



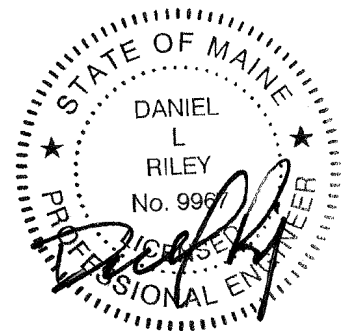
STORMWATER MANAGEMENT PLAN

**Maine Medical Center
Congress Street Building
Portland, Maine**

Prepared for

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

October 30, 2018



10/30/2018

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 of 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 hydrologic soil group 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.

Stormwater Treatment System

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	= 5,829 cf
Storage Volume Provided	= 5,949 cf
Surface Area Required (Congress Building only)	= 2,564 sf
Surface Area Required (Congress Building and Visitor Garage)	= 3,883 sf
Surface Area Provided	= 3,134 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	3.59	-2.87	9.14	6.73	-2.41	11.23	10.91	-0.32
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	1.61	0.28	-1.33 (83%)

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 83%.

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.

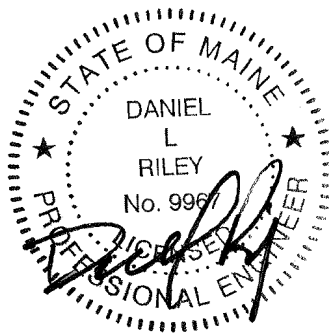
Prepared by,

SEBAGO TECHNICS, INC.



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

October 30, 2018



10/30/2018

Attachment A

STORWATER QUALITY CALCULATIONS

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)	1.593
Total Redevelopment Area (acres)	1.593

Ranked Impact Change Due to Redevelopment (Item E)	-0.5
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Percent Increase in Developed Area	0.00%
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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

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%

SEBAGO TECHNICS, INC.

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

JOB 15466 - Congress Street Building
 SHEET NO. 1 OF 3
 CALCULATED BY DLR DATE 10/25/2018
 FILE NAME 15466 - Stormwater calcs Congre PRINT DATE 10/30/2018

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				3,134.0	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				5,949.0	CF	@ Elev 51.2		
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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75 John Roberts Road Suite 4A
 South Portland, Maine 04106
 Tel. (207) 200-2100

JOB 15466 - Congress Street Building
 SHEET NO. 2 OF 3
 CALCULATED BY DLR DATE 10/25/2018
 FILE NAME 15466 - Stormwater calcs Congre PRINT DATE 10/30/2018

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				
	CPV Required				2,198.8	CF	0.050	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				

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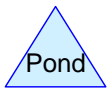
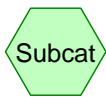
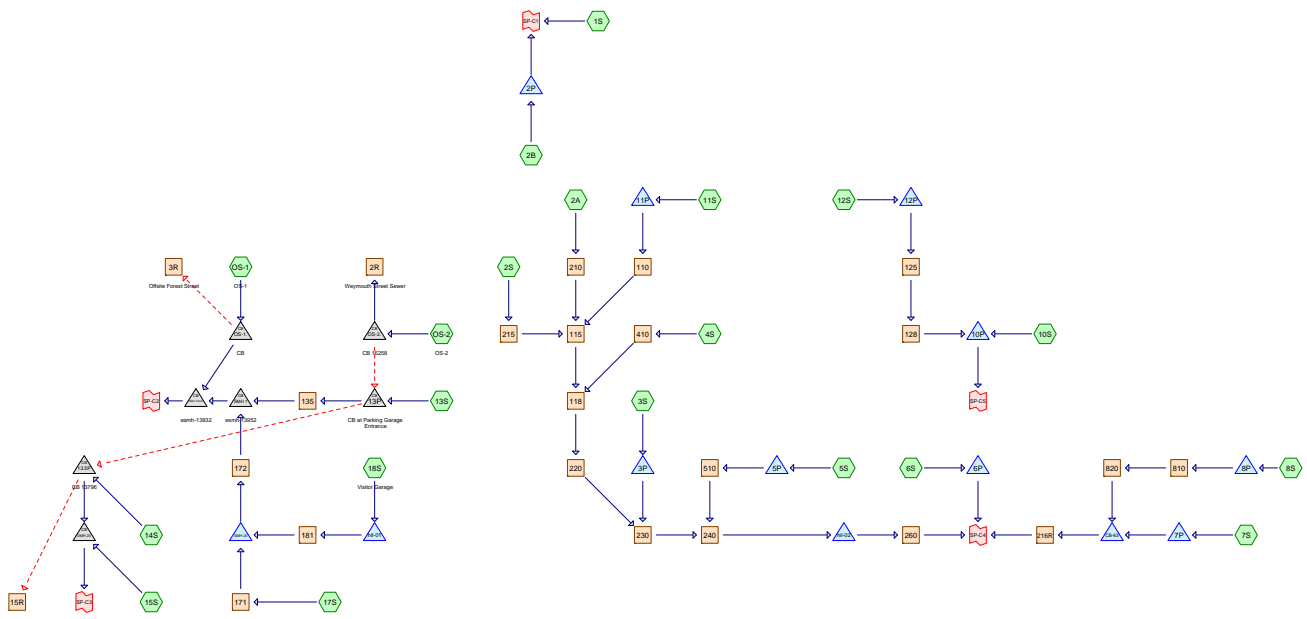
75 John Roberts Road Suite 4A
 South Portland, Maine 04106
 Tel. (207) 200-2100

