Residential Development Plans

Assessor's Parcel 220-87-2
74 EMERY STREET
&
Assessor's Parcel 220-87-3
64 EMERY STREET
Portsmouth, New Hampshire

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

Issued:

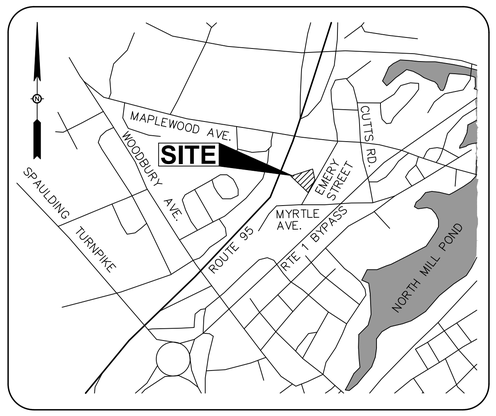
OCTOBER 11, 2018 PLANNING BOARD SUBMISSION
~~SEPTEMBER 14, 2018 TAC Submission~~

Owner/Applicant:

HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

Civil Engineer:

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com



LOCUS MAP
1" = 1,000 FEET +/-

Sheet Index Title	*Sheet No.:*	*Rev.*	*Date*
Existing Conditions Plan (by Civil Consultants, Inc.)	EC-1	0	09/27/13
Site Plan	C-1	2	10/11/18
Grading Plan	C-2	2	10/11/18
Utilities Plan	C-3	2	10/11/18
General Notes & Sitework Details	C-4	1	10/11/18
Sitework Details	C-5	0	09/14/18

P4916

REFERENCE PLANS:

1) PROPOSED DIVISION OF LAND OF CATHERINE T. MORETTI, 261 MYRTLE AVENUE, PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE. DATED APRIL 2, 2013, BY CIVIL CONSULTANTS AND ALTUS ENGINEERING, INC., RECORDED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AS PLAN D-37764.

2) SEE PLAN REFERENCES 1-13 ON ABOVE REFERENCED PLAN.

CERTIFICATION:

THIS SURVEY WAS PERFORMED UNDER MY DIRECTION IN ACCORDANCE WITH THE ETHICS AND STANDARDS ESTABLISHED BY THE NEW HAMPSHIRE BOARD OF LICENSURE FOR LAND SURVEYORS ON JANUARY 1, 2009 FOR A STANDARD PROPERTY SURVEY, URBAN CLASSIFICATION. (SEE NOTES HEREON).

SEPTEMBER 27, 2013

CHRISTOPHER H. MENDE — DATE:
NEW HAMPSHIRE LICENSED LAND SURVEYOR #792
CIVIL CONSULTANTS SOUTH BERWICK, MAINE 03908

STATE OF NEW HAMPSHIRE — No. 792 — CHRISTOPHER H. MENDE — LICENSED LAND SURVEYOR — SIGNATURE

NOTES:

1) CIVIL CONSULTANTS DID NOT SEARCH FOR A LAYOUT FOR MYRTLE AVENUE. THE ROAD LINE AS SHOWN IS BASED ON THE DEEDS AND PLANS REFERENCED HEREON. SEE NOTES AND PLAN REFERENCES HEREON REGARDING THE ROAD LINES FOR ROUTE 95 AND CENTRAL AVENUE. ALL ARE PUBLIC ROADS.

2) RECORDS RESEARCH FOR THIS SURVEY WAS LIMITED TO THE PERIOD FROM 1838 TO JANUARY 21, 2013.

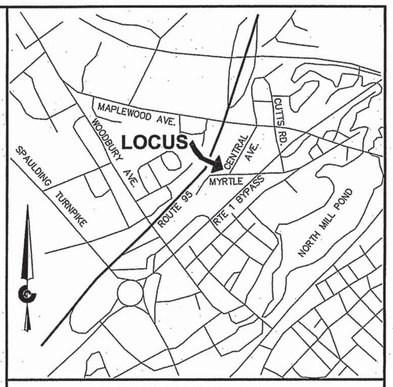
3) UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL EVIDENCE LOCATED IN THE FIELD. UTILITIES DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS NEED TO CONTACT DIGSAFE AND FIELD-VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION OR EXCAVATION. NO INVESTIGATION FOR UNDERGROUND UTILITIES WAS CONDUCTED. SEE EASEMENT DEEDS RELATING TO ELECTRIC POWER LINES REFERENCED HEREON.

4) THE FIELD SURVEY WAS CONDUCTED ON JANUARY 23 AND 28, 2013 USING AN ELECTRONIC TOTAL STATION AND PRECISE, SURVEY-GRADE GPS EQUIPMENT. TRAVERSE MISCLOSURE WAS BETTER THAN 1:15,000.

5) BEARINGS, DISTANCES AND COORDINATES AS SHOWN ARE BASED ON THE NEW HAMPSHIRE STATE PLANE COORDINATE SYSTEM, NAD83. COORDINATES OF SURVEY CONTROL POINTS WERE DERIVED BY PRECISE GPS OBSERVATIONS PROCESSED ON THE N.G.S. OPUS WEBSITE USING THE FOLLOWING BASE STATIONS: BOSTON WAAS 1 CORS ARP (DF9215 ZBW1), BARTLETT CORS ARP (AJ1630 BARN) AND BRUNSWICK 2 CORS ARP (AF9585 BRU2). THE REFERENCE FRAME IS NAD83 (CORS96) (EPOCH: 2002.0000). UNITS ARE U.S. SURVEY FEET. TO SCALE GRID DISTANCES TO GROUND DISTANCES, MULTIPLY BY AN AVERAGE COMBINED SCALE FACTOR OF 0.999966981.

6) ALL ELEVATIONS FOR THIS PROJECT ARE BASED ON NAVD88 DERIVED FROM THE SAME GPS SURVEY OBSERVATIONS (SEE NOTE 5 ABOVE). SEE BENCH MARKS HEREON

NH STATE PLANE COORDINATE SYSTEM NAD83



LOCATION PLAN
(NOT TO SCALE)

LEGEND:

- FOUND RAILROAD SPIKE
- SET 5/8" DIA. REBAR W/ CAP
- FOUND IRON PIPE
- FOUND REBAR OR IRON ROD
- FOUND BOUND AS NOTED
- SEWER MAN HOLE
- UTILITY POLE
- CATCH BASIN
- INV.=14.25 — INVERT ELEVATION
- CURB STOP VALVE
- WATER GATE
- FIRE HYDRANT
- RET. WALL — RETAINING WALL
- CONC. — CONCRETE
- OHW — OVERHEAD WIRE
- 1252/125 — DEED BOOK/PAGE
- R.C.R.D. — ROCKINGHAM REGISTRY OF DEEDS
- PARCELS IN SAME OWNERSHIP
- DECIDUOUS TREE
- LOCUS PARCEL BOUNDARY
- ABUTTING PARCEL BOUNDARY
- EASEMENT BOUNDARY
- BUILDING SETBACK
- PROPOSED LOT BOUNDARY

CITY OF PORTSMOUTH, PLANNING BOARD

CHAIRMAN DATE

INTERSTATE ROUTE 95

MAP 220, LOT 88
N/F SEAMANS SUPPLY COMPANY, INC.
R.C.R.D. 2909/977
(SEE 290/269 FOR ORIGIN OF LINE COMMON TO LOCUS AT STONE WALL)

FOUND 5"x5", FLUSH CONCRETE NHDOT BOUND N26°46'W, 0.17' FROM CORNER

MAP 220, LOT 90
N/F PAUL MCINNIS & CHRISTOPHER D. MCINNIS, TRUSTEES OF PORTSMOUTH CITY INVESTMENT REALTY TRUST
R.C.R.D. 5358/207
(SEE 640/100 & 640/100 FOR ORIGIN OF LINE COMMON TO LOCUS)

SEE EASEMENT DEED FROM MAINE-NH INTERSTATE BRIDGE AUTHORITY TO NEW HAMPSHIRE GAS & ELECTRIC CO. AT R.C.R.D. 975/490 (80 FEET WIDE)

FOUND 1"x3" IRON PIPE

PSCNH 339 33

FOUND 5/8"x3" REBAR W/CAP "KNIGHT HILL"

SEE EASEMENT DEED FROM EDITH M. CARKIN TO NEW HAMPSHIRE GAS & ELECTRIC COMPANY AT R.C.R.D. 1146/297 (45 FEET WIDE)

BOUNDARY SHOWN ON REF. PLAN 1 (AREA OF OVERLAP W/ R.C.R.D PLAN D-31278 = 2072 S.F.)

SEE ALSO EASEMENT DEED FROM ADOLPH F. ANDERSON TO PORTSMOUTH POWER COMPANY AT R.C.R.D. 836/116 (33 FEET WIDE) LOCATION NOT DISCERNABLE

MAP 220, LOT 88
R.C.R.D. 2909/977

FOUND 3/8" DRILL HOLE

5/8" DIA. REBAR SET

FOUND 5/8"x6" REBAR W/CAP "KNIGHT HILL"

SEE EASEMENT DEED FROM ETHEL B. ANDERSON TO NEW HAMPSHIRE GAS & ELECTRIC COMPANY AT R.C.R.D. 1137/357 (55 FEET WIDE) (SEE REF. PLAN 12)

BUILDING SETBACK LINE AND POLE LINE EASEMENT BOUNDARY

30' REAR SETBACK (TYP.)

MAP 220, LOT 87-2
93,050 S.F.
2.1361 ACRES
(18,149 S.F. IN POLE LINE EASEMENT)

SEE R.C.R.D. 1929/490 FOR COMMISSIONERS' RETURN OF HIGHWAY LAYOUT

5/8" DIA. REBARS SET

FOUND 2"x48" IRON PIPE 2.12' OFF LINE

4' WIRE MESH FENCE

LAWN

10' SIDE SETBACK (TYP.)

FOUND 5"x5", FLUSH CONCRETE NHDOT BOUND S86°50'W, 0.17' FROM CORNER

5/8" DIA. REBAR SET

ARBOR

BARN

WOODED

MAP 220, LOT 87-1
N/F JOHN & JULIANA FLINTOSH
R.C.R.D. 5477/2909
(SEE REF. PLAN 1)

2.5 STORY HOUSE

6' STOCKADE FENCE

6' CHAINLINK FENCE

FOUND 2"x36" IRON PIPE

(SEE R.C.R.D. 1380/385)
(SEE R.C.R.D. 595/373)

FOUND 2"x20" IRON PIPE WITH MUSHROOMED TOP N10°15'W, 2.81' FROM CORNER

21-188-13A

FOUND 5"x5", FLUSH CONCRETE NHDOT BOUND S29°03'W, 0.16' FROM CORNER

MAP 220, LOT 86
N/F THOMAS E. & DYAN D. KOZIKOWSKI
R.C.R.D. 4131/1979
(SEE 595/373 & 1380/385 FOR ORIGIN OF LINES COMMON TO LOCUS)

SEE EASEMENT DEED FROM MARSHALL & DOROTHY CHALK TO NEW HAMPSHIRE ELECTRIC CO. AND NET&T AT R.C.R.D. 1520/412 (NO WIDTH)

STONE RET. WALL

FOUND 5"x5", FLUSH CONCRETE NHDOT BOUND S84°27'W, 0.12' FROM CORNER

P.K. NAIL - FOUND

5/8" DIA. REBARS SET

21.60'

gravel drive

FRONT SETBACK (TYP.)

REMAINS 4' WIRE MESH FENCE

INV=37.44

12" CMP CULVERT INV=37.7

CENTRAL AVENUE

MAP 220, LOT 91
N/F CITY OF PORTSMOUTH
R.C.R.D. 3479/2870

FOUND 5/8"x12" REBAR W/CAP "JAMES VERRA"

FOUND 1"x12" IRON PIPE

MAP 220, LOT 93
N/F THE INGEBORG C. PENTA REVOCABLE TRUST
R.C.R.D. 4976/488

MAP 220, LOT 92
N/F THE DIANA FRYE MARTEN REVOCABLE TRUST OF 2009
R.C.R.D. 5173/228

6" WATER MAIN - PER CITY RECORDS

15" HIGH LEDGE OUTCROP

EDGE OF PAVEMENT

GRAVEL

MYRTLE AVENUE

GRAN. CURB

6" CL. MAIN - PER CITY RECORDS

NETT 20/12 CMP 188/13

NETT 120 10" VIT. CLAY PIPE W/ LAMP

CONC. HEAD WALL INV=37.0±

6" PVC DRAIN

RIM=40.87 INV=39.0

INV=37.5

100.00' S 89°59'28" W

PAINTED GAS LOCATION

8" PVC

RIM=47.34 INV=40.1> INV=<40.2

FOUND 1"x5" IRON PIPE, LEANING - AT BASE

NHG&E 21-188-14

FOUND STEEL "T" STAKE W/ CAP "LLS 738"

FOUND 5/8" FLUSH REBAR

FOUND 4"x4"x2" GRANITE BOUND

FOUND R.R. SPIKE

TBM-1=45.86 NUT ON TOP HYDR. FLANGE STREET SIDE

FOUND 1"x5" IRON PIPE, LEANING - AT BASE

RIM=42.35 INV=38.1

PAINTED GAS LOCATION

MAP 220, LOT 101
N/F KENNETH E. SMITH & DEBORAH S. BOUCHARD-SMITH
R.C.R.D. 3117/2797

MAP 220, LOT 100
N/F DAVID C. LEAR
R.C.R.D. 4830/221

MAP 220, LOT 99
N/F CHARLES E. SHULTZ & KATHERINE CAHILL
R.C.R.D. 5325/2844

MAP 220, LOT 98-1
N/F DEVIN GLADSTONE
R.C.R.D. 4431/343

CONSULTING ENGINEER:

ALTUS ENGINEERING, INC.
133 COURT STREET
PORTSMOUTH, NH 03801
(603) 433-2335
WWW.ALTUS-ENG.COM

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

THIS SHEET NOT PREPARED FOR RECORDING

TAX MAP 220, LOT 87-2

NO.	REVISIONS	INT.	DATE
8			
7			
6			
5			
4			
3			
2			
1			

DRAWN CHM | CALC. CHM
DATE SEPTEMBER 27, 2013
CHECKED MPP
APPROVED CHM
SCALE 1"=30'
FIELD BOOK NB 413A, PAGE 11, 20

© CIVIL CONSULTANTS

CIVIL CONSULTANTS
Engineers
Planners
Surveyors
P.O. Box 100
South Berwick
Maine 03908
207-384-2650
civcon@civcon.com

PROPOSED DIVISION OF LAND OF CATHERINE T. MORETTI
PHASE 2 - MYRTLE AVENUE & CENTRAL AVENUE
PORTSMOUTH, ROCKINGHAM COUNTY, NEW HAMPSHIRE

PREPARED FOR:
CATHERINE T. MORETTI
MAILING ADDRESS: 261 MYRTLE AVENUE, PORTSMOUTH, NEW HAMPSHIRE 03801

SHEET NUMBER: EC1
EXISTING CONDITIONS
SHEET 1 OF 1
PROJ # 13-101.01

STAMP: SEPTEMBER 27, 2013/13:00 DRAWING LOCATION: J:\AA\2013\1310101\CARLSON\DRAWING\PHASE2-EXISTING-CONDITIONS-09-21-2013.DWG FILE: J:\AA\2013\1310100\CARLSON\POINTS\BOUNDARY2013NHSPC.CRD

ZONING RELIEF

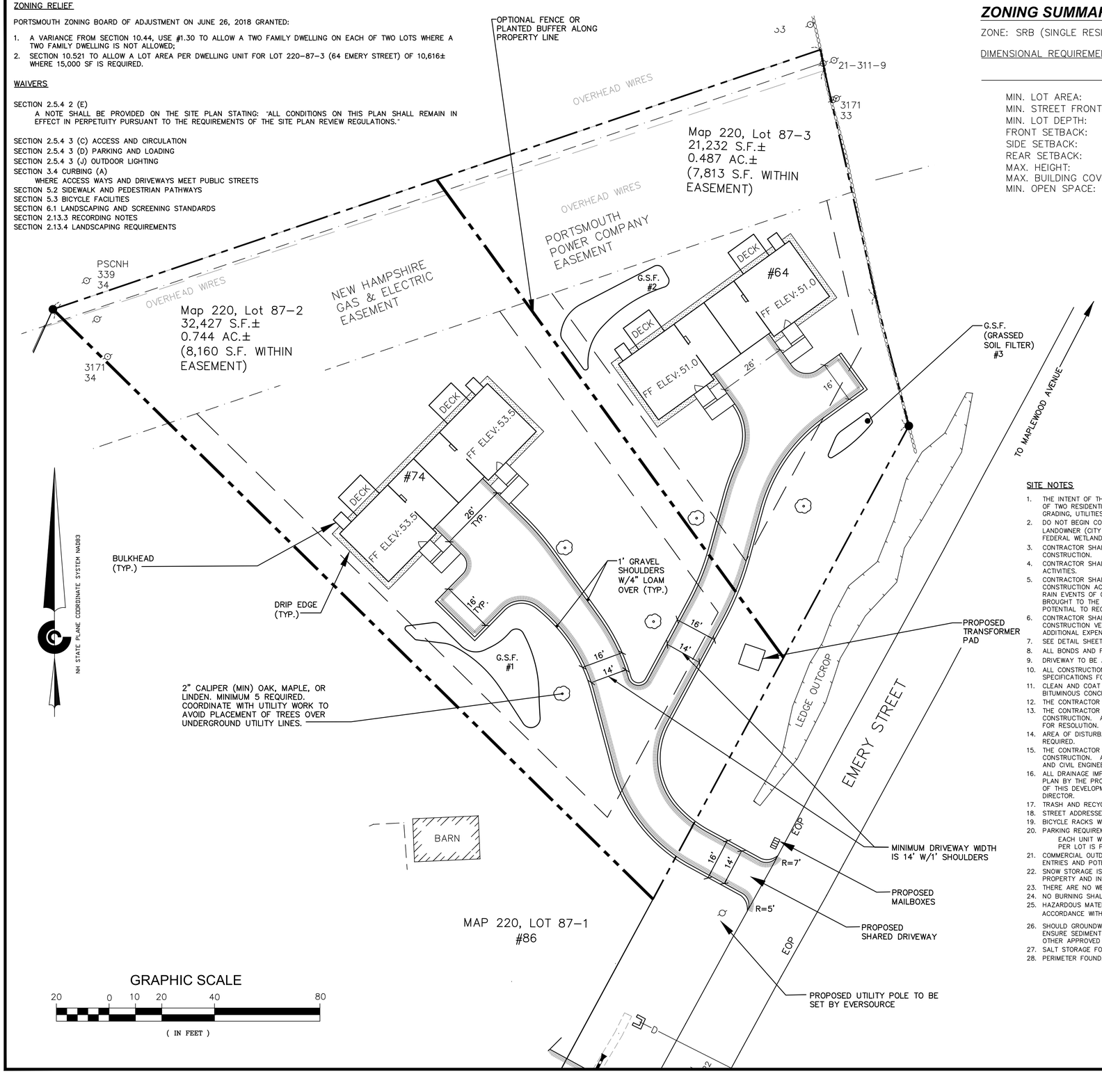
PORTSMOUTH ZONING BOARD OF ADJUSTMENT ON JUNE 26, 2018 GRANTED:

1. A VARIANCE FROM SECTION 10.44, USE #1.30 TO ALLOW A TWO FAMILY DWELLING ON EACH OF TWO LOTS WHERE A TWO FAMILY DWELLING IS NOT ALLOWED;
2. SECTION 10.521 TO ALLOW A LOT AREA PER DWELLING UNIT FOR LOT 220–87–3 (64 EMERY STREET) OF 10,616± WHERE 15,000 SF IS REQUIRED.

WAIVERS

SECTION 2.5.4 2 (E)
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."

SECTION 2.5.4 3 (C) ACCESS AND CIRCULATION
SECTION 2.5.4 3 (D) PARKING AND LOADING
SECTION 2.5.4 3 (J) OUTDOOR LIGHTING
SECTION 3.4 CURBING (A)
WHERE ACCESS WAYS AND DRIVEWAYS MEET PUBLIC STREETS
SECTION 5.2 SIDEWALK AND PEDESTRIAN PATHWAYS
SECTION 5.3 BICYCLE FACILITIES
SECTION 6.1 LANDSCAPING AND SCREENING STANDARDS
SECTION 2.13.3 RECORDING NOTES
SECTION 2.13.4 LANDSCAPING REQUIREMENTS



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

ZONING SUMMARY

ZONE: SRB (SINGLE RESIDENCE B)

DIMENSIONAL REQUIREMENTS	REQUIRED	PROVIDED ASSESSOR'S PARCEL 220–87–2	PROVIDED ASSESSOR'S PARCEL 220–87–3
MIN. LOT AREA:	15,000 S.F.	32,427 SF	21,232 S.F.
MIN. STREET FRONTAGE:	100'	104'±	100'
MIN. LOT DEPTH:	100'	224'±	146'±
FRONT SETBACK:	30'	125'±	56'±
SIDE SETBACK:	10'	14'±	14'±
REAR SETBACK:	30'	75'±	57'±
MAX. HEIGHT:	35'	<35'	<35'
MAX. BUILDING COVERAGE:	20%	8.2%±	12.5%±
MIN. OPEN SPACE:	40%	71%±	74%±

DWELLING DENSITY PER LOT:

LOT 220–87–2: 16,213.5 SF/DWELLING UNIT

LOT 220–87–3: 10,616 SF/DWELLING UNIT

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

SITE NOTES

1. THE INTENT OF THIS PLAN SET IS TO PROVIDE THE NECESSARY INFORMATION FOR THE REVIEW, PERMITTING AND DEVELOPMENT OF TWO RESIDENTIAL DUPLEXES ON TWO ABUTTING LOTS. THESE PLANS PROVIDE DETAILED INFORMATION FOR THE SITE LAYOUT, GRADING, UTILITIES, STORMWATER MANAGEMENT, AND LANDSCAPE IMPROVEMENTS.
2. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE, LOCAL AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. THE LANDOWNER (CITY OF PORTSMOUTH) AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH LOCAL, STATE AND FEDERAL WETLAND PERMITTING REQUIREMENTS INCLUDING PROTECTION OF NATURAL RESOURCES AND THEIR BUFFERS.
3. CONTRACTOR SHALL CALL DIG SAFE AT 1 (800) DIG–SAFE AT LEAST SEVENTY–TWO (72) HOURS PRIOR TO COMMENCING CONSTRUCTION.
4. CONTRACTOR SHALL NOTIFY CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS TO PREVENT SEDIMENT FROM CONSTRUCTION ACTIVITIES FROM LEAVING THE SITE. CONTROLS SHALL BE INSPECTED ON A REGULAR BASIS AND AFTER ALL RAIN EVENTS OF 0.25 INCHES OR GREATER. ANY DEFICIENCIES IN THE CONTROLS SHALL BE ADDRESSED IMMEDIATELY AND BROUGHT TO THE ATTENTION OF THE OWNER. ALL STORMS DRAINS WITHIN OR ADJACENT TO THE WORK AREA, WITH THE POTENTIAL TO RECEIVE RUNOFF FROM EXPOSED CONSTRUCTION AREAS, SHALL RECEIVE STORM DRAIN INLET PROTECTION.
6. CONTRACTOR SHALL PREVENT TRACKING OF DIRT ONTO ANY PUBLIC OR PRIVATE ROADWAYS. IF TRACKING OF DIRT FROM CONSTRUCTION VEHICLES IS PRESENT ON THE OPEN STREETS, CONTRACTOR WILL BE REQUIRED TO SWEEP THE ROADWAY AT NO ADDITIONAL EXPENSE TO THE OWNER.
7. SEE DETAIL SHEET FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
8. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
9. DRIVEWAY TO BE A MINIMUM OF 16' WIDE WITH 2' SHOULDERS. SHOULDERS SHALL BE PLOWED.
10. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
11. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS–1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
12. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
13. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
14. AREA OF DISTURBANCE IS UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
15. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
16. ALL DRAINAGE 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 TO THE STORMWATER MANAGMENT ASPECTS OF THIS DEVELOPMENT SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
17. TRASH AND RECYCLING SHALL BE STORED INSIDE THE HOMES.
18. STREET ADDRESSES FOR EACH UNIT SHALL BE DETERMINED BY FIRE DEPARTMENT & PORTSMOUTH DPW.
19. BICYCLE RACKS WILL NOT BE PROVIDED.
20. PARKING REQUIREMENTS
    EACH UNIT WILL HAVE A SINGLE SPACE IN THE GARAGE AND SPACE STACKED BEHIND THE GARAGE. ONE ADDITONAL SPACE PER LOT IS PROVIDED FOR A TOTAL OF 10 SPACES FOR 4 RESIDENTIAL UNITS.
21. COMMERCIAL OUTDOOR LIGHTING WILL NOT BE PROVIDED. OUTDOOR LIGHTING WILL BE LIMITED TO BUILDING MOUNTED LIGHTS AT ENTRIES AND POTENTIALLY RESIDENTIAL SCALED LIGHTS ALONG THE DRIVEWAY. ALL LIGHTS WILL BE DARK SKY FRIENDLY.
22. SNOW STORAGE IS NOT DEPICTED ON THE PLANS. IT WILL BE STORED ALONG THE EDGE OF THE DRIVEWAY ON PRIVATE PROPERTY AND IN LOCATIONS AS NOT TO IMPEDE SITE DISTANCE AT THE DRIVEWAY.
23. THERE ARE NO WETLANDS ON THE PROPERTY OR WITHIN 100–FEET OF ANY PROPOSED SITE DISTRUBANCES.
24. NO BURNING SHALL BE PERMITTED PER LOCAL REGULATIONS.
25. HAZARDOUS MATERIALS ENCOUNTERED DURING CONSTRUCTION ACTIVITIES SHALL BE ABATED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL REGULATIONS.
26. SHOULD GROUNDWATER BE ENCOUNTERED DURING SITEWORK EXCAVATION, BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO ENSURE SEDIMENT LADEN WATER IS NOT DISCHARGED INTO THE CITY DRAINAGE SYSTEM. CONTRACTOR SHALL USE SILT BAGS OR OTHER APPROVED DPW DEVICES.
27. SALT STORAGE FOR DEICING SHALL BE LOCATED INDOORS.
28. PERIMETER FOUNDATION DRAINS IF PROVIDED MAY REQUIRE PUMPING TO DAYLIGHT.

