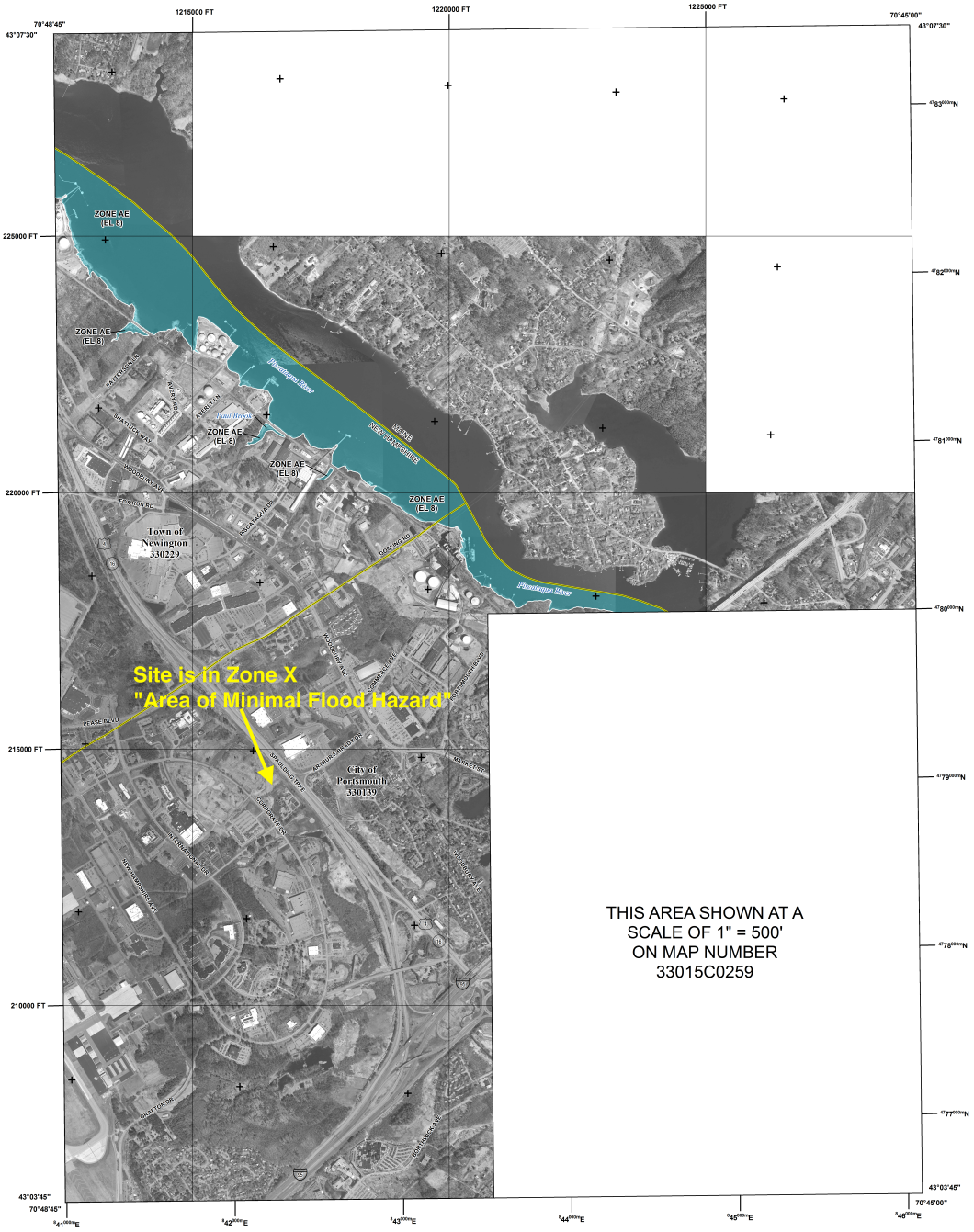
Please call if you have questions regarding this work.

Sincerely,

Michael Cuomo
NH Soil Scientist #006
NH Wetland Scientist #004

Locus Map
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH

Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

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*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Mapping and Insurance eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Mapping and Insurance eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). This information was derived from digital orthophotography at a 1-foot resolution from photography dated 2010.

SCALE

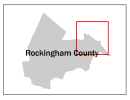
Map Projection:
NAD 1983 StatePlane New Hampshire FIPS 2800 Feet;
Western Hemisphere; Vertical Datum: NAVD 88

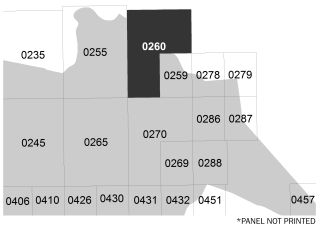
1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 Feet

0 260 520 1,040 Meters

PANEL LOCATOR





*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

ROCKINGHAM COUNTY, NEW HAMPSHIRE
(All Jurisdictions)

PANEL 260 OF 681

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
NEWINGTON, TOWN OF	330229	0260	F
PORTSMOUTH, CITY OF	330139	0260	F

VERSION NUMBER
2.3.2.1

MAP NUMBER
33015C0260F

MAP REVISED
January 29, 2021

WETLAND FUNCTION-VALUE ASSESSMENT

WETLAND I.D. A

PROJECT NAME: Pease Wastewater Treatment Facility

PROJECT LOCATION: 135 Corporate Drive PREPARED BY: Michael Cuomo DATE: 21 October 2022

TOTAL APPROXIMATE AREA OF WETLAND: IS WETLAND PART OF A WILDLIFE CORRIDOR? yes OR A "HABITAT ISLAND"? no

ADJACENT LAND USE? Commercial/industrial/transportation MAN MADE? no DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT 25ft

DOMINANT WETLAND SYSTEMS PRESENT: Palustrine shrub swamp CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? no

IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? no IF NOT, WHERE DOES THE WETLAND LIE IN THE DRAINAGE BASIN?

OF TRIBUTARIES INTO THE WETLAND? two AQUATIC DIVERSITY/ABUNDANCE low VEGETATIVE DIVERSITY/ABUNDANCE moderate diversity high abundance

WILDLIFE DIVERSITY/ABUNDANCE moderate ANTICIPATED IMPACTS Buffer only WETLAND AREA IMPACTED: NONE

TREES	SHRUBS	HERBS	WILDLIFE	COMMENTS
few red maple (Acer rubrum)	Autumn olive (Elaegnus umbellata) speckled alder (Alnus rugosa) multiflora rose (Rosa multiflora)	purple loose-strife (Lythrium salicaria) broad-leaf cattail (Typha latifolia) Goldenrod (Solidago sp.)		Soils are mostly the Scitico annd Maybid series. These are poorly and very poorly drained glacial marine and lacustrine origin sediments high in silt and clay. Generally these key out as hydric soils using National Indicator A11. The stream channel of Hodgson Brook is within the wetland. The Brook has been significantly altered by human activity. Invasive plant species are widespread in the wetland and uplands

FUNCTION	Occurrence Y	Occurrence N	Rationale Numbers	Principal Valuable Function(s)	Comments
Groundwater Recharge/Discharge		No	6, 7		Underlain by soils high in silt and clay
Floodflow Alteration	Yes		1, 4, 6, 9, 10, 13, 15, 18	Principal function	Dense vegetation, flat topography, and constricted outlet for Hodgson Brook
Sediment/Shoreline Stabilization	Yes		1, 4, 6, 7, 9, 12, 14,		Dense vegetation of sufficient width borders the Brook
Sediment/Toxicant Retention	Yes		1, 2, 3, 4, 5, 7, 10, 13, 14, 16,	Principal function	Dense vegetation, flat topography, and constricted outlet for Hodgson Brook
Nutrient Removal	Yes		3, 4, 7, 8, 9, 10, 11, 13,	Principal function	Dense vegetation, fine grained sediments, and constricted outlet
Production Export (Nutrient)	Yes		1, 4, 7, 12,		Dense vegetation includes flowing plants for pollenators and seed bearing plants for forage
Fish & Shellfish Habitat		No			Watercourse not deep and oxygenated enough for fisheries
Wildlife Habitat	Yes		17, 19,		Human disturbance limits this function, but wetland serves as refuge in local area
Endangered Species Habitat					Unknown : site will be investigated by others for smooth black sedge when appropriate
Visual Quality/Aesthetics	Yes		4, 9		Odor, lack of vegetative diversity, dense vegetation
Educational Scientific Value		No			Human disturbance, many invasive plants
Recreation ((Non)Consumptive)		No			Difficult to access and enter, dense vegetation, no trails
Uniqueness/Heritage		No	1, 2, 7, 9, 22,		Common wetland type resulting from regrowth after agricultural clearing, invasive species common, limited vegetative diversity

