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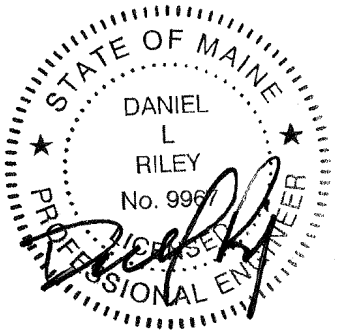
STORMWATER MANAGEMENT PLAN

Maine Medical Center
Congress Street Building
Portland, Maine

Prepared for

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

September 25, 2018



09/25/2018

STORMWATER MANAGEMENT PLAN

Maine Medical Center Congress Street Building
Portland, ME

Introduction

This Stormwater Management Plan has been prepared to address the potential impacts on stormwater runoff associated with the construction of a new hospital building on Maine Medical Center's Bramhall Campus.

The Congress Street Building project will consist of a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The proposed building replaces the existing employee-parking garage located at the corner of Congress Street and Gilman Street and includes redevelopment of the site along Congress Street. The total area of the campus affected by the work, as shown on the exhibits attached to this report is approximately 1.95 acres.

As discussed in this report, the Stormwater analysis and treatment/detention system has been designed to detain and treat rooftop runoff from the existing Visitors Parking Garage adjacent to the new building. Providing treatment from an additional 26,400 sf of parking deck that currently drains un-detained into the combined sewer system in Congress Street.

The impact of the new building is mitigated in part by redeveloping an existing parking structure with the new building whose rooftop includes green roof components.

Development on the Maine Medical Center Bramhall Campus is subject to the Maine Department of Environmental Protection (MDEP) Site location of Development Act and Chapter 500 Stormwater standards, reviewed by the City of Portland under its delegated review authority from MDEP. Based on the proposed development, the project is subject to the MDEP Chapter 500 Basic, General, and Flooding standards, including the redevelopment standards for a Site Law project, as incorporated into the City of Portland Land Use Ordinance and Site Plan review regulations.

The site is located in an area served by a combined sewer system where the City of Portland seeks to mitigate and reduce combined sewer overflow (CSO) events. The design storm events for CSO evaluation is a 1" rainfall, 24-hour design storm (CSO Storm).

Based on discussions with the City staff, the stormwater analysis and the proposed detention/treatment system has been designed to reduce the rate of runoff from the project site including both the new Congress Street Building and the existing Visitor Garage, to the greatest extent possible during this 1" CSO Storm event.

The proposed erosion controls, inspection and maintenance criteria, and the stormwater management systems have been designed to meet MDEP and City of Portland requirements. The proposed design includes a subsurface sand filter Best Management Practice (BMP) which has been designed to meet

the system sizing and treatment requirements for the new building's and redevelopment project standard. The system has been expanded to the extent practicable and to provide treatment for runoff from the adjacent parking garage.

The proposed design meets the applicable standards for system volume, but due to the limited site area, incorporating the runoff from the Visitor Garage will require waiver of the system surface area design criteria. The waiver is simply a trade-off to allow detention of existing runoff volume to address the CSO flows reduction desired by the City.

Permitting and Analysis History

A comprehensive stormwater analysis of the Maine Medical Center Bramhall Campus was completed in January 2004 as part of the Site Location of Development review, by the City of Portland, of the Bramhall Campus Expansion project. This project constructed from 2004-2007 was significant redevelopment of the campus including the construction of the Visitors Garage, Central Utility Plant and East Tower and renovations of the Emergency Department. The 2004 project also included the reconstruction and re-alignment of Crescent Street and separation of storm drainage in Gilman Street.

The redevelopment project fully separated stormwater runoff from the combined sewers within hospital property the campus and the immediately adjacent streets. The separated runoff re-enters the City's combined system at 7 locations abutting the site to facilitate future separation projects that may be undertaken by the City as part if its CSO program.

The 2004 redevelopment project included the installation of two hydrodynamic separator treatment units and separated runoff from approximately 6.3 acres of the campus and Gilman Street (uphill of A Street) the municipal separated storm drain in A Street, fully utilizing the design capacity of the A Street Storm drain.

The 2004 analysis is presented in a Stormwater Management Report dated January 2004 attached to the Maine Medical Center's January 2004 Site Location of Development Application on file in the City of Portland Planning office.

The 2004 post-development analysis subdivided the campus and tributary offsite areas into 20 onsite and offsite sub catchment areas. These sub catchment areas are the basis of the current study's pre-development analysis. The full campus watershed plan is attached for reference, identifying the sub catchments affected by the currently proposed redevelopment.

The discussion of our current analysis focuses on those sub catchments and study points affected by the proposed project, the analysis of off site areas of the campus remains unchanged from the 2004 analysis with exception of the design rainfall events which have been updated in accordance with the design rainfall adopted by the MDEP Chapter 500 regulations in August of 2015.

Site Existing Conditions

The project site includes the area occupied by the hospital's existing employee garage at the corner of Congress Street and Gilman Street. The runoff evaluation area includes portions of Congress Street to the north and east, Gilman Street to the west and the access road between the existing garage and the LL Bean Wing of the hospital to the south.

The campus located in a densely developed urban setting consisting of hospital and office buildings with their associated parking and landscaped areas, public roadways, and multi-family residential housing. The undeveloped areas of the site consist of steeply sloped land abutting Congress Street and Gilman Street. Ground cover in this area consists primarily of grass, brush and evergreen tree growth.

The subject site is located at a high point in the west end of the Portland Peninsula. Runoff from the project site is collected through a series of roof drains and catch basins and conveyed to the combined sanitary/stormwater sewers located within public streets abutting the site. There are currently two Downstream Defender units, installed in 2005, which provide stormwater quality treatment to runoff from the site. One Downstream Defender unit is located in the Visitor Garage on Congress Street, tributary to the municipal combined sewer system that runs down Forest Street to Park Avenue. The outfall of the Visitor Garage's downstream defender will be redirected to a proposed detention and treatment system associated with new Congress Street building to provide peak flow mitigation during the CSO design storm.

The second Downstream Defender unit is located along Gilman Street, in front of the Central Utility Plant, treating stormwater before it enters the municipal separated storm drain in A Street.

Soils

Soil classifications within the project area were referenced from the Cumberland County Medium Intensity Soil Survey. The site is primarily comprised of Hinckley gravelly sand loam. The project geotechnical evaluation report indicates significant depths of granular fill overlaying glacial till. For modeling purposes of this report the soils were considered hydraulic soil groups A consistent with the Cumberland County soil survey.

Proposed Development

Maine Medical Center proposes to construct a new 6 story, 264,300 square foot hospital building with an approximately 43,900 sf footprint area. The new building incorporates green roof elements and replaces the impervious surfaces associated with the existing employee-parking garage.

The Visitors Garage east of the site will remain. The drainage system from the Visitors Garage will be modified for redirect runoff to the proposed building's stormwater treatment system. The stormwater analysis was developed to consider treatment for both the proposed hospital expansion and the existing parking garage.

The site is subject to the Chapter 500 redevelopment standards as a Site Law, although the proposed development will result in the following:

Total Developed Area Subject to Treatment Standards	= 1.53 acres
Total Post Development Impervious area	= 1.19 acres
Redevelopment Impact Rating	= (- 0.5)
Redeveloped Area Requiring Treatment (50%)	= 0.77 acres
Redeveloped Area Receiving Treatment	= 1.95 acres

Regulatory Requirements

City of Portland:

The project is subject to the City of Portland's land use ordinance and Technical Standards applicable to a project with an existing Site Location of Development Permit and reviewed under the City's delegated review authority. The City's standards incorporate the MDEP Chapter 500 standards as follows.

Maine Department of Environmental Protection (MDEP)

MDEP Rule Chapters 500 and 502 describe stormwater management requirements for new development projects. These rules describe performance standards divided into five major categories: Basic Standard, General Standard, Phosphorous Standard, Urban Impaired Stream Standard, and Flooding Standard. The following sections describe how this project will address these stormwater management performance standards.

Basic Standard: A project must meet basic standards if it disturbs an area greater than one (1) acre. As this development will disturb approximately 1.53 acres, it must meet the basic standard. The standard includes various erosion and sedimentation controls, inspection and maintenance procedures, and general housekeeping requirements.

General Standard: A project is subject to the general standard if it results in the creation of one (1) or more acres of impervious area or developed areas greater than five (5) acres. As this project will include approximately 1.19 acres of impervious area, it must meet the general standard, including provisions in the General Standards for Redevelopment projects.

The redevelopment standard applicable to this project is outlined in the Chapter 500.4.C(2)(d). This standard establishes treatment requirements based on a pre and post development pollutant impact rating which establishes a sliding scale of the percentage of Developed Area which must be treated. For Site Law projects, the scale ranges from a minimum of 50% of the developed area to a maximum treatment equal to a new development.

The redevelopment calculations for the current project indicates that a minimum of 50% of the site's redevelopment must be treated. The treatment system proposed exceeds the minimum requirement

as a stand alone project including the Congress Street building and significantly exceeds the minimum standards by providing treatment for the Visitor Garage runoff.

Standard BMPs have been defined by the MDEP and are described thoroughly in their publication Stormwater Management for Maine: Best Management Practices manual, as revised March 2016.

Phosphorous Standard: A project must meet the phosphorous standards if located within a lake watershed. As this project is not tributary to a lake watershed, it is not subject to the phosphorus standard.

Urban Impaired Stream Standard: A project must meet the urban impaired stream standards if located within an urban impaired stream watershed. As this project is not tributary to an Urban Impaired Stream as defined by MDEP Chapter 502, this project is not subject to the urban impaired stream standard.

Flooding Standard: A project must meet to the flooding standards if it creates impervious areas greater than three (3) acres, or developed areas greater than twenty (20) acres. This project includes approximately 1.19 acres of impervious area; however, the City of Portland Technical Manual Section II-C states that all Level III site plans are required to meet the Maine DEP Chapter 500 flooding standard.

City of Portland Combined Sewers

In addition to the Stormwater Management provisions of the Land Use Ordinance and Technical Standards, the project is located in an area served by a combined sewer system where the City seeks to mitigate the rate of flow in the system that contribute to Combined Sewer Overflow (CSO) events. Discussions with the City Public works department in July 2018 have defined the CSO storm event to be a 1" rainfall event modeled using a 24-hour duration Type III storm distribution. The City has requested that the proposed treatment system be designed to mitigate to the extent practicable the rate of runoff from the site during this storm event, and to detain if practicable the runoff from the existing parking garage.

Quality Treatment

To meet the stormwater quality treatment requirements for the site, a subsurface sand filter BMP and a vegetated roof BMP are proposed to treat runoff from proposed development.

A subsurface sand filter utilizing a Cultec pretreatment row and ACF R-Tank detention modules is proposed to treat and store runoff generated from the roof surface of the proposed Congress Street building. Runoff from the roof will be collected in the building's roof drainage system and directed to the subsurface sand filter installed beneath the paved area of the proposed main entrance. The treated stormwater will discharge to the existing combined sewer at a new Manhole in Congress Street, tributary to Study Point C2.

The proposed subsurface sand filter has been sized based on chapter 7.3 of the Maine Department of Environmental Protection (MDEP) BMP Manual: Subsurface Sand Filters, to provide adequate treatment for the water quality volume, pretreatment of the one-year storm using an inlet control structure and isolator row, and detention for larger storm events.

Redevelopment standards apply because the proposed building will replace existing buildings and pavement areas. After completing the calculations outlined in §4.C(2)(d) of Chapter 500, the ranked impact change due to redevelopment is calculated to be -0.5. Because the project is subject to an existing Site Law Permit the minimum level of treatment required 50% of the redeveloped area.

The redevelopment impact ratings are included in Attachment A to this report.

Also included in Attachment A are tables summarizing the impervious and developed areas for the proposed development and the BMP measures treating these areas. The conclusion is a tabulation of the effective treatment percentages for the proposed development. The results of this tabulation indicate the following:

- The post-development area subject to treatment standards includes 1.53 acres of developed area on the Congress Street building site. This area is comprised of approximately 1.19 acres of impervious area (rooftop, driveway and sidewalk areas) and 0.34 acres of landscaped areas.

- The redevelopment standard requires treatment for 50% of this developed areas for a minimum of 0.77 acres.

- The total area receiving treatment is approximately 1.95 acres of developed area including the new Congress Street Building roof and entrance driveway area (1.34 acres) and the Visitor Garage (0.61 acres).

The redevelopment standard requires treatment for 50% of the new developed areas. As such, the site is required to provide treatment for a minimum of 0.77 acres. The total area receiving treatment is approximately 1.95 acres or 128% of the required area.

<u>Stormwater Treatment System</u>

A subsurface soil filter system is proposed below the Congress Street building's entrance plaza at Congress Street is proposed to provide Stormwater Quality and Quantity Treatment. The system presented on the plans is based on R-Tank chambers with Cultec chamber isolator rows for pre treatment

The system sizing criteria is provided in Attachment A to this report and summarized as follows:

Storage Volume Required	= 5,279 cf
Storage Volume Provided	= 5,385 cf
Surface Area Required (Congress Building only)	= 2,564 sf
Surface Area Required (Congress Building and Visitor Garage)	= 3,883 sf
Surface Area Provided	= 3,082 sf

Methodology:

In order to evaluate drainage characteristics as a result of the proposed development activities, a quantitative analysis was performed to determine peak runoff rates in the pre-development and post-development conditions. The evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations.

The peak runoff rates were calculated using a 24-hour duration storm event with a Type III rainfall distribution. The rainfall amounts for Cumberland County have recently been updated and the following 24-hour duration rainfall amounts were used for this report:

Storm Frequency	24-hr Duration Rainfall (in.)
CSO Storm	1.0
2-yr	3.1
10-yr	4.6
25-yr	5.8

Twenty sub catchments were analyzed in the pre-development condition, and twenty-two watersheds in the post-development condition. The pre development sub catchment delineations are based the 2004 study post-development watersheds modified to reflect site improvements constructed as part of the 2004-2007 Bramhall Campus Expansion project construction along with record drawings, and field surveys of the drainage infrastructure.

Sub catchment delineations along the hospital building rooftops are based on visible roof drain locations and record design drawings. Due to the age of a number of buildings, records indicating the locations of roof drain connections to the surrounding sewer system are not available. In these cases, the assumed watershed delineations were made based observations of the rooflines and the surrounding topography and sewer infrastructure.

Five Study Points, identified on the attached watershed plans and hydrologic model output as points SP-C1 through SP-C5 have historically been used to evaluate pre and post-developed runoff conditions from the campus. The Study Points represent locations where stormwater runoff, from the project site, enters the public drainage infrastructure system. In most cases, the capacity of the existing combined sewers is small relative the area draining to them under existing conditions. In these cases,

the study points represent the total stormwater discharge at the study point including both gutter flow and flow into the sewer.

Of these study points only two SP-C2 and SP-C3 are affected by the proposed redevelopment.

Study Point SP-C1 represents the point where stormwater runoff from the site enters a combined sewer at the intersection of Wescott Street and Crescent Street. The study point represents runoff at a manhole identified as DMH-25868 on the project plans. The sewer outlet from this manhole is a 12" cement line that drains in a westerly direction along Crescent Street, eventually draining to Park Avenue via sewers in Ellsworth Street, Congress Street and Weymouth Street.

Study Point SP-C2 represents the point where runoff from the existing Maine Medical Center parking garage, enters a combined sewer at the intersection of Congress Street and Forest Street. The study point represents runoff at a manhole SMH-13952 on the project plans. The sewer outlet from this manhole is an 18" reinforced concrete pipe that drains in a northerly direction along Forest Street to Park Avenue.

Study Point SP-C3 represents the point where runoff from areas of the project site east of the existing visitor garage enters the combined sewer system at the intersection of Gilman Street and Congress Street. At this point runoff within the sewer system discharges in a northerly direction along Gilman Street to Park Avenue. Runoff in the roadway that bypasses the catch basins at the intersection discharges in a westerly direction along Congress Street to St. John Street.

Study Point SP-C4 represents at the intersection of Gilman Street and A Street where runoff from areas of the site including the existing emergency room parking area, L.L. Bean wing, and service areas abutting the central utility plant is directed to the A Street storm drain. A Downstream Defender stormwater treatment system was installed in 2005.

Study Point SP-C5 represents runoff at the intersection of Ellsworth Street and Wescott Street. Runoff currently enters the combined sewer system via manholes in Ellsworth Street and drains in an easterly direction along Ellsworth Street towards its intersection with Congress Street.

The areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development. Due to the highly-developed nature of the site, the time of concentration in some watersheds is less than six minutes. A minimum time of concentration of six minutes was used in these cases.

Table 1 summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

Table 1 Stormwater Peak Discharge Summary Table									
Study Point	2-Year Storm			10-Year Storm			25-Year Storm		
	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)	Pre (cfs)	Post (cfs)	Diff. (cfs)
SP-C1	1.28	1.28	0.00	2.39	2.39	0.00	3.31	3.31	0.00
SP-C2	6.45	3.78	-2.67	9.14	6.88	-2.26	11.23	11.15	-0.08
SP-C3	1.72	1.53	-0.19	4.28	4.05	-0.23	5.76	5.21	-0.55
SP-C4	14.04	13.78	-0.26	25.22	24.94	-0.28	34.61	34.33	-0.28
SP-C5	1.60	1.60	0.00	3.01	3.01	0.00	4.07	4.07	0.00

The results of the stormwater modeling at Study Point SP-C1 to SP-C5 indicate that the peak rates of runoff in the post-development condition will be less than the pre-developed condition for the 2-year, 10-year, and 25-year storm events.

Study points SP-C2 and SP-C3 were further evaluated to determine the impact on peak flow rate and runoff duration from the project site during the 1" CSO Storm event. The proposed subsurface sand filter has been expanded in size to allow for the detention of runoff from the Congress building and the Parking Garage. The system outlets have been designed to maximize the detention of runoff generated from a 1" rainfall to reduce the peak rate of runoff during this storm and to extend the duration of that runoff as long as practicable to mitigate and reduce the site's contribution to offsite CSO events. The results during this event are summarized in Table 2 below.

The modeling node used to evaluate the connection point to the City system is node SMH-1 representing ESMH-13952.

Table 2 CSO Event Summary Table			
Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
ESMH-13952	1.34	0.28	-1.06 (80%)

The results of the analysis indicates that the proposed system reduces the rate of runoff at the connection to the City's combined sewer by approximately 80%.

To further evaluate the attenuation of flow from the project site during smaller storm events, Table 3 below summarized the performance of the proposed subsurface sand filter detention system identified as Node 1P+G(R-Tank System with Garage) in the model. The table below evaluates the inflow

hydrograph into the system and the outflow hydrograph to the City system during a 1" storm event. This summary most closely represents the contribution of the project site runoff, without the influence of offsite runoff.

The proposed design will reduce the peak rate of runoff from a 1" storm event by 97% compared to the un detained discharge

Table 3 CSO Event Summary Table

Study Point	1"- 24 Hour Type III Storm		
	Peak Runoff		
	Pre (cfs)	Post (cfs)	Diff. (cfs)
R-Tank System	1.48	0.04	-1.44 (97%)

Conclusion

Erosion and sedimentation controls, inspection and maintenance procedures and general housekeeping requirements have been outlined to prevent unreasonable impacts on the site and to the surrounding environment.

By utilizing Best Management practices, stormwater quality treatment has been provided for at least 50% of the total impervious area and at least 50% of the total developed area. Based on the modeling data, the post-development peak rates of runoff for the 2-year, 10-year, and 25-year storm events demonstrate decreases in the peak rates of runoff when compared to the pre-development peak rates of runoff.

The proposed detention and treatment system meets all of the applicable sizing criteria for minimum surface area, channel protection volume, sediment pretreatment volume to address the requirements for the Congress Street Building project. At the City's request, the system has been expanded to accept runoff from the adjacent Visitor Garage for the purpose of detaining runoff from the existing development during a CSO event storm.

With the addition of this area, the system continues to meet the applicable sizing criteria with the exception of the minimum surface area criteria. The proposed system provides approximately 120% of the required area for the Congress Street Building alone. The proposed system provides 80% of the required area for the combined Congress Building and parking garage footprint. Meeting the full area requirement would require an additional 800 sf of system area which is not available on this site.

With the incorporation of the above referenced erosion control, treatment and detention measures, the project has been designed in conformance with the Maine Department of Environmental Protection Chapter 500 Stormwater Law and City of Portland Stormwater Management Standards.

Accordingly, it is anticipated that stormwater runoff from the proposed development will not cause a significant adverse effect to off-site receiving channels or downstream properties.

Prepared by,

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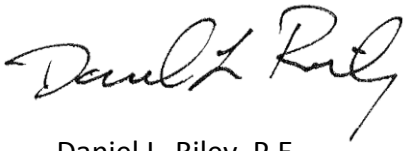

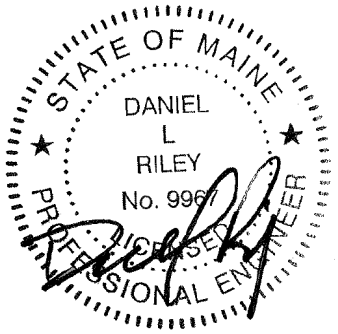

Daniel L. Riley, P.E.
Vice President, Engineering

09/25/2018

September 25, 2018

Appendix A

STORWATER QUALITY CALCULATIONS

Table 3: MDEP GENERAL STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

AREA ID	WATERSHED SIZE (S.F.)	EXISTING IMPERVIOUS AREA (To Remain) (S.F.)	NEW IMPERVIOUS AREA (S.F.)	EXISTING LANDSCAPED AREA (To Remain) (S.F.)	NEW LANDSCAPED AREA (S.F.)	NEW DEVELOPED AREA (S.F.)	UNDEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	NEW IMPERVIOUS AREA TREATED* (S.F.)	NEW LANDSCAPED AREA TREATED* (S.F.)	NEW DEVELOPED AREA TREATED* (S.F.)	TREATMENT BMP
3.1	10,051	8,335	0	1,716	0	0	0	NO	0	0	0	NONE
3.2	4,089	4,089	0	0	0	0	0	NO	0	0	0	NONE
14.1	22,477	14,929	5,018	0	2,530	7,548	0	NO	0	0	0	NONE
15.1	18,644	10,163	443	8,038	0	443	0	NO	0	0	0	NONE
17.1A	43,616	0	43,616	0	0	43,616	0	YES	43,616	0	43,616	SSSF
17.1B	14,879	0	2,836	0	12,043	14,879	0	YES	2,836	12,043	14,879	Green Roof
18	26,386	26,386	0	0	0	0	0	YES	26,386	0	26,386	SSSF
SUM	**140,142**	**63,902**	**51,913**	**9,754**	**14,573**	**66,486**	**0**	**-**	**72,838**	**12,043**	**84,881**	**-**

Designations: SSSF=Subsurface Sand Filter

TOTAL NEW IMPERVIOUS AREA (S.F.)	**51,913**	**TOTAL NEW DEVELOPED AREA (S.F.)**	**66,486**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	**72,838**	**TOTAL DEV. AREA RECEIVING TREATMENT (S.F.)**	**84,881**
% OF IMPERVIOUS AREA RECEIVING TREATMENT	**140.3%**	**% OF DEV. AREA RECEIVING TREATMENT**	**127.7%**

Table 4: MDEP REDEVELOPMENT STANDARD CALCULATIONS: MMC Congress Street Building, Portland, Maine

Existing Areas by Pollutant Ranking (S.F.)							Proposed Areas by Pollutant Ranking (S.F.)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0	6,538	17,424	1,739	43,699	0	69,400	0	328	22,153	46,919	0	0	69,400

Existing Areas by Pollutant Ranking (acres)							Proposed Areas by Pollutant Ranking (acres)						
0	1	2	3	4	5	SUM	0	1	2	3	4	5	SUM
0.000	0.150	0.400	0.040	1.003	0.000	1.593	0.000	0.008	0.509	1.077	0.000	0.000	1.593

Existing Weighted Average (Item C)	Proposed Weighted Average (Item D)
5.083	**4.256**

Total Development Area (acres)	Total Redevelopment Area (acres)
1.593	**1.593**

Ranked Impact Change Due to Redevelopment (Item E)
-0.5

Percent Increase in Developed Area
0.00%

Treatment Levels for Redevelopment Projects

Ranked Impact Change Due to Redevelopment (Item E)	Percentage of Developed Area that Must be Treated
0.0 or less	**0% (Stormwater projects)** **50% (Site projects)**
≤ 0.0 to ≥ 1.0	**60%**
> 1.0 to ≥ 2.0	**70%**
> 2.0 to ≥ 3.0	**80%**
> 3.0	**Same treatment level as for new development**

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JOB	15466 - Congress Street Building		
SHEET NO.	1	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Proposed Congress Building

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,043	SF				
Impervious Area	46,452	SF				

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,043	SF	Area	240.9	SF				
Total Impervious Area	46,452	SF	Area	2,322.6	SF				
Required Minimum Surface Area				2,563.5	SF				
Provided Surface Area				3,082.0	SF				

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,043	SF	Volume	401.4					
Impervious Area	46,452	SF	Volume	3,871.0					
CPV Required				4,272.4	CF	0.098	AF		
Provided CPV				6,800.0	CF	4,790 cf@ Elev 52.75			

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	3.32	cfs	
Iso Row sizing for: 902HD	**0.2**	cfs	
Total number of Isolator Row Chambers required:	17	25	Provided

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JOB	15466 - Congress Street Building		
SHEET NO.	2	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Existing Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	0	SF					
Impervious Area	26,386	SF					

Minimum Surface Area for sand filter and chamber system

Required	(2% X Landscaped + 5% X Impervious)					
Total Landscaped Area	0	SF	Area	0.0	SF	
Total Impervious Area	26,386	SF	Area	1,319.3	SF	
Required Minimum Surface Area				1,319.3	SF	
Provided Surface Area				*	SF	

Channel Protection Volume (CPV)

Required	(0.4" X Landscaped + 1.0" X Impervious)							
Landscaped Area	0	SF	Volume	0.0				
Impervious Area	26,386	SF	Volume	2,198.8				
Pre Treatment Credit (%)	25%							
CPV Required				1,649.1	CF	0.038	AF	
Provided CPV				*	CF			

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:		1.53	cfs
Iso Row sizing for:	902HD	**0.2**	cfs
Total number of Isolator Row Chambers required:		8	

SEBAGO TECHNICS, INC.
75 John Roberts Road Suite 4A
South Portland, Maine 04106
Tel. (207) 200-2100

JOB	15466 - Congress Street Building		
SHEET NO.	3	OF	3
CALCULATED BY	DLR	DATE	7/18/2018
FILE NAME	15466 - Stormwater calcs Congre:	PRNT DATE	9/24/2018

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References 1. Maine DEP Chapter 500, Section 4.B.(2)(b)

a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

Congress Building and Visitor Garage

Tributary to Subsurface Sand Filter #1

Landscaped Area	12,073	SF				
Impervious Area	72,838	SF				

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5% X Impervious)

Total Landscaped Area	12,073	SF	Area	241	SF	
Total Impervious Area	72,838	SF	Area	3,642	SF	
Required Minimum Surface Area				3,883	SF	
Provided Surface Area				3,082	SF	

Channel Protection Volume (CPV)

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	12,073	SF	Volume	402			
Impervious Area (Bldg)	43,558	SF	Volume	3,630			
Site Pavement	2,894						
Impervious Area (Garage)	26,386			2,199			
Pretreatment Credit (Garage, 25%)		-25%		-550		(ASSUMES 25% Pretreament Credit for HIL Unit)	
CPV Required				5,279	CF	0.121	AF
Provided CPV				5,385	CF	@ Elev 51.2	

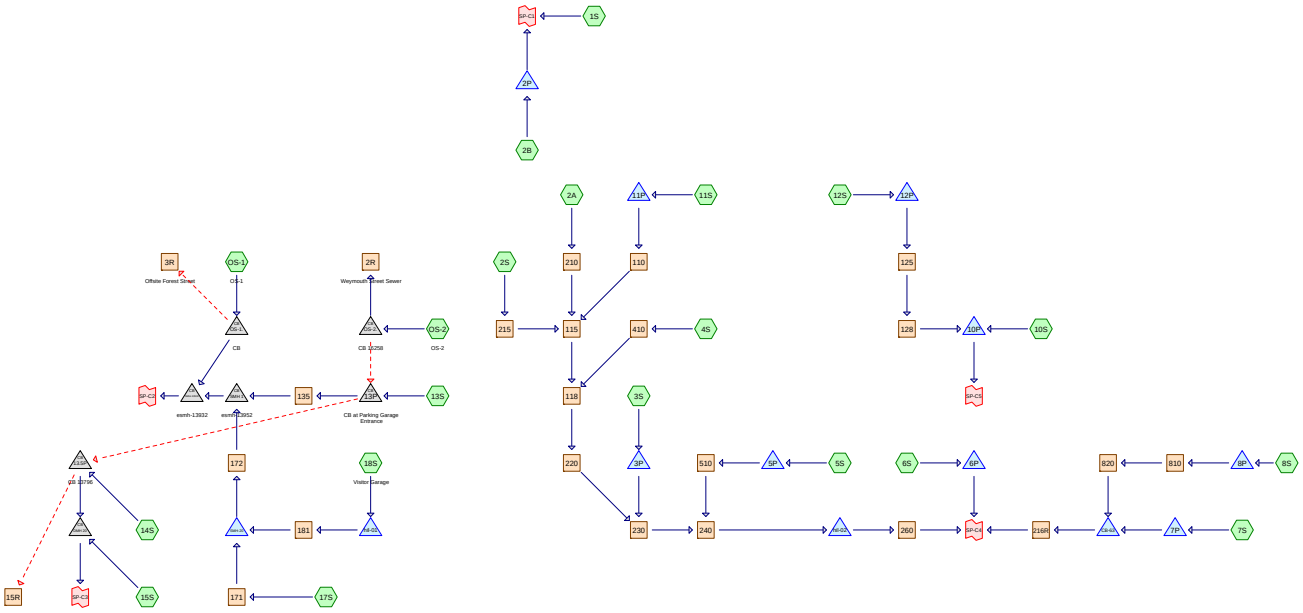
Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	4.50	cfs	
Iso Row sizing for: 902HD	**0.2**	cfs	
Total number of Isolator Row Chambers required:	23	25	

Appendix B

HYDROCAD OUTPUT



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD PRE

Prepared by Sebago Technics, Inc., Printed 9/24/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.354	39	>75% Grass cover, Good, HSG A (1S, 2B, 3S, 5S, 6S, 8S, 10S, 14S, 15S)
7.080	98	Paved parking (1S, 2A, 2B, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14S, 15S, 17S)
2.834	98	Roofs (5S, 6S, 8S, 10S, 18S)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**83**	**TOTAL AREA**

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,157	98	Paved parking
	16,157		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3S:

Runoff = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	3,076	39	>75% Grass cover, Good, HSG A
*	11,898	98	Paved parking
	14,974	86	Weighted Average
	3,076		20.54% Pervious Area
	11,898		79.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	106	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.2	222	0.0530	14.83	26.20	**Pipe Channel, PIPE C TO D** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	358	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	56,212	43	Woods/grass comb., Fair, HSG A
*	36,084	98	Paved parking
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14S:

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,684	98	Paved parking
	15,059	39	>75% Grass cover, Good, HSG A
	29,743	68	Weighted Average
	15,059		50.63% Pervious Area
	14,684		49.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	45	0.0680	0.23		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
1.0	217	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
1.7					**Direct Entry, DIRECT**
6.0	262	Total			

Summary for Subcatchment 15S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	11,909	39	>75% Grass cover, Good, HSG A
*	15,681	98	Paved parking
	27,590	73	Weighted Average
	11,909		43.16% Pervious Area
	15,681		56.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.5	190	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.5	176	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	384	Total			

Summary for Subcatchment 17S:

Runoff = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	40,392	98	Paved parking
	40,392		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	27,443	98	Roofs
	27,443		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	135	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	316	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

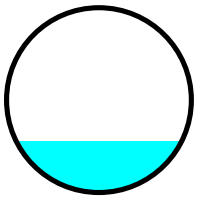
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



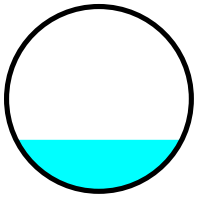
Summary for Reach 115:

Inflow Area = 1.203 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.04 cfs @ 12.10 hrs, Volume= 0.079 af
Outflow = 1.02 cfs @ 12.10 hrs, Volume= 0.079 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.73 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 0.9 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



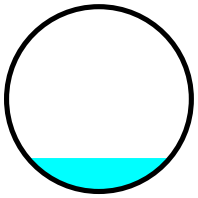
Summary for Reach 118:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.48 cfs @ 12.10 hrs, Volume= 0.114 af
Outflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.86 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.26 fps, Avg. Travel Time= 0.7 min

Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



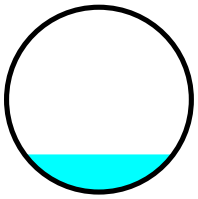
Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



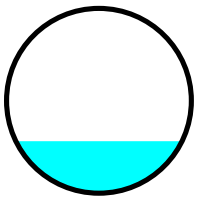
Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



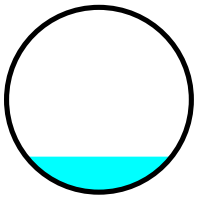
Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



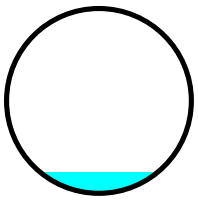
Summary for Reach 171:

Inflow Area = 0.927 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.81 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.40 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 2 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 29.32 cfs

15.0" Round Pipe
n= 0.012
Length= 31.0' Slope= 0.1755 '/'
Inlet Invert= 57.44', Outlet Invert= 52.00'



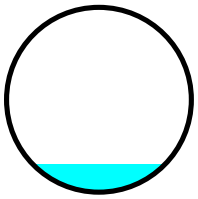
Summary for Reach 172:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Outflow = 1.34 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.53 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.82 fps, Avg. Travel Time= 0.2 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 27.27 cfs

15.0" Round Pipe
n= 0.012
Length= 38.0' Slope= 0.1518 '/'
Inlet Invert= 51.66', Outlet Invert= 45.89'



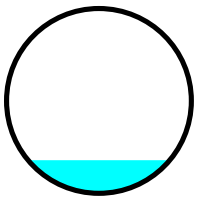
Summary for Reach 181:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Outflow = 0.54 cfs @ 12.10 hrs, Volume= 0.042 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.81 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.91 fps, Avg. Travel Time= 0.9 min

Peak Storage= 10 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 7.96 cfs

12.0" Round Pipe
n= 0.012
Length= 104.0' Slope= 0.0425 '/'
Inlet Invert= 56.28', Outlet Invert= 51.86'



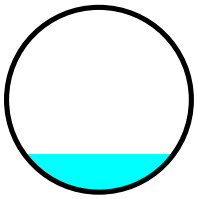
Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



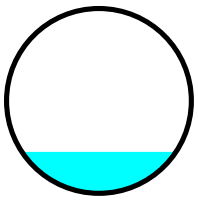
Summary for Reach 215:

Inflow Area = 0.371 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.32 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.32 cfs @ 12.10 hrs, Volume= 0.024 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 1.1 min

Peak Storage= 7 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



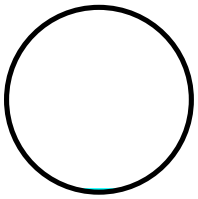
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



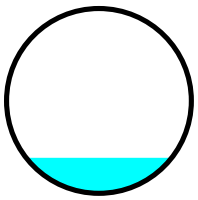
Summary for Reach 220:

Inflow Area = 1.737 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.47 cfs @ 12.11 hrs, Volume= 0.114 af
Outflow = 1.42 cfs @ 12.12 hrs, Volume= 0.114 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.18 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.05 fps, Avg. Travel Time= 1.8 min

Peak Storage= 51 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



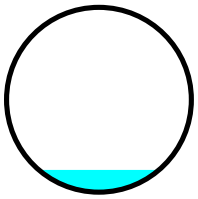
Summary for Reach 230:

Inflow Area = 2.081 ac, 96.61% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.48 cfs @ 12.12 hrs, Volume= 0.120 af
Outflow = 1.47 cfs @ 12.13 hrs, Volume= 0.120 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.41 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.27 fps, Avg. Travel Time= 0.3 min

Peak Storage= 10 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



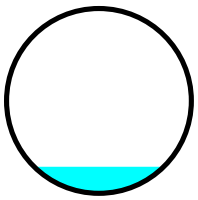
Summary for Reach 240:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 2.00 cfs @ 12.12 hrs, Volume= 0.167 af
Outflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 2%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.83 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.43 fps, Avg. Travel Time= 0.4 min

Peak Storage= 15 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



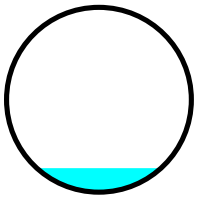
Summary for Reach 260:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Outflow = 1.96 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.28 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.87 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



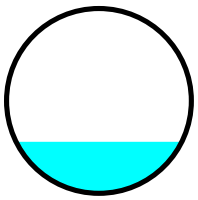
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



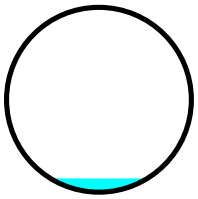
Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



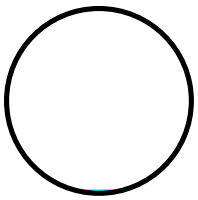
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



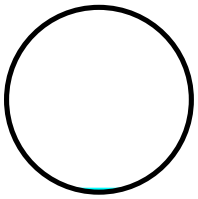
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900
n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.344 ac, 79.46% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.683 ac, 49.37% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 23.95 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 23.95 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 23.95 hrs HW=42.50' (Free Discharge)
└**1=12" SD** (Passes 0.00 cfs of 4.72 cfs potential flow)
└**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.06 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB at Parking Garage Entrance

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads
#2	Secondary	66.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
└**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.8 min
Primary = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)
Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.61' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=37.61' (Free Discharge)
1=12" SD (Inlet Controls 0.00 cfs @ 0.45 fps)

Summary for Pond hil-01:

Inflow Area = 0.630 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af
Primary = 0.55 cfs @ 12.09 hrs, Volume= 0.042 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.951 ac, 86.33% Impervious, Inflow Depth = 0.41" for 1-Inch event
Inflow = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af
Primary = 1.97 cfs @ 12.13 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
↑└**1=Stormdrain** (Passes 0.07 cfs of 5.24 cfs potential flow)
↑└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
↑└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min
Primary = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
└**1=Stormdrain** (Passes 0.30 cfs of 3.12 cfs potential flow)
└**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond SMH 1: esmh-13952

Inflow Area = 2.384 ac, 95.01% Impervious, Inflow Depth = 0.63" for 1-Inch event
Inflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af
Outflow = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.10 hrs, Volume= 0.125 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 45.19' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0660 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.60 cfs @ 12.10 hrs HW=45.18' (Free Discharge)
└**1=Sewer** (Inlet Controls 1.60 cfs @ 2.58 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Outflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 41.23' @ 12.10 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=1.70 cfs @ 12.10 hrs HW=41.23' (Free Discharge)
└**1=Sewer** (Inlet Controls 1.70 cfs @ 2.62 fps)

Summary for Pond SMH-20:

Inflow Area = 1.557 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af
Primary = 1.35 cfs @ 12.09 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 2.775 ac, 93.60% Impervious, Inflow Depth = 0.58" for 1-Inch event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Primary = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 1.316 ac, 52.96% Impervious, Inflow Depth = 0.01" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.370 ac, 71.34% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af
Primary = 2.00 cfs @ 12.13 hrs, Volume= 0.176 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.09 cfs 0.089 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=1.75"
Flow Length=358' Tc=6.0 min CN=86 Runoff=0.69 cfs 0.050 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=0.68"
Flow Length=262' Tc=6.0 min CN=68 Runoff=0.45 cfs 0.039 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=0.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=0.62 cfs 0.049 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=188' Tc=6.0 min CN=98 Runoff=2.72 cfs 0.222 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=316' Tc=6.0 min CN=98 Runoff=1.85 cfs 0.151 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.68' Max Vel=5.19 fps Inflow=3.51 cfs 0.288 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.48 cfs 0.288 af

Reach 118: Avg. Flow Depth=0.50' Max Vel=9.76 fps Inflow=5.04 cfs 0.415 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=5.01 cfs 0.415 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.28' Max Vel=9.40 fps Inflow=1.29 cfs 0.136 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.28 cfs 0.136 af

Reach 171: Avg. Flow Depth=0.26' Max Vel=14.91 fps Inflow=2.72 cfs 0.222 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=2.72 cfs 0.222 af

Reach 172: Avg. Flow Depth=0.35' Max Vel=16.46 fps Inflow=4.56 cfs 0.372 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=4.55 cfs 0.372 af

Reach 181: Avg. Flow Depth=0.33' Max Vel=8.24 fps Inflow=1.85 cfs 0.151 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=1.84 cfs 0.151 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.42' Max Vel=3.48 fps Inflow=1.09 cfs 0.089 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.08 cfs 0.089 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.54' Max Vel=8.82 fps Inflow=5.01 cfs 0.415 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.91 cfs 0.415 af

Reach 230: Avg. Flow Depth=0.34' Max Vel=18.51 fps Inflow=5.59 cfs 0.465 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.57 cfs 0.465 af

Reach 240: Avg. Flow Depth=0.51' Max Vel=21.42 fps Inflow=11.29 cfs 0.883 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=11.25 cfs 0.883 af

Reach 260: Avg. Flow Depth=0.61' Max Vel=13.86 fps Inflow=11.25 cfs 0.883 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=11.22 cfs 0.883 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.69 cfs 0.050 af
Primary=0.69 cfs 0.050 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.81' Inflow=1.10 cfs 0.045 af
Primary=1.10 cfs 0.045 af Secondary=0.00 cfs 0.000 af Outflow=1.10 cfs 0.045 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.29' Inflow=1.94 cfs 0.143 af
Primary=1.29 cfs 0.136 af Secondary=0.65 cfs 0.007 af Outflow=1.94 cfs 0.143 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: Peak Elev=38.30' Inflow=1.72 cfs 0.094 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=1.72 cfs 0.094 af

Pond hil-01: Inflow=1.85 cfs 0.151 af
Primary=1.85 cfs 0.151 af

Pond hil-02: Inflow=11.25 cfs 0.883 af
Primary=11.25 cfs 0.883 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH 1: esmh-13952 Peak Elev=45.84' Inflow=5.83 cfs 0.509 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=5.83 cfs 0.509 af

Pond SMH-13932: esmh-13932 Peak Elev=41.96' Inflow=6.45 cfs 0.572 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.45 cfs 0.572 af

Pond SMH-20: Inflow=4.56 cfs 0.372 af
Primary=4.56 cfs 0.372 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=6.45 cfs 0.572 af
Primary=6.45 cfs 0.572 af

Link SP-C3: Inflow=1.72 cfs 0.094 af
Primary=1.72 cfs 0.094 af

Link SP-C4: Inflow=14.04 cfs 1.117 af
Primary=14.04 cfs 1.117 af

Link SP-C5: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.219 af Average Runoff Depth = 1.69"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=244' Tc=6.0 min CN=98 Runoff=1.63 cfs 0.135 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=3.10"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.21 cfs 0.089 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=1.60"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.21 cfs 0.091 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=1.97"
Flow Length=384' Tc=6.0 min CN=73 Runoff=1.42 cfs 0.104 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=188' Tc=6.0 min CN=98 Runoff=4.07 cfs 0.337 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=316' Tc=6.0 min CN=98 Runoff=2.77 cfs 0.229 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=0.81 cfs 0.006 af
Outflow=0.81 cfs 0.006 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.89' Max Vel=5.64 fps Inflow=5.25 cfs 0.438 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.21 cfs 0.438 af

Reach 118: Avg. Flow Depth=0.62' Max Vel=10.90 fps Inflow=7.54 cfs 0.632 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.50 cfs 0.632 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.31' Max Vel=9.87 fps Inflow=1.55 cfs 0.215 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.54 cfs 0.215 af

Reach 171: Avg. Flow Depth=0.31' Max Vel=16.76 fps Inflow=4.07 cfs 0.337 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=4.07 cfs 0.337 af

Reach 172: Avg. Flow Depth=0.43' Max Vel=18.44 fps Inflow=6.81 cfs 0.566 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=6.81 cfs 0.566 af

Reach 181: Avg. Flow Depth=0.41' Max Vel=9.21 fps Inflow=2.77 cfs 0.229 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=2.75 cfs 0.229 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.53' Max Vel=3.86 fps Inflow=1.63 cfs 0.135 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.62 cfs 0.135 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.67' Max Vel=9.84 fps Inflow=7.50 cfs 0.632 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.37 cfs 0.632 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.94 fps Inflow=8.56 cfs 0.720 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.53 cfs 0.720 af

Reach 240: Avg. Flow Depth=0.67' Max Vel=24.51 fps Inflow=18.55 cfs 1.461 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.50 cfs 1.461 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.91 fps Inflow=18.50 cfs 1.461 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.46 cfs 1.461 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.21 cfs 0.089 af
Primary=1.21 cfs 0.089 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.10' Inflow=3.67 cfs 0.129 af
Primary=2.86 cfs 0.123 af Secondary=0.81 cfs 0.006 af Outflow=3.67 cfs 0.129 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.41' Inflow=4.01 cfs 0.253 af
Primary=1.55 cfs 0.215 af Secondary=2.47 cfs 0.038 af Outflow=4.01 cfs 0.253 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: Peak Elev=39.37' Inflow=4.28 cfs 0.227 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.28 cfs 0.227 af

Pond hil-01: Inflow=2.77 cfs 0.229 af
Primary=2.77 cfs 0.229 af

Pond hil-02: Inflow=18.50 cfs 1.461 af
Primary=18.50 cfs 1.461 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH 1: esmh-13952 Peak Elev=46.32' Inflow=8.33 cfs 0.781 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=8.33 cfs 0.781 af

Pond SMH-13932: esmh-13932 Peak Elev=42.54' Inflow=9.14 cfs 0.884 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=9.14 cfs 0.884 af

Pond SMH-20: Inflow=6.81 cfs 0.566 af
Primary=6.81 cfs 0.566 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=9.14 cfs 0.884 af
Primary=9.14 cfs 0.884 af

Link SP-C3: Inflow=4.28 cfs 0.227 af
Primary=4.28 cfs 0.227 af

Link SP-C4: Inflow=25.22 cfs 1.972 af
Primary=25.22 cfs 1.972 af

Link SP-C5: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.847 af Average Runoff Depth = 2.92"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=244' Tc=6.0 min CN=98 Runoff=2.06 cfs 0.172 af

Subcatchment3S: Runoff Area=14,974 sf 79.46% Impervious Runoff Depth=4.22"
Flow Length=358' Tc=6.0 min CN=86 Runoff=1.63 cfs 0.121 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14S: Runoff Area=29,743 sf 49.37% Impervious Runoff Depth=2.47"
Flow Length=262' Tc=6.0 min CN=68 Runoff=1.92 cfs 0.140 af

Subcatchment15S: Runoff Area=27,590 sf 56.84% Impervious Runoff Depth=2.92"
Flow Length=384' Tc=6.0 min CN=73 Runoff=2.13 cfs 0.154 af

Subcatchment 17S: Runoff Area=40,392 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=188' Tc=6.0 min CN=98 Runoff=5.15 cfs 0.430 af

Subcatchment 18S: Visitor Garage Runoff Area=27,443 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=316' Tc=6.0 min CN=98 Runoff=3.50 cfs 0.292 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.41 cfs 0.027 af
Outflow=2.41 cfs 0.027 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.15' Max Vel=5.72 fps Inflow=6.64 cfs 0.558 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.57 cfs 0.558 af

Reach 118: Avg. Flow Depth=0.71' Max Vel=11.58 fps Inflow=9.50 cfs 0.805 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.46 cfs 0.805 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.32' Max Vel=10.11 fps Inflow=1.70 cfs 0.273 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.69 cfs 0.273 af

Reach 171: Avg. Flow Depth=0.35' Max Vel=17.93 fps Inflow=5.15 cfs 0.430 af
15.0" Round Pipe n=0.012 L=31.0' S=0.1755 '/' Capacity=29.32 cfs Outflow=5.14 cfs 0.430 af

Reach 172: Avg. Flow Depth=0.48' Max Vel=19.67 fps Inflow=8.62 cfs 0.722 af
15.0" Round Pipe n=0.012 L=38.0' S=0.1518 '/' Capacity=27.27 cfs Outflow=8.61 cfs 0.722 af

Reach 181: Avg. Flow Depth=0.46' Max Vel=9.79 fps Inflow=3.50 cfs 0.292 af
12.0" Round Pipe n=0.012 L=104.0' S=0.0425 '/' Capacity=7.96 cfs Outflow=3.48 cfs 0.292 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.61' Max Vel=4.07 fps Inflow=2.06 cfs 0.172 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=2.04 cfs 0.172 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.44 fps Inflow=9.46 cfs 0.805 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.32 cfs 0.805 af