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
OCTOBER 11, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	08/07/18
1	PER TAC COMMENTS	EDW	09/14/18
2	PB APPROVAL	EDW	10/11/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

SCALE:
11"x17": 1" = 40'
22"x 34": 1" = 20'

APPLICANT/OWNER:

HAPPY MOUNTAIN HOLDINGS, LLC

901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:

RESIDENTIAL DEVELOPMENT

ASSESSOR'S PARCEL 220–87–2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220–87–3
64 EMERY STREET

PORTSMOUTH, NEW HAMPSHIRE

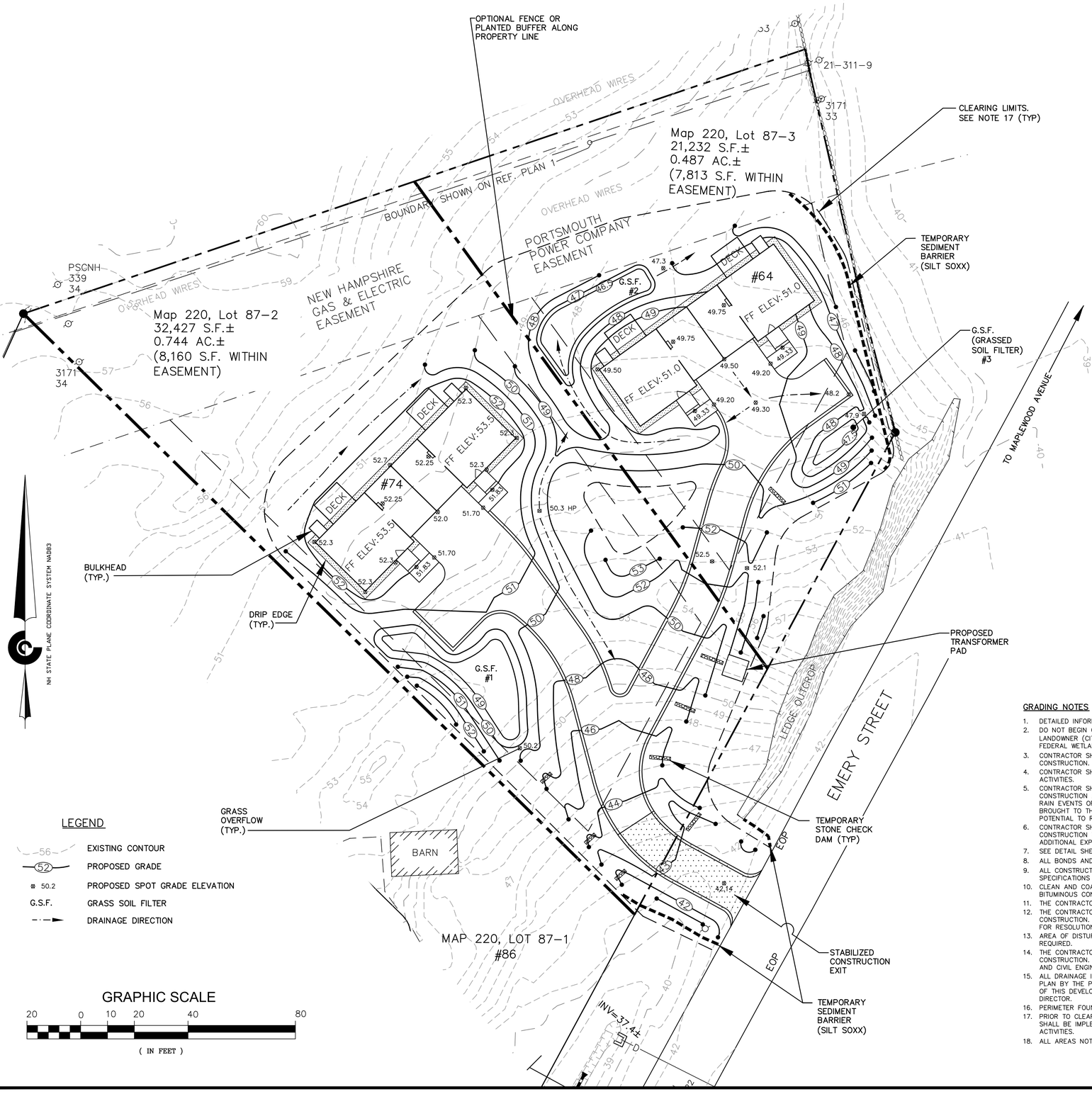
TITLE:

SITE PLAN

SHEET NUMBER:

C - 1

P4916



LEGEND

- EXISTING CONTOUR
- PROPOSED GRADE
- ⊠ 50.2 PROPOSED SPOT GRADE ELEVATION
- G.S.F. GRASS SOIL FILTER
- DRAINAGE DIRECTION

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

APPROVED BY THE PORTSMOUTH PLANNING BOARD

CHAIRMAN DATE

GRASS SOIL FILTERS

G.S.F. #1 – BOTTOM AREA: 615 S.F.
BOTTOM ELEV.: 49.0
GRASSED OVERFLOW WEIR: 50.2

G.S.F. #2 – BOTTOM AREA: 500 S.F.
BOTTOM ELEV.: 46.5
GRASSED OVERFLOW WEIR: 47.3

G.S.F. #3 – BOTTOM AREA: 110 S.F.
BOTTOM ELEV.: 47.5
GRASSED OVERFLOW WEIR: 47.9

GRADING NOTES

1. DETAILED INFORMATION FOR THE SITE LAYOUT, GRADING, UTILITIES, STORMWATER MANAGEMENT, AND LANDSCAPE IMPROVEMENTS.
2. DO NOT BEGIN CONSTRUCTION UNTIL ALL STATE, LOCAL AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED. THE LANDOWNER (CITY OF PORTSMOUTH) AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH LOCAL, STATE AND FEDERAL WETLAND PERMITTING REQUIREMENTS INCLUDING PROTECTION OF NATURAL RESOURCES AND THEIR BUFFERS.
3. CONTRACTOR SHALL CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO COMMENCING CONSTRUCTION.
4. CONTRACTOR SHALL NOTIFY CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS TO PREVENT SEDIMENT FROM CONSTRUCTION ACTIVITIES FROM LEAVING THE SITE. CONTROLS SHALL BE INSPECTED ON A REGULAR BASIS AND AFTER ALL RAIN EVENTS OF 0.25 INCHES OR GREATER. ANY DEFICIENCIES IN THE CONTROLS SHALL BE ADDRESSED IMMEDIATELY AND BROUGHT TO THE ATTENTION OF THE OWNER. ALL STORMS DRAINS WITHIN OR ADJACENT TO THE WORK AREA, WITH THE POTENTIAL TO RECEIVE RUNOFF FROM EXPOSED CONSTRUCTION AREAS, SHALL RECEIVE STORM DRAIN INLET PROTECTION.
6. CONTRACTOR SHALL PREVENT TRACKING OF DIRT ONTO ANY PUBLIC OR PRIVATE ROADWAYS. IF TRACKING OF DIRT FROM CONSTRUCTION VEHICLES IS PRESENT ON THE OPEN STREETS, CONTRACTOR WILL BE REQUIRED TO SWEEP THE ROADWAY AT NO ADDITIONAL EXPENSE TO THE OWNER.
7. SEE DETAIL SHEET FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
8. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
9. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
10. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
11. THE CONTRACTOR SHALL VERIFY ALL BENCHMARKS AND TOPOGRAPHY IN THE FIELD PRIOR TO CONSTRUCTION.
12. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL PLANS PRIOR TO CONSTRUCTION. ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION.
13. AREA OF DISTURBANCE IS UNDER 43,560 SF, COVERAGE UNDER EPA NPDES PHASE II CONSTRUCTION GENERAL PERMIT IS NOT REQUIRED.
14. THE CONTRACTOR SHALL VERIFY ALL BUILDING DIMENSIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO CONSTRUCTION. ANY AND ALL DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF BOTH THE ARCHITECT AND CIVIL ENGINEER FOR RESOLUTION.
15. ALL DRAINAGE 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 TO THE STORMWATER MANAGMENT ASPECTS OF THIS DEVELOPMENT SHALL BE MADE TO THIS SITE PLAN WITHOUT THE EXPRESS APPROVAL OF THE PORTSMOUTH PLANNING DIRECTOR.
16. PERIMETER FOUNDATION DRAINS IF PROVIDED MAY REQUIRE PUMPING TO DAYLIGHT.
17. PRIOR TO CLEARING SITE, A LICENSED LAND SURVEYOR SHALL BE ENGAGED TO STAKE THE CLEARING LIMITS TREE PROTECTION SHALL BE IMPLEMENTED TOT ENSURE THAT HEALTHY TREES SCHEDULED TO REMAIN ARE NOT DISTURBED BY TEH CONSTRUCTION ACTIVITIES.
18. ALL AREAS NOT INTENDED TO BE OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED, FERTILIZER AND MULCH.

P4916

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
OCTOBER 11, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	08/07/18
1	PER TAC COMMENTS	EDW	09/14/18
2	PB APPROVAL	EDW	10/11/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

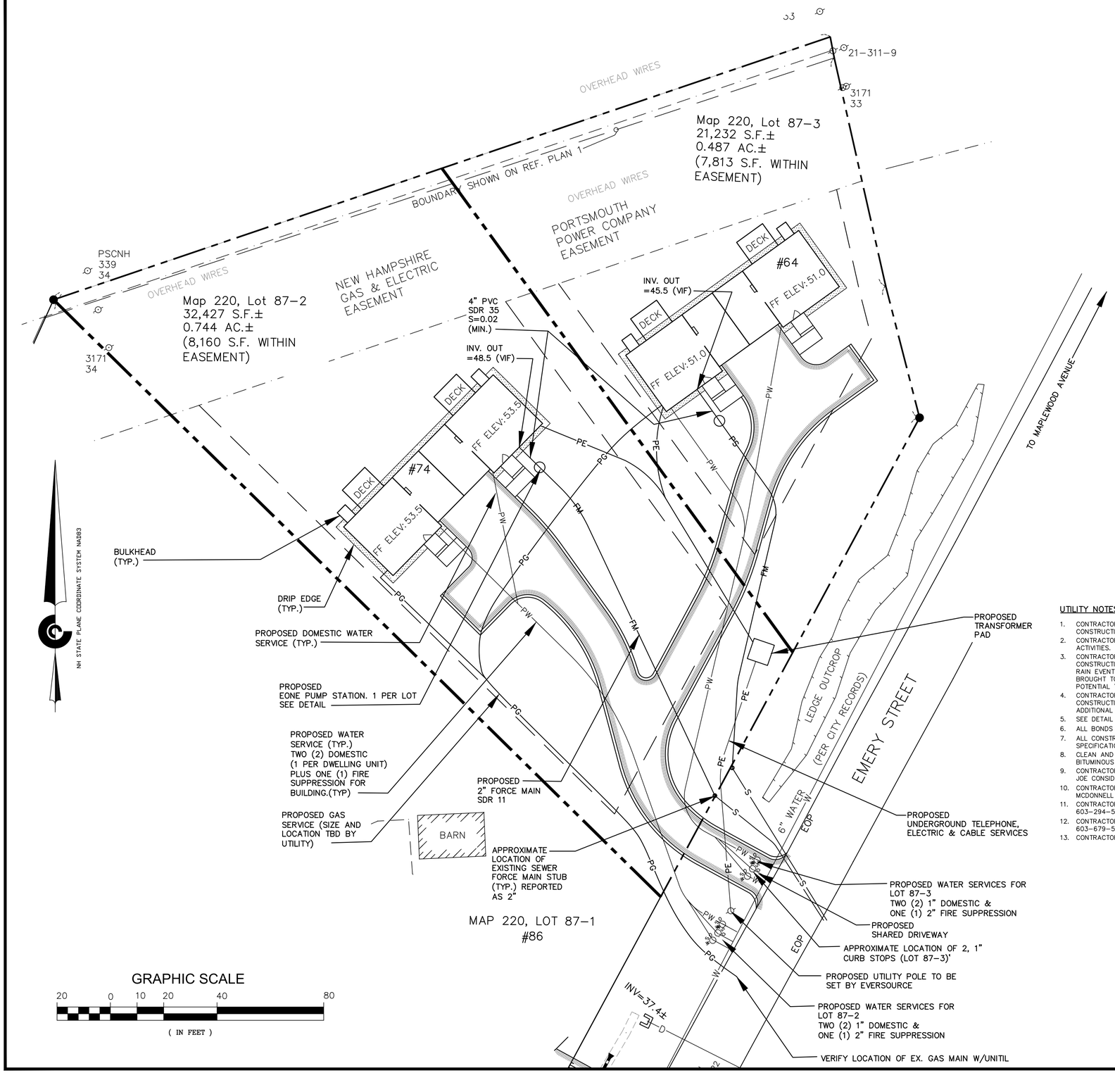
SCALE:
11"x17": 1" = 40'
22"x 34": 1" = 20'

APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
GRADING PLAN

SHEET NUMBER:
C - 2



UTILITY NOTES

1. CONTRACTOR SHALL CALL DIG SAFE AT 1 (800) DIG-SAFE AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO COMMENCING CONSTRUCTION.
2. CONTRACTOR SHALL NOTIFY CITY OF PORTSMOUTH DEPARTMENT OF PUBLIC WORKS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
3. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SEDIMENT AND EROSION CONTROL ITEMS TO PREVENT SEDIMENT FROM CONSTRUCTION ACTIVITIES FROM LEAVING THE SITE. CONTROLS SHALL BE INSPECTED ON A REGULAR BASIS AND AFTER ALL RAIN EVENTS OF 0.25 INCHES OR GREATER. ANY DEFICIENCIES IN THE CONTROLS SHALL BE ADDRESSED IMMEDIATELY AND BROUGHT TO THE ATTENTION OF THE OWNER. ALL STORMS DRAINS WITHIN OR ADJACENT TO THE WORK AREA, WITH THE POTENTIAL TO RECEIVE RUNOFF FROM EXPOSED CONSTRUCTION AREAS, SHALL RECEIVE STORM DRAIN INLET PROTECTION.
4. CONTRACTOR SHALL PREVENT TRACKING OF DIRT ONTO ANY PUBLIC OR PRIVATE ROADWAYS. IF TRACKING OF DIRT FROM CONSTRUCTION VEHICLES IS PRESENT ON THE OPEN STREETS, CONTRACTOR WILL BE REQUIRED TO SWEEP THE ROADWAY AT NO ADDITIONAL EXPENSE TO THE OWNER.
5. SEE DETAIL SHEET FOR EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
6. ALL BONDS AND FEES SHALL BE PAID/POSTED PRIOR TO INITIATING CONSTRUCTION.
7. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE CITY OF PORTSMOUTH & NHDOT'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE, LATEST EDITION. THE MORE STRINGENT SPECIFICATION SHALL GOVERN.
8. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
9. CONTRACTOR SHALL COORDINATE ALL TELE-COMMUNICATION DISCONNECTIONS AND INSTALLATION WITH CONSOLIDATED. CONTACT JOE CONSIDINE @ 603-427-5525.
10. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL CONNECTIONS/INSTALLATIONS WITH EVERSOURCE. CONTACT: CASEY MCDONNELL @ 603-436-7708 EXT 5555641.
11. CONTRACTOR SHALL COORDINATE ALL NATURAL GAS INSTALLATIONS WITH UNITIL CORPORATION. CONTACT: JANET OLIVER @ 603-294-5174
12. CONTRACTOR SHALL COORDINATE ALL CABLE CONNECTIONS/INSTALLATIONS WITH COMCAST. CONTACT: MIKE COLLINS @ 603-679-5695, EXT. 1037
13. CONTRACTOR SHALL LOCATE EXISTING SEWER SERVICE. CONFIRM SIZE & INVERT ELEVATION WITH ENGINEER.

P4916

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
OCTOBER 11, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	08/07/18
1	PER TAC COMMENTS	EDW	09/14/18
2	PB APPROVL	EDW	10/11/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

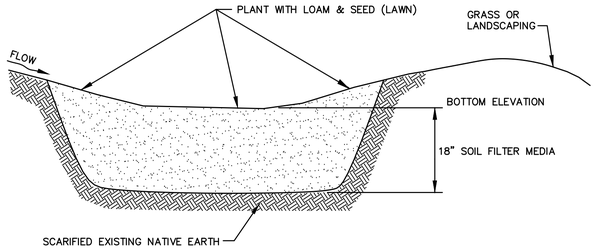
SCALE:
11"x 17": 1" = 40'
22"x 34": 1" = 20'

APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
UTILITIES PLAN

SHEET NUMBER:
C - 3



FILTER MEDIA MIXTURES			
Component Material	Percent of Mixture by Volume	Gradation of material	
		Sieve No.	Percent by Weight Passing Standard Sieve
Filter Media			
ASTM C-33 concrete sand	30		
Loamy sand topsoil, with fines as indicated	70	200	15 to 25

NOTES

1. CONTRACTOR SHALL EXCAVATE THE POND AREA TO SUBGRADE AND DESIGN ENGINEER SHALL PERFORM SUBSURFACE EVALUATION PRIOR TO THE PLACEMENT OF ANY SELECT MATERIAL OR OTHER BACKFILL.
2. SOIL FILTER MEDIA SHALL BE PER THE DESIGN FILTER MIXTURE. IF AN ALTERNATIVE MIXTURE IS PROPOSED, IT SHALL BE APPROVED BY THE DESIGN ENGINEER.
3. DO NOT PLACE THE POND INTO SERVICE UNTIL THE BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
4. DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE POND AREA DURING ANY STAGE OF CONSTRUCTION.
5. DO NOT TRAFFIC EXPOSED SOIL SURFACE WITH CONSTRUCTION EQUIPMENT. IF FEASIBLE, PERFORM EXCAVATIONS WITH EQUIPMENT POSITIONED OUTSIDE THE LIMITS OF THE INFILTRATION COMPONENTS OF THE SYSTEM.

MAINTENANCE REQUIREMENTS

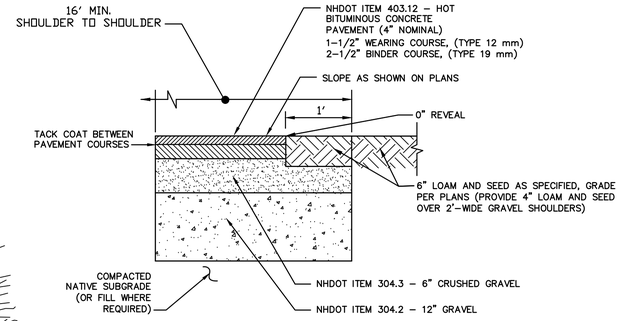
- PONDS SHOULD BE INSPECTED ANNUALLY, AND FOLLOWING ANY RAINFALL EXCEEDING 2.5 INCHES IN A 24-HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
- AT LEAST ONCE ANNUALLY, SYSTEM SHOULD BE INSPECTED FOR DRAWDOWN TIME. IF POND DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION OR INFILTRATION FUNCTION (AS APPLICABLE), INCLUDING BUT NOT LIMITED TO REMOVAL OF ACCUMULATED SEDIMENTS OR RECONSTRUCTION OF THE FILTER MEDIA.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING, PRUNING, REMOVAL, AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

GRASS SOIL FILTER

NOT TO SCALE

GRADING & DRAINAGE NOTES

1. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
2. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS.
3. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
4. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
5. ALL DRAINAGE PIPE SHALL BE ADS N-12 OR EQUAL APPROVED BY THE ENGINEER.
6. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
7. UNLESS OTHERWISE SPECIFIED, ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE A MINIMUM OF SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND HAY MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
8. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.

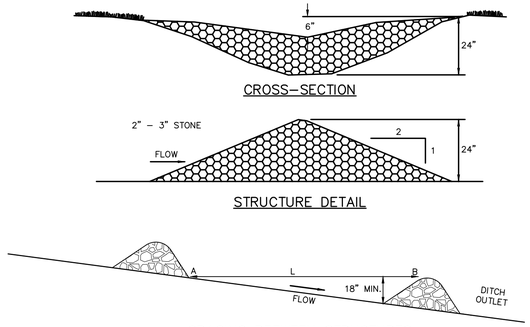


MINIMUM DRIVEWAY WIDTH TO BE 14' WITH 1' SHOULDER EACH SIDE.

NOTE: SUBGRADE AREA TO BE PROOF ROLLED.

PAVEMENT CROSS SECTION

NOT TO SCALE



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

MAINTENANCE

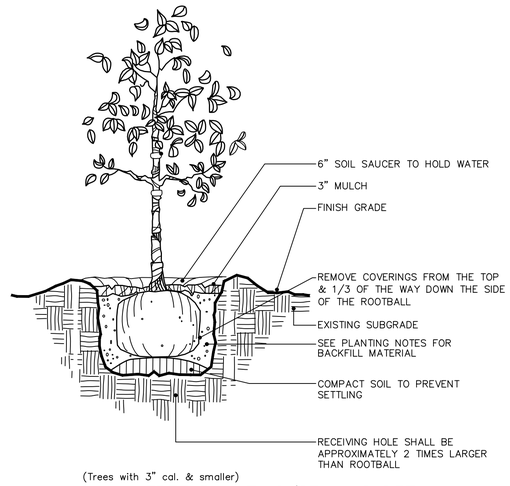
TEMPORARY GRADE STABILIZATION STRUCTURES SHOULD BE CHECKED AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED STORMS. ANY NECESSARY REPAIRS SHOULD BE MADE IMMEDIATELY. PARTICULAR ATTENTION SHOULD BE GIVEN TO END RUN AND EROSION AT THE DOWNSTREAM TOE OF THE STRUCTURE. WHEN THE STRUCTURES ARE REMOVED,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

CONSTRUCTION SPECIFICATIONS

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

STONE CHECK DAM

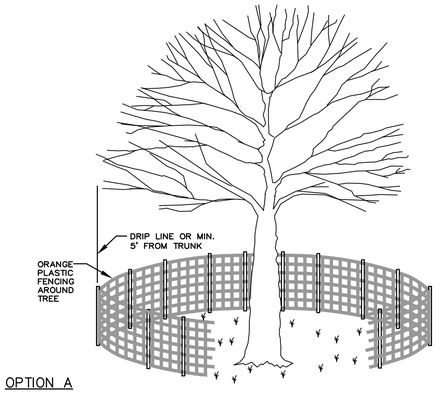
NOT TO SCALE



(Trees with 3" cal. & smaller)

SMALL TREE PLANTING/STAKING DETAIL

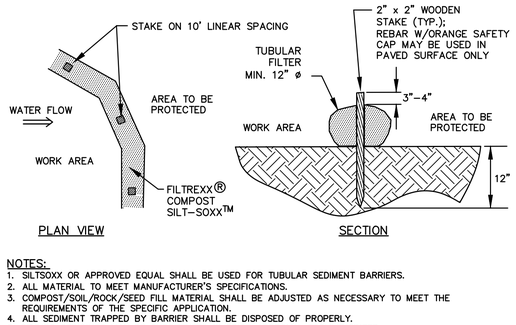
NOT TO SCALE



OPTION A

TREE PROTECTION DETAILS

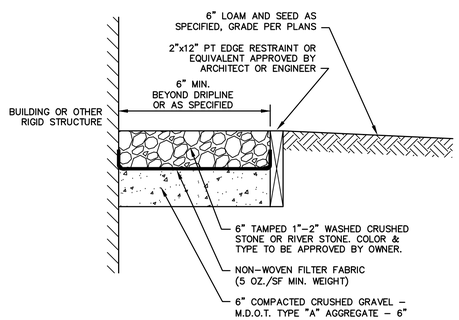
NOT TO SCALE



NOTES:
1. SILTSOXX OR APPROVED EQUAL SHALL BE USED FOR TUBULAR SEDIMENT BARRIERS.
2. ALL MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
3. COMPOST/SOIL/ROCK/SEED FILL MATERIAL SHALL BE ADJUSTED AS NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFIC APPLICATION.
4. ALL SEDIMENT TRAPPED BY BARRIER SHALL BE DISPOSED OF PROPERLY.
5. STUMPS GRINDINGS MAY BE SUBSTITUTED W/PRIOR APPROVAL FROM ENGINEER,

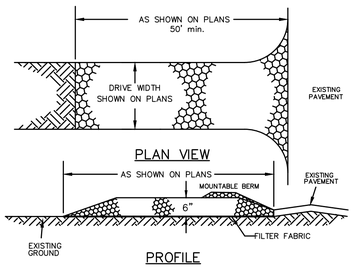
SILT SOXX BARRIER

NOT TO SCALE



STONE DRIP EDGE

NOT TO SCALE



STONE GRADATION TABLE

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

CONSTRUCTION SPECIFICATIONS

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

STABILIZED CONSTRUCTION EXIT

NOT TO SCALE

P4916

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
OCTOBER 11, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/14/18
1	PB APPROVAL	EDW	10/11/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 DETAILS.DWG

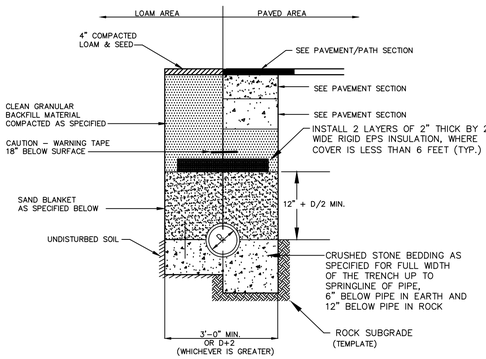
SCALE:
22"x 34": N.T.S.

APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
GENERAL NOTES & SITEWORK DETAILS

SHEET NUMBER:
C - 4



BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.

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

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

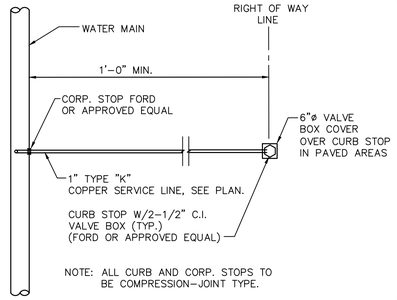
* EQUIVALENT TO STANDARD STONE SIZE #67 – SECTION 703 OF NHDOT STANDARD SPECIFICATIONS

SEWER TRENCH SECTION

NOT TO SCALE

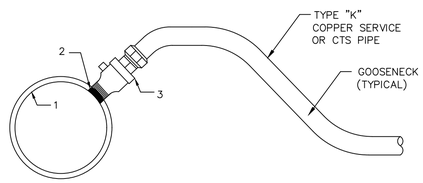
STANDARD TRENCH NOTES:

1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE: BACKFILL AS STATED IN THE TECHNICAL SPECIFICATIONS OR AS SHOWN OF THE DRAWING.
2. BEDDING: SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C33, STONE SIZE NO. 67.
   100% PASSING 1 INCH SCREEN
   90 – 100% PASSING 3/4 INCH SCREEN
   20 – 55% PASSING 3/8 INCH SCREEN
   0–10% PASSING #4 SIEVE
   0–5% PASSING #8 SIEVE
   WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE, SCREENED GRAVEL OR CRUSHED STONE 1–1/2 INCH TO 1/2 INCH SHALL BE USED.
3. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 90 – 100% PASSES 1/2 INCH SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST–IRON, DUCTILE IRON, AND REINFORCED CONCRETE PIPE PROVIDED HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.
4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS; PIECES OF PAVEMENT; ORGANIC MATTER; TOP SOIL; ALL WET OR SOFT MUCK, PEAT, OR CLAY; ALL EXCAVATED LEDGE MATERIAL; ALL ROCKS OVER 6 INCHES IN LARGEST DIMENSION; AND ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.
5. BASE COURSE AND PAVEMENT SHALL MEET THE REQUIREMENTS OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES – DIVISIONS 300 AND 400 RESPECTIVELY.
6. SHEETING, IF REQUIRED: WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID–DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE TO AN ELEVATION 1 FOOT ABOVE THE TOP OF PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW FINISHED GRADE, BUT NOT LESS THAT 1 FOOT ABOVE THE TOP OF THE PIPE.
7. W = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER OR LESS, W SHALL BE NO MORE THAN 36 INCHES. FOR PIPES GREATER THAN 15 INCHES IN NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS PIPE OUTSIDE DIAMETER (O.D.) ALSO, W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.
8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
9. CONCRETE FOR ENCASEMENT SHALL CONFORM TO THE NEW HAMPSHIRE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS STANDARD SPECIFICATION REQUIREMENTS FOR CLASS A (3000#) CONCRETE AS FOLLOWS:
   CEMENT: 6.0 BAGS PER CUBIC YARD
   WATER: 5.75 GALLONS PER BAG CEMENT
   MAXIMUM SIZE OF AGGREGATE: 1 INCH
   CONCRETE ENCASEMENT IS NOT ALLOWED FOR PVC PIPE.
10. CONCRETE FULL ENCASEMENT: IF FULL ENCASEMENT IS UTILIZED, DEPTH OF CONCRETE BELOW PIPE SHALL BE 1/4 I.D. (4" MINIMUM). BLOCK SUPPORT SHALL BE SOLID CONCRETE BLOCKS.
11. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES DESIGN STANDARDS REQUIRE TEN FEET (10') SEPARATION BETWEEN WATER AND SEWER. REFER TO CITY'S STANDARD SPECIFICATIONS FOR METHODS OF PROTECTION IN AREAS THAT CANNOT MEET THESE REQUIREMENTS.



WATER SERVICE CONNECTION TYPICAL

NOTES:
1. REPORTED 6"
2. REPORTED 6" x 1" OR 2" TAP. (PER PLANS)
3. CORPORATION STOP, FORD OR APPROVED EQUAL TO BE INSTALLED.