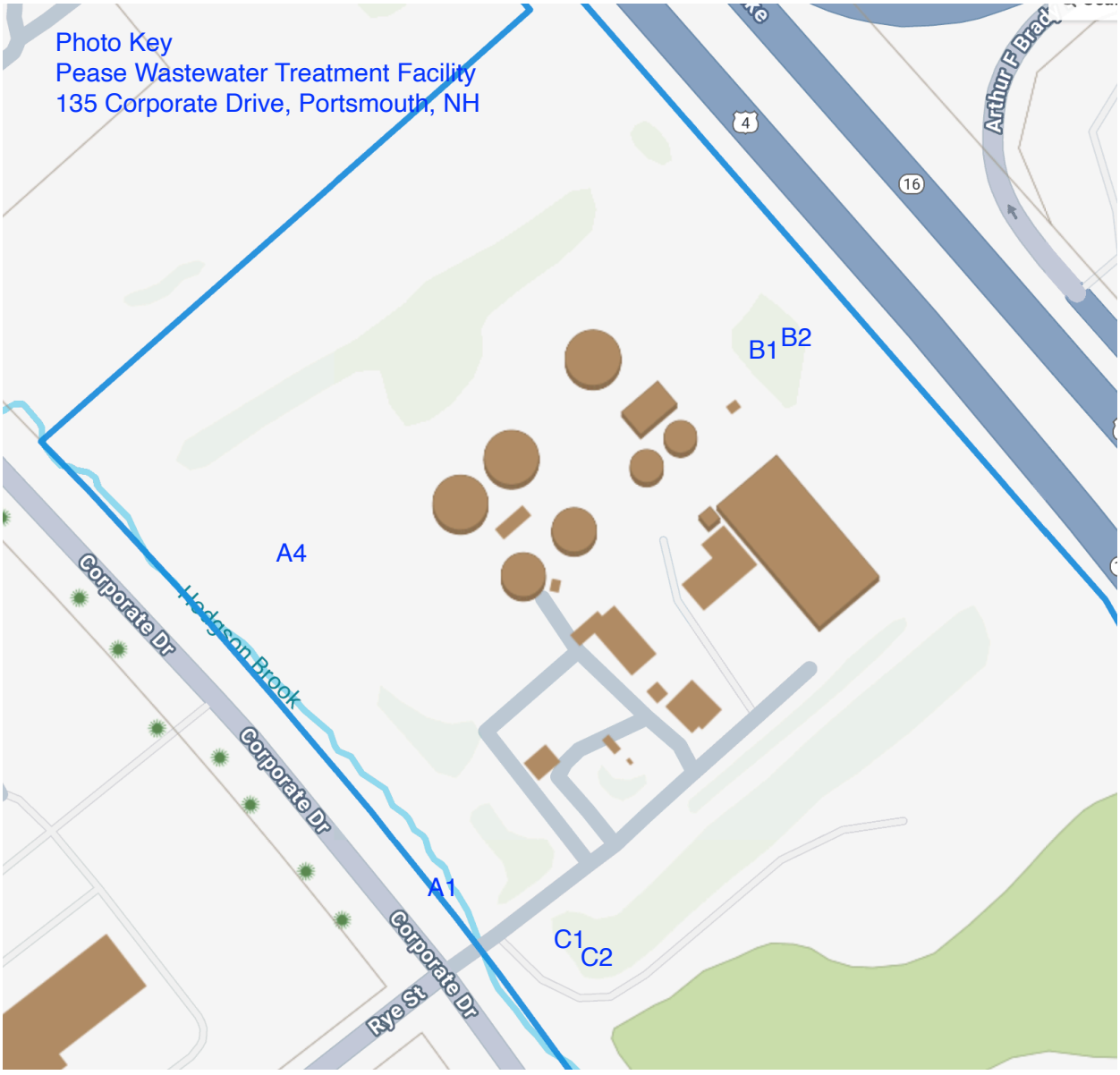


Photo Key
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
4
16
Arthur F Brad
B1
B2
A4
A1
C1
C2
Hodgson Brook
Corporate Dr
Corporate Dr
Corporate Dr
Rye St

Photo A1
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

Photo A4
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

Photo B1
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

Photo B2
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

Photo C1
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

Photo C2
Pease Wastewater Treatment Facility
135 Corporate Drive, Portsmouth, NH
October 2022

0239-0013-0000
NEW FRONTIERS CHURCH INC
1 GOSLING RD
PORTSMOUTH, NH 03801

0239-0015-0000
GIRI DOVER LLC
225 W SQUANTUM ST SUITE 200
QUINCY, MA 02171

0237-0057-0000
CROWN VIEW PROPERTIES LLC
PO BOX 1201
PORTSMOUTH, NH 03802-1201

0260-0138-0000
EVANS SEAN & HANNAH
96 SAGAMORE RD
RYE, NH 03870

0260-0142-0000
DOLL MICHAEL P
284 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0136-0000
YOUNG KENNETH W
346 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0133-0000
WAHBI KHALID
277 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0130-0000
BERLING PROPERTIES LLC
117 ASH ST
PORTSMOUTH, NH 03801

0260-0109-0000
LEWIS JASON & STEVENS LINDSAY
180 DECATUR RD
PORTSMOUTH, NH 03801

0260-0112-0000
RICHARDS MAUREEN & MARK
140 DECATUR RD
PORTSMOUTH, NH 03801

0239-0018-0000
OAK STREET INVEST GRD NET
C/O OAK STREET REAL ESTATE
CAP - 30 N LA SALLE ST SUITE 4140
CHICAGO, IL 60602

0238-0020-0000
R K PORTSMOUTH LLC
C/O R K FUNDING LLC
50 CABOT ST
NEEDHAM, MA 02494

0237-0056-0000
N E MARINE AND INDUSTRIAL INC
200 SPAULDING TPKE
PORTSMOUTH, NH 03801

0260-0139-0000
OLEARY THOMAS A
316 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0143-0000
MONAGHAN PAUL G & KAREN L
272 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0135-0000
KELLEY JANICE M
303 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0132-0000
PAISLEY PL & HEALY CM
4802 51ST ST WEST #807
BRADENTON, FL 34210

0260-0129-0000
UPTON JOHN & CARRIE 2017 REV
TRUST - UPTON CARRIE L & JOHN J
76 EXETER RD
N HAMPTON, NH 03862

0260-0110-0000
SHUMP MATTHEW
3 PRINCETON ST
PORTSMOUTH, NH 03801

0260-0113-0000
HIRATA DAVID D
128 DECATUR RD
PORTSMOUTH, NH 03801

0239-0013-0002
OAK STREET INVEST GRD NET
C/O OAK STREET REAL ESTATE
CAP - 30 N LA SALLE ST SUITE 4140
CHICAGO, IL 60602

0238-0002-0000
SLF REALTY GROUP LLC
400 SPAULDING TPKE
PORTSMOUTH, NH 03801

0260-0137-0000
JEFFRIES CYNTHIA D
7 VICTORY RD
PORTSMOUTH, NH 03801

0260-0141-0000
BEDRICK JARED & AMY L
296 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0144-0000
SIMMONS CRAIG M
9 WORTHEN RD
PORTSMOUTH, NH 03801

0260-0134-0000
CARNEY-ROHACEK MARY J FAMILY
TRUST - CARNEY-ROHACEK MARY
J TRUSTEE - 291 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0131-0000
ST LAURENT FAMILY REVOC
TRUST - WILLIAM & SANDRA ST
LAURENT - 253 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0108-0000
COLONIAL PROPERTIES LLC
364 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0111-0000
DUNN RAMONA G REVOC TRUST
OF 2015 - DUNN RAMONA G
154 DECATUR RD
PORTSMOUTH, NH 03801

0260-0051-0000
WILLETT KURT J
6 VICTORY RD
PORTSMOUTH, NH 03801

0260-0050-0000
YZAGUIRRE RUBEN
337 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0049-0000
DEWITT JOY E
355 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0048-0000
HOLLOWAY COURTNEY & JENNIFER
367 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0047-0000
PARISI JOSEPH P & LORIN M
379 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0046-0000
HARTENSTEIN CRAIG
DICKSON PRESLEY
391 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0045-0000
ARNOLD JUDITH G
FOGARTY LORRAINE M
403 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0044-0000
EDWARDS FAMILY REV TRUST
EDWARDS STEPHEN A & CAROL A TT - 144 SPINNAKER WAY
PORTSMOUTH, NH 03801

0260-0043-0000
GARGANTA FAMILY TRUST OF 2020
GARGANTA AARON & JOCELYN TSTE - 423 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0042-0000
DOYLE SUSAN L REVO TRUST 06
DOYLE SUSAN L TRUSTEE
435 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0041-0000
HAMBLET JOAN L
447 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0040-0000
GARGANTA MANUEL S REVOC TRUST & GARGANTA DONNA J REVOC TRUST - 471 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0039-0000
TUCKER HANNA L
SWINDELL BRIAN
481 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0038-0000
GOODRICH JASON
493 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0037-0000
HOLT BRADLEY S & MICHAUD CHELSEA
2475 TRAYMORE RD
UNIVERSITY HEIGHTS, OH 44118

0260-0036-0000
ANDERSON FAMILY REVOC TRUST OF 2012 - ANDERSON P M & E S CO-TRUSTEES - 38 GEORGES TER
PORTSMOUTH, NH 03801

0260-0035-0000
ARSENAULT JAMES H JR
39 GEORGES TER
PORTSMOUTH, NH 03801

0260-0034-0000
ANDERSON FAMILY REVO TRUST OF 2012 - ANDERSON E S & P M
38 GEORGES TER
PORTSMOUTH, NH 03801

0260-0033-0000
PEARL DAVID D & BETSY A
30 GEORGES TER
PORTSMOUTH, NH 03801

0260-0032-0000
GORMAN SHAWN O
GOODRICH-GORMAN CARIANN
20 GEORGES TER
PORTSMOUTH, NH 03801

0260-0031-0000
OLDENHUIS NATHAN
HUGHES STACEY
533 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0030-0000
BATCHELDER JASON
MALDONADO NICOLE
547 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0029-0000
TOUHAMI ABDEL
ZNIBER BTISSAM
563 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0028-0000
FESSENDEN MATTHEW
581 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0027-0000
CLARK ASHLEY
595 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0026-0000
BARTLETT WILLIAM S & KAREN C
607 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0052-0000
303 DECATUR ROAD LLC
303 DECATUR RD
PORTSMOUTH, NH 03801

0260-0053-0000
400 COLONIAL DRIVE LLC
99 MARNE AVE
PORTSMOUTH, NH 03801

0260-0054-0000
SHEA RICHARD M & SUSAN H
19 HOWARD ST
PORTSMOUTH, NH 03801

0260-0055-0000
MCCAIN TIMOTHY JOSHUA
MCCAIN SARAH ELIZABETH
424 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0056-0000
FLEMING PATRICK W
FESTERVAN JANET L
438 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0057-0000
KNOWLES NANCY K
452 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0058-0000
COAKLEY DENNIS & MARY REVOCABLE TRUST
10 BARBERRY LN
PORTSMOUTH, NH 03801

0260-0059-0000
RISTAINO NICHOLAS J
478 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0060-0000
CORRELL SUZANNE M REV TRUST
CORRELL SUZANNE M TRUSTEE
492 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0061-0000
CHOMAS FAMILY REVOCABLE TRUST OF 2018
506 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0062-0000
BOCASH MICHAEL
BOCASH SARAH
520 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0063-0000
BUNNELL JUDITH P REVOCABLE TRUST OF 07
534 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0064-0000
BUCK MICHAEL N & GENEVIEVE R
107 MASON AVE
PORTSMOUTH, NH 03801

