PROPOSED SITE PLAN
MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE

PORTSMOUTH, NEW HAMPSHIRE

TAC SUBMISSION PLAN

OWNER/APPLICANT:

ISLAMIC SOCIETY OF
THE SEACOAST AREA
42N DOVER POINT ROAD
DOVER, NH 03820

CIVIL ENGINEER & LAND SURVEYOR:

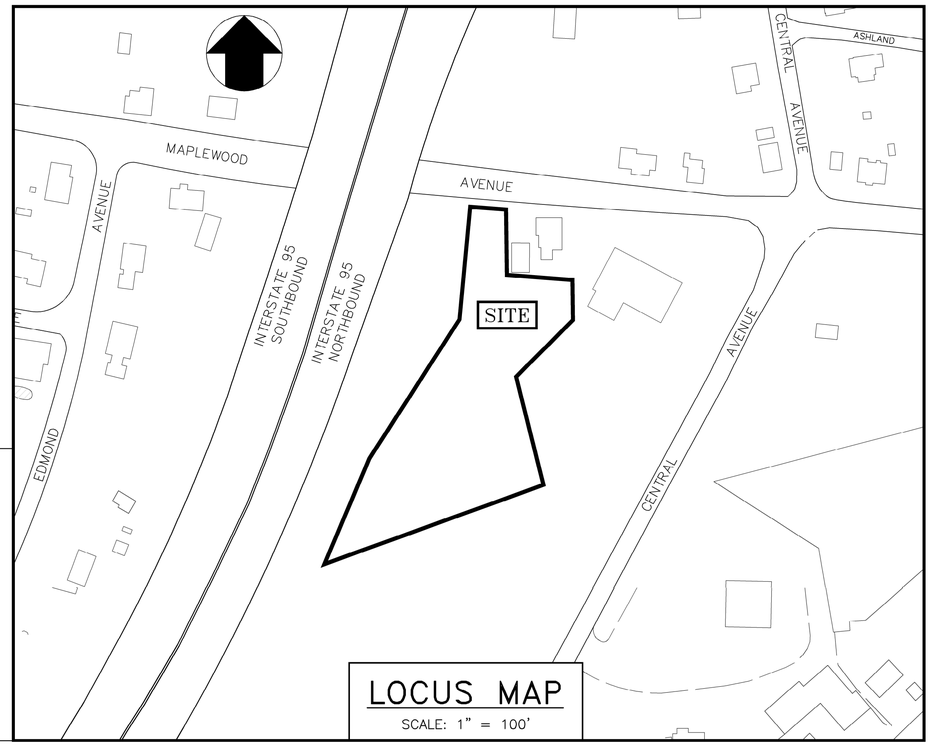
AMBIT ENGINEERING, INC.
200 GRIFFIN ROAD, UNIT 3
PORTSMOUTH, N.H. 03801
Tel. (603) 430-9282
Fax (603) 436-2315

BUILDING DESIGNER:

LIVING SPACES, INC.
1247 WASHINGTON ROAD
RYE, NH ZIP 03870
Tel. (603) 954-5180

LANDSCAPE DESIGNER:

KRIS ROMANIAK
20 BRADFORD STREET
DERRY, NH ZIP 03038
Tel. (617) 576-2129



LOCUS MAP
SCALE: 1" = 100'

INDEX OF SHEETS

PORTSMOUTH APPROVAL CONDITIONS NOTE:
ALL CONDITIONS ON THIS PLAN SET SHALL REMAIN IN EFFECT IN PERPETUITY PURSUANT TO THE REQUIREMENTS OF THE CITY OF PORTSMOUTH SITE PLAN REVIEW REGULATIONS.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

UTILITY CONTACTS

ELECTRIC:
EVERSOURCE
1700 LAFAYETTE ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 436-7708, Ext. 555.5678
ATTN: MICHAEL BUSBY, P.E. (MANAGER)

NATURAL GAS:
UNITIL
325 WEST ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 294-5144
ATTN: DAVE BEAULIEU

CABLE:
COMCAST
155 COMMERCE WAY
PORTSMOUTH, N.H. 03801
Tel. (603) 679-5695 (X1037)
ATTN: MIKE COLLINS

SEWER & WATER:
PORTSMOUTH DEPARTMENT OF PUBLIC WORKS
680 PEVERLY HILL ROAD
PORTSMOUTH, N.H. 03801
Tel. (603) 766-1438 ATTN: JIM TOW

COMMUNICATIONS:
FAIRPOINT COMMUNICATIONS
JOE CONSIDINE
1575 GREENLAND ROAD
GREENLAND, N.H. 03840
Tel. (603) 427-5525

DIG SAFE
MA – ME – NH – RI – VT
1-888-344-7233
CALL TOLL FREE

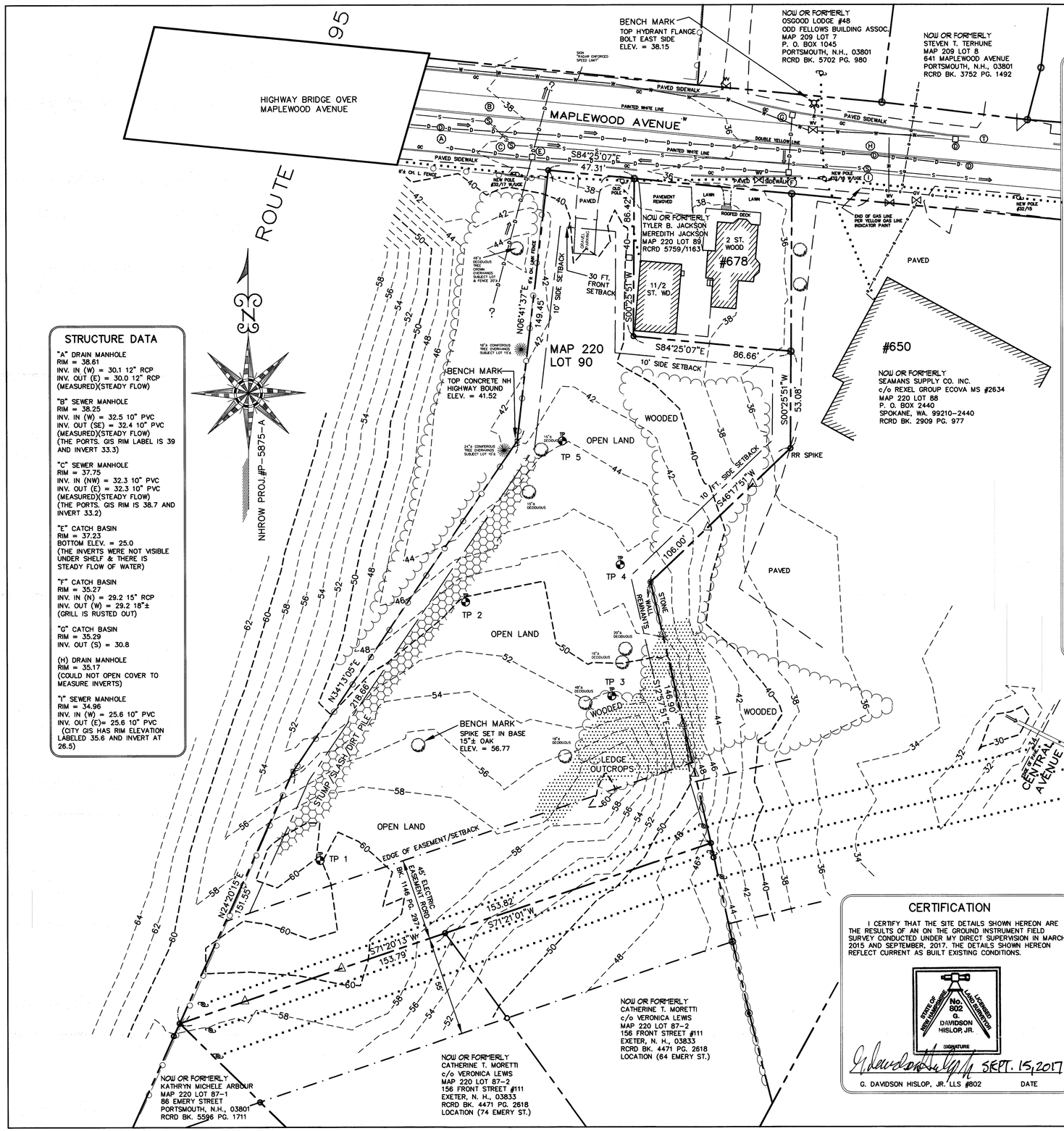
LEGEND:

EXISTING	PROPOSED	
		PROPERTY LINE
		SETBACK
S	S	SEWER PIPE
SL	SL	SEWER LATERAL
G	G	GAS LINE
D	D	STORM DRAIN
W	W	WATER LINE
WS	WS	WATER SERVICE
UGE	UGE	UNDERGROUND ELECTRIC
OHW	OHW / UD	OVERHEAD ELECTRIC/WIRES / FOUNDATION DRAIN
		EDGE OF PAVEMENT (EP)
100	100	CONTOUR
97x3	98x0	SPOT ELEVATION
		UTILITY POLE
		WALL MOUNTED EXTERIOR LIGHTS
		TRANSFORMER ON CONCRETE PAD
		ELECTRIC HANDHOLD
WS CS	WS CS	SHUT OFFS (WATER/GAS)
	GV	GATE VALVE
	HYD	HYDRANT
CB	CB	CATCH BASIN
S	SMH	SEWER MANHOLE
D	DMH	DRAIN MANHOLE
T	TMH	TELEPHONE MANHOLE
14	14	PARKING SPACE COUNT
PM		PARKING METER
LSA		LANDSCAPED AREA
TBD	TBD	TO BE DETERMINED
CI	CI	CAST IRON PIPE
COP	COP	COPPER PIPE
DI	DI	DUCTILE IRON PIPE
PVC	PVC	POLYVINYL CHLORIDE PIPE
RCP	RCP	REINFORCED CONCRETE PIPE
AC	–	ASBESTOS CEMENT PIPE
VC	VC	VITRIFIED CLAY PIPE
EP	EP	EDGE OF PAVEMENT
EL.	EL.	ELEVATION
FF	FF	FINISHED FLOOR
INV.	INV	INVERT
S =	S =	SLOPE FT/FT
TBM	TBM	TEMPORARY BENCH MARK
TYP	TYP	TYPICAL

TAC SUBMISSION PLAN
PROPOSED SITE OF DEVELOPMENT
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

PLAN SET SUBMITTAL DATE: 15 OCTOBER 2018



STRUCTURE DATA

"A" DRAIN MANHOLE
RIM = 38.61
INV. IN (W) = 30.1 12" RCP
INV. OUT (E) = 30.0 12" RCP
(MEASURED)(STEADY FLOW)

"B" SEWER MANHOLE
RIM = 38.25
INV. IN (W) = 32.5 10" PVC
INV. OUT (SE) = 32.4 10" PVC
(MEASURED)(STEADY FLOW)
(THE PORTS. GIS RIM LABEL IS 39 AND INVERT 33.3)

"C" SEWER MANHOLE
RIM = 37.75
INV. IN (NW) = 32.3 10" PVC
INV. OUT (E) = 32.3 10" PVC
(MEASURED)(STEADY FLOW)
(THE PORTS. GIS RIM IS 38.7 AND INVERT 33.2)

"E" CATCH BASIN
RIM = 37.23
BOTTOM ELEV. = 25.0
(THE INVERTS WERE NOT VISIBLE UNDER SHELF & THERE IS STEADY FLOW OF WATER)

"F" CATCH BASIN
RIM = 35.27
INV. IN (N) = 29.2 15" RCP
INV. OUT (W) = 29.2 18"±
(GRILL IS RUSTED OUT)

"G" CATCH BASIN
RIM = 35.29
INV. OUT (S) = 30.8

(H) DRAIN MANHOLE
RIM = 35.17
(COULD NOT OPEN COVER TO MEASURE INVERTS)

"I" SEWER MANHOLE
RIM = 34.96
INV. IN (W) = 25.6 10" PVC
INV. OUT (E)= 25.6 10" PVC
(CITY GIS HAS RIM ELEVATION LABELED 35.6 AND INVERT AT 26.5)

GENERAL NOTES:

1.) ZONING DISTRICT-"SRB" SINGLE RESIDENCE "B"
MIN. LOT AREA = 15,000 S.F.
MIN. FRONTAGE = 100'
MIN. LOT DEPTH = 100'
BUILDING SETBACKS
FRONT SETBACK = 30'
REAR SETBACK = 30'
SIDE SETBACK = 10'
WETLANDS SETBACK = 100' (10,000 S.F. OR GREATER)
WET LIMITED CUT ZONE = 50' (10,000 S.F. OR GREATER)
WET VEGETATED BUFFER = 25' (10,000 S.F. OR GREATER)
BUILDING RESTRICTIONS
MAX. HEIGHT = 35'
MAX. BUILDING COVERAGE = 20%
MIN OPEN SPACE = 40%

2.) THIS IS AN AS-BUILT PLAN DEPICTING EXISTING CONDITIONS AS OF APRIL 2015 AND UPDATED SEPTEMBER 2017. THE LOT CORNER/LOT LINE MONUMENT LOCATIONS WERE HELD AS SHOWN ON THIS PLAN. THE BEARINGS AND DISTANCES MAY VARY SLIGHTLY FROM THE CALCULATED RECORDED DISTANCE AND BEARINGS PER REFERENCE PLAN #4 (RCRD D-38016). THE BEARING BASE IS NH GRID NORTH PER ABOVE PLAN REF. #1 (NH PROJ. P-5875-A). THIS AUTOCAD DRAWING HAS BEEN SHIFTED ONTO PORTSMOUTH GIS COORDINATES NH NAD83 GRID NORTH AS DIRECTED BY PORTSMOUTH GIS DEPT..

3.) THE ELEVATION DATUM BASE IS NAVD88 ESTABLISHED USING THE HYDRANT FLANGE BOLT BENCH MARK ON MYRTLE AVENUE. THIS IS DEPICTED AS TBM-1 ELEVATION 45.86 ON RECORDED PLAN RCRD PLAN # D-37764. PLAN D-37664 NOTES ELEVATION DATUM ESTABLISHED BY SURVEY GRADE GPS READINGS.

4.) THE ABUTTER HOUSE AND GARAGE/APARTMENT AT 678 MAPLEWOOD IS SERVICED BY CITY SEWER AND WATER. PORTSMOUTH COMPUTERIZED GIS UTILITY INFORMATION WAS OBTAINED FROM PORTSMOUTH DPW. THE DIAGRAM INDICATES SEWER, DRAIN AND WATER IS IN THE STREET. THE GIS DIAGRAM DOES NOT INDICATE HOW SUBJECT LOT HOUSE AND GARAGE APARTMENT ARE HOOKED INTO WATER AND SEWER. THE PORTS. WATER/SEWER DIVISION FOREMAN JOHN ADAMS DOES NOT KNOW OF ANY UTILITY RECORDS AVAILABLE TO SHOW THE LOCATION OF THE UTILITY SERVICE CONNECTIONS. THIS APARTMENT (FORMER GARAGE) HAS BEEN GUTTED AND NEW INTERIOR ROOMS ARE CURRENTLY UNDER CONSTRUCTION. THE CARPENTER INDICATED THAT SEWER AND WATER SERVICE WAS FROM THE BIG HOUSE BETWEEN BUILDINGS.

5.) SUBJECT PROPERTIES DO NOT LIE IN A FLOOD HAZARD ZONE AS SHOWN ON ROCKINGHAM COUNTY FLOOD INSURANCE RATE MAP (FIRM) FOR CITY OF PORTSMOUTH COMMUNITY #330139, PANEL #0259, SUFFIX "E" AND KNOWN AS MAP #33015C0259E WITH AN EFFECTIVE DATE OF MAY 17, 2005.

6.) ABUTTING PROPERTY AT #678 MAPLEWOOD HAS A TWO STORY HOUSE AND A SEPARATE GARAGE (GARAGE NOW BEING REFRAMED WITH ABOVE APARTMENT). A VARIANCE WAS GRANTED APRIL 10, 1979 TO ALLOW CONVERSION OF THE SECOND FLOOR OF AN EXISTING GARAGE INTO AN APARTMENT IN A SINGLE RESIDENCE II DISTRICT. A BUILDING PERMIT WAS GIVEN APRIL 25, 1979.

7.) SUBJECT LOT MAP 220 LOT 90 IS A VACANT LOT PARTLY WOODED. THIS PROPERTY IS REFERED TO AS #686 MAPLEWOOD AVENUE IN A DRIVEWAY PERMIT APPLICATION DATED 7-31-12. THE PAVED SIDEWALK CURBING WAS REMOVED WHERE THE PAVED DRIVEWAY IS NOW LOCATED AS SHOWN HEREON.

8.) THE UNDERGROUND GAS SERVICE SHOWN HEREON IN FRONT OF 650 MAPLEWOOD AVE. WAS PLOTTED FROM YELLOW GAS LINE PAINT MARKINGS LOCATED BY FIELD SURVEY. THE GAS PAINT MARKS INDICATES THE GAS LINE ENDS BEFORE CROSSING IN FRONT OF SUBJECT LOT AS SHOWN.

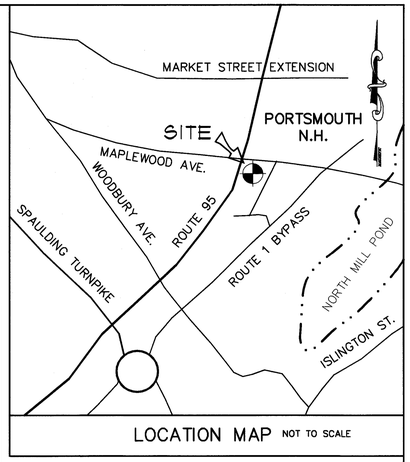
9.) UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE, BEING PLOTTED FROM OBSERVED ABOVE GROUND STRUCTURES AND PAINT MARKS.

10.) SUBJECT LOT 90 SUBJECT TO AN ELECTRIC EASEMENT PER RCRD BK. 1146 PG. 297. THIS EASEMENT IS ON THE REAR 45 FEET OF SUBJECT LOT 90 ADJOINING THE MORETTI PROPERTIES AS SHOWN AND ALLOWS FOR THE ELECTRIC TRANSMISSION LINES OPERATION AND MAINTENANCE. THERE IS CURRENTLY AN OVERHEAD ELECTRIC LINE CROSSING SUBJECT LOT AS SHOWN.

11.) SUBJECT LOT SUBJECT TO AN EASEMENT TO PERMIT THE STAIRWAY AND DECK ON APARTMENT BUILDING THAT ENCROACH SUBJECT LOT 90 PER RCRD BK. 5759 PG. 1160. THIS EASEMENT TO EXTINGUISH UPON REMOVAL OF ENCROACHING DECK AND STAIRS IF NOT REPLACED WITHIN 6 MONTHES OF REMOVAL. THE ENCROACHING STAIRS AND DECK ON THE WEST SIDE OF THE APARTMENT (GARAGE) BUILDING WERE REMOVED AS OF SEPT. 7, 2017.

12.) JOSEPH W. NOEL, N.H. CERTIFIED WETLAND SCIENTIST #086, (207-384-5587) INVESTIGATED THE SUBJECT PROPERTIES LOT 89 & LOT 90 APRIL 4, 2015 AND THERE WERE NO WETLANDS.

13.) PER PORTSMOUTH PLANNING DEPT. SUBJECT PROPERTY MAP 220 LOT 90 AT 686 MAPLEWOOD AVENUE RECEIVED A VARIANCE ON FEB. 21, 2017 TO PERMIT THE CONSTRUCTION OF A 4,000 SQ. FOOT PLACE OF WORSHIP AND A VARIANCE FOR REQUIRED FRONTAGE.



LOCATION MAP NOT TO SCALE

PLAN REFERENCES:

1.) STATE OF N. H. DEPT. OF PUBLIC WORKS AND HIGHWAYS FEDERAL AID RIGHT OF WAY PROJECT #1-95-1(9)14, INTERSTATE ROUTE 95 N. H. PROJECT #P-5875-A RCRD PLAN #D-2229-6.

2.) STATE OF N. H. DEPT. OF PUBLIC WORKS AND HIGHWAYS FEDERAL AID RIGHT OF WAY PROJECT #1-95-1(10)14, INTERSTATE ROUTE 95 N. H. PROJECT #P-5875-B, RCRD PLAN #D-2498-3.

3.) "PROPOSED DIVISION OF LAND OF CATHERINE T. MORETTI, PHASE 2 – MYRTLE AVENUE & CENTRAL AVENUE PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE" BY CIVIL CONSULTANTS ENGINEERS, REVISED 5-30-2014, RCRD PLAN #D-38286. (SEE ALSO EARLIER PLAN RCRD PLAN #D-37764)

4.) "CORRECTION PLAN, LAND BOUNDARY SURVEY PLAN DEPICTING LAND OWNED BY INDEPENDENT ORDER OF ODD FELLOWS, OSGOOD LODGE #48 KNOWN AS TAX MAP 209 LOT 6/#651 MAPLEWOOD AVE. AND DEPICTING LAND OWNED BY WARREN V. STEARNS & HELEN W. STEARNS KNOWN AS TAX MAP 220 LOT 89/#678 MAPLEWOOD AVE AND DEPICTING LAND OWNED BY WARREN V. STEARNS KNOWN AS TAX MAP 220 LOT 90" BY KNIGHT HILL LAND SURVEYING SERVICES, INC. DATED OCT., 2003, REVISED NOV. 19, 2013, RCRD PLAN #D-38016.

SITE DATA
TAX MAP 220 LOT 90

OWNER OF RECORD:
ISLAMIC SOCIETY OF THE SEACOAST AREA
42N DOVER POINT ROAD
DOVER, N. H., 03820

DEED: RCRD BK. 5806 PG. 2816

AREA: 1.44 ACRE

CERTIFICATION

I CERTIFY THAT THE SITE DETAILS SHOWN HEREON ARE THE RESULTS OF AN ON THE GROUND INSTRUMENT FIELD SURVEY CONDUCTED UNDER MY DIRECT SUPERVISION IN MARCH 2015 AND SEPTEMBER, 2017. THE DETAILS SHOWN HEREON REFLECT CURRENT AS BUILT EXISTING CONDITIONS.

STATE OF NEW HAMPSHIRE No. 802 G. DAVIDSON HISLOP, JR. LICENSED LAND SURVEYOR SIGNATURE

SEPT. 15, 2017

G. DAVIDSON HISLOP, JR. LLS #802 DATE

LEGEND

PROPERTY LINE
EDGE OF PAVEMENT
IRON PIPE OR PIN
DRILL HOLE IN STONE WALL
N. H. HIGHWAY BOUND
EDGE OF EASEMENT
APPROX. EDGE OF WOODS
STONE WALL
CATCH BASIN
WATER SHUT OFF VALVE
BELL MANHOLE
SEWER MANHOLE
UTILITY POLE
OVERHEAD ELECTRIC
APPROX. UNDERGROUND DRAIN
SIGN
SETBACK
ROCKINGHAM COUNTY REGISTRY OF DEEDS RCRD
DECIDUOUS TREE
CONIFEROUS TREE
DRAIN MANHOLE
GAS SHUT OFF VALVE
CHAIN LINK FENCE
STUMP/DIRT/SLASH PILE
APPROX. UNDERGROUND SEWER
GRANITE CURB
APPROX. UNDERGROUND WATER
APPROX. UNDERGROUND GAS
LEDGE OUTCROP AREA
2 FOOT CONTOUR
CONTOUR AT EVEN 10 FOOT
TALL STAKE SET ON LOT LINE

EXISTING CONDITIONS & TOPOGRAPHY PLAN

for vacant lot known as

TAX MAP 220 LOT 90

owned by

ISLAMIC SOCIETY OF THE SEACOAST AREA

located at

686 MAPLEWOOD AVENUE
PORTSMOUTH, NEW HAMPSHIRE
ROCKINGHAM COUNTY

DATE: SEPT. 14, 2017 SCALE: 1" = 30' PROJECT # 1938ASBUILT

PREPARED FOR:
ISLAMIC SOCIETY OF THE SEACOAST AREA
42N DOVER POINT RD.
DOVER, N. H., 03820
c/o MOHAMMED EBRAHIM, PH.D., P.E.
attn: DOUG LAROSA
dj@ambitengineering.com
603-430-9282 (312)

PREPARED BY:
KNIGHT HILL LAND SURVEYING SERVICES, INC.
c/o DAVE HISLOP
34 OLD POST ROAD
NEWINGTON, N. H. 03801
(603) 436-1330
dave@khlandsurveying.com

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

1938PNTS

Z360

DEMOLITION NOTES

a) THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE DESIGNER. IT IS THE CONTRACTORS' RESPONSIBILITY TO LOCATE UTILITIES AND ANTICIPATE CONFLICTS. CONTRACTOR SHALL REPAIR EXISTING UTILITIES DAMAGED BY THEIR WORK AND RELOCATE EXISTING UTILITIES THAT ARE REQUIRED TO BE RELOCATED PRIOR TO COMMENCING ANY WORK IN THE IMPACTED AREA OF THE PROJECT.

b) ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTORS UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES. THE CONTRACTOR SHALL COORDINATE REMOVAL, RELOCATION, DISPOSAL, OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.

c) ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO THE ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

d) THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES AND CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.

e) SAWCUT AND REMOVE PAVEMENT ONE FOOT OFF PROPOSED EDGE OF PAVEMENT OR EXISTING CURB LINE IN AREAS WHERE PAVEMENT TO BE REMOVED ABUTS EXISTING PAVEMENT OR CONCRETE TO REMAIN.

f) IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH THE CONDITIONS OF ALL THE PERMIT APPROVALS.

g) THE CONTRACTOR SHALL OBTAIN AND PAY FOR ADDITIONAL CONSTRUCTION PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR ANY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ADDITIONAL AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK.

h) THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, CONCRETE, UTILITIES, VEGETATION, PAVEMENT, AND CONTAMINATED SOIL WITHIN THE WORK LIMITS SHOWN UNLESS SPECIFICALLY IDENTIFIED TO REMAIN. ANY EXISTING DOMESTIC / IRRIGATION SERVICE WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER FOR PROPER CAPPING / RE-USE. ANY EXISTING MONITORING WELLS IN THE PROJECT AREA IDENTIFIED DURING THE CONSTRUCTION AND NOT CALLED OUT ON THE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER TO COORDINATE MONITORING WELL REMOVAL AND/OR RELOCATION WITH NHDES AND OTHER AUTHORITY WITH JURISDICTION PRIOR TO CONSTRUCTION.

i) ALL WORK WITHIN THE CITY OF PORTSMOUTH RIGHT OF WAY SHALL BE COORDINATED WITH THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS (DPW).

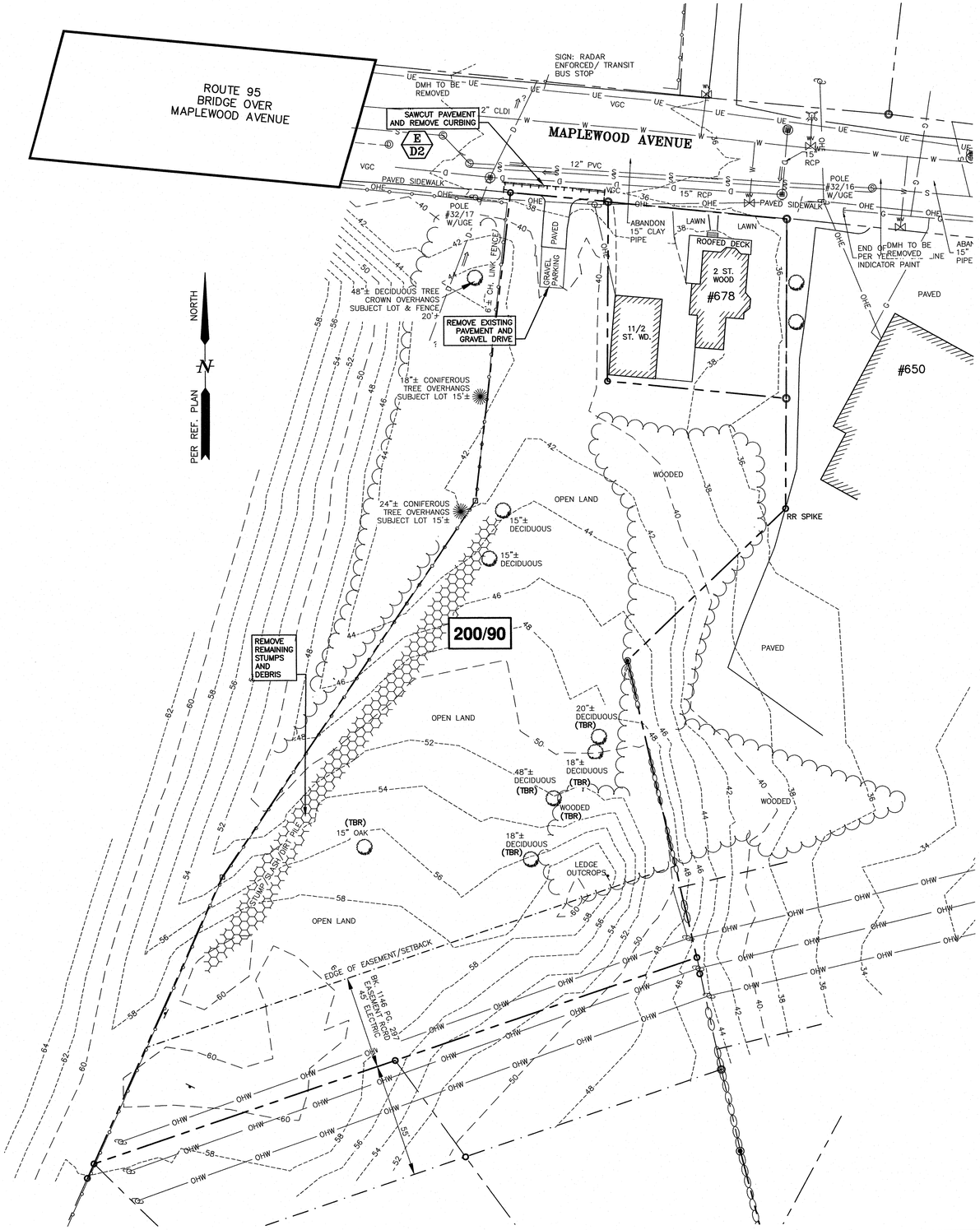
j) REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF-SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.

k) CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED, THE CONTRACTOR SHALL EMPLOY A NH LICENSED LAND SURVEYOR TO REPLACE THEM.

l) PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS WITHIN CONSTRUCTION LIMITS AND MAINTAIN FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE HIGH FLOW SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF WARRANTED OR FABRIC BECOMES CLOGGED. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.

m) THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFELY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.

n) ANY CONTAMINATED MATERIAL REMOVED DURING THE COURSE OF THE WORK WILL REQUIRE HANDLING IN ACCORDANCE WITH NHDES REGULATIONS. CONTRACTOR SHALL HAVE A HEALTH AND SAFETY PLAN IN PLACE, AND COMPLY WITH ALL APPLICABLE PERMITS, APPROVALS, AUTHORIZATIONS, AND REGULATIONS



GRAPHIC SCALE

30 0 50 100 120 FEET
10 5 0 10 20 30 METERS

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360SITE01.dwg, C1 DEMO

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) ALL SEWER CONSTRUCTION SHALL COMPLY WITH THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES) STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWERAGE AND WASTEWATER TREATMENT FACILITIES, LATEST EDITION.

5) ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH AND THE N.H.D.O.T STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATIONS SHALL GOVERN.

6) CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF DEMOLITION DEBRIS.

7) CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH BITUMEN EMULSION RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.

8) INSTALL CATCH BASIN INLET PROTECTION ON ALL EXISTING AND PROPOSED CATCH BASINS UNTIL CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

9) COORDINATE ANY DEMOLITION WORK WITHIN CITY RIGHT-OF-WAY WITH THE CITY OF PORTSMOUTH.

10) OWNER SHALL ARRANGE FOR LAND SURVEYOR TO SET ADDITIONAL BENCHMARKS PRIOR TO ANY SITE CONSTRUCTION.

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

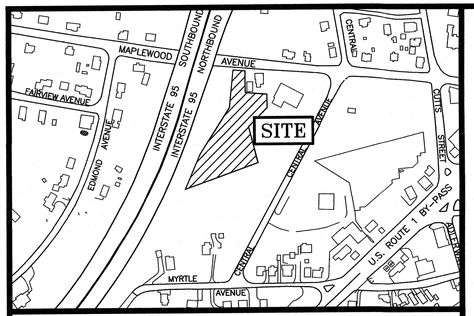
REVISIONS

STATE OF NEW HAMPSHIRE
JOHN R. CHAGNON
No. 7851
LICENSED
PROFESSIONAL ENGINEER

SCALE: 1" = 30' MARCH 2018

DEMOLITION PLAN C1

2360

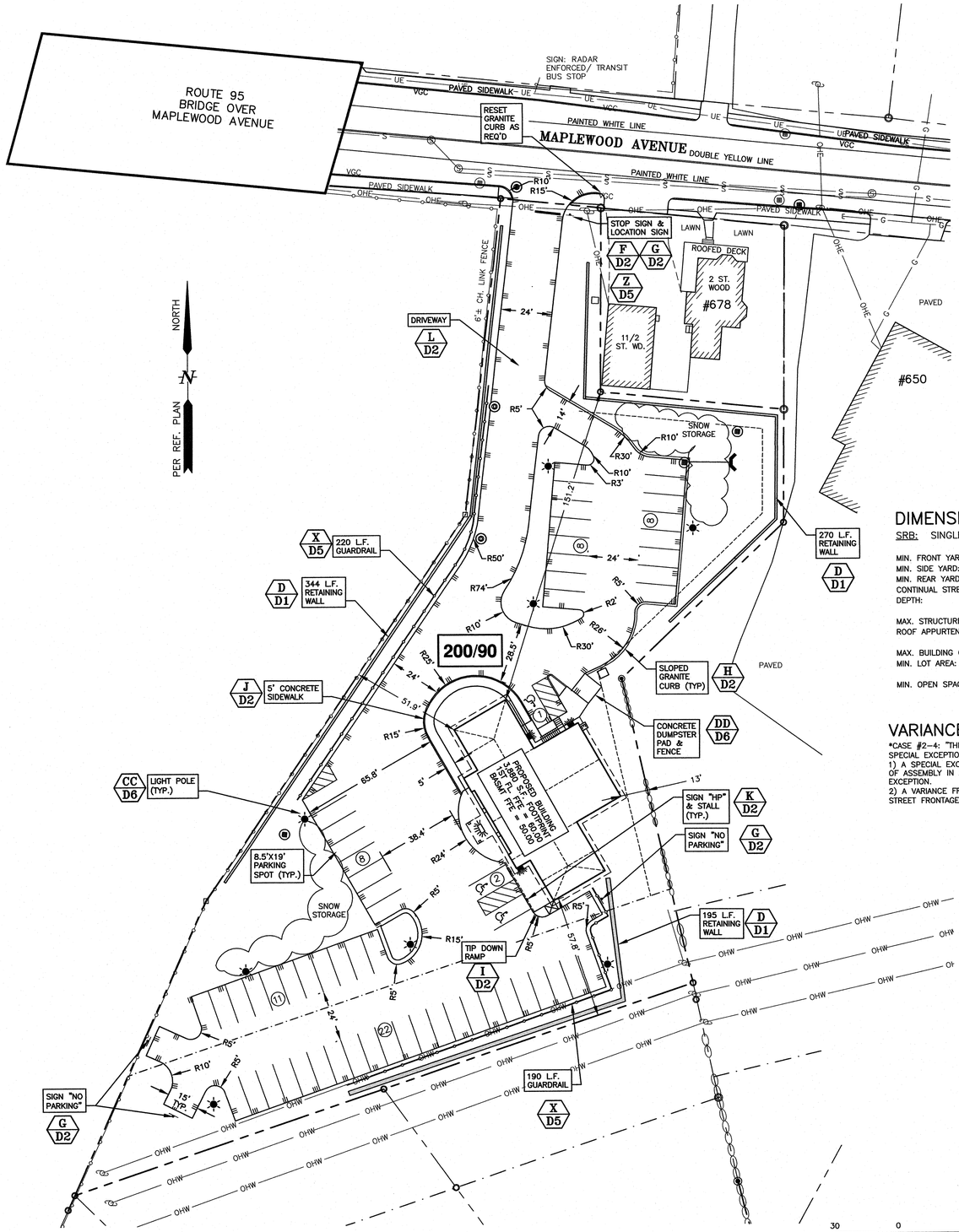


LOCATION MAP SCALE 1"=300'

LEGEND:
SEE SHEET C1

IMPERVIOUS SURFACE AREAS
(TO PROPERTY LINE)

STRUCTURE	PRE-CONSTRUCTION IMPERVIOUS (S.F.)	POST-CONSTRUCTION IMPERVIOUS (S.F.)
MAIN STRUCTURE	0	3,880
PAVEMENT	306	30,695
GRAVEL	219	0
RETAINING WALLS	0	820
STEPS AND LANDINGS	0	24
PORCH	0	88
CONCRETE PADS & SIDEWALK	0	1,987
TOTAL	525	37494
LOT SIZE	62,776	62,776
% LOT COVERAGE	0.8%	59.7%



APPROVAL 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.

3) THE OWNER OF RECORD AND SUBSEQUENTLY THE CONDOMINIUM UNIT ASSOCIATION SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.

4) 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.

5) 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.

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

DIMENSIONAL REQUIREMENTS:

SRB: SINGLE RESIDENCE "B"

	REQUIRED	EXISTING	PROPOSED
MIN. FRONT YARD:	30 FEET	NA	151.2 FEET
MIN. SIDE YARD:	10 FEET	NA	13.0 FEET
MIN. REAR YARD:	30 FEET	NA	57.8 FEET
CONTINUAL STREET FRONTAGE:	100 FEET	47.2 FEET	*47.2 FEET
DEPTH:	100 FEET	>100 FEET	>100 FEET
MAX. STRUCTURE HEIGHT:	35 FEET	0 FEET	<35 FEET
ROOF APPURTENANCE:	8 FEET	0 FEET	8 FEET
MAX. BUILDING COVERAGE:	20%	0%	6.2%
MIN. LOT AREA:	15,000 SF	62,776 SF	62,776 SF
MIN. OPEN SPACE COVERAGE:	40%	99.6%	40.3%

VARIANCES GRANTED (2/21/2017):

*CASE #2-4: "THE BOARD VOTED, IN SEPARATE MOTIONS, TO GRANT THE SPECIAL EXCEPTION AND VARIANCE AS PRESENTED AND ADVERTISED."
1) A SPECIAL EXCEPTION FOR SECTION 10.440 TO ALLOW A RELIGIOUS PLACE OF ASSEMBLY IN A DISTRICT WHERE THE USE IS ONLY ALLOWED BY SPECIAL EXCEPTION.
2) A VARIANCE FROM SECTION 10.521 TO ALLOW 47'± OF CONTINUOUS STREET FRONTAGE WHERE 100' IS REQUIRED.

GRAPHIC SCALE
30 0 50 100 120 FEET
10 5 0 10 20 30 METERS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) PARCEL LOCATED ON 686 MAPLEWOOD AVENUE IS SHOWN ON THE CITY OF PORTSMOUTH ASSESSOR'S MAP 220 AS LOT 90.

2) OWNER OF RECORD:
ISLAMIC SOCIETY OF SEACOAST AREA
PO BOX 684
DOVER, NH 03821
5806/2816

3) SITE AREA IS 62,776 S.F. (1.44 ACRES)

4) PARCEL IS NOT IN A SPECIAL FLOOD HAZARD AREA AS SHOWN ON FIRM PANEL 33015C0259E. EFFECTIVE DATE MAY 17, 2005.

5) PARCEL ARE LOCATED IN THE SINGLE RESIDENCE "B" (SRB) ZONING DISTRICT.

6) THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED LAYOUT OF SITE DEVELOPMENT ON TAX MAP 220 LOT 90.

7) VERTICAL DATUM IS MEAN SEA LEVEL NAVD88.
SEE PLAN REFERENCE #1.

8) BUILDING NUMBERING TO BE COORDINATED WITH 911.

9) EXCESS SNOW SHALL BE TRUCKED FROM SITE

10) THE PLAN FOR SOLID WASTE REMOVAL IS TO PROVIDE DUMPSTERS FOR WEEKLY PICKUP.

11) STORMWATER MANAGEMENT INSTALLATIONS SHALL BE INSPECTED BY DPW DURING CONSTRUCTION AND AN ANNUAL REPORT SHALL BE SUBMITTED TO THE DPW DEPARTMENT REGARDING THE FUNCTION OF THE DESIGN.

PARKING ANALYSIS:

PLACE OF ASSEMBLY: 1 PER 4 PERSONS MAXIMUM OCCUPANCY OF ASSEMBLY AREA: 60 PARKING SPACES PROPOSED: MAXIMUM OCCUPANCY 240 PEOPLE.

PROPOSED PARKING:

REGULAR SPACES = 57 SPACES
HANDICAP SPACES = 3 SPACES
TOTAL SPACES = 60 TOTAL SPACES

REFERENCE PLAN:

1) "EXISTING CONDITIONS & TOPOGRAPHY PLAN FOR VACANT LOT KNOWN AS TAX MAP 220 LOT 90 OWNED BY ISLAMIC SOCIETY OF THE SEACOAST AREA LOCATED AT 686 MAPLEWOOD AVENUE PORTSMOUTH NH ROCKINGHAM COUNTY" DATE: SEPT. 14, 2017, SCALE: 1" = 30' PREPARED BY: KNIGHT HILL LAND SURVEYING SERVICES, INC. C/O DAVE HISLOP 34 OLD POST ROAD, NEWINGTON NH 03801 (603) 436-1330, dave@khlandsurveying.com

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED FOR APPROVAL	10/15/18
0	ISSUED FOR COMMENT	8/29/18

REVISIONS

JOHN R. CHAGNON No. 7851 LICENSED PROFESSIONAL ENGINEER - STATE OF NEW HAMPSHIRE

No. 738 JOHN R. CHAGNON LICENSED LAND SURVEYOR - STATE OF NEW HAMPSHIRE

SCALE: 1" = 30' AUGUST 2018

SITE PLAN C2

2360

J:\JOBS2\JN2300's\JN 2360's\JN 2360\2017 Site Plan\Plans & Specs\Site\2360SITE01.dwg, C2 SITE

UTILITY NOTES:

1) SEE EXISTING CONDITIONS PLAN FOR BENCHMARK INFORMATION.
2) COORDINATE ALL UTILITY WORK WITH APPROPRIATE UTILITY.
3) SEE GRADING AND DRAINAGE PLAN FOR PROPOSED GRADING AND EROSION CONTROL MEASURES.
4) ALL WATER MAIN INSTALLATIONS SHALL BE CLASS 52, POLYWRAPPED, CEMENT LINED DUCTILE IRON PIPE.
5) ALL WATERMAIN INSTALLATIONS SHALL BE PRESSURE TESTED AND CHLORINATED AFTER CONSTRUCTION AND BEFORE ACTIVATING THE SYSTEM. CONTRACTOR SHALL COORDINATE WITH THE CITY OF PORTSMOUTH.
6) ALL SEWER PIPE SHALL BE PVC SDR 35 UNLESS OTHERWISE STATED.
7) ALL WORK WITHIN CITY R.O.W. SHALL BE COORDINATED WITH CITY OF PORTSMOUTH
8) CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO ABUTTING PROPERTIES THROUGHOUT CONSTRUCTION.
9) ANY CONNECTION TO EXISTING WATERMAIN SHALL BE CONSTRUCTED BY THE CITY OF PORTSMOUTH.
10) EXISTING UTILITIES TO BE REMOVED SHALL BE CAPPED AT THE MAIN AND MEET THE DEPARTMENT OF PUBLIC WORKS STANDARDS FOR CAPPING OF WATER AND SEWER SERVICES.
11) ALL ELECTRICAL MATERIAL WORKMANSHIP SHALL CONFORM TO THE NATIONAL ELECTRIC CODE, LATEST EDITION, AND ALL APPLICABLE STATE AND LOCAL CODES.
12) THE EXACT LOCATION OF NEW UTILITY SERVICES AND CONNECTIONS SHALL BE COORDINATED WITH BUILDING DRAWINGS AND UTILITY COMPANIES.
13) ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
14) ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
15) THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATED TO THE OWNER PRIOR TO THE COMPLETION OF PROJECT.
16) THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANHOLES, BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED IN THESE DRAWING TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL.
17) CONTRACTOR SHALL PROVIDE EXCAVATION, BEDDING, BACKFILL AND COMPACTION FOR NATURAL GAS SERVICES.
18) A 10-FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. AN 18-INCH MINIMUM OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER/SANITARY SEWER CROSSINGS WATER ABOVE SEWER.
19) SAWCUT AND REMOVE PAVEMENT AND CONSTRUCT PAVEMENT TRENCH PATCH FOR ALL PROPOSED UTILITIES LOCATED IN EXISTING PAVED AREAS.
20) GATE VALVES, FITTINGS, ETC. SHALL MEET THE REQUIREMENTS OF THE CITY OF PORTSMOUTH.
21) COORDINATE TESTING OF SEWER CONSTRUCTION WITH THE CITY OF PORTSMOUTH.
22) ALL SEWER PIPES WITH LESS THAN 6' COVER SHALL BE INSULATED.
23) CONTRACTOR SHALL COORDINATE ALL ELECTRIC WORK INCLUDING BUT NOT LIMITED TO: CONDUIT CONSTRUCTION, MANHOLE CONSTRUCTION, UTILITY POLE CONSTRUCTION, OVERHEAD WIRE RELOCATION, AND TRANSFORMER CONSTRUCTION WITH POWER COMPANY.
24) CONTRACTOR SHALL PHASE UTILITY CONSTRUCTION, PARTICULARLY WATER MAIN AND GAS MAIN CONSTRUCTION AS TO MAINTAIN CONTINUOUS SERVICE TO ABUTTING PROPERTIES. CONTRACTOR SHALL COORDINATE TEMPORARY SERVICES TO ABUTTERS WITH UTILITY COMPANY AND AFFECTED ABUTTER.
25) SITE LIGHTING SPECIFICATIONS, CONDUIT LAYOUT AND CIRCUITRY FOR PROPOSED SITE LIGHTING AND SIGN ILLUMINATION SHALL BE PROVIDED BY THE PROJECT ELECTRICAL ENGINEER IN COORDINATION WITH THE SITE CIVIL ENGINEER.
26) CONTRACTOR SHALL CONSTRUCT ALL UTILITIES AND DRAINS TO WITHIN 10' OF THE FOUNDATION WALLS AND CONNECT THESE TO SERVICE STUBS FROM THE BUILDING.
27) THE CONTRACTOR SHALL INSTALL THE SEWER LINE AND MANHOLE IN CONSULTATION AND COORDINATION WITH DEPARTMENT OF PUBLIC WORKS.
28) BRASS WEDGES FOR CONTINUITY OF SIGNAL MUST BE INSTALLED ON WATER MAINS PER THE PORTSMOUTH WATER DEPARTMENT
29) FINAL REVIEW OF ALL UTILITIES SHALL BE MADE DURING THE REQUIRED SEWER CONNECTION PERMIT PROCESS IN COORDINATION WITH DEPARTMENT OF PUBLIC WORKS.
30) ALL WORK PERFORMED IN THE PUBLIC RIGHT-OF-WAY SHALL BE BUILT TO DEPARTMENT OF PUBLIC WORKS STANDARDS.
31) THIRD PARTY UTILITY INSTALLATION INSPECTIONS SHALL BE REQUIRED ON WATER MAIN, SEWER, AND DRAINAGE SYSTEM CONSTRUCTION, AS WELL AS CONSTRUCTION AND REPAIRS TO CITY STREETS.

STRUCTURE DATA

"A" DRAIN MANHOLE
RIM = 38.61
INV. IN (W) = 30.1 12" RCP
INV. OUT (E) = 30.0 12" RCP
(MEASURED)(STEADY FLOW)

"B" SEWER MANHOLE
RIM = 38.25
INV. IN (W) = 32.5 10" PVC
INV. OUT (SE) = 32.4 10" PVC
(MEASURED)(STEADY FLOW)
(THE PORTS. GIS RIM LABEL IS 39 AND INVERT 33.3)

"C" SEWER MANHOLE 98
RIM = 37.75
INV. IN (NW) = 32.3 10" PVC
INV. OUT (E) = 32.3 10" PVC
(MEASURED)(STEADY FLOW)
(THE PORTS. GIS RIM IS 38.7 AND INVERT 33.2)

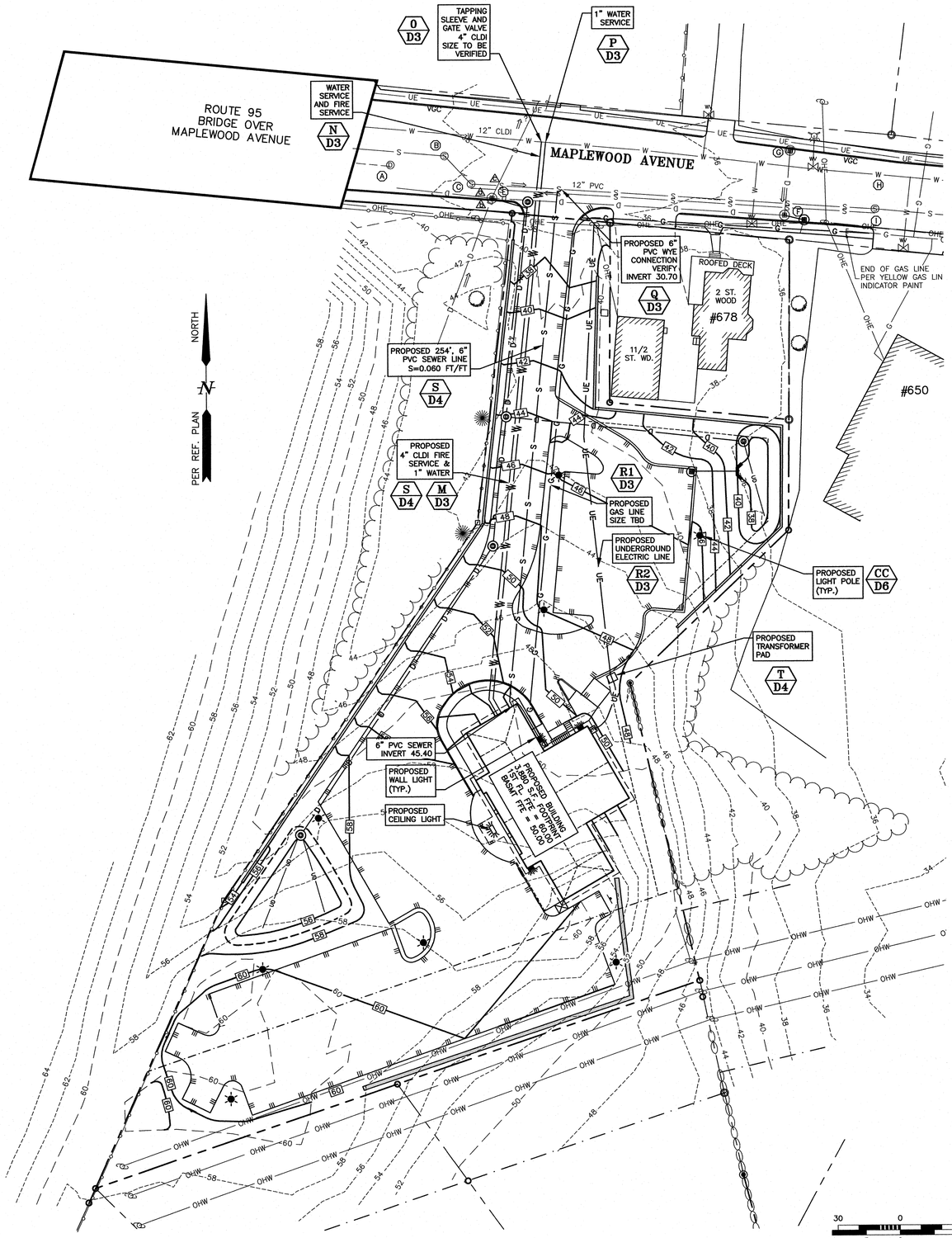
"E" CATCH BASIN (CB-11)
RIM = 37.23
BOTTOM ELEV. = 25.0
INV. a = 26.85 - 15" RCP
INV. b = 25.35 - 15" RCP
INV. c = 25.35 - 48" (SCALED)

"F" CATCH BASIN
RIM = 35.27
INV. IN (N) = 29.2 15" RCP
INV. OUT (W) = 29.2 18"±
(GRILL IS RUSTED OUT)

"G" CATCH BASIN
RIM = 35.29
INV. OUT (S) = 30.8

(H) DRAIN MANHOLE
RIM = 35.17
(COULD NOT OPEN COVER TO MEASURE INVERTS)

"I" SEWER MANHOLE 97
RIM = 34.96
INV. IN (W) = 25.6 10" PVC
INV. OUT (E)= 25.6 10" PVC
(CITY GIS HAS RIM ELEVATION LABELED 35.6 AND INVERT AT 26.5)



APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

2) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) INSTALL CATCH BASIN INLET PROTECTION ON ALL EXISTING AND PROPOSED CATCH BASINS UNTIL CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

5) A JOINT USE AGREEMENT WITH EVERSOURCE REQUIRED FOR PARKING WITHIN THE 45'/55' ELECTRIC EASEMENT (R17715) WORK NUMBER .

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

REVISIONS

JOHN R. CHAGNON No. 7951 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE: 1" = 30' MAY 2018

UTILITY PLAN

C3

2360

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360SITE01.dwg, C3 UTILITY

TEST PIT 1, ELEV. 60.1

Date: 8/18/17
Logged by: DOUG LAROSA
ESHWT: NONE
Observed Water: NONE
Restrictive layer: NONE
REFUSAL: LEDGE AT 24"

DEPTH	DESCRIPTION
0" – 6"	10YR 3/3 FINE SANDY LOAM, MASSIVE, FRIABLE
6" – 24"	10YR 5/6 FINE SANDY LOAM, GRANULAR, FRIABLE

TEST PIT 2, ELEV. 50.1

Date: 8/18/17
Logged by: DOUG LAROSA
ESHWT: NONE
Observed Water: NONE
Restrictive layer: NONE
REFUSAL: LEDGE AT 28"

DEPTH	DESCRIPTION
0" – 5"	10YR 3/3 FINE SANDY LOAM, MASSIVE, FRIABLE
5" – 28"	10YR 5/6 FINE SANDY LOAM, GRANULAR, FRIABLE

TEST PIT 3, ELEV. 52.1

Date: 8/18/17
Logged by: DOUG LAROSA
ESHWT: NONE
Observed Water: NONE
Restrictive layer: NONE
REFUSAL: LEDGE AT 27"

DEPTH	DESCRIPTION
0" – 6"	10YR 3/3 FINE SANDY LOAM, MASSIVE, FRIABLE
6" – 27"	10YR 5/6 FINE SANDY LOAM, GRANULAR, FRIABLE

TEST PIT 4, ELEV. 44.5

Date: 8/18/17
Logged by: DOUG LAROSA
ESHWT: NONE
Observed Water: NONE
Restrictive layer: NONE
REFUSAL: LEDGE AT 30"

DEPTH	DESCRIPTION
0" – 8"	10YR 4/3 FINE SANDY LOAM, MASSIVE, FRIABLE
8" – 30"	10YR 4/6 FINE SANDY LOAM, GRANULAR, FRIABLE

TEST PIT 5, ELEV. 43.5

Date: 8/18/17
Logged by: DOUG LAROSA
ESHWT: NONE
Observed Water: NONE
Restrictive layer: NONE
REFUSAL: LEDGE AT 25"

DEPTH	DESCRIPTION
0" – 5"	10YR 4/3 FINE SANDY LOAM, MASSIVE, FRIABLE
5" – 25"	10YR 5/6 FINE SANDY LOAM, GRANULAR, FRIABLE

STRUCTURE DATA

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RIM = 38.61
INV. IN (W) = 30.1 12" RCP
INV. OUT (E) = 30.0 12" RCP
(MEASURED)(STEADY FLOW)

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RIM = 38.25
INV. IN (W) = 32.5 10" PVC
INV. OUT (SE) = 32.4 10" PVC
(MEASURED)(STEADY FLOW)
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"C" SEWER MANHOLE 98
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INV. OUT (E) = 32.3 10" PVC
(MEASURED)(STEADY FLOW)
(THE PORTS. GIS RIM IS 38.7 AND INVERT 33.2)

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RIM = 37.23
BOTTOM ELEV. = 25.0
INV. a = 26.85 – 15" RCP
INV. b = 25.35 – 15" RCP
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RIM = 35.27
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INV. OUT (W) = 29.2 18"±
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RIM = 35.29
INV. OUT (S) = 30.8

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(COULD NOT OPEN COVER TO MEASURE INVERTS)

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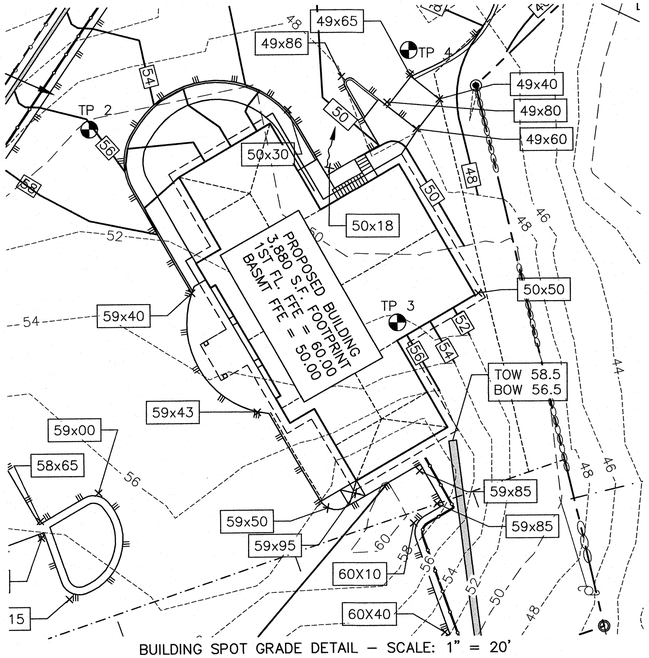
(CITY GIS HAS RIM ELEVATION LABELED 35.6 AND INVERT AT 26.5)

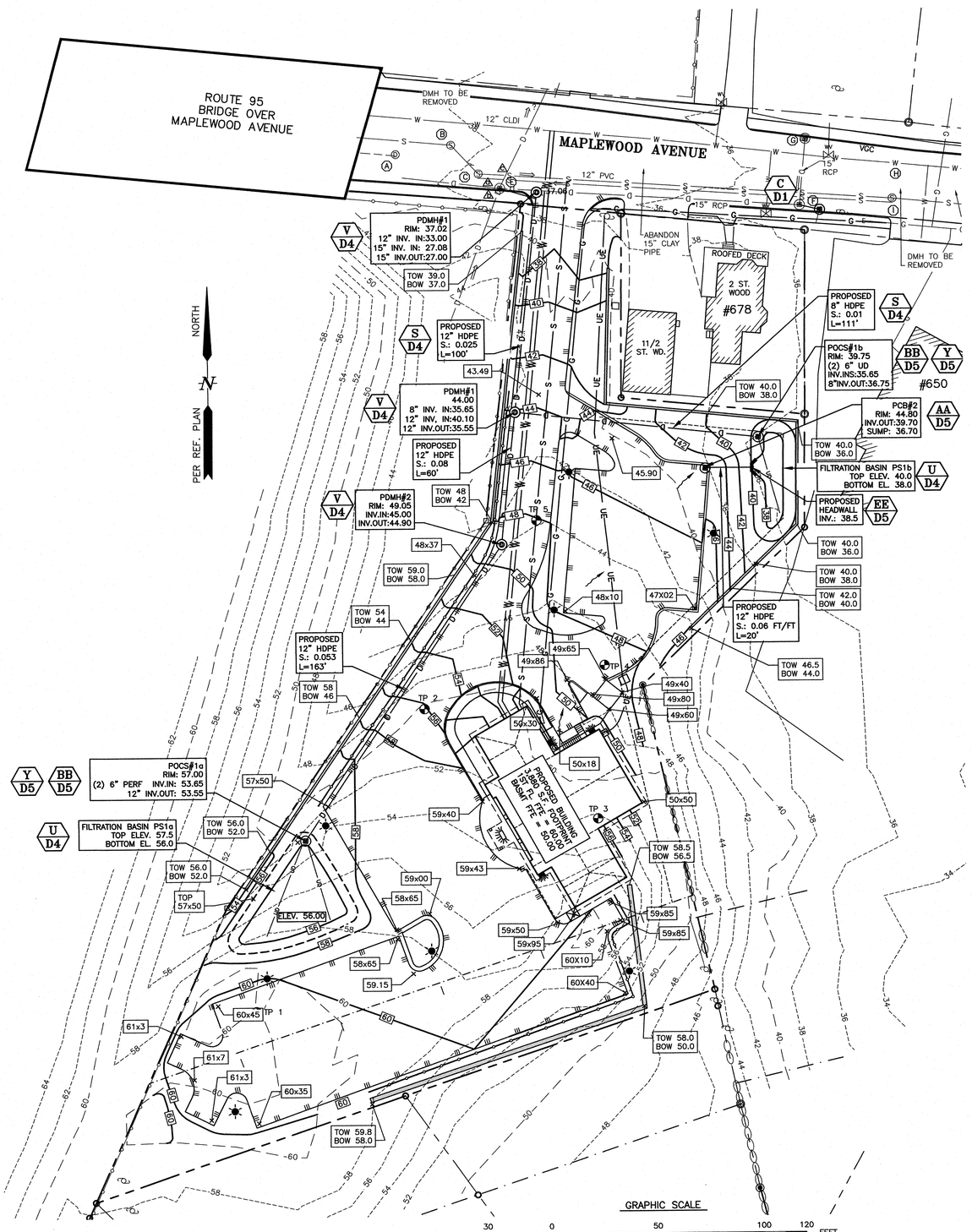


BUILDING SPOT GRADE DETAIL – SCALE: 1" = 20'

GRAPHIC SCALE
10 0 20 40 60 80 FEET
5 0 5 10 15 20 25 METERS

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____



GRAPHIC SCALE
30 0 50 100 120 FEET
10 5 0 10 20 30 METERS

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NOTES:

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) INSTALL CATCH BASIN INLET PROTECTION ON ALL EXISTING AND PROPOSED CATCH BASINS UNTIL CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

5) ALL WATER MAIN AND SANITARY SEWER WORK SHALL MEET THE STANDARDS OF THE NEW HAMPSHIRE STATE PLUMBING CODE AND CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS.