JOB: 15466 - Congress Street Building
 SHEET NO. 3 OF 3
 CALCULATED BY: DLR DATE: 10/25/2018
 FILE NAME: 15466 - Stormwater calcs Congress PRINT DATE: 10/30/2018

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				3,134	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				
					0				(ASSUMES 25% Pretreatment Credit for HIL Unit)
	CPV Required				5,829	CF	0.134	AF	
	Provided CPV				5,949	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			

Attachment B

HYDROCAD OUTPUT



Routing Diagram for 15466 - Congress CD PRE
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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

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Type III 24-hr 1-Inch Rainfall=1.00"

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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			

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Type III 24-hr 1-Inch Rainfall=1.00"

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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			

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Type III 24-hr 1-Inch Rainfall=1.00"

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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			

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Type III 24-hr 1-Inch Rainfall=1.00"

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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

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Type III 24-hr 1-Inch Rainfall=1.00"

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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"

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Type III 24-hr 1-Inch Rainfall=1.00"

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	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

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Type III 24-hr 1-Inch Rainfall=1.00"

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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

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Type III 24-hr 1-Inch Rainfall=1.00"

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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

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Type III 24-hr 1-Inch Rainfall=1.00"

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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

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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

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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

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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

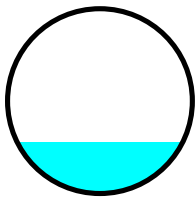
Summary for Reach 110:

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

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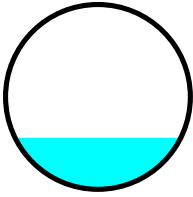
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Peak Storage= 19 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.35'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 6.17 cfs

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



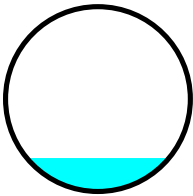
Summary for Reach 118:

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

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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'

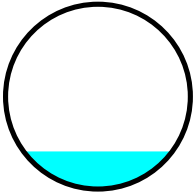
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 5.21 cfs

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'

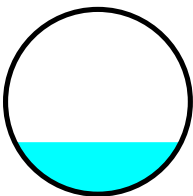
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.67 cfs

12.0" Round Pipe

n= 0.012

Length= 71.0' Slope= 0.0048 '/'

Inlet Invert= 130.40', Outlet Invert= 130.06'



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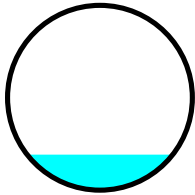
Summary for Reach 135:

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'



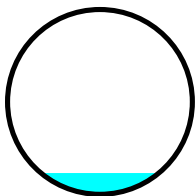
Summary for Reach 171:

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'



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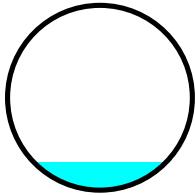
Summary for Reach 172:

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'



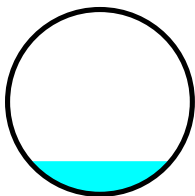
Summary for Reach 181:

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'



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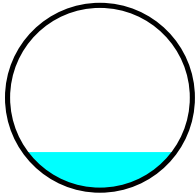
Summary for Reach 210:

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'



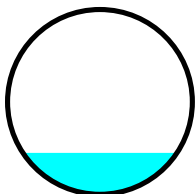
Summary for Reach 215:

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'



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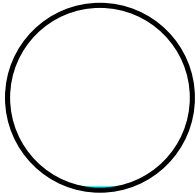
Summary for Reach 216R:

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'



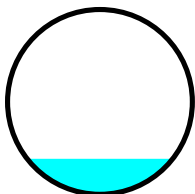
Summary for Reach 220:

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'



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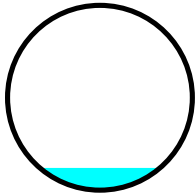
Summary for Reach 230:

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'



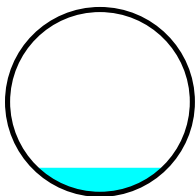
Summary for Reach 240:

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'



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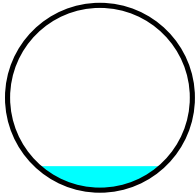
Summary for Reach 260:

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'



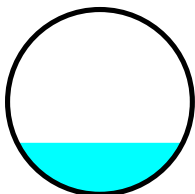
Summary for Reach 410:

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'



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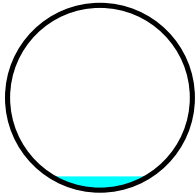
Summary for Reach 510:

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'



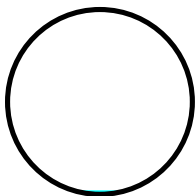
Summary for Reach 810:

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'



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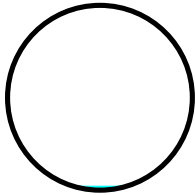
Summary for Reach 820:

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

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Inlet / Outlet Invert= 107.00' / 106.50' S= 0.0100 1' 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

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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 1/1' 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