0260-0065-0000
GOODWIN FAMILY REVOC TRUST OF 2016
87 MASON AVE
PORTSMOUTH, NH 03801

0260-0066-0000
MEADE BRADFORD L JR
DUQUETTE LINDSAY M
71 MASON AVE
PORTSMOUTH, NH 03801

0260-0067-0000
NOVESKA STANLEY J
DIGIULIO MARIA R
57 MASON AVE
PORTSMOUTH, NH 03801

0260-0068-0000
DECRISTOFARO MICHAEL J REVOC TRST 2015
PO BOX 102
NEW CASTLE, NH 03854

0260-0069-0000
PEATFIELD RICHARD E
PEATFIELD SHARON M
29 MASON AVE
PORTSMOUTH, NH 03801

0260-0070-0000
LAROCHE ROBERT J & KRISTY M
15 MASON AVE
PORTSMOUTH, NH 03801

0260-0071-0000
DOW MERRILL DEVELOPMENT LLC
5 HARDY LANE
HAMPTON FALLS, NH 03844

0260-0072-0000
CHAVEZ MICHAEL E
CHAVEZ MICHELLE WILSON
10 MASON AVE
PORTSMOUTH, NH 03801

0260-0073-0000
BRUCHAS EMILY LYNN
BRUCHAS JORDAN RONALD
34 MASON AVE
PORTSMOUTH, NH 03801

0260-0074-0000
ACKLEY MARGARET H
MCDONELL PETER J
54 MASON AVE
PORTSMOUTH, NH 03801

0260-0075-0000
JESSURUN SCOTT AND NANCY FAMILY TRUST
51 CASWELL DR
GREENLAND, NH 03840

0260-0076-0000
HOUSE TIMOTHY A
HOUSE CYNTHIA
82 MASON AVE
PORTSMOUTH, NH 03801

0260-0077-0000
HEISEY DANIEL F
HEISEY FRANCES C
96 MASON AVE
PORTSMOUTH, NH 03801

0260-0078-0000
KRAMER TODD
KRAMER BRANDIE LAINE
95 GROVE ROAD
RYE, NH 03870

0260-0107-0000
HUYNH COT VAN
137 DECATOR RD
PORTSMOUTH, NH 03801

0260-0106-0000
BARNETTE D & J FAMILY REVO TRUST
121 DECATUR RD
PORTSMOUTH, NH 03801

0260-0087-0000
ALLEN BARBARA
712 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0088-0000
FAGAN ALEXANDRA J
726 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0089-0000
COHEN JOAN N TRUST - 2017
COHEN JOAN N TRUSTEE
69 SPINNAKER WAY
PORTSMOUTH, NH 03801

0260-0090-0000
DATE DUANE A JR
DATE SUSAN E
61 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0091-0000
TURNER LAURA A
77 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0092-0000
KERN E&L FAMILY TRUST
KERN E S & L A TRUSTEES
93 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0093-0000
DAILEY THEODORE P
DAILEY CHERYL L
107 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0156-0000
TRAVER CHARLES R JR REV TST
OSHAUGHNESSY KAREN J REV TST
100 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0160-0000
WALKER THOMAS E
14 SCHURMAN AVE
PORTSMOUTH, NH 03801

0260-0163-0000
PLOVANICH VERONICA R
22 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0166-0000
ST JEAN ROMEO REVO TR
ST JEAN PATSY REVO TR
211 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0169-0000
KAPLAN AMANDA C
145 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0003-0000
HUNTER DONALD E
HUNTER KAREN E
150 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0006-0000
MARTENSON RONALD D &
MCCORMICK MARTENSON
CATHERINE J - 180 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0014-0000
GEIST KELLY ROSE & NICHOLAS J
725 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0016-0000
TOWNSEND JASON R
691 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0095-0000
SCHMIGLE C&K FAMILY REVO
TRUST - SCHMIGLE CHARLES B &
KATHY - 442 CIDER HILL RD
YORK, ME 03909

0260-0157-0000
SZYMANSKI ALEXANDER P
86 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0161-0000
JAMIESON ROBERT J 1997 RV TR
JAMIESON ROBERT J TRUSTEE
35 THORNTON ST
SEABROOK, NH 03874

0260-0164-0000
SIROIS IRENE S
10 COLONIAL DR
PORTSMOUTH, NH 03801

0260-0167-0000
HUSSEIN MOSTAFA
AHMED DALIA
179 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0001-0000
CAMPAGNA STEPHANE &
MATTHEW
100 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0004-0000
GRIGGS PHILIP D
176 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0012-0000
DISALVO ANDREW W
303 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0014-0000
GEIST KELLY ROSE & NICHOLAS J
725 COLONIAL DR
PORTSMOUTH, NH 03801

0261-0001-0000
KNOWLES CLARK E
KNOWLES GAIL M
234 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0096-0000
KENT GRAHAM & ROSE REV LIVING
TRUST KENT GRAHAM T & ROSE M
40 WHIPPLE COURT
PORTSMOUTH, NH 03801

0260-0158-0000
BECKSTED GENEVIEVE ANN 2004
TRUST - BECKSTED GENEVIEVE
9 SCHURMAN AVE
PORTSMOUTH, NH 03801

0260-0162-0000
COOPER N JOHN
BOWDEN COOPER KAREN
7409 RICHLAND PL
PITTSBURG, PA 15208

0260-0165-0000
KAROLESKI DENNIS E
KAROLESKI MARIE M
229 SHERBURNE ROAD
PORTSMOUTH, NH 03801

0260-0168-0000
YESKE J A
YESKE JUDY A
153 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0002-0000
SQUIRES FAMILY REVOCABLE
TRUST
130 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0005-0000
TREMBLAY CATHERINE
490 FW HARTFORD DR
PORTSMOUTH, NH 03801

0260-0013-0000
HOWELL ROBERT W
HOWELL DANA
289 SHERBURNE RD
PORTSMOUTH, NH 03801

0260-0015-0000
PANDAPOTAN ANGGIAT
SIHOMBING ANGGRIN
711 COLONIAL DR
PORTSMOUTH, NH 03801

0261-0002-0000
BOUTIN RICHARD R
278 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0003-0000
MILES RYAN
MILES DANIELLE
282 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0004-0002
LORUSSO MARK D
380 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0005-0000
MANCHEGO GLORIA M
NAVARRO-IGLESIAS LUIS F
362 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0008-0000
WHEATCRAFT BARBARA V
422 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0011-0000
CRONIN WILLIAM J JR
DELISLE LORRAINE L
445 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0013-0000
CURTIS TRUST OF 2005
CURTIS MARTIN W AND JOANNE B
423 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0015-0000
MAZZAGLIA JOSEPH A
MAZZAGLIA HEATHER E
450 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0018-0000
MINER ANNE JAREK
27 SUTTON AVE
PORTSMOUTH, NH 03801

0261-0021-0000
LAPANNE ALPHONSE & STELLA
REVO TRUST
460 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0024-0000
MEADE HANNAH K
29 SUTTON AVE
PORTSMOUTH, NH 03801

0261-003A-0000
FISK NORMAN J REV TST OF 2021
FISK NORMAN J TTEE
61 NORTH ST
AMHERST, NY 03031

0261-0004-0003
FRATAMICO CHERYL A
392 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0006-0000
MCINNIS MICHAEL
418 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0009-0000
PURCELL WILLIAM
30 SUTTON AVE
PORTSMOUTH, NH 03801

0261-0011-0000
CRONIN WILLIAM J JR
DELISLE LORRAINE L
445 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0014-0000
COCCHIARO THOMAS A
424 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0016-0000
BURKE JARED S
470 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0019-0000
SMITH JEREMY O
SMITH ALYSON K
436 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0022-0000
MULVEY JAMES A
7 RANDOM RD
RYE, NH 03870

0261-0025-0000
CONLEY ARIANNE C
MCCARTHY WILLIAM J
21 SUTTON AVE
PORTSMOUTH, NH 03801

0261-0004-0001
TURNER CHARLES E
TURNER KELLY D
368 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0004-0004
SAUNDERS CAMERON R
SAUNDERS JASON D
406 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0007-0000
WADLINGTON THOMAS
GLYNN SHEILA EILEEN
420 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0010-0000
LEDDY CHRISTOPHER A
455 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0012-0000
SULLIVAN DONNA J
19 COTE DR
DOVER, NH 03820

0261-0014-0000
COCCHIARO THOMAS A
424 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0017-0000
KUMPH FAMILY LIVING TRUST
KUMPH SCOTT P & KIMBERLY T TT
24 SUTTON AVE
PORTSMOUTH, NH 03801

0261-0020-0000
DOYON DANIEL P
DOYON EILEEN M
456 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0023-0000
CLARK LOU
CARBONE CHRISTINE
28 DORIS AVE
PORTSMOUTH, NH 03801

0261-0026-0000
SACRAMONE THOMAS JAMES
SACRAMONE VINCENT J & MARIEL
20 WITMER AVE
PORTSMOUTH, NH 03801

0261-0027-0000
BARNAUD ALIX M
516 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0028-0000
CURINGTON CALVIN
CURINGTON DIANA
540 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0029-0000
GEORGE REVOCABLE TRUST
GEORGE APRIL K TRUSTEE
576 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0030-0000
CORBETT JENNIFER J
CORBETT PHILIP A
582 GREENSIDE AVE
PORTSMOUTH, NH 03801

0261-0031-0000
DECRISTOFARO MICHAEL J REV TRUST 2015
PO BOX 102
NEW CASTLE, NH 03854

0261-0032-0000
SACRAMONE THOMAS
20 WITMER AVE
PORTSMOUTH, NH 03801

0261-0033-0000
KEARSEY SHEILA A
KEARSEY CHARLES A
29 DORIS AVE
PORTSMOUTH, NH 03801

0261-0034-0000
RUDZINSKI EWA B
19 DORIS AVE
PORTSMOUTH, NH 03801

0261-0035-0000
SCOTT NATHAN B
SCOTT MICHELE S
476 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0036-0000
WERKELIN P&S FAMILY REV TRUST - WERKELIN PETER & SANDRA
506 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0037-0000
DIECIDUE MICHAEL V
WINTER CAROLINE K
510 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0038-0000
UNITED STATES OF AMERICA
GSA PROPERTY MANAGEMENT
10 CAUSEWAY ST
BOSTON, MA 02222

0261-0039-0000
THURBER GEORGE D
THURBER JULIE A
515 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0040-0000
BLADES JASON R
507 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0041-0000
GAYLE JOHN W
497 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0042-0000
JACKSON ROBERT D
JACKSON KRISTEN J
469 SHERBURNE ROAD
PORTSMOUTH, NH 03801

0261-0043-0000
MCCAULEY DAVID E IRREVOCABLE TRUST - MCCAULEY MICHELE N
443 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0044-0000
HARDTKE TIMOTHY W
274 HOLLY LN
PORTSMOUTH, NH 03801

