BLACK ROCK SOCIAL CLUB

140 WEST RD

Portsmouth, NH 03801

LIST OF PROJECT PLANS AND DOCUMENTS:

CIVIL

1 - Existing Conditions
2 - Site Plan
3 - Landscape Plan
4 - Utility Plan
5 - Parking Plan
6 - Grading & Drainage
7 - Test Pit Data
8 - Stormtech Details
9 - Stormwater Management Details
10 - Stormwater Management Details
11 - Details
12 - Notes
13 - Erosion Control Plan
Lighting Plan

PREPARED BY:

ROSS ENGINEERING, LLC

Civil/Structural Engineering
& Surveying

909 Islington St.
Portsmouth, NH 03801
(603) 433-7560

PREPARED FOR:

Road to the West, LLC
Alexander B. Choquette
14 Lafayette Rd. Unit 9
North Hampon, NH 03862

June 21, 2022

REFERENCE PLANS

1) "SUBDIVISION PLAN" BY KIMBALL CHASE COMPANY, INC. DATED MAY 15, 1983. RCRD D-11744.

2) "CONDOMINIUM SITE PLAN 300 WEST CONDOMINIUM FOR FREDERICK & THOMAS DAIGNEAULT" BY RICHARD P. MILLETTE AND ASSOCIATES. DATED MAY 1987. RCRD D-17576

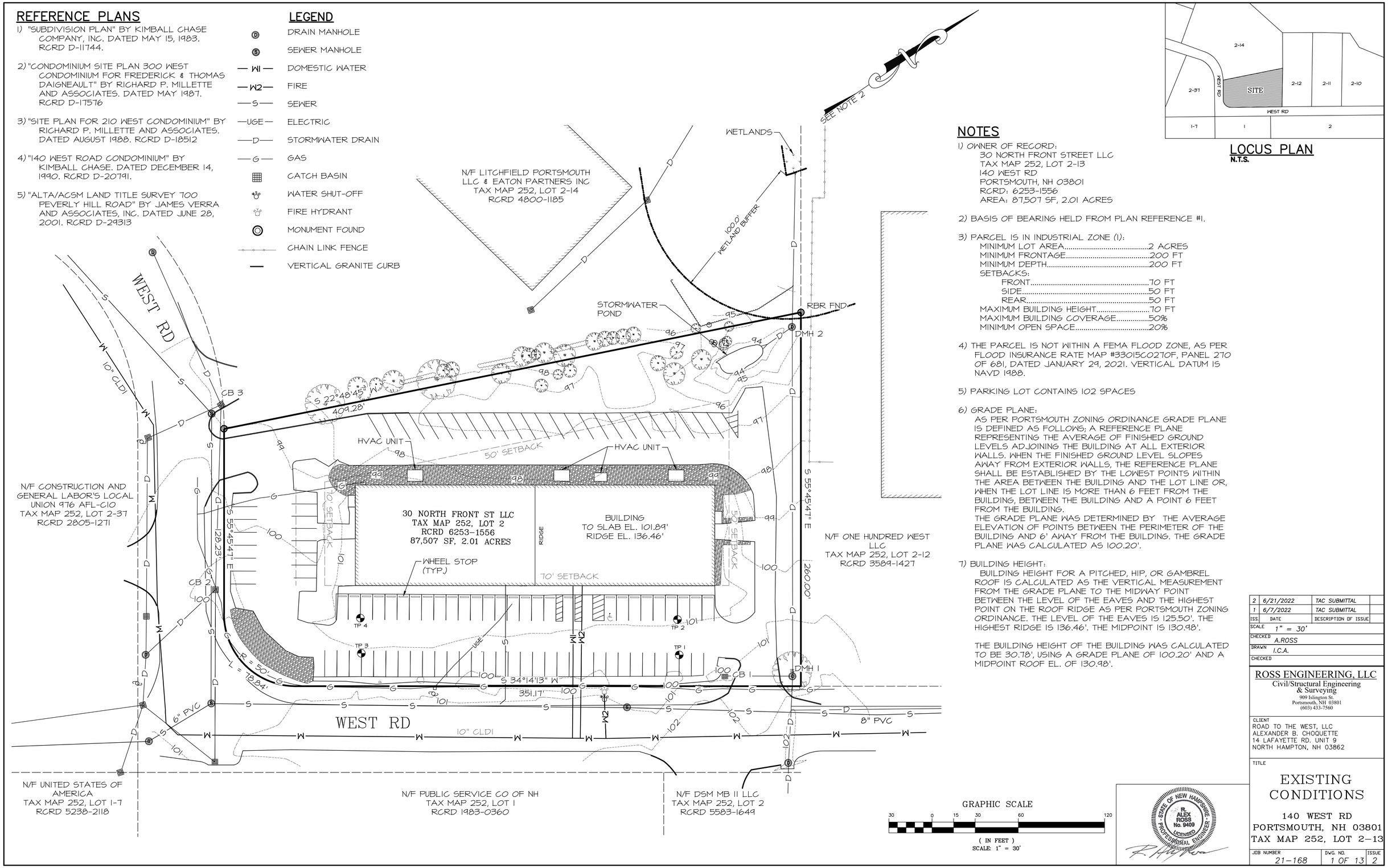
3) "SITE PLAN FOR 210 WEST CONDOMINIUM" BY RICHARD P. MILLETTE AND ASSOCIATES. DATED AUGUST 1988. RCRD D-18512

4) "140 WEST ROAD CONDOMINIUM" BY KIMBALL CHASE. DATED DECEMBER 14, 1990. RCRD D-20791.

5) "ALTA/ACSM LAND TITLE SURVEY 700 PEVERLY HILL ROAD" BY JAMES VERRA AND ASSOCIATES, INC. DATED JUNE 28, 2001. RCRD D-29313

LEGEND

- DRAIN MANHOLE
- SEWER MANHOLE
- W1 — DOMESTIC WATER
- W2 — FIRE
- S — SEWER
- UGE — ELECTRIC
- D — STORMWATER DRAIN
- G — GAS
- CATCH BASIN
- WATER SHUT-OFF
- FIRE HYDRANT
- MONUMENT FOUND
- CHAIN LINK FENCE
- VERTICAL GRANITE CURB



LOCUS PLAN
N.T.S.

NOTES

1) OWNER OF RECORD:
30 NORTH FRONT STREET LLC
TAX MAP 252, LOT 2-13
140 WEST RD
PORTSMOUTH, NH 03801
RCRD: 6253-1556
AREA: 87,507 SF, 2.01 ACRES

2) BASIS OF BEARING HELD FROM PLAN REFERENCE #1.

3) PARCEL IS IN INDUSTRIAL ZONE (I):

MINIMUM LOT AREA	2 ACRES
MINIMUM FRONTAGE	200 FT
MINIMUM DEPTH	200 FT
SETBACKS:	
FRONT	70 FT
SIDE	50 FT
REAR	50 FT
MAXIMUM BUILDING HEIGHT	70 FT
MAXIMUM BUILDING COVERAGE	50%
MINIMUM OPEN SPACE	20%

4) THE PARCEL IS NOT WITHIN A FEMA FLOOD ZONE, AS PER FLOOD INSURANCE RATE MAP #33015C0270F, PANEL 270 OF 681, DATED JANUARY 29, 2021. VERTICAL DATUM IS NAVD 1988.

5) PARKING LOT CONTAINS 102 SPACES

6) GRADE PLANE:
AS PER PORTSMOUTH ZONING ORDINANCE GRADE PLANE IS DEFINED AS FOLLOWS; A REFERENCE PLANE REPRESENTING THE AVERAGE OF FINISHED GROUND LEVELS ADJOINING THE BUILDING AT ALL EXTERIOR WALLS. WHEN THE FINISHED GROUND LEVEL SLOPES AWAY FROM EXTERIOR WALLS, THE REFERENCE PLANE SHALL BE ESTABLISHED BY THE LOWEST POINTS WITHIN THE AREA BETWEEN THE BUILDING AND THE LOT LINE OR, WHEN THE LOT LINE IS MORE THAN 6 FEET FROM THE BUILDING, BETWEEN THE BUILDING AND A POINT 6 FEET FROM THE BUILDING.
THE GRADE PLANE WAS DETERMINED BY THE AVERAGE ELEVATION OF POINTS BETWEEN THE PERIMETER OF THE BUILDING AND 6' AWAY FROM THE BUILDING. THE GRADE PLANE WAS CALCULATED AS 100.20'.

7) BUILDING HEIGHT:
BUILDING HEIGHT FOR A PITCHED, HIP, OR GAMBREL ROOF IS CALCULATED AS THE VERTICAL MEASUREMENT FROM THE GRADE PLANE TO THE MIDWAY POINT BETWEEN THE LEVEL OF THE EAVES AND THE HIGHEST POINT ON THE ROOF RIDGE AS PER PORTSMOUTH ZONING ORDINANCE. THE LEVEL OF THE EAVES IS 125.50'. THE HIGHEST RIDGE IS 136.46'. THE MIDPOINT IS 130.98'.

THE BUILDING HEIGHT OF THE BUILDING WAS CALCULATED TO BE 30.78', USING A GRADE PLANE OF 100.20' AND A MIDPOINT ROOF EL. OF 130.98'.

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
SCALE: 1" = 30'

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
1	6/7/2022	TAC SUBMITTAL

SCALE 1" = 30'
CHECKED A.ROSS
DRAWN I.C.A.
CHECKED

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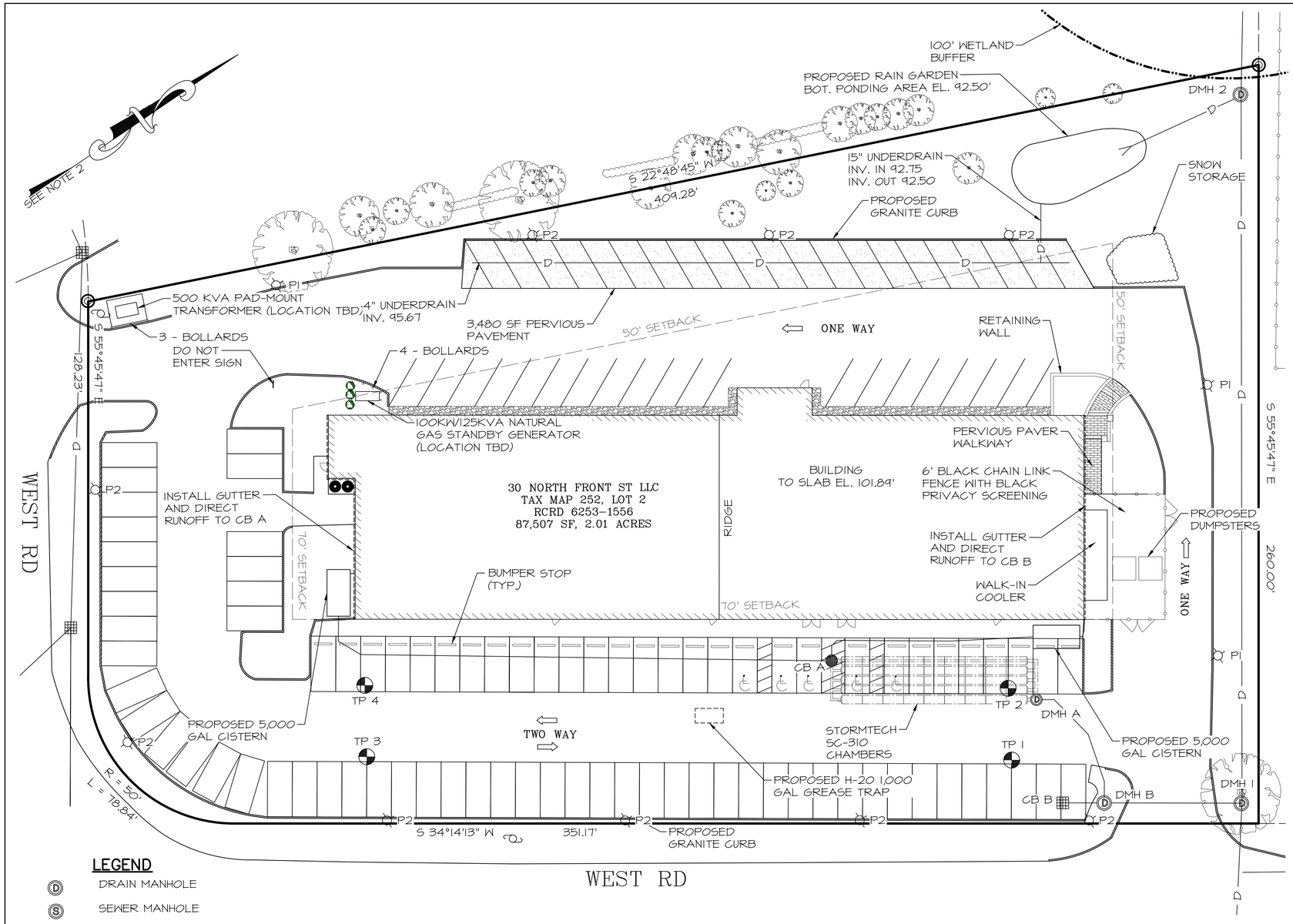
Portsmouth, NH 03801
(603) 433-7560

CLIENT
ROAD TO THE WEST, LLC
ALEXANDER B. CHOQUETTE
14 LAFAYETTE RD. UNIT 9
NORTH HAMPTON, NH 03862

TITLE
EXISTING CONDITIONS
140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER 21-168 | DWG. NO. 1 OF 13 | ISSUE 2

STATE OF NEW HAMPSHIRE - R. ALEX ROSS No. 9409 - LICENSED PROFESSIONAL ENGINEER -



NOTES

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30 NORTH FRONT STREET LLC
TAX MAP 252, LOT 2-13
140 WEST RD
PORTSMOUTH, NH 03801
RCRD: 6253-1556
AREA: 87,507 SF, 2.01 ACRES

2) COVERAGES

EXISTING BUILDING COVERAGE

BUILDING	17,500 SF
TOTAL	17,500 SF

BUILDING COVERAGE = 20.0%

PROPOSED BUILDING COVERAGE

BUILDING	17,922 SF
WALK-IN COOLER	248 SF
TOTAL	18,170 SF

BUILDING COVERAGE = 20.8% < 50%

EXISTING OPEN SPACE

BUILDING COVERAGE	17,500 SF
ASPHALT	42,529 SF
TOTAL LOT COVERAGE	60,029 SF

OPEN SPACE = 87507 - 60029 = 27478 SF
OPEN SPACE = 31.4%

PROPOSED OPEN SPACE

BUILDING COVERAGE	18,170 SF
ASPHALT	45,901 SF
CONCRETE PAD	140 SF
RETAINING WALL	76 SF
STAIRS	32 SF
TOTAL	64,319 SF

OPEN SPACE = 87507 - 64319 = 23,188 SF
OPEN SPACE = 26.5% > 20%

3) THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

4) 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.

LEGEND

- DRAIN MANHOLE
- SEWER MANHOLE
- WATER
- SEWER
- STORMWATER DRAIN
- GAS
- CATCH BASIN
- WATER SHUT-OFF
- FIRE HYDRANT
- MONUMENT FOUND
- CHAIN LINK FENCE
- VERTICAL GRANITE CURB

ALL CONDITIONS ON THIS PLAN SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE SITE PLAN REVIEW REGULATIONS.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
SCALE: 1" = 20'

ZBA APPROVALS

1) THE PORTSMOUTH ZONING BOARD OF ADJUSTMENT GRANTED THE FOLLOWING VARIANCES ON 5-24-22.

A) SECTION 10.440 USE #4.30 TO ALLOW INDOOR RECREATION USE WHERE THE USE IS NOT PERMITTED.

B) 10.1113.41 TO ALLOW PARKING TO BE LOCATED 2 FEET FROM THE FRONT LOT LINE WHERE 50 FEET IS REQUIRED.

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DRAWN D.D.D.
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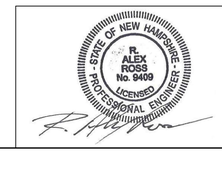
14 LAFAYETTE RD. UNIT 9
NORTH HAMPTON, NH 03862

TITLE

SITE PLAN

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

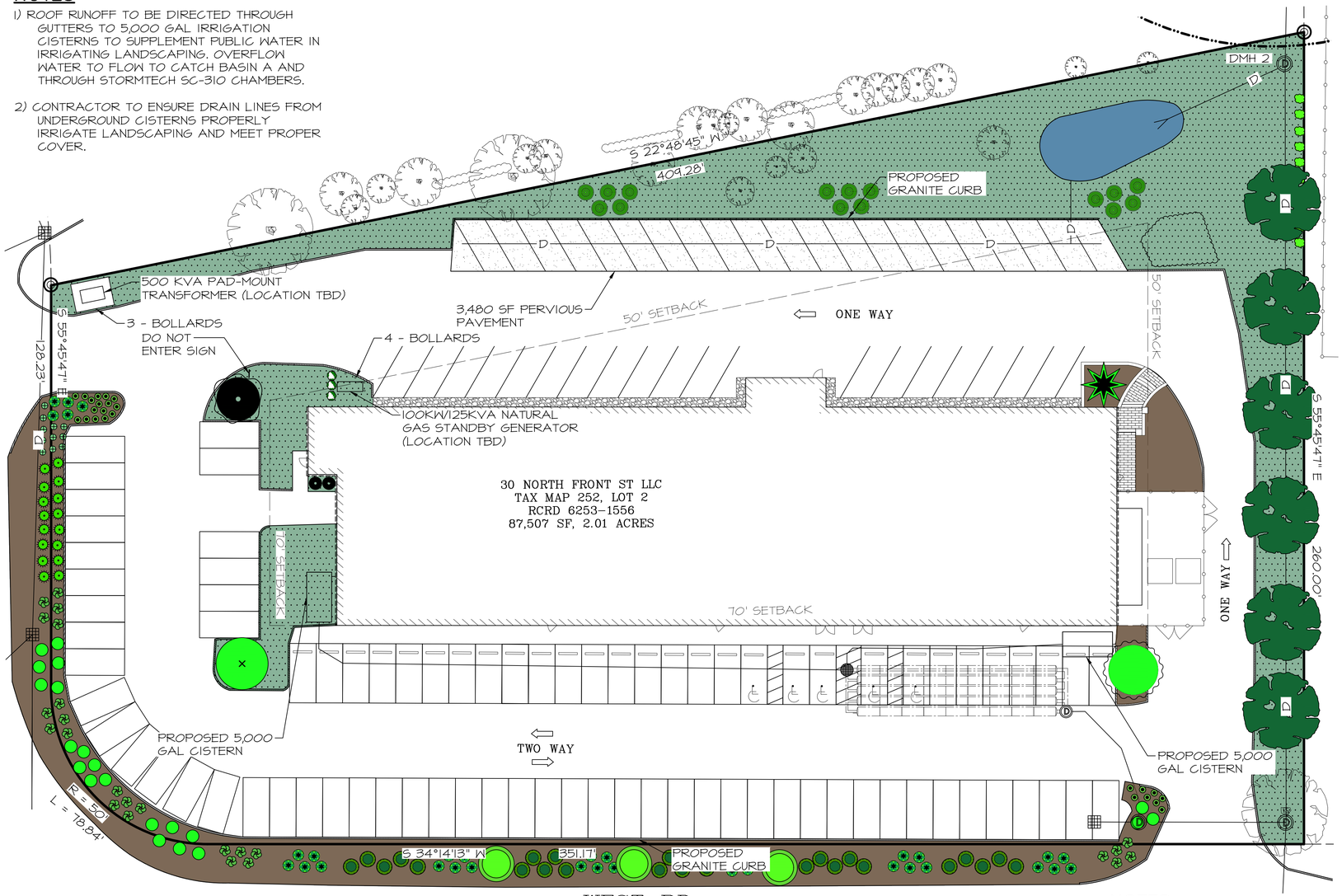
JOB NUMBER	DWG. NO.	ISSUE
21-168	2 OF 13	2



NOTES

1) ROOF RUNOFF TO BE DIRECTED THROUGH GUTTERS TO 5,000 GAL IRRIGATION CISTERNS TO SUPPLEMENT PUBLIC WATER IN IRRIGATING LANDSCAPING. OVERFLOW WATER TO FLOW TO CATCH BASIN A AND THROUGH STORMTECH SC-310 CHAMBERS.

2) CONTRACTOR TO ENSURE DRAIN LINES FROM UNDERGROUND CISTERNS PROPERLY IRRIGATE LANDSCAPING AND MEET PROPER COVER.



BOTANICAL NAME	COMMON NAME	SIZE	QTY:
ACER GINNALA 'FLAME'	FLAME AMUR MAPLE	3" C	1
BUXUX 'GREEN VELVET'	GREEN VELVET BOXWOOD	#5	2
CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'	FEATHER REED GRASS	1 GAL	16
CORNUS KOUSA 'MILKY WAY'	MILKY WAY KOUSA DOGWOOD	3" C	2
HEMEROCALLIS 'RUBY RETURNS'	RE-BLOOMING DAYLILY	1 QT	24
MAGNOLIA LOEBNERI 'LEONARD MESSEL'	LEONARD MESSEL MAGNOLIA	3" C	1
NIPPONAUTHERMUM NIPPONICUM	MONTAUK DAISY	1 QT	21
PINUS MUGO 'MOPS'	MOPS MUGO PINE	2 GAL	35
PLATANUS X ACERIFOLIA 'EXCLAMATION'	EXCLAMATION PLANETREE	3" C	6
PRUNUS SARGENTII 'RANCHO'	RANCHO SARGENT CHERRY TREE	2" C	3
ROSA RUGOSA	SALT SPRAY ROSE	2 GAL	25
SEDUM 'AUTUMN JOY'	STONECROP	1 QT	11
SYRINGA PATULA 'BABY HIM'	DWARF KOREAN LILAC	2 GAL	25
TAXUS CUSPIDATA 'CAPITATA'	PYRAMIDIAL JAPANESE YEW	4' BB	1
THUJA OCCIDENTALIS 'HOLMSTRUP'	HOLMSTRUP ARBORVITAE	4-5 BB	3
VACCINIUM CORYURBOSUM	HIGHBUSH BLUEBERRY	2 GAL	15

INSTALLATION REQUIREMENTS:

1. THE INSTALLATION OF A DRIP IRRIGATION SYSTEM IS RECOMMENDED TO ASSURE WELL GROWN PLANTS.
2. IN CASE OF DROUGHT (DEFINED AS TWO WEEK PERIOD WITHOUT RAIN) ALL NEW PLANTS SHALL BE WATERED THROUGH NOVEMBER 1ST DURING THE FIRST SEASON IN WHICH THE ARE INSTALLED. THEY SHALL BE WATERED ONE TIME PER DAY FOR THE FIRST WEEK AFTER INSTALLATION AND THREE TIMES PER WEEK FOR THE REMAINDER OF THE SEASON. AFTER THE FIRST SEASON WHEN THE ROOTS OF THE PLANTS ARE ESTABLISHED THEY WILL ONLY REQUIRE WATERING DURING TIMES OF LENGTHY DROUGHT.
3. SOAKER HOSES WOUND THROUGH THE BED NEAR THE BASE OF EACH PLANT ARE THE RECOMMENDED METHOD OF WATERING DURING THE FIRST SEASON. THESE CAN BE REMOVED AFTER NOVEMBER 30TH WHEN THE PLANTS ARE ESTABLISHED.

NOTES

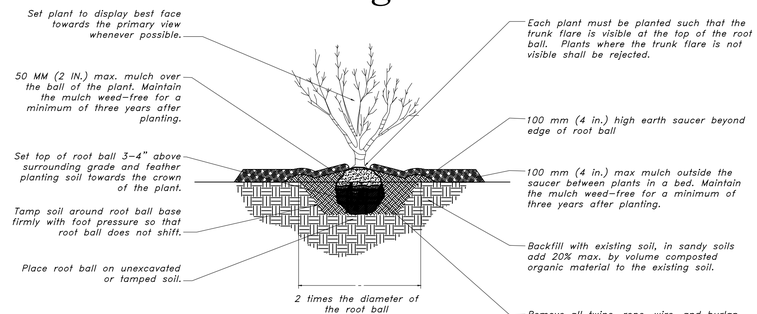
1) THIS SITE PLAN SHALL BE RECORDED IN THE ROCKINGHAM COUNTY REGISTRY OF DEEDS.

2) 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.

CITY OF PORTSMOUTH PLANNING BOARD

CHAIRPERSON DATE

Planting Detail



PLANTING NOTES

1. ALL PLANT MATERIALS SHALL BE FIRST QUALITY NURSERY GROWN STOCK.
2. ALL PLANTS SHALL BE PLANTED IN ACCORDANCE WITH NEW HAMPSHIRE LANDSCAPE ASSOCIATION STANDARDS AND GUARANTEED FOR ONE YEAR BY THE LANDSCAPE CONTRACTOR.
3. AFTER PLANTING, ALL PLANTS SHALL BE FLOODED AT THE BASE WITH WATER FROM A SLOW-RUNNING HOSE FOR 5 MINUTES EACH.
4. ALL PLANTS SHALL BE INSTALLED BEFORE ANY GRASS IS SEEDED.
5. ALL SHRUBS AND PLANTING BEDS SHALL BE MULCHED WITH 3" OF DARK BROWN AGED BARK MULCH AS A FINAL STEP. MULCH MUST BE KEPT 2" AWAY FROM BASE OF EACH PLANT.
6. THE PROPERTY OWNER AND ALL FUTURE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR, AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.
7. ALL REQUIRED PLANT MATERIALS SHALL BE TENDED AND MAINTAINED IN A HEALTHY GROWING CONDITION, REPLACED WHEN NECESSARY, AND KEPT FREE OF REFUSE AND DEBRIS. ALL REQUIRED FENCES AND WALLS SHALL BE MAINTAINED IN GOOD REPAIR.
8. THE PROPERTY OWNER SHALL BE RESPONSIBLE TO REMOVE AND REPLACE DEAD OR DISEASED PLANT MATERIALS IMMEDIATELY WITH THE SAME TYPE, SIZE, AND QUANTITY OF PLANT MATERIALS AS ORIGINALLY INSTALLED, UNLESS ALTERNATIVE PLANTINGS ARE REQUESTED, JUSTIFIED, AND APPROVED BY THE PLANNING BOARD OR PLANNING DIRECTOR.
9. MULCH USED WILL BE NON-COMBUSTIBLE OR APPROVED BY THE PORTSMOUTH FIRE DEPARTMENT

LEGEND

- HOMSTRUP ARBORVITAE
- SEDUM 'AUTUMN JOY'
- HEMEROCALLIS
- BUXUS 'GREEN VELVET'
- NIPPONAUTHERMUM NIPPONICUM
- CALAMAGROSTIS
- SYRINGA MEYERI 'PALIBIN'
- PINUS MUGO 'MOPS'
- VACCINIUM CORYUBOSUM
- ROSA RUGOSA
- PRUNUS SARGENTI
- MAGNOLIA LOEBNERI 'LEONARD MESSEL'
- CORNUS KOUSA 'MILKY WAY'
- TAXUS CUSPIDATA 'CAPITATA'
- ACER GINNALA 'FLAME'
- PLATANUS X ACERFOLIA

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
1	6/7/2022	TAC SUBMITTAL

SCALE	1" = 20'
CHECKED	A.ROSS
DRAWN	D.D.D.
CHECKED	

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NORTH HAMPTON, NH 03862

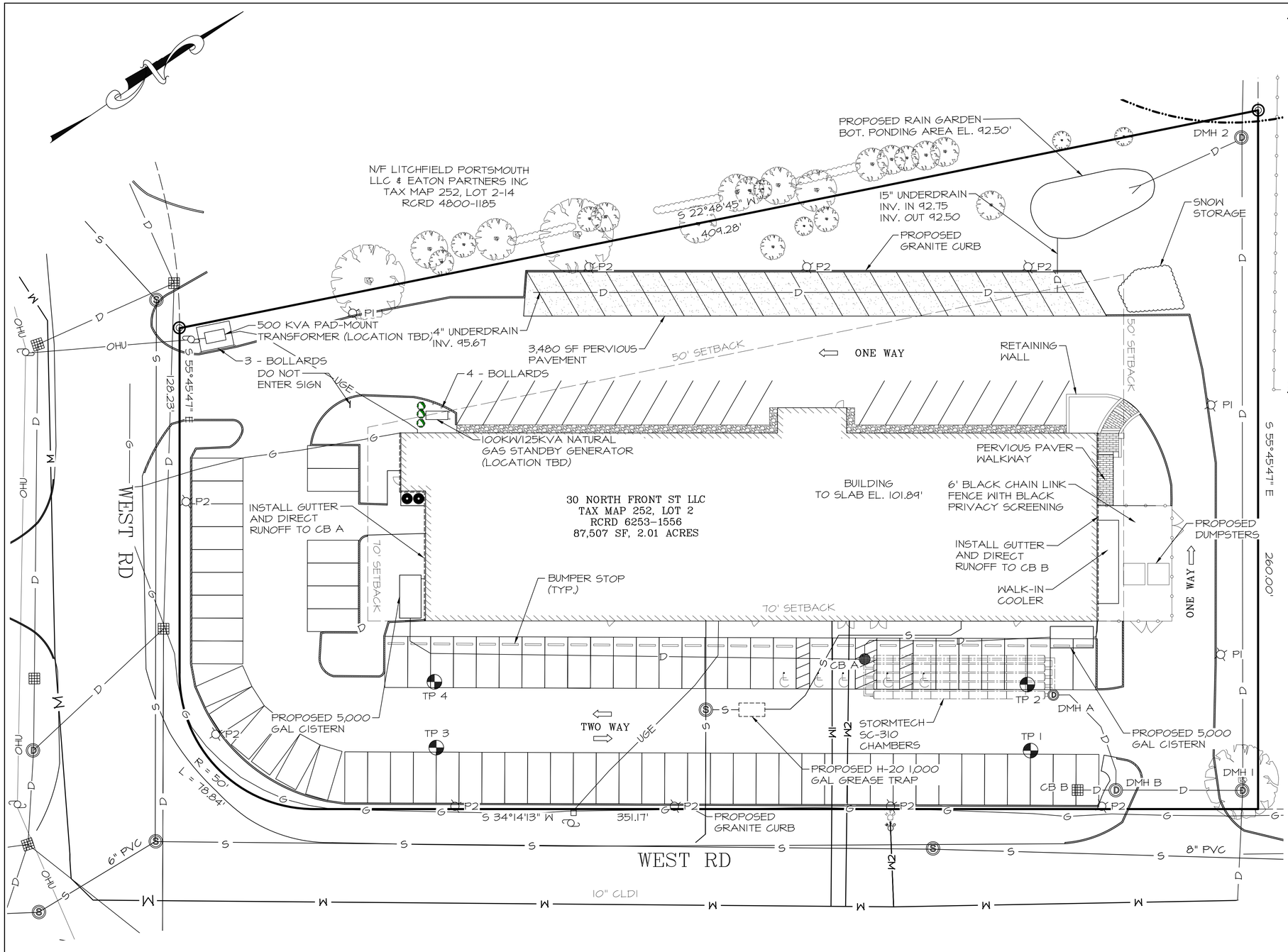
R. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

TITLE

LANDSCAPE PLAN

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER	DWG. NO.	ISSUE
21-168	3 OF 13	2



UTILITIES:

CONTACT LIST:

GAS: UNITIL: SUSAN L. DUPLISEA.....603-294-5147
WATER: PORTSMOUTH DPW: 603-427-1530
SEWER: PORTSMOUTH DPW: 603-427-1530
STORMWATER: PORTSMOUTH DPW: 603-427-1530
ELECTRIC: EVERSOURCE: CASEY MCDONALD.....603-436-7708 EXT 5641

PROPOSED UTILITIES:

GAS:
EXISTING 1-¼" GAS LINE SERVES BUILDING

WATER:
EXISTING 2" DOMESTIC WATER - W1
EXISTING 6" FIRE - W2

SEWER:
EXISTING 6" SEWER SERVES BUILDING. THE LINE IS DAMAGE 33' OUT FROM THE BUILDING. DAMAGED SECTION WILL BE REPLACED.

STORMWATER:
INSTALL CB A, CB B, CB C, DMH A, DMH B
INSTALL 45 STORMTECH SC-310 CHAMBERS (ST A)
INSTALL 40 STORMTECH SC-310 CHAMBERS (ST B)
REPLACE CB 1 WITH CB D
INSTALL GUTTERS ON THE SOUTHERN ROOF TO DIRECT ROOF RUNOFF TO STORMTECH A
INSTALL GUTTERS ON THE NORTHERN ROOF TO DIRECT ROOF RUNOFF TO CATCH BASIN B

ELECTRIC:
THE EXISTING SERVICE IS 800A, 208Y/120V 3-PHASE, 4-WIRE
THE PROPOSED SERVICE IS 1600A, 208Y/120V 3-PHASE
INSTALL 500 KVA PAD-MOUNT TRANSFORMER
INSTALL A 100KW/125KVA NATURAL GAS STANDBY GENERATOR
INSTALL SOLAR PANELS ON THE EXISTING ROOF

GENERAL NOTES

1) CONTRACTOR TO REVIEW ALL SURFACING TYPES, AND MATERIAL SPECIFICATIONS WITH COMMISSIONER OF PUBLIC WORKS.
2) ALL NECESSARY NHDOT, NHDES & TOWN PERMITS MUST BE OBTAINED.
3) ALL CONSTRUCTION SHALL BE PER NH-DOT, STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION. LATEST REVISION.
4) CONTRACTOR SHALL MEET STATE AND TOWN REQUIREMENTS. TO ASSURE TYPE, SEPARATION, COVER, ETC. ALWAYS CALL DIGSAFE PRIOR TO DIGGING. UTILITIES SHOWN ARE APPROXIMATE AND MUST BE VERIFIED.
5) SIZE ALL LINES AS PER REQUIREMENTS AND ASSURE THAT PROPOSED HOUSE LOADING AND PRESSURE DEMANDS WILL BE MET.

LEGEND

- DRAIN MANHOLE
- SEWER MANHOLE
- WATER
- SEWER
- STORMWATER DRAIN
- GAS
- CATCH BASIN
- WATER SHUT-OFF
- FIRE HYDRANT
- MONUMENT FOUND
- CHAIN LINK FENCE
- VERTICAL GRANITE CURB
- UTILITY POLE
- OVERHEAD UTILITY
- DRAINAGE FLOW PATH
- P1 LIGHT POST EX-P1
- P2 LIGHT POST EX-P2

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
SCALE: 1" = 20'

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STATE OF NEW HAMPSHIRE - P. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER

TITLE

UTILITY PLAN

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER 21-168 | DWG. NO. 4 OF 13 | ISSUE 2

NOTES

1) PARKING SPACES PROVIDED = 122 SPACES

N/F LITCHFIELD PORTSMOUTH LLC & EATON PARTNERS INC
TAX MAP 252, LOT 2-14
RCRD 4800-1185

S 22°48'45" W
409.28'

PROPOSED GRANITE CURB

P1 P2

16.0'

8.5'

3,480 SF PERVIOUS PAVEMENT

50' SETBACK

24.0'

ONE WAY

AASHTO WB-50 TRUCK TURNING RADIUS

S 55°45'47" E
128.23'

10.0'

DO NOT ENTER SIGN

24.0'

30 NORTH FRONT ST LLC
TAX MAP 252, LOT 2
RCRD 6253-1556
87,507 SF, 2.01 ACRES

70' SETBACK

S 55°45'47" E
260.00'

N/F ONE HUNDRED WEST LLC
TAX MAP 252, LOT 2-12
RCRD 3589-1427

WEST RD

25.5'

PROPOSED 5,000 GAL CISTERN

5.0'

8.0'

TWO WAY

R = 50.0'
L = 78.84'

S 34°14'13" W
351.17'

PROPOSED GRANITE CURB

WEST RD

GRAPHIC SCALE

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(IN FEET)
SCALE: 1" = 20'

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TITLE

PARKING PLAN

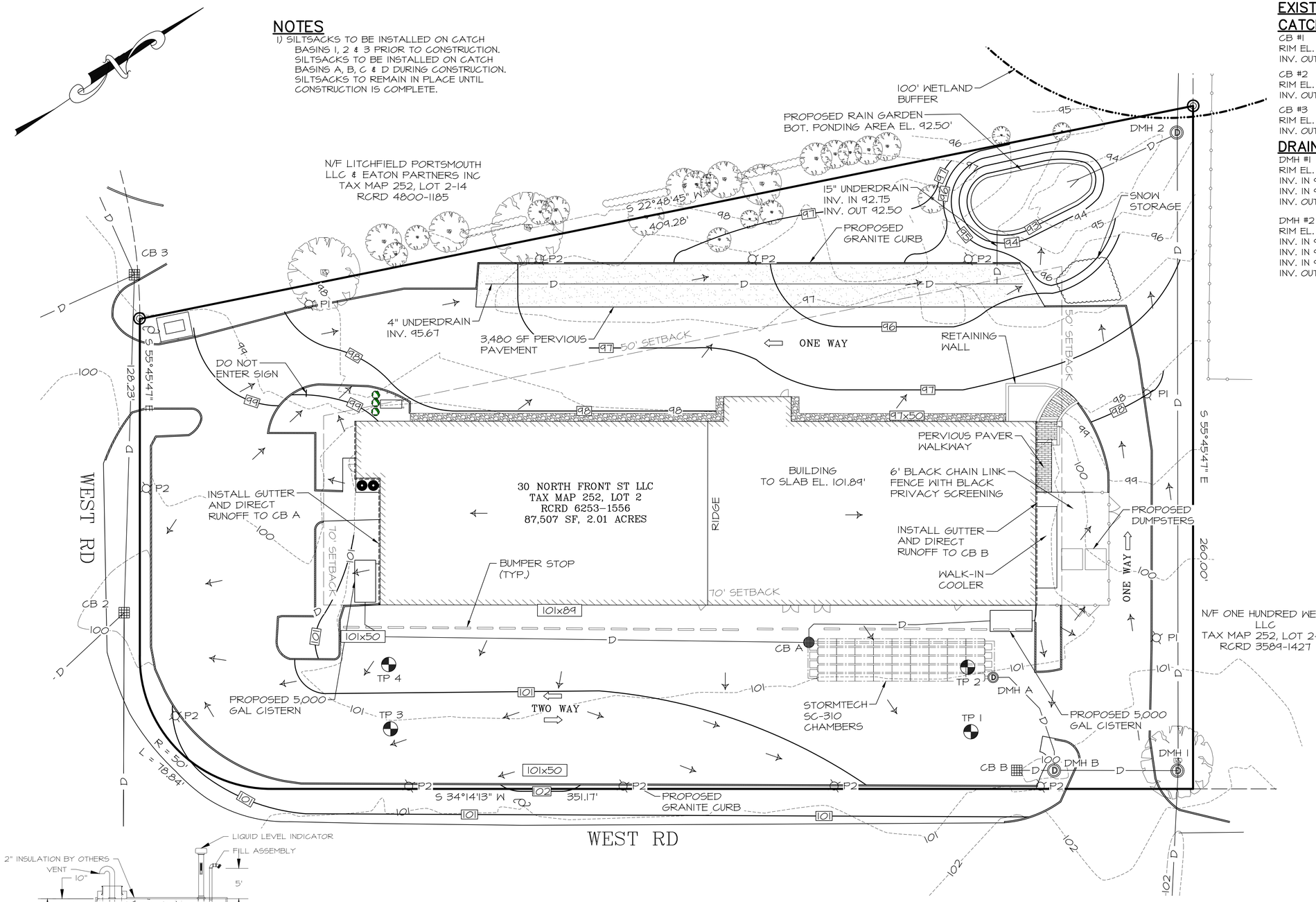
140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

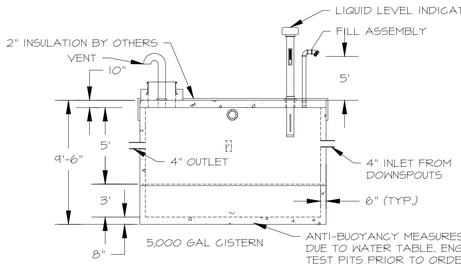
JOB NUMBER	DWG. NO.	ISSUE
21-168	5 OF 13	2

STATE OF NEW HAMPSHIRE - R. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER

NOTES

1) SILTSACKS TO BE INSTALLED ON CATCH BASINS 1, 2 & 3 PRIOR TO CONSTRUCTION. SILTSACKS TO BE INSTALLED ON CATCH BASINS A, B, C & D DURING CONSTRUCTION. SILTSACKS TO REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.





IRRIGATION CISTERN (TYP.)

NTS

EXISTING STRUCTURES

CATCH BASINS

CB #1
RIM EL. 99.28
INV. OUT 95.28 (12" RCP)

CB #2
RIM EL. 99.66
INV. OUT 95.26

CB #3
RIM EL. 98.36
INV. OUT 94.06

DRAIN MANHOLES

DMH #1
RIM EL. 101.37
INV. IN 93.37 (12" RCP)
INV. IN 93.12 (24" RCP)
INV. OUT 92.79 (24" RCP)

DMH #2
RIM EL. 95.64
INV. IN 92.24 (4" ADS-N-12) REMOVED
INV. IN 90.75 (10" ADS-N-12) PROPOSED
INV. IN 90.50 (24" RCP)
INV. OUT 90.47 (20" RCP)

PROPOSED STRUCTURES

CATCH BASINS

CB A
RIM EL. 101.50
INV. IN 98.25 (4" ADS-N-12)
INV. IN 98.25 (4" ADS-N-12)
INV. OUT 98.17 (8" ADS-N-12)
INV. OUT 98.17 (12" ADS-N-12)
STRUCTURE: 4' Ø CONC. BASIN

CB B
RIM EL. 99.50
INV. OUT 95.40 (12" ADS-N-12)
STRUCTURE: 4'Ø JELLYFISH FILTER

DRAIN MANHOLES

DMH A
RIM EL. 101.25
INV. IN 98.17 (12" ADS-N-12)
INV. OUT 98.00 (12" ADS-N-12)
STRUCTURE: 4' Ø CONC. BASIN

DMH B
RIM EL. 99.50
INV. IN 95.40 (12" ADS-N-12)
INV. IN 95.35 (12" ADS-N-12)
INV. OUT 95.28 (24" ADS-N-12)
STRUCTURE: 4' Ø CONC. BASIN

LEGEND

- DRAIN MANHOLE
- SEWER MANHOLE
- WATER
- SEWER
- STORMWATER DRAIN
- GAS
- CATCH BASIN
- WATER SHUT-OFF
- FIRE HYDRANT
- MONUMENT FOUND
- CHAIN LINK FENCE
- VERTICAL GRANITE CURB
- UTILITY POLE
- OVERHEAD UTILITY
- DRAINAGE FLOW PATH

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
SCALE: 1" = 20'

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
1	6/7/2022	TAC SUBMITTAL

SCALE 1" = 20'
CHECKED A.ROSS
DRAWN D.D.D.
CHECKED

ROSS ENGINEERING, LLC
Civil/Structural Engineering & Surveying
909 Islington St.
Portsmouth, NH 03801
(603) 433-7560

CLIENT
ROAD TO THE WEST, LLC
ALEXANDER B. CHOQUETTE
14 LAFAYETTE RD. UNIT 9
NORTH HAMPTON, NH 03862

TITLE

GRADING & DRAINAGE

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER	DWG. NO.	ISSUE
21-168	6 OF 13	2

R. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

TEST PIT 1 (of 4)

DEPTH (INCHES)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE
+3	ASPHALT	N/A	N/A	N/A
0	10 YR 5/3 BROWN	GRAVELLY LOAMY SAND (FILL)	MASSIVE	MOIST FRIABLE
5	10 YR 5/3 BROWN	GRAVELLY SANDY LOAM (FILL)	MASSIVE	MOIST FRIABLE
36	10 YR 5/4 YELLOWISH BROWN, 10% 7.5 YR 5/6 STRONG BROWN REDOXIMORPHIC CONCENTRATIONS	GRAVELLY FINE SANDY LOAM	MASSIVE	MOIST FRIABLE

ESHWT	36 INCHES	ROOTS	NONE	RESTRICTIVE LAYERS	N/A
OBSERVED H_2O	NONE	REFUSAL (INCHES):	POSSIBLE @ 54"	ESTIMATED PERCOLATION RATE (MIN/IN)	N/A
NOTES	OLD GRAVEL PIT, LONG SINCE DEVELOPED, FILL (EXCEPT FOR LAYER IMMEDIATELY BENEATH ASPHALT) MAY ALSO BE UNCONSOLIDATED SPOIL REMAINING AFTER MINING ACTIVITIES				

TEST PIT 2 (of 4)

DEPTH (INCHES)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE
0	10 YR 5/3 BROWN	GRAVELLY LOAMY SAND (FILL)	MASSIVE	MOIST FRIABLE
14	10 YR 5/3 BROWN	GRAVELLY FINE SANDY LOAM (FILL)	MASSIVE	MOIST FRIABLE
42	10 YR 5/3 BROWN, 10% 7.5 YR 5/6 STRONG BROWN REDOXIMORPHIC CONCENTRATIONS	VERY STONY FINE SANDY LOAM (FILL/SPOIL?)	MASSIVE	MOIST FRIABLE

ESHWT	42 INCHES	ROOTS	NONE	RESTRICTIVE LAYERS	N/A
OBSERVED H_2O	NONE	REFUSAL (INCHES):	NONE TO 64"	ESTIMATED PERCOLATION RATE (MIN/IN)	N/A
NOTES	FILL (EXCEPT FOR LAYER IMMEDIATELY BENEATH ASPHALT) MAY ALSO BE UNCONSOLIDATED SPOIL LEFTOVER FROM MINING ACTIVITIES				

TEST PIT 3 (of 4)

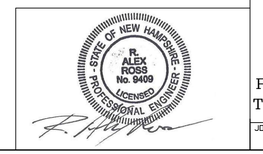
DEPTH (INCHES)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE
+3	ASPHALT	N/A	N/A	N/A
0	10 YR 5/3 BROWN	GRAVELLY LOAMY SAND (FILL)	MASSIVE	MOIST FRIABLE
5	10 YR 5/3 BROWN	FINE SAND	MASSIVE	MOIST FRIABLE
23	10 YR 5/3 BROWN, 15% FINE 7.5 YR 5/6 STRONG BROWN REDOXIMORPHIC CONCENTRATIONS	FINE SAND, DISCONTINUOUS LENSES OF SILT LOAM FROM 18"-24" IN SOME LOCATIONS	WEAK MEDIUM PLATY	MOIST FRIABLE
35	10 YR 5/3 BROWN (NO REDOXIMORPHIC FEAUTRES)	VERY FINE SAND	MASSIVE	MOIST FIRM

ESHWT	23 INCHES (PERCHED)	ROOTS	NONE	RESTRICTIVE LAYERS	35"
OBSERVED H_2O	NONE	REFUSAL (INCHES):	NONE TO 66"	ESTIMATED PERCOLATION RATE (MIN/IN)	N/A
NOTES					

TEST PIT 4 (of 4)

DEPTH (INCHES)	COLOR	TEXTURE	STRUCTURE	CONSISTENCE
+3	ASPHALT	N/A	N/A	N/A
0	10 YR 5/3 BROWN	GRAVELLY LOAMY SAND (FILL)	MASSIVE	MOIST FRIABLE
10	10 YR 4/4 DARK YELLOWISH BROWN	GRAVELLY LOAMY SAND (FILL)	MASSIVE	MOIST FRIABLE
18	10 YR 4/2 DARK GRAYISH BROWN, ≤3% 10 YR 5/2 GRAYISH BROWN REDOXIMORPHIC DEPLETIONS	GRAVELLY SANDY LOAM (FILL)	WEAK FINE SUBANGULAR BLOCKY	MOIST FRIABLE
24	10 YR 5/3 BROWN, 5% FINE 10 YR 5/6 YELLOWISH BROWN REDOXIMORPHIC CONCENTRATIONS	FINE SAND, DISCONTINUOUS LENSES OF SILT LOAM FROM 18"-24" IN SOME PIT LOCATIONS	WEAK MEDIUM PLATY	MOIST FRIABLE
36	10 YR 5/3 BROWN (NO REDOXIMORPHIC FEATURES)	VERY FINE SAND (W/ DISCONTINUOUS LENSES OF SILT LOAM)	MASSIVE (WEAK FINE PLATY)	MOIST FIRM

ESHWT	23 INCHES (PERCHED-SHORT TERM)	ROOTS	NONE	RESTRICTIVE LAYERS	36"
OBSERVED H_2O	NONE	REFUSAL (INCHES):	NONE TO 66"	ESTIMATED PERCOLATION RATE (MIN/IN)	N/A
NOTES	LOW CONFIDENCE LEVEL IN REDOXIMORPHIC FEATURES AT 24" - MORPHOLOGY POSSIBLY INFLUENCED BY ROOF RUNOFF, CONVERSELYM OTHER FEATURES RELICT - POSSIBLY REFLECTIVE OF FORMER CONDITIONS				



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PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

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STORMTECH GENERAL NOTES

1. STORMTECH REQUIRES INSTALLING CONTRACTORS TO USE AND UNDERSTAND STORMTECH'S LATEST INSTALLATION INSTRUCTIONS PRIOR TO BEGINNING SYSTEM INSTALLATION.

2. OUR TECHNICAL SERVICES DEPARTMENT OFFERS INSTALLATION CONSULTATIONS TO INSTALLING CONTRACTORS. CONTACT OUR TECHNICAL SERVICES REPRESENTATIVE AT LEAST 30 DAYS PRIOR TO SYSTEM INSTALLATION TO ARRANGE A PRE-INSTALLATION CONSULTATION. OUR REPRESENTATIVES CAN THEN ANSWER QUESTIONS OR ADDRESS COMMENTS ON THE STORMTECH CHAMBER SYSTEM AND INFORM THE INSTALLING CONTRACTOR OF THE MINIMUM INSTALLATION REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION. CALL **1-888-892-2694** TO SPEAK TO A TECHNICAL SERVICES REPRESENTATIVE OR VISIT **WWW. STORMTECH.COM** TO RECEIVE A COPY OF OUR INSTALLATION INSTRUCTIONS.

3. STORMTECH'S REQUIREMENTS FOR SYSTEMS WITH PAVEMENT DESIGN (ASPHALT, CONCRETE PAVERS, ETC.):MINIMUM COVER IS 18" (457 mm) NOT INCLUDING PAVEMENT; MAXIMUM COVER IS 96" (2438 mm) INCLUDING PAVEMENT. FOR INSTALLATIONS THAT DO NOT INCLUDE PAVEMENT, WHERE RUTTING FROM VEHICLES MAY OCCUR, MINIMUM REQUIRED COVER IS 24" (610 mm), MAXIMUM COVER IS 96" (2438 mm).

4. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE DESIGN ENGINEER.

5. AASHTO M288 CLASS 2 NON-WOVEN GEOTEXTILE (FILTER FABRIC) MUST BE USED AS INDICATED IN THE PROJECT PLANS.

6. STONE PLACEMENT BETWEEN CHAMBERS ROWS AND AROUND PERIMETER MUST FOLLOW INSTRUCTIONS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.

7. BACKFILLING OVER THE CHAMBERS MUST FOLLOW REQUIREMENTS AS INDICATED IN THE MOST CURRENT VERSION OF STORMTECH'S INSTALLATION INSTRUCTIONS.

8. THE CONTRACTOR MUST REFER TO STORMTECH'S INSTALLATION INSTRUCTIONS FOR A TABLE OF ACCEPTABLE VEHICLE LOADS AT VARIOUS DEPTHS OF COVER. THIS INFORMATION IS ALSO AVAILABLE AT STORMTECH'S WEBSITE: **WWW.STORMTECH.COM**. THE CONTRACTOR IS RESPONSIBLE FOR PREVENTING VEHICLES THAT EXCEED STORMTECH'S REQUIREMENTS FROM TRAVELING ACROSS OR PARKING OVER THE STORMWATER SYSTEM. TEMPORARY FENCING, WARNING TAPE AND APPROPRIATELY LOCATED SIGNS ARE COMMONLY USED TO PREVENT UNAUTHORIZED VEHICLES FROM ENTERING SENSITIVE CONSTRUCTION AREAS.

9. THE CONTRACTOR MUST APPLY EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF SITE CONSTRUCTION PER LOCAL CODES AND DESIGN ENGINEER'S SPECIFICATIONS.

10. STORMTECH PRODUCT WARRANTY IS LIMITED. SEE CURRENT PRODUCT WARRANTY FOR DETAILS. TO ACQUIRE A COPY CALL STORMTECH AT **1-888-892-2694** OR VISIT **WWW.STORMTECH.COM**

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.

2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.

3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.

5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.

6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.

7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.

9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.

2. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".

3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.

4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.

5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.

6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.

7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).

8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.

9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

1. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".

2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".

3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

NOTES FOR CONSTRUCTION EQUIPMENT

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CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80MM) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B.
- C. ALL ISOLATOR ROWS
  - C.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - C.2. USING A FLASH LIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE. MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY. FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - C.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80MM) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

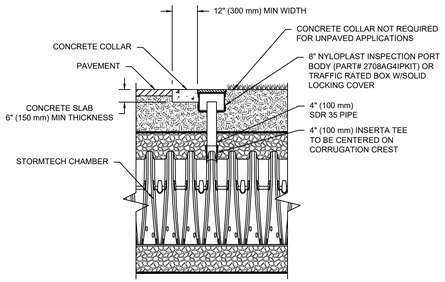
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1M) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

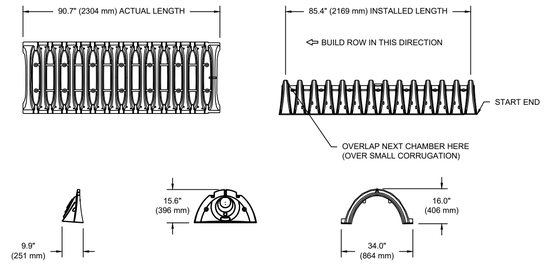
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS. ADJUSTMENT TO THE INSPECTION INTERVAL TIMEFRAME SHALL NOT BE GREATER THAN 12 MONTHS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" INSPECTION PORT DETAIL

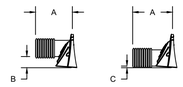
N.T.S.



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)
SC310EPE12BR	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

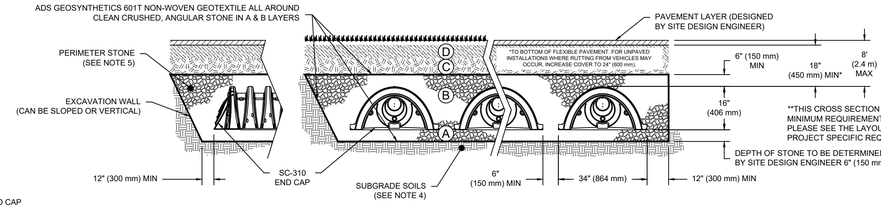
NOTE: ALL DIMENSIONS ARE NOMINAL

SC-310 TECHNICAL SPECIFICATIONS

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

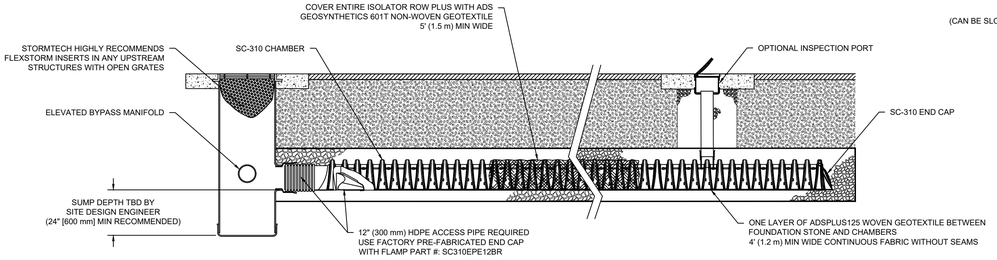
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DESIGN REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE; "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418-16a (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2922 SHALL BE GREATER THAN OR EQUAL TO 400 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



ISOLATOR ROW PROFILE

N.T.S.

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
1	6/7/2022	TAC SUBMITTAL

SCALE 1" = 20'
CHECKED A.ROSS
DRAWN D.D.D.
CHECKED

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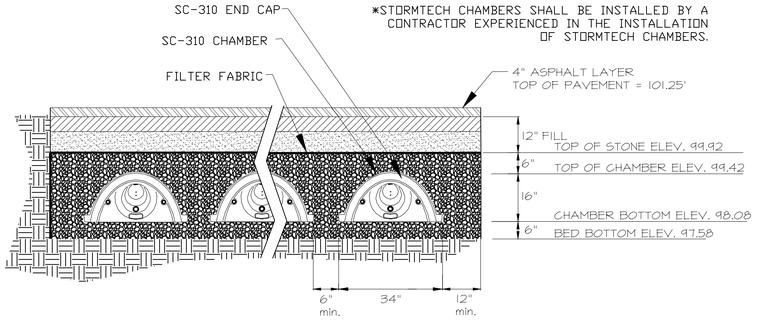
TITLE

STORMTECH DETAILS

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER	DWG. NO.	ISSUE
21-168	8 OF 13	2



STORMTECH SC-310 CHAMBER SYSTEM CROSS SECTION

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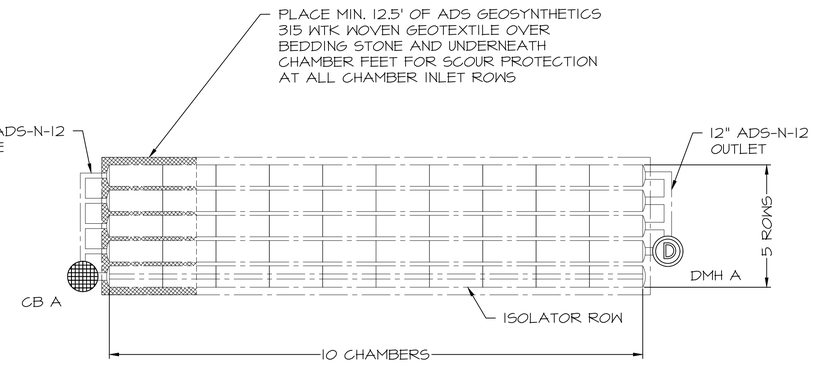
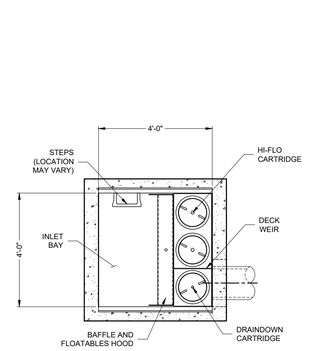


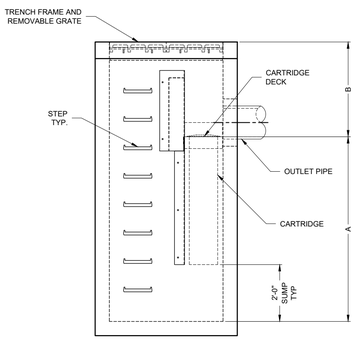
SUBSURFACE CHAMBER LAYOUT

NTS



PLAN VIEW

(TOP SLAB NOT SHOWN FOR CLARITY)



ELEVATION VIEW

JELLYFISH FILTER JFSI0404 DETAIL

N.T.S.

TECHO-BLOC ® PERVIOUS PAVER INSTALLATION GENERAL NOTES

DATA COLLECTION

1. DETERMINE THE SIZE, SHAPE AND INTENDED USE OF FINISHED AREAS.
2. CLASSIFY SUB-GRADE SOILS.
3. DOCUMENT ALL EXISTING CONDITIONS. (FIXED POINTS, EXISTING GRADES, SITE CONTOURS, ETC)
4. DOCUMENT SOIL TYPE, LOCATION, AND ELEVATION OF BELOW GRADE AND OVERHEAD UTILITIES BOTH PUBLIC AND PRIVATE.
5. ENSURE PUBLIC UTILITIES ARE MARKED THROUGH THE USE OF LOCATING SERVICE.
6. DETERMINE THE CROSS SECTION DESIGN OF THE SYSTEM BASED ON SOIL TYPE AND APPLICATION, SHOWING PROPOSED SUB-GRADE AND FINISHED GRADE ELEVATIONS AND ALL GEOTEXTILES AND DRAINAGE DRAINAGE PIPES NEEDED FOR CONSTRUCTION.
7. ESTABLISH THE TYPE, LOCATION, AND ELEVATION OF RELIEF STRUCTURES IF REQUIRED (OVERFLOW PIPE DISCHARGING TO RAIN GARDEN, ETC).
8. DETERMINE CURB OR EDGE RESTRAINT TYPE, ELEVATION, AND LOCATION.
9. CHOOSE PATTERN APPROPRIATE TO THE APPLICATION (TRAFFIC TYPE AND LOAD).

EXCAVATION

1. BEFORE EXCAVATING, CALL ALL LOCAL UTILITY COMPANIES (E.G., PHONE, GAS, ELECTRICAL) TO ENSURE THAT THE AREA IN WHICH YOU PLAN TO DIG IS CLEAR OF UNDERGROUND CABLES OR WIRES. IF ANY ARE FOUND, PLEASE NOTIFY THE APPROPRIATE COMPANIES BEFORE YOU BEGIN.
2. EXCAVATION DEPTH IS DETERMINE FROM THE FOUNDATION THICKNESS ACCORDING TO THE PROJECT SPECIFICATIONS (FOUNDATION THICKNESS IS DETERMINED BY QUALIFIED ENGINEER BASED ON STRUCTURAL AND HYDROLOGIC ANALYSIS.)
3. THE SLOPE OF THE SUB-GRADE WILL DEPEND ON DRAINAGE DESIGN AND INFILTRATION TYPE, A MINIMUM SLOPE OF .5% (1/8" PER FOOT) IS REQUIRED.
4. THE DISTANCE THAT THE EXCAVATED AREA SHOULD EXTEND BEYOND THE AREA TO BE PAVED SHALL BE ONE TO 1.5 TIMES THE THICKNESS OF THE FOUNDATION. EXTRA SPACE ENSURE STABILITY OF PAVERS NEAR EDGE AND EDGE RESTRAINTS.
5. LEVEL THE BOTTOM OF THE EXCAVATED AREA WITH A RAKE.
6. COMPACTION WILL REDUCE THE PERMEABILITY OF THE SUB-GRADE. CARE SHOULD BE TAKEN TO MAINTAIN UNDISTURBED SOIL INFILTRATION DURING EXCAVATION AND CONSTRUCTION. STABILIZATION OF SUB-GRADE MAY BE REQUIRED WITH WEAK, OR CONTINUOUSLY SATURATED SOILS. REDUCED INFILTRATION MAY REQUIRE DRAINAGE PIPES WITHIN THE SUB-BASE TO CONFORM TO STORMWATER DRAINAGE REQUIREMENTS.

GEOTEXTILES, IMPERMEABLE LINERS, AND DRAIN PIPES.

1. USE A WOVEN GEOTEXTILE WITH HIGH BI-AXEL STRENGTH.
2. PLACE THE GEOTEXTILE ON THE BOTTOM AND SIDES OF THE SOIL SUB-GRADE. ELIMINATE WRINKLES IN THE GEOTEXTILE AND ENSURE IT IS NOT DAMAGED DURING CONSTRUCTION.
3. OVERLAP OF GEOTEXTILE SHALL BE A MINIMUM 2'-0" IN THE DIRECTION OF DRAINAGE. OVERLAPPING SHOULD BE "SHINGLE" STYLE WITH RESPECT TO ANY SLOPE DIRECTION AND BASE STONE DISTRIBUTION DIRECTION. KEEP PROPERLY TENSIONED, ELIMINATE WRINKLES, AND AVOID DAMAGING FABRIC (NO SPIKES).

SUB-BASE

1. USE SUB-BASE ASTM NO. 2 OR NO. 3 MEETING THE FOLLOWING REQUIREMENTS:
   - A. 90% FRACTURED SYMMETRICAL PARTICALS
   - B. LESS THAN 5% PASSING 200 SIEVE
   - C. INDUSTRY HARDNESS TESTED
2. MOISTEN SPREAD AND COMPACT ASTM NO. 2 AGGREGATE SUB-BASE IN MINIMUM 6" LIFTS (WITHOUT DAMAGING OR DISTORTING THE GEOTEXTILE).
3. MAKE AT LEAST TWO PASSES IN VIBRATORY MODE FOLLOWED BY AT LEAST TWO PASSES IN STATIC MODE WITH A MINIMUM 10 TON VIBRATORY ROLLER, UNTIL THERE IS NOT VISIBLE MOVEMENT OF THE AGGREGATE.
4. DO NOT ALLOW COMPACTOR TO CRUSH AGGREGATE.
5. SURFACE TOLERANCE OF THE ASTM NO. 2 SUB-BASE SHOULD BE ±2½" OVER 10'.

EDGE RESTRAINT

1. INSTALL AVIGNON, BELGIK, PIETRA, TUNDRA, OR UNIVERSAL EDGE CUT UNITS. CAST-IN-PLACE CONCRETE OR PRECAST CONCRETE CURBS SHALL BE UTILIZED IN VEHICULAR APPLICATIONS.
2. EDGE RESTRAINT MAY REST ON AN OPEN-GRADED OR DENSE-GRADED AGGREGATE BASE.

BASE

1. MOISTEN, SPREAD AND COMPACT THE ASTM NO. 57 AGGREGATE BASE LAYER IN ONE 4" THICK LIFT.
2. MAKE A MINIMUM OF TWO PASSES IN VIBRATORY MODE FOLLOWED BY AT LEAST TWO STATIC MODE WITH A MINIMUM 10 TON ROLLER, UNTIL NO VISIBLE MOVEMENT OF THE AGGREGATE. ALTERNATIVELY, A 13,500 LB PLATE COMPACTOR CAN BE USED TO COMPACTER ASTM NO. 57 AGGREGATE BASE.
3. DO NOT ALLOW COMPACTOR TO CRUSH AGGREGATE.
4. SURFACE TOLERANCE OF THE ASTM NO. 57 BASE SHOULD BE ±1" OVER 10'.

BEDDING COURSE

1. MOISTEN, SPREAD AND SCREED ASTM NO 8. AGGREGATE BEDDING LAYER IN ONE 2" THICK LIFT
2. SURFACE TOLERANCE OF THE ASTM NO 8. BEDDING COURSE ±3/8" OVER 10'
3. CONSTRUCTION EQUIPMENT AND PEDESTRIAN TRAVEL ON SCREEDED BEDDING COARSE IS PROHIBITED.

PAVER

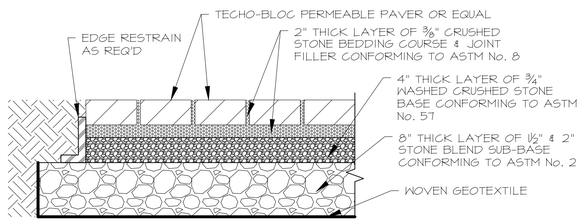
1. PAVERS SHOULD BE PLACED IN PATTERN SHOWN ON DRAWINGS. LAY UNITS TIGHT TO DESIGNATED LAYING PATTERNS. UNITS HAVE LUGS TO MAINTAIN CONSISTENT JOINT WIDTH.
2. IN SLOPED CONDITIONS START LAYING FROM THE BOTTOM IN AN UPHILL DIRECTION.
3. THE MINIMUM SLOPE FOR PERMEABLE PAVEMENT SURFACE IS 1%.
4. INFLO PAVERS CAN BE INSTALLED WITH TBI100SI (TECHO-BLOC MECHANICAL TOOL) TO EXPEDITE INSTALLATION.
5. WHEN SUBJECT IT VEHICULAR TRAFFIC, CUT UNITS SHOULD NOT BE SMALLER THEN ⅓ THE WHOLE PAVER. WHEN USING CUT PAVERS MAINTAIN JOINT.
6. IN VEHICULAR APPLICATION LAY PATTERN PERPENDICULAR TO TRAFFIC FLOW.

JOINT FILL

1. FILL PAVER JOINT OPENINGS WITH ASTM NO. 8 AGGREGATE. SWEEP STONE TO FILL JOINTS. SURFACE MUST BE SWEPT CLEAN PRIOR TO COMPACTION
2. COMPACT WITH 5,000 LB PLATE COMPACTOR (TWO PASSES MINIMUM). INSTALL OF NEOPRENE PAD TO PROTECT THE TEXTURE OF THE PAVING UNITS.
3. DO NOT COMPACT WITHIN 6' OF UNRESTRAINED EDGES OF PAVERS.
4. APPLY ADDITIONAL AGGREGATE TO FILL THE JOINT OPENINGS IF NEEDED AND COMPACT.
5. SURFACE TOLERANCE OF COMPACTED PAVERS SHOULD BE ±3/8" OVER 10'.

POST INSTALLATION PROTECTION

1. MAINTAIN EROSION AND SEDIMENT MEASURES AT PERIMETER TO PREVENT CONTAMINATION OF POROUS PAVEMENT SYSTEM.



PERVIOUS PAVERS DETAIL

N.T.S.

JELLYFISH DESIGN NOTES

JELLYFISH TREATMENT CAPACITY IS A FUNCTION OF THE CARTRIDGE LENGTH AND THE NUMBER OF CARTRIDGES. THE STANDARD SURFACE INLET STYLE WITH TRENCH GRATE AND COVER IS SHOWN. ALTERNATE CURB INLET OR PIPE INLET OPTIONS ARE AVAILABLE. PEAK CONVEYANCE CAPACITY TO BE DETERMINED BY ENGINEER OF RECORD.

CARTRIDGE SELECTION

CARTRIDGE LENGTH	54"	40"	27"	15"
OUTLET INVERT TO STRUCTURE INVERT (A)	6'-6"	5'-4"	4'-3"	3'-3"
FLOW RATE HIGH-FLO / DRAINDOWN (CFS) (PER CART)	0.178 / 0.089	0.133 / 0.067	0.089 / 0.045	0.049 / 0.025
MAX. TREATMENT (CFS)	0.45	0.33	0.22	0.12
OUTLET INVERT TO RIM (MIN) (B)	3'-4"	3'-4"	3'-4"	3'-4"

GENERAL NOTES:

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. www.ContechES.com
3. JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS-20 OR PER APPROVING JURISDICTION REQUIREMENTS, WHICHEVER IS MORE STRINGENT, ASSUMING EARTH COVER OF 0', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
5. STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-857, ASTM C-918, AND AASHTO LOAD FACTOR DESIGN METHOD.
6. OUTLET PIPE INVERT IS EQUAL TO THE CARTRIDGE DECK ELEVATION.
7. THE OUTLET PIPE DIAMETER FOR NEW INSTALLATIONS IS RECOMMENDED TO BE ONE PIPE SIZE LARGER THAN THE INLET PIPE (WHERE APPLICABLE) AT EQUAL OR GREATER SLOPE.
8. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE.
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
D. CARTRIDGE INSTALLATION, BY CONTECH, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION.

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STORMWATER MANAGEMENT DETAILS
140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

R. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE -

JOB NUMBER	DWG. NO.	ISSUE
21-168	9 OF 13	2

CONSTRUCTION SPECIFICATIONS FOR POROUS ASPHALT

REFERENCE DOCUMENT: UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS, UNH STORMWATER CENTER, FEBRUARY, 2014.

INSTALLATION RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS WILL HELP ASSURE THAT THE POROUS ASPHALT PAVEMENT IS PROPERLY INSTALLED.

1. THE FULL PAVEMENT SPECIFICATION MUST BE FOLLOWED CONSCIENTIOUSLY DURING CONSTRUCTION. IT IS BASED ON UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS. THE UNH SPECIFICATION INCLUDE NUMEROUS VITAL PROVISIONS FOR AGGREGATE AND BITUMINOUS MATERIALS, THEIR PLACEMENT, AND QUALITY CONTROL, AMONG ITS NOTABLE PROVISIONS ARE THE FOLLOWING EXAMPLES:
   - OPEN-GRADED AGGREGATE TO MAKE ALL PAVEMENT LAYERS POROUS AND PERMEABLE
   - STIFF ASPHALT BINDER TO ADHERE TO THE AGGREGATE PARTICLES AND RESIST "DRAINDOWN" THROUGH THE PAVEMENT'S PORES, ENHANCING THE MATERIAL'S PERFORMANCE AND DURABILITY;
   - A SPECIFIC LIMIT ON ALLOWABLE DRAINDOWN, AND ADDITION OF A STYRENE-BUTADIENE-STYRENE (SBS) POLYMER ADDITIVE TO HELP MEET THAT REQUIREMENT;
   - THE POROUS PAVEMENT IS TO BE INSTALLED ONLY AFTER MAJOR CONSTRUCTION IS COMPLETED, SO THAT CONSTRUCTION TRAFFIC WILL NOT TRACK POTENTIALLY CLOGGING SEDIMENT ONTO THE PAVEMENT SURFACE. FOR CONSTRUCTION ACCESS, A TEMPORARY SURFACE WILL BE INSTALLED, SIMILAR IN CONSTRUCTION TO A STANDARD STABILIZED CONSTRUCTION ENTRANCE. THIS TYPE OF SURFACE CAN BEAR CONSTRUCTION TRAFFIC WITHOUT ERODING.
   - PROMINENT AND REPEATED STATEMENTS OF THE SPECIAL NATURE AND PURPOSE OF POROUS PAVEMENT, AND THE NECESSITY OF COMPLYING STRICTLY WITH THESE DISTINCTIVE SPECIFICATIONS.
   - PROTECTION OF THE FINISHED POROUS ASPHALT SURFACE FROM TRACKING OF CONSTRUCTION SEDIMENT.

2. THOROUGH COMMUNICATION WITH THE POROUS ASPHALT SUPPLIER AND PAVEMENT INSTALLER IS ESSENTIAL. THEY MUST UNDERSTAND THE POROUS PAVEMENT'S SPECIAL OBJECTIVES, THE SPECIAL MATERIALS AND PROCEDURES NECESSARY TO MAKE IT EFFECTIVE, AND WHY COMPLIANCE WITH SPECIFICATIONS IS ESSENTIAL. TO THIS END, THE SPECIFICATIONS STATE PROMINENTLY AND REPEATEDLY THE SPECIAL NATURE AND PURPOSE OF THE POROUS MATERIALS. IN ADDITION, THE PROJECT ENGINEER SHOULD MEET WITH THE CONTRACTORS IN PERSON TO REVIEW THE SPECIFICATIONS AND MAKE SURE THE CONTRACTORS UNDERSTAND THE OBJECTIVES. HE SHOULD OBSERVE THE CONTRACTORS ON-SITE FREQUENTLY, TO MAKE SURE THE OBJECTIVES ARE CARRIED OUT. HE SHOULD MAINTAIN A WRITTEN RECORD DOCUMENTING REVIEW AND APPROVAL AT CRITICAL PROJECT STAGES SUCH AS EXCAVATION OF THE SUB GRADE AND QUALITY CHECKS OF BASE AND SURFACE MATERIALS. HE SHOULD INSPECT THE SITE TO MAKE SURE CONSTRUCTION VEHICLES ARE NOT ALLOWED TO TRAVERSE EXCAVATED SUB GRADE OR THE PAVEMENT STRUCTURE AT ANY INAPPROPRIATE STAGE. HE SHOULD FORBID CONSTRUCTION TRAFFIC FROM TRACKING SOIL ONTO THE FINISHED PAVEMENT SURFACE.

INSTALLATION

A. PERCOLATION BEDS
   1. OWNER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO ALL PERCOLATION BED AND POROUS PAVING WORK.
   2. SUB GRADE PREPARATION
      a. EXISTING SUB GRADE UNDER BED AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO STONE BED PLACEMENT.
      b. WHERE EROSION OF SUB GRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING, THIS MATERIAL SHALL BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6 INCHES WITH A YORK RAKE OR EQUIVALENT AND LIGHT TRACTOR.
      c. BRING SUB GRADE OF STONE PERCOLATION BED TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSIONS, PONDING, OR TRAFFIC COMPACTION BEFORE THE PLACING OF STONE. ALL BED BOTTOMS ARE LEVEL GRADE.
   3. RECHARGE BED INSTALLATION
      a. UPON COMPLETION OF SUB GRADE WORK, THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT AT HIS DISCRETION BEFORE PROCEEDING WITH PERCOLATION BED INSTALLATION.
      b. PERCOLATION BED AGGREGATE SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUB GRADE PREPARATION. ANY ACCUMULATION OF DEBRIS OR SEDIMENT WHICH HAS TAKEN PLACE AFTER APPROVAL OF SUB GRADE SHALL BE REMOVED PRIOR TO INSTALLATION OF AGGREGATE AT NO EXTRA COST TO THE OWNER.
      c. INSTALL COARSE AGGREGATE (CRUSHED STONE) IN 8-INCH MAXIMUM LIFTS, TO A MAXIMUM OF 95% STANDARD PROCTOR COMPACTION, KEEPING EQUIPMENT MOVEMENT OVER STORAGE BED SUBGRADES TO A MINIMUM. INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
      d. INSTALL FILTER COARSE (BANK RUN GRAVEL) IN 8-INCH MAXIMUM LIFTS, TO A MAXIMUM OF 95% STANDARD PROCTOR COMPACTION, KEEPING EQUIPMENT MOVEMENT OVER STORAGE BED SUBGRADES TO A MINIMUM. INSTALL AGGREGATE TO GRADES INDICATED ON THE DRAWINGS.
      e. INSTALL CHOKER BASE COURSE (SEE MATERIALS SECTION) AGGREGATE EVENLY OVER SURFACE OF STONE BED, SUFFICIENT TO ALLOW PLACEMENT OF PAVEMENT, AND NOTIFY ENGINEER FOR APPROVAL. CHOKER BASE COURSE SHALL BE SUFFICIENT TO ALLOW FOR EVEN PLACEMENT OF ASPHALT BUT NO LESS THAN 4-INCH IN DEPTH.
   4. SURROUNDING AREAS
      a. BEFORE THE POROUS PAVEMENT IS INSTALLED, ADJACENT SOIL AREAS SHOULD BE SLOPED AWAY FROM ALL PAVEMENT EDGES, TO PREVENT POTENTIAL SEDIMENT FROM WASHING ON THE PAVEMENT SURFACE.
      b. TO ACCOMPLISH THIS, A SEQUENCE OF TEMPORARY SWALES SHOULD BE EXCAVATED INTO ALL EARTHEN (UNPAVED) AREAS AT LEAST ON THE UPHILL SIDES OF THE PAVEMENT, AND WHERE NECESSARY, TO BELOW THE CURB OR PAVEMENT ELEVATION. ITS SHAPE AND PLANTINGS CAN BE INTEGRATED WITH THE PROJECT'S ARCHITECTURE AND LANDSCAPE, AND DESIGNED TO MAXIMIZE INFILTRATION. SWALE OVERFLOW, WHEN IT OCCURS, CAN BE DISCHARGED FROM ONE SWALE TO ANOTHER BY CONNECTING PIPES UNDER DRIVEWAYS.
      c. BUILDING BASEMENTS AND FOUNDATIONS SHOULD BE WATERPROOFED AS NECESSARY, WHERE THE POROUS PAVEMENT ABUTS BUILDINGS.

INSTALLATION (CONT...)

B. POROUS ASPHALT
   1. TRANSPORTING MATERIAL
      a. TRANSPORTING OF MIX TO THE SITE SHALL BE IN VEHICLES WITH SMOOTH, CLEAN DUMP BEDS THAT HAVE BEEN SPRAYED WITH A NON-PETROLEUM RELEASE AGENT.
      b. THE MIX SHALL BE COVERED DURING TRANSPORT TO CONTROL COOLING.
   2. POROUS BITUMINOUS ASPHALT SHALL NOT BE STORED IN EXCESS OF 90 MINUTES BEFORE PLACEMENT.
   3. ASPHALT PLACEMENT
      a. THE POROUS BITUMINOUS SURFACE COURSE SHALL BE LAID IN ONE OR TWO LIFTS DIRECTLY OVER THE CHOKER COARSE, FILTER COARSE, AND CRUSHED STONE BASE COURSE TO DEPTH INDICATED. IF LAID IN TWO LIFTS THE PAVEMENT SHALL BE CLEANED AND INSPECTED BY THE ENGINEER BEFORE PLACEMENT OF THE SECOND LIFT.
      b. THE LAYING TEMPERATURE OF THE BITUMINOUS MIX SHALL BE BETWEEN 275 DEGREES FAHRENHEIT AND 325 DEGREES FAHRENHEIT (BASED ON RECOMMENDATIONS OF THE ASPHALT SUPPLIER).
      c. INSTALLATION SHALL TAKE PLACE WHEN AMBIENT TEMPERATURES ARE 55 DEGREES FAHRENHEIT OR ABOVE, WHEN MEASURED IN THE SHADE AWAY FROM ARTIFICIAL HEAT:
      d. THE USE OF A REMIXING MATERIAL TRANSFER DEVICE BETWEEN THE TRUCKS AND THE PAVER IS HIGHLY RECOMMENDED TO ELIMINATE COLD LUMPS IN THE MIX.
      e. THE POLYMER-MODIFIED ASPHALT IS VERY DIFFICULT TO RAKE, A WELL-HEATED SCREED SHOULD BE USED TO MINIMIZE THE NEED FOR RAKING.
      f. COMPACTION OF THE SURFACE COURSE SHALL TAKE PLACE WHEN THE SURFACE IS COOL ENOUGH TO RESIST AN 8-12-TON ROLLER. BREAKDOWN ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 275 DEGREES FAHRENHEIT AND 325 DEGREES FAHRENHEIT. INTERMEDIATE ROLLING SHALL OCCUR WHEN THE MIX TEMPERATURE IS BETWEEN 150 DEGREES FAHRENHEIT AND 200 DEGREES FAHRENHEIT. THE CESSATION TEMPERATURE OCCURS AT APPROXIMATELY 175 DEGREES FAHRENHEIT, AT WHICH POINT THE MIX BECOMES RESISTANT TO COMPACTION. IF COMPACTION HAS NOT BEEN DONE AT TEMPERATURE GREATER THAN THE CESSATION TEMPERATURE, THE PAVEMENT WILL NOT ACHIEVE ADEQUATE DURABILITY.
   4. IN THE EVENT CONSTRUCTION SEDIMENT IS INADVERTENTLY DEPOSITED ON THE FINISHED POROUS SURFACE, IT MUST BE IMMEDIATELY REMOVED BY VACUMING.
   5. AFTER FINAL ROLLING, NO VEHICULAR TRAFFIC OF ANY KIND SHALL BE PERMITTED ON THE SURFACE UNTIL COOLING AND HARDENING HAS TAKEN PLACE, AND IN NO CASE WITHIN THE FIRST 48 HOURS. PROVIDE BARRIERS AS NECESSARY AT NO EXTRA COST TO THE OWNER TO PREVENT VEHICULAR USE; REMOVE AT THE DISCRETION OF THE ENGINEER.
   6. STRIPING PAINT FOR TRAFFIC LANES AND PARKING BAYS SHALL BE CHLORINATED RUBBER BASE, FACTORY MIXED, NON-BLEEDING, FAST DRYING, BEST QUALITY, WHITE TRAFFIC PAINT WITH A LIFE EXPECTANCY OF TWO YEARS UNDER NORMAL TRAFFIC USE.
      a. PAVEMENT-MARKING PAINT; LATEX, WATER-BASE EMULSION, READY-MIXED, COMPLYING WITH FS TT-P-1952.
      b. SWEEP AND CLEAN SURFACE TO ELIMINATE LOOSE MATERIAL AND DUST.
      c. PAINT 4 INCH WIDE PARKING STRIPING AND TRAFFIC LANE STRIPING IN ACCORDANCE WITH LAYOUTS OF PLAN. APPLY PAINT WITH MECHANICAL EQUIPMENT TO PRODUCE UNIFORM STRAIGHT EDGES. APPLY IN TWO COATS AT MANUFACTURER'S RECOMMENDED RATES. PROVIDE CLEAR, SHARP LINES USING WHITE TRAFFIC PAINT, INSTALLED IN ACCORDANCE WITH NHDOT SPECIFICATIONS.
   7. WORK SHALL BE DONE EXPERTLY THROUGHOUT, WITHOUT STAINING OR INJURY TO OTHER WORK. TRANSITION TO ADJACENT IMPERVIOUS BITUMINOUS PAVING SHALL BE MERGED NEATLY WITH FLUSH, CLEAN LINE. FINISHED PAVING SHALL BE EVEN, WITHOUT POCKETS, AND GRADED TO ELEVATIONS SHOWN ON DRAWING.
   8. POROUS PAVEMENT BEDS SHALL NOT BE USED FOR EQUIPMENT OR MATERIALS STORAGE DURING CONSTRUCTION, AND UNDER NO CIRCUMSTANCES SHALL VEHICLES BE ALLOWED TO DEPOSIT SOIL ON PAVED POROUS SURFACES.
   9. REPAIR OF DAMAGED PAVING
      a. ANY EXISTING PAVING ON OR ADJACENT TO THE SITE THAT HAS BEEN DAMAGED AS A RESULT OF CONSTRUCTION WORK SHALL BE REPAIRED TO SATISFACTION OF THE OWNER WITHOUT ADDITIONAL COST TO THE OWNER.
   10. FULL QUALITY CONTROL
      a. THE FULL PERMEABILITY OF THE PAVEMENT SURFACE SHALL BE TESTED BY APPLICATION OF CLEAN WATER AT THE RATE OF AT LEAST 5 GPM OVER THE SURFACE, USING A HOSE OR OTHER DISTRIBUTION DEVISE, WATER USED FOR THE TEST SHALL BE CLEAN, FREE OF SUSPENDED SOLIDS AND DELETERIOUS LIQUIDS AND WILL BE PROVIDED AT NO EXTRA COST TO THE OWNER. ALL APPLIED WATER SHALL INFILTRATE DIRECTLY WITHOUT PUDDLE FORMATION OR SURFACE RUNOFF, AND SHALL BE OBSERVED BY THE ENGINEER AND OWNER.
      b. TEST IN-PLACE BASE AND SURFACE COURSE FOR COMPLIANCE WITH REQUIREMENTS FOR THICKNESS AND SURFACE SMOOTHNESS, REPAIR OR REMOVE AND REPLACE UNACCEPTABLE WORK AS DIRECTED BY THE OWNER.
      c. SURFACE SMOOTHNESS: TEST FINISHED SURFACE FOR SMOOTHNESS AND EVEN DRAINAGE, USING A TEN-FOOT TO CENTERLINE OF PAVED AREA. SURFACE WILL NOT BE ACCEPTED IF GAPS OR RIDGES EXCEED 3/16 OF AN INCH.