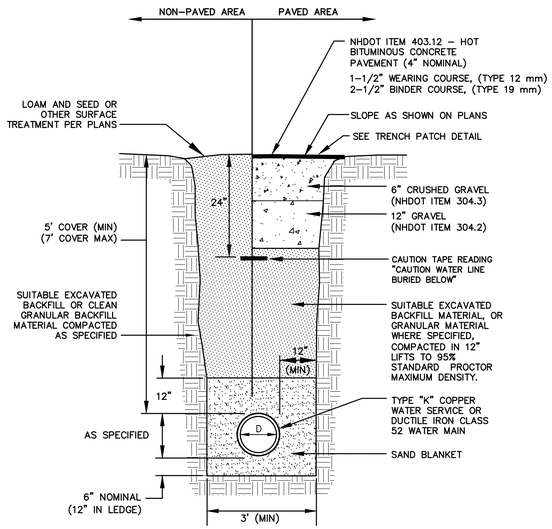


SERVICE TO MAIN CONNECTION DETAIL

NOT TO SCALE

GRADING & DRAINAGE NOTES

1. UNLESS OTHERWISE AGREED IN WRITING, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING TEMPORARY BENCHMARKS (TBMS) AND PERFORMING ALL CONSTRUCTION SURVEY LAYOUT.
2. DEWATERING ACTIVITIES SHALL BE DONE IN ACCORDANCE WITH EPA AND NHDES REGULATIONS.
3. PROTECTION OF SUBGRADE: THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN STABLE, DEWATERED SUBGRADES FOR FOUNDATIONS, PAVEMENT AREAS, UTILITY TRENCHES, AND OTHER AREAS DURING CONSTRUCTION. SUBGRADE DISTURBANCE MAY BE INFLUENCED BY EXCAVATION METHODS, MOISTURE, PRECIPITATION, GROUNDWATER CONTROL, AND CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT SUBGRADE DISTURBANCE. SUCH PRECAUTIONS MAY INCLUDE DIVERTING STORMWATER RUNOFF AWAY FROM CONSTRUCTION AREAS, REDUCING TRAFFIC IN SENSITIVE AREAS, AND MAINTAINING AN EFFECTIVE DEWATERING PROGRAM. SOILS EXHIBITING HEAVING OR INSTABILITY SHALL BE OVER EXCAVATED TO MORE COMPETENT BEARING SOIL AND REPLACED WITH FREE DRAINING STRUCTURAL FILL. IF THE EARTHWORK IS PERFORMED DURING FREEZING WEATHER, EXPOSED SUBGRADES ARE SUSCEPTIBLE TO FROST. NO FILL OR UTILITIES SHALL BE PLACED ON FROZEN GROUND. THIS WILL LIKELY REQUIRE REMOVAL OF A FROZEN SOIL CRUST AT THE COMMENCEMENT OF EACH DAY'S OPERATIONS. THE FINAL SUBGRADE ELEVATION WOULD ALSO REQUIRE AN APPROPRIATE DEGREE OF INSULATION AGAINST FREEZING.
4. IF SUITABLE, EXCAVATED MATERIALS SHALL BE PLACED AS FILL WITHIN UPLAND AREAS ONLY AND SHALL NOT BE PLACED WITHIN WETLANDS. PLACEMENT OF BORROW MATERIALS SHALL BE PERFORMED IN A MANNER THAT PREVENTS LONG TERM DIFFERENTIAL SETTLEMENT. EXCESSIVELY WET MATERIALS SHALL BE STOCKPILED AND ALLOWED TO DRAIN BEFORE PLACEMENT. FROZEN MATERIAL SHALL NOT BE USED FOR CONSTRUCTION.
5. ALL DRAINAGE PIPE SHALL BE ADS N–12 OR EQUAL APPROVED BY THE ENGINEER.
6. ALL SPOT GRADES ARE AT FINISH GRADE AND BOTTOM OF CURB WHERE APPLICABLE.
7. UNLESS OTHERWISE SPECIFIED, ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE A MINIMUM OF SIX (6") INCHES OF LOAM, LIMESTONE, FERTILIZER, SEED, AND HAY MULCH USING APPROPRIATE SOIL STABILIZATION TECHNIQUES. SEE DETAILS FOR ADDITIONAL INFORMATION.
8. IN ORDER TO PROVIDE VISUAL CLARITY ON THE PLANS, DRAINAGE AND OTHER UTILITY STRUCTURES MAY NOT BE DRAWN TO SCALE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER SIZING AND LOCATION OF ALL STRUCTURES AND IS DIRECTED TO RESOLVE ANY POTENTIAL DISCREPANCY WITH THE ENGINEER PRIOR TO CONSTRUCTION.



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

NOTES

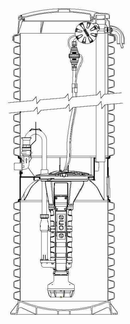
1. BACKFILL MATERIAL BELOW PAVED OR CONCRETE AREAS, BEDDING MATERIAL, AND SAND BLANKET SHALL BE COMPACTED TO NOT LESS THAN 95% OF AASHTO T 99, METHOD C. SUITABLE BACKFILL MATERIAL BELOW LOAM AREAS SHALL BE COMPACTED TO NOT LESS THAN 90% OF AASHTO T 99, METHOD C.
2. WATER MAINS SHALL BE POLY WRAPPED.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

WATER MAIN TRENCH

NOT TO SCALE

E/ONE EXTREME SERIES

DH071/DR071



General Features

The model DH071 or DR071 grinder pump station is a complete unit that includes: the grinder pump, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel. A single DH071 or DR071 is a popular choice for one, average single-family home and can also be used for up to two average single-family homes where codes allow and with consent of the factory.

- Rated for flows of 700 gpd (2650 lpd)
- 70 gallons (265 liters) of capacity
- Indoor or outdoor installation
- Standard outdoor heights range from 61 inches to 160 inches

The DH071 is the "hardwired," or "wired," model where a cable connects the motor controls to the level controls through watertight penetrations.

The DR071 is the "radio frequency identification" (RFID), or "wireless," model that uses wireless technology to communicate between the level controls and the motor controls.

Operational Information

Motor
1 hp, 1,725 rpm, high torque, capacitor start, thermally protected, 120/240V, 60 Hz, 1 phase

Inlet Connections
4-inch inlet grommet standard for DWV pipe. Other inlet configurations available from the factory.

Discharge Connections
Pump discharge terminates in 1.25-inch NPT female thread. Can easily be adapted to 1.25-inch PVC pipe or any other material required by local codes.

Discharge
15 gpm at 0 psig (0.95 lps at 0 m)
11 gpm at 40 psig (0.69 lps at 28 m)
7.8 gpm at 80 psig (0.49 lps at 56 m)

Accessories

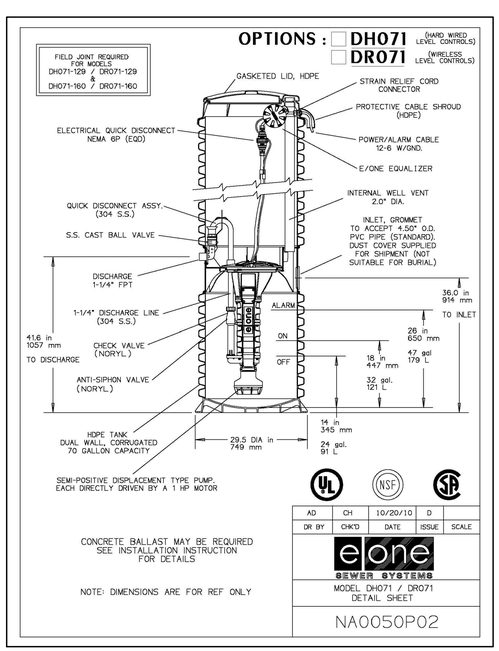
E/One requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the street main for added protection against backflow.

Alarm panels are available with a variety of options, from basic monitoring to advanced notice of service requirements.

The Remote Sentry is ideal for installations where the alarm panel may be hidden from view.

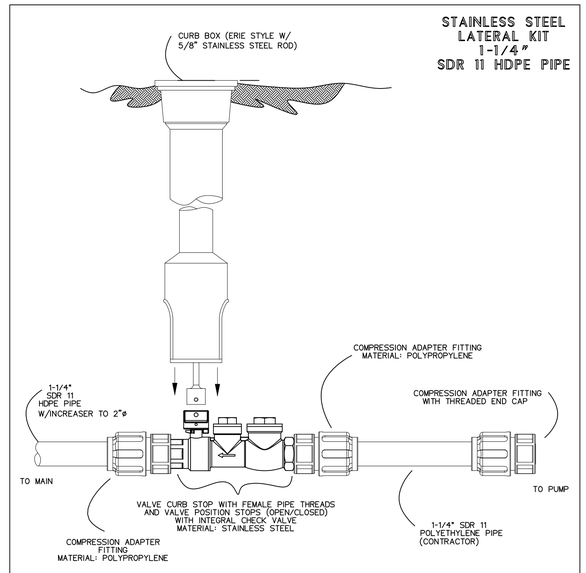
Patent Numbers: 5,752,315
5,562,254 5,439,180

NA0050P01 Rev C



SEWER PUMP STATION (E-ONE) DETAILS

NOT TO SCALE



NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY CONTRACTOR
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE

TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01

CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

KIT PARTS ARE NOT ASSEMBLED

e/one SEWER SYSTEMS
STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE

STAINLESS STEEL LATERAL KIT – 1 1/4" SDR 11 HDPE PIPE

NOT TO SCALE

P4916

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433–2335 www.ALTUS–ENG.com

ISSUED FOR:
PLANNING BOARD APPROVAL

ISSUE DATE:
SEPTEMBER 14, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/14/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 DETAILS.DWG

SCALE:
22"x 34": N.T.S.

APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220–87–2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220–87–3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
SITEWORK DETAILS

SHEET NUMBER:
C - 5

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

October 9, 2018

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

Re: **Application for Site Plan Review - Planning Board Approval**
Assessor's Map 220, Lots 87-2 and 87-3
74 and 64 Emery Street
Altus Project P4916

Dear Juliet:

On behalf of Corey Cawthorn and Happy Mountain Holdings, LLC, Altus Engineering, Inc. (Altus) respectfully submits the revised Site Plan Review application package for the properties located at 64 and 74 Emery Street. The project proposes to construct one two-unit residential building on each lot, each building to be 2-stories with a 2,080 s.f. footprint and a 3,000 s.f. Gross Floor Area, with related paving, lighting, utilities, landscaping, drainage and associated site improvements. Although the project is residential in nature, the development requires Site Plan Approval as four dwelling units will be constructed. As such, we believe many of the "standard" Site Plan Review requirements are not relevant and merit obtaining waivers. The waiver requests are included in this submittal along with the additional supporting documentation.

On June 26, 2018, Happy Mountain Holdings obtained Zoning relief from Section 10.44 and Section 10.521 of the City of Portsmouth Zoning Ordinance to allow the construction of two multi-family dwellings (duplex) where only single family residential units are allowed and a variance from Section 10.521 for Lot 87-3 for lot size of 21,232 SF where 30,000 SF is required. The applicant met with the Technical Advisory Committee (TAC) work session on August 14, 2018 and after addressing initial comments from the work session, the project was considered at the October 2, 2018 TAC Meeting where the Committee voted to **recommend** Site Plan approval to the Planning Board.

The following stipulations were noted by TAC and are addressed below:

1. *Applicant shall show outline of proposed stormwater areas on the site plan so that it is clear to future homeowners.*
   Response: The stormwater areas have been added to the site plan, sheet C-1.
2. *Stormwater features must be maintained by the owners in perpetuity. Stormwater system maintenance and enforcement oversight by City of Portsmouth shall be documented in a deed restriction. The deed restriction for stormwater maintenance shall be recorded and include language that notes any changes shall require review and approval by the Planning Director.*
   Response: Agreed. The deed restriction will be provided prior to CO.
3. *An easement shall be required between the two properties to allow stormwater to drain across lot lines.*
   Response: Agreed. All easements will be provided prior to CO.
4. *A Conditional Use Permit shall be required from the Planning Board to comply with the new Highway Noise Overlay District.*
   Response: The Owner is currently working with Planning Department to address this new zoning regulation.
5. *The applicant may reduce the overall driveway width to 14' driveway as previously proposed.*
   Response: The driveway width has been reduced to 14' indicated.
6. *Applicant shall provide documentation of utility and driveway access easements prior to the issuance of a Certificate of Occupancy for either property.*
   Response: Agreed. Easements will be provided prior to CO.
7. *Applicant shall provide a landscaping plan that includes limits of clearing, loaming and seeding.*
   Response: As discussed at TAC, a minimum of 5 trees are required and are shown on the site plan. All other disturbed areas will be lawn.
8. *Temporary check dams shall be placed during construction to address any impact to abutting property.*
   Response: Temporary check dams are shown on the grading plan.
9. *Drainage and grading shall be updated and clarified to address TAC comments and approved by Planning and DPW staff prior to Planning Board review.*
   Response: The grading plan has been updated and is submitted for final approval.

The Applicant will submit twelve (12) copies of the following items for consideration at the October 18th Planning Board Meeting:

- Site Plan Review Application and Checklist
- Site Plans (two full size (22" x 34") and ten half size (11" x 17"))
- Zoning Board of Adjustment decision letter, dated June 29, 2018.
- Waiver Requests
- Sitework Cost Estimate
- Autoturn - Truck Turning Movements
- Drainage Study (two full copies and ten summaries)
- CD with pdf copies of the complete application package.

As always, Altus looks to working with the Planning Department on this development project. Please call me if you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Eric D. Weinrieb, PE
President

wde/4916-PB cvr ltr_101918

Enclosure

Ecopy: Corey Cawthorn

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

October 9, 2018

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

Re: **Application for Site Plan Review - Planning Board Approval**
Assessor's Map 220, Lots 87-2 and 87-3
74 and 64 Emery Street
Altus Project P4916

Dear Juliet:

On behalf of Corey Cawthron and Happy Mountain Holdings, LLC, Altus Engineering, Inc. (Altus) respectfully submits the revised Site Plan Review application package for the properties located at 64 and 74 Emery Street. The project proposes to construct one two-unit residential building on each lot, each building to be 2-stories with a 2,080 s.f. footprint and a 3,000 s.f. Gross Floor Area, with related paving, lighting, utilities, landscaping, drainage and associated site improvements. Although the project is residential in nature, the development requires Site Plan Approval as four dwelling units will be constructed. As such, we believe many of the "standard" Site Plan Review requirements are not relevant and merit obtaining waivers. The waiver requests are included in this submittal along with the additional supporting documentation.

On June 26, 2018, Happy Mountain Holdings obtained Zoning relief from Section 10.44 and Section 10.521 of the City of Portsmouth Zoning Ordinance to allow the construction of two multi-family dwellings (duplex) where only single family residential units are allowed and a variance from Section 10.521 for Lot 87-3 for lot size of 21,232 SF where 30,000 SF is required. The applicant met with the Technical Advisory Committee (TAC) work session on August 14, 2018 and after addressing initial comments from the work session, the project was considered at the October 2, 2018 TAC Meeting where the Committee voted to **recommend** Site Plan approval to the Planning Board.

The following stipulations were noted by TAC and are addressed below:

1. *Applicant shall show outline of proposed stormwater areas on the site plan so that it is clear to future homeowners.*
   Response: The stormwater areas have been added to the site plan, sheet C-1.
2. *Stormwater features must be maintained by the owners in perpetuity. Stormwater system maintenance and enforcement oversight by City of Portsmouth shall be documented in a deed restriction. The deed restriction for stormwater maintenance shall be recorded and include language that notes any changes shall require review and approval by the Planning Director.*
   Response: Agreed. The deed restriction will be provided prior to CO.
3. *An easement shall be required between the two properties to allow stormwater to drain across lot lines.*
   Response: Agreed. All easements will be provided prior to CO.
4. *A Conditional Use Permit shall be required from the Planning Board to comply with the new Highway Noise Overlay District.*
   Response: The Owner is currently working with Planning Department to address this new zoning regulation.
5. *The applicant may reduce the overall driveway width to 14' driveway as previously proposed.*
   Response: The driveway width has been reduced to 14' indicated.
6. *Applicant shall provide documentation of utility and driveway access easements prior to the issuance of a Certificate of Occupancy for either property.*
   Response: Agreed. Easements will be provided prior to CO.
7. *Applicant shall provide a landscaping plan that includes limits of clearing, loaming and seeding.*
   Response: As discussed at TAC, a minimum of 5 trees are required and are shown on the site plan. All other disturbed areas will be lawn.
8. *Temporary check dams shall be placed during construction to address any impact to abutting property.*
   Response: Temporary check dams are shown on the grading plan.
9. *Drainage and grading shall be updated and clarified to address TAC comments and approved by Planning and DPW staff prior to Planning Board review.*
   Response: The grading plan has been updated and is submitted for final approval.

The Applicant will submit twelve (12) copies of the following items for consideration at the October 18th Planning Board Meeting:

- Site Plan Review Application and Checklist
- Site Plans (two full size (22" x 34") and ten half size (11" x 17"))
- Zoning Board of Adjustment decision letter, dated June 29, 2018.
- Waiver Requests
- Sitework Cost Estimate
- Autoturn - Truck Turning Movements
- Drainage Study (two full copies and ten summaries)
- CD with pdf copies of the complete application package.

As always, Altus looks to working with the Planning Department on this development project. Please call me if you have any questions or need any additional information.

Sincerely,

ALTUS ENGINEERING, INC.

Eric D. Weinrieb, PE
President

wde/4916-PB cvr ltr_101918

Enclosure

Ecopy: Corey Cawthorn

CITY OF PORTSMOUTH
Community Development Department
(603) 610-7281
Planning Department
(603) 610-7216

PLANNING DEPARTMENT

June 29, 2018

Happy Mountain Holdings LLC
901 N. Market St, Ste. 705
Wilmington, Delaware 19801

Re: Property at 64 & 74 Emery Street, Permit #30387
Assessor Plan 220, Lot 87-2&3

Dear Applicant:

The Board of Adjustment at its reconvened meeting on June 26, 2018 completed its consideration of your application described as follows:

Application:

Case 6-7
Petitioner: Happy Mountain Holdings LLC
Property: 64 and 74 Emery Street
Assessor Plan: Map 220, Lots 87-2 and 87-3
Zoning District: Single Residence B
Description: Build a two-family dwelling on two lots
Requests: Variances and/or Special Exceptions necessary to grant the required relief from the Zoning Ordinance including the following variances:

1. from Section 10.440, Use #1.30 to allow a two family dwelling on each of two lots where a two family dwelling on a lot is not allowed; and
2. from Section 10.521 to allow a lot area per dwelling unit for Lot 220-87-3 (64 Emery Street) of 10,616±s.f. where 15,000 s.f. is required.

Action:

The Board voted to **grant** the petition as presented and advertised.

Review Criteria:

The petition was granted for the following reasons:

- Granting the variances will not be contrary to the public interest and the spirit of the ordinance will be observed as the essential character of the neighborhood will not be altered, nor will the health, safety or welfare of the public be threatened. The project will fit appropriately within this neighborhood which is a mixture of commercial and residential uses.
- Substantial justice will be done as the loss to the applicant if the petition were denied and strict adherence to the ordinance enforced would not be outweighed by any gain to the general public.
- The value of surrounding properties will not be diminished. Most of the surrounding properties are either commercial, places of assembly or other residential properties, all of which will sustain their values.
- Literal enforcement of the ordinance would result in unnecessary hardship due to the special conditions of the property. These include the proximity of the properties to the highway and the bypass as well as its location in a single residence zone while surrounded on three sides by commercial uses or places of assembly. Due to the special conditions, there is no fair and substantial relationship between the purposes of the ordinance provision limiting a lot to a single residence and their specific application to these properties. A residential use in a residential zone is a reasonable use.

As provided for in NH RSA Chapter 677, the Board's decision may be appealed 30 days after the vote. Any action taken by the applicant pursuant to the Board's decision during this appeal period shall be at the applicant's risk. Please contact the Planning Department for more details about the appeals process. Construction drawings or sketches must be reviewed and approved by the Building Inspector prior to the issuance of a building permit. Approvals by other land use boards may also be required prior to the issuance of a building permit.

The minutes and tape recording of the meeting may be reviewed in the Planning Department.

Very truly yours,

David Rheaume, Chairman
Board of Adjustment

mek

c: Robert Marsilia, Chief Building Inspector
Roseann Maurice-Lentz, City Assessor
Douglas W. Macdonald, Esq.

ALTUS
ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

WAIVER REQUESTS
Assessor's Map 220
Lot 87-2 (74 Emery Street)
&
Lot 87-3 (64 Emery Street)
Altus Project P4916
September 17, 2018

On behalf of Happy Mountain Holdings, LLC, Altus Engineering, Inc. request the following waivers from the City of Portsmouth, New Hampshire Site Plan Review Regulations.

Section 2.5.4 2 (E) A Note shall be provided on the plan stating, "All conditions on this plan shall remain in effect in perpetuity pursuant to the requirements of the site plan regulations."
Section 2.5.4 3 (C) Access and circulation
Section 2.5.4 3 (D) Parking and loading
Section 2.5.4 3 (J) Outdoor lighting
Section 2.5.4.3 (K) Landscaping
Section 3.4 Curbing (A) where access ways and driveways meet public streets
Section 5.2 Sidewalk and Pedestrian Pathways
Section 5.3 Bicycle Facilities
Section 6.1 Landscaping and Screening Standards.
Section 2.13.3 Recording Notes
Section 2.13.4 Landscaping requirements

This project is unique in the fact that it is the development of two duplex homes on two abutting lots. Because four residential housing units are proposed, the project falls under the criteria for Site Plan Review Regulations. As such, the duplex homes do not require loading, outdoor lighting, curbing at the entrance, bicycle racks and other types of development features that normally are depicted on commercial site developments. We have combined all of the waiver requests with a single explanation.

As discussed at the TAC Workshop, it is understood that the general intent of the Technical Advisory Committee's Review and the concerns that would be of interest to the Planning Board include the design of the stormwater management system and the utility service design. The plans submitted for review and approval demonstrate that there will be no adverse impacts to abutting properties from runoff from the site. A detailed utility service design plan is included in

the plan set.

To require that all conditions on the plan to remain in effect in perpetuity is an overly burdensome requirement for the homes. This would require the homeowners to file an amendment to the Site Plans to install a shed, light post, swing set or any other feature that is normally constructed on a duplex lot without requiring Site Plan Approval. To require the Site Plan to be recorded is an excessive requirement for this development.

Wde/4916 waiver

ALTUS ENGINEERING, INC.

Civil
Site Planning
Environmental
Engineering

133 Court Street
Portsmouth, NH
03801-4413

HAPPY MOUNTAIN HOLDINGS, LCC

64 & 74 EMERY STREET
Portsmouth, NH

PRELIMINARY OPINION OF SITEWORK COST

DATE: 14-Sep-18
PROJECT: 4916

ITEM DESCRIPTION		QUANTITY	UNIT	UNIT PRICE	TOTAL COST
SITEWORK DEMOLITION					
	MOBILIZATION	1	LS	$2,000.00	$2,000.00
CLEARING AND GRUBBING					
	TREE AND VEGETATION REMOVAL	1	LS	$3,000.00	$3,000.00
SEWER SERVICE					
	LOW PRESSURE FORCE MAIN	300	LF	$34.00	$10,200
WATER SERVICE					
	2-INCH FIRE SUPPRESSION WATER SERVICES	420	LF	$36.00	$15,120
	1-INCH DOMESTIC WATER SERVICES	830	LF	$32.00	$26,560
	WATER TAPS AND CURB STOPS	4	EA	$500.00	$2,000
GAS SERVICE					
	GAS SERVICES	335	LF	$26.00	$8,710
ELECTRIC/PHONE/CABLE SERVICES					
	UNDERGROUND ELECTRIC AND TELE-COMMUNICATION CONDUITS	260	LF	$30.00	$7,800
	TRANSFORMER AND PAD	1	EA	$4,000.00	$4,000
STORM DRAINAGE SYSTEM					
	EROSION CONTROL RIPRAP AND DRIP EDGE	1	LS	$1,000.00	$1,000
SEDIMENT AND EROSION CONTROL					
	TEMPORARY EROSION CONTROL	1	LS	$1,500.00	$1,500
AGGREGATE BASE COURSES					
	12" GRAVEL (NHDOT 304.2)	312	CY	$18.00	$5,616
	6" CRUSHED GRAVEL (NHDOT 304.3)	156	CY	$22.00	$3,432
	CUTS AND FILLS	250	CY	$12.00	$3,000
HOT BITUMINOUS PAVEMENT					
	2.5" BASE COURSE	112	TONS	$85.00	$9,520
	1.5" WEARING COURSE	68	TONS	$85.00	$5,780
LANDSCAPING					
	LOAM AND SEED - TURF ESTABLISHMENT	1	LS	$6,000.00	$6,000
LIGHTING					
		NIC			
SUBTOTAL					**$115,238**

TOTAL: $115,238

EXCLUSIONS:
ITEMS EXCLUDED FROM THIS ESTIMATE INCLUDE, BUT ARE NOT LIMITED TO, THOSE ITEMS SPECIFIED ABOVE AS BEING NOT INCLUDED IN THIS ESTIMATE AND THE FOLLOWING:
LEDGE REMOVAL, TAPPING FEES, INSPECTIONS, UTILITY SERVICE FEES

Emery St.
Portsmouth, NH

DRAINAGE STUDY

EXECUTIVE SUMMARY

Happy Mountain Holdings, LLC and Corey Cawthron are planning to develop two residential lots that have recently been approved by the Board of Adjustment to allow each to have a duplex housing. The project involves just lot development as the utility services are available in the public right-of-way. There are no wetlands on the lot or within 100-feet of the lot lines. The lots are encumbered with a utility easement at the rear of the site. No site improvements are proposed in the easement. However, it is expected that the homeowners will mow and maintain the easement areas. The two lots that will be developed are:

Assessor's Parcel	Lot Area
220-87-2	32,427 SF
2220-87-3	21,232 SF

The two lots are 53,659 square feet in size (1.23 acres) and are predominantly wooded lots. The lots were created in 2013. At that time, the City approved the development with a shared driveway and utility cross easements to allow Lot 87-3 to be developed without impacting the ledge outcrop in the Emery Street right-of-way. The two lots are approved developable lots that could be developed with up to 60% impervious area based on zoning regulations, which would allow over 30,000 sf of impervious area. The proposed development will provide approximately 12,000 sf of combined impervious areas as well as three stormwater management ponds to reduce peak flows and provide stormwater treatment.

The proposed project will include the two duplexes, a shared driveway, new utility services and associated site improvements, including; site grading, drainage improvements, and utility service connections. Stormwater ponds will be constructed on each of the two residential lots to manage the storm water flow and provide treatment. The ponds will consist of a depressed lawn area with a loamy-sand material that will promote infiltration, drainage, and provide treatment.

DRAINAGE ANALYSIS

This drainage study is intended to show that the proposed development will manage and treat the stormwater to improve the existing site conditions and minimize impacts from the development. The project was analyzed to compare the ½", 2, 10, 25, and 50 year storm events. As a conservative design approach, which exceeds the city Site Plan Review Regulations, Altus has designed the site following the NHDES Alteration of Terrain rainfall criteria by adding 15-percent to the 24-hour rainfall precipitation for each storm event modeled.

The pre-development subcatchments were modeled and input into HydroCAD for analysis. The "Pre-Development Watershed Plan" illustrates the subcatchments that were modeled for the existing stormwater system. The existing site drains towards the Emery Street right-of-way with a high point near the proposed driveway that directs a portion of the flow to the south towards Myrtle Ave and a portion of the flow to the north towards Maplewood Avenue .

The "Post-Development Watershed Plan" illustrates the proposed stormwater management system. The original subcatchments have been divided into smaller areas to emulate the proposed grading and stormwater management system proposed for construction. The post-development conditions were analyzed at the same primary discharge points examined in the pre-development modeling.

For existing soil conditions the NRCS Web Soil Survey tool was used to determine the existing hydrologic soil groups. The entire site is listed as a type 799 soil series, urban land -canton complex. Hydrologic Soil Group (HSG) Type B was used for the entire as a conservative approach, as much of the site appears to be HSG Type C based on field observations. Referencing the Ksat Values for NH Soils, an infiltration rate of 0.6 was used for the design of the grassed soil filter ponds. The low C Ksat value for Canton is 6.0, but due to the disturbed soil, the design rate used was 1/10 of low Ksat instead of 1/2 (3.0 in/hr) which is a typical design application.

The following Stormwater Modelling Summary compares pre-development and post-development peak rates of runoff for all analyzed storm events:

Stormwater Modeling Summary

The Stormwater Modeling Summary Table below shows the results for the peak flow rates for stormwater discharge for the ½" Inch, 2 year, 10 year, 25 year, and 50 year storm events:

Stormwater Modeling Summary Table
(Pre vs. Post-Development Stormwater Peak Runoff Rates)

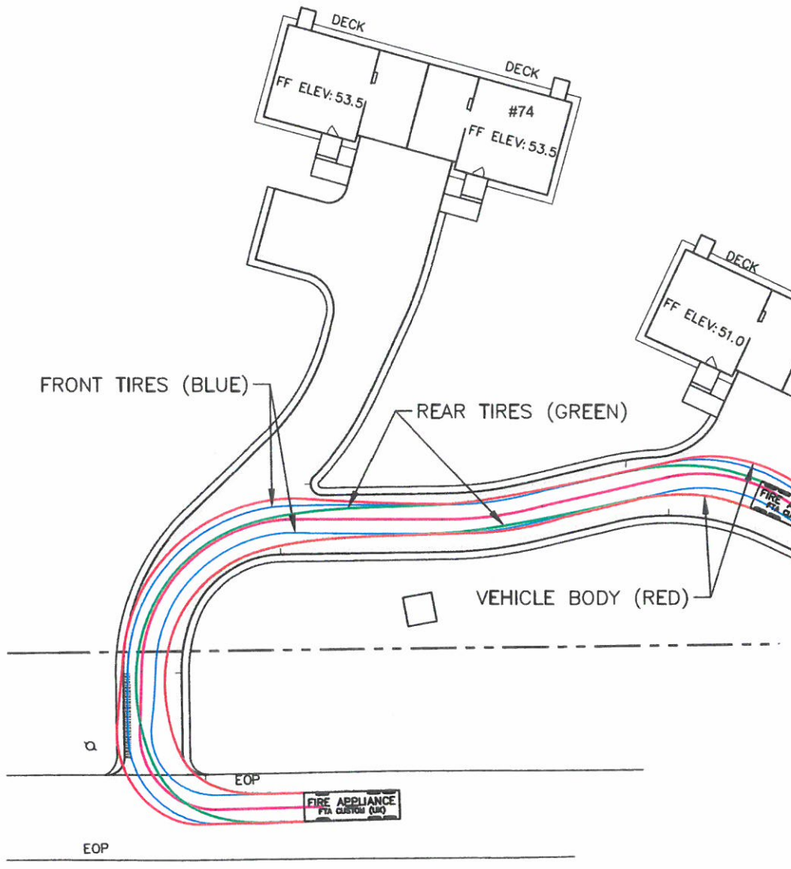
	1/2"- Storm (0.5 inch)	2-Yr Storm (3.69 inch)	10-Yr Storm (5.60 inch)	25-Yr Storm (7.10 inch)	50-Yr Storm (8.50 inch)
POA #1					
Pre	0.00	0.27	1.46	2.82	4.28
Post	0.00	0.28	1.22	1.99	3.78
Change	0.0	+0.01	-0.24	-0.83	-0.50
POA #2					
Pre	0.00	0.05	0.26	0.49	0.72
Post	0.00	0.17	0.36	1.19	2.12
Change	0.0	+0.12	+0.10	+0.70	+1.40
Net Change	**0.0**	**+0.13**	**-0.14**	**-0.13**	**+0.90**

As the Stormwater Modeling Summaries demonstrate, the proposed project will manage the stormwater runoff to mitigate impacts to the surrounding areas. The peak flow rates are managed to replicate the existing conditions, with a variance of 0.1 cfs +/- for the 1/2" storm through the 25 year storm event, which is the design intent for low impact development.