0261-0045-0000
JELLISON RAYMOND C
260 HOLLY LN
PORTSMOUTH, NH 03801

0261-0046-0000
BARSTOW CHRISTOPHER L & PETRA J & BRYANT CHRISTY
528 DENNETT ST
PORTSMOUTH, NH 03801

0261-0047-0000
VISCAROLASAGA EFRAIN
VISCAROLASAGA JENNIFER
246 HOLLY LN
PORTSMOUTH, NH 03801

0261-0048-0000
LEONARD JEANNE L
240 HOLLY LANE
PORTSMOUTH, NH 03801

0261-0049-0000
AUBERTINE DOROTHY
230 HOLLY LANE
PORTSMOUTH, NH 03801

0261-0050-0000
MDR REHAB & DEVELOPMENT LLC
PO BOX 653
GOFFSTOWN, NH 03045

0261-0051-0000
FITCH HEATHER REV TRUST
FITCH HEATHER TRUSTEE
1671 PEGGY LN
PETALUMA, CA 94954

0261-0052-0000
CRESTA SAMUEL W
BILLINGHAM MEGAN L
200 HOLLY LN
PORTSMOUTH, NH 03801

0261-0053-0000
GILMORE DANIEL R
CLARK LESLIE C
188 HOLLY LN
PORTSMOUTH, NH 03801

0261-0054-0000
FRASER NEAL
4062 SHASTA ST APT 9
SAN DIEGO, CA 92019

0261-0055-0000
TIBBETTS FAMILY REVOCABLE TRUST - TIBBETTS PAUL D & ANN C
176 HOLLY LANE
PORTSMOUTH, NH 03801

0261-0056-0000
O'CONNELL MICHAEL J
O'CONNELL SHASTA N
156 HOLLY LN
PORTSMOUTH, NH 03801

0261-0058-0000
DOYLE WILLIAM G
DOYLE MARY JO
138 HOLLY LN
PORTSMOUTH, NH 03801

0261-0059-0000
MOUNTJOY KAREN E REVOC LIVING TRUST
62 ORCHARD ST
PORTSMOUTH, NH 03801

0261-0060-0000
VEILLEUX FAMILY REVOCABLE TRUST - DENNIS R AND AMANDA D
100 HOLLY LN
PORTSMOUTH, NH 03801

0261-0061-0000
MITROOK REVOCABLE TRUST
MITROOK RUSSELL JR TRUSTEE
96 HOLLY LN
PORTSMOUTH, NH 03801

0261-0062-0000
BRAY JENNIFER L
BRAY DENNIS F
78 HOLLY LN
PORTSMOUTH, NH 03801

0261-0063-0000
HARDTKE MICHAEL
HARDTKE TERESA
64 HOLLY LN
PORTSMOUTH, NH 03801

0261-0064-0000
PIERCE ADALYNNE
SULLIVAN DANA W JR
61 HOLLY LN
PORTSMOUTH, NH 03801

0261-0065-0000
ROBICHAUD JASON D
ROBICHAUD EMILY M
77 HOLLY LN
PORTSMOUTH, NH 03801

0261-0066-0000
CRAY JENNIFER S
MURPHY THOMAS B
95 HOLLY LN
PORTSMOUTH, NH 03801

0261-0067-0000
BOWSER TODD A
117 HOLLY LN
PORTSMOUTH, NH 03801

0261-0068-0000
FRASER JONATHAN R
FRASER KATELYNN
143 HOLLY LN
PORTSMOUTH, NH 03801

0261-0069-0000
BURNELL-CHOW REVOCABLE LIVING TRUST
159 HOLLY LN
PORTSMOUTH, NH 03801

0261-0070-0000
GRECO STEVEN C
GRECO LINDA A & STEVEN F
270 FW HARTFORD DR
PORTSMOUTH, NH 03801

0261-0071-0000
207 HOLLY LANE REALTY TRUST
SMALL JAMES & SMALL ELLEN
167 LANGFORD RD
CANDIA, NH 03034

0261-0072-0000
SRIMOUKSAVANH ANUT T
SRIMOUKSAVANH ANDREA A
237 HOLLY LN
PORTSMOUTH, NH 03801

0261-0073-0000
SCRITCHFIELD BILLY JR
174 34TH ST
ACTON, ME 04001

0261-0075-0000
MCCORMICK M & FERLAND P
TOD/ BAKER JONATHAN
50 HOLLY LANE
PORTSMOUTH, NH 03801

0261-0076-0000
KERN KRISTIN K
200 SHERBURNE RD
PORTSMOUTH, NH 03801

0261-0077-0000
CITY OF PORTSMOUTH
1 JUNKINS AVE
PORTSMOUTH, NH 03801

0260-0140-0000
CITY OF PORTSMOUTH
DPW
PO BOX 628
PORTSMOUTH, NH 03802

0260-0159-0000
CITY OF PORTSMOUTH
DPW
PO BOX 628
PORTSMOUTH, NH 03802

0279-0001-0000
ARANOSIAN OIL CO
557 N STATE ST
CONCORD, NH 03301

0279-0002-0000
ARANOSIAN OIL CO INC
557 N STATE ST
CONCORD, NH 03301

0279-0003-0000
CHRISTOPHER B BELIVEAU
SANDRA M BELIVEAU
1620 GREENLAND RD
PORTSMOUTH, NH 03801

0279-0004-0000
ELISABETH M. DARVID REV. TRUST
DARVID ELISABETH M TRUSTEE
1630 GREENLAND RD
PORTSMOUTH, NH 03801

0279-0005-0000
ROBERT A & RUTH E. KEENE
1640 GREENLAND RD
PORTSMOUTH, NH 03801

0279-0006-0000
PDNED GREENLAND LLC
C/O NEW ENGLAND DEVELOP/ACCT
75 PARK PLAZA
BOSTON, MA 02116

0279-0007-0000
SHEVLIN FAMILY REVOC TRUST
SHEVLIN MICHAEL A & MONIQUE ADJAMI - 1648 GREENLAND RD
PORTSMOUTH, NH 03801

0279-0008-0000
ARANOSIAN OIL CO INC
557 N STATE STREET
CONCORD, NH 03301

0279-0009-0000
HODGSON ISABELLE E REVO TR
OF 94/IE HODGSON TRUSTEE
557 N STATE STREET
CONCORD, NH 03301

53-05
Barbara Baird Rev Trust 2001
Barbara Baird, Trustee
316 Newington Rd
Newington, NH 03801

47-01A
Alan N Thomas, Sr
501 Newington Rd
Newington, NH 03801

54-03
Reginald Savageau & Pauline Church
66 Airport Rd
Newington, NH 03801

51-09B
John W & Laura L Stone
436 Newington Rd
Newington, NH 03801

52-05
Brendan W Cornwell & Sara Zoe Patterson
67 Airport Rd
Newington, NH 03801

52-04
Sandra M Taylor
59 Airport Rd
Newington, NH 03801

51-15
Kenneth L Peterson Rev. Trust
Kenneth L Peterson, Trustee
408 Newington Rd
Newington, NH 03801

23-05
Dean R & Emily J Turner
275 Little Bay Rd
Newington, NH 03801

23-07A
Donald & Sylvia Bly Rev. Trust
340 Little Bay Rd
Newington, NH 03801

23-13
Donna L Gifford
6 Little Bay Rd Ext
Newington, NH 03801

51-09
Wayne C Wood, Rev. Trust
Wayne C Wood & Patricia L Bennett-Wood, Trustees
428 Newington Rd

54-05
Alexander Richard Jack & Elaine M D'orto-Jack
62 Airport Rd
Newington, NH 03801

51-06
Joanne L Drinkwater Rev. Trust
Joanne L Drinkwater, Trustee
36 Concord Point
Rye, NH 03870

52-06
Town of Newington
205 Nimble Hill Rd
Newington, NH 03801

24-12
Town of Newington
205 Nimble Hill Rd
Newington, NH 03801

24-13
Town of Newington
205 Nimble Hill Rd
Newington, NH 03801

23-35
Michael Metzger & Myhanh Nguyen
23 Welsh Cove Drive
Newington, NH 03801

23-07B
Karen J Schaffer
338 Little Bay Rd
Newington, NH 03801

23-14
Brian C Rogers Rev Trust
Brian C Rogers, Trustee
2 Little Bay Rd Ext
Newington, NH 03801

23-08-1
Kevin Ryan
888 McIntyre Road
Newington, NH 03801

54-06
Brian D & Mary Ann Short
336 Newington Rd
Newington, NH 03801

47-01B
Alan N Thomas
501 Newington Rd
Newington, NH 03801

54-02
Brent Scott Skillings
Elizabeth Lynne Doucet
56 Airport Rd
Newington, NH 03801

47-04B
Roger W Heath
468 Newington Rd
Newington, NH 03801

52-07
Wayne C Wood
428 Newington Rd
Newington, NH 03801

23-34
Mary Jeppesen Rev. Trust 50%
Russell Jeppesen Rev. Trust 50%
PO Box 9
Greenland, NH 03840-0009

23-36
Marple Revoc Trust
Robert A & Anastasia L Marple
15 Welsh Cove Drive
Newington, NH 03801

23-04
Ruth K Fletcher, Trustee
271 Little Bay Rd
Newington, NH 03801

23-08
Gurubhai K Khalsa
11 Old Post Rd
Newington, NH 03801

23-12
William J Murray, Trustee
10 Little Bay Rd Ext
Newington, NH 03801

23-11
Jennifer R Ruel Rev. Living Trust
9 Little Bay Rd Ext
Newington, NH 03801

23-03
Kimberly & Brian Dumont Rev Trusts
Kimberly & Brian Dumont, Trustees
251 Little Bay Rd
Newington, NH 03801

23-19
Curtis J Pickering
293C Little Bay Rd
Newington, NH 03801

23-31
Dennis & Andrea Glynn
34 Welsh Cove Drive
Newington, NH 03801

23-33
Grand View Trust
Mark & Rosemary Phillips, Trustees
235 Hodgdon Farm Lane
Newington, NH 03801

