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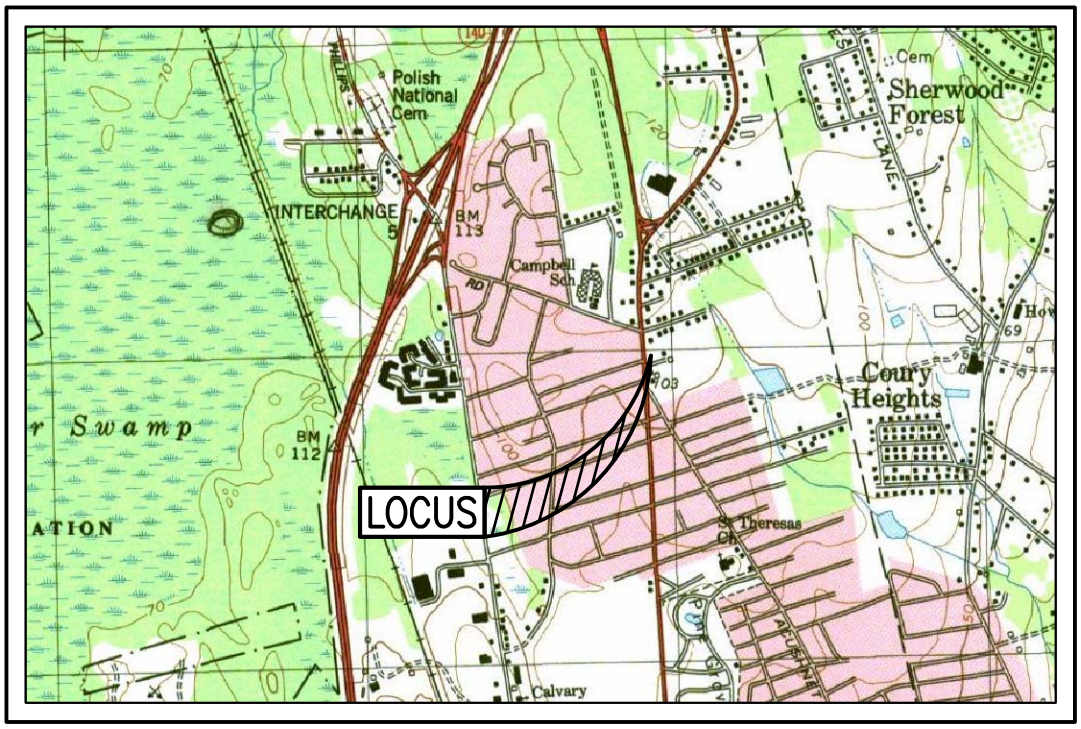
STORMWATER MANAGEMENT REPORT

SITE PLAN

ASSESSORS MAP 130D LOTS 117, 247, 248, & 447
2904 & 2914 ACUSHNET AVENUE
NEW BEDFORD, MASSACHUSETTS



PREPARED FOR:

T.M. CROWLEY & ASSOCIATES
14 BREAKNECK HILL ROAD, SUITE 101
LINCOLN, RI 02865

(MAIN OFFICE) 401 COUNTY STREET, NEW BEDFORD, MA 02740 **P** 508.717.3479 **F** 508.717.3481
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STORMWATER MANAGEMENT REPORT
AND
HYDROLOGIC ANALYSIS

Proposed Site Plan – Cumberland Farms
2904 & 2914 Acushnet Ave, New Bedford, Massachusetts

Project Summary

The project area associated with this project is bordered by Acushnet Avenue to the West of the site, commercial abutters to the North and South, and a new residential subdivision to the East of the site in New Bedford, Massachusetts. The parcel is situated in the Mixed Use Business (MUB) District. The total parcel area is approximately 98,041 S.F.

The applicant is seeking permission to construct a 5,275 S.F convenience store with a gas station and 2,640 S.F. car wash that includes a bituminous pavement parking lot containing a total of 49 spaces with associated grading. Stormwater associated with the development will be controlled via deep-sump hooded catch basins, water quality units and a cultec subsurface recharge drainage system.

Methodology

Drainage computations were performed using the Natural Resources Conservation Services (NRCS) TR-20 method and HydroCAD® Drainage Calculation Software. Sketches of the existing and proposed watershed areas, HydroCAD® Report, and copies of the calculation sheets are included as appendices to this report.

Existing Conditions

The soils underlying the site are identified in the Soil Survey of Bristol County. The Site soils are classified as Paxton Fine Sandy Loam. Paxton soils are well suited to cultivate crops, hay and improved pasture. Paxton soils have a high water capacity and are well suited for intensive agriculture and woodland production.

Proposed Conditions/Stormwater Management Overview

Under proposed conditions, roof drains will collect and direct roof runoff and runoff from the canopy above the gas station area to a subsurface recharge system which, in large storm events, will overflow to a drain manhole and will ultimately tie into the city drainage system. Runoff from the parking areas and grassed area will be collected by two deep sump catch basins which flows to a Contech CDS Water Quality Unit before ultimately flowing to the city drainage system.

The design of the stormwater system was designed for the post-development conditions to handle all storms' peak discharges and runoff volume to include the 2, 10, 25 and 100-year storm events. The site drainage system was designed in consideration of the structural standards and techniques of the Best Management Practices (BMP) and Low Impact Development (LID) outlined in the "Stormwater Management Handbook".

The results of site drainage calculations are presented in the following Tables. The results are based upon evaluation of Pre-development conditions and the design of proposed surface and subsurface drainage systems for the Post-development condition. These results show the Post-Development offsite volume and runoff rates are reduced to less than the Pre-development conditions, thus meeting the BMP guidelines for this site development.

Table 1 - Comparison of Pre- versus Post-Development Offsite Runoff Rate, cfs

Frequency Storm	2-Year	10-Year	25-Year	100-Year
Pre-Development	2.18	4.27	5.56	7.91
Post-Development	0.00	0.76	2.56	5.72

Table 2 - Comparison of Pre- versus Post-Development Offsite Runoff Volume, af

Frequency Storm	2-Year	10-Year	25-Year	100-Year
Pre-Development	0.219	0.413	0.534	0.758
Post-Development	0.000	0.106	0.183	0.319

Groundwater recharge is a factor in the design of the subsurface drainage system. Table-3 below presents the minimum recharge required and the proposed recharge of stormwater based upon the BMP methods of the "Stormwater Management Handbook". The proposed recharge quantities meet or exceed the required minimum recharges.

Table 3 - Drainage Recharge Calculation (Required Recharge = 0.10" Total Site Runoff for Class-C Soils)

Required Recharge	Proposed Recharge
1.51 Acres x 0.10"/12 = 0.0125AF = 548 CF	10,628 CF = 0.244 AF

Total Suspended Solids Removal

In accordance with the guidelines of the Stormwater Management Policy, the Total Suspended Solids (TSS) Removal exceeds the minimum 80% requirement.

EXHIBIT "A"

PRE-DEVELOPMENT WATERSHED PLAN

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"LOT 16" N/F MIH1 LLC

"LOT 15" N/F MIH1 LLC

"LOT 14" N/F MIH1 LLC

"LOT 13" N/F MIH1 LLC

"LOT 12" N/F MIH1 LLC

MAP 130D LOT 389 N/F SOUTHERN MASS CREDIT UNION

PARCEL D-1
(AREA=15,927± S.F.)
NOT A BUILDABLE LOT

ASSESSORS MAP 130D LOT 248
(AREA=8,254± S.F.)

ASSESSORS MAP 130D LOT 247
(AREA=10,645± S.F.)

LOT 28
(AREA=63,218± S.F.)

S-1

140.82'
S13°03'07"E 398.06'
257.25'
108.29'
N89°58'12"E 196.34'
82.46'
N13°58'00"W 165.24'
82.78'
N76°56'53"E 102.87'
99.95'
S04°55'30"W
2.11'
N13°58'00"W
88.09'
N89°47'17"E 117.70'
N89°47'17"E 146.14'
81.00'
N06°54'42"E
49.96'
N06°54'38"E
L=31.94'
R=400.00'
L=137.19'
R=400.00'
152.25'
S85°41'29"W
114.96'
N17°20'19"W

ARNOFF ~PRIVATE~ STREET (NOT CONSTRUCTED)

ACUSHNET ~PUBLIC - 60' WIDE~ AVENUE (ROUTE 18)

BOWLES ~PUBLIC - 50' WIDE~ STREET

~PUBLIC - 50' WIDE~ STREET

ACUSHNET ~PUBLIC - 60' WIDE~ AVENUE

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DRAWN BY: JT
DESIGNED BY: CAF
CHECKED BY: CAF

DRAINAGE MAP
2904 & 2914 ACUSHNET AVENUE

ASSESSORS MAP 130D LOTS 117,247,248,379,387,410,411,A PORTION OF LOTS 380,381,408&409 AND A PORTION OF DECLAN DRIVE AND APPROVED FORM "A" PLAN "LOT 28"& "PARCEL D-1"

NEW BEDFORD, MASSACHUSETTS

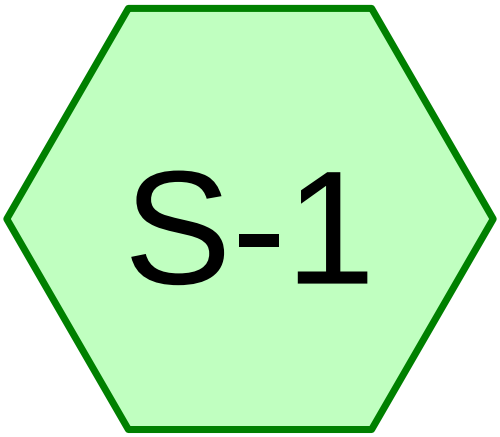
PREPARED FOR: T.M. CROWLEY & ASSOCIATES
14 BREAKNECK HILL ROAD, SUITE 101
LINCOLN, RI 02865

OCTOBER 17, 2018
SCALE: 1"=20'
JOB NO. 17-1134
LATEST REVISION:

PRE-SUBCATCHMENT PLAN

EXHIBIT "B"

PRE-DEVELOPMENT ANALYSIS



Tributary Offsite

Subcat Reach Pond Link

Drainage Diagram for 171134PRE
Prepared by Farland Corp.
HydroCAD® 8.50 s/n 002159 © 2007 HydroCAD Software Solutions LLC

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

Subcatchment S-1: Tributary Offsite Runoff Area=98,054 sf 6.26% Impervious Runoff Depth=1.17"
Flow Length=475' Tc=15.8 min CN=74 Runoff=2.18 cfs 0.220 af

Total Runoff Area = 2.251 ac Runoff Volume = 0.220 af Average Runoff Depth = 1.17"
93.74% Pervious = 2.110 ac 6.26% Impervious = 0.141 ac

Summary for Subcatchment S-1: Tributary Offsite

Runoff = 2.18 cfs @ 12.23 hrs, Volume= 0.220 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2 year Rainfall=3.40"

Area (sf)	CN	Description
70,785	70	Woods, Good, HSG C
21,127	79	50-75% Grass cover, Fair, HSG C
3,746	98	Paved parking & roofs
2,396	98	Paved parking & roofs
98,054	74	Weighted Average
91,912		Pervious Area
6,142		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
0.8	75	0.0530	1.61		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.5	350	0.0150	0.61		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
15.8	475	Total			

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

Subcatchment S-1: Tributary Offsite Runoff Area=98,054 sf 6.26% Impervious Runoff Depth=2.21"
Flow Length=475' Tc=15.8 min CN=74 Runoff=4.27 cfs 0.414 af

Total Runoff Area = 2.251 ac Runoff Volume = 0.414 af Average Runoff Depth = 2.21"
93.74% Pervious = 2.110 ac 6.26% Impervious = 0.141 ac

Summary for Subcatchment S-1: Tributary Offsite

Runoff = 4.27 cfs @ 12.22 hrs, Volume= 0.414 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 year Rainfall=4.80"

Area (sf)	CN	Description
70,785	70	Woods, Good, HSG C
21,127	79	50-75% Grass cover, Fair, HSG C
3,746	98	Paved parking & roofs
2,396	98	Paved parking & roofs
98,054	74	Weighted Average
91,912		Pervious Area
6,142		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
0.8	75	0.0530	1.61		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.5	350	0.0150	0.61		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
15.8	475	Total			

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

Subcatchment S-1: Tributary Offsite Runoff Area=98,054 sf 6.26% Impervious Runoff Depth=2.85"
Flow Length=475' Tc=15.8 min CN=74 Runoff=5.56 cfs 0.535 af

Total Runoff Area = 2.251 ac Runoff Volume = 0.535 af Average Runoff Depth = 2.85"
93.74% Pervious = 2.110 ac 6.26% Impervious = 0.141 ac

Summary for Subcatchment S-1: Tributary Offsite

Runoff = 5.56 cfs @ 12.22 hrs, Volume= 0.535 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 year Rainfall=5.60"