6) UTILITY AS–BUILTS SHALL BE SUBMITTED TO THE CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS UPON COMPLETION OF THE PROJECT.

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED FOR COMMENT	10/15/18
0	ISSUED FOR COMMENT	9/17/18
	REVISIONS	

JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER – STATE OF NEW HAMPSHIRE

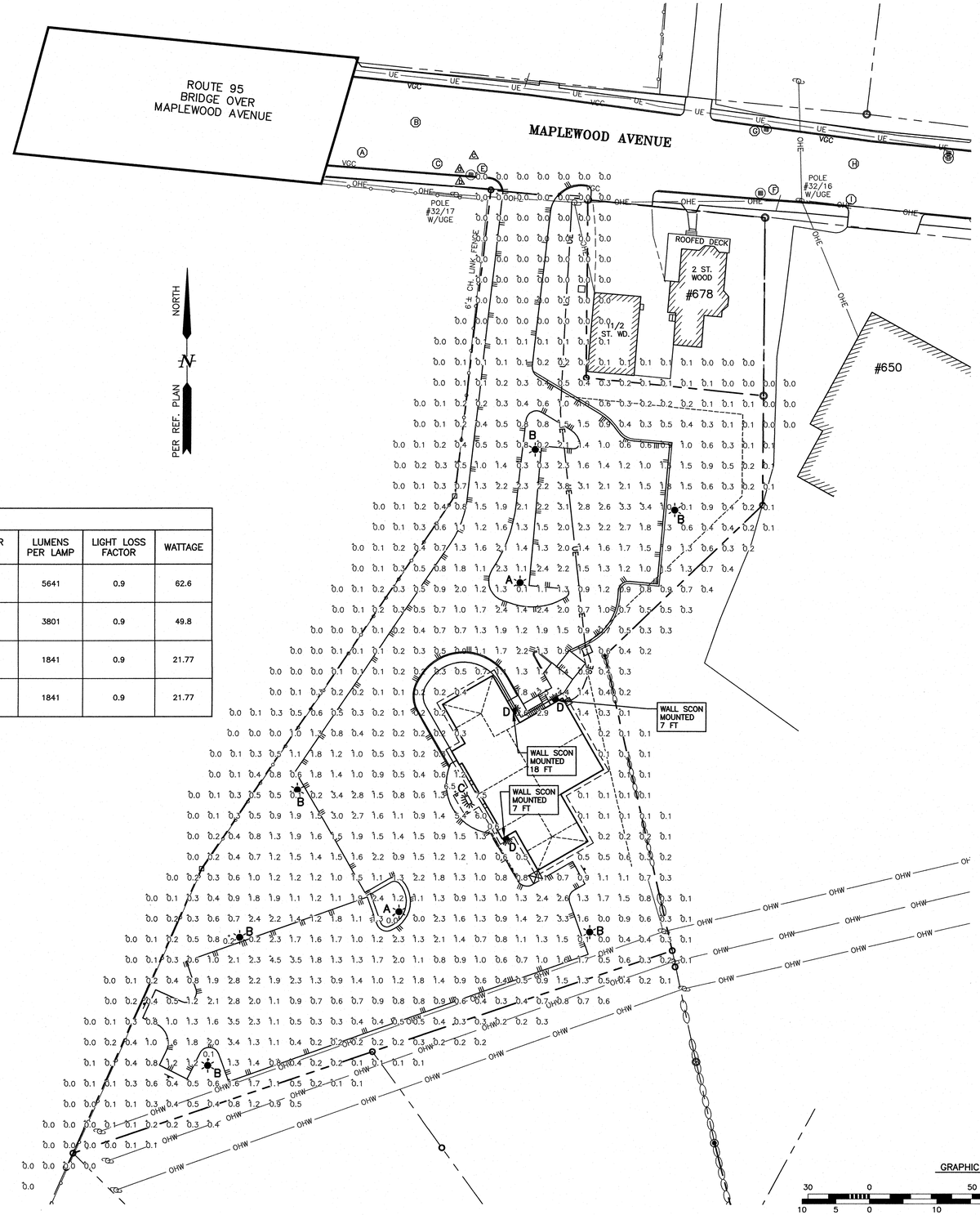
SCALE: 1" = 30'/20' MAY 2018

GRADING, DRAINAGE AND EROSION CONTROL PLAN

C4

2360

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360SITE01.dwg, C4 GRADE



LIGHT FIXTURE TABLE

POLE	QTY.	CATALOG NUMBER	DESCRIPTION	LAMP	NUMBER LAMPS	LUMENS PER LAMP	LIGHT LOSS FACTOR	WATTAGE
A	2	1843LED-4ARC45T5-MDL03-CTA	1843 LED CARSON CITY, 4-SIDED LANTERN, CLEAR TEXTURED ACRYLIC LENS, TYPE 5; MOUNTED AT 14 FT	LED	1	5641	0.9	62.6
B	6	1843LED-3ARC45T4-MDL03-CTA	1843 LED CARSON CITY, 4-SIDED LANTERN, CLEAR TEXTURED ACRYLIC LENS, TYPE 4; MOUNTED AT 14 FT	LED	1	3801	0.9	49.8
C	1	OLWX1-LED-20W-40K-DDB_1	20W 4000K LED BOX CEILING MOUNTED @10 FT	LED	1	1841	0.9	21.77
D	3	OLWX1-LED-20W-40K-DDB	20W 4000K LED WALL SCON SEE PLAN FOR MOUNTING HEIGHTS	LED	1	1841	0.9	21.77

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN _____ DATE _____

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NOTES:

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3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

4) POLE MOUNTED LIGHTS SHALL HAVE A MAXIMUM FIXTURE OF HEIGHT OF 14 FEET, EXCEPT WHERE NOTED.

5) ALL LIGHTING SHALL BE SHIELDED TO MINIMIZE LIGHT TRESPASS AND DIRECT GLARE BEYOND THE PROPERTY.

6) LIGHTING PLAN PREPARED USING AGI32 SOFTWARE. LIGHTING DESIGN BASED ON .IES FILES THAT WERE LAB-TESTED OR COMPUTER GENERATED. ACTUAL RESULTS MAY VARY DEPENDING ON FIELD CONDITIONS, AREA GEOMETRY OR CHANGES IN ELECTRICAL SUPPLY VOLTAGE.

7) LIGHTS SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

REVISIONS

JOHN R. CHAGNON No. 7651 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE: 1" = 30' MAY 2018

LIGHTING PLAN **LT**

2360

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360SITE01.dwg, LT LIGHTING

LANDSCAPE SCHEDULE

Quantity	Botanical Name	Common Name	Size
1	Acer palmatum (Palmatum Group) 'Bloodgood'	BLOODGOOD JAPANESE MAPLE	7-8'
2	Acer rubrum 'Franksred (Red Sunset®)'	FRANKSRED (RED SUNSET®) RED MAPLE	2.5-3" cal
12	Betula nigra 'Cully (Heritage®)'	CULLY (HERITAGE®) RIVER BIRCH	10-12'
18	Calamagrostis x acutiflora 'Karl Foerster'	KARL FOERSTER FEATHER REED GRASS	2gal
1	Cornus florida 'Cherokee Princess'	CHEROKEE PRINCESS FLOWERING DOGWOOD	2.5-3" cal
3	Echinacea purpurea 'Kim's Knee High'	KIM'S KNEE HIGH PURPLE CONEFLOWER	1gal
7	Hemerocallis 'Happy Returns'	HAPPY RETURNS DAYLILY	1gal
6	Hosta 'Sum & Substance'	SUM & SUBSTANCE HOSTA	1gal
5	Hydrangea macrophylla 'Bailmer(Endless Summer®)'	BAILMER(ENDLESS SUMMER®) BIGLEAF HYDRANGEA	3gal
3	Hydrangea paniculata 'ILVOBO' pp#22,782, cbr#4910 (Proven Winners)	BOBO® HARDY HYDRANGEA (Proven Winners)	3gal
3	Hydrangea quercifolia 'Brother Edward' pp#25,413, cbraf (Proven Winners)	GATSBY MOON™ OAKLEAF HYDRANGEA (Proven Winners)	3gal
9	Ilex crenata 'Helleri'	HELLERI JAPANESE HOLLY	5gal
4	Ilex x meserveae 'Blue Princess®'	BLUE PRINCESS® MESERVE HOLLY	4-5'
3	Malus x 'Prairifire'	PRAIRIFIRE FLOWERING CRABAPPLE	2.5-3" cal
8	Microbiota decussata	SIBERIAN CYPRESS	2gal
14	Nepeta x faassenii 'Walker's Low'	WALKER'S LOW CATMINT	1gal
10	Pennisetum alopecuroides 'Hamelin'	HAMELIN CHINESE FOUNTAIN GRASS	2gal
6	Picea abies	NORWAY SPRUCE	7-8'
2	Picea omorika	SERBIAN SPRUCE	7-8'
3	Picea pungens 'Fat Albert'	FAT ALBERT COLORADO SPRUCE	7-8'
6	Pieris japonica 'Mt. Fire'	MT. FIRE JAPANESE PIERIS	5gal
9	Rhododendron (subgenus Rhododendron) 'PJM'	PJM RHODODENDRON	5gal
3	Rhododendron degronianum ssp. yakushimanum 'Yaku Princess'	YAKU PRINCESS RHODODENDRON	5gal
6	Rosa 'Radrazz (Knock Out®)'	RADRAZZ (KNOCK OUT®) ROSE	3gal
5	Salvia nemorosa 'Mainacht (May Night)'	MAINACHT (MAY NIGHT) MEADOW SAGE	1gal
9	Syringa reticulata 'Ivory Silk'	IVORY SILK JAPANESE TREE LILAC	2.5-3" cal
9	Thuja occidentalis 'Nigra'	NIGRA AMERICAN ARBORVITAE	7-8'
3	Viburnum plicatum f. tomentosum 'Mariesii'	MARIESII DOUBLEFILE VIBURNUM	3-4'

APPROVAL 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.

3) THE OWNER OF RECORD AND SUBSEQUENTLY THE CONDOMINIUM UNIT ASSOCIATION SHALL BE RESPONSIBLE FOR THE MAINTENANCE, REPAIR AND REPLACEMENT OF ALL REQUIRED SCREENING AND LANDSCAPE MATERIALS.

4) 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.

5) 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.

0 30' 60' 90'

SCALE: 1" = 30'

NOTES

BASE PLANS PROVIDED ELECTRONICALLY BY ENGINEER OF RECORD:

AMBIT ENGINEERING
SHEET C4 DATED: 9/17/18

No.	Date	Description
		10/10/18

REVISIONS

MAPLE MASJID
686 MAPLEWOOD AVE
PORTSMOUTH, NH

LANDSCAPE PLAN

KRIS ROMANIAK
LANDSCAPE DESIGN
20 BRADFORD ST DERRY, NH 03038
617-756-2129

SCALE: 1" =30'
DRAWN BY: KRIS ROMANIAK
CHECKED BY: KR
DATE: 8-9-18
DATE OF PRINT: 8-9-18

PROJECT NO.

SHEET NO.
L-1

EROSION CONTROL NOTES

CONSTRUCTION SEQUENCE

DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.

THE CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (N.O.I) BEFORE BEGINNING CONSTRUCTION AND SHALL HAVE ON SITE A STORMWATER POLLUTION PREVENTION PLAN (**S.W.P.P.P.**) AVAILABLE FOR INSPECTION BY THE PERMITTING AUTHORITY DURING THE CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THE **S.W.P.P.P.** AND INSPECTING AND MAINTAINING ALL BMP'S CALLED FOR BY THE PLAN. THE CONTRACTOR SHALL SUBMIT A NOTICE OF TERMINATION (**N.O.T.**) FORM TO THE REGIONAL EPA OFFICE WITHIN 30 DAYS OF FINAL STABILIZATION OF THE ENTIRE SITE OR TURNING OVER CONTROL OF THE SITE TO ANOTHER OPERATOR.

INSTALL PERIMETER CONTROLS, i.e., SILT FENCING OR SILTSOXX AROUND THE LIMITS OF DISTURBANCE BEFORE ANY EARTH MOVING OPERATIONS. THE USE OF HAYBALES IS NOT ALLOWED.

CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE.

PERFORM DEMOLITION.

CUT AND GRUB ALL TREES, SHRUBS, SAPLINGS, BRUSH, VINES AND REMOVE OTHER DEBRIS AND RUBBISH AS REQUIRED.

BULLDOZE TOPSOIL INTO STOCKPILES, AND CIRCLE WITH SILT FENCING OR SILTSOXX. IF EROSION IS EXCESSIVE, THEN COVER WITH MULCH.

CONSTRUCT FILTRATION BASINS AND OUTLET, BUT DO NOT ALLOW INFLOW UNTIL ALL CONTRIBUTING AREAS ARE STABILIZED AND EROSION-FREE. ROUGH GRADE SITE. REMOVE AND CRUSH LEDGE, THEN BACKFILL WITH ONSITE SOILS OR GRAVEL IN 12" LIFTS, TYP. ROUGH GRADE SITE. IN LANDSCAPED AREAS OUT OF THE WAY OF SUBSEQUENT CONSTRUCTION ACTIVITY, INSTALL TOPSOIL, MULCH, SEED AND FERTILIZER. STABILIZE STEEPER SLOPES PER DETAILS.

CONSTRUCT FOUNDATIONS.

CONSTRUCT WALLS.

LAYOUT AND INSTALL ALL BURIED UTILITIES AND SERVICES TO THE PROPOSED BUILDING FOUNDATIONS. CAP AND MARK TERMINATIONS OR LOG SWING TIES.

CONSTRUCT BUILDING FRAMES.

FINISH GRADE SITE, BACKFILL DRIVEWAY & PARKING SUBBASE GRAVEL IN TWO, COMPACTED LIFTS. PROVIDE TEMPORARY EROSION PROTECTION TO DITCHES AND SWALES IN THE FORM OF MULCHING, JUTE MESH OR DITCH DAMS.

BUILDING EXTERIOR WORK: LIGHT FIXTURES

INSTALL EXTERIOR LIGHT POLE BASES, AND MAKE FINAL CONNECTIONS TO CONDUIT.

ALL PERMANENT FILTRATION BASINS, DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.

PLACE BINDER LAYER OF PAVEMENT, THEN RAISE CATCH BASIN FRAMES TO FINAL GRADE. REINSTALL BASIN INLET PROTECTION.

PLANT LANDSCAPING IN AREAS OUT OF WAY OF BUILDING CONSTRUCTION. PREPARE AND STABILIZE FINAL SITE GRADING BY ADDING TOPSOIL, SEED, MULCH AND FERTILIZER.

AFTER BUILDINGS ARE COMPLETED, FINISH ALL REMAINING LANDSCAPED WORK.

CONSTRUCT ASPHALT WEARING COURSE.

REMOVE TRAPPED SEDIMENTS FROM COLLECTION DEVICES AS APPROPRIATE, AND THEN REMOVE TEMPORARY EROSION CONTROL MEASURES UPON COMPLETION OF FINAL STABILIZATION OF THE SITE.

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.

GENERAL CONSTRUCTION NOTES

THE EROSION CONTROL PROCEDURES SHALL CONFORM TO SECTION 645 OF THE "STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION" OF THE NHDOT, AND "STORM WATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE". THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.

DURING CONSTRUCTION AND THEREAFTER, EROSION CONTROL MEASURES ARE TO BE IMPLEMENTED AS NOTED. THE SMALLEST PRACTICAL AREA OF LAND SHOULD BE EXPOSED AT ANY ONE TIME DURING DEVELOPMENT. NO DISTURBED AREA SHALL BE LEFT UNSTABILIZED FOR MORE THAN 45 DAYS.

ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY, AND WHICH WILL BE REGRADED LATER DURING CONSTRUCTION SHALL BE MACHINE HAY MULCHED AND SEEDED WITH RYE GRASS TO PREVENT EROSION.

DUST CONTROL: IF TEMPORARY STABILIZATION PRACTICES, SUCH AS TEMPORARY VEGETATION AND MULCHING, DO NOT ADEQUATELY REDUCE DUST GENERATION, APPLICATION OF WATER OR CALCIUM CHLORIDE SHALL BE APPLIED IN ACCORDANCE WITH BEST MANAGEMENT PRACTICES.

SILT FENCES AND SILTSOXX SHALL BE PERIODICALLY INSPECTED DURING THE LIFE OF THE PROJECT AND AFTER EACH STORM. ALL DAMAGED SILT FENCES AND SILTSOXX SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL PERIODICALLY BE REMOVED AND DISPOSED IN A SECURED LOCATION.

AVOID THE USE OF FUTURE OPEN SPACES (LOAM AND SEED AREAS) WHEREVER POSSIBLE DURING CONSTRUCTION. CONSTRUCTION TRAFFIC SHALL USE THE ROADBEDS OF FUTURE ACCESS DRIVES AND PARKING AREAS.

ADDITIONAL TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED IN AMOUNTS NECESSARY TO COMPLETE FINISHED GRADING OF ALL EXPOSED AREAS--CONSTRUCT SILT FENCE OR SILTSOXX AROUND TOPSOIL STOCKPILE.

AREAS TO BE FILLED SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS OR OTHER OBJECTIONABLE MATERIAL. STUMPS SHALL BE DISPOSED OF IN AN APPROVED FACILITY.

ALL FILLS SHALL BE PLACED AND COMPACTED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS.

ALL NON-STRUCTURAL, SITE-FILL SHALL BE PLACED AND COMPACTED TO 90% MODIFIED PROCTOR DENSITY IN LAYERS NOT EXCEEDING 18 INCHES IN THICKNESS UNLESS OTHERWISE NOTED.

FROZEN MATERIAL OR SOFT, MUCKY OR HIGHLY COMPRESSIBLE MATERIAL, TRASH, WOODY DEBRIS, LEAVES, BRUSH OR ANY DELETERIOUS MATTER SHALL NOT BE INCORPORATED INTO FILLS.

FILL MATERIAL SHALL NOT BE PLACED ON FROZEN FOUNDATION SUBGRADE.

DURING CONSTRUCTION AND UNTIL ALL DEVELOPED AREAS ARE FULLY STABILIZED, ALL EROSION CONTROL MEASURES SHALL BE INSPECTED WEEKLY AND AFTER EACH ONE HALF INCH OF RAINFALL.

THE CONTRACTOR SHALL MODIFY OR ADD EROSION CONTROL MEASURES AS NECESSARY TO ACCOMMODATE PROJECT CONSTRUCTION.

ALL ROADWAYS AND PARKING AREAS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE. ALL CUT AND FILL SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
- BASE COURSE GRAVELS HAVE BEEN INSTALLED ON AREAS TO BE PAVED
- A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
- A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED
- EROSION CONTROL BLANKETS HAVE BEEN INSTALLED

VEGETATIVE PRACTICE

FOR PERMANENT MEASURES AND PLANTINGS:

LIMESTONE SHALL BE THOROUGHLY INCORPORATED INTO THE LOAM LAYER AT A RATE OF 2 TONS PER ACRE.

FERTILIZER SHALL BE SPREAD ON THE TOP LAYER OF LOAM AND WORKED INTO THE SURFACE. FERTILIZER APPLICATION RATE SHALL BE 500 POUNDS PER ACRE OF 10-20-20 FERTILIZER.

SEED SHALL BE SOWN AT THE RATES SHOWN IN THE TABLE BELOW. IMMEDIATELY BEFORE SEEDING, THE SOIL SHALL BE LIGHTLY RAKED. ONE HALF THE SEED SHALL BE SOWN IN ONE DIRECTION AND THE OTHER HALF AT RIGHT ANGLES TO THE ORIGINAL DIRECTION. IT SHALL BE LIGHTLY RAKED INTO THE SOIL TO A DEPTH NOT OVER 1/4 INCH AND ROLLED WITH A HAND ROLLER WEIGHING NOT OVER 100 POUNDS PER LINEAR FOOT OF WIDTH. HAY MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING AT A RATE OF 1.5 TO 2 TONS PER ACRE, AND SHALL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE EROSION AND SEDIMENT CONTROL HANDBOOK.

THE SURFACE SHALL BE WATERED AND KEPT MOIST WITH A FINE SPRAY AS REQUIRED, WITHOUT WASHING AWAY THE SOIL UNTIL THE GRASS IS WELL ESTABLISHED. ANY AREAS WHICH ARE NOT SATISFACTORILY COVERED SHALL BE RESEEDED, AND ALL NOXIOUS WEEDS REMOVED.

A GRASS SEED MIXTURE CONTAINING THE FOLLOWING SEED REQUIREMENTS SHALL BE:

GENERAL COVER	PROPORTION	SEEDING RATE
CREEPING RED FESCUE	50%	100 LBS/ACRE
KENTUCKY BLUEGRASS	50%	

SLOPE SEED (USED ON ALL SLOPES GREATER THAN OR EQUAL TO 3:1)

CREEPING RED FESCUE	42%	
TALL FESCUE	42%	48 LBS/ACRE
BIRDSFOOT TREFOIL	16%	

IN NO CASE SHALL THE WEED CONTENT EXCEED ONE PERCENT BY WEIGHT. ALL SEED SHALL COMPLY WITH APPLICABLE STATE AND FEDERAL SEED LAWS.

FOR TEMPORARY PROTECTION OF DISTURBED AREAS:
MULCHING AND SEEDING SHALL BE APPLIED AT THE FOLLOWING RATES:
PERENNIAL RYE: 0.7 LBS/1,000 S.F.
MULCH: 1.5 TONS/ACRE

MAINTENANCE AND PROTECTION

THE CONTRACTOR SHALL MAINTAIN ALL LOAM & SEED AREAS UNTIL FINAL ACCEPTANCE AT THE COMPLETION OF THE CONTRACT. MAINTENANCE SHALL INCLUDE WATERING, WEEDING, REMOVAL OF STONES AND OTHER FOREIGN OBJECTS OVER 1/2 INCHES IN DIAMETER WHICH MAY APPEAR AND THE FIRST TWO (2) CUTTINGS OF GRASS NO CLOSER THEN TEN (10) DAYS APART. THE FIRST CUTTING SHALL BE ACCOMPLISHED WHEN THE GRASS IS FROM 2 1/2 TO 3 INCHES HIGH. ALL BARE AND DEAD SPOTS WHICH BECOME APPARENT SHALL BE PROPERLY PREPARED, LIMED AND FERTILIZED, AND RESEEDED BY THE CONTRACTOR AT HIS EXPENSE AS MANY TIMES AS NECESSARY TO SECURE GOOD GROWTH. THE ENTIRE AREA SHALL BE MAINTAINED, WATERED AND CUT UNTIL ACCEPTANCE OF THE LAWN BY THE OWNER'S REPRESENTATIVE.

THE CONTRACTOR SHALL TAKE WHATEVER MEASURES ARE NECESSARY TO PROTECT THE GRASS WHILE IT IS DEVELOPING.

TO BE ACCEPTABLE, SEEDED AREAS SHALL CONSIST OF A UNIFORM STAND OF AT LEAST 90 PERCENT ESTABLISHED PERMANENT GRASS SPECIES, WITH UNIFORM COUNT OF AT LEAST 100 PLANTS PER SQUARE FOOT.

SEEDED AREAS WILL BE FERTILIZED AND RESEEDED AS NECESSARY TO INSURE VEGETATIVE ESTABLISHMENT.

THE SWALES WILL BE CHECKED WEEKLY AND REPAIRED WHEN NECESSARY UNTIL ADEQUATE VEGETATION IS ESTABLISHED.

THE SILT FENCE OR SILTSOXX BARRIER SHALL BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.

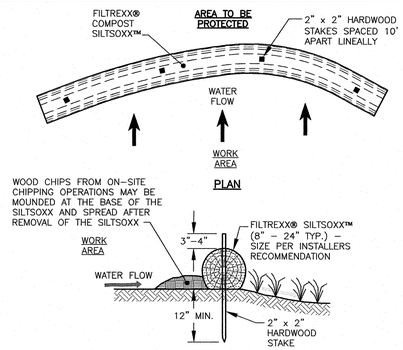
SILT FENCING AND SILTSOXX SHALL BE REMOVED ONCE VEGETATION IS ESTABLISHED, AND DISTURBED AREAS RESULTING FROM SILT FENCE AND SILTSOXX REMOVAL SHALL BE PERMANENTLY SEEDED.

WINTER NOTES

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 COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

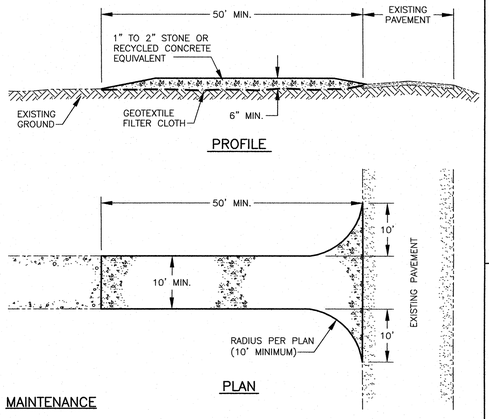
ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.



NOTES:
1. ALL MATERIAL TO MEET FILTREXX SPECIFICATIONS.
2. FILLTREXX SYSTEM SHALL BE INSTALLED BY A CERTIFIED FILTREXX INSTALLER.
3. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTRATION SYSTEM IN A FUNCTIONAL CONDITION AT ALL TIMES. IT WILL BE ROUTINELY INSPECTED AND REPAIRED WHEN REQUIRED.
4. SILTSOXX DEPICTED IS FOR MINIMUM SLOPES, GREATER SLOPES MAY REQUIRE ADDITIONAL PLACEMENTS.
5. THE COMPOST FILTER MATERIAL WILL BE DISPERSED ON SITE WHEN NO LONGER REQUIRED, AS DETERMINED BY THE ENGINEER.

A / C4 FILTREXX® SILTSOXX™ FILTRATION SYSTEM
NTS



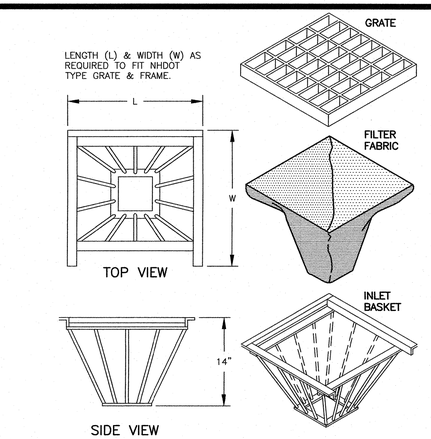
MAINTENANCE

1) MUD AND SOIL PARTICLES WILL EVENTUALLY CLOG THE VOIDS IN THE GRAVEL AND THE EFFECTIVENESS OF THE GRAVEL PAD WILL NOT BE SATISFACTORY. WHEN THIS OCCURS, THE PAD SHOULD BE TOP DRESSED WITH NEW STONE. COMPLETE REPLACEMENT OF THE PAD MAY BE NECESSARY WHEN THE PAD BECOMES COMPLETELY CLOGGED.
2) IF WASHING FACILITIES ARE USED, THE SEDIMENT TRAPS SHOULD BE CLEANED OUT AS OFTEN AS NECESSARY TO ASSURE THAT ADEQUATE TRAPPING EFFICIENCY AND STORAGE VOLUME IS AVAILABLE. VEGETATIVE FILTER STRIPS SHOULD BE MAINTAINED TO INSURE A VIGOROUS STAND OF VEGETATION AT ALL TIMES.

CONSTRUCTION SPECIFICATIONS

1) STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE, RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2) THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3) THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4) THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5) GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENCE LOT.
6) ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8) WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY, WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

B / C4 STABILIZED CONSTRUCTION ENTRANCE
NTS



1) INLET BASKETS SHALL BE INSTALLED IMMEDIATELY AFTER CATCH BASIN CONSTRUCTION IS COMPLETE AND SHALL REMAIN IN PLACE AND BE MAINTAINED UNTIL PAVEMENT BINDER COURSE IS COMPLETE.

2) FILTER FABRIC SHALL BE PUSHED DOWN AND FORMED TO THE SHAPE OF THE BASKET. THE SHEET OF FABRIC SHALL BE LARGE ENOUGH TO BE SUPPORTED BY THE BASKET FRAME WHEN HOLDING SEDIMENT AND, SHALL EXTEND AT LEAST 6" PAST THE FRAME. THE INLET GRATE SHALL BE PLACED OVER THE BASKET/FRAME AND WILL SERVE AS THE FABRIC ANCHOR.

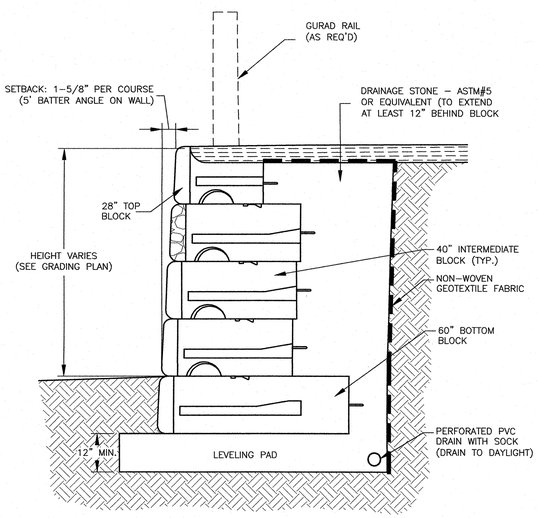
3) THE FILTER FABRIC SHALL BE A GEOTEXTILE FABRIC; POLYESTER, POLYPROPYLENE, STABILIZED NYLON, POLYETHYLENE, OR POLYVINYLIDENE CHLORIDE MEETING THE FOLLOWING SPECIFICATIONS:
- RAB STRENGTH: 45 LB. MIN. IN ANY PRINCIPAL DIRECTION (ASTM D1682)
- MULLEN BURST STRENGTH: MIN. 60 psi (ASTM D774)

4) THE FABRIC SHALL HAVE AN OPENING NO GREATER THAN A NUMBER 20 U.S. STANDARD SIEVE AND A MINIMUM PERMEABILITY OF 120 gpm/s.f. (MULTIPLY THE PERMITTIVITY IN SEC.-1 FROM ASTM 54491-85 CONSTANT HEAD TEST USING THE CONVERSION FACTOR OF 74.)

5) THE INLET BASKET SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING EXTENDED PERIODS OF PRECIPITATION. REPAIRS SHALL BE MADE IMMEDIATELY, AS NECESSARY, TO PREVENT PARTICLES FROM REACHING THE DRAINAGE SYSTEM AND/OR CAUSING SURFACE FLOODING.

6) SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT, OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED.

C / C4 CATCH BASIN INLET BASKET
NTS



D / C2 BLOCK GRAVITY WALL DETAIL
28" REDI ROCK WALL (OR APPROVED EQUAL) NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

1) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

2) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

REVISIONS

JOHN R. CHAGNON No. 7884 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

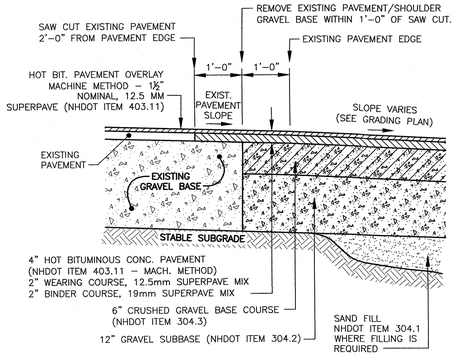
SCALE AS NOTED MAY 2018

EROSION CONTROL NOTES & DETAILS

D1

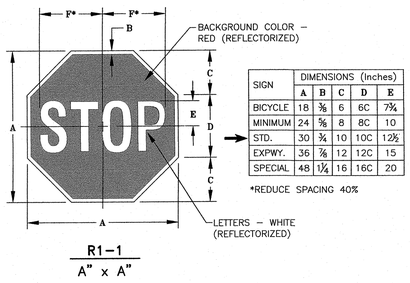
2360

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360DT01.dwg, D1 EROSION



E / C1 FULL DEPTH PAVEMENT SECTION AND PAVEMENT JOINT DETAIL

NTS



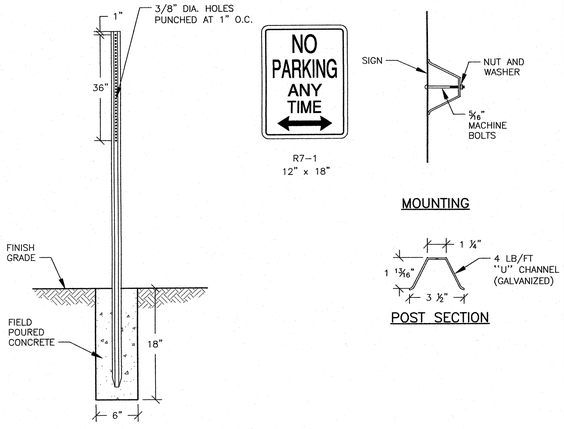
SIGN	DIMENSIONS (Inches)				
	A	B	C	D	E
BICYCLE	18	⅜	6	6C	7¾
MINIMUM	24	⅝	8	8C	10
STD.	30	¾	10	10C	12½
EXPWY.	36	⅞	12	12C	15
SPECIAL	48	1¼	16	16C	20

*REDUCE SPACING 40%

R1-1
A" x A"

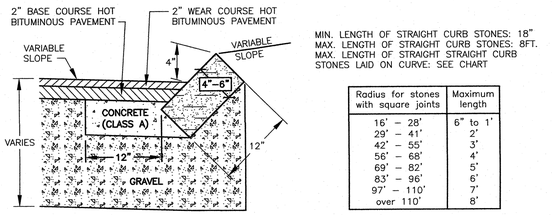
F / C2 STOP SIGN DETAIL

NTS



G / C2 SIGN & POST DETAIL

NTS

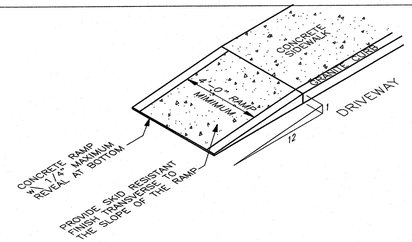


MIN. LENGTH OF STRAIGHT CURB STONES: 18"
MAX. LENGTH OF STRAIGHT CURB STONES: 8FT.
MAX. LENGTH OF STRAIGHT STRAIGHT CURB STONES LAID ON CURVE: SEE CHART

Radius for stones with square joints	Maximum length
16' - 28'	6" to 1'
29' - 41'	2'
42' - 55'	3'
56' - 68'	4'
69' - 82'	5'
83' - 96'	6'
97' - 110'	7'
over 110'	8'

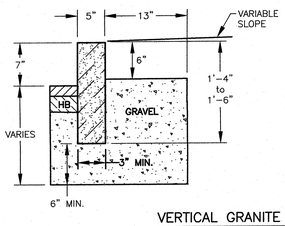
H / C2 SLOPED GRANITE CURBING DETAILS

NTS



I / C2 TYPICAL SIDEWALK TIP DOWN

NTS

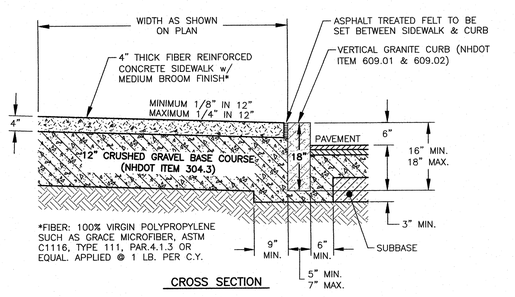


MIN. LENGTH OF CURB STONES: 3FT.
MAX. LENGTH OF CURB STONES: 10FT.
MAX. LENGTH OF STRAIGHT CURB STONES LAID ON CURVE: SEE CHART

NOTE: ADJOINING STONES SHALL HAVE THE SAME OR APPROXIMATE LENGTH.

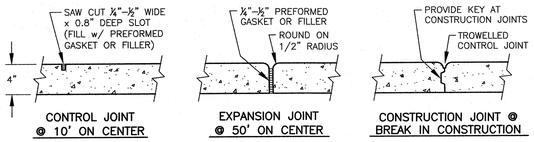
Radius	Max. length
21'	3'
22' - 28'	4'
29' - 35'	5'
36' - 42'	6'
43' - 49'	7'
50' - 56'	8'
57' - 60'	9'
over 60'	10'

VERTICAL GRANITE CURB



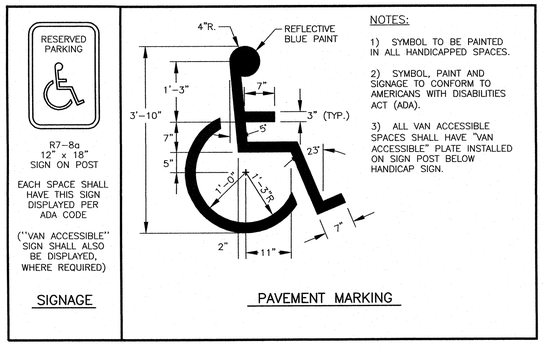
*FIBER: 100% VIRGIN POLYPROPYLENE SUCH AS GRACE MICROFIBER, ASTM C1116, TYPE 111, PAR.4.1.3 OR EQUAL. APPLIED @ 1 LB. PER C.Y.

CROSS SECTION



J / C2 PORTLAND CEMENT CONCRETE SIDEWALK (WITH VERTICAL GRANITE CURB)

NTS

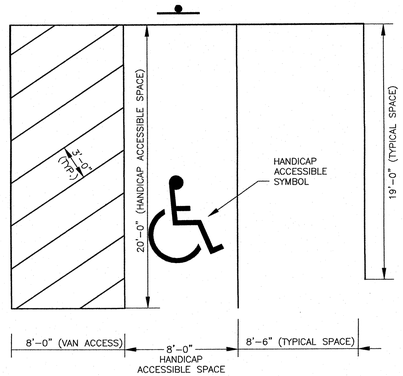


NOTES:

1) SYMBOL TO BE PAINTED IN ALL HANDICAPPED SPACES.

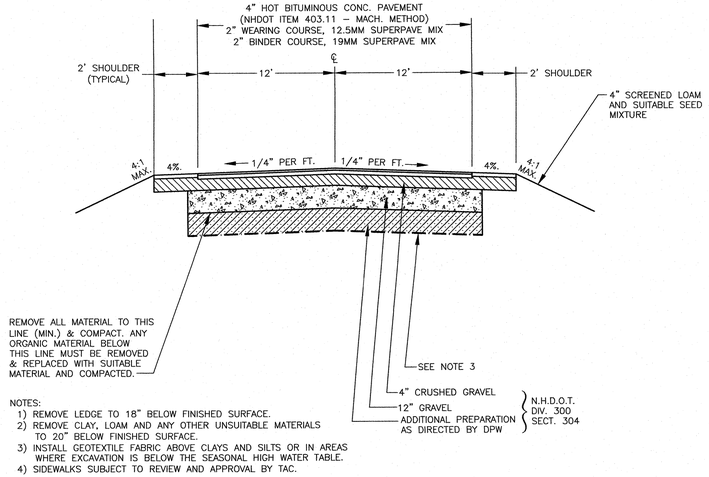
2) SYMBOL, PAINT AND SIGNAGE TO CONFORM TO AMERICANS WITH DISABILITIES ACT (ADA).

3) ALL VAN ACCESSIBLE SPACES SHALL HAVE "VAN ACCESSIBLE" PLATE INSTALLED ON SIGN POST BELOW HANDICAP SIGN.



K / C2 HANDICAP STALL & HANDICAP SYMBOL

NTS



NOTES:
1) REMOVE LEDGE TO 18" BELOW FINISHED SURFACE.
2) REMOVE CLAY, LOAM AND ANY OTHER UNSUITABLE MATERIALS TO 20" BELOW FINISHED SURFACE.
3) INSTALL GEOTEXTILE FABRIC ABOVE CLAYS AND SILTS OR IN AREAS WHERE EXCAVATION IS BELOW THE SEASONAL HIGH WATER TABLE.
4) SIDEWALKS SUBJECT TO REVIEW AND APPROVAL BY TAC.

L / C2 TYPICAL DRIVEWAY SECTION

NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

NOTES:

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MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

REVISIONS

SCALE AS NOTED — MAY 2018

DETAILS — D2

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\236OD01.dwg, D2 DETAILS

HORIZONTAL ANCHOR DIMENSIONS FOR PIPE INSTALLATION IN ROCK

UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	TEE OR TAP SLEEVE		90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND	
	H	L	H	L	H	L	H	L	H	L
* 4"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
6"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
8"	1'-2"	1'-2"	1'-2"	1'-2"	1'-0"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
10"	1'-4"	1'-4"	1'-4"	1'-4"	1'-0"	1'-0"	0'-9"	1'-0"	0'-9"	1'-0"
12"	1'-8"	1'-8"	1'-8"	1'-8"	1'-3"	1'-3"	1'-0"	1'-0"	0'-9"	1'-0"

* – FOR 3" AND SMALLER PIPES

HORIZONTAL ANCHOR DIMENSIONS FOR AVERAGE SOIL CONDITIONS

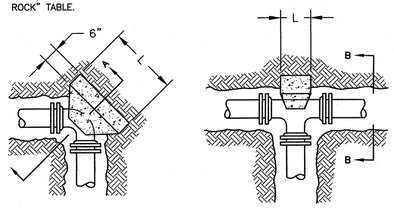
UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	TEE OR TAP SLEEVE		90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND	
	H	L	H	L	H	L	H	L	H	L
* 4"	1'-0"	2'-0"	1'-0"	2'-0"	1'-0"	1'-4"	0'-9"	1'-0"	0'-6"	1'-0"
6"	1'-0"	2'-0"	1'-0"	2'-0"	1'-0"	1'-4"	0'-9"	1'-0"	0'-6"	1'-0"
8"	1'-4"	2'-8"	1'-4"	2'-8"	1'-4"	1'-6"	1'-0"	1'-0"	0'-9"	1'-0"
10"	1'-8"	3'-4"	1'-8"	3'-4"	1'-8"	2'-0"	1'-3"	1'-3"	1'-0"	1'-0"
12"	2'-0"	4'-0"	2'-0"	4'-0"	2'-0"	2'-2"	1'-6"	1'-6"	1'-3"	1'-3"

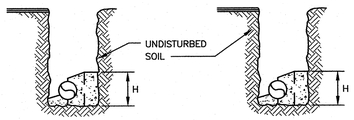
* – FOR 3" AND SMALLER PIPES

NOTES:
1) TABLES ARE BASED ON AN ALLOWABLE SOIL PRESSURE OF 3000 PSF ON UNDISTURBED EARTH BEHIND THE ANCHOR BLOCK. WHERE SOIL HAS BEEN DISTURBED BY ADJACENT EXCAVATIONS OR WHERE SOIL CANNOT WITHSTAND SUCH A PRESSURE, THE TABLE DOES NOT APPLY.

2) WHERE ENTIRE DEPTH OF PIPE IS BELOW THE TOP SURFACE OF SOUND ROCK, USE "HORIZONTAL ANCHOR DIMENSIONS FOR PIPE INSTALLATION IN ROCK" TABLE.



PLAN PLAN



SECTION A–A SECTION B–B

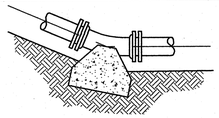
ALL HORIZONTAL BENDS TEE OR TAPPING SLEEVE

HORIZONTAL ANCHORING

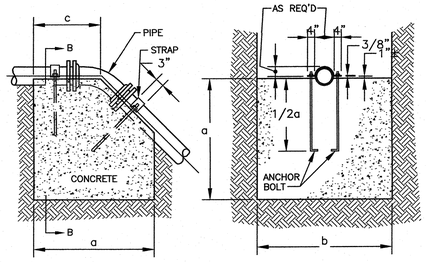
VERTICAL ANCHOR DIMENSIONS

UP TO 150 P.S.I. WORKING PRESSURE

PIPE SIZE	45° BEND				22 1/2° BEND				11 1/4° BEND			
	DIMENSION			ROD DIA.	DIMENSION			ROD DIA.	DIMENSION			ROD DIA.
	a	b	c		a	b	c		a	b	c	
4"	3'-0"	3'-0"	2'-0"	3/4"	2'-6"	2'-3"	1'-6"	3/4"	2'-0"	2'-0"	1'-6"	3/4"
6"	3'-0"	3'-0"	2'-0"	3/4"	2'-6"	2'-3"	1'-6"	3/4"	2'-0"	2'-0"	1'-6"	3/4"
8"	3'-6"	3'-6"	2'-6"	3/4"	3'-0"	3'-0"	1'-9"	3/4"	2'-6"	2'-6"	1'-3"	3/4"
10"	4'-3"	4'-0"	3'-0"	3/4"	3'-6"	3'-3"	2'-0"	3/4"	2'-9"	2'-9"	1'-6"	3/4"
12"	4'-9"	4'-6"	3'-3"	3/4"	4'-0"	3'-9"	2'-6"	3/4"	3'-3"	3'-3"	1'-9"	3/4"



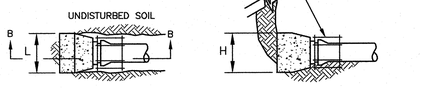
USE SAME DIMENSIONS AS FOR HORIZONTAL BEND ANCHORS



ELEVATION SECTION E–E

VERTICAL BEND

ALL EXPOSED PORTIONS OF ANCHOR STRAPS TO RECEIVE TWO FIELD COATS (MIN.) OF BITUMASTIC MATERIAL



PLAN

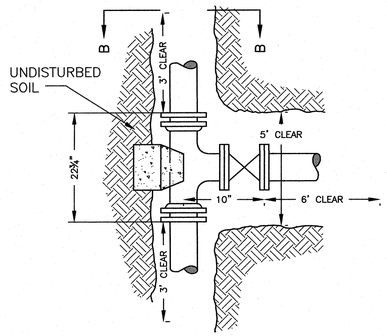
SECTION C–C

RESTRAINED PLUG OR CAP

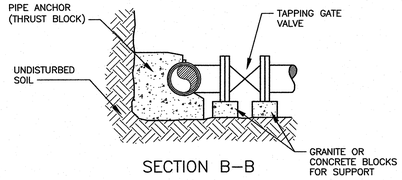
NOTE: SEE CHART "HORIZONTAL ANCHOR DIMENSIONS" TIE RODS TO BE PROVIDED IN LIEU OF THRUST BLOCK

VERTICAL ANCHORING

M C3 PRESSURE PIPE ANCHORING DETAILS
INSTALL PER PORTSMOUTH REQUIREMENTS NTS



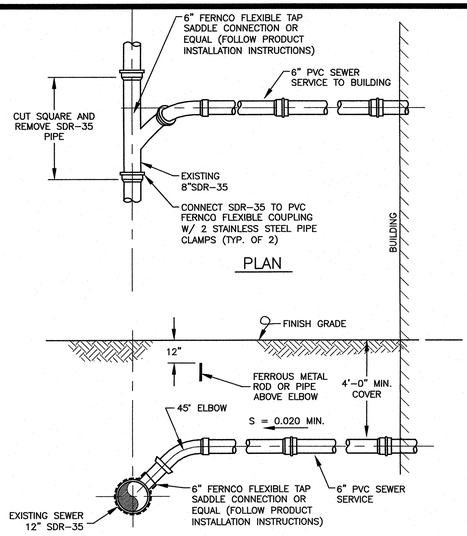
PLAN



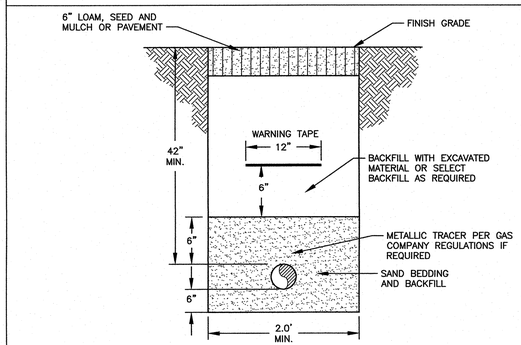
SECTION B–B

NOTES:
1) ALL MATERIALS SHALL BE APPROVED BY THE PORTSMOUTH WATER DEPARTMENT PRIOR TO INSTALLATION AND USE.
2) ALL JOINTS SHALL BE MECHANICAL.
3) "CLEAR" DIMENSIONS SHOWN ATE REQUIRED FOR WORKSPACE. NO JOINTS ON PIPE BEING TAPPED WITHIN "CLEAR" AREA.
4) FORD TYPE STAINLESS STEEL TAPPING SADDLES OR APPROVED EQUAL ARE ALSO ACCEPTABLE.

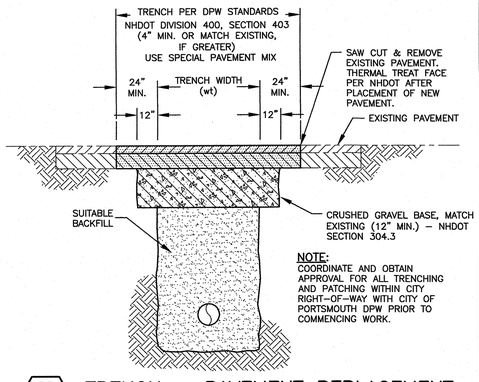
O C3 TAPPING SLEEVE AND GATE
INSTALL PER PORTSMOUTH REQUIREMENTS NTS



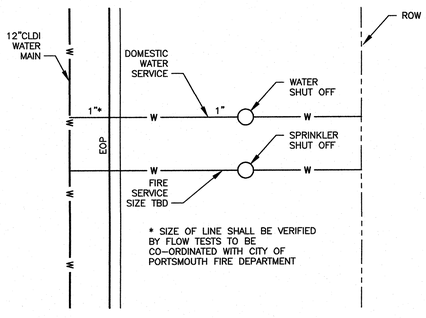
Q C3 TYPE "A" SEWER SERVICE CONNECTION
NTS

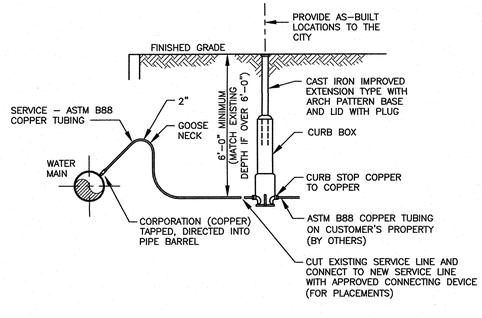


R1 C4 GAS SERVICE TRENCH
NTS

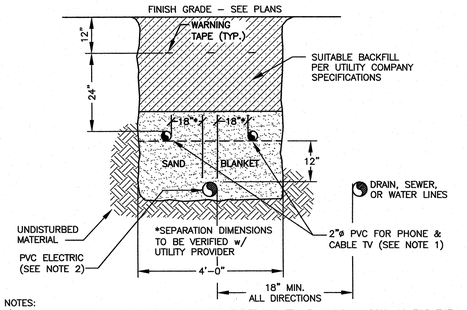


N C3 TRENCH – PAVEMENT REPLACEMENT
NTS





P C3 TYPICAL WATER SERVICE CONNECTION
NTS



NOTES:
1) ALL CONDUIT TO BE U.L. LISTED, SCH. 80 UNDER ALL TRAVEL WAYS, & SCH. 40 FOR THE REMAINDER.
2) NORMAL CONDUIT SIZES FOR PSNH ARE 3 INCH FOR SINGLE PHASE PRIMARY AND SECONDARY VOLTAGE CABLES, 4 INCH FOR THREE PHASE SECONDARY, AND 5 INCH FOR THREE PHASE PRIMARY.
3) ALL WORK TO CONFORM TO THE NATIONAL ELECTRICAL CODE (LATEST REVISION)
4) INSTALL A 200# PULL ROPE FOR EACH CONDUIT
5) VERIFY ALL CONDUIT SPECIFICATIONS WITH UTILITY COMPANIES PRIOR TO ANY CONSTRUCTION.

R2 C3 UTILITY TRENCH
ELECTRIC/PHONE/CABLE NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

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4) ALL WATER LINE INSTALLATION WORK SHALL BE TO CITY OF PORTSMOUTH WATER DEPARTMENT STANDARDS. DETAILS MAY OR MAY NOT BE UP–TO–DATE.

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
0	ISSUED FOR COMMENT	10/15/18

REVISIONS

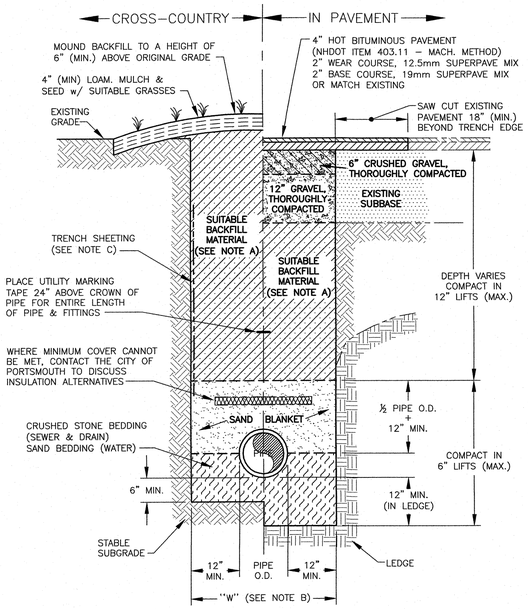
JOHN CHANNON No. 7851 LICENSED PROFESSIONAL ENGINEER STATE OF NEW HAMPSHIRE

SCALE AS NOTED MAY 2018

DETAILS D3

2360

J:\JOBS2\IN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360D01.dwg, D3 DETAILS



S / C4 TYPICAL PIPE TRENCH

NTS

TRENCH NOTES:

A) TRENCH BACKFILL:
– IN PAVED AREAS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIALS DEEMED TO BE UNACCEPTABLE BY THE ENGINEER.