24-06
Town of Newington
Town Office
205 Nimble Hill Road
Newington, NH 03801

18-03B
John Liatsis
271 Nimble Hill Rd
Newington, NH 03801

18-02
Annette Lee Lord & Beverly Packard
8 Fox Point Road
Newington, NH 03801

24-04
Christopher A & Cynthia B Cross
327 Nimble Hill Road
Newington, NH 03801

18-05
Renato J. Maldini
11 Fox Point Road
Newington, NH 03801

23-17
Bulent B & Christine E Unlusoy
264 Little Bay Rd
Newington, NH 03801

23-20
Susan Gordon
299 Little Bay Rd
Newington, NH 03801

23-30
Robert M Chaikin, Revoc Trust
Robert M Chaikin, Trustee
26 Welsh Cove Dr
Newington, NH 03801

23-32
Thomas B & Catherine B Hazelton
44 Welsh Cove Drive
Newington, NH 03801

24-10
Town of Newington
205 Nimble Hill Road
Newington, NH 03801

18-03A
John A Byron Rev. Trust
John A Byron, Trustee
11 Hannah Ln
Newington, NH 03801

12-12
Keith C & Sara F Frizzell Keith C Frizzell, Trustee
PO Box 310
Dover, NH 03820

24-02
Paul & Carolyn Harvey Carolyn C Harvey, Trustee of
517 New Castle Ave
Portsmouth, NH 03801

18-04
O'Reilly Family Rev Trust John James & Luanne O'Reilly, Trustees
7 Fox Point Road
Newington, NH 03801

Judith A Mraz Rev Trust
Judith Mraz, Trustee
67 Bald Hill Rd
Newfields, NH 03856

23-09
Scott W & Patricia Borkland
5 Little Bay Rd Ext
Newington, NH 03801

23-15
Seth M Frink & Debbie Shlain-Frink
1408 Centre St
Newton, MA 02459

23-18
Thomas P Redden Jr., Rev Living Tr
Thomas P Redden Jr., Trustee
283 Little Bay Rd
Newington, NH 03801

24-12
Town of Newington
205 Nimble Hill Road
Newington, NH 03801

23-23
Lulu Arline Pickering & William A Gilbert
339 Little Bay Rd
Newington, NH 03801

23-08-3
Pease Development Authority
360 Corporate Drive
Portsmouth, NH 03801

24-01
Alexander C O'Brien
293 Nimble Hill Road
Newington, NH 03801

18-01
Jay M Link II & Deirdre L Link
16 Fox Point Road
Newington, NH 03801

24-11
Town of Newington Church UCC
c/o Cheryl Bagley
30 Hannah Ln.
Newington, NH 03801

18-06
Frank Family Rev Trust of 2007
Vincent & Shirley Frank, Trustees
19 Fox Point Road
Newington, NH 03801

18-07
Jason Cole & Heather Geraci-Cole
61 Old Post Rd
Newington, NH 03801

53-01
Meredith & Christopher Marconi
3 Airport Rd
Newington, NH 03801

12-15
19 Nimble Hill Realty LLC
19 Nimble Hill Rd
Newington, NH 03801

47-07
K&K Rev Family Trust
6 Faybian Point Rd
Newington, NH 03801

12-10-B
The Michael P Patenaude Rev Trust
Michael P Patenaude, Trustee
65 Nimble Hill Rd.
Newington, NH 03801

47-02
Denise Ann Tessier Moser
Stephen James Moser
933 Ocean Boulevard #305
Hampton, NH 03842

24-06-1
Town of Newington
205 Nimble Hill Rd
Newington, NH 03801

12-13
State of NH
PO Box 483
Concord, NH 03302-0483

54-04
Barbara Hehir E Rev Trust
Barbara E Hehir Trustee
74 Airport Rd
Newington, NH 03801

18-08
Ralph & Barbara Cooley
37 Fox Point Rd
Newington, NH 03801

47-05A
Peter & Gail F. Johnson
7 Fabyan Point Road
Newington , NH 03801

12-11A
Cynthia A Lyons
49 Nimble Hill Road
Newington, NH 03801

47-10
Alan & Roberta Thomas
501 Newington Rd
Newington, NH 03801

47-03
John Emery
4140 Koko Drive
Honolulu, HI 96816

23-21
Poulin, Michael & Judith
311 Little Bay Rd
Newington, NH 03801

08-01
Short Family LTD Partnership
373 Shattuck Way
Newington , NH 03801

18-11
Wendy Lou Sweeney, Rev Trust
Wendy Lou Sweeney, Trustee
28 Fox Point Road
Newington, NH 03801

51-16
Patricia J & Donald F Mitchell
400 Newington Rd
Newington, NH 03801

12-16
25 Nimble Property Ownes, LLC
133 Pearl St.
Boston, MA 02110

47-08
Rebecca Navelski
493 Newington Rd
Newington, NH 03801

12-12
Keith C & Sara F Frizzell Keith C Frizzell, Trustee
PO Box 310
Dover, NH 03820

47-04A
Roger W. Heath
468 Newington Rd
Newington, NH 03801

23-21A
Estes Family Rev Trust
Ralph Estes, Trustee
307 Little Bay Rd
Newington, NH 03801

12-10B
Michael P Patenaude Rev. Trust
Michael P. Patenaude TTEE
65 Nimble Hill Road
Newington, NH 03801

R21-017-000
TWOMBLY MARILYN
703 NARROW LEAD DR
UPPER MARLBOROUGH, MD 20774

R21-018-000
TOBIN KEITH J & HARRIS EMILY E
7 PORTSMOUTH AVENUE
GREENLAND, NH 03840

R21-019-000
KRASKO ROBERT F & THERESA
11 PORTSMOUTH AVENUE
GREENLAND, NH 03840

R21-020-000
CHAG MARK A & SHAWNA L
15 PORTSMOUTH AVENUE
GREENLAND, NH 03840

R21-021-000
FURINO ROBERT S
17 PORTSMOUTH AVENUE
GREENLAND, NH 03840

R21-022-000
BUNKER MICHAEL W & LINDA A TROFATTER
25 PORTSMOUTH AVENUE
GREENLAND, NH 03840

R22-015-000
SMITH GREAT BAY FARM LTD PTR
PO BOX 156
GREENLAND, NH 03840

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

WAIVER REQUEST

June 13, 2025

Re: Tax Map 303, Lot 6
135 Corporate Drive
Altus Project No. 5336

On behalf of AECOM Technical Services, Applicant, Altus Engineering, LLC respectfully requests the following waivers from the Pease Development Authority (PDA) Site Plan Regulations.

Section 405.07 Stormwater Management

Requirements:

(a) All stormwater runoff in contact with developed areas shall be treated by the use of advances stormwater treatment to minimize off-site discharge of pollutants to ground and surface water by minimizing the volume and rate of runoff, the amount of erosion and the export of sediment from the site.

(c) For any development proposing to add impervious surface for the purpose of vehicle parking and/or traffic circulation at the site that does not conform to the requirements of Part 405.07(a), all new impervious area, as well as at least an equal amount of existing impervious area shall be provided with advanced stormwater treatment.

Provided:

The proposed project will add approximately 7,500 S.F. of pavement for vehicular traffic in areas that were not previously paved for vehicles. However, with the removal of buildings, walkways and other impervious areas the site is only increasing the impervious area coverage by approximately 4,000 S.F. Additionally an effort has been made to add stormwater treatment to the site in the form of two bioretention cells that will treat approximately 6,850 S.F. of site impervious surfaces. Of the 6,850 S.F. of impervious surfaces to be treated, approximately 3,850 S.F. of pavement used for vehicular traffic will be treated. The intent of the stormwater design was to treat impervious areas as much as possible while limiting disturbance to the site and reducing off-site flows.

Additional stormwater treatment areas on the site were reviewed and it was determined that it was not feasible as part of this project for a few reasons:

1. The site already has a large functioning stormwater system that was constructed prior to stormwater treatment requirements. Updating or reconstructing the system to treatment areas would be a large cost and would increase overall disturbance to the site.

2. A large part of the site is already located within the 100’ wetland buffer, approximately 52.7% of the site is wetland or is located within the 100’ wetland buffer. Additional stormwater treatment would likely need to be located within this buffer thus increasing disturbance to the wetland buffer.

3. The existing site is significantly developed, it is relatively flat and there are many existing buried utilities on the site that support the function of the treatment facility. This makes it hard to find areas to add stormwater treatment because there are limited areas where these systems will fit and meet treatment requirements. The lack of elevation change also makes it difficult to and the many existing utilities make it difficult to install gravity systems on the site.

By granting the waiver, the overall disturbance to the site can be minimized while still improving the stormwater conditions of the site with two new stormwater treatment areas.

Respectfully submitted by,

ALTUS ENGINEERING, LLC

pmj/5336 waiver

SITE & CONDITIONAL USE APPLICATIONS

FOR

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH

June 13, 2025

Prepared For:
AECOM Technical Services, Inc.
250 Apollo Drive
Chelmsford, MA 01824

On Behalf Of:
City of Portsmouth New Hampshire
Department of Public Works
680 Peverly Hill Road
Portsmouth, NH 03801

Prepared By:
Altus Engineering
133 Court Street
Portsmouth, NH 03801
Phone: (603) 433-2335

ALTUS ENGINEERING

Altus Project 5336

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

June 13, 2025

Michael Mates, Director of Engineering
Pease Development Authority
55 International Drive
Portsmouth, New Hampshire 03801

Re: Application for Conditional Use Permit
Assessor's Map 303, Lot 6
Pease Wastewater Treatment Facility Rehabilitation
135 Corporate Drive
Altus Project No. 5336

Dear Mr. Mates,

On behalf of the City of Portsmouth Department of Public Works (DPW), AECOM Technical Services (AECOM) and Altus Engineering LLC (Altus) are pleased to submit an Application for Site Review and a Conditional Use Permit Application for the Pease Wastewater Treatment Facility (WWTF) Rehabilitation project. The City of Portsmouth DPW owns and operates the treatment facility and intends to improve the function of the existing WWTF.

The WWTF began operation in 1954 under the Air Force prior to City wetland buffer regulations. Wetlands have been identified both on and just outside of the lot; significant portions of the lot are also within the Pease Development Authority (PDA) 100-foot wetlands buffer. No improvements are proposed within the wetlands identified. The project identifies some improvements to the WWTF that are within 100-foot wetland buffer area.

The proposal includes construction of four new buildings on the property: a new Primary Sludge Pump Station (±480 S.F.), new Electrical/Control Building (±653 S.F.), new Chemical Storage Building (±1,956 S.F.) and an expansion of the existing Lab/Administration Building (±912 S.F.). Other improvements to the site include new utilities to each of the buildings, new piping to support the facilities treatment operations, a new generator with concrete pad, a new electrical transformer with concrete pad, new sidewalks, new parking and access ways, new water service and stormwater infrastructure.