CONCLUSION

The proposed project will not have an adverse effect on abutting properties and infrastructure as a result of stormwater runoff. As the stormwater summary indicates, the peak flow rates discharging from the site will be managed to minimize impacts to the surrounding areas. Three grass soil filter ponds will be constructed to provide retention and treatment of stormwater on site prior discharging to the Emery Street drainage. As noted in the drainage report, the stormwater model utilizes a number of conservative design approaches. The estimated soil type and infiltration rates were conservative based on the Soil and Ksat values. Although not a City of Portsmouth requirement, a 15-percent increase was added to each rainfall event, similar to the requirements of NHDES Alteration of Terrain permitting. Additionally, there are proposed stormwater management features such as roof drip edges and grasses swales that were not incorporated in to the design model. It is expected that the drip edges will infiltrate all of the roof flows directed to them in all but the largest storm events. With this conservative approach, the post development stormwater model still indicates a variance of 0.1 cfs +/- for the 1/2" storm through the 25 year storm event, which is within the design modeling tolerance, and illustrates that the project is managing the stormwater flows.

In addition to the permanent stormwater management practices, appropriate steps will be taken to properly mitigate erosion and sedimentation during construction through the use of temporary Best Management Practices for sediment and erosion control. In summary, the proposed development will manage stormwater runoff during construction and post development so that there is no adverse impact to the surrounding area as a result of this development.

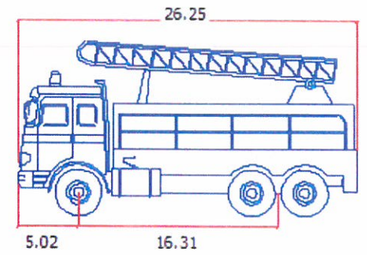


TURN MOVEMENT #1
Entrance from Emery St.

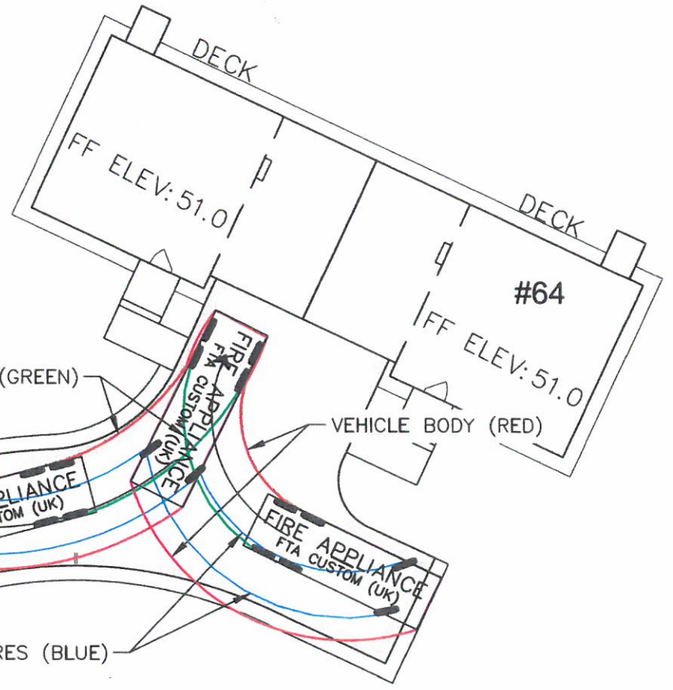
GRAPHIC SCALE (1"=20')

20 0 10 20 40 80

(IN FEET)



FIRE APPLIANCE TRUCK DIMENSIONS



TURN MOVEMENT #2
3Pt Turn - Reverse and Exit

GRAPHIC SCALE (1" =10')

10 0 5 10 20 40

(IN FEET)

NH STATE PLANE COORDINATE SYSTEM NAD83

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: SEPTEMBER 14, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/14/18

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

SCALE:
11"x17": 1" = 40'
22"x 34": 1" = 20'

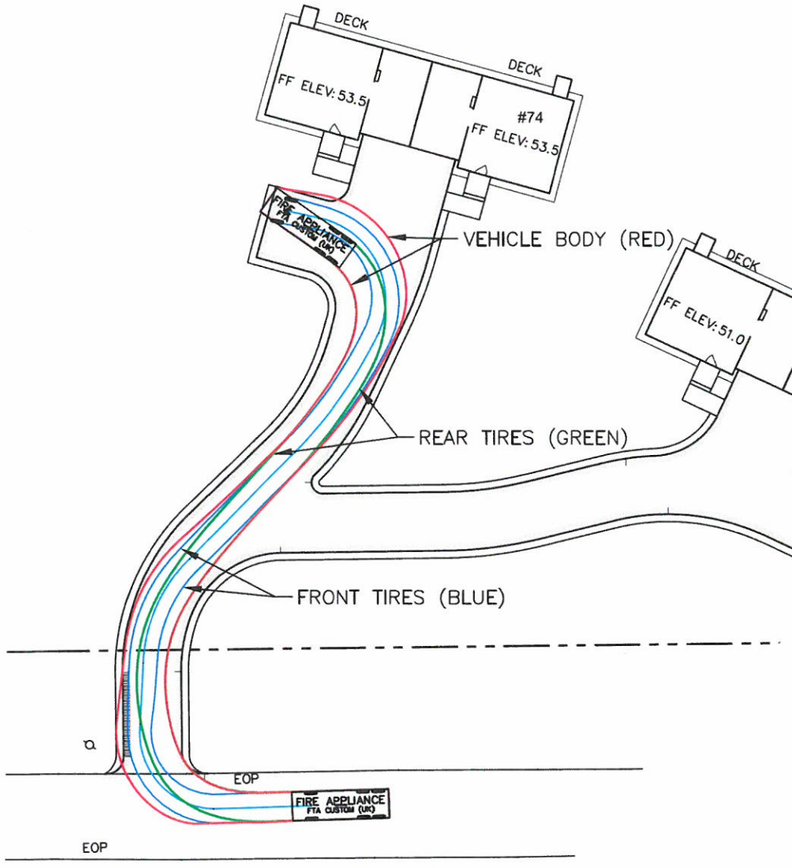
APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
AUTOTURN
64 EMERY ST

SHEET NUMBER:
AT - 1

P4916

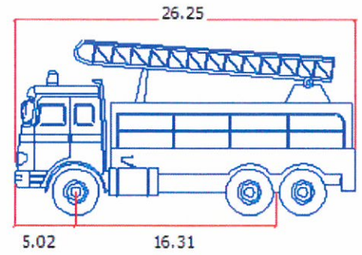


TURN MOVEMENT #1
Entrance from Emery St.

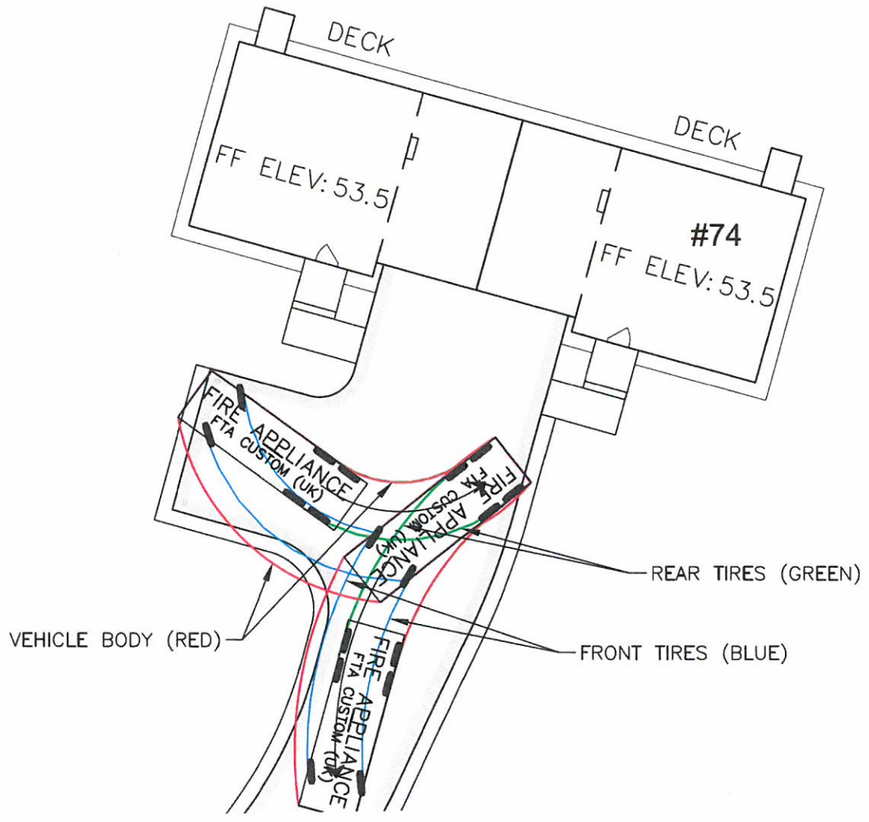
GRAPHIC SCALE (1"=20')

20 0 10 20 40 80

(IN FEET)



FIRE APPLIANCE TRUCK DIMENSIONS



TURN MOVEMENT #2
3Pt Turn - Reverse and Exit

GRAPHIC SCALE (1" =10')

10 0 5 10 20 40

(IN FEET)

NH STATE PLANE COORDINATE SYSTEM NAD83

ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: SEPTEMBER 14, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	09/14/18

DRAWN BY: CDB
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

SCALE: 11"x17": 1" = 40'
22"x 34": 1" = 20'

APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
AUTOTURN
74 EMERY ST

SHEET NUMBER:
AT - 2

P4916

Two Residential Duplexes

64 & 74 Emery Street
Portsmouth, NH
Assessor's Map 220, Lots 87-2 & 87-3

DRAINAGE STUDY

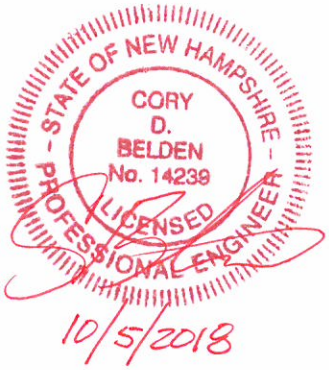
OCTOBER 2018
~~**SEPTEMBER 2018**~~

Prepared For:

HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801
C/O:
Corey Cawthron
750 Lafayette Road
Portsmouth, NH 03801

Prepared By:

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



Emery St.
Portsmouth, NH

DRAINAGE STUDY

EXECUTIVE SUMMARY

Happy Mountain Holdings, LLC and Corey Cawthron are planning to develop two residential lots that have recently been approved by the Board of Adjustment to allow each to have a duplex housing. The project involves just lot development as the utility services are available in the public right-of-way. There are no wetlands on the lot or within 100-feet of the lot lines. The lots are encumbered with a utility easement at the rear of the site. No site improvements are proposed in the easement. However, it is expected that the homeowners will mow and maintain the easement areas. The two lots that will be developed are:

Assessor's Parcel	Lot Area
220-87-2	32,427 SF
2220-87-3	21,232 SF

The two lots are 53,659 square feet in size (1.23 acres) and are predominantly wooded lots. The lots were created in 2013. At that time, the City approved the development with a shared driveway and utility cross easements to allow Lot 87-3 to be developed without impacting the ledge outcrop in the Emery Street right-of-way. The two lots are approved developable lots that could be developed with up to 60% impervious area based on zoning regulations, which would allow over 30,000 sf of impervious area. The proposed development will provide approximately 12,000 sf of combined impervious areas as well as three stormwater management ponds to reduce peak flows and provide stormwater treatment.

The proposed project will include the two duplexes, a shared driveway, new utility services and associated site improvements, including; site grading, drainage improvements, and utility service connections. Stormwater ponds will be constructed on each of the two residential lots to manage the storm water flow and provide treatment. The ponds will consist of a depressed lawn area with a loamy-sand material that will promote infiltration, drainage, and provide treatment.

DRAINAGE ANALYSIS

This drainage study is intended to show that the proposed development will manage and treat the stormwater to improve the existing site conditions and minimize impacts from the development. The project was analyzed to compare the ½", 2, 10, 25, and 50 year storm events. As a conservative design approach, which exceeds the city Site Plan Review Regulations, Altus has designed the site following the NHDES Alteration of Terrain rainfall criteria by adding 15-percent to the 24-hour rainfall precipitation for each storm event modeled.

The pre-development subcatchments were modeled and input into HydroCAD for analysis. The "Pre-Development Watershed Plan" illustrates the subcatchments that were modeled for the existing stormwater system. The existing site drains towards the Emery Street right-of-way with a high point near the proposed driveway that directs a portion of the flow to the south towards Myrtle Ave and a portion of the flow to the north towards Maplewood Avenue .

The "Post-Development Watershed Plan" illustrates the proposed stormwater management system. The original subcatchments have been divided into smaller areas to emulate the proposed grading and stormwater management system proposed for construction. The post-development conditions were analyzed at the same primary discharge points examined in the pre-development modeling.

For existing soil conditions the NRCS Web Soil Survey tool was used to determine the existing hydrologic soil groups. The entire site is listed as a type 799 soil series, urban land -canton complex. Hydrologic Soil Group (HSG) Type B was used for the entire as a conservative approach, as much of the site appears to be HSG Type C based on field observations. Referencing the Ksat Values for NH Soils, an infiltration rate of 0.6 was used for the design of the grassed soil filter ponds. The low C Ksat value for Canton is 6.0, but due to the disturbed soil, the design rate used was 1/10 of low Ksat instead of 1/2 (3.0 in/hr) which is a typical design application.

The following Stormwater Modelling Summary compares pre-development and post-development peak rates of runoff for all analyzed storm events:

Stormwater Modeling Summary

The Stormwater Modeling Summary Table below shows the results for the peak flow rates for stormwater discharge for the ½" Inch, 2 year, 10 year, 25 year, and 50 year storm events:

Stormwater Modeling Summary Table
(Pre vs. Post-Development Stormwater Peak Runoff Rates)

	1/2"- Storm (0.5 inch)	2-Yr Storm (3.69 inch)	10-Yr Storm (5.60 inch)	25-Yr Storm (7.10 inch)	50-Yr Storm (8.50 inch)
POA #1					
Pre	0.00	0.27	1.46	2.82	4.28
Post	0.00	0.28	1.22	1.99	3.78
Change	0.0	+0.01	-0.24	-0.83	-0.50
POA #2					
Pre	0.00	0.05	0.26	0.49	0.72
Post	0.00	0.17	0.36	1.19	2.12
Change	0.0	+0.12	+0.10	+0.70	+1.40
Net Change	**0.0**	**+0.13**	**-0.14**	**-0.13**	**+0.90**

As the Stormwater Modeling Summaries demonstrate, the proposed project will manage the stormwater runoff to mitigate impacts to the surrounding areas. The peak flow rates are managed to replicate the existing conditions, with a variance of 0.1 cfs +/- for the 1/2" storm through the 25 year storm event, which is the design intent for low impact development.

CONCLUSION

The proposed project will not have an adverse effect on abutting properties and infrastructure as a result of stormwater runoff. As the stormwater summary indicates, the peak flow rates discharging from the site will be managed to minimize impacts to the surrounding areas. Three grass soil filter ponds will be constructed to provide retention and treatment of stormwater on site prior discharging to the Emery Street drainage. As noted in the drainage report, the stormwater model utilizes a number of conservative design approaches. The estimated soil type and infiltration rates were conservative based on the Soil and Ksat values. Although not a City of Portsmouth requirement, a 15-percent increase was added to each rainfall event, similar to the requirements of NHDES Alteration of Terrain permitting. Additionally, there are proposed stormwater management features such as roof drip edges and grasses swales that were not incorporated in to the design model. It is expected that the drip edges will infiltrate all of the roof flows directed to them in all but the largest storm events. With this conservative approach, the post development stormwater model still indicates a variance of 0.1 cfs +/- for the 1/2" storm through the 25 year storm event, which is within the design modeling tolerance, and illustrates that the project is managing the stormwater flows.

In addition to the permanent stormwater management practices, appropriate steps will be taken to properly mitigate erosion and sedimentation during construction through the use of temporary Best Management Practices for sediment and erosion control. In summary, the proposed development will manage stormwater runoff during construction and post development so that there is no adverse impact to the surrounding area as a result of this development.

Methodology

The drainage study was completed using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. Reservoir routing was performed with the Dynamic Storage Indication method which automates the calculation of Tailwater conditions. A Type III 24-hour rainfall distribution was utilized in analyzing the data for the 0.5", 2, 10, 25, and 50 year 24-hour storm events using rainfall data obtained from the Northeast Regional Climate Center (NRCC) Extreme Precipitation Tables. As a conservative measure, 15-percent has been added to each rainfall mimic the requirements of NHDES Alteration of Terrain Permitting requirements. Site topography, existing features, proposed site improvements, proposed grading, drainage and erosion control measures are shown on the accompanying plans. Recommended erosion control measures are based upon the December 2008 edition of the "New Hampshire Stormwater Manual Volumes 1 through 3" prepared by NHDES and Comprehensive Environmental, Inc. as amended.

Stormwater Modeling Disclaimer

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

APPENDIX

A. Site Maps

   a. USGS Map

   b. Aerial Image

B. HydroCAD Modeling Results

   a. Extreme Precipitation Table

   b. Pre-Development (2, 10, 25, & 50 Year Storms)

   c. Post Development (2, 10, 25, & 50 Year Storms)

C. Web Soil Survey

D. Plans

   - Project Site Plans (Separate Submittal)
   - Pre-Development Watershed Plan
   - Post-Development Watershed Plan

POA #1

POA #2

Subcat Reach Pond Link

Routing Diagram for 4916 pre
Prepared by Altus Engineering, Inc., Printed 9/14/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.634	48	Brush, Good, HSG B (1S)
1.629	55	Woods, Good, HSG B (1S, 2S)
2.263	**53**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.263	HSG B	1S, 2S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.263		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.634	0.000	0.000	0.000	0.634	Brush, Good	1S
0.000	1.629	0.000	0.000	0.000	1.629	Woods, Good	1S, 2S
0.000	**2.263**	**0.000**	**0.000**	**0.000**	**2.263**	**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 1S: POA #1 Runoff Area=88,216 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=425' Tc=21.5 min CN=53 Runoff=0.00 cfs 0.000 af

Subcatchment 2S: POA #2 Runoff Area=10,360 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=100' Slope=0.1000 '/' Tc=10.5 min CN=55 Runoff=0.00 cfs 0.000 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
100.00% Pervious = 2.263 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: POA #1

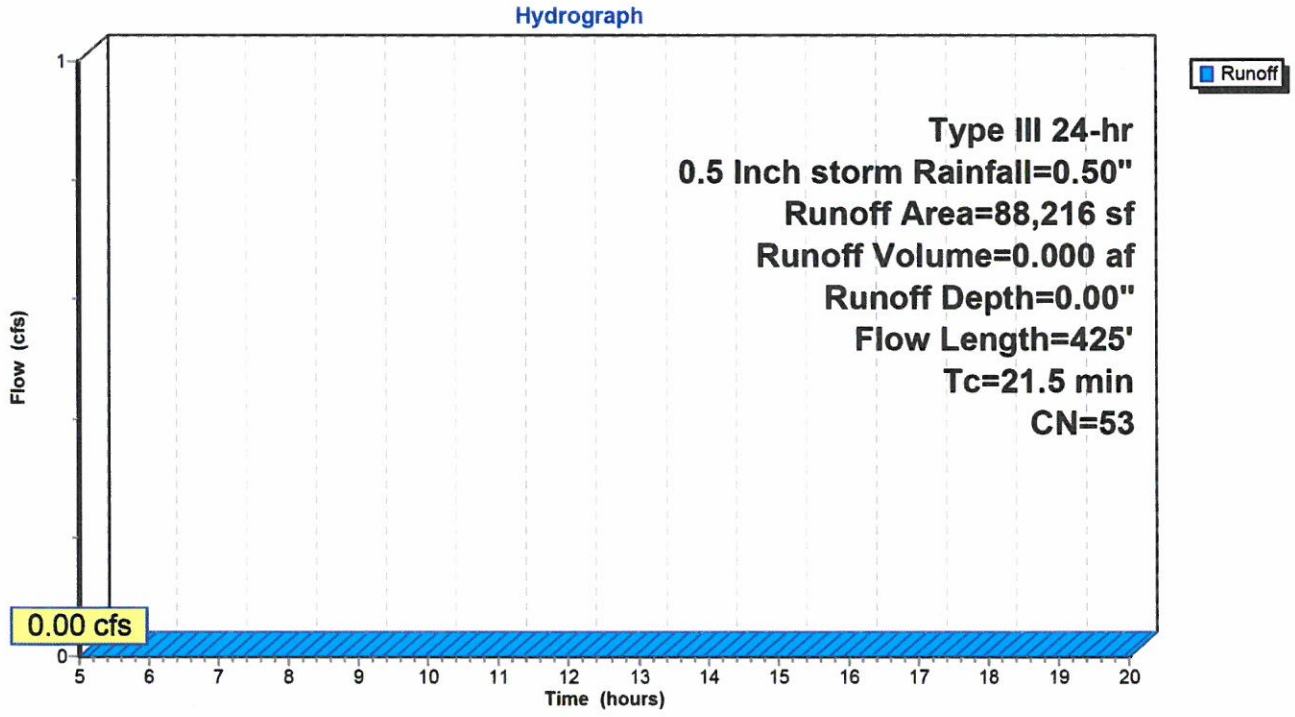
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
27,600	48	Brush, Good, HSG B
60,616	55	Woods, Good, HSG B
88,216	53	Weighted Average
88,216		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
6.3	325	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	425	Total			

Subcatchment 1S: POA #1



Summary for Subcatchment 2S: POA #2

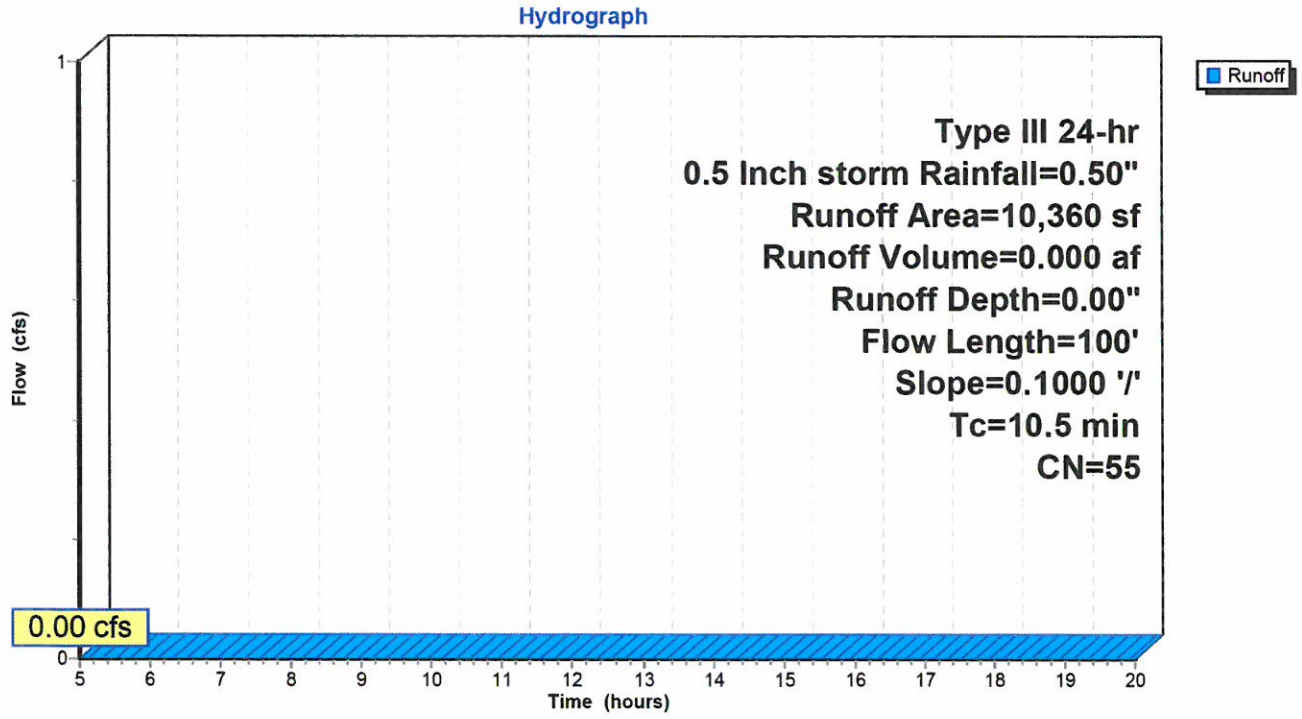
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
10,360	55	Woods, Good, HSG B
10,360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"

Subcatchment 2S: POA #2



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

Subcatchment1S: POA #1 Runoff Area=88,216 sf 0.00% Impervious Runoff Depth>0.29"
Flow Length=425' Tc=21.5 min CN=53 Runoff=0.27 cfs 0.048 af

Subcatchment2S: POA #2 Runoff Area=10,360 sf 0.00% Impervious Runoff Depth>0.35"
Flow Length=100' Slope=0.1000 '/' Tc=10.5 min CN=55 Runoff=0.05 cfs 0.007 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.055 af Average Runoff Depth = 0.29"
100.00% Pervious = 2.263 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: POA #1

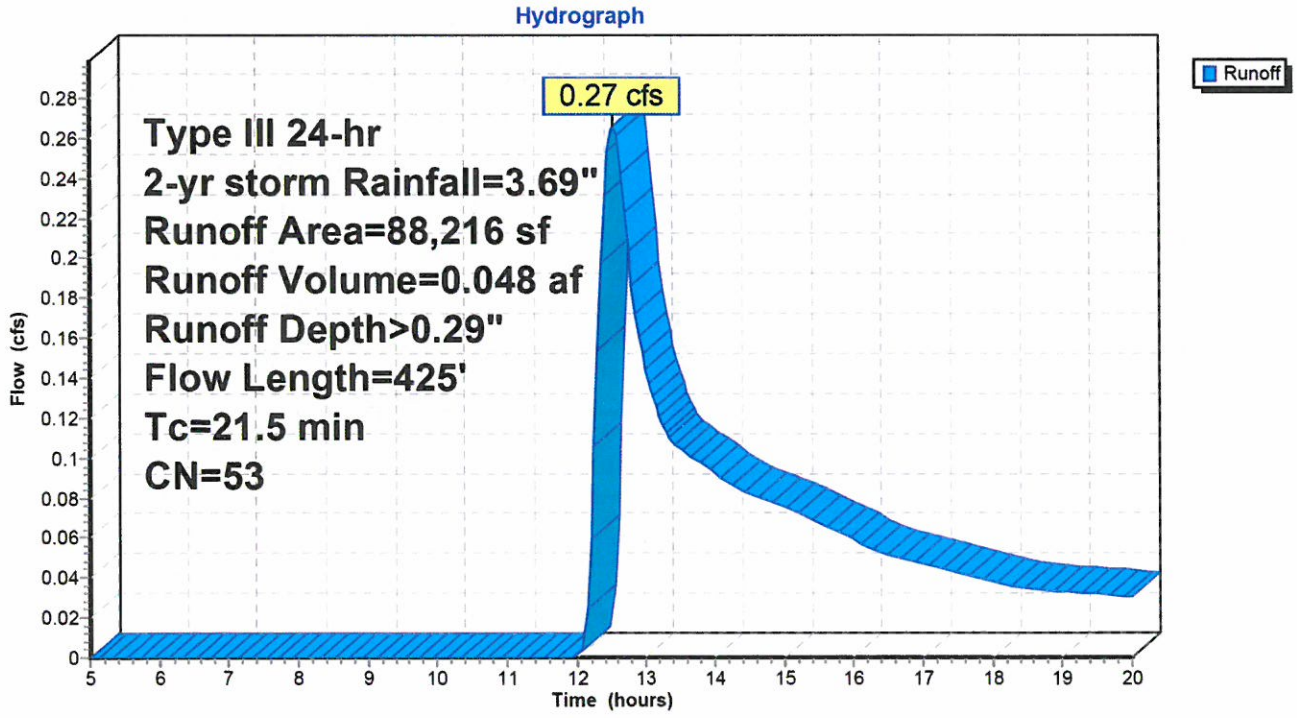
Runoff = 0.27 cfs @ 12.53 hrs, Volume= 0.048 af, Depth> 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
27,600	48	Brush, Good, HSG B
60,616	55	Woods, Good, HSG B
88,216	53	Weighted Average
88,216		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
6.3	325	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	425	Total			