MAINTENANCE SPECIFICATIONS FOR POROUS ASPHALT

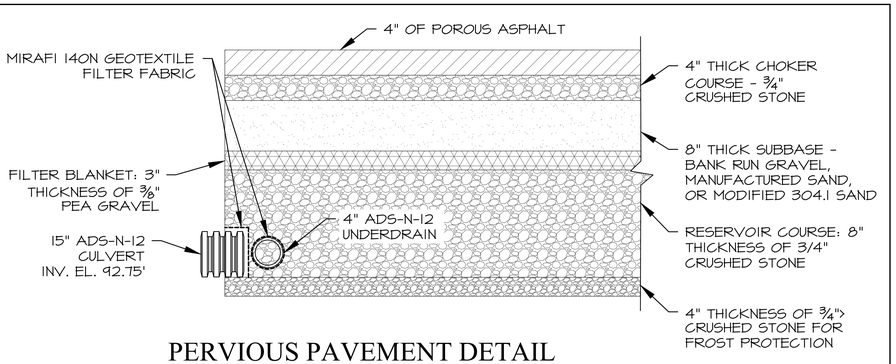
THE FOLLOWING RECOMMENDATIONS WILL HELP ASSURE THAT THE PAVEMENT IS MAINTAINED TO PRESERVE ITS HYDROLOGIC EFFECTIVENESS.

WINTER MAINTENANCE:

1. SANDING FOR WINTER TRACTION IS PROHIBITED. DEICING IS PERMITTED (NaCl, MgCl2, OR EQUIVALENT). REDUCED SALT APPLICATION OF 50% OVER TRADITIONAL PAVEMENT APPLICATION RATES, NONTOXIC, ORGANIC DEICERS, APPLIED EITHER AS BLENDED, MAGNESIUM CHLORIDE-BASED LIQUID PRODUCTS OR AS PRETREATED SALT, ARE PREFERABLE.
2. PLOWING IS ALLOWED, BLADE SHOULD BE SLIGHTLY RAISED (ALTHOUGH NOT NECESSARY, THIS WILL PREVENT PAVEMENT SCARING). ICE AND LIGHT SNOW ACCUMULATION ARE GENERALLY NOT AS PROBLEMATIC AS FOR STANDARD ASPHALT. SNOW WILL ACCUMULATE DURING HEAVIER STORMS AND SHOULD BE PLOWED AFTER 2 TO 4 INCHES OF SNOW ACCUMULATION.

ROUTINE MAINTENANCE:

1. ASPHALT SEAL COATING MUST BE ABSOLUTELY FORBIDDEN. SURFACE SEAL COATING IS NOT REVERSIBLE.
2. THE PAVEMENT SURFACE SHOULD BE VACUMED 2 TO 4 TIMES PER YEAR, ESPECIALLY AFTER WINTER AND FALL SEASONS, AND AT ANY ADDITIONAL TIMES SEDIMENT IS SPILLED, ERODED, OR TRACKED ONTO THE SURFACE.
3. PLANTED AREAS ADJACENT TO PERVIOUS PAVEMENT SHOULD BE WELL MAINTAINED TO PREVENT SOIL WASHOUT ONTO THE PAVEMENT. IF ANY BARE SPOTS OR ERODED AREAS ARE OBSERVED WITHIN THE PLANTED AREAS, THEY SHOULD BE REPLANTED AND/OR STABILIZED AT ONCE.
4. IMMEDIATELY CLEAN ANY SOIL DEPOSITED ON PAVEMENT. SUPERFICIAL DIRT DOES NOT NECESSARILY CLOG THE PAVEMENT VOIDS. HOWEVER, DIRT THAT IS GROUND IN REPEATEDLY BY TIRES CAN LEAD TO CLOGGING. THEREFORE, TRUCKS OR OTHER HEAVY VEHICLES SHOULD BE PREVENTED FROM TRACKING OR SPILLING DIRT ONTO THE PAVEMENT.
5. DO NOT ALLOW CONSTRUCTION STAGING, SOIL/MULCH STORAGE, ETC. ON UNPROTECTED PAVEMENT SURFACE.
6. REPAIRS: FOR THE POROUS ASPHALT PARKING LOT, POTHOLES OF LESS THAN 50 SQUARE FEET CAN BE PATCHED BY ANY MEANS SUITABLE WITH STANDARD PAVEMENT OR A PERVIOUS MIX IS PREFERRED. FOR AREAS GREATER THAN 50 SQ. FT. IS IN NEED OF REPAIR, APPROVAL OF PATCH TYPE SHOULD BE SOUGHT FROM A QUALIFIED ENGINEER. ANY REQUIRED REPAIR OF DRAINAGE STRUCTURES SHOULD BE DONE PROMPTLY TO ENSURE CONTINUED PROPER FUNCTIONING OF THE SYSTEM. REPAIRS TO THE POROUS ASPHALT SIDEWALK SHALL BE MADE WITH A PERVIOUS MIX.
7. WRITTEN AND VERBAL COMMUNICATION TO THE POROUS PAVEMENT'S FUTURE OWNER SHOULD MAKE CLEAR THE PAVEMENT'S SPECIAL PURPOSE AND SPECIAL MAINTENANCE REQUIREMENTS SUCH AS THOSE LISTED HERE.



PERVIOUS PAVEMENT DETAIL

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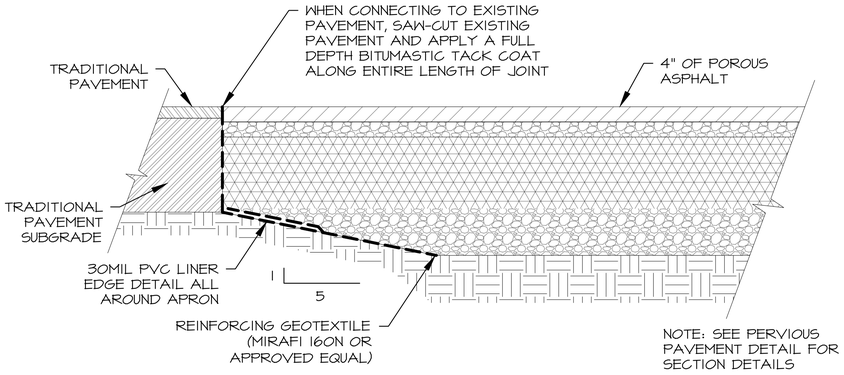

PERVIOUS PAVEMENT TRANSITION DETAIL

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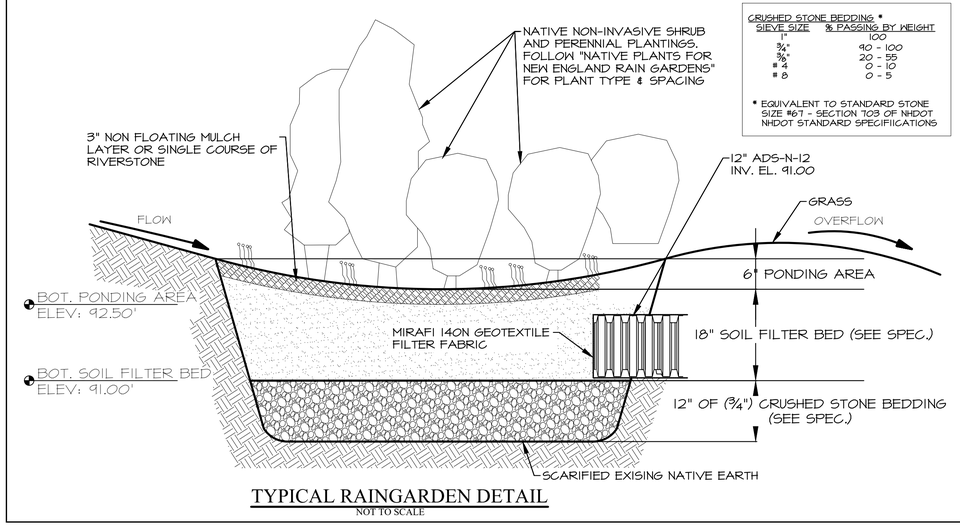
MIX SUMMARY

1. POROUS ASPHALT PAVEMENT MIX PER THE CURRENT UNH STORM WATER CENTER DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS MANUAL.

2. NO WORK SHALL BE STARTED UNTIL THE CONTRACTOR HAS SUBMITTED AND THE ENGINEER HAS APPROVED A MIX DESIGN INCLUDING THE PERCENTAGE OF EACH INGREDIENT INCLUDING BINDER, POLYMER, AND THE JOB-MIX FORMULA FROM SUCH A COMBINATION. THE JOB-MIX FORMULA SHALL ESTABLISH A SINGLE PERCENTAGE OF AGGREGATE PASSING SIEVE AND A SINGLE PERCENTAGE OF BITUMINOUS MATERIAL TO BE ADDED TO THE AGGREGATE. NO CHANGE IN THE JOB-MIX FORMULA MAY BE MADE WITHOUT WRITTEN APPROVAL OF THE ENGINEER. THE JOB-MIX FORMULA MUST FALL WITH THE MASTER RANGE SPECIFIED IN COMPOSITION OF MIXTURE TABLE.

TRANSPORTING MATERIAL: SEE CONSTRUCTION AND INSTALL SPECIFICATIONS



CRUSHED STONE BEDDING *

SIEVE SIZE	% PASSING BY WEIGHT
1"	100
¾"	90 - 100
⅜"	20 - 55
# 4	0 - 10
# 8	0 - 5

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

TYPICAL RAINGARDEN DETAIL

NOT TO SCALE

NOTES:

1) DO NOTE PLACE THE BIORETENTION SYSTEM INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
2) DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE BIORETENTION AREA DURING ANY STAGE OF CONSTRUCTION.
3) DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

Component Material	Percent of Mixture by Volume	Gradation of Material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Moderately fine shredded bark or wood fiber mulch, with fines as indicated	20 to 30	200	<5
Loamy coarse sand	70 to 80	10	85 to 100
		20	70 to 100
		60	15 to 40
		200	8 to 15

FILTER MEDIA SPECIFICATION

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
1	6/7/2022	TAC SUBMITTAL

SCALE: 1" = 20'
CHECKED: A.ROSS
DRAWN: D.D.D.
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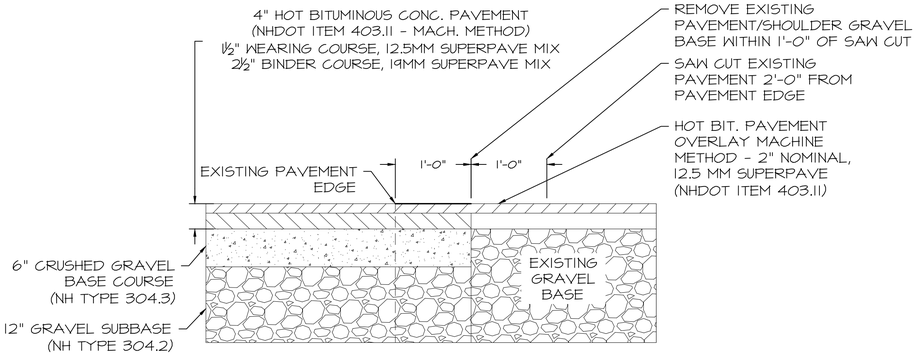
TITLE
STORMWATER MANAGEMENT DETAILS
140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

STATE OF NEW HAMPSHIRE · R. ALEX ROSS No. 9409 · LICENSED PROFESSIONAL ENGINEER

JOB NUMBER	DWG. NO.	ISSUE
21-168	10 OF 13	2



PAVEMENT JOINT DETAIL
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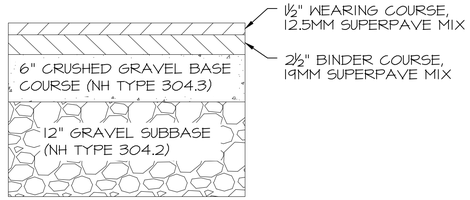

PROPOSED PAVEMENT DETAIL
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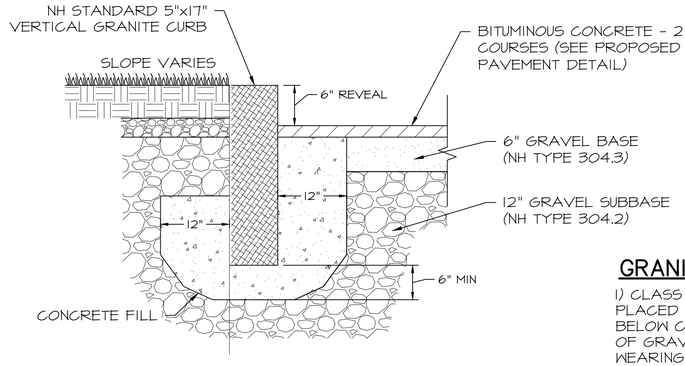


VERTICAL GRANITE CURB DETAIL
N.T.S.

GRANITE CURB NOTES:

1) CLASS B CONCRETE FILL SHALL BE PLACED IN VOIDS IN FRONT, BEHIND, AND BELOW CURBING PRIOR TO INSTALLATION OF GRAVEL BACKING AND FINISH GRADE WEARING COURSE PAVEMENT.

TRENCH NOTES - STORM DRAIN:

1) BEDDING: BEDDING FOR PIPES SHALL CONSIST OF PREPARING THE BOTTOM OF THE TRENCH TO SUPPORT THE ENTIRE LENGTH OF THE PIPE AT A UNIFORM SLOPE AND ALIGNMENT. CRUSHED STONE SHALL BE USED TO BED THE PIPE TO THE ELEVATION SHOWN ON THE DRAWINGS. NORMAL PIPE BEDDING IS CRUSHED STONE TO THE HAUNCH OF THE PIPE AND SAND BEDDING 6" ABOVE THE CROWN. IF THE TOP OF THE PIPE IS LESS THAN 30" FROM FINISH GRADE, BED PIPE COMPLETELY IN STONE UP TO 6" ABOVE PIPE CROWN. UNDERDRAIN TO HAVE 4" MIN' OF STONE OVER PIPE OR AS NECESSARY TO BE IN CONTACT WITH GRAVEL LAYER OF SELECTS ABOVE. FILTER FABRIC TO BE PLACED IN BETWEEN ALL STONE BEDDING MATERIAL AND SUBSEQUENT LAYERS OF FILL MATERIAL.

2) COMPACTION: ALL BACKFILL SHALL BE COMPACTED AT OR NEAR OPTIMUM MOISTURE CONTENT BY PNEUMATIC TAMPERS, VIBRATORY COMPACTORS OR OTHER APPROVED MEANS. BACKFILL BENEATH PAVED SURFACES SHALL BE COMPACTED TO NOT LESS THAN 95 PERCENT OF AASHTO T99, METHOD C.

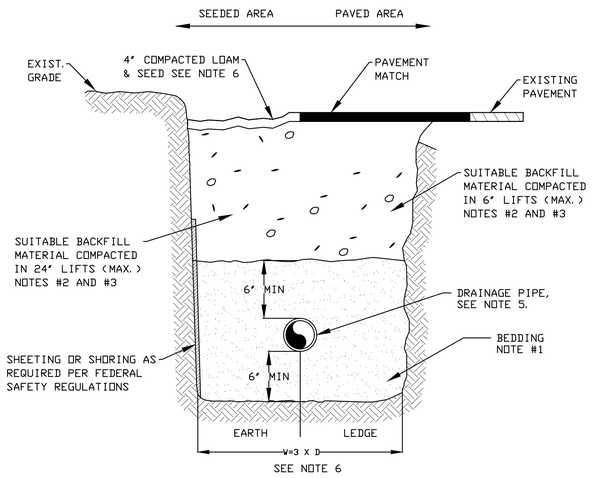
3) SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ROCKS OVER 6 INCHES IN LARGEST DIMENSION; FROZEN EARTH AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

   IN SEEDED AREAS, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAD, ROCKS UNDER 12", FROZEN EARTH OR CLAY, IF HE/SHE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EAST ACCESS TO THE PIPE WILL BE PRESERVED.

4) BASE COURSE AND PAVEMENT: SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES - DIVISIONS 300 AND 400 RESPECTIVELY.

5) DRAINAGE PIPE: PIPE MATERIALS SHALL BE POLYETHYLENE (SEE SPECIFICATIONS).

6) W=MAXIMUM ALLOWABLE TRENCH WIDTH: W SHALL BE THE MAXIMUM PAYMENT WIDTH FOR ROCK EXCAVATION (TRENCH) AND FOR ORDERED EXCAVATION BELOW GRADE.



TRENCH DETAIL - STORM DRAIN
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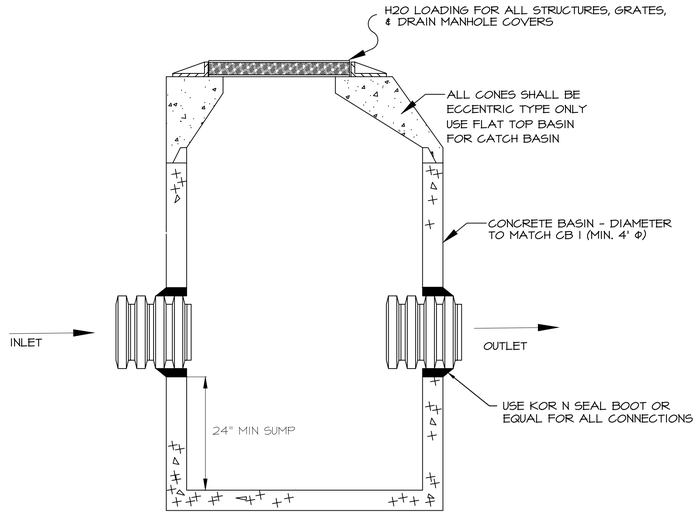

PROPOSED CATCH BASIN/DRAIN MANHOLE
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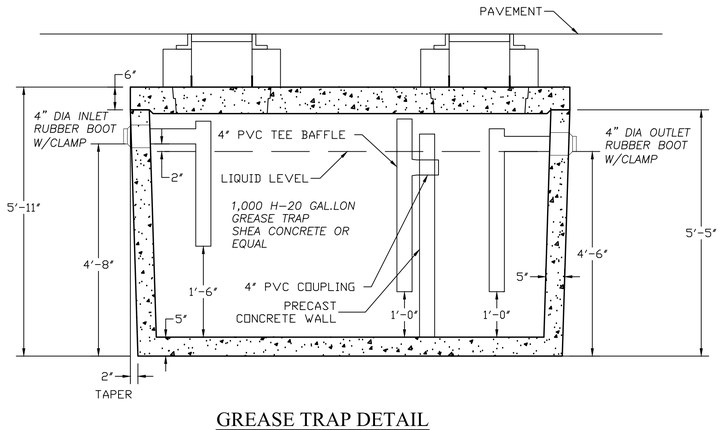
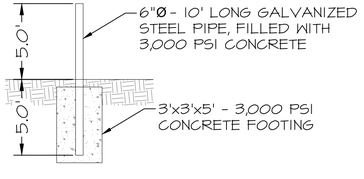


GREASE TRAP DETAIL
Scale : N.T.S.



BOLLARD DETAIL
SCALE: NTS

ISS.	DATE	DESCRIPTION OF ISSUE
2	6/21/2022	TAC SUBMITTAL
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DETAILS

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER 21-168 | DWG. NO. 11 OF 13 | ISSUE 2

STATE OF NEW HAMPSHIRE - R. ALEX ROSS No. 9409 - PROFESSIONAL ENGINEER - LICENSED

MAINTENANCE NOTES

A. MAINTENANCE OF COMMON FACILITIES OR PROPERTY

1. FUTURE OWNERS OR ASSIGNS ARE RESPONSIBLE FOR MAINTENANCE OF ALL STORMWATER INFRASTRUCTURE ASSOCIATED WITH THE FACILITY AND THE PROPERTY. THIS INCLUDES THE ROOF DRAINAGE SYSTEM, RAIN GARDEN, PERVIOUS PAVERS, STORM TECH CHAMBERS, LANDSCAPED AREAS, PERVIOUS ASPHALT AND CONTECH TREATMENT STRUCTURE.

B. GENERAL INSPECTION AND MAINTENANCE REQUIREMENTS

1. PERMANENT STORMWATER AND SEDIMENT AND EROSION CONTROL FACILITIES TO BE MAINTAINED ON THE SITE INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

   a. PARKING AREAS
   b. PERVIOUS ASPHALT
   c. RAIN GARDEN
   d. LANDSCAPED AREAS
   e. PERMEABLE PAVERS
   f. CULVERTS & DRAIN LINES
   g. CONTECH JELLYFISH
   h. ROOF DRAINAGE
   i. STORM TECH CHAMBERS

2. MAINTENANCE OF PERMANENT MEASURES SHALL FOLLOW THE FOLLOWING SCHEDULE:

a. PARKING AREAS, DRIVEWAY:

INSPECTION AT THE END OF EVERY WINTER, PRIOR TO THE START OF THE SPRING RAIN SEASON. SWEEPING SHALL BE DONE ONCE IN EARLY FALL AND THEN AFTER SPRING SNOWMELT. SAND/DEBRIS THAT HAS COLLECTED OFF THE DRIVEWAY AND PARKING LOT SHOULD BE REMOVED OFF-SITE AND DISPOSED OF PROPERLY.

b. PERVIOUS ASPHALT: VISUALLY INSPECT PAVEMENT MONTHLY TO ENSURE IT IS CLEAN OF DEBRIS, DE-WATERS BETWEEN STORMS AND IS CLEAN OF SEDIMENTS. MAINTAIN ALL ADJACENT AND UPLAND AREAS. KEEP SURFACE FREE OF SEDIMENT BY BLOWING, AND VACUUMING AT LEAST AS OFTEN AS ITEM A. ABOVE AND AS NEEDED. AVOID ANY SEALING OR REPAVING WITH IMPERVIOUS MATERIALS.

c. RAIN GARDEN:

RAIN GARDEN MAINTENANCE IS SIMILAR TO THE MAINTENANCE OF ANY PERENNIAL GARDEN, WITH A FEW EXTRA TASKS:

INSPECT: CHECK AFTER STORMS TO VERIFY THE INLET AND OUTLET ARE STABLE, NO CHANNELS HAVE FORMED, THAT PLANTS ARE HEALTHY AND THAT IT IS DRAINING. ADJUST AND REPAIR IF NEEDED.

PLANT CARE: WEED AND WATER AS NEEDED. REPLACE DEAD PLANTS AS NEEDED. CUT BACK, PRUNE OR DIVIDE PLANTS WHEN APPROPRIATE TO ENCOURAGE GROWTH.

CLEAN: IF THE RAIN GARDEN IS RECEIVING RUNOFF THAT CONTAINS SAND OR DEBRIS, SUCH AS FROM A DRIVEWAY OR ROADWAY, CLEAN OUT ACCUMULATED MATERIALS AS NEEDED.

d. LANDSCAPED AREAS:

ANNUAL INSPECTION OF SITE'S VEGETATION AND LANDSCAPING. ANY AREAS THAT ARE BARE SHALL BE RESEEDED AND MULCHED WITH HAY OR, IF THE CASE IS EXTREME, LOAMED AND SEEDED OR SODDED TO ENSURE ADEQUATE VEGETATIVE COVER. LANDSCAPE SPECIMENS SHALL BE REPLACED IN-KIND, IF THEY ARE FOUND TO BE DEAD OR DYING.

e. PERMEABLE PAVERS:

REVIEW PERIODICALLY DURING STORM EVENTS FOR PROPER INFILTRATION. INSPECT ONCE PER YEAR BY RUNNING WATER OVER THE SURFACE WHILE WATCHING FOR PROPER INFILTRATION. CLEAN/REMOVE ANY SEDMENT/DEBRIS FROM THE JOINTS TO ENSURE LARGEST SURFACE AREA FOR WATER TO INFILTRATE, PERFORM LIGHT VACUUMING TWICE A YEAR.

f. CULVERTS AND DRAIN LINES:

INSPECT TWICE A YEAR, MORE OFTEN IF NEEDED. INSPECT FOR ACCUMULATION OF DEBRIS. REMOVE MATERIAL FROM INLET/OUTLET AS NECESSARY, DISPOSE OF OFFSITE.

g. CONTECH JELLYFISH TREATMENT STRUCTURE:

SEE ATTACHED JELLYFISH MAINTENANCE GUIDE.

h. **ROOF DRAINAGE:**

THE FOLLOWING RECOMMENDATIONS WILL HELP ASSURE THAT THE ROOF DRAINAGE SYSTEM IS MAINTAINED TO PRESERVE ITS EFFECTIVENESS:

1. INITIALLY, IT SHOULD BE TESTED BY INSERTING A GARDEN HOSE INTO THE INLET AND ALLOWING THE WATER TO RUN AT FULL STRENGTH FOR A MINIMUM OF ONE HOUR. THE WATER SHOULD STAY UNDERGROUND WITHIN THE GRAVEL. IF WATER COMES OUT OF THE OVERFLOW, THE SYSTEM SHOULD BE FURTHER INSPECTED AND POSSIBLY REPLACED. THIS PROCEDURE SHOULD BE PERFORMED EVERY YEAR DURING THE ANNUAL INSPECTION.

2. IN THE SPRING AND FALL, VISUALLY INSPECT THE AREA AROUND THE SYSTEM AND REPAIR ANY EROSION. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. RE-MULCH ANY VOID AREAS BY HAND AS NEEDED. ALSO, INSPECT THE ROOF COLLECTION AND PIPING AND CLEAN AND REPAIR AS NECESSARY.

3. DO NOT PLANT DEEP ROOTED TREES AND SHRUBS WITHIN 5' OF THE SYSTEM.

i. **STORM TECH CHAMBERS:**

THE FOLLOWING REQUIREMENTS WILL HELP ASSURE THAT THE STORM TECH CHAMBERS SYSTEM IS MAINTAINED TO PRESERVE ITS EFFECTIVENESS:

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT

A. INSPECTION PORTS (IF PRESENT)

A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN

A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED

A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG

A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)

A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80MM) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

B. ALL ISOLATOR ROWS

B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW

B.2. USING A FLASH LIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE. MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY. FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE

B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80MM) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS

A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1M) OR MORE IS PREFERRED

B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN

C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORM TECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS. ADJUSTMENT TO THE INSPECTION INTERVAL TIMEFRAME SHALL NOT BE GREATER THAN 12 MONTHS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

i. INSPECTION OF SITE SHALL OCCUR MONTHLY FOR THE FIRST FEW MONTHS AFTER CONSTRUCTION. THEN INSPECTIONS CAN OCCUR ON AN ANNUAL BASIS, PREFERABLY AFTER RAIN EVENTS WHEN CLOGGING CAN OCCUR AND BE OBVIOUS. PERMEABLE PAVERS REQUIRE MINIMAL MAINTENANCE; HOWEVER MAINTENANCE IS ABSOLUTELY NECESSARY TO ENSURE A PROPER WORKING SYSTEM.

ii. ASPHALT SEAL COATING IS ABSOLUTELY FORBIDDEN. SURFACE SEAL COATING IS NOT REVERSIBLE.

iii. STREET SWEEPERS WITH VACUUMS, WATER, AND BRUSHES CAN BE USED TO RESTORE PERMEABILITY. FOLLOW SWEEPING WITH HIGH-PRESSURE HOSING OF THE SURFACE PORES. SURFACE SHOULD BE VACUUMED 4 TIMES PER YEAR, AND AT ANY ADDITIONAL TIMES SEDIMENT IS SPILLED, ERODED, OR TRACKED ONTO THE SURFACE.

iv. PLANTED AREAS ADJACENT TO PERVIOUS PAVERS SHOULD BE WELL MAINTAINED TO PREVENT SOIL WASHOUT ONTO THE PAVEMENT. IF ANY BARE SPOTS OR ERODED AREAS ARE OBSERVED WITHIN THE PLANTED AREAS, THEY SHOULD BE REPLANTED AND/OR STABILIZED AT ONCE.

v. IMMEDIATELY CLEAN ANY SOIL DEPOSITED ON PAVERS. SUPERFICIAL DIRT DOES NOT NECESSARILY CLOG THE VOIDS. HOWEVER, DIRT THAT IS GROUND IN REPEATEDLY BY TIRES CAN LEAD TO CLOGGING. THEREFORE, TRUCKS OR OTHER HEAVY VEHICLES SHOULD BE PREVENTED FROM TRACKING OR SPILLING DIRT ONTO THE PAVEMENT. REPLACE ANY DAMAGED PAVING BLOCKS.

vi. DO NOT ALLOW CONSTRUCTION STAGING, SOIL/MULCH STORAGE, ETC. ON UNPROTECTED PAVERS SURFACE.

vii. NO WINTER SANDING. MECHANICAL SNOW AND ICE REMOVAL PREFERRED.

viii. WRITTEN AND VERBAL COMMUNICATION TO THE POROUS PAVER'S FUTURE OWNER SHOULD MAKE CLEAR THE SPECIAL PURPOSE AND SPECIAL MAINTENANCE REQUIREMENTS SUCH AS THOSE LISTED HERE.

viij. G. OWNERS SHALL PROVIDE A REPORT ON ACTIVITIES PERFORMED THROUGHOUT THE YEAR. REPORT SHALL INCLUDE DOCUMENTATION THAT PAVEMENT CLEANING IS ACCOMPLISHED PER THIS DOCUMENT AND A CERTIFICATION THAT THE SYSTEM CONTINUES TO FUNCTION AS DESIGNED.

Annual Operations and Maintenance Report

	Activity	Date of Inspection	Who Inspected	Satisfactory: Yes, No, N/A	Maintenance Needed	Implemented date of corrective action	Findings of Inspector
	Parking Areas						
	Pervious Asphalt						
	Rain Garden						
	Landscaped Areas						
	Permeable Pavers						
	Culverts & Drain lines						
	Contech Jellyfish						
	Roof Drainage						
	Storm tech Chambers						

R. ALEX ROSS No. 9409 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

ISS.	DATE	DESCRIPTION OF ISSUE	
2	6/21/2022	TAC SUBMITTAL	
1	6/7/2022	TAC SUBMITTAL	

SCALE 1" = 20'
CHECKED A.ROSS
DRAWN D.D.D.
CHECKED

ROSS ENGINEERING, LLC
Civil/Structural Engineering & Surveying
909 Islington St.
Portsmouth, NH 03801
(603) 433-7560

CLIENT
ROAD TO THE WEST, LLC
ALEXANDER B. CHOQUETTE
14 LAFAYETTE RD. UNIT 9
NORTH HAMPTON, NH 03862

TITLE

NOTES

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER	DWG. NO.	ISSUE
21-168	12 OF 13	2

EROSION AND SEDIMENTATION CONTROL CONSTRICTION PHASING AND SEQUENCING

1. SEE "EROSION AND SEDIMENTATION CONTROL GENERAL NOTES" WHICH ARE TO BE AN INTEGRAL PART OF THIS PROCESS.
2. INSTALL SILTSOXX FENCING AS PER DETAILS AND AT SEDIMENT MIGRATION.
3. CONSTRUCT TREATMENT SWALES , LEVEL SPREADERS AND DETENTION STRUCTURES AS DEPICTED ON DRAWINGS.
4. STRIP AND STOCKPILE TOPSOIL. STABILIZE PILES OF SOIL CONSTRUCTION MATERIAL & COVER WHERE PRACTICABLE.
5. MINIMIZE DUST THROUGH APPROPRIATE APPLICATION OF WATER OR OTHER DUST SUPPRESSION TECHNIQUES ON SITE.
6. ROUGH GRADE SITE. INSTALL CULVERTS AND ROAD DITCHES.
7. FINISH GRADE AND COMPACT SITE.
8. RE-SPREAD AND ADD TOPSOIL TO ALL ROADSIDE SLOPES. TOTAL TOPSOIL THICKNESS TO BE A MINIMUM OF FOUR TO SIX INCHES.
9. STABILIZE ALL AREAS OF BARE SOIL WITH MULCH AND SEEDING.
10. RE-SEED PER EROSION AND SEDIMENTATION CONTROL GENERAL NOTES.
11. SILT SOXX FENCING TO REMAIN AND BE MAINTAINED FOR TWENTY FOUR MONTHS AFTER CONSTRUCTION TO ENSURE ESTABLISHMENT OF ADEQUATE SOIL STABILIZATION AND VEGETATIVE COVER. ALL SILT SOXX FENCING ARE THEN TO BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.
12. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
13. ALL TEMPORARY WATER DIVERSION (SWALES, BASINS, ETC. MUST BE USED AS NECESSARY UNTIL AREAS ARE STABILIZED.
14. PONDS AND SWALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE - BEFORE ROUGH GRADING THE SITE.
15. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM
16. ALL ROADWAYS AND PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
17. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE.
18. ALL EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
19. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
20. LOT DISTURBANCE, OTHER THAN THAT SHOWN ON THE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO DESIGN ELEVATION AND THE ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

PLANTING NOTES:

1. ALL PLANT MATERIALS SHALL BE FIRST QUALITY NURSERY GROWN STOCK.
2. ALL PLANTS SHALL BE PLANTED IN ACCORDANCE WITH NEW HAMPSHIRE LANDSCAPE ASSOCIATION STANDARDS AND GUARANTEED FOR ONE YEAR BY THE LANDSCAPE CONTRACTOR.
3. ALL TREES AND SHRUBS SHALL HAVE WATER SAUCERS BUILT AROUND THEIR BASES AND THESE SHALL BE MULCHED WITH 4" OF DARK BROWN AGED BARK MULCH. MULCH MUST BE KEPT 2" AWAY FROM THEIR TRUNKS.
4. ALL TREES AND SHRUBS SHALL BE PLANTED AND MULCHED BEFORE LAWN IS SEEDED.

MAINTENANCE REQUIREMENTS:

1. ALL TREES, SHRUBS, AND PERENNIALS WILL NEED TO BE WATERED THROUGH THANKSGIVING DURING THE FIRST SEASON IN WHICH THEY ARE INSTALLED.
2. AN UNDERGROUND DRIP IRRIGATION SYSTEM IS RECOMMENDED. IF AN UNDERGROUND DRIP IRRIGATION SYSTEM IS NOT INSTALLED, SOAKER HOSES WOUND THROUGHOUT PLANTING BEDS ARE ACCEPTABLE. ALTHOUGH OVERHEAD SPRINKLERS ARE RECOMMENDED FOR LAWN AREAS, THEY ARE NOT ACCEPTABLE FOR IRRIGATING TREES AND SHRUBS.

SEEDING AND STABILIZATION FOR LOAMED SITE:

FOR TEMPORARY & LONG TERM SEEDINGS USE AGWAY'S SOIL CONSERVATION GRASS SEED OR EQUAL
COMPONENTS: ANNUAL RYE GRASS, PERENNIAL RYE GRASS, WHITE CLOVER, 2 FESCUES, SEED AT A RATE OF 100 POUNDS PER ACRE,
FERTILIZER & LIME:
NITROGEN (N) 50 LBS/ACRE, PHOSPHATE (P205) 100 LBS/ACRE, POTASH (K20) 100 LBS/ACRE, LIME 2000 LBS/ACRE
MULCH:
HAY OR STRAW 1.5-2 TONS/ACRE

A) GRADING AND SHAPING
1) SLOPES SHALL NOT BE STEEPER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED, WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.

B) SEED BED PREPARATION
1) SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
2) STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

EROSION AND SEDIMENTATION CONTROL GENERAL NOTES

1. CONDUCT ALL CONSTRUCTION IN A MANNER AND SEQUENCE THAT CAUSES THE LEAST PRACTICAL DISTURBANCE OF THE PHYSICAL ENVIRONMENT, BUT IN NO CASE SHALL EXCEED 2 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED.
2. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
3. ALL DITCHES, SWALES AND PONDS MUST BE STABILIZED PRIOR TO DIRECTING FLOW TO THEM.
4. ALL GROUND AREAS OPENED UP FOR CONSTRUCTION WILL BE STABILIZED WITHIN 24 HOURS OF EARTH-DISTURBING ACTIVITIES BEING CEASED, AND WILL BE FULLY STABILIZED NO LONGER THAN 14 DAYS AFTER INITIATION, (SEE NOTE 11 FOR DEFINITION OF STABLE). ALL SOILS FINISH GRADED MUST BE STABILIZED WITHIN SEVENTY TWO HOURS OF DISTURBANCE. ALL TEMPORARY OR LONG TERM SEEDING MUST BE APPLIED TO COMPLY WITH "WINTER CONSTRUCTION NOTES" (SEE WINTER CONSTRUCTION NOTES). EMPLOY TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES AS DETAILED ON THIS PLAN AS NECESSARY UNTIL ADEQUATE STABILIZATION HAS BEEN ASSURED (SEE NOTE 11 FOR DEFINITION OF STABLE).
5. TEMPORARY & LONG TERM SEEDING: USE SEED MIXTURES, FERTILIZER, LIME AND MULCHING AS RECOMMENDED (SEE SEEDING AND STABILIZATION NOTES).
6. SILTSOXX FENCING TO BE SECURELY EMBEDDED AND STAKED AS DETAILED. WHEREVER POSSIBLE A VEGETATED STRIP OF AT LEAST TWENTY FIVE FEET IS TO BE KEPT BETWEEN SILTSOXX AND ANY EDGE OF WET AREA.
7. SEEDED AREAS WILL BE FERTILIZED AND RE-SEEDED AS NECESSARY TO ENSURE VEGETATIVE ESTABLISHMENT.
8. SEDIMENT BASIN(S), IF REQUIRED, TO BE CHECKED AFTER EACH SIGNIFICANT RAINFALL AND CLEANED AS NEEDED TO RETAIN DESIGN CAPACITY.
9. SILTSOXX FENCING WILL BE CHECKED REGULARLY AND AFTER EACH SIGNIFICANT RAINFALL. NECESSARY REPAIRS WILL BE MADE TO CORRECT UNDERMINING OR DETERIORATION OF THE BARRIER AS WELL AS CLEANING, REMOVAL AND PROPER DISPOSAL OF TRAPPED SEDIMENT.
10. TREATMENT SWALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY UNTIL ADEQUATE VEGETATIVE COVER HAS BEEN ESTABLISHED.
11. AN AREA SHALL BE CONSIDERED FULLY STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP RAP HAS BEEN INSTALLED.
- EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.

11. ALL EROSION AND SEDIMENTATION CONTROL MEASURES IN THE PLAN SHALL MEET THE DESIGN BASED ON STANDARDS AND SPECIFICATIONS SET FORTH IN THE STORM WATER MANAGEMENT AND EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE (DECEMBER 2008 OR LATEST) PREPARED BY ROCKINGHAM COUNTY CONSERVATION DISTRICT, N.H. DES AND NRCS.

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 SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPETED IN ADVANCE OF THAW OR SPRING MELT EVENT.;
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;
3. AFTER OCTOBER 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.

LONG TERM SEEDING

*WELL TO MODERATELY WELL DRAINED SOILS

FOR CUT AND FILL AREA AND FOR WATERWAYS AND CHANNELS

SEEDING MIXTURE C

	lb/ACRE	lb/1000SF
TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED CLOVER (ALSIKE)	20	0.45
TOTAL	48	1.35

LIME: AT 2 TONS PER ACRE OR 100 LBS PER 1,000 S.F.
FERTILIZER: 10 20 20 (NITROGEN, PHOSPHATE, POTASH AT 500# PER ACRE.
MULCH: HAY OR CLEAN STRAW; 2 TONS/ACRE OR 2 BALES/1000 S.F.

GRADING AND SHAPING:
SLOPES SHALL NOT BE STEEPER THAN 2 TO 1. 3 TO 1 OR FLATTER SLOPES ARE PREFERRED.
SEEDBED PREPARATION:
SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
STONES LARGER THAN FOUR INCHES AND TRASH SHOULD BE REMOVED.
SOD SHOULD BE TILLED TO A DEPTH OF FOUR INCHES TO PREPARE SEEDBED. FERTILIZER & LIME SHOULD BE MIXED INTO THE SOIL.
THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

* FROM: STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE, DECEMBER 2008.

SHORT TERM SEEDING

*WELL TO MODERATELY WELL DRAINED SOILS

FOR CUT AND FILL AREA AND FOR WATERWAYS AND CHANNELS

SEEDING MIXTURE C

	#/ACRE	#/1000SF
FOR APRIL 1 - AUGUST 15		
ANNUAL RYE GRASS	40	1
FOR FALL SEEDING		
WINTER RYE	112	2.5

LIME: AT 1 TON PER ACRE OR 100 LBS PER 1,000 S.F.
FERTILIZER: 10 10 10 (NITROGEN, PHOSPHATE, POTASH AT 500# PER ACRE.
MULCH: HAY OR CLEAN STRAW; 2 TONS/ACRE OR 2 BALES/1000 S.F.

GRADING AND SHAPING:
SLOPES SHALL NOT BE STEEPER THAN 2 TO 1. 3 TO 1 OR FLATTER SLOPES ARE PREFERRED.
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* FROM: STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE, DECEMBER 2008.

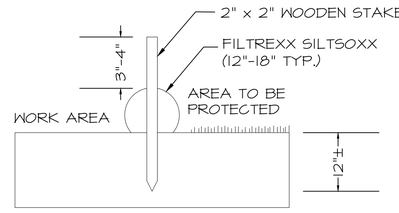
WHEN PROPOSED FOR ALTERATION DURING CONSTRUCTION AS BEING INFESTED WITH INVASIVE SPECIES SHALL BE MANAGED APPROPRIATELY USING THE DISPOSAL PRACTICES IDENTIFIED IN "NHDOT - BEST MANAGEMENT PRACTICES FOR ROADSIDE INVASIVE PLANTS -2008" AND "METHODS FOR DISPOSING NON-NATIVE INVASIVE PLANTS - UNH COOPERATIVE EXTENSION - 2010"

SEED MIXES SHALL NOT CONTAIN ANY SPECIES IDENTIFIED BY THE NEW HAMPSHIRE PROHIBITED INVASIVE PLANT SPECIES LIST.

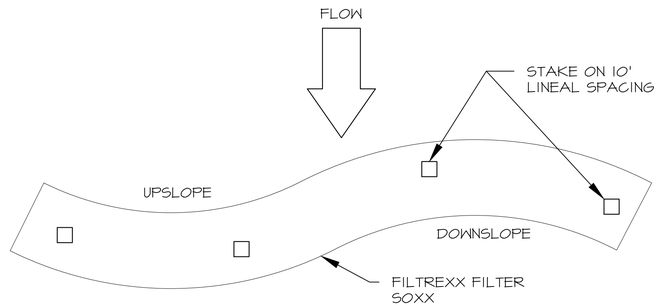
FILTREXX SILTSOXX NOTES

1) ALL MAERTIAL TO MEET FILTREXX SPECIFICATIONS

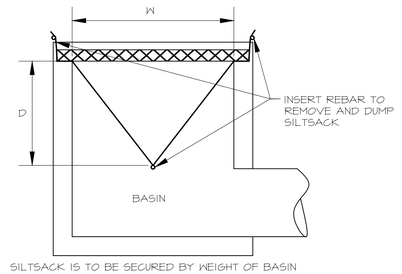
2) SILTSOXX COMPOST, SOIL, ROCK, SEED FILL TO MEET APPLICATION REQUIREMENTS



Filtrexx SiltSoxx Section
N.T.S.



Filtrexx SiltSoxx Plan View
N.T.S.



SILTSACK IS TO BE SECURED BY WEIGHT OF BASIN GRATE TO PREVENT SEDIMENT FROM ENTERING THE DRAIN LINE

INSTALL SILTSACK TO CATCH BASINS 1, 2, & 3 PRIOR TO CONSTRUCTION & TO CATCH BASINS A, B, C & D DURING CONSTRUCTION. DO NOT REMOVE SILTSACK UNTIL CONSTRUCTION IS COMPLETE.

Siltsack
N.T.S.

ISS.	DATE	DESCRIPTION OF ISSUE	
2	6/21/2022	TAC SUBMITTAL	
1	6/7/2022	TAC SUBMITTAL	
SCALE	1" = 20'		
CHECKED	A.ROSS		
DRAWN	D.D.D.		
CHECKED			

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CLIENT
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ALEXANDER B. CHOQUETTE
14 LAFAYETTE RD. UNIT 9
NORTH HAMPTON, NH 03862

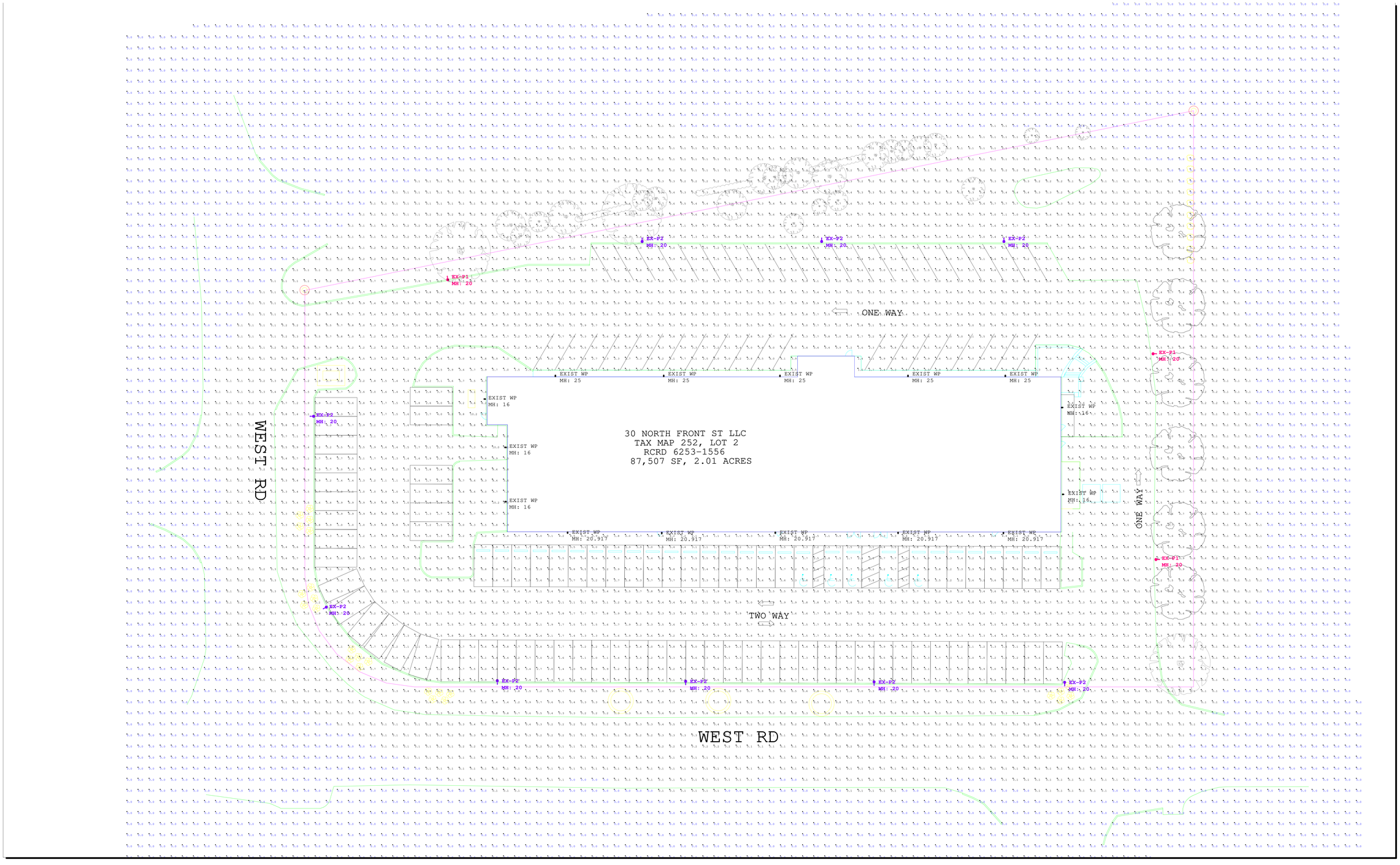
TITLE

EROSION CONTROL PLAN

140 WEST RD
PORTSMOUTH, NH 03801
TAX MAP 252, LOT 2-13

JOB NUMBER	DWG. NO.	ISSUE
21-168	13 OF 13	2

STATE OF NEW HAMPSHIRE
R. ALEX ROSS No. 9409 LICENSED
PROFESSIONAL ENGINEER



Luminaire Schedule						
Symbol	Qty	Label	Arrangement	LLF	Description	Lum. Lumens
	3	EX-P1	SINGLE	0.900	SL630-24L40T2-MDL018-SV1-BLOC	9824
	9	EX-P2	SINGLE	0.900	SL630-24L40T4-MDL018-SV1-BLOC	8414
	15	EXIST WP	SINGLE	0.730	XTOR8B	8502

Calculation Summary								
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Site	Illuminance	Fc	0.90	10.2	0.0	N.A.	N.A.

illuminate

SCALE
NTS

DRAWN BY:
DATE: 6 21 22 V2
NOTES:

PROJECT: 140 WEST ROAD
LOCATION: PORTSMOUTH, NH

**
***IF REFLACTANCE VALUES ARE NOT PROVIDED, STANDARD VALUES WILL BE USED (80/50/20)*

GENERAL CODE COMPLIANCE REVIEW

140 WEST ROAD
PORTSMOUTH, NH 03801

PROJECT DATA:

DESCRIPTION: INTERIOR RENOVATIONS AND EXTERIOR STAIR TOWER ADDITIONS TO AN EXISTING 2B BUILDING, THE USE IS INDOOR RECREATION - ASSEMBLY AND OFFICE.

STATE BUILDING CODE:

2015 INTERNATIONAL BUILDING CODE (2015 IBC)

LIFE SAFETY CODE:

2015 NATIONAL FIRE PROTECTION AGENCY 101 (NFPA 101)

STATE ENERGY CODE:

2015 INTERNATIONAL ENERGY CONSERVATION CODE (2015 IECC)

STATE MECHANICAL CODE:

2015 INTERNATIONAL MECHANICAL CODE (2015 IMC)

STATE ELECTRICAL CODE:

2017 NATIONAL ELECTRICAL CODE (2017 NEC)

STATE PLUMBING CODE:

2015 INTERNATIONAL PLUMBING CODE (2015 IPC)

EXISTING BUILDING CODE:

2015 INTERNATIONAL EXISTING BUILDING CODE

STATE ACCESSIBILITY CODE:

2009 ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES ANSI A117.1

2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

CODE REVIEW

GENERAL BUILDING INFO	COMMENTS	CODE SECTION REFERENCE
OCCUPANCY USE GROUP	(A-2) ASSEMBLY, (B) BUSINESS, (S-2) STORAGE ASSEMBLY, BUSINESS, STORAGE	IBC, CH 3 NFPA101, CH 6 & CH 26
CONSTRUCTION TYPE	TYPE 2-B	IBC 602.2
FIRE SPRINKLER SYSTEM	YES	IBC 903; NFPA 101: 7.1.11
FIRE ALARM	YES	IBC 907; NFPA 101: 4.5.4
MIXED USE	NONSEPARATED OCCUPANCIES - A-2 MOST RESTRICTIVE	IBC 508.3.3; NFPA 101: 6.1.14.3
BUILDING HEIGHT	ALLOWABLE: 75'-0" ACTUAL: 38' - 0" +/-	IBC 504, TABLE 504.3
STORIES(S)	ALLOWABLE: 3 ACTUAL: 2	IBC 504, TABLE 504.4
AREA	ALLOWABLE: 28,500 SF ACTUAL: 18,111 SF	IBC 506, TABLE 506.2
AREA CALCULATIONS	N/A	IBC 506
OCCUPANT LOAD PER SUITE 100	502 (SEE LIFE SAFETY PLAN)	IBC TABLE 1004.5; NFPA 101: 7.3.1
NUMBER OF EXITS	REQUIRED: 3 ACTUAL: 5 (1ST), 3 (2ND)	IBC TABLE 1006.3.1
FIRE RATINGS	**TYPE 2B CONSTRUCTION**	**IBC TABLE 601**
EXTERIOR BEARING WALLS	0 HOUR	
INTERIOR BEARING WALLS	0 HOUR	
NON-BEARING INTERIOR WALLS	0 HOUR	
FLOOR CONSTRUCTION	0 HOUR	
ROOF CONSTRUCTION	0 HOUR	
STRUCTURAL FRAME	0 HOUR	
MEANS OF EGRESS REQUIREMENTS	--	--
MIN EGRESS WIDTH AT DOORS	REQUIRED: 32 INCHES ACTUAL: 32 INCHES	IBC 1005.3.2, IBC 1010.1.1
MIN EGRESS WIDTH AT STAIR	REQUIRED: 44 INCHES ACTUAL: 44 INCHES	IBC 1005.3.1, IBC 1011.2
MAXIMUM DEAD END CORRIDOR	20'	IBC 1020.4
MAXIMUM TRAVEL DISTANCE	250'	IBC TABLE 1017.2
COMMON PATH OF TRAVEL	75'	IBC TABLE 1006.2.1
MINIMUM CORRIDOR WIDTH	REQUIRED: 44" ACTUAL: 60"	IBC 1005.3.2, IBC 1020.2
MINIMUM RAMP WIDTH	REQUIRED: 36" BETWEEN HANDRAILS ACTUAL: 56"	IBC 1005.3.2, IBC 1012.5.1
REMOTENESS	268'-3" (DIAGONAL) / 3 = 89'-5" MINIMUM EXIT SEPARATION DISTANCE	IBC 1007.1.2 NFPA101 7.5.1.3.3
ASSEMBLY EGRESS REQUIREMENTS	--	**IBC SECTION 1018, 1029**
TRAVEL DISTANCE	250' - 0" MAX.	IBC 1029.7
COMMON PATH OF TRAVEL	30' FROM ANY SEAT TO A CHOICE OF TWO PATHS TO EXITS	IBC 1029.8
AISLE WIDTH (.15" PER OCCUPANT)	MINIMUM AT LEVEL AISLE WITH SEATING ON BOTH SIDES: 42" MINIMUM AT LEVEL AISLE WITH SEATING ON ONE SIDE: 36"	IBC 1029.9.1.4 IBC 1029.9.1.5
CONVERGING AISLES	AT CONVERGING AISLES: AISLE WIDTH SHALL NOT BE LESS THAN TOTAL REQUIRED CAPACITY OF ALL CONVERGING AISLES	IBC 1029.9.3
UNIFORM WIDTH AND CAPACITY	AISLES SHALL BE UNIFORM IN MINIMUM OR REQUIRED WIDTH	IBC 1029.9.4
DEAD END AISLES	20' - 0"	IBC 1029.9.6
AISLE MEASURMENT	CLEAR WIDTH OF AISLES SHALL BE MEASURED FROM WALLS TO EDGE OF SEATING EXCEPT FOR PERMITED PROJECTIONS 19" FROM FACE OF COUNTER/TABLE TO FACE OF COUNTER/TABLE	IBC 1029.9.6
AISLE ACCESSWAYS		IBC 1029.12.1
CAPACITY AND WIDTH	12" MIN, .15" PER PERSON ACCESSING AISLE ACCESSWAY	IBC 1029.12.1.1
AISLE ACCESSWAY LENGTH	30' - 0" MAX.	IBC 1029.12.1.2
ACCESSIBILITY REQUIREMENTS	--	--
TOE AND KNEE CLEARANCES	SEE SHEET T4	ANSI A117.1, ADA 2010 SECTION 306
REACH RANGES	SEE SHEET T4	ANSI A117.1, ADA 2010 SECTION 308
SERVICE COUNTERS	SEE SHEET T4	ANSI A117.1, ADA 2010 SECTION 904
CLEAR FLOOR SPACE	CLEAR FLOOR SPACE POSITIONED FOR FORWARD APPROACH SHALL BE PROVIDED	ANSI A117.1, ADA 2012 SECTION 902.2 (305/306)
TABLE HEIGHT	THE TOPS OF TABLES SHALL BE BETWEEN 28" MIN. AND 34" MAX. ABOVE THE FINISH FLOOR	ANSI A117.1, ADA 2012 SECTION 902.3
DINING AND DRINKING AREAS	ALL DINING AND DRINKING AREAS SHALL BE ACCESSIBE AND BE ON AN ACCESSIBLE ROUTE (SEE AISLES ABOVE)	IBC SECTION 1108.2.9
DINING SURFACES	5% OF TOTAL DINING SURFACES FOR THE SEATING AND STANDING SPACES SHALL BE ACCESSIBLE AND BE DISTRIBUTED THROUGHOUT THE FACILITY AND CONNECTED TO AN ACCESSBLE ROUTE, SEE TABLE CLEAR FLOOR SPACE BELOW (2/T2).	IBC SECTION 1108.2.9.1
PLUMBING FIXTURES	--	**A-3 - IBC TABLE 2902.1**
WATER CLOSET:		
MALE: 1 PER / 125 OC	PROVIDED: 8 PER GENDER, 2 UNISEX FAMILY	
FEMALE: 1 PER / 65 OC	REQUIRED: 3	
	REQUIRED: 5	
LAVATORY:	PROVIDED: 4 PER GENDER, 2 UNISEX FAMILY	
MALE: 1 PER / 200 OC	REQUIRED: 2	
FEMALE: 1 PER / 200 OC	REQUIRED: 2	
FAMILY/ASSISTED-USE TOILET ROOM	REQUIRED: 1 ACTUAL: 1 UNISEX FAMILY	IBC 1109.2.1
SERVICE SINK:	REQUIRED: 1 ACTUAL: 1	
DRINKING FOUNTAINS: 1 PER / 500 OC	KITCHEN WILL PROVIDE WATER IN A CONTAINER FREE OF CHARGE, 2 EXISTING WATER FOUNTAINS PROVIDED	IPC 410.4

INTERNATIONAL ENERGY CONSERVATION CODE

PORTSMOUTH ORDINANCE - CLIMATE ZONE 6	
ROOF: INSULATION ENTIRELY ABOVE ROOF DECK[1]	R-30 CONTINUOUS INSULATION
WALLS ABOVE GRADE: METAL FRAMED[1]	R-21
SLAB ON GRADE: UNHEATED[1]	R-10 FOR 24" BELOW
FIXED FENESTRATION[2]	U-0.36
OPERABLE FENESTRATION[2]	U-0.43
ENTRY DOORS[2]	U-0.77

1. SEE TABLE C402.1.3 IN IECC 2015
2. SEE TABLE C402.4 IN IECC 2015

FIRE SPRINKLER NOTES

1. CONTRACTOR TO DESIGN AND PROVIDE NFPA 13 COMPLIANT FIRE SPRINKLER SYSTEM. THE DESIGN SHALL INCLUDE DRAWINGS AND ENGINEERING CALCULATIONS STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN NEW HAMPSHIRE.
2. SYSTEM SHALL MEET ALL STATE AND LOCAL CODES. COORDINATE SYSTEM WITH DESIGN DOCUMENTS.

LIFE SAFETY LEGEND

: FIRE - EGRESS
: FIRE - 1Hr Sep.
: MAIN EGRESS AISLES / CORRIDORS

EGRESS DOOR TAG

EXIT DOOR 001	WIDTH	CAPACITY
DOOR	72"	360
USE		62

DOOR NUMBER
ALLOWED USE
ACTUAL USE
CLEAR WIDTH

EGRESS STAIR TAG

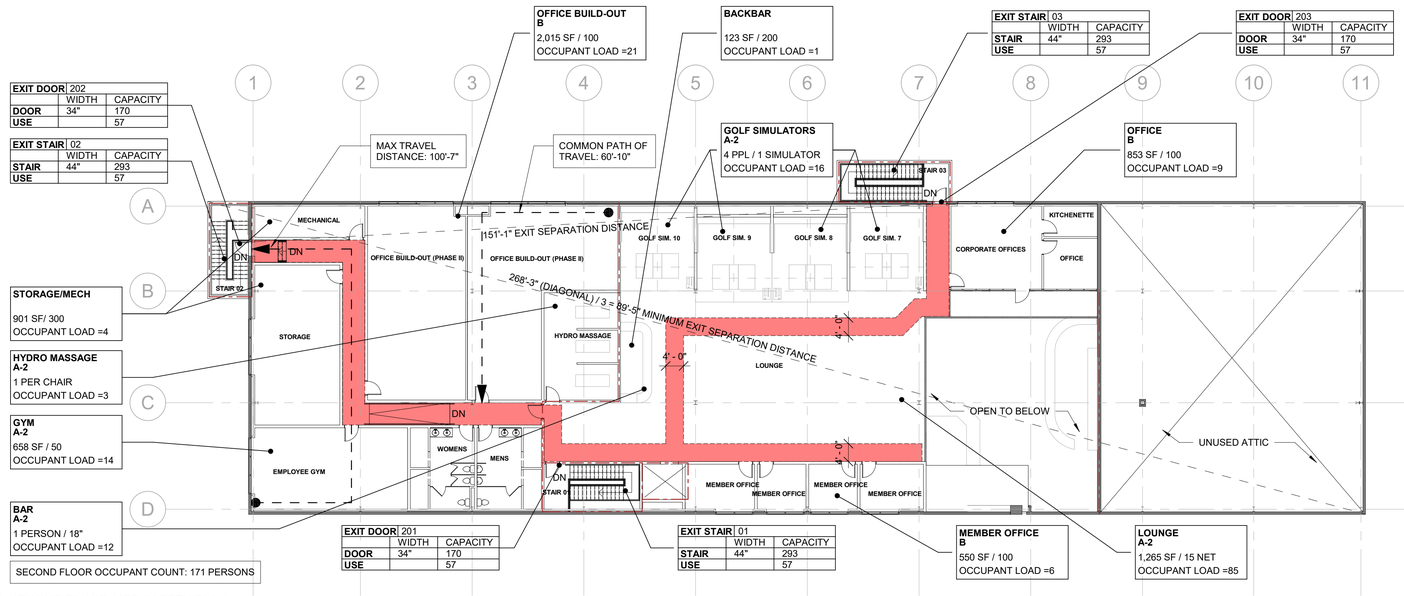
EXIT STAIR 01	WIDTH	CAPACITY
STAIR	72"	360
USE		62

ALLOWED USE
ACTUAL USE
CLEAR WIDTH

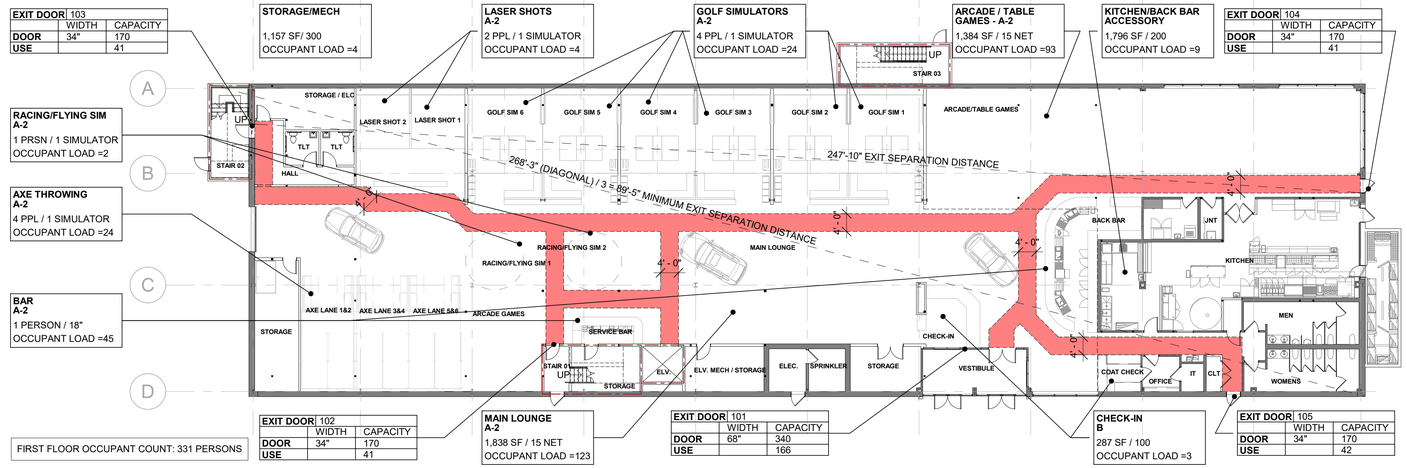
BUILDING USE TAG

ASSEMBLY A-3
600 SF / 15
OCCUPANT LOAD =40

USE
AREA / LOAD FACTOR
OCCUPANT LOAD



2 SECOND FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



1 FIRST FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"

4' 16'
0' 8' 32'
Scale: 1/16" = 1'-0"

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BLACK ROCK SOCIAL CLUB
ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

NOT FOR CONSTRUCTION PERMIT SET ONLY

No.	Description	Date

Project Name: BLACK ROCK SOCIAL CLUB
Drawing Name: GENERAL CODE REVIEW
Project Number: 21121
Date: 06/21/2022
Drawn By: RD
Checked By: MG

T2

Scale: AS INDICATED

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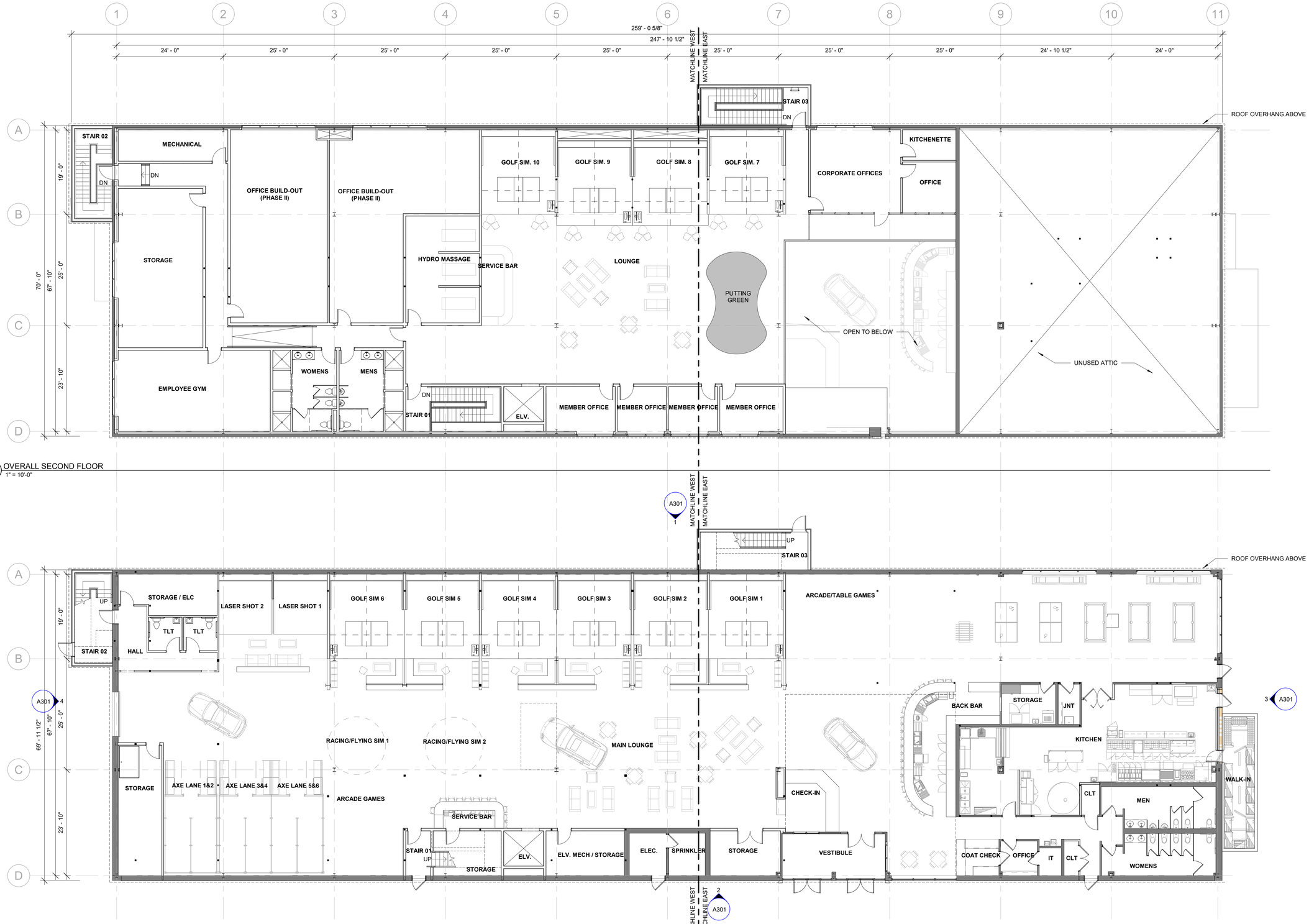

2 OVERALL SECOND FLOOR
1" = 10'-0"

1 OVERALL FIRST FLOOR
1" = 10'-0"

BUILDING FOOTPRINT:	18,111 SF
FIRST FLOOR:	18,111 SF - ASSEMBLY
SECOND FLOOR:	12,053 SF - ASSEMBLY / BUSINESS
GROSS AREA	30,164 SF

0' 10' 20' 40'
Scale: 1:10

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BLACK ROCK SOCIAL CLUB

ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY ARCHITECTURE
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Portsmouth, New Hampshire
603.430.0274

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No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
OVERALL FLOOR PLANS

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A101

Scale: 1" = 10'-0"

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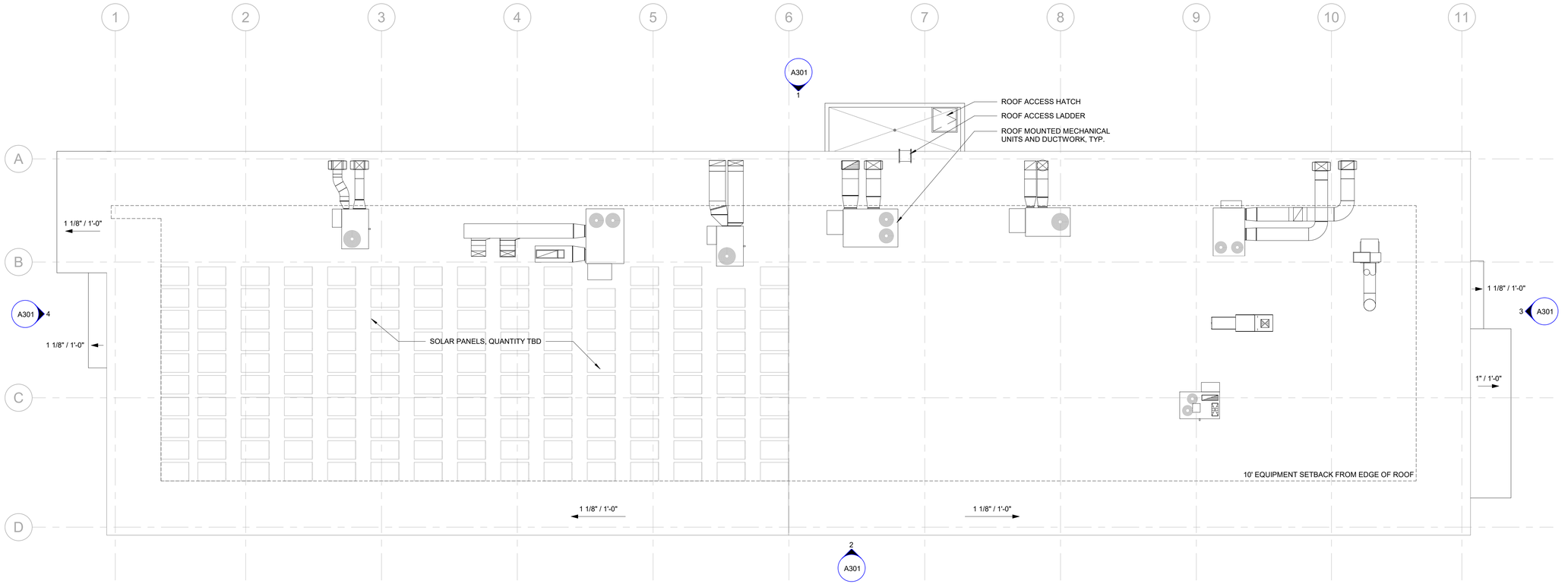

1 OVERALL ROOF PLAN
1" = 10'-0"

0' 10' 20' 40'
Scale: 1:10

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PORTSMOUTH, NH 03801

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603.430.0274

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No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
ROOF PLAN

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A102

Scale: 1" = 10'-0"

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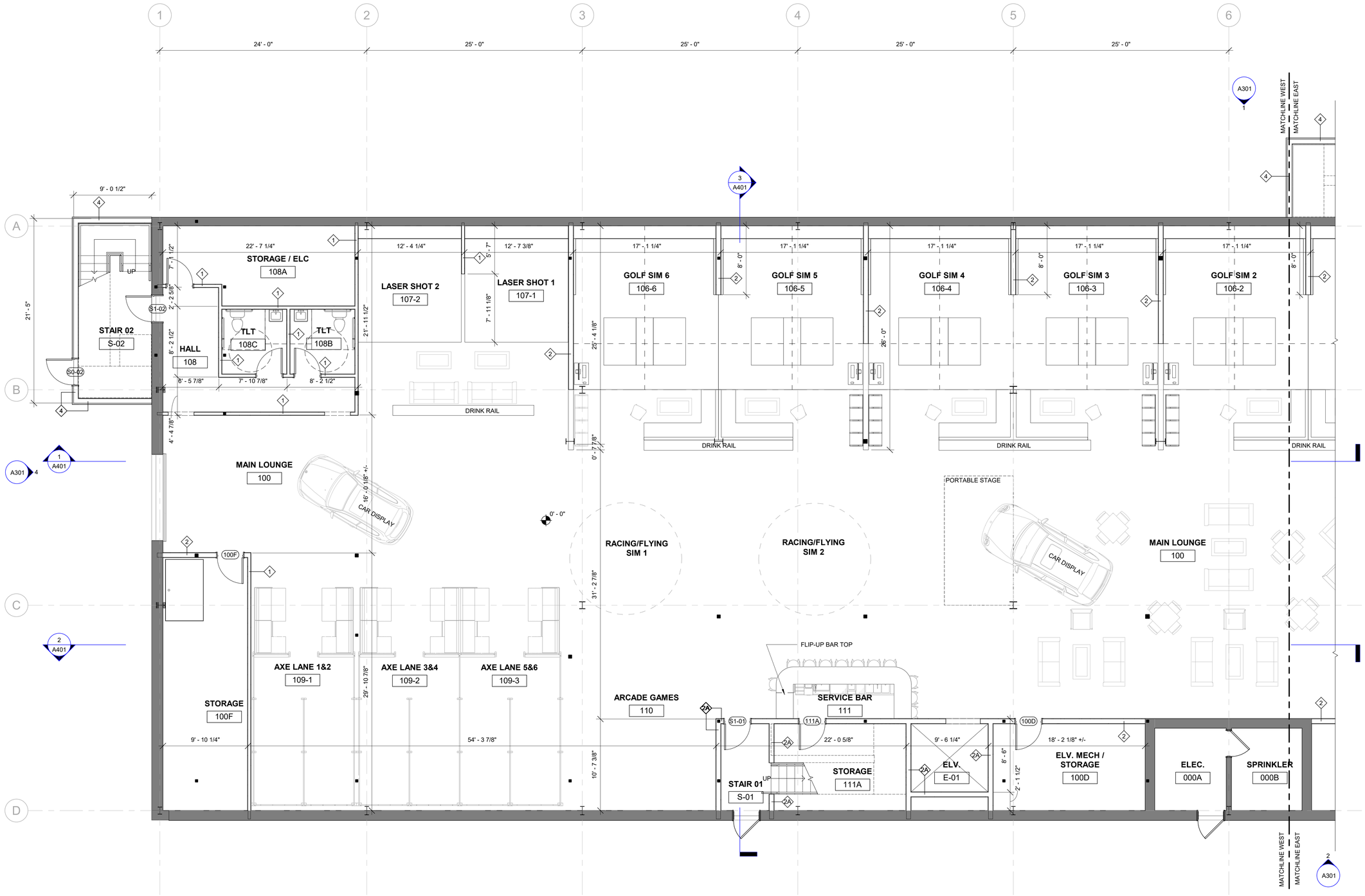

BLACK ROCK SOCIAL CLUB

ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

STAIR 03

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
FIRST FLOOR PLAN - WEST

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A103

Scale: 3/16" = 1'-0"

0' 4' 8' 12'
Scale: 3/16" = 1'-0"

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6 7 8 9 10 11

A B C D

MATCHLINE WEST
MATCHLINE EAST

A301 1

4 A401

4

S0-03

4' - 0"

25' - 4 1/4"

9' - 0 1/2"

17' - 10"

STAIR 03
S-03

2

17' - 1 1/4"

GOLF SIM 2
106-2
422 SF

GOLF SIM 1
106-1
422 SF

ARCADE/TABLE GAMES
105
1968 SF

26' - 0"

1 A401

2 A401

CAR DISPLAY

17' - 5 3/4"

0' - 0"

2' - 1"
0' - 6 5/8"
8' - 2 1/2"
1' - 6 3/8"
3' - 10 1/2"
0' - 6 5/8"

MAIN LOUNGE
100
1315 SF

1A

7' - 1 1/4"

3' - 10 1/2"

CHECK-IN
100B

3' - 7 1/4"

10' - 1 5/8"

0' - 6 5/8"

16' - 11 1/8"

100C

100A

3

SPRINKLER
000B

STORAGE
100C

VESTIBULE
100A

SERVICE BAR

BACK BAR
101
419 SF

STORAGE
105B

JNT
105A

KITCHEN
102
1176 SF

102

FLIP-UP BAR TOP

GOLF SIM 5
103

3' - 6 3/8"

4' - 6"

1

CLT
103D

COAT CHECK
104B

OFFICE
104

IT
104A

103D

103

102D

102E

3A

3 A301

MEN
103A

WOMENS
103B

WALK-IN
102E

2 A301

BLACK ROCK SOCIAL CLUB

ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
FIRST FLOOR PLAN - EAST

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A104

Scale: 3/16" = 1'-0"

0' 4' 8' 12'
Scale: 3/16" = 1'-0"

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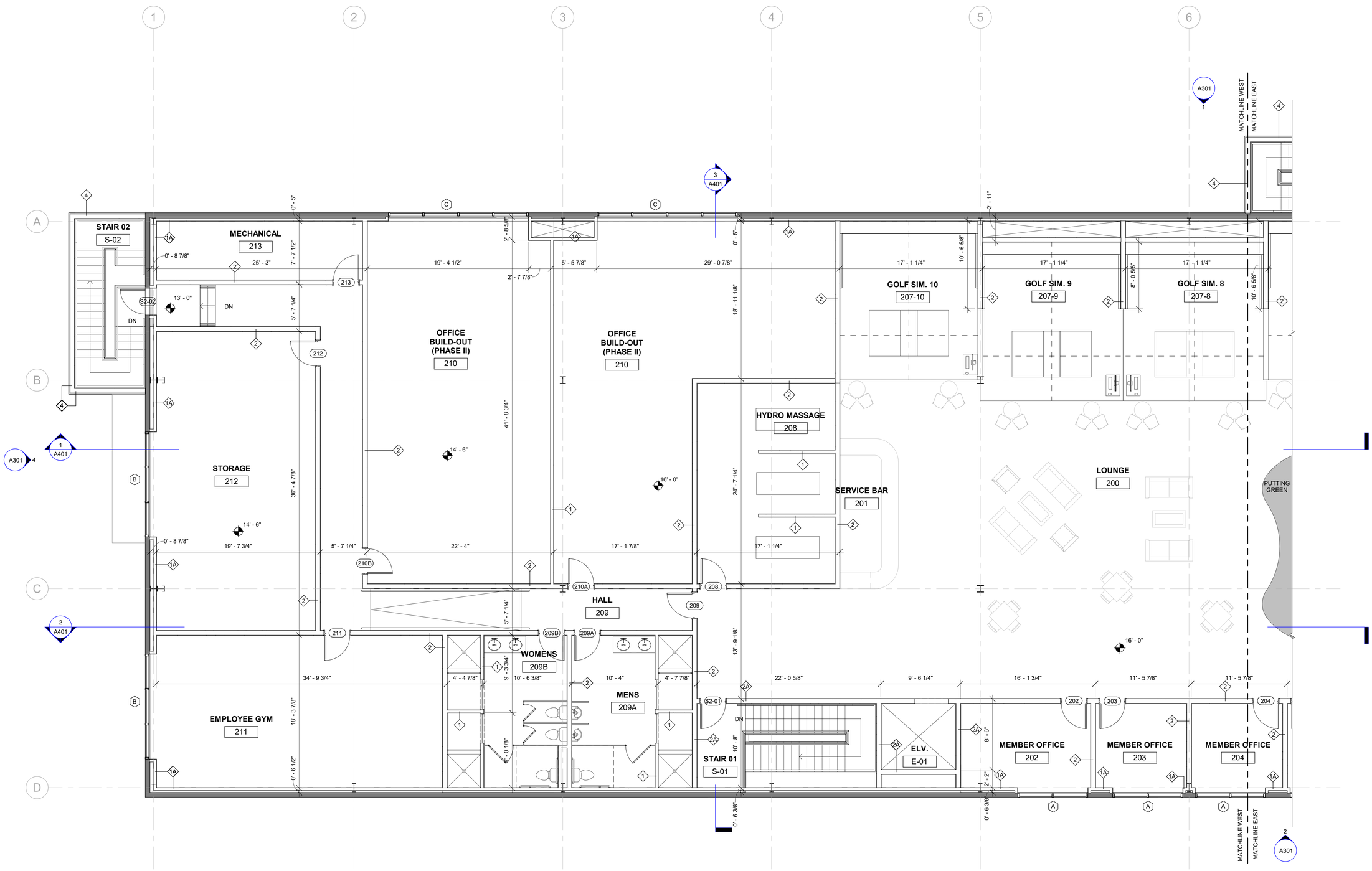

0' 4' 8' 12'
Scale: 3/16" = 1'-0"

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ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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No.	Description	Date

Project Name: BLACK ROCK SOCIAL CLUB

Drawing Name: SECOND FLOOR PLAN - WEST

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A105

Scale: 3/16" = 1'-0"

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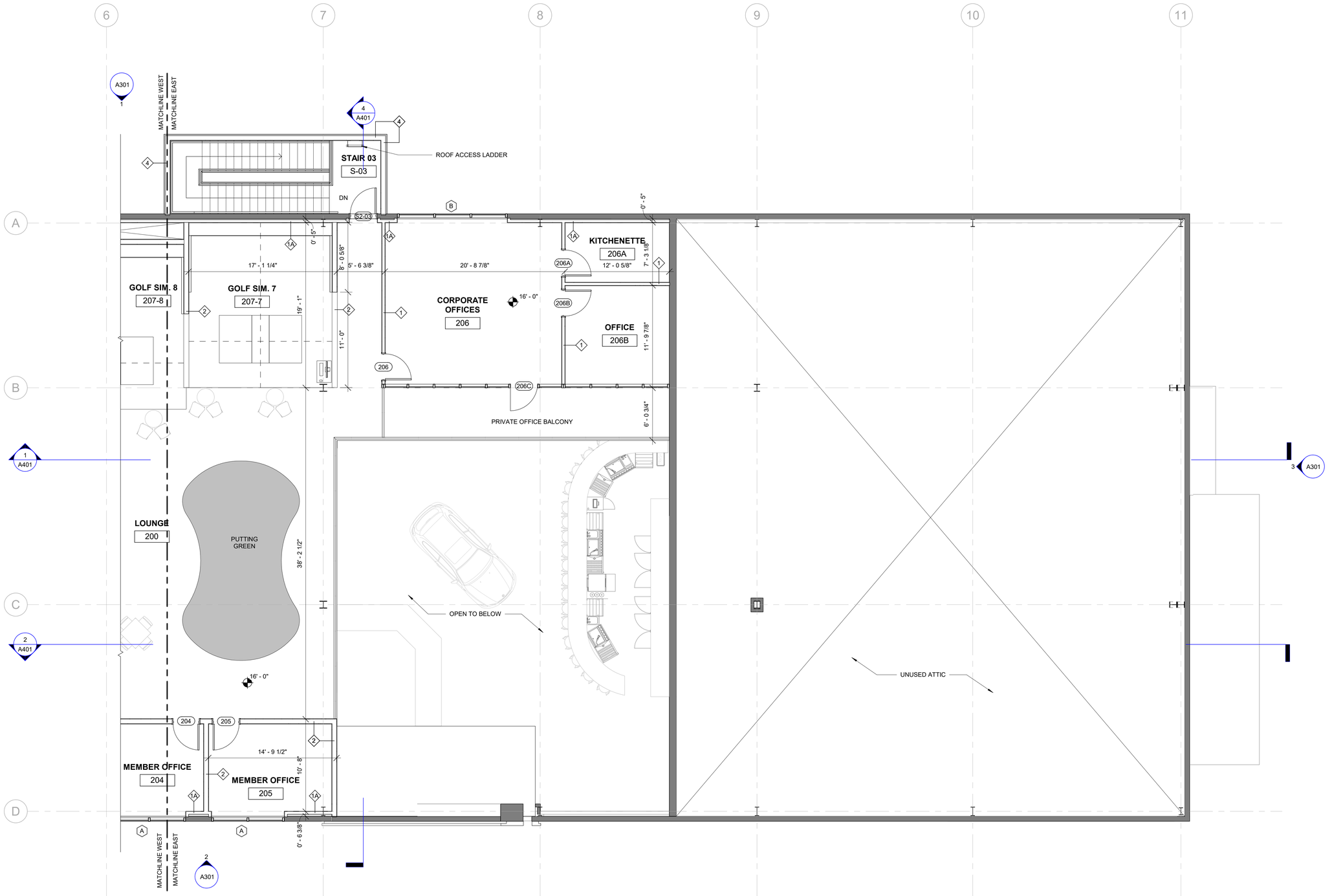

BLACK ROCK SOCIAL CLUB

ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
SECOND FLOOR PLAN - EAST

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A106

Scale: 3/16" = 1'-0"

0' 4' 8' 12'
Scale: 3/16" = 1'-0"

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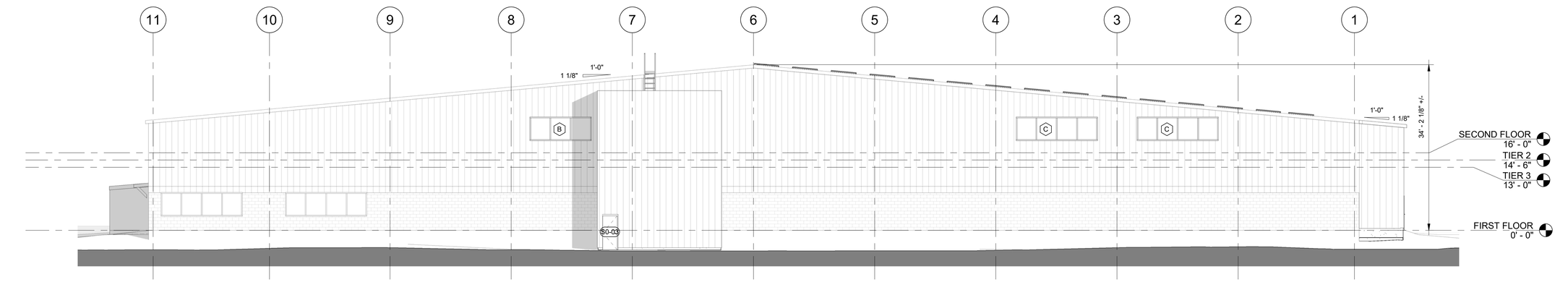
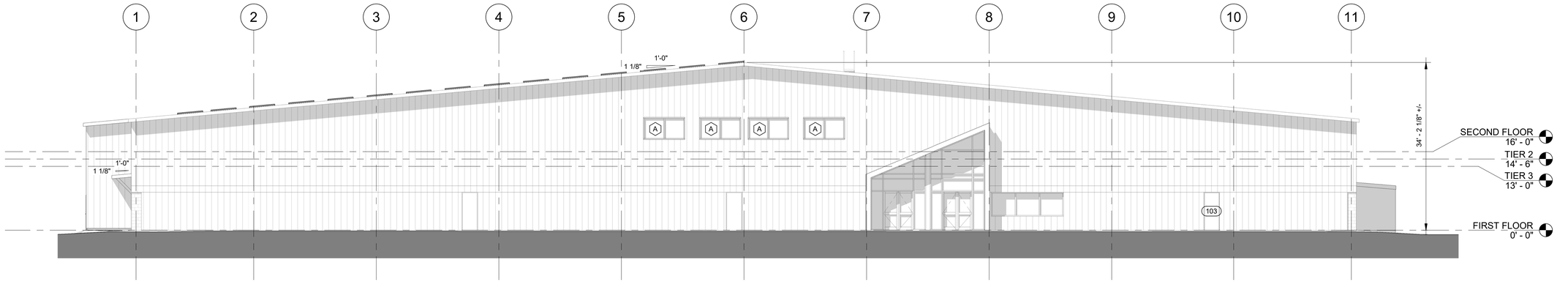
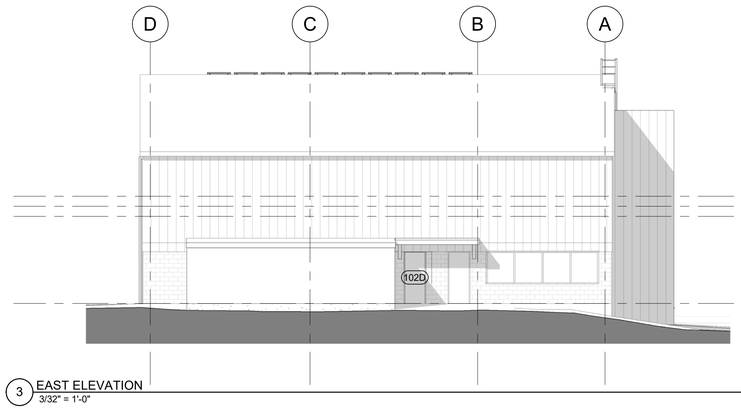


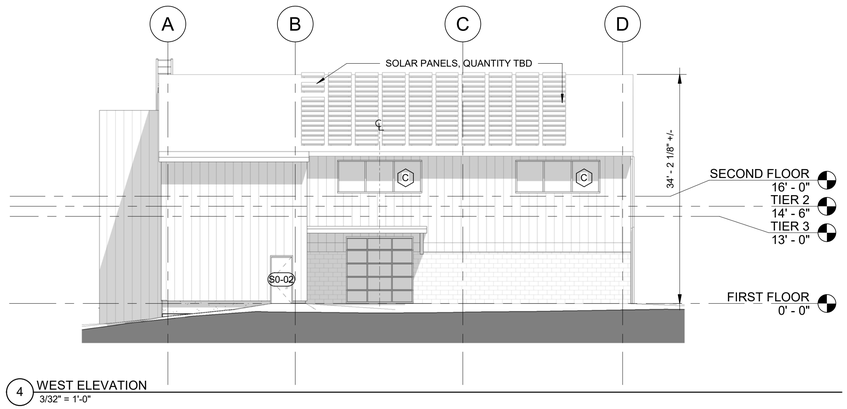
1 NORTH ELEVATION
3/32" = 1'-0"



2 SOUTH ELEVATION
3/32" = 1'-0"



3 EAST ELEVATION
3/32" = 1'-0"



4 WEST ELEVATION
3/32" = 1'-0"

0' 8' 16' 24'
Scale: 3/32" = 1'-0"

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BLACK ROCK SOCIAL CLUB

ROAD TO THE WEST, LLC.
140 WEST ROAD
PORTSMOUTH, NH 03801

McHENRY
ARCHITECTURE
4 Market Street
Portsmouth, New Hampshire
603.430.0274

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PERMIT SET ONLY

No.	Description	Date

Project Name:
BLACK ROCK SOCIAL CLUB

Drawing Name:
OVERALL EXTERIOR ELEVATIONS

Project Number:	21121
Date:	06/21/2022
Drawn By:	RD
Checked By:	MG

A301

Scale: 3/32" = 1'-0"

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6/21/2022 10:11:04 AM

Ross Engineering, LLC
Civil / Structural Engineering
909 Islington Street **603-433-7560**
Portsmouth, NH 03801 **alexross@comcast.net**

140 West Rd--Project Description

June 21, 2022

This site review application is for renovations and site improvements to an existing fully developed site. The existing lot includes a commercial building and asphalt parking lot, with a stormwater pond in the rear. Two stairwells, adequate code conforming parking, a walk-in cooler, a patio walkway, and a new screen-in dumpster area are proposed improvements to the site.