Reach 230: Avg. Flow Depth=0.48' Max Vel=22.44 fps Inflow=10.92 cfs 0.926 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.89 cfs 0.926 af

Reach 240: Avg. Flow Depth=0.78' Max Vel=26.27 fps Inflow=24.37 cfs 1.935 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.31 cfs 1.935 af

Reach 260: Avg. Flow Depth=0.93' Max Vel=17.11 fps Inflow=24.31 cfs 1.935 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=24.27 cfs 1.935 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.63 cfs 0.121 af
Primary=1.63 cfs 0.121 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.21' Inflow=6.05 cfs 0.218 af
Primary=3.64 cfs 0.190 af Secondary=2.41 cfs 0.027 af Outflow=6.05 cfs 0.218 af

Pond 13P: CB at Parking Garage Entrance Peak Elev=66.50' Inflow=5.84 cfs 0.351 af
Primary=1.70 cfs 0.273 af Secondary=4.14 cfs 0.077 af Outflow=5.84 cfs 0.351 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: Peak Elev=40.41' Inflow=5.76 cfs 0.345 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.76 cfs 0.345 af

Pond hil-01: Inflow=3.50 cfs 0.292 af
Primary=3.50 cfs 0.292 af

Pond hil-02: Inflow=24.31 cfs 1.935 af
Primary=24.31 cfs 1.935 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH 1: esmh-13952 Peak Elev=46.82' Inflow=10.28 cfs 0.995 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0660 '/' Outflow=10.28 cfs 0.995 af

Pond SMH-13932: esmh-13932 Peak Elev=43.13' Inflow=11.23 cfs 1.128 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=11.23 cfs 1.128 af

Pond SMH-20: Inflow=8.62 cfs 0.722 af
Primary=8.62 cfs 0.722 af

Link SP-C1: Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

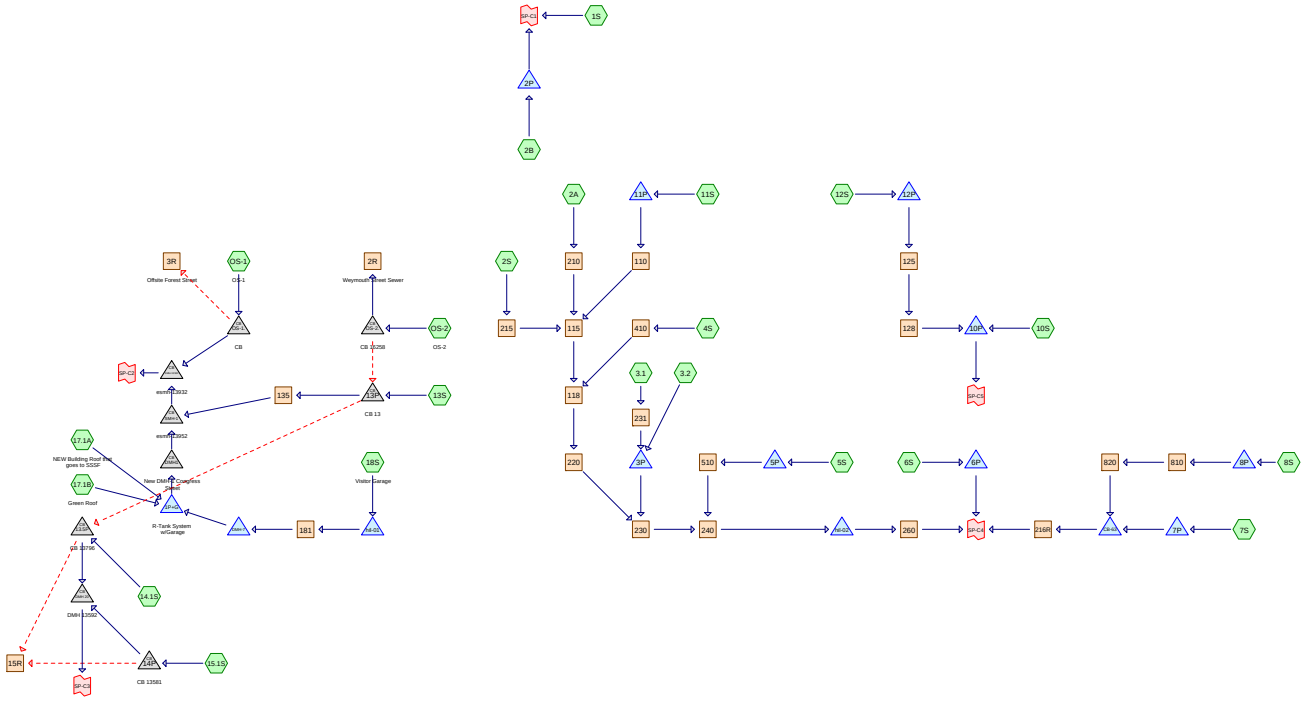
Link SP-C2: Inflow=11.23 cfs 1.128 af
Primary=11.23 cfs 1.128 af

Link SP-C3: Inflow=5.76 cfs 0.345 af
Primary=5.76 cfs 0.345 af

Link SP-C4: Inflow=34.61 cfs 2.702 af
Primary=34.61 cfs 2.702 af

Link SP-C5: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Total Runoff Area = 15.783 ac Runoff Volume = 5.230 af Average Runoff Depth = 3.98"
26.42% Pervious = 4.170 ac 73.58% Impervious = 11.613 ac



Subcat Reach Pond Link

Routing Diagram for 15466 - Congress CD Post Dev 20180207
Prepared by Sebago Technics, Inc., Printed 9/24/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.026	39	>75% Grass cover, Good, HSG A (1S, 2B, 2S, 3.1, 3.2, 5S, 6S, 8S, 10S, 14.1S, 15.1S)
0.276	86	Green roof (no Walkways) (17.1B)
6.639	98	Paved parking (1S, 2A, 2B, 2S, 3.1, 3.2, 4S, 5S, 6S, 7S, 8S, 10S, 11S, 12S, 13S, 14.1S, 15.1S, 18S)
0.028	98	Paved parking & roofs (17.1A)
3.260	98	Roofs (2S, 5S, 6S, 8S, 10S, 17.1A, 17.1B)
1.998	89	Urban commercial, 85% imp, HSG A (13S, OS-1, OS-2)
0.039	98	Walkways (17.1B)
1.517	43	Woods/grass comb., Fair, HSG A (7S, 8S, 13S)
15.783	**84**	**TOTAL AREA**

Summary for Subcatchment 1S:

Runoff = 0.03 cfs @ 12.16 hrs, Volume= 0.004 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,272	98	Paved parking
	5,174	39	>75% Grass cover, Good, HSG A
	19,446	82	Weighted Average
	5,174		26.61% Pervious Area
	14,272		73.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	40	0.0500	0.20		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.2	33	0.0500	3.35		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.3	82	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.1	74	0.0500	10.99	8.63	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.0					**Direct Entry, DIRECT**
6.0	229	Total			

Summary for Subcatchment 2A:

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,217	98	Paved parking
	25,217		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.3	112	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
3.9					**Direct Entry, DIRECT**
6.0	142	Total			

Summary for Subcatchment 2B:

Runoff = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	10,133	98	Paved parking
	3,735	39	>75% Grass cover, Good, HSG A
	13,868	82	Weighted Average
	3,735		26.93% Pervious Area
	10,133		73.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	123	0.0380	3.96		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
2.0	131	0.0005	1.10	0.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.9					**Direct Entry, DIRECT**
6.0	284	Total			

Summary for Subcatchment 2S:

Runoff = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,481	98	Paved parking
	2,220	39	>75% Grass cover, Good, HSG A
*	2,456	98	Roofs
	16,157	90	Weighted Average
	2,220		13.74% Pervious Area
	13,937		86.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	30	0.0180	1.00		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	78	0.0370	3.90		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	136	0.0107	5.08	3.99	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.8					**Direct Entry, DIRECT**
6.0	244	Total			

Summary for Subcatchment 3.1:

Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	1,661	39	>75% Grass cover, Good, HSG A
*	8,390	98	Paved parking
	10,051	88	Weighted Average
	1,661		16.53% Pervious Area
	8,390		83.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0250	1.14		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.6	220	0.0810	5.78		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
5.0					**Direct Entry, DIRECT**
6.0	250	Total			

Summary for Subcatchment 3.2:

Runoff = 0.00 cfs @ 12.36 hrs, Volume= 0.001 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	2,788	98	Paved parking
	1,301	39	>75% Grass cover, Good, HSG A
	4,089	79	Weighted Average
	1,301		31.82% Pervious Area
	2,788		68.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	66	0.0250	1.34		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
5.2					**Direct Entry, DIRECT**
6.0	66	Total			

Summary for Subcatchment 4S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,249	98	Paved parking
	23,249		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	50	0.0050	0.67		**Sheet Flow, SHEET A TO B**
					Smooth surfaces n= 0.011 P2= 3.00"
1.3	110	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C**
					Paved Kv= 20.3 fps
3.4					**Direct Entry, DIRECT**
6.0	160	Total			

Summary for Subcatchment 5S:

Runoff = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	25,085	98	Paved parking
	26,415	39	>75% Grass cover, Good, HSG A
*	73,528	98	Roofs
	125,028	86	Weighted Average
	26,415		21.13% Pervious Area
	98,613		78.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	35	0.0050	0.62		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
2.2	355	0.0050	2.65	0.93	**Pipe Channel, PIPE B TO C** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.1	35	0.0300	8.51	6.69	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.2	85	0.0160	6.22	4.88	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
2.6					**Direct Entry, DIRECT**
6.0	510	Total			

Summary for Subcatchment 6S:

Runoff = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	2,282	39	>75% Grass cover, Good, HSG A
*	501	98	Paved parking
*	8,302	98	Roofs
	11,085	86	Weighted Average
	2,282		20.59% Pervious Area
	8,803		79.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	30	0.0100	0.79		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	64	0.0100	3.75	1.31	**Pipe Channel, PIPE B TO C (ROOF DRAIN)** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
0.0	27	0.0740	10.20	3.56	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.1					**Direct Entry, DIRECT**
6.0	121	Total			

Summary for Subcatchment 7S:

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	36,084	98	Paved parking
	56,212	43	Woods/grass comb., Fair, HSG A
	92,296	65	Weighted Average
	56,212		60.90% Pervious Area
	36,084		39.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	75	0.0400	1.66		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.5	78	0.0180	2.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.7	219	0.0590	4.93		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.2	72	0.0970	6.32		**Shallow Concentrated Flow, SHALLOW D TO E** Paved Kv= 20.3 fps
0.2	190	0.1020	15.70	12.33	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.6					**Direct Entry, DIRECT**
6.0	634	Total			

Summary for Subcatchment 8S:

Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	16,895	98	Paved parking
	7,542	43	Woods/grass comb., Fair, HSG A
	8,958	39	>75% Grass cover, Good, HSG A
*	12,138	98	Roofs
	45,533	77	Weighted Average
	16,500		36.24% Pervious Area
	29,033		63.76% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	40	0.0050	0.64		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	93	0.0100	4.91	3.86	**Pipe Channel, PIPE B TO C** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.5	135	0.0100	4.91	3.86	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.4	131	0.0100	4.91	3.86	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
3.8					**Direct Entry, DIRECT**
6.0	399	Total			

Summary for Subcatchment 10S:

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	25,937	39	>75% Grass cover, Good, HSG A
*	9,276	98	Paved parking
*	2,034	98	Roofs
	37,247	57	Weighted Average
	25,937		69.64% Pervious Area
	11,310		30.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	30	0.0400	1.38		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	37	0.0540	4.72		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	75	0.0200	2.87		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
0.3	113	0.0210	7.12	5.59	**Pipe Channel, PIPE D TO E** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
0.3	71	0.0050	3.47	2.73	**Pipe Channel, PIPE E TO F** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.5					**Direct Entry, DIRECT**
6.0	326	Total			

Summary for Subcatchment 11S:

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	11,050	98	Paved parking
	11,050		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.7	60	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.5					**Direct Entry, DIRECT**
6.0	90	Total			

Summary for Subcatchment 12S:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	23,268	98	Paved parking
	23,268		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	30	0.0050	0.60		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.9	80	0.0050	1.44		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.4	90	0.0100	3.75	1.31	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
3.9					**Direct Entry, DIRECT**
6.0	200	Total			

Summary for Subcatchment 13S:

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	14,571	98	Paved parking
	2,309	43	Woods/grass comb., Fair, HSG A
	19,134	89	Urban commercial, 85% imp, HSG A
	36,014	90	Weighted Average
	5,179		14.38% Pervious Area
	30,835		85.62% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	40	0.1000	0.12		**Sheet Flow, SHEET A TO B** Woods: Light underbrush n= 0.400 P2= 3.00"
0.2	51	0.6400	4.00		**Shallow Concentrated Flow, SHALLOW B TO C** Woodland Kv= 5.0 fps
0.4	105	0.0420	4.16		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
6.2	196	Total			

Summary for Subcatchment 14.1S:

Runoff = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	19,947	98	Paved parking
	2,530	39	>75% Grass cover, Good, HSG A
	22,477	91	Weighted Average
	2,530		11.26% Pervious Area
	19,947		88.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	30	0.0500	1.51		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
1.4	295	0.0320	3.63		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
4.3					**Direct Entry, DIRECT ENTRY**
6.0	325	Total			

Summary for Subcatchment 15.1S:

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
	8,038	39	>75% Grass cover, Good, HSG A
*	10,606	98	Paved parking
	18,644	73	Weighted Average
	8,038		43.11% Pervious Area
	10,606		56.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	18	0.2770	0.33		**Sheet Flow, SHEET A TO B** Grass: Short n= 0.150 P2= 3.00"
0.4	170	0.1920	6.57		**Shallow Concentrated Flow, SHALLOW B TO C** Grassed Waterway Kv= 15.0 fps
0.6	195	0.0760	5.60		**Shallow Concentrated Flow, SHALLOW C TO D** Paved Kv= 20.3 fps
4.1					**Direct Entry, DIRECT**
6.0	383	Total			

Summary for Subcatchment 17.1A: NEW Building Roof that goes to SSSF

Runoff = 0.87 cfs @ 12.09 hrs, Volume= 0.066 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	1,202	98	Paved parking & roofs
*	42,414	98	Roofs
	43,616	98	Weighted Average
	43,616		100.00% Impervious Area

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

Summary for Subcatchment 17.1B: Green Roof

Runoff = 0.09 cfs @ 12.10 hrs, Volume= 0.007 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	12,043	86	Green roof (no Walkways)
*	1,692	98	Walkways
*	1,144	98	Roofs
	14,879	88	Weighted Average
	12,043		80.94% Pervious Area
	2,836		19.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.1	14	0.0100	2.03		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.1	134	0.1600	15.00	5.24	**Pipe Channel, PIPE C TO D** 8.0" Round Area= 0.3 sf Perim= 2.1' r= 0.17' n= 0.012
5.0					**Direct Entry, DIRECT**
6.0	188	Total			

Summary for Subcatchment 18S: Visitor Garage

Runoff = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

	Area (sf)	CN	Description
*	26,386	98	Paved parking
	26,386		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	40	0.0100	0.84		**Sheet Flow, SHEET A TO B** Smooth surfaces n= 0.011 P2= 3.00"
0.3	141	0.2000	9.08		**Shallow Concentrated Flow, SHALLOW B TO C** Paved Kv= 20.3 fps
0.3	83	0.0110	5.15	4.05	**Pipe Channel, PIPE C TO D** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.012
4.6					**Direct Entry, DIRECT**
6.0	264	Total			

Summary for Subcatchment OS-1: OS-1

Runoff = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
17,031	89	Urban commercial, 85% imp, HSG A
2,555		15.00% Pervious Area
14,476		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Subcatchment OS-2: OS-2

Runoff = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Inch Rainfall=1.00"

Area (sf)	CN	Description
50,885	89	Urban commercial, 85% imp, HSG A
7,633		15.00% Pervious Area
43,252		85.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	60	0.0400	0.20		**Sheet Flow, Sheet flow A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	180	0.0250	3.21		**Shallow Concentrated Flow, Gutter Flow B-C (Russell Street)** Paved Kv= 20.3 fps
0.7	80	0.0100	2.03		**Shallow Concentrated Flow, Gutter Flow C-D (Hill Street)** Paved Kv= 20.3 fps
1.1	375	0.0800	5.74		**Shallow Concentrated Flow, Gutter Flow D-E (Ellsworth Street)** Paved Kv= 20.3 fps
2.2	605	0.0500	4.54		**Shallow Concentrated Flow, Gutter Flow E-F (Congress Street)** Paved Kv= 20.3 fps
10.0	1,300	Total			