Subcatchment 1S: POA #1



Summary for Subcatchment 2S: POA #2

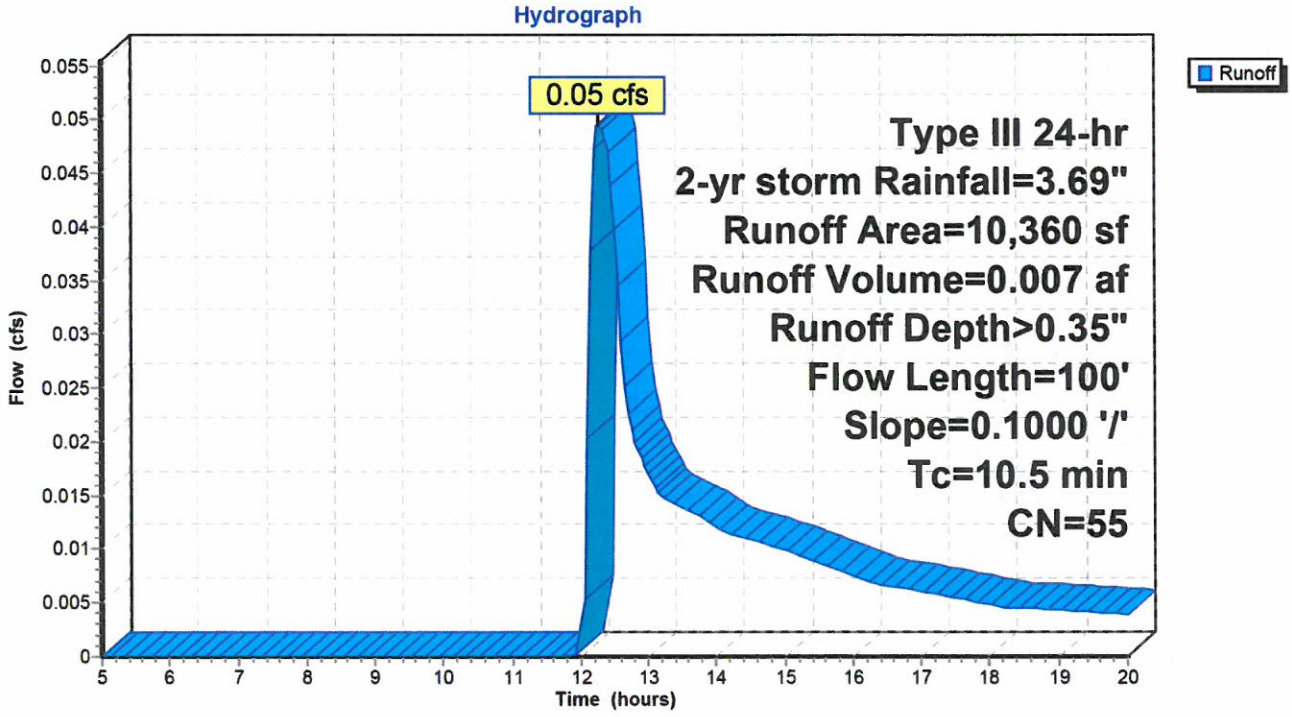
Runoff = 0.05 cfs @ 12.28 hrs, Volume= 0.007 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
10,360	55	Woods, Good, HSG B
10,360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"

Subcatchment 2S: POA #2



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 1S: POA #1 Runoff Area=88,216 sf 0.00% Impervious Runoff Depth>1.02"
Flow Length=425' Tc=21.5 min CN=53 Runoff=1.46 cfs 0.172 af

Subcatchment 2S: POA #2 Runoff Area=10,360 sf 0.00% Impervious Runoff Depth>1.16"
Flow Length=100' Slope=0.1000 '/' Tc=10.5 min CN=55 Runoff=0.26 cfs 0.023 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.195 af Average Runoff Depth = 1.04"
100.00% Pervious = 2.263 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: POA #1

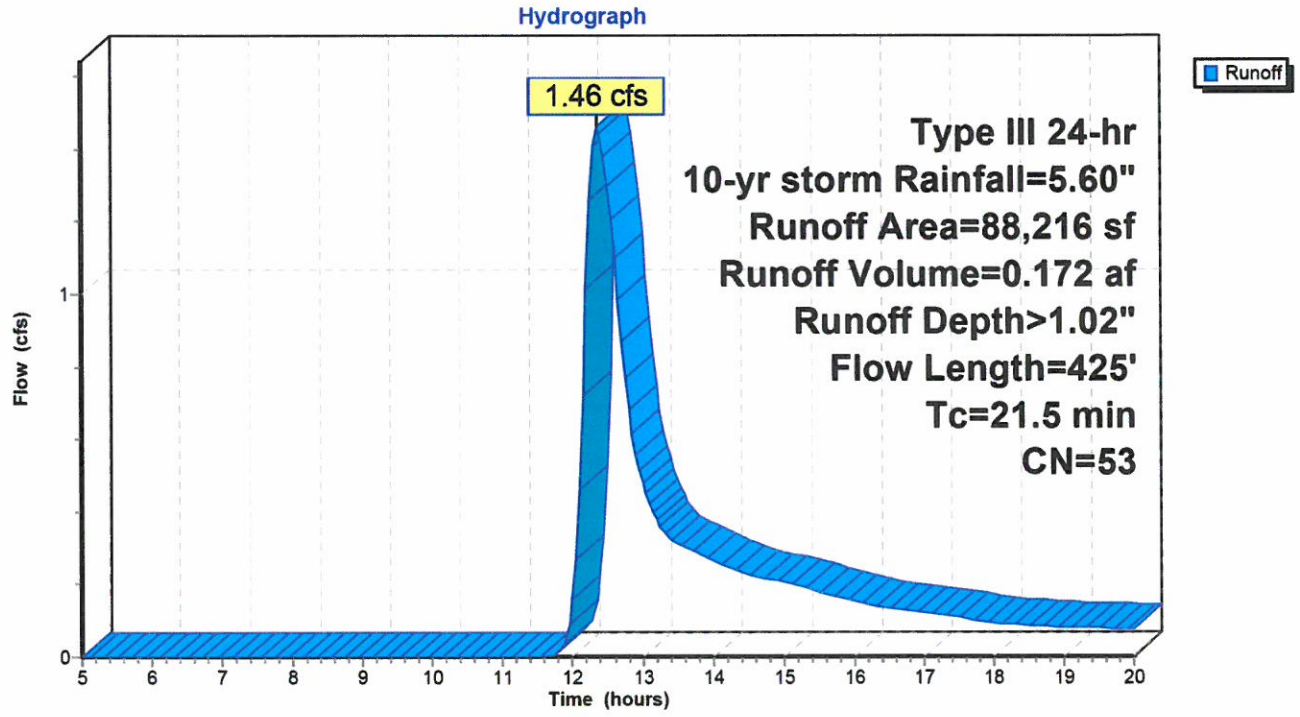
Runoff = 1.46 cfs @ 12.36 hrs, Volume= 0.172 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
27,600	48	Brush, Good, HSG B
60,616	55	Woods, Good, HSG B
88,216	53	Weighted Average
88,216		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
6.3	325	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	425	Total			

Subcatchment 1S: POA #1



Summary for Subcatchment 2S: POA #2

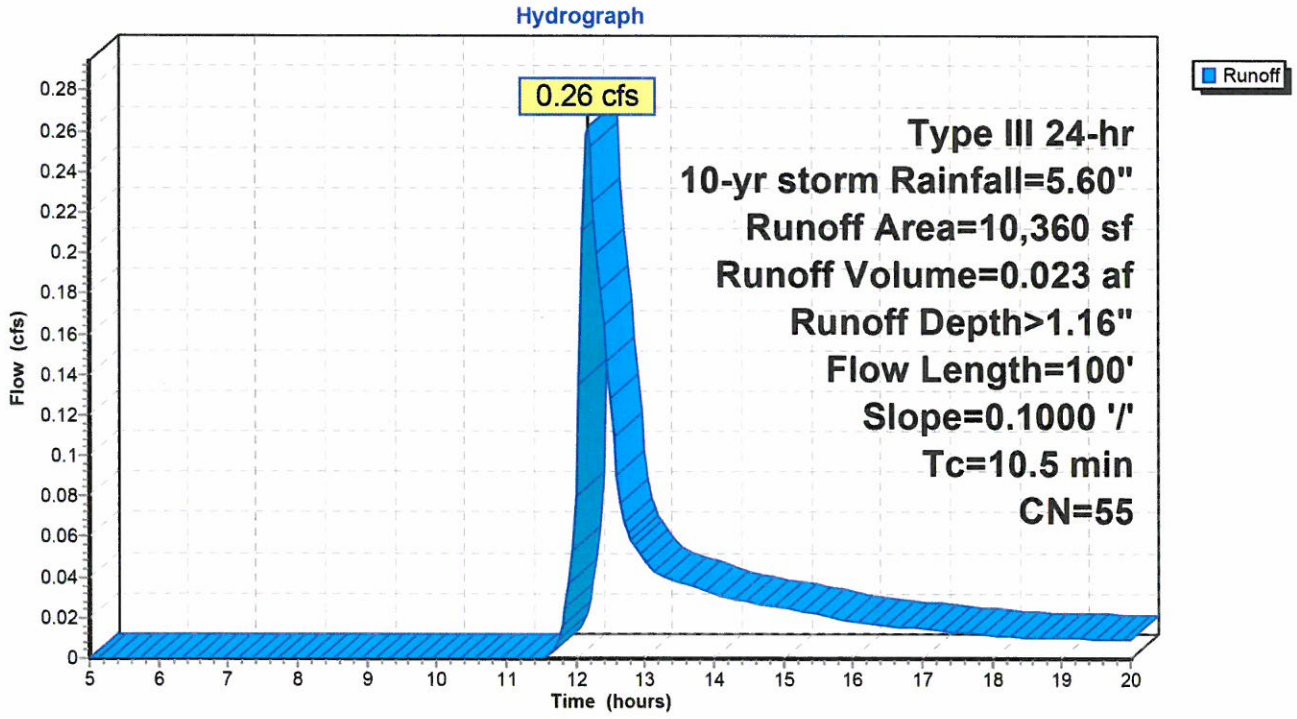
Runoff = 0.26 cfs @ 12.17 hrs, Volume= 0.023 af, Depth> 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
10,360	55	Woods, Good, HSG B
10,360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"

Subcatchment 2S: POA #2



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

Subcatchment1S: POA #1 Runoff Area=88,216 sf 0.00% Impervious Runoff Depth>1.80"
Flow Length=425' Tc=21.5 min CN=53 Runoff=2.82 cfs 0.303 af

Subcatchment2S: POA #2 Runoff Area=10,360 sf 0.00% Impervious Runoff Depth>1.99"
Flow Length=100' Slope=0.1000 '/' Tc=10.5 min CN=55 Runoff=0.49 cfs 0.039 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.343 af Average Runoff Depth = 1.82"
100.00% Pervious = 2.263 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: POA #1

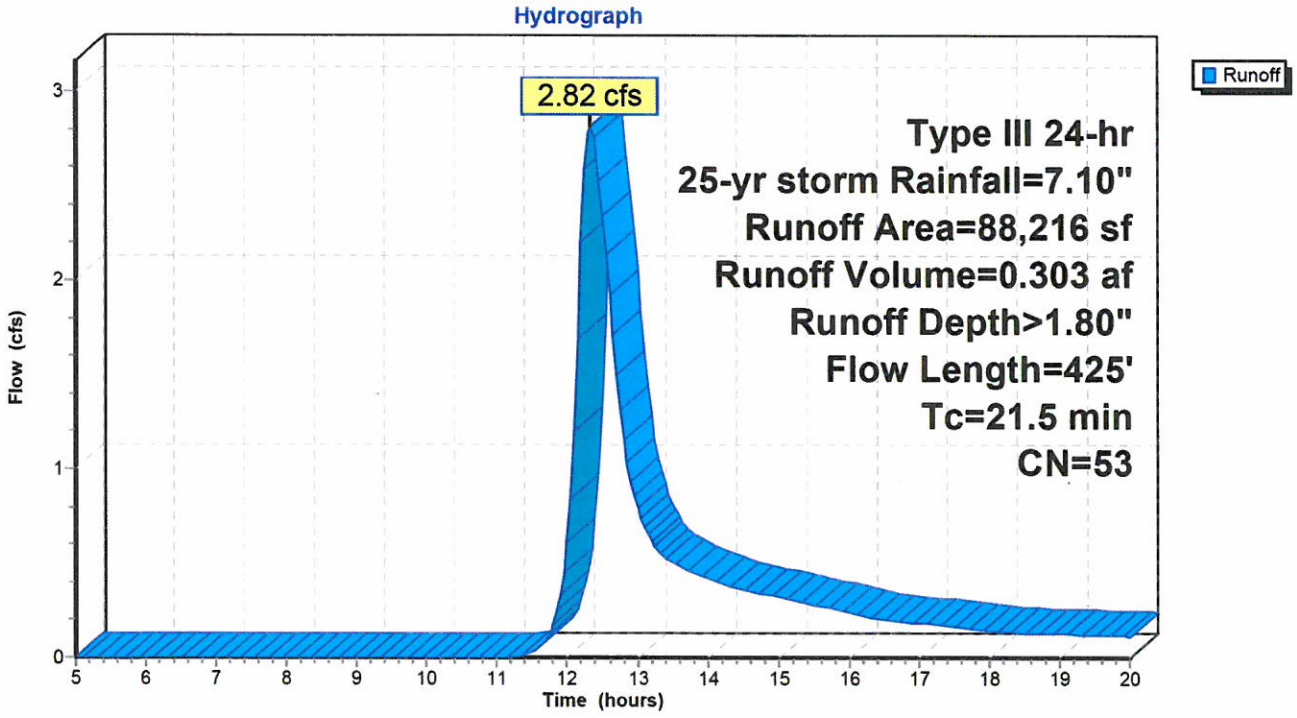
Runoff = 2.82 cfs @ 12.33 hrs, Volume= 0.303 af, Depth> 1.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
27,600	48	Brush, Good, HSG B
60,616	55	Woods, Good, HSG B
88,216	53	Weighted Average
88,216		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
6.3	325	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	425	Total			

Subcatchment 1S: POA #1



Summary for Subcatchment 2S: POA #2

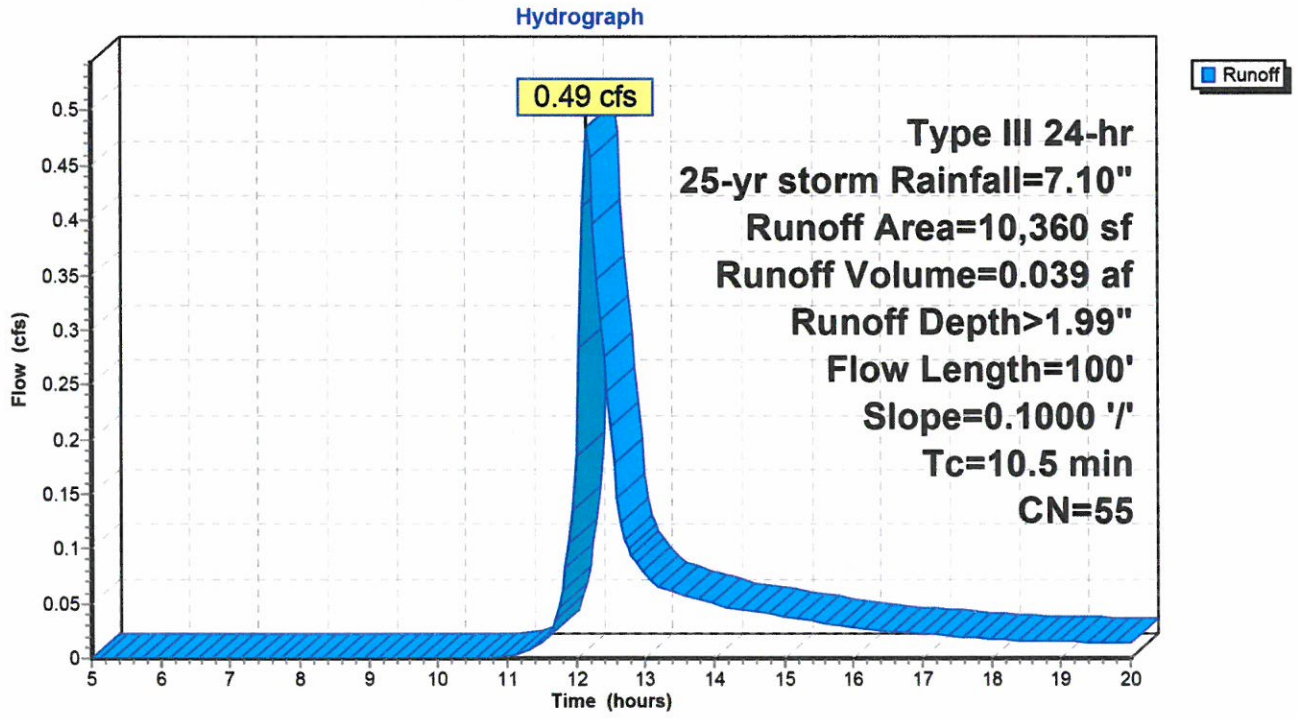
Runoff = 0.49 cfs @ 12.16 hrs, Volume= 0.039 af, Depth> 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
10,360	55	Woods, Good, HSG B
10,360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"

Subcatchment 2S: POA #2



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 1S: POA #1 Runoff Area=88,216 sf 0.00% Impervious Runoff Depth>2.63"
Flow Length=425' Tc=21.5 min CN=53 Runoff=4.28 cfs 0.445 af

Subcatchment 2S: POA #2 Runoff Area=10,360 sf 0.00% Impervious Runoff Depth>2.87"
Flow Length=100' Slope=0.1000 '/' Tc=10.5 min CN=55 Runoff=0.72 cfs 0.057 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.501 af Average Runoff Depth = 2.66"
100.00% Pervious = 2.263 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: POA #1

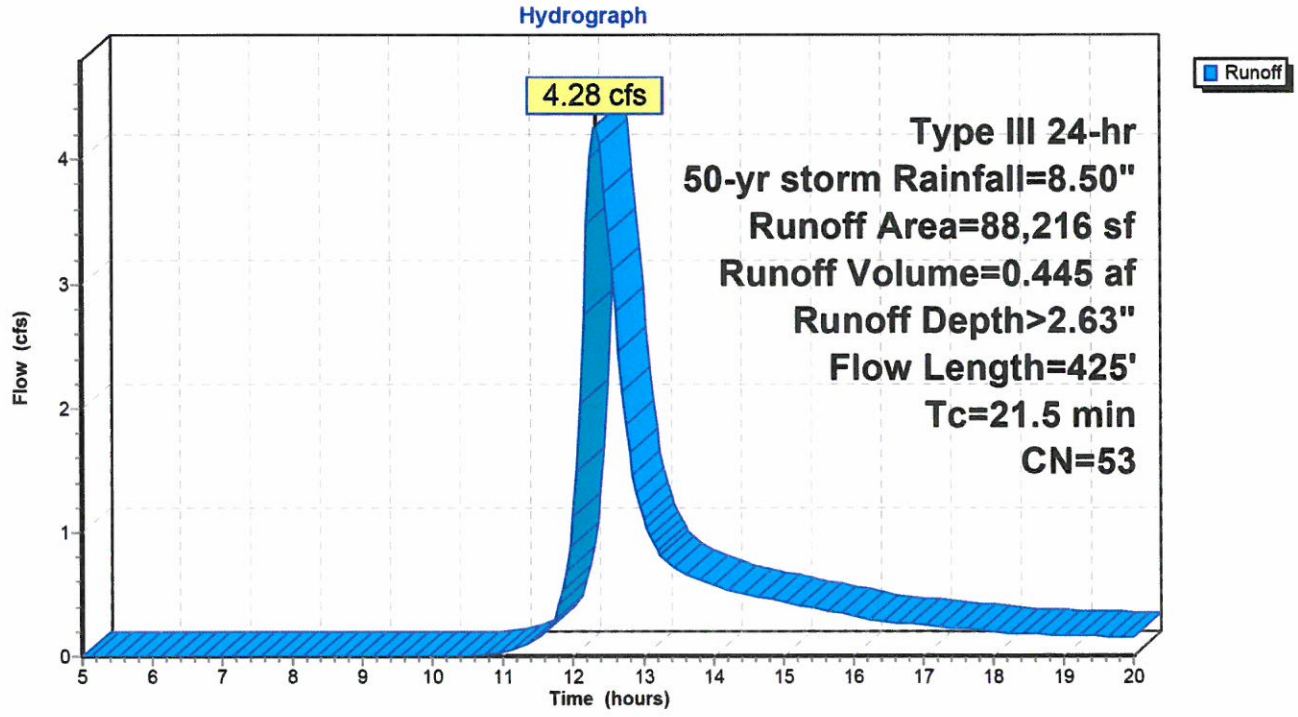
Runoff = 4.28 cfs @ 12.32 hrs, Volume= 0.445 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
27,600	48	Brush, Good, HSG B
60,616	55	Woods, Good, HSG B
88,216	53	Weighted Average
88,216		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
6.3	325	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
21.5	425	Total			

Subcatchment 1S: POA #1



Summary for Subcatchment 2S: POA #2

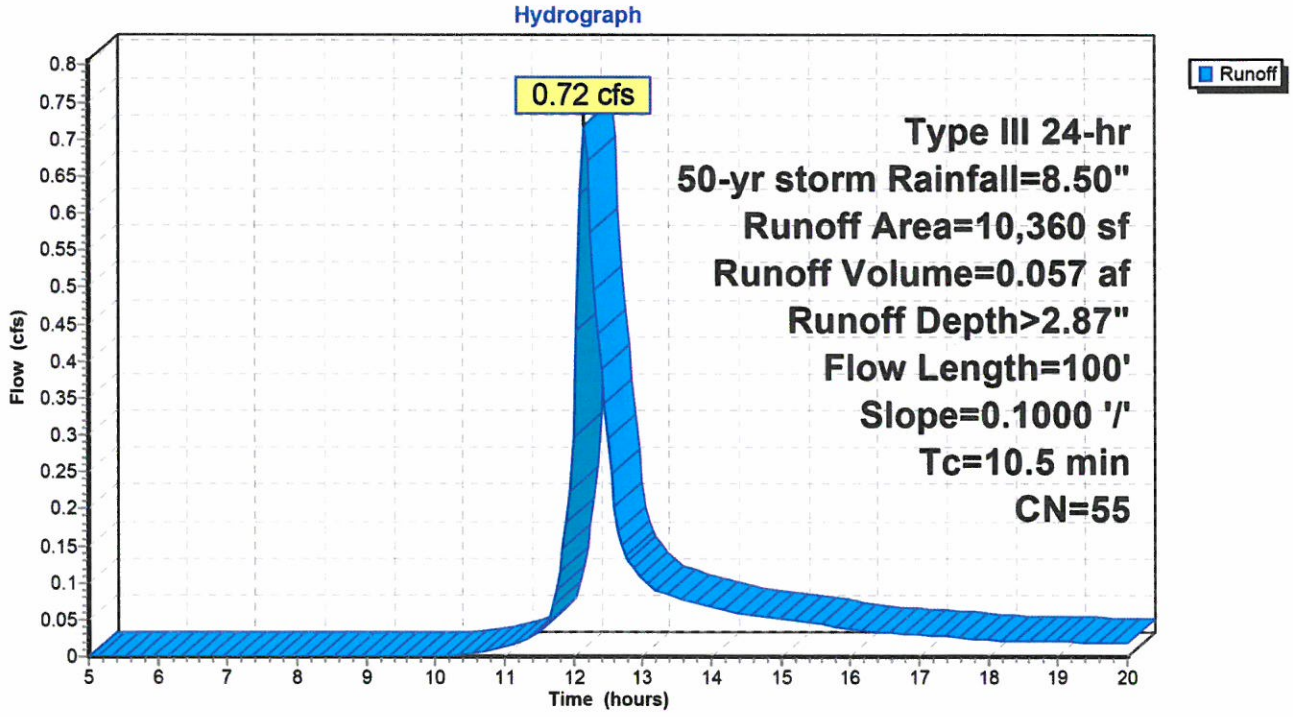
Runoff = 0.72 cfs @ 12.16 hrs, Volume= 0.057 af, Depth> 2.87"

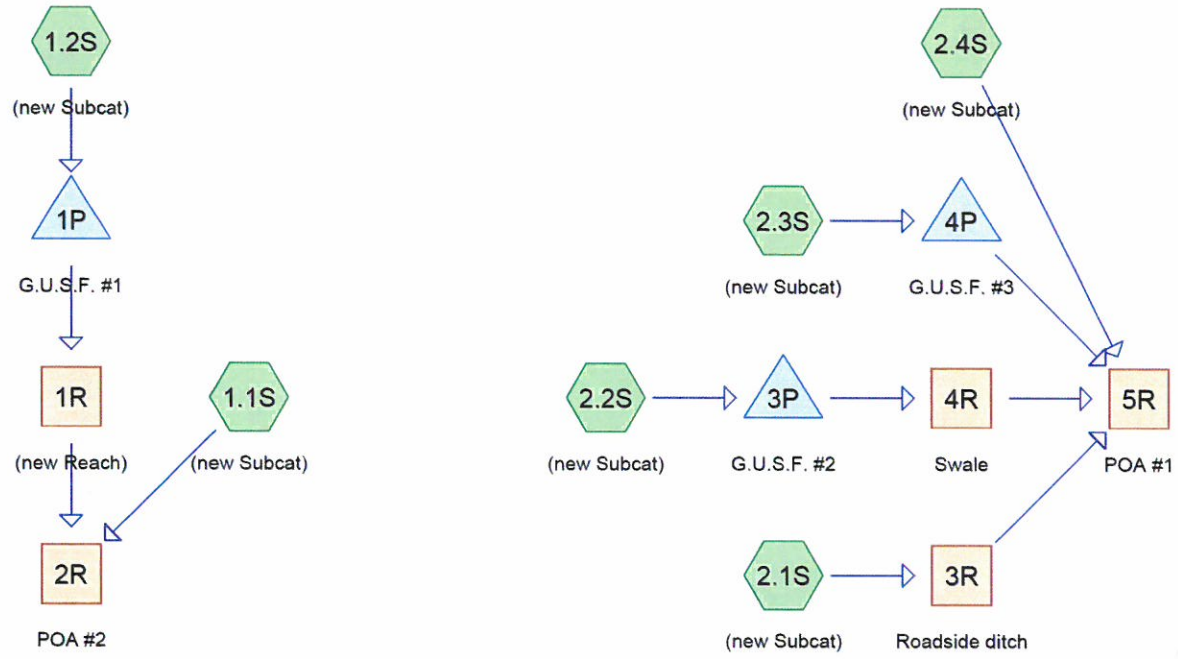
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
10,360	55	Woods, Good, HSG B
10,360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1000	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"