Please feel free to call or email me directly should you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, LLC

Eric D. Weinrieb, P.E.
President

Enclosures

eCopy: Erik Meserve, P.E., AECOM
Xiaojin (Jim) Li, PhD, AECOM
Patrick Journeay, Altus Engineering

pmj/5336.00b-CU Permit Cover Letter

Table of Contents

ALTUS ENGINEERING

Section 1

Application for Site Review
Conditional Use Permit Application

ALTUS
ENGINEERING

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Conditional Use Permit Application

For PDA Use Only			
Date Submitted:	Municipal Review:	Fee:	
Application Complete:	Date Forwarded:	Paid:	Check #:

Applicant Information

Applicant: City of Portsmouth DPW	Agent: AECOM Technical Services, Inc.
Address: 680 Peverly Hill Road Portsmouth, NH 03801	Address: 250 Apollo Drive Chelmsford, MA 01824
Business Phone: (603) 427-1530	Business Phone: (978) 905-2100
Mobile Phone:	Mobile Phone:
Fax: (603) 427-1539	Fax:

Site Information

Portsmouth Tax Map: 303 | Lot #: 6 | Zone: Airport Buisiness Commercial Zone

Address / Location of Work: 135 Corporate Drive, Portsmouth, NH 03801

Proposed Activity (check all that apply)	Impacted Jurisdictional Area(s): Check all that apply
X New Structure	Wetland
X Expansion of Existing Structure	X Wetland Buffer
X Other site alteration (specify): NEW STORMWATER INFASTRUCTURE & WWTF RELATED UTILITY IMPROVEMENTS	

Total area of wetland on subject lot:	127,000 SF
Total area of wetland buffer on subject lot:	163,100 SF
Distance of proposed structure or activity to edge of wetland:	TBD LF

	On subject lot	Off subject lot
Area of wetland impacted:	0 SF	0 SF
Area of wetland buffer impacted:	19,200 SF	500 SF
Total area of wetland and wetland buffer impacted:	19,200 SF	500 SF

Provide complete description of site and work to be completed:

The Pease Wastewater Treatment Facility is proposing improvements to the existing site that includes: demo and rehabilitation of existing buildings, construction of new buildings, new piping to support the facility, new electrical utilities, new stormwater infrastructure, new parking and access ways and replacement of the water line.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for conditional use and acknowledge I will comply with all regulations and any conditions established by the PDA Committees and Board in the development and construction of this project.

Signature of Applicant — Date: 6/11/25

Peter Rice
Printed Name

N:\Engineer\Conditional Use Permit Application.xlsx

Pease Development Authority
55 International Drive, Portsmouth, NH 03801, (603) 433-6088

Application for Site Review

For PDA Use Only			
Date Submitted:	Municipal Review:	Fee:	
Application Complete:	Date Forwarded:	Paid:	Check #:

Applicant Information

Applicant: City of Portsmouth DPW	Agent: AECOM Technical Services, Inc.
Address: 680 Peverly Hill Road Portsmouth, NH 03801	Address: 250 Apollo Drive Chelmsford, MA 01824
Business Phone: (603) 427-1530	Business Phone: (978) 905-2100
Mobile Phone:	Mobile Phone:
Fax: (603) 427-1539	Fax:

Site Information

Portsmouth Tax Map: 303	Lot #: 6	Zone: Airport Buisiness Commercial Zone
Site Address / Location : 135 Corporate Drive, Portsmouth, NH 03801		
Site Address / Location :		Area of On-site Wetlands: 127,000 SF

Activity Information

Change of Use: Yes [ ] No [X] Existing Use: Wastewater Treatment Facility

Proposed Use: Wastewater Treatment Facility

Description of Project: The Pease Wastewater Treatment Facility is proposing improvements to the existing site that includes: demo and rehabilitation of existing buildings, construction of new buildings, new piping to support the facility, new electrical utilities, new stormwater infrastructure, new parking and access ways and replacement of the water line.

All above information shall be shown on a site plan submitted with this application. Provide 3 full size hard copies and one PDF copy of all application materials as well as one half-size set of drawings to PDA. Applicant shall supply additional copies as may be required by applicable municipality. Refer to Chapter 400 of PDA land Use Controls for additional information.

Certification

I hereby certify under the penalties of perjury that the foregoing information and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I hereby apply for Site Review and acknowledge I will comply with all regulations and any conditions established by the Review Committee(s) and PDA Board in the development and construction of this project.

Signature of Applicant — Date: 6/11/25

Peter Rice
Printed Name

N:\Engineer\ ApplicationforSiteReview.xlsx

Section 2

Conditional Use Narrative

ALTUS
ENGINEERING

ALTUS ENGINEERING

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

CONDITIONAL USE PERMIT APPLICATION
Pease Wastewater Treatment Facility
NARRATIVE
June 13, 2025

On behalf of the Applicant, City of Portsmouth Department of Public Works (DPW), AECOM Technical Services (AECOM) and Altus Engineering, LLC (Altus) respectfully submits a Wetlands Conditional Use Permit application for the rehabilitation of the Pease Wastewater Treatment Facility (WWTF) at 135 Corporate Drive. The DPW proposes to significantly renovate the 70+ year old facility.

The WWTF is a ±12.1-acre parcel identified on the Portsmouth Assessor Maps on Tax Map 303, Lot 6. The lot is bounded by the Spaulding Turnpike (U.S. Highway Route 16) to the northeast, Tony Rahn Park to the southeast, Corporate Drive to the southwest and the area to the northwest is undeveloped. The WWTF buildings are located in the center and eastern portion of the parcel. A section of Hodgson Brook is located along the southwest property boundary between the lot and Corporate Drive. The west boundary of the property is undeveloped and there is a mix of woods, maintained lawn and wetland.

The existing built above ground infrastructure includes a Lab/Administration Building, a Blower/Dewatering Building, a Control Operations Building, a Septage Receiving Building, a Headworks Building, a Sludge Storage tank, a Chlorine Contact Tank, two Sequencing Batch reactors, two Primary Clarifiers, and two Post Equalization Tanks. There is also an abandoned Digester and two abandoned Trickling Filter Bases on the property. The facility was originally part of the Pease Air Force Base and is under the jurisdiction of the Pease Development Authority (PDA). The City of Portsmouth operates the WWTF that is under the jurisdiction of the PDA.

The proposal includes construction of four new buildings on the parcel: a new Primary Sludge Pump Station (±480 S.F.), new Electrical/Control Building (±653 S.F.), new Chemical Storage Building (±1,956 S.F.) and an expansion of the existing Lab/Administration Building (±912 S.F.). It also includes razing the existing Control Operations Building. Other improvements to the site include new utilities to each of the buildings, new piping to support the facilities treatment operations, a new generator with concrete pad, a new electrical transformer with concrete pad, new sidewalks, new parking and access ways, and stormwater infrastructure.

Wetlands have been identified on the site, primarily in the western and southern corners of the lot; and small wetland has been identified along the northeast boundary. Portions of the existing WWTF lie within the 100-foot wetland buffer. The project proposes to limit disturbing the wetland buffer as much as possible, but based on the existing layout of the WWTF and the

location of the wetlands, some impact to the wetland buffer is unavoidable. The wetlands and 100-foot wetlands buffer encompasses a significant portion of the lot, making improvements impossible without a Conditional Use Permit. The majority of the on-site wetland is undisturbed and allowed to grow naturally. The WWTF was constructed prior to City wetland buffer regulations and before most zoning ordinances were enacted; additionally the WWTF was constructed by the Air Force which is exempt from most permitting requirements.

The WWTF has an access road from Corporate Drive that crosses over Hodgson Brook. Most of the existing WWTF buildings are located outside of the 100-foot buffer, however there are some existing structures and paved surfaces located within the 100-foot buffer. Currently the entirety of the Septage Receiving Building and Equalization Tank #1 are located within the buffer, additionally a half of Equalization Tank #2 and portions of the Sludge Storage Tank and Sequencing Batch Reactor #1 are also located within the buffer. The existing site has approximately 26,300 SF of impervious surfaces within the buffer consisting of the buildings listed above and paved surfaces.

This project proposes disturbances to the 100-foot wetland buffer area that are in three distinct "areas" on the property. The largest disturbance area within the buffer area is the proposed ±2,500 SF Chemical Storage Building located along the northeast boundary of the site. Based on buildable space remaining on the property, this is the optimal location for the new building. It is close enough to the existing facility to reduce the amount of associated piping needed to support the facility and the building will be surrounded by existing pavement on three sides. There is also existing pavement between the proposed building and the existing wetland. Additionally, stormwater infrastructure will be constructed around the building to adequately capture stormwater runoff and discharge it to the onsite drainage system. The proposed building is approximately 27 feet to the wetland.

The second disturbance area within the buffer on the property is the widening of the access road and construction of a bioretention cell near the entrance to the WWTF. The widening of the access road will add approximately 430 S.F. of pavement within the wetland buffer. However, the construction of the bioretention cell will treat impervious runoff from the site and control the rate of discharge from the contributing catchments. The site currently does not have any stormwater treatment SCMs (Stormwater Control Measures) and the two proposed bioretention cells are sized to treat more impervious surface than the amount of new impervious area that is proposed in this project. The proposed paving associated with widening the access road is approximately 37 feet from the wetlands at the closest point.

The third disturbance area within the wetland buffer area is from the proposed trenching and piping activities that are required throughout the property. These areas are not as confined as the previous two, but this type of disturbance will be less of an impact when construction is completed. These disturbances are below grade and the land will be returned to existing conditions when construction is completed.

The WWTF is overdue in replacing/upgrading water, electric and stormwater utilities. Additionally, with the demolition and construction of several buildings that support the WWTF

operation, underground piping associated with these buildings will also need to be constructed. A portion of these activities will need to be completed within the wetland buffer. Unlike the previous two areas of disturbance within the wetlands buffer area, these disturbances will be temporary. The distance of these improvements to existing wetlands varies across the site, however the new water service from Corporate Drive along the access road will be closest to the existing wetlands.

In accordance with Chapter 300 Pease Development Authority Zoning Requirements, Part 304-A Pease Wetlands Protection, the project will require a Conditional Use Permit from the Planning Board. The project does not require any additional relief from the City of Portsmouth Zoning Ordinance.