Area (sf)	CN	Description
70,785	70	Woods, Good, HSG C
21,127	79	50-75% Grass cover, Fair, HSG C
3,746	98	Paved parking & roofs
2,396	98	Paved parking & roofs
98,054	74	Weighted Average
91,912		Pervious Area
6,142		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
0.8	75	0.0530	1.61		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.5	350	0.0150	0.61		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
15.8	475	Total			

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

Subcatchment S-1: Tributary Offsite Runoff Area=98,054 sf 6.26% Impervious Runoff Depth=4.04"
Flow Length=475' Tc=15.8 min CN=74 Runoff=7.91 cfs 0.758 af

Total Runoff Area = 2.251 ac Runoff Volume = 0.758 af Average Runoff Depth = 4.04"
93.74% Pervious = 2.110 ac 6.26% Impervious = 0.141 ac

Summary for Subcatchment S-1: Tributary Offsite

Runoff = 7.91 cfs @ 12.22 hrs, Volume= 0.758 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100 year Rainfall=7.00"

Area (sf)	CN	Description
70,785	70	Woods, Good, HSG C
21,127	79	50-75% Grass cover, Fair, HSG C
3,746	98	Paved parking & roofs
2,396	98	Paved parking & roofs
98,054	74	Weighted Average
91,912		Pervious Area
6,142		Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0200	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.40"
0.8	75	0.0530	1.61		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
9.5	350	0.0150	0.61		**Shallow Concentrated Flow, Woods** Woodland Kv= 5.0 fps
15.8	475	Total			

EXHIBIT "C"

POST-DEVELOPMENT WATERSHED PLAN

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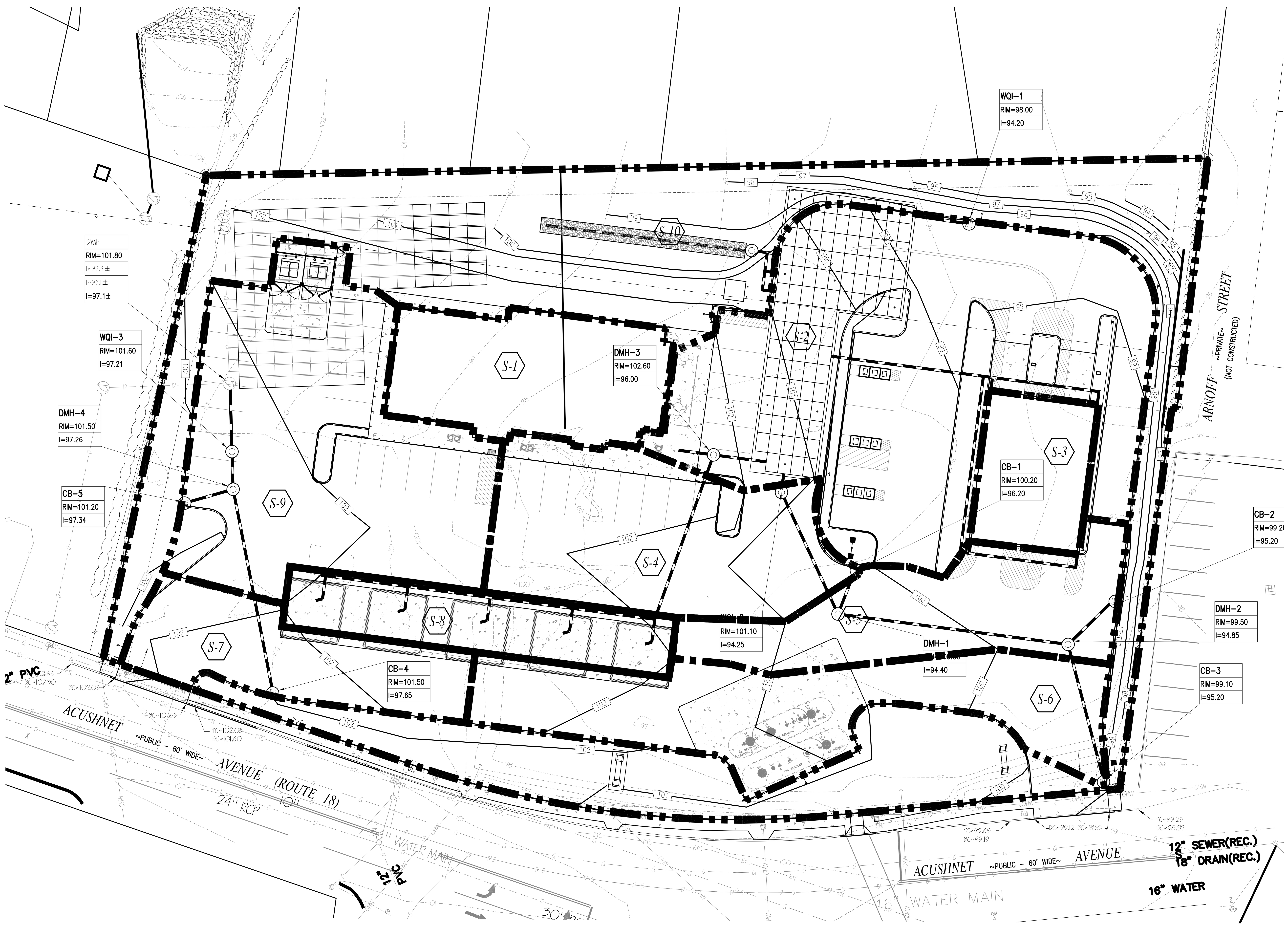

0' 20' 40' 60'
1" = 20'

REVISIONS

COMMONWEALTH OF MASSACHUSETTS
CHRISTIAN ALBERT FARLAND
No. 47544
CIVIL
REGISTERED PROFESSIONAL ENGINEER

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DRAWN BY: JKM
DESIGNED BY: CAF
CHECKED BY: CAF

SITE PLAN

2904 & 2914 ACUSHNET AVENUE
ASSESSORS MAP 130D LOTS 117, 247, 248, & 447
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: T.M. CROWLEY & ASSOCIATES
14 BREAKNECK HILL ROAD, SUITE 101
LINCOLN, RI 02865

NOVEMBER 7, 2018
SCALE: 1"=20'
JOB NO. 17-1134
LATEST REVISION:

POST-SUBCATCHMENT PLAN

CFG05.1

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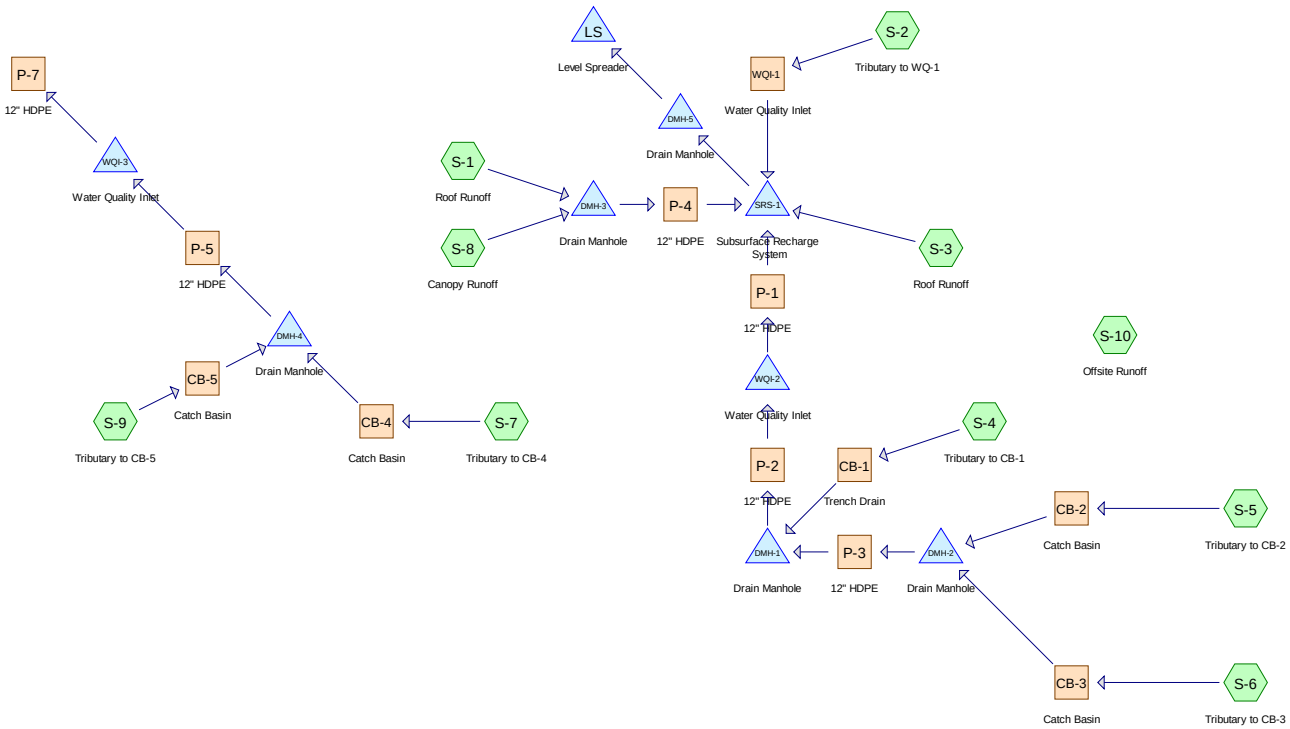
EXHIBIT "D"

POST-DEVELOPMENT ANALYSIS



Subcat Reach Pond Link

Drainage Diagram for 171134POST
Prepared by Farland Corp.
HydroCAD® 8.50 s/n 002159 © 2007 HydroCAD Software Solutions LLC

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Roof Runoff Runoff Area=5,177 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.39 cfs 0.031 af

Subcatchment S-10: Offsite Runoff Runoff Area=6,455 sf 20.98% Impervious Runoff Depth=1.85"
Tc=6.0 min CN=84 Runoff=0.32 cfs 0.023 af

Subcatchment S-2: Tributary to WQ-1 Runoff Area=18,613 sf 86.52% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=95 Runoff=1.34 cfs 0.101 af

Subcatchment S-3: Roof Runoff Runoff Area=2,642 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.20 cfs 0.016 af

Subcatchment S-4: Tributary to CB-1 Runoff Area=7,915 sf 95.14% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=97 Runoff=0.59 cfs 0.046 af

Subcatchment S-5: Tributary to CB-2 Runoff Area=5,979 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.45 cfs 0.036 af

Subcatchment S-6: Tributary to CB-3 Runoff Area=8,152 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.62 cfs 0.049 af

Subcatchment S-7: Tributary to CB-4 Runoff Area=4,356 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.026 af

Subcatchment S-8: Canopy Runoff Runoff Area=3,732 sf 100.00% Impervious Runoff Depth=3.17"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment S-9: Tributary to CB-5 Runoff Area=12,504 sf 96.99% Impervious Runoff Depth=3.06"
Tc=6.0 min CN=97 Runoff=0.94 cfs 0.073 af

Reach CB-1: Trench Drain Avg. Depth=0.15' Max Vel=8.29 fps Inflow=0.59 cfs 0.046 af
D=12.0" n=0.013 L=14.0' S=0.1286 '/' Capacity=12.78 cfs Outflow=0.59 cfs 0.046 af

Reach CB-2: Catch Basin Avg. Depth=0.21' Max Vel=3.91 fps Inflow=0.45 cfs 0.036 af
D=12.0" n=0.013 L=21.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=0.45 cfs 0.036 af

Reach CB-3: Catch Basin Avg. Depth=0.31' Max Vel=2.97 fps Inflow=0.62 cfs 0.049 af
D=12.0" n=0.013 L=51.0' S=0.0069 '/' Capacity=2.95 cfs Outflow=0.62 cfs 0.049 af

Reach CB-4: Catch Basin Avg. Depth=0.24' Max Vel=2.23 fps Inflow=0.33 cfs 0.026 af
D=12.0" n=0.013 L=77.0' S=0.0051 '/' Capacity=2.54 cfs Outflow=0.33 cfs 0.026 af

Reach CB-5: Catch Basin Avg. Depth=0.41' Max Vel=3.04 fps Inflow=0.94 cfs 0.073 af
D=12.0" n=0.013 L=15.0' S=0.0053 '/' Capacity=2.60 cfs Outflow=0.93 cfs 0.073 af

Reach P-1: 12" HDPE Avg. Depth=0.31' Max Vel=7.99 fps Inflow=1.65 cfs 0.132 af
D=12.0" n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=1.65 cfs 0.132 af

Reach P-2: 12" HDPE Avg. Depth=0.55' Max Vel=3.73 fps Inflow=1.65 cfs 0.132 af
D=12.0" n=0.013 L=24.0' S=0.0063 '/' Capacity=2.82 cfs Outflow=1.65 cfs 0.132 af

Reach P-3: 12" HDPE Avg. Depth=0.45' Max Vel=3.11 fps Inflow=1.07 cfs 0.086 af
D=12.0" n=0.013 L=87.0' S=0.0052 '/' Capacity=2.56 cfs Outflow=1.07 cfs 0.086 af