To mitigate the additional impervious coverage from the above improvements, Stormtech SC-310 chambers are proposed underneath the parking at the front of the building. Two large cisterns are proposed to collect runoff from the roof and supply water to irrigate the proposed landscaping. Overflow from these cisterns is directed into the aforementioned stormtech chambers. Pervious pavement will be installed as part of the expanded parking, as well as a pervious paver patio/walkway from the building, to mitigate stormwater runoff. The stormwater pond in the rear of the property will be expanded and converted into a rain garden to handle the increased loading and treat the stormwater. A jellyfish filter by Contech will be installed to treat runoff from the east parking lot.

The June 21 plan set has been updated to include the June 14th TAC Work-Session comments. A traffic study and a video of the sewer line were requested at the work-session. The sewer line has been videoed and submitted to DPW. We are preparing a traffic study and will submit as soon as possible. Due to the usage and the site location with large roadways in the area, we do not anticipate this project to have any significant impact on traffic.

Improvements include:

- Renovations to interior of building
- Two stairwells off of the existing building
- Walk-in cooler
- Pervious paver walkway & retaining wall
- Dumpsters relocated in a privacy screened area
- Install 1,000 gallon grease interceptor
- Install Stormtech Chambers with catch basins and drain manholes
- Install 2 - cisterns
- Install gutters on the south and north roofs to direct runoff to the cisterns
- Expand rear stormwater pond & convert to rain garden
- Install jellyfish filter by Contech to treat runoff
- Install landscaping

These improvements will vastly improve the overall look of the site as well as add a significant amount of landscaping and install a stormwater system that detain, infiltrate, and treat runoff where currently that does not occur.

Sincerely,

Alex Ross, P.E.

Ross Engineering
Civil / Structural Engineering
909 Islington Street **603-433-7560**
Portsmouth, NH 03801 **alexross@comcast.net**

Dated 6-7-2022
To: City of Portsmouth Planning Department

Applicant & Land Owner's Name:
30 North Front Street LLC
14 Lafayette Rd, Unit 9
North Hampton, NH 03862

Location of Land:
140 West Rd
Portsmouth, NH 03801
Tax Map 252, Lot 2-13

List of Abutters

United States of America
US Army Corps of Engineers
New England District
Real Est Division
696 Virginia Rd
Concord, MA 01742-2751
Tax Map 252, Lot 1-7

Public Service Company of NH
PO Box 270
Hartford, CT 06141
Tax Map 252, Lot 1

DSM MB II LLC
875 East St
Tewksbury, MA 08176
Tax Map 252, Lot 2

One Hundred West LLC
100 West Rd
Portsmouth, NH 03801
Tax Map 252, Lot 2-12

Litchfield Portsmouth LLC
& Eaton Partners Inc
175 Canal St Ste 401
Manchester, NH 03101
Tax Map 252, Lot 2-14

Construction and General Labor's Local Union
976 AFL-CIO
PO Box 4119
Portsmouth, NH 03802
Tax Map 252, Lot 2-37

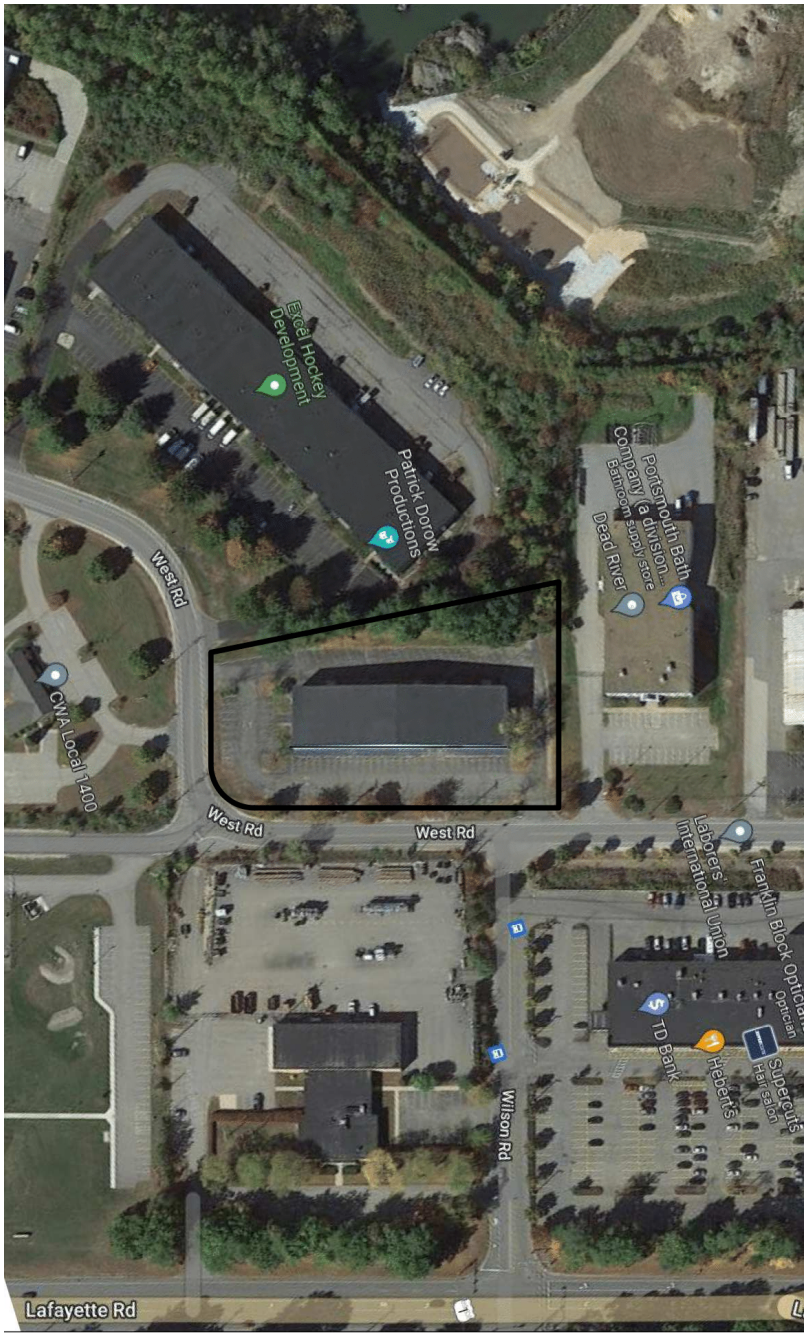
List of Professionals

1. Civil Engineer & Surveyor
   Alex Ross
   Ross Engineering
   Certified Professional Engineer
   Licensed Land Surveyor
   909 Islington Street
   Portsmouth, NH 03801

2. Architect
   McHenry Architecture
   4 Market Street
   Portsmouth, NH 03801

3. MEP Engineer
   CSI Engineering
   125 Aviation Ave #4
   Portsmouth, NH 03801

Ross Engineering
Civil / Structural Engineering
909 Islington Street
Portsmouth, NH 03801
603-433-7560
alexross@comcast.net



Aerial view of site

Ross Engineering
Civil / Structural Engineering
909 Islington Street
Portsmouth, NH 03801
603-433-7560
alexross@comcast.net

View of building looking to the west

View of building looking to the east

Ross Engineering
Civil / Structural Engineering
909 Islington Street
Portsmouth, NH 03801
603-433-7560
alexross@comcast.net

View of building & parking lot looking to the south

View of building looking to the east

Ross Engineering
Civil / Structural Engineering
909 Islington Street
Portsmouth, NH 03801
603-433-7560
alexross@comcast.net

View of building looking to the south

View of dumpsters and stormwater pond looking to the west

Ross Engineering
Civil / Structural Engineering
909 Islington Street
Portsmouth, NH 03801
603-433-7560
alexross@comcast.net

View of existing stormwater pond

View of front parking lot & swale looking to the south

MEMORANDUM

Date:	June 20, 2022
Project:	West Road Sport Club 140 West Rd.
Subject:	Green building components

The scope of the project uses the existing building located on the site of 140 West Road while incorporating green building materials and systems into the renovation and interior expansion. As part of the site plan review application, section 2.5.3.1b, the project has incorporated green components into the project as listed below.

- Pervious asphalt in a portion of the parking stalls.
- Reconstruction and upgrades to the site stormwater system, including a rain garden and jelly fish filtration system.
- Rainwater recovery to be used for irrigation with two 5,000-gallon cisterns located at each end of the building.
- Landscaping around the whole parcel that will include native plantings.
- LED energy efficient lighting for the site and building interior.
- Dark sky compliant site lighting.
- PV solar panel array located on the existing roof.
- Reuse of existing structure and cladding.
- Replacement and upgrade of HVAC units with energy recovery (ERV) that meet or exceed ASHRAE requirements.
- Low flow plumbing fixtures.
- Recycled content for many building components including structural steel for the 2nd floor structure and interior finishes.
- Energy efficient glazing and frames for new windows added. The additional windows also allow for natural light in occupied office space.

MEMORANDUM

Date:	June 20, 2022
Project:	West Road Sport Club 140 West Rd.
Subject:	Parking Calculations

Off street parking requirements, per the city of Portsmouth zoning section 10.1110, calculates office parking based on gross area and assembly spaces based on the calculated occupant load. The first table below outlines the maximum occupant count from Code Review sheet T2, followed by the parking tabulations.

Maximum Occupant Load Table	
Occupant Total (see sheet T2)	502
Office	36
Assembly	466

10.1112.32 Parking Requirements for Nonresidential Uses

Parking Calculations Table				
Use	Use No.	Requirement	Load	Stalls
Office	5.20	1 per 350 sf GFA	3418 sf	10
Assembly	3.10/4.60	1 per 4 persons maximum occupancy	466 persons	117
Total Parking				127

*4.60 Indoor Recreation has the same parking requirements as Assembly.

10.1112.60 Shared Parking
10.1112.61 Methodology

Developments that contain a mix of uses on the same parcel shall reduce the number of off-street parking spaces in accordance with the following methodology:

(1) Determine the minimum number of off-street parking spaces for each land use within the development in accordance with Sections 10.1112.10 through 10.1112.50.
(2) Multiply the minimum parking requirement for each land use by the corresponding parking occupancy rates for each of the five time periods set forth in Columns (B) through (F) of the Parking Occupancy Rates table below.
(3) Add the resulting shared parking requirements for each time period to determine the minimum parking requirement for that period.

The required minimum number of parking spaces for the development shall be the highest of the five time-period totals.

Shared Parking Methodology

Use	Weekday				Weekend					
	Daytime (b)		Evening (c)		Daytime(d)		Evening(e)		Nighttime(f)	
Office	100%	10	20%	2	10%	1	5%	1	5%	1
Entertainment	40%	47	100%	117	80%	94	100%	117	10%	12
Total		57		119		95		118		13

Based on the zoning requirements for off street parking and the shared parking methodology 140 West road will require 119 parking spaces.

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STORMWATER MANAGEMENT OPERATION & MAINTENANCE

140 West Road, Portsmouth, NH

The proposed stormwater structures and improvements will result in a massive upgrade for stormwater runoff control and treatment. For all of these elements to work correctly in the future it is imperative to keep up with proper operation and maintenance.

Inspection and Maintenance of Facilities and Property

A. Maintenance of Common Facilities or Property

1. Future owners or assigns are responsible for maintenance of all stormwater infrastructure associated with the facility and the property. This includes the roof drainage system, rain garden, pervious pavers, Storm Tech Chambers, landscaped areas, pervious asphalt and Contech treatment structure.

B. General Inspection and Maintenance Requirements

1. Permanent stormwater and sediment and erosion control facilities to be maintained on the site include but are not limited to the following:

    a. Parking areas
    b. Pervious Asphalt
    c. Rain Garden
    d. Landscaped areas
    e. Permeable Pavers
    f. Culverts & Drain lines
    g. Contech jellyfish
    h. Roof drainage
    i. Storm Tech Chambers

2. Maintenance of permanent measures shall follow the following schedule:

    a. **Parking areas, Driveway:**
    Inspection at the end of every winter, prior to the start of the spring rain season. Sweeping shall be done once in early fall and then after spring snowmelt. Sand/debris that has collected off the driveway and parking lot should be removed off-site and disposed of properly.

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b. **Pervious Asphalt:** Visually inspect pavement monthly to ensure it is clean of debris, de-waters between storms and is clean of sediments. Maintain all adjacent and upland areas. Keep surface free of sediment by blowing, and vacuuming at least as often as item a. above and as needed. Avoid any sealing or repaving with impervious materials.

c. **Rain Garden:**
Rain garden maintenance is similar to the maintenance of any perennial garden, with a few extra tasks:

INSPECT: Check after storms to verify the inlet and outlet are stable, no channels have formed, that plants are healthy and that it is draining. Adjust and repair if needed.
PLANT CARE: Weed and water as needed. Replace dead plants as needed. Cut back, prune or divide plants when appropriate to encourage growth.
CLEAN: If the rain garden is receiving runoff that contains sand or debris, such as from a driveway or roadway, clean out accumulated materials as needed.

d. **Landscaped Areas:**
Annual inspection of site's vegetation and landscaping. Any areas that are bare shall be reseeded and mulched with hay or, if the case is extreme, loamed and seeded or sodded to ensure adequate vegetative cover. Landscape specimens shall be replaced in-kind, if they are found to be dead or dying.

e. **Permeable Pavers:**
Review periodically during storm events for proper infiltration. Inspect once per year by running water over the surface while watching for proper infiltration. Clean/remove any sedment/debris from the joints to ensure largest surface area for water to infiltrate, perform light vacuuming twice a year.

f. **Culverts and drain lines:**
Inspect twice a year, more often if needed. Inspect for accumulation of debris. Remove material from inlet/outlet as necessary, dispose of offsite.

g. **Contech jellyfish treatment structure:**
See attached Jellyfish Maintenance Guide.

h. **Roof drainage:**
The following recommendations will help assure that the roof drainage system is maintained to preserve its effectiveness:

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1. Initially, it should be tested by inserting a garden hose into the inlet and allowing the water to run at full strength for a minimum of one hour. The water should stay underground within the gravel. If water comes out of the overflow, the system should be further inspected and possibly replaced. This procedure should be performed every year during the annual inspection.

2. In the spring and fall, visually inspect the area around the system and repair any erosion. Use small stones to stabilize erosion along drainage paths. Re-mulch any void areas by hand as needed. Also, inspect the roof collection and piping and clean and repair as necessary.

3. Do not plant deep rooted trees and shrubs within 5' of the system.

i. **Storm Tech Chambers:**
The following requirements will help assure that the storm tech chambers system is maintained to preserve its effectiveness:

STEP 1) inspect isolator row for sediment

A. Inspection ports (if present)
A.1. remove/open lid on nyloplast inline drain
A.2. remove and clean flexstorm filter if installed
A.3. using a flashlight and stadia rod, measure depth of sediment and record on maintenance log
A.4. lower a camera into isolator row for visual inspection of sediment levels (optional)
A.5. if sediment is at, or above, 3" (80mm) proceed to step 2. If not, proceed to step 3.

B. All isolator rows
B.1. remove cover from structure at upstream end of isolator row
B.2. using a flash light, inspect down the isolator row through outlet pipe. mirrors on poles or cameras may be used to avoid a confined space entry. follow osha regulations for confined space entry if entering manhole
B.3. if sediment is at, or above, 3" (80mm) proceed to step 2. If not, proceed to step 3.

STEP 2) Clean out isolator row using the jetvac process

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A. a fixed culvert cleaning nozzle with rear facing spread of 45" (1.1m) or more is preferred
B. apply multiple passes of jetvac until backflush water is clean
C. vacuum structure sump as required

STEP 3) replace all covers, grates, filters, and lids; record observations and actions.

STEP 4) inspect and clean basins and manholes upstream of the storm tech system.

NOTES
1. Inspect every 6 months during the first year of operation. Adjust the inspection interval based on previous observations of sediment accumulation and high water elevations. Adjustment to the inspection interval timeframe shall not be greater than 12 months.
2. Conduct jetting and vactoring annually or when inspection shows that maintenance is necessary.

i. Inspection of site shall occur monthly for the first few months after construction. Then inspections can occur on an annual basis, preferably after rain events when clogging can occur and be obvious. Permeable pavers require minimal maintenance; however maintenance is absolutely necessary to ensure a proper working system.

ii. Asphalt seal coating is absolutely forbidden. Surface seal coating is not reversible.

iii. Street sweepers with vacuums, water, and brushes can be used to restore permeability. Follow sweeping with high-pressure hosing of the surface pores. Surface should be vacuumed 4 times per year, and at any additional times sediment is spilled, eroded, or tracked onto the surface.

iv. Planted areas adjacent to pervious pavers should be well maintained to prevent soil washout onto the pavement. If any bare spots or eroded areas are observed within the planted areas, they should be replanted and/or stabilized at once.

v. Immediately clean any soil deposited on pavers. Superficial dirt does not necessarily clog the voids. However, dirt that is ground in repeatedly by tires can lead to clogging. Therefore, trucks or other heavy vehicles should be prevented from tracking or spilling dirt onto the pavement. Replace any damaged paving blocks.

vi. Do not allow construction staging, soil/mulch storage, etc. on unprotected pavers surface.

vii. No winter sanding. Mechanical snow and ice removal preferred.

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viii. Written and verbal communication to the porous paver's future owner should make clear the special purpose and special maintenance requirements such as those listed here.

g. Owners shall provide a report on activities performed throughout the year. Report shall include documentation that pavement cleaning is accomplished per this document and a certification that the system continues to function as designed.

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Annual Operations and Maintenance Report

	Activity	Date of Inspection	Who Inspected	Satisfactory: Yes, No, N/A	Maintenance Needed	Implemented date of corrective action	Findings of Inspector
	Parking Areas						
	Pervious Asphalt						
	Rain Garden						
	Landscaped Areas						
	Permeable Pavers						
	Culverts & Drain lines						
	Contech Jellyfish						
	Roof Drainage						
	Storm tech Chambers						

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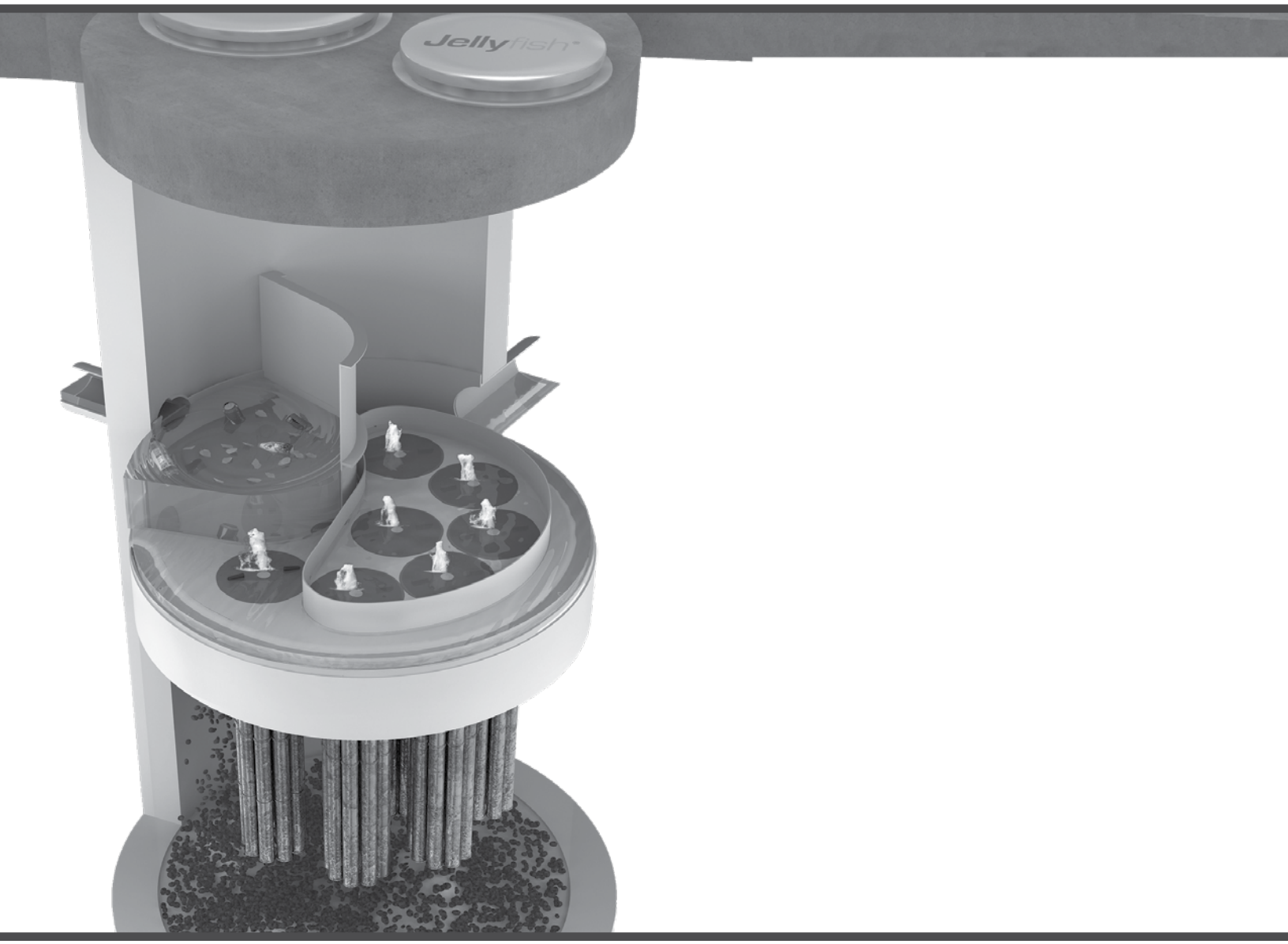
Jellyfish® Filter Maintenance Guide



Jellyfish®

JELLYFISH® FILTER
INSPECTION & MAINTENANCE GUIDE

Jellyfish units are often just one of many structures in a more comprehensive stormwater drainage and treatment system.

In order for maintenance of the Jellyfish filter to be successful, it is imperative that all other components be properly maintained. The maintenance and repair of upstream facilities should be carried out prior to Jellyfish maintenance activities.

In addition to considering upstream facilities, it is also important to correct any problems identified in the drainage area. Drainage area concerns may include: erosion problems, heavy oil loading, and discharges of inappropriate materials.

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1.0 Inspection and Maintenance Overview

The primary purpose of the Jellyfish® Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, these pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

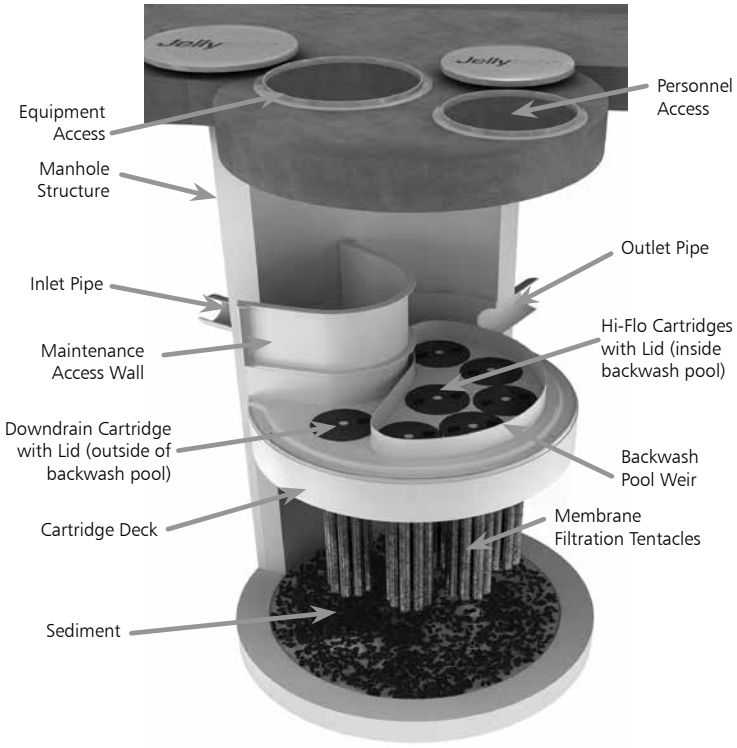
Maintenance frequencies and requirements are site specific and vary depending on pollutant loading. Additional maintenance activities may be required in the event of non-storm event runoff, such as base-flow or seasonal flow, an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Inspection activities are typically conducted from surface observations and include:

- Observe if standing water is present
- Observe if there is any physical damage to the deck or cartridge lids
- Observe the amount of debris in the Maintenance Access Wall (MAW) or inlet bay for vault systems

Maintenance activities include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed



Note: Separator Skirt not shown

2.0 Inspection Timing

Inspection of the Jellyfish Filter is key in determining the maintenance requirements for, and to develop a history of, the site's pollutant loading characteristics. In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicable), whichever is more frequent*.

1. A minimum of quarterly inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
2. Inspection frequency in subsequent years is based on the inspection and maintenance plan developed in the first year of operation. Minimum frequency should be once per year.
3. Inspection is recommended after each major storm event.
4. Inspection is required immediately after an upstream oil, fuel or other chemical spill.

3.0 Inspection Procedure

The following procedure is recommended when performing inspections:

1. Provide traffic control measures as necessary.
2. Inspect the MAW or inlet bay for floatable pollutants such as trash, debris, and oil sheen.
3. Measure oil and sediment depth in several locations, by lowering a sediment probe until contact is made with the floor of the structure. Record sediment depth, and presences of any oil layers.
4. Inspect cartridge lids. Missing or damaged cartridge lids to be replaced.
5. Inspect the MAW (where appropriate), cartridge deck and receptacles, and backwash pool weir, for damaged or broken components.

3.1 Dry weather inspections

- Inspect the cartridge deck for standing water, and/or sediment on the deck.
- No standing water under normal operating conditions.
- Standing water inside the backwash pool, but not outside the backwash pool indicates, that the filter cartridges need to be rinsed.

Inspection Utilizing Sediment Probe

- Standing water outside the backwash pool is not anticipated and may indicate a backwater condition caused by high water elevation in the receiving water body, or possibly a blockage in downstream infrastructure.
- Any appreciable sediment (≥1/16") accumulated on the deck surface should be removed.

3.2 Wet weather inspections

- Observe the rate and movement of water in the unit. Note the depth of water above deck elevation within the MAW or inlet bay.
- Less than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges (i.e. cartridges located outside the backwash pool).
- Greater than 6 inches, flow should be exiting the cartridge lids of each of the draindown cartridges and each of the hi-flo cartridges (i.e. cartridges located inside the backwash pool), and water should be overflowing the backwash pool weir.
- 18 inches or greater and relatively little flow is exiting the cartridge lids and outlet pipe, this condition indicates that the filter cartridges need to be rinsed.

4.0 Maintenance Requirements

Required maintenance for the Jellyfish Filter is based upon results of the most recent inspection, historical maintenance records, or the site specific water quality management plan; whichever is more frequent. In general, maintenance requires some combination of the following:

1. Sediment removal for depths reaching 12 inches or greater, or within 3 years of the most recent sediment cleaning, whichever occurs sooner.
2. Floatable trash, debris, and oil removal.
3. Deck cleaned and free from sediment.
4. Filter cartridges rinsed and re-installed as required by the most recent inspection results, or within 12 months of the most recent filter rinsing, whichever occurs sooner.
5. Replace tentacles if rinsing does not restore adequate hydraulic capacity, remove accumulated sediment, or if damaged or missing. It is recommended that tentacles should remain in service no longer than 5 years before replacement.
6. Damaged or missing cartridge deck components must be repaired or replaced as indicated by results of the most recent inspection.
7. The unit must be cleaned out and filter cartridges inspected immediately after an upstream oil, fuel, or chemical spill. Filter cartridge tentacles should be replaced if damaged or compromised by the spill.

5.0 Maintenance Procedure

The following procedures are recommended when maintaining the Jellyfish Filter:

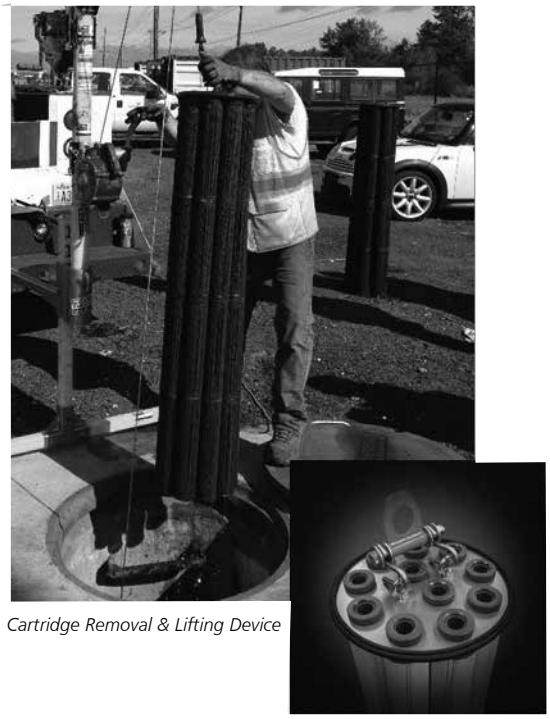
1. Provide traffic control measures as necessary.
2. Open all covers and hatches. Use ventilation equipment as required, according to confined space entry procedures. *Caution: Dropping objects onto the cartridge deck may cause damage*.
3. Perform Inspection Procedure prior to maintenance activity.
4. To access the cartridge deck for filter cartridge service, descend into the structure and step directly onto the deck. Caution: Do not step onto the maintenance access wall (MAW) or backwash pool weir, as damage may result. Note that the cartridge deck may be slippery.
5. Maximum weight of maintenance crew and equipment on the cartridge deck not to exceed 450 lbs.

5.1 Filter Cartridge Removal

1. Remove a cartridge lid.
2. Remove cartridges from the deck using the lifting loops in the cartridge head plate. Rope or a lifting device (available from Contech) should be used. *Caution: Should a snag occur, do not force the cartridge upward as damage to the tentacles may result. Wet cartridges typically weigh between 100 and 125 lbs*.
3. Replace and secure the cartridge lid on the exposed empty receptacle as a safety precaution. Contech does not recommend exposing more than one empty cartridge receptacle at a time.

5.2 Filter Cartridge Rinsing

1. Remove all 11 tentacles from the cartridge head plate. Take care not to lose or damage the O-ring seal as well as the plastic threaded nut and connector.



Cartridge Removal & Lifting Device

2. Position tentacles in a container (or over the MAW), with the threaded connector (open end) facing down, so rinse water is flushed through the membrane and captured in the container.
3. Using the Jellyfish rinse tool (available from Contech) or a low-pressure garden hose sprayer, direct water spray onto the tentacle membrane, sweeping from top to bottom along the length of the tentacle. Rinse until all sediment is removed from the membrane. *Caution: Do not use a high pressure sprayer or focused stream of water on the membrane. Excessive water pressure may damage the membrane*.

4. Collected rinse water is typically removed by vacuum hose.
5. Reassemble cartridges as detailed later in this document. Reuse O-rings and nuts, ensuring proper placement on each tentacle.

5.3 Sediment and Flotables Extraction

1. Perform vacuum cleaning of the Jellyfish Filter only after filter cartridges have been removed from the system. Access the lower chamber for vacuum cleaning only through the maintenance access wall (MAW) opening. Be careful not to damage the flexible plastic separator skirt that is attached to the underside of the deck on manhole systems. Do not lower the vacuum wand through a cartridge receptacle, as damage to the receptacle will result.
2. Vacuum floatable trash, debris, and oil, from the MAW opening or inlet bay. Alternatively, floatable solids may be removed by a net or skimmer.

Vacuuming Sump Through MAW

3. Pressure wash cartridge deck and receptacles to remove all sediment and debris. Sediment should be rinsed into the sump area. Take care not to flush rinse water into the outlet pipe.
4. Remove water from the sump area. Vacuum or pump equipment should only be introduced through the MAW or inlet bay.
5. Remove the sediment from the bottom of the unit through the MAW or inlet bay opening.

Vacuuming Sump Through MAW

6. For larger diameter Jellyfish Filter manholes (≥8-ft) and some vaults complete sediment removal may be facilitated by removing a cartridge lid from an empty receptacle and inserting a jetting wand (not a vacuum wand) through the receptacle. Use the sprayer to rinse loosened sediment toward the vacuum hose in the MAW opening, being careful not to damage the receptacle.

5.4 Filter Cartridge Reinstallation and Replacement

1. Cartridges should be installed after the deck has been cleaned. It is important that the receptacle surfaces be free from grit and debris.
2. Remove cartridge lid from deck and carefully lower the filter cartridge into the receptacle until head plate gasket is seated squarely in receptacle. ***Caution: Do not force the cartridge downward; damage may occur.***
3. Replace the cartridge lid and check to see that both male threads are properly seated before rotating approximately 1/3 of a full rotation until firmly seated. Use of an approved rim gasket lubricant may facilitate installation. See next page for additional details.
4. If rinsing is ineffective in removing sediment from the tentacles, or if tentacles are damaged, provisions must be made to replace the spent or damaged tentacles with new tentacles. Contact Contech to order replacement tentacles.

5.5 Chemical Spills

Caution: If a chemical spill has been captured, do not attempt maintenance. Immediately contact the local hazard response agency and contact Contech.

5.6 Material Disposal

The accumulated sediment found in stormwater treatment and conveyance systems must be handled and disposed of in accordance with regulatory protocols. It is possible for sediments to contain measurable concentrations of heavy metals and organic chemicals (such as pesticides and petroleum products). Areas with the greatest potential for high pollutant loading include industrial areas and heavily traveled roads. Sediments and water must be disposed of in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. This typically requires coordination with a local landfill for solid waste disposal. For liquid waste disposal a number of options are available including a municipal vacuum truck decant facility, local waste water treatment plant or on-site treatment and discharge.

Jellyfish Filter Components & Filter Cartridge Assembly and Installation

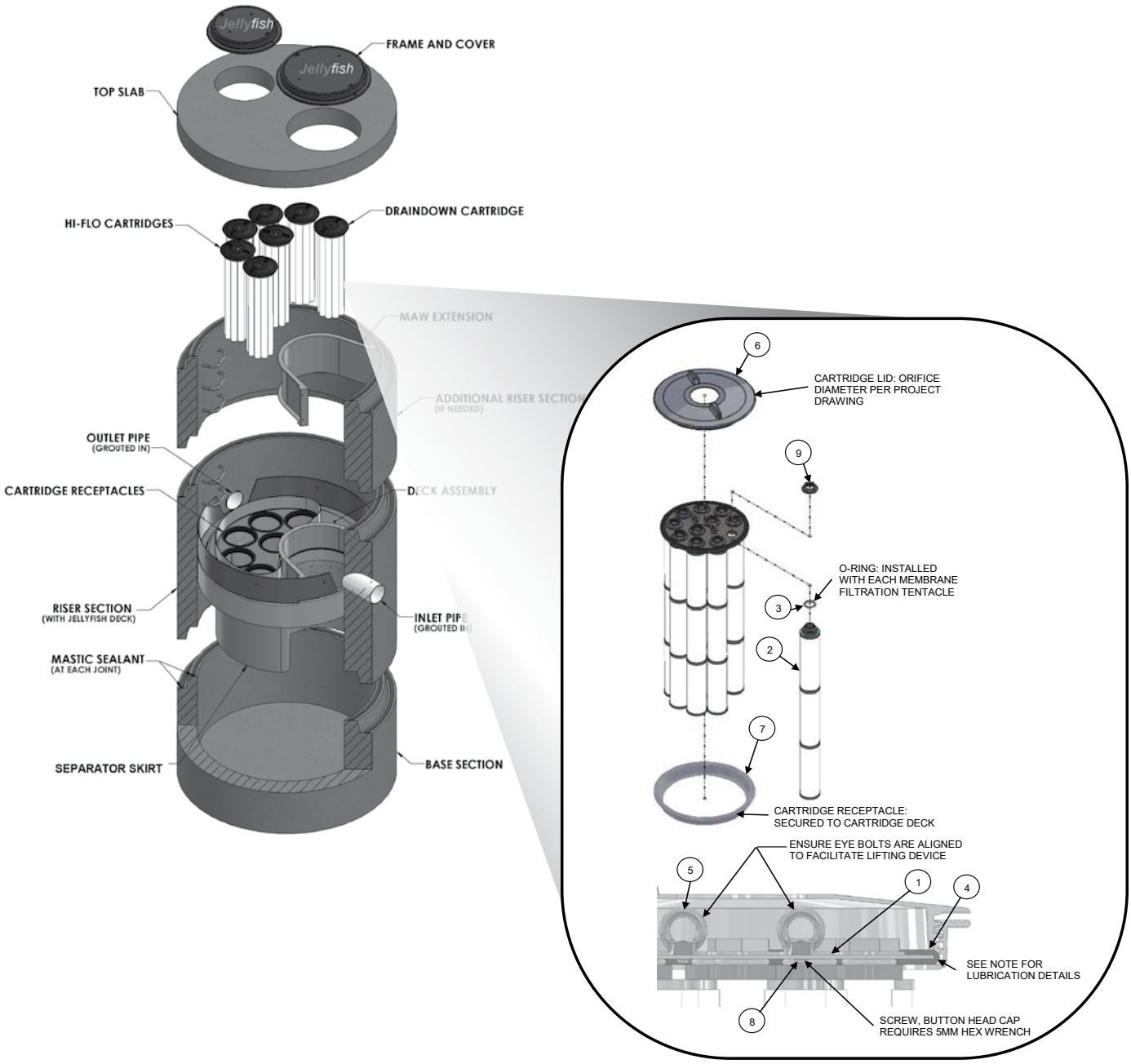


TABLE 1: BOM

ITEM NO.	DESCRIPTION
1	JF HEAD PLATE
2	JF TENTACLE
3	JF O-RING
4	JF HEAD PLATE GASKET
5	JF CARTRIDGE EYELET
6	JF 14IN COVER
7	JF RECEPTACLE
8	BUTTON HEAD CAP SCREW M6X14MM SS
9	JF CARTRIDGE NUT

TABLE 2: APPROVED GASKET LUBRICANTS

PART NO.	MFR	DESCRIPTION
78713	LA-CO	LUBRI-JOINT
40501	HERCULES	DUCK BUTTER
30600	OATEY	PIPE LUBRICANT
PSLUBXL1Q	PROSELECT	PIPE JOINT LUBRICANT

NOTES:

Head Plate Gasket Installation:
Install Head Plate Gasket (Item 4) onto the Head Plate (Item 1) and liberally apply a lubricant from Table 2: Approved Gasket Lubricants onto the gasket where it contacts the Receptacle (Item 7) and Cartridge Lide (ITem 6). Follow Lubricant manufacturer's instructions.

Lid Assembly:
Rotate Cartridge Lid counter-clockwise until both male threads drop down and properly seat. Then rotate Cartridge Lid clock-wise approximately one-third of a full rotation until Cartridge Lid is firmly secured, creating a watertight seal.

Jellyfish Filter Inspection and Maintenance Log

Owner:				Jellyfish Model No:		
Location:				GPS Coordinates:		
Land Use:	Commercial:		Industrial:		Service Station:	
	Roadway/Highway:		Airport:		Residential:	

Date/Time:						
Inspector:						
Maintenance Contractor:						
Visible Oil Present: (Y/N)						
Oil Quantity Removed:						
Floatable Debris Present: (Y/N)						
Floatable Debris Removed: (Y/N)						
Water Depth in Backwash Pool						
Draindown Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Draindown Cartridges: (Y/N)						
Hi-Flo Cartridges externally rinsed and recommissioned: (Y/N)						
New tentacles put on Hi-Flo Cartridges: (Y/N)						
Sediment Depth Measured: (Y/N)						
Sediment Depth (inches or mm):						
Sediment Removed: (Y/N)						
Cartridge Lids intact: (Y/N)						
Observed Damage:						
Comments:						

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Support

- Drawings and specifications are available at www.conteches.com/jellyfish.
- Site-specific design support is available from Contech Engineered Solutions.
- Find a Certified Maintenance Provider at www.conteches.com/ccmp

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City of Portsmouth, New Hampshire

Site Plan Application Checklist

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

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

Name of Owner/Applicant: Alex Ross Date Submitted: 6/21/2022

Phone Number: 603-433-7560 E-mail: alexross@comcast.net

Site Address: 140 West Rd Map: 252 Lot: 2-13

Zoning District: Industrial Lot area: 87,507 sq. ft.

Application Requirements			
☑	**Required Items for Submittal**	**Item Location (e.g. Page or Plan Sheet/Note #)**	**Waiver Requested**
☑	Fully executed and signed Application form. **(2.5.2.3)**	Online Land Use Application	N/A
☑	All application documents, plans, supporting documentation and other materials provided in digital Portable Document Format (PDF) on compact disc, DVD or flash drive. **(2.5.2.8)**	See attached CD	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
☑	Statement that lists and describes "green" building components and systems. **(2.5.3.1A)**	See Attached Statement	☐
☑	Gross floor area and dimensions of all buildings and statement of uses and floor area for each floor. **(2.5.3.1B)**	Sheets A101-A105	N/A
☑	Tax map and lot number, and current zoning of all parcels under Site Plan Review. **(2.5.3.1C)**	Sheet 1 "Existing Conditions"	N/A
☑	Owner's name, address, telephone number, and signature. Name, address, and telephone number of applicant if different from owner. **(2.5.3.1D)**	30 North Front St LLC 14 Lafayette Rd, Unit 9 North Hampton, NH 03862 alexbrian1568@gmail.com	N/A

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	See Attached Abutter's List	N/A
✓	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	See Attached Abutter's List	N/A
✓	List of reference plans. **(2.5.3.1G)**	Sheet 1 "Existing Conditions"	N/A
✓	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Sheet 4 "Utility Plan"	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	Full size plans shall not be larger than 22 inches by 34 inches with match lines as required, unless approved by the Planning Director. Submittals shall be a minimum of 11 inches by 17 inches as specified by Planning Dept. staff. **(2.5.4.1A)**	Required on all plan sheets	N/A
✓	Scale: Not less than 1 inch = 60 feet and a graphic bar scale shall be included on all plans. **(2.5.4.1B)**	Required on all plan sheets	N/A
✓	GIS data should be referenced to the coordinate system New Hampshire State Plane, NAD83 (1996), with units in feet. **(2.5.4.1C)**	Required on all plan sheets Will be added	N/A
✓	Plans shall be drawn to scale. **(2.5.4.1D)**	Required on all plan sheets	N/A
✓	Plans shall be prepared and stamped by a NH licensed civil engineer. **(2.5.4.1D)**	Required on all plan sheets	N/A
✓	Wetlands shall be delineated by a NH certified wetlands scientist. **(2.5.4.1E)**	No wetlands on site	N/A
✓	Title (name of development project), north point, scale, legend. **(2.5.4.2A)**	Required on all plan sheets	N/A
✓	Date plans first submitted, date and explanation of revisions. **(2.5.4.2B)**	Required on all plan sheets	N/A
✓	Individual plan sheet title that clearly describes the information that is displayed. **(2.5.4.2C)**	Required on all plan sheets	N/A

Site Plan Specifications			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	Source and date of data displayed on the plan. **(2.5.4.2D)**	Required on all plan sheets	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)**	Required on all plan sheets	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)**	Sheets 2 & 3	N/A
✓	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**	Sheet 3 "Landscape Plan" - Planting Notes 6-8	N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
✓	a. Surveyed plan of site showing existing natural and built features;	Sheet 1 "Existing Conditions"	☐
✓	b. Zoning boundaries;	Sheet 1 "Existing Conditions"	☐
✓	c. Dimensional Regulations;	Sheet 1 - Note 3	☐
✓	d. Wetland delineation, wetland function and value assessment;	Sheet 1 "Existing Conditions"	☐
✓	e. SFHA, 100-year flood elevation line and BFE data.	Sheet 1 - Note 4	☐
	2. Buildings and Structures: (2.5.4.3B)		
✓	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;	Sheets A101-A105	☐
✓	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;	Sheet A301	☐
✓	c. Total Floor Area;	Sheet A101	☐
✓	d. Number of Usable Floors;	Sheet A101	☐
✓	e. Gross floor area by floor and use.	Sheet A101	☐
	3. Access and Circulation: (2.5.4.3C)		
✓	a. Location/width of access ways within site;	Sheet 2 "Site Plan"	☐
✓	b. Location of curbing, right of ways, edge of pavement and sidewalks;	Sheet 2 "Site Plan"	☐
✓	c. Location, type, size and design of traffic signing (pavement markings);	Sheet 2 "Site Plan"	☐
✓	d. Names/layout of existing abutting streets;	N/A	☐
✓	e. Driveway curb cuts for abutting prop. and public roads;	Sheet 1 "Existing Conditions"	☐
✓	f. If subdivision; Names of all roads, right of way lines and easements noted;	Not a Subdivision	☐
✓	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	Sheet 5 "Parking Plan"	☐
	4. Parking and Loading: (2.5.4.3D)		
✓	a. Location of off street parking/loading areas, landscaped areas/buffers;	Sheet 3 "Landscape Plan"	☐
✓	b. Parking Calculations (# required and the # provided).	Sheet 5 "Parking Plan"	☐
	5. Water Infrastructure: (2.5.4.3E)		
✓	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;	Sheet 4 "Utility Plan"	☐
✓	b. Location of wells and monitoring wells (include protective radii).	N/A	☐
	6. Sewer Infrastructure: (2.5.4.3F)		
✓	a. Size, type and location of sanitary sewage facilities & Engineering data.	Sheet 4 "Utility Plan"	☐
	7. Utilities: (2.5.4.3G)		
✓	a. The size, type and location of all above & below ground utilities;	Sheet 4 "Utility Plan"	☐
✓	b. Size type and location of generator pads, transformers and other fixtures.	Sheet 4 "Utility Plan"	☐

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	**8. Solid Waste Facilities: (2.5.4.3H)**		
✓	a. The size, type and location of solid waste facilities.	Sheet 2 "Site Plan"	☐
	9. Storm water Management: (2.5.4.3I)		
✓	a. The location, elevation and layout of all storm-water drainage.	Sheet 4 "Utility Plan"	☐
	10. Outdoor Lighting: (2.5.4.3J)		
✓	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.	"Lighting Plan"	☐
✓	**11.** Indicate where dark sky friendly lighting measures have been implemented. **(10.1)**	"Lighting Plan"	☐
	12. Landscaping: (2.5.4.3K)		
✓	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	Sheet 3 "Landscape Plan"	☐
✓	**b.** Location of any irrigation system and water source.	N/A	☐
	13. Contours and Elevation: (2.5.4.3L)		
✓	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.	Sheet 4 "Grading & Drainage Plan"	☐
	14. Open Space: (2.5.4.3M)		
✓	a. Type, extent and location of all existing/proposed open space.	Sheet 2 "Site Plan"	☐
✓	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**	N/A	☐
✓	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**	Sheet 2 "Site Plan"	☐
✓	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	N/A	☐
	a. Applicable Building Height (10.5A21.20 & 10.5A43.30);		
	b. Applicable Special Requirements (10.5A21.30);		
	c. Proposed building form/type (10.5A43);		
	d. Proposed community space (10.5A46).		

Other Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	Traffic Impact Study or Trip Generation Report, as required. (*Four (4) hardcopies of the full study/report and Six (6) summaries to be submitted with the Site Plan Application*) **(3.2.1-2)**	Will Be Submitted	☐
✓	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**	Sheet 2 "Site Plan" Rain Garden & Stormtech SC-310 Units	☐
✓	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)**	Development not within wellhead protection area	☐
✓	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**	Sheets 9 & 10	☐
✓	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**	Sheet 2 "Site Plan"	☐
✓	Stormwater Management and Erosion Control Plan. (*Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application*) **(7.4.4.1)**	Sheet 10 "Erosion Control Plan"	✓

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	All local approvals, permits, easements and licenses required, including but not limited to: a. Waivers; b. Driveway permits; c. Special exceptions; d. Variances granted; e. Easements; f. Licenses. **(2.5.3.2A)**		☐
✓	Exhibits, data, reports or studies that may have been required as part of the approval process, including but not limited to: a. Calculations relating to stormwater runoff; b. Information on composition and quantity of water demand and wastewater generated; c. Information on air, water or land pollutants to be discharged, including standards, quantity, treatment and/or controls; d. Estimates of traffic generation and counts pre- and post-construction; e. Estimates of noise generation; f. A Stormwater Management and Erosion Control Plan; g. Endangered species and archaeological / historical studies; h. Wetland and water body (coastal and inland) delineations; i. Environmental impact studies. **(2.5.3.2B)**	See attached Drainage Study & Sheet 13 "Erosion Control Plan"	☐

Final Site Plan Approval Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	A document from each of the required private utility service providers indicating approval of the proposed site plan and indicating an ability to provide all required private utilities to the site. **(2.5.3.2D)**	Has Been Requested and will be submitted	☐
✓	A list of any required state and federal permit applications required for the project and the status of same. **(2.5.3.2E)**	N/A	☐

Applicant's Signature: _____ **Date:** 6/21/22

PLAN FOR
STORMWATER MANAGEMENT

For Property Located At:
140 West Rd
Tax Map 252, Lot 2-13
Portsmouth, NH 03801

Prepared by:
Alex Ross, P.E.
Ross Engineering
June 21, 2022

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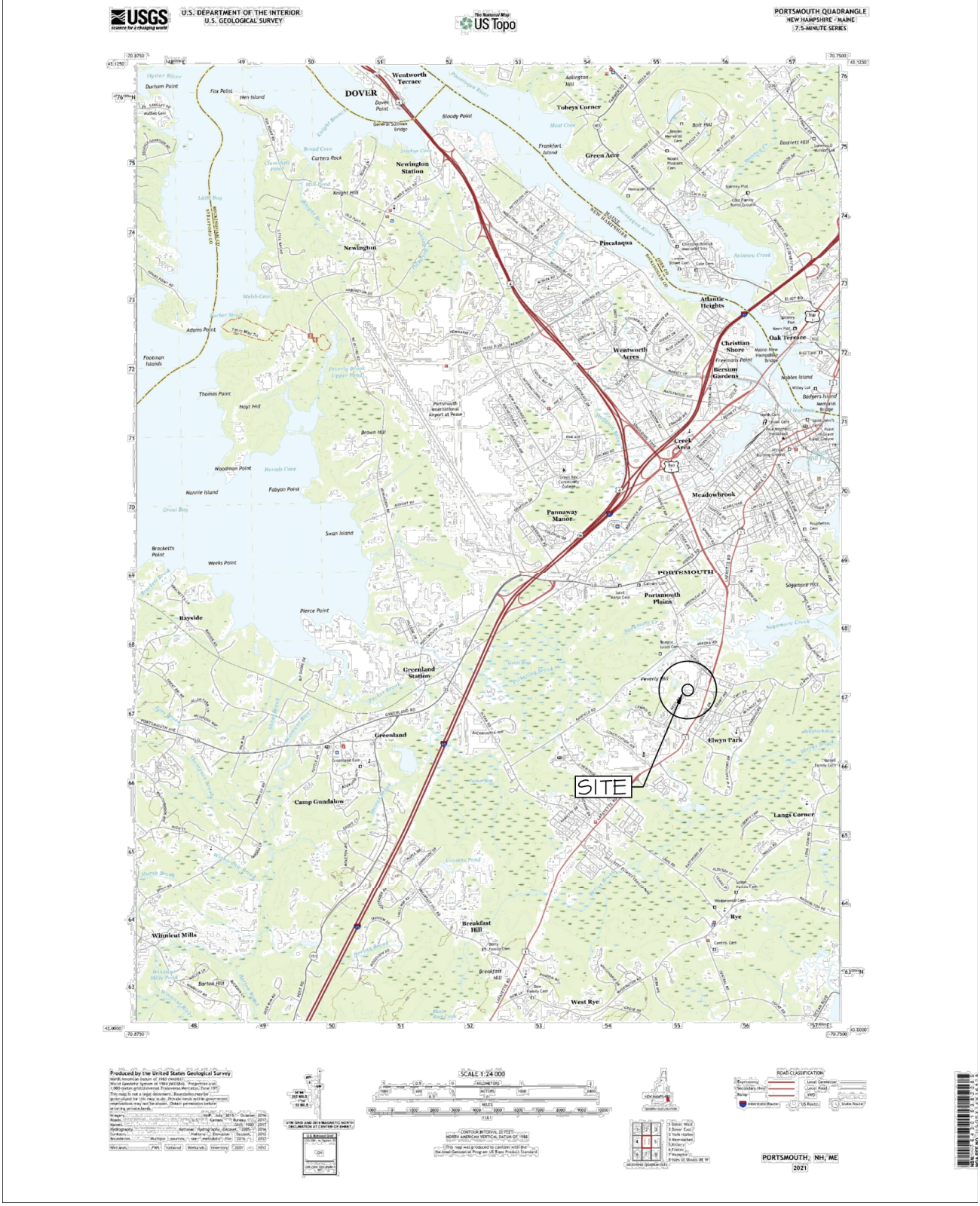
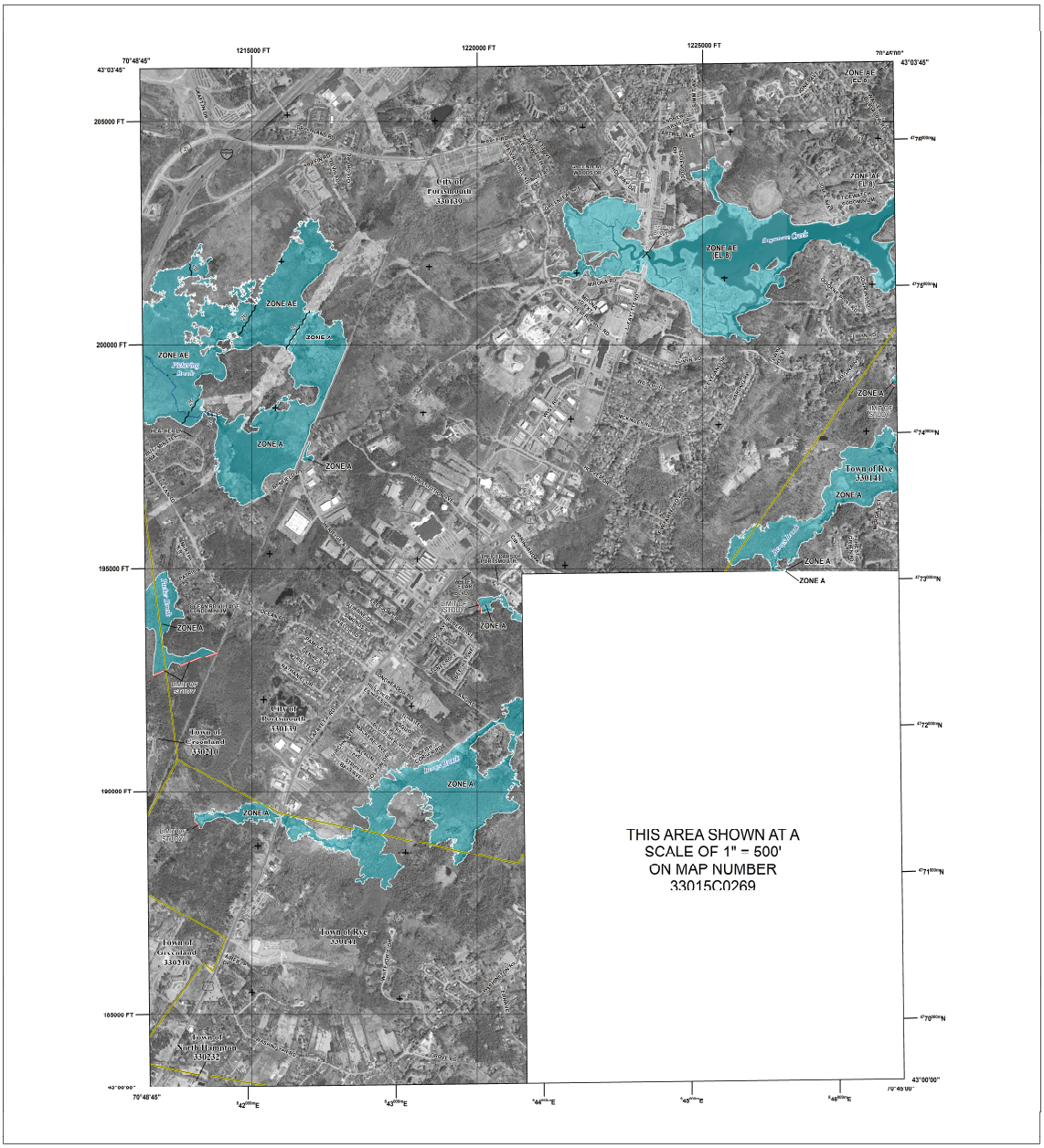
Site Description

The parcel being analyzed is located at 140 West Road in Portsmouth, NH. This is a fully developed 2.01 Acre site that was built in the late 1980's and most recently had a recreational building use. There are wetlands to the north of the site. The site lacks any effective stormwater management. The proposed improvements offer an opportunity to control stormwater and provide protection to the surrounding wetlands, while providing infiltration and aquifer recharge.

The existing building is in the center of the lot, surrounding by an asphalt parking lot. Runoff from the majority of the roof as well as northern, western and a portion of the south side of the lot flows to a stormwater pond located in the north side of the site that is improperly sized. This stormwater pond outlets to a drain manhole. Runoff from the eastern side of the lot also flows to this drain manhole through a series of drainage structures. This drain manhole outlets to the wetlands in the west. A portion of the roof and a small portion of the southern side of the lot flows to a catch basin that is part of a network of drainage structures along West Rd. This network drains to the south away from the site.

The County Soil Survey Map describes the soil in the area as 299 "Udorthents, smoothed". This soil is in the hydrologic soil group C which was used in modeling stormwater events. Four test pits have been dug on site, and the data has been included in the site plan set.


USGS
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
The National Map
US Topo
PORTSMOUTH QUADRANGLE
NEW HAMPSHIRE - MAINE
7.5-MINUTE SERIES
DOVER
Wentworth Terrace
Newington Station
Newington
Tobeys Corner
Green Acre
Piscataqua
Atlantic Heights
Christian Shore
Oak Terrace
Wentworth Acres
Bersum Gardens
Creek Area
Meadowbrook
Pannaway Manor
PORTSMOUTH
Portsmouth Plains
Greenland Station
Greenland
Elwyn Park
SITE
Camp Gundalow
Langs Corner
Rye
Breakfast Hill
West Rye
Winnicut Mills
Bayside
Produced by the United States Geological Survey
SCALE 1:24 000
PORTSMOUTH, NH, ME
2021



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, AH*
- 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
- 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)

OTHER FEATURES
- 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 notes. 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.

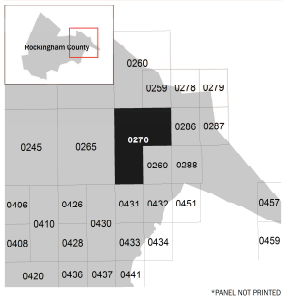
Base map information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). This information was derived from digital orthophotography at a 1 foot resolution from photography dated 2010.

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 270 OF 681

FEMA

Panel Contains:

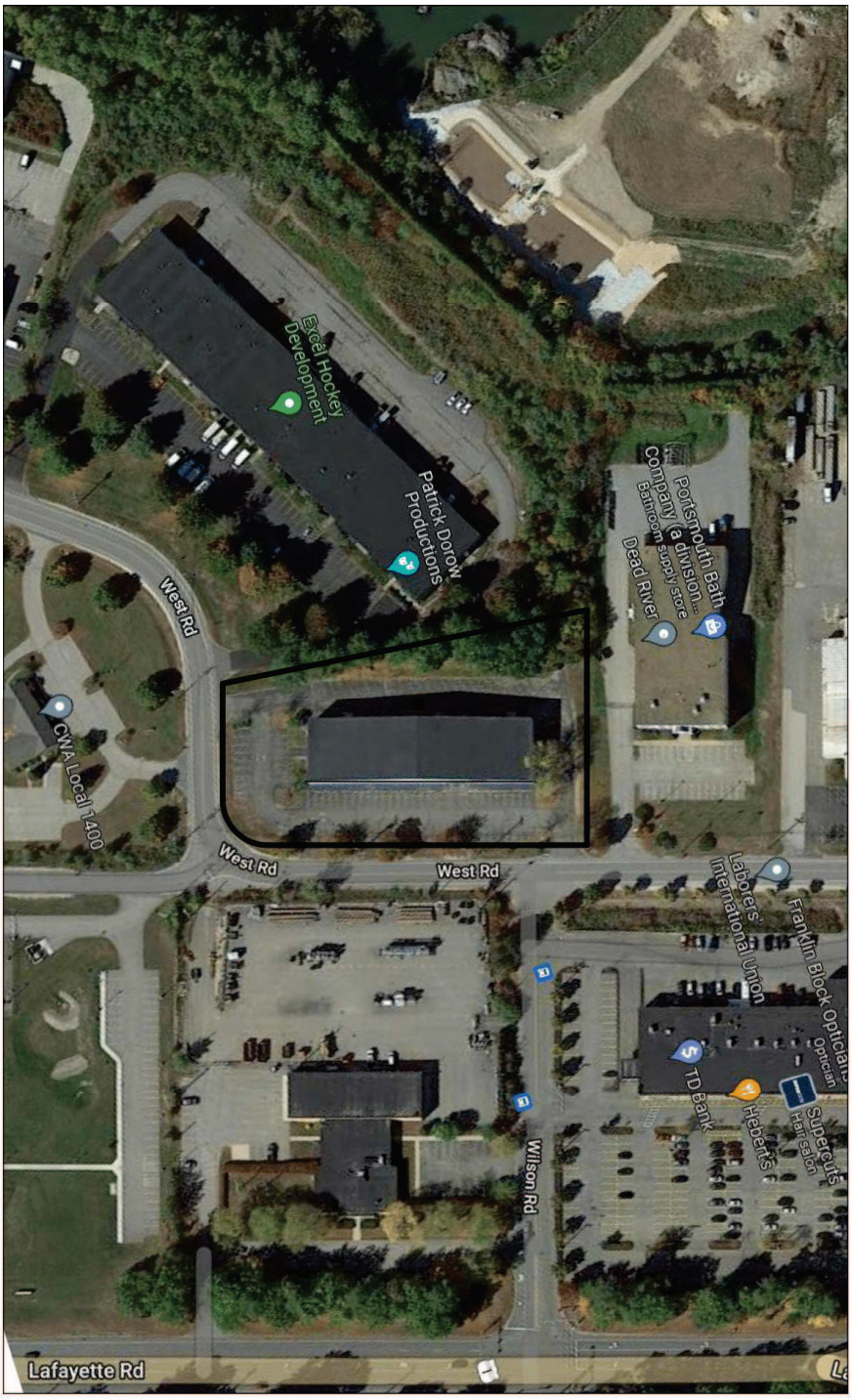
COMMUNITY	NUMBER	PANEL	SUFFIX
GREENLAND, TOWN OF	330210	0270	F
NORTH HAMPTON, TOWN OF	330232	0270	F
PORTSMOUTH, CITY OF	330139	0270	F
RYE, TOWN OF	330141	0270	F

VERSION NUMBER
2.3.2.1

MAP NUMBER
33015C0270F

MAP REVISED
January 29, 2021

Aerial View


Excel Hockey Development
Patrick Dorow Productions
Portsmouth Bath Company (a division... Bathroom supply store
Dead River
West Rd
CWA Local 1400
West Rd
West Rd
Laborers' International Union
Franklin Block Opticians
Optician
TD Bank
Supercuts
Hair salon
Wilson Rd
Lafayette Rd

Drainage Design

Pre-development stormwater runoff flows must be analyzed to establish a comparable baseline for post-development flows. A stormwater management system should be installed that will adequately handle any increased post-development runoff.

The stormwater runoff analysis of the site was based on the **two, ten, twenty-five,** and **fifty** year storm event as per the City Site Plan Review Regulations, Section 7.6.1. The research method applied was the TR-55 method, which was developed from the U.S. Soil Conservation Service's TR-20 runoff procedure. The TR-55 Manual describes the method as a "...procedure to calculate storm runoff, peak rate of discharge, hydrographs, and storage volumes required for floodwater reservoirs." The model begins with a rainfall amount uniformly imposed on the watershed over a specified time distribution. Mass rainfall is converted to mass runoff by using a runoff curve number (CN). The curve number is based on soils, plant cover, amount of impervious area, interception, and surface storage to determine a coefficient representing the capability of a surface to infiltrate stormwater. Runoff is then transformed into a hydrograph by using the unit hydrograph theory and routing procedures through segments of the watershed. A hydrograph models the volume of runoff with respect to time, reflecting the unit hydrograph theory, which is that a one-day rainfall event produces a one inch depth of runoff over a given area. The routing of runoff is segmented into areas of the watershed dependent on topography and travel time. These segmented areas are known as subcatchments. Modeling calculations were performed using the HydrodCAD stormwater modeling system version 10.

Proposed Development

The existing building will be renovated, with stairwell additions on the south and west side, and a walk-in cooler expansion on the north side. Additional parking will be installed, with the new parking being partially pervious pavement and partially asphalt pavement. A patio walkway will be installed on the north exit of the building. Gutters will be added to the existing roof directing runoff into two cisterns (one on the north and one on the south side), with overflow being directed to the stormtech SC-310 units, which will connect to a jellyfish filter (CB B) that treats runoff from both the eastern parking lot as well as water from the SC-310 units. This jellyfish filter will connect to the existing drain manhole (DMH 1) on site. Pervious pavement will be located along the west side of the parking lot. Runoff will flow to the pervious pavement, where it will be stored and slowly released to a proposed rain garden in the northwest of the property. Runoff from the rain garden will be released to an existing drain manhole (DMH 2) on site. The runoff from DMH 1 also flows to DMH 2. The combined runoff then flows to the wetlands off site in the west. A percolation test was performed on the soil with the rate found being 15 inches/hour. A conservative measurement that is 50% of the field test of 7.5 inches/hour was used for exfiltration in this analysis.

Results of Drainage Analysis

Pre-Development Runoff

The existing conditions have been modeled as 3 separate subcatchments and are outlined below.

- Subcatchment area 1 will collect runoff from the north side of the building, the majority of the south side of the building, a portion of West Road, a portion of the southern parking lot, a portion of the northern parking lot, and the west side of the parking lot. Runoff will travel northwest into a stormwater pond, then through a 4" culvert into DMH 2, then through a 20" culvert to the wetlands in the northwest off site.
- Subcatchment area 2 will collect runoff from a small portion of the south side of the building, a portion of the southern parking lot, and a portion of West Road. Runoff will flow to CB 2, then to CB 3, then continue southwest into the Portsmouth drainage network.
- Subcatchment area 3 will collect runoff from the eastern parking lot, as well as a portion of West Road. Runoff will flow into CB 1 then to DMH 1, then to DMH 2, then through a 20" culvert to the wetlands in the northwest off site.

Post-Development Runoff

The proposed conditions have been modeled as 5 separate subcatchments and are outlined below.

- Subcatchment area 1 will collect runoff from the grassed area west of the parking lot and the grassed area northing of the parking lot. Runoff will flow to the northwest to a rain garden, then through a XXXX" culvert to DMH 2, then through a 20" culvert to the wetlands in the northwest off site.
- Subcatchment area 2 will collect runoff from the landscaped area south of the parking lot and a portion of West Road. Runoff will flow to CB 2, then to CB 3, then continue southwest into the Portsmouth drainage network.
- Subcatchment area 3 will collect runoff from the roof and a portion of the eastern parking lot. Runoff will flow through gutters to two irrigation cisterns, then to CB A, then through stormtech SC-310 chambers, then to DMH A, then to a catch basin using a jellyfish filter (CB B), then to DMH 1, then to DMH 2, then through a 20" culvert to the wetlands in the northwest off site.
- Subcatchment 4 will collect runoff from a portion of the eastern parking lot and a portion of West Road. Runoff will flow to a catch basin using a jellyfish filter (CB B), then to DMH 1, then to DMH 2, then through a 20" culvert to the wetlands in the northwest off site.
- Subcatchment area 5 will collect runoff from a portion of the southern parking lot, a portion of the northern parking lot, the western parking lot, and a portion of West Road. Runoff will run along the vertical granite curb,

flowing to the pervious pavers along the west side of the parking lot. Water will be detained then slowly released through an underdrain leading to a XXXX" culvert, then to the rain garden, then through a XXXX" culvert to DMH 2, then through a 20" culvert to the wetlands in the northwest off site.

.

Drainage Summary

As required by the City of Portsmouth's Site Plan Review Regulations for Stormwater Management Best Practices (Section 7.6.1.6), the **two, ten, twenty-five,** and **fifty** year storm events were analyzed. The post-development flow meets or exceeds the requirements set forth by the city, resulting in no net increase in stormwater runoff rates. As shown on the plan, the stormwater system will adequately handle the post-development peak rate of runoff.

The proposed site improvements will have a positive drainage impact on the neighborhood and the city. Currently the flow from the majority of the site travels to either a stormwater pond that is undersized, or to the wetlands without treatment. The stormwater control measures provided by the rain garden, pervious pavement, stormtech SC-310 units, and jellyfish catch basin will both reduce the peak flow to the wetlands, and treat more stormwater than the existing site currently does.