– IN CROSS-COUNTRY CONSTRUCTION, SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK OR PEAT, IF HE IS SATISFIED THAT THE COMPLETED CONSTRUCTION WILL BE ENTIRELY STABLE.

B) "W" = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE O.D..

C) TRENCH SHEETING:
IF REQUIRED. WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAN 1 FOOT ABOVE THE TOP OF THE PIPE.

D) MINIMUM PIPE COVER FOR UTILITY MAINS (UNLESS GOVERNED BY OTHER CODES):
- 6' MINIMUM FOR SEWER (IN PAVEMENT)
- 4' MINIMUM FOR SEWER (CROSS COUNTRY)
- 3' MINIMUM FOR STORMWATER DRAINS
- 5' MINIMUM FOR WATER MAINS

E) ALL PAVEMENT CUTS SHALL BE REPAIRED BY THE INFRARED HEAT METHOD.

SAND SPECIFICATION

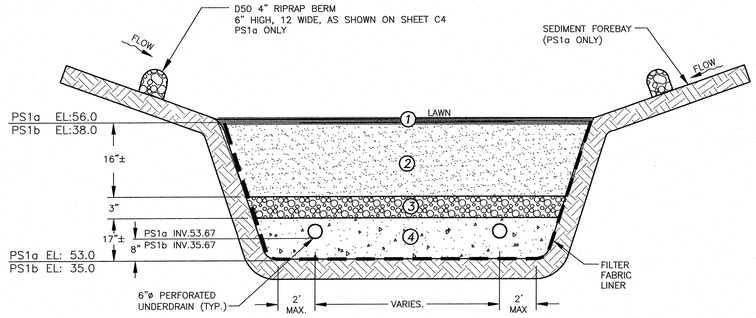
SIEVE SIZE	ASTM C33 FINE AGGREGATE SPECIFICATION
3/8"	100
#4	95–100
#8	80–100
#10	50–85
#16	50–85
#30	25–60
#40	50–85
#50	5–30
#100	0–10

FILTRATION BASIN MEDIA

1. WET MEADOW SEED MIX
2. SOIL FILTER LAYER: 20% – 30% MULCH BY VOLUME, MIXED THOROUGHLY WITH LOAMY, COARSE SAND (70% – 80% BY VOLUME) MEETING THE FOLLOWING GRADATION:

SIEVE NO.	% BY WEIGHT, PASSING
10	85 – 100
20	70 –100
60	15 – 40
200	8 – 15

3. 3/8" PEA STONE
4. 0.75"ø – 1.5"ø CRUSHED STONE, WASHED.



U / C4 UNDERDRAINED FILTRATION BASIN DETAIL

NTS

FILTRATION MAINTENANCE

SOILS: VISUALLY INSPECT AND REPAIR EROSION MONTHLY. USE SMALL STONES TO STABILIZE EROSION ALONG DRAINAGE PATHS. CHECK THE pH ONCE OR TWICE A YEAR. APPLY AN ALKALINE PRODUCT, SUCH AS LIMESTONE, IF NEEDED.

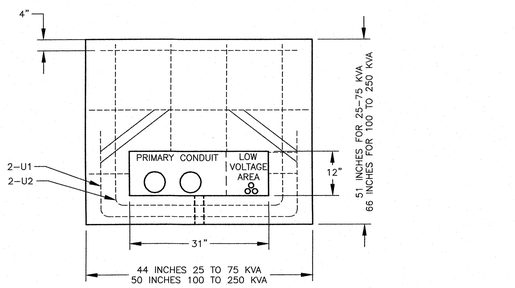
IF FILTRATION BASIN FAILS TO EMPTY 72 AFTER A RAINFALL, THE BASIN SHALL BE INSPECTED. IF AFTER INSPECTION IT IS DETERMINED THAT THE ENGINEERED SOIL HAS CLOGGED, THE ENGINEERED SOIL SHALL BE REPLACED. IN THE EVENT OF SOIL REPLACEMENT IN THE FILTRATION BASIN, AN AIRSPADE SHALL BE USED, TO CAREFULLY REMOVE THE SOILS SURROUNDING THE TREE ROOTS. TREE ROOTS ARE TO BE PROTECTED FROM DRYING OUT DURING THE PLACEMENT OF NEW SOILS AND NEW SOILS ARE TO BE REPLACED IMMEDIATELY UPON EXPOSING THE ROOT SYSTEMS.

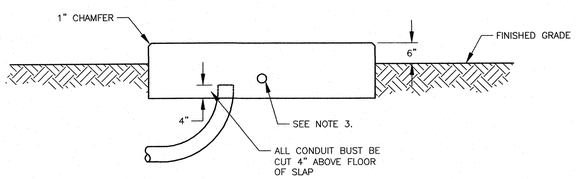
FILTRATION CONSTRUCTION

SOILS: DO NOT COMPACT SOIL. EXCAVATE BASIN, HAND RAKE STONE, PEA STONE AND MULCH LAYERS.

FILTRATION CONSTRUCTION INSPECTION

INSPECT EACH LAYER OF CONSTRUCTION: CONTACT THE PORTSMOUTH DEPARTMENT OF PUBLIC WORKS FOR INSPECTIONS DURING THE CONSTRUCTION PROCESS. CALL FOR INSPECTION BEFORE FILLING EXCAVATION WITH STONE, PEA STONE AND MULCH.



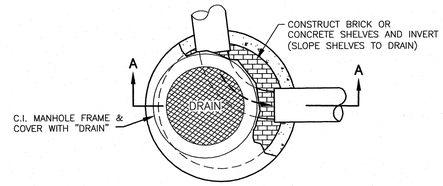


NOTES
1. SEE SHEET "REQUIREMENTS FOR PAD MOUNTED TRANSFORMER SLAB DETAILS", EVERSOURCE SPECIFICATIONS.
2. SEE DTR 56.223 FOR GROUNDING GRID.
3. 1" PVC CONDUIT SLEEVE FOR GROUND GRID LEADS.
4. ALL REBAR TO BE #6.
5. CONDUITS CUT 4" ABOVE SLAB BASE.

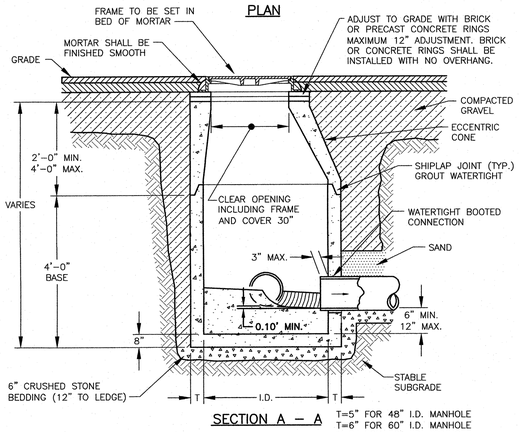
T / C3 TRANSFORMER FOUNDATION SINGLE PHASE

EVERSOURCE

NTS



PLAN



SECTION A – A

T=5" FOR 48" I.D. MANHOLE
T=6" FOR 60" I.D. MANHOLE
T=7" FOR 72" I.D. MANHOLE

NOTES:
1. CONCRETE SHALL BE 4,000 P.S.I. AFTER 28 DAYS.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FOOT IN ALL SECTIONS AND SHALL BE PLACED IN THE CENTER THIRD OF THE WALL.
3. THE TONGUE OR THE GROOVE OF THE JOINT SHALL CONTAIN ONE LINE OF CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ. IN. PER LINEAR FOOT.
4. EACH CASTING TO HAVE LIFTING HOLES CAST IN.
5. ALL MANHOLES SHALL BE 48" I.D. UNLESS SPECIFIED OTHERWISE ON THE PLANS.
6. MANHOLE SHALL BE DESIGNED AND CONSTRUCTED TO WITHSTAND H–20 LOADING.

V / C4 DRAIN MANHOLE DETAIL

NTS

W / -- RESERVED

NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road – Unit 3
Portsmouth, N.H. 03801–7114
Tel (603) 430–9282
Fax (603) 436–2315

NOTES:

1) UNDERGROUND UTILITY LOCATIONS ARE BASED UPON BEST AVAILABLE EVIDENCE AND ARE NOT FIELD VERIFIED. LOCATING AND PROTECTING ANY ABOVEGROUND OR UNDERGROUND UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND/OR THE OWNER. UTILITY CONFLICTS SHOULD BE REPORTED AT ONCE TO THE DESIGN ENGINEER.

2) THE CONTRACTOR SHALL NOTIFY DIG SAFE AT 1–888–DIG–SAFE (1–888–344–7233) AT LEAST 72 HOURS PRIOR TO COMMENCING ANY EXCAVATION ON PUBLIC OR PRIVATE PROPERTY.

3) CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION CONTROL MEASURES IN ACCORDANCE WITH THE "NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION. (NHDES DECEMBER 2008).

MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED FOR APPROVAL	10/15/18
0	ISSUED FOR COMMENT	5/8/18

REVISIONS

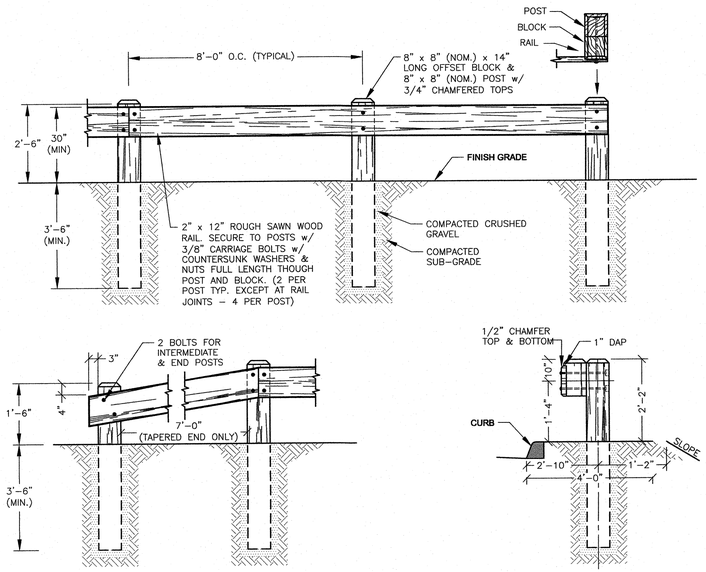
STATE OF NEW HAMPSHIRE · JOHN R. CHAGNON No. 7951 LICENSED PROFESSIONAL ENGINEER

AS NOTED — MAY 2018

DETAILS — **D4**

2360

J:\J0852\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360DT01.dwg, D4 DETAILS



TAPERED END SECTION

GUARD RAIL BEHIND CURB

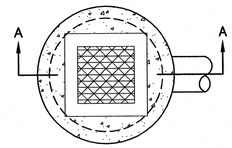
NOTE:
1) ALL METAL COMPONENTS SHALL BE HOT DIPPED GALVANIZED AND ALL WOOD SHALL BE PRESSURE TREATED.
2) TYPE OF MATERIALS AND METHOD OF INSTALLATION SHALL BE IN ACCORDANCE WITH N.H.D.O.T. STANDARD SPECIFICATIONS.

X / C2 WOOD BEAM GUARD RAIL DETAIL

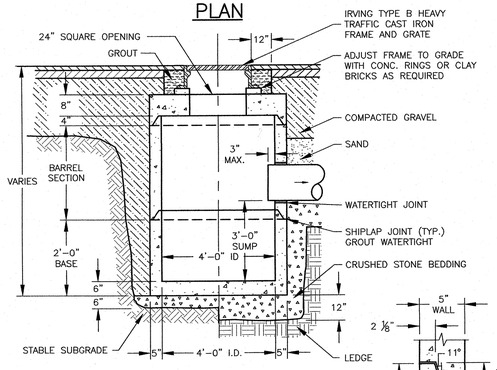
NTS

Z / C2 LOCATION SIGN DETAIL

NTS



PLAN



SECTION A - A

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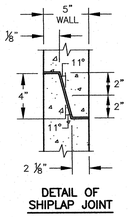
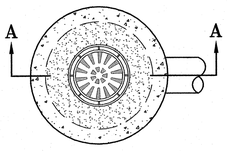


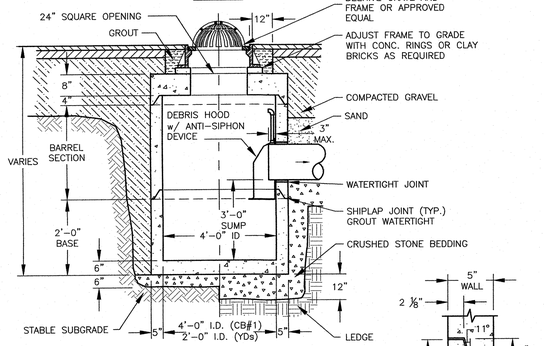
DETAIL OF SHIPLAP JOINT

AA / C4 CATCH BASIN

NTS



PLAN



SECTION A - A

NOTES:
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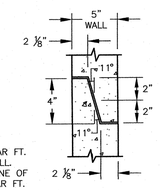
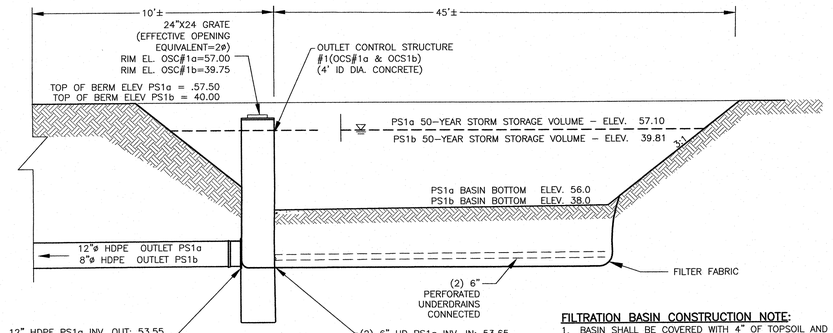


DETAIL OF SHIPLAP JOINT

Y / C4 CATCH BASIN w/ BEEHIVE GRATE

NTS



FILTRATION BASIN CONSTRUCTION NOTE:
1. BASIN SHALL BE COVERED WITH 4" OF TOPSOIL AND APPLY SEED, MULCH, FERTILIZER, AND LIME PER DETAILS OR SPECIFICATIONS. AFTER SITE IS STABILIZED, REMOVE ANY ERODED SOIL AND SEED BASIN BOTTOM.
2. DO NOT DISCHARGE SEDIMENT-LADEN WATER FROM CONSTRUCTION ACTIVITIES (RUNOFF, DEWATERING) TO FILTRATION BASIN UNTIL FACILITY AND CONTRIBUTING AREA IS STABILIZED.
3. DO NOT SUBJECT EXPOSED SOIL SURFACE TO CONSTRUCTION EQUIPMENT. TO THE GREATEST EXTENT FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE BASIN.
4. AFTER THE BASIN IS EXCAVATED TO THE FINISHED GRADE, THE BOTTOM OF THE FILTRATION BASIN SHOULD BE DEEPLY TILLED WITH A ROTARY TILLER OR DISC HARROW, FOLLOWED BY A PASS WITH A LEVELING DRAG.
5. FOR ANY FILL REQUIRED FOR BASIN CONSTRUCTION, USE CLEAN, WASHED, WELL-SORTED AGGREGATE.

STRUCTURE NOTES:
1. CONCRETE SHALL BE 4,000 P.S.I. AFTER 28 DAYS.
2. CIRCUMFERENTIAL REINFORCEMENT SHALL BE 0.12 SQ. IN. PER LINEAR FT. IN ALL SECTIONS & SHALL BE PLACED IN THE CENTER THIRD OF WALL.
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4. EACH CASTING TO HAVE LIFTING HOLES CAST IN.

BB / C4 UNDERDRAINED FILTRATION BASIN DETAIL (GRADING & OUTLET)

PROFILE VIEW

NTS

AMBIT ENGINEERING, INC.
Civil Engineers & Land Surveyors
200 Griffin Road - Unit 3
Portsmouth, N.H. 03801-7114
Tel (603) 430-9282
Fax (603) 436-2315

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MAPLE MASJID OF PORTSMOUTH 686 MAPLEWOOD AVENUE PORTSMOUTH, N.H.

NO.	DESCRIPTION	DATE
1	ISSUED FOR COMMENTS	10/15/18

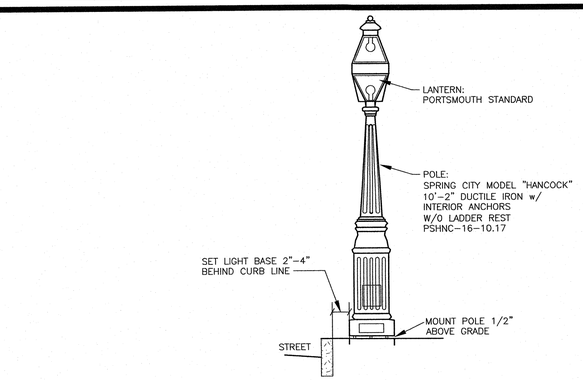
REVISIONS

AS NOTED — MAY 2018

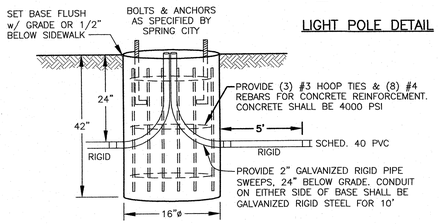
DETAILS — D5

2360

J:\JOBS2\JN2300s\JN 2360\2017 Site Plan\Plans & Specs\Site\2360DT01.dwg, D5 DETAILS



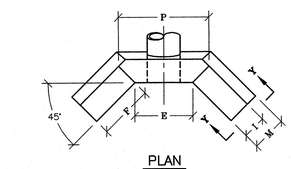
LIGHT POLE DETAIL



LIGHT POLE BASE DETAIL

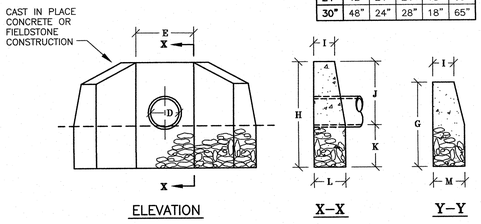
NOTES:
1. ELECTRICAL INSTALLATION SHALL BE BY A LICENSED ELECTRICIAN.
2. LIGHTS SHALL BE WIRED IN ACCORDANCE WITH NEC AND CITY OR PORTSMOUTH ORDINANCES
3. AN ELECTRICAL PERMIT IS REQUIRED FOR ALL CONDUIT AND ELECTRICAL WORK.

CC C2 LIGHT POLE & BASE DETAILS
NTS

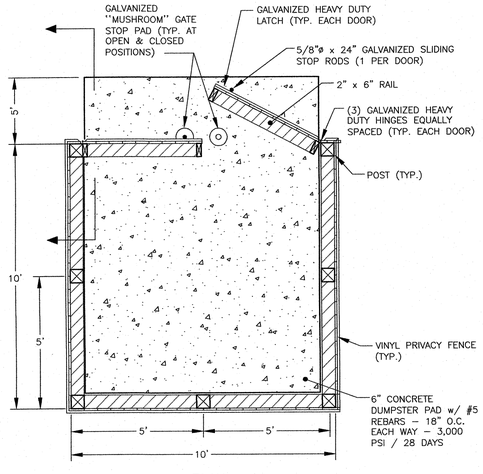


D	E	F	G	H	I
12"	30"	28"	48"	60"	12"
15"	33"	32"	48"	60"	12"
18"	36"	36"	48"	60"	12"
24"	42"	44"	48"	66"	12"
30"	48"	52"	48"	72"	12"

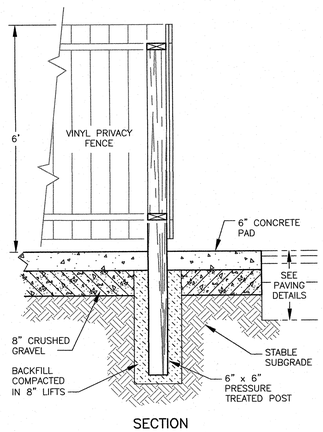
D	J	K	L	M	P
12"	36"	24"	16"	18"	47"
15"	36"	24"	18"	18"	50"
18"	36"	24"	20"	18"	53"
24"	42"	24"	24"	18"	60"
30"	48"	24"	28"	18"	65"



EE C4 HEADWALL DETAIL
NTS



PLAN



SECTION

NOTES:
1) FENCING SHALL BE VINYL PRIVACY FENCE
2) ALL METAL FITTINGS AND FASTENERS SHALL BE HOT DIP GALVANIZED.
3) ALTERNATE DESIGNS & MATERIALS MAY BE USED IF CONSTRUCTION DRAWINGS ARE PROVIDED TO, AND APPROVED BY, THE BUILDING INSPECTOR.

DD C2 DUMPSTER ENCLOSURE DETAILS
NTS

INSPECTION AND MAINTENANCE PLAN
FOR
MAPLE MAJID SITE REDEVELOPMENT
686 MAPLEWOOD AVENUE, PORTSMOUTH NH

INTRODUCTION
THE INTENT OF THIS IS TO PROVIDE MAPLE MAJID AND THE ISLAMIC SOCIETY OF THE SEACOAST AREA WITH A LIST OF PROCEDURES THAT DOCUMENT THE INSPECTION AND MAINTENANCE REQUIREMENTS OF THE STORMWATER MANAGEMENT SYSTEM FOR THIS DEVELOPMENT. SPECIFICALLY, THE FILTRATION BASINS AND ASSOCIATED STRUCTURES ON THE PROJECT SITE (COLLECTIVELY REFERRED TO THE "STORMWATER MANAGEMENT SYSTEM")

THE FOLLOWING INSPECTION AND MAINTENANCE PROGRAM IS NECESSARY TO KEEP THE STORMWATER MANAGEMENT SYSTEM FUNCTIONING PROPERLY. THESE MEASURES WILL ALSO HELP MINIMIZE POTENTIAL ENVIRONMENTAL IMPACTS. BY FOLLOWING THE ENCLOSED PROCEDURES, THE OWNER WILL BE ABLE TO MAINTAIN THE FUNCTIONAL DESIGN OF THE STORMWATER MANAGEMENT SYSTEM AND MAXIMIZED ITS ABILITY TO REMOVE SEDIMENT AND OTHER CONTAMINANTS FROM THE SITE GENERATED STORMWATER RUNOFF.

ANNUAL REPORT
THE OWNER SHALL PREPARE AN ANNUAL INSPECTION & MAINTENANCE REPORT. THE REPORT SHALL INCLUDE A SUMMER OF THE SYSTEMS MAINTENANCE AND REPAIR BY TRANSMISSION OF THE INSPECTION & MAINTENANCE LOG AND OTHER INFORMATION AS REQUIRED. A COPY OF THE REPORT SHALL BE DELIVERED ANNUALLY TO THE CITY OF PORTSMOUTH BUILDING INSPECTOR.

STORMWATER MANAGEMENT SYSTEM COMPONENTS

THE STORMWATER MANAGEMENT SYSTEM IS DESIGNED TO MITIGATE BOTH THE QUANTITY AND QUALITY OF SITE-GENERATED RUNOFF. AS THE RESULT, THE DESIGN INCLUDES THE FOLLOWING ELEMENTS:

NON-STRUCTUAL BMP'S
NON-STRUCTURAL BEST MANAGEMENT PRACTICES (BMP'S) INCLUDE TEMPORARY AND PERMANENT MEASURES THAT TYPICALLY REQUIRE LESS LABOR AND CAPITAL INPUTS AND ARE INTENDED TO PROVIDE PROTECTION AGAINST EROSION OF SOILS. EXAMPLES OF NON-STRUCTURAL BMP'S ON THIS PROJECT INCLUDE BUT ARE NOT LIMITED TO: TEMPORARY AND PERMANENT MULCHING, TEMPORARY AND PERMANENT GRASS COVER, TREES, SHRUBS AND GROUND OVERS, MISCELLANEOUS LANDSCAPE PLANTINGS, DUST CONTROL, TREE PROTECTION, TOPSOILING, SEDIMENT BARRIERS, AND DURING CONSTRUCTION, A STABILIZED CONSTRUCTION ENTRANCE.

STRUCTURAL BMP'S
STRUCTURAL BMP'S REQUIRE MORE SPECIALIZED PERSONNEL TO INSTALL. EXAMPLES ON THE PROJECT INCLUDE BUT ARE NOT LIMITED TO: STORM DRAINS, THE DETENTION POND, AND ASSOCIATED OUTLET CONTROL STRUCTURES, AND INFILTRATION TRENCH DETAIL.

INSPECTION AND MAINTENANCE REQUIREMENTS
THE FOLLOWING SUMMARIZES THE INSPECTION AND MAINTENANCE REQUIREMENTS FOR THE VARIOUS BMP'S THAT MAY BE FOUND ON THIS PROJECT:

1. **GRASSED AREAS:** AFTER EACH RAIN EVEN OF 0.5" OR MORE DURING A 24 HOUR PERIOD, INSPECT GRASSED AREAS FOR SIGNS OF DISTURBANCE, SUCH AS EROSION. IF DAMAGED AREAS ARE DISCOVERED, IMMEDIATELY REPAIR THE DAMAGE. REPAIRS MAY INCLUDE ADDING NEW TOPSOIL, LIME, SEED, FERTILIZER AND MULCH.
2. **PLANTINGS:** PLANTING AND LANDSCAPING (TREES, SHRUBS) SHALL BE MONITORED BI-MONTHLY DURING THE FIRST YEAR TO INSURE VIABILITY AND VIGOROUS GROWTH. REPLACE DEAD OR DYING VEGETATION WITH NEW STOCK AND MAKE ADJUSTMENTS TO THE CONDITIONS THAT CAUSED THE DEAD OR DYING VEGETATION. DURING DRYER TIMES OF THE YEAR, PROVIDED WEEKLY WATERING OR IRRIGATION DURING THE ESTABLISHMENT PERIOD OF THE FIRST YEAR. MAKE NECESSARY ADJUSTMENTS TO ENSURE LONG-TERM HEALTH OF VEGETATED COVER, I.E. PROVIDE MORE PERMANENT MULCH OR COMPOST OR OTHER MEANS OF PROTECTION.
3. **FILTRATION BASIN:** AFTER ACCEPTANCE OF THE FILTRATION BASIN, PERFORM THE FOLLOWING INSPECTIONS ON A SEMI-ANNUAL BASIS OR AFTER SIGNIFICANT RAINFALL EVENTS (10 YEAR, 24 HR STORMS, OR BACK TO BACK 2 YEAR, 24 HOUR STORMS):
   a. MONITOR FOR EXCESSIVE OR CONCENTRATED ACCUMULATIONS OF DEBRIS, OR EXCESSIVE EROSION. REMOVE DEBRIS AS REQUIRED.
   b. MONITOR THE OUTFALL STRUCTURE FOR PROBLEMS WITH CLOGGED PIPES. REPAIR OR REMOVE CLOGS AS REQUIRED, AND DETERMINE CAUSE OF CLOGGING. PIPES SHOULD BE INSPECTED ANNUALLY AND AFTER EVERY MAJOR RAINSTORM. BROKEN OR DAMAGE PIPES SHOULD BE REPAIRED OR REPLACED AS NECESSARY.
   c. MONITOR SIDE SLOPES OF POND FOR DAMAGES OR EROSION – REPAIR AS NECESSARY.
   d. MONITOR TURF HEALTH AND KEEP PROTECTED FROM FIRE, GRAZING, TRAFFIC AND DENSE WEED GROWTH. LIME AND FERTILIZER SHOULD BE APPLIED AS NECESSARY TO PROMOTE GOOD GROWTH AS DETERMINED BY SOIL TESTS. MOWING THE VEGETATED AREAS OF THE BASIN SHOULD BE CARRIED OUT AS NECESSARY.
   e. SEDIMENT ACCUMULATION SHOULD BE CONTINUALLY CHECKED IN THE BASIN. SEDIMENT SHOULD BE REMOVED AS IT IS DISCOVERED PARTICULARLY IF IT HAS ACCUMULATED NEAR THE OUTLET OF THE BASIN.
   f. THE OUTLET CONTROL STRUCTURE SHOULD BE INSPECTED ANNUALLY AND AFTER EVERY MAJOR RAINSTORM. THE OUTLET CONTROL STRUCTURE HAS WITHIN IT A WIER STRUCTURE WITH VARIOUS SIZE ORIFICES FOR CONTROLLING FLOW OUT OF BASIN. THESE ORIFICES SHOULD BE KEPT CLEAR AND UNCLOGGED. ANY SEDIMENT OR DEBRIS THAT HS BUILT UP INSIDE THE OUTLET CONTROL STRUCTURE SHOULD BE REMOVED WHEN DISCOVERED.

INVASIVE SPECIES
MONITOR STORMWATER MANAGEMENT SYSTEM FOR SIGNS OF INVASIVE SPECIES GROWTH. IF CAUGHT EARLIER ENOUGH, THEIR ERADICATION IS MUCH EASIER. THE MOST LIKELY PLACES WHERE INVASIONS START ARE IN WETTER, DISTURBED SOILS OR DETENTION PONDS. SPECIES SUCH AS PHRAGMITES AND PURPLE LOOSE-STRIFE ARE COMMON INVADERS IN THESE WETTER AREAS. IF THEY ARE FOUND THEN THE OWNER SHALL CONTACT A WETLAND SCIENTIST WITH EXPERIENCE IN INVASIVE SPEIES CONTROL TO IMPLEMENT A PLAN OF ACTION TO ERADICATE THE INVADERS. MEASURES THAT DO NOT REQUIRE THE APPLICATION OF CHEMICAL HERBICIDES SHOULD BE THE FIRST LINE OF DEFENSE.

AMBIT ENGINEERING, INC.
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MAPLE MASJID OF PORTSMOUTH
686 MAPLEWOOD AVENUE
PORTSMOUTH, N.H.

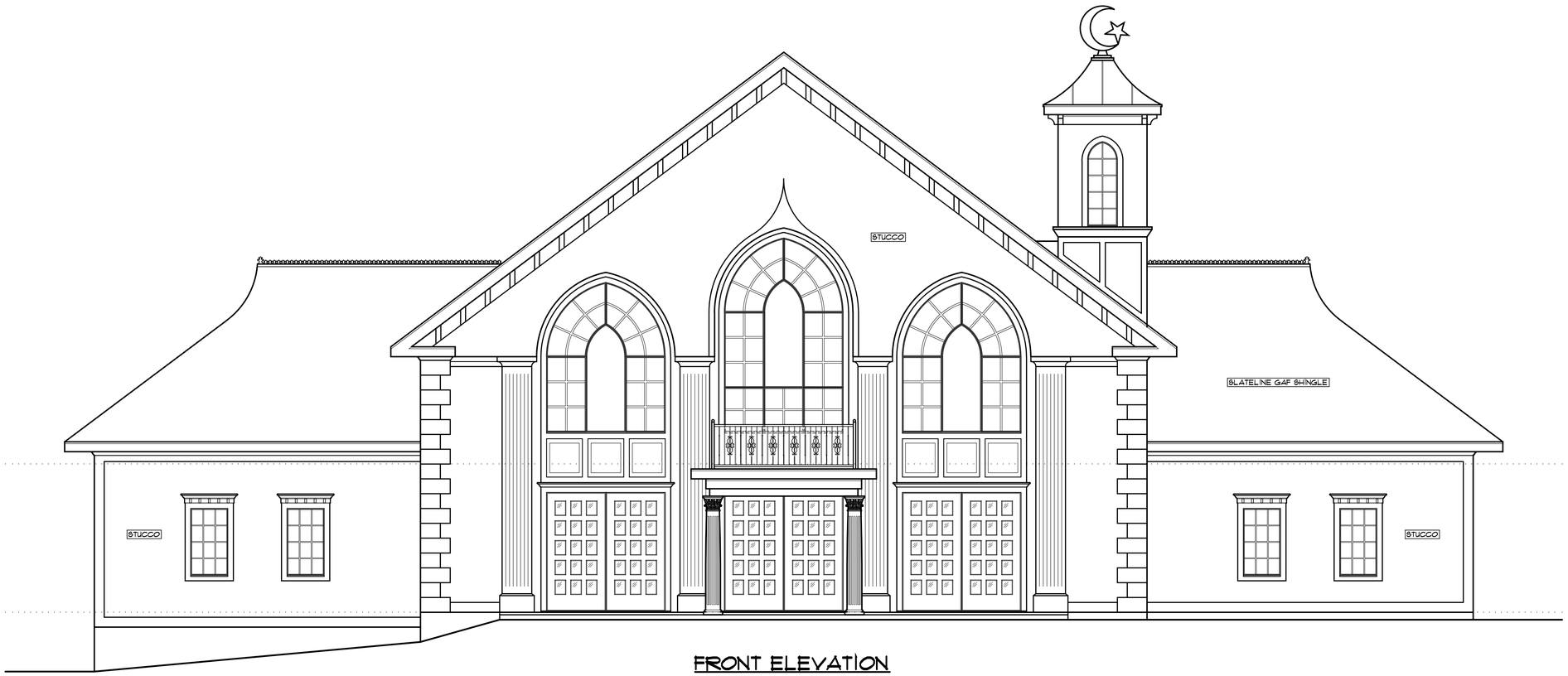
NO.	DESCRIPTION	DATE
1	ISSUED FOR COMMENT	10/15/18

REVISIONS

AS NOTED | MAY 2018

DETAILS | D6

2360



FRONT ELEVATION

¼"=1'-0"

PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Phone: 603-964-5180
Fax: 603-964-2008
Living Spaces, Inc.
Email: livingspacesllc@comcast.net
1247 Washington Road Rye NH 03870

DATE: 9-4-18

REVISED:

DWG. NO. 1

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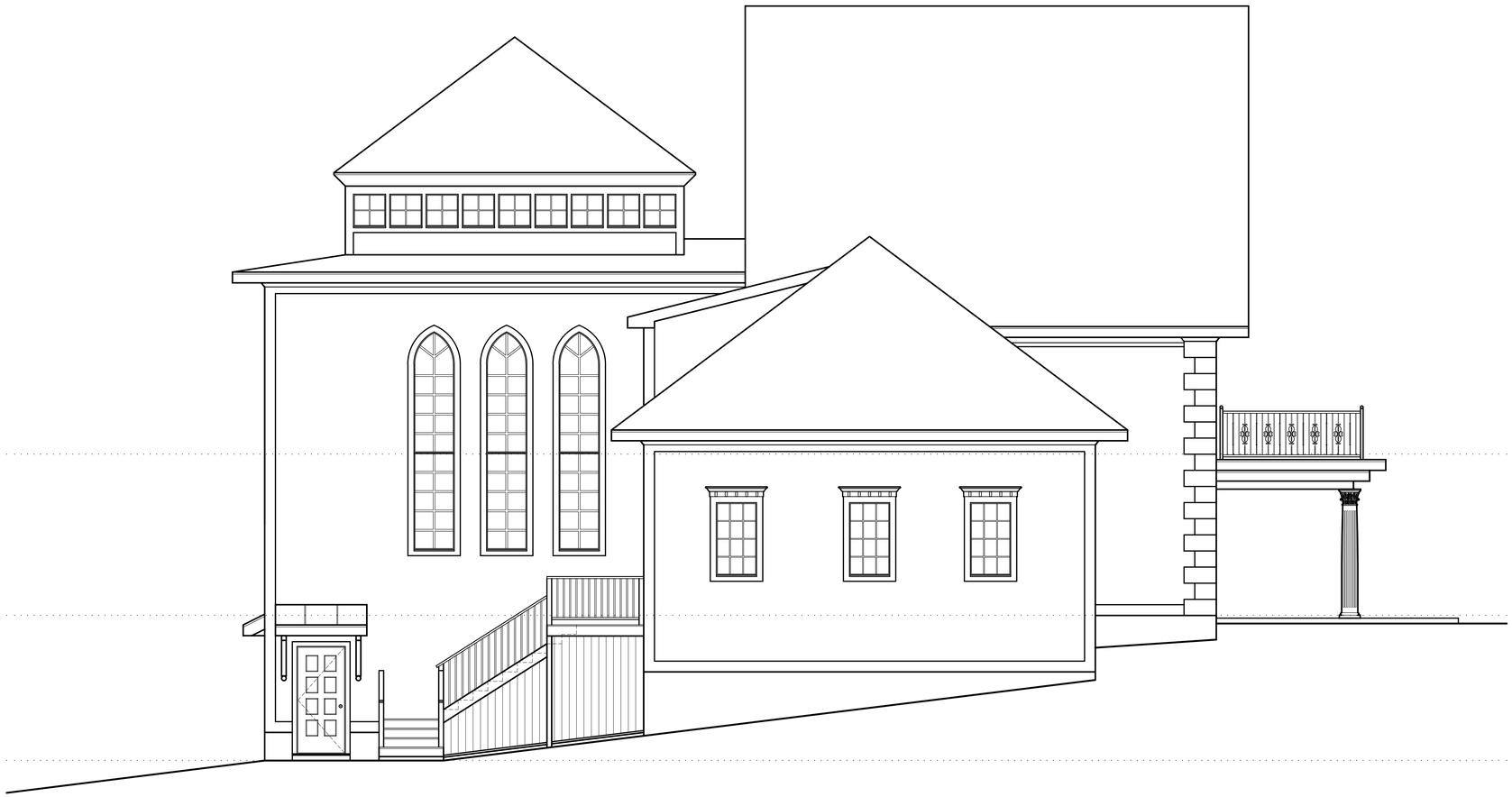


LEFT ELEVATION

¼"=1'-0"

PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Phone: 603-964-5180
Fax: 603-964-2008
Living Spaces, Inc.
Email: livingspacesllc@comcast.net
1247 Washington Road
Rye NH 03870

DATE: 9-4-18

REVISED:

DWG NO. 2

C:\LSI\2018\Mosque80

REAR ELEVATION

¼"=1'-0"

C:\LSI\2018\Masque60

PROJECT:

Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Phone: 603-964-5180
Fax: 603-964-2008

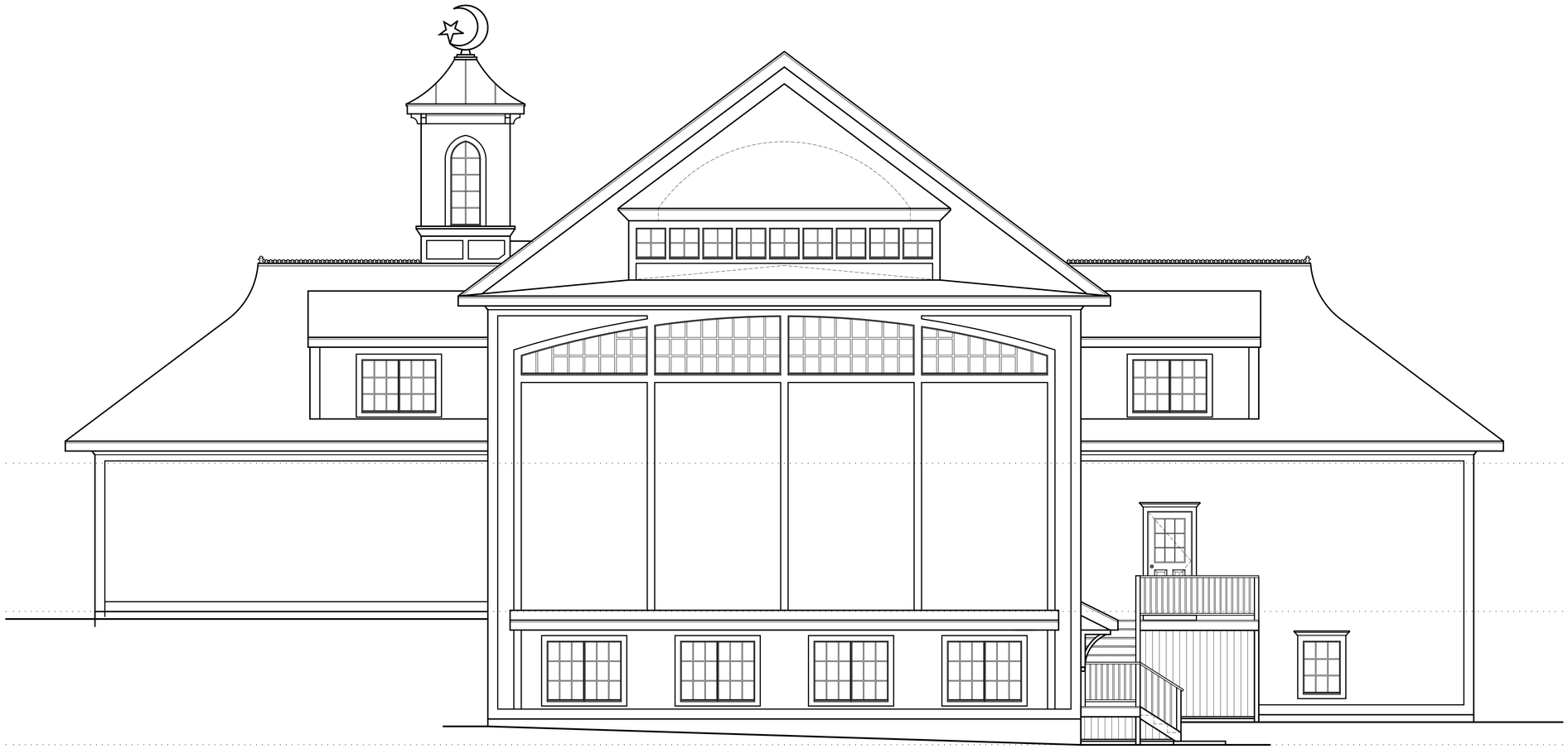
Living Spaces, Inc.

Email: livingspacesllc@comcast.net
1247 Washington Road Rye NH 03870

DATE: 9-4-18

REVISED:

DWG NO: 3



REAR ELEVATION

1/4"=1'-0"

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PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Phone: 603-964-5180
Fax: 603-964-2008
Living Spaces, Inc.
Email: livingspacesllc@comcast.net
1247 Washington Road Rye NH 03870

DATE: 9-4-18

REVISED:

DWG. NO. 4

93'
26'-6"
40'
26'-6"
55'
23'-6"
28'
7'-6"
MIHRAB
PRAYER HALL-1
39'-Ø" x 30'-Ø"
DECK
12'-Ø" x 6'-Ø"
HALL
MEN'S RM.
CL.
CL.
OFFICE
10'-Ø" x 16'-3"
BOOKS
SEAT
DN
PRAYER HALL-2
39'-Ø" x 16'-Ø"
UP
SHOE RACK
SHOE RACK
FOYER
48'-Ø" x 10'-Ø"
ELEV.
PORCH
10'-Ø" x 8'-6"
SAHN
PRAYER AREA
UTILITY
CL.
UP
CL.
WOMEN'S RM.
OVENS
REF.
KITCHENETTE
FUNCTION RM.
21'-6" x 14'-Ø"
SEAT
PATIO
22'-Ø" x 11'-Ø"
RAMP
22'
49'
22'
93'

FIRST FLOOR PLAN

1/4" = 1'-Ø"

TOTAL FINISHED S.F.
FIRST FLOOR = 3,878 S.F.
SECOND FLOOR = 1,455 S.F.
5,333 S.F.

PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Living Spaces, Inc.
Phone: 603-964-5180
Fax: 603-964-2008
Email: livingspacesllc@comcast.net
1247 Washington Road
Rye NH 03870

DATE: 9-4-18
REVISED:
DWG.NO. 5

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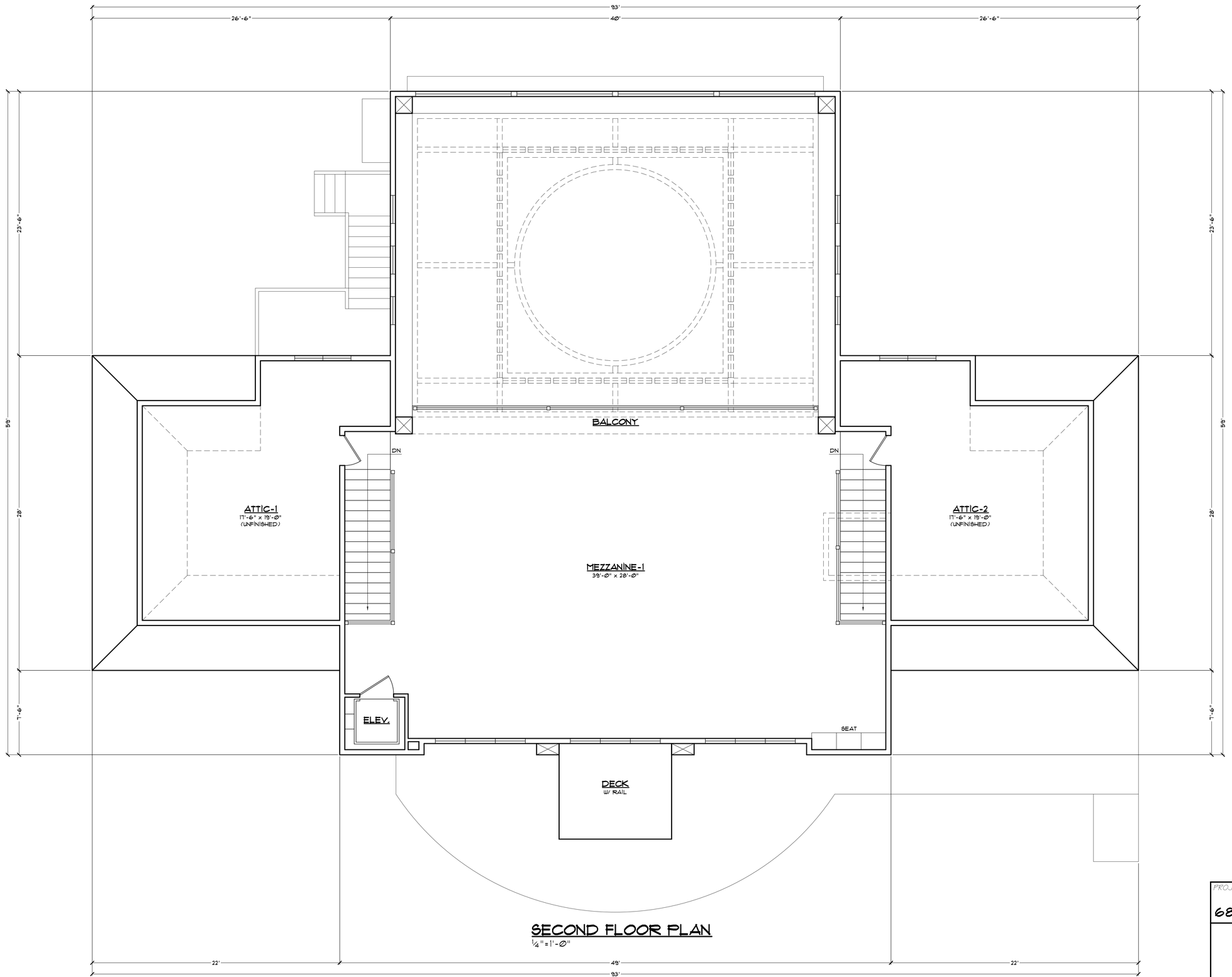

SECOND FLOOR PLAN

1/4" = 1'-0"

PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Living Spaces, Inc.
Phone: 603-964-5180
Fax: 603-964-2008
Email: livingspacesllc@comcast.net
1247 Washington Road
Rye NH 03870

DATE: 9-4-18

REVISED:

DWG.NO. 6

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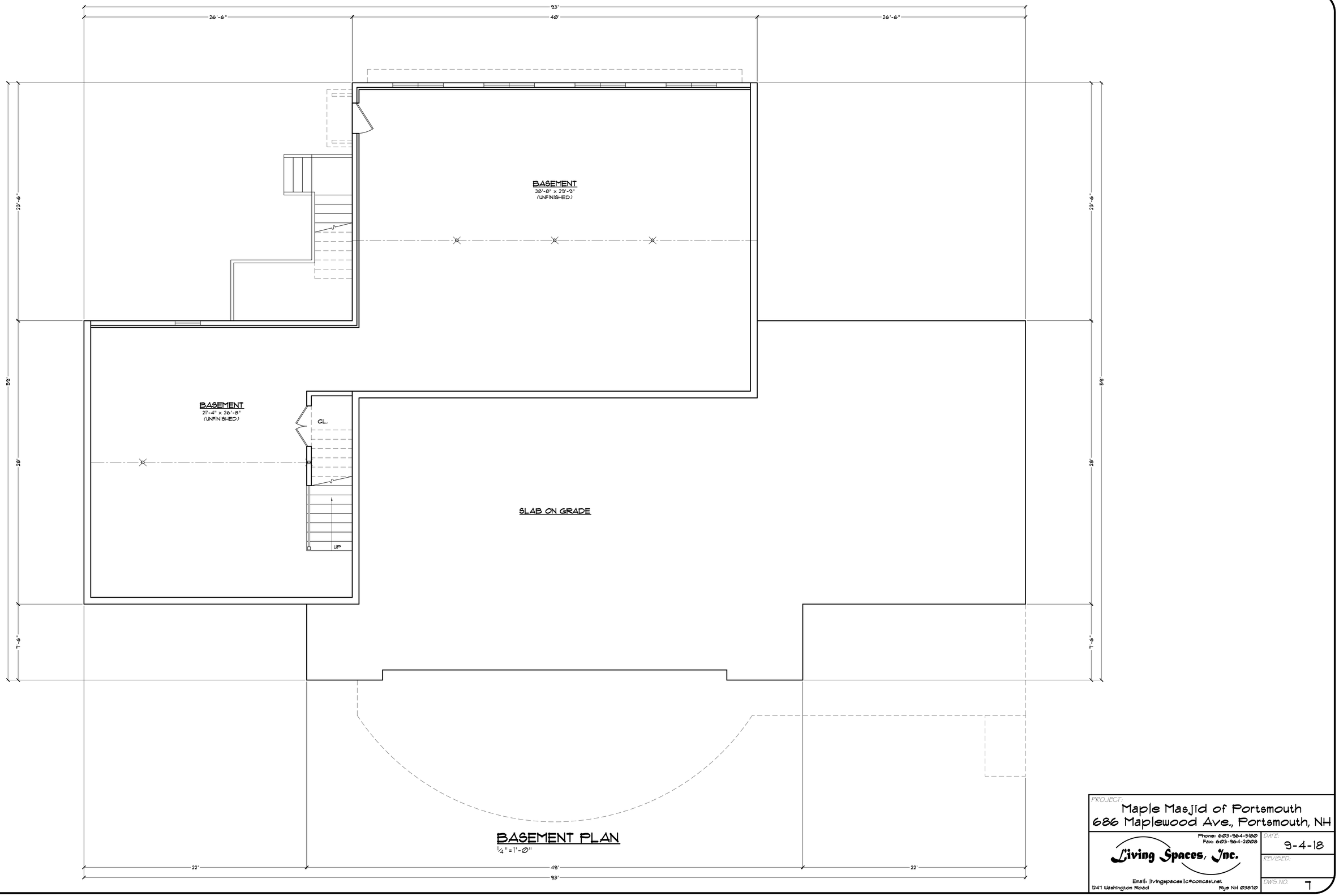

BASEMENT PLAN

1/4" = 1'-0"

C:\LSI\2018\Mosque80

PROJECT:
Maple Masjid of Portsmouth
686 Maplewood Ave., Portsmouth, NH

Living Spaces, Inc.
Phone: 603-964-5180
Fax: 603-964-2008
Email: livingspacesllc@comcast.net
1247 Washington Road
Rye NH 03870

DATE: 9-4-18
REVISED:
DWG.NO. 7

AMBIT ENGINEERING, INC. CIVIL ENGINEERS AND LAND SURVEYORS
200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

15 October, 2018

Juliet Walker, Chair
City of Portsmouth Technical Advisory Committee
1 Junkins Avenue
Portsmouth, NH 03801

RE: Site Plan Submittal for TAC at 686 Maplewood Avenue (Map 220/ Lot 90)

Dear Ms. Walker and Technical Advisory Committee members:

We hereby submit on behalf of the Islamic Society of the Seacoast Area, the Site Plan Application, Fee, Plans and Supplemental Information for the project to be known as Maple Majid.

As discussed at the TAC workshop meeting held on June 12, 2018 we had agreed to reconfigure the site to allow for the building to be moved to the east setback line. We have moved the building, revised the parking, incorporated low impact development stormwater drainage techniques, added lighting, landscaping, utilities and an extensive retaining wall system.

We look forward to reviewing this exciting project at the October 30, 2018 Technical Advisory Committee Meeting.

Sincerely,

Douglas J. LaRosa; Ambit Engineering, Inc.
Enclosures: 4 large, 6 small Plan Sets, PDF of files on a disc, Supplemental Information
CC: Issa, File

J:\JOBS2\JN2300s\JN 2360s\JN 2360\2017 Site Plan\Applications\City of Portsmouth\2360 TAC Letter 10.15.2018.doc

ADDITIONAL SUBMITTAL INFORMATION

FOR

MAPLE MAJID
686 MAPLEWOOD AVENUE
PORTSMOUTH, NH

OCTOBER 15, 2018

- Site Review Application
- Statement of Authorization
- Site Plan Review Application Fee
- Site Cost Estimate
- Will Serve Letter Eversource
- Drainage Memo

CITY OF PORTSMOUTH
NEW HAMPSHIRE

SITE REVIEW APPLICATION

Building Permit Application Number 13729

Case Number _____

Fee $3,299.00

Map 220 Lot 90 Zone SRB Wetlands: Inland None Coastal None Lot Area 62,776 SQ, FT.

Date of Approvals (Indicate if Pending)

Conservation Commission _____ Conditional Use _____ Board of Adjustment Case #2-4 ; 2.21.18

Historic District Commission _____ Subdivision _____ Other _____

Street Address 686 Maplewood Avenue

Description of Project including all use(s) A Proposed Place of Worship to be known as "Maple Majid" with, City Water, City Sewer, LID Stormwater design, 60 parking spaces, Unitil Gas, Eversource Electric, telecommunications, Site Lighting and Landscaping.

Building(s) Footprint 3,880 Sq, Ft. Gross Floor Area 5,333 #of Stories 2

# of Dwelling Units NA Number of Parking Spaces: Existing 0 Proposed 60

Print Information Below

Property Owner's Name Islamic Society of the Seacoast Area

Street Address 42N Dover Point Road City/Town Dover State NH Zip 03820

(603) 750-4060 http://www.issa-nh.org/

Telephone # Cell Phone # Fax # Email Address

Print Information Below

Applicant's / Developer's Name same

Street Address _____ City/Town _____ State _____ Zip _____

Telephone # Cell Phone # Fax # Email Address

Print Information Below (Include Additional Contact Information on Next Page)

Check One: Owner's Attorney ☐ Applicant's Attorney ☐ Engineer ☒ Surveyor ☐ Other ☐ If other, state relationship _____

Representative's Name Ambit Engineering, Inc

Street Address 200 Griffin Road City/Town Portsmouth State NH Zip 03801

603-430-9282 603-436-2315 djl@ambitengineering.com

Telephone # Cell Phone # Fax # Email Address

I hereby apply for Site Review and acknowledge that I will comply with all the ordinances and any stipulations of the Site Review Committee of the City of Portsmouth in the development and construction of this project.

Douglas J. LaRose Agent Douglas J. LaRose 10/15/2018

Owner's Signature Print Owner's Name Date

" " "

Applicant's/Developer's Signature Print Applicant's/Developer's Name Date

Print Information Below

Check One: Owner's Attorney ☐ Applicant's Attorney ☐ Engineer ☐ Surveyor ☐ Other ☐ If other, state relationship _____

Representative's Name AMBIT ENGINEERING INC

Street Address 200 GRIFFIN RD UNIT 3 City/Town PORTSMOUTH State NH Zip 03801

603-430-9282 djl@ambitengineering.com

Telephone # | Cell Phone # | Fax # | Email Address

Print Information Below

Check One: Owner's Attorney ☐ Applicant's Attorney ☐ Engineer ☐ Surveyor ☐ Other ☐ If other, state relationship _____

Representative's Name _____

Street Address _____ City/Town _____ State _____ Zip _____

Telephone # | Cell Phone # | Fax # | Email Address

Print Information Below

Check One: Owner's Attorney ☐ Applicant's Attorney ☐ Engineer ☐ Surveyor ☐ Other ☐ If other, state relationship _____

Representative's Name _____

Street Address _____ City/Town _____ State _____ Zip _____

Telephone # | Cell Phone # | Fax # | Email Address

Attachments

The following materials must be submitted to the Planning Department along with the completed Application Form:

- ☑ Site Plan Application Checklist
- ☑ Ten (10) stamped and folded copies of the site plan – four (4) full-size (22" x 34") and six (6) reduced (11" x 17")
- ☑ Digital copy of any plans and/or exhibits (in PDF format)
- ☐ Application Fee
- ☑ Any required State or Federal Permits

5 March, 2018

To Whom It May Concern

RE: Client Representation for a Development at 686 Maplewood Avenue

This letter is to inform the City of Portsmouth, and other parties in accordance with State Law that Ambit Engineering is authorized to represent the above-mentioned property as our agent in the approval process. This includes signatory powers on any and all applications relative to this property. The owner of the property, ISSA, reserves the right to cancel this authorization at any time.

Please feel free to call me if there is any question regarding this authorization.