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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

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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

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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) 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
#3	Secondary	55.20'	

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) 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
#3	Secondary	83.50'	

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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)

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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

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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

Subcatchment 1S:	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
Subcatchment 2A:	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
Subcatchment 2B:	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
Subcatchment 2S:	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
Subcatchment 3S:	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
Subcatchment 4S:	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
Subcatchment 5S:	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
Subcatchment 6S:	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
Subcatchment 7S:	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
Subcatchment 8S:	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
Subcatchment 10S:	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
Subcatchment 11S:	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
Subcatchment 12S:	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
Subcatchment 13S:	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
Subcatchment 14S:	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
Subcatchment 15S:	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

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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

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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

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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

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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

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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

Subcatchment 1S:	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
Subcatchment 2A:	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
Subcatchment 2B:	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
Subcatchment 2S:	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
Subcatchment 3S:	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
Subcatchment 4S:	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
Subcatchment 5S:	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
Subcatchment 6S:	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
Subcatchment 7S:	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
Subcatchment 8S:	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
Subcatchment 10S:	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
Subcatchment 11S:	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
Subcatchment 12S:	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
Subcatchment 13S:	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
Subcatchment 14S:	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
Subcatchment 15S:	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

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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

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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

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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

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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

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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

Subcatchment 1S:	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
Subcatchment 2A:	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
Subcatchment 2B:	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
Subcatchment 2S:	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
Subcatchment 3S:	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
Subcatchment 4S:	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
Subcatchment 5S:	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
Subcatchment 6S:	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
Subcatchment 7S:	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
Subcatchment 8S:	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
Subcatchment 10S:	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
Subcatchment 11S:	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
Subcatchment 12S:	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
Subcatchment 13S:	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
Subcatchment 14S:	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
Subcatchment 15S:	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

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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

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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

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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

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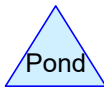
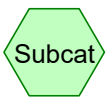
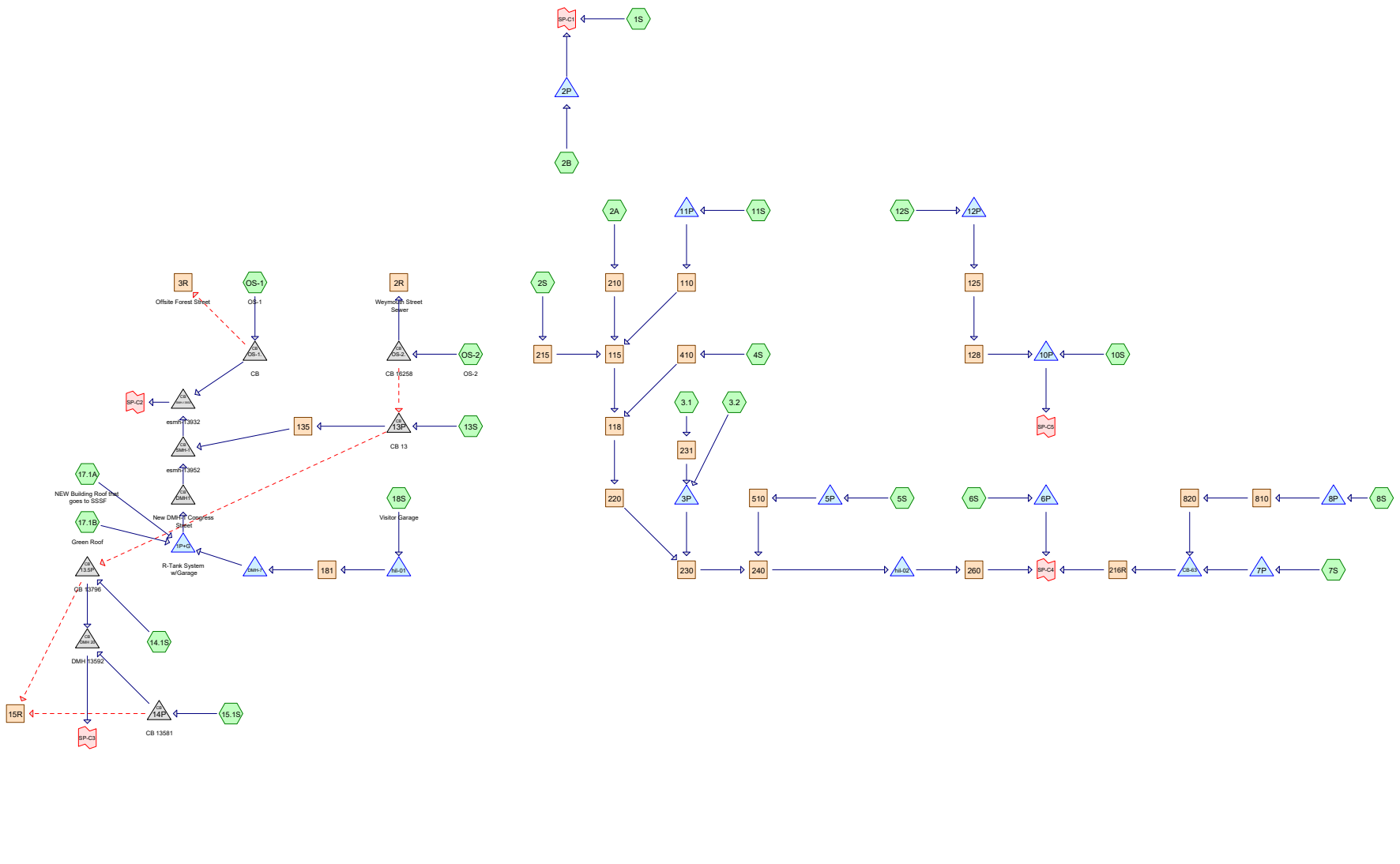
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Link SP-C5:

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



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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

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

Subcatchment 1S:	Runoff Area=19,446 sf 73.39% Impervious Runoff Depth=0.11" Flow Length=229' Tc=6.0 min CN=82 Runoff=0.03 cfs 0.004 af
Subcatchment 2A:	Runoff Area=25,217 sf 100.00% Impervious Runoff Depth=0.79" Flow Length=142' Slope=0.0050 '/ Tc=6.0 min CN=98 Runoff=0.50 cfs 0.038 af
Subcatchment 2B:	Runoff Area=13,868 sf 73.07% Impervious Runoff Depth=0.11" Flow Length=284' Tc=6.0 min CN=82 Runoff=0.02 cfs 0.003 af
Subcatchment 2S:	Runoff Area=16,157 sf 86.26% Impervious Runoff Depth=0.32" Flow Length=244' Tc=6.0 min CN=90 Runoff=0.13 cfs 0.010 af
Subcatchment 3.1:	Runoff Area=10,051 sf 83.47% Impervious Runoff Depth=0.25" Flow Length=250' Tc=6.0 min CN=88 Runoff=0.06 cfs 0.005 af
Subcatchment 3.2:	Runoff Area=4,089 sf 68.18% Impervious Runoff Depth=0.07" Flow Length=66' Slope=0.0250 '/ Tc=6.0 min CN=79 Runoff=0.00 cfs 0.001 af
Subcatchment 4S:	Runoff Area=23,249 sf 100.00% Impervious Runoff Depth=0.79" Flow Length=160' Slope=0.0050 '/ Tc=6.0 min CN=98 Runoff=0.46 cfs 0.035 af
Subcatchment 5S:	Runoff Area=125,028 sf 78.87% Impervious Runoff Depth=0.20" Flow Length=510' Tc=6.0 min CN=86 Runoff=0.53 cfs 0.047 af
Subcatchment 6S:	Runoff Area=11,085 sf 79.41% Impervious Runoff Depth=0.20" Flow Length=121' Tc=6.0 min CN=86 Runoff=0.05 cfs 0.004 af
Subcatchment 7S:	Runoff Area=92,296 sf 39.10% Impervious Runoff Depth=0.00" Flow Length=634' Tc=6.0 min CN=65 Runoff=0.00 cfs 0.000 af
Subcatchment 8S:	Runoff Area=45,533 sf 63.76% Impervious Runoff Depth=0.05" Flow Length=399' Tc=6.0 min CN=77 Runoff=0.01 cfs 0.004 af
Subcatchment 10S:	Runoff Area=37,247 sf 30.36% Impervious Runoff Depth=0.00" Flow Length=326' Tc=6.0 min CN=57 Runoff=0.00 cfs 0.000 af
Subcatchment 11S:	Runoff Area=11,050 sf 100.00% Impervious Runoff Depth=0.79" Flow Length=90' Slope=0.0050 '/ Tc=6.0 min CN=98 Runoff=0.22 cfs 0.017 af
Subcatchment 12S:	Runoff Area=23,268 sf 100.00% Impervious Runoff Depth=0.79" Flow Length=200' Tc=6.0 min CN=98 Runoff=0.46 cfs 0.035 af
Subcatchment 13S:	Runoff Area=36,014 sf 85.62% Impervious Runoff Depth=0.32" Flow Length=196' Tc=6.2 min CN=90 Runoff=0.29 cfs 0.022 af
Subcatchment 14.1S:	Runoff Area=22,477 sf 88.74% Impervious Runoff Depth=0.36" Flow Length=325' Tc=6.0 min CN=91 Runoff=0.21 cfs 0.015 af