Summary for Reach 2R: Weymouth Street Sewer

Inflow Area = 1.168 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.31 cfs @ 12.16 hrs, Volume= 0.028 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Offsite Forest Street

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Reach 15R:

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

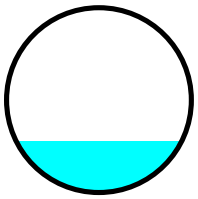
Summary for Reach 110:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Outflow = 0.22 cfs @ 12.10 hrs, Volume= 0.017 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.79 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 1.31 cfs

8.0" Round Pipe
n= 0.012
Length= 51.0' Slope= 0.0100 '/'
Inlet Invert= 110.51', Outlet Invert= 110.00'



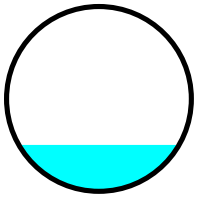
Summary for Reach 115:

Inflow Area = 1.203 ac, 95.77% Impervious, Inflow Depth = 0.65" for 1-Inch event
Inflow = 0.84 cfs @ 12.10 hrs, Volume= 0.065 af
Outflow = 0.83 cfs @ 12.11 hrs, Volume= 0.065 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.52 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 1.0 min

Peak Storage= 16 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.31'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

15.0" Round Pipe
n= 0.012
Length= 67.0' Slope= 0.0078 '/'
Inlet Invert= 110.11', Outlet Invert= 109.59'



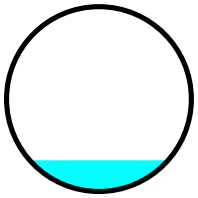
Summary for Reach 118:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.29 cfs @ 12.10 hrs, Volume= 0.100 af
Outflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.58 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.18 fps, Avg. Travel Time= 0.7 min

Peak Storage= 18 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 20.98 cfs

18.0" Round Pipe
n= 0.012
Length= 90.0' Slope= 0.0340 '/'
Inlet Invert= 109.44', Outlet Invert= 106.38'



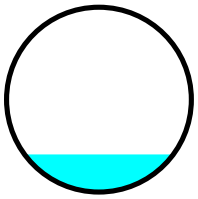
Summary for Reach 125:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.10 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.0 min

Peak Storage= 9 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

12.0" Round Pipe
n= 0.012
Length= 79.0' Slope= 0.0182 '/'
Inlet Invert= 131.87', Outlet Invert= 130.43'



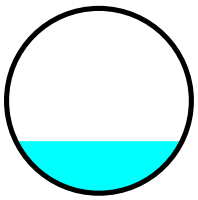
Summary for Reach 128:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af
Outflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.54 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.4 min

Peak Storage= 13 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe
n= 0.012
Length= 71.0' Slope= 0.0048 '/'
Inlet Invert= 130.40', Outlet Invert= 130.06'



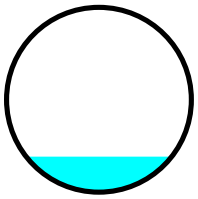
Summary for Reach 135:

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.022 af, Atten= 3%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.13 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 2.40 fps, Avg. Travel Time= 1.6 min

Peak Storage= 11 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.67' Flow Area= 0.3 sf, Capacity= 3.58 cfs

8.0" Round Pipe
n= 0.012
Length= 225.0' Slope= 0.0747 '/'
Inlet Invert= 62.69', Outlet Invert= 45.89'



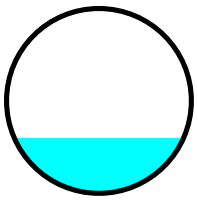
Summary for Reach 181:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Outflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 1%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.69 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 0.88 fps, Avg. Travel Time= 1.1 min

Peak Storage= 12 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.30'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.73 cfs

12.0" Round Pipe
n= 0.012
Length= 60.0' Slope= 0.0050 '/'
Inlet Invert= 54.46', Outlet Invert= 54.16'



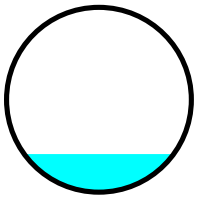
Summary for Reach 210:

Inflow Area = 0.579 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.038 af
Outflow = 0.50 cfs @ 12.10 hrs, Volume= 0.038 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.8 min

Peak Storage= 8 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.46 cfs

12.0" Round Pipe
n= 0.012
Length= 66.0' Slope= 0.0200 '/'
Inlet Invert= 122.35', Outlet Invert= 121.03'



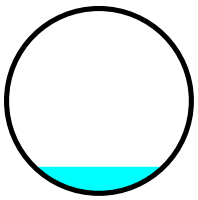
Summary for Reach 215:

Inflow Area = 0.371 ac, 86.26% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.13 cfs @ 12.10 hrs, Volume= 0.010 af
Outflow = 0.13 cfs @ 12.11 hrs, Volume= 0.010 af, Atten= 2%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.89 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.74 fps, Avg. Travel Time= 1.2 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 52.0' Slope= 0.0069 '/'
Inlet Invert= 121.67', Outlet Invert= 121.31'



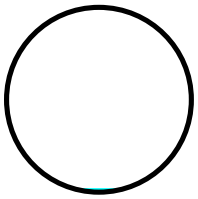
Summary for Reach 216R:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 0 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 16.96 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 12.0' Slope= 0.2267 '/'
Inlet Invert= 60.11', Outlet Invert= 57.39'



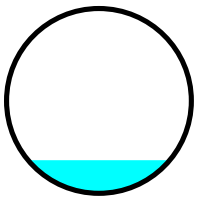
Summary for Reach 220:

Inflow Area = 1.737 ac, 97.07% Impervious, Inflow Depth = 0.69" for 1-Inch event
Inflow = 1.28 cfs @ 12.11 hrs, Volume= 0.100 af
Outflow = 1.23 cfs @ 12.13 hrs, Volume= 0.100 af, Atten= 4%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.93 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 1.97 fps, Avg. Travel Time= 1.8 min

Peak Storage= 47 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.30 cfs

18.0" Round Pipe
n= 0.012
Length= 218.0' Slope= 0.0259 '/'
Inlet Invert= 105.99', Outlet Invert= 100.35'



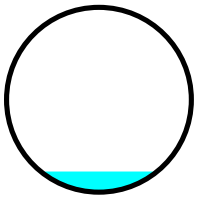
Summary for Reach 230:

Inflow Area = 2.062 ac, 94.23% Impervious, Inflow Depth = 0.61" for 1-Inch event
Inflow = 1.29 cfs @ 12.12 hrs, Volume= 0.105 af
Outflow = 1.28 cfs @ 12.13 hrs, Volume= 0.105 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.91 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.13 fps, Avg. Travel Time= 0.4 min

Peak Storage= 9 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 49.39 cfs

18.0" Round Pipe
n= 0.012
Length= 87.0' Slope= 0.1884 '/'
Inlet Invert= 100.16', Outlet Invert= 83.77'



Summary for Reach 231:

Inflow Area = 0.231 ac, 83.47% Impervious, Inflow Depth = 0.25" for 1-Inch event
Inflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af
Outflow = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

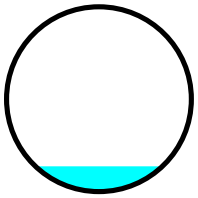
Summary for Reach 240:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.80 cfs @ 12.12 hrs, Volume= 0.153 af
Outflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 1%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 12.45 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 4.31 fps, Avg. Travel Time= 0.4 min

Peak Storage= 14 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 45.69 cfs

18.0" Round Pipe
n= 0.012
Length= 100.0' Slope= 0.1612 '/'
Inlet Invert= 67.96', Outlet Invert= 51.84'



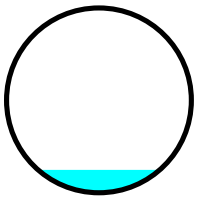
Summary for Reach 260:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Outflow = 1.77 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.04 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.79 fps, Avg. Travel Time= 0.3 min

Peak Storage= 11 cf @ 12.13 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 55.59 cfs

24.0" Round Pipe
n= 0.012
Length= 48.0' Slope= 0.0515 '/'
Inlet Invert= 51.84', Outlet Invert= 49.37'



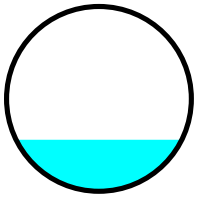
Summary for Reach 410:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 1%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.62 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 0.7 min

Peak Storage= 6 cf @ 12.09 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.77 cfs

12.0" Round Pipe
n= 0.012
Length= 35.0' Slope= 0.0051 '/'
Inlet Invert= 110.68', Outlet Invert= 110.50'



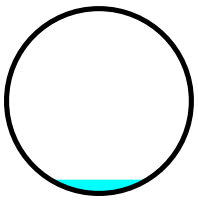
Summary for Reach 510:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Outflow = 0.52 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 1%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 8.95 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 3.94 fps, Avg. Travel Time= 0.3 min

Peak Storage= 4 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 47.85 cfs

18.0" Round Pipe
n= 0.012
Length= 62.0' Slope= 0.1768 '/'
Inlet Invert= 95.90', Outlet Invert= 84.94'



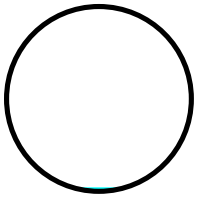
Summary for Reach 810:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af, Atten= 1%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 17.81 cfs

12.0" Round Pipe
n= 0.012
Length= 210.0' Slope= 0.2129 '/'
Inlet Invert= 120.21', Outlet Invert= 75.50'



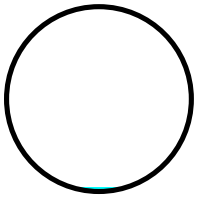
Summary for Reach 820:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.47 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.55 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 1.5 min

Peak Storage= 1 cf @ 12.48 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 12.32 cfs

12.0" Round Pipe
n= 0.012
Length= 164.0' Slope= 0.1020 '/'
Inlet Invert= 75.58', Outlet Invert= 58.86'



Summary for Pond 1P+G: R-Tank System w/Garage

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.70" for 1-Inch event
Inflow = 1.48 cfs @ 12.09 hrs, Volume= 0.113 af
Outflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af, Atten= 98%, Lag= 126.4 min
Primary = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 50.69' @ 17.15 hrs Surf.Area= 2,963 sf Storage= 3,942 cf

Plug-Flow detention time= 504.5 min calculated for 0.030 af (26% of inflow)
Center-of-Mass det. time= 345.5 min (1,139.4 - 794.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	50.58'	973 cf	**8.50'W x 76.37'L x 5.75'H Field A** 3,732 cf Overall - 1,300 cf Embedded = 2,432 cf x 40.0% Voids
#2A	51.33'	1,300 cf	**Cultec R-902HD** x 20 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#3B	48.37'	3,596 cf	**10.56'W x 179.94'L x 8.96'H Field B** 17,019 cf Overall - 8,029 cf Embedded = 8,989 cf x 40.0% Voids
#4B	48.37'	7,628 cf	**ACF R-Tank HD 5.0** x 375 Inside #3 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 75 Chambers
#5C	50.83'	286 cf	**8.50'W x 21.37'L x 5.75'H Field C** 1,044 cf Overall - 329 cf Embedded = 715 cf x 40.0% Voids
#6C	51.58'	329 cf	**Cultec R-902HD** x 5 Inside #5 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap Cap Storage= +2.8 cf x 2 x 1 rows = 5.5 cf
#7D	48.37'	675 cf	**10.56'W x 39.19'L x 7.96'H Field D** 3,293 cf Overall - 1,606 cf Embedded = 1,687 cf x 40.0% Voids
#8D	48.37'	1,526 cf	**ACF R-Tank HD 5.0** x 75 Inside #7 Inside= 15.7"W x 83.5"H => 8.67 sf x 2.35'L = 20.3 cf Outside= 15.7"W x 83.5"H => 9.13 sf x 2.35'L = 21.4 cf 5 Rows of 15 Chambers
		16,312 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard
Storage Group C created with Chamber Wizard
Storage Group D created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	45.94'	**12.0" Round Stromdrain** L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.94' / 45.76' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	46.04'	**1.5" Vert. Orifice/Grate** C= 0.600
#3	Device 2	48.37'	**2.410 in/hr Filtration over Surface area above 48.37'** Excluded Surface area = 2,314 sf
#4	Device 1	51.20'	**6.0" Vert. Orifice** C= 0.600
#5	Primary	52.20'	**0.4' long x 2.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#6	Device 1	53.95'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.04 cfs @ 14.20 hrs HW=50.58' (Free Discharge)
- **1=Stromdrain** (Passes 0.04 cfs of 7.55 cfs potential flow)
  - **2=Orifice/Grate** (Passes 0.04 cfs of 0.13 cfs potential flow)
    - **3=Filtration** (Exfiltration Controls 0.04 cfs)
  - **4=Orifice** (Controls 0.00 cfs)
  - **6=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **5=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Summary for Pond 2P:

Inflow Area = 0.318 ac, 73.07% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af
Outflow = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.2 min
Primary = 0.02 cfs @ 12.16 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 107.03' @ 12.16 hrs Surf.Area= 13 sf Storage= 0 cf

Plug-Flow detention time= 0.3 min calculated for 0.003 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (928.3 - 928.0)

Volume	Invert	Avail.Storage	Storage Description
#1	107.00'	169 cf	**Custom Stage Data (Prismatic)**Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
107.00	13	0	0
120.00	13	169	169

Device	Routing	Invert	Outlet Devices
#1	Primary	107.00'	**18.0" Round Culvert** L= 50.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.16 hrs HW=107.03' (Free Discharge)
- **1=Culvert** (Barrel Controls 0.00 cfs @ 0.81 fps)

Summary for Pond 3P:

Inflow Area = 0.325 ac, 79.05% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 5P:

Inflow Area = 2.870 ac, 78.87% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af
Primary = 0.53 cfs @ 12.11 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 6P:

Inflow Area = 0.254 ac, 79.41% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af
Primary = 0.05 cfs @ 12.11 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 7P:

Inflow Area = 2.119 ac, 39.10% Impervious, Inflow Depth = 0.00" for 1-Inch event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 8P:

Inflow Area = 1.045 ac, 63.76% Impervious, Inflow Depth = 0.05" for 1-Inch event
Inflow = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af
Primary = 0.01 cfs @ 12.44 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 10P:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 11P:

Inflow Area = 0.254 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 12P:

Inflow Area = 0.534 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond 13.5P: CB 13796

Inflow Area = 0.516 ac, 88.74% Impervious, Inflow Depth = 0.36" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.015 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.60' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	38.86'	**10.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 38.86' / 37.64' S= 0.0813 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.55 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.20 cfs @ 12.10 hrs HW=42.60' (Free Discharge)
└**1=12" SD** (Passes 0.20 cfs of 4.79 cfs potential flow)
└**2=Curb Inlet** (Weir Controls 0.20 cfs @ 1.03 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=38.86' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 13P: CB 13

Inflow Area = 0.827 ac, 85.62% Impervious, Inflow Depth = 0.32" for 1-Inch event
Inflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Outflow = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 66.03' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.00'	**1.0" x 3.0" Horiz. Grate X 24.00** C= 0.600 Limited to weir flow at low heads

#2	Secondary	66.20'	**5.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.28 cfs @ 12.10 hrs HW=66.03' (Free Discharge)
└**1=Grate** (Weir Controls 0.28 cfs @ 0.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 14P: CB 13581

Inflow Area = 0.428 ac, 56.89% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 15.12 hrs, Volume= 0.001 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 42.50' @ 15.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	40.62'	**8.0" Round 12" SD** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.62' / 39.00' S= 0.1080 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.35 sf
#2	Device 1	42.50'	**2.0' long Curb Inlet** 2 End Contraction(s)
#3	Secondary	43.00'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.00 cfs @ 15.12 hrs HW=42.50' (Free Discharge)
└**1=12" SD** (Passes 0.00 cfs of 2.09 cfs potential flow)
└**2=Curb Inlet** (Weir Controls 0.00 cfs @ 0.11 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=40.62' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond CB-63:

Inflow Area = 3.164 ac, 47.24% Impervious, Inflow Depth = 0.02" for 1-Inch event
Inflow = 0.01 cfs @ 12.50 hrs, Volume= 0.004 af
Outflow = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.8 min
Primary = 0.01 cfs @ 12.52 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 59.84' @ 12.52 hrs Surf.Area= 13 sf Storage= 1 cf

Plug-Flow detention time= 0.8 min calculated for 0.004 af (100% of inflow)