Per Part 304-A.08 for criteria for approval of a Conditional Use Permit, Altus offers the following:

(1) The land is reasonably suited to the use;

The property is an existing wastewater treatment facility located in the Airport Business Commercial Zone. The existing site currently serves residential, industrial and commercial users. The proposed project does not change the use of the site.

(2) There is no alternative location outside the wetland buffer that is feasible and reasonable for the proposed use;

<u>The proposed Chemical Storage Building:</u>

The existing lot is already significantly developed to support the existing WWTF, new buildings under this proposed project are located near to the existing buildings and in areas that have already been disturbed during the original construction of the WWTF.

A significant amount of the lot that has not been previously disturbed remains undeveloped, wetland or wetland buffer. Building within the wetland is not feasible and a large portion of the lot is within the wetland buffer. Construction in undeveloped areas would cause more overall disturbance on the parcel. Building within the buffer near the existing WWTF structures reduces overall disturbance.

<u>The new pavement for the access road and bioretention cell #1:</u>

The existing access road already travels through the wetland buffer and relocation of the access road is not feasible. The widening of the road is to provide safer access for vehicles and to provide protection to the underground duct bank that provides power to all of PDA. The amount of new impervious within the buffer

(±2,950 S.F.) is minimal compared to the amount of total on-site buffer area (±163,100 S.F.) and buffer area that is already impervious (±26,300 S.F.). The location of the bioretention cell was ideal to maximize the amount of stormwater treatment and control of offsite flows. While this cell is located in the buffer, when construction is completed it will be a permeable grassed depression.

<u>The utility trenching and piping activities:</u>

The property has significant areas of wetland and wetland buffer encumbering a significant portion of the site. No utility piping is within the wetlands. New utility piping activities within the buffer are unavoidable based on the location of the existing access road and the existing buildings on site. Where possible, piping and trenching in the wetland buffer is avoided but in many situations there is no other option. While construction is ongoing temporary erosion control SCMs will be in place to protect resource assets. When this work is completed the areas disturbed will be returned to existing conditions, either to be repaved or loamed and seeded as necessary.

(3) There will be no adverse impact on the wetland functional values of the site or surrounding properties;

The majority of the on-site wetland system is undisturbed and a majority of the WWTF is outside of the 100-foot wetlands buffer. Most of the areas within the wetland buffer to be impacted during this project have already been disturbed previously during the original construction of the WWTF. Work within the wetland buffer for this project should not have any adverse impacts on the functional values of the wetland areas or surrounding properties.

<u>The Proposed Chemical Storage building:</u>

The existing wetland system near the proposed building is a small stormwater ditch that is downstream from the Spaulding Turnpike. This wetland discharges into a 36" drainage culvert that travels across the site. While the proposed building is adding impervious area to the wetland buffer, stormwater SCM's are proposed control flows from this new building that were not previously in place. While no stormwater treatment is present for this building, stormwater treatment has been proposed elsewhere on the site to offset the impact of this proposed building.

<u>The new pavement for the access road and bioretention cell #1:</u>

The existing wetland system to the southeast is a small depression that collects rainwater from upgradient. There is no direct connection between this small patch of wetland and Hodgeson Brook that is located to the west and south. This small wetland already collects large amounts of runoff from the existing WWTF access

road and there is no existing stormwater treatment. While the new pavement for the access road is adding impervious area within the wetland buffer it is only increasing by ±430 SF. Additionally, the bioretention cell is proposed to intercept a large amount of the runoff from the access road that currently discharges to the wetland and provide treatment, where previously it was untreated.

<u>The utility piping and trenching activities:</u>

No adverse impacts to the wetland functional values are anticipated. This type of work is only temporarily disturbing the existing ground surface and proper erosion control SCM's will be in place to protect areas outside of the work. When construction is completed these areas will be returned to existing conditions. Additionally, the utilities to be installed within the buffer are primarily water, stormwater and electric which all pose a minimal risk to wetland functional value. Areas disturbed will be returned to existing conditions after the work is completed.

The site effective impervious area will increase in both the wetland buffer and the entire lot, however two bioretention cells are proposed to provide treatment to impervious surfaces that currently do not exist on the site. Furthermore, the bioretention cells have been sized to treat more impervious surface area (±6,844 S.F.) than is being added under this project (±4,006 S.F.). In summary, stormwater quantity will be enhanced and volume and peak rate of runoff discharging from the site will be reduced. These improvements provide a benefit to Hodgson Brook and the properties located down gradient.

(4) Alteration of the natural vegetative state or managed woodland will occur only to the extent necessary to achieve construction goals; and

The entire WWTF rehabilitation project will be within areas that have previously been disturbed. Tree and shrub removal within the buffer will be minimal.

(5) Potential impacts have been avoided to the maximum extent practicable and unavoidable impacts have been minimized.

Yes, as stated under previous conditions, impacts and disturbance to the wetland buffer have been avoided or minimized to the maximum extent practicable. Wetland buffer areas were avoided where possible, however the lot is already significantly developed in areas outside of wetlands and wetland buffers. Areas chosen within the buffer were identified as areas where overall disturbance on the site could be minimized. Stormwater treatment SCM's are also being utilized to further reduce adverse impacts to wetland areas that are not present on the existing site.

Section 3

Pease Development Authority Wetland Overview with Recommended Buffers Plan

ALTUS ENGINEERING

NIMBLE HILL RD

Piscataqua River

WOODBURY AVE

SPAULDING TPK

NEWINGTON RD.

Newington

Portsmouth

Greenland

LEGEND

Pease Boundary

RTE Occurrence

Town Bounds

Recommended Buffers

25-Foot Buffer

50-Foot Buffer

100-Foot Buffer

Man-made Areas (No Buffer)

Pease Wetlands with ID

01	30	59	
02	31	60	
03	32	61	
04	33	62	
05	34	63	
06	35	64	
07	36	65	
08	37	66	
09	38	67	
10	39	68	
11	40	69	
12	41	70	
13	42	71	
14	43	72	
15	44	73	
16	45	74	
17	46	75	
18	47	76	
19	48	77	
20	49	78	
21	50	79	
22	51	80	
23	52	81	
24	53	82	
25	54	83	
26	55	84	
27	56	85	
28	57	86	
29	58	87	

1000 0 1000 2000 3000 4000 Feet

Pease International Tradeport
Wetland Overview with
Recommended Buffers

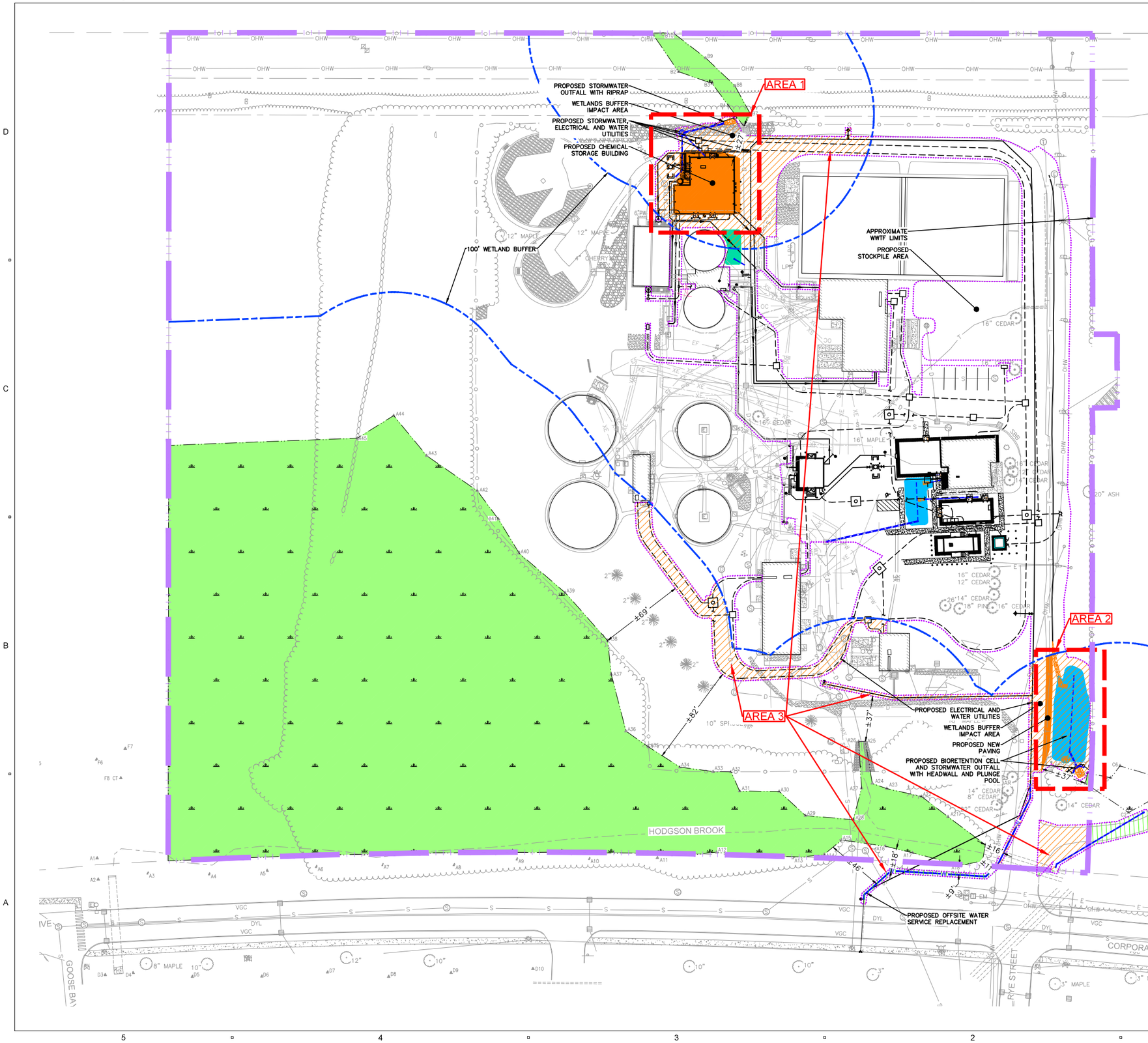
GES Gove Environmental Services, Inc.