Subcatchment 15.1S:	Runoff Area=18,644 sf	56.89% Impervious	Runoff Depth=0.02"
	Flow Length=383'	Tc=6.0 min	CN=73
		Runoff=0.00 cfs	0.001 af
Subcatchment 17.1A: NEW Building Roof	Runoff Area=43,616 sf	100.00% Impervious	Runoff Depth=0.79"
		Tc=6.0 min	CN=98
		Runoff=0.87 cfs	0.066 af
Subcatchment 17.1B: Green Roof	Runoff Area=14,879 sf	19.06% Impervious	Runoff Depth=0.25"
	Flow Length=188'	Tc=6.0 min	CN=88
		Runoff=0.09 cfs	0.007 af
Subcatchment 18S: Visitor Garage	Runoff Area=26,386 sf	100.00% Impervious	Runoff Depth=0.79"
	Flow Length=264'	Tc=6.0 min	CN=98
		Runoff=0.53 cfs	0.040 af
Subcatchment OS-1: OS-1	Runoff Area=17,031 sf	85.00% Impervious	Runoff Depth=0.28"
	Flow Length=1,300'	Tc=10.0 min	CN=89
		Runoff=0.10 cfs	0.009 af
Subcatchment OS-2: OS-2	Runoff Area=50,885 sf	85.00% Impervious	Runoff Depth=0.28"
	Flow Length=1,300'	Tc=10.0 min	CN=89
		Runoff=0.31 cfs	0.028 af
Reach 2R: Weymouth Street Sewer		Inflow=0.31 cfs	0.028 af
		Outflow=0.31 cfs	0.028 af
Reach 3R: Offsite Forest Street		Inflow=0.00 cfs	0.000 af
		Outflow=0.00 cfs	0.000 af
Reach 15R:		Inflow=0.00 cfs	0.000 af
		Outflow=0.00 cfs	0.000 af
Reach 110:	Avg. Flow Depth=0.19'	Max Vel=2.79 fps	Inflow=0.22 cfs
8.0" Round Pipe	n=0.012	L=51.0'	S=0.0100 '/'
		Capacity=1.31 cfs	Outflow=0.22 cfs
			0.017 af
Reach 115:	Avg. Flow Depth=0.31'	Max Vel=3.52 fps	Inflow=0.84 cfs
15.0" Round Pipe	n=0.012	L=67.0'	S=0.0078 '/'
		Capacity=6.17 cfs	Outflow=0.83 cfs
			0.065 af
Reach 118:	Avg. Flow Depth=0.25'	Max Vel=6.58 fps	Inflow=1.29 cfs
18.0" Round Pipe	n=0.012	L=90.0'	S=0.0340 '/'
		Capacity=20.98 cfs	Outflow=1.28 cfs
			0.100 af
Reach 125:	Avg. Flow Depth=0.20'	Max Vel=4.10 fps	Inflow=0.46 cfs
12.0" Round Pipe	n=0.012	L=79.0'	S=0.0182 '/'
		Capacity=5.21 cfs	Outflow=0.46 cfs
			0.035 af
Reach 128:	Avg. Flow Depth=0.28'	Max Vel=2.54 fps	Inflow=0.46 cfs
12.0" Round Pipe	n=0.012	L=71.0'	S=0.0048 '/'
		Capacity=2.67 cfs	Outflow=0.45 cfs
			0.035 af
Reach 135:	Avg. Flow Depth=0.13'	Max Vel=6.13 fps	Inflow=0.29 cfs
8.0" Round Pipe	n=0.012	L=225.0'	S=0.0747 '/'
		Capacity=3.58 cfs	Outflow=0.28 cfs
			0.022 af
Reach 181:	Avg. Flow Depth=0.30'	Max Vel=2.69 fps	Inflow=0.53 cfs
12.0" Round Pipe	n=0.012	L=60.0'	S=0.0050 '/'
		Capacity=2.73 cfs	Outflow=0.52 cfs
			0.040 af
Reach 210:	Avg. Flow Depth=0.21'	Max Vel=4.34 fps	Inflow=0.50 cfs
12.0" Round Pipe	n=0.012	L=66.0'	S=0.0200 '/'
		Capacity=5.46 cfs	Outflow=0.50 cfs
			0.038 af
Reach 215:	Avg. Flow Depth=0.14'	Max Vel=1.89 fps	Inflow=0.13 cfs
12.0" Round Pipe	n=0.013	L=52.0'	S=0.0069 '/'
		Capacity=2.96 cfs	Outflow=0.13 cfs
			0.010 af