Reach P-4: 12" HDPE Avg. Depth=0.14' Max Vel=10.07 fps Inflow=0.68 cfs 0.054 af
D=12.0" n=0.013 L=10.0' S=0.2000 '/' Capacity=15.93 cfs Outflow=0.68 cfs 0.054 af

Reach P-5: 12" HDPE Avg. Depth=0.50' Max Vel=3.21 fps Inflow=1.26 cfs 0.099 af
D=12.0" n=0.013 L=10.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=1.26 cfs 0.099 af

Reach P-7: 12" HDPE Avg. Depth=0.50' Max Vel=3.21 fps Inflow=1.26 cfs 0.099 af
D=12.0" n=0.013 L=22.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=1.26 cfs 0.099 af

Reach WQI-1: Water Quality Inlet Avg. Depth=0.51' Max Vel=3.32 fps Inflow=1.34 cfs 0.101 af
D=12.0" n=0.013 L=38.0' S=0.0053 '/' Capacity=2.58 cfs Outflow=1.34 cfs 0.101 af

Pond DMH-1: Drain Manhole Inflow=1.65 cfs 0.132 af
Primary=1.65 cfs 0.132 af

Pond DMH-2: Drain Manhole Inflow=1.07 cfs 0.086 af
Primary=1.07 cfs 0.086 af

Pond DMH-3: Drain Manhole Inflow=0.68 cfs 0.054 af
Primary=0.68 cfs 0.054 af

Pond DMH-4: Drain Manhole Inflow=1.26 cfs 0.099 af
Primary=1.26 cfs 0.099 af

Pond DMH-5: Drain Manhole Inflow=0.30 cfs 0.078 af
Primary=0.30 cfs 0.078 af

Pond LS: Level Spreader Peak Elev=98.34' Storage=1,220 cf Inflow=0.30 cfs 0.078 af
Discarded=0.00 cfs 0.015 af Primary=0.20 cfs 0.047 af Outflow=0.20 cfs 0.062 af

Pond SRS-1: Subsurface Recharge System Peak Elev=96.14' Storage=8,231 cf Inflow=3.85 cfs 0.303 af
Discarded=0.03 cfs 0.150 af Primary=0.30 cfs 0.078 af Outflow=0.32 cfs 0.228 af

Pond WQI-2: Water Quality Inlet Inflow=1.65 cfs 0.132 af
Primary=1.65 cfs 0.132 af

Pond WQI-3: Water Quality Inlet Inflow=1.26 cfs 0.099 af
Primary=1.26 cfs 0.099 af

Total Runoff Area = 1.734 ac Runoff Volume = 0.425 af Average Runoff Depth = 2.94"
11.08% Pervious = 0.192 ac 88.92% Impervious = 1.542 ac

Summary for Subcatchment S-1: Roof Runoff

Runoff = 0.39 cfs @ 12.08 hrs, Volume= 0.031 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

	Area (sf)	CN	Description
*	5,177	98	Rooftop
	5,177		Impervious Area

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

Summary for Subcatchment S-10: Offsite Runoff

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
5,101	80	>75% Grass cover, Good, HSG D
1,354	98	Paved parking & roofs
6,455	84	Weighted Average
5,101		Pervious Area
1,354		Impervious Area

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

Summary for Subcatchment S-2: Tributary to WQ-1

Runoff = 1.34 cfs @ 12.08 hrs, Volume= 0.101 af, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
2,509	74	>75% Grass cover, Good, HSG C
16,104	98	Paved parking
18,613	95	Weighted Average
2,509		Pervious Area
16,104		Impervious Area

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

Summary for Subcatchment S-3: Roof Runoff

Runoff = 0.20 cfs @ 12.08 hrs, Volume= 0.016 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

	Area (sf)	CN	Description
*	2,642	98	Rooftop
	2,642		Impervious Area

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

Summary for Subcatchment S-4: Tributary to CB-1

Runoff = 0.59 cfs @ 12.08 hrs, Volume= 0.046 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
385	74	>75% Grass cover, Good, HSG C
7,530	98	Paved parking
7,915	97	Weighted Average
385		Pervious Area
7,530		Impervious Area

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

Summary for Subcatchment S-5: Tributary to CB-2

Runoff = 0.45 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
5,979	98	Paved parking
5,979		Impervious Area

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

Summary for Subcatchment S-6: Tributary to CB-3

Runoff = 0.62 cfs @ 12.08 hrs, Volume= 0.049 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
8,152	98	Paved parking
8,152		Impervious Area

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

Summary for Subcatchment S-7: Tributary to CB-4

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 0.026 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
4,356	98	Paved parking
4,356		Impervious Area

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

Summary for Subcatchment S-8: Canopy Runoff

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 0.023 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

	Area (sf)	CN	Description
*	3,732	98	Canopy
	3,732		Impervious Area

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

Summary for Subcatchment S-9: Tributary to CB-5

Runoff = 0.94 cfs @ 12.08 hrs, Volume= 0.073 af, Depth= 3.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2Yr Rainfall=3.40"

Area (sf)	CN	Description
12,128	98	Paved parking
376	74	>75% Grass cover, Good, HSG C
12,504	97	Weighted Average
376		Pervious Area
12,128		Impervious Area

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

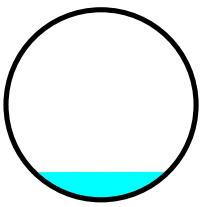
Summary for Reach CB-1: Trench Drain

Inflow Area = 0.182 ac, 95.14% Impervious, Inflow Depth = 3.06" for 2Yr event
Inflow = 0.59 cfs @ 12.08 hrs, Volume= 0.046 af
Outflow = 0.59 cfs @ 12.08 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.29 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.71 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 12.78 cfs

12.0" Diameter Pipe, n= 0.013
Length= 14.0' Slope= 0.1286 '/'
Inlet Invert= 96.20', Outlet Invert= 94.40'



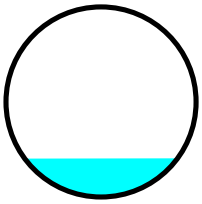
Summary for Reach CB-2: Catch Basin

Inflow Area = 0.137 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 0.45 cfs @ 12.08 hrs, Volume= 0.036 af
Outflow = 0.45 cfs @ 12.09 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 0.3 min

Peak Storage= 2 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.92 cfs

12.0" Diameter Pipe, n= 0.013
Length= 21.0' Slope= 0.0190 '/'
Inlet Invert= 95.20', Outlet Invert= 94.80'



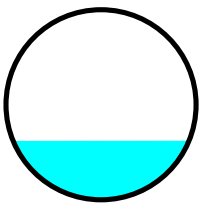
Summary for Reach CB-3: Catch Basin

Inflow Area = 0.187 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 0.62 cfs @ 12.08 hrs, Volume= 0.049 af
Outflow = 0.62 cfs @ 12.09 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.97 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 0.9 min

Peak Storage= 11 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.95 cfs

12.0" Diameter Pipe, n= 0.013
Length= 51.0' Slope= 0.0069 '/'
Inlet Invert= 95.20', Outlet Invert= 94.85'



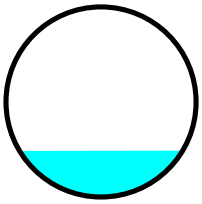
Summary for Reach CB-4: Catch Basin

Inflow Area = 0.100 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 0.33 cfs @ 12.08 hrs, Volume= 0.026 af
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 0.026 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.23 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 1.8 min

Peak Storage= 11 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.013
Length= 77.0' Slope= 0.0051 '/'
Inlet Invert= 97.65', Outlet Invert= 97.26'



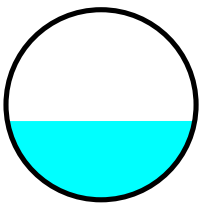
Summary for Reach CB-5: Catch Basin

Inflow Area = 0.287 ac, 96.99% Impervious, Inflow Depth = 3.06" for 2Yr event
Inflow = 0.94 cfs @ 12.08 hrs, Volume= 0.073 af
Outflow = 0.93 cfs @ 12.09 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.2 min

Peak Storage= 5 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.60 cfs

12.0" Diameter Pipe, n= 0.013
Length= 15.0' Slope= 0.0053 '/'
Inlet Invert= 97.34', Outlet Invert= 97.26'



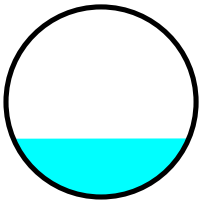
Summary for Reach P-1: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 3.13" for 2Yr event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af
Outflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.99 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 7.97 cfs

12.0" Diameter Pipe, n= 0.013
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 94.25', Outlet Invert= 94.00'



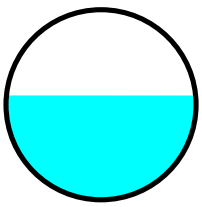
Summary for Reach P-2: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 3.13" for 2Yr event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af
Outflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.82 cfs

12.0" Diameter Pipe, n= 0.013
Length= 24.0' Slope= 0.0063 '/'
Inlet Invert= 94.40', Outlet Invert= 94.25'



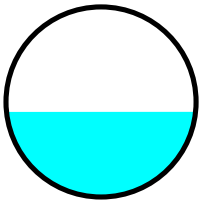
Summary for Reach P-3: 12" HDPE

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.086 af
Outflow = 1.07 cfs @ 12.10 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.11 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 1.4 min

Peak Storage= 30 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.56 cfs

12.0" Diameter Pipe, n= 0.013
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 94.85', Outlet Invert= 94.40'



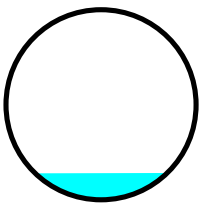
Summary for Reach P-4: 12" HDPE

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 0.68 cfs @ 12.08 hrs, Volume= 0.054 af
Outflow = 0.68 cfs @ 12.08 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.07 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.31 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 15.93 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.2000 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



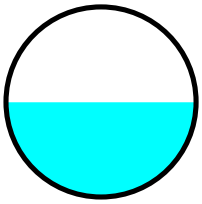
Summary for Reach P-5: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 3.08" for 2Yr event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 96.26', Outlet Invert= 96.21'



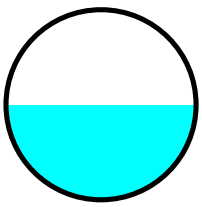
Summary for Reach P-7: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 3.08" for 2Yr event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af
Outflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.21 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 0.3 min

Peak Storage= 9 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.50'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 22.0' Slope= 0.0050 '/'
Inlet Invert= 97.21', Outlet Invert= 97.10'



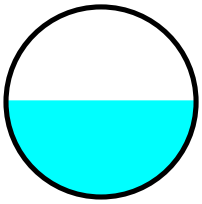
Summary for Reach WQI-1: Water Quality Inlet

Inflow Area = 0.427 ac, 86.52% Impervious, Inflow Depth = 2.84" for 2Yr event
Inflow = 1.34 cfs @ 12.08 hrs, Volume= 0.101 af
Outflow = 1.34 cfs @ 12.09 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 0.6 min

Peak Storage= 15 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.58 cfs

12.0" Diameter Pipe, n= 0.013
Length= 38.0' Slope= 0.0053 '/'
Inlet Invert= 94.20', Outlet Invert= 94.00'



Summary for Pond DMH-1: Drain Manhole

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 3.13" for 2Yr event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af
Primary = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-2: Drain Manhole

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 1.07 cfs @ 12.09 hrs, Volume= 0.086 af
Primary = 1.07 cfs @ 12.09 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-3: Drain Manhole

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 3.17" for 2Yr event
Inflow = 0.68 cfs @ 12.08 hrs, Volume= 0.054 af
Primary = 0.68 cfs @ 12.08 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-4: Drain Manhole

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 3.08" for 2Yr event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af
Primary = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-5: Drain Manhole

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 0.78" for 2Yr event
Inflow = 0.30 cfs @ 13.03 hrs, Volume= 0.078 af
Primary = 0.30 cfs @ 13.03 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond LS: Level Spreader

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 0.78" for 2Yr event
Inflow = 0.30 cfs @ 13.03 hrs, Volume= 0.078 af
Outflow = 0.20 cfs @ 14.03 hrs, Volume= 0.062 af, Atten= 31%, Lag= 60.1 min
Discarded = 0.00 cfs @ 12.63 hrs, Volume= 0.015 af
Primary = 0.20 cfs @ 14.03 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.34' @ 14.03 hrs Surf.Area= 492 sf Storage= 1,220 cf

Plug-Flow detention time= 513.6 min calculated for 0.062 af (79% of inflow)
Center-of-Mass det. time= 444.1 min (1,380.6 - 936.5)

Volume	Invert	Avail.Storage	Storage Description
#1	92.33'	1,352 cf	**6.00'W x 82.00'L x 7.00'H Prismatoid**
			3,444 cf Overall - 63 cf Embedded = 3,381 cf x 40.0% Voids
#2	94.33'	63 cf	**12.0"D x 80.00'L Horizontal Cylinder** Inside #1
		1,415 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.33'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	98.33'	**82.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.00 cfs @ 12.63 hrs HW=92.40' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 14.03 hrs HW=98.34' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.12 cfs @ 0.20 fps)