Rate of Runoff Comparison

Pre-Development (CFS)				
Analysis Points	**2yr**	**10yr**	**25yr**	**50yr**
Analysis Point 1	4.95	8.16	10.63	12.94
Analysis Point 2	4.89	3.76	4.83	5.83
Post-Development (CFS)				
Analysis Point 1	2.49	8.09	9.87	11.08
Analysis Point 2	0.37	0.64	0.85	1.04
Decrease in Flow (CFS)				
Analysis Point 1	0.06	0.07	0.76	1.86
Analysis Point 2	2.12	3.12	3.98	4.79

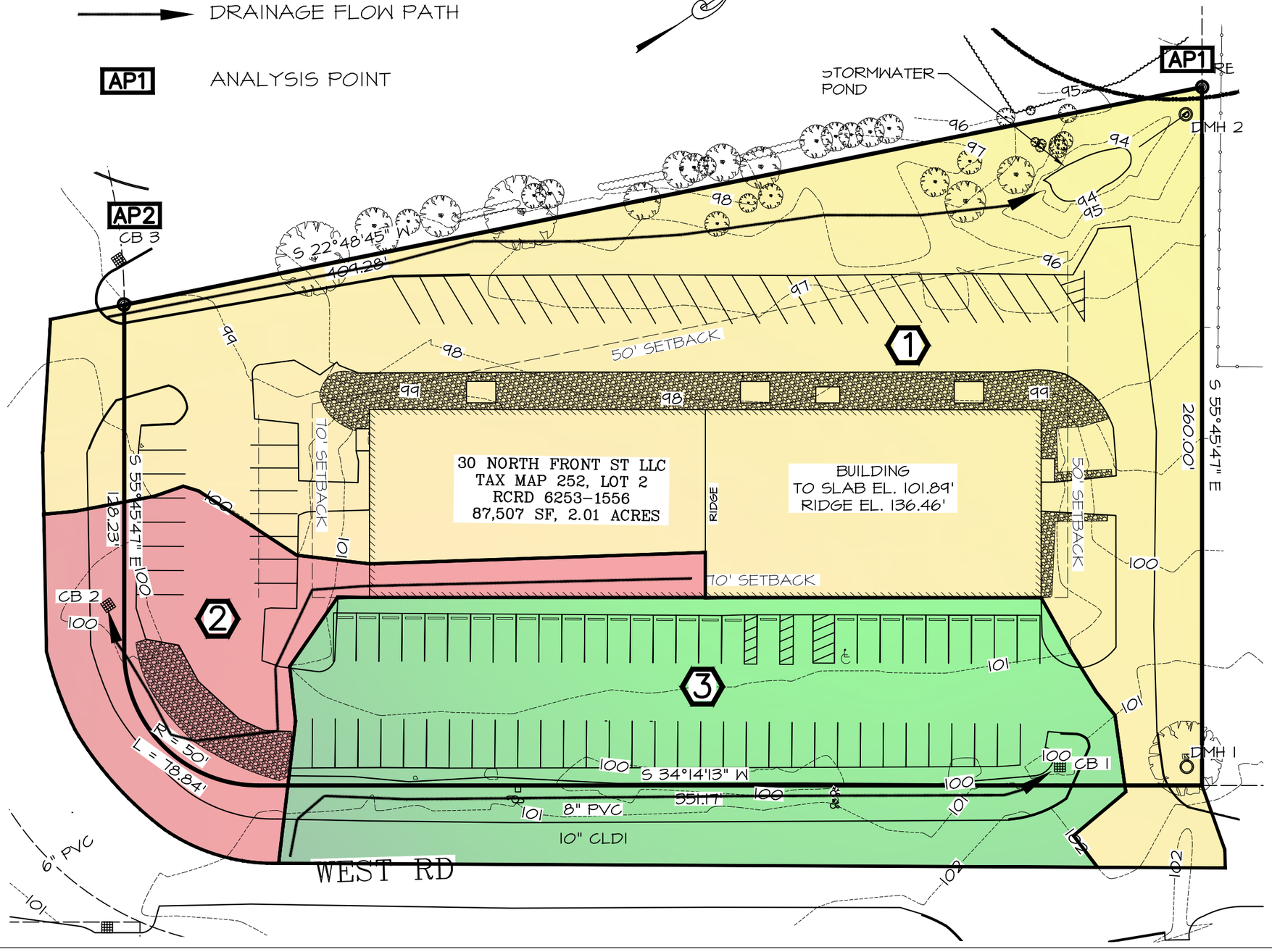
PRE-DEVELOPMENT CALCULATIONS

LEGEND

1 SUBCATCHMENT

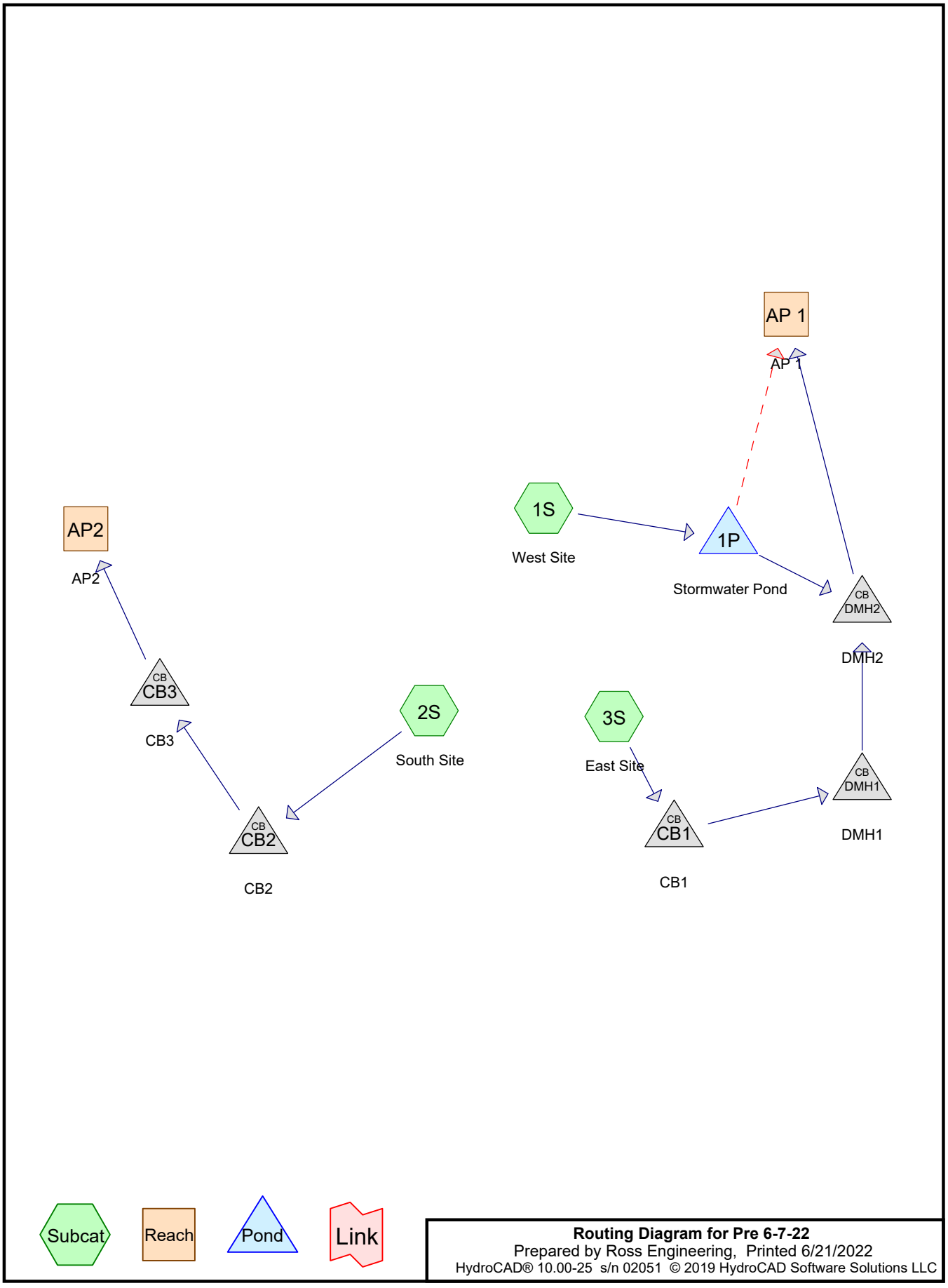
DRAINAGE FLOW PATH

AP1 ANALYSIS POINT



PRE-DEVELOPMENT

SCALE: 1" = 40'



Routing Diagram for Pre 6-7-22
Prepared by Ross Engineering, Printed 6/21/2022
HydroCAD® 10.00-25 s/n 02051 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.627	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S)
0.007	98	Concrete, HSG C (1S)
0.002	98	Granite Curb, HSG C (1S)
0.124	96	Gravel surface, HSG C (1S, 2S, 3S)
1.232	98	Paved roads w/curbs & sewers, HSG C (1S, 2S, 3S)
0.402	98	Roofs, HSG C (1S, 3S)
2.395	**92**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.395	HSG C	1S, 2S, 3S
0.000	HSG D	
0.000	Other	
2.395		**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	0.627	0.000	0.000	0.627	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.000	0.007	0.000	0.000	0.007	Concrete	1S
0.000	0.000	0.002	0.000	0.000	0.002	Granite Curb	1S
0.000	0.000	0.124	0.000	0.000	0.124	Gravel surface	1S, 2S, 3S
0.000	0.000	1.232	0.000	0.000	1.232	Paved roads w/curbs & sewers	1S, 2S, 3S
0.000	0.000	0.402	0.000	0.000	0.402	Roofs	1S, 3S
0.000	**0.000**	**2.395**	**0.000**	**0.000**	**2.395**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	93.60	92.24	21.2	0.0642	0.010	4.0	0.0	0.0
2	CB1	95.28	93.37	47.2	0.0405	0.012	12.0	0.0	0.0
3	CB2	95.26	94.06	129.0	0.0093	0.012	12.0	0.0	0.0
4	CB3	94.06	94.06	1.0	0.0000	0.012	12.0	0.0	0.0
5	DMH1	92.79	90.50	47.2	0.0485	0.012	24.0	0.0	0.0
6	DMH2	90.47	90.06	105.9	0.0039	0.012	20.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: West Site Runoff Area=62,055 sf 61.01% Impervious Runoff Depth>2.64"
Flow Length=350' Tc=7.6 min CN=90 Runoff=4.11 cfs 0.314 af

Subcatchment2S: South Site Runoff Area=29,613 sf 83.41% Impervious Runoff Depth>3.04"
Tc=5.0 min CN=94 Runoff=2.38 cfs 0.172 af

Subcatchment3S: East Site Runoff Area=12,646 sf 71.50% Impervious Runoff Depth>2.93"
Flow Length=288' Tc=8.5 min CN=93 Runoff=0.88 cfs 0.071 af

Reach AP 1: AP 1 Inflow=4.95 cfs 0.383 af
Outflow=4.95 cfs 0.383 af

Reach AP2: AP2 Inflow=2.38 cfs 0.172 af
Outflow=2.38 cfs 0.172 af

Pond 1P: Stormwater Pond Peak Elev=94.17' Storage=365 cf Inflow=4.11 cfs 0.314 af
Primary=0.27 cfs 0.148 af Secondary=3.80 cfs 0.164 af Outflow=4.07 cfs 0.312 af

Pond CB1: CB1 Peak Elev=95.76' Inflow=0.88 cfs 0.071 af
12.0" Round Culvert n=0.012 L=47.2' S=0.0405 '/' Outflow=0.88 cfs 0.071 af

Pond CB2: CB2 Peak Elev=96.21' Inflow=2.38 cfs 0.172 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=2.38 cfs 0.172 af

Pond CB3: CB3 Peak Elev=95.17' Inflow=2.38 cfs 0.172 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=2.38 cfs 0.172 af

Pond DMH1: DMH1 Peak Elev=93.17' Inflow=0.88 cfs 0.071 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=0.88 cfs 0.071 af

Pond DMH2: DMH2 Peak Elev=91.01' Inflow=1.15 cfs 0.219 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=1.15 cfs 0.219 af

Total Runoff Area = 2.395 ac Runoff Volume = 0.557 af Average Runoff Depth = 2.79"
31.36% Pervious = 0.751 ac 68.64% Impervious = 1.644 ac

Summary for Subcatchment 1S: West Site

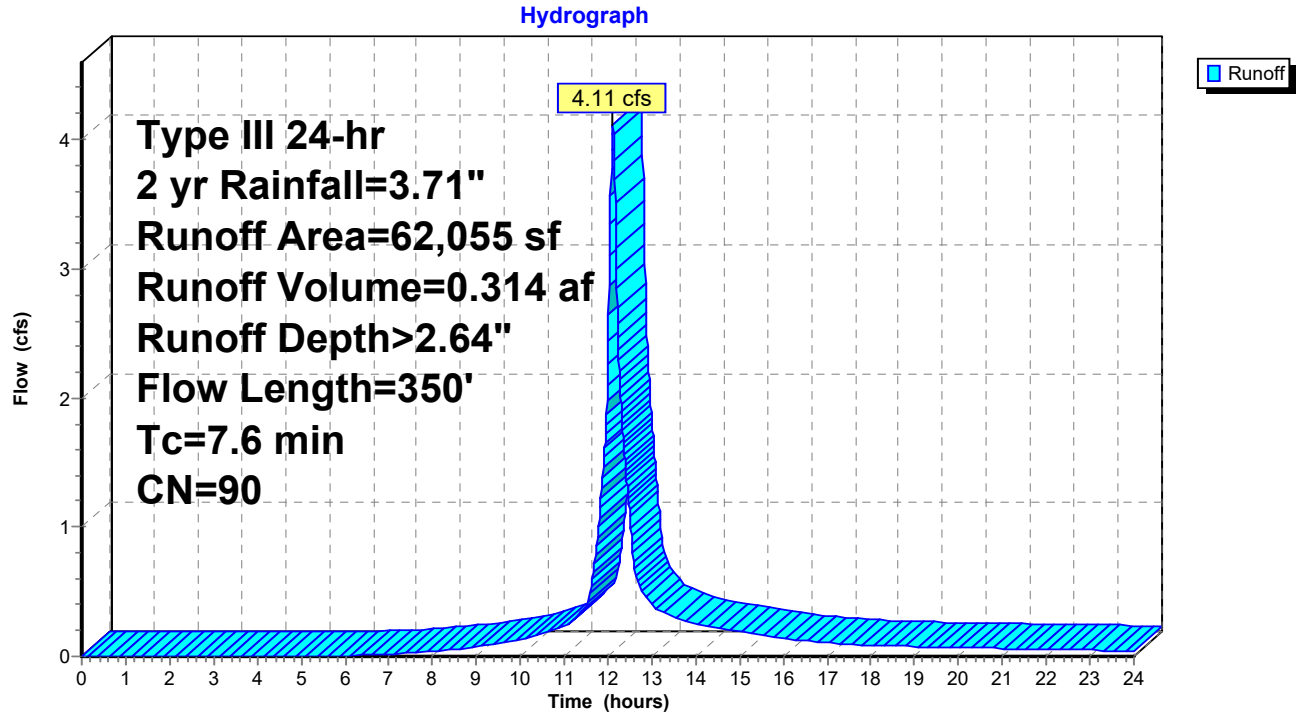
Runoff = 4.11 cfs @ 12.11 hrs, Volume= 0.314 af, Depth> 2.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

	Area (sf)	CN	Description
	19,963	74	>75% Grass cover, Good, HSG C
	15,667	98	Roofs, HSG C
	4,231	96	Gravel surface, HSG C
	21,772	98	Paved roads w/curbs & sewers, HSG C
*	315	98	Concrete, HSG C
*	107	98	Granite Curb, HSG C
	62,055	90	Weighted Average
	24,194		38.99% Pervious Area
	37,861		61.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.6	350	Total			

Subcatchment 1S: West Site



Summary for Subcatchment 2S: South Site

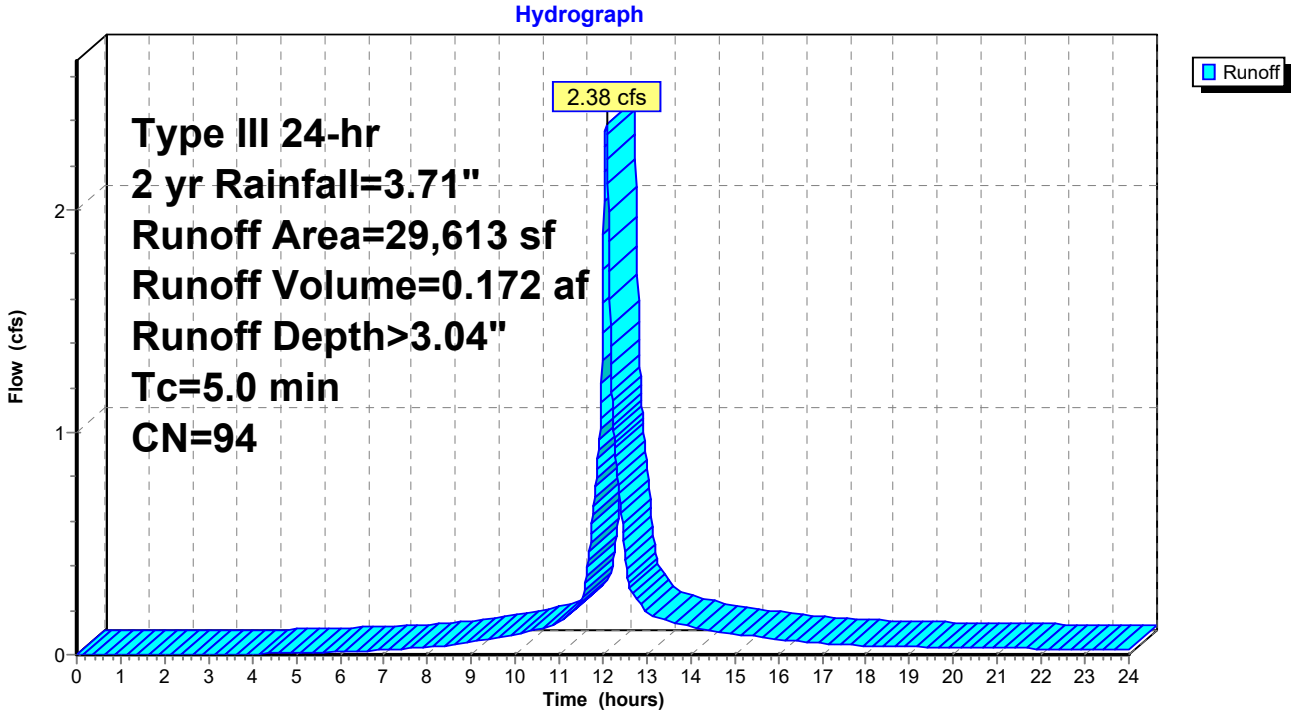
Runoff = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

Area (sf)	CN	Description
4,910	74	>75% Grass cover, Good, HSG C
3	96	Gravel surface, HSG C
24,700	98	Paved roads w/curbs & sewers, HSG C
29,613	94	Weighted Average
4,913		16.59% Pervious Area
24,700		83.41% Impervious Area

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

Subcatchment 2S: South Site



Summary for Subcatchment 3S: East Site

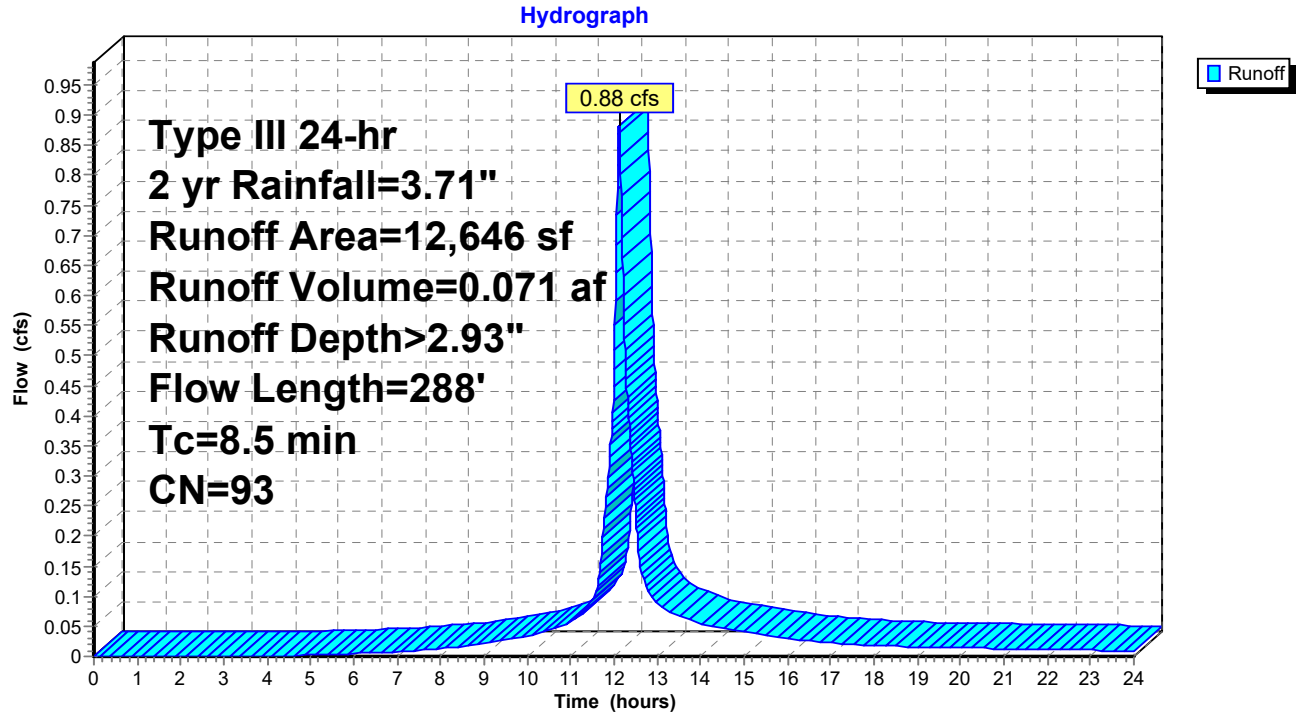
Runoff = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

Area (sf)	CN	Description
2,426	74	>75% Grass cover, Good, HSG C
1,845	98	Roofs, HSG C
1,178	96	Gravel surface, HSG C
7,197	98	Paved roads w/curbs & sewers, HSG C
12,646	93	Weighted Average
3,604		28.50% Pervious Area
9,042		71.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	237	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	288	Total			

Subcatchment 3S: East Site



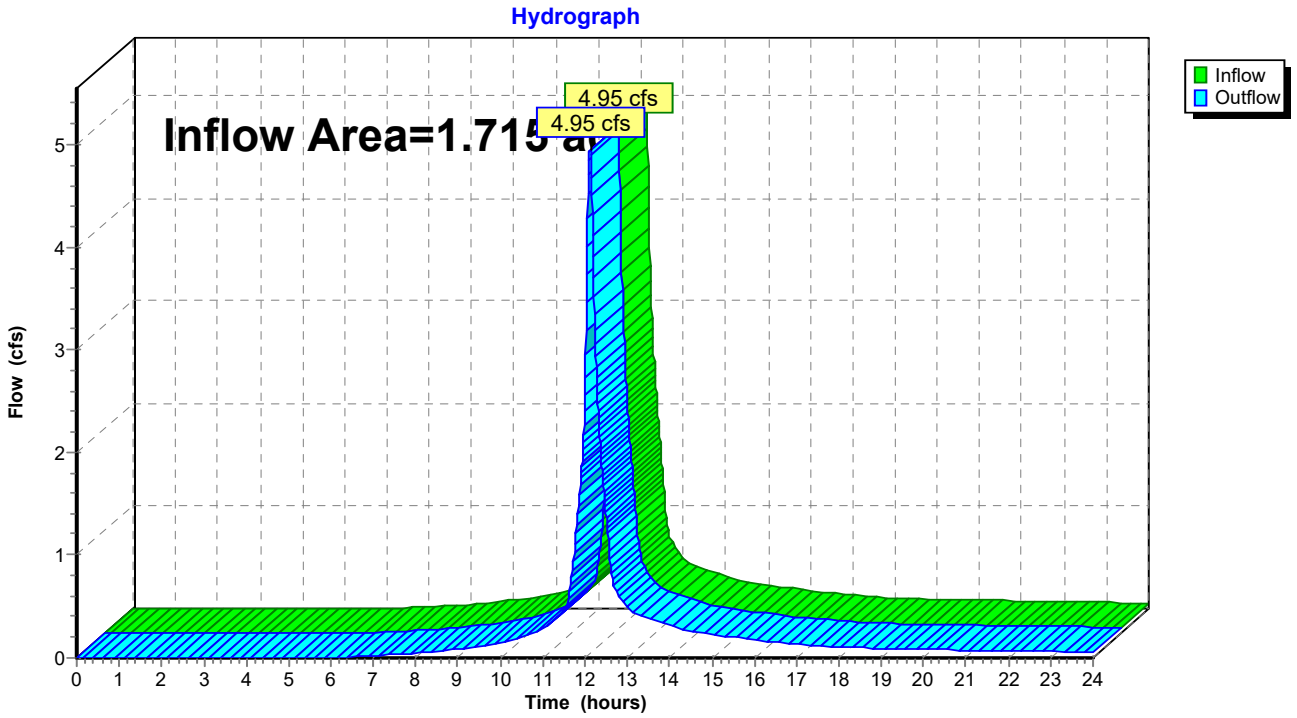
Summary for Reach AP 1: AP 1

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

Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 2.68" for 2 yr event
Inflow = 4.95 cfs @ 12.12 hrs, Volume= 0.383 af
Outflow = 4.95 cfs @ 12.12 hrs, Volume= 0.383 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP 1: AP 1



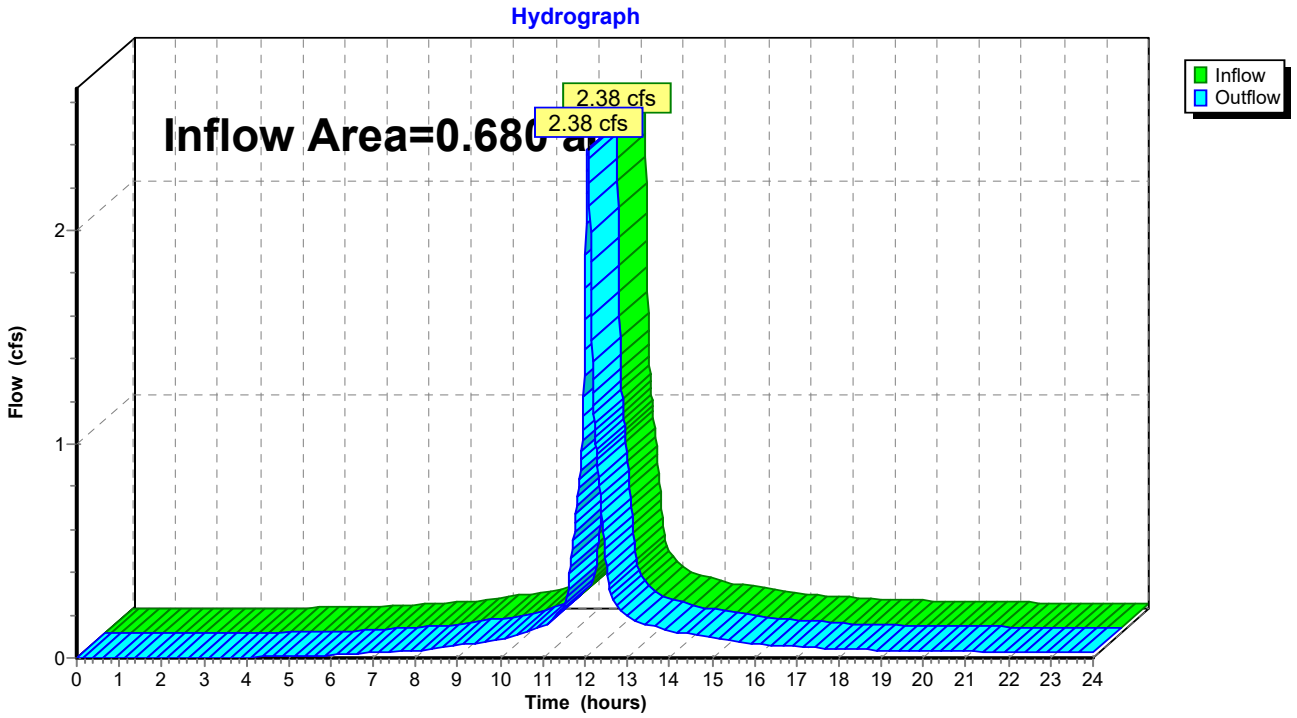
Summary for Reach AP2: AP2

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

Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 3.04" for 2 yr event
Inflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af
Outflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP2: AP2



Summary for Pond 1P: Stormwater Pond

Inflow Area = 1.425 ac, 61.01% Impervious, Inflow Depth > 2.64" for 2 yr event
Inflow = 4.11 cfs @ 12.11 hrs, Volume= 0.314 af
Outflow = 4.07 cfs @ 12.12 hrs, Volume= 0.312 af, Atten= 1%, Lag= 0.8 min
Primary = 0.27 cfs @ 12.12 hrs, Volume= 0.148 af
Secondary = 3.80 cfs @ 12.12 hrs, Volume= 0.164 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 94.17' @ 12.12 hrs Surf.Area= 935 sf Storage= 365 cf

Plug-Flow detention time=8.7 min calculated for 0.312 af (100% of inflow)
Center-of-Mass det. time=5.9 min (807.8 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.60'	1,541 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

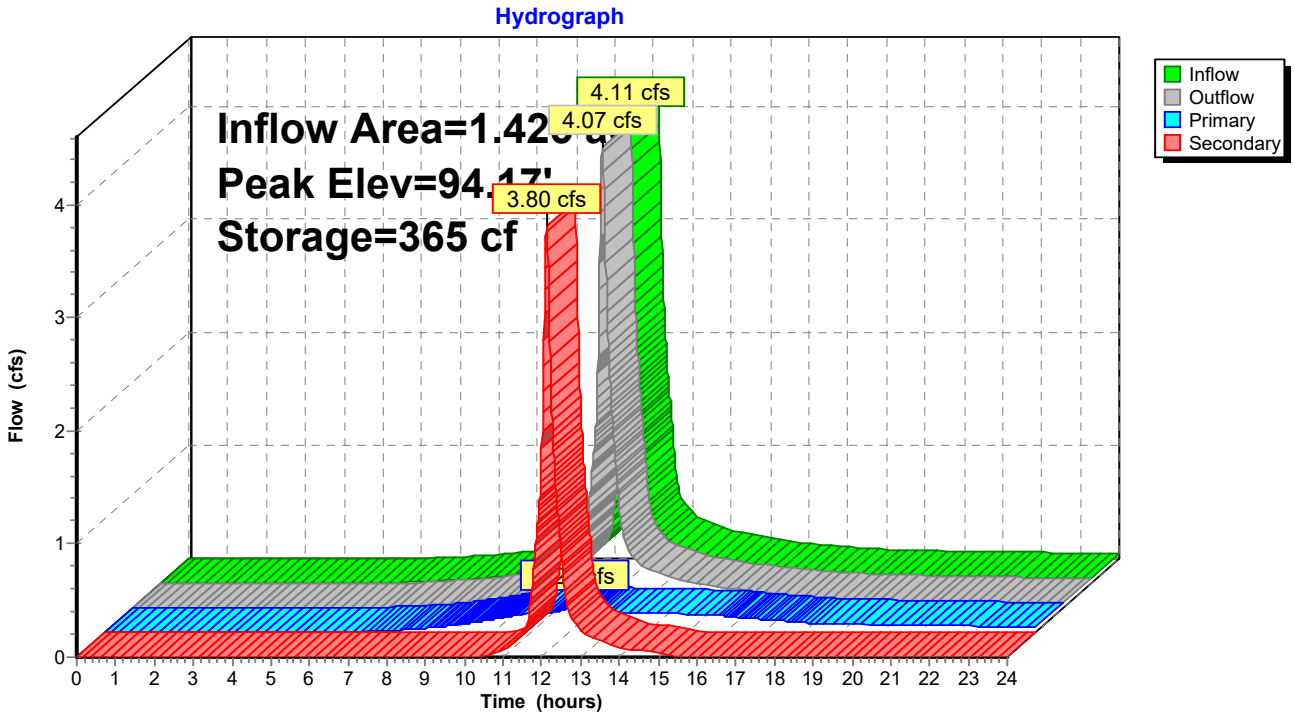
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.60	374	0	0
94.00	737	222	222
95.00	1,900	1,319	1,541

Device	Routing	Invert	Outlet Devices
#1	Primary	93.60'	**4.0" Round Culvert** L= 21.2' Ke= 0.500 Inlet / Outlet Invert= 93.60' / 92.24' S= 0.0642 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	93.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.27 cfs @ 12.12 hrs HW=94.17' TW=91.01' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.27 cfs @ 3.06 fps)

Secondary OutFlow Max=3.80 cfs @ 12.12 hrs HW=94.17' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 3.80 cfs @ 1.40 fps)

Pond 1P: Stormwater Pond



Summary for Pond CB1: CB1

[57] Hint: Peaked at 95.76' (Flood elevation advised)

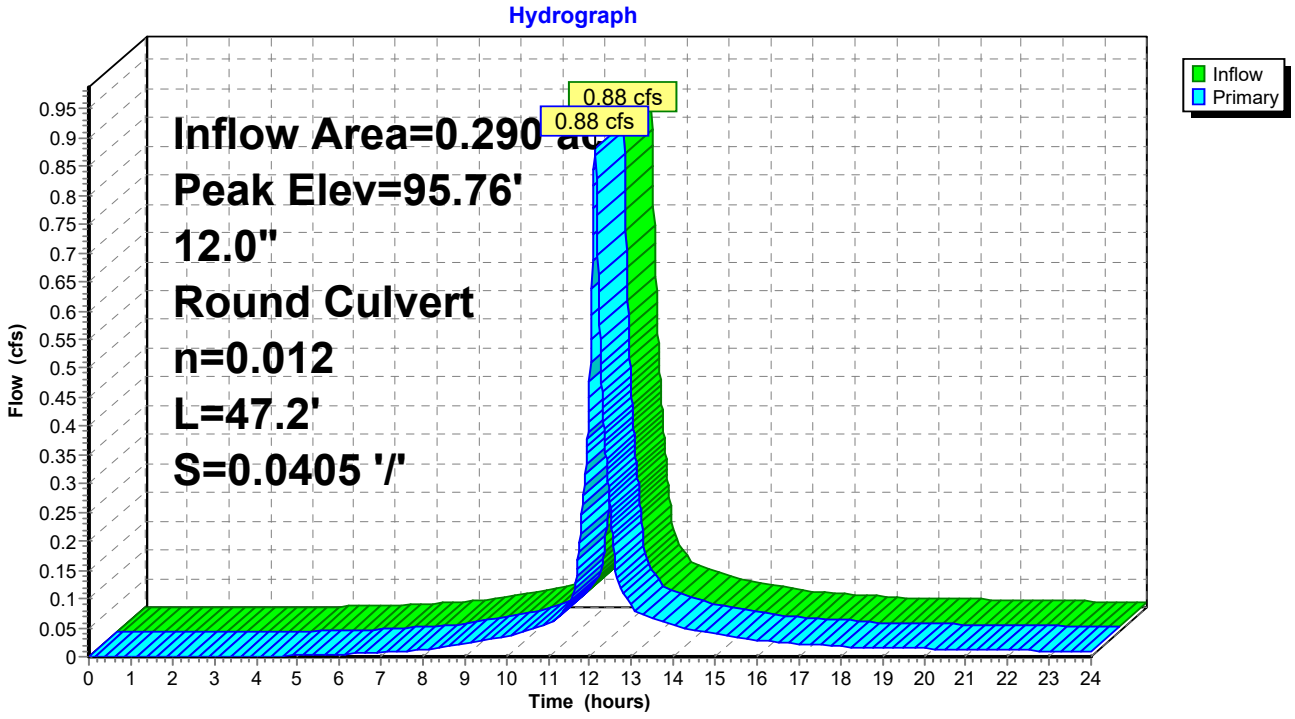
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 2.93" for 2 yr event
Inflow = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af
Outflow = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 95.76' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**12.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0405 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.88 cfs @ 12.12 hrs HW=95.76' TW=93.17' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 0.88 cfs @ 2.36 fps)

Pond CB1: CB1



Summary for Pond CB2: CB2

[57] Hint: Peaked at 96.21' (Flood elevation advised)

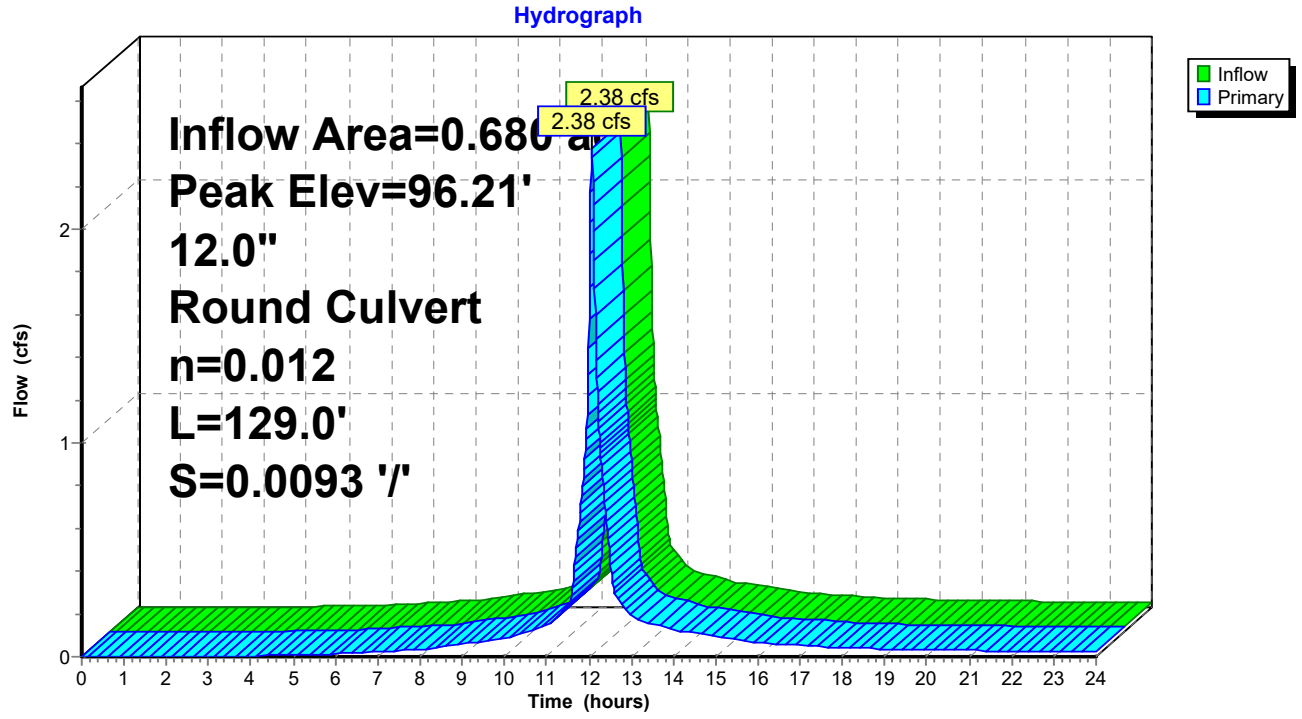
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 3.04" for 2 yr event
Inflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af
Outflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 96.21' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=2.38 cfs @ 12.07 hrs HW=96.21' TW=95.16' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 2.38 cfs @ 3.98 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 95.17' (Flood elevation advised)

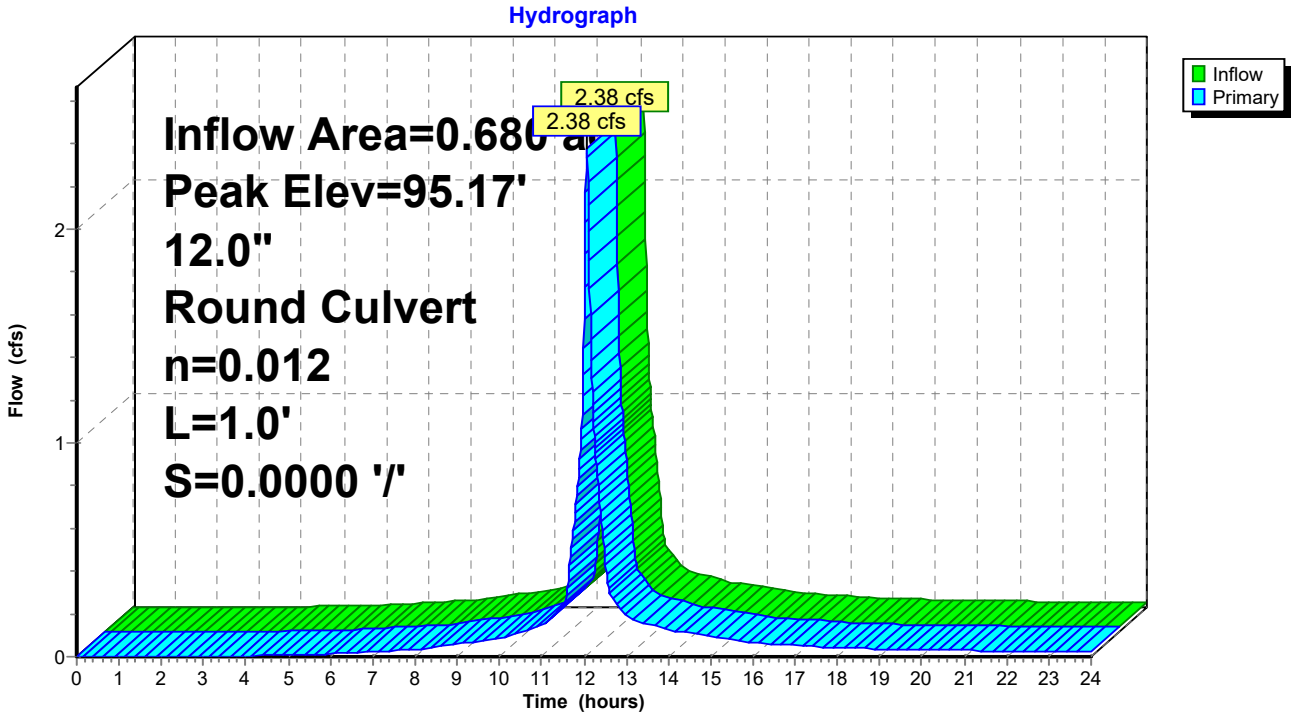
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 3.04" for 2 yr event
Inflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af
Outflow = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min
Primary = 2.38 cfs @ 12.07 hrs, Volume= 0.172 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 95.17'@ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=2.38 cfs @ 12.07 hrs HW=95.16' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 2.38 cfs @ 3.42 fps)

Pond CB3: CB3



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.17' (Flood elevation advised)

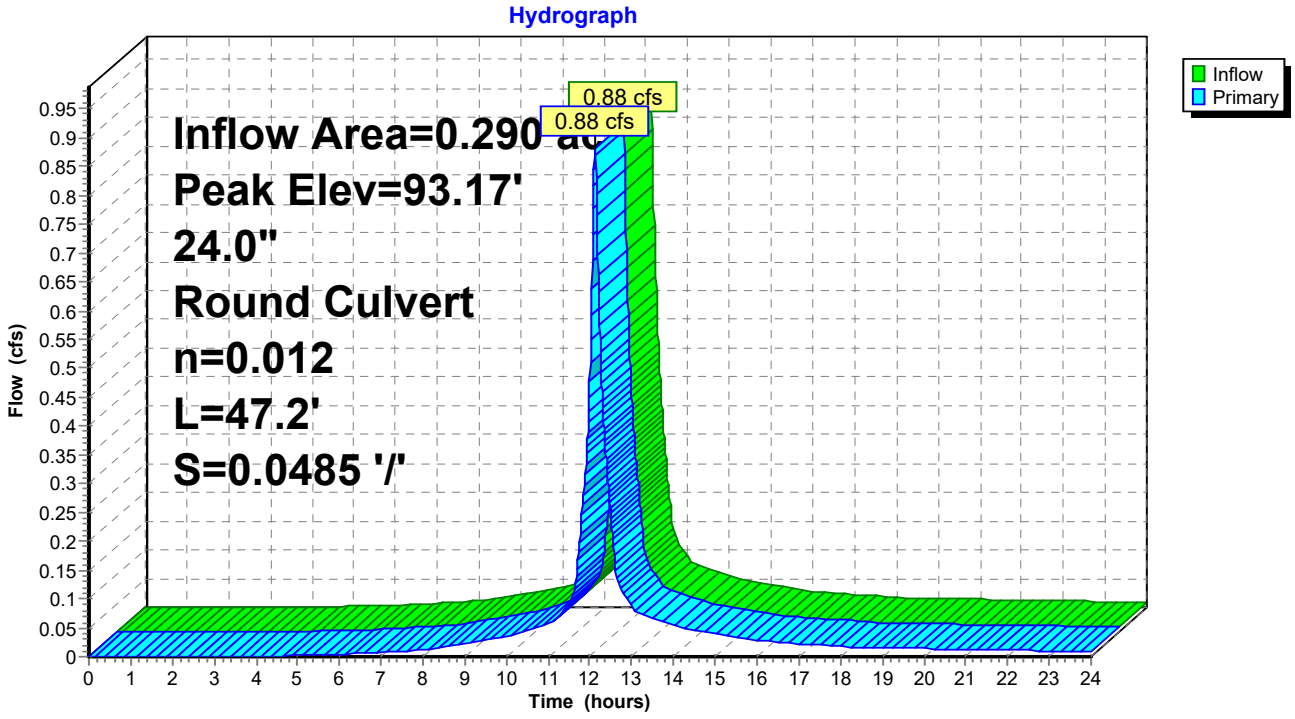
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 2.93" for 2 yr event
Inflow = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af
Outflow = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min
Primary = 0.88 cfs @ 12.12 hrs, Volume= 0.071 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 93.17' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=0.88 cfs @ 12.12 hrs HW=93.17' TW=91.01' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 0.88 cfs @ 2.10 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 91.01' (Flood elevation advised)

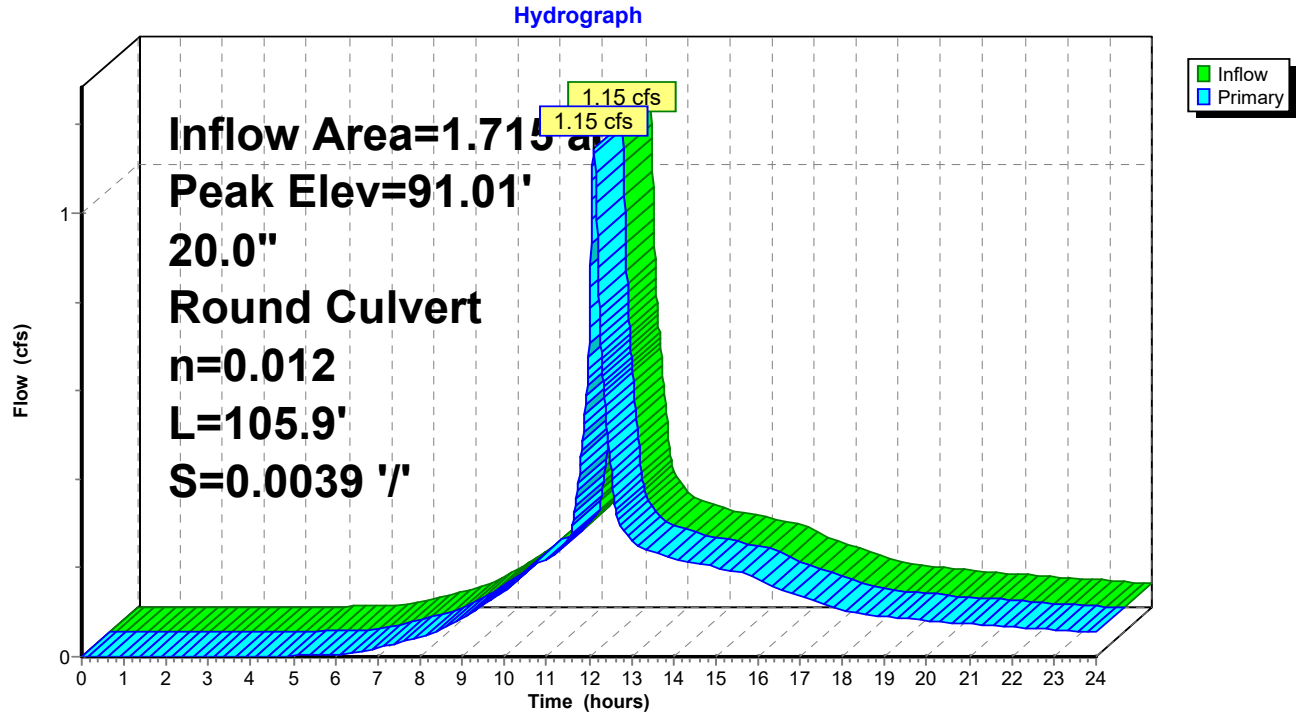
Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 1.53" for 2 yr event
Inflow = 1.15 cfs @ 12.12 hrs, Volume= 0.219 af
Outflow = 1.15 cfs @ 12.12 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.12 hrs, Volume= 0.219 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 91.01' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=1.15 cfs @ 12.12 hrs HW=91.01' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 1.15 cfs @ 2.79 fps)

Pond DMH2: DMH2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: West Site Runoff Area=62,055 sf 61.01% Impervious Runoff Depth>4.49"
Flow Length=350' Tc=7.6 min CN=90 Runoff=6.81 cfs 0.533 af

Subcatchment2S: South Site Runoff Area=29,613 sf 83.41% Impervious Runoff Depth>4.94"
Tc=5.0 min CN=94 Runoff=3.76 cfs 0.280 af

Subcatchment3S: East Site Runoff Area=12,646 sf 71.50% Impervious Runoff Depth>4.82"
Flow Length=288' Tc=8.5 min CN=93 Runoff=1.41 cfs 0.117 af

Reach AP 1: AP 1 Inflow=8.16 cfs 0.648 af
Outflow=8.16 cfs 0.648 af

Reach AP2: AP2 Inflow=3.76 cfs 0.280 af
Outflow=3.76 cfs 0.280 af

Pond 1P: Stormwater Pond Peak Elev=94.28' Storage=478 cf Inflow=6.81 cfs 0.533 af
Primary=0.30 cfs 0.201 af Secondary=6.45 cfs 0.331 af Outflow=6.75 cfs 0.531 af

Pond CB1: CB1 Peak Elev=95.91' Inflow=1.41 cfs 0.117 af
12.0" Round Culvert n=0.012 L=47.2' S=0.0405 '/' Outflow=1.41 cfs 0.117 af

Pond CB2: CB2 Peak Elev=97.37' Inflow=3.76 cfs 0.280 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=3.76 cfs 0.280 af

Pond CB3: CB3 Peak Elev=95.60' Inflow=3.76 cfs 0.280 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=3.76 cfs 0.280 af

Pond DMH1: DMH1 Peak Elev=93.28' Inflow=1.41 cfs 0.117 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=1.41 cfs 0.117 af

Pond DMH2: DMH2 Peak Elev=91.14' Inflow=1.71 cfs 0.317 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=1.71 cfs 0.317 af

Total Runoff Area = 2.395 ac Runoff Volume = 0.929 af Average Runoff Depth = 4.66"
31.36% Pervious = 0.751 ac 68.64% Impervious = 1.644 ac

Summary for Subcatchment 1S: West Site

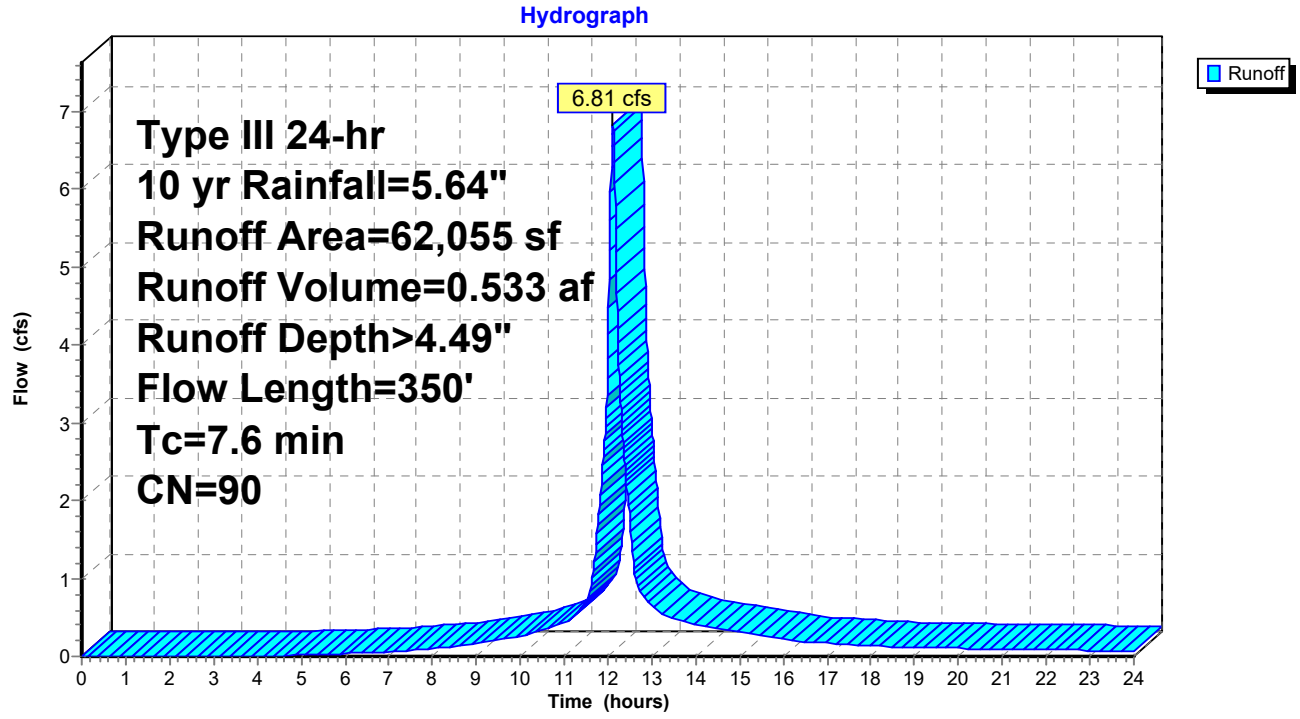
Runoff = 6.81 cfs @ 12.10 hrs, Volume= 0.533 af, Depth> 4.49"

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

	Area (sf)	CN	Description
	19,963	74	>75% Grass cover, Good, HSG C
	15,667	98	Roofs, HSG C
	4,231	96	Gravel surface, HSG C
	21,772	98	Paved roads w/curbs & sewers, HSG C
*	315	98	Concrete, HSG C
*	107	98	Granite Curb, HSG C
	62,055	90	Weighted Average
	24,194		38.99% Pervious Area
	37,861		61.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.6	350	Total			

Subcatchment 1S: West Site



Summary for Subcatchment 2S: South Site

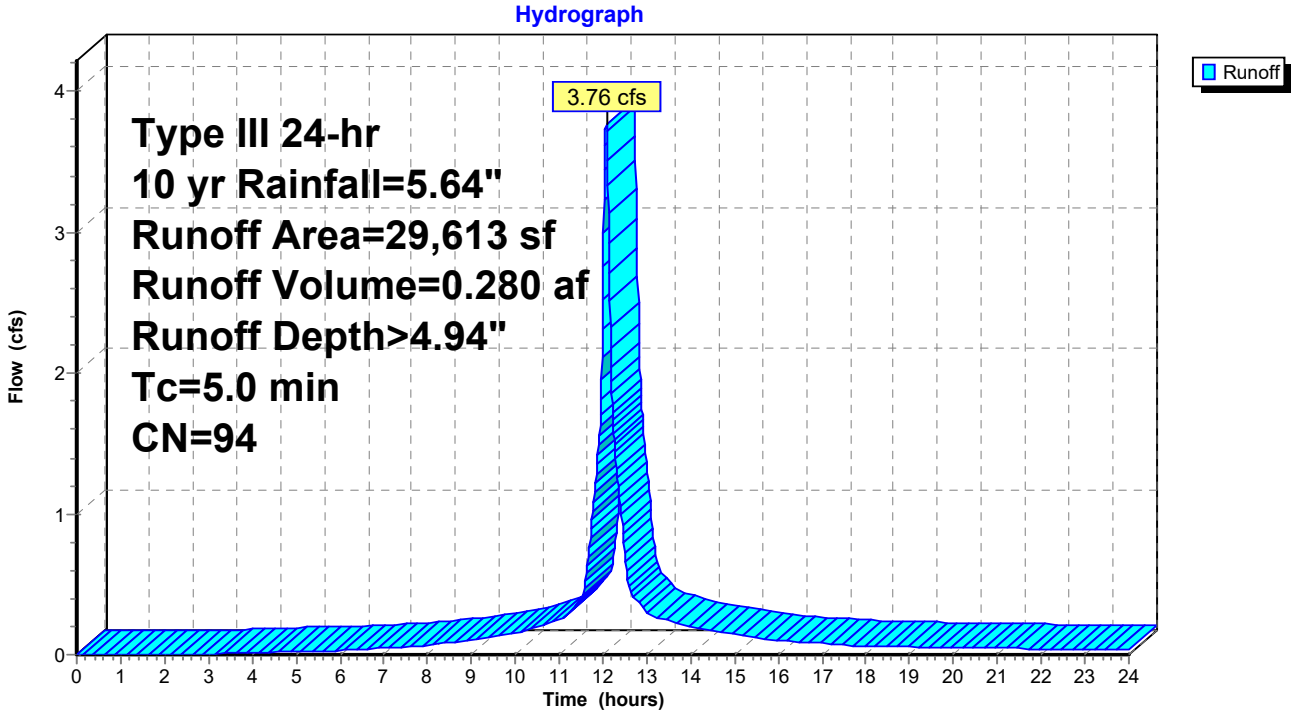
Runoff = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af, Depth> 4.94"

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

Area (sf)	CN	Description
4,910	74	>75% Grass cover, Good, HSG C
3	96	Gravel surface, HSG C
24,700	98	Paved roads w/curbs & sewers, HSG C
29,613	94	Weighted Average
4,913		16.59% Pervious Area
24,700		83.41% Impervious Area

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

Subcatchment 2S: South Site



Summary for Subcatchment 3S: East Site

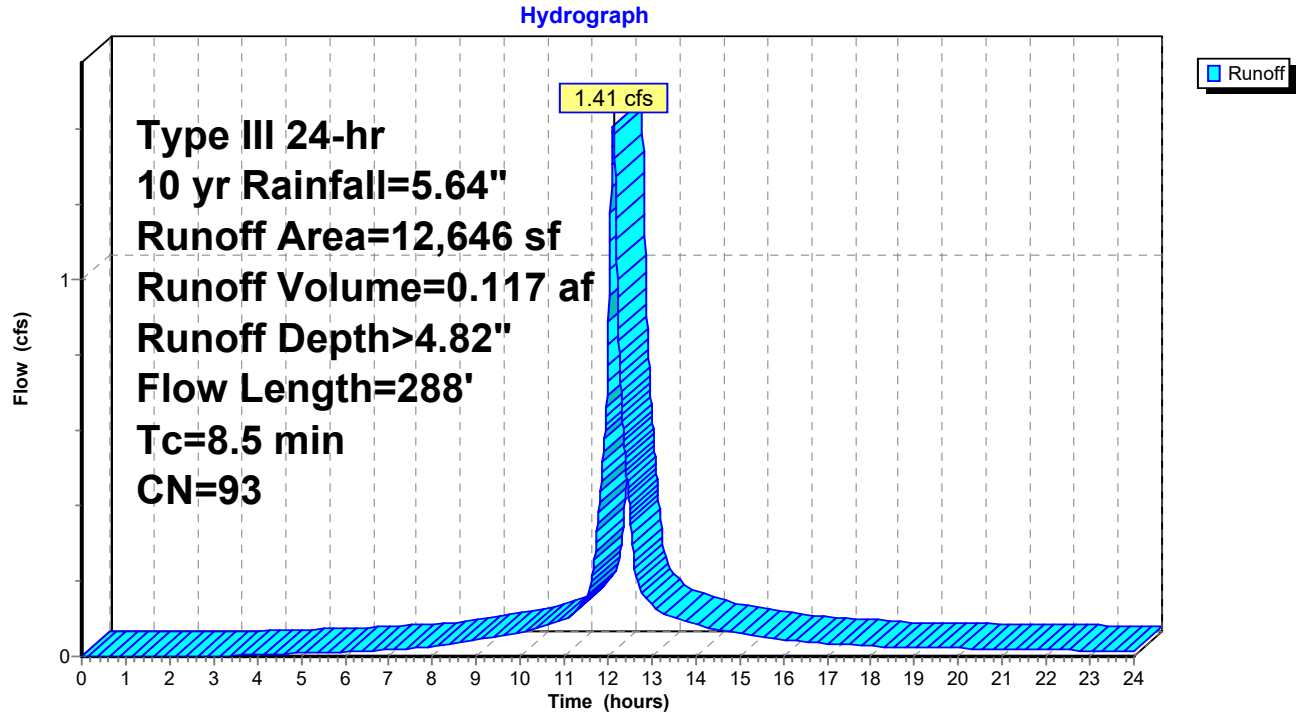
Runoff = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af, Depth> 4.82"

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

Area (sf)	CN	Description
2,426	74	>75% Grass cover, Good, HSG C
1,845	98	Roofs, HSG C
1,178	96	Gravel surface, HSG C
7,197	98	Paved roads w/curbs & sewers, HSG C
12,646	93	Weighted Average
3,604		28.50% Pervious Area
9,042		71.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	237	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	288	Total			

Subcatchment 3S: East Site



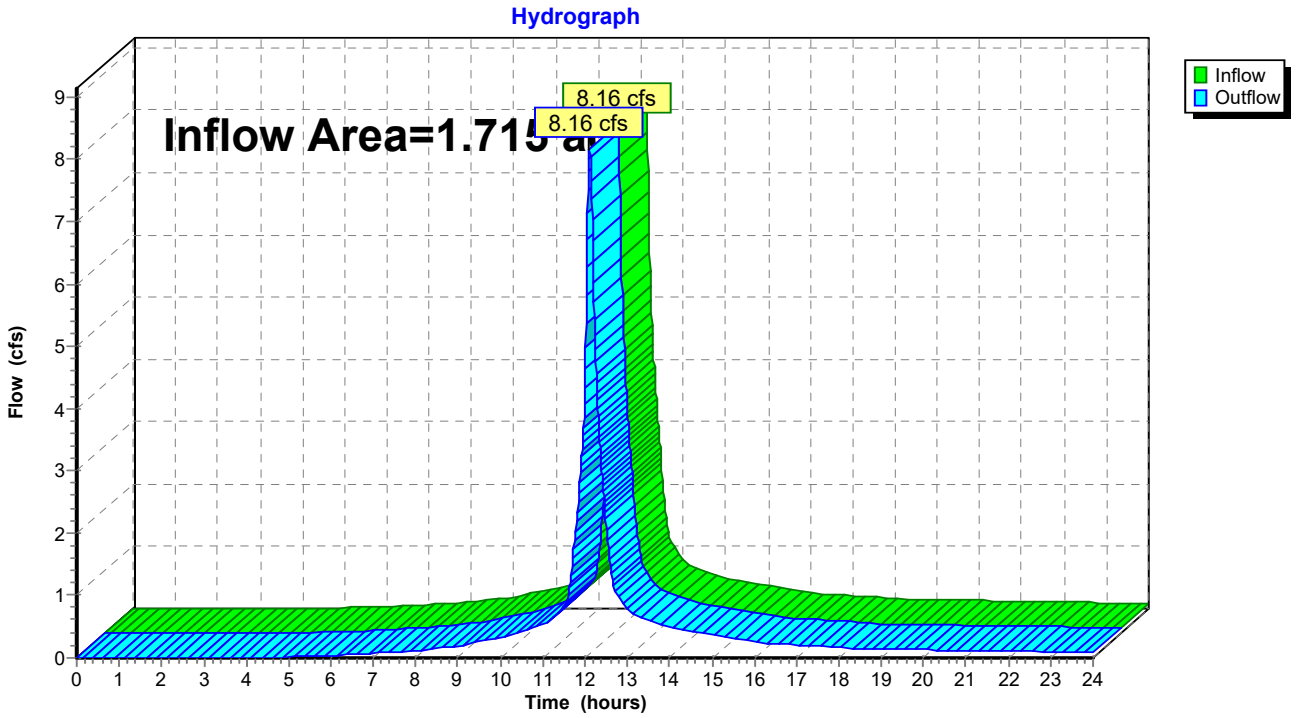
Summary for Reach AP 1: AP 1

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

Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 4.53" for 10 yr event
Inflow = 8.16 cfs @ 12.12 hrs, Volume= 0.648 af
Outflow = 8.16 cfs @ 12.12 hrs, Volume= 0.648 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP 1: AP 1



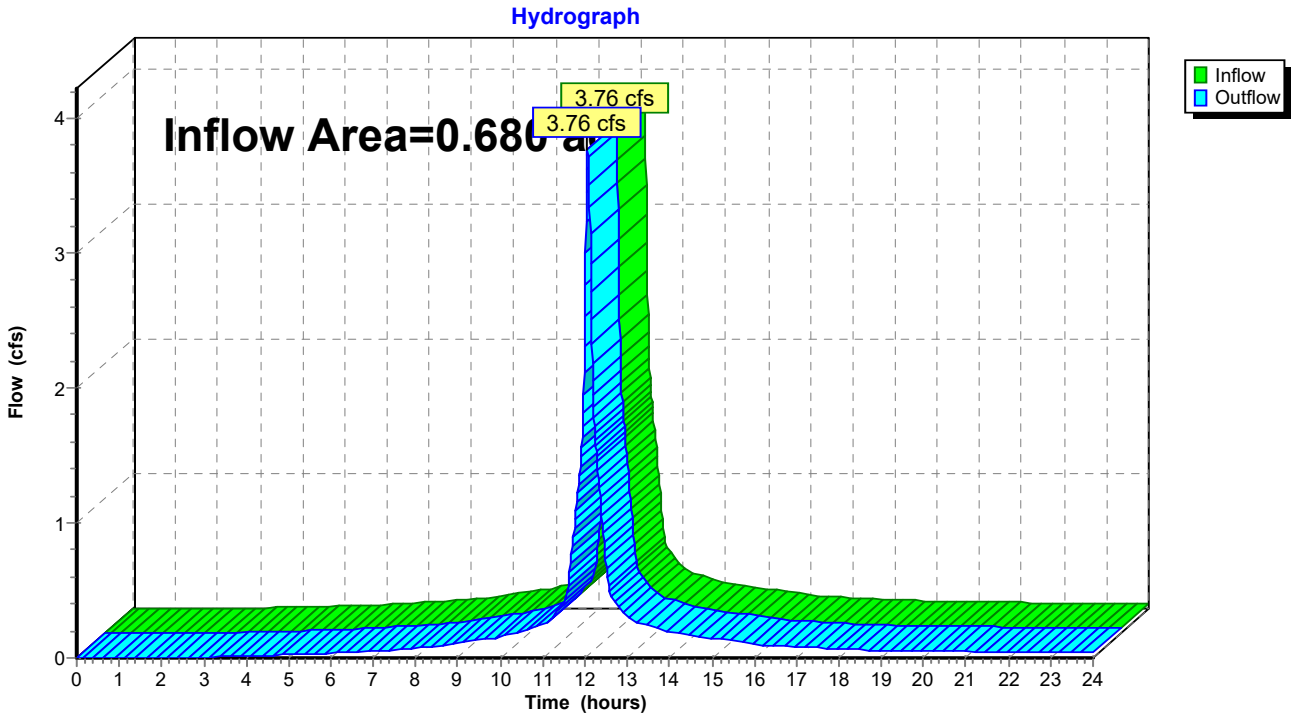
Summary for Reach AP2: AP2

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

Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 4.94" for 10 yr event
Inflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af
Outflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP2: AP2



Summary for Pond 1P: Stormwater Pond

Inflow Area = 1.425 ac, 61.01% Impervious, Inflow Depth > 4.49" for 10 yr event
Inflow = 6.81 cfs @ 12.10 hrs, Volume= 0.533 af
Outflow = 6.75 cfs @ 12.12 hrs, Volume= 0.531 af, Atten= 1%, Lag= 0.7 min
Primary = 0.30 cfs @ 12.12 hrs, Volume= 0.201 af
Secondary = 6.45 cfs @ 12.12 hrs, Volume= 0.331 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 94.28' @ 12.12 hrs Surf.Area= 1,066 sf Storage= 478 cf

Plug-Flow detention time=6.7 min calculated for 0.531 af (100% of inflow)
Center-of-Mass det. time=4.5 min (791.9 - 787.4)

Volume	Invert	Avail.Storage	Storage Description
#1	93.60'	1,541 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

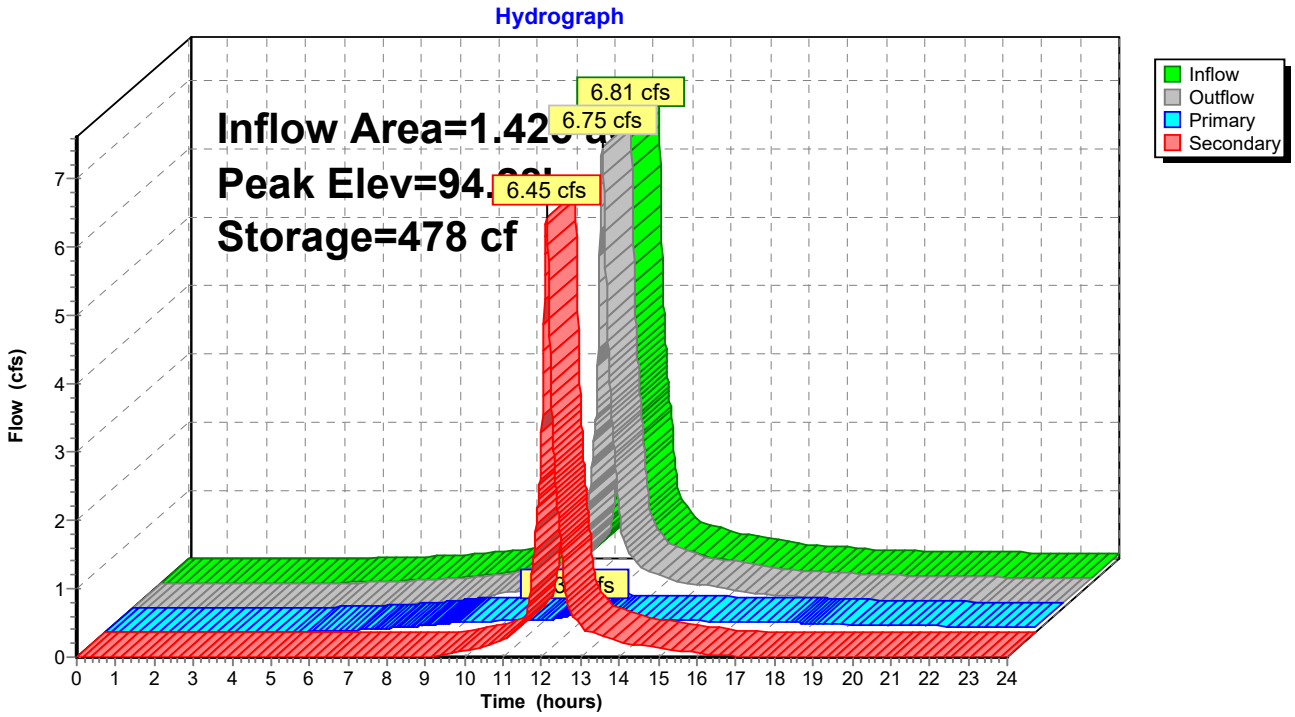
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.60	374	0	0
94.00	737	222	222
95.00	1,900	1,319	1,541

Device	Routing	Invert	Outlet Devices
#1	Primary	93.60'	**4.0" Round Culvert** L= 21.2' Ke= 0.500 Inlet / Outlet Invert= 93.60' / 92.24' S= 0.0642 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	93.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.30 cfs @ 12.12 hrs HW=94.28' TW=91.14' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.30 cfs @ 3.46 fps)

Secondary OutFlow Max=6.44 cfs @ 12.12 hrs HW=94.28' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 6.44 cfs @ 1.68 fps)

Pond 1P: Stormwater Pond



Summary for Pond CB1: CB1

[57] Hint: Peaked at 95.91' (Flood elevation advised)

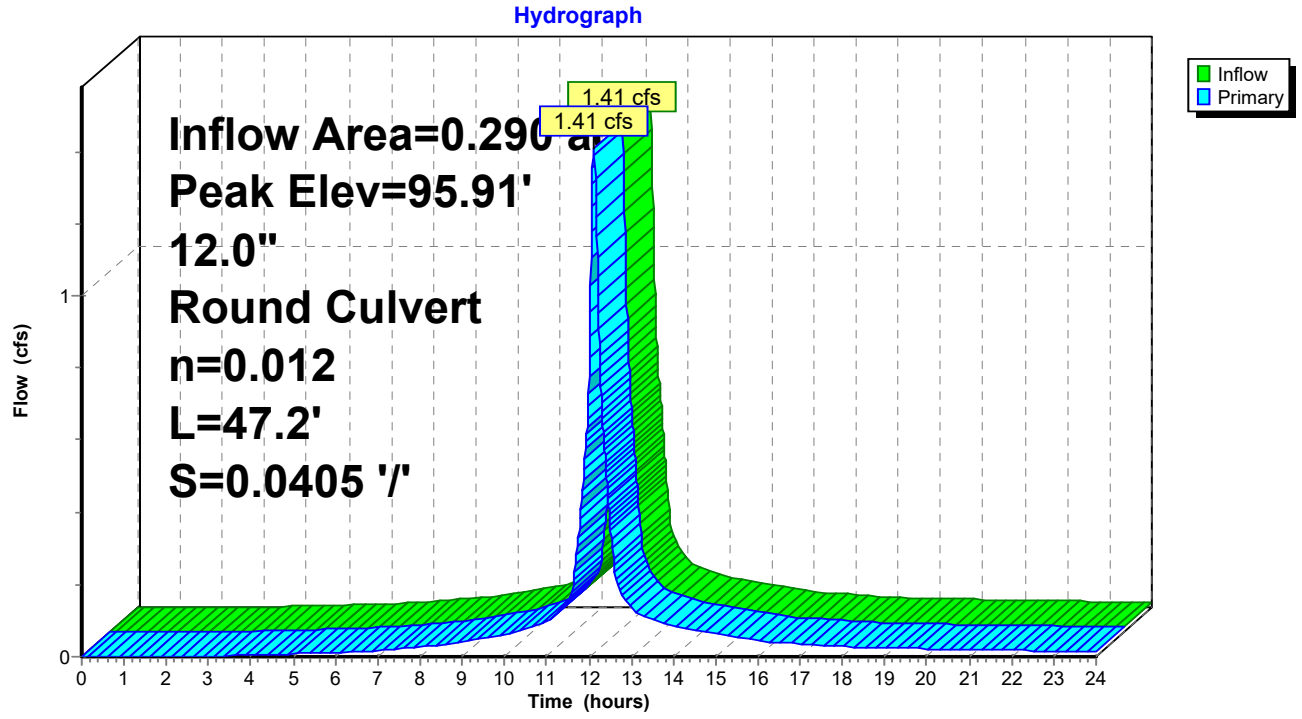
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 4.82" for 10 yr event
Inflow = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af
Outflow = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 95.91'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**12.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0405 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.41 cfs @ 12.12 hrs HW=95.91' TW=93.28' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.41 cfs @ 2.70 fps)

Pond CB1: CB1



Summary for Pond CB2: CB2

[57] Hint: Peaked at 97.37' (Flood elevation advised)

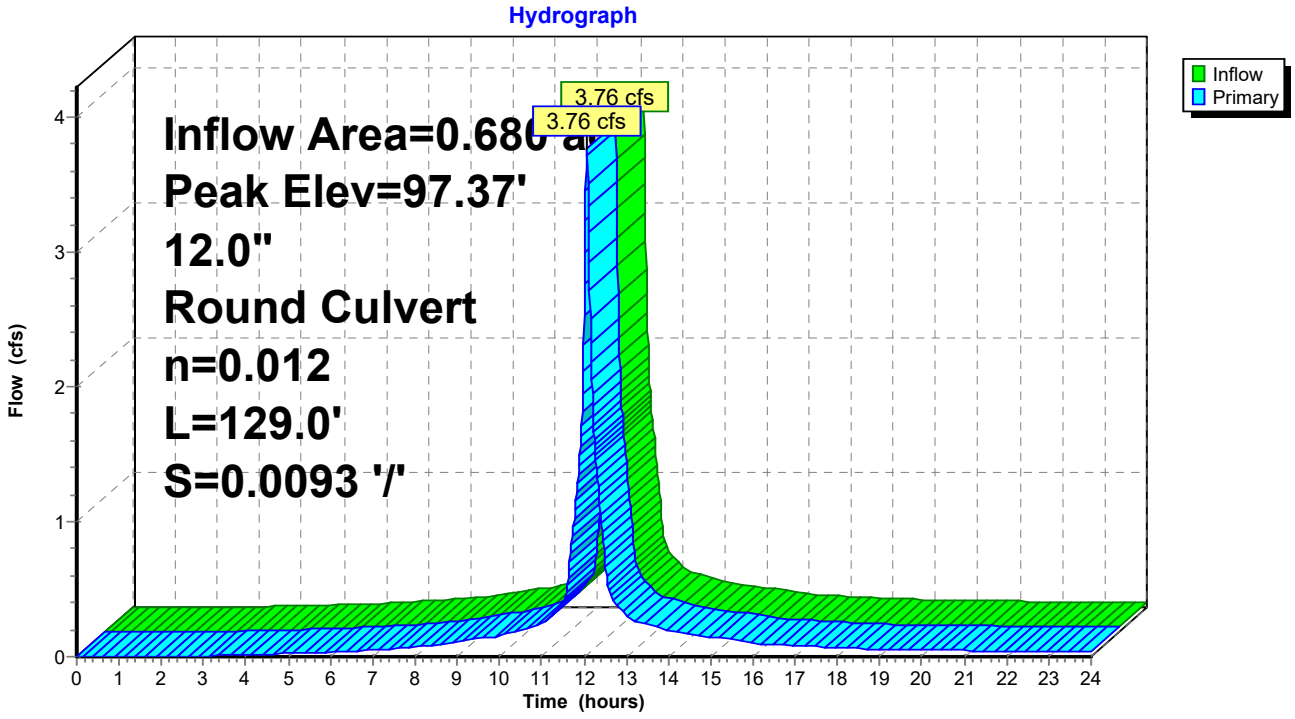
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 4.94" for 10 yr event
Inflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af
Outflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Primary = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 97.37' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=3.76 cfs @ 12.07 hrs HW=97.37' TW=95.60' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 3.76 cfs @ 4.79 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 95.60' (Flood elevation advised)

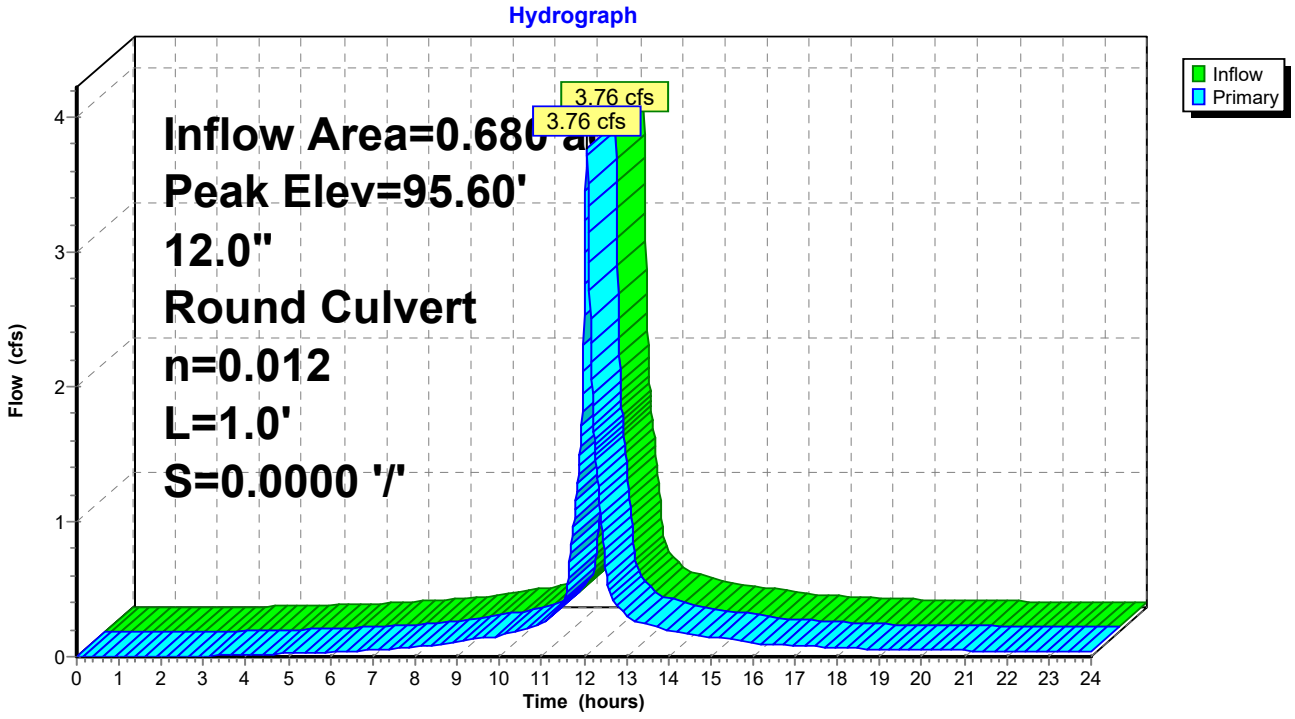
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 4.94" for 10 yr event
Inflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af
Outflow = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af, Atten= 0%, Lag= 0.0 min
Primary = 3.76 cfs @ 12.07 hrs, Volume= 0.280 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 95.60'@ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=3.76 cfs @ 12.07 hrs HW=95.60' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 3.76 cfs @ 4.79 fps)

Pond CB3: CB3



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.28' (Flood elevation advised)

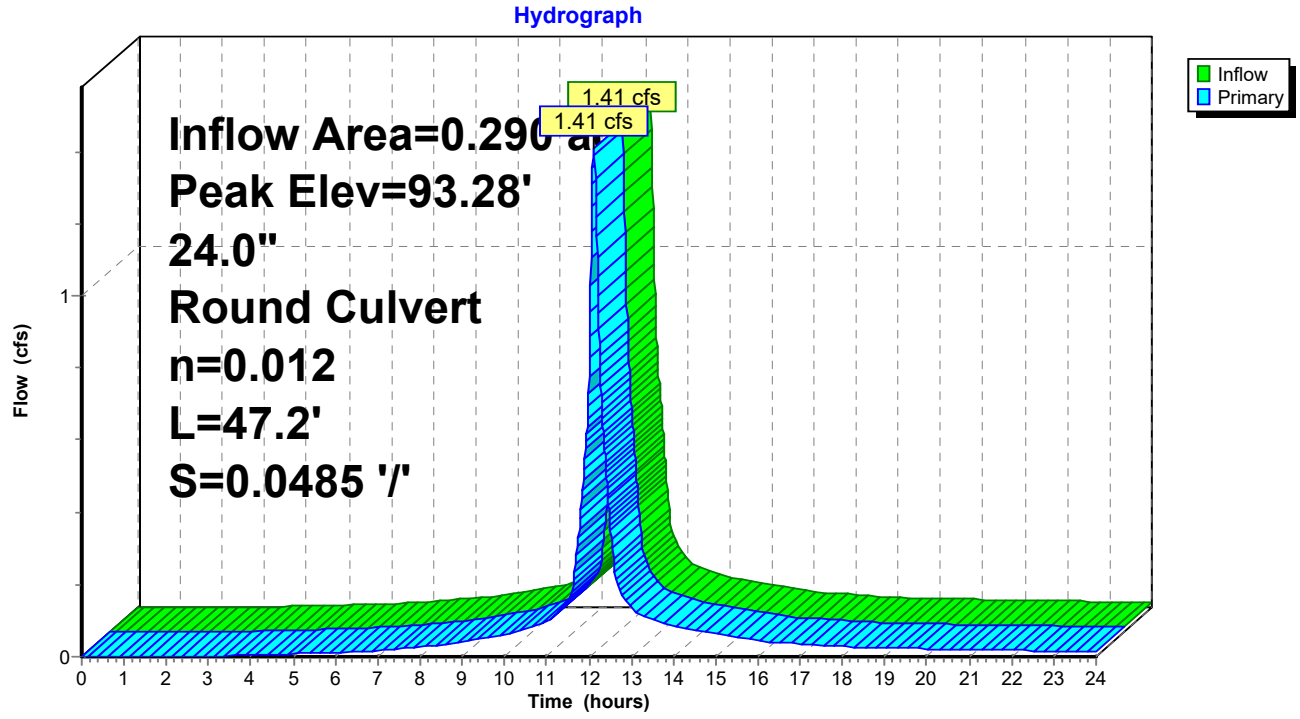
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 4.82" for 10 yr event
Inflow = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af
Outflow = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 1.41 cfs @ 12.12 hrs, Volume= 0.117 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 93.28' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=1.41 cfs @ 12.12 hrs HW=93.28' TW=91.14' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 1.41 cfs @ 2.38 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 91.14' (Flood elevation advised)

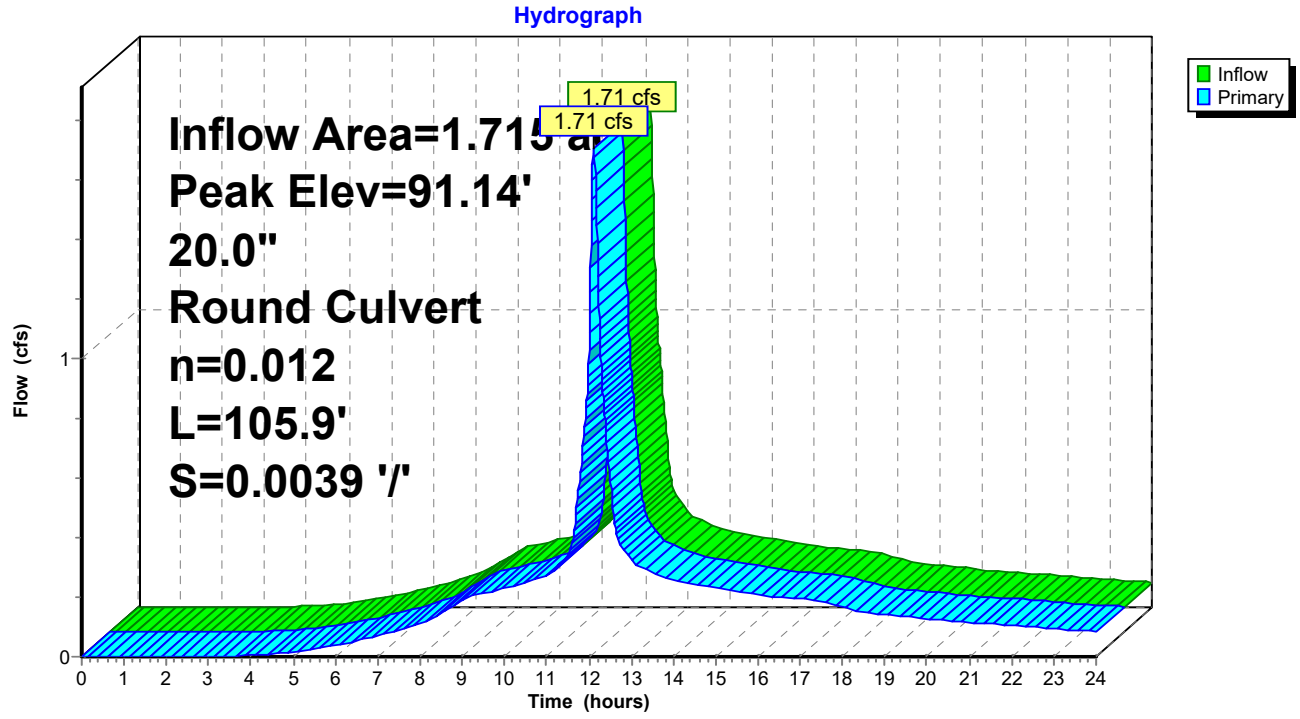
Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 2.22" for 10 yr event
Inflow = 1.71 cfs @ 12.12 hrs, Volume= 0.317 af
Outflow = 1.71 cfs @ 12.12 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min
Primary = 1.71 cfs @ 12.12 hrs, Volume= 0.317 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 91.14' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=1.71 cfs @ 12.12 hrs HW=91.14' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 1.71 cfs @ 3.10 fps)

Pond DMH2: DMH2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: West Site Runoff Area=62,055 sf 61.01% Impervious Runoff Depth>5.95"
Flow Length=350' Tc=7.6 min CN=90 Runoff=8.88 cfs 0.707 af

Subcatchment2S: South Site Runoff Area=29,613 sf 83.41% Impervious Runoff Depth>6.42"
Tc=5.0 min CN=94 Runoff=4.83 cfs 0.364 af

Subcatchment3S: East Site Runoff Area=12,646 sf 71.50% Impervious Runoff Depth>6.30"
Flow Length=288' Tc=8.5 min CN=93 Runoff=1.81 cfs 0.152 af

Reach AP 1: AP 1 Inflow=10.63 cfs 0.857 af
Outflow=10.63 cfs 0.857 af

Reach AP2: AP2 Inflow=4.83 cfs 0.364 af
Outflow=4.83 cfs 0.364 af

Pond 1P: Stormwater Pond Peak Elev=94.36' Storage=562 cf Inflow=8.88 cfs 0.707 af
Primary=0.32 cfs 0.232 af Secondary=8.49 cfs 0.472 af Outflow=8.81 cfs 0.705 af

Pond CB1: CB1 Peak Elev=96.02' Inflow=1.81 cfs 0.152 af
12.0" Round Culvert n=0.012 L=47.2' S=0.0405 '/' Outflow=1.81 cfs 0.152 af

Pond CB2: CB2 Peak Elev=99.09' Inflow=4.83 cfs 0.364 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=4.83 cfs 0.364 af

Pond CB3: CB3 Peak Elev=96.19' Inflow=4.83 cfs 0.364 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=4.83 cfs 0.364 af

Pond DMH1: DMH1 Peak Elev=93.35' Inflow=1.81 cfs 0.152 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=1.81 cfs 0.152 af

Pond DMH2: DMH2 Peak Elev=91.22' Inflow=2.14 cfs 0.385 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=2.14 cfs 0.385 af

Total Runoff Area = 2.395 ac Runoff Volume = 1.223 af Average Runoff Depth = 6.13"
31.36% Pervious = 0.751 ac 68.64% Impervious = 1.644 ac

Summary for Subcatchment 1S: West Site

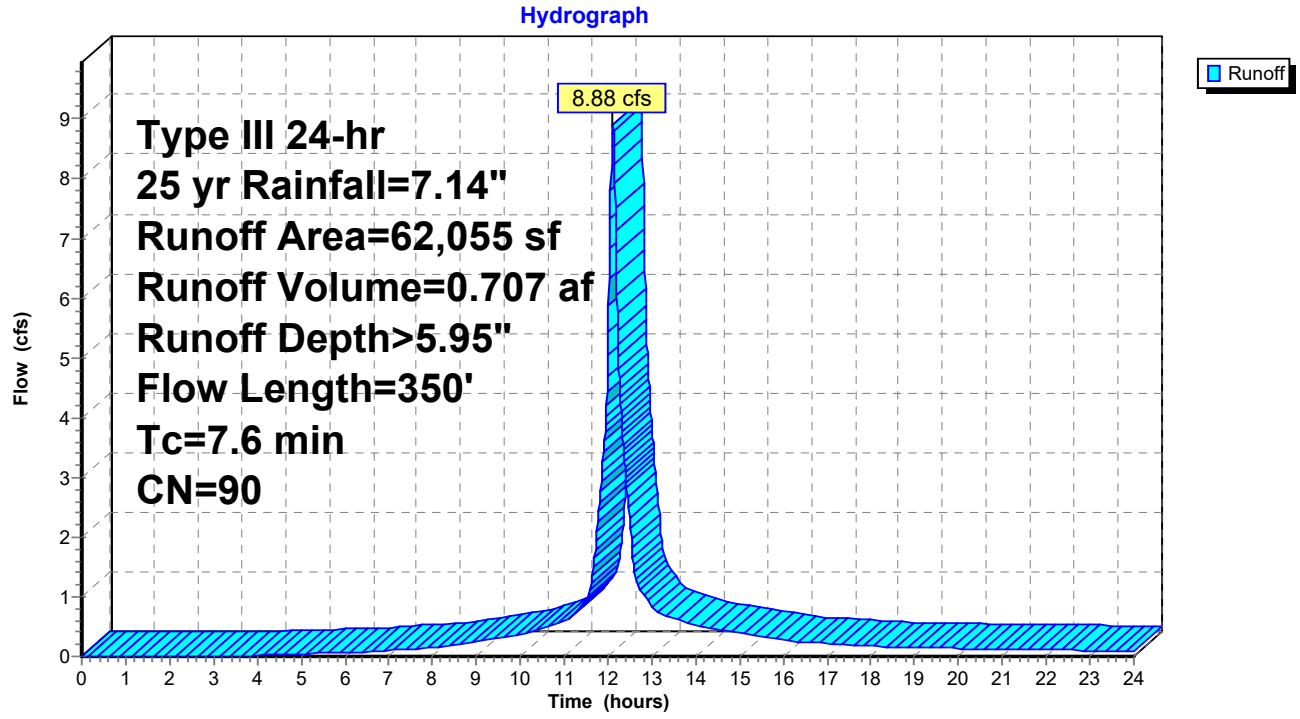
Runoff = 8.88 cfs @ 12.10 hrs, Volume= 0.707 af, Depth> 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

	Area (sf)	CN	Description
	19,963	74	>75% Grass cover, Good, HSG C
	15,667	98	Roofs, HSG C
	4,231	96	Gravel surface, HSG C
	21,772	98	Paved roads w/curbs & sewers, HSG C
*	315	98	Concrete, HSG C
*	107	98	Granite Curb, HSG C
	62,055	90	Weighted Average
	24,194		38.99% Pervious Area
	37,861		61.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.6	350	Total			

Subcatchment 1S: West Site



Summary for Subcatchment 2S: South Site

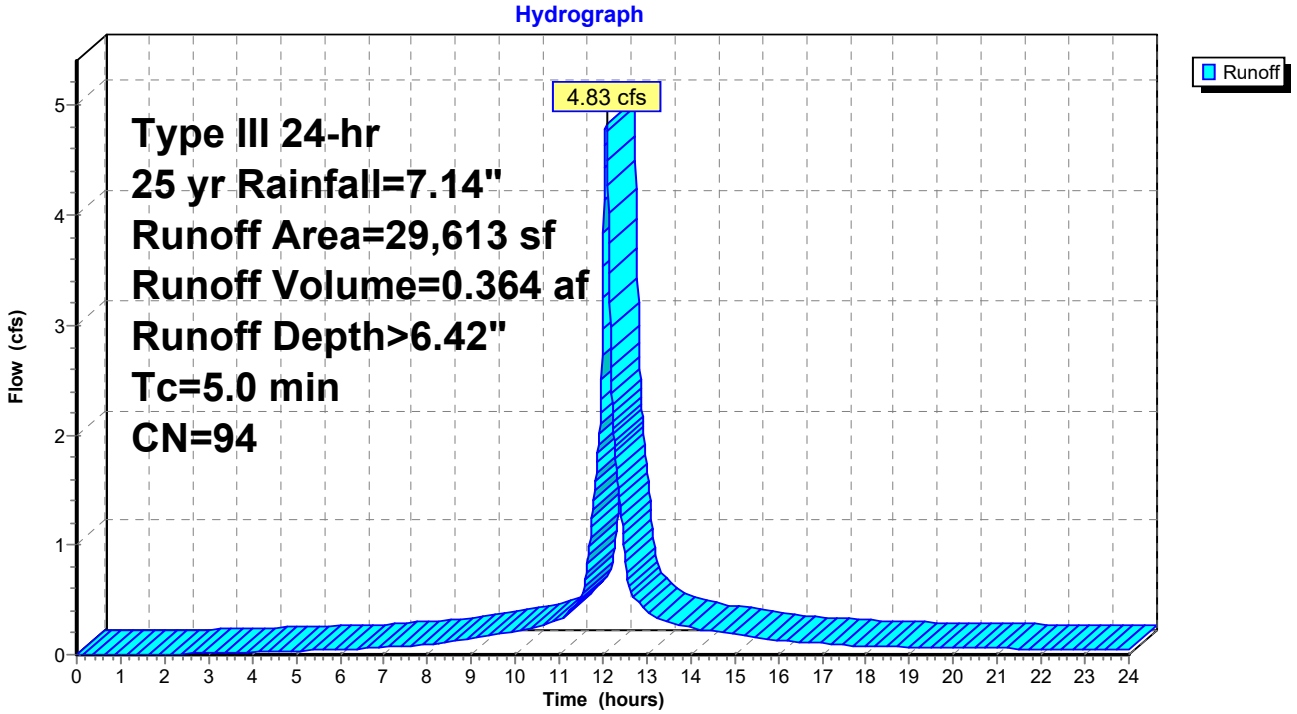
Runoff = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af, Depth> 6.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