Subcatchment 2S: POA #2





Subcat Reach Pond Link

Routing Diagram for 4916 post
Prepared by Altus Engineering, Inc., Printed 10/5/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.434	61	>75% Grass cover, Good, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
0.634	48	Brush, Good, HSG B (1.2S, 2.2S, 2.4S)
0.166	98	Paved parking, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
0.025	98	Roofs, HSG B (1.2S, 2.2S, 2.4S)
0.066	98	Unconnected roofs, HSG B (1.2S, 2.2S, 2.4S)
0.939	55	Woods, Good, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
2.263	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.263	HSG B	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.263		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.434	0.000	0.000	0.000	0.434	>75% Grass cover, Good	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	0.634	0.000	0.000	0.000	0.634	Brush, Good	1.2S, 2.2S, 2.4S
0.000	0.166	0.000	0.000	0.000	0.166	Paved parking	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	0.025	0.000	0.000	0.000	0.025	Roofs	1.2S, 2.2S, 2.4S
0.000	0.066	0.000	0.000	0.000	0.066	Unconnected roofs	1.2S, 2.2S, 2.4S
0.000	0.939	0.000	0.000	0.000	0.939	Woods, Good	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	**2.263**	**0.000**	**0.000**	**0.000**	**2.263**	**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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth=0.00"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth=0.00"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.00 cfs 0.000 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth=0.00"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.00 cfs 0.000 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth=0.00"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.00 cfs 0.000 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth=0.00"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.00 cfs 0.000 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth=0.00"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.00 cfs 0.000 af

Reach 1R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: POA #2 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.00 cfs 0.000 af

Reach 4R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.00 cfs 0.000 af

Reach 5R: POA #1 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: G.U.S.F. #1 Peak Elev=46.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 3P: G.U.S.F. #2 Peak Elev=44.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 4P: G.U.S.F. #3 Peak Elev=45.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'

Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'

Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'

Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'

Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'

Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.17' @ 5.00 hrs Surf.Area= 615 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
↑**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 44.17' @ 5.00 hrs Surf.Area= 500 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 45.17' @ 5.00 hrs Surf.Area= 110 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.17' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.17' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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

Subcatchment1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>1.26"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.17 cfs 0.011 af

Subcatchment1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>0.35"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.18 cfs 0.028 af

Subcatchment2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>1.20"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.27 cfs 0.018 af

Subcatchment2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>0.54"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.18 cfs 0.020 af

Subcatchment2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>1.08"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.11 cfs 0.008 af

Subcatchment2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>0.26"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.06 cfs 0.011 af

Reach 1R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: POA #2 Avg. Flow Depth=0.09' Max Vel=3.23 fps Inflow=0.17 cfs 0.011 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.17 cfs 0.011 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.18' Max Vel=1.78 fps Inflow=0.27 cfs 0.018 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.25 cfs 0.018 af

Reach 4R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.00 cfs 0.000 af

Reach 5R: POA #1 Avg. Flow Depth=0.12' Max Vel=3.76 fps Inflow=0.28 cfs 0.031 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.28 cfs 0.031 af

Pond 1P: G.U.S.F. #1 Peak Elev=49.34' Storage=930 cf Inflow=0.18 cfs 0.028 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 3P: G.U.S.F. #2 Peak Elev=46.84' Storage=621 cf Inflow=0.18 cfs 0.020 af
Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond 4P: G.U.S.F. #3 Peak Elev=47.91' Storage=175 cf Inflow=0.11 cfs 0.008 af
Discarded=0.00 cfs 0.002 af Primary=0.01 cfs 0.001 af Outflow=0.01 cfs 0.004 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.096 af Average Runoff Depth = 0.51"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.18 cfs @ 12.43 hrs, Volume= 0.028 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.018 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.18 cfs @ 12.21 hrs, Volume= 0.020 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.06 cfs @ 12.39 hrs, Volume= 0.011 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 2-yr storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'

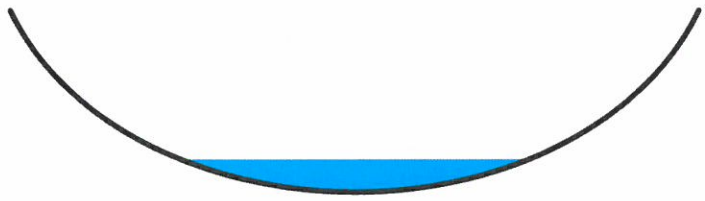
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 0.13" for 2-yr storm event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



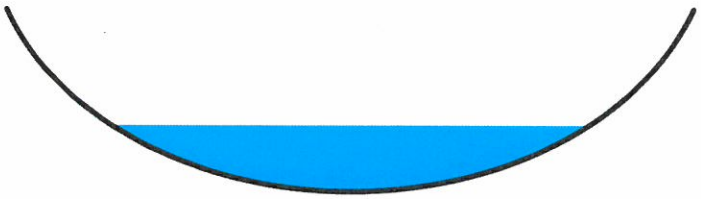
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 1.20" for 2-yr storm event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 0.018 af
Outflow = 0.25 cfs @ 12.15 hrs, Volume= 0.018 af, Atten= 6%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.78 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 3.6 min

Peak Storage= 23 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 2-yr storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'

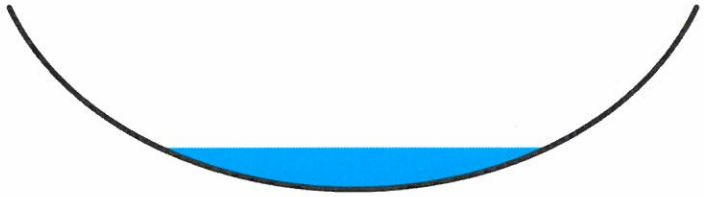
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 0.30" for 2-yr storm event
Inflow = 0.28 cfs @ 12.16 hrs, Volume= 0.031 af
Outflow = 0.28 cfs @ 12.16 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 0.35" for 2-yr storm event
Inflow = 0.18 cfs @ 12.43 hrs, Volume= 0.028 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.006 af, Atten= 94%, Lag= 454.0 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 49.34' @ 20.00 hrs Surf.Area= 787 sf Storage= 930 cf

Plug-Flow detention time= 232.7 min calculated for 0.006 af (23% of inflow)
Center-of-Mass det. time= 101.2 min (977.3 - 876.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=49.34' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 0.54" for 2-yr storm event
Inflow = 0.18 cfs @ 12.21 hrs, Volume= 0.020 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.005 af, Atten= 95%, Lag= 467.1 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.005 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.84' @ 20.00 hrs Surf.Area= 636 sf Storage= 621 cf

Plug-Flow detention time= 236.6 min calculated for 0.005 af (27% of inflow)
Center-of-Mass det. time= 120.0 min (972.4 - 852.3)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=46.84' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 1.08" for 2-yr storm event
Inflow = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow = 0.01 cfs @ 13.13 hrs, Volume= 0.004 af, Atten= 89%, Lag= 61.9 min
Discarded = 0.00 cfs @ 13.13 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 13.13 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.91' @ 13.13 hrs Surf.Area= 266 sf Storage= 175 cf

Plug-Flow detention time= 195.4 min calculated for 0.004 af (49% of inflow)
Center-of-Mass det. time= 104.2 min (922.9 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 13.13 hrs HW=47.91' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 13.13 hrs HW=47.91' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.18 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>2.65"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.36 cfs 0.024 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>1.15"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.85 cfs 0.091 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>2.56"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.58 cfs 0.039 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>1.51"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.64 cfs 0.055 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>2.39"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.25 cfs 0.017 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>0.96"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.43 cfs 0.041 af

Reach 1R: (new Reach) Avg. Flow Depth=0.09' Max Vel=3.27 fps Inflow=0.17 cfs 0.039 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.17 cfs 0.038 af

Reach 2R: POA #2 Avg. Flow Depth=0.13' Max Vel=4.05 fps Inflow=0.36 cfs 0.062 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.36 cfs 0.062 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.26' Max Vel=2.25 fps Inflow=0.58 cfs 0.039 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.55 cfs 0.039 af

Reach 4R: Swale Avg. Flow Depth=0.10' Max Vel=2.77 fps Inflow=0.18 cfs 0.024 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.17 cfs 0.024 af

Reach 5R: POA #1 Avg. Flow Depth=0.23' Max Vel=5.84 fps Inflow=1.22 cfs 0.115 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.22 cfs 0.115 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.26' Storage=1,845 cf Inflow=0.85 cfs 0.091 af
Discarded=0.02 cfs 0.011 af Primary=0.17 cfs 0.039 af Outflow=0.19 cfs 0.050 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.37' Storage=1,027 cf Inflow=0.64 cfs 0.055 af
Discarded=0.01 cfs 0.008 af Primary=0.18 cfs 0.024 af Outflow=0.19 cfs 0.032 af

Pond 4P: G.U.S.F. #3 Peak Elev=47.99' Storage=192 cf Inflow=0.25 cfs 0.017 af
Discarded=0.00 cfs 0.003 af Primary=0.25 cfs 0.010 af Outflow=0.26 cfs 0.013 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.266 af Average Runoff Depth = 1.41"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.85 cfs @ 12.29 hrs, Volume= 0.091 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.039 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.64 cfs @ 12.18 hrs, Volume= 0.055 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.017 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.43 cfs @ 12.18 hrs, Volume= 0.041 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

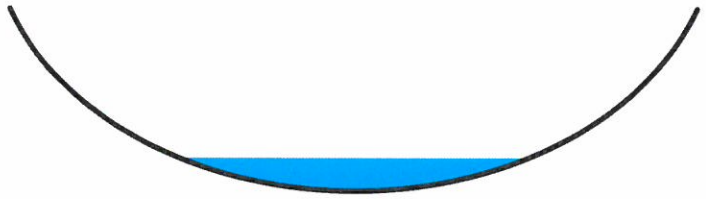
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 0.49" for 10-yr storm event
Inflow = 0.17 cfs @ 13.18 hrs, Volume= 0.039 af
Outflow = 0.17 cfs @ 13.20 hrs, Volume= 0.038 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 0.7 min

Peak Storage= 5 cf @ 13.20 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



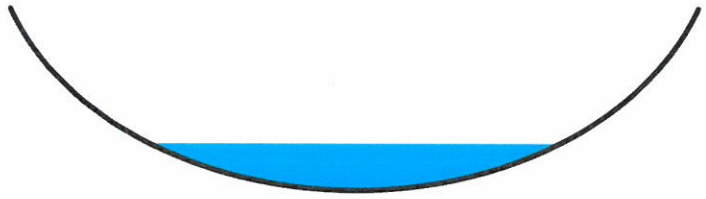
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 0.71" for 10-yr storm event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.062 af
Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



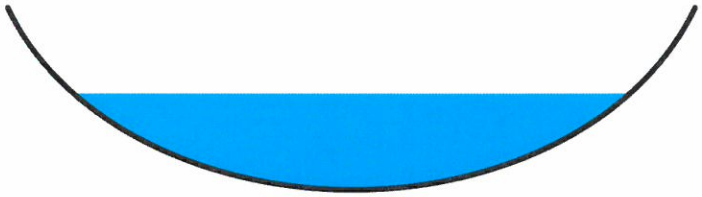
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 2.56" for 10-yr storm event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.55 cfs @ 12.13 hrs, Volume= 0.039 af, Atten= 6%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 3.0 min

Peak Storage= 41 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



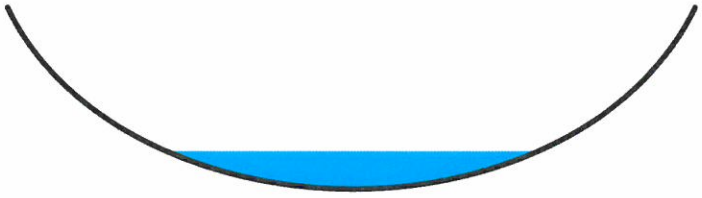
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 0.67" for 10-yr storm event
Inflow = 0.18 cfs @ 12.67 hrs, Volume= 0.024 af
Outflow = 0.17 cfs @ 12.69 hrs, Volume= 0.024 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.9 min

Peak Storage= 5 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



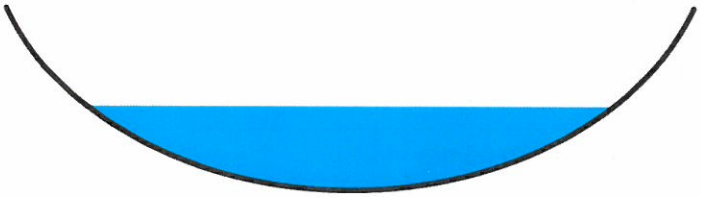
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 1.13" for 10-yr storm event
Inflow = 1.22 cfs @ 12.15 hrs, Volume= 0.115 af
Outflow = 1.22 cfs @ 12.15 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.84 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.15" for 10-yr storm event
Inflow = 0.85 cfs @ 12.29 hrs, Volume= 0.091 af
Outflow = 0.19 cfs @ 13.18 hrs, Volume= 0.050 af, Atten= 78%, Lag= 53.2 min
Discarded = 0.02 cfs @ 13.18 hrs, Volume= 0.011 af
Primary = 0.17 cfs @ 13.18 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.26' @ 13.18 hrs Surf.Area= 1,285 sf Storage= 1,845 cf

Plug-Flow detention time= 175.7 min calculated for 0.050 af (55% of inflow)
Center-of-Mass det. time= 85.0 min (927.3 - 842.3)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 13.18 hrs HW=50.26' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.16 cfs @ 13.18 hrs HW=50.26' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.16 cfs @ 0.62 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 1.51" for 10-yr storm event
Inflow = 0.64 cfs @ 12.18 hrs, Volume= 0.055 af
Outflow = 0.19 cfs @ 12.67 hrs, Volume= 0.032 af, Atten= 70%, Lag= 29.0 min
Discarded = 0.01 cfs @ 12.67 hrs, Volume= 0.008 af
Primary = 0.18 cfs @ 12.67 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.37' @ 12.67 hrs Surf.Area= 846 sf Storage= 1,027 cf

Plug-Flow detention time= 154.1 min calculated for 0.032 af (59% of inflow)
Center-of-Mass det. time= 70.0 min (896.6 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.67 hrs HW=47.37' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.17 cfs @ 12.67 hrs HW=47.37' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.17 cfs @ 0.63 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area =	0.084 ac,	31.53% Impervious,	Inflow Depth >	2.39" for 10-yr storm event
Inflow =	0.25 cfs @	12.10 hrs, Volume=	0.017 af	
Outflow =	0.26 cfs @	12.16 hrs, Volume=	0.013 af,	Atten= 0%, Lag= 3.6 min
Discarded =	0.00 cfs @	12.16 hrs, Volume=	0.003 af	
Primary =	0.25 cfs @	12.16 hrs, Volume=	0.010 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.99' @ 12.16 hrs Surf.Area= 297 sf Storage= 192 cf

Plug-Flow detention time= 90.7 min calculated for 0.013 af (76% of inflow)
Center-of-Mass det. time= 31.3 min (832.3 - 801.0)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.16 hrs HW=47.98' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.24 cfs @ 12.16 hrs HW=47.98' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.24 cfs @ 0.70 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>3.86"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.52 cfs 0.035 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>1.98"
Flow Length=230' Tc=18.1 min CN=55 Runoff=1.58 cfs 0.155 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>3.75"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.85 cfs 0.058 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>2.45"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=1.08 cfs 0.089 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>3.55"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.37 cfs 0.025 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>1.72"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.88 cfs 0.073 af

Reach 1R: (new Reach) Avg. Flow Depth=0.22' Max Vel=5.67 fps Inflow=1.09 cfs 0.102 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=1.08 cfs 0.102 af

Reach 2R: POA #2 Avg. Flow Depth=0.23' Max Vel=5.78 fps Inflow=1.19 cfs 0.137 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.19 cfs 0.137 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.32' Max Vel=2.52 fps Inflow=0.85 cfs 0.058 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.81 cfs 0.058 af

Reach 4R: Swale Avg. Flow Depth=0.21' Max Vel=4.34 fps Inflow=0.80 cfs 0.058 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.75 cfs 0.058 af

Reach 5R: POA #1 Avg. Flow Depth=0.29' Max Vel=6.73 fps Inflow=1.99 cfs 0.206 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.99 cfs 0.206 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.43' Storage=2,062 cf Inflow=1.58 cfs 0.155 af
Discarded=0.02 cfs 0.012 af Primary=1.09 cfs 0.102 af Outflow=1.11 cfs 0.114 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.49' Storage=1,129 cf Inflow=1.08 cfs 0.089 af
Discarded=0.01 cfs 0.008 af Primary=0.80 cfs 0.058 af Outflow=0.81 cfs 0.066 af

Pond 4P: G.U.S.F. #3 Peak Elev=48.01' Storage=198 cf Inflow=0.37 cfs 0.025 af
Discarded=0.00 cfs 0.003 af Primary=0.35 cfs 0.018 af Outflow=0.36 cfs 0.021 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.435 af Average Runoff Depth = 2.30"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 1.58 cfs @ 12.27 hrs, Volume= 0.155 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.85 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 1.08 cfs @ 12.17 hrs, Volume= 0.089 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.025 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.88 cfs @ 12.16 hrs, Volume= 0.073 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

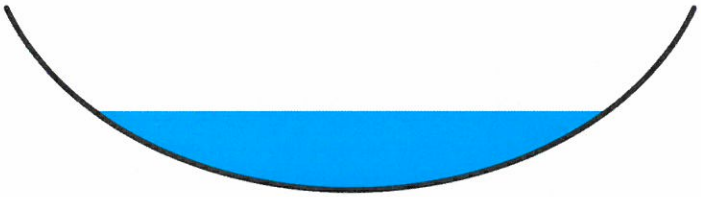
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.30" for 25-yr storm event
Inflow = 1.09 cfs @ 12.52 hrs, Volume= 0.102 af
Outflow = 1.08 cfs @ 12.53 hrs, Volume= 0.102 af, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.6 min

Peak Storage= 19 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



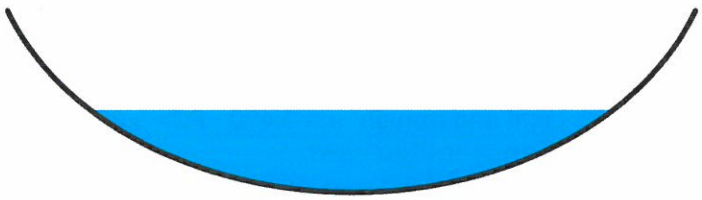
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 1.57" for 25-yr storm event
Inflow = 1.19 cfs @ 12.52 hrs, Volume= 0.137 af
Outflow = 1.19 cfs @ 12.52 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.78 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



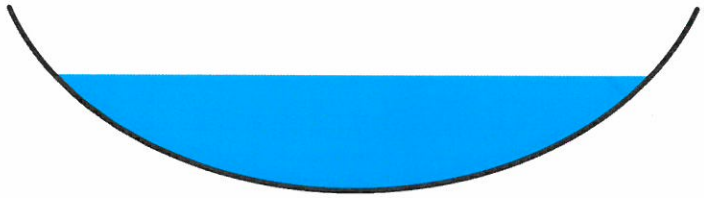
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 3.75" for 25-yr storm event
Inflow = 0.85 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.81 cfs @ 12.12 hrs, Volume= 0.058 af, Atten= 5%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 2.8 min

Peak Storage= 54 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



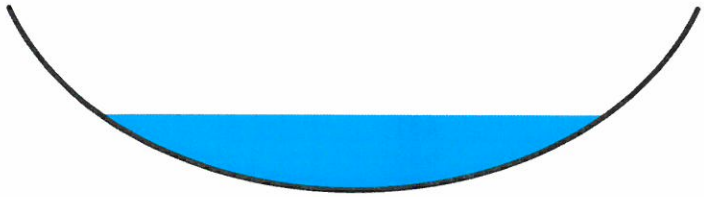
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 1.59" for 25-yr storm event
Inflow = 0.80 cfs @ 12.32 hrs, Volume= 0.058 af
Outflow = 0.75 cfs @ 12.34 hrs, Volume= 0.058 af, Atten= 6%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 0.7 min

Peak Storage= 16 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



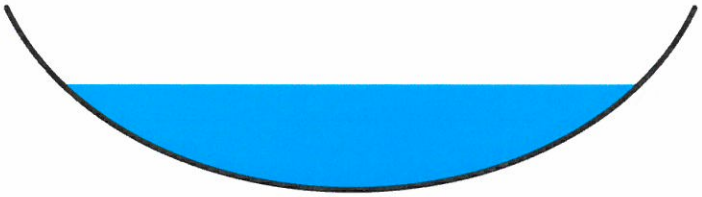
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 2.04" for 25-yr storm event
Inflow = 1.99 cfs @ 12.14 hrs, Volume= 0.206 af
Outflow = 1.99 cfs @ 12.14 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.73 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.98" for 25-yr storm event
Inflow = 1.58 cfs @ 12.27 hrs, Volume= 0.155 af
Outflow = 1.11 cfs @ 12.52 hrs, Volume= 0.114 af, Atten= 30%, Lag= 14.5 min
Discarded = 0.02 cfs @ 12.52 hrs, Volume= 0.012 af
Primary = 1.09 cfs @ 12.52 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.43' @ 12.52 hrs Surf.Area= 1,392 sf Storage= 2,062 cf

Plug-Flow detention time= 105.2 min calculated for 0.114 af (74% of inflow)
Center-of-Mass det. time= 40.6 min (870.3 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 12.52 hrs HW=50.43' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.07 cfs @ 12.52 hrs HW=50.43' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.07 cfs @ 1.17 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 2.45" for 25-yr storm event
Inflow = 1.08 cfs @ 12.17 hrs, Volume= 0.089 af
Outflow = 0.81 cfs @ 12.32 hrs, Volume= 0.066 af, Atten= 25%, Lag= 9.0 min
Discarded = 0.01 cfs @ 12.32 hrs, Volume= 0.008 af
Primary = 0.80 cfs @ 12.32 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.49' @ 12.32 hrs Surf.Area= 895 sf Storage= 1,129 cf

Plug-Flow detention time= 99.2 min calculated for 0.066 af (75% of inflow)
Center-of-Mass det. time= 36.4 min (852.3 - 815.8)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.32 hrs HW=47.48' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.75 cfs @ 12.32 hrs HW=47.48' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.75 cfs @ 1.04 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 3.55" for 25-yr storm event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.36 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 3%, Lag= 1.0 min
Discarded = 0.00 cfs @ 12.11 hrs, Volume= 0.003 af
Primary = 0.35 cfs @ 12.11 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.01' @ 12.11 hrs Surf.Area= 304 sf Storage= 198 cf

Plug-Flow detention time= 68.6 min calculated for 0.021 af (84% of inflow)
Center-of-Mass det. time= 22.3 min (814.4 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=48.01' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.34 cfs @ 12.11 hrs HW=48.01' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 0.80 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>5.04"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.67 cfs 0.046 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>2.86"
Flow Length=230' Tc=18.1 min CN=55 Runoff=2.33 cfs 0.224 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>4.92"
Flow Length=85' Tc=6.0 min CN=73 Runoff=1.11 cfs 0.076 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>3.42"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=1.53 cfs 0.124 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>4.69"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.48 cfs 0.033 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>2.54"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=1.35 cfs 0.108 af

Reach 1R: (new Reach) Avg. Flow Depth=0.30' Max Vel=6.89 fps Inflow=2.12 cfs 0.170 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=2.11 cfs 0.170 af

Reach 2R: POA #2 Avg. Flow Depth=0.31' Max Vel=7.05 fps Inflow=2.35 cfs 0.216 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=2.35 cfs 0.216 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.36' Max Vel=2.72 fps Inflow=1.11 cfs 0.076 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=1.06 cfs 0.076 af

Reach 4R: Swale Avg. Flow Depth=0.29' Max Vel=5.21 fps Inflow=1.47 cfs 0.092 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=1.47 cfs 0.092 af

Reach 5R: POA #1 Avg. Flow Depth=0.39' Max Vel=8.12 fps Inflow=3.78 cfs 0.301 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=3.78 cfs 0.301 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.55' Storage=2,223 cf Inflow=2.33 cfs 0.224 af
Discarded=0.02 cfs 0.013 af Primary=2.12 cfs 0.170 af Outflow=2.14 cfs 0.183 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.58' Storage=1,207 cf Inflow=1.53 cfs 0.124 af
Discarded=0.01 cfs 0.009 af Primary=1.47 cfs 0.092 af Outflow=1.48 cfs 0.101 af

Pond 4P: G.U.S.F. #3 Peak Elev=48.03' Storage=206 cf Inflow=0.48 cfs 0.033 af
Discarded=0.00 cfs 0.003 af Primary=0.46 cfs 0.026 af Outflow=0.47 cfs 0.029 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.610 af Average Runoff Depth = 3.23"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 5.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 2.33 cfs @ 12.27 hrs, Volume= 0.224 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 0.076 af, Depth> 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 1.53 cfs @ 12.17 hrs, Volume= 0.124 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 1.35 cfs @ 12.16 hrs, Volume= 0.108 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

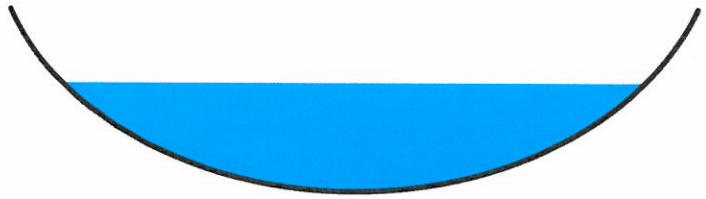
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 2.17" for 50-yr storm event
Inflow = 2.12 cfs @ 12.37 hrs, Volume= 0.170 af
Outflow = 2.11 cfs @ 12.37 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.89 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.34 fps, Avg. Travel Time= 0.5 min

Peak Storage= 31 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



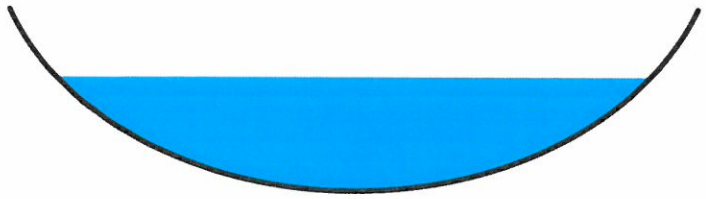
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 2.46" for 50-yr storm event
Inflow = 2.35 cfs @ 12.37 hrs, Volume= 0.216 af
Outflow = 2.35 cfs @ 12.37 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



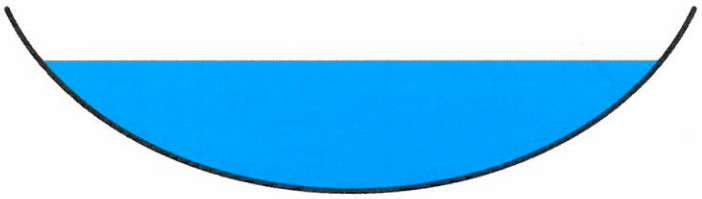
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 4.92" for 50-yr storm event
Inflow = 1.11 cfs @ 12.09 hrs, Volume= 0.076 af
Outflow = 1.06 cfs @ 12.12 hrs, Volume= 0.076 af, Atten= 5%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 2.7 min

Peak Storage= 65 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



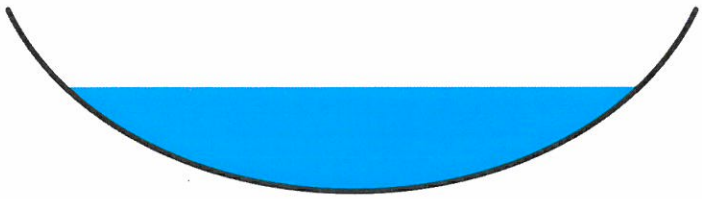
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 2.55" for 50-yr storm event
Inflow = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af
Outflow = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 0.6 min

Peak Storage= 25 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



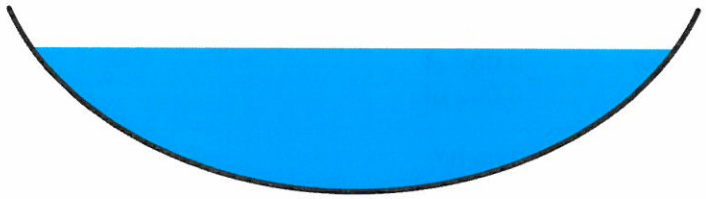
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 2.98" for 50-yr storm event
Inflow = 3.78 cfs @ 12.20 hrs, Volume= 0.301 af
Outflow = 3.78 cfs @ 12.20 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.12 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 2.86" for 50-yr storm event
Inflow = 2.33 cfs @ 12.27 hrs, Volume= 0.224 af
Outflow = 2.14 cfs @ 12.37 hrs, Volume= 0.183 af, Atten= 8%, Lag= 6.1 min
Discarded = 0.02 cfs @ 12.37 hrs, Volume= 0.013 af
Primary = 2.12 cfs @ 12.37 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.55' @ 12.37 hrs Surf.Area= 1,470 sf Storage= 2,223 cf

Plug-Flow detention time= 76.5 min calculated for 0.182 af (81% of inflow)
Center-of-Mass det. time= 27.1 min (848.7 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 12.37 hrs HW=50.55' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.07 cfs @ 12.37 hrs HW=50.55' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 1.48 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 3.42" for 50-yr storm event
Inflow = 1.53 cfs @ 12.17 hrs, Volume= 0.124 af
Outflow = 1.48 cfs @ 12.22 hrs, Volume= 0.101 af, Atten= 3%, Lag= 3.1 min
Discarded = 0.01 cfs @ 12.22 hrs, Volume= 0.009 af
Primary = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.58' @ 12.22 hrs Surf.Area= 932 sf Storage= 1,207 cf