Summary for Pond SRS-1: Subsurface Recharge System

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 3.03" for 2Yr event
Inflow = 3.85 cfs @ 12.09 hrs, Volume= 0.303 af
Outflow = 0.32 cfs @ 13.03 hrs, Volume= 0.228 af, Atten= 92%, Lag= 56.2 min
Discarded = 0.03 cfs @ 5.47 hrs, Volume= 0.150 af
Primary = 0.30 cfs @ 13.03 hrs, Volume= 0.078 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.14' @ 13.03 hrs Surf.Area= 4,267 sf Storage= 8,231 cf

Plug-Flow detention time= 1,137.6 min calculated for 0.228 af (75% of inflow)
Center-of-Mass det. time= 1,052.5 min (1,818.0 - 765.5)

Volume	Invert	Avail.Storage	Storage Description
#1	93.50'	2,964 cf	**27.00'W x 114.50'L x 4.00'H Prismatoid**
			12,366 cf Overall - 4,957 cf Embedded = 7,409 cf x 40.0% Voids
#2	94.00'	4,957 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 74 Inside #1
#3	93.50'	1,076 cf	**25.00'W x 47.00'L x 4.00'H Prismatoid**
			4,700 cf Overall - 2,009 cf Embedded = 2,691 cf x 40.0% Voids
#4	94.00'	2,009 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 30 Inside #3
		11,006 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	96.00'	**8.0" x 5.0' long Culvert X 3.00**
			RCP, rounded edge headwall, Ke= 0.100
			Outlet Invert= 95.50' S= 0.1000 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.03 cfs @ 5.47 hrs HW=93.54' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.30 cfs @ 13.03 hrs HW=96.14' (Free Discharge)
↑**2=Culvert** (Inlet Controls 0.30 cfs @ 1.77 fps)

Summary for Pond WQI-2: Water Quality Inlet

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 3.13" for 2Yr event
Inflow = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af
Primary = 1.65 cfs @ 12.10 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond WQI-3: Water Quality Inlet

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 3.08" for 2Yr event
Inflow = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af
Primary = 1.26 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

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

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Roof Runoff Runoff Area=5,177 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.56 cfs 0.045 af

Subcatchment S-10: Offsite Runoff Runoff Area=6,455 sf 20.98% Impervious Runoff Depth=3.09"
Tc=6.0 min CN=84 Runoff=0.53 cfs 0.038 af

Subcatchment S-2: Tributary to WQ-1 Runoff Area=18,613 sf 86.52% Impervious Runoff Depth=4.22"
Tc=6.0 min CN=95 Runoff=1.95 cfs 0.150 af

Subcatchment S-3: Roof Runoff Runoff Area=2,642 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment S-4: Tributary to CB-1 Runoff Area=7,915 sf 95.14% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=97 Runoff=0.85 cfs 0.067 af

Subcatchment S-5: Tributary to CB-2 Runoff Area=5,979 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.64 cfs 0.052 af

Subcatchment S-6: Tributary to CB-3 Runoff Area=8,152 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.88 cfs 0.071 af

Subcatchment S-7: Tributary to CB-4 Runoff Area=4,356 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment S-8: Canopy Runoff Runoff Area=3,732 sf 100.00% Impervious Runoff Depth=4.56"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment S-9: Tributary to CB-5 Runoff Area=12,504 sf 96.99% Impervious Runoff Depth=4.45"
Tc=6.0 min CN=97 Runoff=1.34 cfs 0.106 af

Reach CB-1: Trench Drain Avg. Depth=0.17' Max Vel=9.22 fps Inflow=0.85 cfs 0.067 af
D=12.0" n=0.013 L=14.0' S=0.1286 '/' Capacity=12.78 cfs Outflow=0.85 cfs 0.067 af

Reach CB-2: Catch Basin Avg. Depth=0.24' Max Vel=4.33 fps Inflow=0.64 cfs 0.052 af
D=12.0" n=0.013 L=21.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=0.64 cfs 0.052 af

Reach CB-3: Catch Basin Avg. Depth=0.37' Max Vel=3.28 fps Inflow=0.88 cfs 0.071 af
D=12.0" n=0.013 L=51.0' S=0.0069 '/' Capacity=2.95 cfs Outflow=0.88 cfs 0.071 af

Reach CB-4: Catch Basin Avg. Depth=0.29' Max Vel=2.46 fps Inflow=0.47 cfs 0.038 af
D=12.0" n=0.013 L=77.0' S=0.0051 '/' Capacity=2.54 cfs Outflow=0.47 cfs 0.038 af

Reach CB-5: Catch Basin Avg. Depth=0.51' Max Vel=3.33 fps Inflow=1.34 cfs 0.106 af
D=12.0" n=0.013 L=15.0' S=0.0053 '/' Capacity=2.60 cfs Outflow=1.34 cfs 0.106 af

Reach P-1: 12" HDPE Avg. Depth=0.37' Max Vel=8.82 fps Inflow=2.34 cfs 0.191 af
D=12.0" n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=2.34 cfs 0.191 af

Reach P-2: 12" HDPE Avg. Depth=0.70' Max Vel=4.01 fps Inflow=2.35 cfs 0.191 af
D=12.0" n=0.013 L=24.0' S=0.0063 '/' Capacity=2.82 cfs Outflow=2.34 cfs 0.191 af

Reach P-3: 12" HDPE Avg. Depth=0.55' Max Vel=3.40 fps Inflow=1.52 cfs 0.123 af
D=12.0" n=0.013 L=87.0' S=0.0052 '/' Capacity=2.56 cfs Outflow=1.51 cfs 0.123 af

Reach P-4: 12" HDPE Avg. Depth=0.17' Max Vel=11.18 fps Inflow=0.96 cfs 0.078 af
D=12.0" n=0.013 L=10.0' S=0.2000 '/' Capacity=15.93 cfs Outflow=0.96 cfs 0.078 af

Reach P-5: 12" HDPE Avg. Depth=0.62' Max Vel=3.49 fps Inflow=1.80 cfs 0.144 af
D=12.0" n=0.013 L=10.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=1.80 cfs 0.144 af

Reach P-7: 12" HDPE Avg. Depth=0.62' Max Vel=3.48 fps Inflow=1.80 cfs 0.144 af
D=12.0" n=0.013 L=22.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=1.80 cfs 0.144 af

Reach WQI-1: Water Quality Inlet Avg. Depth=0.65' Max Vel=3.61 fps Inflow=1.95 cfs 0.150 af
D=12.0" n=0.013 L=38.0' S=0.0053 '/' Capacity=2.58 cfs Outflow=1.94 cfs 0.150 af

Pond DMH-1: Drain Manhole Inflow=2.35 cfs 0.191 af
Primary=2.35 cfs 0.191 af

Pond DMH-2: Drain Manhole Inflow=1.52 cfs 0.123 af
Primary=1.52 cfs 0.123 af

Pond DMH-3: Drain Manhole Inflow=0.96 cfs 0.078 af
Primary=0.96 cfs 0.078 af

Pond DMH-4: Drain Manhole Inflow=1.80 cfs 0.144 af
Primary=1.80 cfs 0.144 af

Pond DMH-5: Drain Manhole Inflow=2.62 cfs 0.214 af
Primary=2.62 cfs 0.214 af

Pond LS: Level Spreader Peak Elev=98.38' Storage=1,228 cf Inflow=2.62 cfs 0.214 af
Discarded=0.00 cfs 0.015 af Primary=2.44 cfs 0.181 af Outflow=2.45 cfs 0.197 af

Pond SRS-1: Subsurface Recharge System Peak Elev=96.48' Storage=9,158 cf Inflow=5.52 cfs 0.442 af
Discarded=0.03 cfs 0.153 af Primary=2.62 cfs 0.214 af Outflow=2.64 cfs 0.366 af

Pond WQI-2: Water Quality Inlet Inflow=2.34 cfs 0.191 af
Primary=2.34 cfs 0.191 af

Pond WQI-3: Water Quality Inlet Inflow=1.80 cfs 0.144 af
Primary=1.80 cfs 0.144 af

Total Runoff Area = 1.734 ac Runoff Volume = 0.624 af Average Runoff Depth = 4.32"
11.08% Pervious = 0.192 ac 88.92% Impervious = 1.542 ac

Summary for Subcatchment S-1: Roof Runoff

Runoff = 0.56 cfs @ 12.08 hrs, Volume= 0.045 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

	Area (sf)	CN	Description
*	5,177	98	Rooftop
	5,177		Impervious Area

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

Summary for Subcatchment S-10: Offsite Runoff

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
5,101	80	>75% Grass cover, Good, HSG D
1,354	98	Paved parking & roofs
6,455	84	Weighted Average
5,101		Pervious Area
1,354		Impervious Area

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

Summary for Subcatchment S-2: Tributary to WQ-1

Runoff = 1.95 cfs @ 12.08 hrs, Volume= 0.150 af, Depth= 4.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
2,509	74	>75% Grass cover, Good, HSG C
16,104	98	Paved parking
18,613	95	Weighted Average
2,509		Pervious Area
16,104		Impervious Area

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

Summary for Subcatchment S-3: Roof Runoff

Runoff = 0.28 cfs @ 12.08 hrs, Volume= 0.023 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

	Area (sf)	CN	Description
*	2,642	98	Rooftop
	2,642		Impervious Area

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

Summary for Subcatchment S-4: Tributary to CB-1

Runoff = 0.85 cfs @ 12.08 hrs, Volume= 0.067 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
385	74	>75% Grass cover, Good, HSG C
7,530	98	Paved parking
7,915	97	Weighted Average
385		Pervious Area
7,530		Impervious Area

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

Summary for Subcatchment S-5: Tributary to CB-2

Runoff = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
5,979	98	Paved parking
5,979		Impervious Area

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

Summary for Subcatchment S-6: Tributary to CB-3

Runoff = 0.88 cfs @ 12.08 hrs, Volume= 0.071 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
8,152	98	Paved parking
8,152		Impervious Area

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

Summary for Subcatchment S-7: Tributary to CB-4

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
4,356	98	Paved parking
4,356		Impervious Area

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

Summary for Subcatchment S-8: Canopy Runoff

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 4.56"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

	Area (sf)	CN	Description
*	3,732	98	Canopy
	3,732		Impervious Area

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

Summary for Subcatchment S-9: Tributary to CB-5

Runoff = 1.34 cfs @ 12.08 hrs, Volume= 0.106 af, Depth= 4.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10Yr Rainfall=4.80"

Area (sf)	CN	Description
12,128	98	Paved parking
376	74	>75% Grass cover, Good, HSG C
12,504	97	Weighted Average
376		Pervious Area
12,128		Impervious Area

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

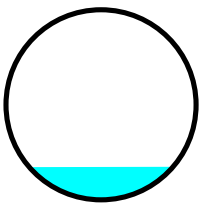
Summary for Reach CB-1: Trench Drain

Inflow Area = 0.182 ac, 95.14% Impervious, Inflow Depth = 4.45" for 10Yr event
Inflow = 0.85 cfs @ 12.08 hrs, Volume= 0.067 af
Outflow = 0.85 cfs @ 12.08 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.22 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.01 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 12.78 cfs

12.0" Diameter Pipe, n= 0.013
Length= 14.0' Slope= 0.1286 '/'
Inlet Invert= 96.20', Outlet Invert= 94.40'



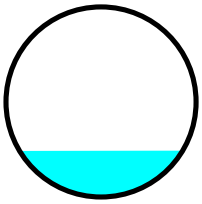
Summary for Reach CB-2: Catch Basin

Inflow Area = 0.137 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 0.64 cfs @ 12.08 hrs, Volume= 0.052 af
Outflow = 0.64 cfs @ 12.09 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.42 fps, Avg. Travel Time= 0.2 min

Peak Storage= 3 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.24'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.92 cfs

12.0" Diameter Pipe, n= 0.013
Length= 21.0' Slope= 0.0190 '/'
Inlet Invert= 95.20', Outlet Invert= 94.80'



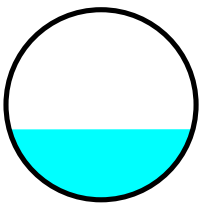
Summary for Reach CB-3: Catch Basin

Inflow Area = 0.187 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 0.88 cfs @ 12.08 hrs, Volume= 0.071 af
Outflow = 0.88 cfs @ 12.09 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.28 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.09 fps, Avg. Travel Time= 0.8 min

Peak Storage= 14 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.95 cfs

12.0" Diameter Pipe, n= 0.013
Length= 51.0' Slope= 0.0069 '/'
Inlet Invert= 95.20', Outlet Invert= 94.85'



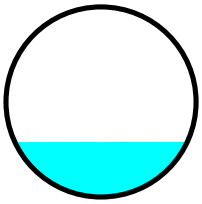
Summary for Reach CB-4: Catch Basin

Inflow Area = 0.100 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af
Outflow = 0.47 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.46 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 1.6 min