Center-of-Mass det. time= 0.8 min (1,000.9 - 1,000.1)

Volume	Invert	Avail.Storage	Storage Description
#1	59.80'	81 cf	**Custom Stage Data (Prismatic)** Listed below

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.80	13	0	0
66.00	13	81	81

Device	Routing	Invert	Outlet Devices
#1	Primary	59.80'	**12.0" Round Culvert** L= 10.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 59.80' / 58.46' S= 0.1340 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.52 hrs HW=59.84' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.71 fps)

Summary for Pond DMH 20: DMH 13592

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Outflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 37.81' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	37.59'	**12.0" Round 12" SD** L= 20.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 37.59' / 35.00' S= 0.1295 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.10 hrs HW=37.81' (Free Discharge)
1=12" SD (Inlet Controls 0.21 cfs @ 1.60 fps)

Summary for Pond DMH-7:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af
Primary = 0.52 cfs @ 12.10 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond DMH1: New DMH-1 Congress Street

Inflow Area = 1.949 ac, 85.81% Impervious, Inflow Depth = 0.18" for 1-Inch event
Inflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af
Outflow = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 14.20 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 45.77' @ 14.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.66'	**15.0" Round Stormdrain** L= 4.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.66' / 45.64' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.04 cfs @ 14.20 hrs HW=45.77' (Free Discharge)
1=Stormdrain (Barrel Controls 0.04 cfs @ 1.09 fps)

Summary for Pond hil-01:

Inflow Area = 0.606 ac,100.00% Impervious, Inflow Depth = 0.79" for 1-Inch event
Inflow = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.53 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond hil-02:

Inflow Area = 4.932 ac, 85.29% Impervious, Inflow Depth = 0.37" for 1-Inch event
Inflow = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af
Primary = 1.78 cfs @ 12.13 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond OS-1.: CB

Inflow Area = 0.391 ac, 85.00% Impervious, Inflow Depth = 0.28" for 1-Inch event
Inflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Outflow = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.16 hrs, Volume= 0.009 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 55.05' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	45.00'	**8.0" Round Stormdrain** L= 15.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 45.00' / 44.44' S= 0.0373 '/' Cc= 0.900

n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

#2	Device 1	55.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	55.20'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.07 cfs @ 12.16 hrs HW=55.05' (Free Discharge)
1=Stormdrain (Passes 0.07 cfs of 5.24 cfs potential flow)
2=Sharp-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=45.00' (Free Discharge)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond OS-2.: CB 16258

Inflow Area =	1.168 ac, 85.00% Impervious, Inflow Depth = 0.28"	for 1-Inch event		
Inflow	=	0.31 cfs @ 12.16 hrs, Volume=	0.028 af	
Outflow	=	0.31 cfs @ 12.16 hrs, Volume=	0.028 af, Atten= 0%, Lag= 0.0 min	
Primary	=	0.31 cfs @ 12.16 hrs, Volume=	0.028 af	
Secondary	=	0.00 cfs @ 0.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.13' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	79.02'	**8.0" Round Stormdrain**
			L= 35.0' CPP, square edge headwall, Ke= 0.500
			Inlet / Outlet Invert= 79.02' / 78.25' S= 0.0220 '/' Cc= 0.900
			n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf
#2	Device 1	83.00'	**2.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Secondary	83.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.30 cfs @ 12.16 hrs HW=83.13' (Free Discharge)
1=Stormdrain (Passes 0.30 cfs of 3.12 cfs potential flow)
2=Sharp-Crested Rectangular Weir (Weir Controls 0.30 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=79.02' (Free Discharge)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SMH-1: esmh-13952

Inflow Area =	2.775 ac, 85.75% Impervious, Inflow Depth = 0.22"	for 1-Inch event		
Inflow	=	0.28 cfs @ 12.12 hrs, Volume=	0.052 af	
Outflow	=	0.28 cfs @ 12.12 hrs, Volume=	0.052 af, Atten= 0%, Lag= 0.0 min	
Primary	=	0.28 cfs @ 12.12 hrs, Volume=	0.052 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 44.84' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	44.61'	**18.0" Round Culvert** L= 41.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 44.61' / 41.64' S= 0.0724 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.27 cfs @ 12.12 hrs HW=44.84' (Free Discharge)
└**1=Culvert** (Inlet Controls 0.27 cfs @ 1.62 fps)

Summary for Pond SMH-13932: esmh-13932

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af
Outflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 40.90' @ 12.13 hrs
Flood Elev= 52.64'

Device	Routing	Invert	Outlet Devices
#1	Primary	40.64'	**18.0" Round Sewer** L= 45.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 40.64' / 38.00' S= 0.0587 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.77 sf

Primary OutFlow Max=0.36 cfs @ 12.13 hrs HW=40.90' (Free Discharge)
└**1=Sewer** (Inlet Controls 0.36 cfs @ 1.74 fps)

Summary for Link SP-C1:

Inflow Area = 0.765 ac, 73.26% Impervious, Inflow Depth = 0.11" for 1-Inch event
Inflow = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af
Primary = 0.05 cfs @ 12.16 hrs, Volume= 0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C2:

Inflow Area = 3.166 ac, 85.66% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af
Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C3:

Inflow Area = 0.944 ac, 74.30% Impervious, Inflow Depth = 0.20" for 1-Inch event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af
Primary = 0.21 cfs @ 12.10 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C4:

Inflow Area = 8.351 ac, 70.70% Impervious, Inflow Depth = 0.23" for 1-Inch event
Inflow = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af
Primary = 1.82 cfs @ 12.13 hrs, Volume= 0.161 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-C5:

Inflow Area = 1.389 ac, 57.14% Impervious, Inflow Depth = 0.30" for 1-Inch event
Inflow = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af
Primary = 0.45 cfs @ 12.11 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=1.46"
Flow Length=229' Tc=6.0 min CN=82 Runoff=0.75 cfs 0.054 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.70 cfs 0.138 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=1.46"
Flow Length=284' Tc=6.0 min CN=82 Runoff=0.53 cfs 0.039 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=2.08"
Flow Length=244' Tc=6.0 min CN=90 Runoff=0.88 cfs 0.064 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=1.91"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.50 cfs 0.037 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=1.26"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.13 cfs 0.010 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=1.75"
Flow Length=510' Tc=6.0 min CN=86 Runoff=5.77 cfs 0.418 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=1.75"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.51 cfs 0.037 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.55"
Flow Length=634' Tc=6.0 min CN=65 Runoff=1.03 cfs 0.098 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=1.14"
Flow Length=399' Tc=6.0 min CN=77 Runoff=1.33 cfs 0.099 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.28"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.11 cfs 0.020 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=0.74 cfs 0.061 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=200' Tc=6.0 min CN=98 Runoff=1.57 cfs 0.128 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=2.08"
Flow Length=196' Tc=6.2 min CN=90 Runoff=1.94 cfs 0.143 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=2.16"
Flow Length=325' Tc=6.0 min CN=91 Runoff=1.26 cfs 0.093 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=0.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.42 cfs 0.033 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=2.87"
Tc=6.0 min CN=98 Runoff=2.94 cfs 0.239 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=1.91"
Flow Length=188' Tc=6.0 min CN=88 Runoff=0.75 cfs 0.054 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=2.87"
Flow Length=264' Tc=6.0 min CN=98 Runoff=1.78 cfs 0.145 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=0.78 cfs 0.065 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=1.99"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=2.34 cfs 0.194 af

Reach 2R: Weymouth Street Sewer Inflow=2.28 cfs 0.194 af
Outflow=2.28 cfs 0.194 af

Reach 3R: Offsite Forest Street Inflow=0.13 cfs 0.001 af
Outflow=0.13 cfs 0.001 af

Reach 15R: Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach 110: Avg. Flow Depth=0.36' Max Vel=3.87 fps Inflow=0.74 cfs 0.061 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=0.74 cfs 0.061 af

Reach 115: Avg. Flow Depth=0.65' Max Vel=5.11 fps Inflow=3.30 cfs 0.263 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=3.27 cfs 0.263 af

Reach 118: Avg. Flow Depth=0.49' Max Vel=9.65 fps Inflow=4.83 cfs 0.391 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=4.80 cfs 0.391 af

Reach 125: Avg. Flow Depth=0.38' Max Vel=5.80 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=1.56 cfs 0.128 af

Reach 128: Avg. Flow Depth=0.55' Max Vel=3.53 fps Inflow=1.56 cfs 0.128 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=1.54 cfs 0.128 af

Reach 135: Avg. Flow Depth=0.29' Max Vel=9.56 fps Inflow=1.37 cfs 0.137 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.36 cfs 0.137 af

Reach 181: Avg. Flow Depth=0.59' Max Vel=3.70 fps Inflow=1.78 cfs 0.145 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=1.76 cfs 0.145 af

Reach 210: Avg. Flow Depth=0.38' Max Vel=6.13 fps Inflow=1.70 cfs 0.138 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=1.69 cfs 0.138 af

Reach 215: Avg. Flow Depth=0.37' Max Vel=3.29 fps Inflow=0.88 cfs 0.064 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=0.87 cfs 0.064 af

Reach 216R: Avg. Flow Depth=0.25' Max Vel=15.09 fps Inflow=2.33 cfs 0.197 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=2.33 cfs 0.197 af

Reach 220: Avg. Flow Depth=0.52' Max Vel=8.72 fps Inflow=4.80 cfs 0.391 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=4.70 cfs 0.391 af

Reach 230: Avg. Flow Depth=0.33' Max Vel=18.24 fps Inflow=5.32 cfs 0.437 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=5.30 cfs 0.437 af

Reach 231: Inflow=0.50 cfs 0.037 af
Outflow=0.50 cfs 0.037 af

Reach 240: Avg. Flow Depth=0.50' Max Vel=21.28 fps Inflow=11.02 cfs 0.855 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=10.98 cfs 0.855 af

Reach 260: Avg. Flow Depth=0.60' Max Vel=13.77 fps Inflow=10.98 cfs 0.855 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=10.95 cfs 0.855 af

Reach 410: Avg. Flow Depth=0.54' Max Vel=3.63 fps Inflow=1.57 cfs 0.128 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=1.56 cfs 0.128 af

Reach 510: Avg. Flow Depth=0.35' Max Vel=18.27 fps Inflow=5.77 cfs 0.418 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=5.76 cfs 0.418 af

Reach 810: Avg. Flow Depth=0.19' Max Vel=13.33 fps Inflow=1.33 cfs 0.099 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=1.32 cfs 0.099 af

Reach 820: Avg. Flow Depth=0.22' Max Vel=10.22 fps Inflow=1.32 cfs 0.099 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=1.30 cfs 0.099 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=53.01' Storage=9,113 cf Inflow=5.45 cfs 0.438 af
Outflow=2.18 cfs 0.355 af

Pond 2P: Peak Elev=107.31' Storage=4 cf Inflow=0.53 cfs 0.039 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 3P: Inflow=0.64 cfs 0.047 af
Primary=0.64 cfs 0.047 af

Pond 5P: Inflow=5.77 cfs 0.418 af
Primary=5.77 cfs 0.418 af

Pond 6P: Inflow=0.51 cfs 0.037 af
Primary=0.51 cfs 0.037 af

Pond 7P: Inflow=1.03 cfs 0.098 af
Primary=1.03 cfs 0.098 af

Pond 8P: Inflow=1.33 cfs 0.099 af
Primary=1.33 cfs 0.099 af

Pond 10P: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Pond 11P: Inflow=0.74 cfs 0.061 af
Primary=0.74 cfs 0.061 af

Pond 12P: Inflow=1.57 cfs 0.128 af
Primary=1.57 cfs 0.128 af

Pond 13.5P: CB 13796 Peak Elev=42.94' Inflow=1.83 cfs 0.099 af
Primary=1.83 cfs 0.099 af Secondary=0.00 cfs 0.000 af Outflow=1.83 cfs 0.099 af

Pond 13P: CB 13 Peak Elev=66.33' Inflow=1.94 cfs 0.143 af
Primary=1.37 cfs 0.137 af Secondary=0.56 cfs 0.006 af Outflow=1.94 cfs 0.143 af

Pond 14P: CB 13581 Peak Elev=42.66' Inflow=0.42 cfs 0.033 af
Primary=0.42 cfs 0.033 af Secondary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.033 af

Pond CB-63: Peak Elev=60.68' Storage=11 cf Inflow=2.33 cfs 0.197 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=2.33 cfs 0.197 af

Pond DMH 20: DMH 13592 Peak Elev=38.44' Inflow=2.25 cfs 0.132 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=2.25 cfs 0.132 af

Pond DMH-7: Inflow=1.76 cfs 0.145 af
Primary=1.76 cfs 0.145 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=46.57' Inflow=2.18 cfs 0.355 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=2.18 cfs 0.355 af

Pond hil-01: Inflow=1.78 cfs 0.145 af
Primary=1.78 cfs 0.145 af

Pond hil-02: Inflow=10.98 cfs 0.855 af
Primary=10.98 cfs 0.855 af

Pond OS-1.: CB Peak Elev=55.22' Inflow=0.78 cfs 0.065 af
Primary=0.65 cfs 0.064 af Secondary=0.13 cfs 0.001 af Outflow=0.78 cfs 0.065 af

Pond OS-2.: CB 16258 Peak Elev=83.51' Inflow=2.34 cfs 0.194 af
Primary=2.28 cfs 0.194 af Secondary=0.06 cfs 0.000 af Outflow=2.34 cfs 0.194 af

Pond SMH-1: esmh-13952 Peak Elev=45.45' Inflow=3.17 cfs 0.493 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=3.17 cfs 0.493 af

Pond SMH-13932: esmh-13932 Peak Elev=41.57' Inflow=3.78 cfs 0.556 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=3.78 cfs 0.556 af

Link SP-C1: Inflow=1.28 cfs 0.093 af
Primary=1.28 cfs 0.093 af

Link SP-C2: Inflow=3.78 cfs 0.556 af
Primary=3.78 cfs 0.556 af

Link SP-C3: Inflow=2.25 cfs 0.132 af
Primary=2.25 cfs 0.132 af

Link SP-C4: Inflow=13.78 cfs 1.089 af
Primary=13.78 cfs 1.089 af

Link SP-C5: Inflow=1.60 cfs 0.147 af
Primary=1.60 cfs 0.147 af

Total Runoff Area = 15.783 ac Runoff Volume = 2.296 af Average Runoff Depth = 1.75"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=2.72"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.40 cfs 0.101 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.54 cfs 0.211 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=2.72"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.00 cfs 0.072 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=3.49"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.44 cfs 0.108 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=3.29"
Flow Length=250' Tc=6.0 min CN=88 Runoff=0.85 cfs 0.063 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=2.46"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.27 cfs 0.019 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=3.10"
Flow Length=510' Tc=6.0 min CN=86 Runoff=10.09 cfs 0.740 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=3.10"
Flow Length=121' Tc=6.0 min CN=86 Runoff=0.89 cfs 0.066 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=1.39"
Flow Length=634' Tc=6.0 min CN=65 Runoff=3.18 cfs 0.246 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=2.29"
Flow Length=399' Tc=6.0 min CN=77 Runoff=2.75 cfs 0.200 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.90"
Flow Length=326' Tc=6.0 min CN=57 Runoff=0.71 cfs 0.064 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.11 cfs 0.092 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.34 cfs 0.194 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=3.49"
Flow Length=196' Tc=6.2 min CN=90 Runoff=3.19 cfs 0.241 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=3.59"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.05 cfs 0.155 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=1.97"
Flow Length=383' Tc=6.0 min CN=73 Runoff=0.96 cfs 0.070 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=4.36"
Tc=6.0 min CN=98 Runoff=4.40 cfs 0.364 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=3.29"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.26 cfs 0.094 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=4.36"
Flow Length=264' Tc=6.0 min CN=98 Runoff=2.66 cfs 0.220 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.31 cfs 0.110 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=3.39"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=3.92 cfs 0.330 af

Reach 2R: Weymouth Street Sewer Inflow=2.95 cfs 0.318 af
Outflow=2.95 cfs 0.318 af

Reach 3R: Offsite Forest Street Inflow=0.46 cfs 0.008 af
Outflow=0.46 cfs 0.008 af

Reach 15R: Inflow=1.22 cfs 0.011 af
Outflow=1.22 cfs 0.011 af

Reach 110: Avg. Flow Depth=0.47' Max Vel=4.21 fps Inflow=1.11 cfs 0.092 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.11 cfs 0.092 af

Reach 115: Avg. Flow Depth=0.86' Max Vel=5.61 fps Inflow=5.06 cfs 0.411 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=5.03 cfs 0.411 af