Sincerely,

Mohamed Ebrahim

ISSA, Islamic Society of the Seacoast Area
Authorized Representative
M. Ebrahim, Director

42N Dover Point Road
Dover NH, 03820
603-750-4060

AMBIT ENGINEERING, INC. CIVIL ENGINEERS AND LAND SURVEYORS
200 Griffin Road, Unit 3, Portsmouth, NH 03801 Phone (603) 430-9282 Fax 436-2315

Construction/Site Cost Estimate					
Maple Majid, 686 Maplewood Ave.					10/12/2018
Portsmouth, NH					
Item No.	DESCRIPTION	Units	Quantity	Unit Cost	Total
1	**Site - Earthwork**	LS	1	$ 95,000	$ 95,000
2	**Site - Landscaping**	LS	1	$ 22,000	$ 22,000
3	**Site - Asphalt**	TON	540	$ 100	$ 54,000
4	**Site -Vertical Granite Curb**	LF	120	$ 25	$ 3,000
5	**Site - Retaining Wall**	SF	3600	$ 50	$ 180,000
6	**Site - Fence (Dumpster)**	LF	40	$ 50	$ 2,000
7	**Site - Concrete Sidewalk**	SY	170	$ 25	$ 4,250
8	**Site - Sloped Granite Curb**	LF	210	$ 20	$ 4,200
9	**Site - Ledge Removal**	CY	150	$ 50	$ 7,500
10	**Utility - Underdrains**	LF	120	$ 10	$ 1,200
11	**Utility - Drain Pipes - 12" HDPE**	LF	460	$ 40	$ 18,400
12	**Utility - Portsmouth Lights**	EA	7	$ 2,800	$ 19,600
13	**Utility - Drain Manhole/Catch Basin**	EA	7	$ 3,250	$ 22,750
14	**Utility - Sewer Pipes**	LF	260	$ 25	$ 6,500
15	**Utility - Fire Service**	LF	250	$ 40	$ 10,000
16	**Utility - Electric, Phone, Cable**	LF	250	$ 12	$ 3,000
17	**Utility - Water Service**	LF	250	$ 8	$ 2,000
18	**Drainage - 2 Filtration Basins**	SF	3050	$ 10	$ 30,500
19	**Drainage - Forebay**	SF	400	$ 5	$ 2,000
20	**Drainage - riprap**	SF	100	$ 7	$ 700
21	**Erosion Control**	LS	1	$ 4,000	$ 4,000
Sub-Total					$ 492,600

APPLICATION FEE:

$500 + ($385,700/1000 x $5) + (62,000/ 1,000 x $10)= $ 3,299.00

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: Islamic Society of the Seacost Area Date Submitted: Oct. 15, 2018

Phone Number: (603) 750-4060 E-mail: http://www.issa-nh.org/

Site Address: 686 Maplewood Avenue Map: 220 Lot: 90

Zoning District: SRB Lot area: 62,726 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)**	Attached	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)**		N/A

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

Site Plan Review Application Required Information			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	Names and addresses (including Tax Map and Lot number and zoning districts) of all direct abutting property owners (including properties located across abutting streets) and holders of existing conservation, preservation or agricultural preservation restrictions affecting the subject property. **(2.5.3.1E)**	Existing Conditions	N/A
✓	Names, addresses and telephone numbers of all professionals involved in the site plan design. **(2.5.3.1F)**	Cover Sheet	N/A
✓	List of reference plans. **(2.5.3.1G)**	Exsiting Conditions Plan & Sheet C2	N/A
✓	List of names and contact information of all public or private utilities servicing the site. **(2.5.3.1H)**	Cover Sheet	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	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 within 50' of 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)**		N/A
✓	Plan sheets showing landscaping and screening shall also include the following additional notes: a. "The property owner and all future property owners shall be responsible for the maintenance, repair and replacement of all required screening and landscape materials." b. "All required plant materials shall be tended and maintained in a healthy growing condition, replaced when necessary, and kept free of refuse and debris. All required fences and walls shall be maintained in good repair." c. "The property owner shall be responsible to remove and replace dead or diseased plant materials immediately with the same type, size and quantity of plant materials as originally installed, unless alternative plantings are requested, justified and approved by the Planning Board or Planning Director." **(2.13.4)**		N/A

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
	1. Existing Conditions: (2.5.4.3A)		
✓	a. Surveyed plan of site showing existing natural and built features;	Existing Conditions and Topographic Plan	☐
✓	b. Zoning boundaries;	Cover Sheet	☐
✓	c. Dimensional Regulations;	Exixting Conditions Plan	☐
✓	d. Wetland delineation, wetland function and value assessment;	Supplemental Report "No Wetlands"	☐
✓	e. SFHA, 100-year flood elevation line and BFE data.	Existing Conditions and Topographic Plan	☐
	2. Buildings and Structures: (2.5.4.3B)		
✓	a. Plan view: Use, size, dimensions, footings, overhangs, 1st fl. elevation;		☐
✓	b. Elevations: Height, massing, placement, materials, lighting, façade treatments;		☐
✓	c. Total Floor Area;		☐
✓	d. Number of Usable Floors;		☐
✓	e. Gross floor area by floor and use.		☐
	3. Access and Circulation: (2.5.4.3C)		
✓	a. Location/width of access ways within site;		☐
☐	b. Location of curbing, right of ways, edge of pavement and sidewalks;		☐
☐	c. Location, type, size and design of traffic signing (pavement markings);		☐
✓	d. Names/layout of existing abutting streets;		☐
✓	e. Driveway curb cuts for abutting prop. and public roads;		☐
☐	f. If subdivision; Names of all roads, right of way lines and easements noted;		✓
✓	g. AASHTO truck turning templates, description of minimum vehicle allowed being a WB-50 (unless otherwise approved by TAC).	FireTruck Exhibit	☐
	4. Parking and Loading: (2.5.4.3D)		
✓	a. Location of off street parking/loading areas, landscaped areas/buffers;		☐
✓	b. Parking Calculations (# required and the # provided).		☐
	5. Water Infrastructure: (2.5.4.3E)		
✓	a. Size, type and location of water mains, shut-offs, hydrants & Engineering data;		☐
☐	b. Location of wells and monitoring wells (include protective radii).	na	☐
	6. Sewer Infrastructure: (2.5.4.3F)		
✓	a. Size, type and location of sanitary sewage facilities & Engineering data.		☐
	7. Utilities: (2.5.4.3G)		
✓	a. The size, type and location of all above & below ground utilities;		☐
✓	b. Size type and location of generator pads, transformers and other fixtures.		☐

Site Plan Specifications – Required Exhibits and Data			
☑	**Required Items for Submittal**	**Item Location (e.g. Page/line or Plan Sheet/Note #)**	**Waiver Requested**
✓	**8. Solid Waste Facilities: (2.5.4.3H)**		
	a. The size, type and location of solid waste facilities.		☐
	9. Storm water Management: (2.5.4.3I)		
✓	a. The location, elevation and layout of all storm-water drainage.		☐
	10. Outdoor Lighting: (2.5.4.3J)		
✓	a. Type and placement of all lighting (exterior of building, parking lot and any other areas of the site) and; b. photometric plan.		☐
✓	**11. Indicate where dark sky friendly lighting measures have been implemented. (10.1)**		☐
	12. Landscaping: (2.5.4.3K)		
✓	a. Identify all undisturbed area, existing vegetation and that which is to be retained;	na	☐
☐	**b.** Location of any irrigation system and water source.		☐
	13. Contours and Elevation: (2.5.4.3L)		
✓	a. Existing/Proposed contours (2 foot minimum) and finished grade elevations.		☐
	14. Open Space: (2.5.4.3M)		
✓	a. Type, extent and location of all existing/proposed open space.		☐
✓	**15. All easements, deed restrictions and non-public rights of ways. (2.5.4.3N)**		☐
✓	**16. Location of snow storage areas and/or off-site snow removal. (2.5.4.3O)**		☐
☐	**17. Character/Civic District (All following information shall be included): (2.5.4.3Q)**	na	☐
	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)**		☐
☑	Indicate where Low Impact Development Design practices have been incorporated. **(7.1)**		☐
☐	Indicate whether the proposed development is located in a wellhead protection or aquifer protection area. Such determination shall be approved by the Director of the Dept. of Public Works. **(7.3.1)**	na	☐
☑	Indicate where measures to minimize impervious surfaces have been implemented. **(7.4.3)**		☐
☑	Calculation of the maximum effective impervious surface as a percentage of the site. **(7.4.3.2)**		☐
☑	Stormwater Management and Erosion Control Plan. *(Four (4) hardcopies of the full plan/report and Six (6) summaries to be submitted with the Site Plan Application)* **(7.4.4.1)**		☐

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)**	C2	☐
☑	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)**		☐

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

Applicant's Signature: _____ **Date:** _____

EVERSOURCE ENERGY

Electric Service Support Center PO
Box 330
Manchester, NH 03105
1-800-362-7764

10/11/2018

Douglas Larosa
200 Griffin Rd.
Portsmouth, NH 03801

Re: 4000 sq. ft place of worship
686 Maplewood Ave.
Portsmouth, NH 03801

Dear Doug:

Eversource Energy agrees to provide electric service to the above site in accordance with the Tariff for Electric Service on file with the New Hampshire Public Utilities Commission (NHPUC), subject to the applicable NHPUC rules and regulations, as well as Eversource's "Requirements for Electric Service Connections".

Please keep in mind that all requirements for providing electric service, such as, but not limited to, contracts, licenses, fees, payments, easements and inspections must be provided to Eversource prior to the construction of the electric facilities.

Should you have any questions or concerns, please call us at 1-800-362-7764

Sincerely,

Tom Eger
Electric Service Support Center
PO Box 330
Manchester, NH 03105-9989

ISSA Maple Majid
686 Maplewood Avenue
October 15, 2018

PROPOSED GREEN BUILDING COMPONENTS

LOCATION AND TRANSPORTATION

1. **Public Transportation** - Bus stops are located in front of the site on Maplewood Avenue.
2. **Nearby Amenities** - There are numerous businesses located nearby, including a grocery store, pharmacies, restaurants and retail shops that can be used and incorporated in the same trip reducing number of total vehicle trips.
3. **Increased Use** - The project will provide increased development in a developed, reducing sprawl by reducing the need for development in undeveloped areas.

SITE

4. **Adaptive Reuse** - Redevelopment of an existing urban site for infill development.
5. **Stormwater Design** - The stormwater system has been designed using Low Impact Design techniques, such as filtration basins and deep sump catch basins.
6. **Parking** - Parking calculations have been performed using the City's new parking requirements.

WATER

7. **Plumbing Fixtures** - Dual flush or low-flow toilets and other low-flow fixtures will be provided where possible.
8. **Domestic Hot Water** - Will be designed to exceed code requirements.

ENERGY

9. **Building Envelope** - The building envelope will be designed as a high-performance assembly to significantly exceed minimum Energy Code requirements and minimize heating and cooling costs, while achieving a high standard of occupant comfort.
10. **HVAC Units** - High-efficiency HVAC units will be employed where possible.
11. **High-Efficiency Lighting** - Efficient LED lighting will be used for interior and exterior fixtures where possible.
12. **Energy Star Appliances** – Appliances will be Energy Star rated where possible.
13. **Roofing** - Roofing will be of a light-colored roofing to reduce the heat island effect were possible.

MATERIALS AND RESOURCES

14. Minimize Waste - Material waste will be minimized as much as possible during construction.

INDOOR ENVIRONMENTAL QUALITY

15. Low-VOC Materials - Building materials with low volatile organic compound levels will be specified where possible.
16. Indoor Air Quality – The building will have operable windows for access to fresh air.
17. Daylight - Spaces will have access to windows for daylight.

Note: Green building components reflect proposed project features and are subject to feasibility of construction.

DRAINAGE ANALYSIS

SITE REDEVELOPMENT MAPLE MAJID

386 Maplewood Avenue
PORTSMOUTH, NH

October 15, 2018

STATE OF NEW HAMPSHIRE
JOHN R. CHAGNON
No. 7651
LICENSED
PROFESSIONAL ENGINEER

10-15-18

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(Ambit Job Number2862)

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EXECUTIVE SUMMARY

This drainage analysis examines the pre-development (existing) and post-development (proposed) stormwater drainage patterns for the proposed development which includes a place of worship building at 386 Maplewood Avenue in Portsmouth, NH. The site is shown on the City of Portsmouth Assessor's Tax Map 220 as Lot 90. The lot size is 62,726 square-feet (1.44 acres).

The new building will be serviced by public water and public sewer. The development has the potential to increase stormwater runoff to adjacent properties, and therefore must be designed in a manner to prevent that occurrence. This will be done primarily by capturing stormwater runoff and routing it through appropriate stormwater facilities, designed to ensure that there will be no increase in peak runoff from the site as a result of this project.

In a recent review by the Planning Board, it was suggested that the hydrologic modeling consider the "Extreme Precipitation" values from The Northeast Regional Climate Center (Cornell University) be as used for modeling purposes. Because Portsmouth is in the Seacoast area we have increased these values by 15% and incorporated these values in this report.

SITE REDEVELOPMENT

Maple Majid, 686 Maplewood Avenue

PORTSMOUTH, NH

INTRODUCTION / PROJECT DESCRIPTION

This drainage report is designed to assist the owner, planning board, contractor, regulatory reviewer, and others in understanding the impact of the proposed development project on local surface water runoff and quality. The project site is shown on the City of Portsmouth, NH Assessor's Tax Map 220 Lot 90.

Bounding the site to the northeast is Maplewood Avenue. Bounding the site to the West is the Interstate Route 95. Bounding the site to the south-east are vacant lots that have received variances for two family homes along Emery Street which are also to the rear of the lot. Bounding the Site to the East is Seamans Supply Co which is in the Business Zone. The subject property is situated in the Single Residence B zone (SRB). A vicinity map is included in the Appendix to this report.

The proposed development plan is to construct a new place of worship, parking areas, and other associated improvements such as a utilities and landscaping. The project is anticipated to begin construction in the spring of 2019 and be substantially completed by the summer of 2020.

This report includes information about the existing site and the proposed development necessary to analyze stormwater runoff and to design any required mitigation. The report includes maps of pre-development and post-development watersheds, sub-catchment areas and calculations of runoff. The report will provide a narrative of the stormwater runoff and describe numerically and graphically the surface water runoff patterns for this site. Proposed stormwater management and treatment structures and methods will also be described, as well as erosion and sediment control practices. To fully understand the proposed site development the reader should also review a complete site plan set in addition to this report.

METHODOLOGY

This report uses the US Soil Conservation Service (SCS) Method for estimating stormwater runoff. The SCS method is published in The National Engineering Handbook (NEH), Section 4 “Hydrology” and includes the Technical Release No. 20, (TR-20) "Computer Program for Project Formulation Hydrology", and Technical Release No. 55 (TR-55) “Urban Hydrology for Small Watersheds” methods. This report uses the HydroCAD version 10.0 program, written by HydroCAD Software Solutions LLC, Chocorua, N.H., to apply these methods for the calculation of runoff and for pond modeling. In a recent review by the Planning Board, it was suggested that the hydrologic modeling consider the “Extreme Precipitation” values from The Northeast Regional Climate Center (Cornell University) increased by 15% be as used for modeling purposes. These values have been used and are included in this report.

Time of Concentration (Tc) is calculated by entering measured flow path data such as flow path type, length, slope and surface characteristics into the HydroCAD program. For the purposes of this report, a minimum time of concentration of 5 minutes is used.

The storm events used for the calculations in this report are the 2-year, 10-year and 50-year (24-hour) storms. Watershed basin boundaries have been delineated using topographic maps prepared by Ambit Engineering and field observations to confirm.

SITE SPECIFIC INFORMATION

Based on the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Soil Survey of Rockingham County, New Hampshire, the site is made up of one soil type:

799 – Urban land – Canton Complex (3-15% slopes), well drained with a typical depth to restrictive feature of more than 80 inches. This soil has a Hydrologic Soil Group (HSG) classification of B, with a Low runoff class. Offsite run-off is not calculated using this value.

5 Test Pits performed around the perimeter of the site indicate that the soil within the property boundary is not a well-drained soil. The test pits indicate that the soil is a moderately well drained soil with a typical depth to restrictive feature of 24-36” inches. This soil has a Hydrologic Soil Group (HSG) classification of C. Site run-off is computed using this value.

The physical characteristics of the site consist of (3-15%) grades that generally slope downward from Rear of (back) towards Maplewood Avenue. Elevations on the site range from 36 to 60 feet above sea level. The existing site is undeveloped and includes a paved driveway and gravel drive. Vegetation around the developed portion of the lot consists of established grasses, shrubs and trees. Currently the site is being used as a laydown yard for Road Construction.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) number 33015C0259E (effective date May 17, 2005), the project site is located in Zone X and is determined to be outside of the 0.2% annual chance floodplain. A copy of the FIRM map is included in the Appendix.

PRE-DEVELOPMENT DRAINAGE

The existing site drains via overland flow from a localized high point from the rear of the property towards the rear, front and sides of the site. Runoff flows overland toward Maplewood Avenue until it enters a closed storm sewer system in front of 678 Maplewood Ave. There is no existing stormwater detention or treatment on the site (aside from the minimal treatment achieved from infiltration that occurs).

In the pre-development condition, the site has been analyzed as three watershed basins (ES1, ES2 and ES3) based on localized topography and discharge location. ES1 flows overland directly to the existing driveway of the lot to Discharge Point 1 (DP1). ES2 flows overland toward the front and east side of the property. ES3 flows from the highpoint to the south/rear of the property. The runoff curve number (CN) for Subcatchment ES1 is calculated to be 74 with impervious coverage of 1.12%. The runoff curve number (CN) for Subcatchment ES2 is 73 with impervious coverage of 1.83%. The runoff curve number (CN) for Subcatchment ES3 is 74 with impervious coverage of 0.66%.

Table 1: Pre-Development Watershed Basin Summary

Watershed Basin ID	Basin Area (SF)	Tc (MIN)	CN	10-Year Runoff (CFS)	50-Year Runoff (CFS)	Design Point
ES1	27,206	9.3	74	2.77	5.14	DP1
ES2	25,730	6.7	73	2.77	5.19	DP2
ES3	9,837	5	74	1.13	2.41	DP3

POST-DEVELOPMENT DRAINAGE

The proposed development has been designed to match the pre-development drainage patterns to the greatest extent feasible. In the post-development condition, the site has been analyzed as four separate watersheds (PS1a, PS1b, PS1c, and PS2) based on localized topography and discharge locations. Basins PS1a, the majority of the top level, flows into a filtration basin PS1a. The middle of the development flows; PS1b flows into a deep sump, hooded catch basin and then into Filtration Basin PS1b, and then once full to overflow into the closed drainage system that exits the site to the north to DP1. Basin PS1c flows directly offsite. Basins PS2 and PS3 are the small area behind the building that is mostly grass. PS2 flows to design point DP2. PS3 is the remaining grass area that flow to the south to DP3. All runoff from the sub-watershed basins Ps1a, Ps1b and Ps1c are discharged to Design Point 1 (DP1). This allows for a direct review of Design Points to show the comparison of runoff from the site in the pre-development and post-development conditions.

The runoff curve number (CN) for basin PS1a is calculated to be 93 with impervious coverage of 79.26%. The runoff curve number (CN) for basin PS1b is calculated to be 90 with impervious coverage of 65.26%. The runoff curve number (CN) for basin PS1c is calculated to be 87 with impervious coverage of 53.49%. The runoff curve number (CN) for basin PS2 is calculated to be 78 with impervious coverage of 81.34%. The runoff curve number (CN) for basin PS3 is calculated to be 75 with impervious coverage of 3.78%.

Table 2: Post-Development Watershed Basin Summary

Watershed Basin ID	Basin Area (SF)	Tc (MIN)	CN	10-Year Runoff (CFS)	50-Year Runoff (CFS)	Design Point
PS1a	23,312	135	93	0.72	1.13	DP1
PS1b	16,596	135	90	0.49	0.78	DP1
PS1c	12,523	5	87	2.27	3.67	DP1
Ps2	5,767	5.0	78	0.86	1.51	DP2
PS3	4,578	5.0	75	0.61	1.12	DP3

The overall impervious coverage of the area analyzed in this report for all basins **increases** from 842 square feet (3.61%) in the pre-development condition to 37,253 square feet (59.34%) in the post-development condition. Since the site represents an increase in impervious area, the project proposes the construction of stormwater filter basins to provide treatment and storage of roof run-off, as well as the use of pretreatment. Since no treatment or dedicated stormwater storage systems currently exist for the site, providing the proposed treatment by means of the porous pavement and filtration basin represents a vast improvement on the water quality of the runoff.

Table 3 shows a summary of the comparison between pre-developed flows and post-developed flows for the design point.

Table 3: Pre-Development to Post-Development Comparison

	Q2 (CFS)		Q10 (CFS)		Q50 (CFS)	
Design Point	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP1	2.59	1.78	5.48	1.18	10.23	5.18
DP2	1.31	0.45	2.77	0.86+	5.19	1.51
DP3	0.64	0.30	1.31	0.61	2.41	1.12

EROSION AND SEDIMENT CONTROL PRACTICES

The erosion potential for this site as it exists is low due to the existing vegetation and the built-up nature of the surrounding sites. During construction, the major potential for erosion is wind and stormwater runoff. The contractor will be required to inspect and maintain all necessary erosion control measures, as well as installing any additional measures as required. All erosion control practices shall conform to "The Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire." Some examples of erosion and sediment control measures to be utilized for this project during construction may include:

- Silt Soxx (or approved alternative) located at the toe of disturbed slopes
- Stabilized construction entrance at access point to the site
- Temporary mulching and seeding for disturbed areas
- Spraying water over disturbed areas to minimize wind erosion

After construction, permanent stabilization will be accomplished by permanent seeding, landscaping and surfacing the access drives and parking areas with asphalt paving.

CONCLUSION

The proposed development has been designed to be less than the pre-development drainage pattern. With the design of two filtration basins and the slow release of storm water, the post-development runoff rates are reduced to be below the pre-development runoff rates and will provide treatment. Erosion and sediment control practices will be implemented for both the temporary condition during construction and for final stabilization after construction. Therefore, there are no negative impacts to downstream receptors or adjacent properties anticipated as a result of this project. There is also no negative impact to the City of Portsmouth storm drainage system.

REFERENCES

1. City of Portsmouth, NH. Site Plan Review Regulations amended September 15, 2016.

2. Comprehensive Environmental Inc. and New Hampshire Department of Environmental Services. *New Hampshire Stormwater Manual (Volumes 1, 2 and 3)*, December 2008 (Revision 1.0).

3. Minnick, E.L. and H.T. Marshall. *Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire*, prepared by Rockingham County Conservation District, prepared for New Hampshire Department of Environmental Services, in cooperation with USDA Soil Conservation Service, August 1992.

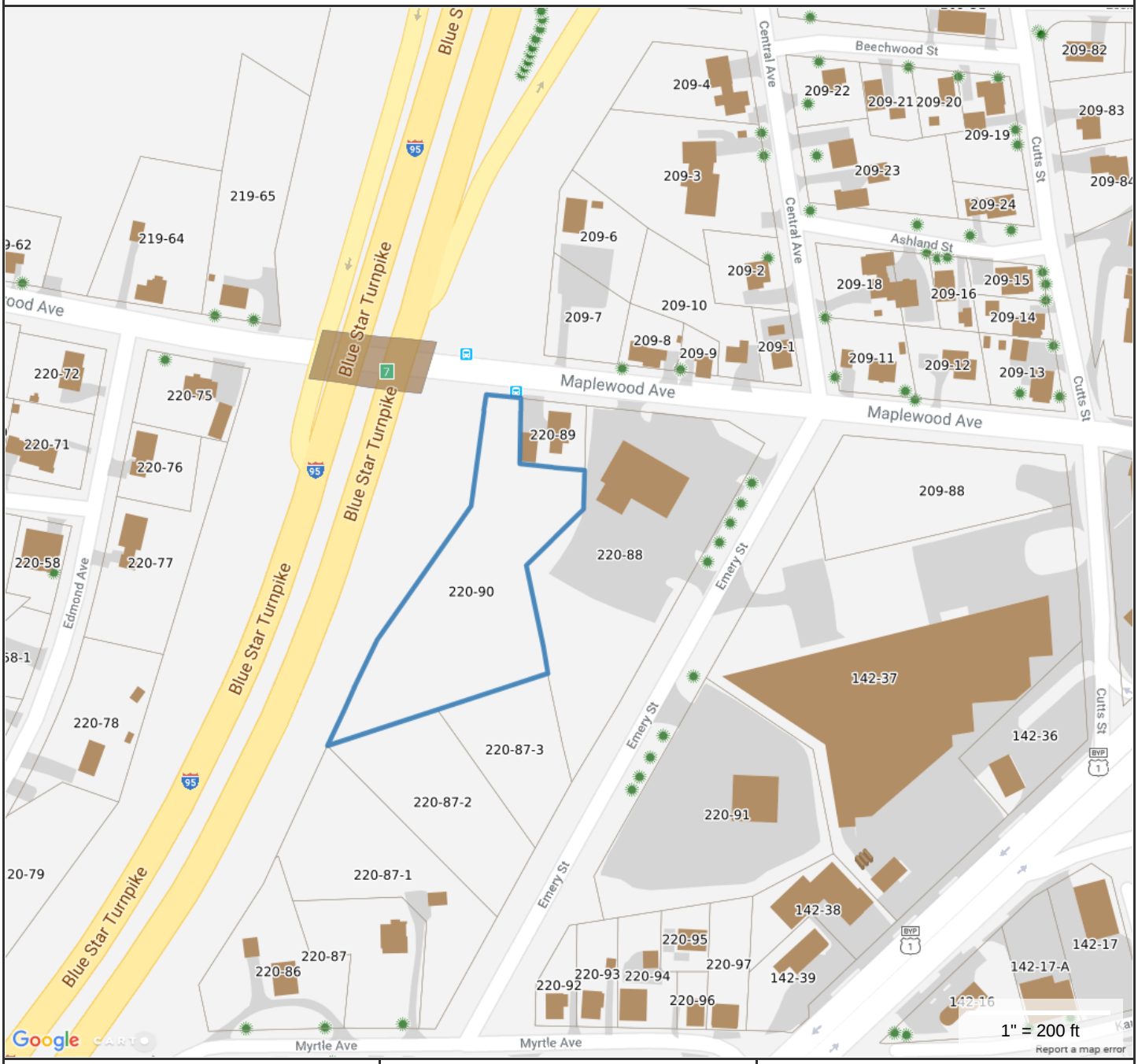
4. HydroCAD Software Solution, LLC. *HydroCAD Stormwater Modeling System Version 10.0* copyright 2013. HydroCAD Software Solution, LLC. *HydroCAD Stormwater Modeling System Version 10.0* copyright 2013.

5. University of New Hampshire Stormwater Center 2009 Biannual Report, Pages 14-21 for references to Lag time (TC) for Porous Pavement and Filtration Basins.

APPENDIX A

VICINITY (TAX) MAP

Vicinity Map - Maple Majid, 686 Maplewood Avenue



Property Information

Property ID	0220-0090-0000
Location	686 MAPLEWOOD AVE
Owner	ISLAMIC SOCIETY OF THE SEACOAST AREA

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

City of Portsmouth, NH makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 01/04/2018
Properties updated 09/13/2018

APPENDIX B

TABLES, CHARTS, ETC.

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	70.768 degrees West
Latitude	43.080 degrees North
Elevation	0 feet
Date/Time	Thu, 13 Sep 2018 14:02:44 -0400

24 Hour Storm Inches x 15% =

2 Year 3.20 x 1.15 = 3.68

10 Year 4.86 x 1.15 = 5.59

50 Year 7.38 x 1.15 = 8.49

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.81	1.04	**1yr**	0.70	0.98	1.21	1.56	2.03	2.66	2.92	**1yr**	2.35	2.80	3.21	3.94	4.54	**1yr**
2yr	0.32	0.50	0.62	0.81	1.02	1.30	**2yr**	0.88	1.18	1.52	1.94	2.48	3.20	3.56	**2yr**	2.84	3.43	3.93	4.67	5.32	**2yr**
5yr	0.37	0.58	0.73	0.97	1.25	1.60	**5yr**	1.08	1.46	1.88	2.43	3.13	4.06	4.57	**5yr**	3.59	4.39	5.03	5.92	6.69	**5yr**
10yr	0.41	0.65	0.82	1.11	1.45	1.89	**10yr**	1.25	1.72	2.23	2.89	3.74	4.86	5.52	**10yr**	4.30	5.31	6.07	7.09	7.96	**10yr**
25yr	0.48	0.76	0.96	1.33	1.77	2.33	**25yr**	1.53	2.14	2.77	3.62	4.73	6.16	7.09	**25yr**	5.45	6.81	7.78	9.00	10.03	**25yr**
50yr	0.53	0.86	1.10	1.53	2.06	2.75	**50yr**	1.78	2.52	3.28	4.31	5.65	7.38	8.57	**50yr**	6.53	8.24	9.40	10.79	11.95	**50yr**
100yr	0.59	0.96	1.24	1.76	2.41	3.24	**100yr**	2.08	2.97	3.89	5.14	6.75	8.83	10.36	**100yr**	7.82	9.96	11.35	12.93	14.25	**100yr**
200yr	0.67	1.09	1.42	2.03	2.81	3.82	**200yr**	2.43	3.50	4.60	6.11	8.06	10.59	12.52	**200yr**	9.37	12.04	13.71	15.50	16.99	**200yr**
500yr	0.79	1.31	1.70	2.47	3.46	4.74	**500yr**	2.98	4.36	5.74	7.68	10.19	13.45	16.11	**500yr**	11.90	15.49	17.60	19.72	21.45	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.23	0.36	0.44	0.59	0.73	0.88	**1yr**	0.63	0.86	0.92	1.32	1.68	2.22	2.49	**1yr**	1.97	2.39	2.86	3.17	3.87	**1yr**
2yr	0.31	0.49	0.60	0.81	1.00	1.19	**2yr**	0.86	1.16	1.37	1.82	2.34	3.05	3.45	**2yr**	2.70	3.32	3.82	4.54	5.07	**2yr**
5yr	0.35	0.54	0.67	0.92	1.17	1.40	**5yr**	1.01	1.37	1.61	2.12	2.73	3.78	4.18	**5yr**	3.35	4.02	4.71	5.52	6.23	**5yr**
10yr	0.38	0.59	0.73	1.02	1.32	1.60	**10yr**	1.14	1.56	1.81	2.39	3.06	4.36	4.85	**10yr**	3.86	4.67	5.43	6.40	7.18	**10yr**

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
25yr	0.44	0.67	0.83	1.18	1.56	1.90	**25yr**	1.35	1.86	2.10	2.76	3.54	4.69	5.88	**25yr**	4.15	5.65	6.63	7.77	8.66	**25yr**
50yr	0.48	0.73	0.91	1.31	1.76	2.17	**50yr**	1.52	2.12	2.35	3.08	3.94	5.30	6.79	**50yr**	4.69	6.53	7.70	9.02	9.99	**50yr**
100yr	0.53	0.81	1.01	1.46	2.01	2.47	**100yr**	1.73	2.41	2.63	3.42	4.36	5.94	7.83	**100yr**	5.26	7.53	8.94	10.47	11.53	**100yr**
200yr	0.59	0.89	1.13	1.63	2.27	2.81	**200yr**	1.96	2.75	2.93	3.80	4.81	6.65	9.04	**200yr**	5.89	8.69	10.38	12.18	13.33	**200yr**
500yr	0.68	1.02	1.31	1.90	2.71	3.36	**500yr**	2.33	3.29	3.41	4.34	5.48	7.73	10.91	**500yr**	6.84	10.50	12.64	14.89	16.13	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.54	0.72	0.89	1.08	**1yr**	0.77	1.06	1.26	1.74	2.21	2.98	3.15	**1yr**	2.64	3.03	3.58	4.37	5.04	**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	3.42	3.70	**2yr**	3.03	3.55	4.08	4.83	5.63	**2yr**
5yr	0.40	0.62	0.76	1.05	1.33	1.62	**5yr**	1.15	1.58	1.88	2.53	3.25	4.33	4.95	**5yr**	3.83	4.76	5.37	6.36	7.14	**5yr**
10yr	0.47	0.72	0.89	1.24	1.61	1.97	**10yr**	1.39	1.93	2.28	3.10	3.95	5.33	6.19	**10yr**	4.72	5.95	6.80	7.82	8.73	**10yr**
25yr	0.57	0.87	1.09	1.55	2.04	2.56	**25yr**	1.76	2.50	2.95	4.06	5.14	7.79	8.32	**25yr**	6.90	8.00	9.12	10.32	11.39	**25yr**
50yr	0.67	1.02	1.27	1.82	2.45	3.12	**50yr**	2.11	3.05	3.59	4.99	6.30	9.76	10.43	**50yr**	8.64	10.03	11.41	12.70	13.94	**50yr**
100yr	0.79	1.19	1.49	2.15	2.95	3.79	**100yr**	2.54	3.71	4.36	6.14	7.73	12.22	13.08	**100yr**	10.81	12.57	14.26	15.66	17.06	**100yr**
200yr	0.92	1.38	1.75	2.53	3.53	4.63	**200yr**	3.05	4.52	5.32	7.56	9.49	15.34	16.41	**200yr**	13.57	15.78	17.86	19.30	20.88	**200yr**
500yr	1.14	1.69	2.18	3.17	4.50	6.00	**500yr**	3.89	5.87	6.91	9.99	12.48	20.74	22.15	**500yr**	18.35	21.30	24.04	25.45	27.30	**500yr**

Powered by ACIS
Northeast Regional Climate Center

SCS METHODS

Technical Release - 55 Urban Hydrology for Small Watersheds

TR-55 presents simplified procedures to calculate storm runoff volume, peak rate of discharge, partial hydrographs and storage volumes for water control structures. The procedures are applicable to small watersheds, especially urbanizing watersheds with time of concentration between 0.1 hours and 10.0 hours. TR-55 is an approximation of the more detailed TR-20 method and does not have TR-20's capability to flood route. The user should examine the sensitivity of the analysis being conducted to ensure that the degree of error is tolerable. TR-55 contains two methods, the Tabular Hydrograph method and the Graphical Peak Discharge method. The accuracy of both methods is comparable; they differ only in their output. Both methods are based on open and unconfined flow over land and in channels.

The TR-55 Tabular Method can develop partial composite flood hydrographs at any point in a watershed by dividing the watershed into homogeneous subareas. By doing this, the method can estimate runoff from a larger nonhomogeneous watershed. The method is especially applicable for estimating the effects of land use change in a portion of a watershed. It can also be used to estimate the effects of proposed structures. The TR-55 Graphical Peak Discharge method calculates peak discharge using an assumed unit hydrograph and a thorough, but rapid, evaluation of the soils, slope, and surface cover characteristics of the watershed. This method is recommended for use in the design of all erosion and sediment control measures and simple stormwater management practices. When more detail and accuracy are required or when an accurate simulation of natural conditions is required, one of the other appropriate methods should be used. The TR-55 Graphical Peak Discharge method is the method that is discussed in this manual.

SCS TR-55 Graphical Peak Discharge Method

The peak discharge equation used in this method is:

$$q_p = q_u A_m Q F_p$$

where:

q_p is the peak discharge in cubic feet per second (cfs).

q_u is the unit peak discharge in cubic feet per second per square mile per inch of runoff (csm/in).

A_m is the drainage area in square miles.

Q is the runoff from the watershed in inches.

F_p is a pond and swamp adjustment factor that can be applied for ponds or swamps that are spread throughout the watershed and not in the time of concentration flow path.

Technical Release-20 Computer Program for Project Formulation Hydrology

The TR-20 computer program assists the engineer in hydrologic evaluation of flood events for use in analysis of water resource projects. The program is a single event model which computes direct runoff resulting from any natural or synthetic rainstorm. It develops flood hydrographs from runoff and routes the flow through stream channels and reservoirs. It combines the routed hydrograph with those from tributaries and computes the peak discharges, their times of occurrence and the water surface elevations at any desired cross section or structure. The program provides for the analysis of up to nine different rainstorm distributions over a watershed under various combinations of land treatment. The analysis can be performed on as many as 200 reaches and 99 structures in any one continuous run. The procedure should probably not be used for subarea drainage areas less than 5 acres nor more than 20 square miles.

Input Data Required

The following information is required to use TR-20:

Drainage Area - The drainage area of each subwatershed in square miles.

Runoff Curve Number - A factor that relates mass rainfall to mass runoff. It is based on soil characteristics, cover type, and land treatment. Tables 6-4.1 - 6-4.3 provides runoff curve numbers for urban areas and agricultural areas.

Time of Concentration - The time which would be required for the surface runoff from the hydraulically most remote part of the drainage area to reach the point being evaluated. A more detailed discussion of time of concentration is found later in this chapter.

Reach Length - The length of the stream or valley in feet selected for generally constant hydraulic characteristics for use in the study. A watershed may have several reaches in the flow path.

Cross Section Information - This information consists of either surveyed valley and channel sections with appropriate Manning's "n" values or "x" and "m" discharge coefficient values obtained from nomographs in the TR-20 documentation for the valley and channel reach.

Rainfall Data - The average depth, in inches, of rainfall occurring over a watershed or subwatershed for a given design frequency and duration storm event.

Structural Data - Information on any culverts, bridges, or reservoirs in the watershed that includes elevations, discharges, and storage behind the structures.

Output Data

The type and amount of output can be controlled by options within the program. In general the output data will provide estimates of peak flow, hydrographs, peak times, runoff volumes, and water surface elevations at any location within the watershed.

Runoff Curve Number (RCN)

The runoff curve number is a factor that relates mass rainfall to mass runoff. It is based on soil characteristics, cover type, hydrologic condition, and land treatment. Tables 6-4.1 through 6-4.3 provide runoff curve numbers for urban areas, cultivated agricultural areas, and other agricultural areas for various hydrologic conditions

Cover type relates to the kind of cover found on the soil such as vegetation, bare soil, and impervious surfaces such as parking areas, roofs, streets, and roads.

Hydrologic condition indicates the effects of cover type and treatment on infiltration and runoff rates. It is generally estimated from the density of plant and crop residue on the area. Good hydrologic condition indicates that the soil usually has low runoff potential for that specific hydrologic soil group, cover type and treatment. Some factors to consider in estimating the effect of cover on infiltration and runoff are: canopy or density of leaves, amount of year-round cover, amount of grass or close-seeded legumes in a rotation, percent of residue cover, and the degree of surface roughness.

Treatment is a cover type modifier used to describe the management of cultivated agricultural lands. It includes mechanical practices such as contouring and terracing, and management practices, such as crop rotations and reduced or no tillage.

TABLE 6-4.1 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION Cover type and hydrologic condition	Average percent impervious area[2]	CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP A	B	C	D
FULLY DEVELOPED URBAN AREAS[1] (Vegetation Established)					
Lawns, open spaces, parks, golf courses, cemeteries, etc.					
good condition; grass cover on 75% or more of the area		39	61	74	80
fair condition; grass cover on 50% to 75% of the area		49	69	79	84
poor condition; grass cover on 50% or less of the area		68	79	86	89
Paved parking lots, roofs, driveways, etc.		98	98	98	98
Streets and roads;					
paved with curbs and storm sewers		98	98	98	98
gravel		76	85	89	91
dirt		72	82	87	89
paved with open ditches		83	89	92	93
Commercial and business areas	85	89	92	94	95
Industrial districts	72	81	88	91	93
Row houses, town houses, and residential with lot sizes 1/8 acre or less	65	77	85	90	92
Residential					
Average lot size					
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acre	12	46	65	77	82
DEVELOPING URBAN AREAS[3] (No vegetation Established)					
Newly graded area		77	86	91	94

1. For land uses with impervious areas, curve numbers are computed assuming that 100% of runoff from impervious areas is directly connected to the drainage system. Pervious areas (lawn) are considered to be equivalent to lawns in good condition and the impervious areas have an RCN of 98.

2. Includes paved streets.

3. Use for the design of temporary measures during grading and construction. Impervious area percent for urban areas under development vary considerably. The user will determine the percent impervious. Then using the newly graded area RCN and Table 6-4, the composite RCN can be computed for any degree of development.

Source: USDA Soil Conservation Service

TABLE 6-4.2 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION		Hydrologic condition[4]	CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP			
Cover type and hydrologic condition			A	B	C	D
CULTIVATED AGRICULTURAL LAND						
Fallow	Bare soil		77	86	91	94
	Crop residue cover (CR)	poor	76	85	90	93
	CR	good	74	83	88	90
Row crops	Straight row (SR)	poor	72	81	88	91
	SR	good	67	78	85	89
	SR & CR	poor	71	80	87	90
	SR & CR	good	64	75	82	85
	Contoured (C)	poor	70	79	84	88
	C	good	65	75	82	86
	C & CR	poor	69	78	83	87
	C & CR	good	64	74	81	85
	Contoured & Terraces (C&T)	poor	66	74	80	82
	C&T	good	62	71	78	81
	C&T & CR	poor	65	73	79	81
	C&T & CR	good	61	70	77	80
Small grain	SR	poor	65	76	84	88
	SR	good	63	75	83	87
	SR & CR	poor	64	75	83	86
	SR & CR	good	60	72	80	84
	C	poor	63	74	82	85
	C	good	61	73	81	84
	C & CR	poor	62	73	81	84
	C & CR	good	60	72	80	83
	C&T	poor	61	72	79	82
	C&T	good	59	70	78	81
	C&T & CR	poor	60	71	78	81
	C&T & CR	good	58	69	77	80
Close-seeded Legumes or Rotation Meadow[5]	SR	poor	66	77	85	89
	SR	good	58	72	81	85
	C	poor	64	75	83	85
	C	good	55	69	78	83
	C&T	poor	63	73	80	83
	C&T	good	51	67	76	80

4. For conservation tillage poor hydrologic condition, 5 to 20 percent of the surface is covered with residue (less than 750 #/acre row crops or 300#/acre small grain).
   For conservation tillage good hydrologic condition, more than 20 percent of the surface is covered with residue (greater than 750 #/acre row crops or 300 #/acre small grain).
5. Close-drilled or broadcast.

Source: USDA Soil Conservation Service

TABLE 6-4.3 -- RUNOFF CURVE NUMBERS (Average Watershed Condition)

COVER DESCRIPTION		CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP			
Cover type and hydrologic condition	Hydrologic condition[6]	A	B	C	D
NON-CULTIVATED AGRICULTURAL LAND					
Pasture, grassland, or range - continuous forage for grazing	poor	68	79	86	89
	fair	49	69	79	84
	good	39	61	74	80
Meadow - continuous grass, protected from grazing and generally mowed for hay	---	30	58	71	78
Woods-grass combination (orchard or tree farm)	poor	57	73	82	86
	fair	43	65	76	82
	good	32	58	72	79
Brush - brush-weed-grass mixture with brush the major element	poor	48	67	77	83
	fair	35	56	70	77
	good	30	48	65	73
Woods	poor	45	66	77	83
	fair	36	60	73	79
	good	30	55	70	77
Farmsteads - buildings, lanes, driveways, and surrounding lots	---	59	74	82	86

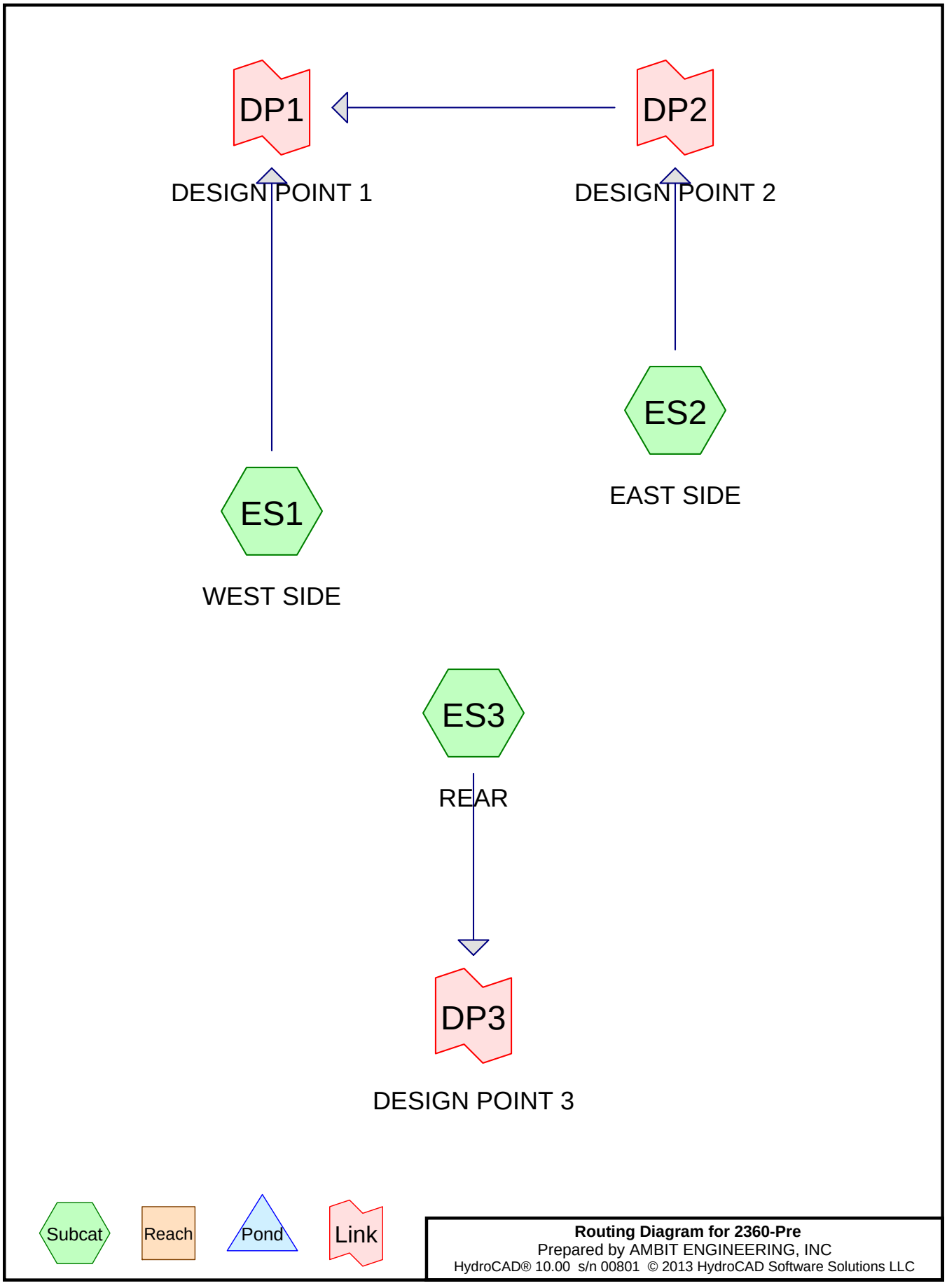
6. Poor hydrologic condition has less than 50 percent ground cover density.
   Fair hydrologic condition has between 50 and 75 percent ground cover density.
   Good hydrologic condition has more than 75 percent ground cover density.

Source: USDA Soil Conservation Service

APPENDIX C

HYDROCAD DRAINAGE

ANALYSIS CALCULATIONS



Routing Diagram for 2360-Pre
Prepared by AMBIT ENGINEERING, INC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
52,004	74	>75% Grass cover, Good, HSG C (ES1, ES2, ES3)
219	96	Gravel surface, HSG C (ES1)
306	98	Paved parking, HSG C (ES1)
536	98	Unconnected pavement, HSG C (ES2, ES3)
9,708	70	Woods, Good, HSG C (ES1, ES2, ES3)
62,773	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
62,773	HSG C	ES1, ES2, ES3
0	HSG D	
0	Other	
62,773		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	52,004	0	0	52,004	>75% Grass cover, Good	
0	0	219	0	0	219	Gravel surface	
0	0	306	0	0	306	Paved parking	
0	0	536	0	0	536	Unconnected pavement	
0	0	9,708	0	0	9,708	Woods, Good	
0	**0**	**62,773**	**0**	**0**	**62,773**	**TOTAL AREA**	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES1: WEST SIDE Runoff Area=27,206 sf 1.12% Impervious Runoff Depth>1.24"
Flow Length=136' Tc=9.3 min CN=74 Runoff=1.31 cfs 2,807 cf

Subcatchment ES2: EAST SIDE Runoff Area=25,730 sf 1.83% Impervious Runoff Depth>1.18"
Flow Length=303' Tc=6.7 min CN=73 Runoff=1.31 cfs 2,529 cf

Subcatchment ES3: REAR Runoff Area=9,837 sf 0.66% Impervious Runoff Depth>1.24"
Tc=0.0 min CN=74 Runoff=0.64 cfs 1,019 cf

Link DP1: DESIGN POINT 1 Inflow=2.59 cfs 5,336 cf
Primary=2.59 cfs 5,336 cf

Link DP2: DESIGN POINT 2 Inflow=1.31 cfs 2,529 cf
Primary=1.31 cfs 2,529 cf

Link DP3: DESIGN POINT 3 Inflow=0.64 cfs 1,019 cf
Primary=0.64 cfs 1,019 cf

Total Runoff Area = 62,773 sf Runoff Volume = 6,355 cf Average Runoff Depth = 1.21"
98.66% Pervious = 61,931 sf 1.34% Impervious = 842 sf

Summary for Subcatchment ES1: WEST SIDE

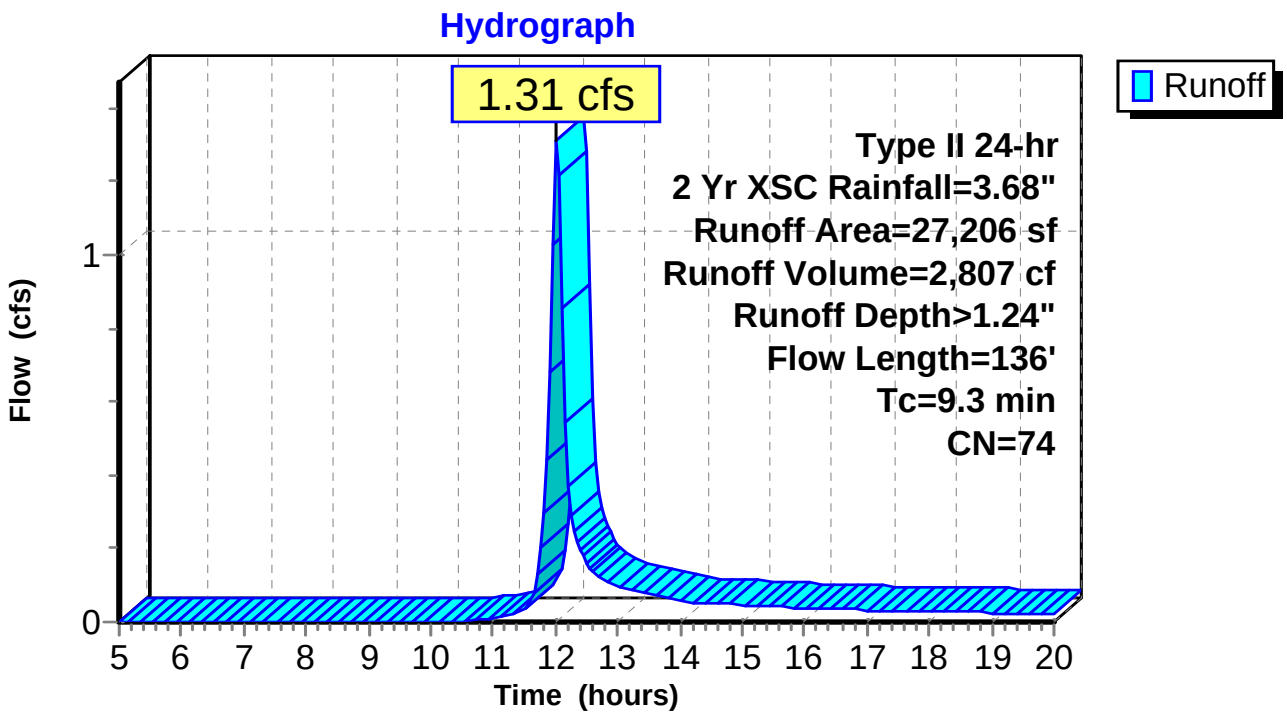
Runoff = 1.31 cfs @ 12.01 hrs, Volume= 2,807 cf, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

Area (sf)	CN	Description
306	98	Paved parking, HSG C
26,198	74	>75% Grass cover, Good, HSG C
483	70	Woods, Good, HSG C
219	96	Gravel surface, HSG C
27,206	74	Weighted Average
26,900		98.88% Pervious Area
306		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.2	36	0.0660	3.85		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
9.3	136	Total			

Subcatchment ES1: WEST SIDE



Summary for Subcatchment ES2: EAST SIDE

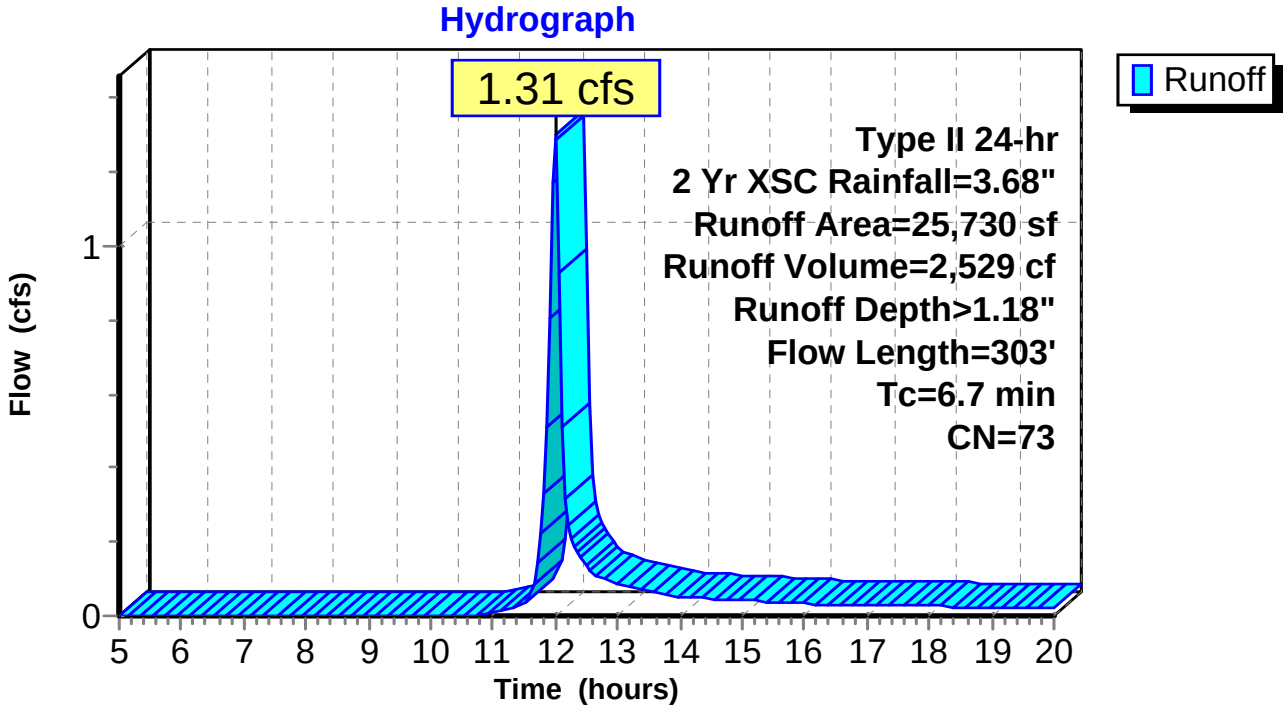
Runoff = 1.31 cfs @ 11.99 hrs, Volume= 2,529 cf, Depth> 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

Area (sf)	CN	Description
16,075	74	>75% Grass cover, Good, HSG C
471	98	Unconnected pavement, HSG C
2,795	70	Woods, Good, HSG C
6,389	70	Woods, Good, HSG C
25,730	73	Weighted Average
25,259		98.17% Pervious Area
471		1.83% Impervious Area
471		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0630	0.29		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.9	203	0.0640	3.79		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
6.7	303	Total			

Subcatchment ES2: EAST SIDE



Summary for Subcatchment ES3: REAR

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

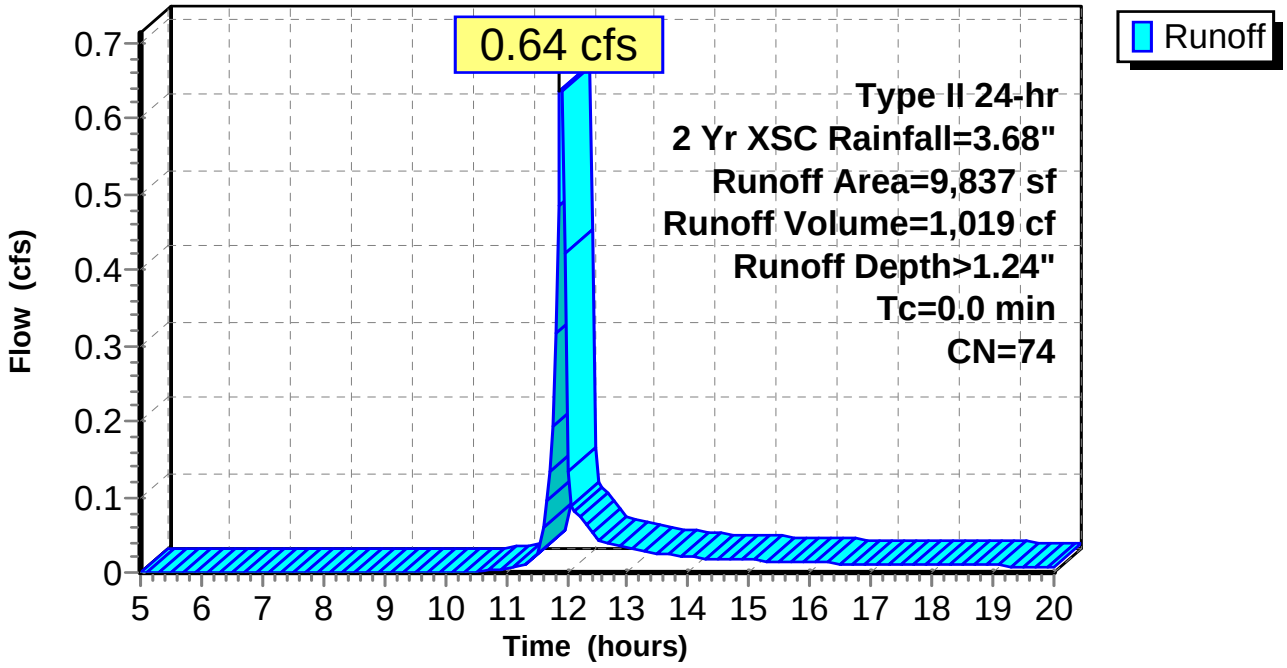
Runoff = 0.64 cfs @ 11.90 hrs, Volume= 1,019 cf, Depth> 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

Area (sf)	CN	Description
9,731	74	>75% Grass cover, Good, HSG C
65	98	Unconnected pavement, HSG C
41	70	Woods, Good, HSG C
9,837	74	Weighted Average
9,772		99.34% Pervious Area
65		0.66% Impervious Area
65		100.00% Unconnected