Reach 216R:	Avg. Flow Depth=0.02'	Max Vel=3.12 fps	Inflow=0.01 cfs	0.004 af
	12.0" Round Pipe n=0.013	L=12.0'	S=0.2267 '/	Capacity=16.96 cfs Outflow=0.01 cfs 0.004 af
Reach 220:	Avg. Flow Depth=0.27'	Max Vel=5.93 fps	Inflow=1.28 cfs	0.100 af
	18.0" Round Pipe n=0.012	L=218.0'	S=0.0259 '/	Capacity=18.30 cfs Outflow=1.23 cfs 0.100 af
Reach 230:	Avg. Flow Depth=0.17'	Max Vel=11.91 fps	Inflow=1.29 cfs	0.105 af
	18.0" Round Pipe n=0.012	L=87.0'	S=0.1884 '/	Capacity=49.39 cfs Outflow=1.28 cfs 0.105 af
Reach 231:			Inflow=0.06 cfs	0.005 af
			Outflow=0.06 cfs	0.005 af
Reach 240:	Avg. Flow Depth=0.20'	Max Vel=12.45 fps	Inflow=1.80 cfs	0.153 af
	18.0" Round Pipe n=0.012	L=100.0'	S=0.1612 '/	Capacity=45.69 cfs Outflow=1.78 cfs 0.153 af
Reach 260:	Avg. Flow Depth=0.25'	Max Vel=8.04 fps	Inflow=1.78 cfs	0.153 af
	24.0" Round Pipe n=0.012	L=48.0'	S=0.0515 '/	Capacity=55.59 cfs Outflow=1.77 cfs 0.153 af
Reach 410:	Avg. Flow Depth=0.28'	Max Vel=2.62 fps	Inflow=0.46 cfs	0.035 af
	12.0" Round Pipe n=0.012	L=35.0'	S=0.0051 '/	Capacity=2.77 cfs Outflow=0.46 cfs 0.035 af
Reach 510:	Avg. Flow Depth=0.11'	Max Vel=8.95 fps	Inflow=0.53 cfs	0.047 af
	18.0" Round Pipe n=0.012	L=62.0'	S=0.1768 '/	Capacity=47.85 cfs Outflow=0.52 cfs 0.047 af
Reach 810:	Avg. Flow Depth=0.02'	Max Vel=3.26 fps	Inflow=0.01 cfs	0.004 af
	12.0" Round Pipe n=0.012	L=210.0'	S=0.2129 '/	Capacity=17.81 cfs Outflow=0.01 cfs 0.004 af
Reach 820:	Avg. Flow Depth=0.02'	Max Vel=2.55 fps	Inflow=0.01 cfs	0.004 af
	12.0" Round Pipe n=0.012	L=164.0'	S=0.1020 '/	Capacity=12.32 cfs Outflow=0.01 cfs 0.004 af
Pond 1P+G: R-Tank System w/Garage	Peak Elev=50.62'	Storage=4,017 cf	Inflow=1.48 cfs	0.113 af
			Outflow=0.04 cfs	0.027 af
Pond 2P:	Peak Elev=107.03'	Storage=0 cf	Inflow=0.02 cfs	0.003 af
	18.0" Round Culvert n=0.011	L=50.0'	S=0.0100 '/	Outflow=0.02 cfs 0.003 af
Pond 3P:			Inflow=0.06 cfs	0.005 af
			Primary=0.06 cfs	0.005 af
Pond 5P:			Inflow=0.53 cfs	0.047 af
			Primary=0.53 cfs	0.047 af
Pond 6P:			Inflow=0.05 cfs	0.004 af
			Primary=0.05 cfs	0.004 af
Pond 7P:			Inflow=0.00 cfs	0.000 af
			Primary=0.00 cfs	0.000 af
Pond 8P:			Inflow=0.01 cfs	0.004 af
			Primary=0.01 cfs	0.004 af

Pond 10P:	Inflow=0.45 cfs 0.035 af Primary=0.45 cfs 0.035 af
Pond 11P:	Inflow=0.22 cfs 0.017 af Primary=0.22 cfs 0.017 af
Pond 12P:	Inflow=0.46 cfs 0.035 af Primary=0.46 cfs 0.035 af
Pond 13.5P: CB 13796	Peak Elev=42.60' Inflow=0.21 cfs 0.015 af Primary=0.21 cfs 0.015 af Secondary=0.00 cfs 0.000 af Outflow=0.21 cfs 0.015 af
Pond 13P: CB 13	Peak Elev=66.03' Inflow=0.29 cfs 0.022 af Primary=0.29 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.29 cfs 0.022 af
Pond 14P: CB 13581	Peak Elev=42.50' Inflow=0.00 cfs 0.001 af Primary=0.00 cfs 0.001 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af
Pond CB-63:	Peak Elev=59.84' Storage=1 cf Inflow=0.01 cfs 0.004 af 12.0" Round Culvert n=0.012 L=10.0' S=0.1340 '/' Outflow=0.01 cfs 0.004 af
Pond DMH 20: DMH 13592	Peak Elev=37.81' Inflow=0.21 cfs 0.016 af 12.0" Round Culvert n=0.010 L=20.0' S=0.1295 '/' Outflow=0.21 cfs 0.016 af
Pond DMH-7:	Inflow=0.52 cfs 0.040 af Primary=0.52 cfs 0.040 af
Pond DMH1: New DMH-1 Congress Street	Peak Elev=45.77' Inflow=0.04 cfs 0.027 af 15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=0.04 cfs 0.027 af
Pond hil-01:	Inflow=0.53 cfs 0.040 af Primary=0.53 cfs 0.040 af
Pond hil-02:	Inflow=1.78 cfs 0.153 af Primary=1.78 cfs 0.153 af
Pond OS-1.: CB	Peak Elev=55.05' Inflow=0.10 cfs 0.009 af Primary=0.10 cfs 0.009 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.009 af
Pond OS-2.: CB 16258	Peak Elev=83.13' Inflow=0.31 cfs 0.028 af Primary=0.31 cfs 0.028 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.028 af
Pond SMH-1: esmh-13952	Peak Elev=44.84' Inflow=0.28 cfs 0.049 af 18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=0.28 cfs 0.049 af
Pond SMH-13932: esmh-13932	Peak Elev=40.90' Inflow=0.37 cfs 0.059 af 18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=0.37 cfs 0.059 af
Link SP-C1:	Inflow=0.05 cfs 0.007 af Primary=0.05 cfs 0.007 af
Link SP-C2:	Inflow=0.37 cfs 0.059 af Primary=0.37 cfs 0.059 af

15466 - Congress CD Post Dev 20181025

Type III 24-hr 1-Inch Rainfall=1.00"

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Link SP-C3:

Inflow=0.21 cfs 0.016 af
Primary=0.21 cfs 0.016 af

Link SP-C4:

Inflow=1.82 cfs 0.161 af
Primary=1.82 cfs 0.161 af

Link SP-C5:

Inflow=0.45 cfs 0.035 af
Primary=0.45 cfs 0.035 af

Total Runoff Area = 15.783 ac Runoff Volume = 0.392 af Average Runoff Depth = 0.30"
26.10% Pervious = 4.119 ac 73.90% Impervious = 11.664 ac

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

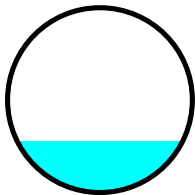
Summary for Reach 110:

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'



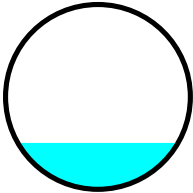
Summary for Reach 115:

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'



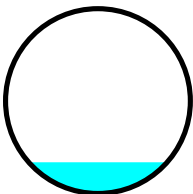
Summary for Reach 118:

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'



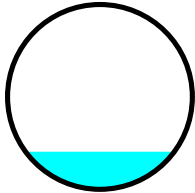
Summary for Reach 125:

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'



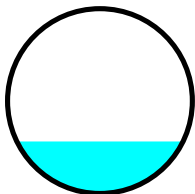
Summary for Reach 128:

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'



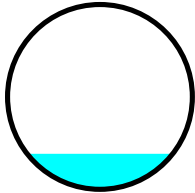
Summary for Reach 135:

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'



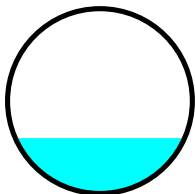
Summary for Reach 181:

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'



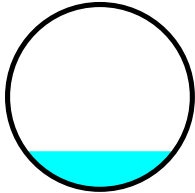
Summary for Reach 210:

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'



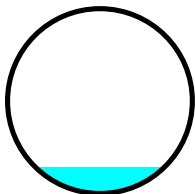
Summary for Reach 215:

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'



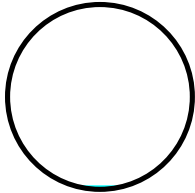
Summary for Reach 216R:

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'



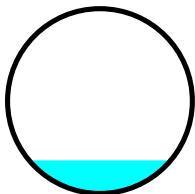
Summary for Reach 220:

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'



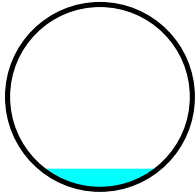
Summary for Reach 230:

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

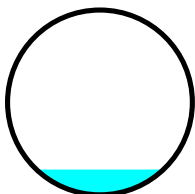
Summary for Reach 240:

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'



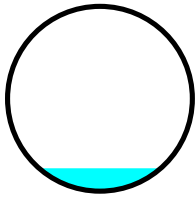
Summary for Reach 260:

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'



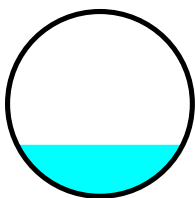
Summary for Reach 410:

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'



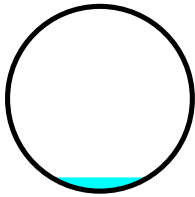
Summary for Reach 510:

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'



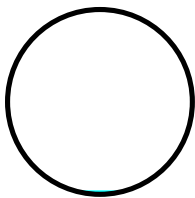
Summary for Reach 810:

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'



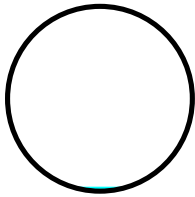
Summary for Reach 820:

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 @ 15.15 hrs, Volume= 0.027 af, Atten= 98%, Lag= 183.4 min
Primary = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 50.62' @ 17.15 hrs Surf.Area= 3,087 sf Storage= 4,017 cf
Flood Elev= 60.04' Surf.Area= 3,269 sf Storage= 17,041 cf

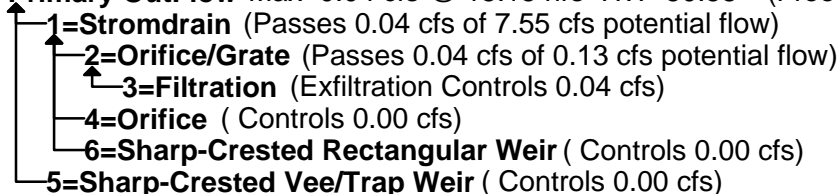
Plug-Flow detention time= 535.9 min calculated for 0.027 af (24% of inflow)
Center-of-Mass det. time= 369.5 min (1,163.5 - 794.0)

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'	3,779 cf	10.56'W x 189.32'L x 8.96'H Field B 17,906 cf Overall - 8,458 cf Embedded = 9,449 cf x 40.0% Voids
#4B	48.37'	8,035 cf	ACF R-Tank HD 5.0 x 395 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 79 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'	711 cf	10.56'W x 41.53'L x 7.96'H Field D 3,490 cf Overall - 1,713 cf Embedded = 1,777 cf x 40.0% Voids
#8D	48.37'	1,627 cf	ACF R-Tank HD 5.0 x 80 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 16 Chambers
		17,041 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 Stormdrain 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 = 2,438 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 @ 15.15 hrs HW=50.58' (Free Discharge)