Reach 118: Avg. Flow Depth=0.61' Max Vel=10.83 fps Inflow=7.35 cfs 0.605 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=7.31 cfs 0.605 af

Reach 125: Avg. Flow Depth=0.47' Max Vel=6.45 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.33 cfs 0.194 af

Reach 128: Avg. Flow Depth=0.72' Max Vel=3.83 fps Inflow=2.33 cfs 0.194 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.30 cfs 0.194 af

Reach 135: Avg. Flow Depth=0.33' Max Vel=10.15 fps Inflow=1.73 cfs 0.219 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.72 cfs 0.219 af

Reach 181: Avg. Flow Depth=0.80' Max Vel=3.96 fps Inflow=2.66 cfs 0.220 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.64 cfs 0.220 af

Reach 210: Avg. Flow Depth=0.48' Max Vel=6.82 fps Inflow=2.54 cfs 0.211 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=2.53 cfs 0.211 af

Reach 215: Avg. Flow Depth=0.49' Max Vel=3.75 fps Inflow=1.44 cfs 0.108 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.43 cfs 0.108 af

Reach 216R: Avg. Flow Depth=0.41' Max Vel=19.62 fps Inflow=5.88 cfs 0.446 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=5.87 cfs 0.446 af

Reach 220: Avg. Flow Depth=0.66' Max Vel=9.78 fps Inflow=7.31 cfs 0.605 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=7.19 cfs 0.605 af

Reach 230: Avg. Flow Depth=0.42' Max Vel=20.75 fps Inflow=8.29 cfs 0.687 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=8.26 cfs 0.687 af

Reach 231: Inflow=0.85 cfs 0.063 af
Outflow=0.85 cfs 0.063 af

Reach 240: Avg. Flow Depth=0.66' Max Vel=24.42 fps Inflow=18.27 cfs 1.428 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=18.22 cfs 1.428 af

Reach 260: Avg. Flow Depth=0.79' Max Vel=15.85 fps Inflow=18.22 cfs 1.428 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=18.19 cfs 1.428 af

Reach 410: Avg. Flow Depth=0.71' Max Vel=3.95 fps Inflow=2.34 cfs 0.194 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.33 cfs 0.194 af

Reach 510: Avg. Flow Depth=0.47' Max Vel=21.44 fps Inflow=10.09 cfs 0.740 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=10.08 cfs 0.740 af

Reach 810: Avg. Flow Depth=0.27' Max Vel=16.46 fps Inflow=2.75 cfs 0.200 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=2.73 cfs 0.200 af

Reach 820: Avg. Flow Depth=0.32' Max Vel=12.61 fps Inflow=2.73 cfs 0.200 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=2.70 cfs 0.200 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=53.95' Storage=11,275 cf Inflow=8.29 cfs 0.678 af
Outflow=4.58 cfs 0.595 af

Pond 2P: Peak Elev=107.44' Storage=6 cf Inflow=1.00 cfs 0.072 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.00 cfs 0.072 af

Pond 3P: Inflow=1.12 cfs 0.083 af
Primary=1.12 cfs 0.083 af

Pond 5P: Inflow=10.09 cfs 0.740 af
Primary=10.09 cfs 0.740 af

Pond 6P: Inflow=0.89 cfs 0.066 af
Primary=0.89 cfs 0.066 af

Pond 7P: Inflow=3.18 cfs 0.246 af
Primary=3.18 cfs 0.246 af

Pond 8P: Inflow=2.75 cfs 0.200 af
Primary=2.75 cfs 0.200 af

Pond 10P: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Pond 11P: Inflow=1.11 cfs 0.092 af
Primary=1.11 cfs 0.092 af

Pond 12P: Inflow=2.34 cfs 0.194 af
Primary=2.34 cfs 0.194 af

Pond 13.5P: CB 13796 Peak Elev=43.13' Inflow=4.31 cfs 0.189 af
Primary=3.09 cfs 0.178 af Secondary=1.22 cfs 0.011 af Outflow=4.31 cfs 0.189 af

Pond 13P: CB 13 Peak Elev=66.52' Inflow=4.01 cfs 0.253 af
Primary=1.73 cfs 0.219 af Secondary=2.29 cfs 0.034 af Outflow=4.01 cfs 0.253 af

Pond 14P: CB 13581 Peak Elev=42.78' Inflow=0.96 cfs 0.070 af
Primary=0.96 cfs 0.070 af Secondary=0.00 cfs 0.000 af Outflow=0.96 cfs 0.070 af

Pond CB-63: Peak Elev=62.71' Storage=38 cf Inflow=5.88 cfs 0.446 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=5.88 cfs 0.446 af

Pond DMH 20: DMH 13592 Peak Elev=39.23' Inflow=4.05 cfs 0.249 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=4.05 cfs 0.249 af

Pond DMH-7: Inflow=2.64 cfs 0.220 af
Primary=2.64 cfs 0.220 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=47.13' Inflow=4.58 cfs 0.595 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=4.58 cfs 0.595 af

Pond hil-01: Inflow=2.66 cfs 0.220 af
Primary=2.66 cfs 0.220 af

Pond hil-02: Inflow=18.22 cfs 1.428 af
Primary=18.22 cfs 1.428 af

Pond OS-1.: CB Peak Elev=55.26' Inflow=1.31 cfs 0.110 af
Primary=0.85 cfs 0.102 af Secondary=0.46 cfs 0.008 af Outflow=1.31 cfs 0.110 af

Pond OS-2.: CB 16258 Peak Elev=83.61' Inflow=3.92 cfs 0.330 af
Primary=2.95 cfs 0.318 af Secondary=0.97 cfs 0.013 af Outflow=3.92 cfs 0.330 af

Pond SMH-1: esmh-13952 Peak Elev=45.88' Inflow=6.09 cfs 0.813 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=6.09 cfs 0.813 af

Pond SMH-13932: esmh-13932 Peak Elev=42.04' Inflow=6.88 cfs 0.916 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.88 cfs 0.916 af

Link SP-C1: Inflow=2.39 cfs 0.174 af
Primary=2.39 cfs 0.174 af

Link SP-C2: Inflow=6.88 cfs 0.916 af
Primary=6.88 cfs 0.916 af

Link SP-C3: Inflow=4.05 cfs 0.249 af
Primary=4.05 cfs 0.249 af

Link SP-C4: Inflow=24.94 cfs 1.939 af
Primary=24.94 cfs 1.939 af

Link SP-C5: Inflow=3.01 cfs 0.258 af
Primary=3.01 cfs 0.258 af

Total Runoff Area = 15.783 ac Runoff Volume = 3.955 af Average Runoff Depth = 3.01"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=3.80"
Flow Length=229' Tc=6.0 min CN=82 Runoff=1.93 cfs 0.141 af

Subcatchment2A: Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=142' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=3.21 cfs 0.268 af

Subcatchment2B: Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=3.80"
Flow Length=284' Tc=6.0 min CN=82 Runoff=1.38 cfs 0.101 af

Subcatchment2S: Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=4.65"
Flow Length=244' Tc=6.0 min CN=90 Runoff=1.89 cfs 0.144 af

Subcatchment3.1: Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=4.43"
Flow Length=250' Tc=6.0 min CN=88 Runoff=1.14 cfs 0.085 af

Subcatchment3.2: Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=3.50"
Flow Length=66' Slope=0.0250 '/' Tc=6.0 min CN=79 Runoff=0.38 cfs 0.027 af

Subcatchment4S: Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=160' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.247 af

Subcatchment5S: Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=4.22"
Flow Length=510' Tc=6.0 min CN=86 Runoff=13.59 cfs 1.009 af

Subcatchment6S: Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=4.22"
Flow Length=121' Tc=6.0 min CN=86 Runoff=1.20 cfs 0.089 af

Subcatchment7S: Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=2.21"
Flow Length=634' Tc=6.0 min CN=65 Runoff=5.25 cfs 0.390 af

Subcatchment8S: Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=3.31"
Flow Length=399' Tc=6.0 min CN=77 Runoff=3.97 cfs 0.288 af

Subcatchment10S: Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=1.56"
Flow Length=326' Tc=6.0 min CN=57 Runoff=1.39 cfs 0.111 af

Subcatchment11S: Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=90' Slope=0.0050 '/' Tc=6.0 min CN=98 Runoff=1.41 cfs 0.118 af

Subcatchment12S: Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=200' Tc=6.0 min CN=98 Runoff=2.96 cfs 0.248 af

Subcatchment13S: Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=4.65"
Flow Length=196' Tc=6.2 min CN=90 Runoff=4.19 cfs 0.320 af

Subcatchment14.1S: Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=4.76"
Flow Length=325' Tc=6.0 min CN=91 Runoff=2.67 cfs 0.205 af

Subcatchment 15.1S: Runoff Area=18,644 sf 56.89% Impervious Runoff Depth=2.92"
Flow Length=383' Tc=6.0 min CN=73 Runoff=1.44 cfs 0.104 af

Subcatchment 17.1A: NEW Building Roof Runoff Area=43,616 sf 100.00% Impervious Runoff Depth=5.56"
Tc=6.0 min CN=98 Runoff=5.56 cfs 0.464 af

Subcatchment 17.1B: Green Roof Runoff Area=14,879 sf 19.06% Impervious Runoff Depth=4.43"
Flow Length=188' Tc=6.0 min CN=88 Runoff=1.68 cfs 0.126 af

Subcatchment 18S: Visitor Garage Runoff Area=26,386 sf 100.00% Impervious Runoff Depth=5.56"
Flow Length=264' Tc=6.0 min CN=98 Runoff=3.36 cfs 0.281 af

Subcatchment OS-1: OS-1 Runoff Area=17,031 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=1.73 cfs 0.148 af

Subcatchment OS-2: OS-2 Runoff Area=50,885 sf 85.00% Impervious Runoff Depth=4.54"
Flow Length=1,300' Tc=10.0 min CN=89 Runoff=5.17 cfs 0.442 af

Reach 2R: Weymouth Street Sewer Inflow=3.31 cfs 0.412 af
Outflow=3.31 cfs 0.412 af

Reach 3R: Offsite Forest Street Inflow=0.73 cfs 0.016 af
Outflow=0.73 cfs 0.016 af

Reach 15R: Inflow=2.76 cfs 0.033 af
Outflow=2.76 cfs 0.033 af

Reach 110: Avg. Flow Depth=0.61' Max Vel=4.27 fps Inflow=1.41 cfs 0.118 af
8.0" Round Pipe n=0.012 L=51.0' S=0.0100 '/' Capacity=1.31 cfs Outflow=1.39 cfs 0.118 af

Reach 115: Avg. Flow Depth=1.09' Max Vel=5.70 fps Inflow=6.47 cfs 0.530 af
15.0" Round Pipe n=0.012 L=67.0' S=0.0078 '/' Capacity=6.17 cfs Outflow=6.41 cfs 0.530 af

Reach 118: Avg. Flow Depth=0.70' Max Vel=11.53 fps Inflow=9.35 cfs 0.777 af
18.0" Round Pipe n=0.012 L=90.0' S=0.0340 '/' Capacity=20.98 cfs Outflow=9.30 cfs 0.777 af

Reach 125: Avg. Flow Depth=0.54' Max Vel=6.84 fps Inflow=2.96 cfs 0.248 af
12.0" Round Pipe n=0.012 L=79.0' S=0.0182 '/' Capacity=5.21 cfs Outflow=2.95 cfs 0.248 af

Reach 128: Avg. Flow Depth=1.00' Max Vel=3.87 fps Inflow=2.95 cfs 0.248 af
12.0" Round Pipe n=0.012 L=71.0' S=0.0048 '/' Capacity=2.67 cfs Outflow=2.79 cfs 0.248 af

Reach 135: Avg. Flow Depth=0.35' Max Vel=10.44 fps Inflow=1.94 cfs 0.280 af
8.0" Round Pipe n=0.012 L=225.0' S=0.0747 '/' Capacity=3.58 cfs Outflow=1.93 cfs 0.280 af

Reach 181: Avg. Flow Depth=1.00' Max Vel=3.94 fps Inflow=3.36 cfs 0.281 af
12.0" Round Pipe n=0.012 L=60.0' S=0.0050 '/' Capacity=2.73 cfs Outflow=2.94 cfs 0.281 af

Reach 210: Avg. Flow Depth=0.55' Max Vel=7.22 fps Inflow=3.21 cfs 0.268 af
12.0" Round Pipe n=0.012 L=66.0' S=0.0200 '/' Capacity=5.46 cfs Outflow=3.20 cfs 0.268 af

Reach 215: Avg. Flow Depth=0.58' Max Vel=4.00 fps Inflow=1.89 cfs 0.144 af
12.0" Round Pipe n=0.013 L=52.0' S=0.0069 '/' Capacity=2.96 cfs Outflow=1.88 cfs 0.144 af

Reach 216R: Avg. Flow Depth=0.52' Max Vel=22.00 fps Inflow=9.15 cfs 0.678 af
12.0" Round Pipe n=0.013 L=12.0' S=0.2267 '/' Capacity=16.96 cfs Outflow=9.15 cfs 0.678 af

Reach 220: Avg. Flow Depth=0.76' Max Vel=10.40 fps Inflow=9.30 cfs 0.777 af
18.0" Round Pipe n=0.012 L=218.0' S=0.0259 '/' Capacity=18.30 cfs Outflow=9.15 cfs 0.777 af

Reach 230: Avg. Flow Depth=0.47' Max Vel=22.28 fps Inflow=10.64 cfs 0.890 af
18.0" Round Pipe n=0.012 L=87.0' S=0.1884 '/' Capacity=49.39 cfs Outflow=10.61 cfs 0.890 af

Reach 231: Inflow=1.14 cfs 0.085 af
Outflow=1.14 cfs 0.085 af

Reach 240: Avg. Flow Depth=0.77' Max Vel=26.20 fps Inflow=24.09 cfs 1.899 af
18.0" Round Pipe n=0.012 L=100.0' S=0.1612 '/' Capacity=45.69 cfs Outflow=24.04 cfs 1.899 af

Reach 260: Avg. Flow Depth=0.92' Max Vel=17.05 fps Inflow=24.04 cfs 1.899 af
24.0" Round Pipe n=0.012 L=48.0' S=0.0515 '/' Capacity=55.59 cfs Outflow=23.99 cfs 1.899 af

Reach 410: Avg. Flow Depth=0.90' Max Vel=4.02 fps Inflow=2.96 cfs 0.247 af
12.0" Round Pipe n=0.012 L=35.0' S=0.0051 '/' Capacity=2.77 cfs Outflow=2.94 cfs 0.247 af

Reach 510: Avg. Flow Depth=0.55' Max Vel=23.28 fps Inflow=13.59 cfs 1.009 af
18.0" Round Pipe n=0.012 L=62.0' S=0.1768 '/' Capacity=47.85 cfs Outflow=13.57 cfs 1.009 af

Reach 810: Avg. Flow Depth=0.32' Max Vel=18.26 fps Inflow=3.97 cfs 0.288 af
12.0" Round Pipe n=0.012 L=210.0' S=0.2129 '/' Capacity=17.81 cfs Outflow=3.94 cfs 0.288 af

Reach 820: Avg. Flow Depth=0.39' Max Vel=13.96 fps Inflow=3.94 cfs 0.288 af
12.0" Round Pipe n=0.012 L=164.0' S=0.1020 '/' Capacity=12.32 cfs Outflow=3.91 cfs 0.288 af

Pond 1P+G: R-Tank System w/Garage Peak Elev=54.27' Storage=11,982 cf Inflow=9.96 cfs 0.871 af
Outflow=8.32 cfs 0.788 af

Pond 2P: Peak Elev=107.53' Storage=7 cf Inflow=1.38 cfs 0.101 af
18.0" Round Culvert n=0.011 L=50.0' S=0.0100 '/' Outflow=1.38 cfs 0.101 af

Pond 3P: Inflow=1.51 cfs 0.113 af
Primary=1.51 cfs 0.113 af

Pond 5P: Inflow=13.59 cfs 1.009 af
Primary=13.59 cfs 1.009 af

Pond 6P: Inflow=1.20 cfs 0.089 af
Primary=1.20 cfs 0.089 af

Pond 7P: Inflow=5.25 cfs 0.390 af
Primary=5.25 cfs 0.390 af

Pond 8P: Inflow=3.97 cfs 0.288 af
Primary=3.97 cfs 0.288 af

Pond 10P: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Pond 11P: Inflow=1.41 cfs 0.118 af
Primary=1.41 cfs 0.118 af