Subcatchment ES3: REAR

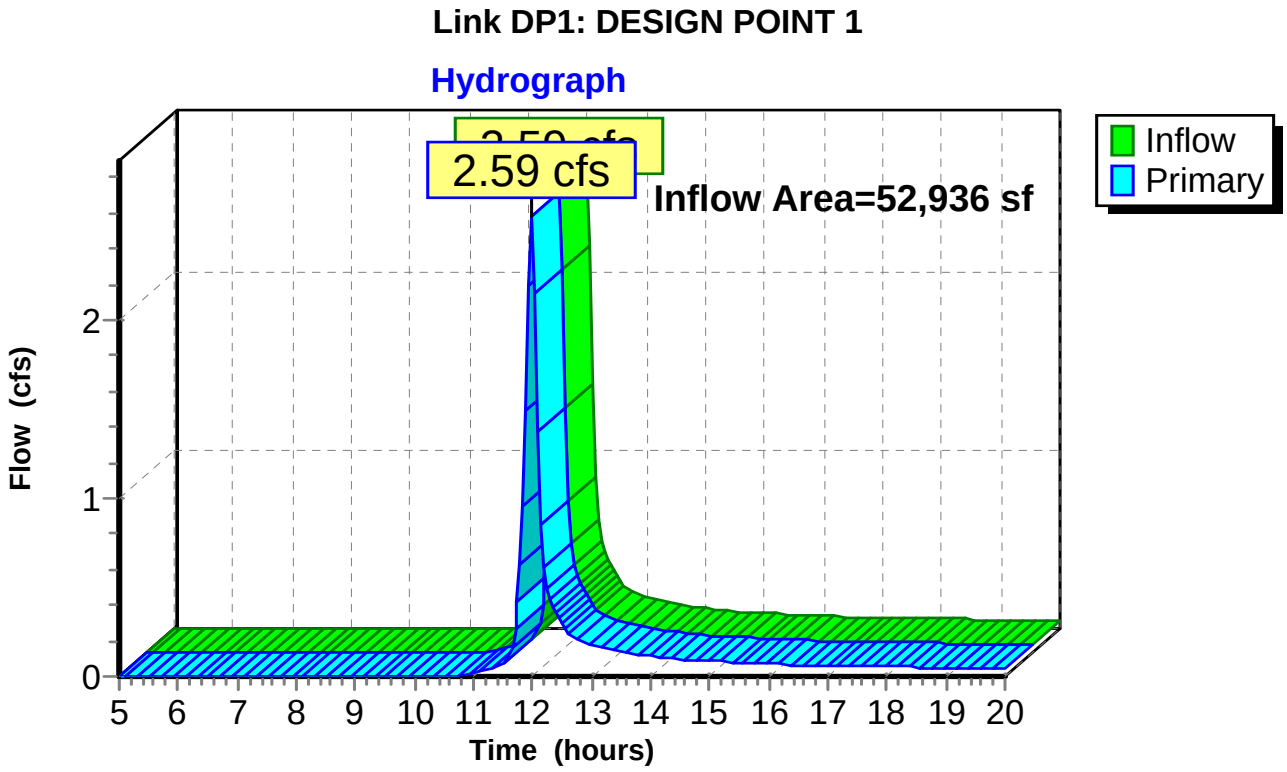
Hydrograph



Summary for Link DP1: DESIGN POINT 1

Inflow Area = 52,936 sf, 1.47% Impervious, Inflow Depth > 1.21" for 2 Yr XSC event
Inflow = 2.59 cfs @ 12.00 hrs, Volume= 5,336 cf
Primary = 2.59 cfs @ 12.00 hrs, Volume= 5,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

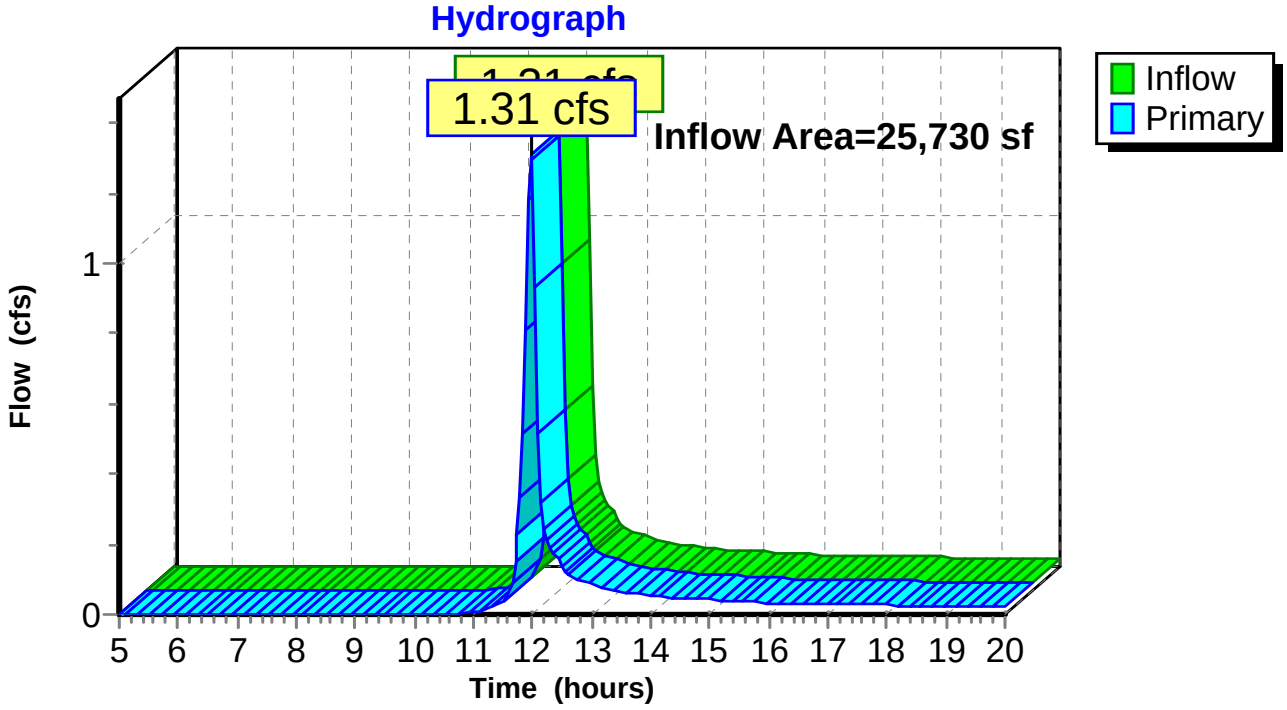


Summary for Link DP2: DESIGN POINT 2

Inflow Area = 25,730 sf, 1.83% Impervious, Inflow Depth > 1.18" for 2 Yr XSC event
Inflow = 1.31 cfs @ 11.99 hrs, Volume= 2,529 cf
Primary = 1.31 cfs @ 11.99 hrs, Volume= 2,529 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP2: DESIGN POINT 2

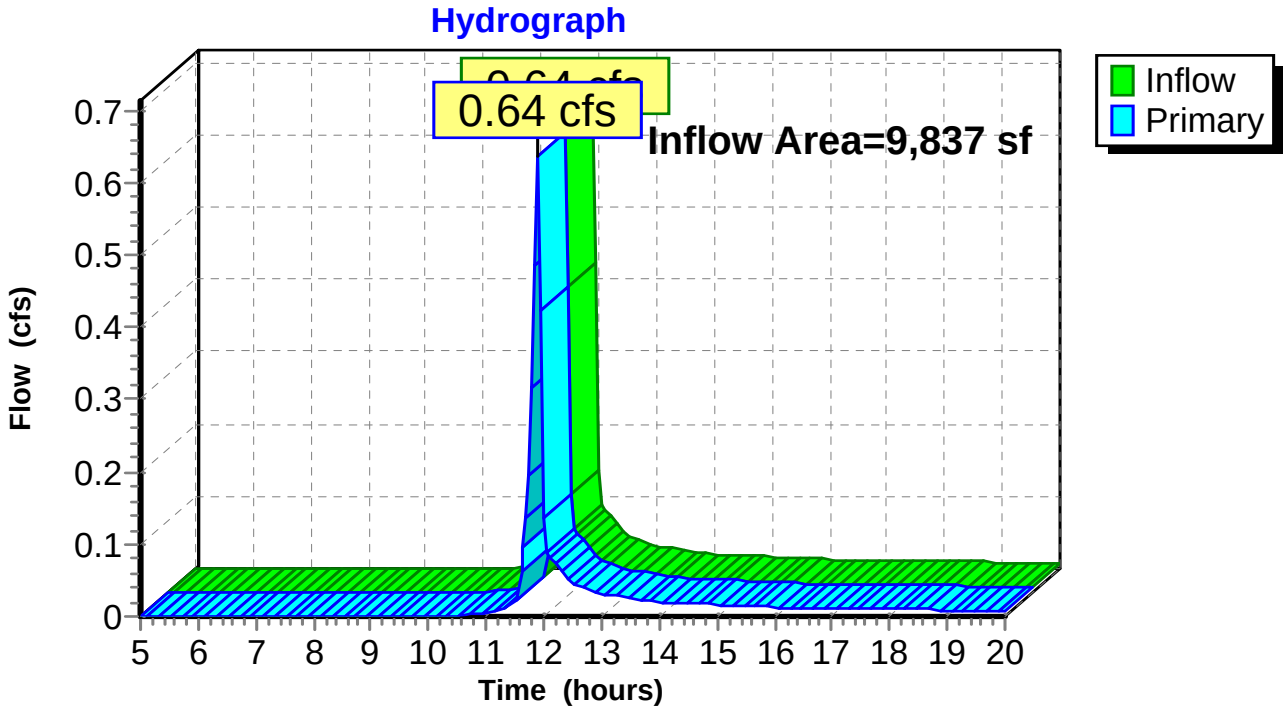


Summary for Link DP3: DESIGN POINT 3

Inflow Area = 9,837 sf, 0.66% Impervious, Inflow Depth > 1.24" for 2 Yr XSC event
Inflow = 0.64 cfs @ 11.90 hrs, Volume= 1,019 cf
Primary = 0.64 cfs @ 11.90 hrs, Volume= 1,019 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP3: DESIGN POINT 3



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES1: WEST SIDE Runoff Area=27,206 sf 1.12% Impervious Runoff Depth>2.62"
Flow Length=136' Tc=9.3 min CN=74 Runoff=2.77 cfs 5,932 cf

Subcatchment ES2: EAST SIDE Runoff Area=25,730 sf 1.83% Impervious Runoff Depth>2.53"
Flow Length=303' Tc=6.7 min CN=73 Runoff=2.77 cfs 5,426 cf

Subcatchment ES3: REAR Runoff Area=9,837 sf 0.66% Impervious Runoff Depth>2.62"
Tc=0.0 min CN=74 Runoff=1.31 cfs 2,152 cf

Link DP1: DESIGN POINT 1 Inflow=5.48 cfs 11,358 cf
Primary=5.48 cfs 11,358 cf

Link DP2: DESIGN POINT 2 Inflow=2.77 cfs 5,426 cf
Primary=2.77 cfs 5,426 cf

Link DP3: DESIGN POINT 3 Inflow=1.31 cfs 2,152 cf
Primary=1.31 cfs 2,152 cf

Total Runoff Area = 62,773 sf Runoff Volume = 13,510 cf Average Runoff Depth = 2.58"
98.66% Pervious = 61,931 sf 1.34% Impervious = 842 sf

Summary for Subcatchment ES1: WEST SIDE

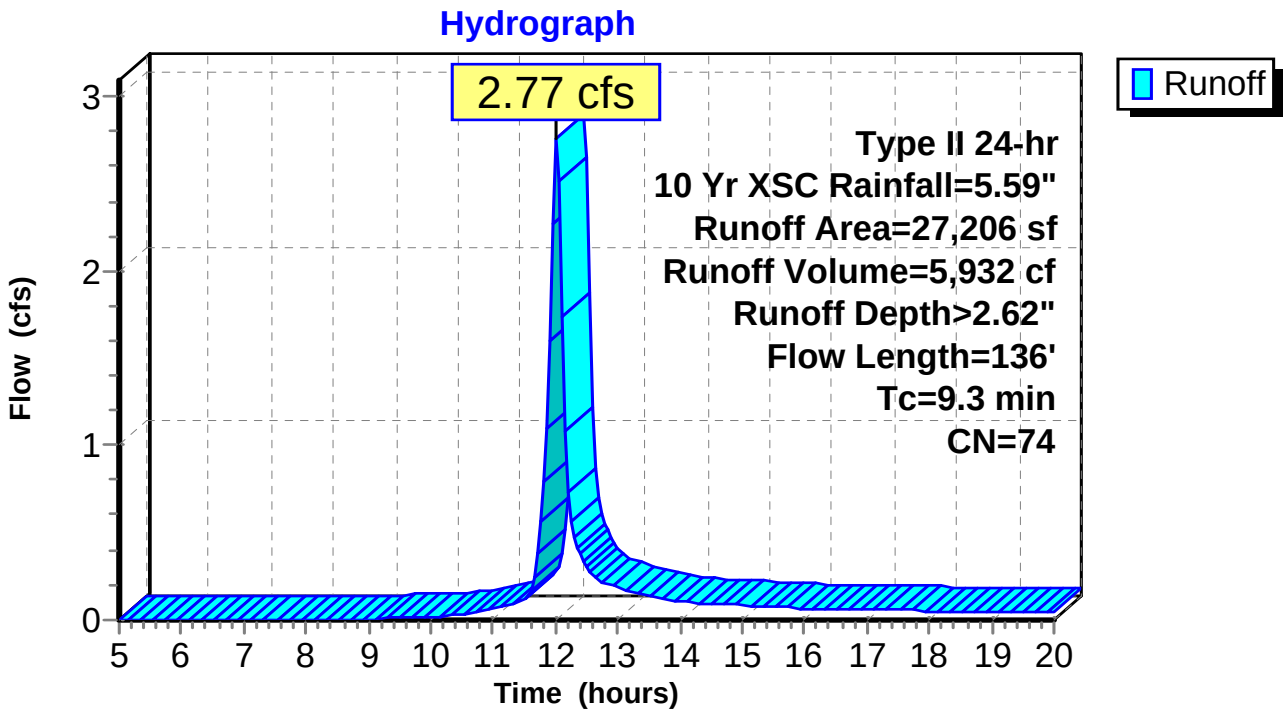
Runoff = 2.77 cfs @ 12.01 hrs, Volume= 5,932 cf, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

Area (sf)	CN	Description
306	98	Paved parking, HSG C
26,198	74	>75% Grass cover, Good, HSG C
483	70	Woods, Good, HSG C
219	96	Gravel surface, HSG C
27,206	74	Weighted Average
26,900		98.88% Pervious Area
306		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.2	36	0.0660	3.85		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
9.3	136	Total			

Subcatchment ES1: WEST SIDE



Summary for Subcatchment ES2: EAST SIDE

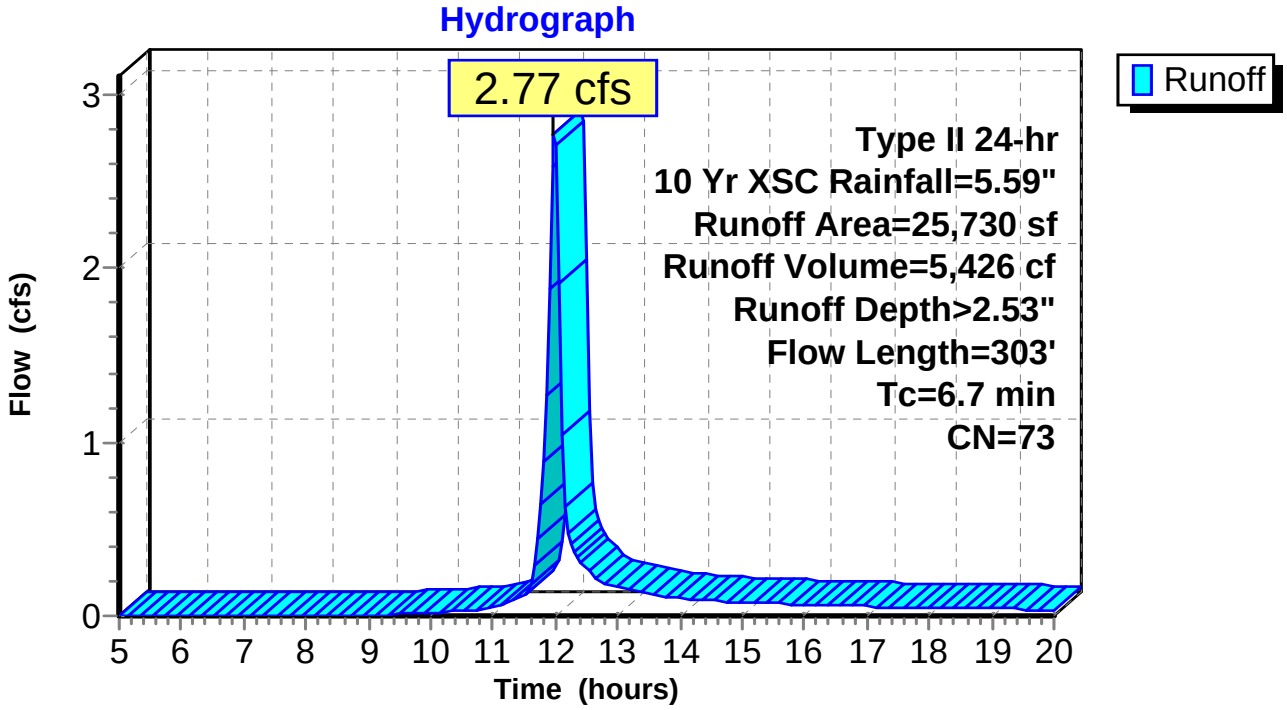
Runoff = 2.77 cfs @ 11.98 hrs, Volume= 5,426 cf, Depth> 2.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

Area (sf)	CN	Description
16,075	74	>75% Grass cover, Good, HSG C
471	98	Unconnected pavement, HSG C
2,795	70	Woods, Good, HSG C
6,389	70	Woods, Good, HSG C
25,730	73	Weighted Average
25,259		98.17% Pervious Area
471		1.83% Impervious Area
471		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0630	0.29		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.9	203	0.0640	3.79		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
6.7	303	Total			

Subcatchment ES2: EAST SIDE



Summary for Subcatchment ES3: REAR

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

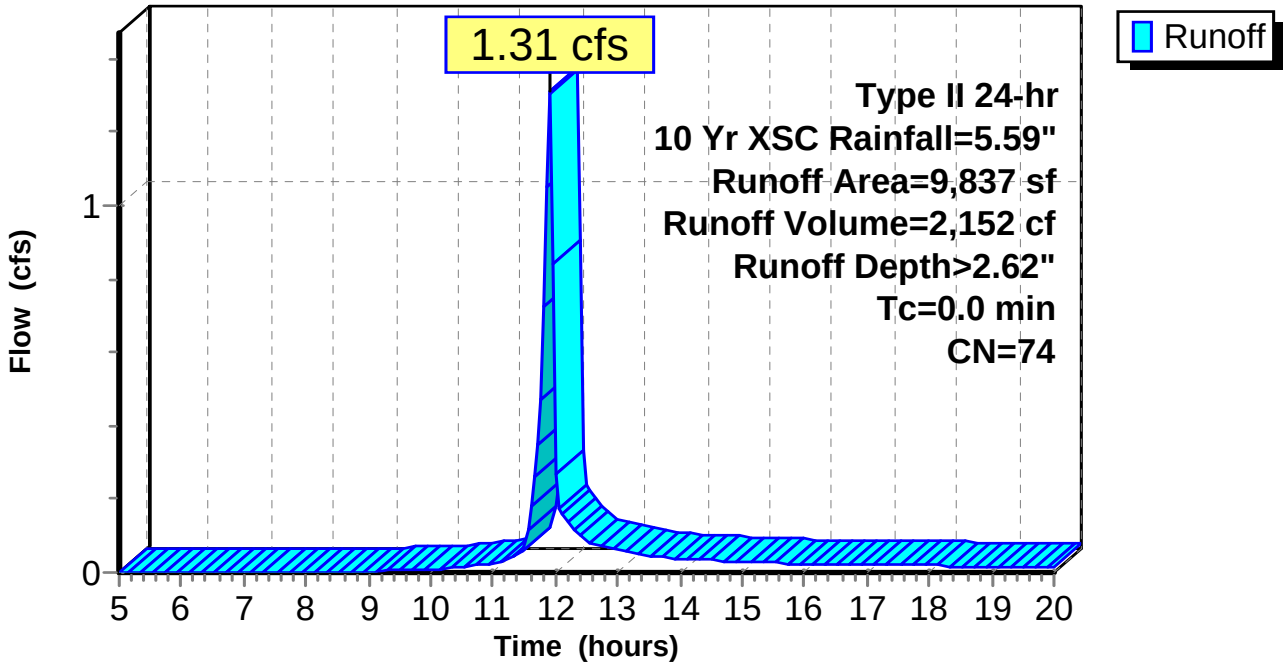
Runoff = 1.31 cfs @ 11.89 hrs, Volume= 2,152 cf, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

Area (sf)	CN	Description
9,731	74	>75% Grass cover, Good, HSG C
65	98	Unconnected pavement, HSG C
41	70	Woods, Good, HSG C
9,837	74	Weighted Average
9,772		99.34% Pervious Area
65		0.66% Impervious Area
65		100.00% Unconnected

Subcatchment ES3: REAR

Hydrograph



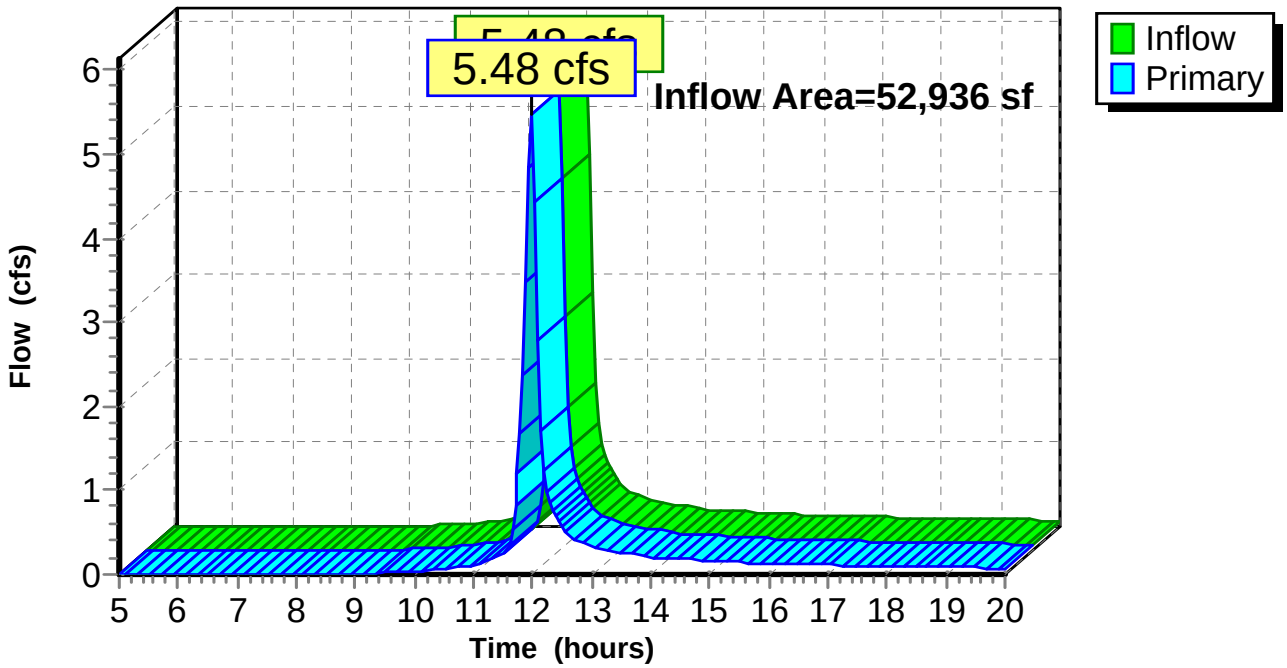
Summary for Link DP1: DESIGN POINT 1

Inflow Area = 52,936 sf, 1.47% Impervious, Inflow Depth > 2.57" for 10 Yr XSC event
Inflow = 5.48 cfs @ 11.99 hrs, Volume= 11,358 cf
Primary = 5.48 cfs @ 11.99 hrs, Volume= 11,358 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP1: DESIGN POINT 1

Hydrograph

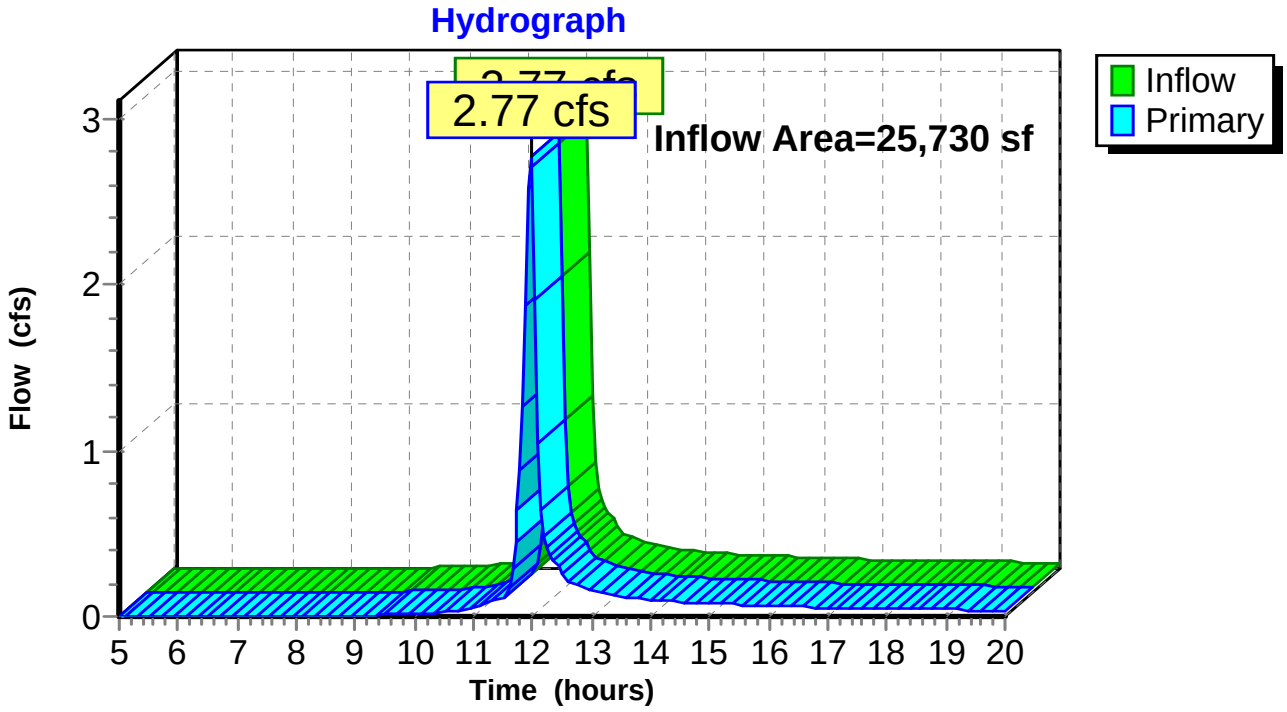


Summary for Link DP2: DESIGN POINT 2

Inflow Area = 25,730 sf, 1.83% Impervious, Inflow Depth > 2.53" for 10 Yr XSC event
Inflow = 2.77 cfs @ 11.98 hrs, Volume= 5,426 cf
Primary = 2.77 cfs @ 11.98 hrs, Volume= 5,426 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP2: DESIGN POINT 2

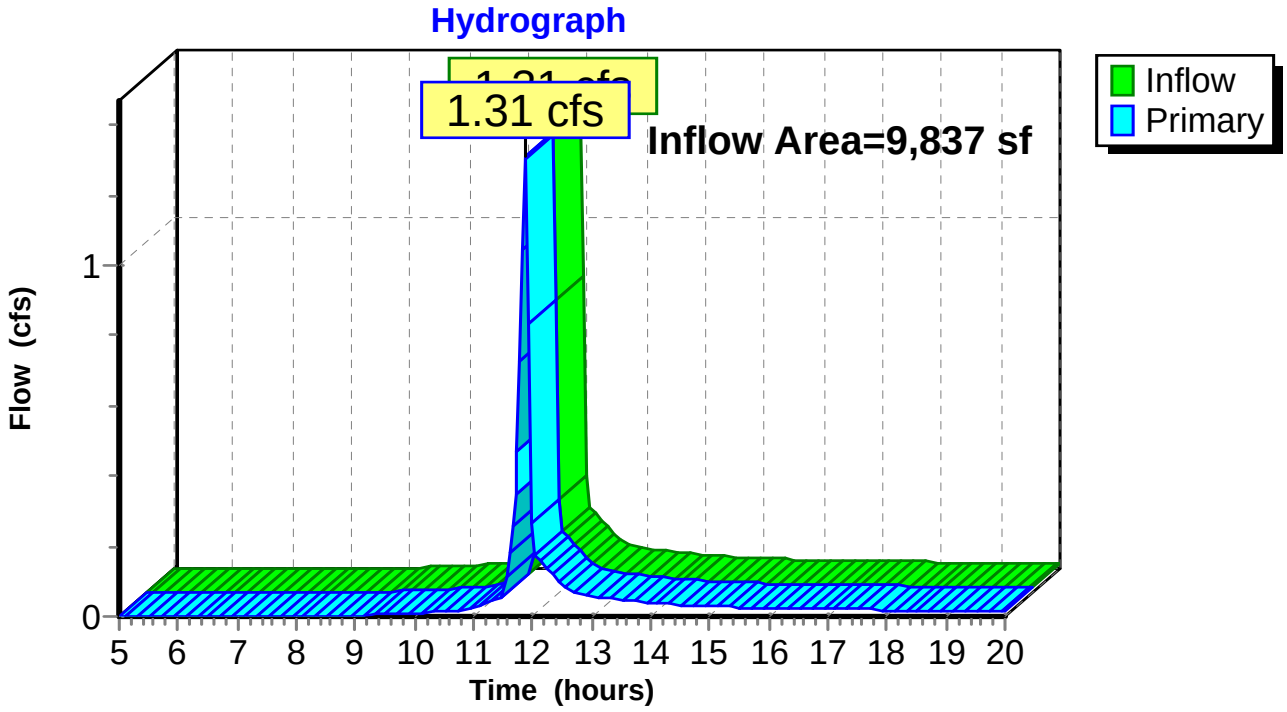


Summary for Link DP3: DESIGN POINT 3

Inflow Area = 9,837 sf, 0.66% Impervious, Inflow Depth > 2.62" for 10 Yr XSC event
Inflow = 1.31 cfs @ 11.89 hrs, Volume= 2,152 cf
Primary = 1.31 cfs @ 11.89 hrs, Volume= 2,152 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP3: DESIGN POINT 3



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment ES1: WEST SIDE Runoff Area=27,206 sf 1.12% Impervious Runoff Depth>4.99"
Flow Length=136' Tc=9.3 min CN=74 Runoff=5.14 cfs 11,308 cf

Subcatchment ES2: EAST SIDE Runoff Area=25,730 sf 1.83% Impervious Runoff Depth>4.88"
Flow Length=303' Tc=6.7 min CN=73 Runoff=5.19 cfs 10,453 cf

Subcatchment ES3: REAR Runoff Area=9,837 sf 0.66% Impervious Runoff Depth>5.00"
Tc=0.0 min CN=74 Runoff=2.41 cfs 4,100 cf

Link DP1: DESIGN POINT 1 Inflow=10.23 cfs 21,761 cf
Primary=10.23 cfs 21,761 cf

Link DP2: DESIGN POINT 2 Inflow=5.19 cfs 10,453 cf
Primary=5.19 cfs 10,453 cf

Link DP3: DESIGN POINT 3 Inflow=2.41 cfs 4,100 cf
Primary=2.41 cfs 4,100 cf

Total Runoff Area = 62,773 sf Runoff Volume = 25,862 cf Average Runoff Depth = 4.94"
98.66% Pervious = 61,931 sf 1.34% Impervious = 842 sf

Summary for Subcatchment ES1: WEST SIDE

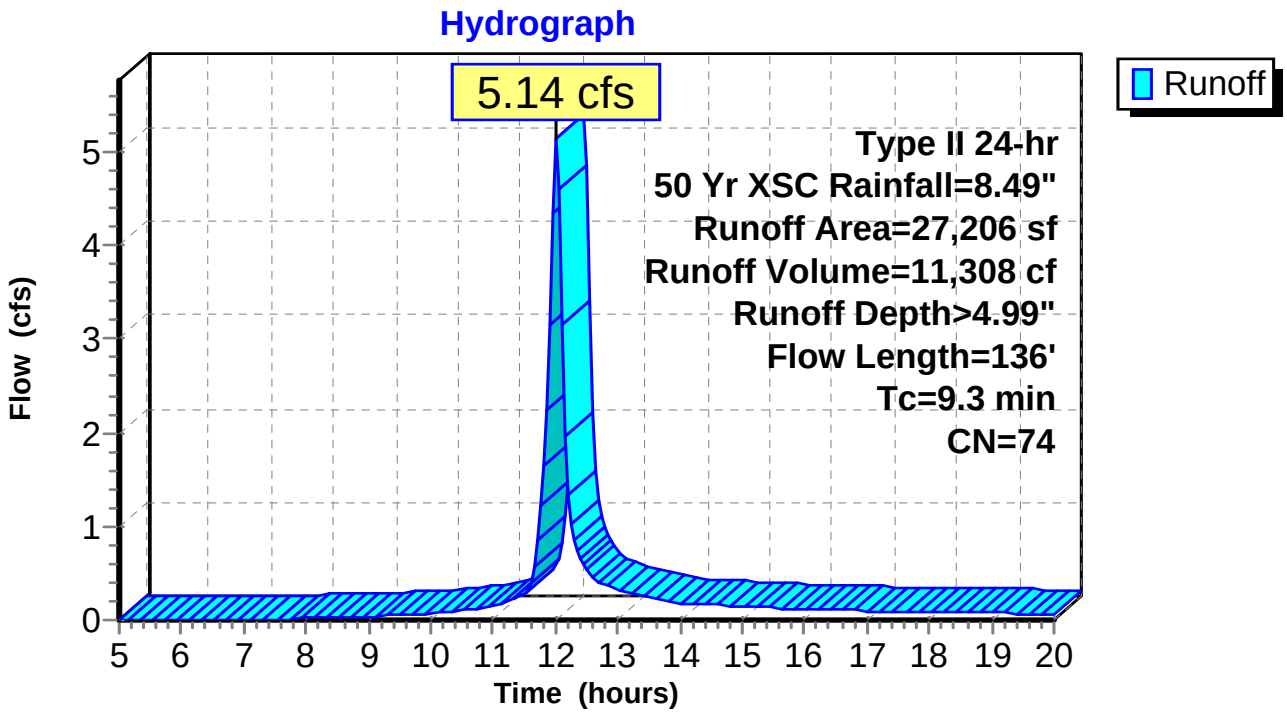
Runoff = 5.14 cfs @ 12.01 hrs, Volume= 11,308 cf, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

Area (sf)	CN	Description
306	98	Paved parking, HSG C
26,198	74	>75% Grass cover, Good, HSG C
483	70	Woods, Good, HSG C
219	96	Gravel surface, HSG C
27,206	74	Weighted Average
26,900		98.88% Pervious Area
306		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.0200	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.2	36	0.0660	3.85		**Shallow Concentrated Flow, grass** Grassed Waterway Kv= 15.0 fps
9.3	136	Total			

Subcatchment ES1: WEST SIDE



Summary for Subcatchment ES2: EAST SIDE

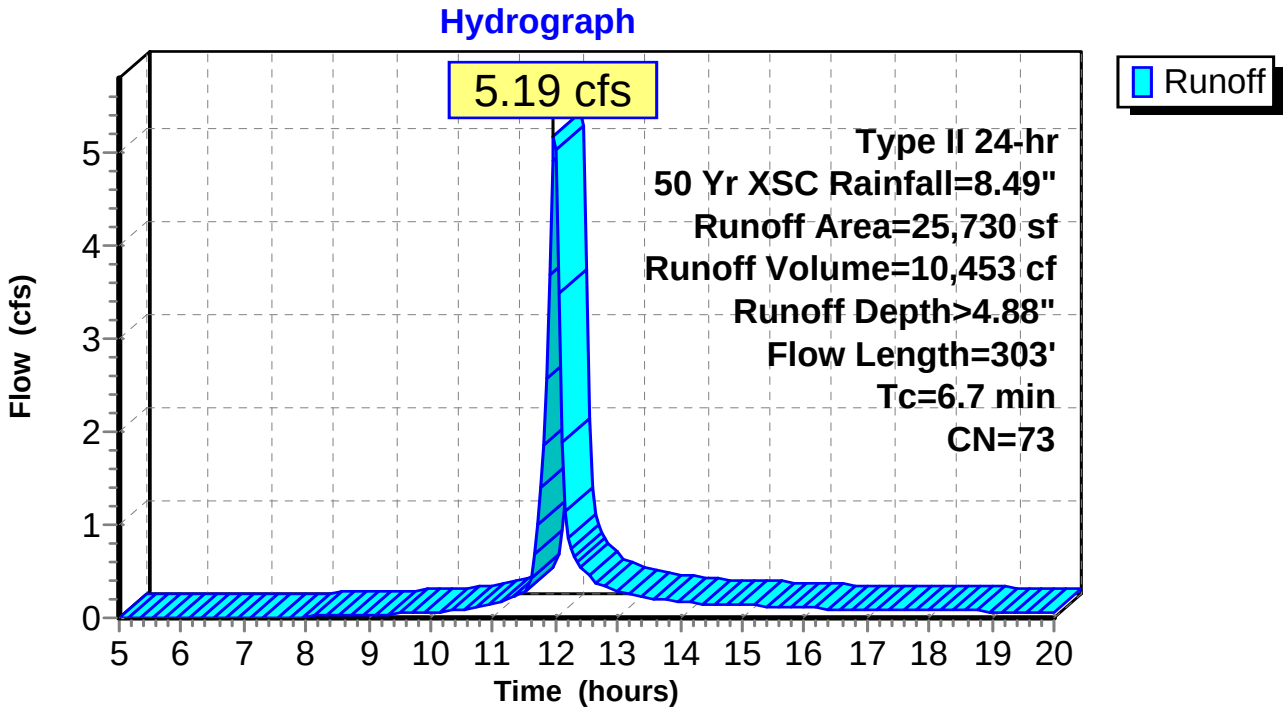
Runoff = 5.19 cfs @ 11.98 hrs, Volume= 10,453 cf, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

Area (sf)	CN	Description
16,075	74	>75% Grass cover, Good, HSG C
471	98	Unconnected pavement, HSG C
2,795	70	Woods, Good, HSG C
6,389	70	Woods, Good, HSG C
25,730	73	Weighted Average
25,259		98.17% Pervious Area
471		1.83% Impervious Area
471		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	100	0.0630	0.29		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.68"
0.9	203	0.0640	3.79		**Shallow Concentrated Flow, Shallow Concentrated** Grassed Waterway Kv= 15.0 fps
6.7	303	Total			

Subcatchment ES2: EAST SIDE



Summary for Subcatchment ES3: REAR

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

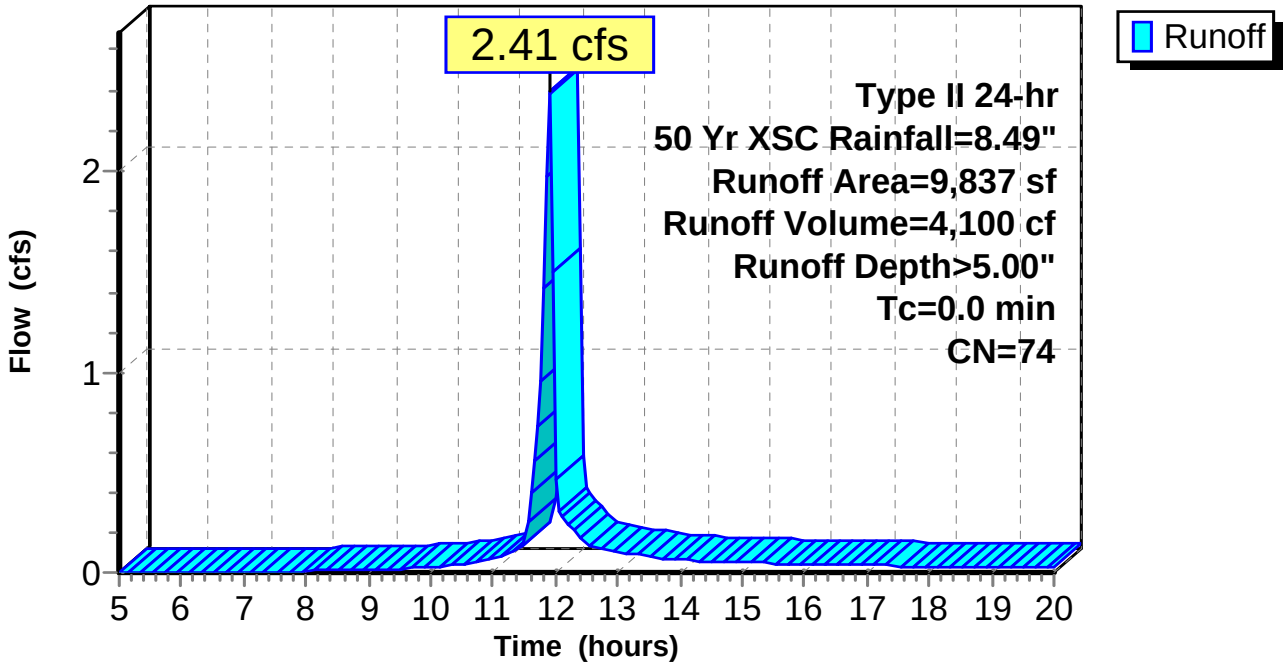
Runoff = 2.41 cfs @ 11.89 hrs, Volume= 4,100 cf, Depth> 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

Area (sf)	CN	Description
9,731	74	>75% Grass cover, Good, HSG C
65	98	Unconnected pavement, HSG C
41	70	Woods, Good, HSG C
9,837	74	Weighted Average
9,772		99.34% Pervious Area
65		0.66% Impervious Area
65		100.00% Unconnected

Subcatchment ES3: REAR

Hydrograph

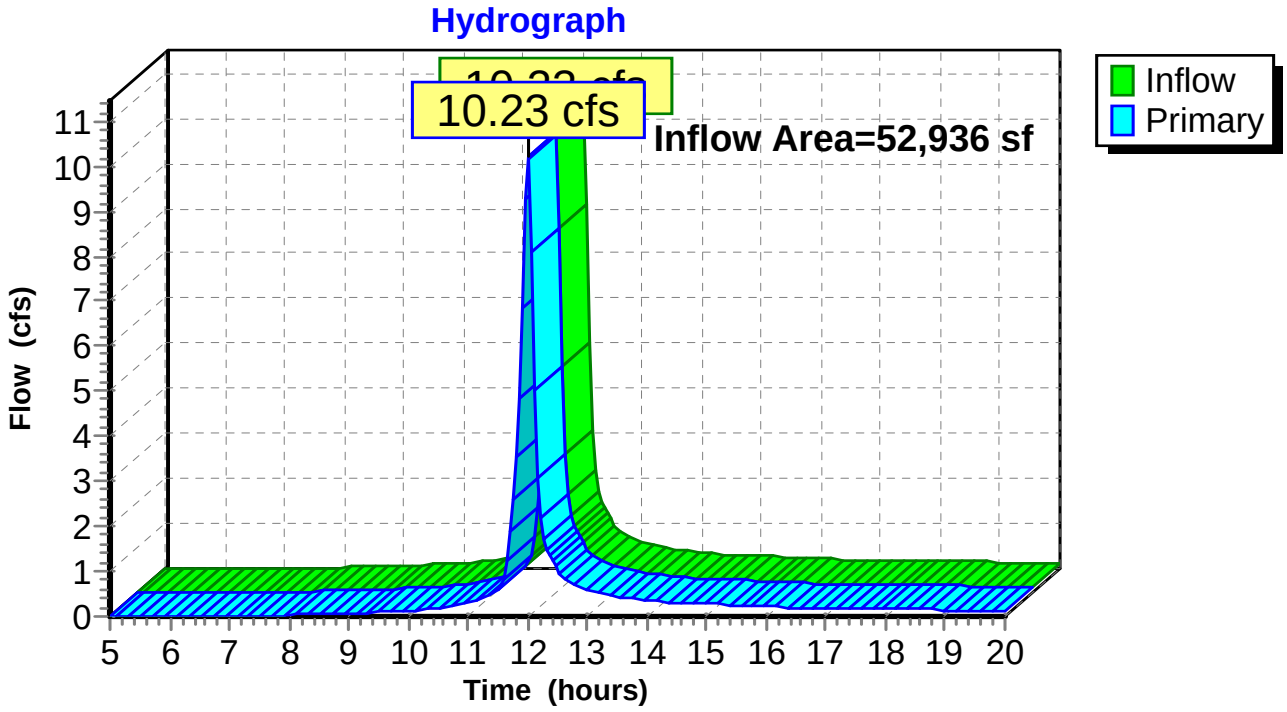


Summary for Link DP1: DESIGN POINT 1

Inflow Area = 52,936 sf, 1.47% Impervious, Inflow Depth > 4.93" for 50 Yr XSC event
Inflow = 10.23 cfs @ 11.99 hrs, Volume= 21,761 cf
Primary = 10.23 cfs @ 11.99 hrs, Volume= 21,761 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP1: DESIGN POINT 1

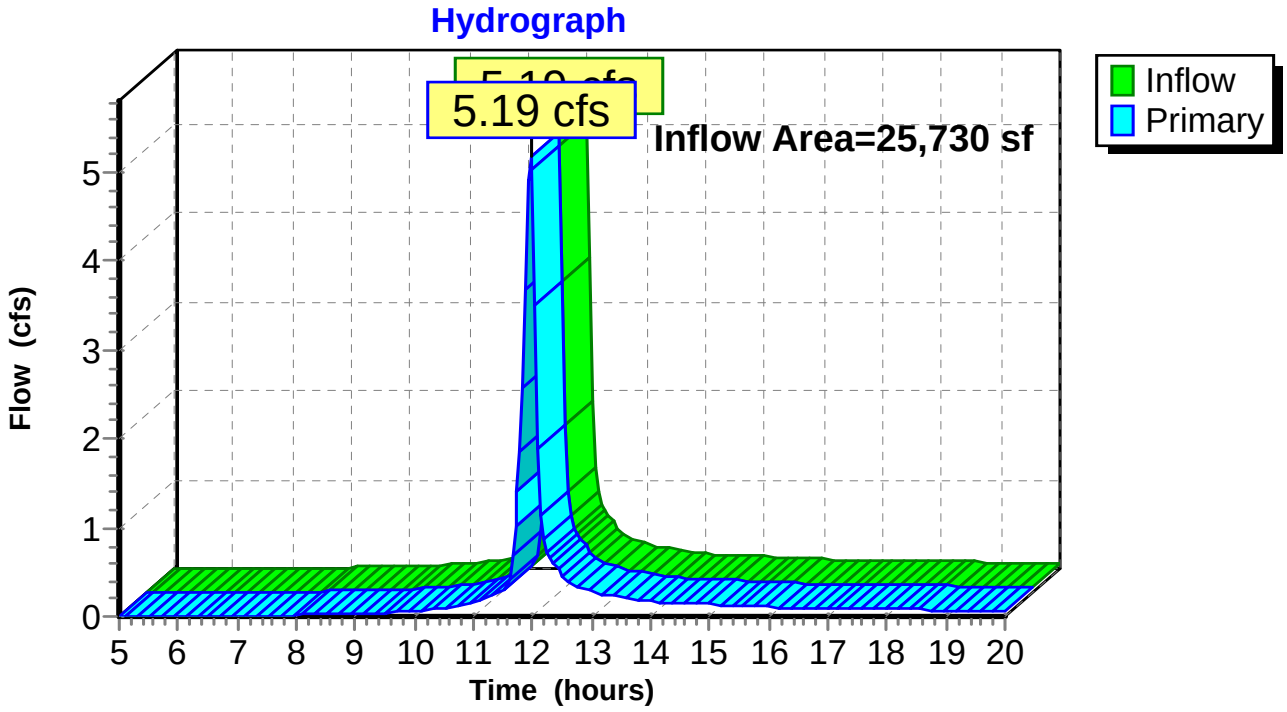


Summary for Link DP2: DESIGN POINT 2

Inflow Area = 25,730 sf, 1.83% Impervious, Inflow Depth > 4.88" for 50 Yr XSC event
Inflow = 5.19 cfs @ 11.98 hrs, Volume= 10,453 cf
Primary = 5.19 cfs @ 11.98 hrs, Volume= 10,453 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP2: DESIGN POINT 2

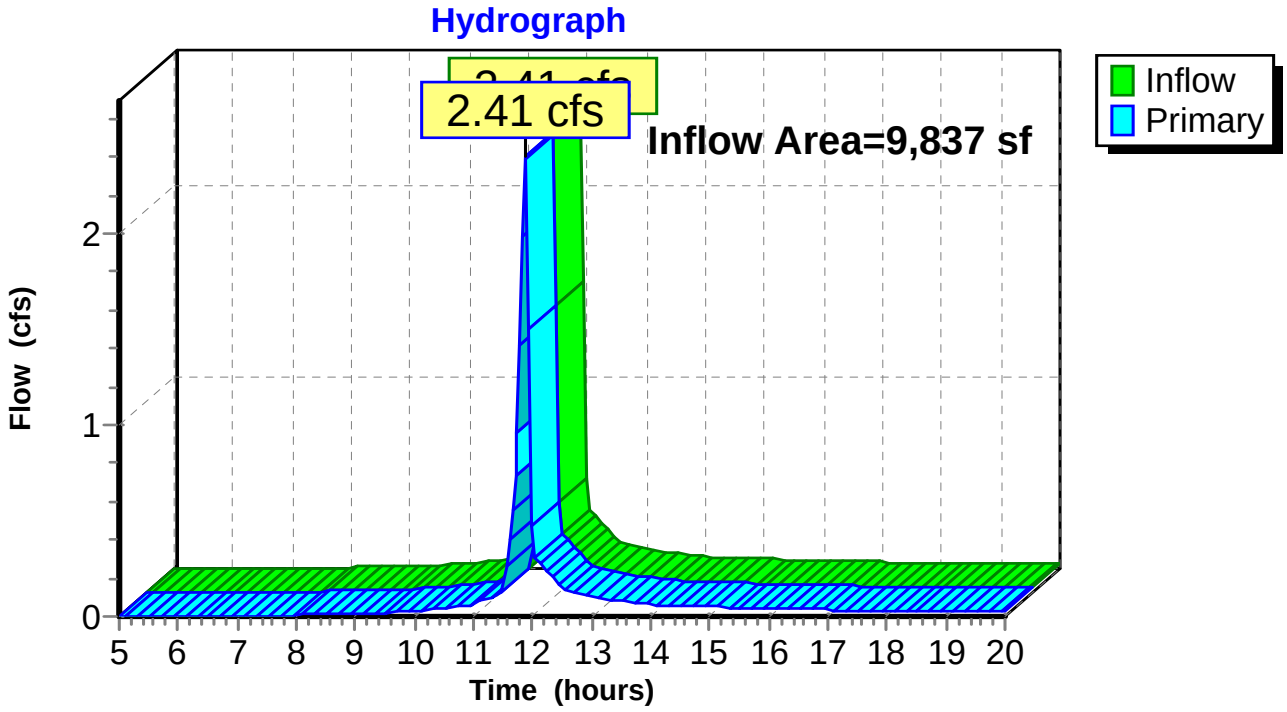


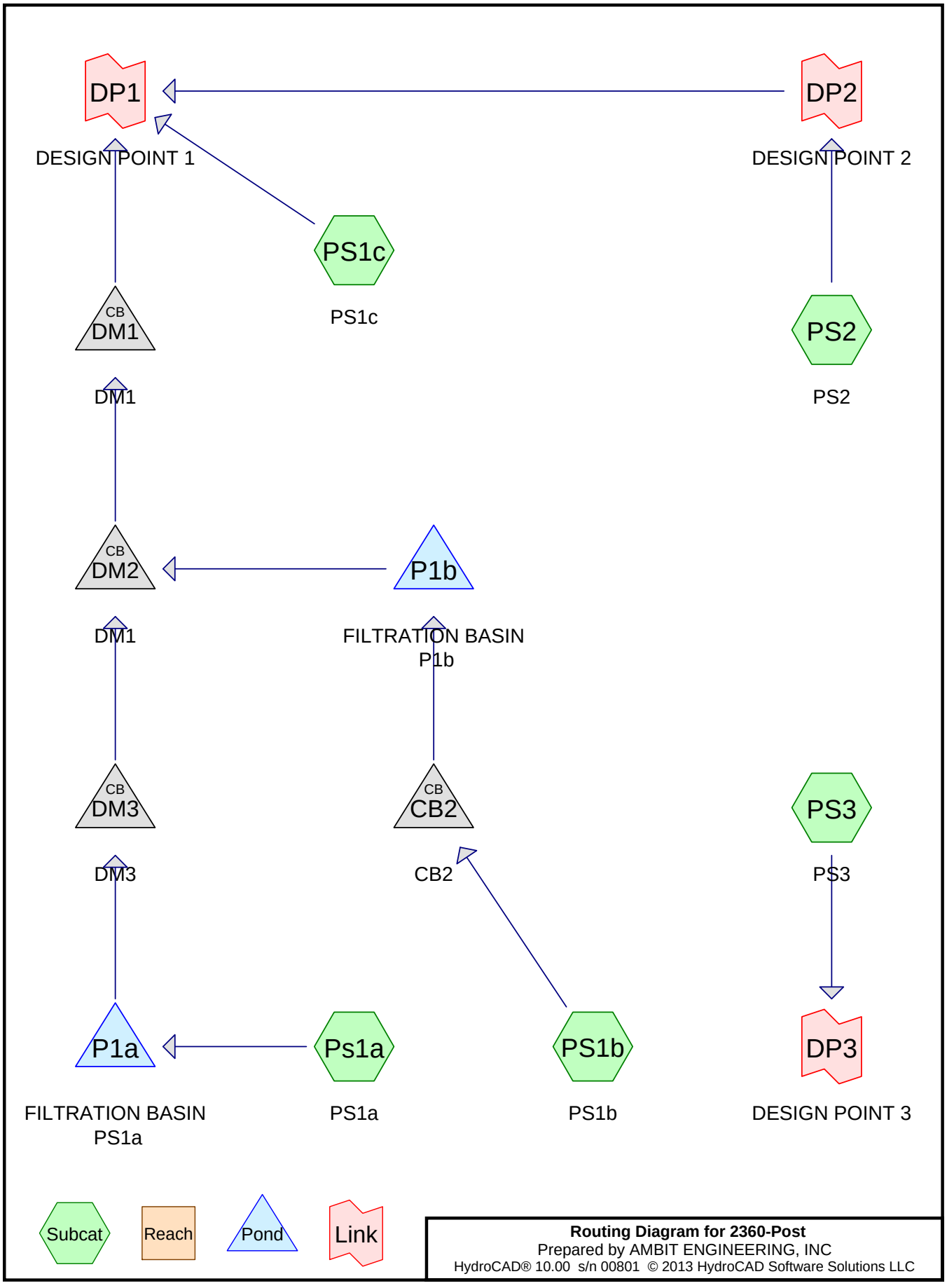
Summary for Link DP3: DESIGN POINT 3

Inflow Area = 9,837 sf, 0.66% Impervious, Inflow Depth > 5.00" for 50 Yr XSC event
Inflow = 2.41 cfs @ 11.89 hrs, Volume= 4,100 cf
Primary = 2.41 cfs @ 11.89 hrs, Volume= 4,100 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link DP3: DESIGN POINT 3




DP1
DESIGN POINT 1
DP2
DESIGN POINT 2
PS1c
PS1c
CB
DM1
DM1
PS2
PS2
CB
DM2
P1b
DM1
FILTRATION BASIN
P1b
CB
DM3
CB
CB2
PS3
DM3
CB2
PS3
P1a
Ps1a
PS1b
DP3
FILTRATION BASIN
PS1a
PS1a
PS1b
DESIGN POINT 3
Subcat
Reach
Pond
Link
Routing Diagram for 2360-Post
Prepared by AMBIT ENGINEERING, INC
HydroCAD® 10.00 s/n 00801 © 2013 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
25,523	74	>75% Grass cover, Good, HSG C (Ps1a, PS1b, PS1c, PS2, PS3)
819	98	Conc Walk HSG C (PS1b)
475	98	Conc Walk, HSG C (Ps1a)
30,695	98	Paved parking, HSG C (Ps1a, PS1b, PS1c)
4,444	98	Roofs, HSG C (Ps1a, PS1b, PS2)
820	98	Unconnected wall, HSG C (PS1b, PS1c, PS2, PS3)
62,776	**88**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
62,776	HSG C	Ps1a, PS1b, PS1c, PS2, PS3
0	HSG D	
0	Other	
62,776		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	25,523	0	0	25,523	>75% Grass cover, Good	
0	0	1,294	0	0	1,294	Conc Walk	
0	0	30,695	0	0	30,695	Paved parking	
0	0	4,444	0	0	4,444	Roofs	
0	0	820	0	0	820	Unconnected wall	
0	**0**	**62,776**	**0**	**0**	**62,776**	**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	39.70	38.50	20.0	0.0600	0.013	12.0	0.0	0.0
2	DM1	27.00	26.85	1.0	0.1500	0.011	15.0	0.0	0.0
3	DM2	40.10	33.00	99.0	0.0717	0.013	12.0	0.0	0.0
4	DM3	53.55	45.00	163.0	0.0525	0.013	12.0	0.0	0.0
5	P1a	53.67	53.65	35.0	0.0006	0.013	6.0	0.0	0.0
6	P1b	36.75	25.65	111.0	0.1000	0.013	8.0	0.0	0.0

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

Subcatchment Ps1a: PS1a Runoff Area=23,312 sf 79.26% Impervious Runoff Depth>2.91"
Tc=135.0 min CN=93 Runoff=0.45 cfs 5,651 cf