Area (sf)	CN	Description
4,910	74	>75% Grass cover, Good, HSG C
3	96	Gravel surface, HSG C
24,700	98	Paved roads w/curbs & sewers, HSG C
29,613	94	Weighted Average
4,913		16.59% Pervious Area
24,700		83.41% Impervious Area

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

Subcatchment 2S: South Site



Summary for Subcatchment 3S: East Site

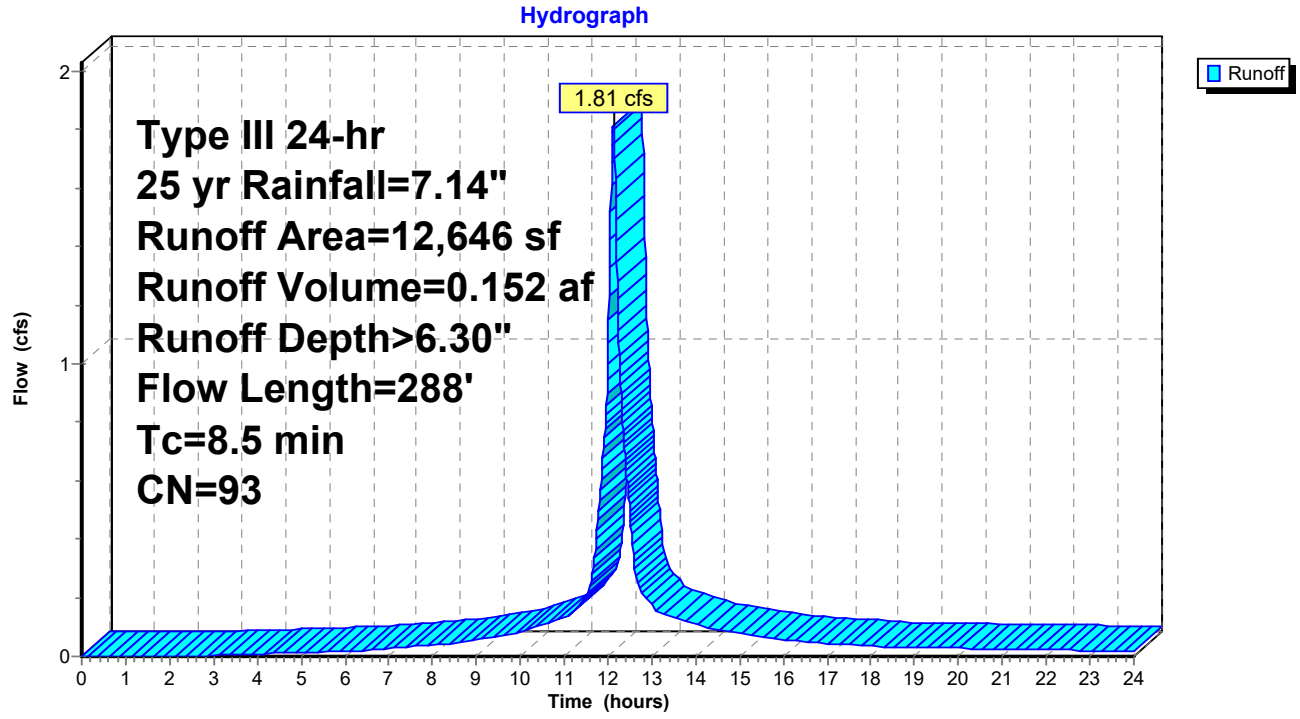
Runoff = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af, Depth> 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

Area (sf)	CN	Description
2,426	74	>75% Grass cover, Good, HSG C
1,845	98	Roofs, HSG C
1,178	96	Gravel surface, HSG C
7,197	98	Paved roads w/curbs & sewers, HSG C
12,646	93	Weighted Average
3,604		28.50% Pervious Area
9,042		71.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	237	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	288	Total			

Subcatchment 3S: East Site



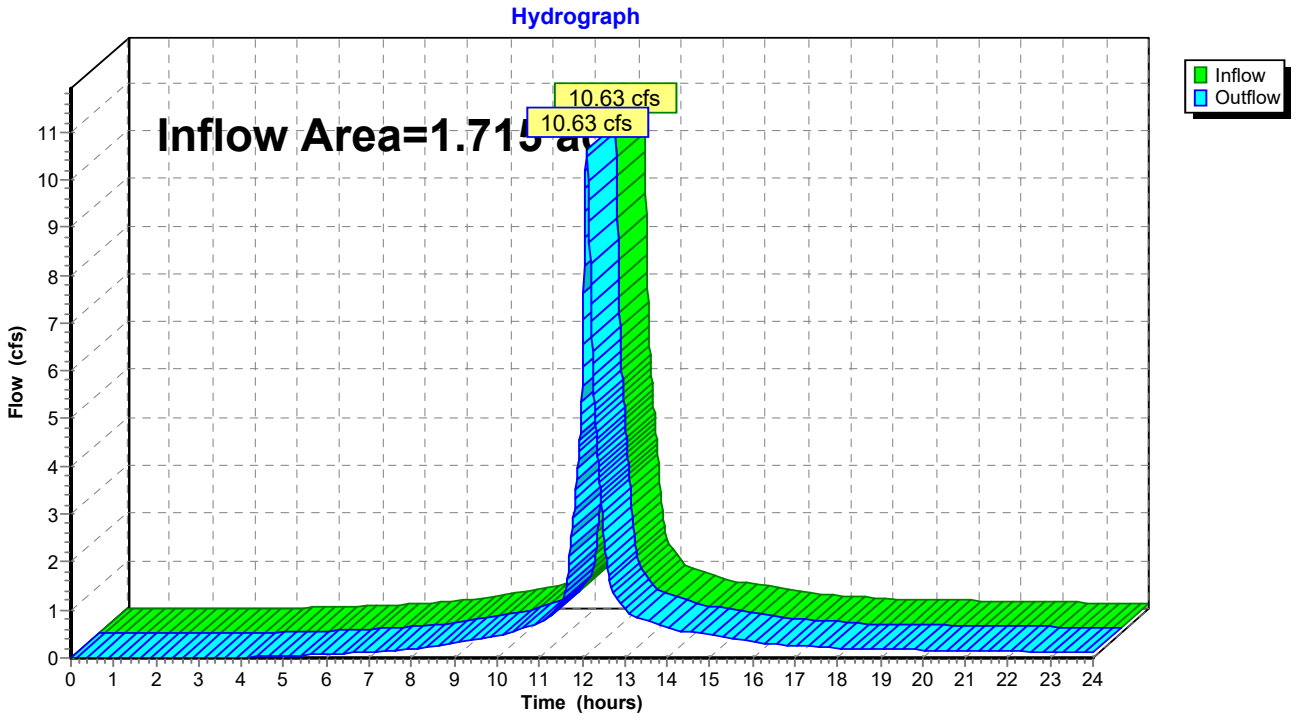
Summary for Reach AP 1: AP 1

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

Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 6.00" for 25 yr event
Inflow = 10.63 cfs @ 12.12 hrs, Volume= 0.857 af
Outflow = 10.63 cfs @ 12.12 hrs, Volume= 0.857 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP 1: AP 1



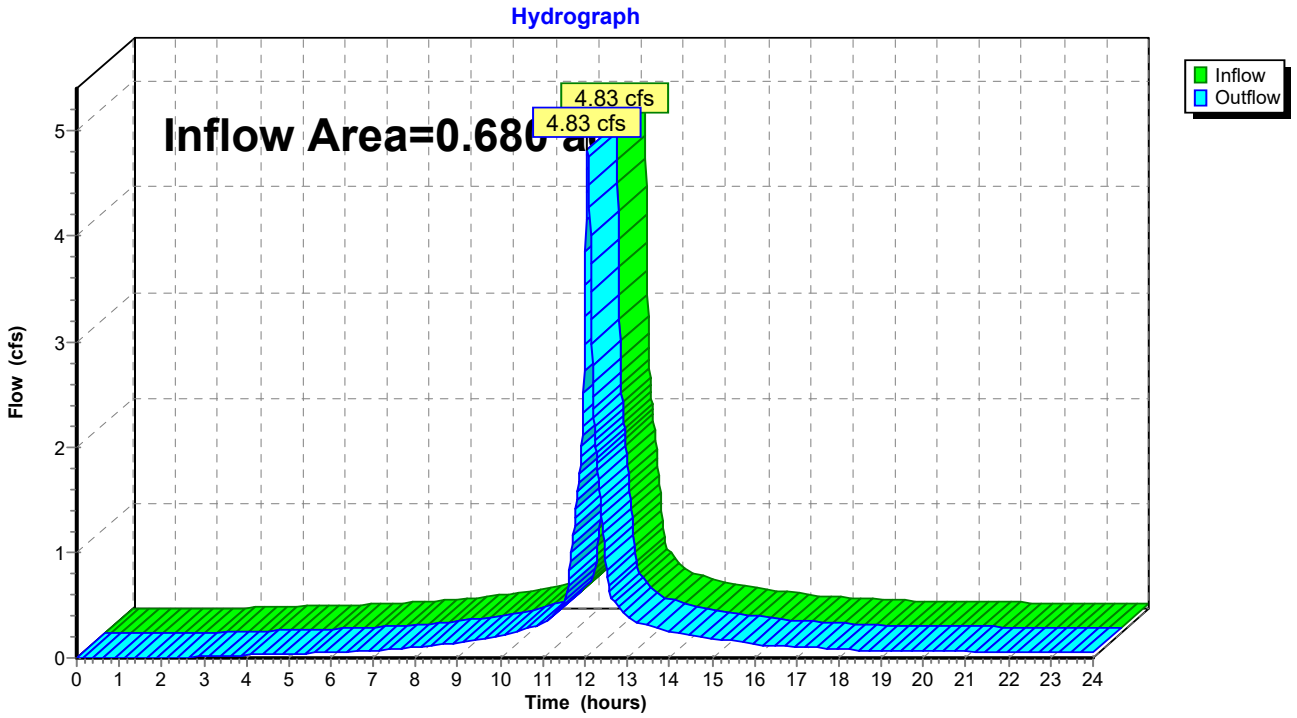
Summary for Reach AP2: AP2

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

Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 6.42" for 25 yr event
Inflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af
Outflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP2: AP2



Summary for Pond 1P: Stormwater Pond

Inflow Area = 1.425 ac, 61.01% Impervious, Inflow Depth > 5.95" for 25 yr event
Inflow = 8.88 cfs @ 12.10 hrs, Volume= 0.707 af
Outflow = 8.81 cfs @ 12.12 hrs, Volume= 0.705 af, Atten= 1%, Lag= 0.7 min
Primary = 0.32 cfs @ 12.12 hrs, Volume= 0.232 af
Secondary = 8.49 cfs @ 12.12 hrs, Volume= 0.472 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 94.36' @ 12.12 hrs Surf.Area= 1,155 sf Storage= 562 cf

Plug-Flow detention time=5.9 min calculated for 0.705 af (100% of inflow)
Center-of-Mass det. time=3.8 min (783.8 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	93.60'	1,541 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

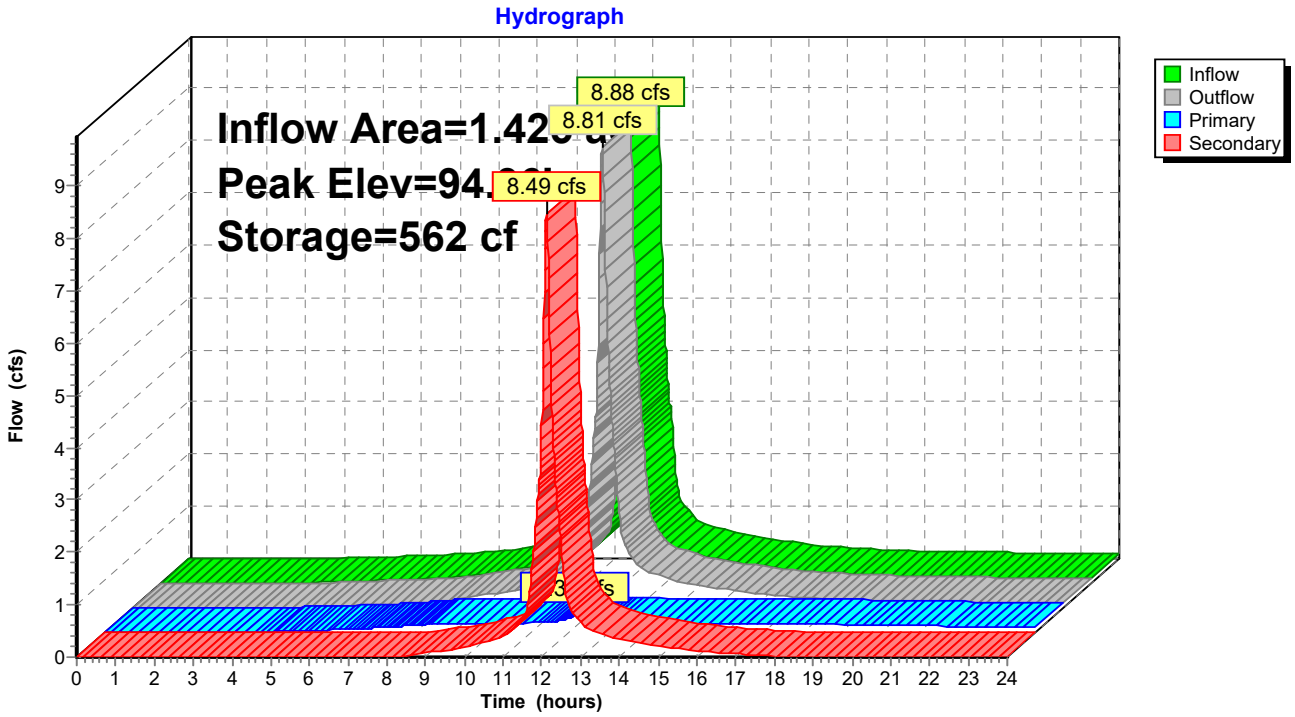
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.60	374	0	0
94.00	737	222	222
95.00	1,900	1,319	1,541

Device	Routing	Invert	Outlet Devices
#1	Primary	93.60'	**4.0" Round Culvert** L= 21.2' Ke= 0.500 Inlet / Outlet Invert= 93.60' / 92.24' S= 0.0642 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	93.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.32 cfs @ 12.12 hrs HW=94.36' TW=91.22' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.32 cfs @ 3.70 fps)

Secondary OutFlow Max=8.48 cfs @ 12.12 hrs HW=94.36' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 8.48 cfs @ 1.85 fps)

Pond 1P: Stormwater Pond



Summary for Pond CB1: CB1

[57] Hint: Peaked at 96.02' (Flood elevation advised)

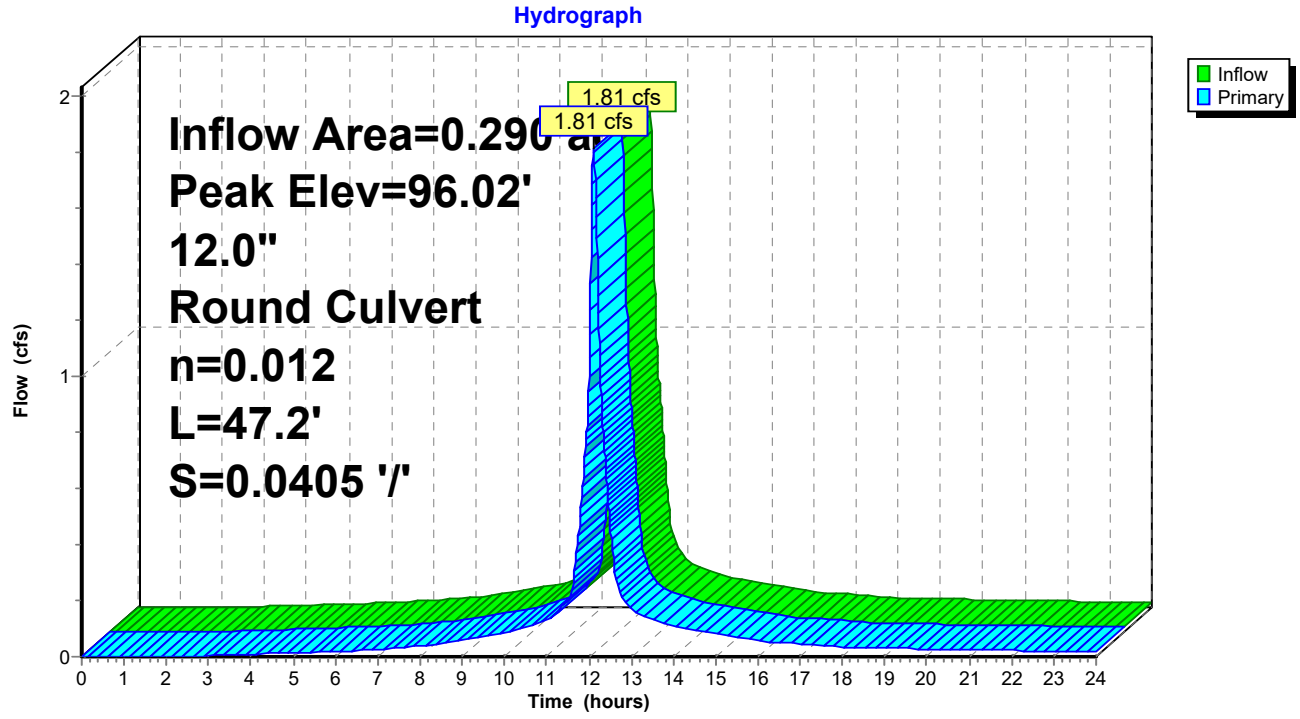
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 6.30" for 25 yr event
Inflow = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af
Outflow = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 96.02' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**12.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0405 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.81 cfs @ 12.12 hrs HW=96.02' TW=93.35' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.81 cfs @ 2.92 fps)

Pond CB1: CB1



Summary for Pond CB2: CB2

[57] Hint: Peaked at 99.09' (Flood elevation advised)

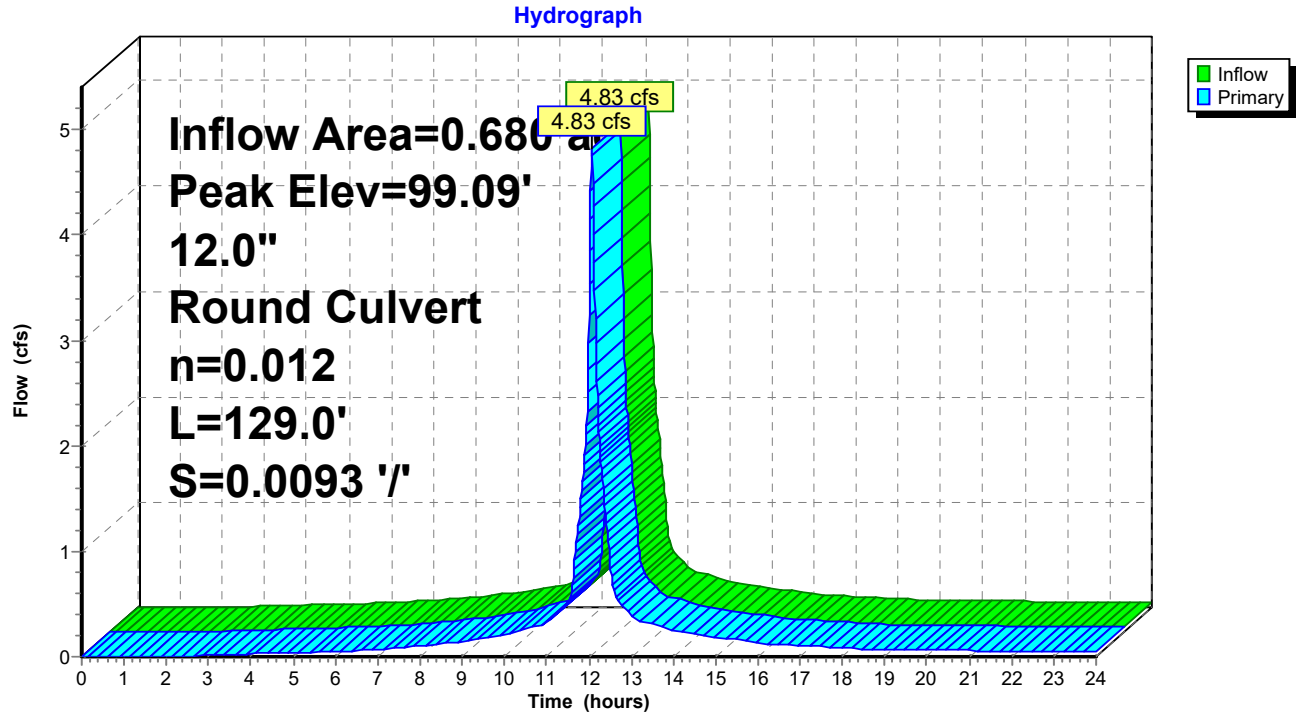
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 6.42" for 25 yr event
Inflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af
Outflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min
Primary = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 99.09' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=4.82 cfs @ 12.07 hrs HW=99.09' TW=96.19' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 4.82 cfs @ 6.14 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 96.19' (Flood elevation advised)

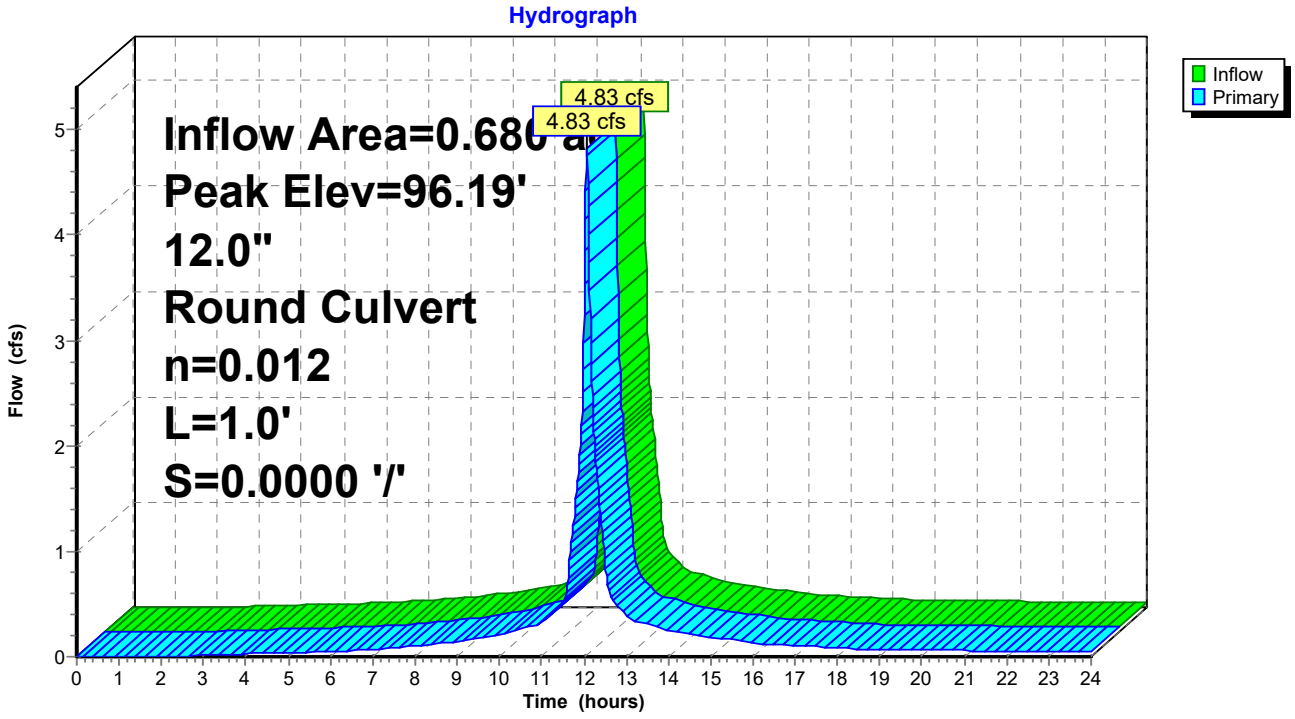
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 6.42" for 25 yr event
Inflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af
Outflow = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.0 min
Primary = 4.83 cfs @ 12.07 hrs, Volume= 0.364 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 96.19' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=4.82 cfs @ 12.07 hrs HW=96.19' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 4.82 cfs @ 6.14 fps)

Pond CB3: CB3



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.35' (Flood elevation advised)

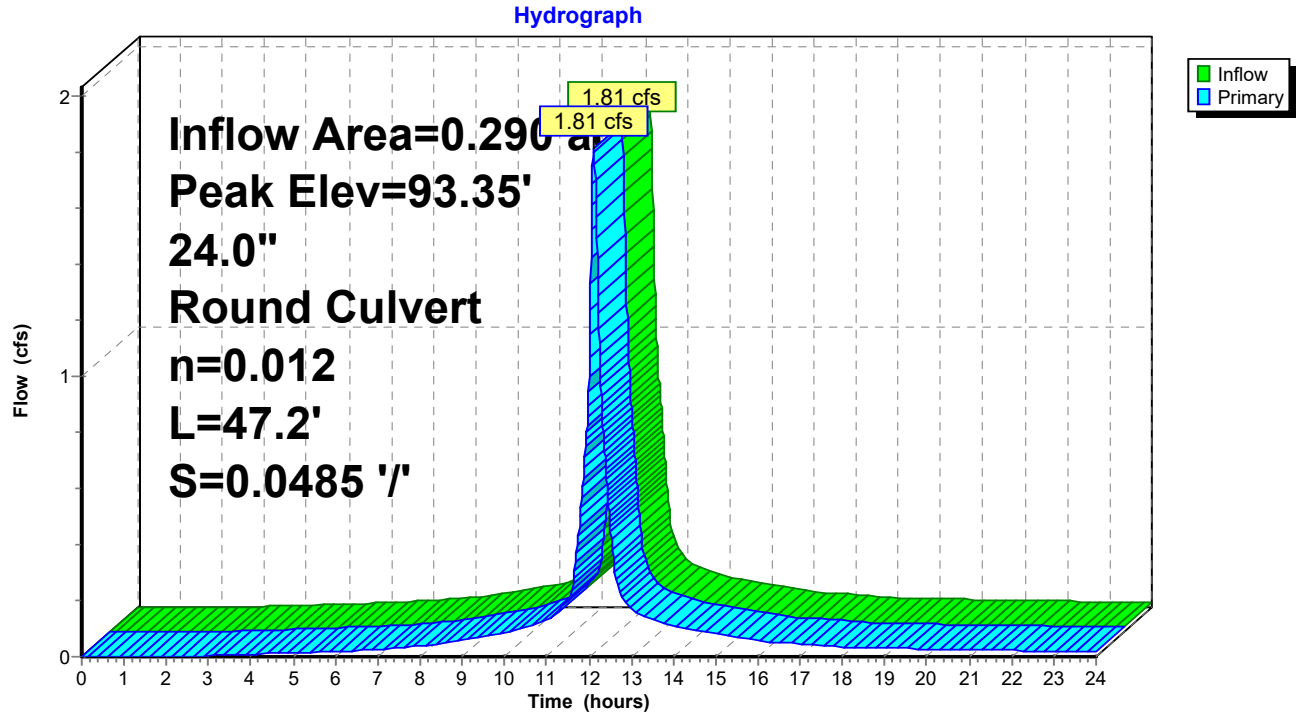
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 6.30" for 25 yr event
Inflow = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af
Outflow = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min
Primary = 1.81 cfs @ 12.12 hrs, Volume= 0.152 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 93.35'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=1.81 cfs @ 12.12 hrs HW=93.35' TW=91.22' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.81 cfs @ 2.54 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 91.22' (Flood elevation advised)

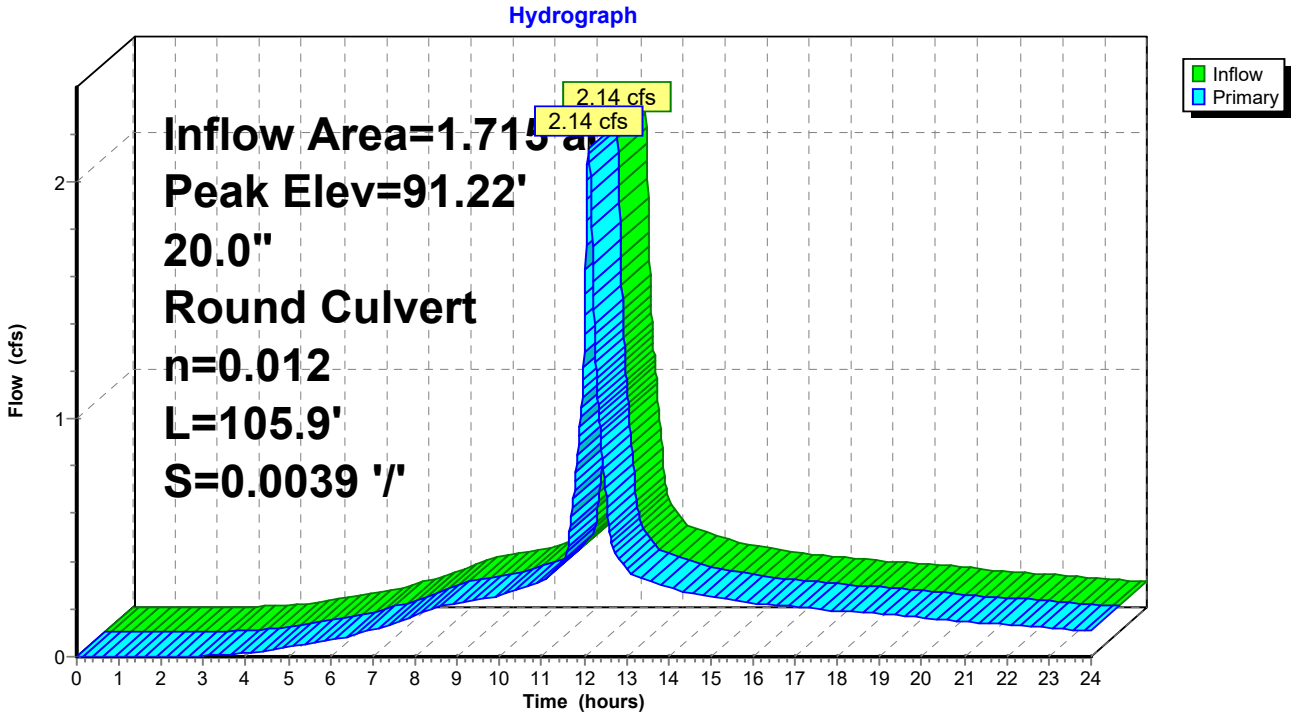
Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 2.69" for 25 yr event
Inflow = 2.14 cfs @ 12.12 hrs, Volume= 0.385 af
Outflow = 2.14 cfs @ 12.12 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.0 min
Primary = 2.14 cfs @ 12.12 hrs, Volume= 0.385 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 91.22' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=2.14 cfs @ 12.12 hrs HW=91.22' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 2.14 cfs @ 3.28 fps)

Pond DMH2: DMH2



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: West Site Runoff Area=62,055 sf 61.01% Impervious Runoff Depth>7.35"
Flow Length=350' Tc=7.6 min CN=90 Runoff=10.84 cfs 0.872 af

Subcatchment2S: South Site Runoff Area=29,613 sf 83.41% Impervious Runoff Depth>7.83"
Tc=5.0 min CN=94 Runoff=5.83 cfs 0.444 af

Subcatchment3S: East Site Runoff Area=12,646 sf 71.50% Impervious Runoff Depth>7.71"
Flow Length=288' Tc=8.5 min CN=93 Runoff=2.20 cfs 0.187 af

Reach AP 1: AP 1 Inflow=12.94 cfs 1.056 af
Outflow=12.94 cfs 1.056 af

Reach AP2: AP2 Inflow=5.83 cfs 0.444 af
Outflow=5.83 cfs 0.444 af

Pond 1P: Stormwater Pond Peak Elev=94.42' Storage=640 cf Inflow=10.84 cfs 0.872 af
Primary=0.34 cfs 0.257 af Secondary=10.41 cfs 0.613 af Outflow=10.75 cfs 0.870 af

Pond CB1: CB1 Peak Elev=96.12' Inflow=2.20 cfs 0.187 af
12.0" Round Culvert n=0.012 L=47.2' S=0.0405 '/' Outflow=2.20 cfs 0.187 af

Pond CB2: CB2 Peak Elev=101.16' Inflow=5.83 cfs 0.444 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=5.83 cfs 0.444 af

Pond CB3: CB3 Peak Elev=96.93' Inflow=5.83 cfs 0.444 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=5.83 cfs 0.444 af

Pond DMH1: DMH1 Peak Elev=93.41' Inflow=2.20 cfs 0.187 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=2.20 cfs 0.187 af

Pond DMH2: DMH2 Peak Elev=91.30' Inflow=2.54 cfs 0.443 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=2.54 cfs 0.443 af

Total Runoff Area = 2.395 ac Runoff Volume = 1.503 af Average Runoff Depth = 7.53"
31.36% Pervious = 0.751 ac 68.64% Impervious = 1.644 ac

Summary for Subcatchment 1S: West Site

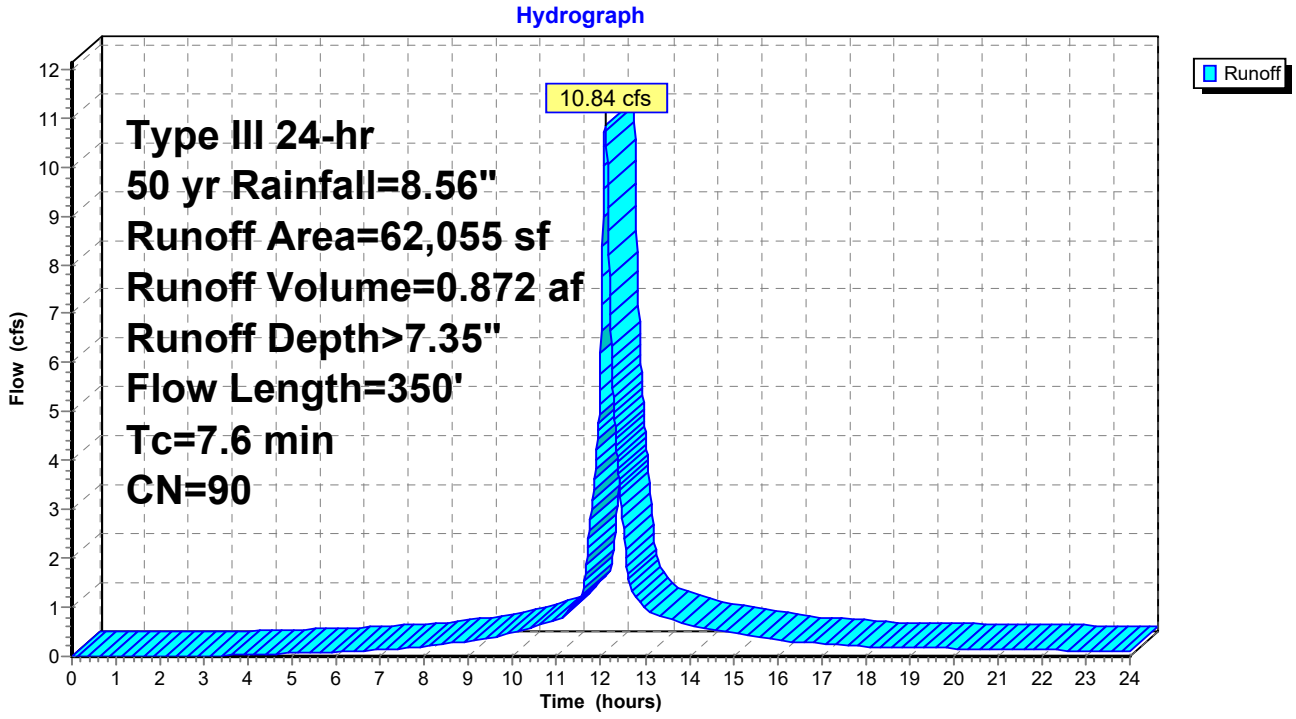
Runoff = 10.84 cfs @ 12.10 hrs, Volume= 0.872 af, Depth> 7.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

	Area (sf)	CN	Description
	19,963	74	>75% Grass cover, Good, HSG C
	15,667	98	Roofs, HSG C
	4,231	96	Gravel surface, HSG C
	21,772	98	Paved roads w/curbs & sewers, HSG C
*	315	98	Concrete, HSG C
*	107	98	Granite Curb, HSG C
	62,055	90	Weighted Average
	24,194		38.99% Pervious Area
	37,861		61.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.7	300	0.0150	1.84		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.6	350	Total			

Subcatchment 1S: West Site



Summary for Subcatchment 2S: South Site

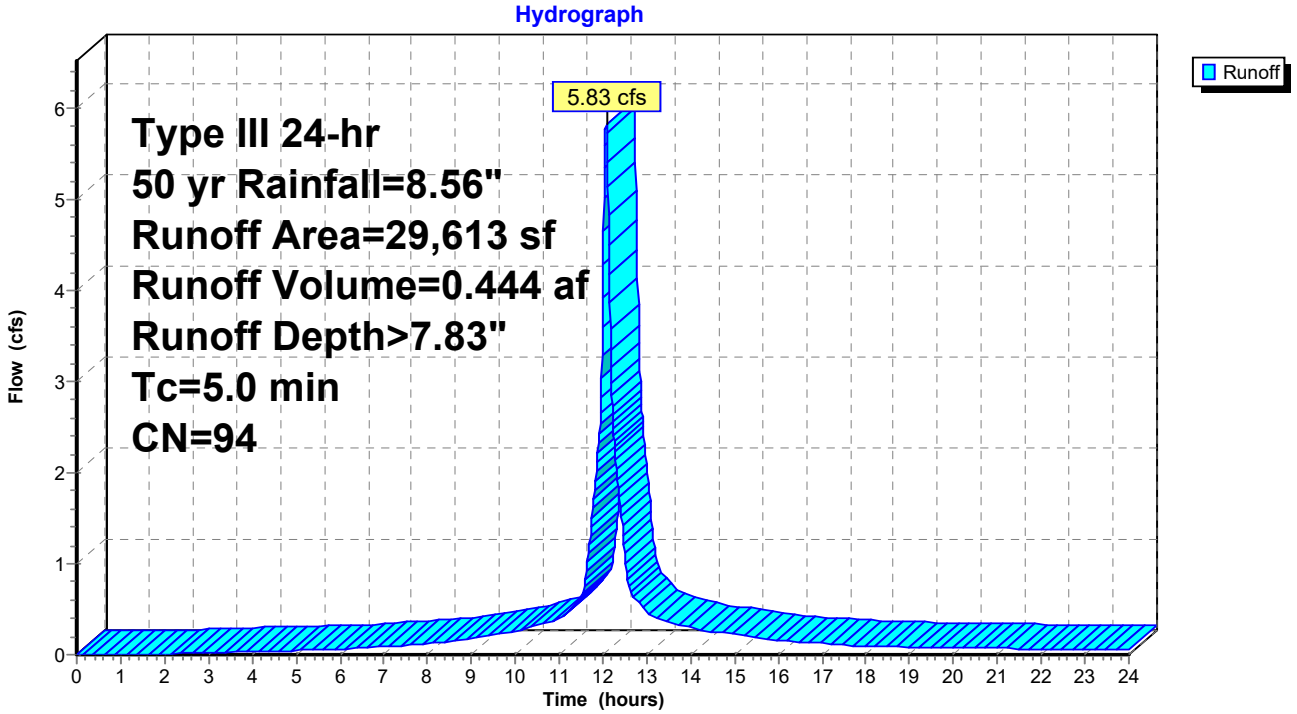
Runoff = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af, Depth> 7.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

Area (sf)	CN	Description
4,910	74	>75% Grass cover, Good, HSG C
3	96	Gravel surface, HSG C
24,700	98	Paved roads w/curbs & sewers, HSG C
29,613	94	Weighted Average
4,913		16.59% Pervious Area
24,700		83.41% Impervious Area

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

Subcatchment 2S: South Site



Summary for Subcatchment 3S: East Site

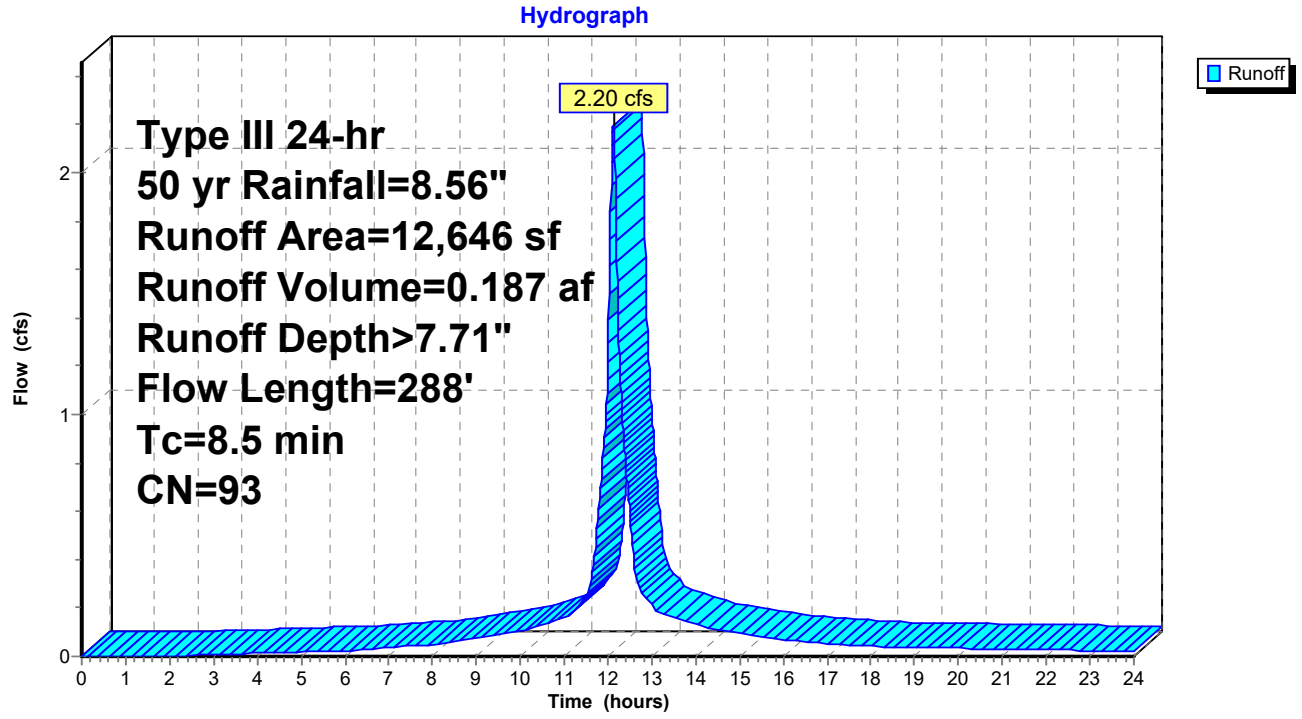
Runoff = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af, Depth> 7.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

Area (sf)	CN	Description
2,426	74	>75% Grass cover, Good, HSG C
1,845	98	Roofs, HSG C
1,178	96	Gravel surface, HSG C
7,197	98	Paved roads w/curbs & sewers, HSG C
12,646	93	Weighted Average
3,604		28.50% Pervious Area
9,042		71.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
3.7	237	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.5	288	Total			

Subcatchment 3S: East Site



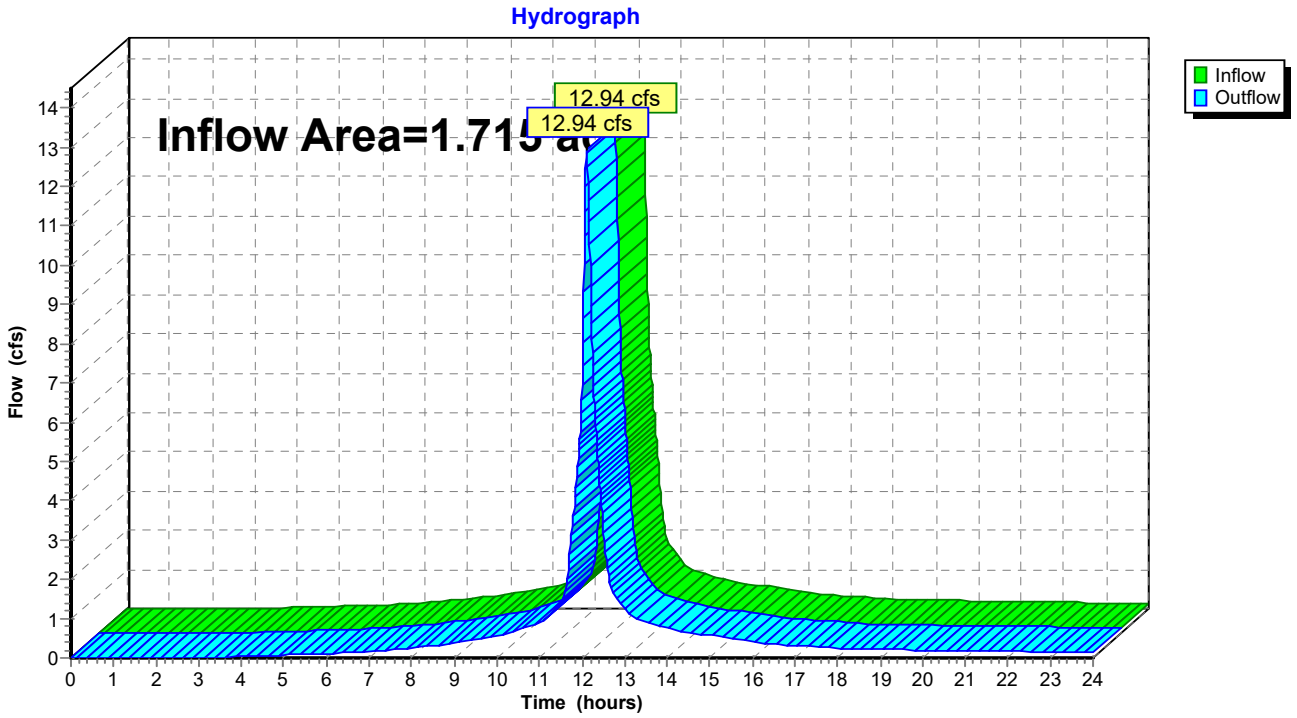
Summary for Reach AP 1: AP 1

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

Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 7.39" for 50 yr event
Inflow = 12.94 cfs @ 12.12 hrs, Volume= 1.056 af
Outflow = 12.94 cfs @ 12.12 hrs, Volume= 1.056 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP 1: AP 1



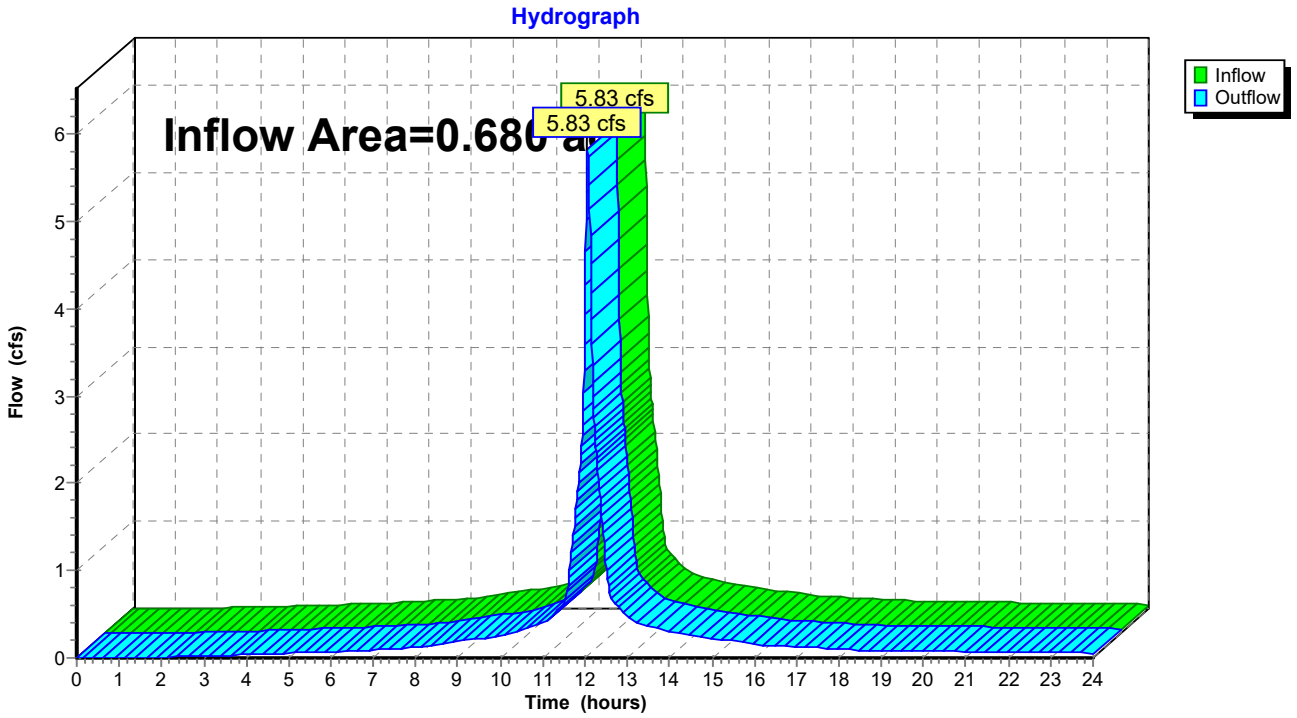
Summary for Reach AP2: AP2

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

Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 7.83" for 50 yr event
Inflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af
Outflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Reach AP2: AP2



Summary for Pond 1P: Stormwater Pond

Inflow Area = 1.425 ac, 61.01% Impervious, Inflow Depth > 7.35" for 50 yr event
Inflow = 10.84 cfs @ 12.10 hrs, Volume= 0.872 af
Outflow = 10.75 cfs @ 12.12 hrs, Volume= 0.870 af, Atten= 1%, Lag= 0.7 min
Primary = 0.34 cfs @ 12.12 hrs, Volume= 0.257 af
Secondary = 10.41 cfs @ 12.12 hrs, Volume= 0.613 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 94.42' @ 12.12 hrs Surf.Area= 1,231 sf Storage= 640 cf

Plug-Flow detention time=5.2 min calculated for 0.870 af (100% of inflow)
Center-of-Mass det. time=3.3 min (778.0 - 774.7)

Volume	Invert	Avail.Storage	Storage Description
#1	93.60'	1,541 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

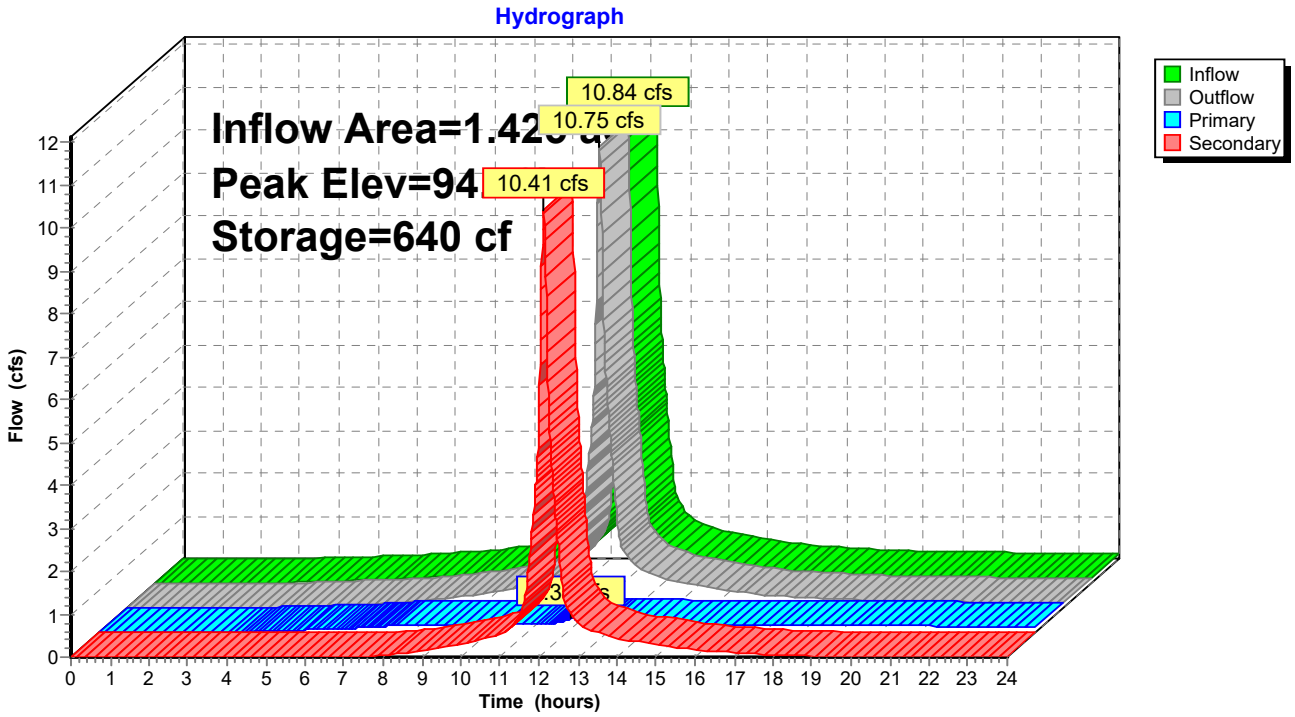
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
93.60	374	0	0
94.00	737	222	222
95.00	1,900	1,319	1,541

Device	Routing	Invert	Outlet Devices
#1	Primary	93.60'	**4.0" Round Culvert** L= 21.2' Ke= 0.500 Inlet / Outlet Invert= 93.60' / 92.24' S= 0.0642 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.09 sf
#2	Secondary	93.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=0.34 cfs @ 12.12 hrs HW=94.42' TW=91.30' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.34 cfs @ 3.90 fps)

Secondary OutFlow Max=10.39 cfs @ 12.12 hrs HW=94.42' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 10.39 cfs @ 1.98 fps)

Pond 1P: Stormwater Pond



Summary for Pond CB1: CB1

[57] Hint: Peaked at 96.12' (Flood elevation advised)

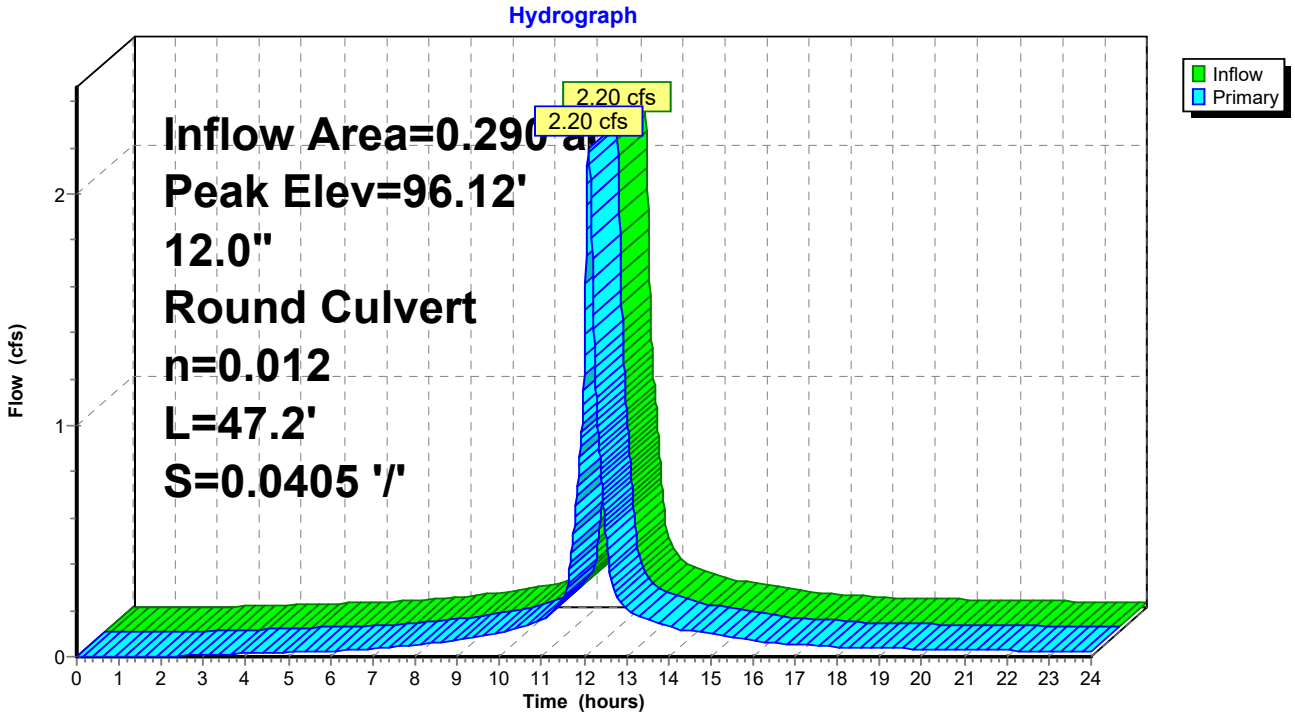
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 7.71" for 50 yr event
Inflow = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af
Outflow = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min
Primary = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 96.12' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**12.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0405 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=2.19 cfs @ 12.12 hrs HW=96.12' TW=93.41' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.19 cfs @ 3.12 fps)

Pond CB1: CB1



Summary for Pond CB2: CB2

[57] Hint: Peaked at 101.16' (Flood elevation advised)

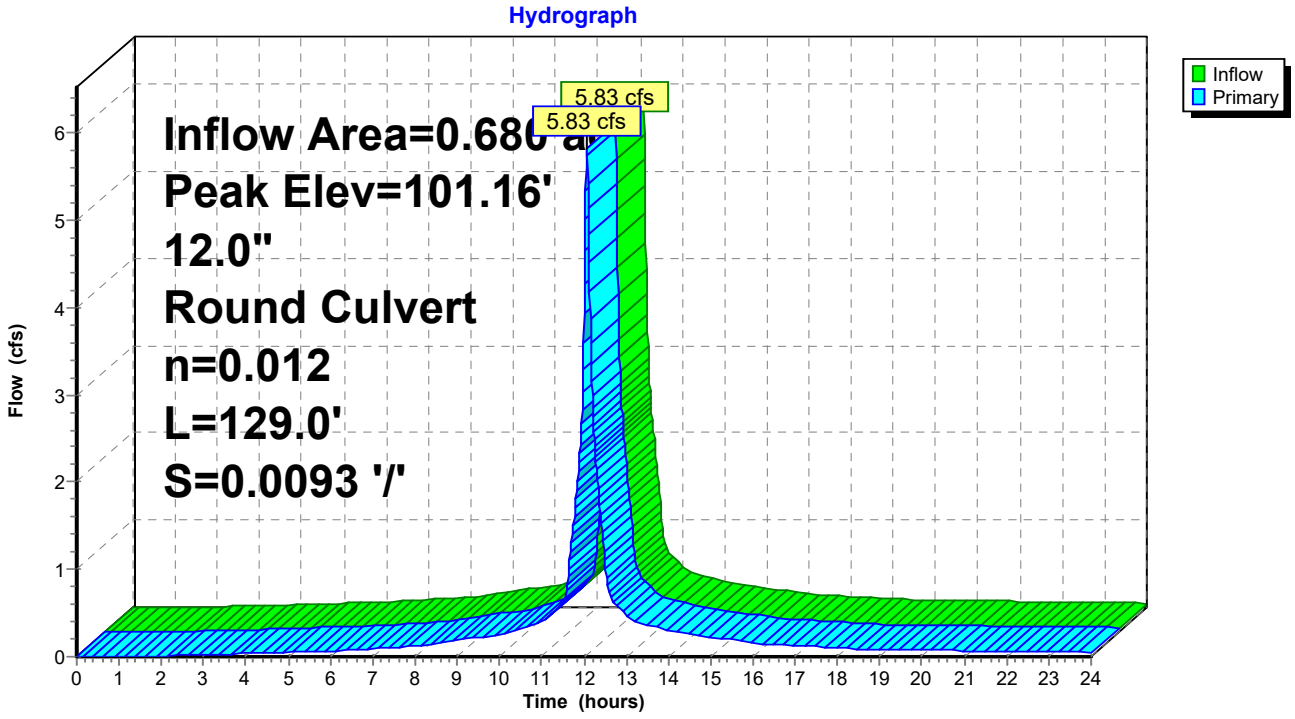
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 7.83" for 50 yr event
Inflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af
Outflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min
Primary = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 101.16'@ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=5.82 cfs @ 12.07 hrs HW=101.16' TW=96.93' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.82 cfs @ 7.42 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 96.93' (Flood elevation advised)

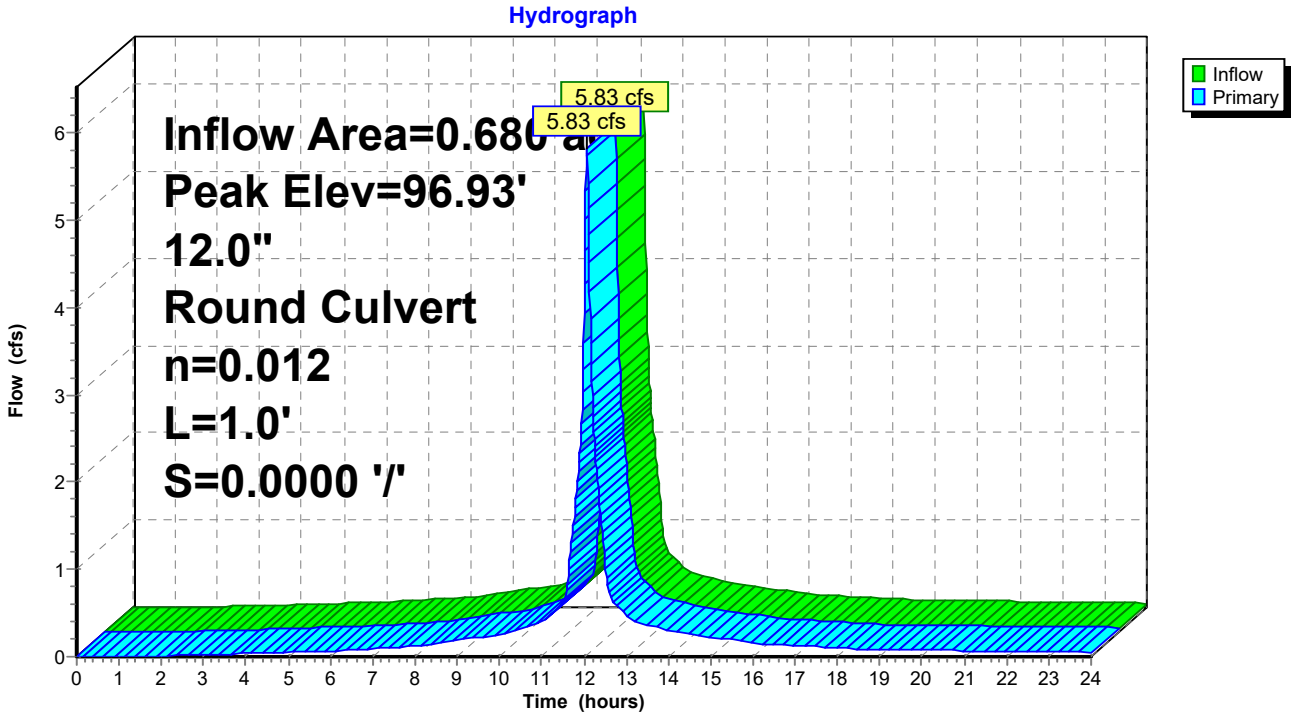
Inflow Area = 0.680 ac, 83.41% Impervious, Inflow Depth > 7.83" for 50 yr event
Inflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af
Outflow = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af, Atten= 0%, Lag= 0.0 min
Primary = 5.83 cfs @ 12.07 hrs, Volume= 0.444 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 96.93' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=5.82 cfs @ 12.07 hrs HW=96.93' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 5.82 cfs @ 7.42 fps)

Pond CB3: CB3



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.41' (Flood elevation advised)

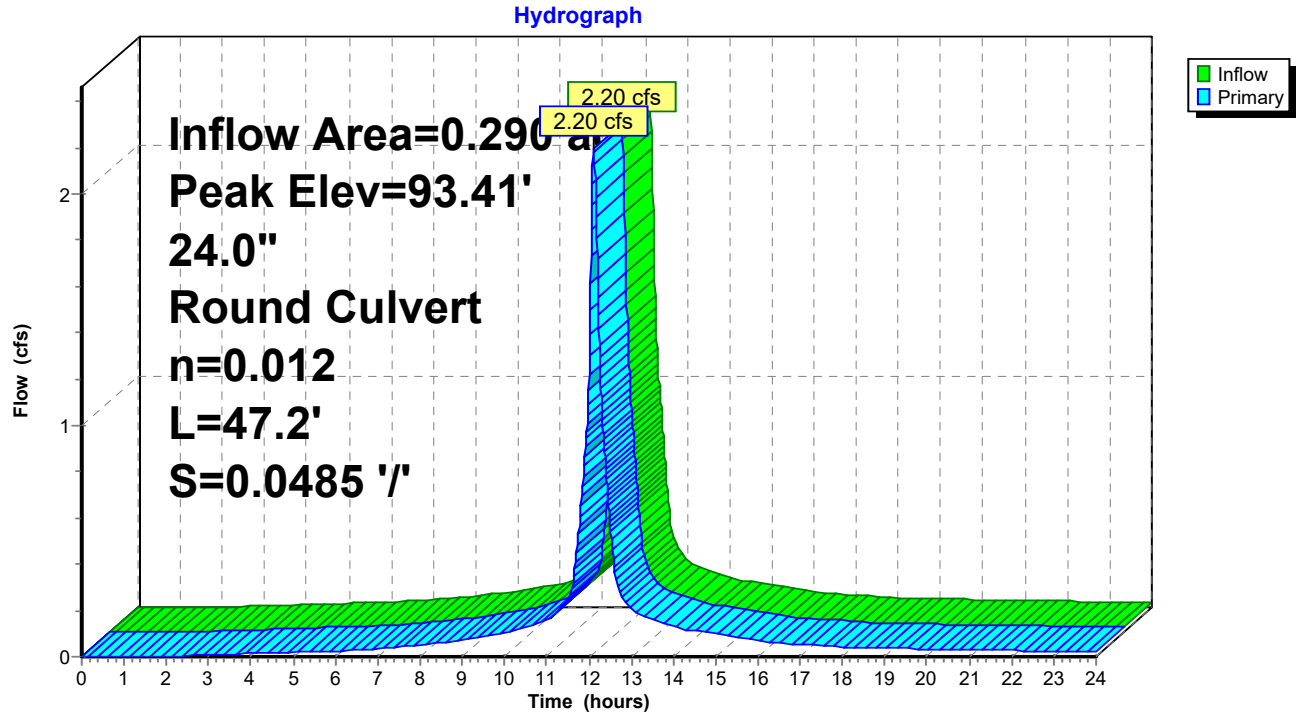
Inflow Area = 0.290 ac, 71.50% Impervious, Inflow Depth > 7.71" for 50 yr event
Inflow = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af
Outflow = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af, Atten= 0%, Lag= 0.0 min
Primary = 2.20 cfs @ 12.12 hrs, Volume= 0.187 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 93.41'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=2.19 cfs @ 12.12 hrs HW=93.41' TW=91.30' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.19 cfs @ 2.67 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 91.30' (Flood elevation advised)

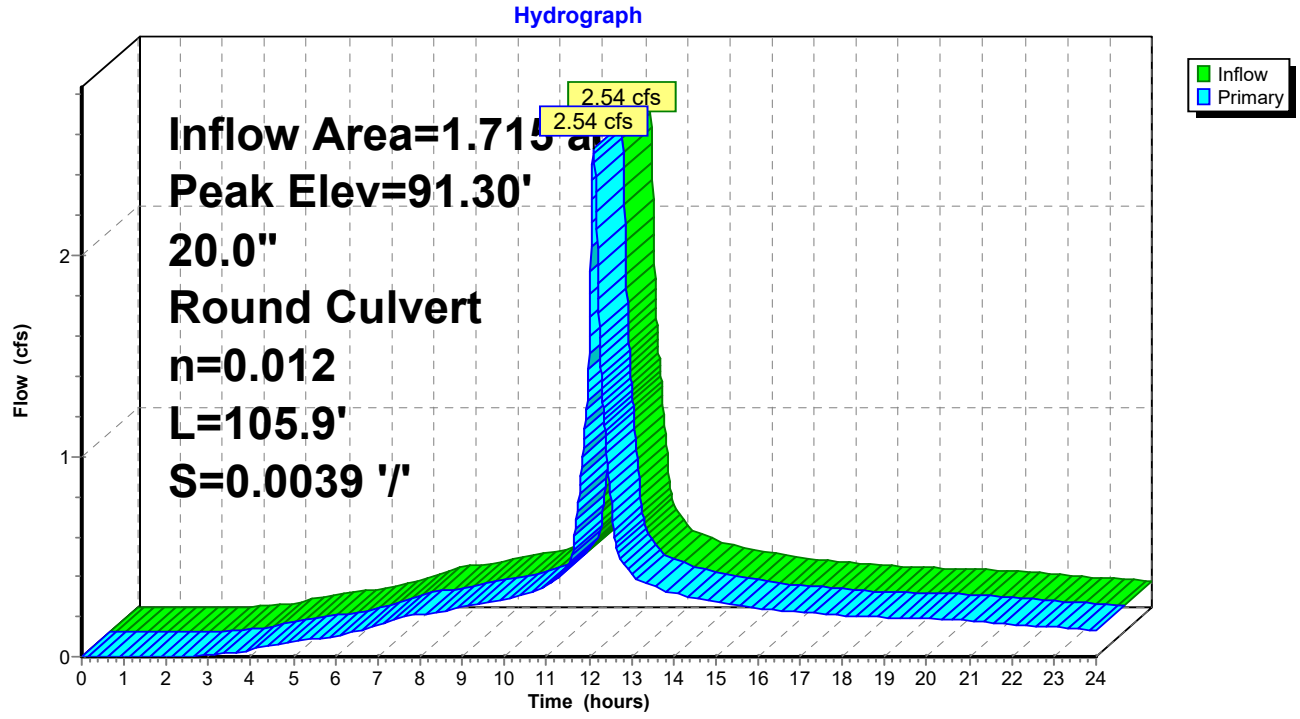
Inflow Area = 1.715 ac, 62.79% Impervious, Inflow Depth > 3.10" for 50 yr event
Inflow = 2.54 cfs @ 12.12 hrs, Volume= 0.443 af
Outflow = 2.54 cfs @ 12.12 hrs, Volume= 0.443 af, Atten= 0%, Lag= 0.0 min
Primary = 2.54 cfs @ 12.12 hrs, Volume= 0.443 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 91.30' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=2.53 cfs @ 12.12 hrs HW=91.30' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.53 cfs @ 3.42 fps)

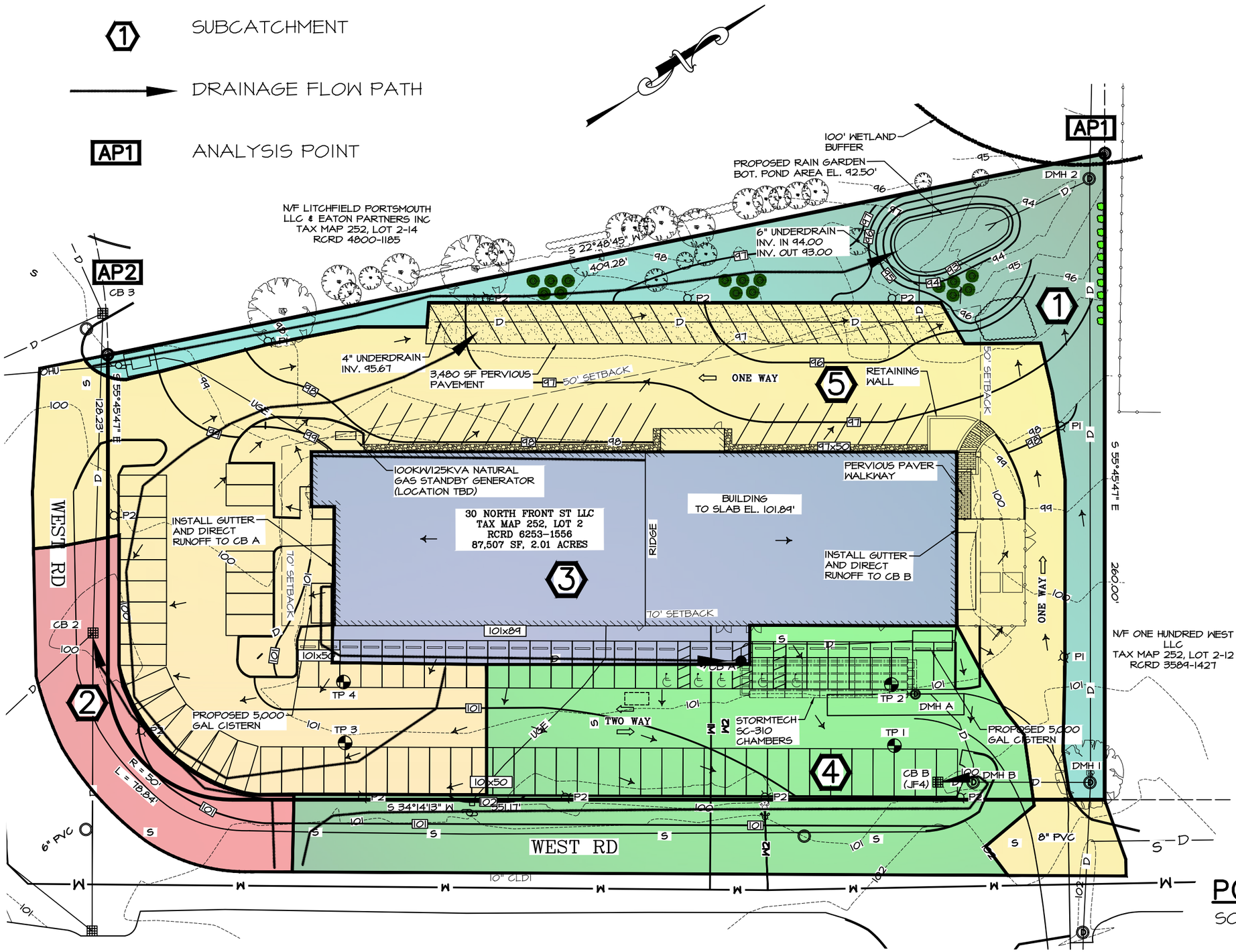
Pond DMH2: DMH2



POST-DEVELOPMENT CALCULATIONS

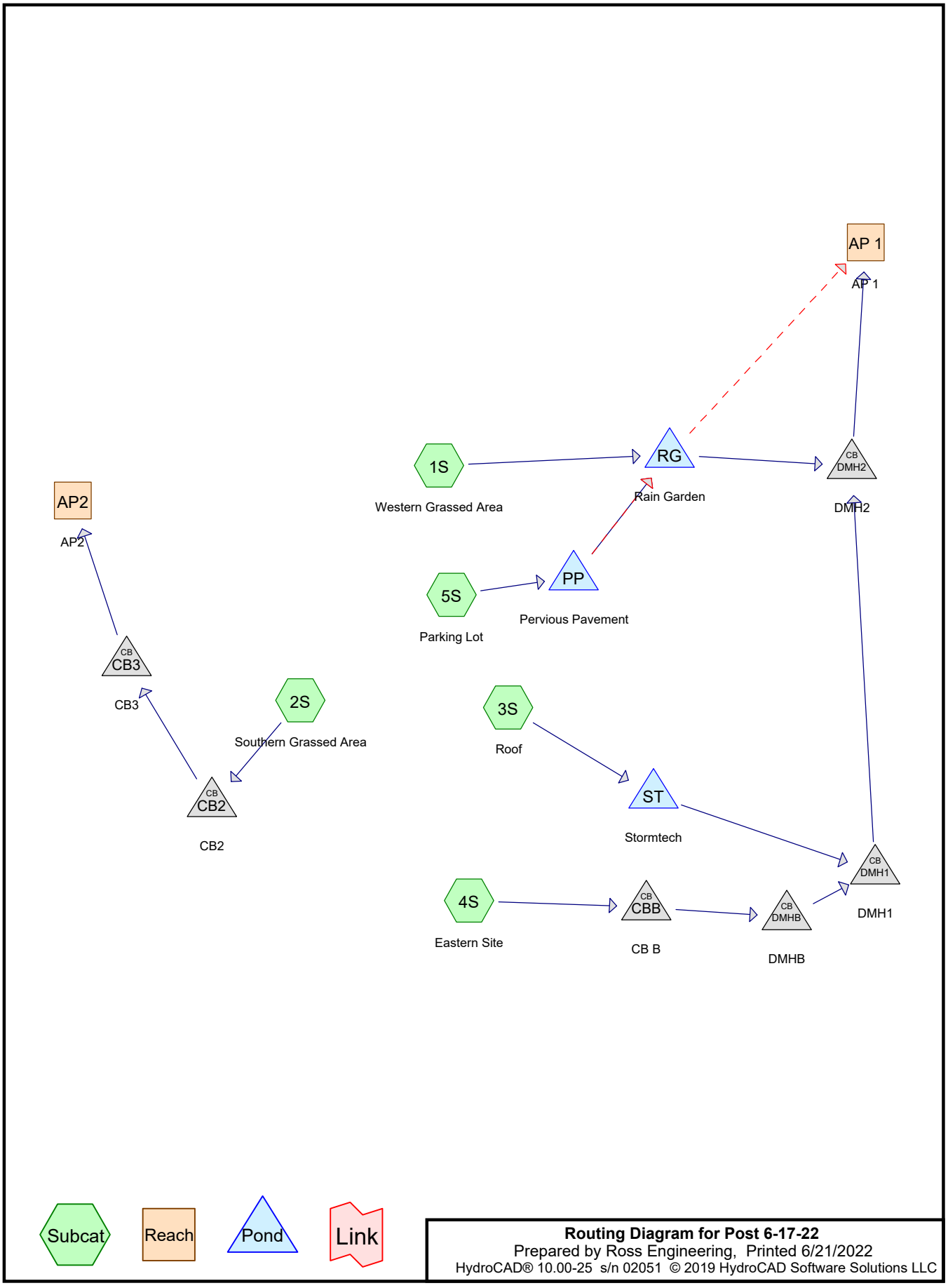
LEGEND

- (1) SUBCATCHMENT
- DRAINAGE FLOW PATH
- AP1 ANALYSIS POINT



POST-DEVELOPMENT

SCALE: 1" = 40'



Routing Diagram for Post 6-17-22
Prepared by Ross Engineering, Printed 6/21/2022
HydroCAD® 10.00-25 s/n 02051 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.532	74	>75% Grass cover, Good, HSG C (1S, 2S, 4S, 5S)
0.003	98	Concrete (1S, 5S)
0.015	96	Gravel surface, HSG C (5S)
1.321	98	Paved roads w/curbs & sewers, HSG C (1S, 2S, 3S, 4S, 5S)
0.080	61	Pervious Pavement, HSG C (5S)
0.005	42	Pervious Pavers, HSG C (5S)
0.019	58	Rain Garden, HSG C (1S)
0.002	98	Retaining Wall & Stairs, HSG C (5S)
0.417	98	Roofs, HSG C (3S, 5S)
2.395	**91**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
2.392	HSG C	1S, 2S, 3S, 4S, 5S
0.000	HSG D	
0.003	Other	1S, 5S
2.395		**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	0.532	0.000	0.000	0.532	>75% Grass cover, Good	1S, 2S, 4S, 5S
0.000	0.000	0.000	0.000	0.003	0.003	Concrete	1S, 5S
0.000	0.000	0.015	0.000	0.000	0.015	Gravel surface	5S
0.000	0.000	1.321	0.000	0.000	1.321	Paved roads w/curbs & sewers	1S, 2S, 3S, 4S, 5S
0.000	0.000	0.080	0.000	0.000	0.080	Pervious Pavement	5S
0.000	0.000	0.005	0.000	0.000	0.005	Pervious Pavers	5S
0.000	0.000	0.019	0.000	0.000	0.019	Rain Garden	1S
0.000	0.000	0.002	0.000	0.000	0.002	Retaining Wall & Stairs	5S
0.000	0.000	0.417	0.000	0.000	0.417	Roofs	3S, 5S
0.000	**0.000**	**2.392**	**0.000**	**0.003**	**2.395**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	CB2	95.26	94.06	129.0	0.0093	0.012	12.0	0.0	0.0
2	CB3	94.06	94.06	1.0	0.0000	0.012	12.0	0.0	0.0
3	CBB	95.40	95.35	10.0	0.0050	0.012	12.0	0.0	0.0
4	DMH1	92.79	90.50	47.2	0.0485	0.012	24.0	0.0	0.0
5	DMH2	90.47	90.06	105.9	0.0039	0.012	20.0	0.0	0.0
6	DMHB	95.28	93.37	45.0	0.0424	0.012	24.0	0.0	0.0
7	PP	92.75	92.50	20.0	0.0125	0.012	15.0	0.0	0.0
8	RG	91.00	90.75	38.8	0.0064	0.010	12.0	0.0	0.0
9	ST	98.00	95.40	43.0	0.0605	0.010	12.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 4
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: WesternGrassedArea Runoff Area=14,438 sf 3.17% Impervious Runoff Depth>1.38"
Flow Length=316' Tc=7.5 min CN=74 Runoff=0.50 cfs 0.038 af

Subcatchment2S: SouthernGrassedArea Runoff Area=5,631 sf 54.43% Impervious Runoff Depth>2.37"
Tc=5.0 min CN=87 Runoff=0.37 cfs 0.026 af

Subcatchment3S: Roof Runoff Area=20,293 sf 100.00% Impervious Runoff Depth>3.47"
Tc=5.0 min CN=98 Runoff=1.74 cfs 0.135 af

Subcatchment4S: EasternSite Runoff Area=21,625 sf 79.90% Impervious Runoff Depth>2.93"
Flow Length=303' Tc=8.8 min CN=93 Runoff=1.49 cfs 0.121 af

Subcatchment5S: ParkingLot Runoff Area=42,327 sf 82.42% Impervious Runoff Depth>2.94"
Tc=5.0 min CN=93 Runoff=3.33 cfs 0.238 af

ReachAP 1: AP 1 Inflow=4.89 cfs 0.219 af
Outflow=4.89 cfs 0.219 af

ReachAP2: AP2 Inflow=0.37 cfs 0.026 af
Outflow=0.37 cfs 0.026 af

Pond CB2: CB2 Peak Elev=95.56' Inflow=0.37 cfs 0.026 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=0.37 cfs 0.026 af

Pond CB3: CB3 Peak Elev=94.44' Inflow=0.37 cfs 0.026 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=0.37 cfs 0.026 af

Pond CBB: CB B Peak Elev=96.20' Inflow=1.49 cfs 0.121 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0050 '/' Outflow=1.49 cfs 0.121 af

Pond DMH1: DMH1 Peak Elev=93.48' Inflow=2.74 cfs 0.159 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=2.74 cfs 0.159 af

Pond DMH2: DMH2 Peak Elev=91.68' Inflow=4.89 cfs 0.219 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=4.89 cfs 0.219 af

Pond DMHB: DMHB Peak Elev=95.78' Inflow=1.49 cfs 0.121 af
24.0" Round Culvert n=0.012 L=45.0' S=0.0424 '/' Outflow=1.49 cfs 0.121 af

Pond PP: PerviousPavement Peak Elev=93.50' Storage=974 cf Inflow=3.33 cfs 0.238 af
Discarded=0.60 cfs 0.183 af Primary=2.04 cfs 0.054 af Secondary=0.00 cfs 0.000 af Outflow=2.65 cfs 0.238 af

Pond RG: Rain Garden Peak Elev=92.05' Storage=345 cf Inflow=2.53 cfs 0.093 af
Discarded=0.14 cfs 0.033 af Primary=2.26 cfs 0.060 af Secondary=0.00 cfs 0.000 af Outflow=2.40 cfs 0.093 af

Pond ST: Stormtech Peak Elev=98.59' Storage=644 cf Inflow=1.74 cfs 0.135 af
Discarded=0.18 cfs 0.097 af Primary=1.25 cfs 0.038 af Outflow=1.43 cfs 0.135 af

Total Runoff Area = 2.395 ac Runoff Volume = 0.558 af Average Runoff Depth = 2.79"
27.16% Pervious = 0.650 ac 72.84% Impervious = 1.744 ac