Pond 12P: Inflow=2.96 cfs 0.248 af
Primary=2.96 cfs 0.248 af

Pond 13.5P: CB 13796 Peak Elev=43.23' Inflow=6.54 cfs 0.276 af
Primary=3.78 cfs 0.243 af Secondary=2.76 cfs 0.033 af Outflow=6.54 cfs 0.276 af

Pond 13P: CB 13 Peak Elev=66.65' Inflow=5.84 cfs 0.351 af
Primary=1.94 cfs 0.280 af Secondary=3.91 cfs 0.071 af Outflow=5.84 cfs 0.351 af

Pond 14P: CB 13581 Peak Elev=42.87' Inflow=1.44 cfs 0.104 af
Primary=1.44 cfs 0.104 af Secondary=0.00 cfs 0.000 af Outflow=1.44 cfs 0.104 af

Pond CB-63: Peak Elev=66.15' Storage=81 cf Inflow=9.16 cfs 0.678 af
12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=9.15 cfs 0.678 af

Pond DMH 20: DMH 13592 Peak Elev=39.99' Inflow=5.21 cfs 0.347 af
12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=5.21 cfs 0.347 af

Pond DMH-7: Inflow=2.94 cfs 0.281 af
Primary=2.94 cfs 0.281 af

Pond DMH1: New DMH-1 Congress Street Peak Elev=48.22' Inflow=8.32 cfs 0.788 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=8.32 cfs 0.788 af

Pond hil-01: Inflow=3.36 cfs 0.281 af
Primary=3.36 cfs 0.281 af

Pond hil-02: Inflow=24.04 cfs 1.899 af
Primary=24.04 cfs 1.899 af

Pond OS-1.: CB Peak Elev=55.29' Inflow=1.73 cfs 0.148 af
Primary=1.00 cfs 0.132 af Secondary=0.73 cfs 0.016 af Outflow=1.73 cfs 0.148 af

Pond OS-2.: CB 16258 Peak Elev=83.68' Inflow=5.17 cfs 0.442 af
Primary=3.31 cfs 0.412 af Secondary=1.86 cfs 0.030 af Outflow=5.17 cfs 0.442 af

Pond SMH-1: esmh-13952 Peak Elev=46.78' Inflow=10.17 cfs 1.067 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=10.17 cfs 1.067 af

Pond SMH-13932: esmh-13932 Peak Elev=43.10' Inflow=11.15 cfs 1.200 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=11.15 cfs 1.200 af

Link SP-C1: Inflow=3.31 cfs 0.242 af
Primary=3.31 cfs 0.242 af

Link SP-C2: Inflow=11.15 cfs 1.200 af
Primary=11.15 cfs 1.200 af

Link SP-C3: Inflow=5.21 cfs 0.347 af
Primary=5.21 cfs 0.347 af

Link SP-C4: Inflow=34.33 cfs 2.666 af
Primary=34.33 cfs 2.666 af

Link SP-C5: Inflow=4.07 cfs 0.358 af
Primary=4.07 cfs 0.358 af

Total Runoff Area = 15.783 ac Runoff Volume = 5.358 af Average Runoff Depth = 4.07"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

Appendix C

INSPECTION, MAINTENANCE, AND HOUSEKEEPING

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Maine Medical Center
Portland, ME

Introduction

The owner of the development is Maine Medical Center. The owner's address is 22 Bramhall Street, Portland, Maine 04102. The owner of the proposed project will be responsible for the maintenance of all stormwater management structures, the establishment of any contract services required to implement the program, and the keeping of records and maintenance logbook. The owner will assure that the following maintenance program will be adhered.

Records of all inspections and maintenance work accomplished must be kept on file and retained for a minimum 5-year time span. The maintenance logbook will be made available to the Maine Department of Environmental Protection (MDEP) and the City of Portland upon request. At a minimum, the appropriate and relevant activities for each of the stormwater management systems will be performed on the prescribed schedule.

The following plan outlines the anticipated inspection, maintenance, and housekeeping procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in the Inspection, Maintenance, and Housekeeping Plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional details on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the MDEP.

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within seven (7) calendar days and prior to any storm event (rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken.

   The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three (3) years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

   A. <u>Sediment Barriers:</u>

   - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
   - If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
   - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
   - Filter berms shall be reshaped as needed.
   - Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

   B. <u>Riprap Materials:</u>

   - Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to this plan.

D. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

E. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.
- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

F. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

   A. Spill Prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

   B. Groundwater Protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

   C. Fugitive Sediment and Dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

   D. Debris and Other Materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   E. Trench or Foundation Dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

After Construction

1. **Inspection:** After construction, the owner or operator shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

2. **Maintenance, and repair:** If a BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator shall take corrective actions to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective actions to the Department of Public Works (DPW). The following is a list of permanent erosion control and stormwater management measures and the inspection, maintenance, and housekeeping tasks to be performed after construction.

A. Vegetated Areas:

- Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
- Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

B. Winter Sanding:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

C. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.

D. ACF R-Tank System:

- Refer to R-Tank – Operation, Inspection & Maintenance manual for guidance on required maintenance and inspection.

E. Cultec Stormwater Chamber System:

- Refer to Cultec – Operation & Maintenance Guidelines for guidance on required maintenance and inspection.

3. **Annual Report:** The owner or operator or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification that the person has inspected the BMPs and that they are adequately maintained

and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance or repair, including the record of the deficiency and corrective actions taken.

4. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility, and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

Attachments

Attachment 1 – Sample Stormwater Inspection and Maintenance Form

Attachment 1 - Sample Stormwater Inspection and Maintenance Form

Maine Medical Center
Portland, ME

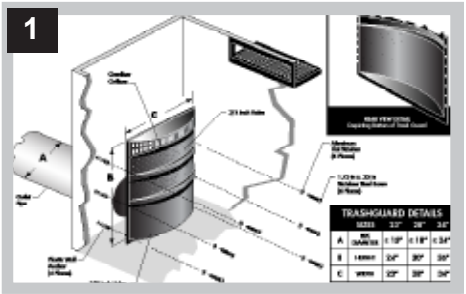
This log is intended to accompany the stormwater Inspection, Maintenance and Housekeeping Plan for Maine Medical Center. The following items shall be checked, cleaned and maintained on a regular basis as specified in the Maintenance Plan and as described in the table below. This log shall be kept on file for a minimum of five (5) years and shall be available for review. Qualified personnel familiar with drainage systems and soils shall perform all inspections. Attached is a copy of the construction and post-construction maintenance logs.

Item	Maintenance Required & Frequency	Date Completed	Maintenance Personnel	Comments
Ditches and Swales	Inspect after major rainfall event producing greater than 3" of rain in 2 hours.			
	Repair erosion or damage immediately.			
Catch Basins	Remove accumulated sediment and debris			
	Sump depth			
Vegetated Areas	Inspect Slopes			
	Replant Bare Areas			
	Check after Major Storms			
Winter Sanding	Clean annually (Spring)			
	Remove sand and sediment from roadway shoulders			
ACF R-Tanks	Inspect quarterly through first year of use, with yearly inspections thereafter			
Cultec Stormwater Chambers	Inspect monthly in first year, with yearly inspections thereafter and every third year following			

R-TANK MAINTENANCE

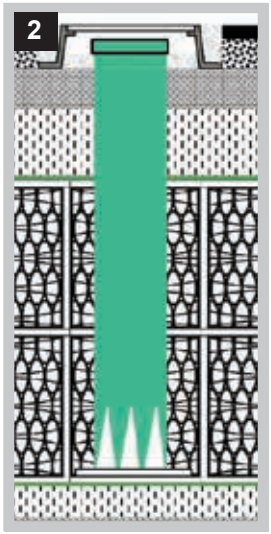
With adequate pre-treatment of stormwater before it enters the ACF R-Tank, heavy sediments, trash, and other debris will not enter the system. Systems like the TrashGuard (see image 1) are simple and inexpensive, but also highly effective. Therefore, most maintenance efforts should be directed at the pre-treatment structures to ensure they are functioning properly.

To monitor the accumulation of fine sediments that may enter the detention/ retention area, ACF R-Tank systems should include maintanance ports.



Maintenance

Running from the bottom of the ACF R-Tank up to ground level, Maintenance Ports are made from solid PVC Pipe with notches cut into the bottom. As water is pumped into the port the notches will direct water throughout the bottom of the system to create turbulence, thereby re-suspending accumulated sediments.



After pumping water into the tanks, flushing is completed by vacuuming sediment laden water out of the system either through the outlet structure or through the flush port.

The diameter of the flush port is determined by a number of factors including the rate at which water will be pumped into the system, the number of flush ports incorporated, and the possible requirement of vacuuming through the port. Experience has shown that a 12” port is more than adequate for virtually any required use, with 6” ports more common when vacuuming will be performed at the outlet structure.

Installing the Maintenance System

To install the PCV Pipe, remove the center small plate and cut the top large plate between the remaining interior small plates. Before inserting the port into the Tank, install an anti-scour plate in the bottom of the Tank to prevent disturbance of the base materials.

Maintenance ports should be capped at the surface. In landscaped areas, this may be accomplished with a simple pipe cap or plastic valve box (see image 4 lower inset). In paved areas, metal lids are more appropriate (see image 4).

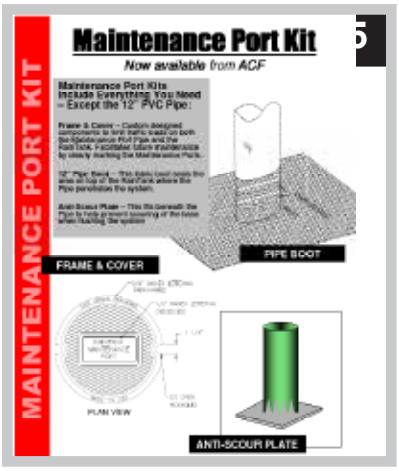
R-TANK MAINTENANCE

Maintenance Intervals

Maintenance Schedules for the ACF R-Tank System are a function of the contributing area and the type of pre-treatment specified. A standard maintenance schedule may include quarterly inspections through the first year of use, with yearly inspections thereafter. Flushing should be performed if sediment should the lesser of 6" or 15% of the system height.

Availability

All system components, including caps, lids, anti-scour plates, frames and covers are available from ACF. In fact, we've created Maintenance Port Kids (see image 5) that include everything needed except for the pipe itself. Contact your local sales representative or our Sales Office at 800-448-3636 for assistance.



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acfenvironmental.com

R-TANK OPERATION, INSPECTION & MAINTENANCE

Operation

Your ACF R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspection frequency for your system must be determined based on the contributing drainage area, but should never exceed one year between inspections (six months during the first year of operation).

Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment your inspection and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you MUST follow all local/regional requirements as well as OSHA standards.

R-Tank Systems may incorporate Inspection Ports, Maintenance Ports, and/or adjoining manholes. Each of these features are easily accessed by removing the lid at the surface. With the cover removed, a visual inspection can be performed to identify sediment deposits within the structure. Using a flashlight, ALL access points should be examined to complete a thorough inspection.

Inspection Ports
Usually located centrally in the R-Tank System, these perforated columns are designed to give the user a base-line sediment depth across the system floor.

Maintenance Ports
Usually located near the inlet and outlet connections, you'll likely find deeper deposits of heavier sediments when compared to the Inspection Ports.

Manholes
Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Bear in mind that these manholes often include a sump below the invert of the pipe connecting to the R-Tank. These sumps are designed to capture sediment before it reaches the R-Tank, and they should be kept clean to ensure they function properly. However, existence of sediment in the sump does NOT necessarily mean sediment has accumulated in the R-Tank.

After inspecting the bottom of the structure, use a mirror on a pole (or some other device) to check for sediment or debris in the pipe connecting to the R-Tank.

R-TANK OPERATION INSPECTION & MAINTENANCE

If sediment or debris is observed in any of these structures, you should determine the depth of the material. This is typically accomplished with a stadia rod, but you should determine the best way to obtain the measurement.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guideline.

Maintenance

The R-Tank System should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Use the chart below as a guideline to determine the point at which maintenance is required on your system.

R-Tank Unit	Height	Max Sediment Dept
Mini	9.5"	1.5"
Single	17"	3"
Double	34"	5"
Triple	50"	6"
Quad	67"	6"
Pent	84"	6"

Before any maintenance is performed on your system, be sure to plug the outlet pipe to prevent contamination of the adjacent systems.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. Water should be pumped into ALL Maintenance Ports. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out.

If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

Once removed, sediment-laden water may be captured for disposal or pumped through a Dirtbag™ (if permitted by the locality).

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Step-By-Step Inspection & Maintenance Routine

1) **Inspection**
    a. Inspection Port
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
    b. Maintenance Port/s
        i. Remove Cap
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod
        iv. Record results on Maintenance Log
        v. Replace Cap
        vi. Repeat for ALL Maintenance Ports
    c. Adjacent Manholes
        i. Remove Cover
        ii. Use flashlight to detect sediment deposits
        iii. If present, measure sediment depth with stadia rod, accounting for depth of sump (if present)
        iv. Inspect pipes connecting to R-Tank
        v. Record results on Maintenance Log
        vi. Replace Cover
        vii. Repeat for ALL Manholes that connect to the R-Tank

2) **Maintenance**
    a. Plug system outlet to prevent discharge of back-flush water
    b. Determine best location to pump out back-flush water
    c. Remove Cap from Maintenance Port
    d. Pump water as rapidly as possible (without over-topping port) into system until at least 1”
    of water covers system bottom
    e. Replace Cap
    f. Repeat at ALL Maintenance Ports
    g. Pump out back-flush water to complete back-flushing
    h. Vacuum all adjacent structures and any other structures or stormwater pre-treatment systems that require attention
    i. Sediment-laden water may be captured for disposal or pumped through a Dirtbag™.
    j. Replace any remaining Caps or Covers
    k. Record the back-flushing event in your Maintenance Log with any relevant specifics

R-Tank Maintenance Log

Site Name:________________________________

Location:________________________________

System Owner:________________________________

Company Responsible for Maintenance:________________________________

Contact:________________________________

Phone Numer:________________________________

Date	Location	Depth to Bottom	Depth to Sediment	Sediment Depth	Observations/Notes	Initials

Contactor® & Recharger®
Stormwater Chambers

Operation and Maintenance Guidelines
for CULTEC Stormwater Management Systems

The Founder of Plastic Chamber Technology

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Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail tech@cultec.com.

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These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pretreatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

WQMP
Operation & Maintenance (O&M) Plan

Project Name:_____

Prepared for:

Project Name: _____

Address:_____

City, State Zip:_____

Prepared on:

Date:_____

This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

8.1.1 Project Information

Project name	
Address	
City, State Zip	
Site size	
List of structural BMPs, number of each	
Other notes	

8.1.2 Responsible Party

The responsible party for implementation of this WQMP is:

Name of Person or HOA Property Manager	
Address	
City, State Zip	
Phone number	
24-Hour Emergency Contact number	
Email	

8.1.3 Record Keeping

Parties responsible for the O&M plan shall retain records for at least 5 years.

All training and educational activities and BMP operation and maintenance shall be documented to verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in this document.

8.1.4 Electronic Data Submittal

This document along with the Site Plan and Attachments shall be provided in PDF format. AutoCAD files and/or GIS coordinates of BMPs shall also be submitted to the City.

Appendix ____

BMP SITE PLAN

Site plan is preferred on minimum 11” by 17” colored sheets, as long as legible.

BMP OPERATION & MAINTENANCE LOG

Project Name: _____

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Minor Maintenance

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

Major Maintenance

	Frequency		Action
Inlets and Outlets	**Every 3 years**		Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
			Notes
	□ Year 1	Date:	
	□ Year 4	Date:	
	□ Year 7	Date:	
	□ Year 10	Date:	
	□ Year 13	Date:	
	□ Year 16	Date:	
	□ Year 19	Date:	
	□ Year 22	Date:	
	Spring and Fall		Check inlet and outlets for clogging and remove any debris, as required.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
CULTEC Stormwater Chambers	**2 years after commissioning**		□ Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
			Notes
	□ Year 2	Date:	

Major Maintenance

	Frequency		Action
CULTEC Stormwater Chambers	**9 years after commissioning every 9 years following**		□ Clean stormwater management chambers and feed connectors of any debris. □ Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
			Notes
	□ Year 9	Date:	
	□ Year 18	Date:	
	□ Year 27	Date:	
	□ Year 36	Date:	
	45 years after commissioning		□ Clean stormwater management chambers and feed connectors of any debris. □ Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. □ Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. □ Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. □ Attain the appropriate approvals as required. □ Establish a new operation and maintenance schedule.
			Notes
	□ Year 45	Date:	

Major Maintenance

	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

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