Plug-Flow detention time= 75.8 min calculated for 0.101 af (82% of inflow)
Center-of-Mass det. time= 25.8 min (834.2 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.22 hrs HW=47.57' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.40 cfs @ 12.22 hrs HW=47.57' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 1.29 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area =	0.084 ac, 31.53% Impervious, Inflow Depth >	4.69"	for 50-yr storm event	
Inflow =	0.48 cfs @	12.09 hrs, Volume=	0.033 af	
Outflow =	0.47 cfs @	12.11 hrs, Volume=	0.029 af, Atten= 3%, Lag= 1.1 min	
Discarded =	0.00 cfs @	12.11 hrs, Volume=	0.003 af	
Primary =	0.46 cfs @	12.11 hrs, Volume=	0.026 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.03' @ 12.11 hrs Surf.Area= 309 sf Storage= 206 cf

Plug-Flow detention time= 57.1 min calculated for 0.029 af (88% of inflow)
Center-of-Mass det. time= 19.2 min (804.9 - 785.6)

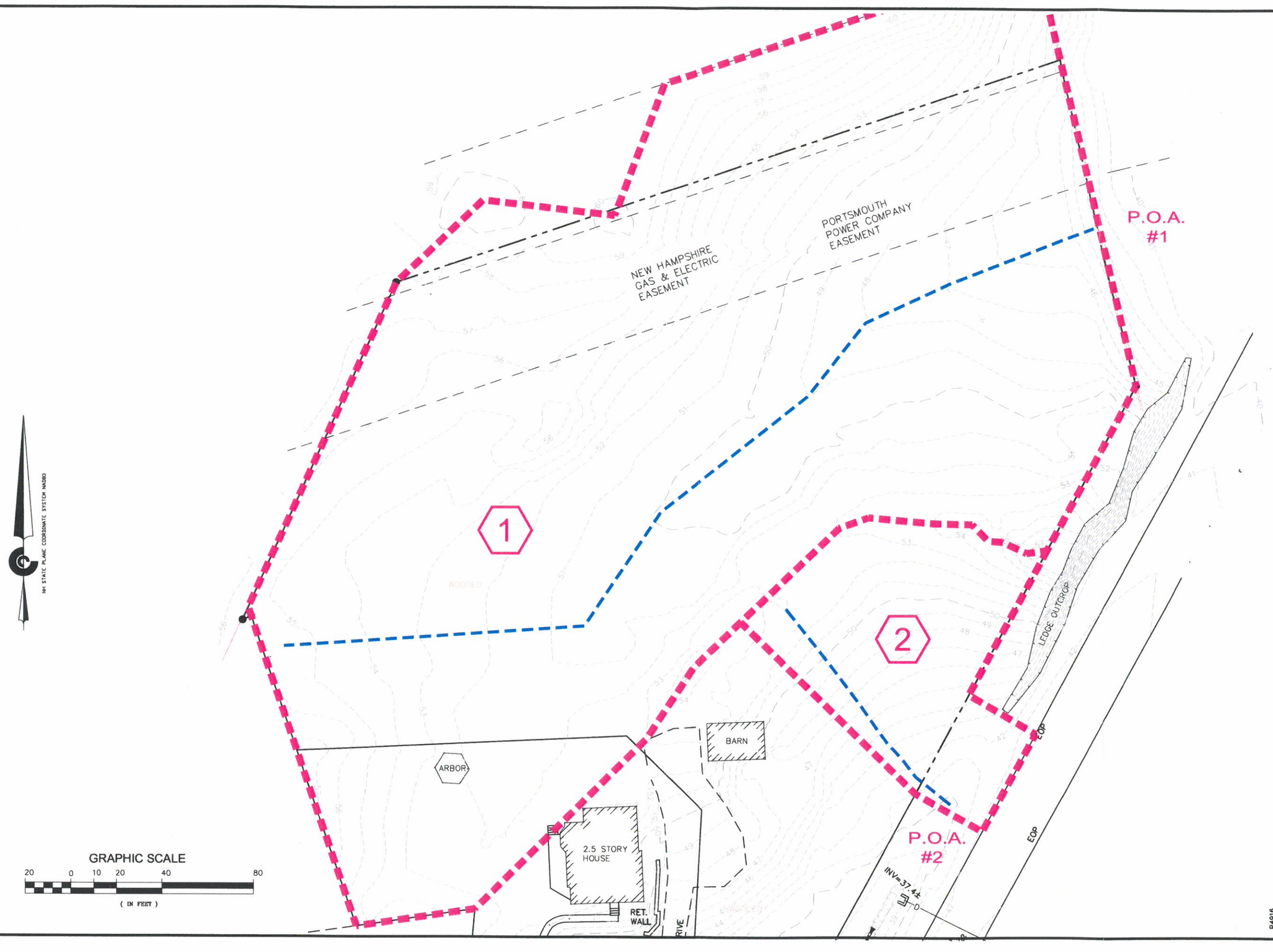
Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=48.03' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.45 cfs @ 12.11 hrs HW=48.03' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.45 cfs @ 0.87 fps)



ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: SEPTEMBER 14, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	08/07/18
1	PER TAC COMMENTS	EDW	09/14/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

SCALE:
11"x17": 1" = 40'
22"x 34": 1" = 20'

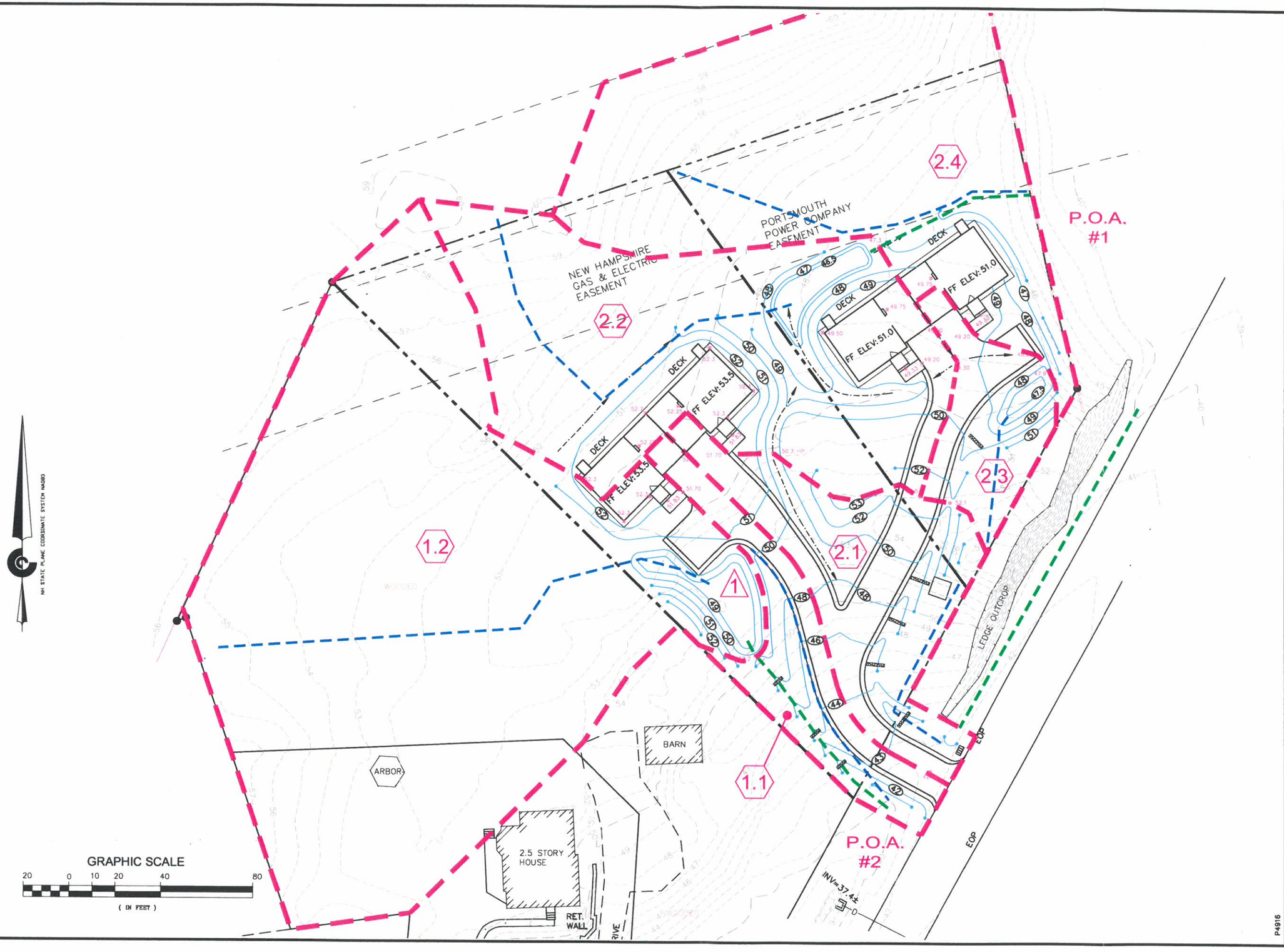
APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
PRE-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
DS - 1

P4916



ALTUS ENGINEERING, INC.
133 COURT STREET PORTSMOUTH, NH 03801
(603) 433-2335 www.ALTUS-ENG.com

ISSUED FOR: TAC

ISSUE DATE: SEPTEMBER 14, 2018

REVISIONS

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	EDW	08/07/18
1	PER TAC COMMENTS	EDW	09/14/18

DRAWN BY: RLH
APPROVED BY: EDW
DRAWING FILE: 4916 SITE.DWG

SCALE: 11"x17": 1" = 40'
22"x 34": 1" = 20'

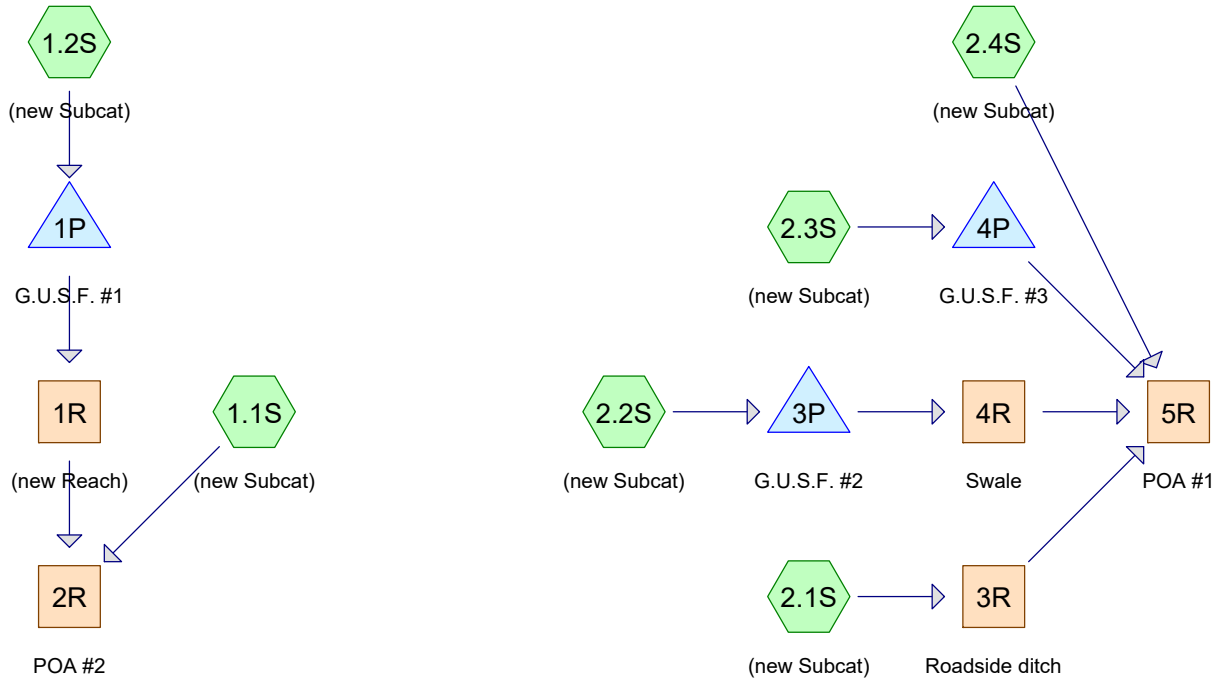
APPLICANT/OWNER:
HAPPY MOUNTAIN HOLDINGS, LLC
901 N. MARKET STREET
SUITE 705
WILMINGTON, DE 19801

PROJECT:
RESIDENTIAL DEVELOPMENT
ASSESSOR'S PARCEL 220-87-2
74 EMERY STREET
&
ASSESSOR'S PARCEL 220-87-3
64 EMERY STREET
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
POST-DEVELOPMENT WATERSHED PLAN

SHEET NUMBER:
DS - 2

P4916



Subcat Reach Pond Link

Routing Diagram for 4916 post
Prepared by Altus Engineering, Inc., Printed 10/5/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.434	61	>75% Grass cover, Good, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
0.634	48	Brush, Good, HSG B (1.2S, 2.2S, 2.4S)
0.166	98	Paved parking, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
0.025	98	Roofs, HSG B (1.2S, 2.2S, 2.4S)
0.066	98	Unconnected roofs, HSG B (1.2S, 2.2S, 2.4S)
0.939	55	Woods, Good, HSG B (1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S)
2.263	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.263	HSG B	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	HSG C	
0.000	HSG D	
0.000	Other	
2.263		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.434	0.000	0.000	0.000	0.434	>75% Grass cover, Good	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	0.634	0.000	0.000	0.000	0.634	Brush, Good	1.2S, 2.2S, 2.4S
0.000	0.166	0.000	0.000	0.000	0.166	Paved parking	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	0.025	0.000	0.000	0.000	0.025	Roofs	1.2S, 2.2S, 2.4S
0.000	0.066	0.000	0.000	0.000	0.066	Unconnected roofs	1.2S, 2.2S, 2.4S
0.000	0.939	0.000	0.000	0.000	0.939	Woods, Good	1.1S, 1.2S, 2.1S, 2.2S, 2.3S, 2.4S
0.000	**2.263**	**0.000**	**0.000**	**0.000**	**2.263**	**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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth=0.00"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth=0.00"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.00 cfs 0.000 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth=0.00"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.00 cfs 0.000 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth=0.00"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.00 cfs 0.000 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth=0.00"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.00 cfs 0.000 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth=0.00"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.00 cfs 0.000 af

Reach 1R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: POA #2 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.00 cfs 0.000 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.00 cfs 0.000 af

Reach 4R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.00 cfs 0.000 af

Reach 5R: POA #1 Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: G.U.S.F. #1 Peak Elev=46.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 3P: G.U.S.F. #2 Peak Elev=44.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 4P: G.U.S.F. #3 Peak Elev=45.17' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.000 af Average Runoff Depth = 0.00"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 0.5 Inch storm Rainfall=0.50"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

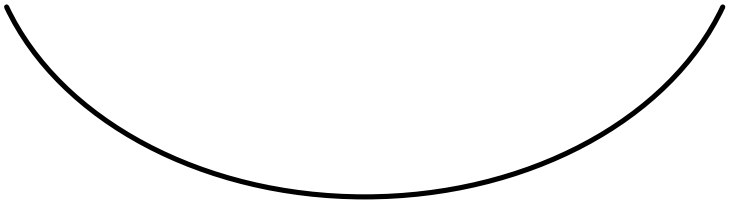
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



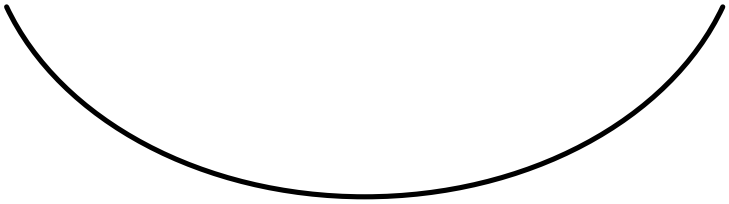
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



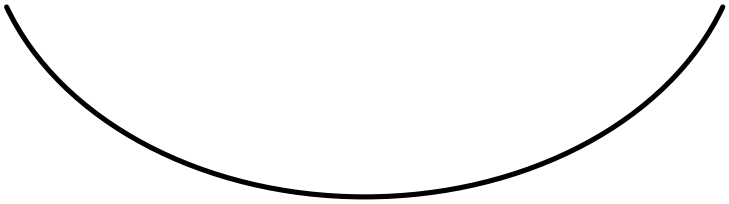
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



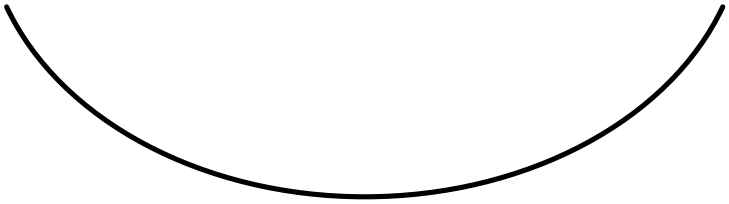
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



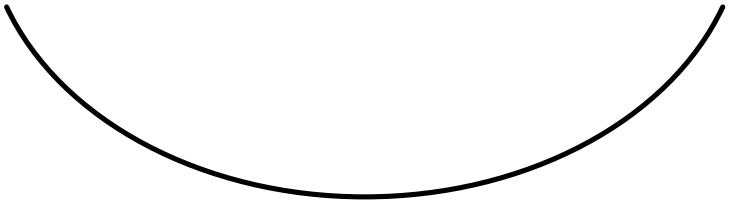
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.17' @ 5.00 hrs Surf.Area= 615 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
↑—**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 44.17' @ 5.00 hrs Surf.Area= 500 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth = 0.00" for 0.5 Inch storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 45.17' @ 5.00 hrs Surf.Area= 110 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.17' (Free Discharge)
1=Exfiltration (Passes 0.00 cfs of 0.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=45.17' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>1.26"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.17 cfs 0.011 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>0.35"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.18 cfs 0.028 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>1.20"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.27 cfs 0.018 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>0.54"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.18 cfs 0.020 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>1.08"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.11 cfs 0.008 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>0.26"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.06 cfs 0.011 af

Reach 1R: (new Reach) Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.00 cfs 0.000 af

Reach 2R: POA #2 Avg. Flow Depth=0.09' Max Vel=3.23 fps Inflow=0.17 cfs 0.011 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.17 cfs 0.011 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.18' Max Vel=1.78 fps Inflow=0.27 cfs 0.018 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.25 cfs 0.018 af

Reach 4R: Swale Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.00 cfs 0.000 af

Reach 5R: POA #1 Avg. Flow Depth=0.12' Max Vel=3.76 fps Inflow=0.28 cfs 0.031 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.28 cfs 0.031 af

Pond 1P: G.U.S.F. #1 Peak Elev=49.34' Storage=930 cf Inflow=0.18 cfs 0.028 af
Discarded=0.01 cfs 0.006 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.006 af

Pond 3P: G.U.S.F. #2 Peak Elev=46.84' Storage=621 cf Inflow=0.18 cfs 0.020 af
Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond 4P: G.U.S.F. #3 Peak Elev=47.91' Storage=175 cf Inflow=0.11 cfs 0.008 af
Discarded=0.00 cfs 0.002 af Primary=0.01 cfs 0.001 af Outflow=0.01 cfs 0.004 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.096 af Average Runoff Depth = 0.51"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.18 cfs @ 12.43 hrs, Volume= 0.028 af, Depth> 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.018 af, Depth> 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.18 cfs @ 12.21 hrs, Volume= 0.020 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.06 cfs @ 12.39 hrs, Volume= 0.011 af, Depth> 0.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr storm Rainfall=3.69"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

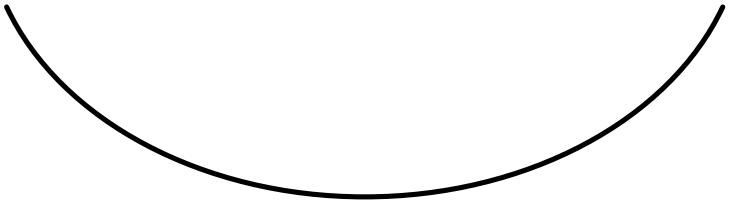
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth = 0.00" for 2-yr storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



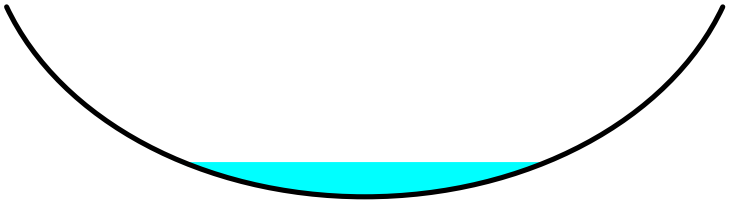
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 0.13" for 2-yr storm event
Inflow = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af
Outflow = 0.17 cfs @ 12.10 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.23 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



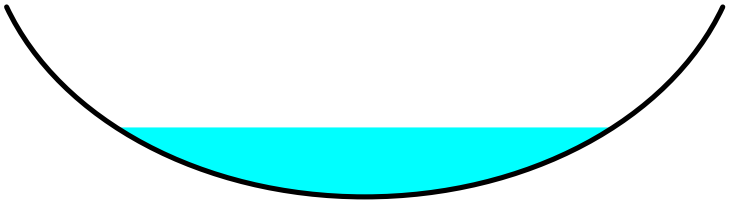
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 1.20" for 2-yr storm event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 0.018 af
Outflow = 0.25 cfs @ 12.15 hrs, Volume= 0.018 af, Atten= 6%, Lag= 2.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.78 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 3.6 min

Peak Storage= 23 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



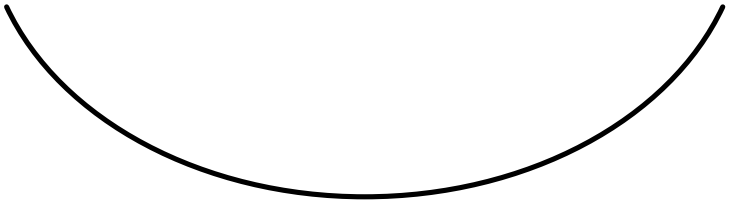
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth = 0.00" for 2-yr storm event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 5.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



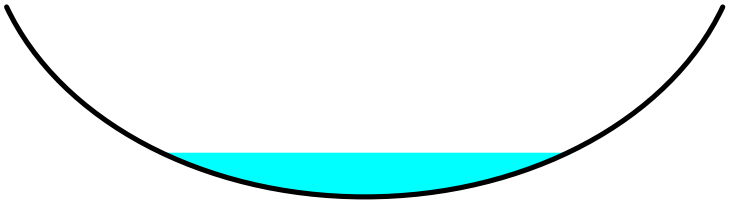
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 0.30" for 2-yr storm event
Inflow = 0.28 cfs @ 12.16 hrs, Volume= 0.031 af
Outflow = 0.28 cfs @ 12.16 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.76 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.87 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 0.35" for 2-yr storm event
Inflow = 0.18 cfs @ 12.43 hrs, Volume= 0.028 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.006 af, Atten= 94%, Lag= 454.0 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.006 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 49.34' @ 20.00 hrs Surf.Area= 787 sf Storage= 930 cf

Plug-Flow detention time= 232.7 min calculated for 0.006 af (23% of inflow)
Center-of-Mass det. time= 101.2 min (977.3 - 876.0)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=49.34' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=46.17' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 0.54" for 2-yr storm event
Inflow = 0.18 cfs @ 12.21 hrs, Volume= 0.020 af
Outflow = 0.01 cfs @ 20.00 hrs, Volume= 0.005 af, Atten= 95%, Lag= 467.1 min
Discarded = 0.01 cfs @ 20.00 hrs, Volume= 0.005 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 46.84' @ 20.00 hrs Surf.Area= 636 sf Storage= 621 cf

Plug-Flow detention time= 236.6 min calculated for 0.005 af (27% of inflow)
Center-of-Mass det. time= 120.0 min (972.4 - 852.3)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 20.00 hrs HW=46.84' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=44.17' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 1.08" for 2-yr storm event
Inflow = 0.11 cfs @ 12.10 hrs, Volume= 0.008 af
Outflow = 0.01 cfs @ 13.13 hrs, Volume= 0.004 af, Atten= 89%, Lag= 61.9 min
Discarded = 0.00 cfs @ 13.13 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 13.13 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.91' @ 13.13 hrs Surf.Area= 266 sf Storage= 175 cf

Plug-Flow detention time= 195.4 min calculated for 0.004 af (49% of inflow)
Center-of-Mass det. time= 104.2 min (922.9 - 818.7)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 13.13 hrs HW=47.91' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 13.13 hrs HW=47.91' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.18 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>2.65"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.36 cfs 0.024 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>1.15"
Flow Length=230' Tc=18.1 min CN=55 Runoff=0.85 cfs 0.091 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>2.56"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.58 cfs 0.039 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>1.51"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=0.64 cfs 0.055 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>2.39"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.25 cfs 0.017 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>0.96"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.43 cfs 0.041 af

Reach 1R: (new Reach) Avg. Flow Depth=0.09' Max Vel=3.27 fps Inflow=0.17 cfs 0.039 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=0.17 cfs 0.038 af

Reach 2R: POA #2 Avg. Flow Depth=0.13' Max Vel=4.05 fps Inflow=0.36 cfs 0.062 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=0.36 cfs 0.062 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.26' Max Vel=2.25 fps Inflow=0.58 cfs 0.039 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.55 cfs 0.039 af

Reach 4R: Swale Avg. Flow Depth=0.10' Max Vel=2.77 fps Inflow=0.18 cfs 0.024 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.17 cfs 0.024 af

Reach 5R: POA #1 Avg. Flow Depth=0.23' Max Vel=5.84 fps Inflow=1.22 cfs 0.115 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.22 cfs 0.115 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.26' Storage=1,845 cf Inflow=0.85 cfs 0.091 af
Discarded=0.02 cfs 0.011 af Primary=0.17 cfs 0.039 af Outflow=0.19 cfs 0.050 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.37' Storage=1,027 cf Inflow=0.64 cfs 0.055 af
Discarded=0.01 cfs 0.008 af Primary=0.18 cfs 0.024 af Outflow=0.19 cfs 0.032 af

Pond 4P: G.U.S.F. #3 Peak Elev=47.99' Storage=192 cf Inflow=0.25 cfs 0.017 af
Discarded=0.00 cfs 0.003 af Primary=0.25 cfs 0.010 af Outflow=0.26 cfs 0.013 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.266 af Average Runoff Depth = 1.41"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.36 cfs @ 12.09 hrs, Volume= 0.024 af, Depth> 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 0.85 cfs @ 12.29 hrs, Volume= 0.091 af, Depth> 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.58 cfs @ 12.09 hrs, Volume= 0.039 af, Depth> 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 0.64 cfs @ 12.18 hrs, Volume= 0.055 af, Depth> 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.25 cfs @ 12.10 hrs, Volume= 0.017 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.43 cfs @ 12.18 hrs, Volume= 0.041 af, Depth> 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr storm Rainfall=5.60"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

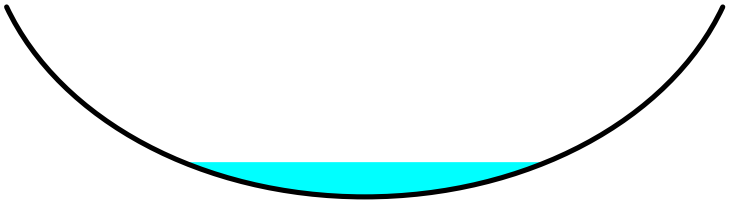
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 0.49" for 10-yr storm event
Inflow = 0.17 cfs @ 13.18 hrs, Volume= 0.039 af
Outflow = 0.17 cfs @ 13.20 hrs, Volume= 0.038 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.27 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 0.7 min

Peak Storage= 5 cf @ 13.20 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



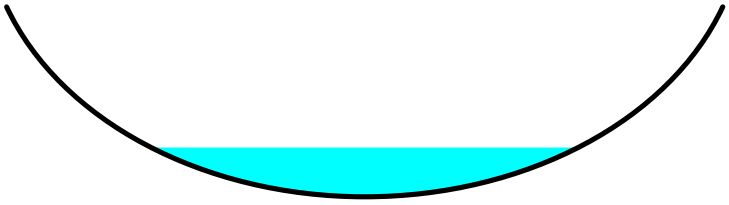
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 0.71" for 10-yr storm event
Inflow = 0.36 cfs @ 12.09 hrs, Volume= 0.062 af
Outflow = 0.36 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