Subcatchment PS1b: PS1b Runoff Area=16,596 sf 65.26% Impervious Runoff Depth>2.62"
Tc=135.0 min CN=90 Runoff=0.29 cfs 3,619 cf

Subcatchment PS1c: PS1c Runoff Area=12,523 sf 53.49% Impervious Runoff Depth=2.34"
Tc=5.0 min CN=87 Runoff=1.19 cfs 2,447 cf

Subcatchment PS2: PS2 Runoff Area=5,767 sf 18.66% Impervious Runoff Depth=1.64"
Tc=0.0 min CN=78 Runoff=0.45 cfs 786 cf

Subcatchment PS3: PS3 Runoff Area=4,578 sf 3.78% Impervious Runoff Depth=1.37"
Tc=0.0 min UI Adjusted CN=74 Runoff=0.30 cfs 521 cf

Pond CB2: CB2 Peak Elev=40.00' Inflow=0.29 cfs 3,619 cf
Outflow=0.29 cfs 3,619 cf

Pond DM1: DM1 Peak Elev=27.00' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=1.0' S=0.1500 '/' Outflow=0.00 cfs 0 cf

Pond DM2: DM1 Peak Elev=40.10' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.013 L=99.0' S=0.0717 '/' Outflow=0.00 cfs 0 cf

Pond DM3: DM3 Peak Elev=53.55' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.013 L=163.0' S=0.0525 '/' Outflow=0.00 cfs 0 cf

Pond P1a: FILTRATION BASIN PS1a Peak Elev=54.56' Storage=702 cf Inflow=0.45 cfs 5,651 cf
Discarded=0.28 cfs 5,651 cf Primary=0.00 cfs 0 cf Outflow=0.28 cfs 5,651 cf

Pond P1b: FILTRATION BASIN P1b Peak Elev=36.48' Storage=634 cf Inflow=0.29 cfs 3,619 cf
Discarded=0.15 cfs 3,619 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 3,619 cf

Link DP1: DESIGN POINT 1 Inflow=1.49 cfs 3,233 cf
Primary=1.49 cfs 3,233 cf

Link DP2: DESIGN POINT 2 Inflow=0.45 cfs 786 cf
Primary=0.45 cfs 786 cf

Link DP3: DESIGN POINT 3 Inflow=0.30 cfs 521 cf
Primary=0.30 cfs 521 cf

Total Runoff Area = 62,776 sf Runoff Volume = 13,024 cf Average Runoff Depth = 2.49"
40.66% Pervious = 25,523 sf 59.34% Impervious = 37,253 sf

Summary for Subcatchment Ps1a: PS1a

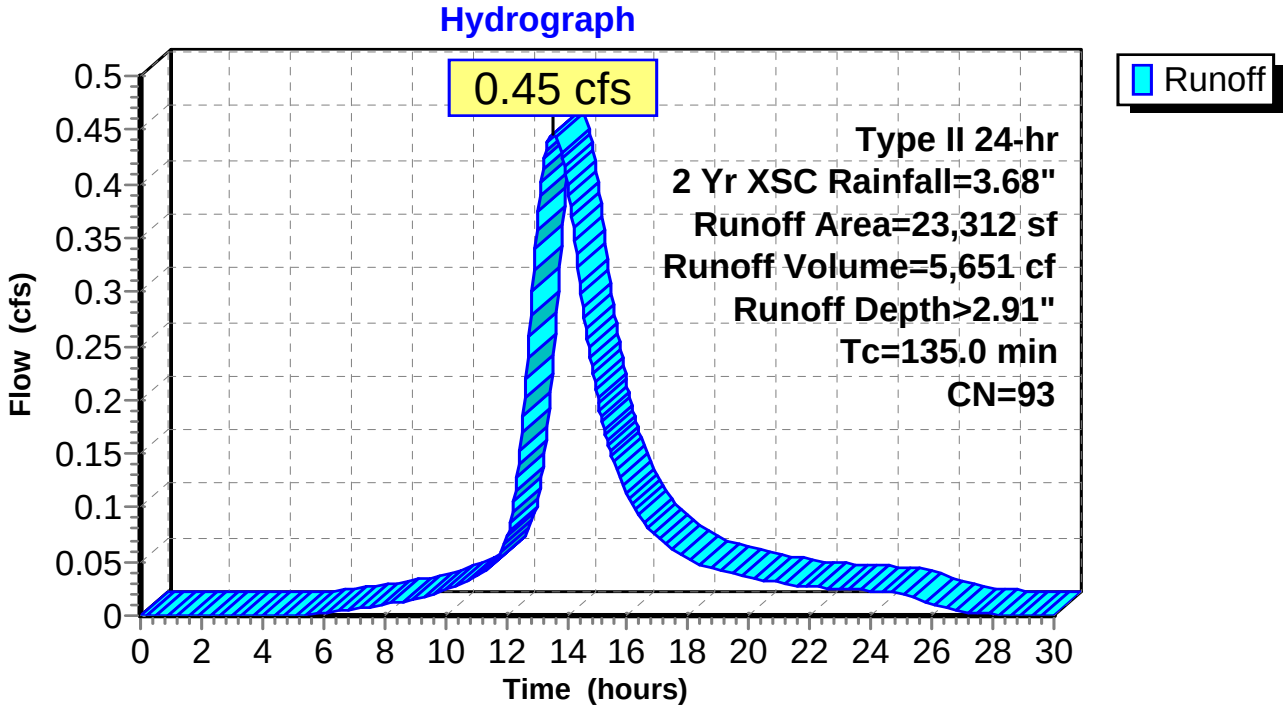
Runoff = 0.45 cfs @ 13.56 hrs, Volume= 5,651 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

	Area (sf)	CN	Description
	16,073	98	Paved parking, HSG C
*	475	98	Conc Walk, HSG C
	1,928	98	Roofs, HSG C
	4,836	74	>75% Grass cover, Good, HSG C
	23,312	93	Weighted Average
	4,836		20.74% Pervious Area
	18,476		79.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
135.0					**Direct Entry, TC PER UNHSC**

Subcatchment Ps1a: PS1a



Summary for Subcatchment PS1b: PS1b

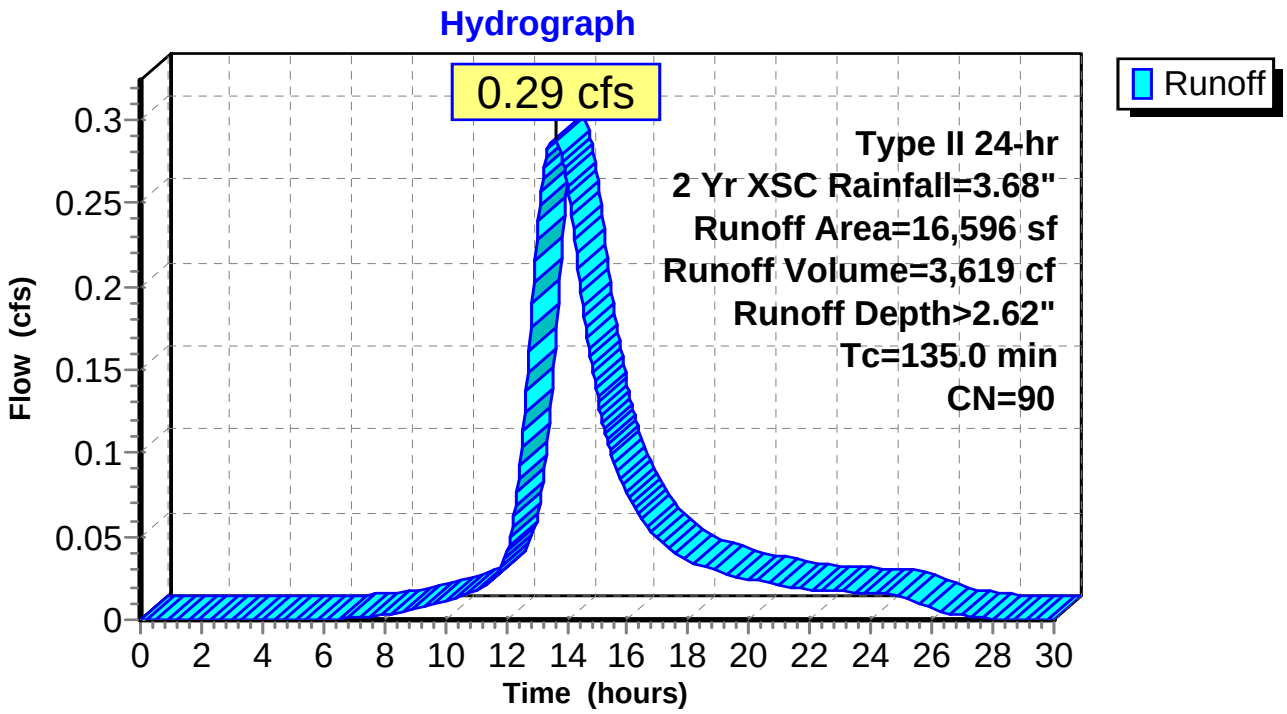
Runoff = 0.29 cfs @ 13.60 hrs, Volume= 3,619 cf, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

	Area (sf)	CN	Description
	8,343	98	Paved parking, HSG C
*	218	98	Unconnected wall, HSG C
*	819	98	Conc Walk HSG C
	1,450	98	Roofs, HSG C
	5,766	74	>75% Grass cover, Good, HSG C
	16,596	90	Weighted Average
	5,766		34.74% Pervious Area
	10,830		65.26% Impervious Area
	218		2.01% Unconnected

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

Subcatchment PS1b: PS1b



Summary for Subcatchment PS1c: PS1c

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.19 cfs @ 11.95 hrs, Volume= 2,447 cf, Depth= 2.34"

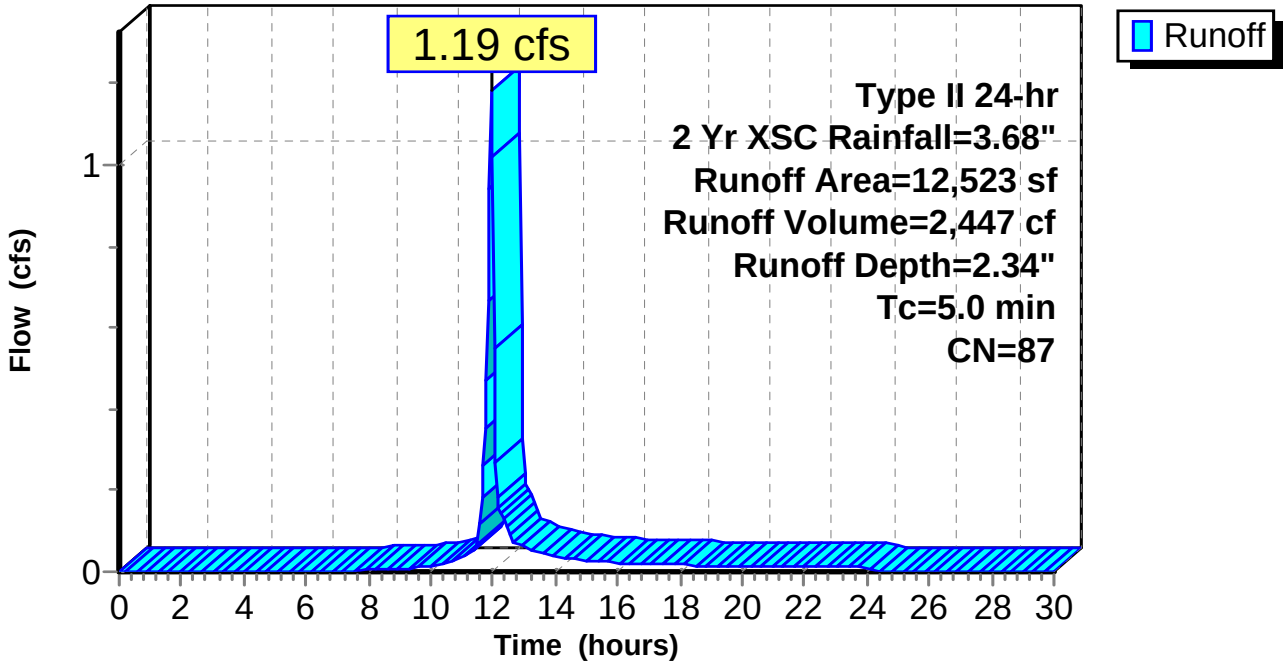
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

	Area (sf)	CN	Description
	6,279	98	Paved parking, HSG C
*	419	98	Unconnected wall, HSG C
	5,825	74	>75% Grass cover, Good, HSG C
	12,523	87	Weighted Average
	5,825		46.51% Pervious Area
	6,698		53.49% Impervious Area
	419		6.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, TR55 MIN 5 mINUTES**

Subcatchment PS1c: PS1c

Hydrograph



Summary for Subcatchment PS2: PS2

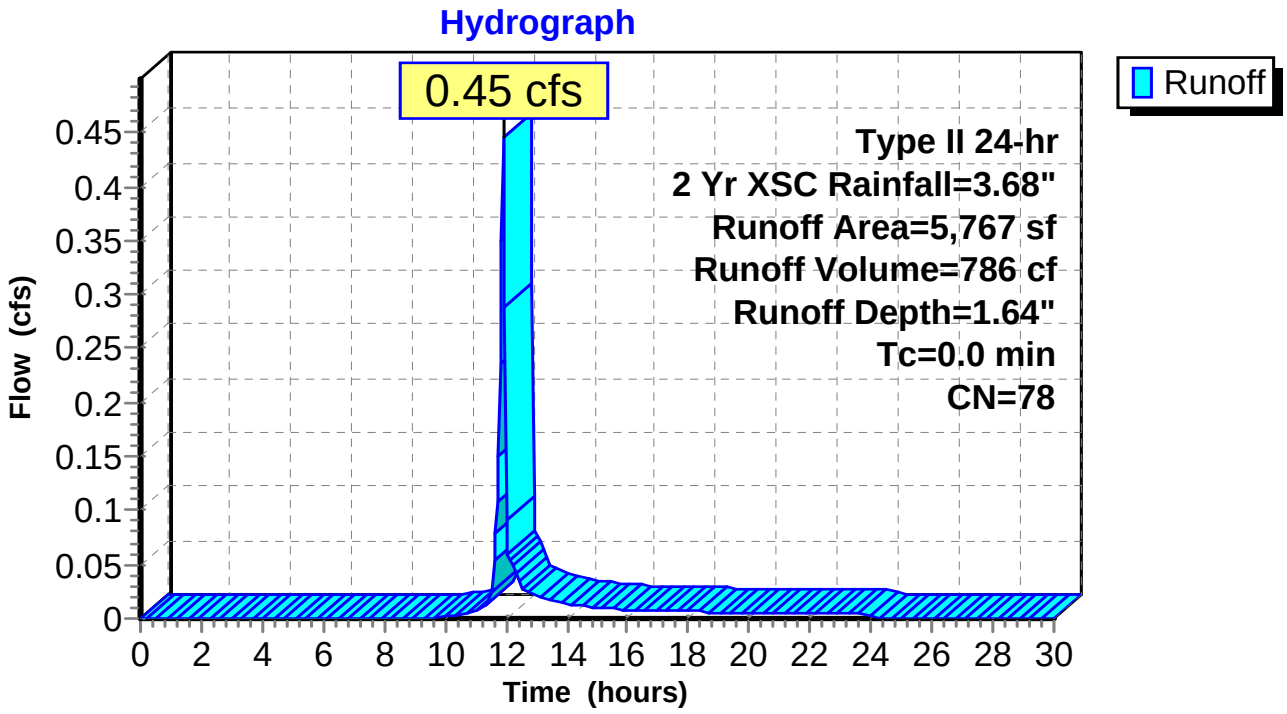
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.45 cfs @ 11.89 hrs, Volume= 786 cf, Depth= 1.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

	Area (sf)	CN	Description
*	10	98	Unconnected wall, HSG C
	1,066	98	Roofs, HSG C
	4,691	74	>75% Grass cover, Good, HSG C
	5,767	78	Weighted Average
	4,691		81.34% Pervious Area
	1,076		18.66% Impervious Area
	10		0.93% Unconnected

Subcatchment PS2: PS2



Summary for Subcatchment PS3: PS3

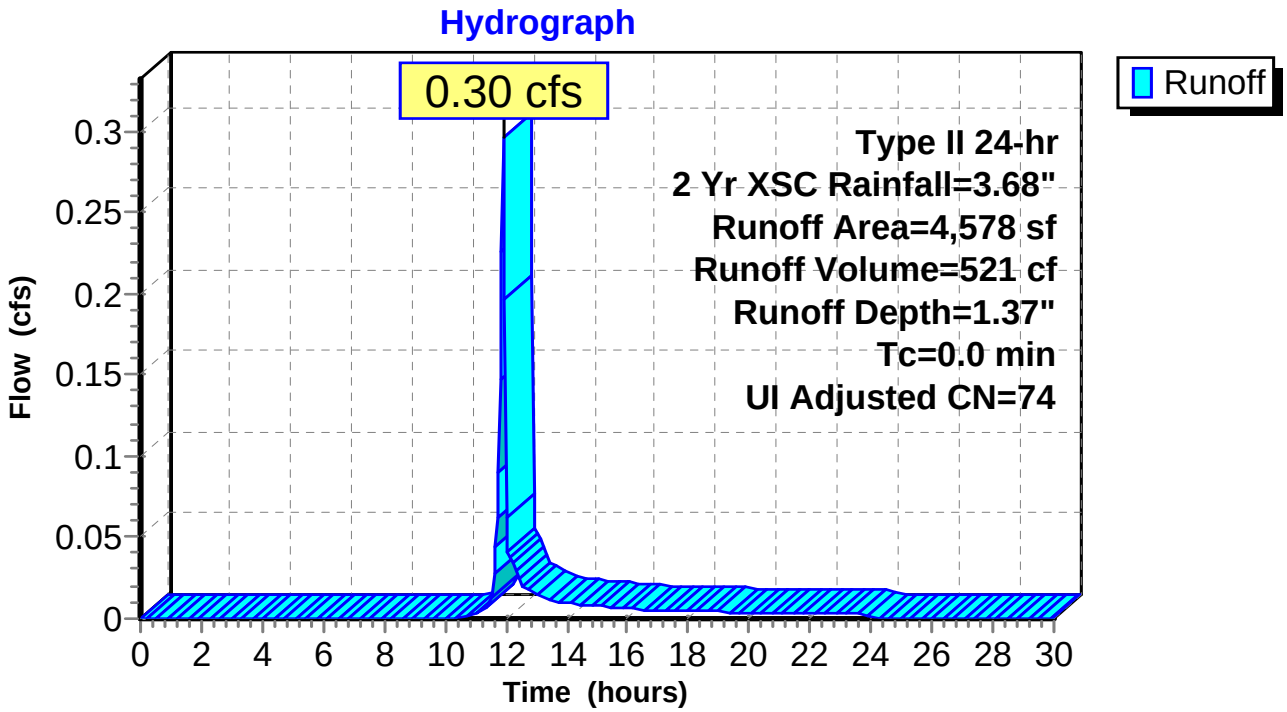
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.30 cfs @ 11.90 hrs, Volume= 521 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 2 Yr XSC Rainfall=3.68"

	Area (sf)	CN	Adj	Description
*	173	98		Unconnected wall, HSG C
	4,405	74		>75% Grass cover, Good, HSG C
	4,578	75	74	Weighted Average, UI Adjusted
	4,405			96.22% Pervious Area
	173			3.78% Impervious Area
	173			100.00% Unconnected

Subcatchment PS3: PS3



Summary for Pond CB2: CB2

[57] Hint: Peaked at 40.00' (Flood elevation advised)

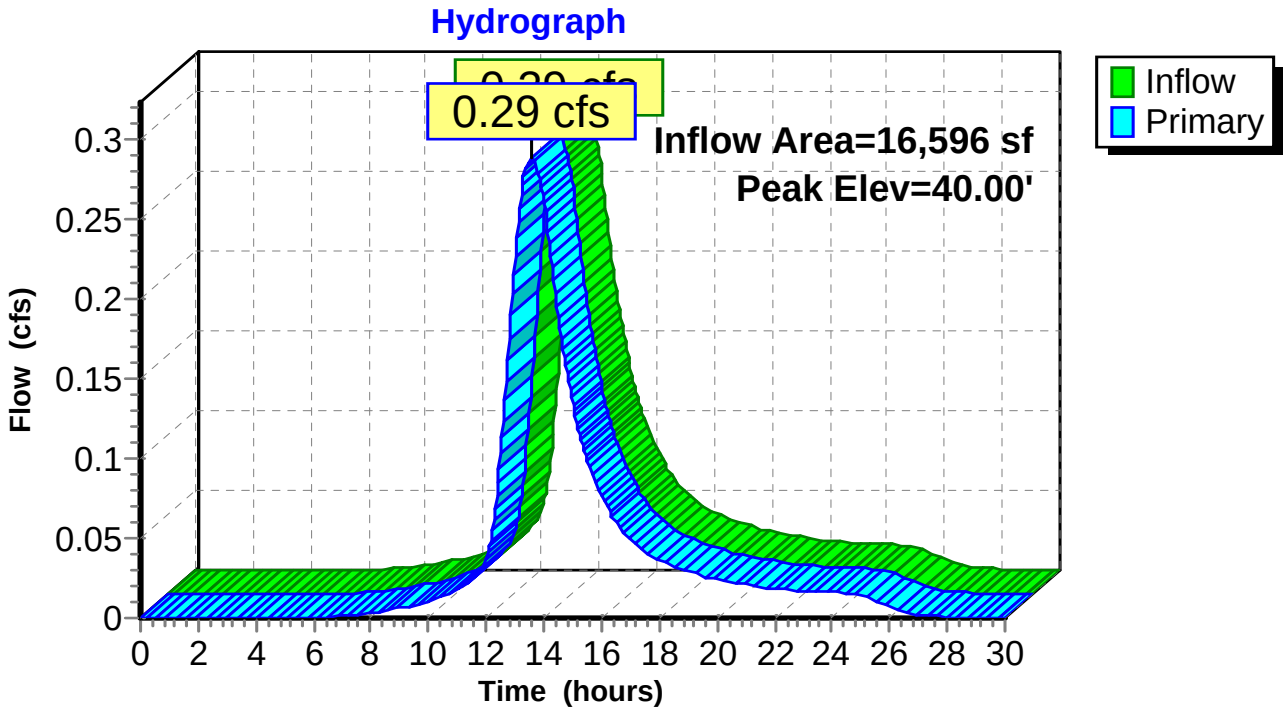
Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 2.62" for 2 Yr XSC event
Inflow = 0.29 cfs @ 13.60 hrs, Volume= 3,619 cf
Outflow = 0.29 cfs @ 13.60 hrs, Volume= 3,619 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 13.60 hrs, Volume= 3,619 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.00' @ 13.60 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	39.70'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 39.70' / 38.50' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.29 cfs @ 13.60 hrs HW=40.00' (Free Discharge)
└─**1=Orifice/Grate** (Controls 0.00 cfs)
└─**2=Culvert** (Inlet Controls 0.29 cfs @ 1.47 fps)

Pond CB2: CB2



Summary for Pond DM1: DM1

[57] Hint: Peaked at 27.00' (Flood elevation advised)

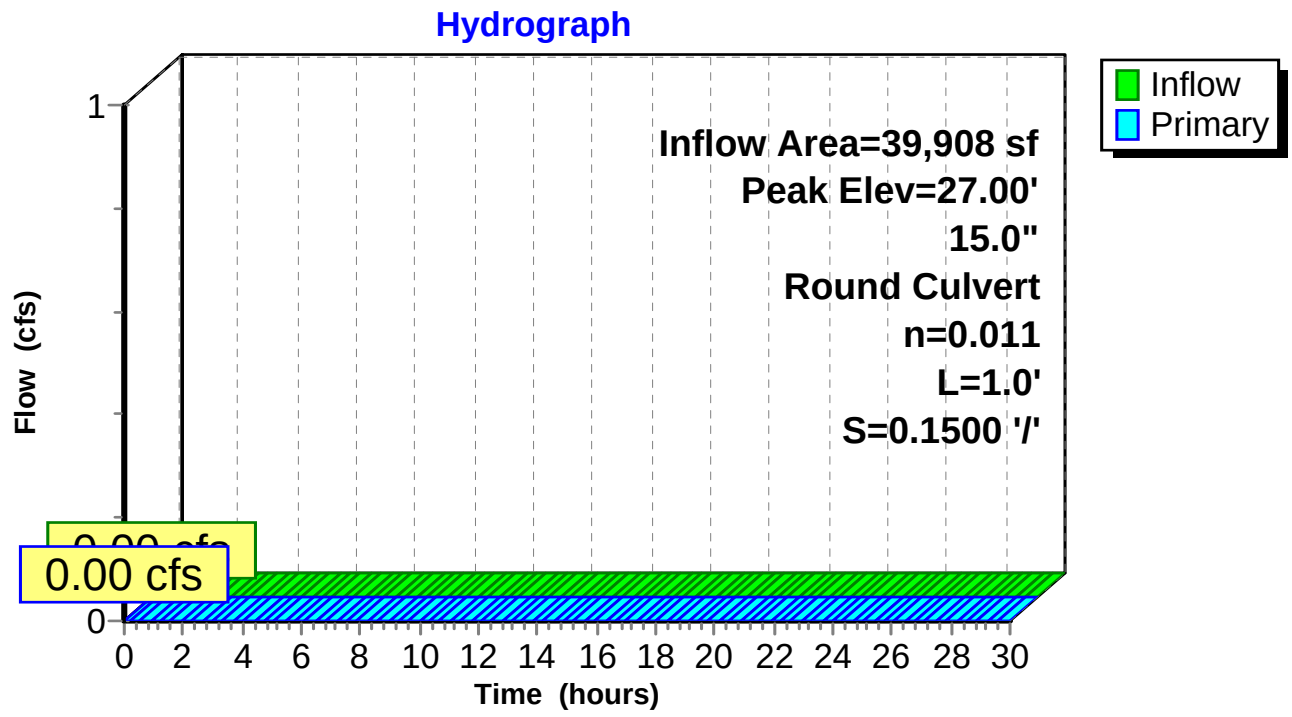
Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.00" for 2 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 27.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Round Culvert** L= 1.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.00' / 26.85' S= 0.1500 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond DM1: DM1



Summary for Pond DM2: DM1

[57] Hint: Peaked at 40.10' (Flood elevation advised)
[81] Warning: Exceeded Pond P1b by 5.10' @ 0.00 hrs

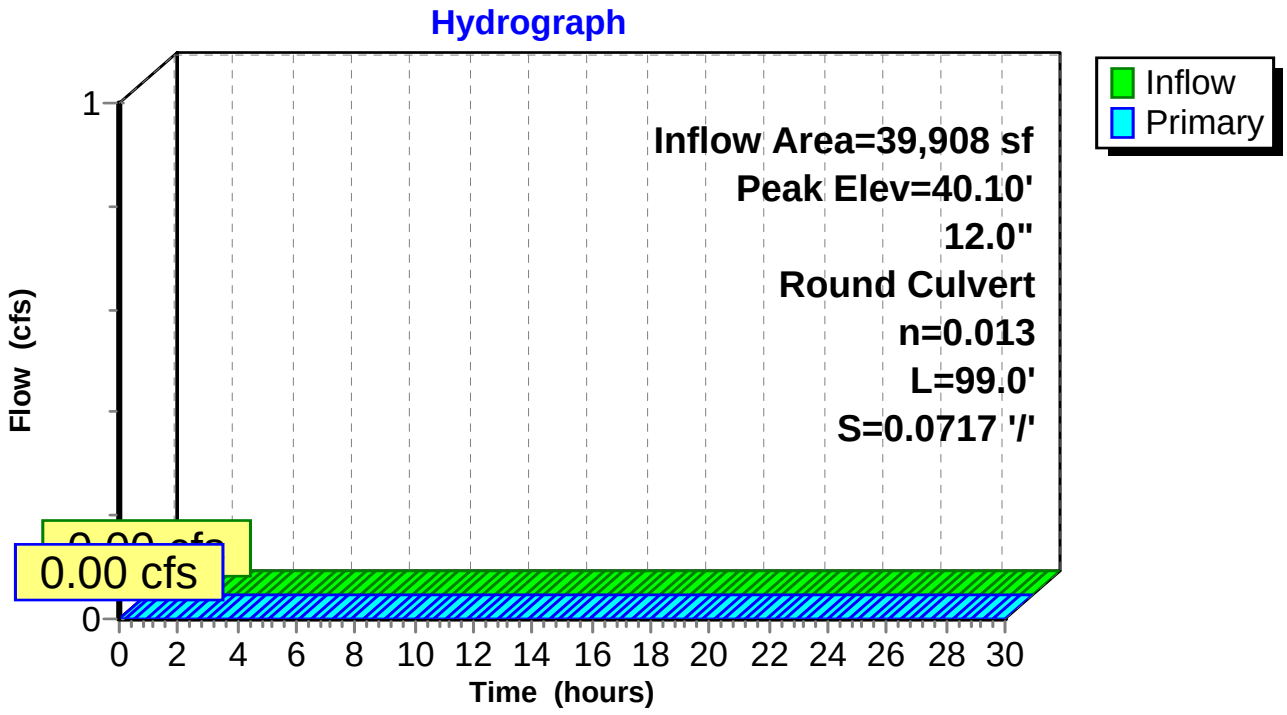
Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.00" for 2 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.10' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.10'	**12.0" Round Culvert** L= 99.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 40.10' / 33.00' S= 0.0717 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=40.10' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DM2: DM1



Summary for Pond DM3: DM3

[57] Hint: Peaked at 53.55' (Flood elevation advised)

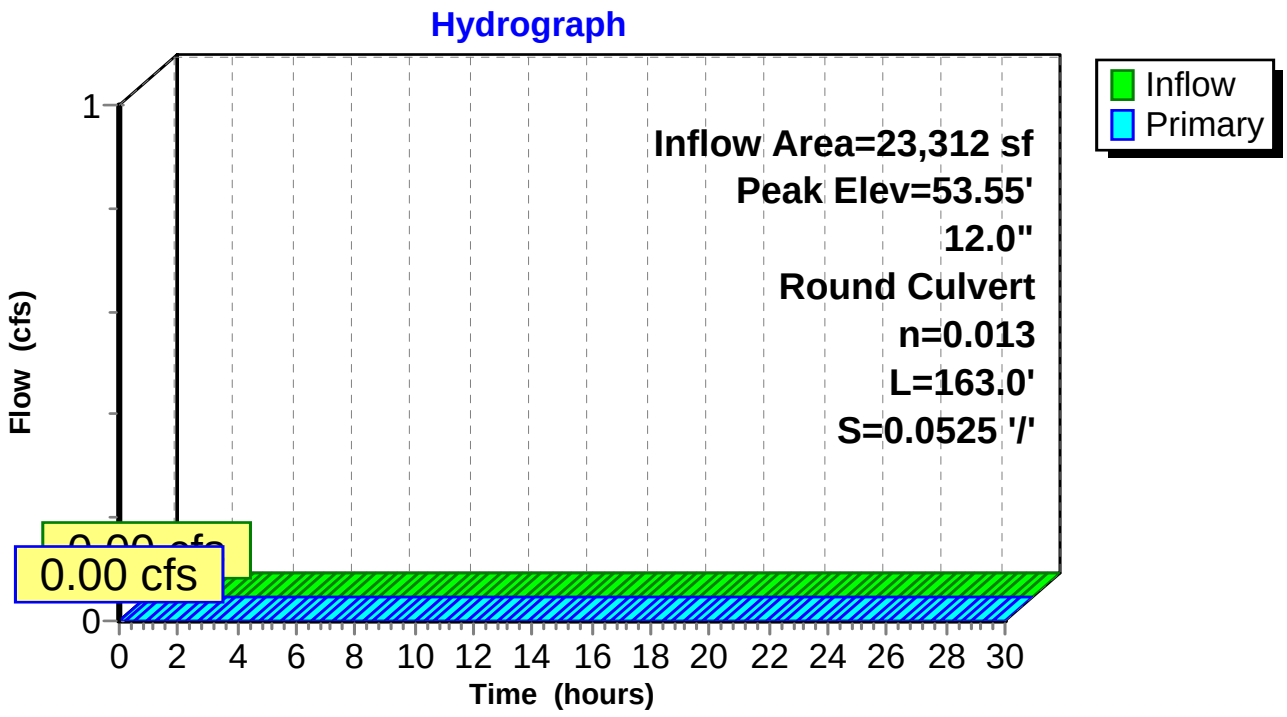
Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth = 0.00" for 2 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 53.55' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	53.55'	**12.0" Round Culvert** L= 163.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.55' / 45.00' S= 0.0525 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.55' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond DM3: DM3



Summary for Pond P1a: FILTRATION BASIN PS1a

[85] Warning: Oscillations may require Finer Routing>1 (severity=1)

Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth > 2.91" for 2 Yr XSC event
Inflow = 0.45 cfs @ 13.56 hrs, Volume= 5,651 cf
Outflow = 0.28 cfs @ 14.54 hrs, Volume= 5,651 cf, Atten= 38%, Lag= 58.9 min
Discarded = 0.28 cfs @ 14.54 hrs, Volume= 5,651 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 54.56' @ 14.54 hrs Surf.Area= 1,963 sf Storage= 702 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.5 min (919.5 - 903.9)

Volume	Invert	Avail.Storage	Storage Description
#1	53.67'	4,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

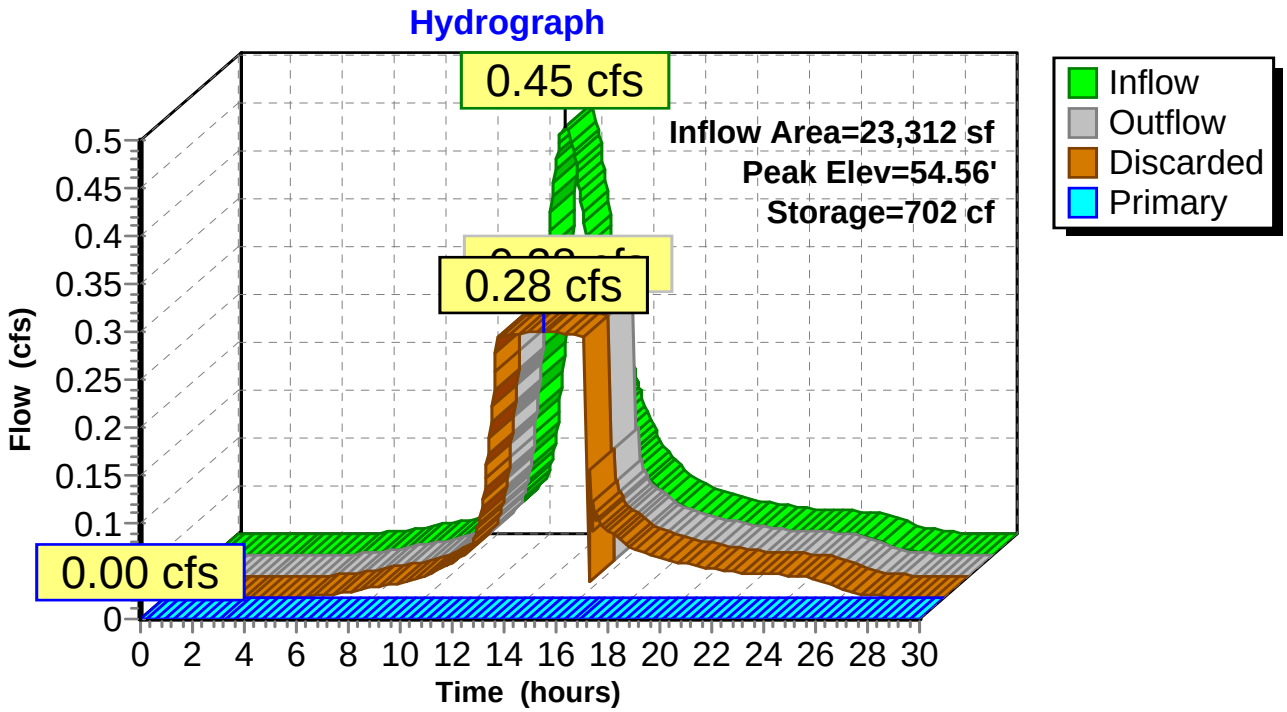
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.67	1,963	0.0	0	0
53.68	1,963	40.0	8	8
54.00	1,963	40.0	251	259
56.00	1,963	40.0	1,570	1,830
56.01	1,963	0.0	0	1,830
56.02	1,210	100.0	16	1,845
57.50	1,963	100.0	2,348	4,193

Device	Routing	Invert	Outlet Devices
#1	Primary	53.67'	**6.0" Round Culvert X 3.00** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.67' / 53.65' S= 0.0006 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	57.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	53.67'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.28 cfs @ 14.54 hrs HW=54.56' (Free Discharge)
└**3=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.67' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1a: FILTRATION BASIN PS1a



Summary for Pond P1b: FILTRATION BASIN P1b

[85] Warning: Oscillations may require Finer Routing>1 (severity=1)

Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 2.62" for 2 Yr XSC event
Inflow = 0.29 cfs @ 13.60 hrs, Volume= 3,619 cf
Outflow = 0.15 cfs @ 14.78 hrs, Volume= 3,619 cf, Atten= 46%, Lag= 70.7 min
Discarded = 0.15 cfs @ 14.78 hrs, Volume= 3,619 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 36.48' @ 14.78 hrs Surf.Area= 1,069 sf Storage= 634 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.5 min (946.2 - 917.7)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,744 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

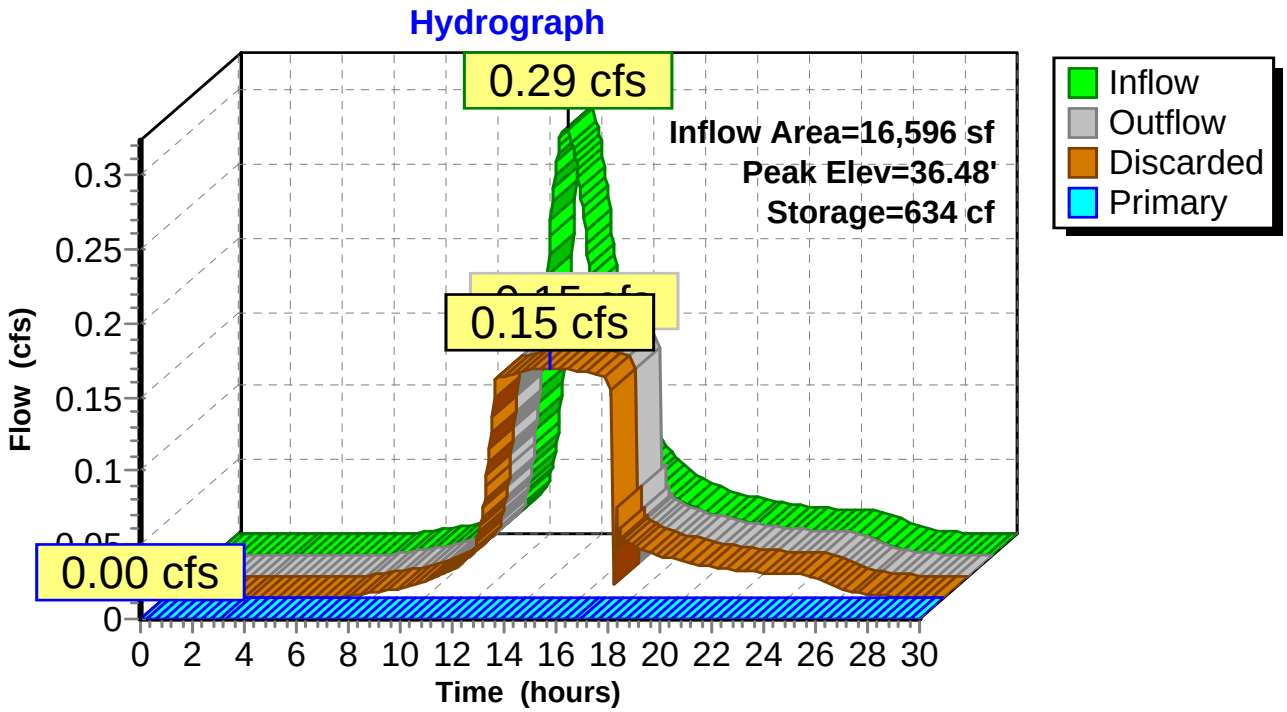
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	1,069	0.0	0	0
35.01	1,069	40.0	4	4
37.99	1,069	40.0	1,274	1,279
38.00	400	0.0	0	1,279
38.01	400	100.0	4	1,283
40.00	1,069	100.0	1,462	2,744

Device	Routing	Invert	Outlet Devices
#1	Primary	36.75'	**8.0" Round Culvert** L= 111.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.75' / 25.65' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	39.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	35.00'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.15 cfs @ 14.78 hrs HW=36.48' (Free Discharge)
└**3=Exfiltration** (Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1b: FILTRATION BASIN P1b

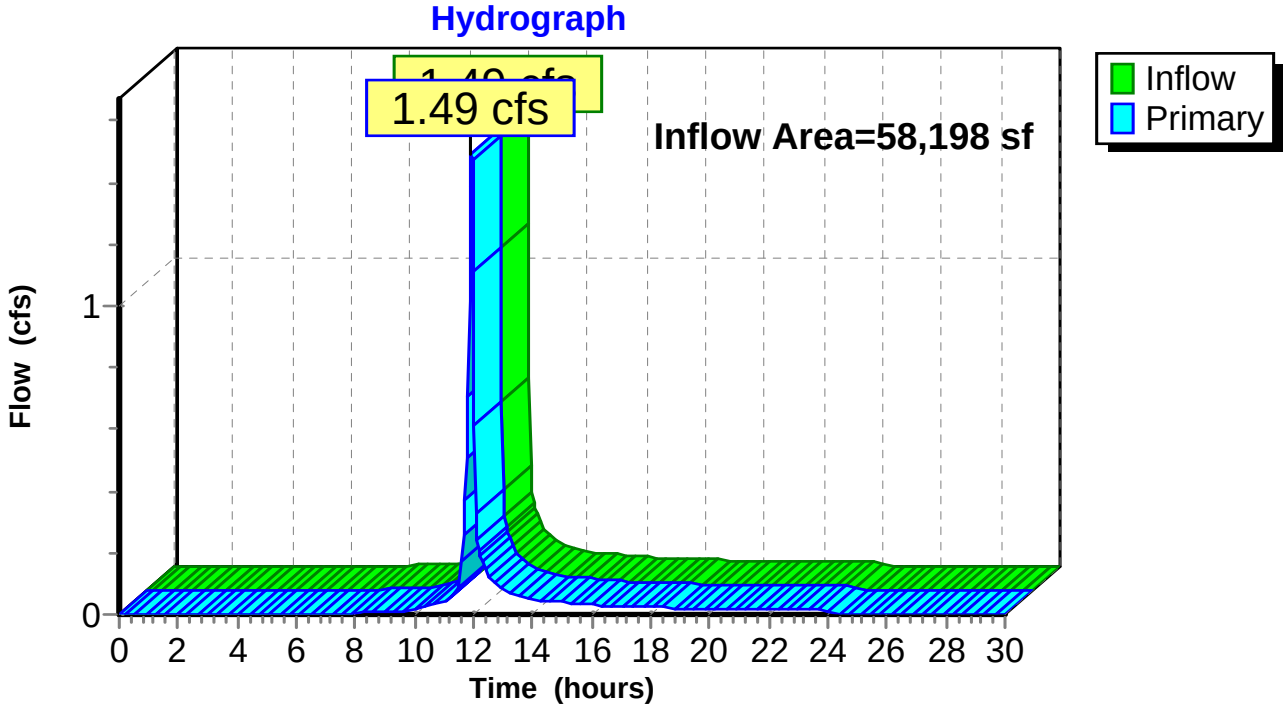


Summary for Link DP1: DESIGN POINT 1

Inflow Area = 58,198 sf, 63.71% Impervious, Inflow Depth = 0.67" for 2 Yr XSC event
Inflow = 1.49 cfs @ 11.93 hrs, Volume= 3,233 cf
Primary = 1.49 cfs @ 11.93 hrs, Volume= 3,233 cf, Atten= 0%, Lag= 0.0 min

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

Link DP1: DESIGN POINT 1

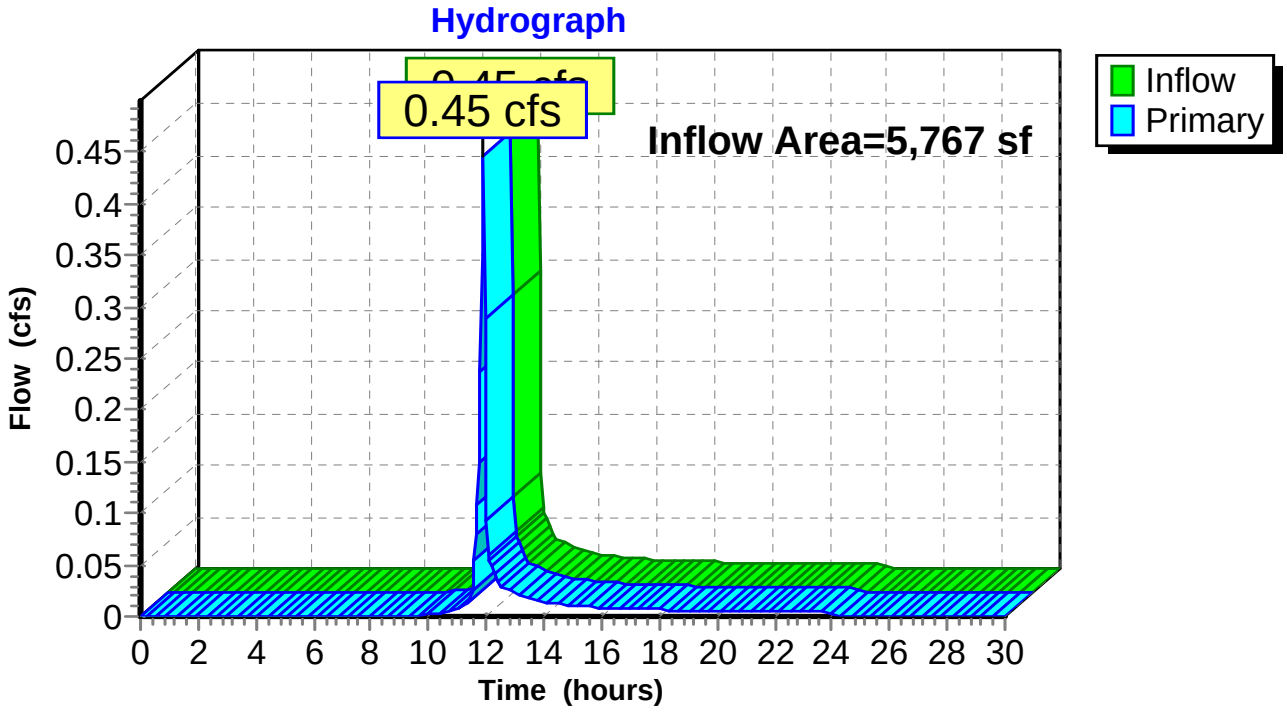


Summary for Link DP2: DESIGN POINT 2

Inflow Area = 5,767 sf, 18.66% Impervious, Inflow Depth = 1.64" for 2 Yr XSC event
Inflow = 0.45 cfs @ 11.89 hrs, Volume= 786 cf
Primary = 0.45 cfs @ 11.89 hrs, Volume= 786 cf, Atten= 0%, Lag= 0.0 min

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

Link DP2: DESIGN POINT 2

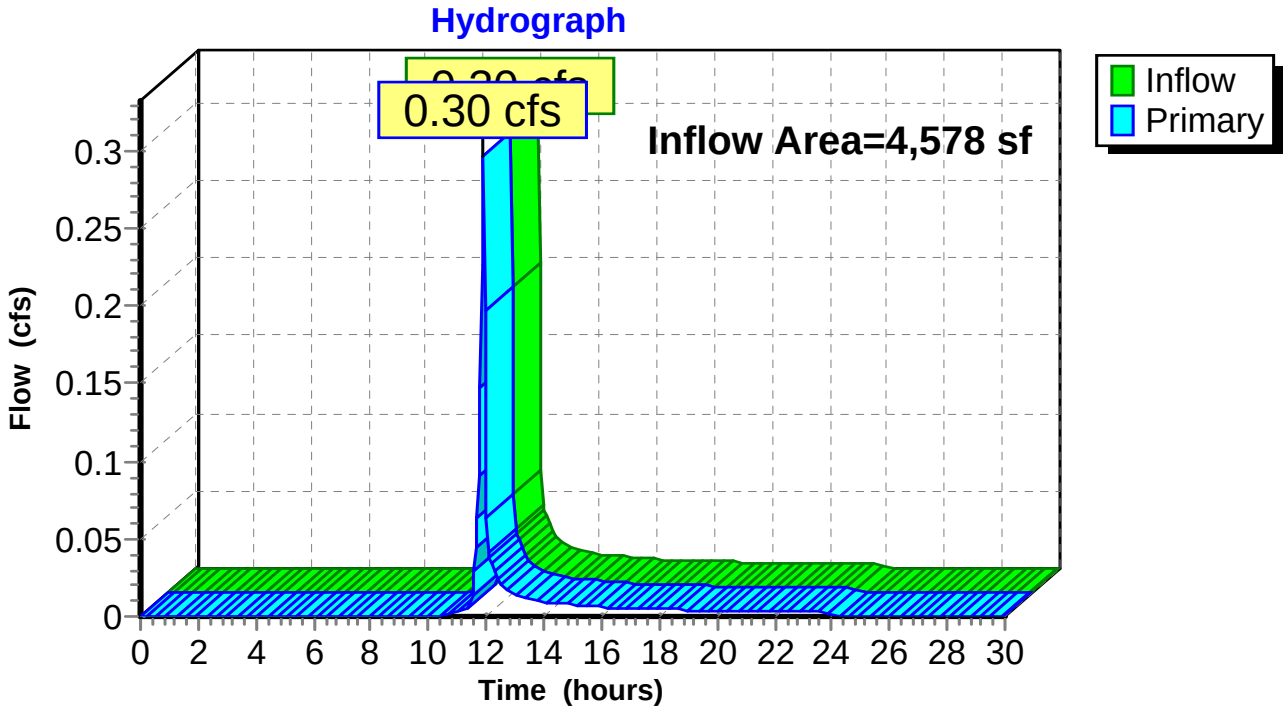


Summary for Link DP3: DESIGN POINT 3

Inflow Area = 4,578 sf, 3.78% Impervious, Inflow Depth = 1.37" for 2 Yr XSC event
Inflow = 0.30 cfs @ 11.90 hrs, Volume= 521 cf
Primary = 0.30 cfs @ 11.90 hrs, Volume= 521 cf, Atten= 0%, Lag= 0.0 min

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

Link DP3: DESIGN POINT 3



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

Subcatchment Ps1a: PS1a Runoff Area=23,312 sf 79.26% Impervious Runoff Depth>4.78"
Tc=135.0 min CN=93 Runoff=0.72 cfs 9,282 cf

Subcatchment PS1b: PS1b Runoff Area=16,596 sf 65.26% Impervious Runoff Depth>4.45"
Tc=135.0 min CN=90 Runoff=0.49 cfs 6,150 cf

Subcatchment PS1c: PS1c Runoff Area=12,523 sf 53.49% Impervious Runoff Depth=4.13"
Tc=5.0 min CN=87 Runoff=2.02 cfs 4,306 cf

Subcatchment PS2: PS2 Runoff Area=5,767 sf 18.66% Impervious Runoff Depth=3.22"
Tc=0.0 min CN=78 Runoff=0.86 cfs 1,547 cf

Subcatchment PS3: PS3 Runoff Area=4,578 sf 3.78% Impervious Runoff Depth=2.84"
Tc=0.0 min UI Adjusted CN=74 Runoff=0.61 cfs 1,085 cf

Pond CB2: CB2 Peak Elev=40.09' Inflow=0.49 cfs 6,150 cf
Outflow=0.49 cfs 6,150 cf

Pond DM1: DM1 Peak Elev=27.00' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=1.0' S=0.1500 '/' Outflow=0.00 cfs 0 cf

Pond DM2: DM1 Peak Elev=40.10' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.013 L=99.0' S=0.0717 '/' Outflow=0.00 cfs 0 cf

Pond DM3: DM3 Peak Elev=53.55' Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.013 L=163.0' S=0.0525 '/' Outflow=0.00 cfs 0 cf

Pond P1a: FILTRATION BASIN PS1a Peak Elev=56.41' Storage=2,353 cf Inflow=0.72 cfs 9,282 cf
Discarded=0.31 cfs 9,282 cf Primary=0.00 cfs 0 cf Outflow=0.31 cfs 9,282 cf

Pond P1b: FILTRATION BASIN P1b Peak Elev=38.92' Storage=1,788 cf Inflow=0.49 cfs 6,150 cf
Discarded=0.21 cfs 6,150 cf Primary=0.00 cfs 0 cf Outflow=0.21 cfs 6,150 cf

Link DP1: DESIGN POINT 1 Inflow=2.62 cfs 5,853 cf
Primary=2.62 cfs 5,853 cf

Link DP2: DESIGN POINT 2 Inflow=0.86 cfs 1,547 cf
Primary=0.86 cfs 1,547 cf

Link DP3: DESIGN POINT 3 Inflow=0.61 cfs 1,085 cf
Primary=0.61 cfs 1,085 cf

Total Runoff Area = 62,776 sf Runoff Volume = 22,370 cf Average Runoff Depth = 4.28"
40.66% Pervious = 25,523 sf 59.34% Impervious = 37,253 sf

Summary for Subcatchment Ps1a: PS1a

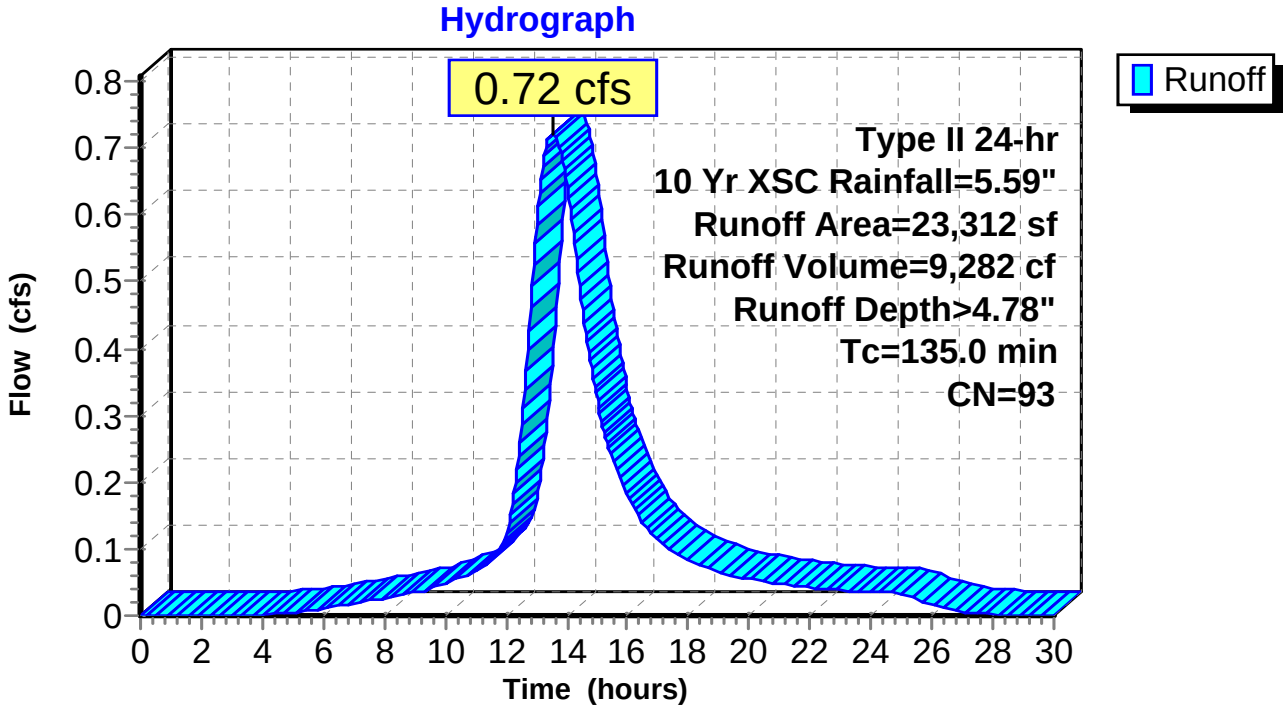
Runoff = 0.72 cfs @ 13.52 hrs, Volume= 9,282 cf, Depth> 4.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

	Area (sf)	CN	Description
	16,073	98	Paved parking, HSG C
*	475	98	Conc Walk, HSG C
	1,928	98	Roofs, HSG C
	4,836	74	>75% Grass cover, Good, HSG C
	23,312	93	Weighted Average
	4,836		20.74% Pervious Area
	18,476		79.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
135.0					**Direct Entry, TC PER UNHSC**