RETURN TO ENGINEERING

Section 4

Wetlands Buffer Conditional Use Plan

ALTUS
ENGINEERING



LEGEND

- APPROX. WWTF LIMIT
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WETLANDS
- LIMIT OF DISTURBANCE
- 100' WETLANDS BUFFER
- ONSITE WETLANDS BUFFER DISTURBANCE AREA
- PROPOSED NEW IMPERVIOUS IN BUFFER
- PROPOSED BIORETENTION CELL
- PROPOSED STORMWATER BASIN
- OFFSITE WETLANDS BUFFER DISTURBANCE AREA

WETLAND BUFFER SUMMARY

	AREA (S.F.)	% OF LOT
APPROX. WWTF AREA	±502,200	100
WETLAND AREA IN WWTF AREA	±125,900	25.1
WETLANDS BUFFER AREA IN WWTF AREA	±139,000	27.7
TOTAL WETLANDS BUFFER AREA (WETLAND + WETLANDS BUFFER)	±264,900	52.7
WWTF AREA NOT WITHIN TOTAL WETLANDS BUFFER AREA	±237,300	47.3
EXISTING IMPERVIOUS WITHIN TOTAL WETLANDS BUFFER AREA	±26,400	10.0
PROPOSED NEW IMPERVIOUS WITHIN TOTAL WETLANDS BUFFER AREA	±2,950	1.1
PROPOSED ONSITE IMPACTS WITHIN TOTAL WETLANDS BUFFER AREA (DISTURBANCE + NEW IMPERVIOUS)	±20,500	7.7
PROPOSED OFFSITE IMPACTS WITHIN WETLANDS BUFFER	±2,100	N/A

*AREAS BASED ON GENERAL LIMITS OF WWTF FENCED AREA AND PROPERTY BOUNDARIES

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

AECOM

PROJECT

PEASE WASTEWATER TREATMENT FACILITY REHABILITATION

135 Corporate Drive
Portsmouth, NH 03801

OWNER

CITY OF PORTSMOUTH NEW HAMPSHIRE

DEPARTMENT OF PUBLIC WORKS
680 Peverly Hill Road
Portsmouth, NH 03801
603-427-1530 tel 603-427-1539 fax
http://www.cityofportsmouth.com/publicworks

ENGINEER

AECOM TECHNICAL SERVICES, INC.
250 APOLLO DRIVE
CHELMSFORD, MA 01824
PHONE: (978) 905-2100
www.aecom.com

CONSULTANTS

HVAC, PLUMBING, FIRE PROTECTION
Petersen Engineering, INC
PO Box 4516
Portsmouth, NH 03802
603-436-4233 tel
https://www.petersenengineering.com

STORMWATER DESIGN
Altus Engineering
133 Court Street
Portsmouth, NH 03801
603-433-2335 tel
https://www.altus-eng.com

REGISTRATION

100% SUBMITTAL
PRELIMINARY COPY

NOTE: This document is preliminary only and is not intended for any purpose except review and comment by the owner and its agents.

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	3/26/2025	INITIAL SUBMISSION
	4/28/2025	REV. PER COMMENTS
	5/29/2025	OFF-SITE CONCEPT

STATE OF NEW HAMPSHIRE – ERIC D. WEINRIEB No. 7634 LICENSED PROFESSIONAL ENGINEER

5/29/25

PROJECT NUMBER

60693508

Designed By:	EDW
Drawn By:	PMJ
Dept Check:	EDW
Proj Check:	-
Date:	MAY 29, 2025
Scale:	1" = 40'

DISCIPLINE

SHEET TITLE

WETLANDS BUFFER CONDITIONAL USE PLAN

SHEET NUMBER

CU-1

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. The checklist is required to be completed and uploaded to the Site Plan application in the City's online permitting system. 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 Applicant: City of Portsmouth DPW Date Submitted: 6/5/2025

Application # (in City's online permitting): _____

Site Address: 135 Corporate Drive, Portsmouth NH Map: 303 Lot: 6

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☒	Complete application form submitted via the City's web-based permitting program (2.5.2.1**(2.5.2.3A)**	In submission package	N/A
☒	All application documents, plans, supporting documentation and other materials uploaded to the application form in viewpoint in digital Portable Document Format (PDF). One hard copy of all plans and materials shall be submitted to the Planning Department by the published deadline. **(2.5.2.8)**	Completed	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. **(2.5.3.1B)**	Application Package	N/A
☒	Existing and proposed gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1C)**	See Architectural Sheets	N/A
☒	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1D)**	See Sheet D-1	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1E)**	Application Package	N/A
☒	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. **(2.5.3.1F)**	See Existing Conditions Sheets	N/A
☒	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1G)**	Application Package, see title block of design sheets	N/A
☒	List of reference plans. **(2.5.3.1H)**	See Existing Conditions Sheets	N/A
☒	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1I)**	See Sheet D-1	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.. **(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)**	See Existing Conditions Sheets	N/A
☒	Plans shall be drawn to scale and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
☒	Wetlands shall be delineated by a NH certified wetlands scientist and so stamped. **(2.5.4.1E)**	Application Package, See Existing Conditions	N/A
☒	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	See all plans, multiple locations	N/A
☒	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	See title block on each sheet	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)**	See title block on each sheet	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)** • Surveyed plan of site showing existing natural and built features; • Existing building footprints and gross floor area; • Existing parking areas and number of parking spaces provided; • Zoning district boundaries; • Existing, required, and proposed dimensional zoning requirements including building and open space coverage, yards and/or setbacks, and dwelling units per acre; • Existing impervious and disturbed areas; • Limits and type of existing vegetation; • Wetland delineation, wetland function and value assessment (including vernal pools); • SFHA, 100-year flood elevation line and BFE data, as required.	See Existing Conditions Sheets -Wetlands delineated, see plans and wetland report in application. -Lot not within 100-year zone.	N/A
☒	**2. Buildings and Structures: (2.5.4.3B)** • Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation; • Elevations: Height, massing, placement, materials, lighting, façade treatments; • Total Floor Area; • Number of Usable Floors; • Gross floor area by floor and use.	See Architectural sheets.	N/A
☒	**3. Access and Circulation: (2.5.4.3C)** • Location/width of access ways within site; • Location of curbing, right of ways, edge of pavement and sidewalks; • Location, type, size and design of traffic signing (pavement markings); • Names/layout of existing abutting streets; • Driveway curb cuts for abutting prop. and public roads; • If subdivision; Names of all roads, right of way lines and easements noted; • AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	See Plan Set	N/A
☒	**4. Parking and Loading: (2.5.4.3D)** • Location of off street parking/loading areas, landscaped areas/buffers; • Parking Calculations (# required and the # provided).	See Plan Set	N/A
☒	**5. Water Infrastructure: (2.5.4.3E)** • Size, type and location of water mains, shut-offs, hydrants & Engineering data; • Location of wells and monitoring wells (include protective radii).	See Plan Set	N/A
☒	**6. Sewer Infrastructure: (2.5.4.3F)** • Size, type and location of sanitary sewage facilities & Engineering data, including any onsite temporary facilities during construction period.	See Plan Set	N/A

☒	**7. Utilities: (2.5.4.3G)** • The size, type and location of all above & below ground utilities; • Size type and location of generator pads, transformers and other fixtures.	See Plan Set	N/A
☒	**8. Solid Waste Facilities: (2.5.4.3H)**	N/A	N/A
	• The size, type and location of solid waste facilities.		
☒	**9. Storm water Management: (2.5.4.3I)** • The location, elevation and layout of all storm-water drainage. • The location of onsite snow storage areas and/or proposed off-site snow removal provisions. • Location and containment measures for any salt storage facilities • Location of proposed temporary and permanent material storage locations and distance from wetlands, water bodies, and stormwater structures.	See Grading & Drainage and Erosion Control Plans, Sheets C-1 through C-4	Yes, see waiver request in Application Package
☒	**10. Outdoor Lighting: (2.5.4.3J)** • Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and photometric plan.	See Plan Set	N/A
☒	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	N/A	N/A
☒	**12. Landscaping: (2.5.4.3K)** • Identify all undisturbed area, existing vegetation and that which is to be retained; • Location of any irrigation system and water source.	N/A, disturbed areas to be loamed and seeded.	N/A
☒	**13. Contours and Elevation: (2.5.4.3L)** • Existing/Proposed contours (2 foot minimum) and finished grade elevations.	See Grading & Erosion Control Plans, Sheets C-1 & C-2	N/A
☒	**14. Open Space: (2.5.4.3M)** • Type, extent and location of all existing/proposed open space.	N/A	N/A
☒	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	No easements within WWTF area boundaries	N/A
☒	**16. Character/Civic District (All following information shall be included): (2.5.4.3P)** • Applicable Building Height (10.5A21.20 & 10.5A43.30); • Applicable Special Requirements (10.5A21.30); • Proposed building form/type (10.5A43); • Proposed community space (10.5A46).	N/A	N/A
☒	**17. Special Flood Hazard Areas (2.5.4.3Q)** • The proposed development is consistent with the need to minimize flood damage; • All public utilities and facilities are located and construction to minimize or eliminate flood damage; • Adequate drainage is provided so as to reduce exposure to flood hazards.	N/A	N/A

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. **(3.2.1-2)**	Not applicable, no change to traffic patterns	N/A
☐	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	See Application Package	N/A
☒	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	N/A	N/A
☒	Stormwater Management and Erosion Control Plan. **(7.4)**	See Sheets C-1 through C-4	N/A
☒	Inspection and Maintenance Plan **(7.6.5)**	See Application Package	N/A

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: • Waivers; • Driveway permits; • Special exceptions; • Variances granted; • Easements; • Licenses. **(2.5.3.2A)**	See Application Package for waivers. No driveway permit, special exception, variance, easement or license required.	N/A
☒	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: • Calculations relating to stormwater runoff; • Information on composition and quantity of water demand and wastewater generated; • Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; • Estimates of traffic generation and counts pre- and post-construction; • Estimates of noise generation; • A Stormwater Management and Erosion Control Plan; • Endangered species and archaeological / historical studies; • Wetland and water body (coastal and inland) delineations; • Environmental impact studies. **(2.5.3.2B)**	See Application Package. -Stormwater analysis report included. -No traffic analysis required. -No change to noise generation post construction. -See sheets C-1 through C-4 for stormwater management and erosion control. -Site reviewed by NHB, USFWS and NOAA -Wetlands identified by CWS and delineated.	N/A
☒	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)**	N/A	N/A

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☒	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	See application package	N/A
☒	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	N/A
☒	For site plans that involve land designated as "Special Flood Hazard Areas" (SFHA) by the National Flood Insurance Program (NFIP) confirmation that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334. **(2.5.4.2F)**	N/A	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	N/A

Applicant's Signature: _____ Date: _____