Summary for Subcatchment 1S: Western Grassed Area

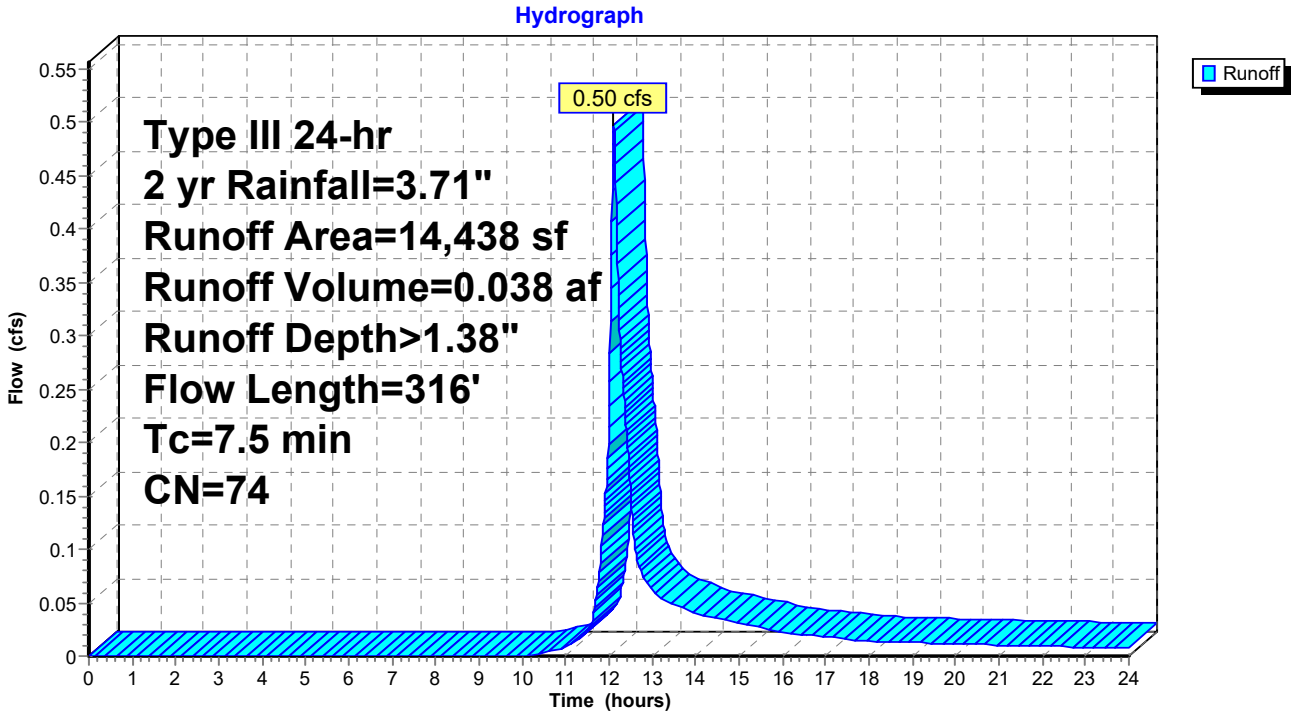
Runoff = 0.50 cfs @ 12.11 hrs, Volume= 0.038 af, Depth> 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

	Area (sf)	CN	Description
	13,159	74	>75% Grass cover, Good, HSG C
	344	98	Paved roads w/curbs & sewers, HSG C
*	114	98	Concrete
*	821	58	Rain Garden, HSG C
	14,438	74	Weighted Average
	13,980		96.83% Pervious Area
	458		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.6	266	0.0132	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.5	316	Total			

Subcatchment 1S: Western Grassed Area



Summary for Subcatchment 2S: Southern Grassed Area

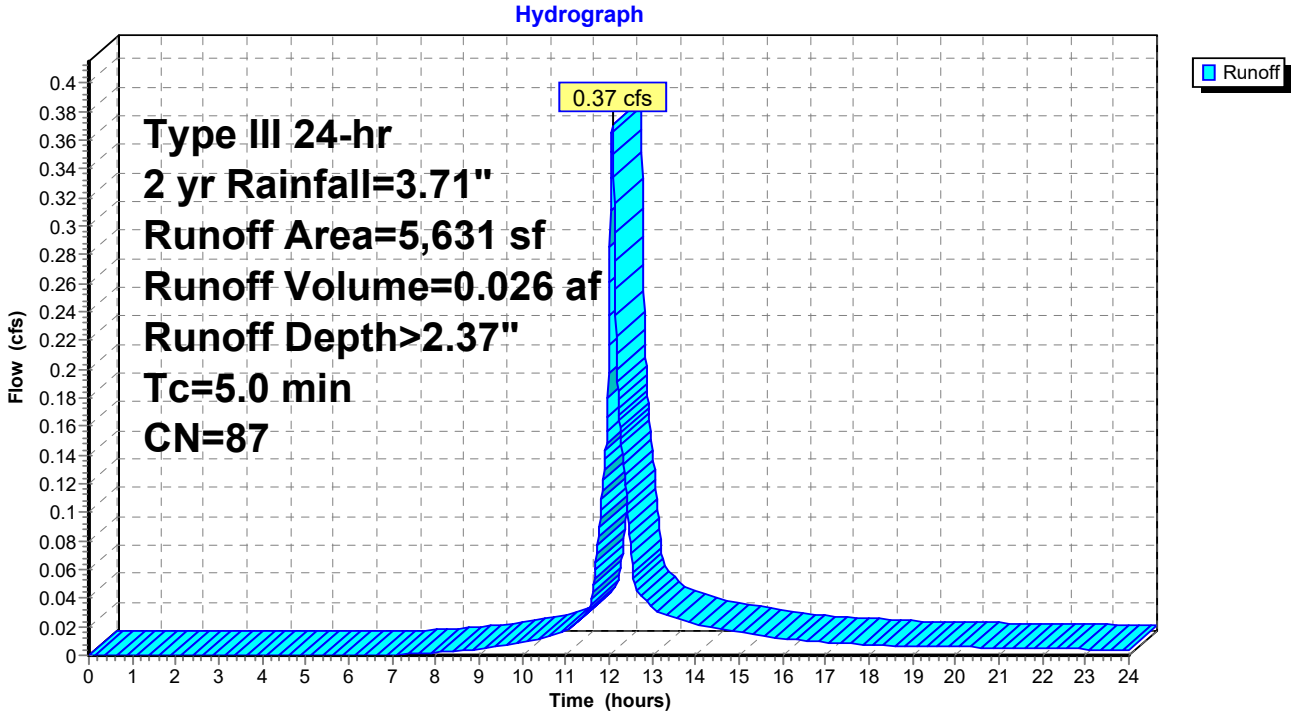
Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af, Depth> 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

Area (sf)	CN	Description
2,566	74	>75% Grass cover, Good, HSG C
3,065	98	Paved roads w/curbs & sewers, HSG C
5,631	87	Weighted Average
2,566		45.57% Pervious Area
3,065		54.43% Impervious Area

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

Subcatchment 2S: Southern Grassed Area



Summary for Subcatchment 3S: Roof

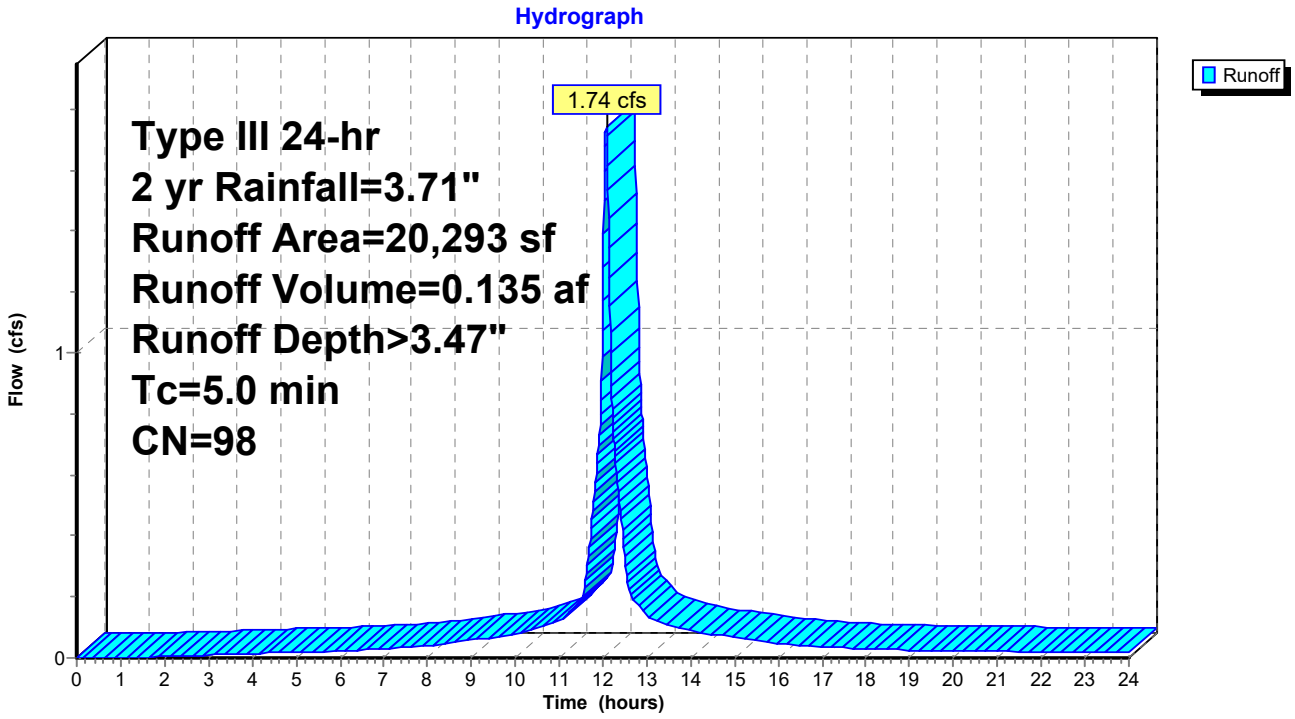
Runoff = 1.74 cfs @ 12.07 hrs, Volume= 0.135 af, Depth> 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

Area (sf)	CN	Description
2,612	98	Paved roads w/curbs & sewers, HSG C
17,681	98	Roofs, HSG C
20,293	98	Weighted Average
20,293		100.00% Impervious Area

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

Subcatchment 3S: Roof



Summary for Subcatchment 4S: Eastern Site

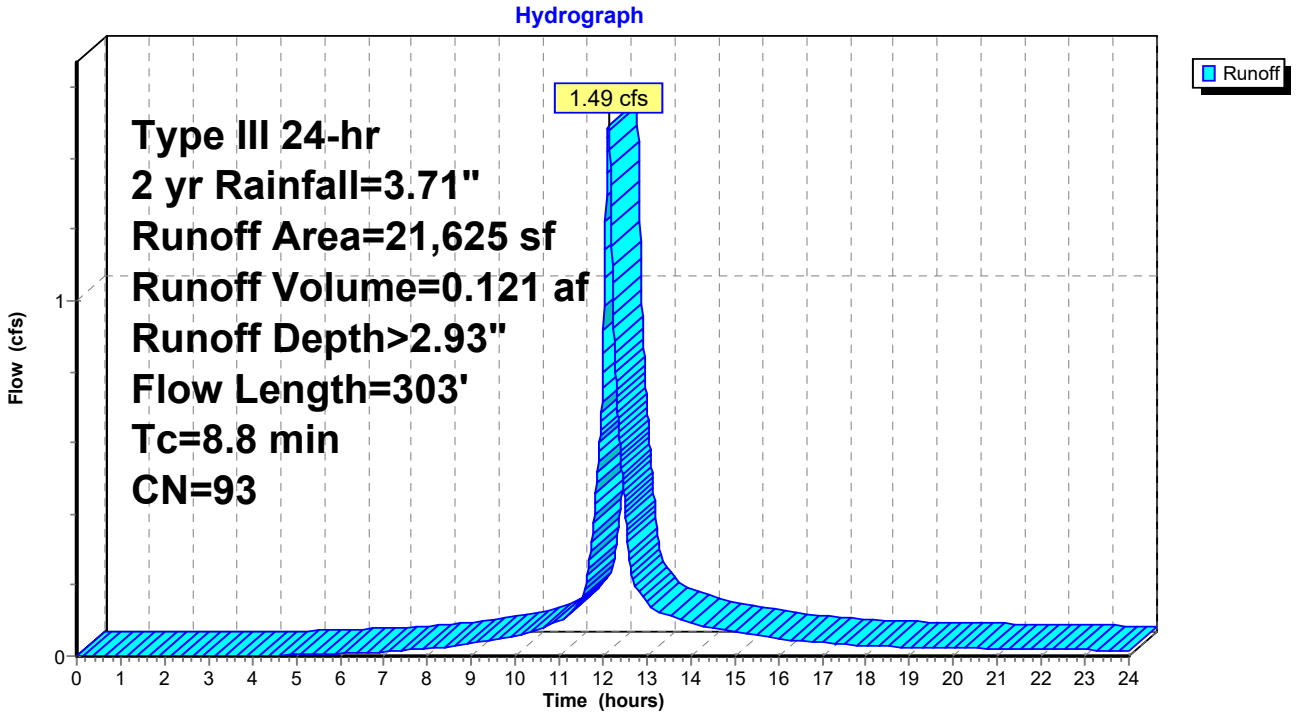
Runoff = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af, Depth> 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

Area (sf)	CN	Description
4,347	74	>75% Grass cover, Good, HSG C
17,278	98	Paved roads w/curbs & sewers, HSG C
21,625	93	Weighted Average
4,347		20.10% Pervious Area
17,278		79.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	252	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.8	303	Total			

Subcatchment 4S: Eastern Site



Summary for Subcatchment 5S: Parking Lot

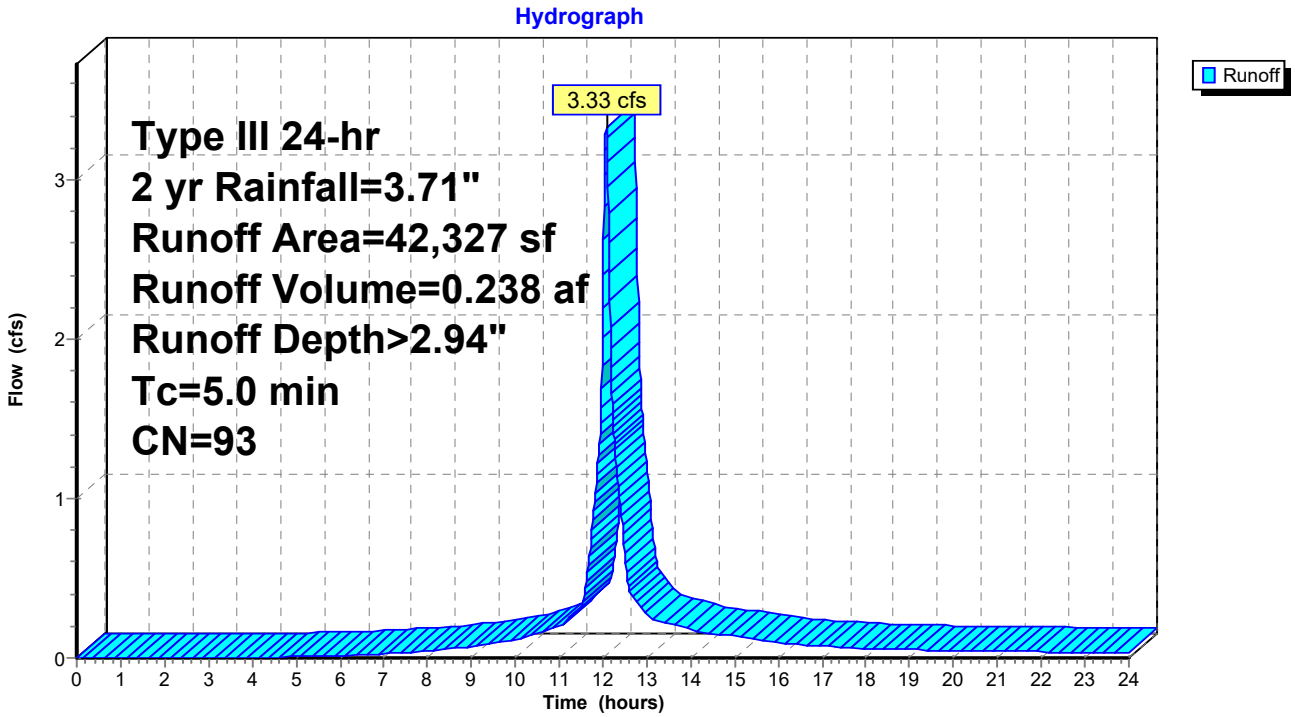
Runoff = 3.33 cfs @ 12.07 hrs, Volume= 0.238 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 yr Rainfall=3.71"

	Area (sf)	CN	Description
	3,085	74	>75% Grass cover, Good, HSG C
	34,264	98	Paved roads w/curbs & sewers, HSG C
*	26	98	Concrete
*	231	42	Pervious Pavers, HSG C
*	3,480	61	Pervious Pavement, HSG C
	490	98	Roofs, HSG C
	643	96	Gravel surface, HSG C
*	108	98	Retaining Wall & Stairs, HSG C
	42,327	93	Weighted Average
	7,439		17.58% Pervious Area
	34,888		82.42% Impervious Area

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

Subcatchment 5S: Parking Lot



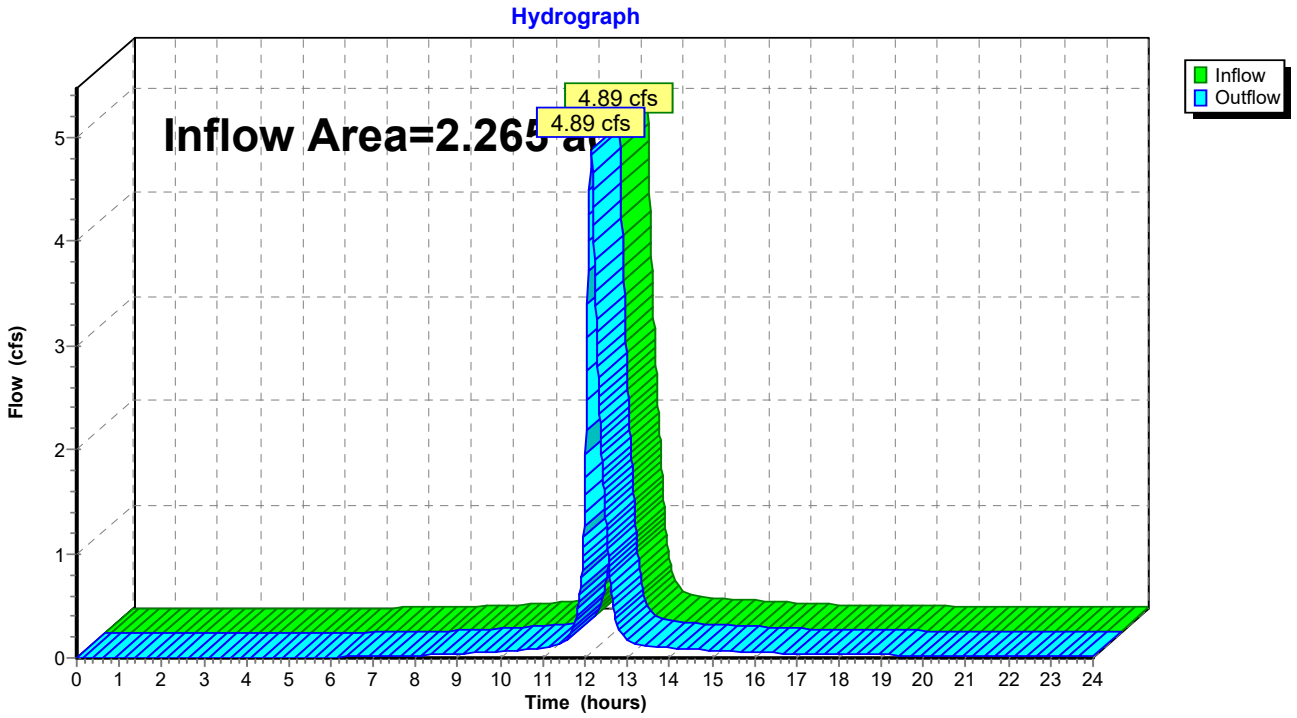
Summary for Reach AP 1: AP 1

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

Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 1.16" for 2 yr event
Inflow = 4.89 cfs @ 12.14 hrs, Volume= 0.219 af
Outflow = 4.89 cfs @ 12.14 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP 1: AP 1



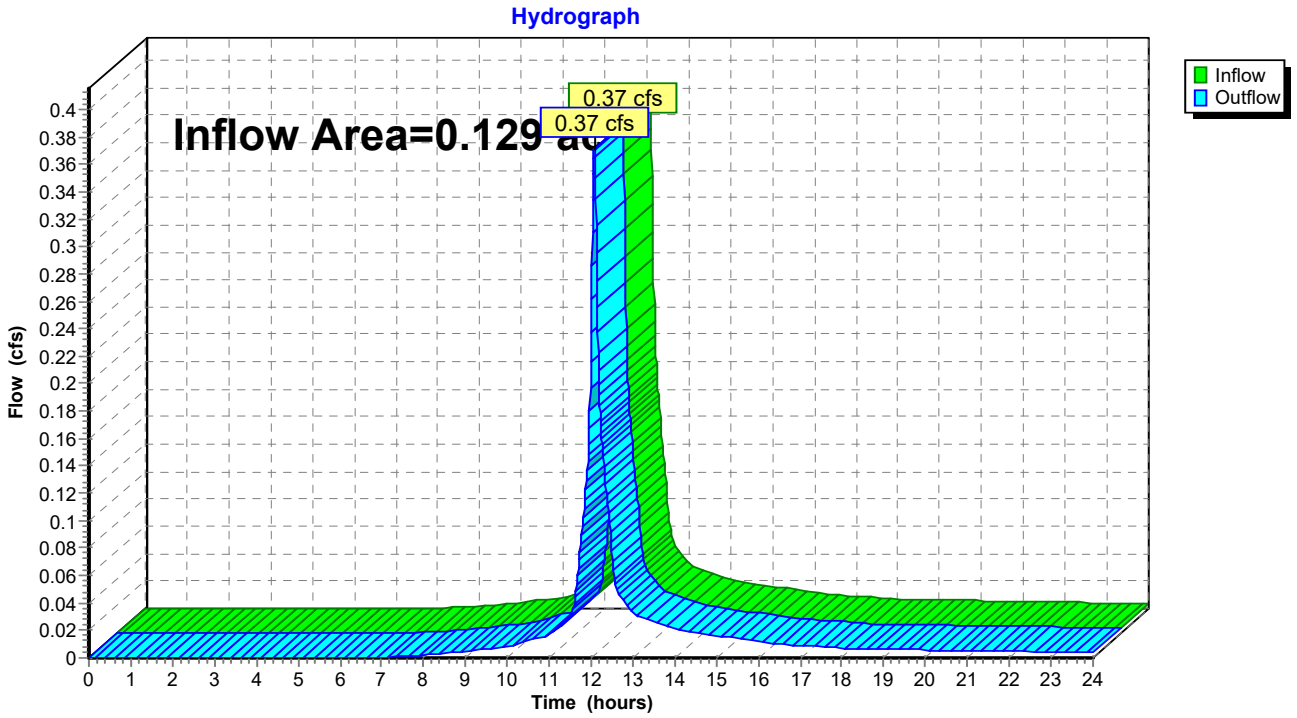
Summary for Reach AP2: AP2

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

Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 2.37" for 2 yr event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af
Outflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP2: AP2



Summary for Pond CB2: CB2

[57] Hint: Peaked at 95.56' (Flood elevation advised)

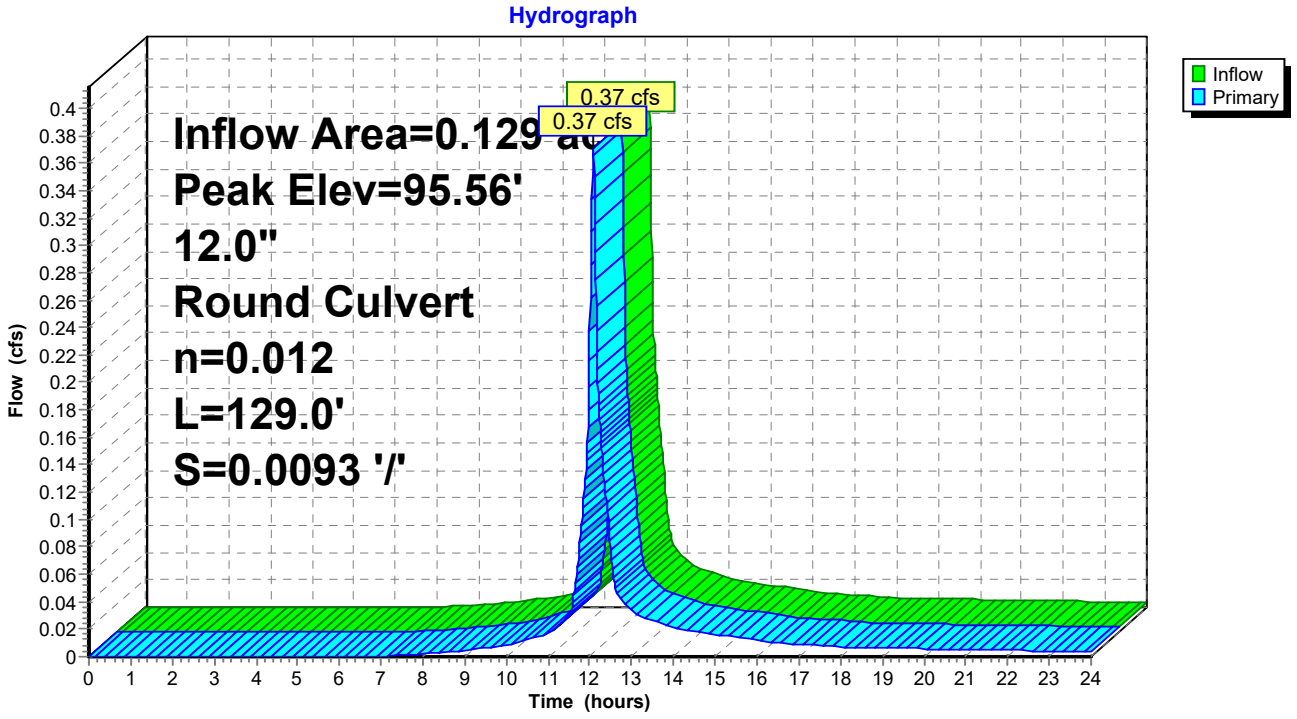
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 2.37" for 2 yr event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af
Outflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.56' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.07 hrs HW=95.56' TW=94.44' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.37 cfs @ 2.77 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 94.44' (Flood elevation advised)

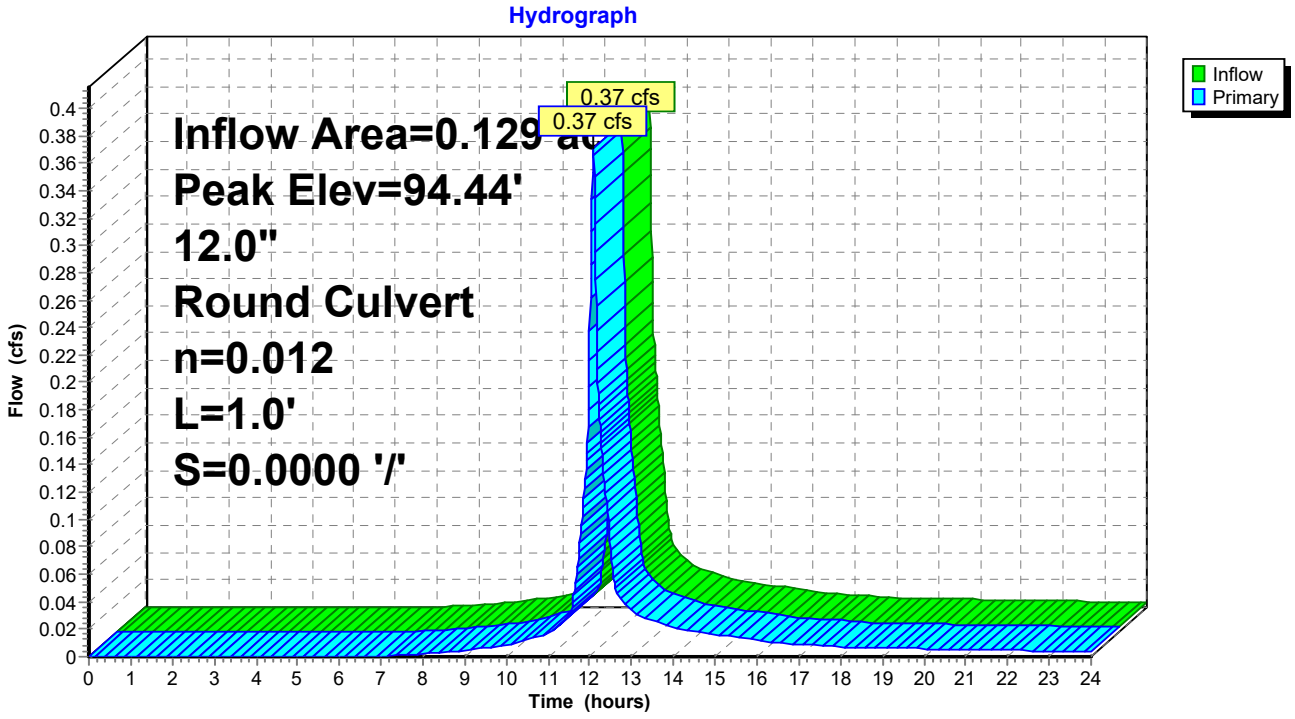
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 2.37" for 2 yr event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af
Outflow = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.07 hrs, Volume= 0.026 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.44' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.07 hrs HW=94.44' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 0.37 cfs @ 1.99 fps)

Pond CB3: CB3



Summary for Pond CBB: CB B

[57] Hint: Peaked at 96.20' (Flood elevation advised)

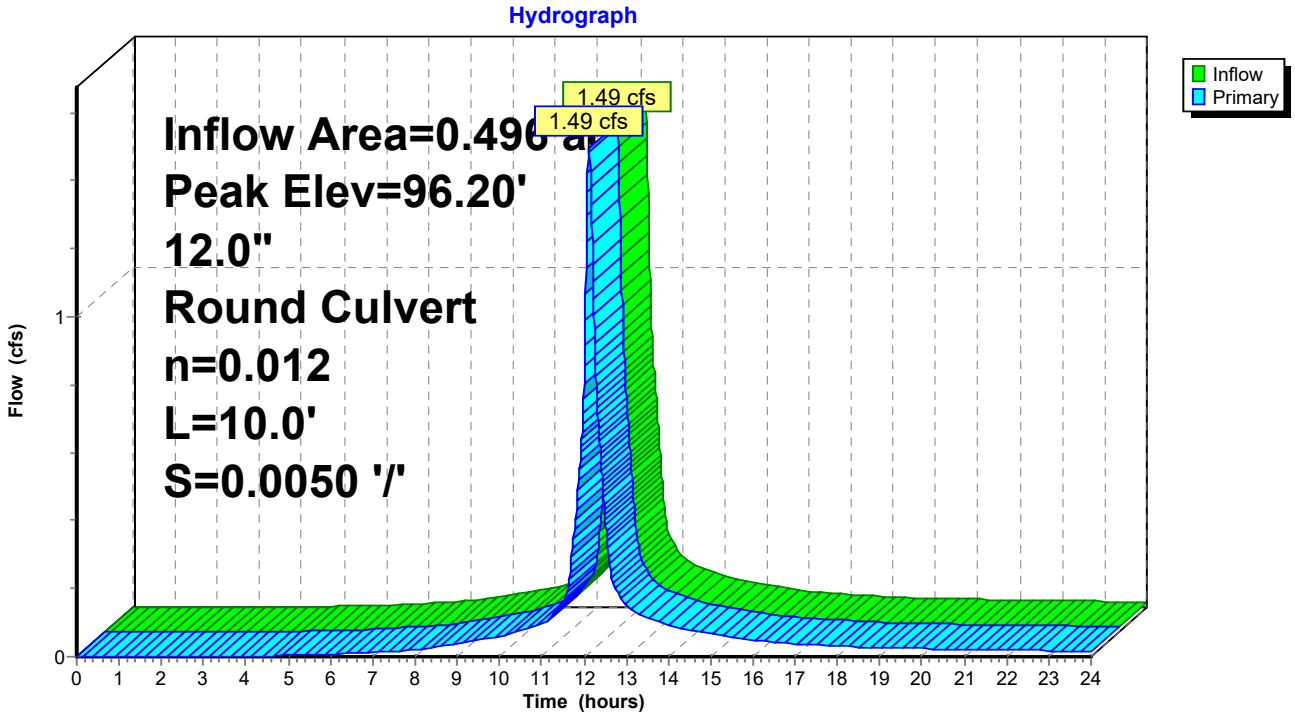
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 2.93" for 2 yr event
Inflow = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af
Outflow = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 96.20'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.40'	**12.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 95.40' / 95.35' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.49 cfs @ 12.12 hrs HW=96.20' TW=95.78' (Dynamic Tailwater)
1=Culvert (Barrel Controls 1.49 cfs @ 3.04 fps)

Pond CBB: CB B



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.48' (Flood elevation advised)

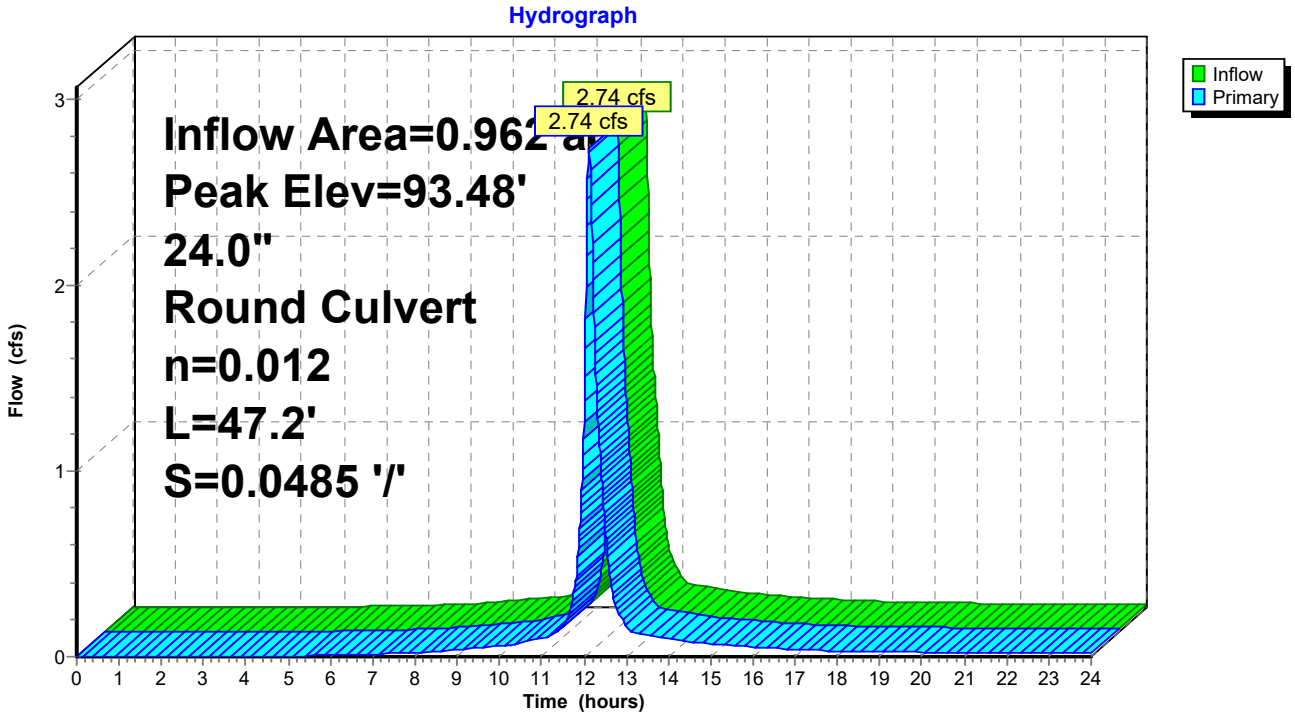
Inflow Area = 0.962 ac, 89.63% Impervious, Inflow Depth > 1.98" for 2 yr event
Inflow = 2.74 cfs @ 12.12 hrs, Volume= 0.159 af
Outflow = 2.74 cfs @ 12.12 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min
Primary = 2.74 cfs @ 12.12 hrs, Volume= 0.159 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.48' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=2.74 cfs @ 12.12 hrs HW=93.48' TW=91.65' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 2.74 cfs @ 2.83 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 91.68' (Flood elevation advised)

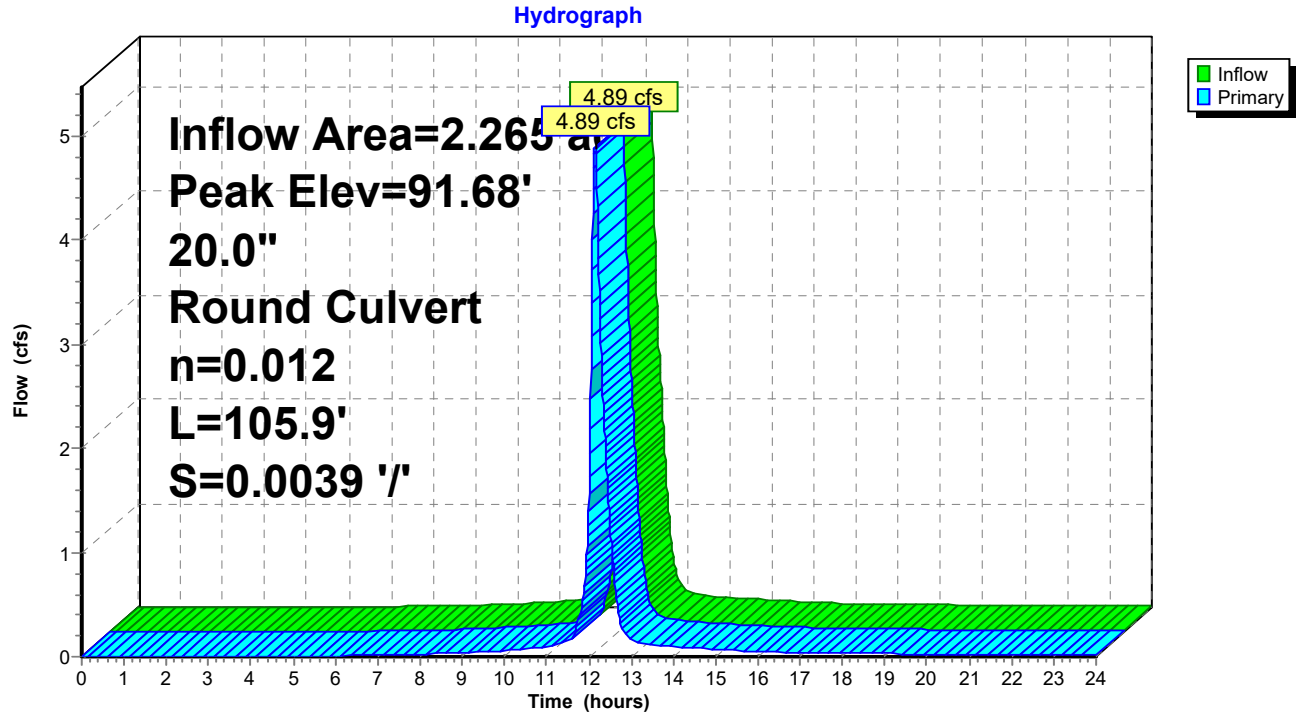
Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 1.16" for 2 yr event
Inflow = 4.89 cfs @ 12.14 hrs, Volume= 0.219 af
Outflow = 4.89 cfs @ 12.14 hrs, Volume= 0.219 af, Atten= 0%, Lag= 0.0 min
Primary = 4.89 cfs @ 12.14 hrs, Volume= 0.219 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 91.68' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=4.88 cfs @ 12.14 hrs HW=91.68' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 4.88 cfs @ 4.02 fps)

Pond DMH2: DMH2



Summary for Pond DMHB: DMHB

[57] Hint: Peaked at 95.78' (Flood elevation advised)

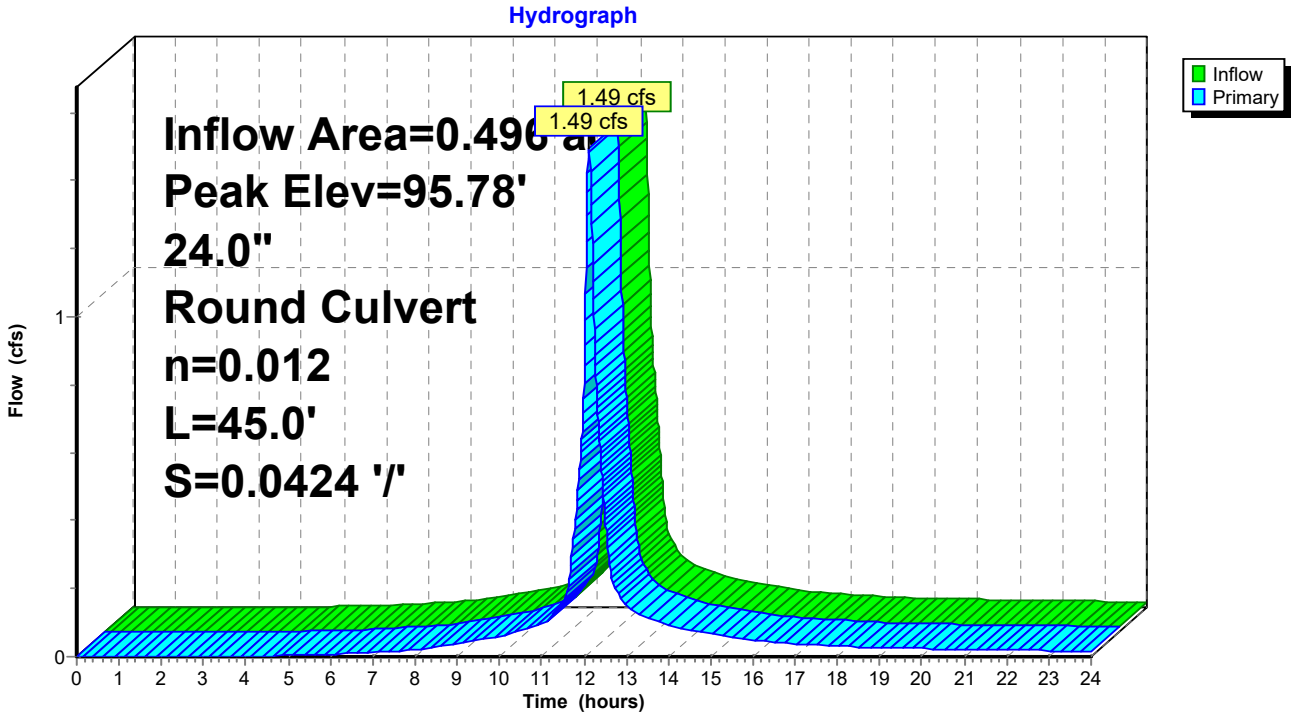
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 2.93" for 2 yr event
Inflow = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af
Outflow = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af, Atten= 0%, Lag= 0.0 min
Primary = 1.49 cfs @ 12.12 hrs, Volume= 0.121 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.78' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**24.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0424 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=1.49 cfs @ 12.12 hrs HW=95.78' TW=93.48' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.49 cfs @ 2.41 fps)

Pond DMHB: DMHB



Summary for Pond PP: Pervious Pavement

Inflow Area = 0.972 ac, 82.42% Impervious, Inflow Depth > 2.94" for 2 yr event
Inflow = 3.33 cfs @ 12.07 hrs, Volume= 0.238 af
Outflow = 2.65 cfs @ 12.13 hrs, Volume= 0.238 af, Atten= 20%, Lag= 3.4 min
Discarded = 0.60 cfs @ 11.68 hrs, Volume= 0.183 af
Primary = 2.04 cfs @ 12.13 hrs, Volume= 0.054 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.50' @ 12.13 hrs Surf.Area= 3,480 sf Storage= 974 cf

Plug-Flow detention time=3.0 min calculated for 0.238 af (100% of inflow)
Center-of-Mass det. time=3.0 min (789.2 - 786.3)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	1,705 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.75	3,480	0.0	0	0
92.76	3,480	40.0	14	14
93.42	3,480	40.0	919	933
93.43	3,480	15.0	5	938
93.67	3,480	15.0	125	1,063
93.68	3,480	5.0	2	1,065
94.33	3,480	5.0	113	1,178
94.34	3,480	30.0	10	1,188
94.67	3,480	30.0	345	1,533
94.68	3,480	15.0	5	1,538
95.00	3,480	15.0	167	1,705

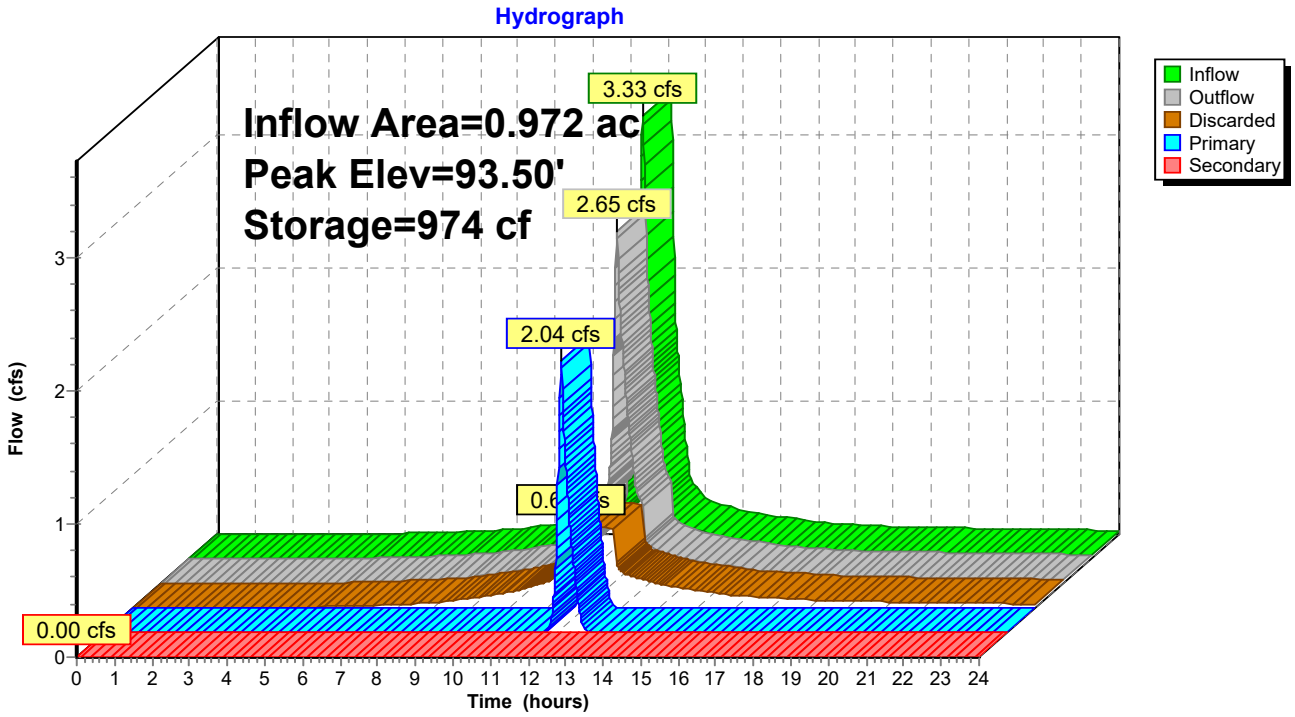
Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0125 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Secondary	94.90'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	92.75'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.60 cfs @ 11.68 hrs HW=92.76' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=2.04 cfs @ 12.13 hrs HW=93.50' TW=92.01' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.04 cfs @ 3.81 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.75' TW=90.99' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PP: Pervious Pavement



Summary for Pond RG: Rain Garden

Inflow Area = 1.303 ac, 62.27% Impervious, Inflow Depth > 0.85" for 2 yr event
Inflow = 2.53 cfs @ 12.13 hrs, Volume= 0.093 af
Outflow = 2.40 cfs @ 12.16 hrs, Volume= 0.093 af, Atten= 5%, Lag= 1.8 min
Discarded = 0.14 cfs @ 11.84 hrs, Volume= 0.033 af
Primary = 2.26 cfs @ 12.16 hrs, Volume= 0.060 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 92.05' @ 12.15 hrs Surf.Area= 821 sf Storage= 345 cf

Plug-Flow detention time=2.2 min calculated for 0.093 af (100% of inflow)
Center-of-Mass det. time=2.2 min (785.1 - 783.0)

Volume	Invert	Avail.Storage	Storage Description
#1	90.99'	3,826 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.99	1	0.0	0	0
91.00	821	40.0	2	2
92.50	821	40.0	493	494
93.00	1,000	100.0	455	949
94.00	1,402	100.0	1,201	2,150
95.00	1,950	100.0	1,676	3,826

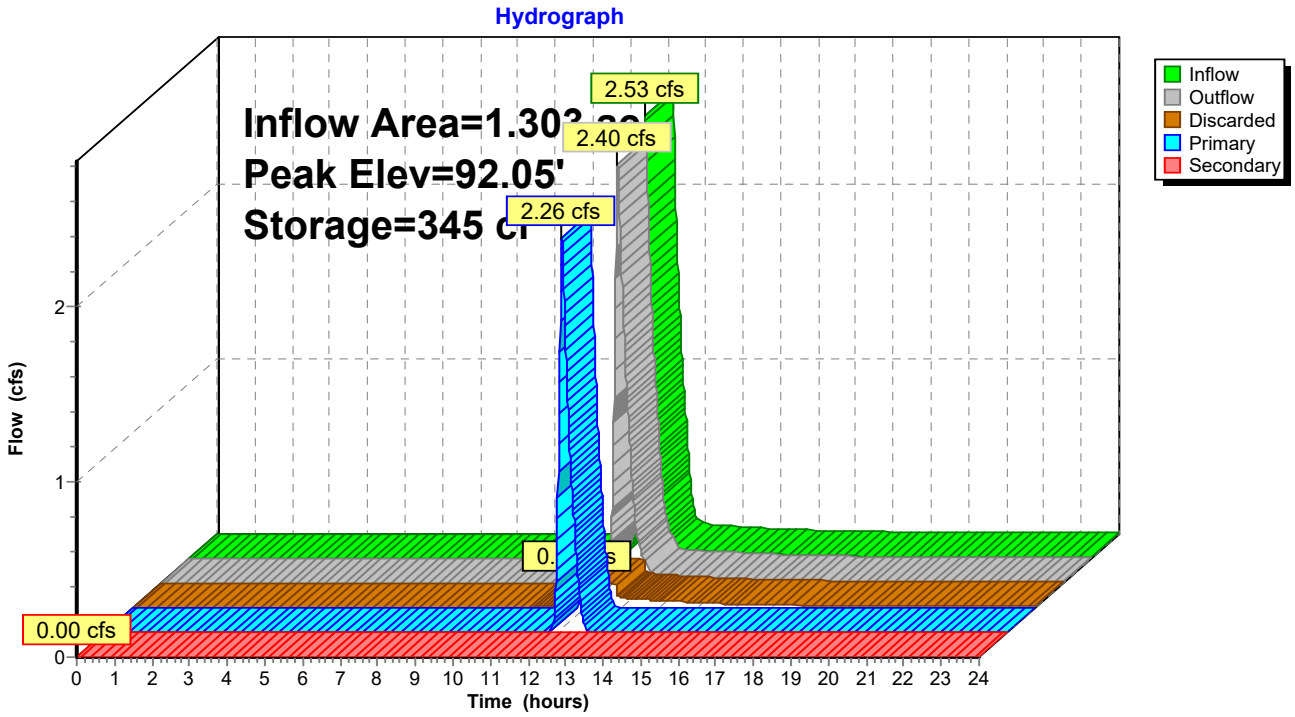
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**12.0" Round Culvert** L= 38.8' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.75' S= 0.0064 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	94.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	90.99'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.14 cfs @ 11.84 hrs HW=91.00' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=2.25 cfs @ 12.16 hrs HW=92.04' TW=91.67' (Dynamic Tailwater)
↑—**1=Culvert** (Outlet Controls 2.25 cfs @ 3.41 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.99' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond RG: Rain Garden



Summary for Pond ST: Stormtech

Inflow Area = 0.466 ac, 100.00% Impervious, Inflow Depth > 3.47" for 2 yr event
Inflow = 1.74 cfs @ 12.07 hrs, Volume= 0.135 af
Outflow = 1.43 cfs @ 12.12 hrs, Volume= 0.135 af, Atten= 18%, Lag= 3.1 min
Discarded = 0.18 cfs @ 11.59 hrs, Volume= 0.097 af
Primary = 1.25 cfs @ 12.12 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 98.59' @ 12.12 hrs Surf.Area= 1,056 sf Storage= 644 cf

Plug-Flow detention time=5.8 min calculated for 0.135 af (100% of inflow)
Center-of-Mass det. time=5.8 min (757.8 - 752.0)

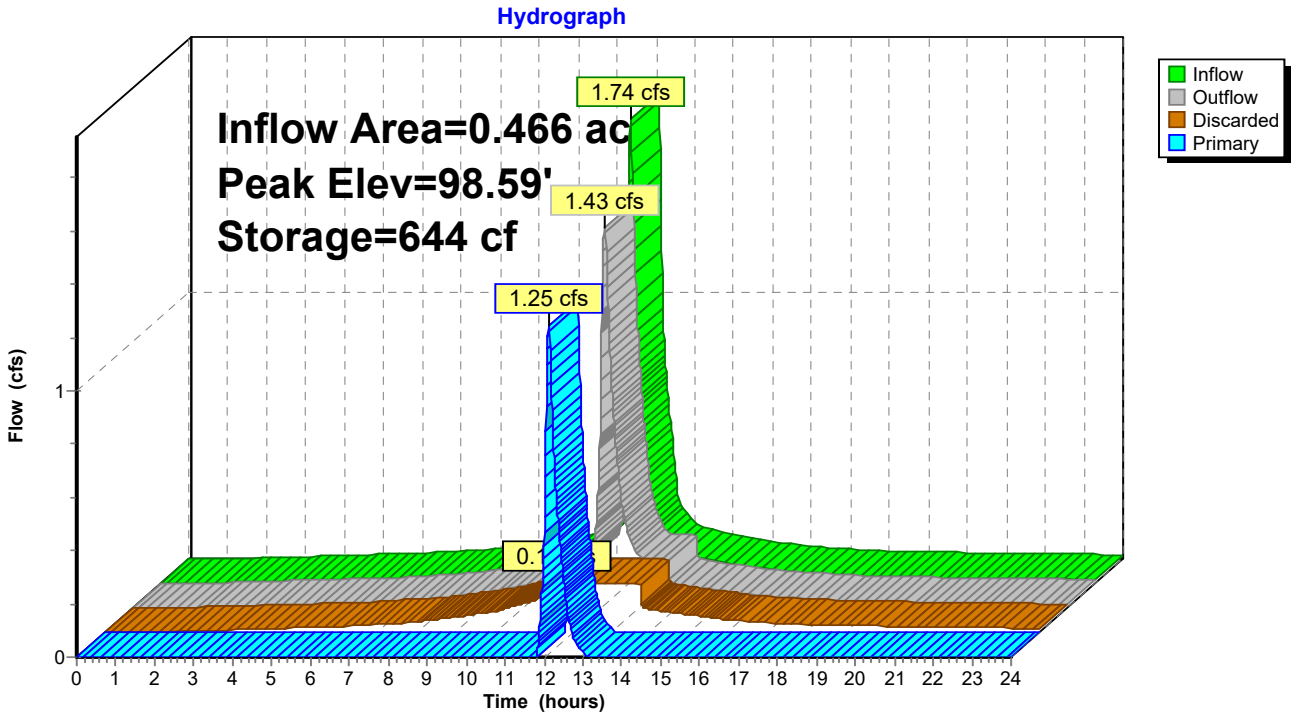
Volume	Invert	Avail.Storage	Storage Description
#1	97.58'	717 cf	**16.15'W x 65.36'L x 2.33'H Prismatoid** 2,459 cf Overall - 668 cf Embedded = 1,792 cf x 40.0% Voids
#2	98.08'	668 cf	**ADS_StormTech SC-310** x 45 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 5 rows
		1,385 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**12.0" Round Culvert** L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 98.00' / 95.40' S= 0.0605 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf
#2	Discarded	97.58'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 11.59 hrs HW=97.61' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=1.24 cfs @ 12.12 hrs HW=98.59' TW=93.48' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.24 cfs @ 2.60 fps)

Pond ST: Stormtech



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 4
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: WesternGrassedArea Runoff Area=14,438 sf 3.17% Impervious Runoff Depth>2.88"
Flow Length=316' Tc=7.5 min CN=74 Runoff=1.06 cfs 0.080 af

Subcatchment2S: SouthernGrassedArea Runoff Area=5,631 sf 54.43% Impervious Runoff Depth>4.17"
Tc=5.0 min CN=87 Runoff=0.64 cfs 0.045 af

Subcatchment3S: Roof Runoff Area=20,293 sf 100.00% Impervious Runoff Depth>5.40"
Tc=5.0 min CN=98 Runoff=2.67 cfs 0.210 af

Subcatchment4S: EasternSite Runoff Area=21,625 sf 79.90% Impervious Runoff Depth>4.82"
Flow Length=303' Tc=8.8 min CN=93 Runoff=2.39 cfs 0.199 af

Subcatchment5S: ParkingLot Runoff Area=42,327 sf 82.42% Impervious Runoff Depth>4.82"
Tc=5.0 min CN=93 Runoff=5.31 cfs 0.391 af

ReachAP 1: AP 1 Inflow=8.09 cfs 0.418 af
Outflow=8.09 cfs 0.418 af

ReachAP2: AP2 Inflow=0.64 cfs 0.045 af
Outflow=0.64 cfs 0.045 af

Pond CB2: CB2 Peak Elev=95.67' Inflow=0.64 cfs 0.045 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=0.64 cfs 0.045 af

Pond CB3: CB3 Peak Elev=94.57' Inflow=0.64 cfs 0.045 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=0.64 cfs 0.045 af

Pond CBB: CB B Peak Elev=96.49' Inflow=2.39 cfs 0.199 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0050 '/' Outflow=2.39 cfs 0.199 af

Pond DMH1: DMH1 Peak Elev=93.70' Inflow=4.50 cfs 0.274 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=4.50 cfs 0.274 af

Pond DMH2: DMH2 Peak Elev=92.16' Inflow=8.09 cfs 0.418 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=8.09 cfs 0.418 af

Pond DMHB: DMHB Peak Elev=95.92' Inflow=2.39 cfs 0.199 af
24.0" Round Culvert n=0.012 L=45.0' S=0.0424 '/' Outflow=2.39 cfs 0.199 af

Pond PP: PerviousPavement Peak Elev=94.05' Storage=1,129 cf Inflow=5.31 cfs 0.391 af
Discarded=0.60 cfs 0.270 af Primary=4.65 cfs 0.120 af Secondary=0.00 cfs 0.000 af Outflow=5.26 cfs 0.391 af

Pond RG: Rain Garden Peak Elev=93.13' Storage=1,085 cf Inflow=5.67 cfs 0.200 af
Discarded=0.18 cfs 0.055 af Primary=3.84 cfs 0.145 af Secondary=0.00 cfs 0.000 af Outflow=4.02 cfs 0.200 af

Pond ST: Stormtech Peak Elev=98.82' Storage=826 cf Inflow=2.67 cfs 0.210 af
Discarded=0.18 cfs 0.135 af Primary=2.12 cfs 0.074 af Outflow=2.30 cfs 0.210 af

Total Runoff Area = 2.395 ac Runoff Volume = 0.924 af Average Runoff Depth = 4.63"
27.16% Pervious = 0.650 ac 72.84% Impervious = 1.744 ac

Summary for Subcatchment 1S: Western Grassed Area

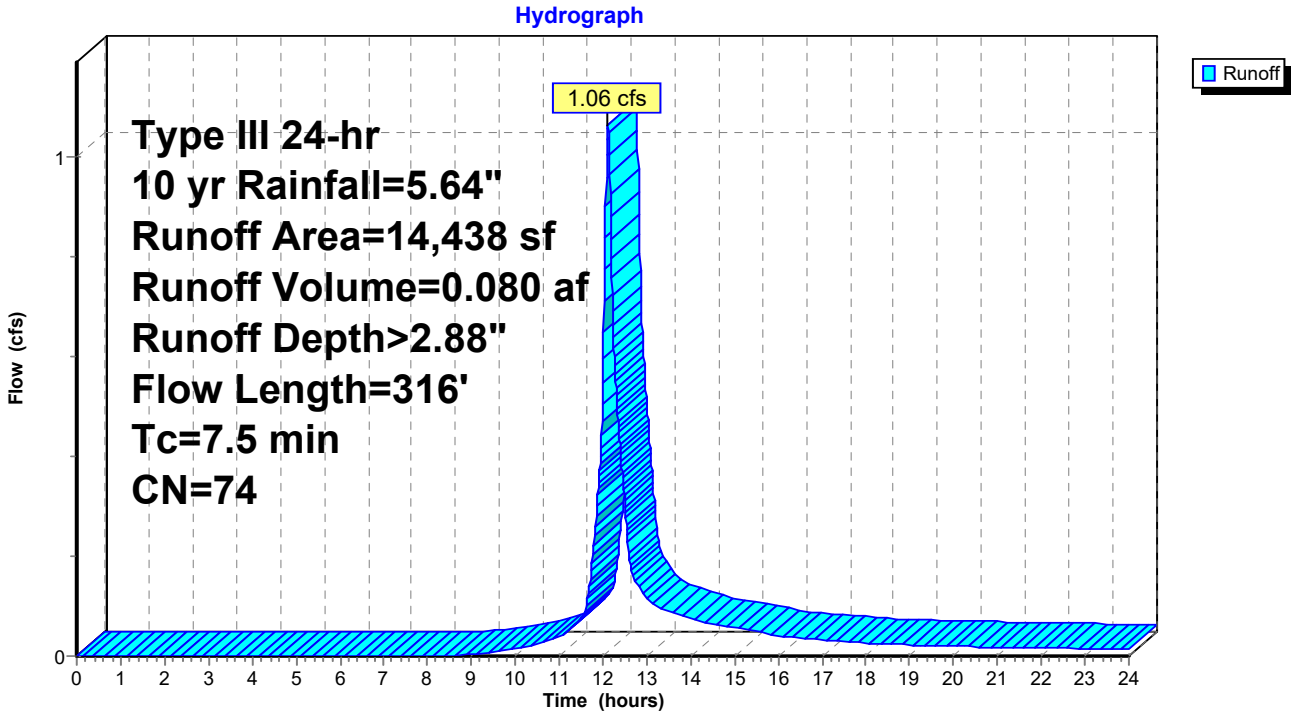
Runoff = 1.06 cfs @ 12.11 hrs, Volume= 0.080 af, Depth> 2.88"

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

	Area (sf)	CN	Description
	13,159	74	>75% Grass cover, Good, HSG C
	344	98	Paved roads w/curbs & sewers, HSG C
*	114	98	Concrete
*	821	58	Rain Garden, HSG C
	14,438	74	Weighted Average
	13,980		96.83% Pervious Area
	458		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.6	266	0.0132	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.5	316	Total			

Subcatchment 1S: Western Grassed Area



Summary for Subcatchment 2S: Southern Grassed Area

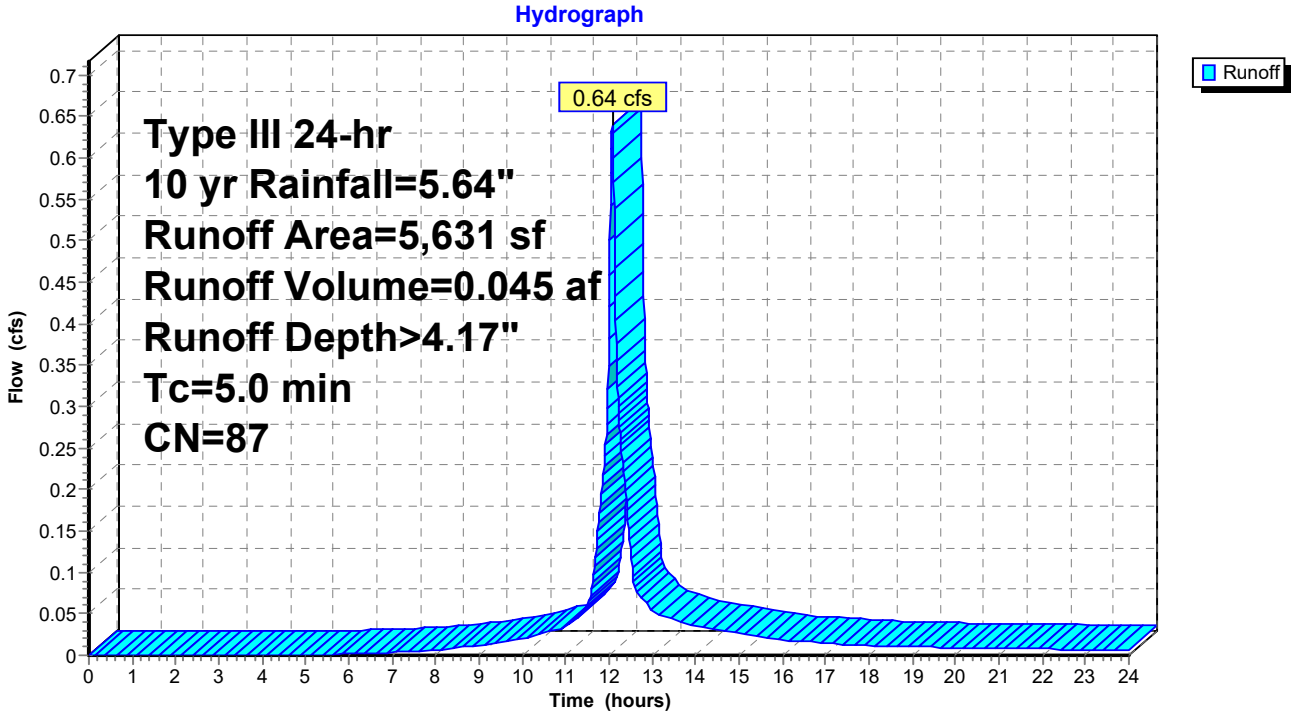
Runoff = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af, Depth> 4.17"

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

Area (sf)	CN	Description
2,566	74	>75% Grass cover, Good, HSG C
3,065	98	Paved roads w/curbs & sewers, HSG C
5,631	87	Weighted Average
2,566		45.57% Pervious Area
3,065		54.43% Impervious Area

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

Subcatchment 2S: Southern Grassed Area



Summary for Subcatchment 3S: Roof

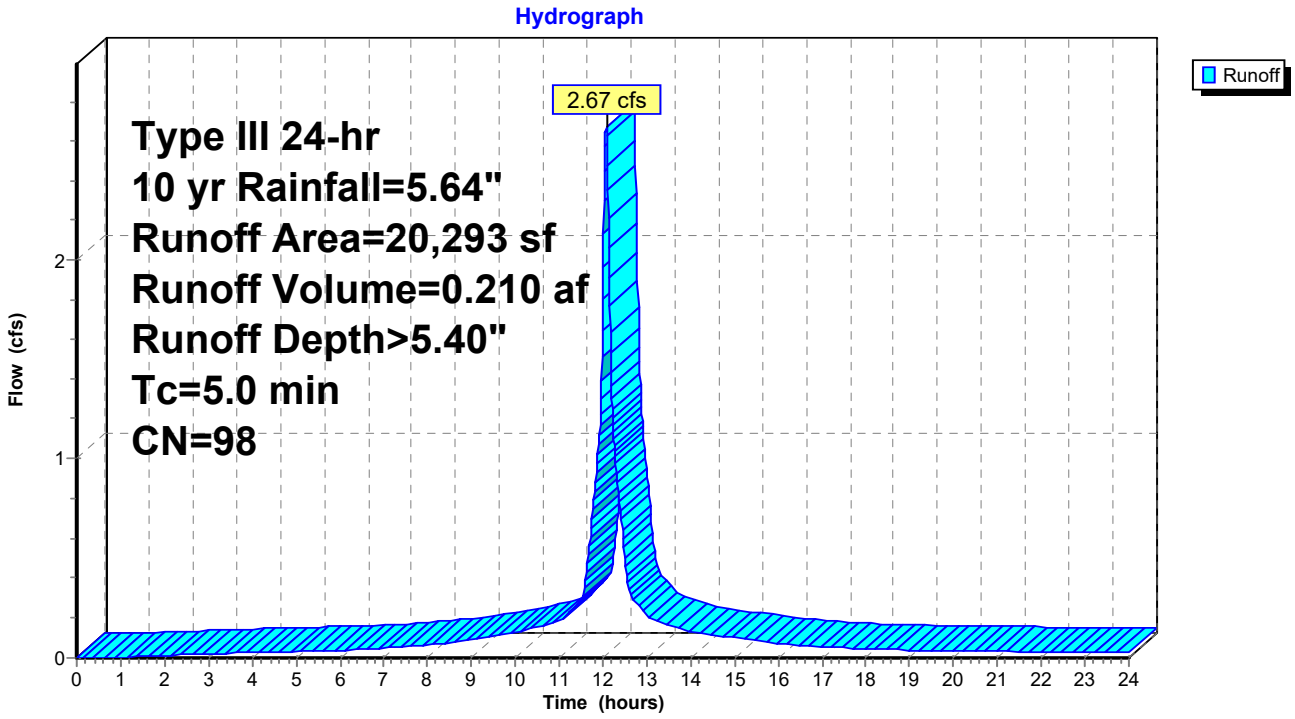
Runoff = 2.67 cfs @ 12.07 hrs, Volume= 0.210 af, Depth> 5.40"

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

Area (sf)	CN	Description
2,612	98	Paved roads w/curbs & sewers, HSG C
17,681	98	Roofs, HSG C
20,293	98	Weighted Average
20,293		100.00% Impervious Area

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

Subcatchment 3S: Roof



Summary for Subcatchment 4S: Eastern Site

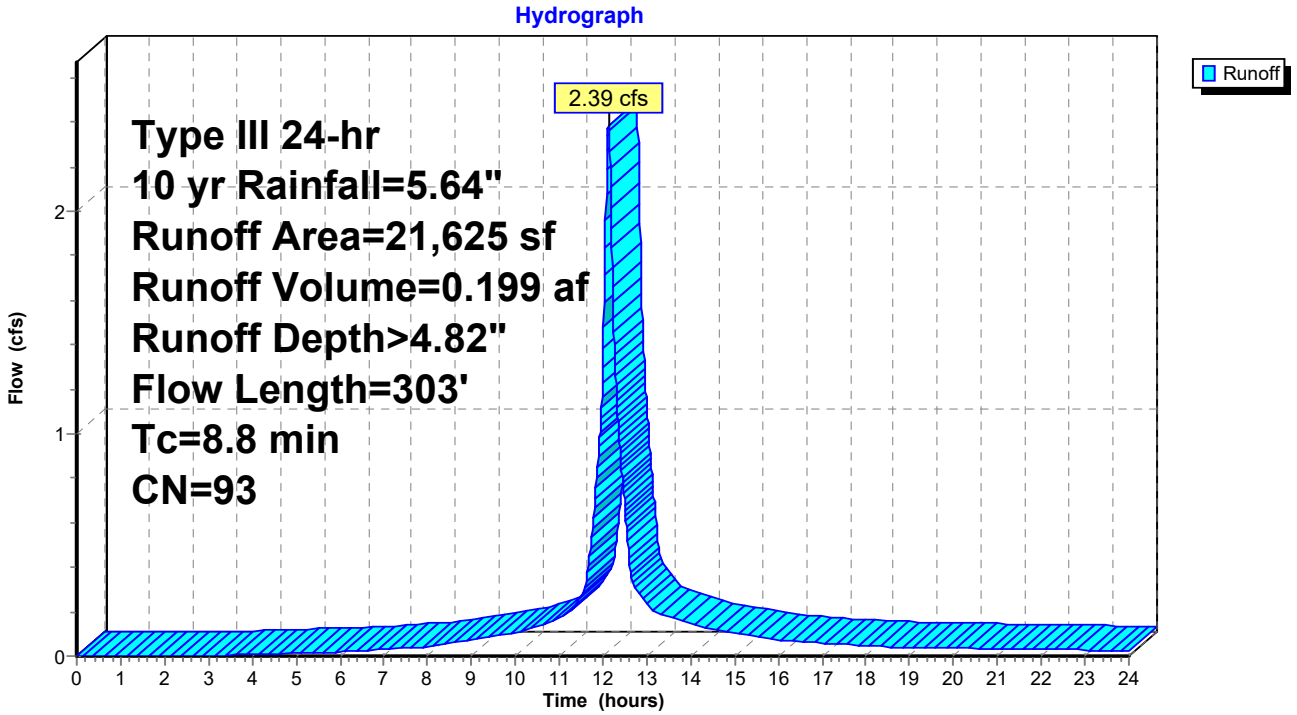
Runoff = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af, Depth> 4.82"

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

Area (sf)	CN	Description
4,347	74	>75% Grass cover, Good, HSG C
17,278	98	Paved roads w/curbs & sewers, HSG C
21,625	93	Weighted Average
4,347		20.10% Pervious Area
17,278		79.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	252	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.8	303	Total			

Subcatchment 4S: Eastern Site



Summary for Subcatchment 5S: Parking Lot

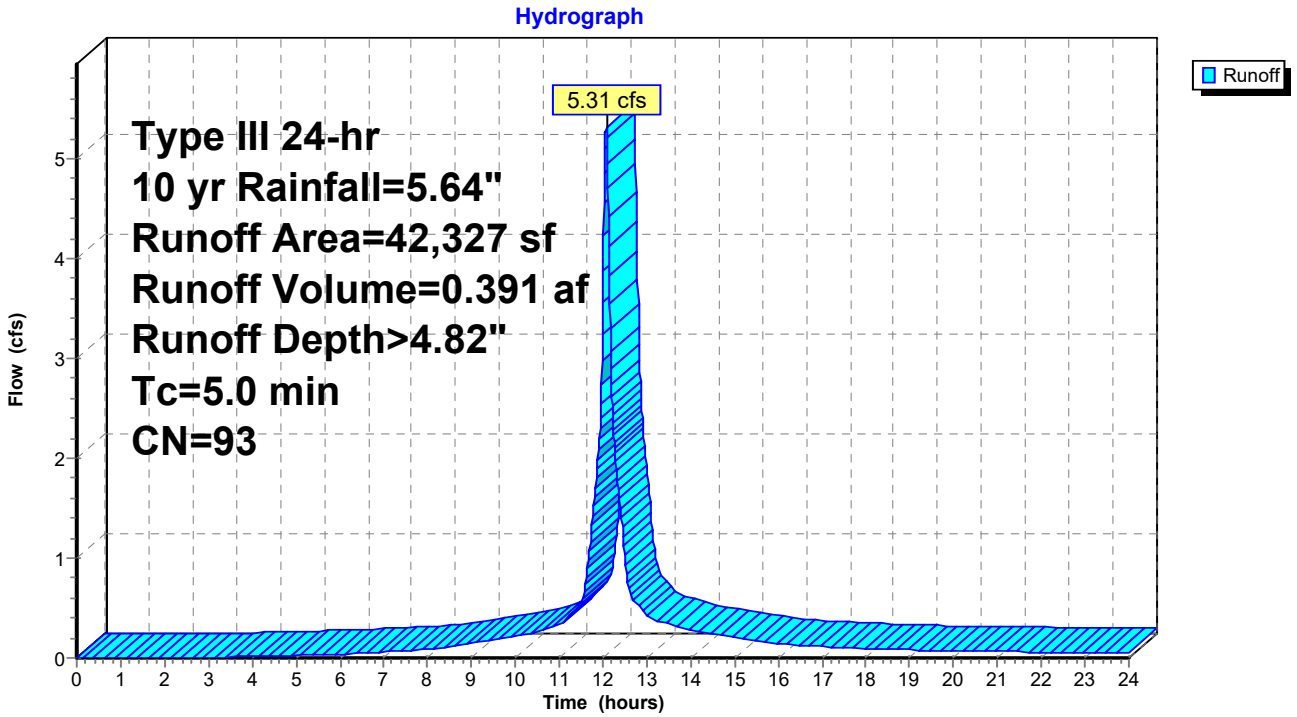
Runoff = 5.31 cfs @ 12.07 hrs, Volume= 0.391 af, Depth> 4.82"

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

	Area (sf)	CN	Description
	3,085	74	>75% Grass cover, Good, HSG C
	34,264	98	Paved roads w/curbs & sewers, HSG C
*	26	98	Concrete
*	231	42	Pervious Pavers, HSG C
*	3,480	61	Pervious Pavement, HSG C
	490	98	Roofs, HSG C
	643	96	Gravel surface, HSG C
*	108	98	Retaining Wall & Stairs, HSG C
	42,327	93	Weighted Average
	7,439		17.58% Pervious Area
	34,888		82.42% Impervious Area

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

Subcatchment 5S: Parking Lot



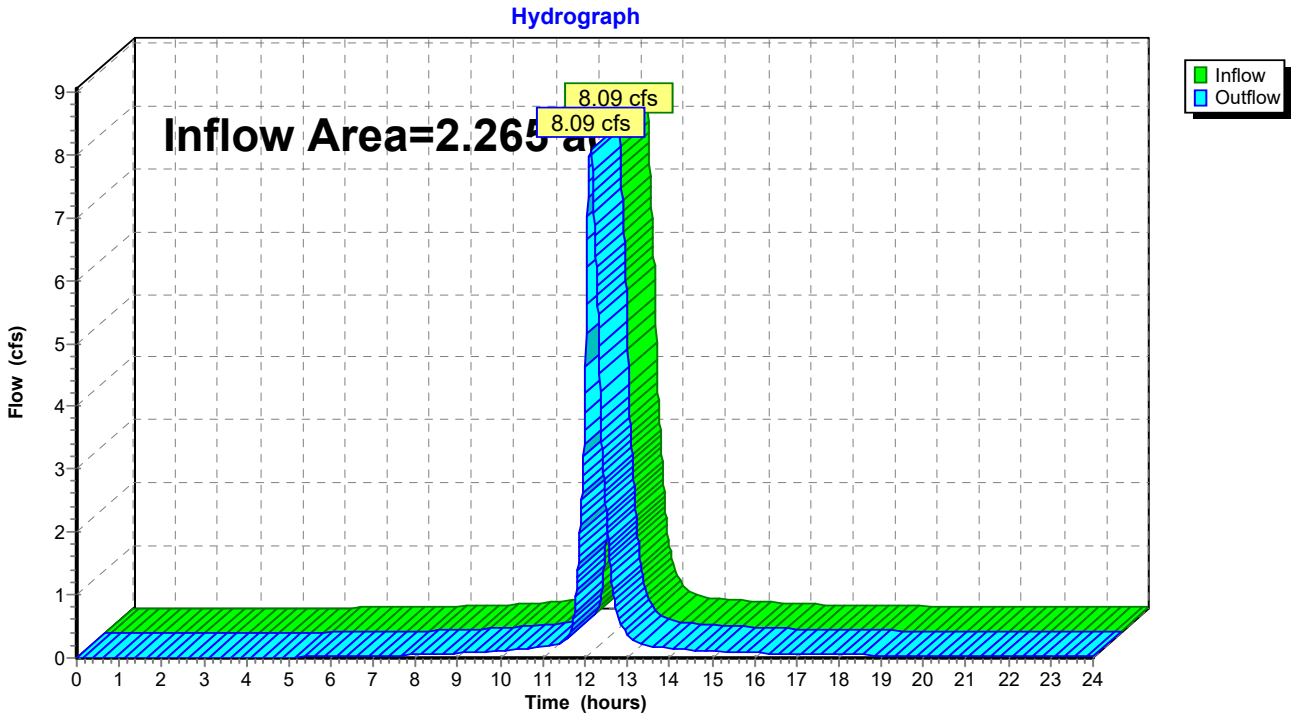
Summary for Reach AP 1: AP 1

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

Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 2.22" for 10 yr event
Inflow = 8.09 cfs @ 12.13 hrs, Volume= 0.418 af
Outflow = 8.09 cfs @ 12.13 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP 1: AP 1



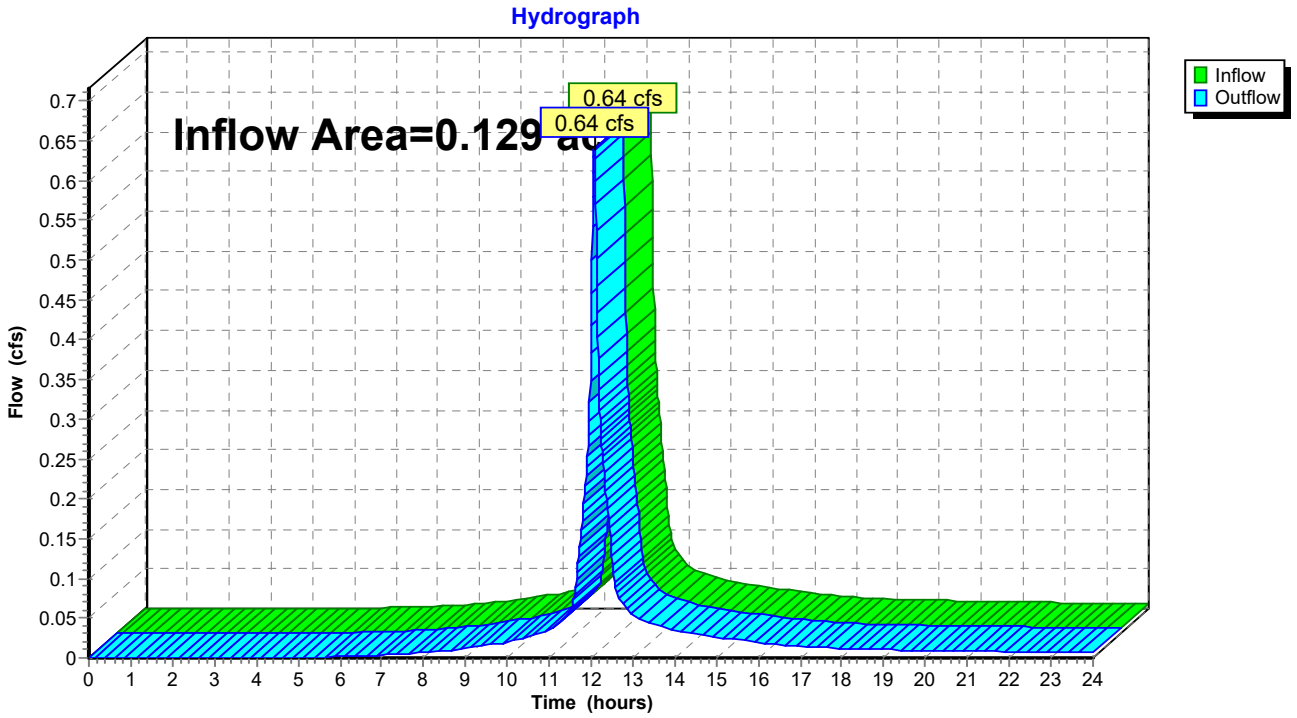
Summary for Reach AP2: AP2

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

Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 4.17" for 10 yr event
Inflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af
Outflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP2: AP2



Summary for Pond CB2: CB2

[57] Hint: Peaked at 95.67' (Flood elevation advised)

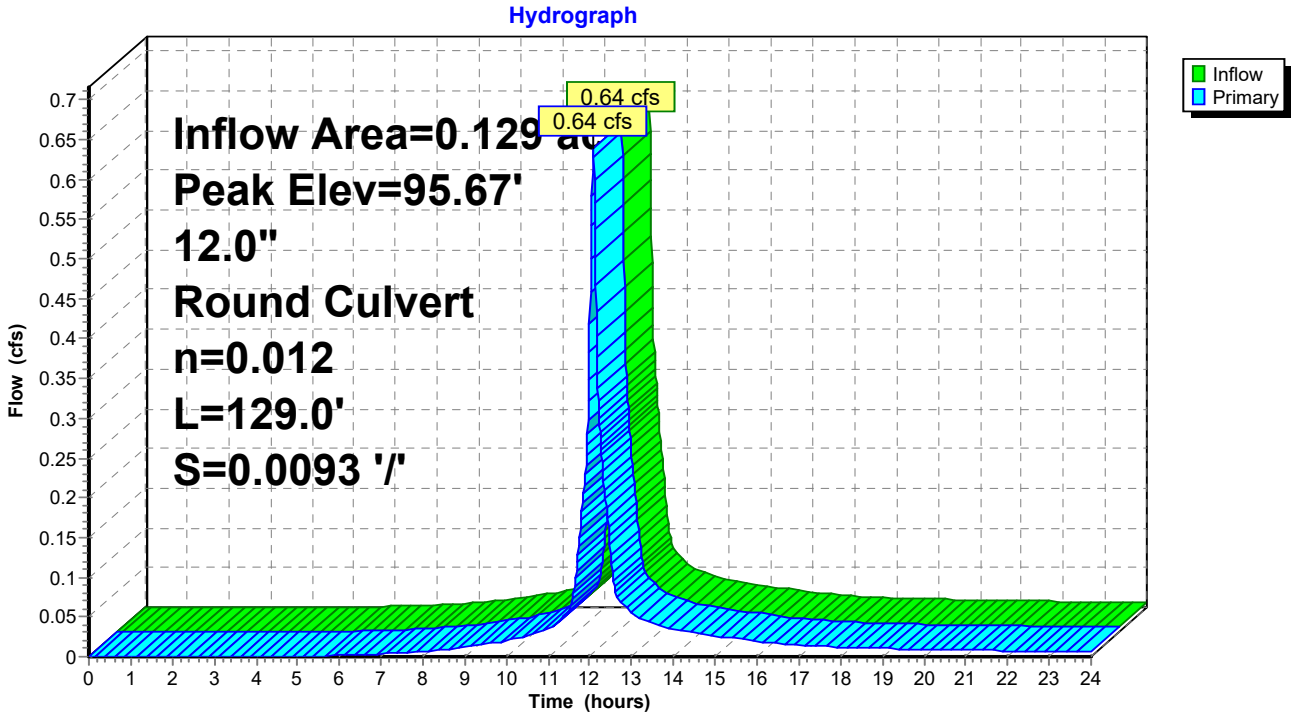
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 4.17" for 10 yr event
Inflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af
Outflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.67' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=95.67' TW=94.57' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.64 cfs @ 3.15 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 94.57' (Flood elevation advised)