Subcatchment Ps1a: PS1a



Summary for Subcatchment PS1b: PS1b

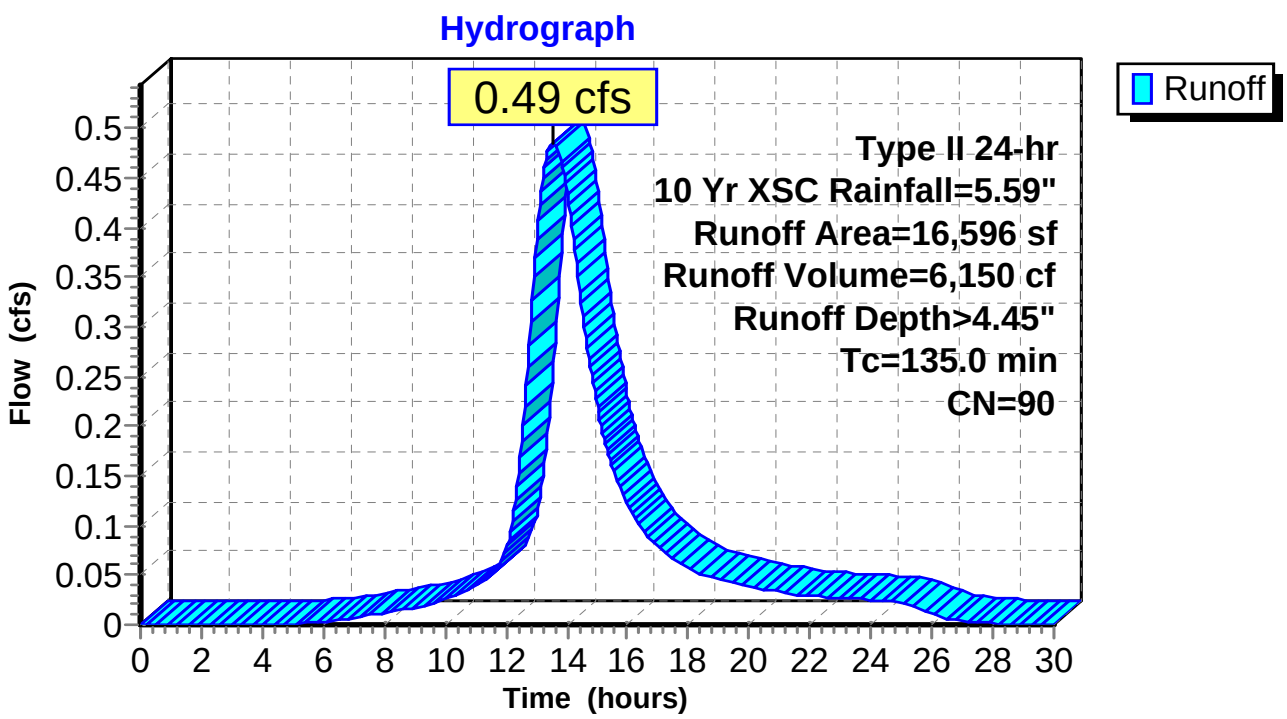
Runoff = 0.49 cfs @ 13.56 hrs, Volume= 6,150 cf, Depth> 4.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

	Area (sf)	CN	Description
	8,343	98	Paved parking, HSG C
*	218	98	Unconnected wall, HSG C
*	819	98	Conc Walk HSG C
	1,450	98	Roofs, HSG C
	5,766	74	>75% Grass cover, Good, HSG C
	16,596	90	Weighted Average
	5,766		34.74% Pervious Area
	10,830		65.26% Impervious Area
	218		2.01% Unconnected

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

Subcatchment PS1b: PS1b



Summary for Subcatchment PS1c: PS1c

[49] Hint: Tc<2dt may require smaller dt

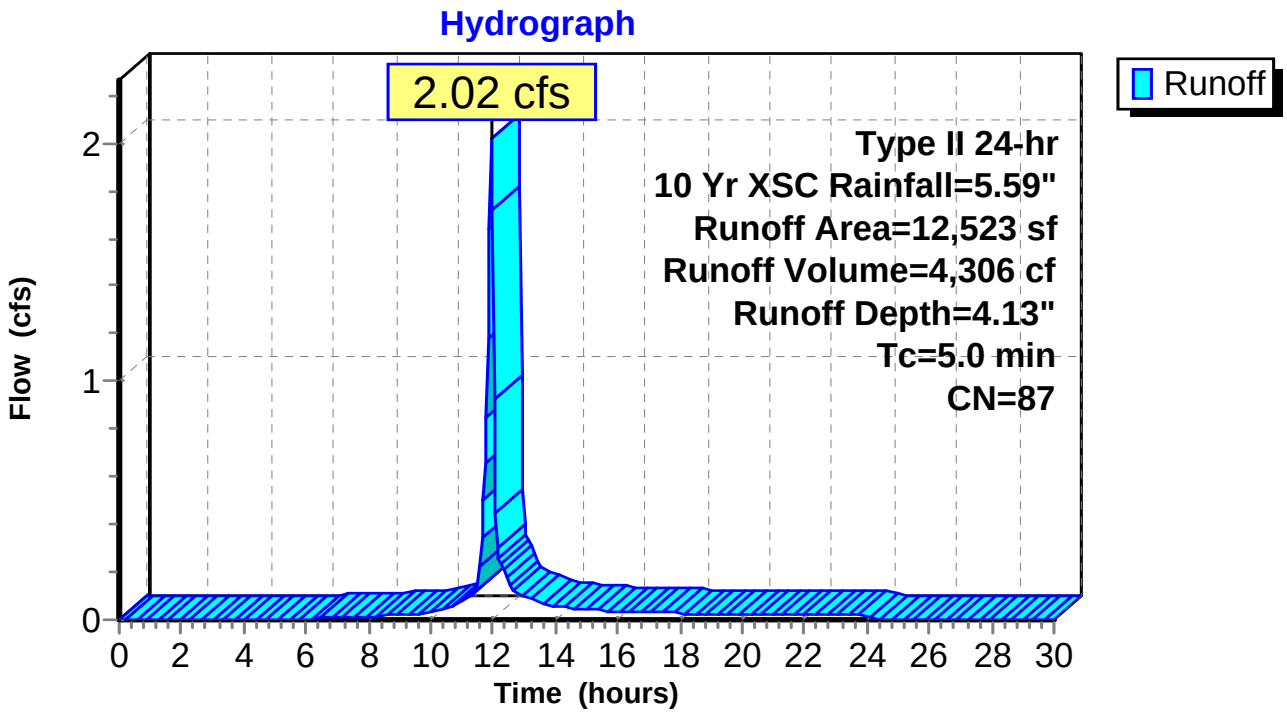
Runoff = 2.02 cfs @ 11.95 hrs, Volume= 4,306 cf, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

	Area (sf)	CN	Description
	6,279	98	Paved parking, HSG C
*	419	98	Unconnected wall, HSG C
	5,825	74	>75% Grass cover, Good, HSG C
	12,523	87	Weighted Average
	5,825		46.51% Pervious Area
	6,698		53.49% Impervious Area
	419		6.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, TR55 MIN 5 mINUTES**

Subcatchment PS1c: PS1c



Summary for Subcatchment PS2: PS2

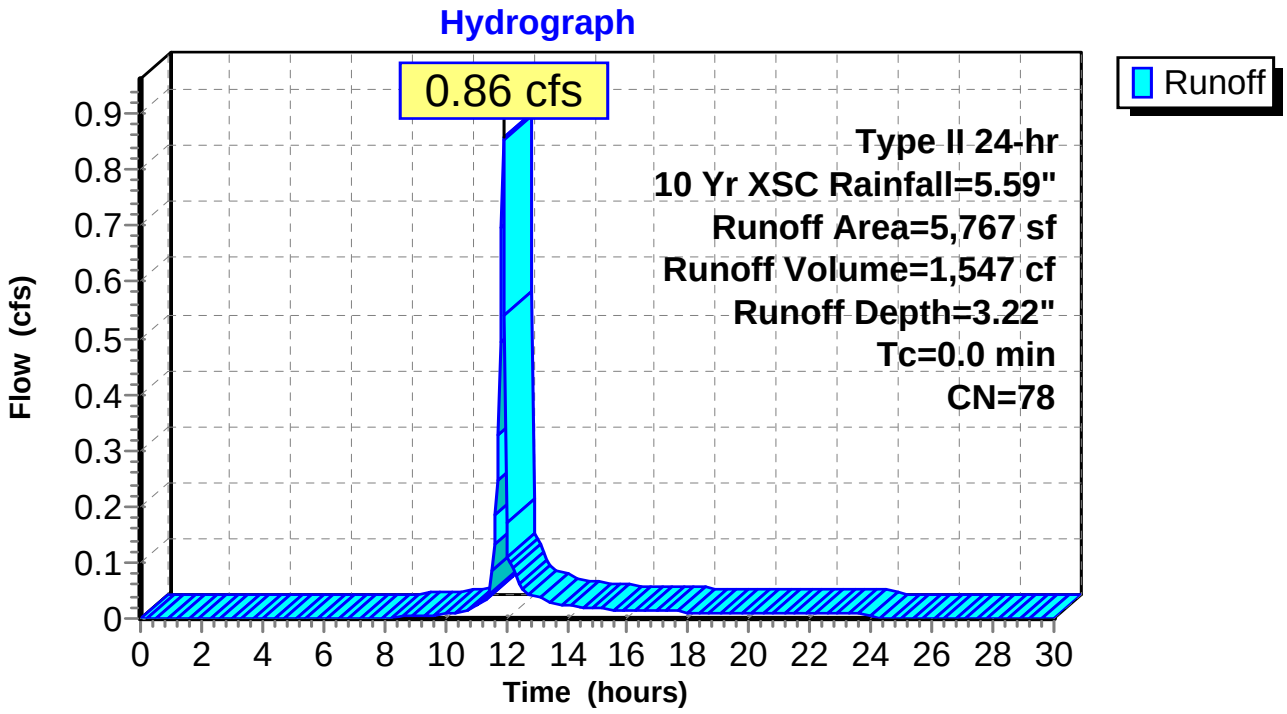
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.86 cfs @ 11.89 hrs, Volume= 1,547 cf, Depth= 3.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

	Area (sf)	CN	Description
*	10	98	Unconnected wall, HSG C
	1,066	98	Roofs, HSG C
	4,691	74	>75% Grass cover, Good, HSG C
	5,767	78	Weighted Average
	4,691		81.34% Pervious Area
	1,076		18.66% Impervious Area
	10		0.93% Unconnected

Subcatchment PS2: PS2



Summary for Subcatchment PS3: PS3

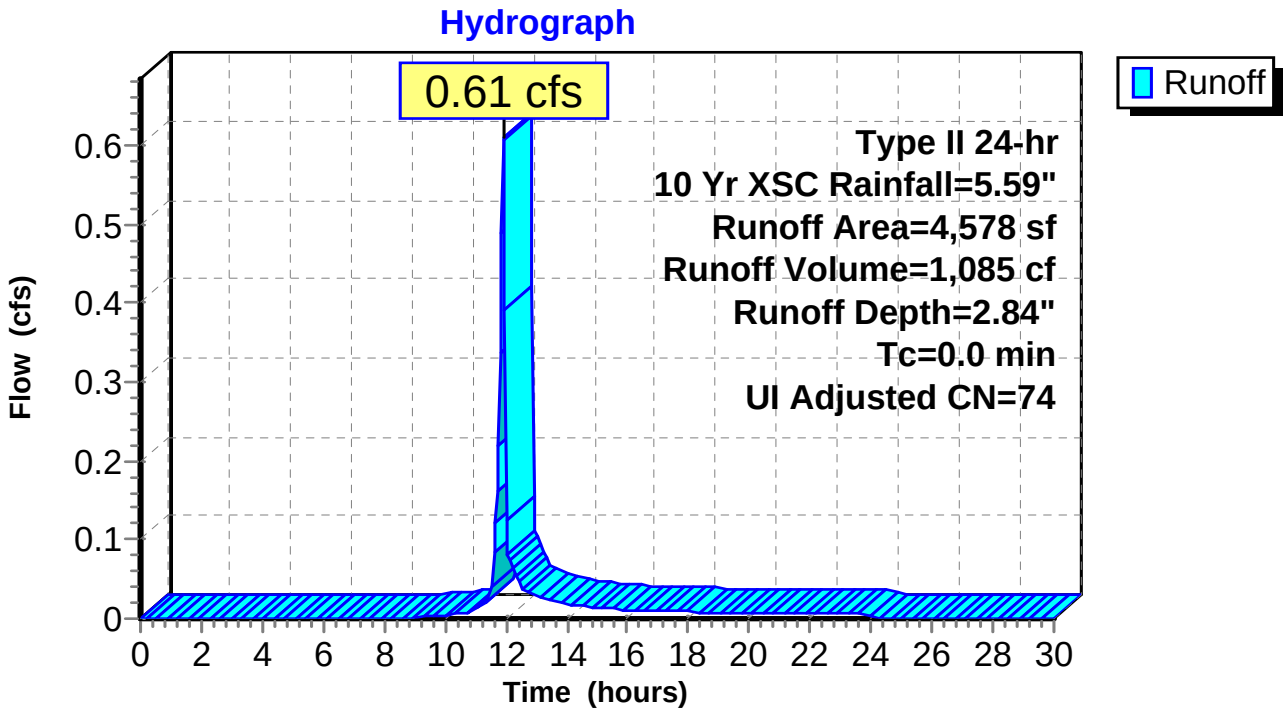
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.61 cfs @ 11.89 hrs, Volume= 1,085 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 Yr XSC Rainfall=5.59"

	Area (sf)	CN	Adj	Description
*	173	98		Unconnected wall, HSG C
	4,405	74		>75% Grass cover, Good, HSG C
	4,578	75	74	Weighted Average, UI Adjusted
	4,405			96.22% Pervious Area
	173			3.78% Impervious Area
	173			100.00% Unconnected

Subcatchment PS3: PS3



Summary for Pond CB2: CB2

[57] Hint: Peaked at 40.09' (Flood elevation advised)

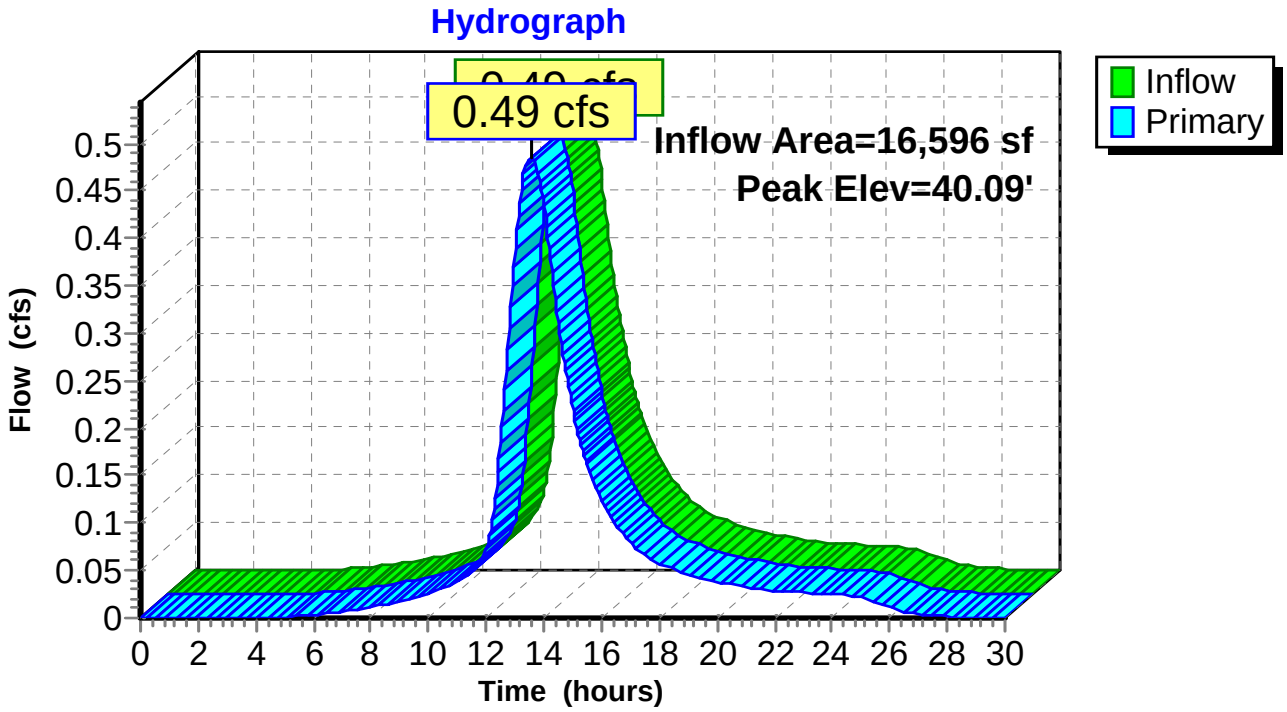
Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 4.45" for 10 Yr XSC event
Inflow = 0.49 cfs @ 13.56 hrs, Volume= 6,150 cf
Outflow = 0.49 cfs @ 13.56 hrs, Volume= 6,150 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 13.56 hrs, Volume= 6,150 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.09' @ 13.56 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	39.70'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 39.70' / 38.50' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.48 cfs @ 13.56 hrs HW=40.09' (Free Discharge)
└**1=Orifice/Grate** (Controls 0.00 cfs)
└**2=Culvert** (Inlet Controls 0.48 cfs @ 1.69 fps)

Pond CB2: CB2



Summary for Pond DM1: DM1

[57] Hint: Peaked at 27.00' (Flood elevation advised)

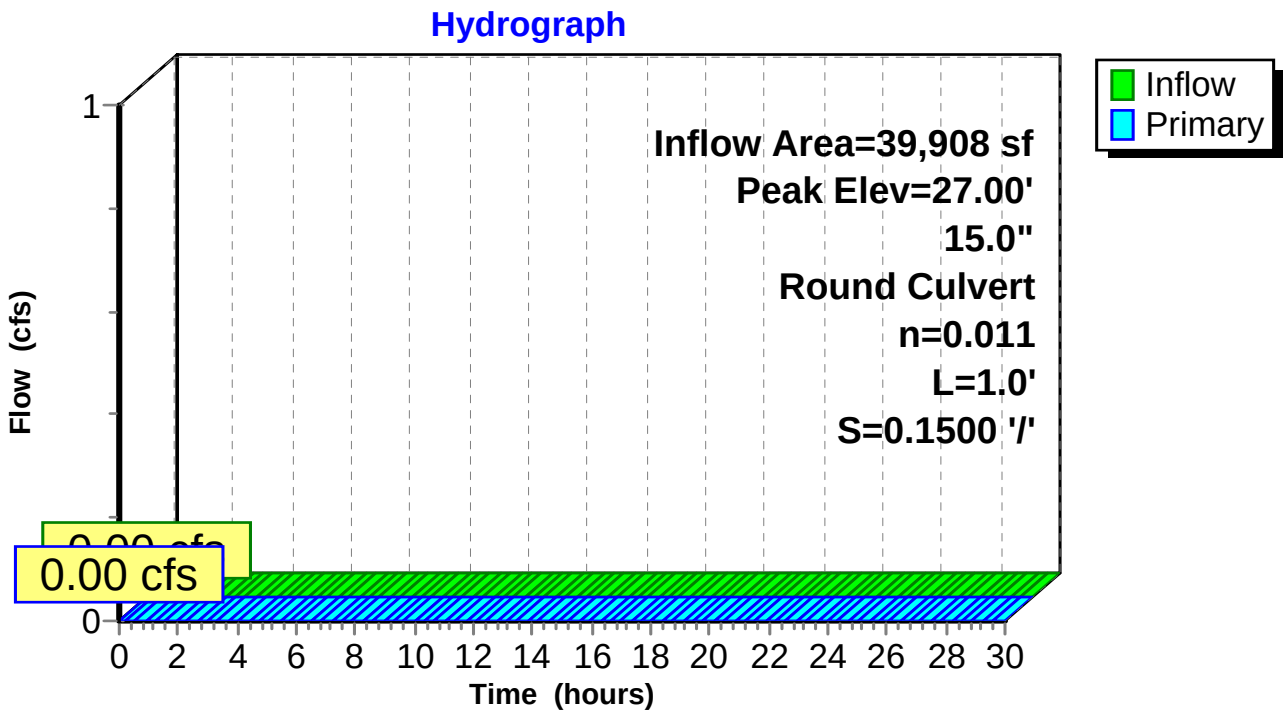
Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.00" for 10 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 27.00' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Round Culvert** L= 1.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.00' / 26.85' S= 0.1500 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=27.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond DM1: DM1



Summary for Pond DM2: DM1

[57] Hint: Peaked at 40.10' (Flood elevation advised)
[81] Warning: Exceeded Pond P1b by 5.10' @ 0.00 hrs

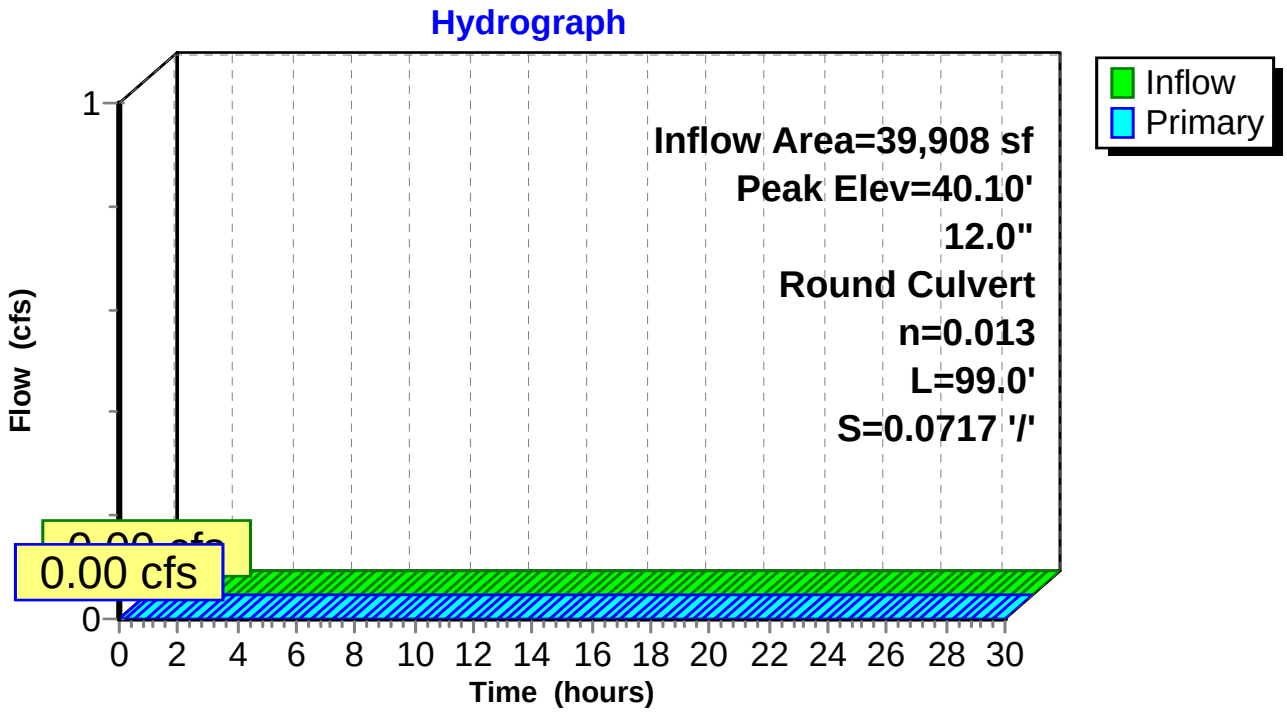
Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.00" for 10 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.10' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.10'	**12.0" Round Culvert** L= 99.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 40.10' / 33.00' S= 0.0717 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=40.10' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)

Pond DM2: DM1



Summary for Pond DM3: DM3

[57] Hint: Peaked at 53.55' (Flood elevation advised)

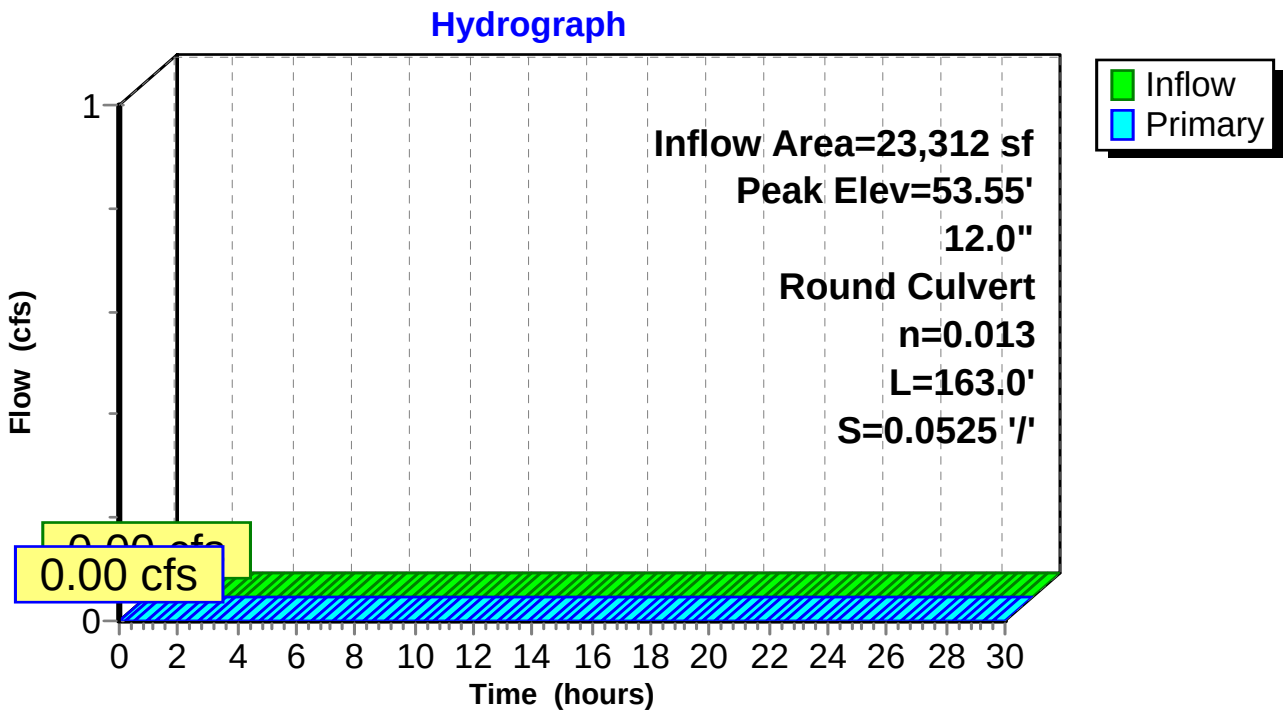
Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth = 0.00" for 10 Yr XSC event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 53.55' @ 0.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	53.55'	**12.0" Round Culvert** L= 163.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.55' / 45.00' S= 0.0525 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.55' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond DM3: DM3



Summary for Pond P1a: FILTRATION BASIN PS1a

[85] Warning: Oscillations may require Finer Routing>1 (severity=1)

Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth > 4.78" for 10 Yr XSC event
Inflow = 0.72 cfs @ 13.52 hrs, Volume= 9,282 cf
Outflow = 0.31 cfs @ 15.05 hrs, Volume= 9,282 cf, Atten= 57%, Lag= 91.5 min
Discarded = 0.31 cfs @ 15.05 hrs, Volume= 9,282 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 56.41' @ 15.05 hrs Surf.Area= 1,408 sf Storage= 2,353 cf

Plug-Flow detention time= 59.7 min calculated for 9,267 cf (100% of inflow)
Center-of-Mass det. time= 59.6 min (950.3 - 890.8)

Volume	Invert	Avail.Storage	Storage Description
#1	53.67'	4,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

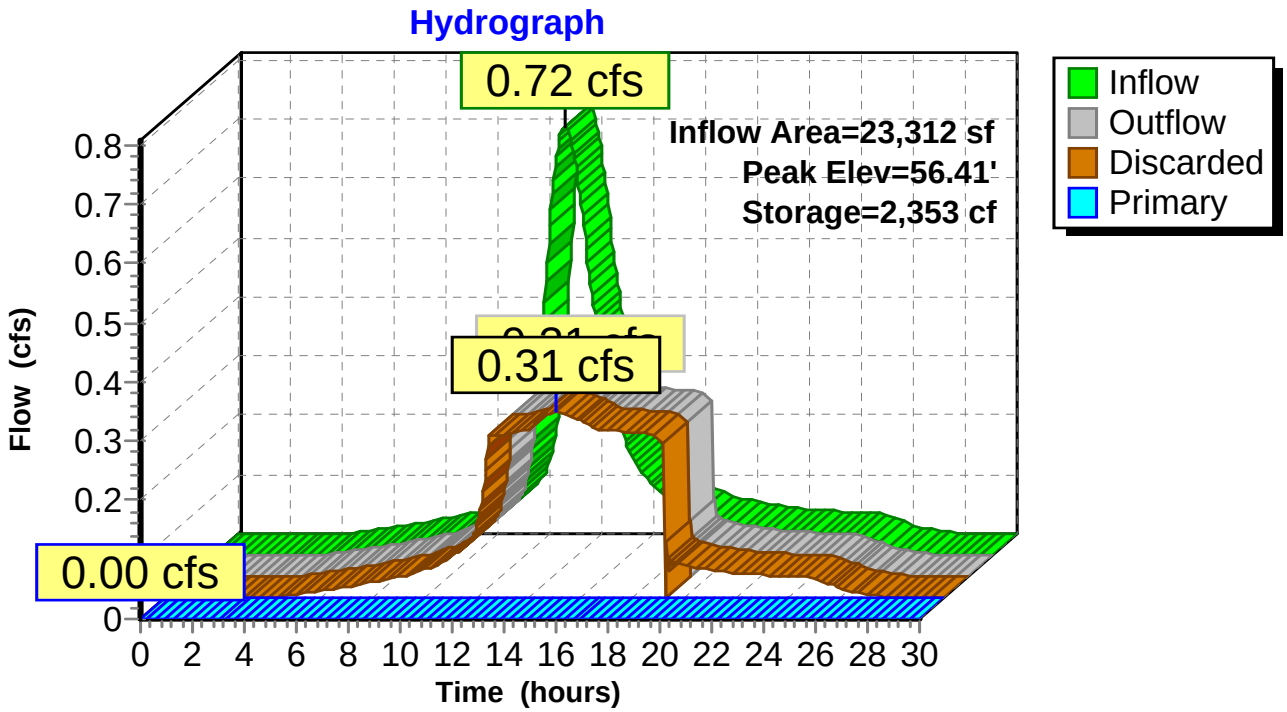
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.67	1,963	0.0	0	0
53.68	1,963	40.0	8	8
54.00	1,963	40.0	251	259
56.00	1,963	40.0	1,570	1,830
56.01	1,963	0.0	0	1,830
56.02	1,210	100.0	16	1,845
57.50	1,963	100.0	2,348	4,193

Device	Routing	Invert	Outlet Devices
#1	Primary	53.67'	**6.0" Round Culvert X 3.00** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.67' / 53.65' S= 0.0006 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	57.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	53.67'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.31 cfs @ 15.05 hrs HW=56.41' (Free Discharge)
└**3=Exfiltration** (Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=53.67' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1a: FILTRATION BASIN PS1a



Summary for Pond P1b: FILTRATION BASIN P1b

[79] Warning: Submerged Pond CB2 Primary device # 2 OUTLET by 0.42'

Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 4.45" for 10 Yr XSC event
Inflow = 0.49 cfs @ 13.56 hrs, Volume= 6,150 cf
Outflow = 0.21 cfs @ 15.09 hrs, Volume= 6,150 cf, Atten= 57%, Lag= 91.8 min
Discarded = 0.21 cfs @ 15.09 hrs, Volume= 6,150 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 38.92' @ 15.09 hrs Surf.Area= 707 sf Storage= 1,788 cf

Plug-Flow detention time= 79.9 min calculated for 6,150 cf (100% of inflow)
Center-of-Mass det. time= 79.9 min (982.8 - 903.0)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,744 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

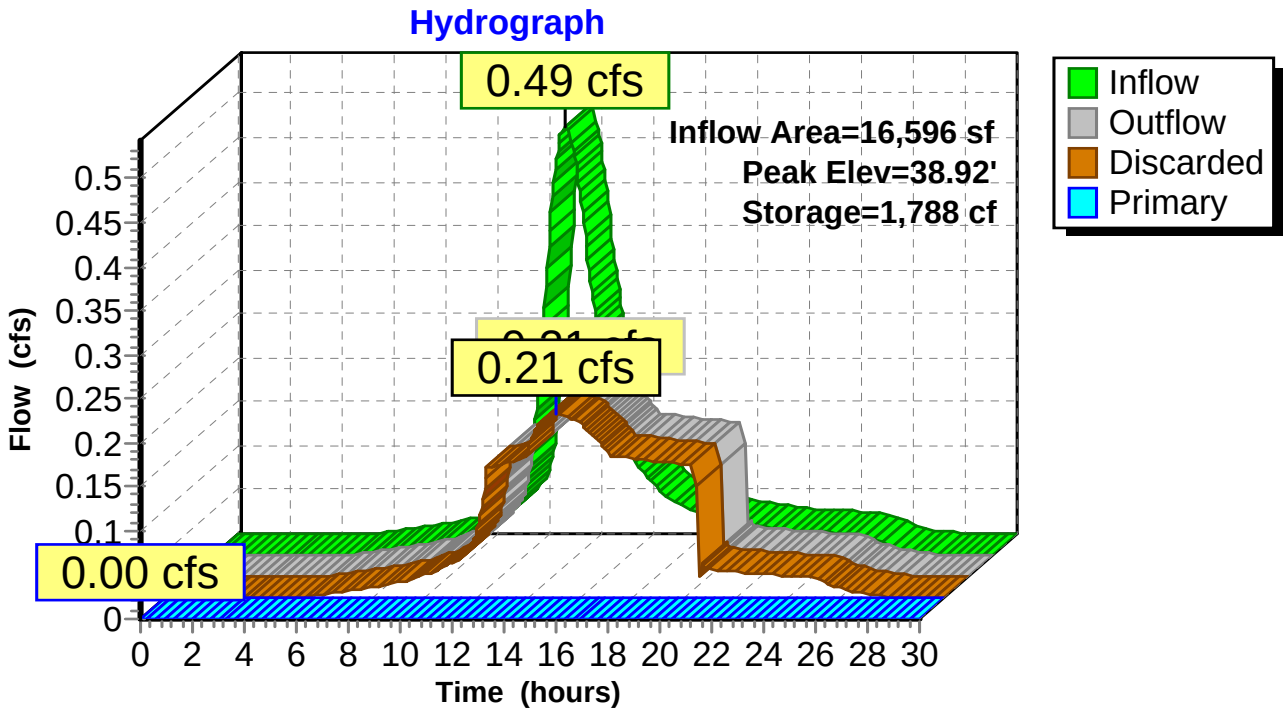
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	1,069	0.0	0	0
35.01	1,069	40.0	4	4
37.99	1,069	40.0	1,274	1,279
38.00	400	0.0	0	1,279
38.01	400	100.0	4	1,283
40.00	1,069	100.0	1,462	2,744

Device	Routing	Invert	Outlet Devices
#1	Primary	36.75'	**8.0" Round Culvert** L= 111.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.75' / 25.65' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	39.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	35.00'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.21 cfs @ 15.09 hrs HW=38.92' (Free Discharge)
└**3=Exfiltration** (Controls 0.21 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=35.00' (Free Discharge)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1b: FILTRATION BASIN P1b



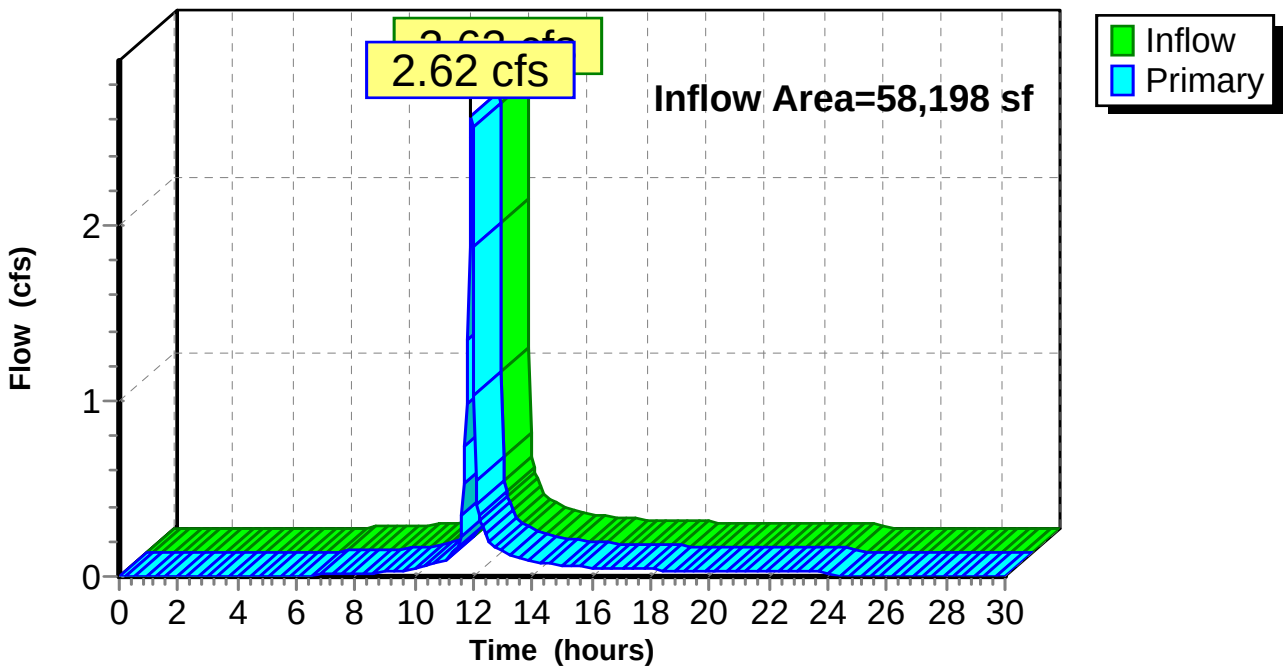
Summary for Link DP1: DESIGN POINT 1

Inflow Area = 58,198 sf, 63.71% Impervious, Inflow Depth = 1.21" for 10 Yr XSC event
Inflow = 2.62 cfs @ 11.93 hrs, Volume= 5,853 cf
Primary = 2.62 cfs @ 11.93 hrs, Volume= 5,853 cf, Atten= 0%, Lag= 0.0 min

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

Link DP1: DESIGN POINT 1

Hydrograph

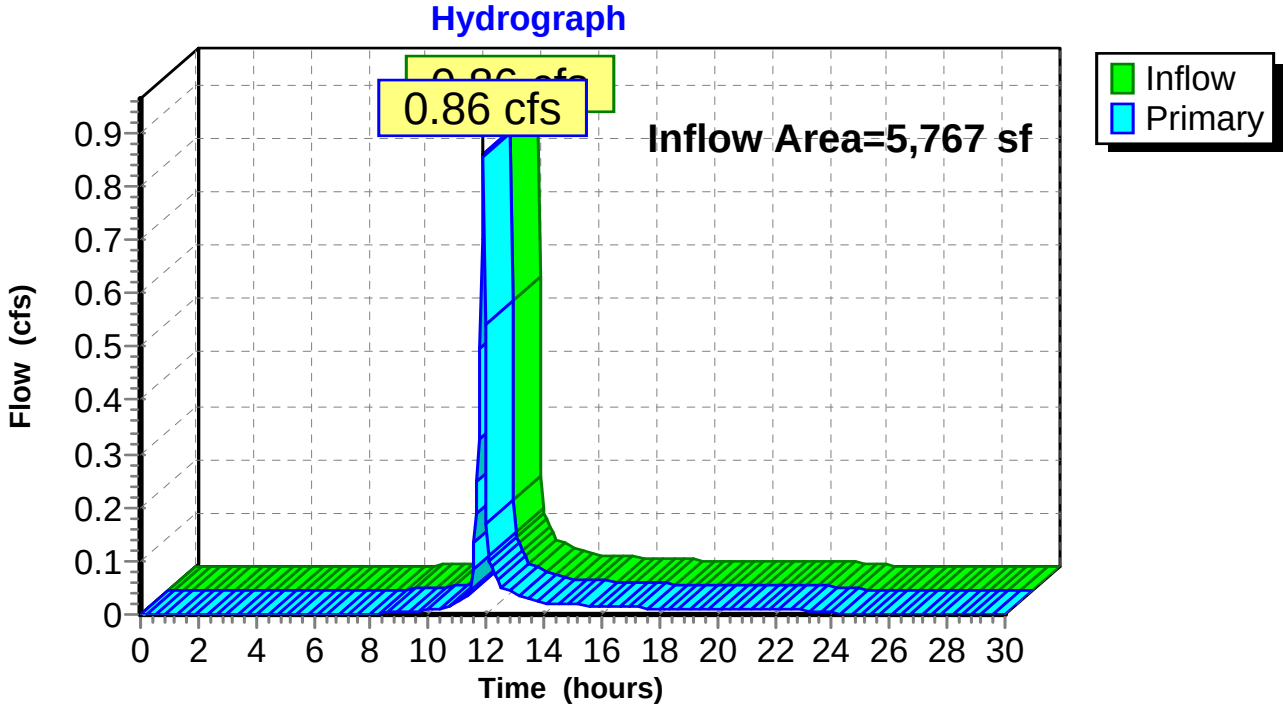


Summary for Link DP2: DESIGN POINT 2

Inflow Area = 5,767 sf, 18.66% Impervious, Inflow Depth = 3.22" for 10 Yr XSC event
Inflow = 0.86 cfs @ 11.89 hrs, Volume= 1,547 cf
Primary = 0.86 cfs @ 11.89 hrs, Volume= 1,547 cf, Atten= 0%, Lag= 0.0 min

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

Link DP2: DESIGN POINT 2

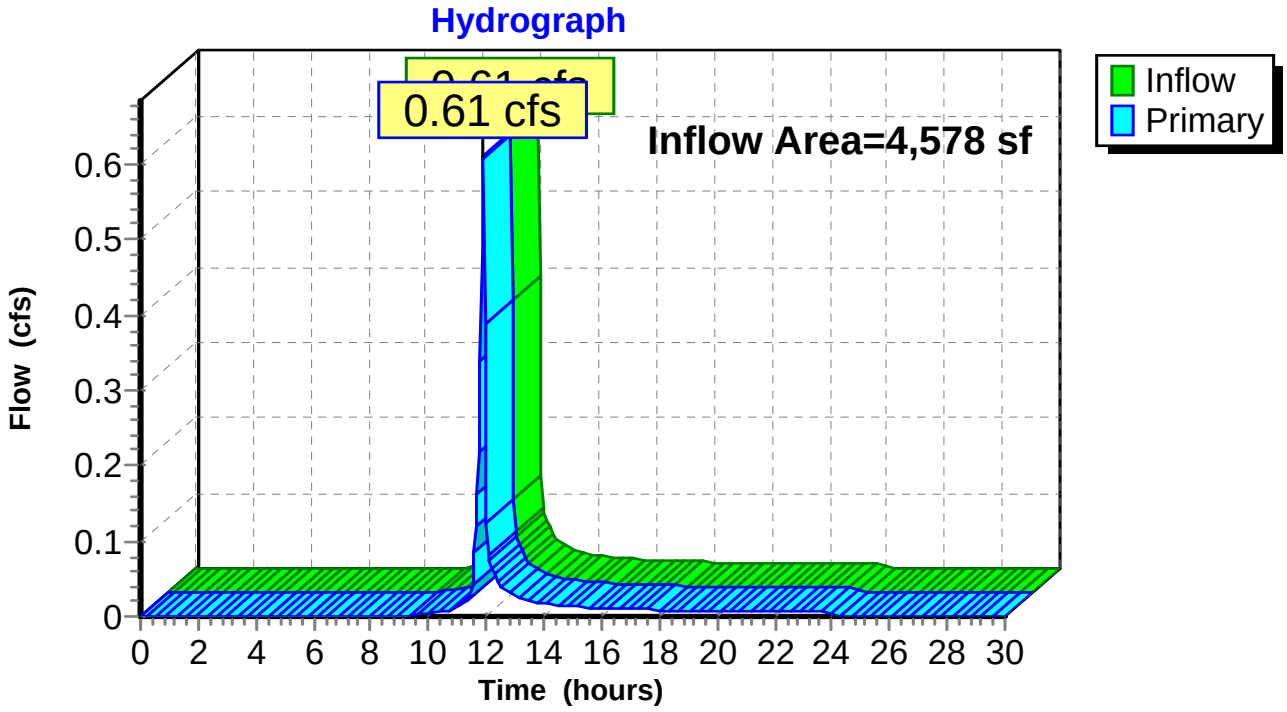


Summary for Link DP3: DESIGN POINT 3

Inflow Area = 4,578 sf, 3.78% Impervious, Inflow Depth = 2.84" for 10 Yr XSC event
Inflow = 0.61 cfs @ 11.89 hrs, Volume= 1,085 cf
Primary = 0.61 cfs @ 11.89 hrs, Volume= 1,085 cf, Atten= 0%, Lag= 0.0 min

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

Link DP3: DESIGN POINT 3



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

Subcatchment Ps1a: PS1a Runoff Area=23,312 sf 79.26% Impervious Runoff Depth>7.65"
Tc=135.0 min CN=93 Runoff=1.13 cfs 14,859 cf

Subcatchment PS1b: PS1b Runoff Area=16,596 sf 65.26% Impervious Runoff Depth>7.29"
Tc=135.0 min CN=90 Runoff=0.78 cfs 10,079 cf

Subcatchment PS1c: PS1c Runoff Area=12,523 sf 53.49% Impervious Runoff Depth=6.93"
Tc=5.0 min CN=87 Runoff=3.29 cfs 7,229 cf

Subcatchment PS2: PS2 Runoff Area=5,767 sf 18.66% Impervious Runoff Depth=5.85"
Tc=0.0 min CN=78 Runoff=1.51 cfs 2,809 cf

Subcatchment PS3: PS3 Runoff Area=4,578 sf 3.78% Impervious Runoff Depth=5.37"
Tc=0.0 min UI Adjusted CN=74 Runoff=1.12 cfs 2,047 cf

Pond CB2: CB2 Peak Elev=40.21' Inflow=0.78 cfs 10,079 cf
Outflow=0.78 cfs 10,079 cf

Pond DM1: DM1 Peak Elev=27.46' Inflow=1.04 cfs 2,901 cf
15.0" Round Culvert n=0.011 L=1.0' S=0.1500 '/' Outflow=1.04 cfs 2,901 cf

Pond DM2: DM1 Peak Elev=40.71' Inflow=1.04 cfs 2,901 cf
12.0" Round Culvert n=0.013 L=99.0' S=0.0717 '/' Outflow=1.04 cfs 2,901 cf

Pond DM3: DM3 Peak Elev=54.00' Inflow=0.61 cfs 1,761 cf
12.0" Round Culvert n=0.013 L=163.0' S=0.0525 '/' Outflow=0.61 cfs 1,761 cf

Pond P1a: FILTRATION BASIN PS1a Peak Elev=57.10' Storage=3,440 cf Inflow=1.13 cfs 14,859 cf
Discarded=0.36 cfs 13,100 cf Primary=0.61 cfs 1,761 cf Outflow=0.98 cfs 14,861 cf

Pond P1b: FILTRATION BASIN P1b Peak Elev=39.81' Storage=2,550 cf Inflow=0.78 cfs 10,079 cf
Discarded=0.25 cfs 8,939 cf Primary=0.43 cfs 1,140 cf Outflow=0.69 cfs 10,079 cf

Link DP1: DESIGN POINT 1 Inflow=4.35 cfs 12,940 cf
Primary=4.35 cfs 12,940 cf

Link DP2: DESIGN POINT 2 Inflow=1.51 cfs 2,809 cf
Primary=1.51 cfs 2,809 cf

Link DP3: DESIGN POINT 3 Inflow=1.12 cfs 2,047 cf
Primary=1.12 cfs 2,047 cf

Total Runoff Area = 62,776 sf Runoff Volume = 37,024 cf Average Runoff Depth = 7.08"
40.66% Pervious = 25,523 sf 59.34% Impervious = 37,253 sf

Summary for Subcatchment Ps1a: PS1a

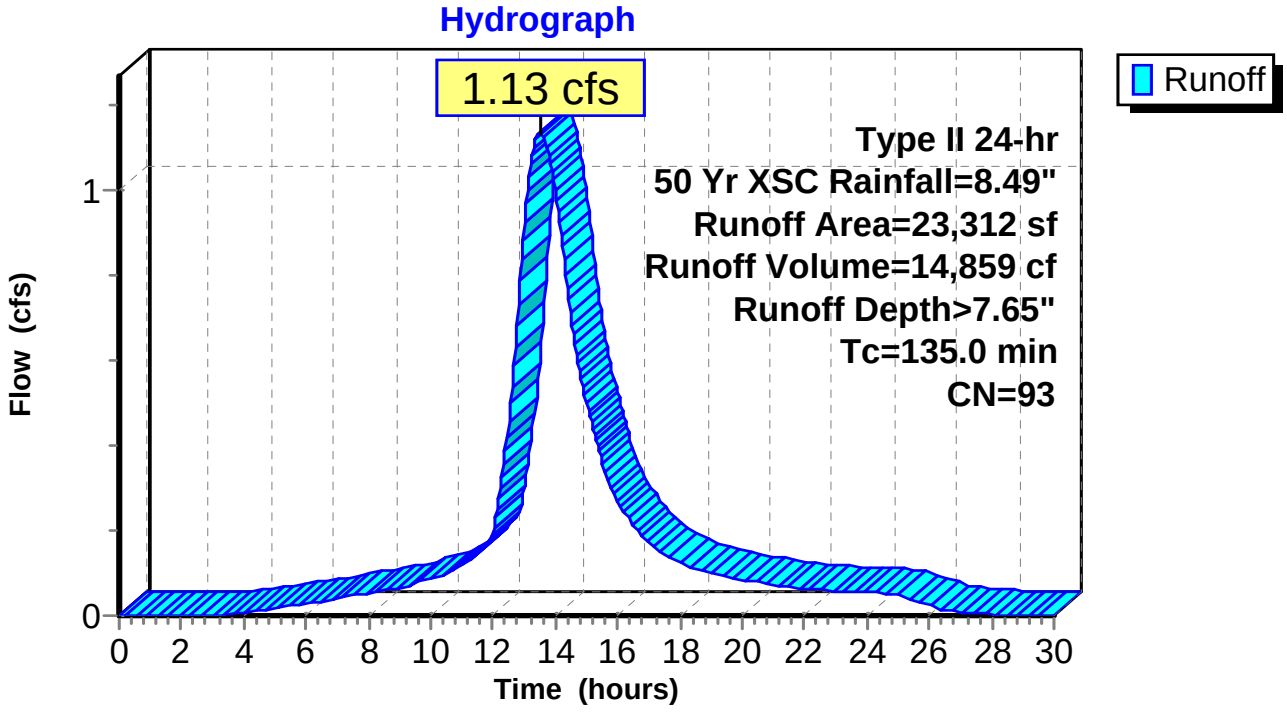
Runoff = 1.13 cfs @ 13.52 hrs, Volume= 14,859 cf, Depth> 7.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

	Area (sf)	CN	Description
	16,073	98	Paved parking, HSG C
*	475	98	Conc Walk, HSG C
	1,928	98	Roofs, HSG C
	4,836	74	>75% Grass cover, Good, HSG C
	23,312	93	Weighted Average
	4,836		20.74% Pervious Area
	18,476		79.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
135.0					**Direct Entry, TC PER UNHSC**

Subcatchment Ps1a: PS1a



Summary for Subcatchment PS1b: PS1b

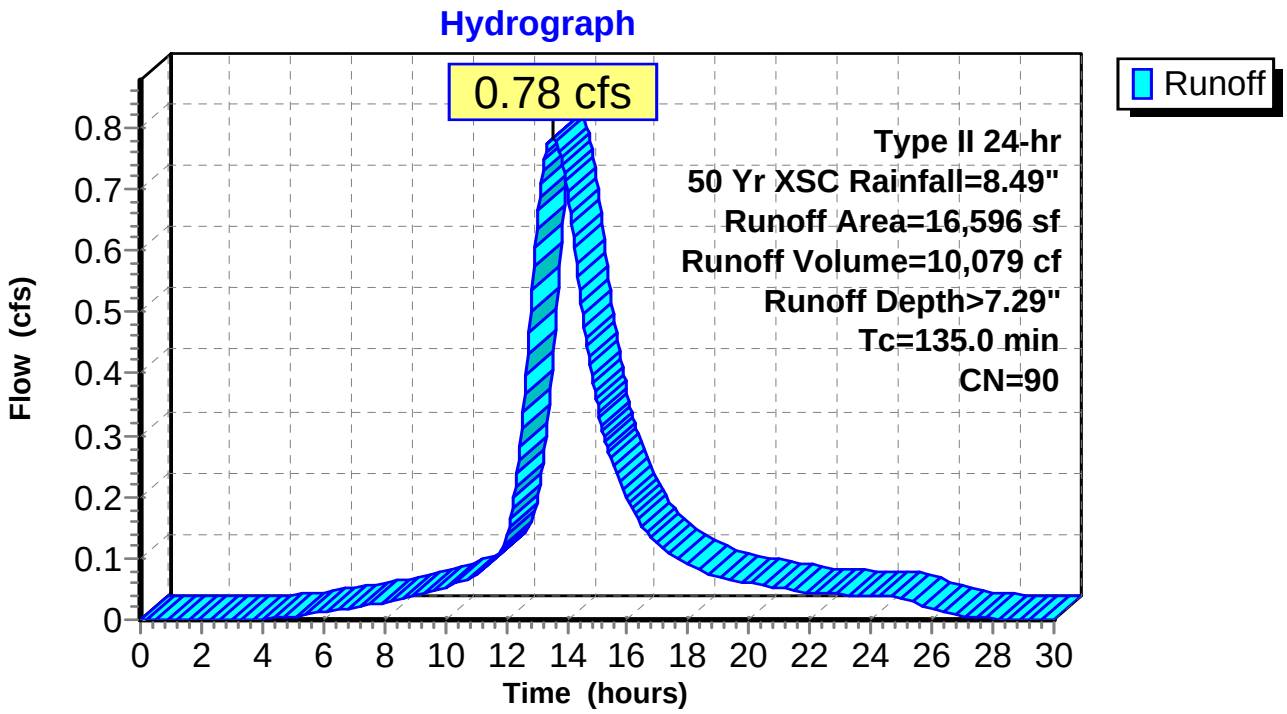
Runoff = 0.78 cfs @ 13.52 hrs, Volume= 10,079 cf, Depth> 7.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

	Area (sf)	CN	Description
	8,343	98	Paved parking, HSG C
*	218	98	Unconnected wall, HSG C
*	819	98	Conc Walk HSG C
	1,450	98	Roofs, HSG C
	5,766	74	>75% Grass cover, Good, HSG C
	16,596	90	Weighted Average
	5,766		34.74% Pervious Area
	10,830		65.26% Impervious Area
	218		2.01% Unconnected

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

Subcatchment PS1b: PS1b



Summary for Subcatchment PS1c: PS1c

[49] Hint: Tc<2dt may require smaller dt

Runoff = 3.29 cfs @ 11.95 hrs, Volume= 7,229 cf, Depth= 6.93"

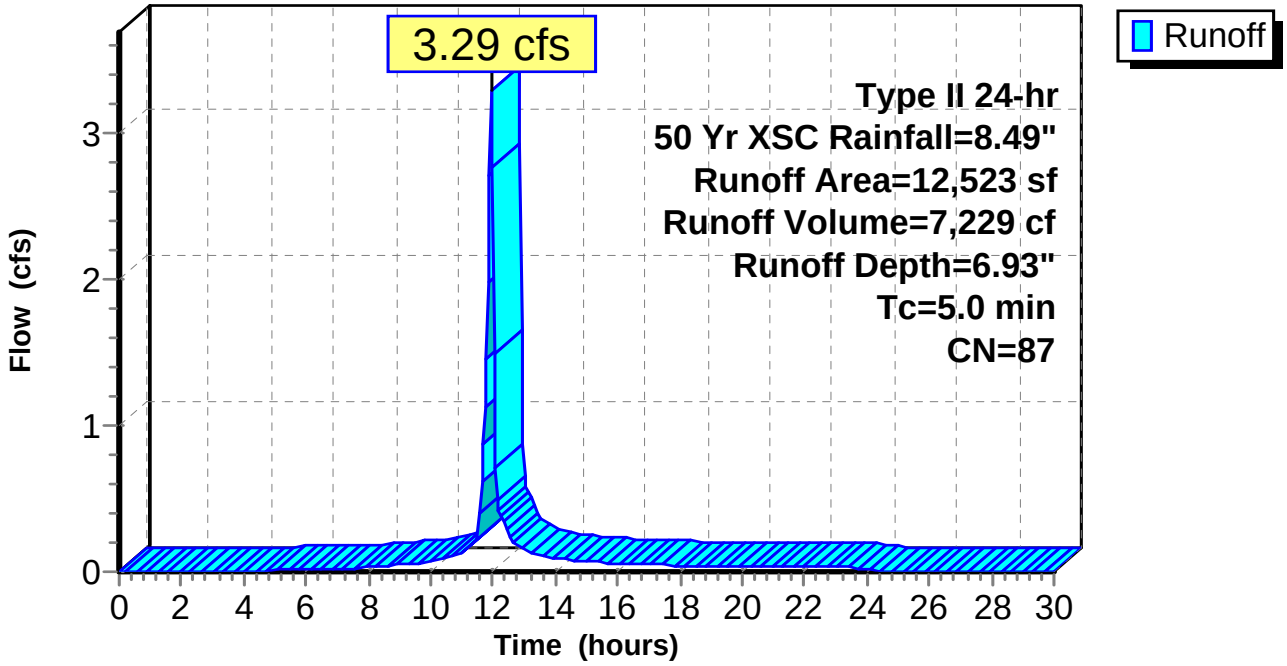
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

	Area (sf)	CN	Description
	6,279	98	Paved parking, HSG C
*	419	98	Unconnected wall, HSG C
	5,825	74	>75% Grass cover, Good, HSG C
	12,523	87	Weighted Average
	5,825		46.51% Pervious Area
	6,698		53.49% Impervious Area
	419		6.26% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, TR55 MIN 5 mINUTES**