Peak Storage= 15 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.013
Length= 77.0' Slope= 0.0051 '/'
Inlet Invert= 97.65', Outlet Invert= 97.26'



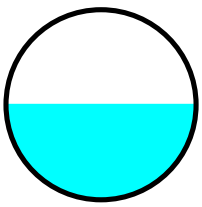
Summary for Reach CB-5: Catch Basin

Inflow Area = 0.287 ac, 96.99% Impervious, Inflow Depth = 4.45" for 10Yr event
Inflow = 1.34 cfs @ 12.08 hrs, Volume= 0.106 af
Outflow = 1.34 cfs @ 12.09 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.33 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 0.2 min

Peak Storage= 6 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.60 cfs

12.0" Diameter Pipe, n= 0.013
Length= 15.0' Slope= 0.0053 '/'
Inlet Invert= 97.34', Outlet Invert= 97.26'



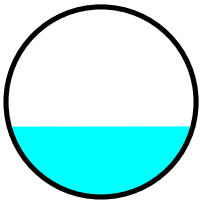
Summary for Reach P-1: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 4.52" for 10Yr event
Inflow = 2.34 cfs @ 12.10 hrs, Volume= 0.191 af
Outflow = 2.34 cfs @ 12.10 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.82 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.91 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 7.97 cfs

12.0" Diameter Pipe, n= 0.013
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 94.25', Outlet Invert= 94.00'



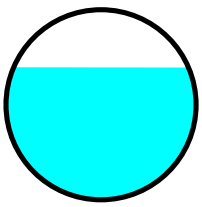
Summary for Reach P-2: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 4.52" for 10Yr event
Inflow = 2.35 cfs @ 12.10 hrs, Volume= 0.191 af
Outflow = 2.34 cfs @ 12.10 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.01 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 0.3 min

Peak Storage= 14 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.82 cfs

12.0" Diameter Pipe, n= 0.013
Length= 24.0' Slope= 0.0063 '/'
Inlet Invert= 94.40', Outlet Invert= 94.25'



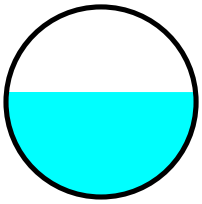
Summary for Reach P-3: 12" HDPE

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 1.52 cfs @ 12.09 hrs, Volume= 0.123 af
Outflow = 1.51 cfs @ 12.10 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.40 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 1.3 min

Peak Storage= 39 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.56 cfs

12.0" Diameter Pipe, n= 0.013
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 94.85', Outlet Invert= 94.40'



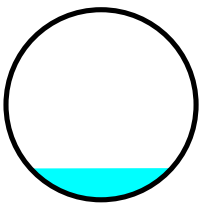
Summary for Reach P-4: 12" HDPE

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 0.96 cfs @ 12.08 hrs, Volume= 0.078 af
Outflow = 0.96 cfs @ 12.08 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.18 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.67 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 15.93 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.2000 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



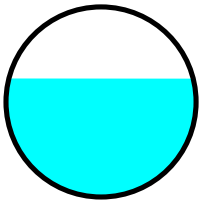
Summary for Reach P-5: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 4.48" for 10Yr event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af
Outflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.49 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 96.26', Outlet Invert= 96.21'



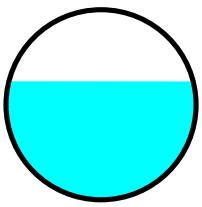
Summary for Reach P-7: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 4.48" for 10Yr event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af
Outflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.48 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 22.0' Slope= 0.0050 '/'
Inlet Invert= 97.21', Outlet Invert= 97.10'



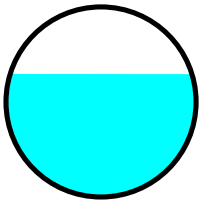
Summary for Reach WQI-1: Water Quality Inlet

Inflow Area = 0.427 ac, 86.52% Impervious, Inflow Depth = 4.22" for 10Yr event
Inflow = 1.95 cfs @ 12.08 hrs, Volume= 0.150 af
Outflow = 1.94 cfs @ 12.09 hrs, Volume= 0.150 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.61 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 0.5 min

Peak Storage= 20 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.58 cfs

12.0" Diameter Pipe, n= 0.013
Length= 38.0' Slope= 0.0053 '/'
Inlet Invert= 94.20', Outlet Invert= 94.00'



Summary for Pond DMH-1: Drain Manhole

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 4.52" for 10Yr event
Inflow = 2.35 cfs @ 12.10 hrs, Volume= 0.191 af
Primary = 2.35 cfs @ 12.10 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-2: Drain Manhole

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 1.52 cfs @ 12.09 hrs, Volume= 0.123 af
Primary = 1.52 cfs @ 12.09 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-3: Drain Manhole

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 4.56" for 10Yr event
Inflow = 0.96 cfs @ 12.08 hrs, Volume= 0.078 af
Primary = 0.96 cfs @ 12.08 hrs, Volume= 0.078 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-4: Drain Manhole

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 4.48" for 10Yr event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af
Primary = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-5: Drain Manhole

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 2.14" for 10Yr event
Inflow = 2.62 cfs @ 12.25 hrs, Volume= 0.214 af
Primary = 2.62 cfs @ 12.25 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond LS: Level Spreader

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 2.14" for 10Yr event
Inflow = 2.62 cfs @ 12.25 hrs, Volume= 0.214 af
Outflow = 2.45 cfs @ 12.31 hrs, Volume= 0.197 af, Atten= 6%, Lag= 3.9 min
Discarded = 0.00 cfs @ 12.12 hrs, Volume= 0.015 af
Primary = 2.44 cfs @ 12.31 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.38' @ 12.31 hrs Surf.Area= 492 sf Storage= 1,228 cf

Plug-Flow detention time= 180.6 min calculated for 0.197 af (92% of inflow)
Center-of-Mass det. time= 143.4 min (1,003.4 - 860.0)

Volume	Invert	Avail.Storage	Storage Description
#1	92.33'	1,352 cf	**6.00'W x 82.00'L x 7.00'H Prismatoid**
			3,444 cf Overall - 63 cf Embedded = 3,381 cf x 40.0% Voids
#2	94.33'	63 cf	**12.0"D x 80.00'L Horizontal Cylinder** Inside #1
		1,415 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.33'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	98.33'	**82.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.00 cfs @ 12.12 hrs HW=92.43' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=2.06 cfs @ 12.31 hrs HW=98.38' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 2.06 cfs @ 0.52 fps)

Summary for Pond SRS-1: Subsurface Recharge System

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 4.42" for 10Yr event
Inflow = 5.52 cfs @ 12.09 hrs, Volume= 0.442 af
Outflow = 2.64 cfs @ 12.25 hrs, Volume= 0.366 af, Atten= 52%, Lag= 9.3 min
Discarded = 0.03 cfs @ 3.85 hrs, Volume= 0.153 af
Primary = 2.62 cfs @ 12.25 hrs, Volume= 0.214 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.48' @ 12.25 hrs Surf.Area= 4,267 sf Storage= 9,158 cf

Plug-Flow detention time= 747.5 min calculated for 0.366 af (83% of inflow)
Center-of-Mass det. time= 677.9 min (1,435.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.50'	2,964 cf	**27.00'W x 114.50'L x 4.00'H Prismatoid**
			12,366 cf Overall - 4,957 cf Embedded = 7,409 cf x 40.0% Voids
#2	94.00'	4,957 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 74 Inside #1
#3	93.50'	1,076 cf	**25.00'W x 47.00'L x 4.00'H Prismatoid**
			4,700 cf Overall - 2,009 cf Embedded = 2,691 cf x 40.0% Voids
#4	94.00'	2,009 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 30 Inside #3
		11,006 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	96.00'	**8.0" x 5.0' long Culvert X 3.00**
			RCP, rounded edge headwall, Ke= 0.100
			Outlet Invert= 95.50' S= 0.1000 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.03 cfs @ 3.85 hrs HW=93.54' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=2.62 cfs @ 12.25 hrs HW=96.48' (Free Discharge)
↑**2=Culvert** (Inlet Controls 2.62 cfs @ 3.22 fps)

Summary for Pond WQI-2: Water Quality Inlet

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 4.52" for 10Yr event
Inflow = 2.34 cfs @ 12.10 hrs, Volume= 0.191 af
Primary = 2.34 cfs @ 12.10 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond WQI-3: Water Quality Inlet

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 4.48" for 10Yr event
Inflow = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af
Primary = 1.80 cfs @ 12.09 hrs, Volume= 0.144 af, Atten= 0%, Lag= 0.0 min

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

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Roof Runoff Runoff Area=5,177 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.65 cfs 0.053 af

Subcatchment S-10: Offsite Runoff Runoff Area=6,455 sf 20.98% Impervious Runoff Depth=3.82"
Tc=6.0 min CN=84 Runoff=0.66 cfs 0.047 af

Subcatchment S-2: Tributary to WQ-1 Runoff Area=18,613 sf 86.52% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=95 Runoff=2.29 cfs 0.179 af

Subcatchment S-3: Roof Runoff Runoff Area=2,642 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.33 cfs 0.027 af

Subcatchment S-4: Tributary to CB-1 Runoff Area=7,915 sf 95.14% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=97 Runoff=0.99 cfs 0.079 af

Subcatchment S-5: Tributary to CB-2 Runoff Area=5,979 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.061 af

Subcatchment S-6: Tributary to CB-3 Runoff Area=8,152 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=1.03 cfs 0.084 af

Subcatchment S-7: Tributary to CB-4 Runoff Area=4,356 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.045 af

Subcatchment S-8: Canopy Runoff Runoff Area=3,732 sf 100.00% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=98 Runoff=0.47 cfs 0.038 af

Subcatchment S-9: Tributary to CB-5 Runoff Area=12,504 sf 96.99% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=97 Runoff=1.57 cfs 0.125 af

Reach CB-1: Trench Drain Avg. Depth=0.19' Max Vel=9.65 fps Inflow=0.99 cfs 0.079 af
D=12.0" n=0.013 L=14.0' S=0.1286 '/' Capacity=12.78 cfs Outflow=0.99 cfs 0.079 af

Reach CB-2: Catch Basin Avg. Depth=0.26' Max Vel=4.53 fps Inflow=0.75 cfs 0.061 af
D=12.0" n=0.013 L=21.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=0.75 cfs 0.061 af

Reach CB-3: Catch Basin Avg. Depth=0.41' Max Vel=3.42 fps Inflow=1.03 cfs 0.084 af
D=12.0" n=0.013 L=51.0' S=0.0069 '/' Capacity=2.95 cfs Outflow=1.02 cfs 0.084 af

Reach CB-4: Catch Basin Avg. Depth=0.32' Max Vel=2.58 fps Inflow=0.55 cfs 0.045 af
D=12.0" n=0.013 L=77.0' S=0.0051 '/' Capacity=2.54 cfs Outflow=0.55 cfs 0.045 af

Reach CB-5: Catch Basin Avg. Depth=0.56' Max Vel=3.46 fps Inflow=1.57 cfs 0.125 af
D=12.0" n=0.013 L=15.0' S=0.0053 '/' Capacity=2.60 cfs Outflow=1.56 cfs 0.125 af

Reach P-1: 12" HDPE Avg. Depth=0.40' Max Vel=9.20 fps Inflow=2.74 cfs 0.224 af
D=12.0" n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=2.74 cfs 0.224 af

Reach P-2: 12" HDPE Avg. Depth=0.80' Max Vel=4.09 fps Inflow=2.75 cfs 0.224 af
D=12.0" n=0.013 L=24.0' S=0.0063 '/' Capacity=2.82 cfs Outflow=2.74 cfs 0.224 af

Reach P-3: 12" HDPE Avg. Depth=0.61' Max Vel=3.52 fps Inflow=1.78 cfs 0.145 af
D=12.0" n=0.013 L=87.0' S=0.0052 '/' Capacity=2.56 cfs Outflow=1.77 cfs 0.145 af

Reach P-4: 12" HDPE Avg. Depth=0.18' Max Vel=11.70 fps Inflow=1.12 cfs 0.091 af
D=12.0" n=0.013 L=10.0' S=0.2000 '/' Capacity=15.93 cfs Outflow=1.12 cfs 0.091 af

Reach P-5: 12" HDPE Avg. Depth=0.70' Max Vel=3.59 fps Inflow=2.11 cfs 0.170 af
D=12.0" n=0.013 L=10.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=2.10 cfs 0.170 af

Reach P-7: 12" HDPE Avg. Depth=0.70' Max Vel=3.59 fps Inflow=2.10 cfs 0.170 af
D=12.0" n=0.013 L=22.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=2.10 cfs 0.170 af

Reach WQI-1: Water Quality Inlet Avg. Depth=0.73' Max Vel=3.72 fps Inflow=2.29 cfs 0.179 af
D=12.0" n=0.013 L=38.0' S=0.0053 '/' Capacity=2.58 cfs Outflow=2.29 cfs 0.179 af