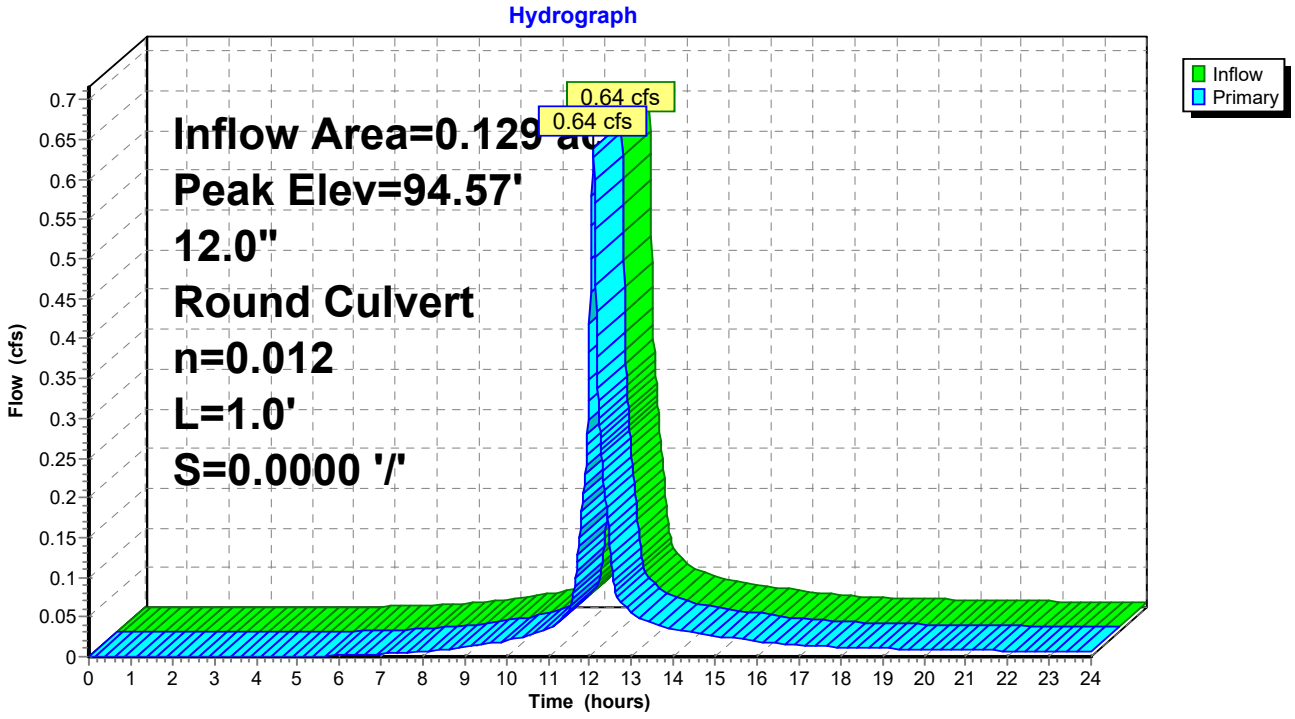
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 4.17" for 10 yr event
Inflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af
Outflow = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.07 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.57' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.07 hrs HW=94.57' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 0.64 cfs @ 2.31 fps)

Pond CB3: CB3



Summary for Pond CBB: CB B

[57] Hint: Peaked at 96.49' (Flood elevation advised)

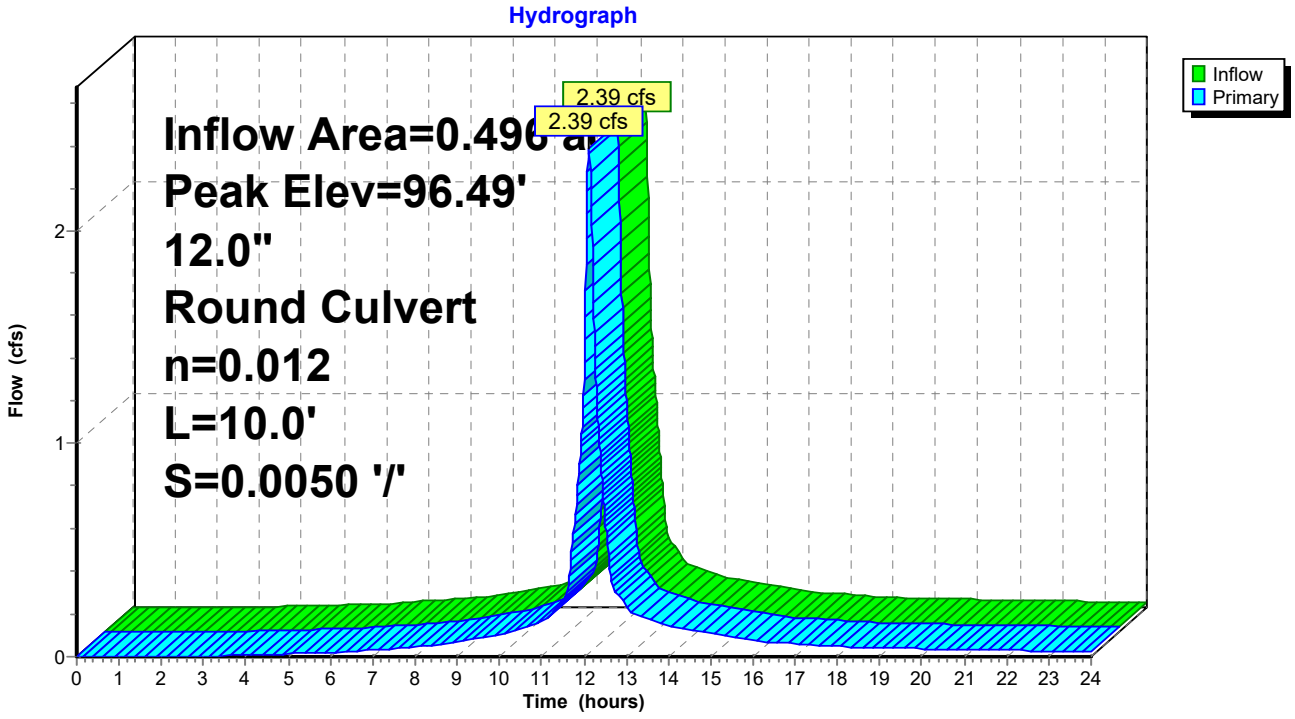
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 4.82" for 10 yr event
Inflow = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af
Outflow = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min
Primary = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 96.49'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.40'	**12.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 95.40' / 95.35' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=2.39 cfs @ 12.12 hrs HW=96.49' TW=95.92' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.39 cfs @ 3.48 fps)

Pond CBB: CB B



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.70' (Flood elevation advised)

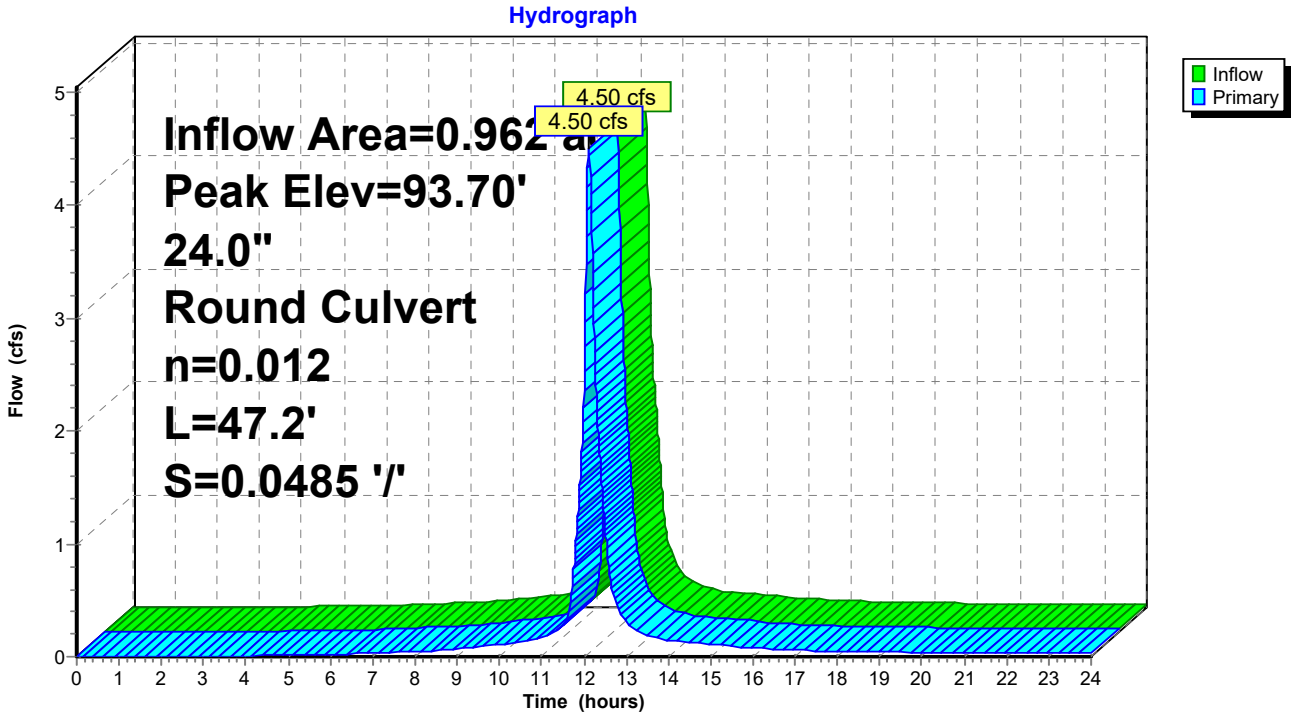
Inflow Area = 0.962 ac, 89.63% Impervious, Inflow Depth > 3.41" for 10 yr event
Inflow = 4.50 cfs @ 12.12 hrs, Volume= 0.274 af
Outflow = 4.50 cfs @ 12.12 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.0 min
Primary = 4.50 cfs @ 12.12 hrs, Volume= 0.274 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.70' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=4.50 cfs @ 12.12 hrs HW=93.70' TW=92.15' (Dynamic Tailwater)
1=Culvert (Inlet Controls 4.50 cfs @ 3.24 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 92.16' (Flood elevation advised)

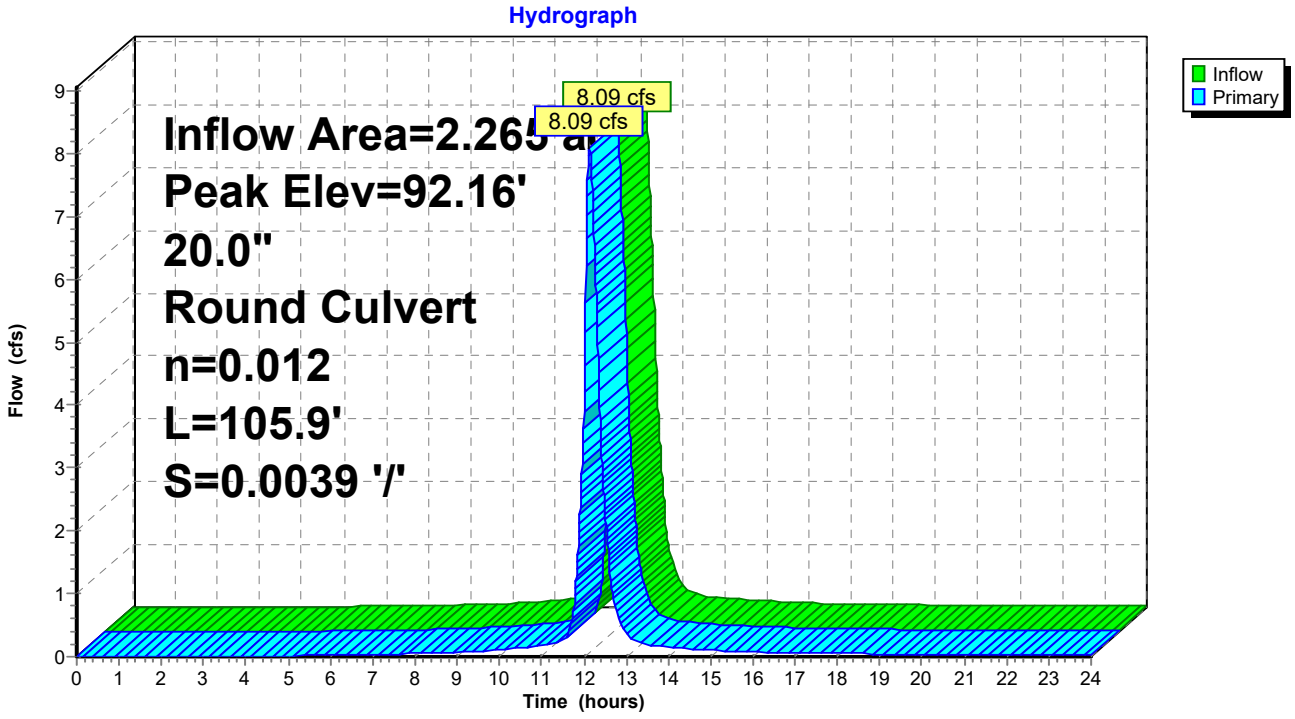
Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 2.22" for 10 yr event
Inflow = 8.09 cfs @ 12.13 hrs, Volume= 0.418 af
Outflow = 8.09 cfs @ 12.13 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min
Primary = 8.09 cfs @ 12.13 hrs, Volume= 0.418 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 92.16'@ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=8.08 cfs @ 12.13 hrs HW=92.16' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 8.08 cfs @ 4.53 fps)

Pond DMH2: DMH2



Summary for Pond DMHB: DMHB

[57] Hint: Peaked at 95.92' (Flood elevation advised)

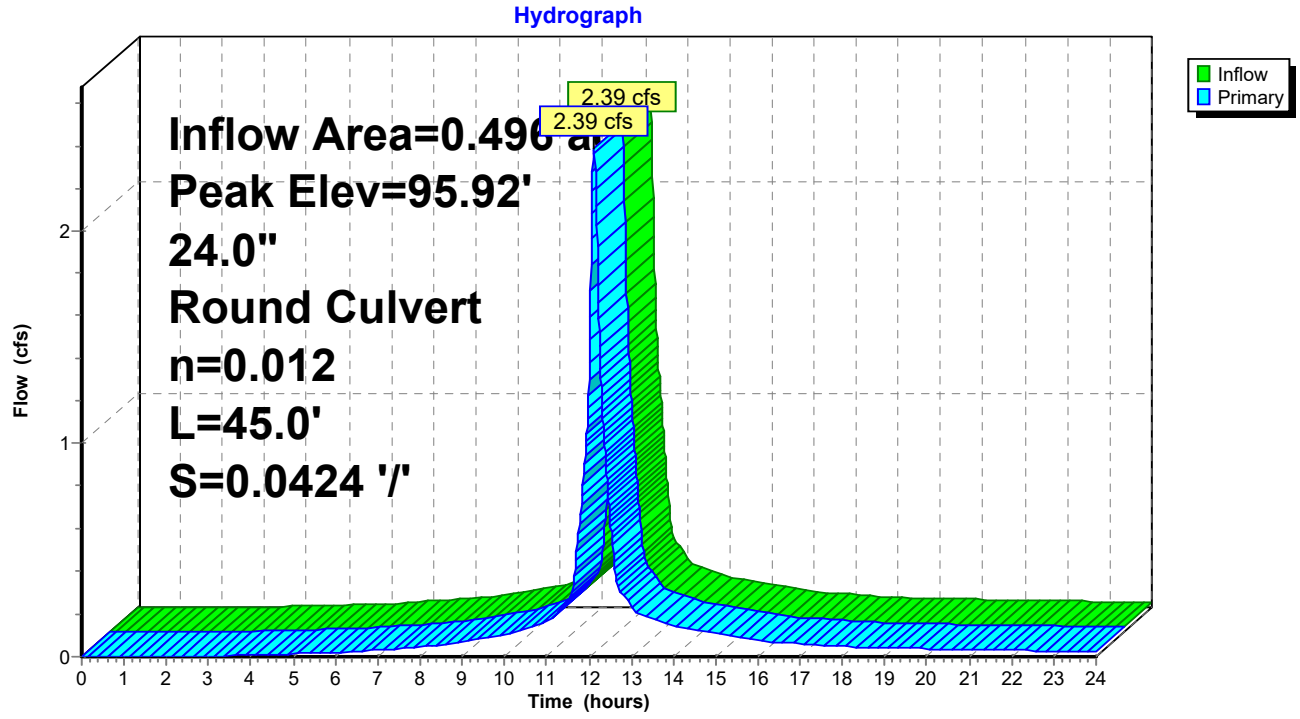
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 4.82" for 10 yr event
Inflow = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af
Outflow = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min
Primary = 2.39 cfs @ 12.12 hrs, Volume= 0.199 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.92'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**24.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0424 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=2.39 cfs @ 12.12 hrs HW=95.92' TW=93.70' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.39 cfs @ 2.73 fps)

Pond DMHB: DMHB



Summary for Pond PP: Pervious Pavement

Inflow Area = 0.972 ac, 82.42% Impervious, Inflow Depth > 4.82" for 10 yr event
Inflow = 5.31 cfs @ 12.07 hrs, Volume= 0.391 af
Outflow = 5.26 cfs @ 12.08 hrs, Volume= 0.391 af, Atten= 1%, Lag= 0.7 min
Discarded = 0.60 cfs @ 11.57 hrs, Volume= 0.270 af
Primary = 4.65 cfs @ 12.08 hrs, Volume= 0.120 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.05' @ 12.08 hrs Surf.Area= 3,480 sf Storage= 1,129 cf

Plug-Flow detention time=2.9 min calculated for 0.391 af (100% of inflow)
Center-of-Mass det. time=2.9 min (776.2 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	1,705 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.75	3,480	0.0	0	0
92.76	3,480	40.0	14	14
93.42	3,480	40.0	919	933
93.43	3,480	15.0	5	938
93.67	3,480	15.0	125	1,063
93.68	3,480	5.0	2	1,065
94.33	3,480	5.0	113	1,178
94.34	3,480	30.0	10	1,188
94.67	3,480	30.0	345	1,533
94.68	3,480	15.0	5	1,538
95.00	3,480	15.0	167	1,705

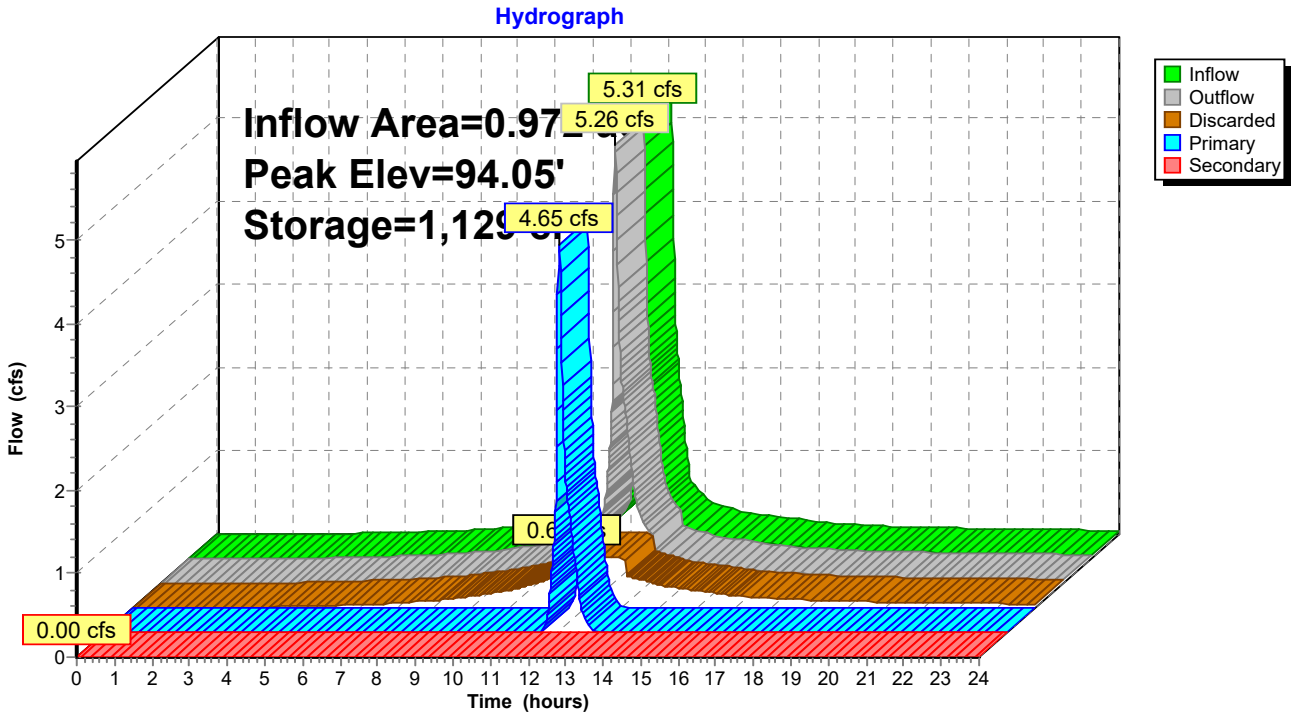
Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0125 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Secondary	94.90'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	92.75'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.60 cfs @ 11.57 hrs HW=92.76' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=4.64 cfs @ 12.08 hrs HW=94.05' TW=92.76' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.64 cfs @ 4.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.75' TW=90.99' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PP: Pervious Pavement



Summary for Pond RG: Rain Garden

Inflow Area = 1.303 ac, 62.27% Impervious, Inflow Depth > 1.84" for 10 yr event
Inflow = 5.67 cfs @ 12.09 hrs, Volume= 0.200 af
Outflow = 4.02 cfs @ 12.19 hrs, Volume= 0.200 af, Atten= 29%, Lag= 6.4 min
Discarded = 0.18 cfs @ 12.16 hrs, Volume= 0.055 af
Primary = 3.84 cfs @ 12.19 hrs, Volume= 0.145 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.13' @ 12.16 hrs Surf.Area= 1,053 sf Storage= 1,085 cf

Plug-Flow detention time=2.7 min calculated for 0.200 af (100% of inflow)
Center-of-Mass det. time=2.7 min (774.5 - 771.8)

Volume	Invert	Avail.Storage	Storage Description
#1	90.99'	3,826 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.99	1	0.0	0	0
91.00	821	40.0	2	2
92.50	821	40.0	493	494
93.00	1,000	100.0	455	949
94.00	1,402	100.0	1,201	2,150
95.00	1,950	100.0	1,676	3,826

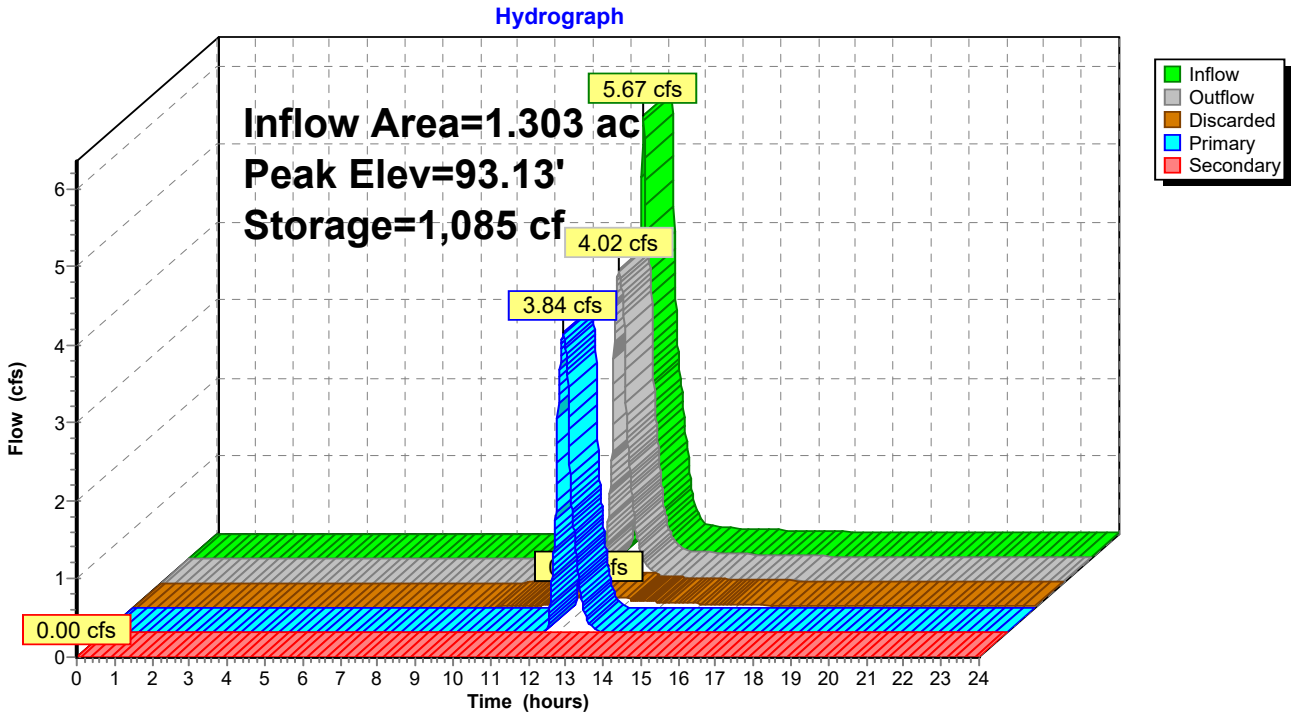
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**12.0" Round Culvert** L= 38.8' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.75' S= 0.0064 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	94.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	90.99'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 12.16 hrs HW=93.13' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=3.84 cfs @ 12.19 hrs HW=93.08' TW=92.05' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.84 cfs @ 4.89 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.99' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond RG: Rain Garden



Summary for Pond ST: Stormtech

Inflow Area = 0.466 ac, 100.00% Impervious, Inflow Depth > 5.40" for 10 yr event
Inflow = 2.67 cfs @ 12.07 hrs, Volume= 0.210 af
Outflow = 2.30 cfs @ 12.11 hrs, Volume= 0.210 af, Atten= 14%, Lag= 2.6 min
Discarded = 0.18 cfs @ 11.15 hrs, Volume= 0.135 af
Primary = 2.12 cfs @ 12.11 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 98.82' @ 12.11 hrs Surf.Area= 1,056 sf Storage= 826 cf

Plug-Flow detention time=6.0 min calculated for 0.209 af (100% of inflow)
Center-of-Mass det. time=6.0 min (750.7 - 744.7)

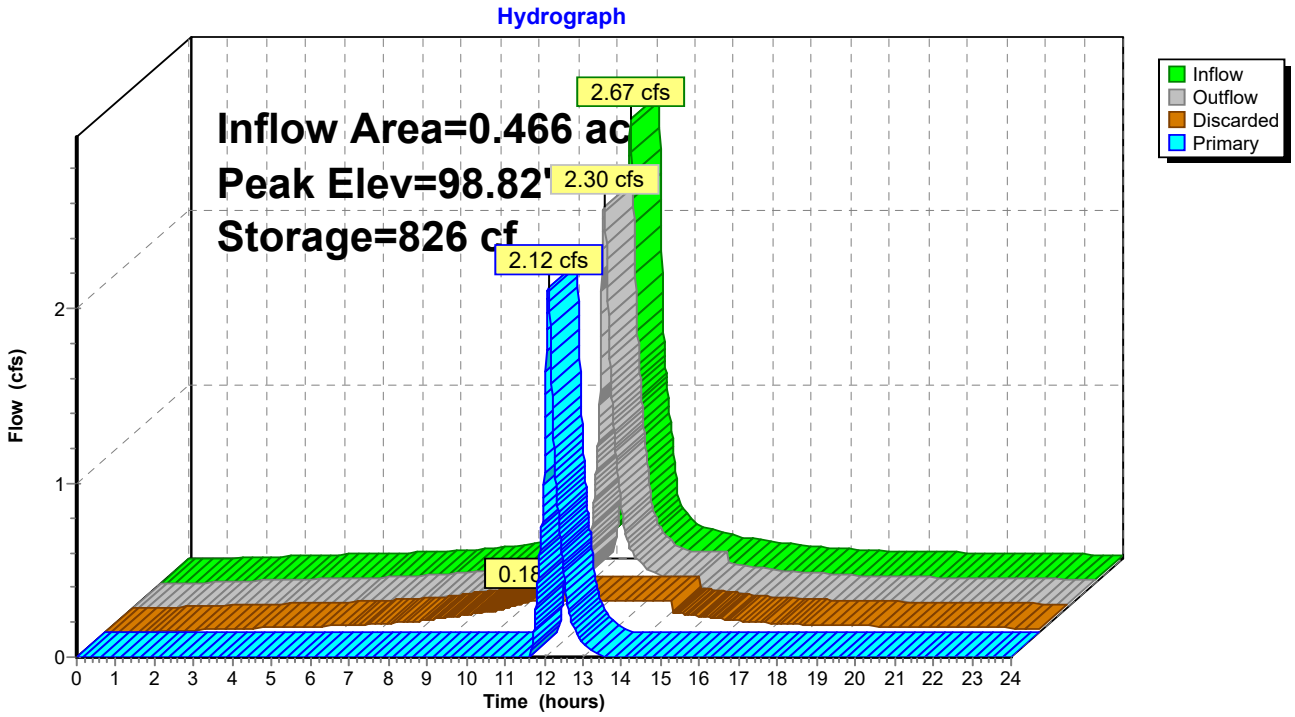
Volume	Invert	Avail.Storage	Storage Description
#1	97.58'	717 cf	**16.15'W x 65.36'L x 2.33'H Prismatoid** 2,459 cf Overall - 668 cf Embedded = 1,792 cf x 40.0% Voids
#2	98.08'	668 cf	**ADS_StormTech SC-310** x 45 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 5 rows
		1,385 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**12.0" Round Culvert** L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 98.00' / 95.40' S= 0.0605 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf
#2	Discarded	97.58'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 11.15 hrs HW=97.60' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=2.12 cfs @ 12.11 hrs HW=98.82' TW=93.70' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.12 cfs @ 3.08 fps)

Pond ST: Stormtech



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 4
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: WesternGrassedArea Runoff Area=14,438 sf 3.17% Impervious Runoff Depth>4.16"
Flow Length=316' Tc=7.5 min CN=74 Runoff=1.54 cfs 0.115 af

Subcatchment2S: SouthernGrassedArea Runoff Area=5,631 sf 54.43% Impervious Runoff Depth>5.61"
Tc=5.0 min CN=87 Runoff=0.85 cfs 0.060 af

Subcatchment3S: Roof Runoff Area=20,293 sf 100.00% Impervious Runoff Depth>6.90"
Tc=5.0 min CN=98 Runoff=3.38 cfs 0.268 af

Subcatchment4S: EasternSite Runoff Area=21,625 sf 79.90% Impervious Runoff Depth>6.30"
Flow Length=303' Tc=8.8 min CN=93 Runoff=3.07 cfs 0.261 af

Subcatchment5S: ParkingLot Runoff Area=42,327 sf 82.42% Impervious Runoff Depth>6.31"
Tc=5.0 min CN=93 Runoff=6.84 cfs 0.511 af

ReachAP 1: AP 1 Inflow=9.87 cfs 0.586 af
Outflow=9.87 cfs 0.586 af

ReachAP2: AP2 Inflow=0.85 cfs 0.060 af
Outflow=0.85 cfs 0.060 af

Pond CB2: CB2 Peak Elev=95.74' Inflow=0.85 cfs 0.060 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=0.85 cfs 0.060 af

Pond CB3: CB3 Peak Elev=94.65' Inflow=0.85 cfs 0.060 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=0.85 cfs 0.060 af

Pond CBB: CB B Peak Elev=96.77' Inflow=3.07 cfs 0.261 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0050 '/' Outflow=3.07 cfs 0.261 af

Pond DMH1: DMH1 Peak Elev=93.83' Inflow=5.78 cfs 0.368 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=5.78 cfs 0.368 af

Pond DMH2: DMH2 Peak Elev=92.50' Inflow=9.87 cfs 0.586 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=9.87 cfs 0.586 af

Pond DMHB: DMHB Peak Elev=96.02' Inflow=3.07 cfs 0.261 af
24.0" Round Culvert n=0.012 L=45.0' S=0.0424 '/' Outflow=3.07 cfs 0.261 af

Pond PP: PerviousPavement Peak Elev=94.38' Storage=1,234 cf Inflow=6.84 cfs 0.511 af
Discarded=0.60 cfs 0.334 af Primary=5.85 cfs 0.176 af Secondary=0.00 cfs 0.000 af Outflow=6.45 cfs 0.511 af

Pond RG: Rain Garden Peak Elev=93.84' Storage=1,930 cf Inflow=7.34 cfs 0.291 af
Discarded=0.23 cfs 0.073 af Primary=4.64 cfs 0.218 af Secondary=0.00 cfs 0.000 af Outflow=4.86 cfs 0.291 af

Pond ST: Stormtech Peak Elev=99.01' Storage=961 cf Inflow=3.38 cfs 0.268 af
Discarded=0.18 cfs 0.161 af Primary=2.70 cfs 0.107 af Outflow=2.89 cfs 0.268 af

Total Runoff Area = 2.395 ac Runoff Volume = 1.214 af Average Runoff Depth = 6.09"
27.16% Pervious = 0.650 ac 72.84% Impervious = 1.744 ac

Summary for Subcatchment 1S: Western Grassed Area

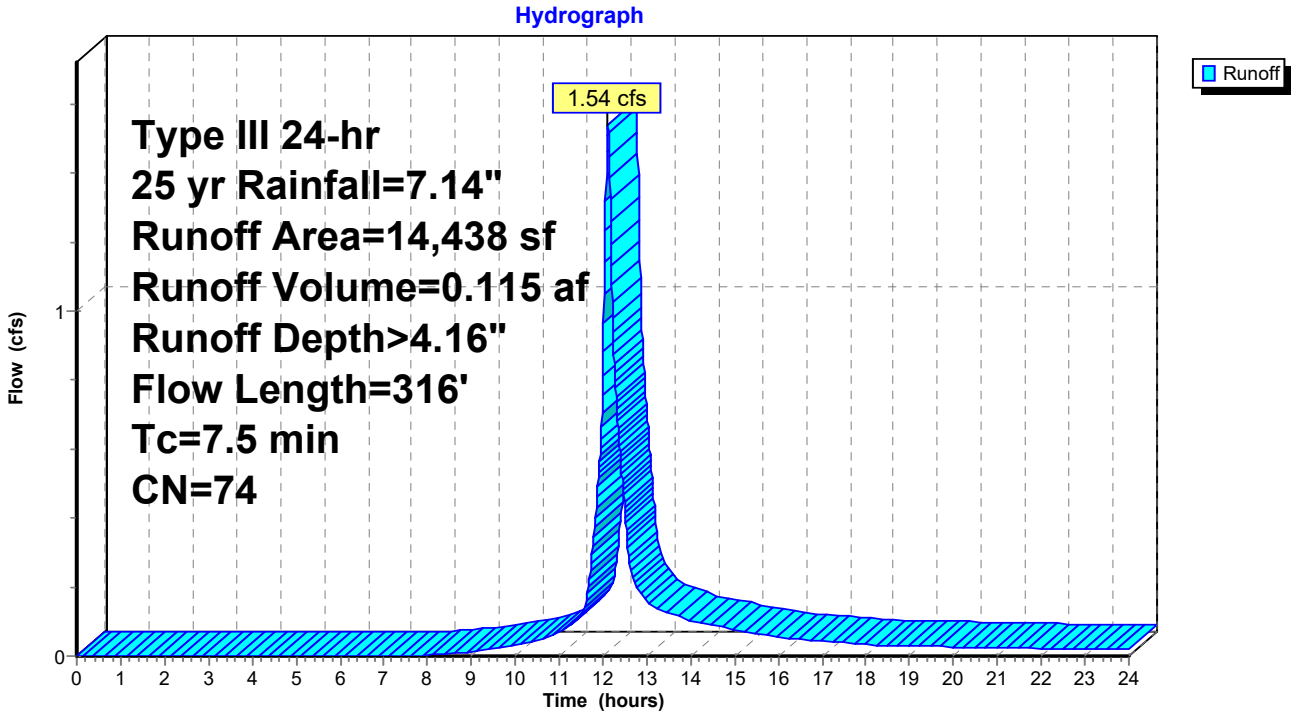
Runoff = 1.54 cfs @ 12.11 hrs, Volume= 0.115 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

	Area (sf)	CN	Description
	13,159	74	>75% Grass cover, Good, HSG C
	344	98	Paved roads w/curbs & sewers, HSG C
*	114	98	Concrete
*	821	58	Rain Garden, HSG C
	14,438	74	Weighted Average
	13,980		96.83% Pervious Area
	458		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.6	266	0.0132	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.5	316	Total			

Subcatchment 1S: Western Grassed Area



Summary for Subcatchment 2S: Southern Grassed Area

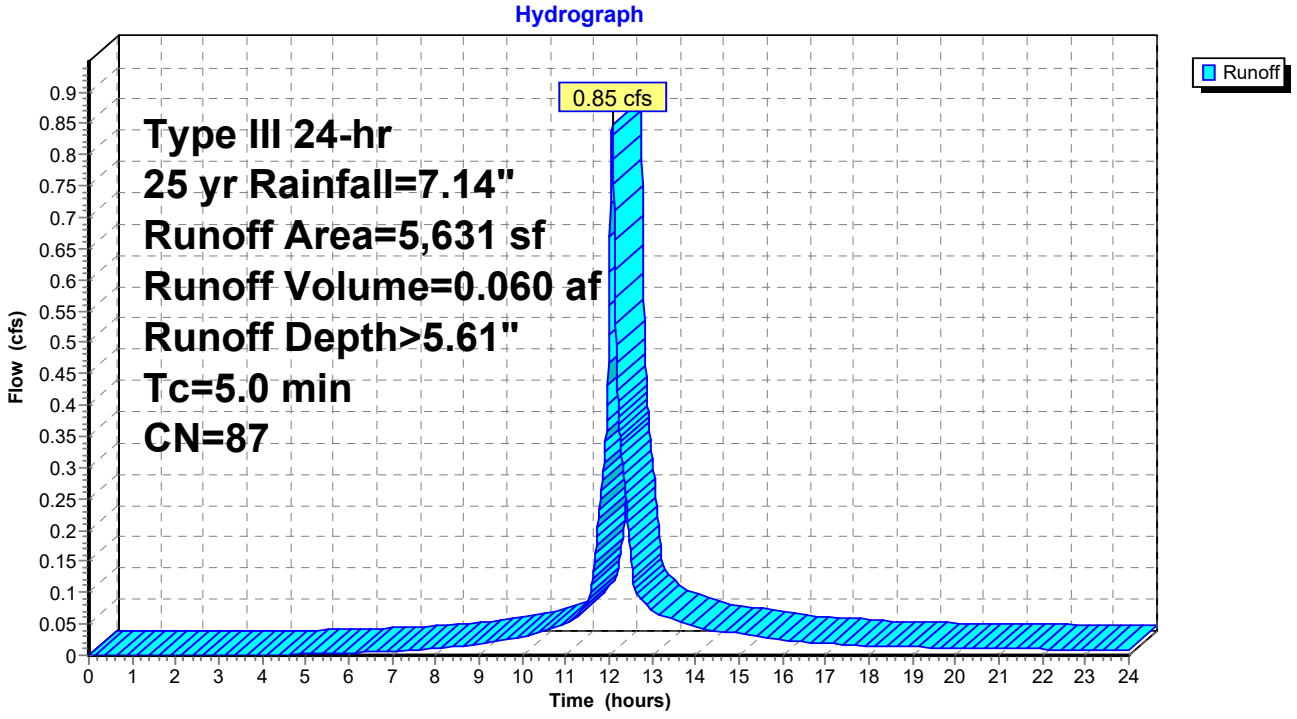
Runoff = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af, Depth> 5.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

Area (sf)	CN	Description
2,566	74	>75% Grass cover, Good, HSG C
3,065	98	Paved roads w/curbs & sewers, HSG C
5,631	87	Weighted Average
2,566		45.57% Pervious Area
3,065		54.43% Impervious Area

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

Subcatchment 2S: Southern Grassed Area



Summary for Subcatchment 3S: Roof

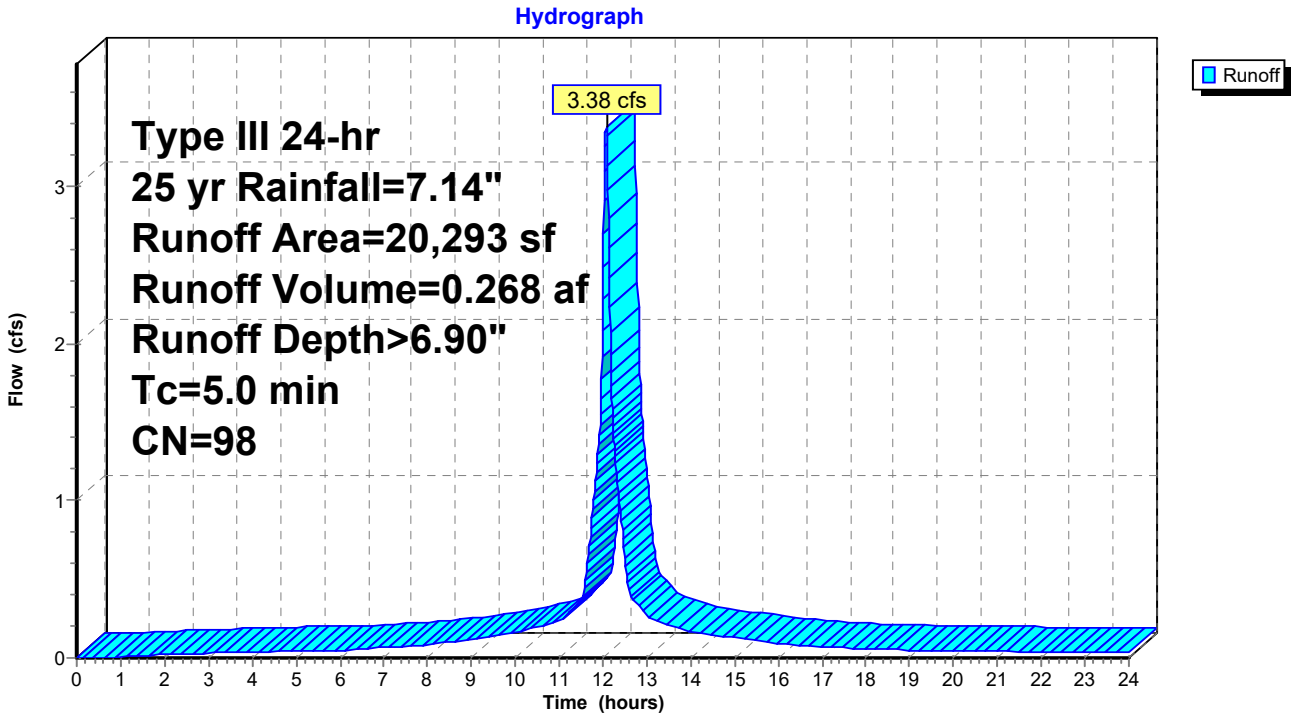
Runoff = 3.38 cfs @ 12.07 hrs, Volume= 0.268 af, Depth> 6.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

Area (sf)	CN	Description
2,612	98	Paved roads w/curbs & sewers, HSG C
17,681	98	Roofs, HSG C
20,293	98	Weighted Average
20,293		100.00% Impervious Area

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

Subcatchment 3S: Roof



Summary for Subcatchment 4S: Eastern Site

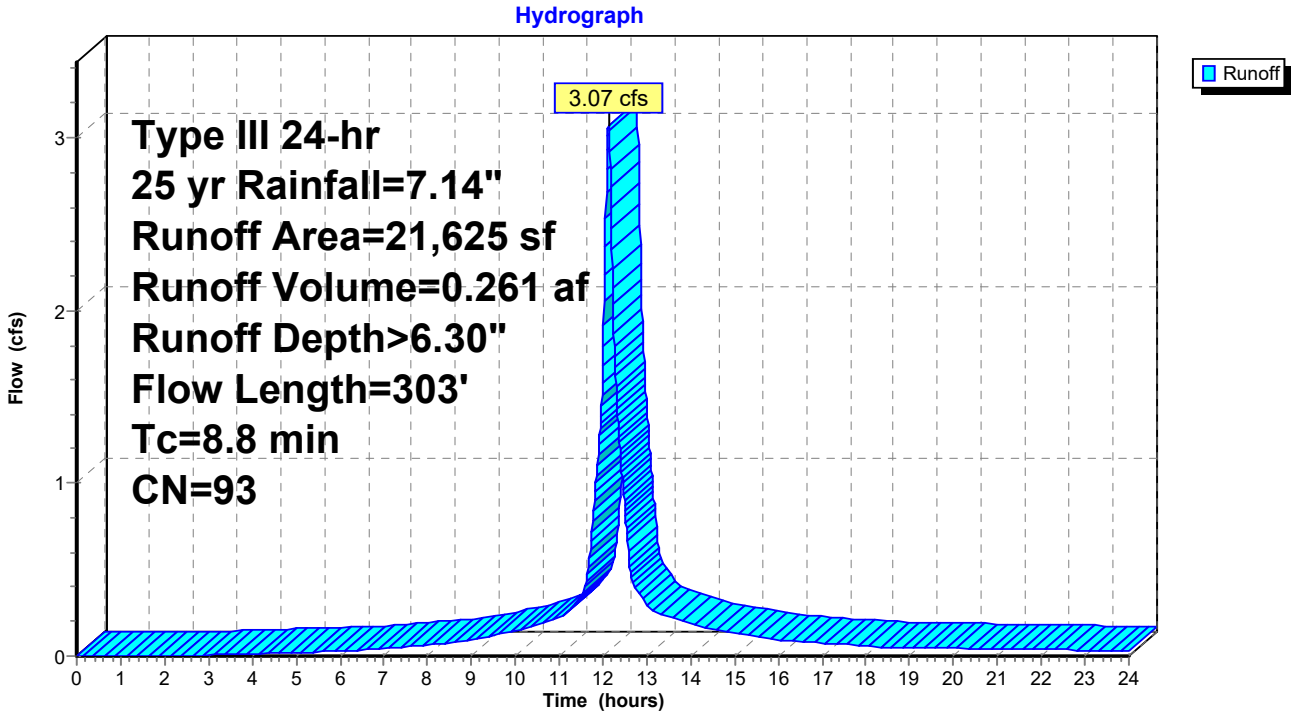
Runoff = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af, Depth> 6.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

Area (sf)	CN	Description
4,347	74	>75% Grass cover, Good, HSG C
17,278	98	Paved roads w/curbs & sewers, HSG C
21,625	93	Weighted Average
4,347		20.10% Pervious Area
17,278		79.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	252	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.8	303	Total			

Subcatchment 4S: Eastern Site



Summary for Subcatchment 5S: Parking Lot

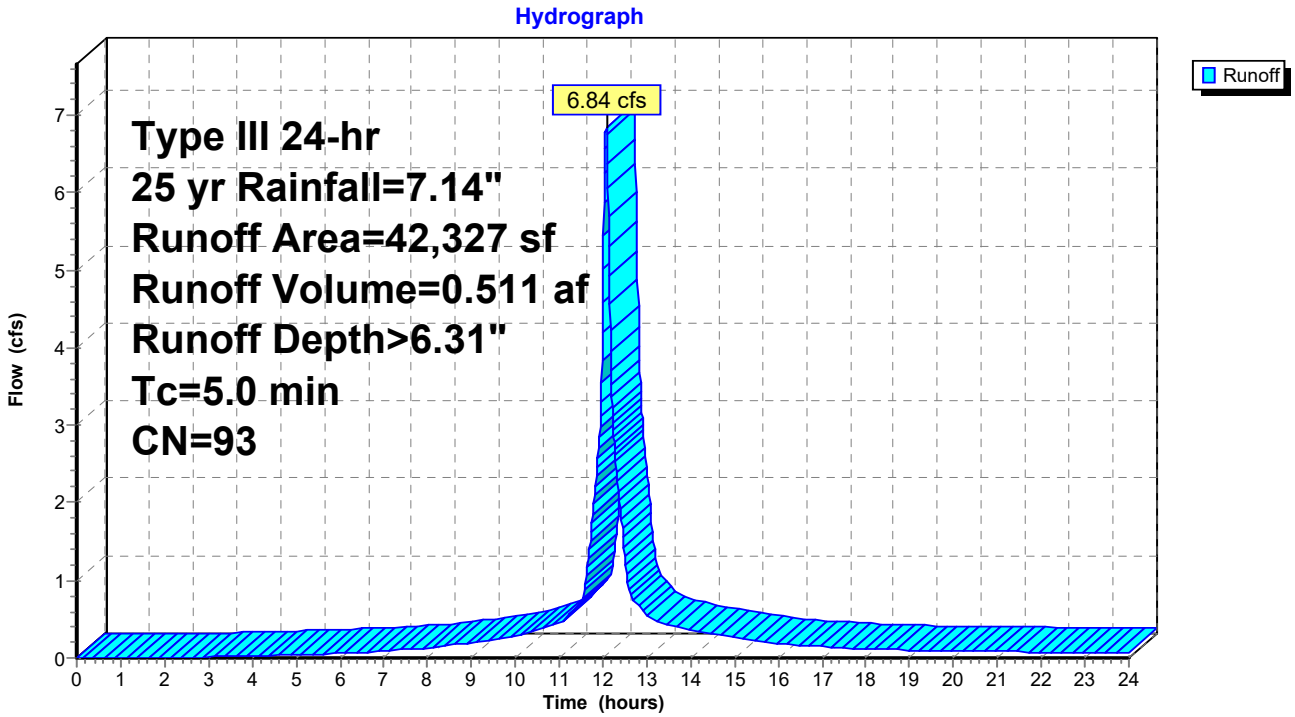
Runoff = 6.84 cfs @ 12.07 hrs, Volume= 0.511 af, Depth> 6.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 yr Rainfall=7.14"

	Area (sf)	CN	Description
	3,085	74	>75% Grass cover, Good, HSG C
	34,264	98	Paved roads w/curbs & sewers, HSG C
*	26	98	Concrete
*	231	42	Pervious Pavers, HSG C
*	3,480	61	Pervious Pavement, HSG C
	490	98	Roofs, HSG C
	643	96	Gravel surface, HSG C
*	108	98	Retaining Wall & Stairs, HSG C
	42,327	93	Weighted Average
	7,439		17.58% Pervious Area
	34,888		82.42% Impervious Area

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

Subcatchment 5S: Parking Lot



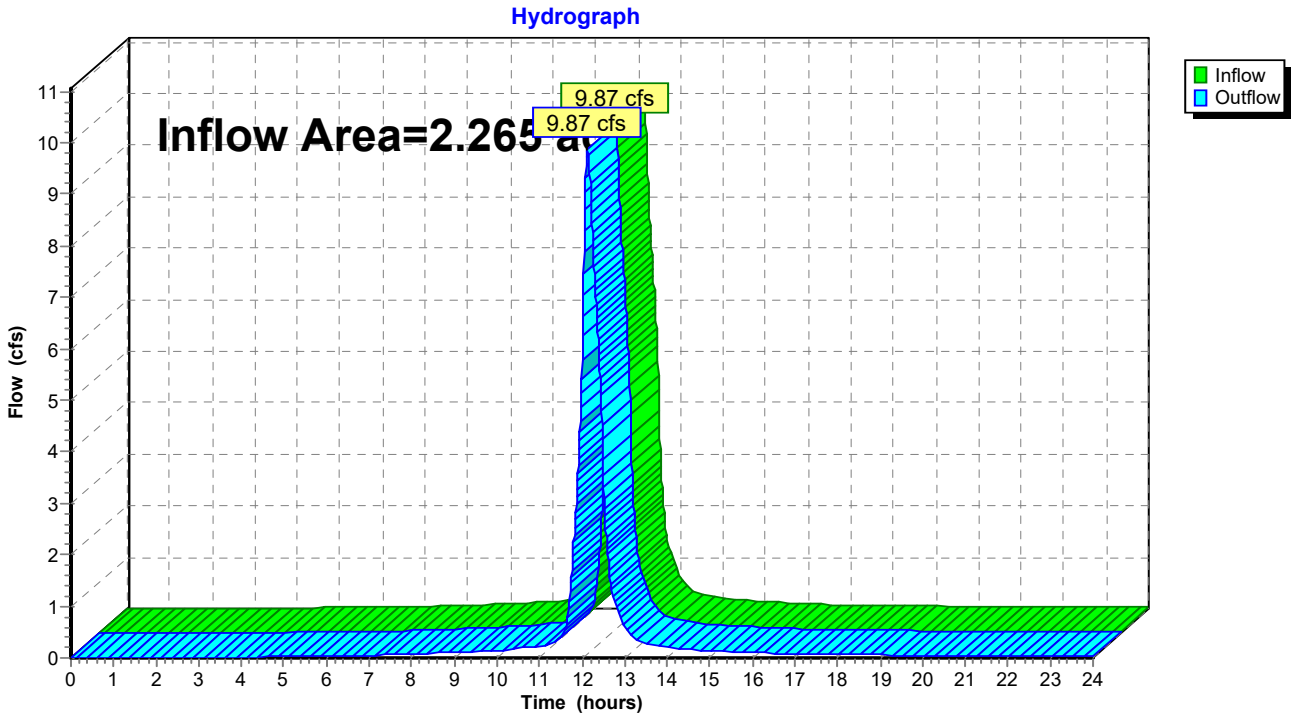
Summary for Reach AP 1: AP 1

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

Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 3.10" for 25 yr event
Inflow = 9.87 cfs @ 12.14 hrs, Volume= 0.586 af
Outflow = 9.87 cfs @ 12.14 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP 1: AP 1



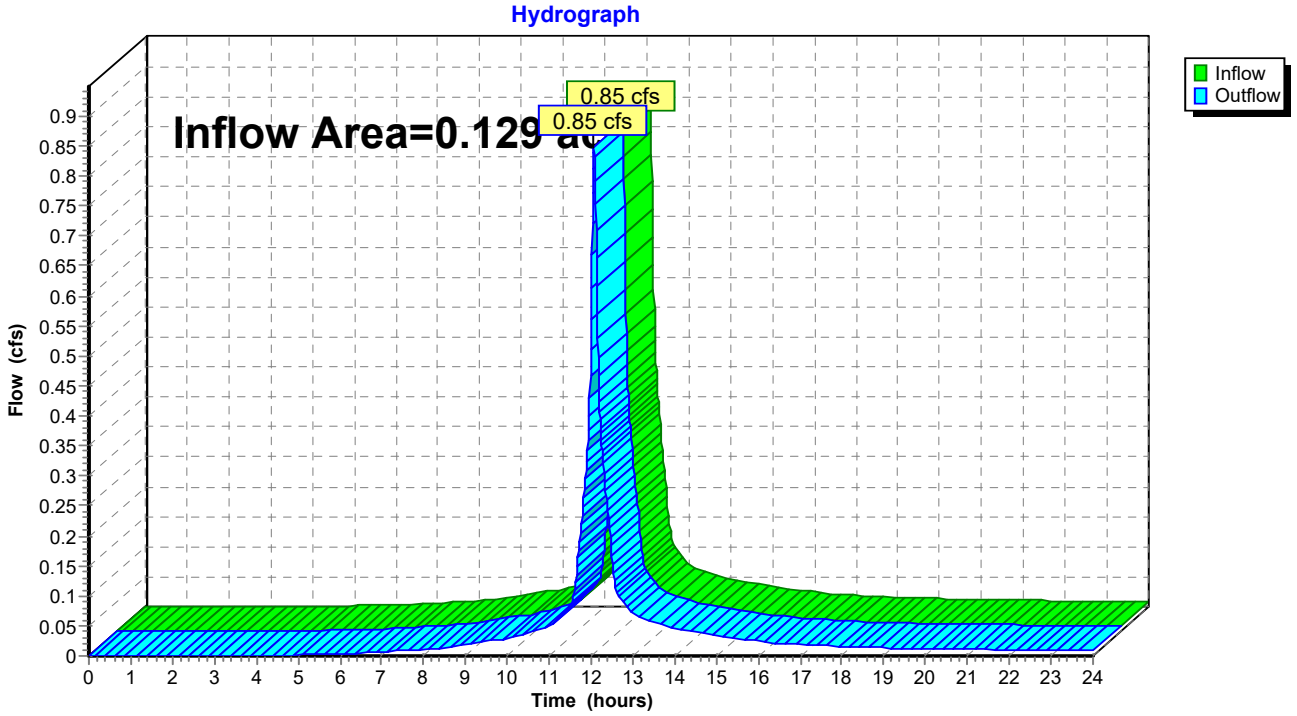
Summary for Reach AP2: AP2

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

Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 5.61" for 25 yr event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP2: AP2



Summary for Pond CB2: CB2

[57] Hint: Peaked at 95.74' (Flood elevation advised)

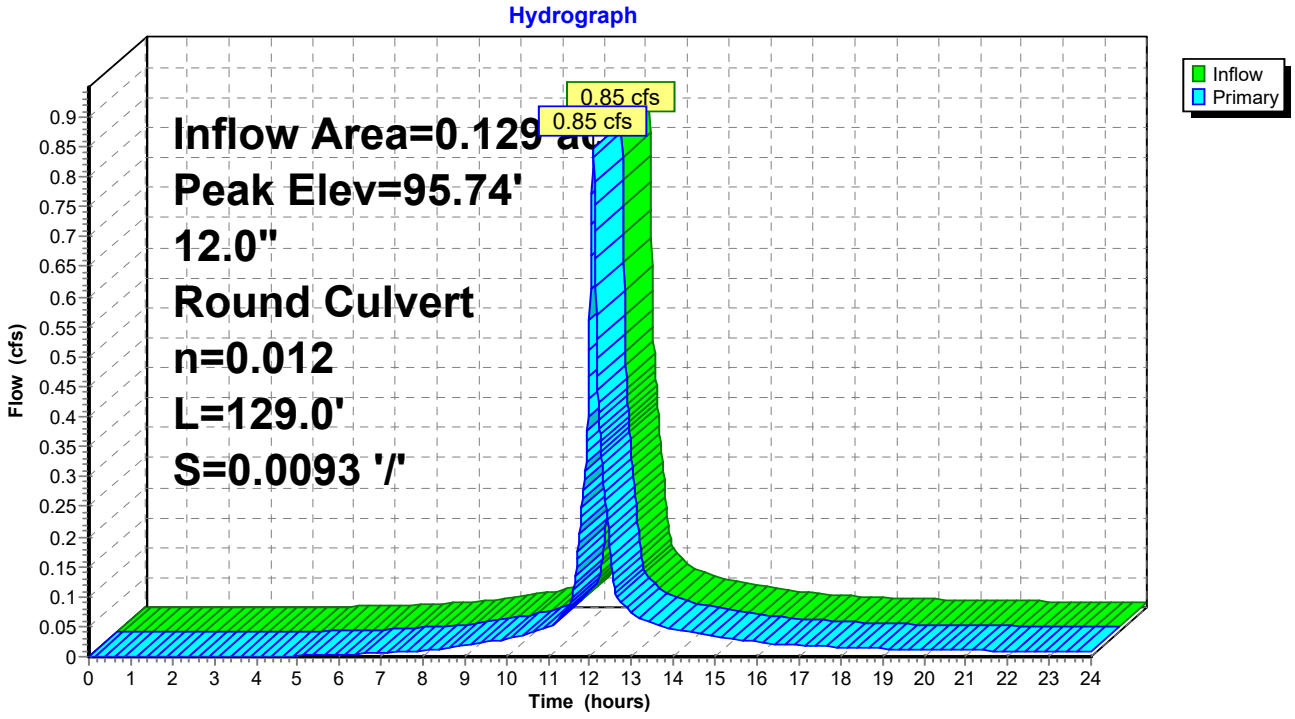
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 5.61" for 25 yr event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.74' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.07 hrs HW=95.74' TW=94.65' (Dynamic Tailwater)
↳**1=Culvert** (Outlet Controls 0.85 cfs @ 3.34 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 94.65' (Flood elevation advised)

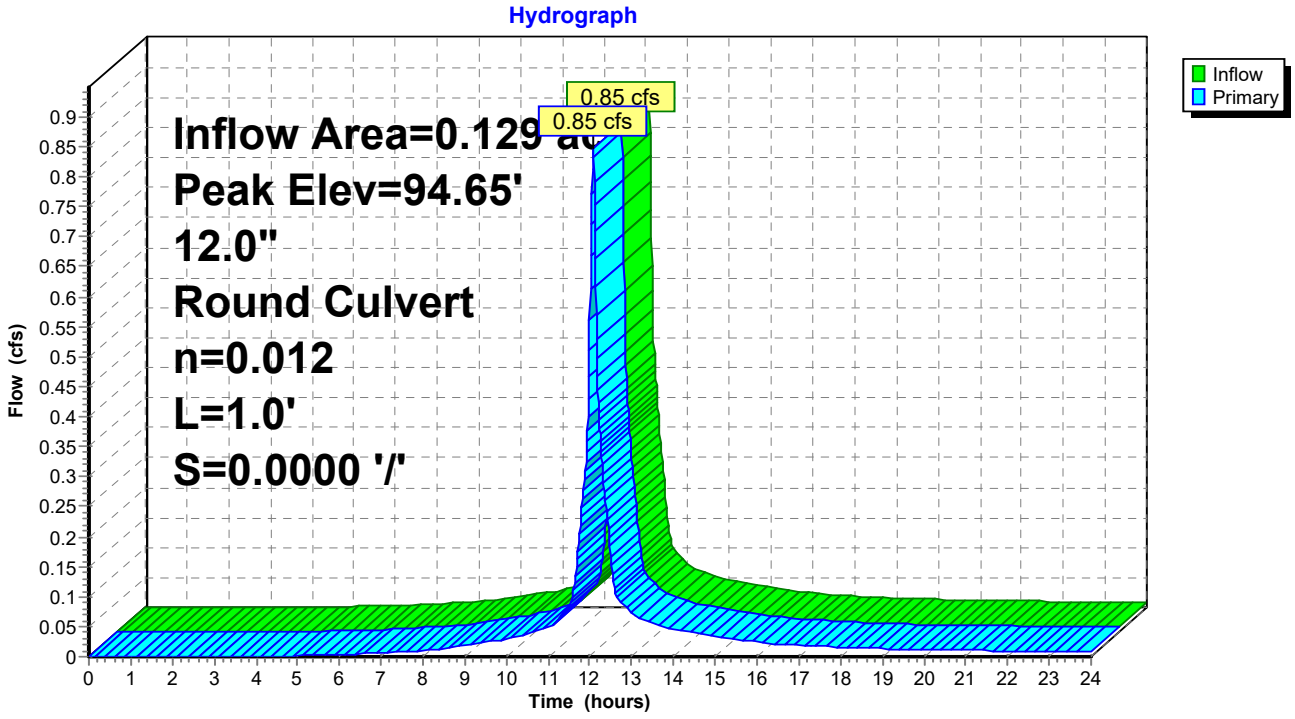
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 5.61" for 25 yr event
Inflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af
Outflow = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 0.85 cfs @ 12.07 hrs, Volume= 0.060 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.65' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.07 hrs HW=94.65' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 0.85 cfs @ 2.50 fps)

Pond CB3: CB3



Summary for Pond CBB: CB B

[57] Hint: Peaked at 96.77' (Flood elevation advised)

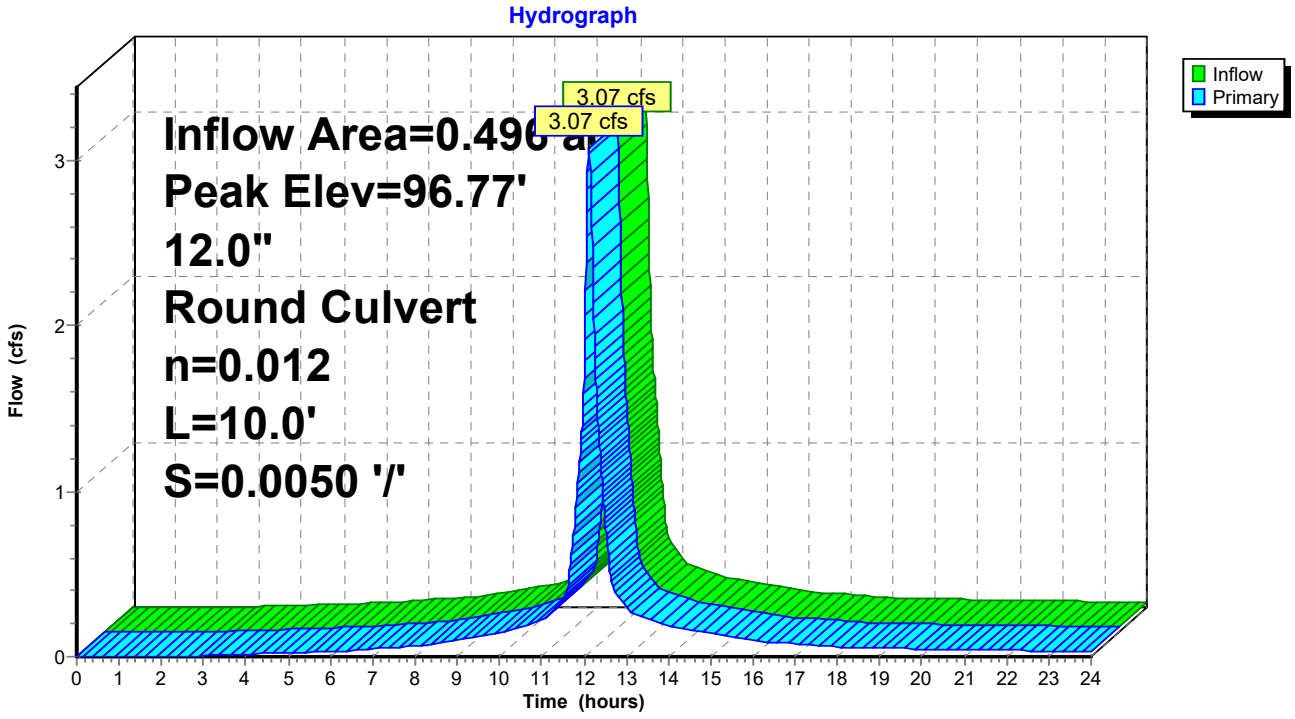
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 6.30" for 25 yr event
Inflow = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af
Outflow = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af, Atten= 0%, Lag= 0.0 min
Primary = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 96.77' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.40'	**12.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 95.40' / 95.35' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.12 hrs HW=96.77' TW=96.02' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 3.07 cfs @ 3.91 fps)

Pond CBB: CB B



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.83' (Flood elevation advised)

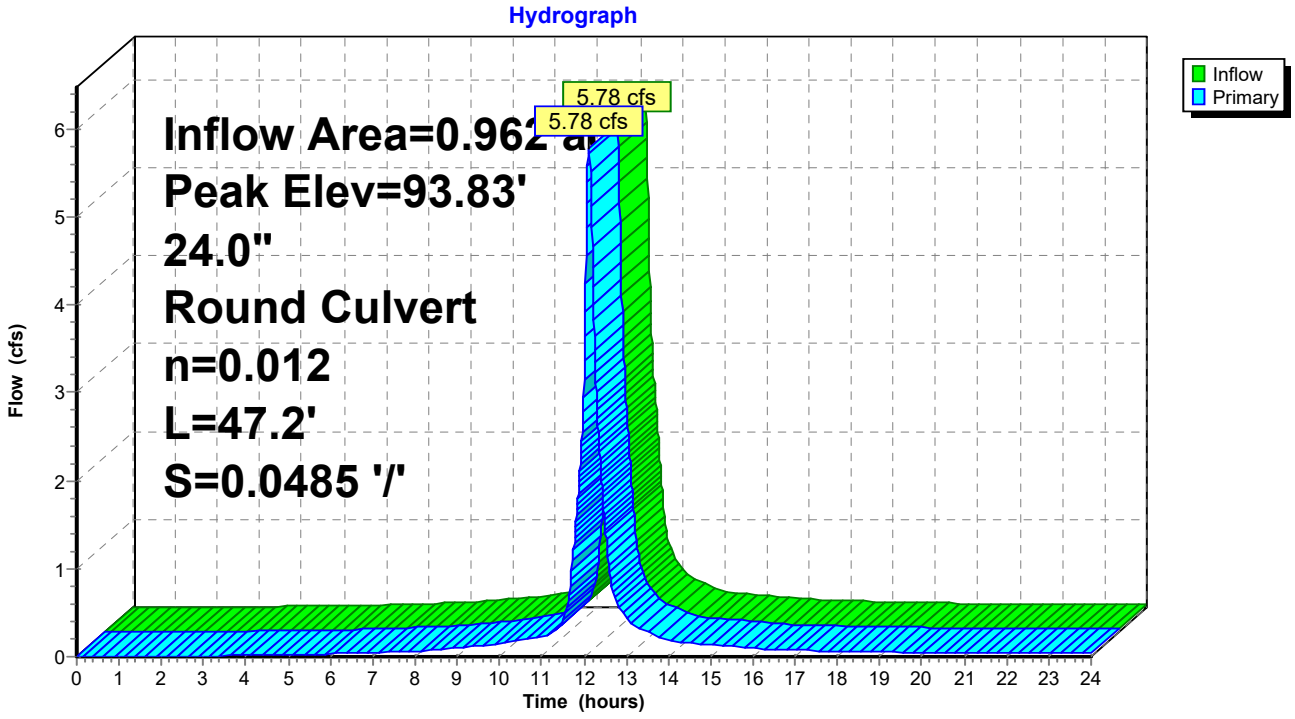
Inflow Area = 0.962 ac, 89.63% Impervious, Inflow Depth > 4.59" for 25 yr event
Inflow = 5.78 cfs @ 12.12 hrs, Volume= 0.368 af
Outflow = 5.78 cfs @ 12.12 hrs, Volume= 0.368 af, Atten= 0%, Lag= 0.0 min
Primary = 5.78 cfs @ 12.12 hrs, Volume= 0.368 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.83' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=5.77 cfs @ 12.12 hrs HW=93.83' TW=92.48' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 5.77 cfs @ 3.48 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 92.50' (Flood elevation advised)

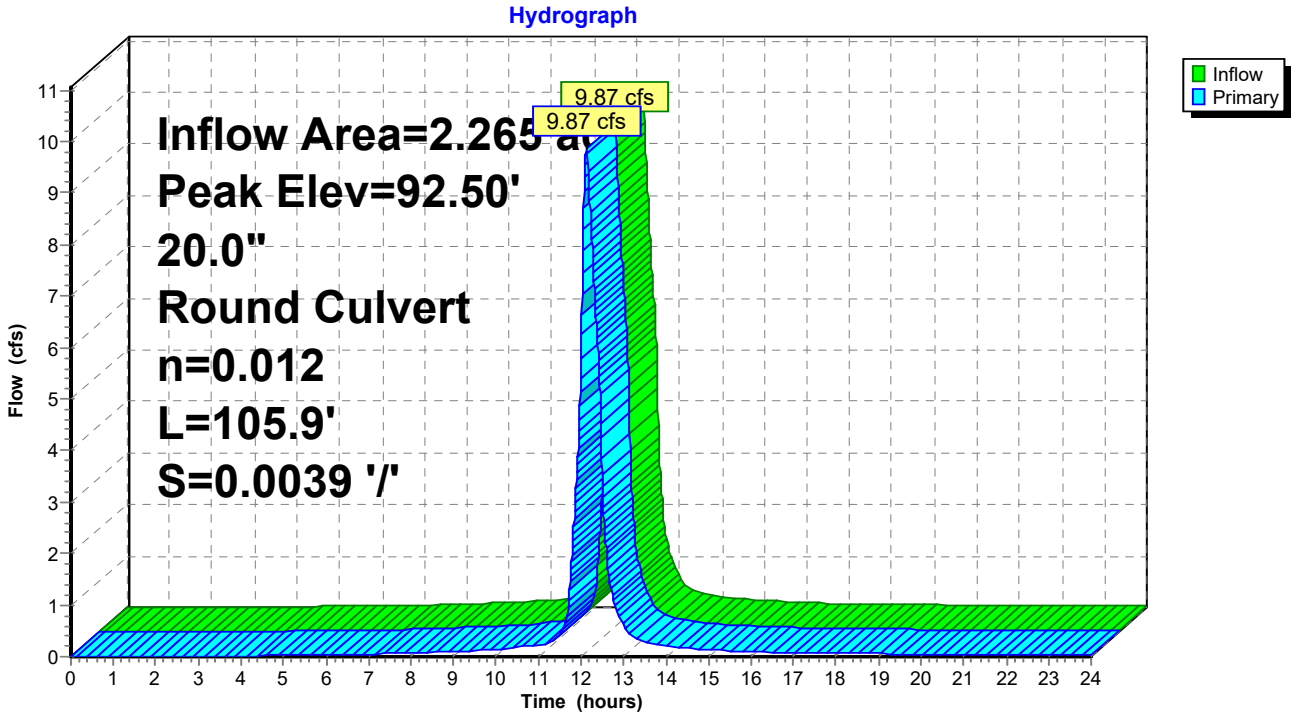
Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 3.10" for 25 yr event
Inflow = 9.87 cfs @ 12.14 hrs, Volume= 0.586 af
Outflow = 9.87 cfs @ 12.14 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min
Primary = 9.87 cfs @ 12.14 hrs, Volume= 0.586 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 92.50' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=9.87 cfs @ 12.14 hrs HW=92.50' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 9.87 cfs @ 4.72 fps)

Pond DMH2: DMH2



Summary for Pond DMHB: DMHB

[57] Hint: Peaked at 96.02' (Flood elevation advised)

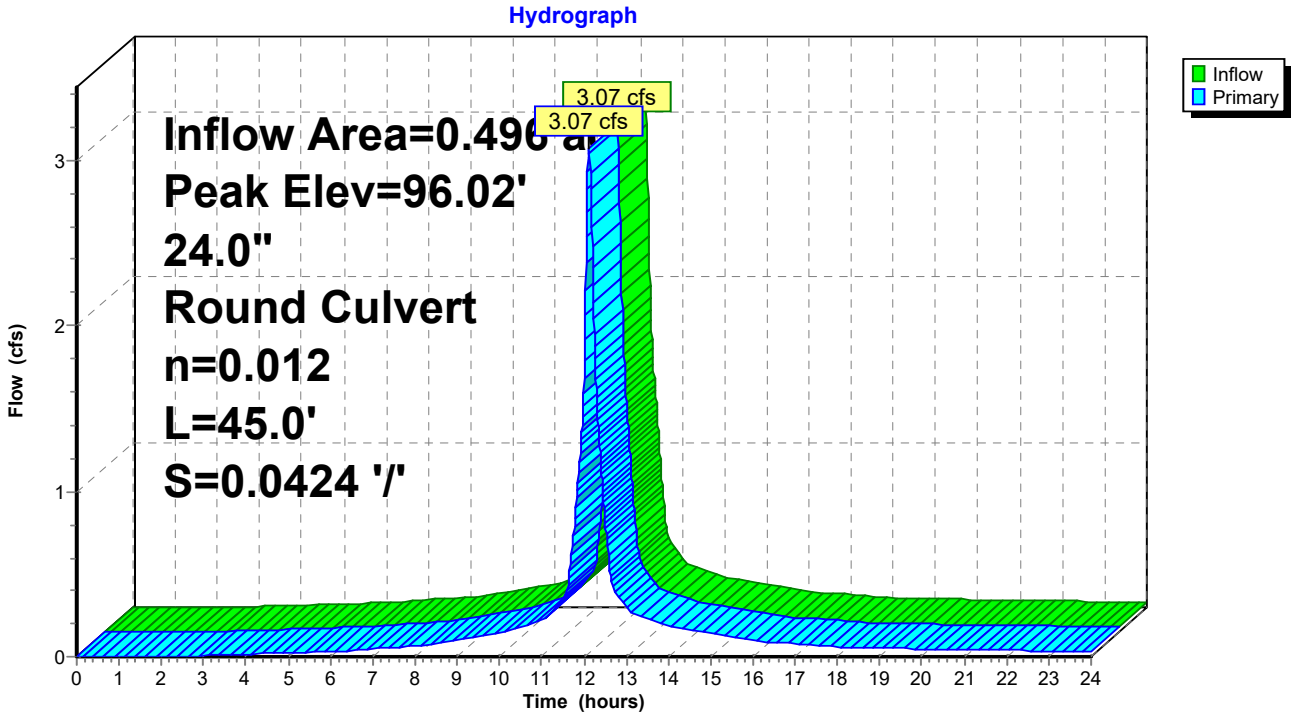
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 6.30" for 25 yr event
Inflow = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af
Outflow = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af, Atten= 0%, Lag= 0.0 min
Primary = 3.07 cfs @ 12.12 hrs, Volume= 0.261 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 96.02' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**24.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0424 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=3.07 cfs @ 12.12 hrs HW=96.02' TW=93.83' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 3.07 cfs @ 2.92 fps)

Pond DMHB: DMHB



Summary for Pond PP: Pervious Pavement

Inflow Area = 0.972 ac, 82.42% Impervious, Inflow Depth > 6.31" for 25 yr event
Inflow = 6.84 cfs @ 12.07 hrs, Volume= 0.511 af
Outflow = 6.45 cfs @ 12.09 hrs, Volume= 0.511 af, Atten= 6%, Lag= 0.9 min
Discarded = 0.60 cfs @ 11.33 hrs, Volume= 0.334 af
Primary = 5.85 cfs @ 12.09 hrs, Volume= 0.176 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.38' @ 12.12 hrs Surf.Area= 3,480 sf Storage= 1,234 cf

Plug-Flow detention time=2.9 min calculated for 0.510 af (100% of inflow)
Center-of-Mass det. time=2.9 min (769.7 - 766.9)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	1,705 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.75	3,480	0.0	0	0
92.76	3,480	40.0	14	14
93.42	3,480	40.0	919	933
93.43	3,480	15.0	5	938
93.67	3,480	15.0	125	1,063
93.68	3,480	5.0	2	1,065
94.33	3,480	5.0	113	1,178
94.34	3,480	30.0	10	1,188
94.67	3,480	30.0	345	1,533
94.68	3,480	15.0	5	1,538
95.00	3,480	15.0	167	1,705

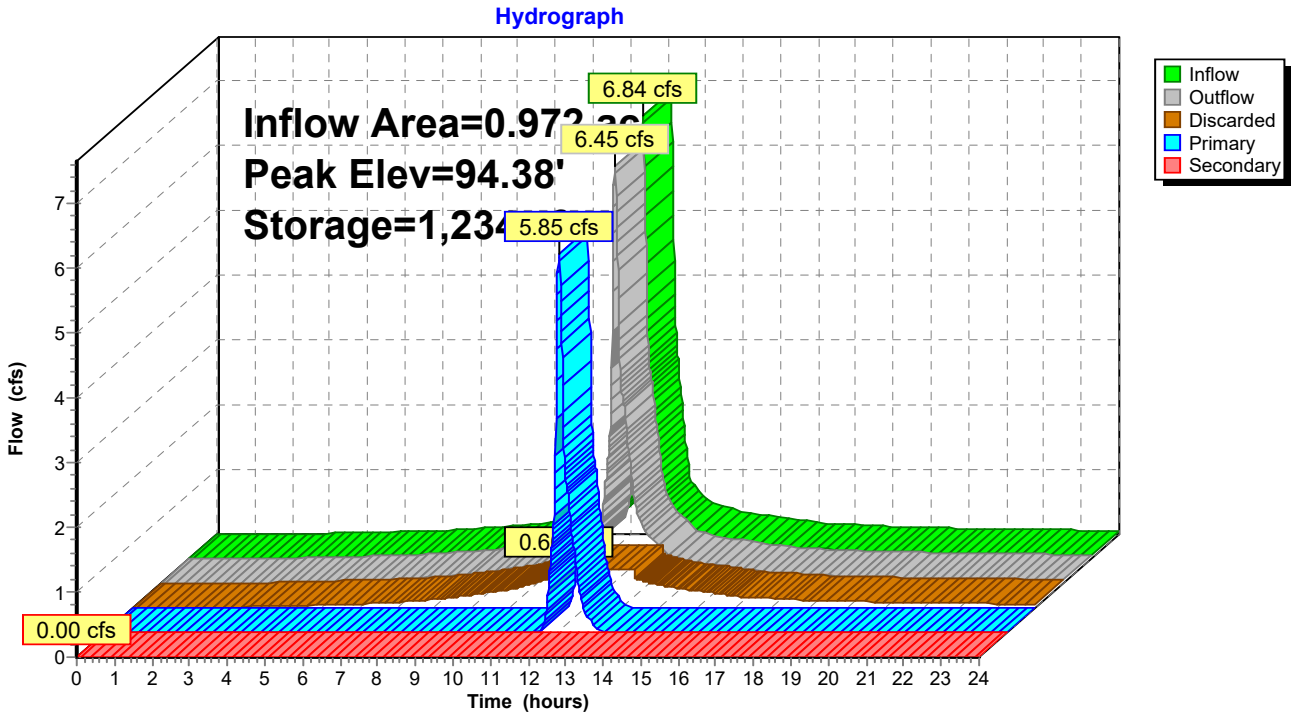
Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0125 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Secondary	94.90'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	92.75'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.60 cfs @ 11.33 hrs HW=92.76' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=5.82 cfs @ 12.09 hrs HW=94.37' TW=93.33' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 5.82 cfs @ 4.78 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.75' TW=90.99' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond PP: Pervious Pavement



Summary for Pond RG: Rain Garden

Inflow Area = 1.303 ac, 62.27% Impervious, Inflow Depth > 2.68" for 25 yr event
Inflow = 7.34 cfs @ 12.09 hrs, Volume= 0.291 af
Outflow = 4.86 cfs @ 12.22 hrs, Volume= 0.291 af, Atten= 34%, Lag= 7.9 min
Discarded = 0.23 cfs @ 12.18 hrs, Volume= 0.073 af
Primary = 4.64 cfs @ 12.22 hrs, Volume= 0.218 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.84' @ 12.18 hrs Surf.Area= 1,337 sf Storage= 1,930 cf

Plug-Flow detention time=3.6 min calculated for 0.291 af (100% of inflow)
Center-of-Mass det. time=3.6 min (770.6 - 767.1)

Volume	Invert	Avail.Storage	Storage Description
#1	90.99'	3,826 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.99	1	0.0	0	0
91.00	821	40.0	2	2
92.50	821	40.0	493	494
93.00	1,000	100.0	455	949
94.00	1,402	100.0	1,201	2,150
95.00	1,950	100.0	1,676	3,826

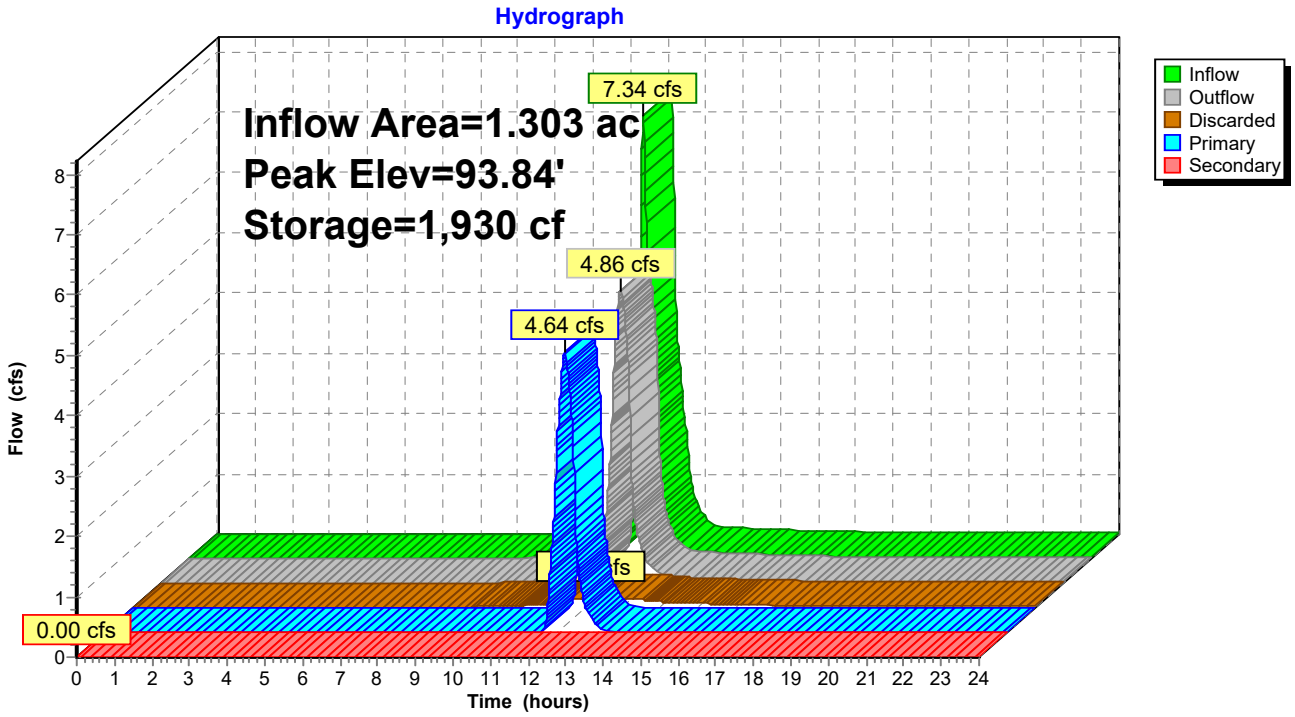
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**12.0" Round Culvert** L= 38.8' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.75' S= 0.0064 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	94.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	90.99'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.23 cfs @ 12.18 hrs HW=93.84' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=4.64 cfs @ 12.22 hrs HW=93.75' TW=92.25' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.64 cfs @ 5.90 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.99' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond RG: Rain Garden



Summary for Pond ST: Stormtech

Inflow Area = 0.466 ac, 100.00% Impervious, Inflow Depth > 6.90" for 25 yr event
Inflow = 3.38 cfs @ 12.07 hrs, Volume= 0.268 af
Outflow = 2.89 cfs @ 12.12 hrs, Volume= 0.268 af, Atten= 15%, Lag= 2.7 min
Discarded = 0.18 cfs @ 10.55 hrs, Volume= 0.161 af
Primary = 2.70 cfs @ 12.12 hrs, Volume= 0.107 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 99.01' @ 12.12 hrs Surf.Area= 1,056 sf Storage= 961 cf

Plug-Flow detention time=6.5 min calculated for 0.268 af (100% of inflow)
Center-of-Mass det. time=6.5 min (747.8 - 741.3)