Subcatchment PS1c: PS1c

Hydrograph



Summary for Subcatchment PS2: PS2

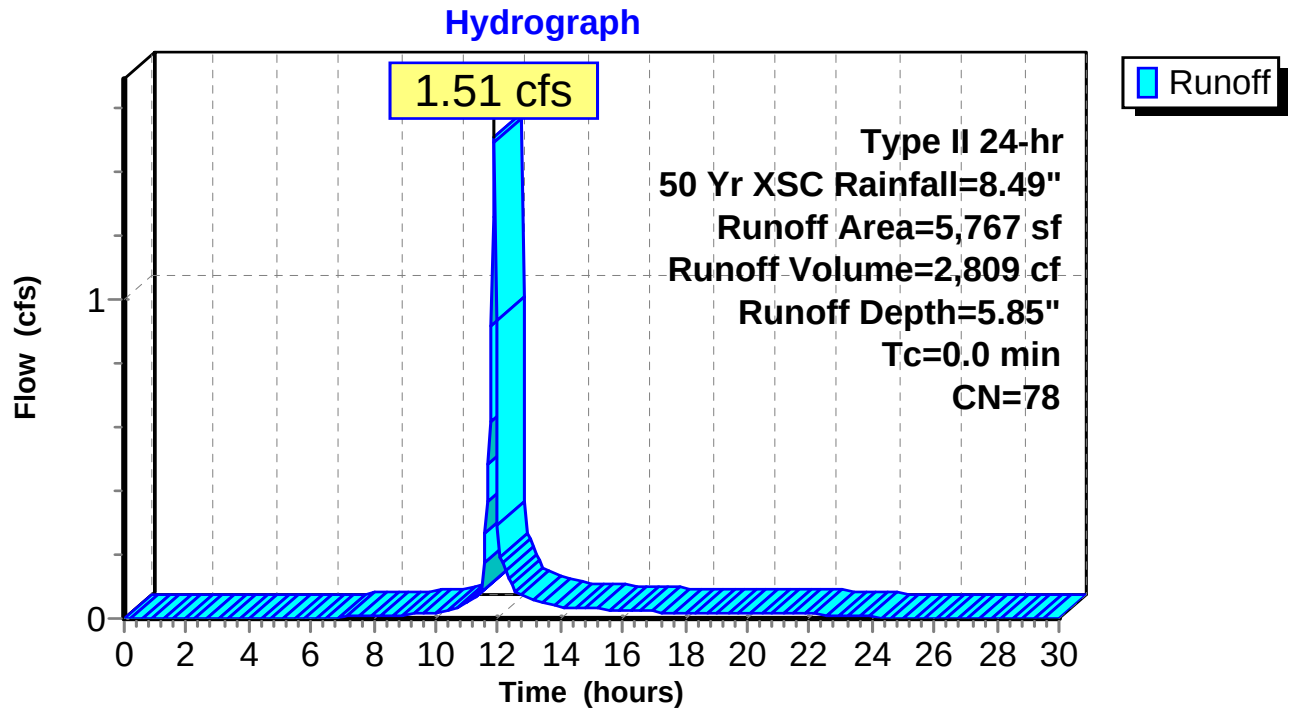
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.51 cfs @ 11.89 hrs, Volume= 2,809 cf, Depth= 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

	Area (sf)	CN	Description
*	10	98	Unconnected wall, HSG C
	1,066	98	Roofs, HSG C
	4,691	74	>75% Grass cover, Good, HSG C
	5,767	78	Weighted Average
	4,691		81.34% Pervious Area
	1,076		18.66% Impervious Area
	10		0.93% Unconnected

Subcatchment PS2: PS2



Summary for Subcatchment PS3: PS3

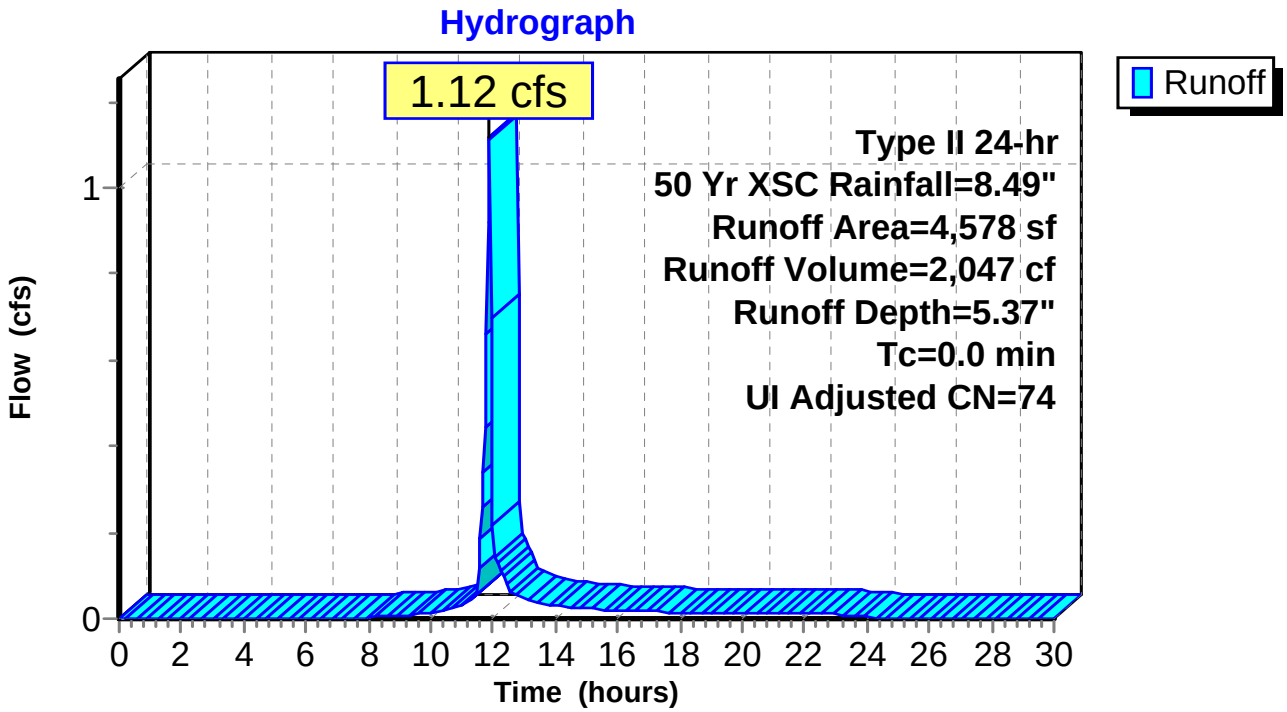
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.12 cfs @ 11.89 hrs, Volume= 2,047 cf, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type II 24-hr 50 Yr XSC Rainfall=8.49"

	Area (sf)	CN	Adj	Description
*	173	98		Unconnected wall, HSG C
	4,405	74		>75% Grass cover, Good, HSG C
	4,578	75	74	Weighted Average, UI Adjusted
	4,405			96.22% Pervious Area
	173			3.78% Impervious Area
	173			100.00% Unconnected

Subcatchment PS3: PS3



Summary for Pond CB2: CB2

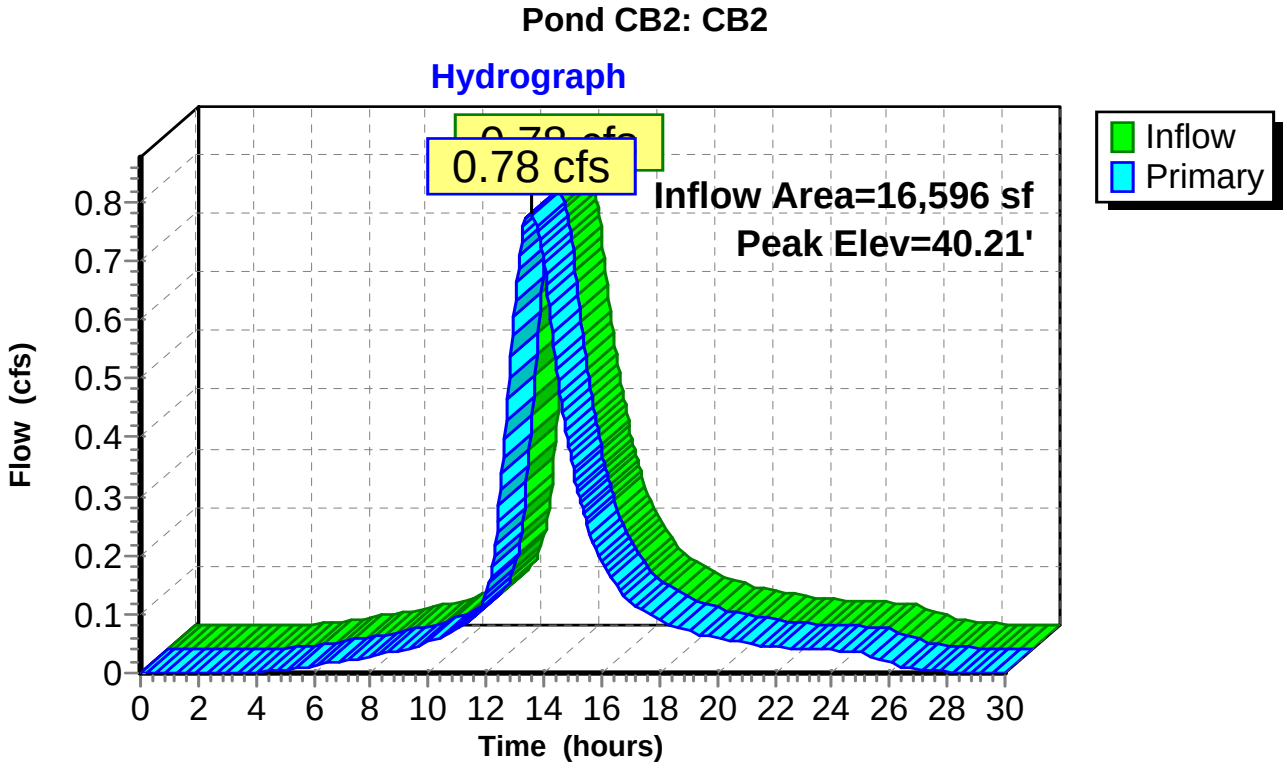
[57] Hint: Peaked at 40.21' (Flood elevation advised)

Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 7.29" for 50 Yr XSC event
Inflow = 0.78 cfs @ 13.52 hrs, Volume= 10,079 cf
Outflow = 0.78 cfs @ 13.52 hrs, Volume= 10,079 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.78 cfs @ 13.52 hrs, Volume= 10,079 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.21' @ 13.52 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	39.70'	**12.0" Round Culvert** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 39.70' / 38.50' S= 0.0600 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 13.52 hrs HW=40.21' (Free Discharge)
1=Orifice/Grate (Controls 0.00 cfs)
2=Culvert (Inlet Controls 0.78 cfs @ 1.93 fps)



Summary for Pond DM1: DM1

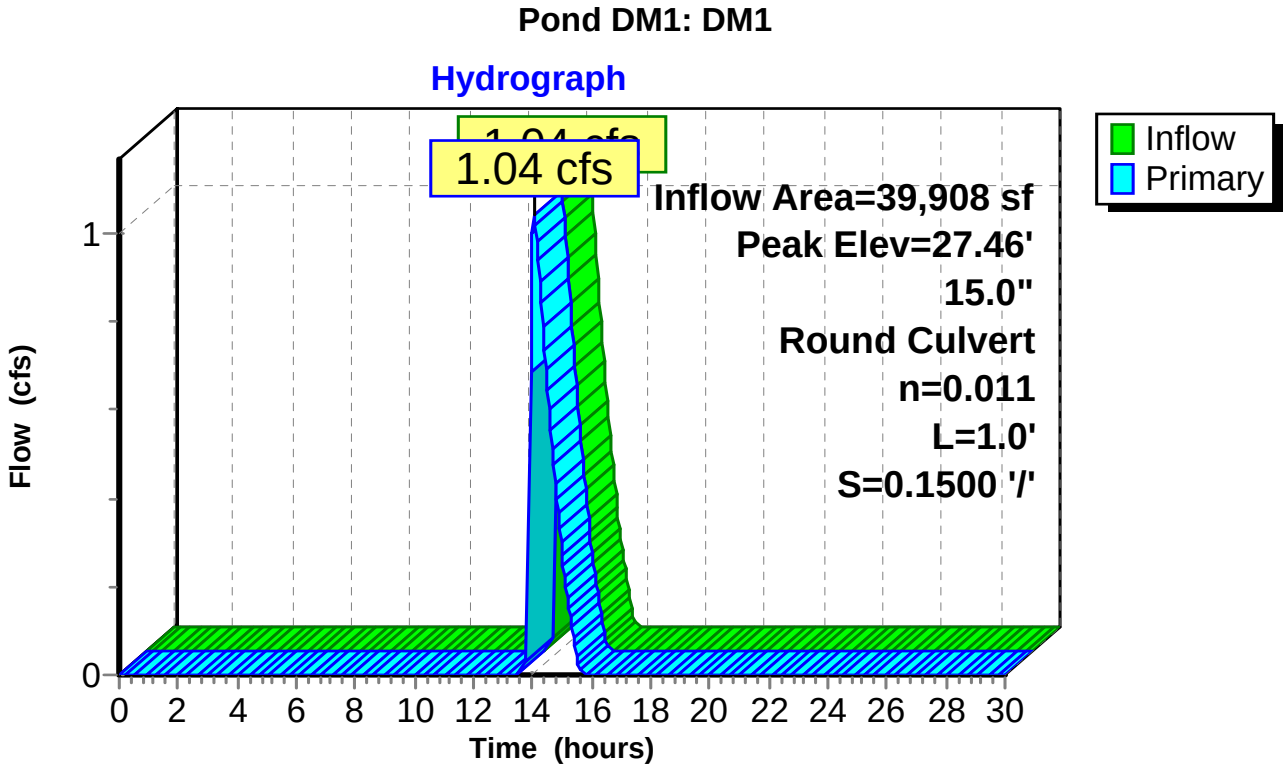
[57] Hint: Peaked at 27.46' (Flood elevation advised)

Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.87" for 50 Yr XSC event
Inflow = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf
Outflow = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 27.46' @ 14.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	27.00'	**15.0" Round Culvert** L= 1.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 27.00' / 26.85' S= 0.1500 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.04 cfs @ 14.06 hrs HW=27.46' (Free Discharge)
1=Culvert (Barrel Controls 1.04 cfs @ 3.73 fps)



Summary for Pond DM2: DM1

[57] Hint: Peaked at 40.71' (Flood elevation advised)
[81] Warning: Exceeded Pond P1b by 5.10' @ 0.00 hrs

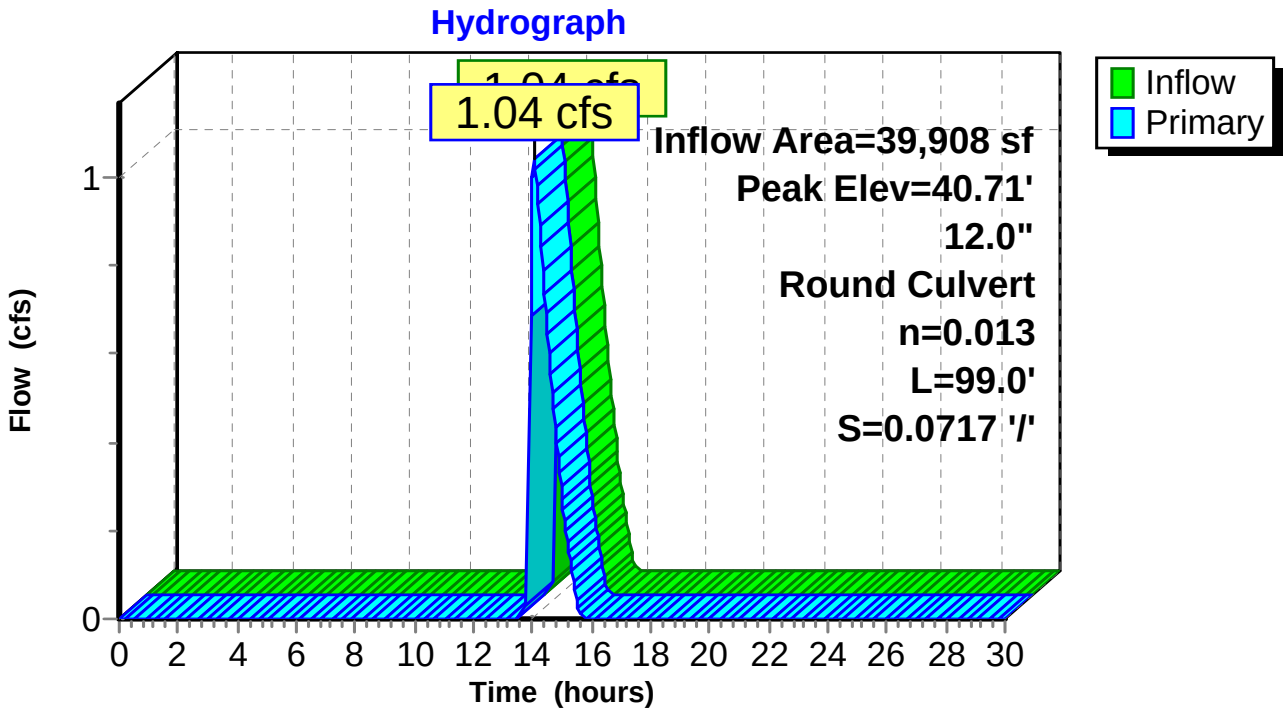
Inflow Area = 39,908 sf, 73.43% Impervious, Inflow Depth = 0.87" for 50 Yr XSC event
Inflow = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf
Outflow = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.04 cfs @ 14.06 hrs, Volume= 2,901 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 40.71' @ 14.06 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.10'	**12.0" Round Culvert** L= 99.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 40.10' / 33.00' S= 0.0717 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.04 cfs @ 14.06 hrs HW=40.70' (Free Discharge)
└**1=Culvert** (Inlet Controls 1.04 cfs @ 2.09 fps)

Pond DM2: DM1



Summary for Pond DM3: DM3

[57] Hint: Peaked at 54.00' (Flood elevation advised)
[79] Warning: Submerged Pond P1a Primary device # 1 INLET by 0.33'

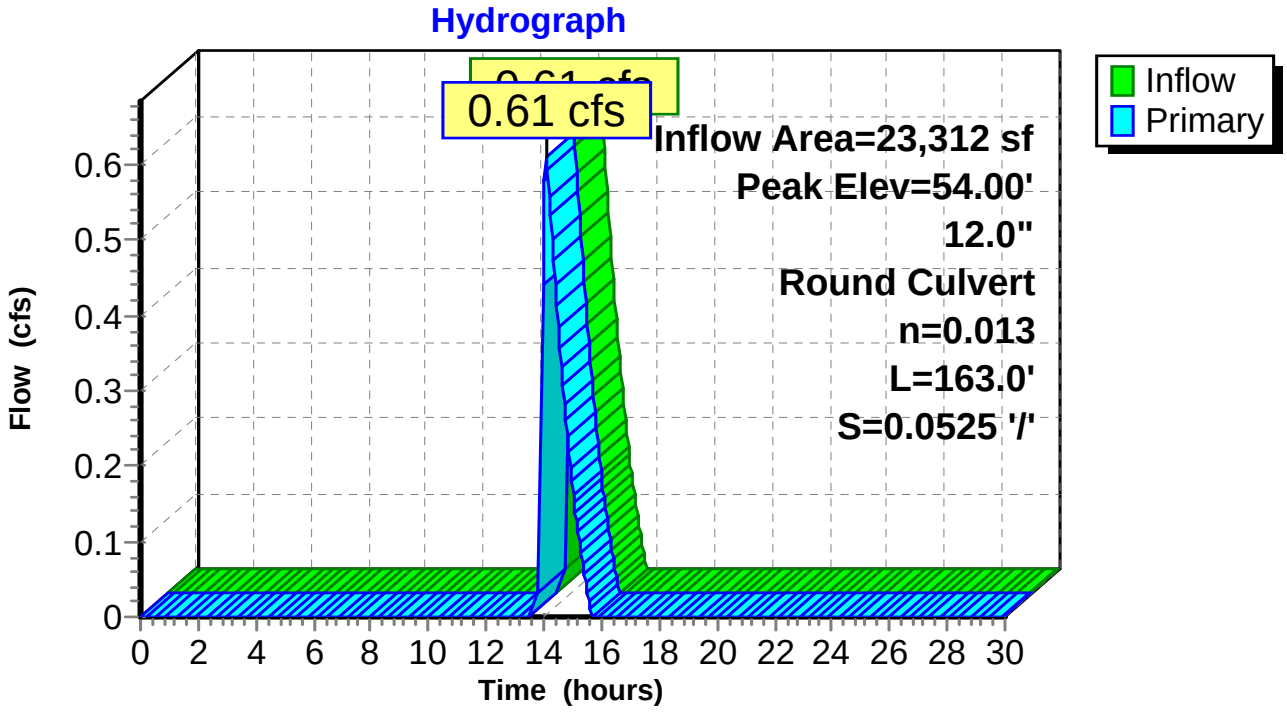
Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth = 0.91" for 50 Yr XSC event
Inflow = 0.61 cfs @ 14.07 hrs, Volume= 1,761 cf
Outflow = 0.61 cfs @ 14.07 hrs, Volume= 1,761 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.61 cfs @ 14.07 hrs, Volume= 1,761 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 54.00' @ 14.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	53.55'	**12.0" Round Culvert** L= 163.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.55' / 45.00' S= 0.0525 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 14.07 hrs HW=54.00' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.61 cfs @ 1.79 fps)

Pond DM3: DM3



Summary for Pond P1a: FILTRATION BASIN PS1a

[85] Warning: Oscillations may require Finer Routing>1 (severity=1)

Inflow Area = 23,312 sf, 79.26% Impervious, Inflow Depth > 7.65" for 50 Yr XSC event
Inflow = 1.13 cfs @ 13.52 hrs, Volume= 14,859 cf
Outflow = 0.98 cfs @ 14.07 hrs, Volume= 14,861 cf, Atten= 14%, Lag= 33.1 min
Discarded = 0.36 cfs @ 14.07 hrs, Volume= 13,100 cf
Primary = 0.61 cfs @ 14.07 hrs, Volume= 1,761 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 57.10' @ 14.07 hrs Surf.Area= 1,757 sf Storage= 3,440 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 73.1 min (952.6 - 879.4)

Volume	Invert	Avail.Storage	Storage Description
#1	53.67'	4,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

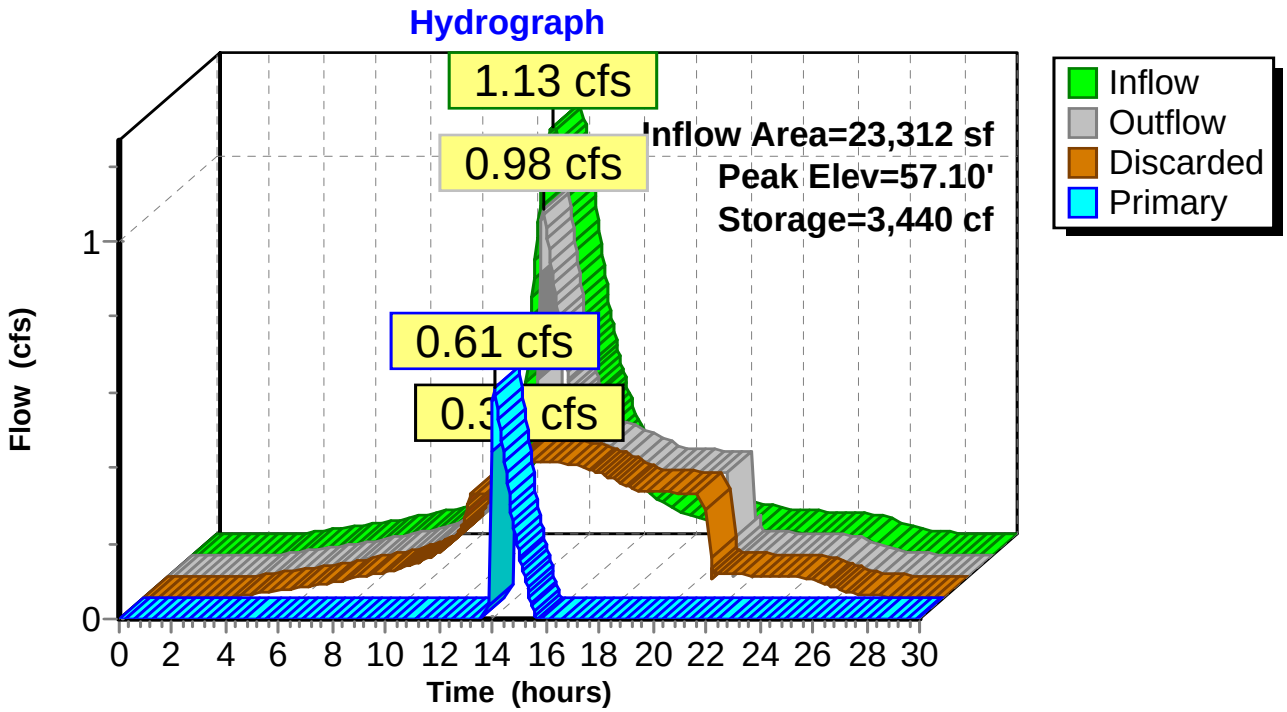
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
53.67	1,963	0.0	0	0
53.68	1,963	40.0	8	8
54.00	1,963	40.0	251	259
56.00	1,963	40.0	1,570	1,830
56.01	1,963	0.0	0	1,830
56.02	1,210	100.0	16	1,845
57.50	1,963	100.0	2,348	4,193

Device	Routing	Invert	Outlet Devices
#1	Primary	53.67'	**6.0" Round Culvert X 3.00** L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 53.67' / 53.65' S= 0.0006 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf
#2	Device 1	57.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	53.67'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.36 cfs @ 14.07 hrs HW=57.09' (Free Discharge)
└**3=Exfiltration** (Controls 0.36 cfs)

Primary OutFlow Max=0.60 cfs @ 14.07 hrs HW=57.09' (Free Discharge)
└**1=Culvert** (Passes 0.60 cfs of 3.75 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.60 cfs @ 1.01 fps)

Pond P1a: FILTRATION BASIN PS1a



Summary for Pond P1b: FILTRATION BASIN P1b

[79] Warning: Submerged Pond CB2 Primary device # 2 INLET by 0.11'

Inflow Area = 16,596 sf, 65.26% Impervious, Inflow Depth > 7.29" for 50 Yr XSC event
Inflow = 0.78 cfs @ 13.52 hrs, Volume= 10,079 cf
Outflow = 0.69 cfs @ 14.04 hrs, Volume= 10,079 cf, Atten= 12%, Lag= 31.2 min
Discarded = 0.25 cfs @ 14.04 hrs, Volume= 8,939 cf
Primary = 0.43 cfs @ 14.04 hrs, Volume= 1,140 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 39.81' @ 14.04 hrs Surf.Area= 1,006 sf Storage= 2,550 cf

Plug-Flow detention time= 89.8 min calculated for 10,079 cf (100% of inflow)
Center-of-Mass det. time= 89.8 min (979.7 - 890.0)

Volume	Invert	Avail.Storage	Storage Description
#1	35.00'	2,744 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

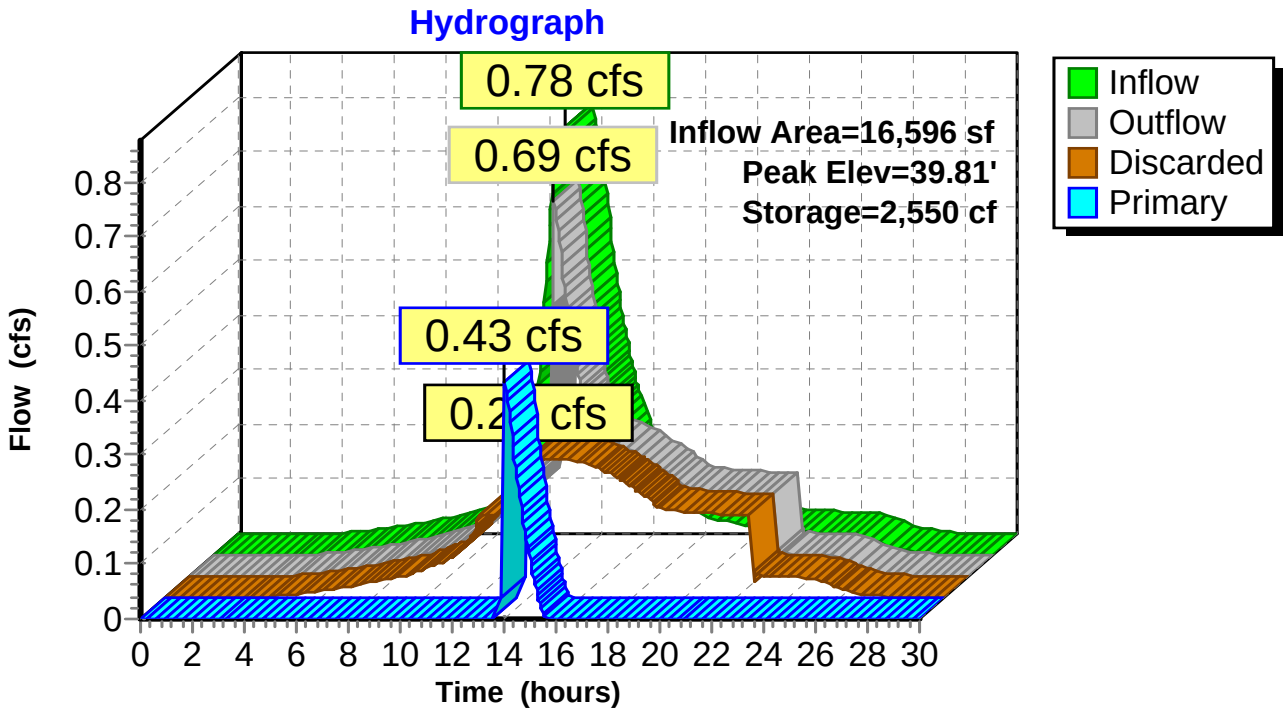
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
35.00	1,069	0.0	0	0
35.01	1,069	40.0	4	4
37.99	1,069	40.0	1,274	1,279
38.00	400	0.0	0	1,279
38.01	400	100.0	4	1,283
40.00	1,069	100.0	1,462	2,744

Device	Routing	Invert	Outlet Devices
#1	Primary	36.75'	**8.0" Round Culvert** L= 111.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 36.75' / 25.65' S= 0.1000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	39.75'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	35.00'	**6.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'

Discarded OutFlow Max=0.25 cfs @ 14.04 hrs HW=39.81' (Free Discharge)
└**3=Exfiltration** (Controls 0.25 cfs)

Primary OutFlow Max=0.41 cfs @ 14.04 hrs HW=39.81' (Free Discharge)
└**1=Culvert** (Passes 0.41 cfs of 2.19 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.41 cfs @ 0.82 fps)

Pond P1b: FILTRATION BASIN P1b

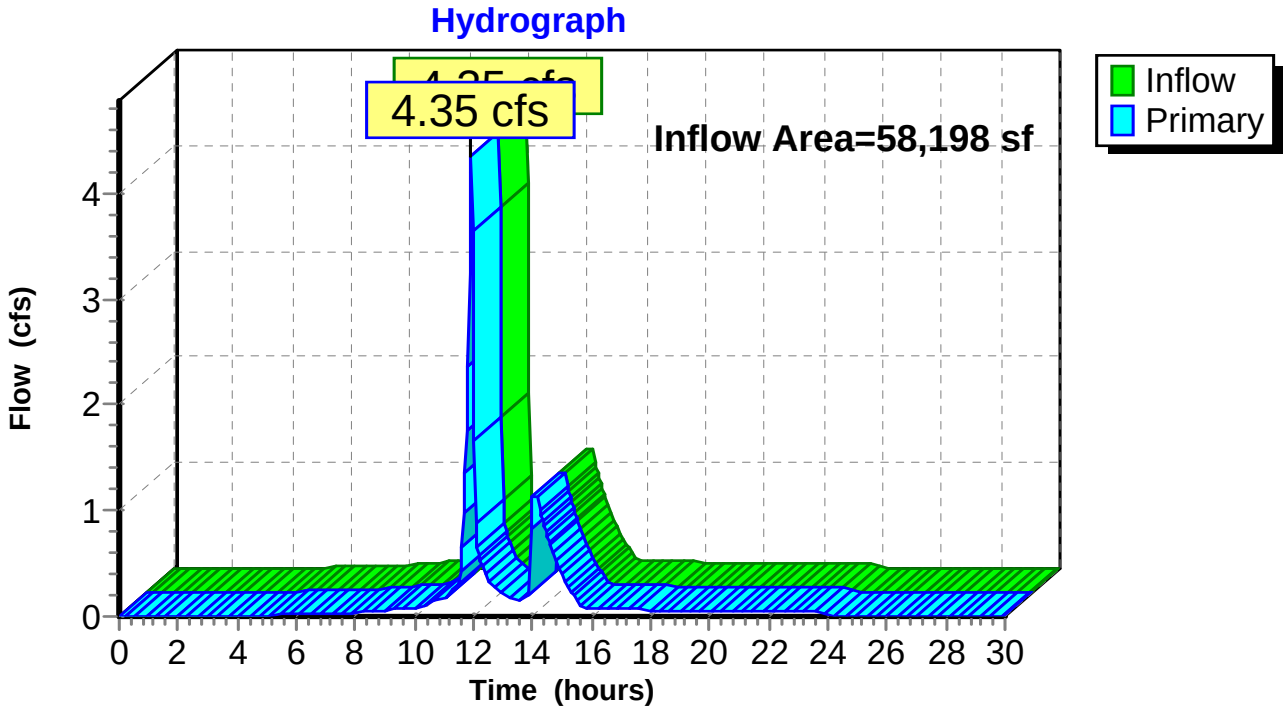


Summary for Link DP1: DESIGN POINT 1

Inflow Area = 58,198 sf, 63.71% Impervious, Inflow Depth = 2.67" for 50 Yr XSC event
Inflow = 4.35 cfs @ 11.93 hrs, Volume= 12,940 cf
Primary = 4.35 cfs @ 11.93 hrs, Volume= 12,940 cf, Atten= 0%, Lag= 0.0 min

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

Link DP1: DESIGN POINT 1



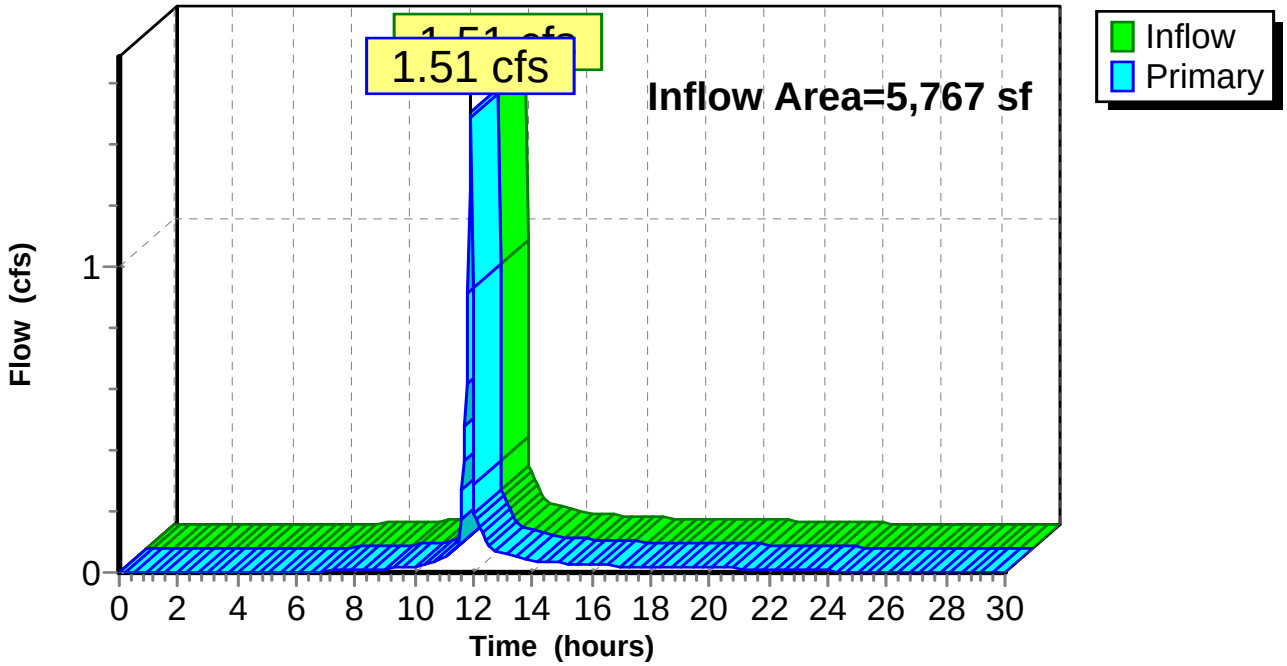
Summary for Link DP2: DESIGN POINT 2

Inflow Area = 5,767 sf, 18.66% Impervious, Inflow Depth = 5.85" for 50 Yr XSC event
Inflow = 1.51 cfs @ 11.89 hrs, Volume= 2,809 cf
Primary = 1.51 cfs @ 11.89 hrs, Volume= 2,809 cf, Atten= 0%, Lag= 0.0 min

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

Link DP2: DESIGN POINT 2

Hydrograph

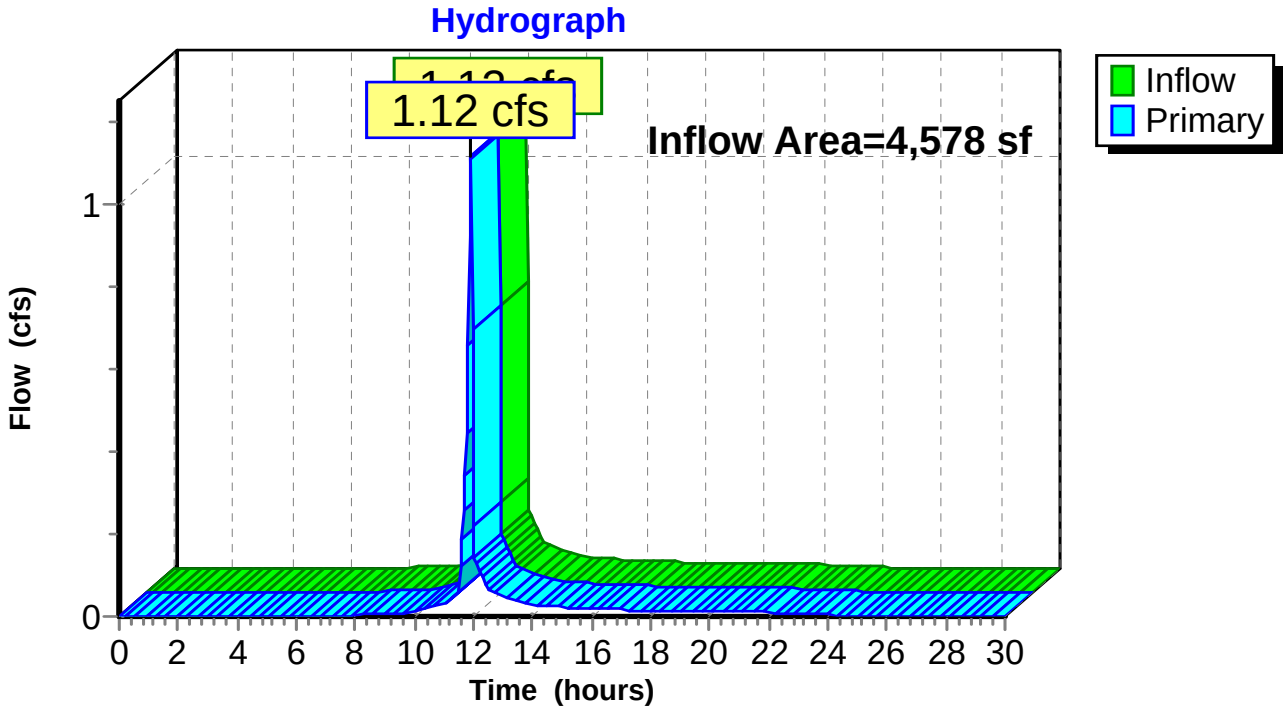


Summary for Link DP3: DESIGN POINT 3

Inflow Area = 4,578 sf, 3.78% Impervious, Inflow Depth = 5.37" for 50 Yr XSC event
Inflow = 1.12 cfs @ 11.89 hrs, Volume= 2,047 cf
Primary = 1.12 cfs @ 11.89 hrs, Volume= 2,047 cf, Atten= 0%, Lag= 0.0 min

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

Link DP3: DESIGN POINT 3



Bioretention Systems

UNHSC research is showing that bioretention systems are most effective when they serve as local source control devices, intercepting and managing relatively small areas of impervious cover, in a well-distributed network of runoff control measures.

About Bioretention Systems

Bioretention systems, also known as "rain gardens," are among the most common LID stormwater approaches in use today. In general, runoff flows into landscaped depressions, where it ponds, filters through a soil mix, and infiltrates into the ground, or is connected to storm drains. The engineered soil mix and vegetation mimic the water quality treatment and infiltration similar to undeveloped areas. Soil mix design is essential to the performance and longevity of these systems. While the mix must contain enough fines and organic matter to sustain vegetation and slow down infiltration rates, too much of these components may cause systems to clog prematurely eliminating any water quality benefits. There are soil mix specifications available to support designers in successfully implementing bioretention systems in a wide range of site conditions. UNHSC has evaluated many such systems; this report looks at a design we call "Bio II."

Implementation

Bioretention systems can be used throughout the United States, and their acceptance and implementation varies regionally. However, an increasing number of states require a level of water quality treatment and volume reduction that only can be achieved through the incorporation of LID designs like bioretention. In some regions, local acceptance is hindered by lack of performance data, unfamiliarity with the design, and suspicions about seasonal functionality.

To achieve maximum volume reduction, bioretention systems should be located in soils that accommodate infiltration, such as those in group "A" (sand, loamy sand, or sandy loam with high infiltration rates) and "B" (silt loam or loam with moderate infiltration rates). Careful site analysis is required to design an effective, integrated network of these systems that allows infiltration throughout a site. Bioretention systems can also be used to great effect in areas with poor soils, where pre-development infiltration would have been minimal. These systems in poor soils will require underdrains to ensure proper drainage and treatment.

UNHSC research is showing that bioretention systems are most effective when they serve as local source control devices, intercepting and managing relatively small areas of impervious cover in a well-distributed network of runoff control measures. They can be used as an end-of-pipe system; however, such usage requires a more sophisticated design for the system to function properly, particularly when

Fast Facts

CATEGORY / BMP TYPE

Infiltration, Low Impact Development Design

UNIT OPERATIONS & PROCESSES

Hydrologic (Flow Alteration)

Water Quality: Physical (Sedimentation, Filtration), Biological (Vegetative Uptake), & Chemical (Some Sorption possible with proper design)

DESIGN SOURCE

Low Impact Development Center, Maryland

BASIC DIMENSIONS

Filtration Basin: 8 ft wide X 34 ft long X 2.5 ft deep

Forebay: 14 ft long X 8 ft wide

Total Area: 272 sf

SPECIFICATIONS

Catchment Area: 1 acre

Water Quality Flow: 1 cfs

Water Quality Volume: 3,300 cf

INSTALLATION COST

$18,000 per acre

MAINTENANCE

Maintenance Sensitivity: Low

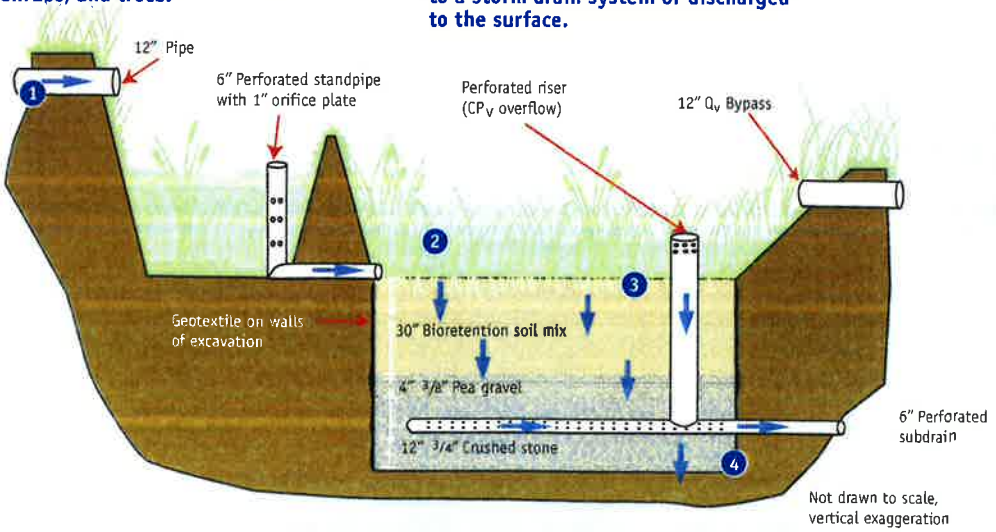
Inspections: Low

Sediment Removal: High

How the System Works

WATER QUALITY TREATMENT PROCESS

1. **Runoff flows into a sedimentation forebay or other pretreatment chamber. From there, it is slowly released into the filter basin through a perforated standpipe. When forebay capacity is reached, the overflow spills across a weir into the bioretention basin.**
2. **Biological treatment occurs through the uptake of pollutants by vegetation and soil microorganisms. Physical and chemical unit operations and processes that occur within the soil media include sedimentation, filtration, and sorption with organic matter and mineral complexes.**
3. **Nutrients like nitrogen are taken up by the roots of the vegetation and metabolized by the system's plants, shrubs, and trees.**
4. **The treated runoff can be allowed to infiltrate the native soils, or collected in a perforated subdrain and returned to a storm drain system or discharged to the surface.**



treating one or more acres of impervious cover. As with any infiltration or filtration system, when used in pollution hotspots or poor soils, they should be lined and outfitted with subdrains that discharge to the surface.

System Performance

Cost & Maintenance

The cost to install Bio II to treat runoff from a one-acre parking lot was $18,000. However, UNHSC expects this cost to come down as installers and designers gain familiarity with the systems. The Center installed a third bioretention system in 2007 at $14,000 per acre for the total cost; labor and installation were calculated to be $8,500 per acre, and materials and plantings cost $5,500 per acre. This indicates that for a municipality that has both equipment and personnel, the cost for retrofits is nearly $5,500 per acre of drainage.

Bioretention systems are designed to minimize maintenance. Generally, the highest maintenance burden is in the first three to four months, as the vegetation grows and the system begins to stabilize. Once vegetation is established, the maintenance decreases and becomes similar to that required for standard landscaping, such as seasonal mowing, raking, and pruning of vegetation. Systems with fine media may require more frequent attention due to clogging. However, since most clogging occurs on the surface, servicing these systems is simple. Long-term maintenance may involve routine inspection and occasional scraping and removal of surface fines.

Cold Climate

Bio II's ability to treat water quality and control water quantity remained relatively consistent in all seasons. UNHSC researchers have observed that most LID stormwater systems, when properly designed and installed, are not negatively impacted by cold climate. In fact, these systems showed fewer seasonal variation than many conventional approaches that depend on sedimentation as the primary unit operation. While some seasonal variation did occur in Bio II, significant design alterations do not appear to be necessary for cold weather applications of this system.

Water Quality Treatment

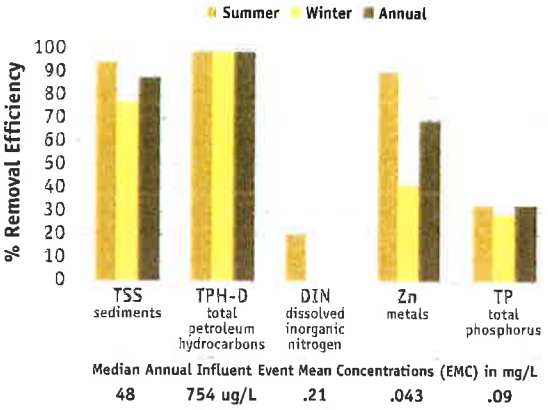
Bio II has proven effective at removing nearly all of the pollutants commonly associated with stormwater treatment performance assessment. It consistently exceeded EPA's recommended level of removal for total suspended solids and meets regional ambient water quality criteria for petroleum hydrocarbons. This system had lower removal of nitrogen and phosphorous than the previous bioretention system tested at the UNHSC. This may be due to reduced contact time and/or less dense root mat. These design variations are being examined in Bio III and Bio IV presently. Like the other systems monitored at UNHSC, Bio II does not provide chloride removal, although it does exhibit an ability to dampen chloride peaks.

The chart at top right reflects the bioretention performance in removing total suspended solids, total petroleum hydrocarbons, dissolved inorganic nitrogen, total phosphorus, and zinc.

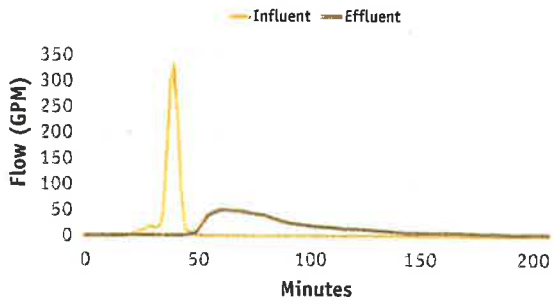
Water Quantity Control

Like other infiltration and filtration systems, Bio II has a tremendous capacity to reduce peak flows and runoff volume in appropriate soils, i.e., those belonging to groups A and B. In the figure at bottom right, Bio II demonstrates effective peak flow reduction and large lag times regardless of season. Vegetation contributes to stormwater volume reduction through the process of evapotranspiration.

POLLUTANT REMOVAL: 2006–2008



HYDRAULIC PERFORMANCE



	Winter	Summer	Annual Average
Average Peak Flow Reduction	76%	82%	79%
Average Lag Time (minutes)	376	254	309

16"/30" X 254 = 135 Avg. Lag Time

SYSTEM DESIGN

Bio II is comprised of a sedimentation forebay and a bioretention filtration basin. The basin is filled with a 30 inch bioretention soil mix (BSM), consisting of 60 percent sand, 20 percent woodchips, 10 percent compost, and 10 percent native soil. The filtration basin is well vegetated. Researchers selected vegetation for flood and drought tolerance, the capacity for maximum ground cover, and aesthetics.

The forebay holds 25 percent of the water quality volume (WQ_v), and drains through a stone level spreader into the bioretention basin, which holds 75 percent of the WQ_v. The basin allows eight inches of ponding, and the BSM has an infiltration rate of eight feet per day. Overflow contingencies exist for channel protection volume (CP_v) and conveyance protection volume (Q10) events. Typically Q2 events are conveyed over 24 to 48 hours, and Q10 events bypass to the surface.

The appropriate BSM design is important to ensure adequate drainage, support plant growth, and achieve water quality treatment objectives. It is important for soils to slowly percolate enough to achieve high quality treatment, yet fast enough to filter sufficient volumes of water such that the filter area not be inordinately large. Bio II's BSM specifications were developed with input from the Low Impact Development Center. The resulting BSM had reduced silts and clays of about 6 percent maintains an infiltration rate of approximately 8 feet per day, and had about 3 percent organic matter. Results indicate that this BSM had reduced removal performance for nitrogen and phosphorus, in comparison to Bio I that had an infiltration rate of 0.5 feet per day.

UNHSC is currently studying BSM for two other designs with high infiltration rates that use outlet controls to slowly release the WQ_v. One with 8 percent fines and 10 percent organic matter, and infiltration rate of 100 feet per day, and another with 10 percent fines, 7 percent organic matter, and an infiltration rate of 40 feet per day. Soil chemistry is important, especially when targeting phosphorus reduction. BSMs must contain relatively low levels of phosphorus to maintain a sorption capacity that can remove phosphorous from runoff. Studies from North Carolina State University recommend BSMs with a Phosphorus Index (P-Index) of 25 to 40.

APPENDIX D

SOIL SURVEY INFORMATION

Soil Map—Rockingham County, New Hampshire
(686 Maplewood Ave., Portsmouth, NH)

Map Scale: 1:742 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

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 20, Sep 7, 2018

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

Date(s) aerial images were photographed: Dec 31, 2009—Jun 26, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
799	Urban land-Canton complex, 3 to 15 percent slopes	1.3	100.0%
Totals for Area of Interest		**1.3**	**100.0%**

APPENDIX E

FEMA FIRM MAP

National Flood Hazard Layer FIRMette

FEMA

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/15/2018 at 12:55:50 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX F

INSPECTION & MAINTENANCE PLAN

INSPECTION & MAINTENANCE PLAN

FOR

ISSA

Site Redevelopment

686 Maplewood Avenue

Portsmouth, NH

Introduction

The intent of this plan is to provide ISSA (herein referred to as "owner") with a list of procedures that document the inspection and maintenance requirements of the stormwater management system for this development. Specifically, the filtration system and associated structures on the project site (collectively referred to as the "Stormwater Management System").

The following inspection and maintenance program is necessary to keep the stormwater management system functioning properly. These measures will also help minimize potential environmental impacts. By following the enclosed procedures, the owner will be able to maintain the functional design of the stormwater management system and maximize its ability to remove sediment and other contaminants from site generated stormwater runoff.

Annual Report

The owner shall prepare an annual Inspection & Maintenance Report. The report shall include a summary of the system's maintenance and repair by transmission of the Inspection & Maintenance Log and other information as required. A copy of the report shall be delivered annually to the City of Portsmouth Code Enforcement Officer.

Inspection & Maintenance Checklist/Log

The following pages contain a Stormwater Management System Inspection & Maintenance Checklist and a blank copy of the Stormwater Management System Inspection & Maintenance Log. These forms are provided to the owner as a guideline for performing the inspection and maintenance of the Stormwater Management System. This is a guideline and should be periodically reviewed for conformance with current practice and standards.

STORMWATER MANAGEMENT SYSTEM COMPONENTS

The Stormwater Management System is designed to mitigate both the quantity and quality of site-generated stormwater runoff. As a result, the design includes the following elements:

Non-Structural BMP's

Non-Structural best management practices (BMP's) include temporary and permanent measures that typically require less labor and capital inputs and are intended to provide protection against erosion of soils. Examples of non-structural BMP's on this project include but are not limited to: temporary and permanent mulching, temporary and permanent grass cover, trees, shrubs and ground covers, miscellaneous landscape plantings, dust control, tree protection, topsoiling, sediment barriers, and a stabilized construction entrance.

Structural BMP's

Structural BMP's are more labor and capital-intensive structures or installations that require more specialized personnel to install. Examples on this project include but are not limited to: storm drains, the micro detention ponds and associated outlet control structures, and the infiltration trench system.

Inspection and Maintenance Requirements

The following summarizes the inspection and maintenance requirements for the various BMP's that may be found on this project.

1. **Grassed areas:** After each rain event of 0.5" or more during a 24-hour period, inspect grassed areas for signs of disturbance, such as erosion. If damaged areas are discovered, immediately repair the damage. Repairs may include adding new topsoil, lime, seed, fertilizer and mulch.
2. **Plantings**: Planting and landscaping (trees, shrubs) shall be monitored bi-monthly during the first year to insure viability and vigorous growth. Replace dead or dying vegetation with new stock and adjust the conditions that caused the dead or dying vegetation. During dryer times of the year, provide weekly watering or irrigation during the establishment period of the first year. Make the necessary adjustments to ensure long-term health of the vegetated covers, i.e. provide more permanent mulch or compost or other means of protection.
3. **Storm Drain Outlets and Outlet Control Structures:** Monitor drain inlets and outlet aprons for excessive accumulation of sediments or missing stone/riprap. Remove sediments as required to maintain filtering capabilities of the stone. Replace missing riprap.
4. **Filtration Basin:** After acceptance of the Filtration Basin, perform the following inspections on a semi-annual basis or after significant rainfall events (10-year, 24-hour storms, or back to back 2-year, 24-hour storms):
    a. Monitor Filtration Basin for 72 hours following a rain storm. If the Filtration Basin fails to fully drain within this period time, the engineered soil may have become plugged. Inspect for other causes of blockage. If it's determined that the soil has become plugged and is no longer functioning as engineered, then replacement of soils shall be required. Contractor shall use care in removing soil around tree roots. An Airspade shall be used to remove soils around tree roots.

b. Monitor for excessive or concentrated accumulations of debris, or excessive erosion. Remove debris as required.
c. Monitor the outfall structure for problems with clogged pipes. Repair or remove clogs as required and determine cause of clogging. Pipes should be inspected annually and after every major rainstorm. Broken or damaged pipes should be repaired or replaced as necessary.
d. Monitor side slopes of ponds for damages or erosion—repair as necessary.
e. Monitor turf health and keep protected from fire, grazing, traffic and dense weed growth. Lime and fertilizer should be applied as necessary to promote good growth as determined by soil tests. Mowing the vegetated areas of the basin should be carried out as necessary.
f. Sediment accumulation should be continually checked in the basin. Sediment should be removed as it is discovered. Particularly if it has accumulated near the outlet of the basin.
g. The outlet control structure should be inspected annually and after every major rainstorm. The outlet control structure has within it a weir structure with various size orifices for controlling flow out of the basin. These orifices should be kept clear and unclogged. Any sediment or debris that has built up inside the outlet control structure should be removed when discovered.
h. The use of sand shall be prohibited, and the use of salt shall be limited.

Invasive Species

Monitor Stormwater Management System for signs of invasive species growth. If caught earlier enough, their eradication is much easier. The most likely places where invasions start is in wetter, disturbed soils or detention ponds. Species such as phragmites and purple loose-strife are common invaders in these wetter areas. If they are found, then the owner shall contact a wetlands scientist with experience in invasive species control to implement a plan of action to eradicate the invaders. Measures that do not require the application of chemical herbicides should be the first line of defense.

Stormwater Management System

Inspection & Maintenance Checklist for Post Construction Condition—for ISSA, 686 Maplewood Avenue, Portsmouth, NH

BMP/System Component	Minimum Inspection Frequency	Minimum Inspection Requirements	Maintenance/Cleanout Threshold
Closed Drainage System			
Drainage Pipes	Yearly	*Check for sediment clogging, or soiled runoff.*	Clean entire drainage system and remove all sediments if discovered in piping.
Filtration Basin	2 X Annually	*Check for sediment clogging, excessive weed growth and standing water*	Remove any weeds, trash, debris and accumulated sediment. If trench does not drain within 72 hours following a rain event, a qualified professional should assess the condition of the facility to determine restoration measures.
Annual Report	Yearly	*Prepare Annual Report, including all Inspection & Maintenance Logs. Provide to City (if required).*	N/A

Stormwater Management System Maintenance Summary

Inspection & Maintenance Log—for ISSA, 686 Maplewood Avenue, Portsmouth, NH

BMP/System Component	Date Inspected	Inspector	Problems Noted, Required Maintenance *(List Items/Comments)*	Date of Maintenance	Performed By

Data Sheets