Pond DMH-1: Drain Manhole Inflow=2.75 cfs 0.224 af
Primary=2.75 cfs 0.224 af

Pond DMH-2: Drain Manhole Inflow=1.78 cfs 0.145 af
Primary=1.78 cfs 0.145 af

Pond DMH-3: Drain Manhole Inflow=1.12 cfs 0.091 af
Primary=1.12 cfs 0.091 af

Pond DMH-4: Drain Manhole Inflow=2.11 cfs 0.170 af
Primary=2.11 cfs 0.170 af

Pond DMH-5: Drain Manhole Inflow=4.40 cfs 0.292 af
Primary=4.40 cfs 0.292 af

Pond LS: Level Spreader Peak Elev=98.41' Storage=1,234 cf Inflow=4.40 cfs 0.292 af
Discarded=0.00 cfs 0.015 af Primary=4.31 cfs 0.259 af Outflow=4.31 cfs 0.274 af

Pond SRS-1: Subsurface Recharge System Peak Elev=96.74' Storage=9,708 cf Inflow=6.47 cfs 0.521 af
Discarded=0.03 cfs 0.154 af Primary=4.40 cfs 0.292 af Outflow=4.42 cfs 0.446 af

Pond WQI-2: Water Quality Inlet Inflow=2.74 cfs 0.224 af
Primary=2.74 cfs 0.224 af

Pond WQI-3: Water Quality Inlet Inflow=2.10 cfs 0.170 af
Primary=2.10 cfs 0.170 af

Total Runoff Area = 1.734 ac Runoff Volume = 0.739 af Average Runoff Depth = 5.11"
11.08% Pervious = 0.192 ac 88.92% Impervious = 1.542 ac

Summary for Subcatchment S-1: Roof Runoff

Runoff = 0.65 cfs @ 12.08 hrs, Volume= 0.053 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

	Area (sf)	CN	Description
*	5,177	98	Rooftop
	5,177		Impervious Area

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

Summary for Subcatchment S-10: Offsite Runoff

Runoff = 0.66 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
5,101	80	>75% Grass cover, Good, HSG D
1,354	98	Paved parking & roofs
6,455	84	Weighted Average
5,101		Pervious Area
1,354		Impervious Area

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

Summary for Subcatchment S-2: Tributary to WQ-1

Runoff = 2.29 cfs @ 12.08 hrs, Volume= 0.179 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
2,509	74	>75% Grass cover, Good, HSG C
16,104	98	Paved parking
18,613	95	Weighted Average
2,509		Pervious Area
16,104		Impervious Area

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

Summary for Subcatchment S-3: Roof Runoff

Runoff = 0.33 cfs @ 12.08 hrs, Volume= 0.027 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

	Area (sf)	CN	Description
*	2,642	98	Rooftop
	2,642		Impervious Area

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

Summary for Subcatchment S-4: Tributary to CB-1

Runoff = 0.99 cfs @ 12.08 hrs, Volume= 0.079 af, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
385	74	>75% Grass cover, Good, HSG C
7,530	98	Paved parking
7,915	97	Weighted Average
385		Pervious Area
7,530		Impervious Area

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

Summary for Subcatchment S-5: Tributary to CB-2

Runoff = 0.75 cfs @ 12.08 hrs, Volume= 0.061 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
5,979	98	Paved parking
5,979		Impervious Area

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

Summary for Subcatchment S-6: Tributary to CB-3

Runoff = 1.03 cfs @ 12.08 hrs, Volume= 0.084 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
8,152	98	Paved parking
8,152		Impervious Area

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

Summary for Subcatchment S-7: Tributary to CB-4

Runoff = 0.55 cfs @ 12.08 hrs, Volume= 0.045 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
4,356	98	Paved parking
4,356		Impervious Area

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

Summary for Subcatchment S-8: Canopy Runoff

Runoff = 0.47 cfs @ 12.08 hrs, Volume= 0.038 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

	Area (sf)	CN	Description
*	3,732	98	Canopy
	3,732		Impervious Area

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

Summary for Subcatchment S-9: Tributary to CB-5

Runoff = 1.57 cfs @ 12.08 hrs, Volume= 0.125 af, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25Yr Rainfall=5.60"

Area (sf)	CN	Description
12,128	98	Paved parking
376	74	>75% Grass cover, Good, HSG C
12,504	97	Weighted Average
376		Pervious Area
12,128		Impervious Area

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

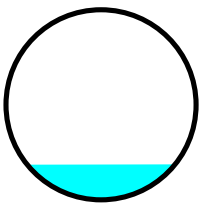
Summary for Reach CB-1: Trench Drain

Inflow Area = 0.182 ac, 95.14% Impervious, Inflow Depth = 5.25" for 25Yr event
Inflow = 0.99 cfs @ 12.08 hrs, Volume= 0.079 af
Outflow = 0.99 cfs @ 12.08 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.16 fps, Avg. Travel Time= 0.1 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 12.78 cfs

12.0" Diameter Pipe, n= 0.013
Length= 14.0' Slope= 0.1286 '/'
Inlet Invert= 96.20', Outlet Invert= 94.40'



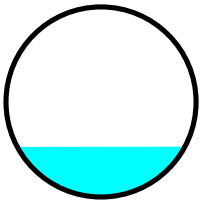
Summary for Reach CB-2: Catch Basin

Inflow Area = 0.137 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 0.061 af
Outflow = 0.75 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.49 fps, Avg. Travel Time= 0.2 min

Peak Storage= 3 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.92 cfs

12.0" Diameter Pipe, n= 0.013
Length= 21.0' Slope= 0.0190 '/'
Inlet Invert= 95.20', Outlet Invert= 94.80'



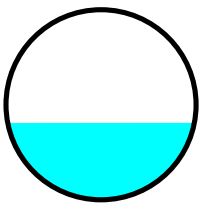
Summary for Reach CB-3: Catch Basin

Inflow Area = 0.187 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 1.03 cfs @ 12.08 hrs, Volume= 0.084 af
Outflow = 1.02 cfs @ 12.09 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.42 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.14 fps, Avg. Travel Time= 0.7 min

Peak Storage= 15 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.95 cfs

12.0" Diameter Pipe, n= 0.013
Length= 51.0' Slope= 0.0069 '/'
Inlet Invert= 95.20', Outlet Invert= 94.85'



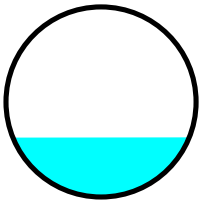
Summary for Reach CB-4: Catch Basin

Inflow Area = 0.100 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 0.55 cfs @ 12.08 hrs, Volume= 0.045 af
Outflow = 0.55 cfs @ 12.10 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.58 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.85 fps, Avg. Travel Time= 1.5 min

Peak Storage= 16 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.32'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.013
Length= 77.0' Slope= 0.0051 '/'
Inlet Invert= 97.65', Outlet Invert= 97.26'



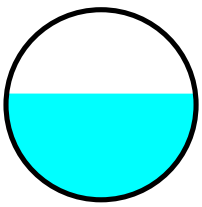
Summary for Reach CB-5: Catch Basin

Inflow Area = 0.287 ac, 96.99% Impervious, Inflow Depth = 5.25" for 25Yr event
Inflow = 1.57 cfs @ 12.08 hrs, Volume= 0.125 af
Outflow = 1.56 cfs @ 12.09 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.46 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 0.2 min

Peak Storage= 7 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.56'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.60 cfs

12.0" Diameter Pipe, n= 0.013
Length= 15.0' Slope= 0.0053 '/'
Inlet Invert= 97.34', Outlet Invert= 97.26'



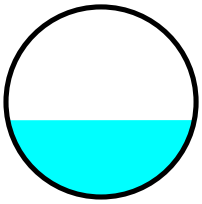
Summary for Reach P-1: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 5.32" for 25Yr event
Inflow = 2.74 cfs @ 12.10 hrs, Volume= 0.224 af
Outflow = 2.74 cfs @ 12.10 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.20 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.06 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 7.97 cfs

12.0" Diameter Pipe, n= 0.013
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 94.25', Outlet Invert= 94.00'



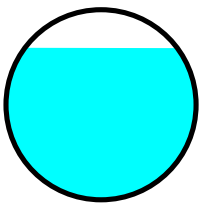
Summary for Reach P-2: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 5.32" for 25Yr event
Inflow = 2.75 cfs @ 12.09 hrs, Volume= 0.224 af
Outflow = 2.74 cfs @ 12.10 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 0.3 min

Peak Storage= 16 cf @ 12.10 hrs, Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.82 cfs

12.0" Diameter Pipe, n= 0.013
Length= 24.0' Slope= 0.0063 '/'
Inlet Invert= 94.40', Outlet Invert= 94.25'



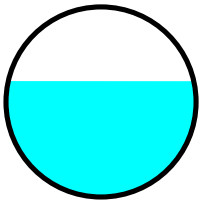
Summary for Reach P-3: 12" HDPE

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 0.145 af
Outflow = 1.77 cfs @ 12.10 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 1.2 min

Peak Storage= 44 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.61'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.56 cfs

12.0" Diameter Pipe, n= 0.013
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 94.85', Outlet Invert= 94.40'



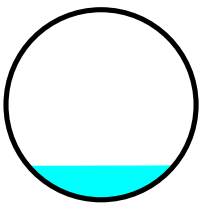
Summary for Reach P-4: 12" HDPE

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.091 af
Outflow = 1.12 cfs @ 12.08 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.70 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.85 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 15.93 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.2000 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



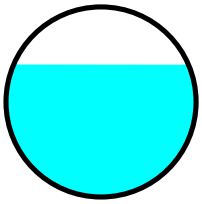
Summary for Reach P-5: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 5.28" for 25Yr event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 0.170 af
Outflow = 2.10 cfs @ 12.09 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.1 min

Peak Storage= 6 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 96.26', Outlet Invert= 96.21'



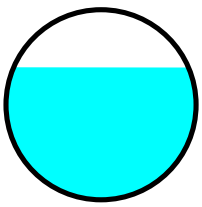
Summary for Reach P-7: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 5.28" for 25Yr event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 0.170 af
Outflow = 2.10 cfs @ 12.09 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.59 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.25 fps, Avg. Travel Time= 0.3 min

Peak Storage= 13 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.70'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 22.0' Slope= 0.0050 '/'
Inlet Invert= 97.21', Outlet Invert= 97.10'



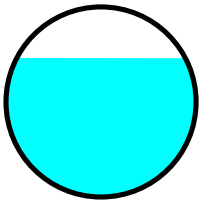
Summary for Reach WQI-1: Water Quality Inlet

Inflow Area = 0.427 ac, 86.52% Impervious, Inflow Depth = 5.01" for 25Yr event
Inflow = 2.29 cfs @ 12.08 hrs, Volume= 0.179 af
Outflow = 2.29 cfs @ 12.09 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.72 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 0.5 min

Peak Storage= 23 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.73'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.58 cfs

12.0" Diameter Pipe, n= 0.013
Length= 38.0' Slope= 0.0053 '/'
Inlet Invert= 94.20', Outlet Invert= 94.00'



Summary for Pond DMH-1: Drain Manhole

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 5.32" for 25Yr event
Inflow = 2.75 cfs @ 12.09 hrs, Volume= 0.224 af
Primary = 2.75 cfs @ 12.09 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-2: Drain Manhole

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 0.145 af
Primary = 1.78 cfs @ 12.09 hrs, Volume= 0.145 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-3: Drain Manhole

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 5.36" for 25Yr event
Inflow = 1.12 cfs @ 12.08 hrs, Volume= 0.091 af
Primary = 1.12 cfs @ 12.08 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-4: Drain Manhole

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 5.28" for 25Yr event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 0.170 af
Primary = 2.11 cfs @ 12.09 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-5: Drain Manhole

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 2.92" for 25Yr event
Inflow = 4.40 cfs @ 12.18 hrs, Volume= 0.292 af
Primary = 4.40 cfs @ 12.18 hrs, Volume= 0.292 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond LS: Level Spreader

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 2.92" for 25Yr event
Inflow = 4.40 cfs @ 12.18 hrs, Volume= 0.292 af
Outflow = 4.31 cfs @ 12.20 hrs, Volume= 0.274 af, Atten= 2%, Lag= 1.2 min
Discarded = 0.00 cfs @ 12.04 hrs, Volume= 0.015 af
Primary = 4.31 cfs @ 12.20 hrs, Volume= 0.259 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.41' @ 12.20 hrs Surf.Area= 492 sf Storage= 1,234 cf

Plug-Flow detention time= 134.1 min calculated for 0.274 af (94% of inflow)
Center-of-Mass det. time= 103.1 min (948.8 - 845.7)

Volume	Invert	Avail.Storage	Storage Description
#1	92.33'	1,352 cf	**6.00'W x 82.00'L x 7.00'H Prismatoid**
			3,444 cf Overall - 63 cf Embedded = 3,381 cf x 40.0% Voids
#2	94.33'	63 cf	**12.0"D x 80.00'L Horizontal Cylinder** Inside #1
		1,415 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.33'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	98.33'	**82.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.00 cfs @ 12.04 hrs HW=92.43' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=4.08 cfs @ 12.20 hrs HW=98.41' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 4.08 cfs @ 0.65 fps)