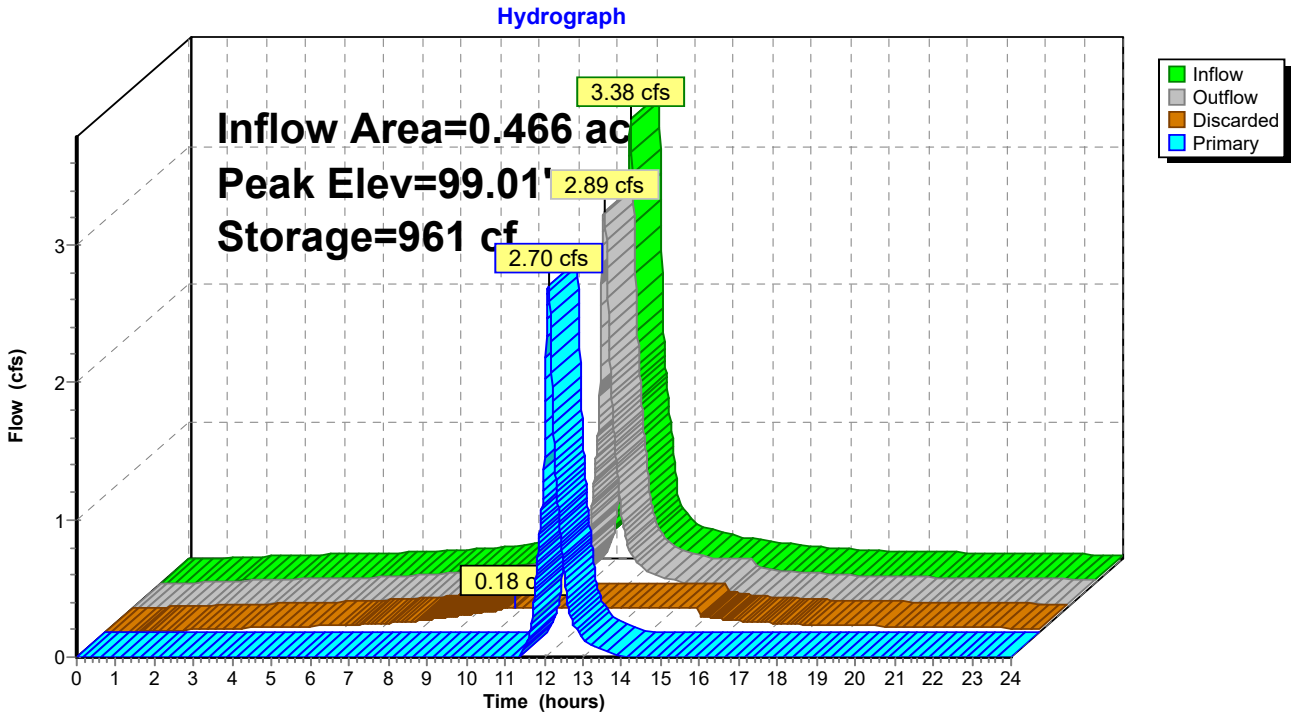
Volume	Invert	Avail.Storage	Storage Description
#1	97.58'	717 cf	**16.15'W x 65.36'L x 2.33'H Prismatoid** 2,459 cf Overall - 668 cf Embedded = 1,792 cf x 40.0% Voids
#2	98.08'	668 cf	**ADS_StormTech SC-310** x 45 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 2.07 sf x 5 rows
		1,385 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**12.0" Round Culvert** L= 43.0' Ke= 0.500 Inlet / Outlet Invert= 98.00' / 95.40' S= 0.0605 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf
#2	Discarded	97.58'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 10.55 hrs HW=97.60' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=2.70 cfs @ 12.12 hrs HW=99.01' TW=93.83' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 2.70 cfs @ 3.44 fps)

Pond ST: Stormtech



Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points x 4
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: WesternGrassedArea Runoff Area=14,438 sf 3.17% Impervious Runoff Depth>5.42"
Flow Length=316' Tc=7.5 min CN=74 Runoff=1.99 cfs 0.150 af

Subcatchment2S: SouthernGrassedArea Runoff Area=5,631 sf 54.43% Impervious Runoff Depth>6.99"
Tc=5.0 min CN=87 Runoff=1.04 cfs 0.075 af

Subcatchment3S: Roof Runoff Area=20,293 sf 100.00% Impervious Runoff Depth>8.31"
Tc=5.0 min CN=98 Runoff=4.06 cfs 0.323 af

Subcatchment4S: EasternSite Runoff Area=21,625 sf 79.90% Impervious Runoff Depth>7.71"
Flow Length=303' Tc=8.8 min CN=93 Runoff=3.72 cfs 0.319 af

Subcatchment5S: ParkingLot Runoff Area=42,327 sf 82.42% Impervious Runoff Depth>7.71"
Tc=5.0 min CN=93 Runoff=8.28 cfs 0.625 af

ReachAP 1: AP 1 Inflow=11.08 cfs 0.754 af
Outflow=11.08 cfs 0.754 af

ReachAP2: AP2 Inflow=1.04 cfs 0.075 af
Outflow=1.04 cfs 0.075 af

Pond CB2: CB2 Peak Elev=95.80' Inflow=1.04 cfs 0.075 af
12.0" Round Culvert n=0.012 L=129.0' S=0.0093 '/' Outflow=1.04 cfs 0.075 af

Pond CB3: CB3 Peak Elev=94.73' Inflow=1.04 cfs 0.075 af
12.0" Round Culvert n=0.012 L=1.0' S=0.0000 '/' Outflow=1.04 cfs 0.075 af

Pond CBB: CB B Peak Elev=97.06' Inflow=3.72 cfs 0.319 af
12.0" Round Culvert n=0.012 L=10.0' S=0.0050 '/' Outflow=3.72 cfs 0.319 af

Pond DMH1: DMH1 Peak Elev=93.96' Inflow=6.98 cfs 0.460 af
24.0" Round Culvert n=0.012 L=47.2' S=0.0485 '/' Outflow=6.98 cfs 0.460 af

Pond DMH2: DMH2 Peak Elev=92.90' Inflow=11.08 cfs 0.754 af
20.0" Round Culvert n=0.012 L=105.9' S=0.0039 '/' Outflow=11.08 cfs 0.754 af

Pond DMHB: DMHB Peak Elev=96.10' Inflow=3.72 cfs 0.319 af
24.0" Round Culvert n=0.012 L=45.0' S=0.0424 '/' Outflow=3.72 cfs 0.319 af

Pond PP: PerviousPavement Peak Elev=94.93' Storage=1,669 cf Inflow=8.28 cfs 0.625 af
Discarded=0.60 cfs 0.391 af Primary=6.07 cfs 0.233 af Secondary=0.30 cfs 0.001 af Outflow=6.67 cfs 0.625 af

Pond RG: Rain Garden Peak Elev=94.36' Storage=2,691 cf Inflow=7.82 cfs 0.383 af
Discarded=0.28 cfs 0.090 af Primary=5.23 cfs 0.293 af Secondary=0.00 cfs 0.000 af Outflow=5.50 cfs 0.383 af

Pond ST: Stormtech Peak Elev=99.25' Storage=1,098 cf Inflow=4.06 cfs 0.323 af
Discarded=0.18 cfs 0.181 af Primary=3.27 cfs 0.141 af Outflow=3.45 cfs 0.323 af

Total Runoff Area = 2.395 ac Runoff Volume = 1.491 af Average Runoff Depth = 7.47"
27.16% Pervious = 0.650 ac 72.84% Impervious = 1.744 ac

Summary for Subcatchment 1S: Western Grassed Area

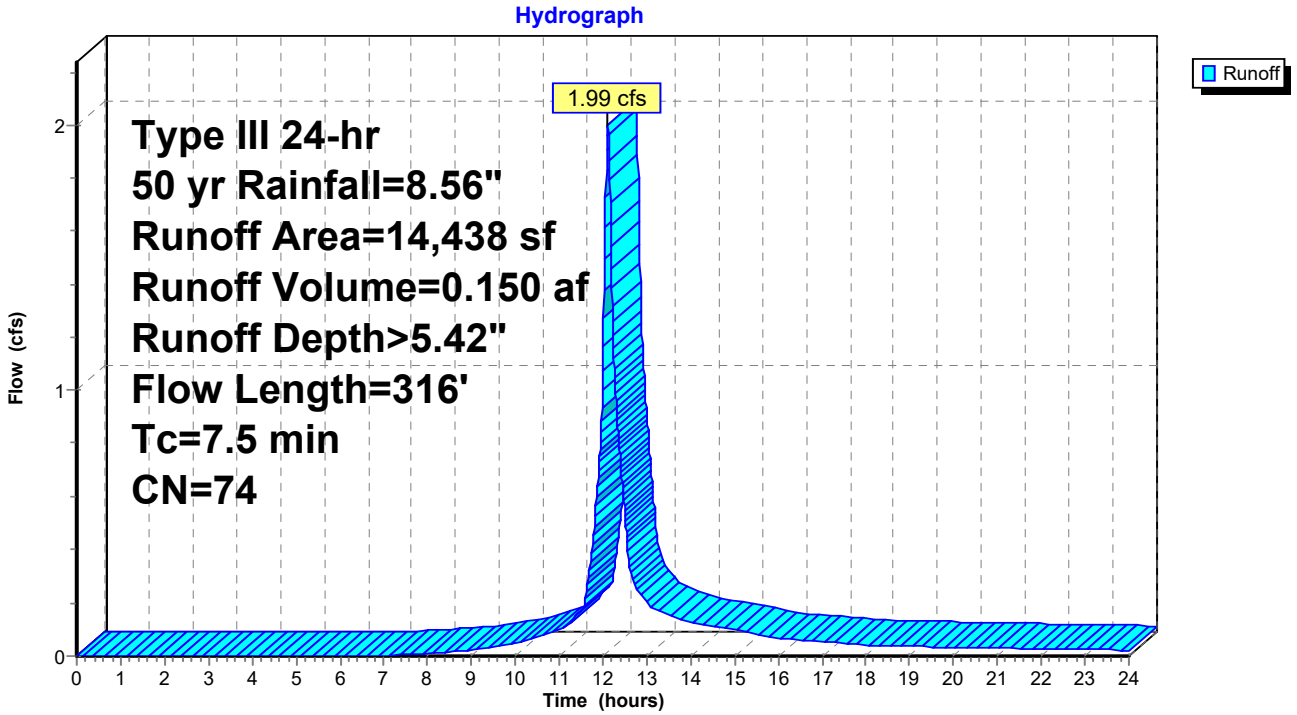
Runoff = 1.99 cfs @ 12.11 hrs, Volume= 0.150 af, Depth> 5.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

	Area (sf)	CN	Description
	13,159	74	>75% Grass cover, Good, HSG C
	344	98	Paved roads w/curbs & sewers, HSG C
*	114	98	Concrete
*	821	58	Rain Garden, HSG C
	14,438	74	Weighted Average
	13,980		96.83% Pervious Area
	458		3.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0232	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
2.6	266	0.0132	1.72		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
7.5	316	Total			

Subcatchment 1S: Western Grassed Area



Summary for Subcatchment 2S: Southern Grassed Area

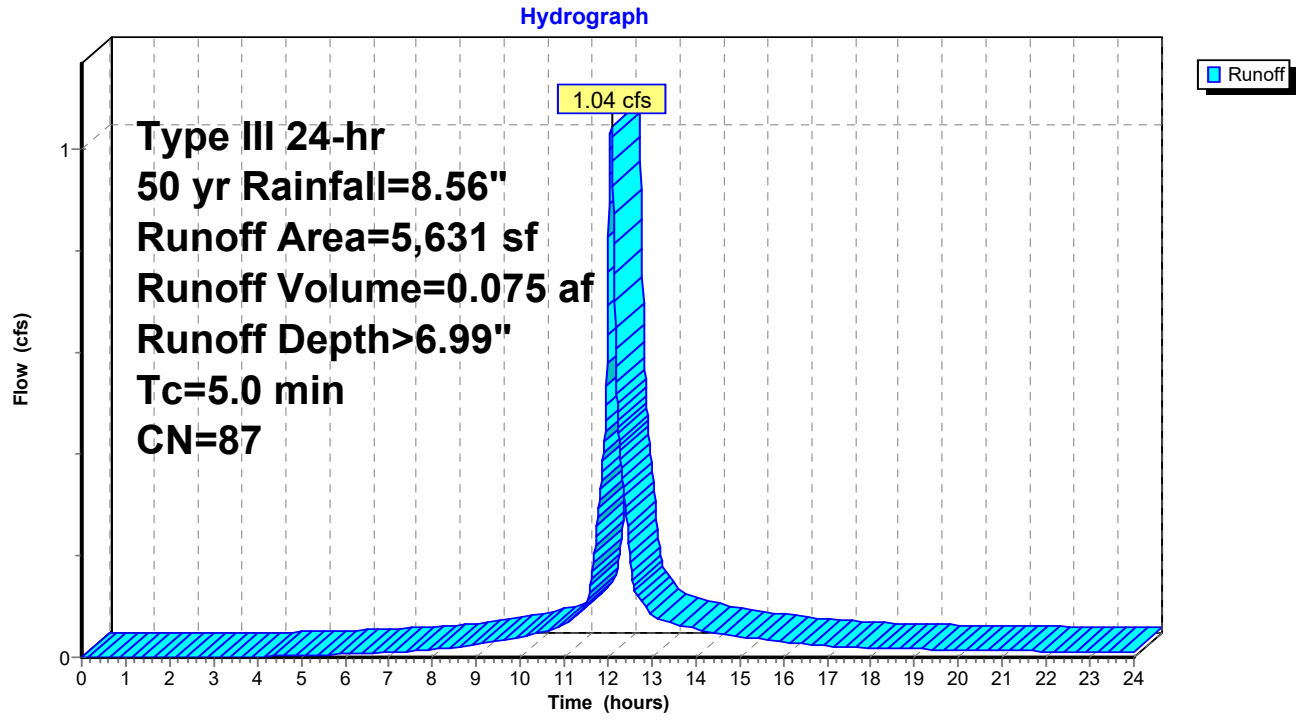
Runoff = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af, Depth> 6.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

Area (sf)	CN	Description
2,566	74	>75% Grass cover, Good, HSG C
3,065	98	Paved roads w/curbs & sewers, HSG C
5,631	87	Weighted Average
2,566		45.57% Pervious Area
3,065		54.43% Impervious Area

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

Subcatchment 2S: Southern Grassed Area



Summary for Subcatchment 3S: Roof

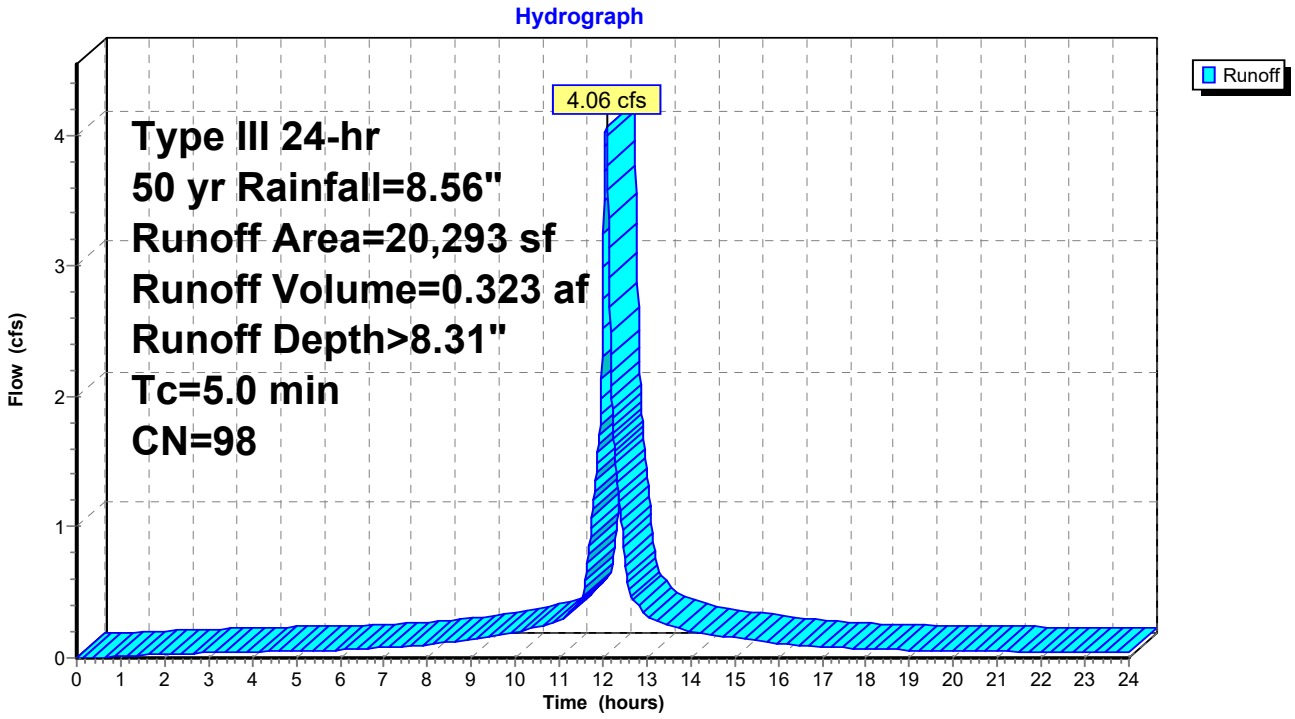
Runoff = 4.06 cfs @ 12.07 hrs, Volume= 0.323 af, Depth> 8.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

Area (sf)	CN	Description
2,612	98	Paved roads w/curbs & sewers, HSG C
17,681	98	Roofs, HSG C
20,293	98	Weighted Average
20,293		100.00% Impervious Area

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

Subcatchment 3S: Roof



Summary for Subcatchment 4S: Eastern Site

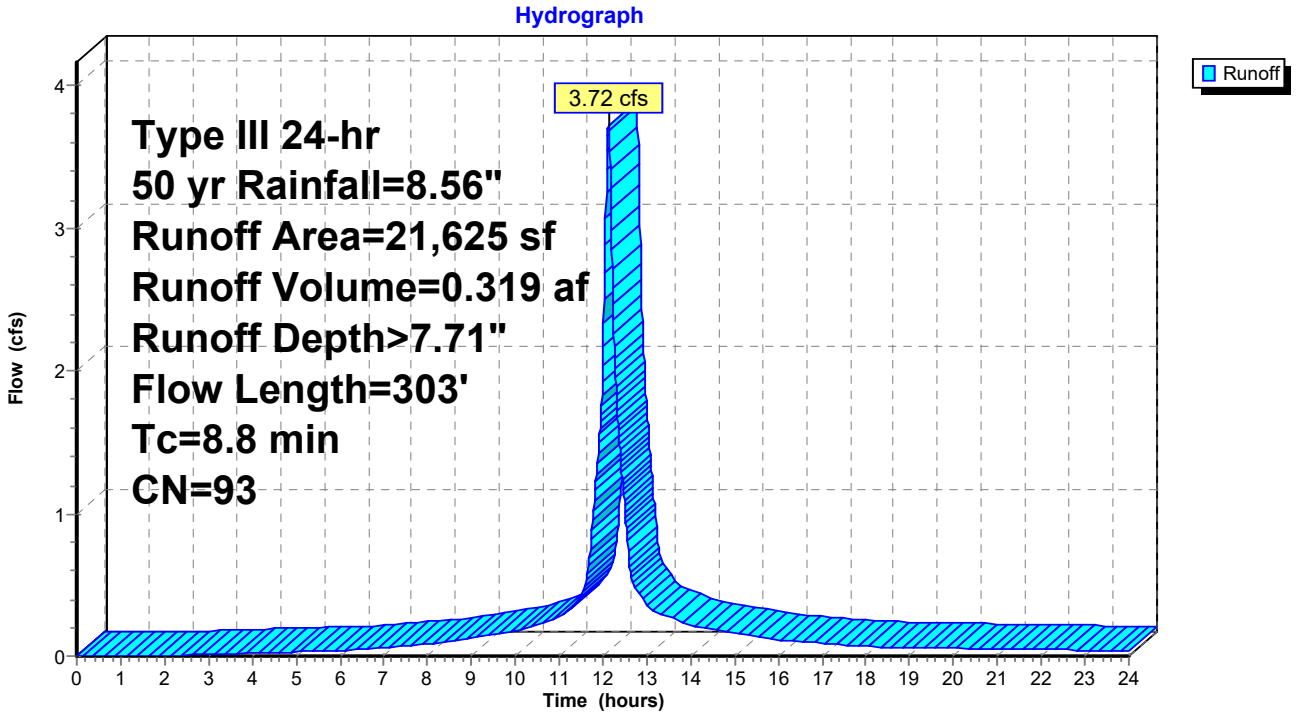
Runoff = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af, Depth> 7.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

Area (sf)	CN	Description
4,347	74	>75% Grass cover, Good, HSG C
17,278	98	Paved roads w/curbs & sewers, HSG C
21,625	93	Weighted Average
4,347		20.10% Pervious Area
17,278		79.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	14	0.0208	1.01		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.70"
4.6	37	0.0154	0.14		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.70"
4.0	252	0.0050	1.06		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
8.8	303	Total			

Subcatchment 4S: Eastern Site



Summary for Subcatchment 5S: Parking Lot

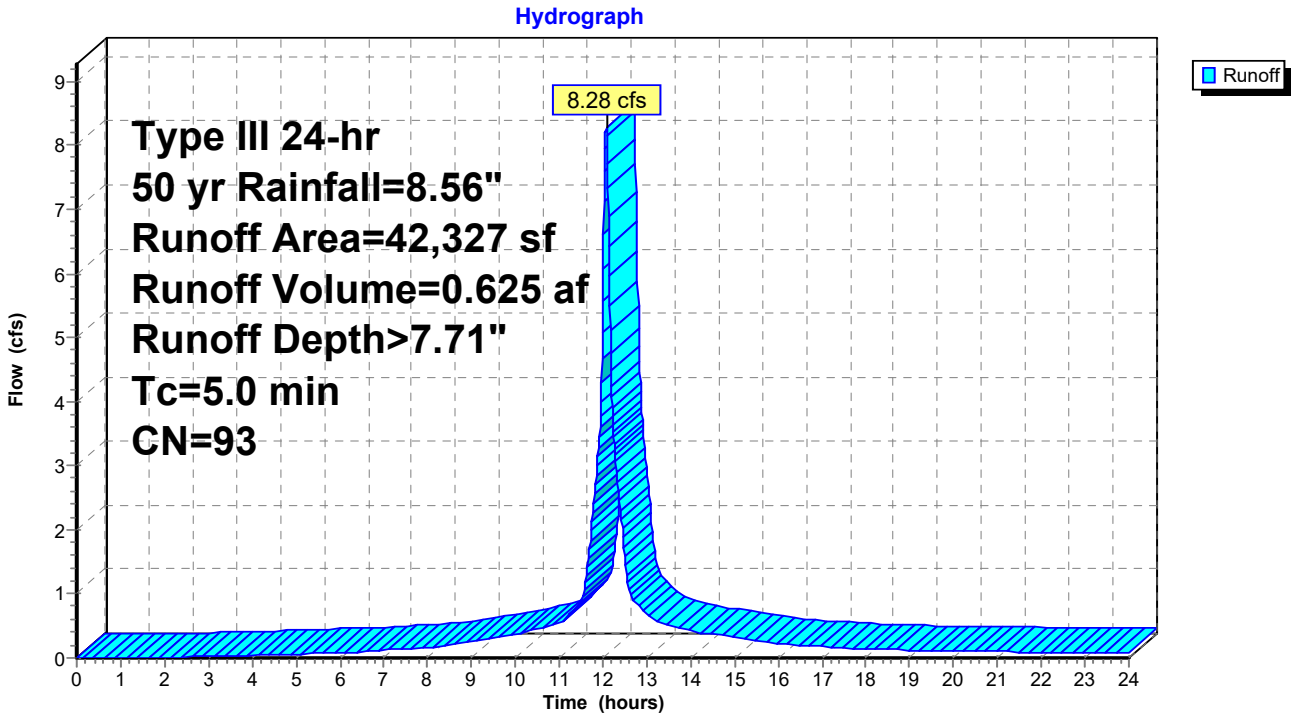
Runoff = 8.28 cfs @ 12.07 hrs, Volume= 0.625 af, Depth> 7.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 yr Rainfall=8.56"

	Area (sf)	CN	Description
	3,085	74	>75% Grass cover, Good, HSG C
	34,264	98	Paved roads w/curbs & sewers, HSG C
*	26	98	Concrete
*	231	42	Pervious Pavers, HSG C
*	3,480	61	Pervious Pavement, HSG C
	490	98	Roofs, HSG C
	643	96	Gravel surface, HSG C
*	108	98	Retaining Wall & Stairs, HSG C
	42,327	93	Weighted Average
	7,439		17.58% Pervious Area
	34,888		82.42% Impervious Area

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

Subcatchment 5S: Parking Lot



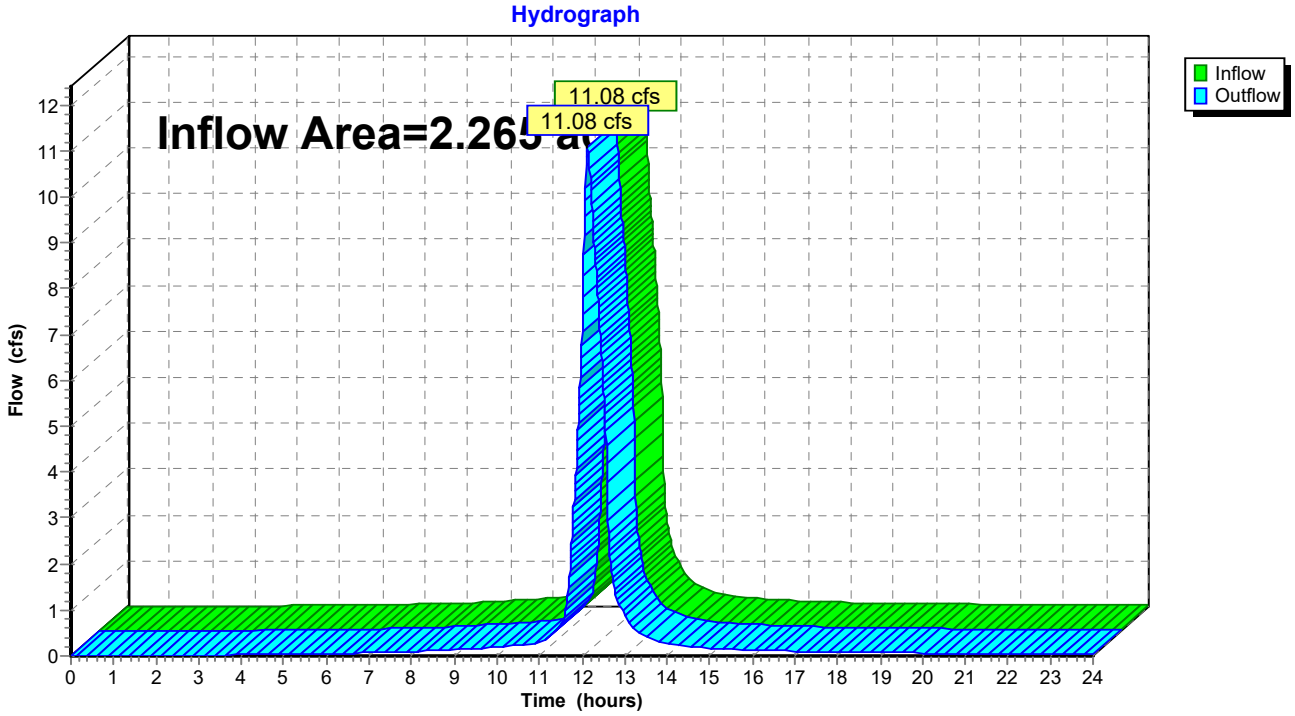
Summary for Reach AP 1: AP 1

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

Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 3.99" for 50 yr event
Inflow = 11.08 cfs @ 12.14 hrs, Volume= 0.754 af
Outflow = 11.08 cfs @ 12.14 hrs, Volume= 0.754 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP 1: AP 1



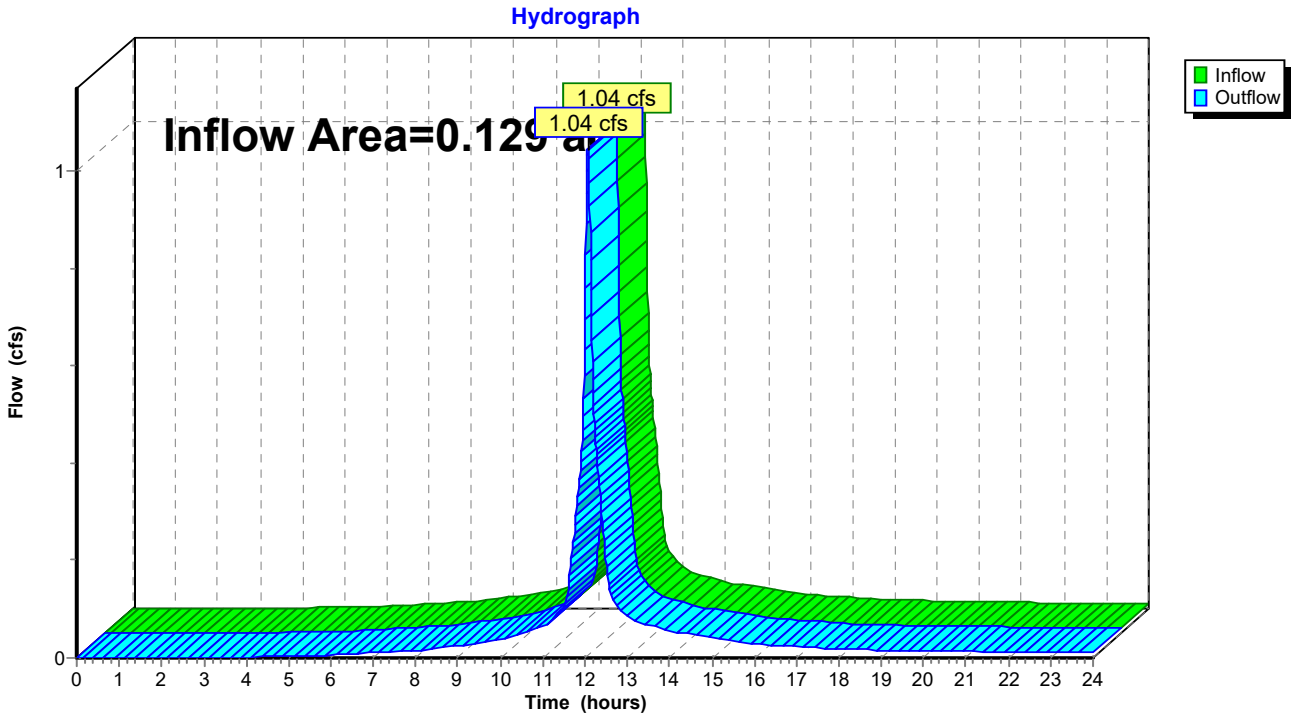
Summary for Reach AP2: AP2

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

Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 6.99" for 50 yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af
Outflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4

Reach AP2: AP2



Summary for Pond CB2: CB2

[57] Hint: Peaked at 95.80' (Flood elevation advised)

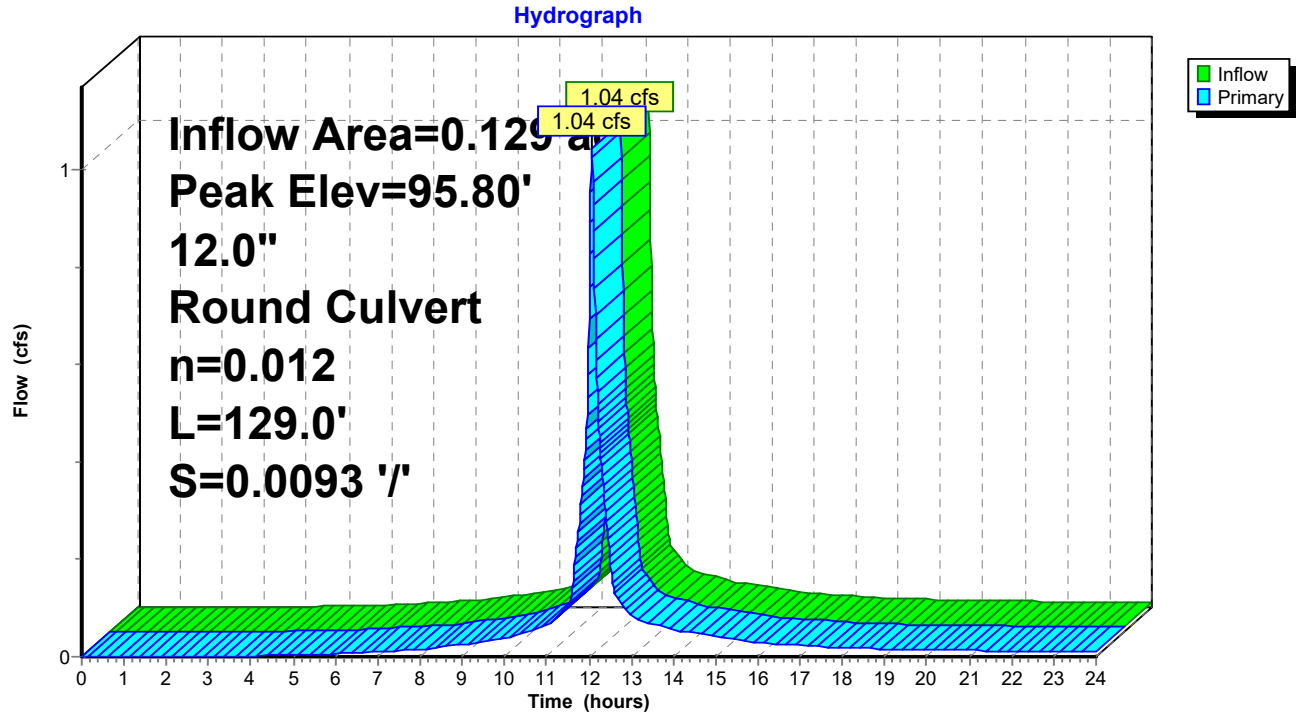
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 6.99" for 50 yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af
Outflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 95.80' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.26'	**12.0" Round Culvert** L= 129.0' Ke= 0.500 Inlet / Outlet Invert= 95.26' / 94.06' S= 0.0093 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.04 cfs @ 12.07 hrs HW=95.80' TW=94.73' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.04 cfs @ 3.49 fps)

Pond CB2: CB2



Summary for Pond CB3: CB3

[57] Hint: Peaked at 94.73' (Flood elevation advised)

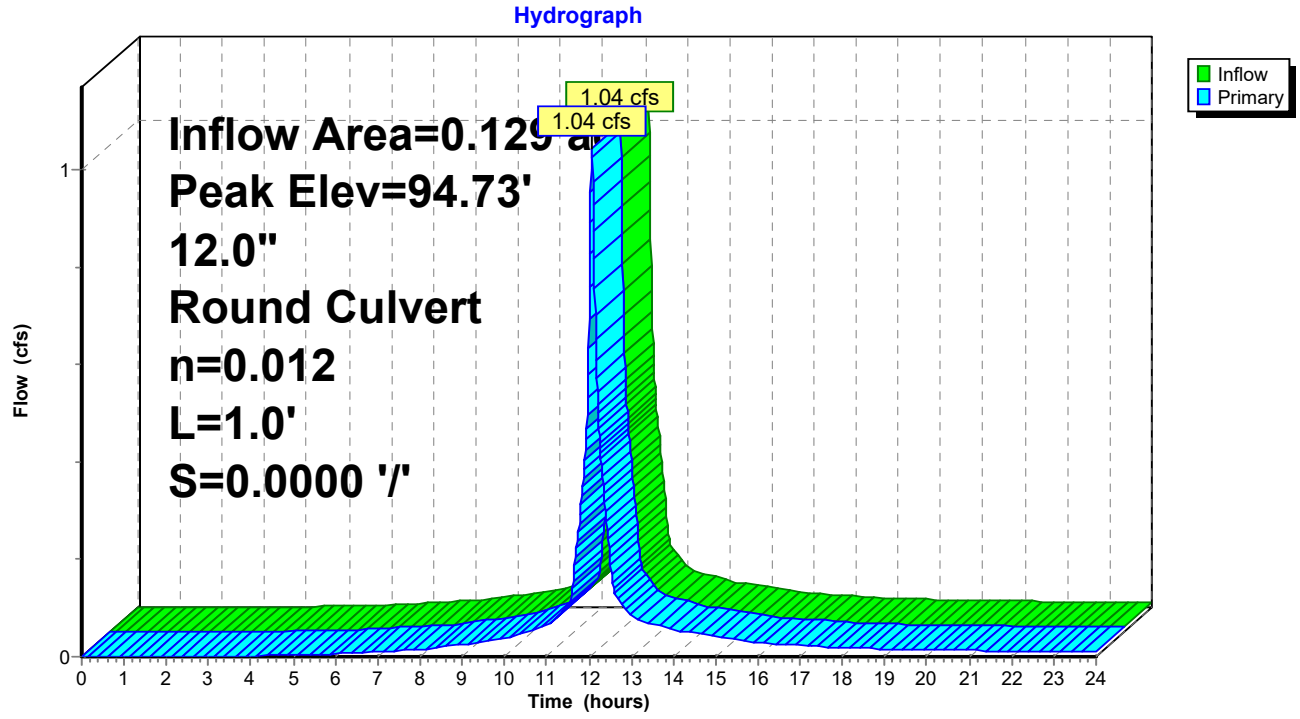
Inflow Area = 0.129 ac, 54.43% Impervious, Inflow Depth > 6.99" for 50 yr event
Inflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af
Outflow = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 12.07 hrs, Volume= 0.075 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.73' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	94.06'	**12.0" Round Culvert** L= 1.0' Ke= 0.500 Inlet / Outlet Invert= 94.06' / 94.06' S= 0.0000 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=1.04 cfs @ 12.07 hrs HW=94.73' TW=0.00' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 1.04 cfs @ 2.65 fps)

Pond CB3: CB3



Summary for Pond CBB: CB B

[57] Hint: Peaked at 97.06' (Flood elevation advised)

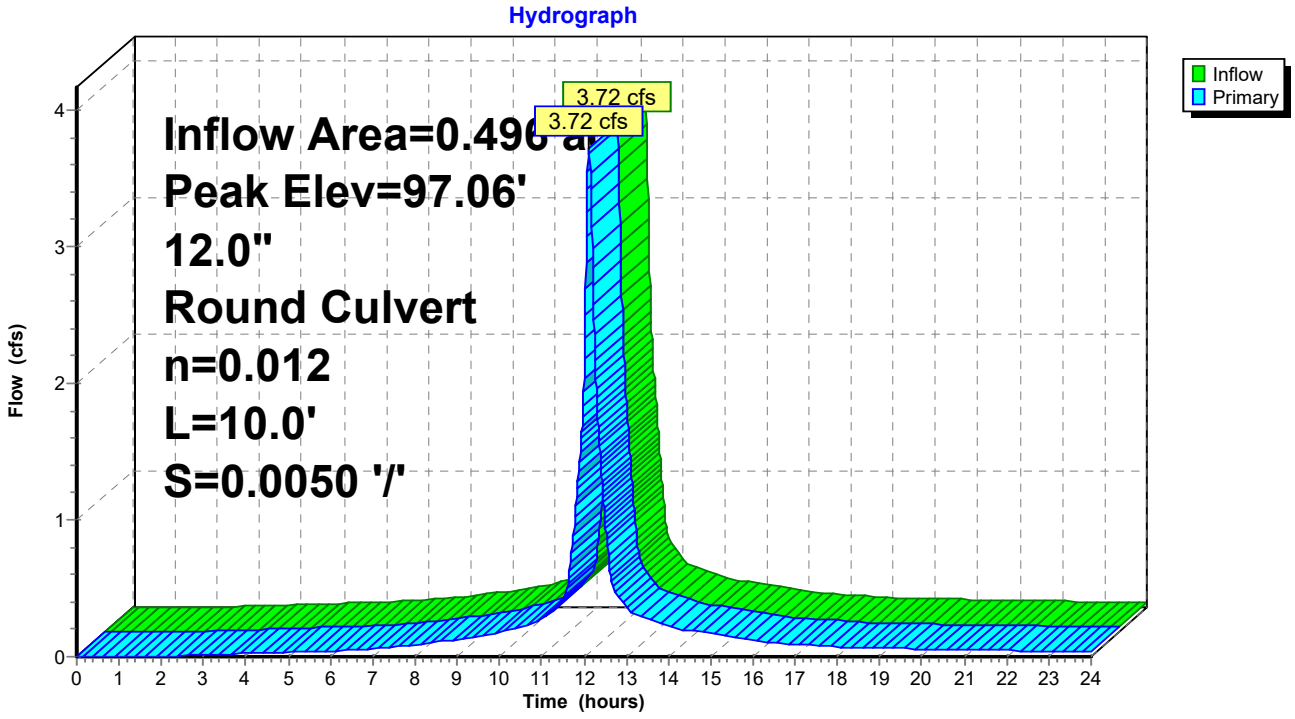
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 7.71" for 50 yr event
Inflow = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af
Outflow = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af, Atten= 0%, Lag= 0.0 min
Primary = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 97.06' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.40'	**12.0" Round Culvert** L= 10.0' Ke= 0.500 Inlet / Outlet Invert= 95.40' / 95.35' S= 0.0050 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 0.79 sf

Primary OutFlow Max=3.72 cfs @ 12.12 hrs HW=97.06' TW=96.10' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.72 cfs @ 4.73 fps)

Pond CBB: CB B



Summary for Pond DMH1: DMH1

[57] Hint: Peaked at 93.96' (Flood elevation advised)

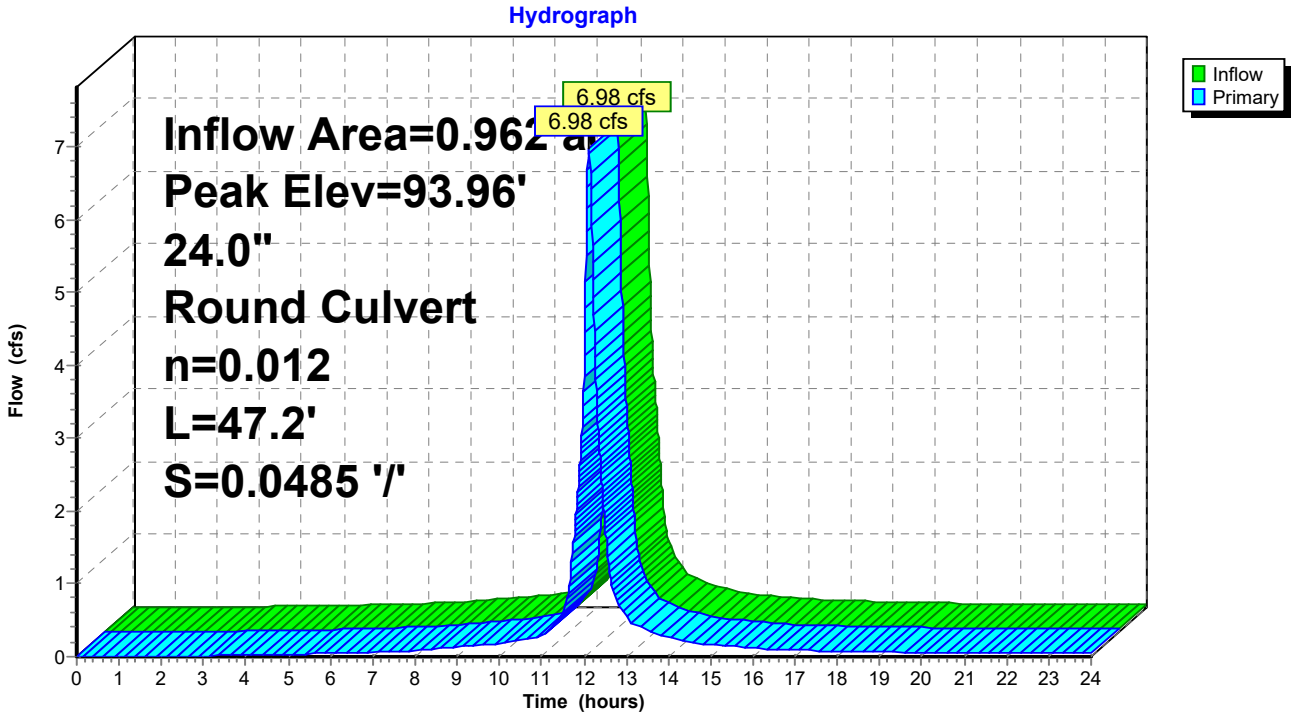
Inflow Area = 0.962 ac, 89.63% Impervious, Inflow Depth > 5.74" for 50 yr event
Inflow = 6.98 cfs @ 12.12 hrs, Volume= 0.460 af
Outflow = 6.98 cfs @ 12.12 hrs, Volume= 0.460 af, Atten= 0%, Lag= 0.0 min
Primary = 6.98 cfs @ 12.12 hrs, Volume= 0.460 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 93.96'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	92.79'	**24.0" Round Culvert** L= 47.2' Ke= 0.500 Inlet / Outlet Invert= 92.79' / 90.50' S= 0.0485 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=6.98 cfs @ 12.12 hrs HW=93.95' TW=92.88' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 6.98 cfs @ 3.67 fps)

Pond DMH1: DMH1



Summary for Pond DMH2: DMH2

[57] Hint: Peaked at 92.90' (Flood elevation advised)

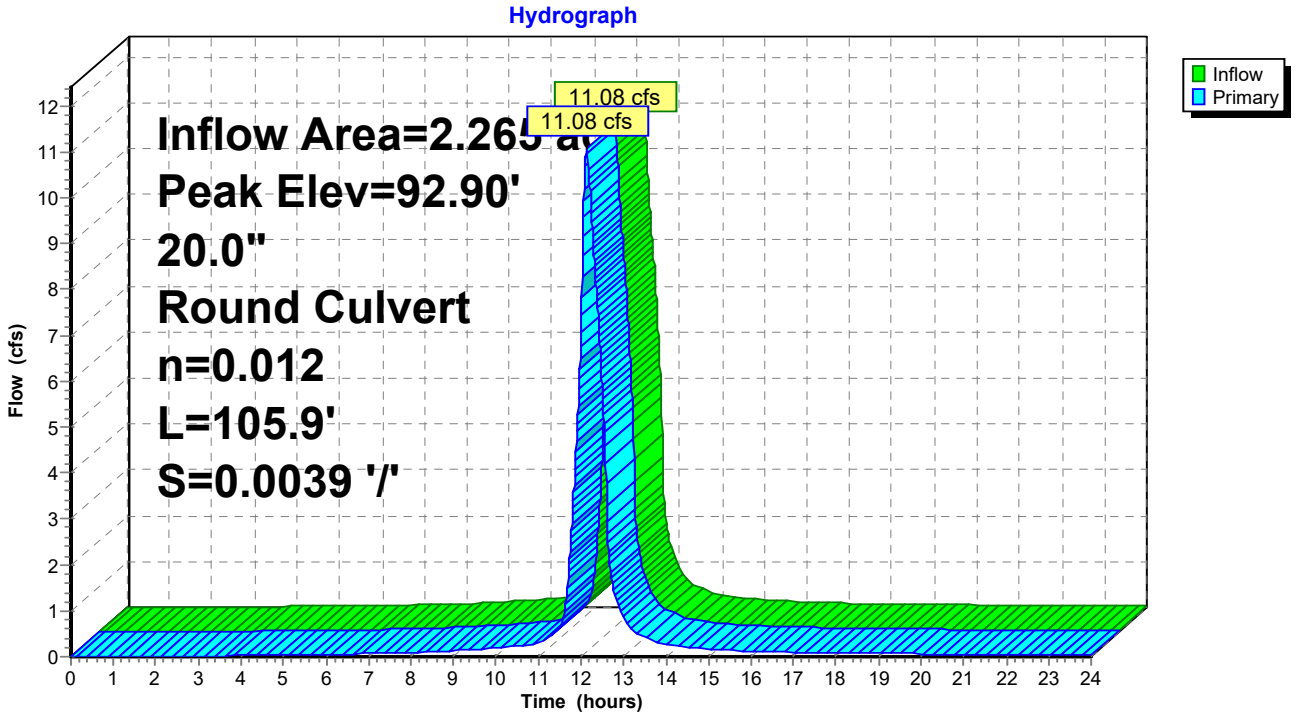
Inflow Area = 2.265 ac, 73.89% Impervious, Inflow Depth > 3.99" for 50 yr event
Inflow = 11.08 cfs @ 12.14 hrs, Volume= 0.754 af
Outflow = 11.08 cfs @ 12.14 hrs, Volume= 0.754 af, Atten= 0%, Lag= 0.0 min
Primary = 11.08 cfs @ 12.14 hrs, Volume= 0.754 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 92.90' @ 12.14 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	90.47'	**20.0" Round Culvert** L= 105.9' Ke= 0.500 Inlet / Outlet Invert= 90.47' / 90.06' S= 0.0039 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 2.18 sf

Primary OutFlow Max=11.07 cfs @ 12.14 hrs HW=92.90' TW=0.00' (Dynamic Tailwater)
1=Culvert (Barrel Controls 11.07 cfs @ 5.07 fps)

Pond DMH2: DMH2



Summary for Pond DMHB: DMHB

[57] Hint: Peaked at 96.10' (Flood elevation advised)

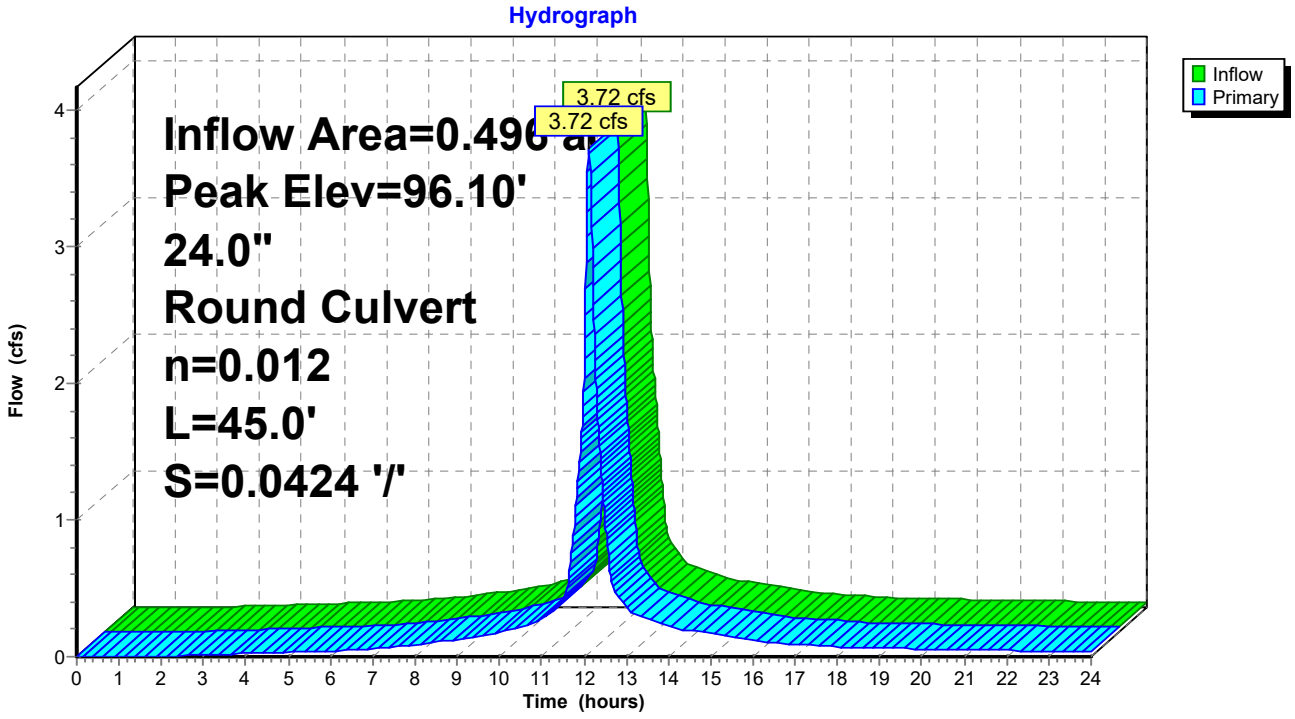
Inflow Area = 0.496 ac, 79.90% Impervious, Inflow Depth > 7.71" for 50 yr event
Inflow = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af
Outflow = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af, Atten= 0%, Lag= 0.0 min
Primary = 3.72 cfs @ 12.12 hrs, Volume= 0.319 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 96.10'@ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	95.28'	**24.0" Round Culvert** L= 45.0' Ke= 0.500 Inlet / Outlet Invert= 95.28' / 93.37' S= 0.0424 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 3.14 sf

Primary OutFlow Max=3.72 cfs @ 12.12 hrs HW=96.10' TW=93.95' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.72 cfs @ 3.08 fps)

Pond DMHB: DMHB



Summary for Pond PP: Pervious Pavement

Inflow Area = 0.972 ac, 82.42% Impervious, Inflow Depth > 7.71" for 50 yr event
Inflow = 8.28 cfs @ 12.07 hrs, Volume= 0.625 af
Outflow = 6.67 cfs @ 12.06 hrs, Volume= 0.625 af, Atten= 19%, Lag= 0.0 min
Discarded = 0.60 cfs @ 11.14 hrs, Volume= 0.391 af
Primary = 6.07 cfs @ 12.06 hrs, Volume= 0.233 af
Secondary = 0.30 cfs @ 12.14 hrs, Volume= 0.001 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.93' @ 12.14 hrs Surf.Area= 3,480 sf Storage= 1,669 cf

Plug-Flow detention time=3.2 min calculated for 0.625 af (100% of inflow)
Center-of-Mass det. time=3.1 min (765.4 - 762.3)

Volume	Invert	Avail.Storage	Storage Description
#1	92.75'	1,705 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.75	3,480	0.0	0	0
92.76	3,480	40.0	14	14
93.42	3,480	40.0	919	933
93.43	3,480	15.0	5	938
93.67	3,480	15.0	125	1,063
93.68	3,480	5.0	2	1,065
94.33	3,480	5.0	113	1,178
94.34	3,480	30.0	10	1,188
94.67	3,480	30.0	345	1,533
94.68	3,480	15.0	5	1,538
95.00	3,480	15.0	167	1,705

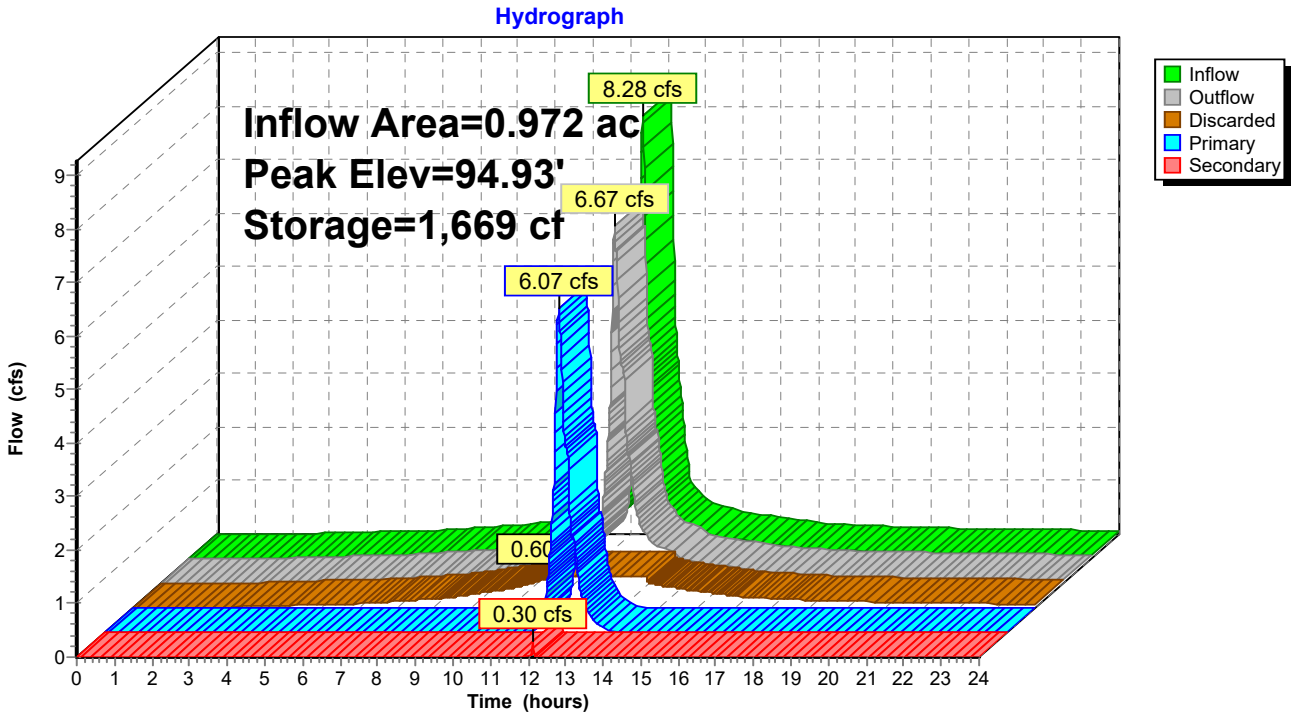
Device	Routing	Invert	Outlet Devices
#1	Primary	92.75'	**15.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 92.75' / 92.50' S= 0.0125 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 1.23 sf
#2	Secondary	94.90'	**20.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	92.75'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.60 cfs @ 11.14 hrs HW=92.76' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.60 cfs)

Primary OutFlow Max=6.07 cfs @ 12.06 hrs HW=94.48' TW=93.42' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.07 cfs @ 4.95 fps)

Secondary OutFlow Max=0.28 cfs @ 12.14 hrs HW=94.93' TW=94.16' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.47 fps)

Pond PP: Pervious Pavement



Summary for Pond RG: Rain Garden

Inflow Area = 1.303 ac, 62.27% Impervious, Inflow Depth > 3.53" for 50 yr event
Inflow = 7.82 cfs @ 12.06 hrs, Volume= 0.383 af
Outflow = 5.50 cfs @ 12.28 hrs, Volume= 0.383 af, Atten= 30%, Lag= 12.8 min
Discarded = 0.28 cfs @ 12.20 hrs, Volume= 0.090 af
Primary = 5.23 cfs @ 12.28 hrs, Volume= 0.293 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 94.36' @ 12.20 hrs Surf.Area= 1,599 sf Storage= 2,691 cf

Plug-Flow detention time=4.5 min calculated for 0.383 af (100% of inflow)
Center-of-Mass det. time=4.5 min (768.5 - 764.0)

Volume	Invert	Avail.Storage	Storage Description
#1	90.99'	3,826 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
90.99	1	0.0	0	0
91.00	821	40.0	2	2
92.50	821	40.0	493	494
93.00	1,000	100.0	455	949
94.00	1,402	100.0	1,201	2,150
95.00	1,950	100.0	1,676	3,826

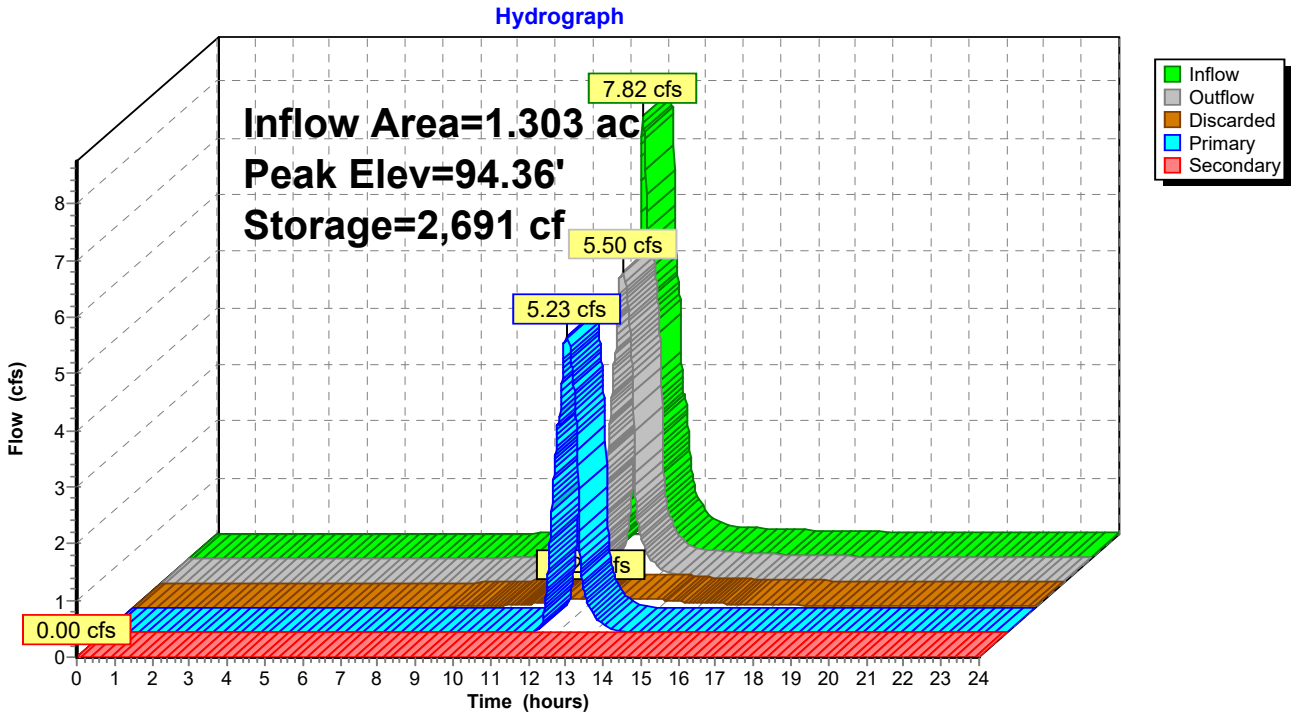
Device	Routing	Invert	Outlet Devices
#1	Primary	91.00'	**12.0" Round Culvert** L= 38.8' Ke= 0.500 Inlet / Outlet Invert= 91.00' / 90.75' S= 0.0064 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#2	Secondary	94.90'	**10.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32
#3	Discarded	90.99'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.28 cfs @ 12.20 hrs HW=94.36' (Free Discharge)
↑—**3=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=5.23 cfs @ 12.28 hrs HW=94.23' TW=92.32' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.23 cfs @ 6.66 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.99' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond RG: Rain Garden



Summary for Pond ST: Stormtech

Inflow Area = 0.466 ac, 100.00% Impervious, Inflow Depth > 8.31" for 50 yr event
Inflow = 4.06 cfs @ 12.07 hrs, Volume= 0.323 af
Outflow = 3.45 cfs @ 12.12 hrs, Volume= 0.323 af, Atten= 15%, Lag= 2.8 min
Discarded = 0.18 cfs @ 10.10 hrs, Volume= 0.181 af
Primary = 3.27 cfs @ 12.12 hrs, Volume= 0.141 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 4
Peak Elev= 99.25' @ 12.12 hrs Surf.Area= 1,056 sf Storage= 1,098 cf

Plug-Flow detention time=7.0 min calculated for 0.323 af (100% of inflow)
Center-of-Mass det. time=6.9 min (745.9 - 739.0)

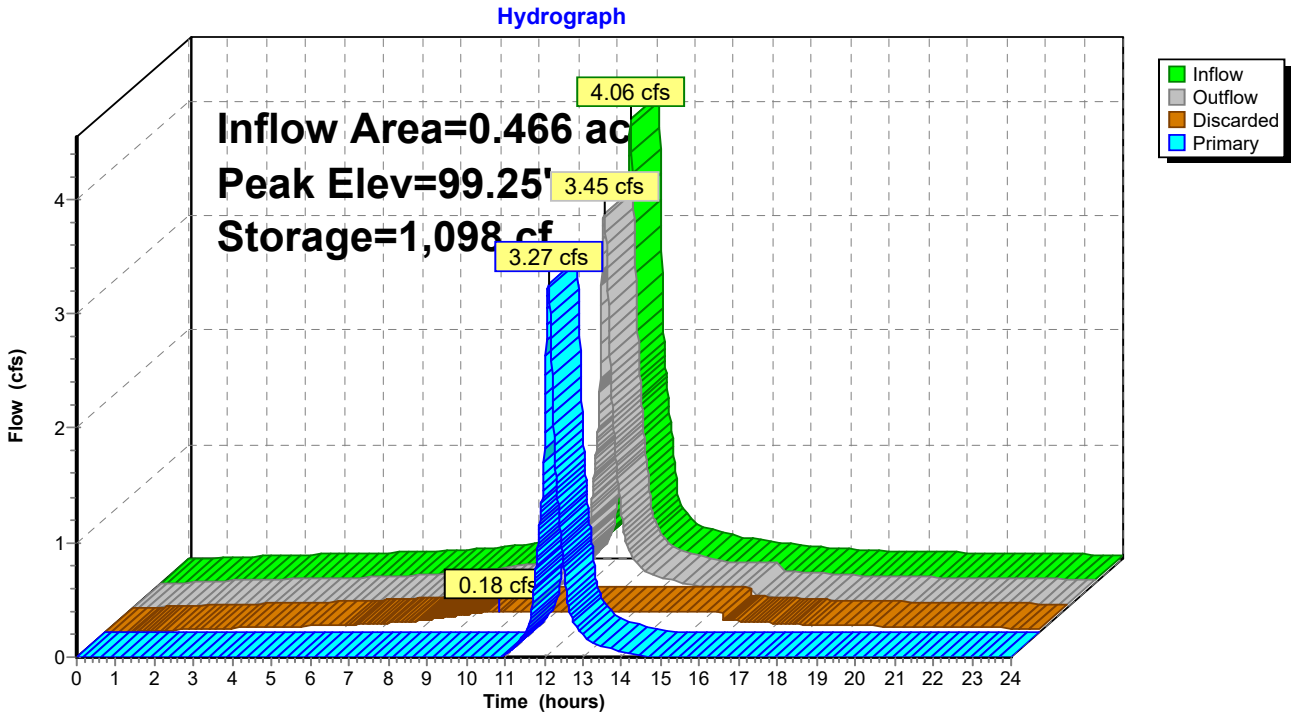
Volume	Invert	Avail.Storage	Storage Description
#1	97.58'	717 cf	**16.15'W x 65.36'L x 2.33'H Prismatoid**
			2,459 cf Overall - 668 cf Embedded = 1,792 cf x 40.0% Voids
#2	98.08'	668 cf	**ADS_StormTech SC-310** x 45 Inside #1
			Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
			Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap
			Row Length Adjustment= +0.44' x 2.07 sf x 5 rows
		1,385 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**12.0" Round Culvert** L= 43.0' Ke= 0.500
			Inlet / Outlet Invert= 98.00' / 95.40' S= 0.0605 '/' Cc= 0.900
			n= 0.010, Flow Area= 0.79 sf
#2	Discarded	97.58'	**7.500 in/hr Exfiltration over Surface area** Phase-In= 0.01'

Discarded OutFlow Max=0.18 cfs @ 10.10 hrs HW=97.60' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=3.26 cfs @ 12.12 hrs HW=99.24' TW=93.95' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 3.26 cfs @ 4.15 fps)

Pond ST: Stormtech



Appendix - A

Extreme Precipitation Tables

Northeast Regional Climate Center

Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.776 degrees West
Latitude	43.043 degrees North
Elevation	0 feet
Date/Time	Thu, 14 Apr 2022 16:44:01 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.04	**1yr**	0.71	0.98	1.22	1.57	2.04	2.67	2.94	**1yr**	2.37	2.83	3.24	3.96	4.58	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.50	3.23	3.59	**2yr**	2.86	3.45	3.96	4.71	5.36	**2yr**
5yr	0.37	0.58	0.73	0.98	1.25	1.61	**5yr**	1.08	1.47	1.89	2.44	3.15	4.09	4.61	**5yr**	3.62	4.43	5.08	5.97	6.74	**5yr**
10yr	0.41	0.65	0.82	1.12	1.45	1.90	**10yr**	1.26	1.73	2.24	2.90	3.77	4.90	5.57	**10yr**	4.34	5.35	6.13	7.16	8.03	**10yr**
25yr	0.48	0.76	0.97	1.34	1.78	2.35	**25yr**	1.54	2.15	2.79	3.65	4.77	6.21	7.15	**25yr**	5.50	6.87	7.87	9.09	10.12	**25yr**
50yr	0.54	0.86	1.10	1.54	2.08	2.77	**50yr**	1.79	2.53	3.30	4.35	5.70	7.44	8.64	**50yr**	6.59	8.31	9.51	10.90	12.06	**50yr**
100yr	0.60	0.97	1.25	1.78	2.43	3.27	**100yr**	2.09	2.99	3.92	5.19	6.81	8.92	10.45	**100yr**	7.89	10.05	11.49	13.08	14.38	**100yr**
200yr	0.68	1.11	1.43	2.05	2.84	3.85	**200yr**	2.45	3.53	4.64	6.17	8.14	10.69	12.64	**200yr**	9.46	12.16	13.90	15.69	17.16	**200yr**
500yr	0.80	1.32	1.72	2.50	3.49	4.79	**500yr**	3.02	4.40	5.80	7.75	10.29	13.59	16.27	**500yr**	12.03	15.64	17.87	19.97	21.67	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.72	0.88	**1yr**	0.63	0.87	0.92	1.33	1.68	2.25	2.54	**1yr**	1.99	2.45	2.88	3.18	3.92	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.33	3.08	3.48	**2yr**	2.72	3.35	3.85	4.58	5.11	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.41	**5yr**	1.01	1.38	1.61	2.12	2.73	3.82	4.24	**5yr**	3.38	4.07	4.76	5.59	6.30	**5yr**
10yr	0.39	0.60	0.74	1.03	1.33	1.60	**10yr**	1.15	1.57	1.81	2.39	3.06	4.41	4.92	**10yr**	3.91	4.74	5.52	6.49	7.27	**10yr**
25yr	0.44	0.67	0.84	1.19	1.57	1.91	**25yr**	1.36	1.86	2.10	2.75	3.53	4.76	5.99	**25yr**	4.21	5.76	6.77	7.91	8.79	**25yr**
50yr	0.49	0.74	0.92	1.32	1.78	2.17	**50yr**	1.54	2.13	2.35	3.07	3.93	5.38	6.93	**50yr**	4.77	6.66	7.89	9.20	10.16	**50yr**
100yr	0.54	0.82	1.02	1.48	2.03	2.48	**100yr**	1.75	2.42	2.63	3.41	4.35	6.06	8.02	**100yr**	5.36	7.71	9.21	10.72	11.74	**100yr**
200yr	0.60	0.90	1.14	1.65	2.31	2.83	**200yr**	1.99	2.76	2.94	3.77	4.79	6.80	9.28	**200yr**	6.02	8.92	10.75	12.50	13.59	**200yr**
500yr	0.70	1.04	1.33	1.94	2.75	3.38	**500yr**	2.38	3.31	3.42	4.31	5.46	7.93	11.25	**500yr**	7.02	10.82	13.20	15.34	16.47	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.44	0.54	0.72	0.89	1.09	**1yr**	0.77	1.06	1.26	1.74	2.20	3.00	3.17	**1yr**	2.66	3.05	3.60	4.39	5.08	**1yr**
2yr	0.34	0.52	0.64	0.86	1.07	1.27	**2yr**	0.92	1.24	1.48	1.96	2.51	3.44	3.72	**2yr**	3.05	3.57	4.10	4.86	5.66	**2yr**
5yr	0.40	0.62	0.77	1.05	1.34	1.62	**5yr**	1.16	1.59	1.88	2.53	3.25	4.36	4.97	**5yr**	3.86	4.78	5.41	6.39	7.18	**5yr**
10yr	0.47	0.72	0.89	1.25	1.61	1.98	**10yr**	1.39	1.93	2.28	3.10	3.95	5.37	6.20	**10yr**	4.75	5.97	6.81	7.85	8.77	**10yr**
25yr	0.58	0.88	1.09	1.56	2.05	2.57	**25yr**	1.77	2.52	2.95	4.07	5.14	7.82	8.33	**25yr**	6.92	8.01	9.12	10.35	11.42	**25yr**
50yr	0.67	1.02	1.27	1.83	2.47	3.14	**50yr**	2.13	3.07	3.59	4.99	6.30	9.79	10.42	**50yr**	8.66	10.02	11.37	12.73	13.97	**50yr**
100yr	0.79	1.20	1.50	2.16	2.97	3.82	**100yr**	2.56	3.73	4.37	6.15	7.74	12.24	13.04	**100yr**	10.84	12.54	14.19	15.69	17.08	**100yr**
200yr	0.93	1.39	1.77	2.56	3.56	4.66	**200yr**	3.08	4.56	5.33	7.57	9.50	15.36	16.33	**200yr**	13.59	15.70	17.72	19.32	20.90	**200yr**
500yr	1.15	1.71	2.20	3.19	4.54	6.05	**500yr**	3.92	5.92	6.92	10.01	12.49	20.74	21.99	**500yr**	18.36	21.15	23.77	25.45	27.30	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Appendix - B

Soil Information

Map Scale: 1:860 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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 24, Aug 31, 2021

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

Date(s) aerial images were photographed: Sep 19, 2021—Nov 1, 2021

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
299	Udorthents, smoothed	2.4	100.0%
Totals for Area of Interest		**2.4**	**100.0%**

SL635 SOLANA SERIES

LED

EPA .5 (ft²)
WEIGHT 17 LBS

7 YEAR WARRANTY

LUMEN RANGE 2,820 to 14,020

LIFE SPAN L70 MINIMUM 100,000 HOURS

UL LISTED

CLICK FOR FAQ's

IP RATING IP66

JOB NAME

FIXTURE TYPE

MEMO

BUILD A PART NUMBER

ORDERING EXAMPLE: 1-U01-SL635-12L40T3-MDL18-SV1-FHD-BLOC/RSA14A500-D1-SL900-5/UGMT

Mounting Config.	Fixture	LED	CCT	Type	Driver	Lens	Optional Control Receptacle	Option Control	Option Motion Sensor	Option Fuse	Option House Side Shield	Pole See Pole Spec Sheets	Finish

Mounting Configuration[1]

- 1-U01S
- 1-U01
- 2-U01
- 1-U02
- 2-U02
- 1-U03
- 2-U03
- 1-U04
- 2-U04

[1] See arm spec sheets for more information.

Fixture

- SL635

LED

- 24L
- 12L

CCT - Color Temperature (K)

- 27(00)
- 30(00)
- 35(00)
- 40(00)
- 50(00)

Distribution Type

- T2
- T3
- T4
- T5

Driver

- **MDL018** (120V-277V, 180mA)
- **MDH018** (347V-480V, 180mA)
- **MDL014** (120V-277V, 140mA)
- **MDH014** (347V-480V, 140mA)
- **MDL008**[2] (120V-277V, 80mA)
- **MDH008**[2] (347V-480V, 80mA)

[2] 12L system only.

Lens

- **CA** (Clear Acrylic)
- **FG** (Flat Glass)
- **SA** (Sag Acrylic)
- **FFG** (Frosted Flat Glass)
- **SV1** (Flat Soft Vue Light Diffused Acrylic)
- **SV2** (Flat Soft Vue Moderate Diffused Acrylic)
- **SV4** (Flat Soft Vue Maximum Diffused Acrylic)
- **SV1SA** (Soft Vue Light Diffused Sag Acrylic)
- **SV2SA** (Soft Vue Moderate Diffused Sag Acrylic)
- **SV4SA** (Soft Vue Maximum Diffused Sag Acrylic)

Options (Click here to view accessories sheet)

- **R** 3-Pin control receptacle only
- **R5** 5-Pin control receptacle only
- **R7** 7-Pin control receptacle only
- **PE**[3] Twist-Lock Photocontrol (120V-277V)
- **PE3**[3] Twist-Lock Photocontrol (347V)
- **PE4**[3] Twist-Lock Photocontrol (480V)
- **SC**[3] Shorting Cap
- **PEC** Electronic Button Photocontrol (120V-277V)
- **PEC4** Electronic Button Photocontrol (480V)
- **MOT1**[4] 360° lens, maximum coverage 40' diameter from 20' height
- **MOT2**[4] 360° lens, maximum coverage 70' diameter from 20' height
- **FHD**[5] Double Fuse and Holder
- **HSS** External 120° House Side Shield
- **BLOC** Back Light Optical Control

[3] Requires control receptacle
[4] Requires FLAT acrylic lens
[5] Ships loose for installation in base

Pole (Click here to link to pole specification page)

See Pole specification sheets.

Finish

Standard Urban Finishes (Click here to view paint finish sheet)

- **UGMT** Gun Metal Textured
- **UGM** Gun Metal Matte
- **UBT** Urban Bronze Textured
- **UB** Urban Bronze Matte
- **USLT** Urban Silver Textured
- **USL** Urban Silver Matte
- **UWHT** Urban White Textured
- **UWH** Urban White Matte
- **BKT** Black Textured

Custom Urban Finishes[6]

- **CM** Custom Match

[6] Smooth finishes are available upon request.

Specifications

Fixture

The medium scale SL635 Solana® arm mount luminaire's stylish design is a perfect accent for urban settings. The subtle, yet sophisticated look enhances the impact of any project The Solana's wide array of arms, optics, lenses and distributions makes this an easy choice for a variety of commercial, institutional and municipal projects. The Luminaire shall be UL listed in US and Canada.

LEDs

The luminaire shall use high output, high brightness LEDs. They shall be mounted in arrays, on printed circuit boards designed to maximize heat transfer to the heat sink surface. The arrays shall be roof mounted to minimize up-light. The LEDs and printed circuit boards shall be 100% recyclable; they shall also be protected from moisture and corrosion by a conformal coating. They shall not contain lead, mercury or any other hazardous substances and shall be RoHS compliant. The LED life rating data shall be determined in accordance with IESNA LM-80. The High Performance white LEDs will have a life expectancy of approximately 100,000 hours with not less than 70% of original brightness (lumen maintenance), rated at 25°C. The High Brightness, High Output LEDs shall be 5000K (4500K, 3000K, 3500K or 2700K option) color temperature with a minimum CRI of 70. Consult factory for custom color CCT. The luminaire shall have a minimum _____ (see table) delivered initial lumen rating when operated at steady state with an average ambient temperature of 25°C (77°F).

Optics

The luminaire shall be provided with refractor type optics applied to each LED array. The luminaire shall provide Type ___ (2, 3, 4 or 5) light distribution per the IESNA classifications. Testing shall be done in accordance with IESNA LM-79.

BLOC Optic: An optional "Back Light Optical Control" shield can be provided at the factory. This is an internal optic level "House Side Shield" offering significantly reduced backlight and glare while maintaining the original design aesthetics of the luminaire.

Electronic Drivers

The LED driver shall be U.L. Recognized. It shall be securely mounted inside the fixture, for optimized performance and longevity. It shall be supplied with a quick-disconnect electrical connector on the power supply, providing easy power connections and fixture installation.

See next page

SternbergLighting
ESTABLISHED 1923

800-621-3376
555 Lawrence Ave., Roselle, IL 60172
contactus@sternberglighting.com
www.sternberglighting.com

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SL635 SOLANA SERIES

LED

It shall have overload, overheat and short circuit protection, and have a DC voltage output, constant current design, 50/60HZ. It shall be supplied with line-ground, line-neutral and neutral-ground electrical surge protection in accordance with IEEE/ANSI C62.41.2 guidelines. It shall be a high efficiency driver with a THD less than 20% and a high power factor greater than .9. It shall be dimming capable using a 0-10v signal, consult factory for more information.

Photocontrols

Button Style: The photocontrol shall be mounted on the fixture and pre-wired to driver. The electronic button type photocontrol is instant on with a 5-10 second turn off, and shall turn on at 1.5 footcandles with a turn-off at 2-3 footcandles. Photocontrol is 120-277 volt and warranted for 6 years. See pole spec sheet for pole mounted version.

Twist-Lock Style: The photocontrol shall be mounted externally on the fixture and pre-wired to driver. The twist lock type photocontrol is instant on with a 3-6 second turn off, and shall turn on at 1.5 footcandles with a turn-off at 2-3 footcandles. Photocontrol is 120-277 volt and warranted for 6 years.

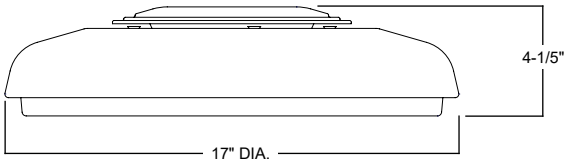
Warranty

Seven-year limited warranty. See product and finish warranty guide for details.

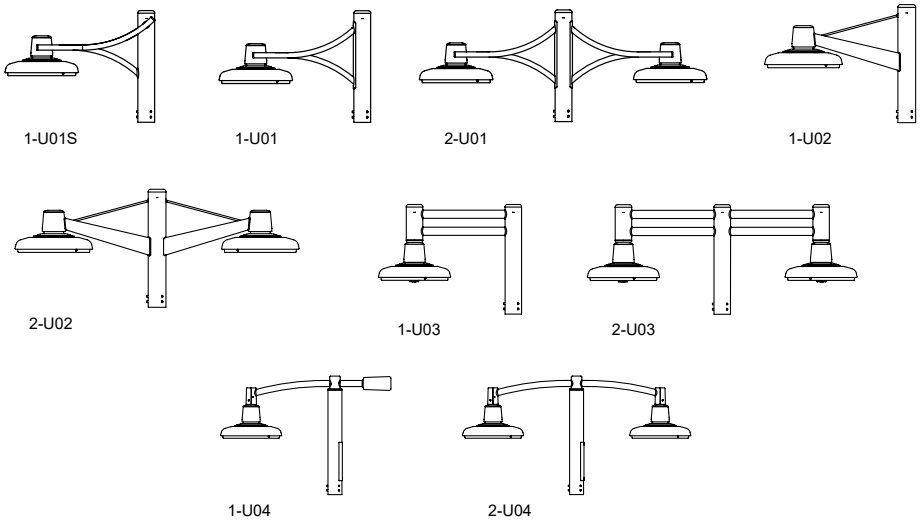
Finish

Refer to website for details.

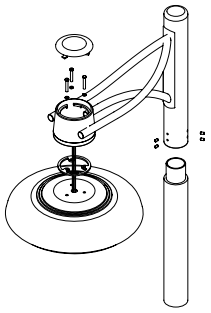
Fixtures



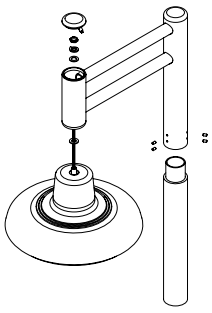
Mounting Configurations



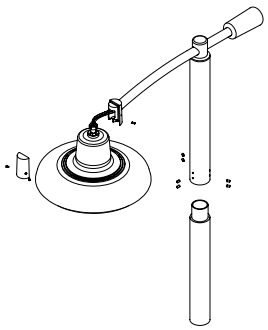
Mounting Details



TYPICAL INSTALLATION
U01, U01S, AND U02 ARMS



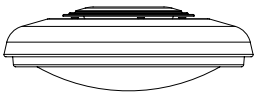
INSTALLATION U03 ARMS



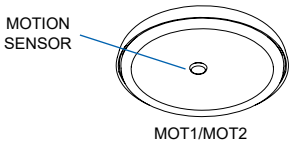
INSTALLATION U04 ARMS

NOTE: MOUNTING HARDWARE SUPPLIED BY STERNBERG

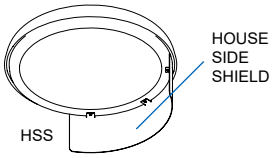
Options



Sag Lens



MOT1/MOT2



HSS

NOTE:
FOR **R** AND **PEC**
CONSULT FACTORY FOR
LOCATION

SternbergLighting
ESTABLISHED 1923

800-621-3376
555 Lawrence Ave., Roselle, IL 60172
contactus@sternberglighting.com
www.sternberglighting.com

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SL635 SOLANA SERIES

LED

Performance (Based on CA Lens)

MODEL #	T2 LUMENS	BUG	EFFICACY (LPW)	T3 LUMENS	BUG	EFFICACY (LPW)	T4 LUMENS	BUG	EFFICACY (LPW)	T5 LUMENS	BUG	EFFICACY (LPW)	WATTS
24L40T_-MDL018	13815	B2U0G2	117.1	13895	B2U0G2	117.8	13345	B2U0G2	113.1	14020	B3U0G1	118.8	118
24L30T_-MDL018	13170	B2U0G2	111.6	13250	B2U0G2	112.3	12725	B2U0G2	107.8	13365	B3U0G1	113.3	118
24L27T_-MDL018	11910	B2U0G2	100.9	11980	B2U0G2	101.5	11505	B2U0G2	97.5	12085	B3U0G1	102.4	118
24L40T_-MDL014	11105	B2U0G2	126.2	11190	B2U0G2	127.2	10720	B2U0G2	121.8	11270	B3U0G1	128.1	88
24L30T_-MDL014	10590	B2U0G2	120.3	10670	B2U0G2	121.3	10220	B2U0G2	116.1	10745	B3U0G1	122.1	88
24L27T_-MDL014	9575	B2U0G2	108.8	9645	B2U0G2	109.6	9240	B2U0G2	105.0	9715	B3U0G1	110.4	88
12L40T_-MDL018	6905	B1U0G1	115.1	6945	B1U0G1	115.8	6635	B1U0G1	110.6	6985	B2U0G1	116.4	60
12L30T_-MDL018	6585	B1U0G1	109.8	6620	B1U0G1	110.3	6325	B1U0G1	105.4	6660	B2U0G1	111.0	60
12L27T_-MDL018	5955	B1U0G1	99.3	5985	B1U0G1	99.8	5720	B1U0G1	95.3	6020	B2U0G1	100.3	60
12L40T_-MDL014	5635	B1U0G1	122.5	5640	B1U0G1	122.6	5400	B1U0G1	117.4	5690	B2U0G1	123.7	46
12L30T_-MDL014	5375	B1U0G1	116.8	5375	B1U0G1	116.8	5150	B1U0G1	112.0	5425	B2U0G1	117.9	46
12L27T_-MDL014	4860	B1U0G1	105.7	4860	B1U0G1	105.7	4655	B1U0G1	101.2	4905	B2U0G1	106.6	46
12L40T_-MDL008	3405	B1U0G1	126.1	3425	B1U0G1	126.9	3270	B1U0G1	121.1	3440	B1U0G0	127.4	27
12L30T_-MDL008	3245	B1U0G1	120.2	3265	B1U0G1	120.9	3120	B1U0G1	115.6	3280	B1U0G0	121.5	27
12L27T_-MDL008	2935	B1U0G1	108.7	2955	B1U0G1	109.4	2820	B1U0G1	104.4	2965	B1U0G0	109.8	27

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