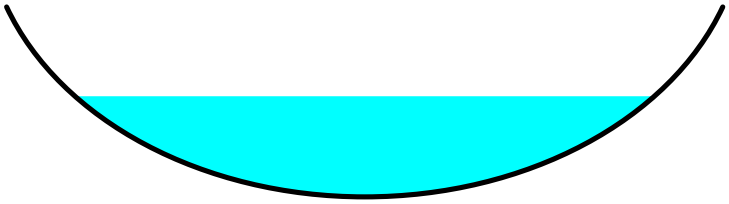
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 2.56" for 10-yr storm event
Inflow = 0.58 cfs @ 12.09 hrs, Volume= 0.039 af
Outflow = 0.55 cfs @ 12.13 hrs, Volume= 0.039 af, Atten= 6%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.25 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 3.0 min

Peak Storage= 41 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



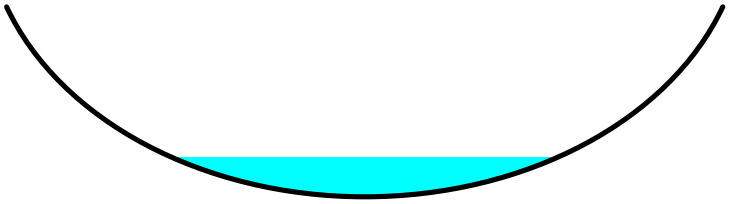
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 0.67" for 10-yr storm event
Inflow = 0.18 cfs @ 12.67 hrs, Volume= 0.024 af
Outflow = 0.17 cfs @ 12.69 hrs, Volume= 0.024 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.65 fps, Avg. Travel Time= 0.9 min

Peak Storage= 5 cf @ 12.67 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



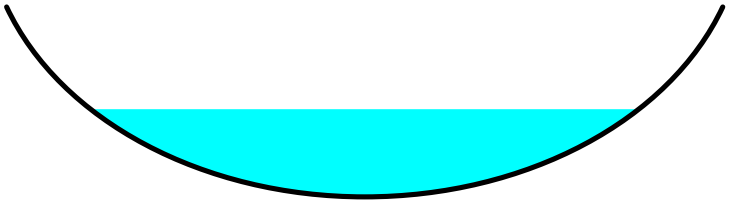
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 1.13" for 10-yr storm event
Inflow = 1.22 cfs @ 12.15 hrs, Volume= 0.115 af
Outflow = 1.22 cfs @ 12.15 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.84 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.52 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.15" for 10-yr storm event
Inflow = 0.85 cfs @ 12.29 hrs, Volume= 0.091 af
Outflow = 0.19 cfs @ 13.18 hrs, Volume= 0.050 af, Atten= 78%, Lag= 53.2 min
Discarded = 0.02 cfs @ 13.18 hrs, Volume= 0.011 af
Primary = 0.17 cfs @ 13.18 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.26' @ 13.18 hrs Surf.Area= 1,285 sf Storage= 1,845 cf

Plug-Flow detention time= 175.7 min calculated for 0.050 af (55% of inflow)
Center-of-Mass det. time= 85.0 min (927.3 - 842.3)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 13.18 hrs HW=50.26' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.16 cfs @ 13.18 hrs HW=50.26' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.16 cfs @ 0.62 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 1.51" for 10-yr storm event
Inflow = 0.64 cfs @ 12.18 hrs, Volume= 0.055 af
Outflow = 0.19 cfs @ 12.67 hrs, Volume= 0.032 af, Atten= 70%, Lag= 29.0 min
Discarded = 0.01 cfs @ 12.67 hrs, Volume= 0.008 af
Primary = 0.18 cfs @ 12.67 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.37' @ 12.67 hrs Surf.Area= 846 sf Storage= 1,027 cf

Plug-Flow detention time= 154.1 min calculated for 0.032 af (59% of inflow)
Center-of-Mass det. time= 70.0 min (896.6 - 826.7)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.67 hrs HW=47.37' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.17 cfs @ 12.67 hrs HW=47.37' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.63 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 2.39" for 10-yr storm event
Inflow = 0.25 cfs @ 12.10 hrs, Volume= 0.017 af
Outflow = 0.26 cfs @ 12.16 hrs, Volume= 0.013 af, Atten= 0%, Lag= 3.6 min
Discarded = 0.00 cfs @ 12.16 hrs, Volume= 0.003 af
Primary = 0.25 cfs @ 12.16 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.99' @ 12.16 hrs Surf.Area= 297 sf Storage= 192 cf

Plug-Flow detention time= 90.7 min calculated for 0.013 af (76% of inflow)
Center-of-Mass det. time= 31.3 min (832.3 - 801.0)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.16 hrs HW=47.98' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.24 cfs @ 12.16 hrs HW=47.98' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.70 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>3.86"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.52 cfs 0.035 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>1.98"
Flow Length=230' Tc=18.1 min CN=55 Runoff=1.58 cfs 0.155 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>3.75"
Flow Length=85' Tc=6.0 min CN=73 Runoff=0.85 cfs 0.058 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>2.45"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=1.08 cfs 0.089 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>3.55"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.37 cfs 0.025 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>1.72"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=0.88 cfs 0.073 af

Reach 1R: (new Reach) Avg. Flow Depth=0.22' Max Vel=5.67 fps Inflow=1.09 cfs 0.102 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=1.08 cfs 0.102 af

Reach 2R: POA #2 Avg. Flow Depth=0.23' Max Vel=5.78 fps Inflow=1.19 cfs 0.137 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.19 cfs 0.137 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.32' Max Vel=2.52 fps Inflow=0.85 cfs 0.058 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=0.81 cfs 0.058 af

Reach 4R: Swale Avg. Flow Depth=0.21' Max Vel=4.34 fps Inflow=0.80 cfs 0.058 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=0.75 cfs 0.058 af

Reach 5R: POA #1 Avg. Flow Depth=0.29' Max Vel=6.73 fps Inflow=1.99 cfs 0.206 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=1.99 cfs 0.206 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.43' Storage=2,062 cf Inflow=1.58 cfs 0.155 af
Discarded=0.02 cfs 0.012 af Primary=1.09 cfs 0.102 af Outflow=1.11 cfs 0.114 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.49' Storage=1,129 cf Inflow=1.08 cfs 0.089 af
Discarded=0.01 cfs 0.008 af Primary=0.80 cfs 0.058 af Outflow=0.81 cfs 0.066 af

Pond 4P: G.U.S.F. #3 Peak Elev=48.01' Storage=198 cf Inflow=0.37 cfs 0.025 af
Discarded=0.00 cfs 0.003 af Primary=0.35 cfs 0.018 af Outflow=0.36 cfs 0.021 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.435 af Average Runoff Depth = 2.30"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.52 cfs @ 12.09 hrs, Volume= 0.035 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 1.58 cfs @ 12.27 hrs, Volume= 0.155 af, Depth> 1.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 0.85 cfs @ 12.09 hrs, Volume= 0.058 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 1.08 cfs @ 12.17 hrs, Volume= 0.089 af, Depth> 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.37 cfs @ 12.09 hrs, Volume= 0.025 af, Depth> 3.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 0.88 cfs @ 12.16 hrs, Volume= 0.073 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr storm Rainfall=7.10"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

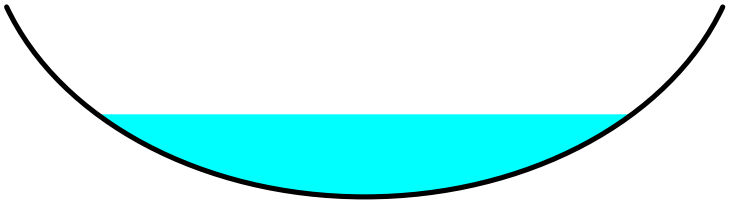
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.30" for 25-yr storm event
Inflow = 1.09 cfs @ 12.52 hrs, Volume= 0.102 af
Outflow = 1.08 cfs @ 12.53 hrs, Volume= 0.102 af, Atten= 1%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.67 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.96 fps, Avg. Travel Time= 0.6 min

Peak Storage= 19 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



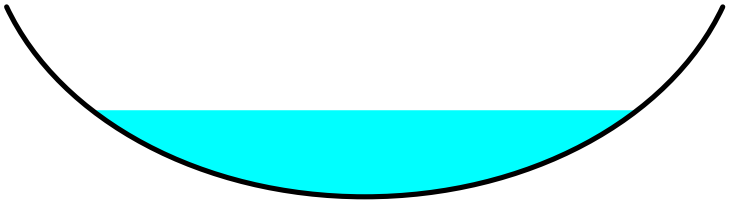
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 1.57" for 25-yr storm event
Inflow = 1.19 cfs @ 12.52 hrs, Volume= 0.137 af
Outflow = 1.19 cfs @ 12.52 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.78 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.50 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.23'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



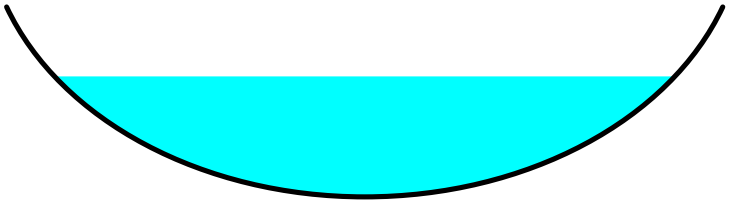
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 3.75" for 25-yr storm event
Inflow = 0.85 cfs @ 12.09 hrs, Volume= 0.058 af
Outflow = 0.81 cfs @ 12.12 hrs, Volume= 0.058 af, Atten= 5%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.52 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 2.8 min

Peak Storage= 54 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



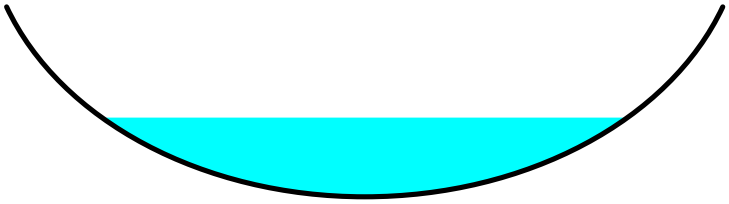
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 1.59" for 25-yr storm event
Inflow = 0.80 cfs @ 12.32 hrs, Volume= 0.058 af
Outflow = 0.75 cfs @ 12.34 hrs, Volume= 0.058 af, Atten= 6%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 0.7 min

Peak Storage= 16 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



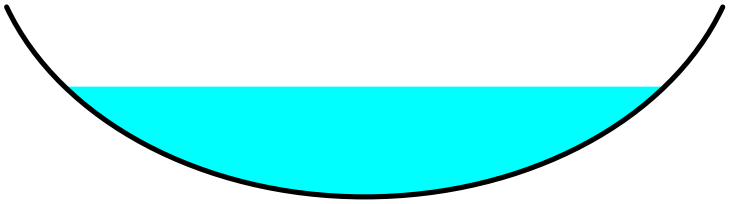
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 2.04" for 25-yr storm event
Inflow = 1.99 cfs @ 12.14 hrs, Volume= 0.206 af
Outflow = 1.99 cfs @ 12.14 hrs, Volume= 0.206 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.73 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.81 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 1.98" for 25-yr storm event
Inflow = 1.58 cfs @ 12.27 hrs, Volume= 0.155 af
Outflow = 1.11 cfs @ 12.52 hrs, Volume= 0.114 af, Atten= 30%, Lag= 14.5 min
Discarded = 0.02 cfs @ 12.52 hrs, Volume= 0.012 af
Primary = 1.09 cfs @ 12.52 hrs, Volume= 0.102 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.43' @ 12.52 hrs Surf.Area= 1,392 sf Storage= 2,062 cf

Plug-Flow detention time= 105.2 min calculated for 0.114 af (74% of inflow)
Center-of-Mass det. time= 40.6 min (870.3 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 12.52 hrs HW=50.43' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=1.07 cfs @ 12.52 hrs HW=50.43' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 1.07 cfs @ 1.17 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 2.45" for 25-yr storm event
Inflow = 1.08 cfs @ 12.17 hrs, Volume= 0.089 af
Outflow = 0.81 cfs @ 12.32 hrs, Volume= 0.066 af, Atten= 25%, Lag= 9.0 min
Discarded = 0.01 cfs @ 12.32 hrs, Volume= 0.008 af
Primary = 0.80 cfs @ 12.32 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.49' @ 12.32 hrs Surf.Area= 895 sf Storage= 1,129 cf

Plug-Flow detention time= 99.2 min calculated for 0.066 af (75% of inflow)
Center-of-Mass det. time= 36.4 min (852.3 - 815.8)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.32 hrs HW=47.48' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.75 cfs @ 12.32 hrs HW=47.48' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.75 cfs @ 1.04 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 3.55" for 25-yr storm event
Inflow = 0.37 cfs @ 12.09 hrs, Volume= 0.025 af
Outflow = 0.36 cfs @ 12.11 hrs, Volume= 0.021 af, Atten= 3%, Lag= 1.0 min
Discarded = 0.00 cfs @ 12.11 hrs, Volume= 0.003 af
Primary = 0.35 cfs @ 12.11 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.01' @ 12.11 hrs Surf.Area= 304 sf Storage= 198 cf

Plug-Flow detention time= 68.6 min calculated for 0.021 af (84% of inflow)
Center-of-Mass det. time= 22.3 min (814.4 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=48.01' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.34 cfs @ 12.11 hrs HW=48.01' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 0.80 fps)

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 1.1S: (new Subcat) Runoff Area=4,731 sf 37.16% Impervious Runoff Depth>5.04"
Flow Length=130' Slope=0.0750 '/' Tc=6.0 min CN=74 Runoff=0.67 cfs 0.046 af

Subcatchment 1.2S: (new Subcat) Runoff Area=41,050 sf 2.04% Impervious Runoff Depth>2.86"
Flow Length=230' Tc=18.1 min CN=55 Runoff=2.33 cfs 0.224 af

Subcatchment 2.1S: (new Subcat) Runoff Area=8,038 sf 36.17% Impervious Runoff Depth>4.92"
Flow Length=85' Tc=6.0 min CN=73 Runoff=1.11 cfs 0.076 af

Subcatchment 2.2S: (new Subcat) Runoff Area=18,932 sf 16.87% Impervious Runoff Depth>3.42"
Flow Length=190' Tc=11.9 min UI Adjusted CN=60 Runoff=1.53 cfs 0.124 af

Subcatchment 2.3S: (new Subcat) Runoff Area=3,654 sf 31.53% Impervious Runoff Depth>4.69"
Flow Length=65' Tc=6.0 min CN=71 Runoff=0.48 cfs 0.033 af

Subcatchment 2.4S: (new Subcat) Runoff Area=22,171 sf 6.02% Impervious Runoff Depth>2.54"
Flow Length=160' Tc=10.4 min UI Adjusted CN=52 Runoff=1.35 cfs 0.108 af

Reach 1R: (new Reach) Avg. Flow Depth=0.30' Max Vel=6.89 fps Inflow=2.12 cfs 0.170 af
n=0.022 L=100.0' S=0.1020 '/' Capacity=6.31 cfs Outflow=2.11 cfs 0.170 af

Reach 2R: POA #2 Avg. Flow Depth=0.31' Max Vel=7.05 fps Inflow=2.35 cfs 0.216 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=2.35 cfs 0.216 af

Reach 3R: Roadside ditch Avg. Flow Depth=0.36' Max Vel=2.72 fps Inflow=1.11 cfs 0.076 af
n=0.022 L=160.0' S=0.0125 '/' Capacity=2.21 cfs Outflow=1.06 cfs 0.076 af

Reach 4R: Swale Avg. Flow Depth=0.29' Max Vel=5.21 fps Inflow=1.47 cfs 0.092 af
n=0.022 L=85.0' S=0.0624 '/' Capacity=4.93 cfs Outflow=1.47 cfs 0.092 af

Reach 5R: POA #1 Avg. Flow Depth=0.39' Max Vel=8.12 fps Inflow=3.78 cfs 0.301 af
n=0.022 L=1.0' S=0.1000 '/' Capacity=6.24 cfs Outflow=3.78 cfs 0.301 af

Pond 1P: G.U.S.F. #1 Peak Elev=50.55' Storage=2,223 cf Inflow=2.33 cfs 0.224 af
Discarded=0.02 cfs 0.013 af Primary=2.12 cfs 0.170 af Outflow=2.14 cfs 0.183 af

Pond 3P: G.U.S.F. #2 Peak Elev=47.58' Storage=1,207 cf Inflow=1.53 cfs 0.124 af
Discarded=0.01 cfs 0.009 af Primary=1.47 cfs 0.092 af Outflow=1.48 cfs 0.101 af

Pond 4P: G.U.S.F. #3 Peak Elev=48.03' Storage=206 cf Inflow=0.48 cfs 0.033 af
Discarded=0.00 cfs 0.003 af Primary=0.46 cfs 0.026 af Outflow=0.47 cfs 0.029 af

Total Runoff Area = 2.263 ac Runoff Volume = 0.610 af Average Runoff Depth = 3.23"
88.66% Pervious = 2.006 ac 11.34% Impervious = 0.257 ac

Summary for Subcatchment 1.1S: (new Subcat)

Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.046 af, Depth> 5.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
1,758	98	Paved parking, HSG B
2,373	61	>75% Grass cover, Good, HSG B
600	55	Woods, Good, HSG B
4,731	74	Weighted Average
2,973		62.84% Pervious Area
1,758		37.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	130	0.0750	4.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.5	130	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 1.2S: (new Subcat)

Runoff = 2.33 cfs @ 12.27 hrs, Volume= 0.224 af, Depth> 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
138	98	Roofs, HSG B
214	98	Unconnected roofs, HSG B
486	98	Paved parking, HSG B
3,131	61	>75% Grass cover, Good, HSG B
4,903	48	Brush, Good, HSG B
32,178	55	Woods, Good, HSG B
41,050	55	Weighted Average
40,212		97.96% Pervious Area
838		2.04% Impervious Area
214		25.54% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.2	100	0.0400	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
2.7	100	0.0150	0.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	30	0.0200	2.12		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
18.1	230	Total			

Summary for Subcatchment 2.1S: (new Subcat)

Runoff = 1.11 cfs @ 12.09 hrs, Volume= 0.076 af, Depth> 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
2,907	98	Paved parking, HSG B
3,899	61	>75% Grass cover, Good, HSG B
1,232	55	Woods, Good, HSG B
8,038	73	Weighted Average
5,131		63.83% Pervious Area
2,907		36.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.6	50	0.2000	0.18		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.2	35	0.0600	3.67		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.8	85	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.2S: (new Subcat)

Runoff = 1.53 cfs @ 12.17 hrs, Volume= 0.124 af, Depth> 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Adj	Description
626	98		Roofs, HSG B
1,794	98		Unconnected roofs, HSG B
774	98		Paved parking, HSG B
5,940	61		>75% Grass cover, Good, HSG B
4,945	48		Brush, Good, HSG B
4,853	55		Woods, Good, HSG B
18,932	62	60	Weighted Average, UI Adjusted
15,738			83.13% Pervious Area
3,194			16.87% Impervious Area
1,794			56.17% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	100	0.0800	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.4	90	0.0500	3.35		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
11.9	190	Total			

Summary for Subcatchment 2.3S: (new Subcat)

Runoff = 0.48 cfs @ 12.09 hrs, Volume= 0.033 af, Depth> 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Description
1,152	98	Paved parking, HSG B
1,622	61	>75% Grass cover, Good, HSG B
880	55	Woods, Good, HSG B
3,654	71	Weighted Average
2,502		68.47% Pervious Area
1,152		31.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	40	0.1500	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
0.1	25	0.1800	6.36		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
4.4	65	Total, Increased to minimum Tc = 6.0 min			

Summary for Subcatchment 2.4S: (new Subcat)

Runoff = 1.35 cfs @ 12.16 hrs, Volume= 0.108 af, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-yr storm Rainfall=8.50"

Area (sf)	CN	Adj	Description
317	98		Roofs, HSG B
872	98		Unconnected roofs, HSG B
145	98		Paved parking, HSG B
1,928	61		>75% Grass cover, Good, HSG B
17,752	48		Brush, Good, HSG B
1,157	55		Woods, Good, HSG B
22,171	53	52	Weighted Average, UI Adjusted
20,837			93.98% Pervious Area
1,334			6.02% Impervious Area
872			65.37% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	80	0.0875	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.69"
1.1	80	0.0625	1.25		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.4	160	Total			

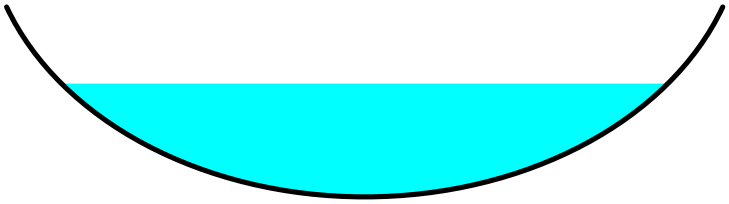
Summary for Reach 1R: (new Reach)

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 2.17" for 50-yr storm event
Inflow = 2.12 cfs @ 12.37 hrs, Volume= 0.170 af
Outflow = 2.11 cfs @ 12.37 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.89 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 3.34 fps, Avg. Travel Time= 0.5 min

Peak Storage= 31 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.31 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 100.0' Slope= 0.1020 '/'
Inlet Invert= 50.20', Outlet Invert= 40.00'



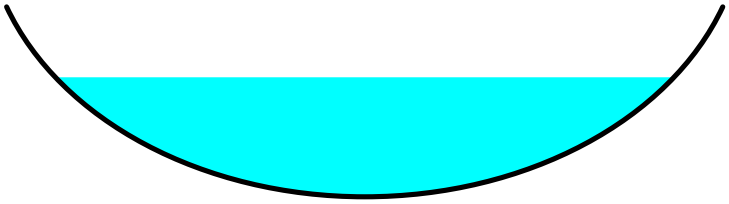
Summary for Reach 2R: POA #2

Inflow Area = 1.051 ac, 5.67% Impervious, Inflow Depth > 2.46" for 50-yr storm event
Inflow = 2.35 cfs @ 12.37 hrs, Volume= 0.216 af
Outflow = 2.35 cfs @ 12.37 hrs, Volume= 0.216 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.05 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.70 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



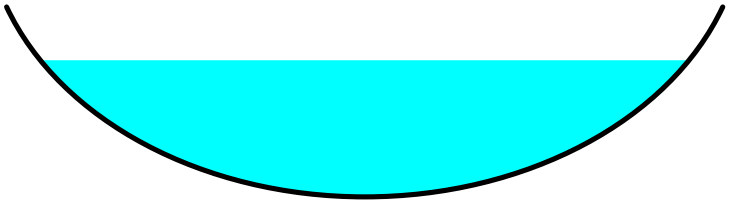
Summary for Reach 3R: Roadside ditch

Inflow Area = 0.185 ac, 36.17% Impervious, Inflow Depth > 4.92" for 50-yr storm event
Inflow = 1.11 cfs @ 12.09 hrs, Volume= 0.076 af
Outflow = 1.06 cfs @ 12.12 hrs, Volume= 0.076 af, Atten= 5%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 2.7 min

Peak Storage= 65 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 2.21 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 42.00', Outlet Invert= 40.00'



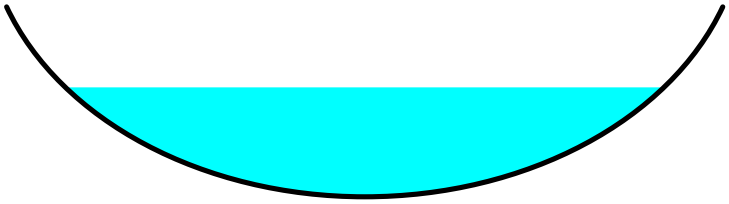
Summary for Reach 4R: Swale

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 2.55" for 50-yr storm event
Inflow = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af
Outflow = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 0.6 min

Peak Storage= 25 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 4.93 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 85.0' Slope= 0.0624 '/'
Inlet Invert= 47.30', Outlet Invert= 42.00'



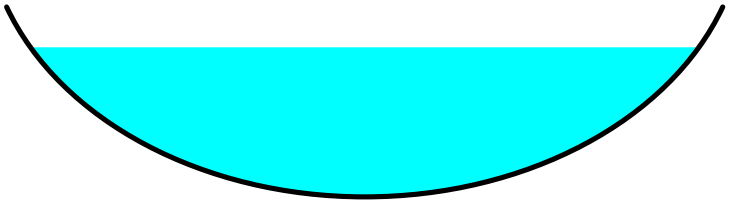
Summary for Reach 5R: POA #1

Inflow Area = 1.212 ac, 16.26% Impervious, Inflow Depth > 2.98" for 50-yr storm event
Inflow = 3.78 cfs @ 12.20 hrs, Volume= 0.301 af
Outflow = 3.78 cfs @ 12.20 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.12 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.50' Flow Area= 0.7 sf, Capacity= 6.24 cfs

2.00' x 0.50' deep Parabolic Channel, n= 0.022 Earth, clean & straight
Length= 1.0' Slope= 0.1000 '/'
Inlet Invert= 40.00', Outlet Invert= 39.90'



Summary for Pond 1P: G.U.S.F. #1

Inflow Area = 0.942 ac, 2.04% Impervious, Inflow Depth > 2.86" for 50-yr storm event
Inflow = 2.33 cfs @ 12.27 hrs, Volume= 0.224 af
Outflow = 2.14 cfs @ 12.37 hrs, Volume= 0.183 af, Atten= 8%, Lag= 6.1 min
Discarded = 0.02 cfs @ 12.37 hrs, Volume= 0.013 af
Primary = 2.12 cfs @ 12.37 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 50.55' @ 12.37 hrs Surf.Area= 1,470 sf Storage= 2,223 cf

Plug-Flow detention time= 76.5 min calculated for 0.182 af (81% of inflow)
Center-of-Mass det. time= 27.1 min (848.7 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	46.17'	2,283 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
46.17	615	0.0	0	0
47.17	615	40.0	246	246
48.67	615	20.0	185	431
49.00	615	100.0	203	633
50.00	1,115	100.0	865	1,498
50.60	1,500	100.0	785	2,283

Device	Routing	Invert	Outlet Devices
#1	Discarded	46.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	50.20'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.02 cfs @ 12.37 hrs HW=50.55' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.07 cfs @ 12.37 hrs HW=50.55' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 1.48 fps)

Summary for Pond 3P: G.U.S.F. #2

Inflow Area = 0.435 ac, 16.87% Impervious, Inflow Depth > 3.42" for 50-yr storm event
Inflow = 1.53 cfs @ 12.17 hrs, Volume= 0.124 af
Outflow = 1.48 cfs @ 12.22 hrs, Volume= 0.101 af, Atten= 3%, Lag= 3.1 min
Discarded = 0.01 cfs @ 12.22 hrs, Volume= 0.009 af
Primary = 1.47 cfs @ 12.22 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 47.58' @ 12.22 hrs Surf.Area= 932 sf Storage= 1,207 cf

Plug-Flow detention time= 75.8 min calculated for 0.101 af (82% of inflow)
Center-of-Mass det. time= 25.8 min (834.2 - 808.4)

Volume	Invert	Avail.Storage	Storage Description
#1	44.17'	1,351 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
44.17	500	0.0	0	0
44.67	500	40.0	100	100
46.17	500	20.0	150	250
46.50	500	100.0	165	415
47.00	697	100.0	299	714
47.75	1,000	100.0	636	1,351

Device	Routing	Invert	Outlet Devices
#1	Discarded	44.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.30'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.01 cfs @ 12.22 hrs HW=47.57' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.40 cfs @ 12.22 hrs HW=47.57' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.40 cfs @ 1.29 fps)

Summary for Pond 4P: G.U.S.F. #3

Inflow Area = 0.084 ac, 31.53% Impervious, Inflow Depth > 4.69" for 50-yr storm event
Inflow = 0.48 cfs @ 12.09 hrs, Volume= 0.033 af
Outflow = 0.47 cfs @ 12.11 hrs, Volume= 0.029 af, Atten= 3%, Lag= 1.1 min
Discarded = 0.00 cfs @ 12.11 hrs, Volume= 0.003 af
Primary = 0.46 cfs @ 12.11 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 48.03' @ 12.11 hrs Surf.Area= 309 sf Storage= 206 cf

Plug-Flow detention time= 57.1 min calculated for 0.029 af (88% of inflow)
Center-of-Mass det. time= 19.2 min (804.9 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	45.17'	372 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
45.17	110	0.0	0	0
45.67	110	40.0	22	22
47.17	110	20.0	33	55
47.50	110	100.0	36	91
48.00	302	100.0	103	194
48.50	410	100.0	178	372

Device	Routing	Invert	Outlet Devices
#1	Discarded	45.17'	**0.600 in/hr Exfiltration over Surface area**
#2	Primary	47.90'	**4.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.00 cfs @ 12.11 hrs HW=48.03' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.45 cfs @ 12.11 hrs HW=48.03' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.45 cfs @ 0.87 fps)