Summary for Pond SRS-1: Subsurface Recharge System

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 5.22" for 25Yr event
Inflow = 6.47 cfs @ 12.09 hrs, Volume= 0.521 af
Outflow = 4.42 cfs @ 12.18 hrs, Volume= 0.446 af, Atten= 32%, Lag= 5.0 min
Discarded = 0.03 cfs @ 3.27 hrs, Volume= 0.154 af
Primary = 4.40 cfs @ 12.18 hrs, Volume= 0.292 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.74' @ 12.18 hrs Surf.Area= 4,267 sf Storage= 9,708 cf

Plug-Flow detention time= 631.0 min calculated for 0.446 af (85% of inflow)
Center-of-Mass det. time= 567.8 min (1,322.4 - 754.7)

Volume	Invert	Avail.Storage	Storage Description
#1	93.50'	2,964 cf	**27.00'W x 114.50'L x 4.00'H Prismatoid**
			12,366 cf Overall - 4,957 cf Embedded = 7,409 cf x 40.0% Voids
#2	94.00'	4,957 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 74 Inside #1
#3	93.50'	1,076 cf	**25.00'W x 47.00'L x 4.00'H Prismatoid**
			4,700 cf Overall - 2,009 cf Embedded = 2,691 cf x 40.0% Voids
#4	94.00'	2,009 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 30 Inside #3
		11,006 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	96.00'	**8.0" x 5.0' long Culvert X 3.00**
			RCP, rounded edge headwall, Ke= 0.100
			Outlet Invert= 95.50' S= 0.1000 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.03 cfs @ 3.27 hrs HW=93.54' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=4.39 cfs @ 12.18 hrs HW=96.74' (Free Discharge)
↑**2=Culvert** (Inlet Controls 4.39 cfs @ 4.20 fps)

Summary for Pond WQI-2: Water Quality Inlet

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 5.32" for 25Yr event
Inflow = 2.74 cfs @ 12.10 hrs, Volume= 0.224 af
Primary = 2.74 cfs @ 12.10 hrs, Volume= 0.224 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond WQI-3: Water Quality Inlet

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 5.28" for 25Yr event
Inflow = 2.10 cfs @ 12.09 hrs, Volume= 0.170 af
Primary = 2.10 cfs @ 12.09 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min

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

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment S-1: Roof Runoff Runoff Area=5,177 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=0.82 cfs 0.067 af

Subcatchment S-10: Offsite Runoff Runoff Area=6,455 sf 20.98% Impervious Runoff Depth=5.14"
Tc=6.0 min CN=84 Runoff=0.87 cfs 0.063 af

Subcatchment S-2: Tributary to WQ-1 Runoff Area=18,613 sf 86.52% Impervious Runoff Depth=6.41"
Tc=6.0 min CN=95 Runoff=2.89 cfs 0.228 af

Subcatchment S-3: Roof Runoff Runoff Area=2,642 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=0.42 cfs 0.034 af

Subcatchment S-4: Tributary to CB-1 Runoff Area=7,915 sf 95.14% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=97 Runoff=1.24 cfs 0.101 af

Subcatchment S-5: Tributary to CB-2 Runoff Area=5,979 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=0.94 cfs 0.077 af

Subcatchment S-6: Tributary to CB-3 Runoff Area=8,152 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=1.29 cfs 0.105 af

Subcatchment S-7: Tributary to CB-4 Runoff Area=4,356 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=0.69 cfs 0.056 af

Subcatchment S-8: Canopy Runoff Runoff Area=3,732 sf 100.00% Impervious Runoff Depth=6.76"
Tc=6.0 min CN=98 Runoff=0.59 cfs 0.048 af

Subcatchment S-9: Tributary to CB-5 Runoff Area=12,504 sf 96.99% Impervious Runoff Depth=6.64"
Tc=6.0 min CN=97 Runoff=1.96 cfs 0.159 af

Reach CB-1: Trench Drain Avg. Depth=0.21' Max Vel=10.32 fps Inflow=1.24 cfs 0.101 af
D=12.0" n=0.013 L=14.0' S=0.1286 '/' Capacity=12.78 cfs Outflow=1.24 cfs 0.101 af

Reach CB-2: Catch Basin Avg. Depth=0.30' Max Vel=4.83 fps Inflow=0.94 cfs 0.077 af
D=12.0" n=0.013 L=21.0' S=0.0190 '/' Capacity=4.92 cfs Outflow=0.94 cfs 0.077 af

Reach CB-3: Catch Basin Avg. Depth=0.46' Max Vel=3.63 fps Inflow=1.29 cfs 0.105 af
D=12.0" n=0.013 L=51.0' S=0.0069 '/' Capacity=2.95 cfs Outflow=1.28 cfs 0.105 af

Reach CB-4: Catch Basin Avg. Depth=0.36' Max Vel=2.74 fps Inflow=0.69 cfs 0.056 af
D=12.0" n=0.013 L=77.0' S=0.0051 '/' Capacity=2.54 cfs Outflow=0.68 cfs 0.056 af

Reach CB-5: Catch Basin Avg. Depth=0.65' Max Vel=3.64 fps Inflow=1.96 cfs 0.159 af
D=12.0" n=0.013 L=15.0' S=0.0053 '/' Capacity=2.60 cfs Outflow=1.96 cfs 0.159 af

Reach P-1: 12" HDPE Avg. Depth=0.42' Max Vel=9.34 fps Inflow=2.91 cfs 0.283 af
D=12.0" n=0.013 L=5.0' S=0.0500 '/' Capacity=7.97 cfs Outflow=2.90 cfs 0.283 af

Reach P-2: 12" HDPE Avg. Depth=1.00' Max Vel=4.09 fps Inflow=3.44 cfs 0.283 af
D=12.0" n=0.013 L=24.0' S=0.0063 '/' Capacity=2.82 cfs Outflow=2.91 cfs 0.283 af

Reach P-3: 12" HDPE Avg. Depth=0.72' Max Vel=3.67 fps Inflow=2.22 cfs 0.183 af
D=12.0" n=0.013 L=87.0' S=0.0052 '/' Capacity=2.56 cfs Outflow=2.21 cfs 0.183 af

Reach P-4: 12" HDPE Avg. Depth=0.20' Max Vel=12.50 fps Inflow=1.40 cfs 0.115 af
D=12.0" n=0.013 L=10.0' S=0.2000 '/' Capacity=15.93 cfs Outflow=1.40 cfs 0.115 af

Reach P-5: 12" HDPE Avg. Depth=0.87' Max Vel=3.66 fps Inflow=2.64 cfs 0.215 af
D=12.0" n=0.013 L=10.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=2.64 cfs 0.215 af

Reach P-7: 12" HDPE Avg. Depth=0.87' Max Vel=3.66 fps Inflow=2.64 cfs 0.215 af
D=12.0" n=0.013 L=22.0' S=0.0050 '/' Capacity=2.52 cfs Outflow=2.64 cfs 0.215 af

Reach WQI-1: Water Quality Inlet Avg. Depth=1.00' Max Vel=3.75 fps Inflow=2.89 cfs 0.228 af
D=12.0" n=0.013 L=38.0' S=0.0053 '/' Capacity=2.58 cfs Outflow=2.72 cfs 0.228 af

Pond DMH-1: Drain Manhole Inflow=3.44 cfs 0.283 af
Primary=3.44 cfs 0.283 af

Pond DMH-2: Drain Manhole Inflow=2.22 cfs 0.183 af
Primary=2.22 cfs 0.183 af

Pond DMH-3: Drain Manhole Inflow=1.40 cfs 0.115 af
Primary=1.40 cfs 0.115 af

Pond DMH-4: Drain Manhole Inflow=2.64 cfs 0.215 af
Primary=2.64 cfs 0.215 af

Pond DMH-5: Drain Manhole Inflow=6.09 cfs 0.430 af
Primary=6.09 cfs 0.430 af

Pond LS: Level Spreader Peak Elev=98.43' Storage=1,238 cf Inflow=6.09 cfs 0.430 af
Discarded=0.00 cfs 0.015 af Primary=6.09 cfs 0.400 af Outflow=6.09 cfs 0.416 af

Pond SRS-1: Subsurface Recharge System Peak Elev=97.12' Storage=10,354 cf Inflow=7.28 cfs 0.661 af
Discarded=0.03 cfs 0.155 af Primary=6.09 cfs 0.430 af Outflow=6.12 cfs 0.585 af

Pond WQI-2: Water Quality Inlet Inflow=2.91 cfs 0.283 af
Primary=2.91 cfs 0.283 af

Pond WQI-3: Water Quality Inlet Inflow=2.64 cfs 0.215 af
Primary=2.64 cfs 0.215 af

Total Runoff Area = 1.734 ac Runoff Volume = 0.940 af Average Runoff Depth = 6.50"
11.08% Pervious = 0.192 ac 88.92% Impervious = 1.542 ac

Summary for Subcatchment S-1: Roof Runoff

Runoff = 0.82 cfs @ 12.08 hrs, Volume= 0.067 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

	Area (sf)	CN	Description
*	5,177	98	Rooftop
	5,177		Impervious Area

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

Summary for Subcatchment S-10: Offsite Runoff

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.063 af, Depth= 5.14"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
5,101	80	>75% Grass cover, Good, HSG D
1,354	98	Paved parking & roofs
6,455	84	Weighted Average
5,101		Pervious Area
1,354		Impervious Area

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

Summary for Subcatchment S-2: Tributary to WQ-1

Runoff = 2.89 cfs @ 12.08 hrs, Volume= 0.228 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
2,509	74	>75% Grass cover, Good, HSG C
16,104	98	Paved parking
18,613	95	Weighted Average
2,509		Pervious Area
16,104		Impervious Area

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

Summary for Subcatchment S-3: Roof Runoff

Runoff = 0.42 cfs @ 12.08 hrs, Volume= 0.034 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

	Area (sf)	CN	Description
*	2,642	98	Rooftop
	2,642		Impervious Area

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

Summary for Subcatchment S-4: Tributary to CB-1

Runoff = 1.24 cfs @ 12.08 hrs, Volume= 0.101 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
385	74	>75% Grass cover, Good, HSG C
7,530	98	Paved parking
7,915	97	Weighted Average
385		Pervious Area
7,530		Impervious Area

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

Summary for Subcatchment S-5: Tributary to CB-2

Runoff = 0.94 cfs @ 12.08 hrs, Volume= 0.077 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
5,979	98	Paved parking
5,979		Impervious Area

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

Summary for Subcatchment S-6: Tributary to CB-3

Runoff = 1.29 cfs @ 12.08 hrs, Volume= 0.105 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
8,152	98	Paved parking
8,152		Impervious Area

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

Summary for Subcatchment S-7: Tributary to CB-4

Runoff = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
4,356	98	Paved parking
4,356		Impervious Area

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

Summary for Subcatchment S-8: Canopy Runoff

Runoff = 0.59 cfs @ 12.08 hrs, Volume= 0.048 af, Depth= 6.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

	Area (sf)	CN	Description
*	3,732	98	Canopy
	3,732		Impervious Area

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

Summary for Subcatchment S-9: Tributary to CB-5

Runoff = 1.96 cfs @ 12.08 hrs, Volume= 0.159 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100yr Rainfall=7.00"

Area (sf)	CN	Description
12,128	98	Paved parking
376	74	>75% Grass cover, Good, HSG C
12,504	97	Weighted Average
376		Pervious Area
12,128		Impervious Area

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

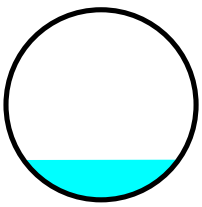
Summary for Reach CB-1: Trench Drain

Inflow Area = 0.182 ac, 95.14% Impervious, Inflow Depth = 6.64" for 100yr event
Inflow = 1.24 cfs @ 12.08 hrs, Volume= 0.101 af
Outflow = 1.24 cfs @ 12.08 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.32 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.38 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 12.78 cfs

12.0" Diameter Pipe, n= 0.013
Length= 14.0' Slope= 0.1286 '/'
Inlet Invert= 96.20', Outlet Invert= 94.40'



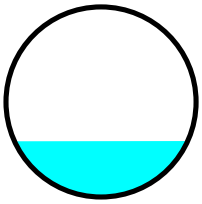
Summary for Reach CB-2: Catch Basin

Inflow Area = 0.137 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 0.94 cfs @ 12.08 hrs, Volume= 0.077 af
Outflow = 0.94 cfs @ 12.09 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 4.92 cfs

12.0" Diameter Pipe, n= 0.013
Length= 21.0' Slope= 0.0190 '/'
Inlet Invert= 95.20', Outlet Invert= 94.80'



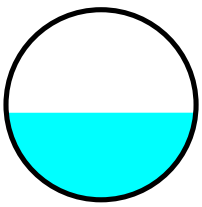
Summary for Reach CB-3: Catch Basin

Inflow Area = 0.187 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 1.29 cfs @ 12.08 hrs, Volume= 0.105 af
Outflow = 1.28 cfs @ 12.09 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 0.7 min

Peak Storage= 18 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.95 cfs

12.0" Diameter Pipe, n= 0.013
Length= 51.0' Slope= 0.0069 '/'
Inlet Invert= 95.20', Outlet Invert= 94.85'



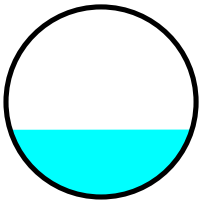
Summary for Reach CB-4: Catch Basin

Inflow Area = 0.100 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 0.69 cfs @ 12.08 hrs, Volume= 0.056 af
Outflow = 0.68 cfs @ 12.10 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.74 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.91 fps, Avg. Travel Time= 1.4 min

Peak Storage= 19 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.36'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.54 cfs

12.0" Diameter Pipe, n= 0.013
Length= 77.0' Slope= 0.0051 '/'
Inlet Invert= 97.65', Outlet Invert= 97.26'



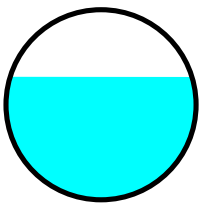
Summary for Reach CB-5: Catch Basin

Inflow Area = 0.287 ac, 96.99% Impervious, Inflow Depth = 6.64" for 100yr event
Inflow = 1.96 cfs @ 12.08 hrs, Volume= 0.159 af
Outflow = 1.96 cfs @ 12.09 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.64 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 0.2 min

Peak Storage= 8 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.65'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.60 cfs

12.0" Diameter Pipe, n= 0.013
Length= 15.0' Slope= 0.0053 '/'
Inlet Invert= 97.34', Outlet Invert= 97.26'



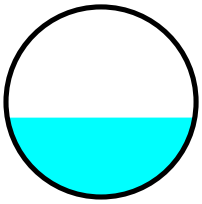
Summary for Reach P-1: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 6.72" for 100yr event
Inflow = 2.91 cfs @ 12.05 hrs, Volume= 0.283 af
Outflow = 2.90 cfs @ 12.05 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 0.0 min

Peak Storage= 2 cf @ 12.05 hrs, Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 7.97 cfs

12.0" Diameter Pipe, n= 0.013
Length= 5.0' Slope= 0.0500 '/'
Inlet Invert= 94.25', Outlet Invert= 94.00'



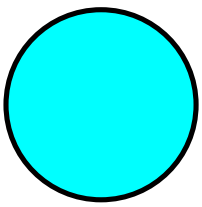
Summary for Reach P-2: 12" HDPE

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 6.72" for 100yr event
Inflow = 3.44 cfs @ 12.09 hrs, Volume= 0.283 af
Outflow = 2.91 cfs @ 12.05 hrs, Volume= 0.283 af, Atten= 16%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.09 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 0.3 min

Peak Storage= 19 cf @ 12.06 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.82 cfs

12.0" Diameter Pipe, n= 0.013
Length= 24.0' Slope= 0.0063 '/'
Inlet Invert= 94.40', Outlet Invert= 94.25'



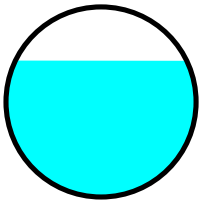
Summary for Reach P-3: 12" HDPE

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 2.22 cfs @ 12.09 hrs, Volume= 0.183 af
Outflow = 2.21 cfs @ 12.10 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.67 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 1.1 min

Peak Storage= 53 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.72'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.56 cfs

12.0" Diameter Pipe, n= 0.013
Length= 87.0' Slope= 0.0052 '/'
Inlet Invert= 94.85', Outlet Invert= 94.40'



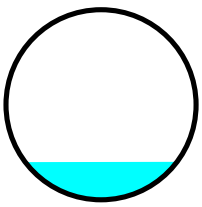
Summary for Reach P-4: 12" HDPE

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.115 af
Outflow = 1.40 cfs @ 12.08 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.50 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 0.0 min

Peak Storage= 1 cf @ 12.08 hrs, Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 15.93 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.2000 '/'
Inlet Invert= 96.00', Outlet Invert= 94.00'



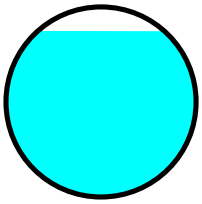
Summary for Reach P-5: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 6.67" for 100yr event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af
Outflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.1 min

Peak Storage= 7 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 96.26', Outlet Invert= 96.21'



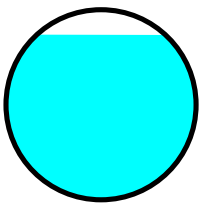
Summary for Reach P-7: 12" HDPE

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 6.67" for 100yr event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af
Outflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.66 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 0.3 min

Peak Storage= 16 cf @ 12.09 hrs, Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.52 cfs

12.0" Diameter Pipe, n= 0.013
Length= 22.0' Slope= 0.0050 '/'
Inlet Invert= 97.21', Outlet Invert= 97.10'



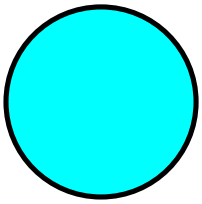
Summary for Reach WQI-1: Water Quality Inlet

Inflow Area = 0.427 ac, 86.52% Impervious, Inflow Depth = 6.41" for 100yr event
Inflow = 2.89 cfs @ 12.08 hrs, Volume= 0.228 af
Outflow = 2.72 cfs @ 12.16 hrs, Volume= 0.228 af, Atten= 6%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.75 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.39 fps, Avg. Travel Time= 0.5 min

Peak Storage= 30 cf @ 12.07 hrs, Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00', Capacity at Bank-Full= 2.58 cfs

12.0" Diameter Pipe, n= 0.013
Length= 38.0' Slope= 0.0053 '/'
Inlet Invert= 94.20', Outlet Invert= 94.00'



Summary for Pond DMH-1: Drain Manhole

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 6.72" for 100yr event
Inflow = 3.44 cfs @ 12.09 hrs, Volume= 0.283 af
Primary = 3.44 cfs @ 12.09 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-2: Drain Manhole

Inflow Area = 0.324 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 2.22 cfs @ 12.09 hrs, Volume= 0.183 af
Primary = 2.22 cfs @ 12.09 hrs, Volume= 0.183 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-3: Drain Manhole

Inflow Area = 0.205 ac,100.00% Impervious, Inflow Depth = 6.76" for 100yr event
Inflow = 1.40 cfs @ 12.08 hrs, Volume= 0.115 af
Primary = 1.40 cfs @ 12.08 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-4: Drain Manhole

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 6.67" for 100yr event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af
Primary = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond DMH-5: Drain Manhole

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 4.31" for 100yr event
Inflow = 6.09 cfs @ 12.17 hrs, Volume= 0.430 af
Primary = 6.09 cfs @ 12.17 hrs, Volume= 0.430 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond LS: Level Spreader

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 4.31" for 100yr event
Inflow = 6.09 cfs @ 12.17 hrs, Volume= 0.430 af
Outflow = 6.09 cfs @ 12.17 hrs, Volume= 0.416 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.00 cfs @ 11.84 hrs, Volume= 0.015 af
Primary = 6.09 cfs @ 12.17 hrs, Volume= 0.400 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 98.43' @ 12.17 hrs Surf.Area= 492 sf Storage= 1,238 cf

Plug-Flow detention time= 85.6 min calculated for 0.415 af (97% of inflow)
Center-of-Mass det. time= 67.1 min (899.1 - 832.0)

Volume	Invert	Avail.Storage	Storage Description
#1	92.33'	1,352 cf	**6.00'W x 82.00'L x 7.00'H Prismatoid**
			3,444 cf Overall - 63 cf Embedded = 3,381 cf x 40.0% Voids
#2	94.33'	63 cf	**12.0"D x 80.00'L Horizontal Cylinder** Inside #1
		1,415 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	92.33'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	98.33'	**82.0' long x 5.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.00 cfs @ 11.84 hrs HW=92.40' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=5.97 cfs @ 12.17 hrs HW=98.43' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 5.97 cfs @ 0.74 fps)

Summary for Pond SRS-1: Subsurface Recharge System

Inflow Area = 1.199 ac, 94.46% Impervious, Inflow Depth = 6.62" for 100yr event
Inflow = 7.28 cfs @ 12.06 hrs, Volume= 0.661 af
Outflow = 6.12 cfs @ 12.17 hrs, Volume= 0.585 af, Atten= 16%, Lag= 6.7 min
Discarded = 0.03 cfs @ 2.56 hrs, Volume= 0.155 af
Primary = 6.09 cfs @ 12.17 hrs, Volume= 0.430 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 97.12' @ 12.17 hrs Surf.Area= 4,267 sf Storage= 10,354 cf

Plug-Flow detention time= 502.1 min calculated for 0.585 af (88% of inflow)
Center-of-Mass det. time= 447.0 min (1,197.7 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	93.50'	2,964 cf	**27.00'W x 114.50'L x 4.00'H Prismatoid**
			12,366 cf Overall - 4,957 cf Embedded = 7,409 cf x 40.0% Voids
#2	94.00'	4,957 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 74 Inside #1
#3	93.50'	1,076 cf	**25.00'W x 47.00'L x 4.00'H Prismatoid**
			4,700 cf Overall - 2,009 cf Embedded = 2,691 cf x 40.0% Voids
#4	94.00'	2,009 cf	**52.6"W x 34.0"H x 7.50'L Cultec R-V8** x 30 Inside #3
		11,006 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	96.00'	**8.0" x 5.0' long Culvert X 3.00**
			RCP, rounded edge headwall, Ke= 0.100
			Outlet Invert= 95.50' S= 0.1000 '/' Cc= 0.900 n= 0.013

Discarded OutFlow Max=0.03 cfs @ 2.56 hrs HW=93.54' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=6.09 cfs @ 12.17 hrs HW=97.12' (Free Discharge)
↑**2=Culvert** (Inlet Controls 6.09 cfs @ 5.81 fps)

Summary for Pond WQI-2: Water Quality Inlet

Inflow Area = 0.506 ac, 98.25% Impervious, Inflow Depth = 6.72" for 100yr event
Inflow = 2.91 cfs @ 12.05 hrs, Volume= 0.283 af
Primary = 2.91 cfs @ 12.05 hrs, Volume= 0.283 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond WQI-3: Water Quality Inlet

Inflow Area = 0.387 ac, 97.77% Impervious, Inflow Depth = 6.67" for 100yr event
Inflow = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af
Primary = 2.64 cfs @ 12.09 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min

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

EXHIBIT "E"

TSS REMOVAL CALCULATION WORKSHEET

(MAIN OFFICE) 401 COUNTY STREET, NEW BEDFORD, MA 02740 **P** 508.717.3479 **F** 508.717.3481
ADDITIONAL OFFICES IN: TAUNTON ● MARLBOROUGH ● WARWICK, RI
WWW.FARLANDCORP.COM

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ENGINEERING | SITE WORK | LAND SURVEYING

TSS Removal Worksheet

Location:	New Bedford, MA
Project:	Cumberland Farms
Project No.:	17-1134
Prepared by:	***JKM***
Date:	***30-Oct-18***

Detention Basin 4

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining TSS Load
Infiltration Basin	80%	1.00	0.80	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	0%	0.20	0.00	0.20
	Total TSS Removal =		80%	

EXHIBIT "F"

CUSTOM SOIL RESOURCE REPORT

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

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

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

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

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

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Bristol County, Massachusetts, Southern Part														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
305B—Paxton fine sandy loam, 3 to 8 percent slopes														
Paxton	80	C	0-8	Fine sandy loam, loam, gravelly sandy loam, gravelly fine sandy loam	SM, SC-SM	A-1, A-7, A-4	0- 0- 22	0- 0- 22	47-89-89	44-89-89	34-75-85	18-43-55	0-29 -41	NP-3 -11
			8-15	Fine sandy loam, loam, gravelly sandy loam	CL-ML, GM, CL, ML, SM	A-2, A-1, A-6, A-4	0- 0- 7	0- 0- 14	52-91-91	50-91-91	38-76-87	20-44-57	0-21 -32	NP-3 -11
			15-26	Fine sandy loam, loam, gravelly sandy loam	CL-ML, ML, SM, GM, CL	A-2, A-1, A-6, A-4	0- 0- 6	0- 0- 13	56-85-92	55-85-92	41-71-88	22-41-57	0-19 -29	NP-3 -11
			26-65	Gravelly sandy loam, gravelly fine sandy loam, fine sandy loam, loam, gravelly coarse sandy loam	CL-ML, SM, ML, GM, CL	A-1, A-6, A-4, A-2-4	0- 0- 6	0- 0- 12	61-70-94	59-69-93	45-58-90	24-34-58	0-18 -28	NP-3 -11

Data Source Information

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 12, Sep 7, 2018