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 1' 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 1/ S= 0.0813 1/ 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 1' 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 = 0.17" for 1-Inch event
 Inflow = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af
 Outflow = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.04 cfs @ 15.15 hrs, Volume= 0.027 af

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

Peak Elev= 45.77' @ 15.15 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 @ 15.15 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 = 0.21" for 1-Inch event
 Inflow = 0.28 cfs @ 12.12 hrs, Volume= 0.049 af
 Outflow = 0.28 cfs @ 12.12 hrs, Volume= 0.049 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.28 cfs @ 12.12 hrs, Volume= 0.049 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 = 0.22" for 1-Inch event
 Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af
 Outflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.059 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 = 0.22" for 1-Inch event
 Inflow = 0.37 cfs @ 12.13 hrs, Volume= 0.059 af
 Primary = 0.37 cfs @ 12.13 hrs, Volume= 0.059 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

- Subcatchment 1S:** 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
- Subcatchment 2A:** 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
- Subcatchment 2B:** 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
- Subcatchment 2S:** 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
- Subcatchment 3.1:** 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
- Subcatchment 3.2:** 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
- Subcatchment 4S:** 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
- Subcatchment 5S:** 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
- Subcatchment 6S:** 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
- Subcatchment 7S:** 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
- Subcatchment 8S:** 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
- Subcatchment 10S:** 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
- Subcatchment 11S:** 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
- Subcatchment 12S:** 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
- Subcatchment 13S:** 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
- Subcatchment 14.1S:** 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=52.94' Storage=9,376 cf Inflow=5.45 cfs 0.438 af
 Outflow=2.03 cfs 0.353 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=46.54' Inflow=2.03 cfs 0.353 af
15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=2.03 cfs 0.353 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=45.42' Inflow=2.99 cfs 0.490 af
18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=2.99 cfs 0.490 af

Pond SMH-13932: esmh-13932 Peak Elev=41.54' Inflow=3.59 cfs 0.554 af
18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=3.59 cfs 0.554 af

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

Link SP-C2: Inflow=3.59 cfs 0.554 af
Primary=3.59 cfs 0.554 af

15466 - Congress CD Post Dev 20181025

Type III 24-hr 2-YR Rainfall=3.10"

Prepared by {enter your company name here}

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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

Subcatchment 1S:	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
Subcatchment 2A:	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
Subcatchment 2B:	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
Subcatchment 2S:	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
Subcatchment 3.1:	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
Subcatchment 3.2:	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
Subcatchment 4S:	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
Subcatchment 5S:	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
Subcatchment 6S:	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
Subcatchment 7S:	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
Subcatchment 8S:	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
Subcatchment 10S:	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
Subcatchment 11S:	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
Subcatchment 12S:	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
Subcatchment 13S:	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
Subcatchment 14.1S:	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=53.90'	Storage=11,657 cf	Inflow=8.29 cfs	0.678 af
			Outflow=4.42 cfs	0.592 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=47.09' Inflow=4.42 cfs 0.592 af 15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=4.42 cfs 0.592 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=45.85' Inflow=5.94 cfs 0.811 af 18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=5.94 cfs 0.811 af
Pond SMH-13932: esmh-13932	Peak Elev=42.01' Inflow=6.73 cfs 0.913 af 18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=6.73 cfs 0.913 af
Link SP-C1:	Inflow=2.39 cfs 0.174 af Primary=2.39 cfs 0.174 af
Link SP-C2:	Inflow=6.73 cfs 0.913 af Primary=6.73 cfs 0.913 af

15466 - Congress CD Post Dev 20181025

Type III 24-hr 10-YR Rainfall=4.60"

Prepared by {enter your company name here}

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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

Subcatchment 1S:	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
Subcatchment 2A:	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
Subcatchment 2B:	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
Subcatchment 2S:	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
Subcatchment 3.1:	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
Subcatchment 3.2:	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
Subcatchment 4S:	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
Subcatchment 5S:	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
Subcatchment 6S:	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
Subcatchment 7S:	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
Subcatchment 8S:	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
Subcatchment 10S:	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
Subcatchment 11S:	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
Subcatchment 12S:	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
Subcatchment 13S:	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
Subcatchment 14.1S:	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=54.25' Storage=12,492 cf Inflow=9.96 cfs 0.871 af
 Outflow=8.08 cfs 0.785 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=48.09' Inflow=8.08 cfs 0.785 af 15.0" Round Culvert n=0.013 L=4.0' S=0.0050 '/' Outflow=8.08 cfs 0.785 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=46.71' Inflow=9.92 cfs 1.065 af 18.0" Round Culvert n=0.012 L=41.0' S=0.0724 '/' Outflow=9.92 cfs 1.065 af
Pond SMH-13932: esmh-13932	Peak Elev=43.02' Inflow=10.90 cfs 1.197 af 18.0" Round Culvert n=0.025 L=45.0' S=0.0587 '/' Outflow=10.90 cfs 1.197 af
Link SP-C1:	Inflow=3.31 cfs 0.242 af Primary=3.31 cfs 0.242 af
Link SP-C2:	Inflow=10.90 cfs 1.197 af Primary=10.90 cfs 1.197 af

15466 - Congress CD Post Dev 20181025

Type III 24-hr 25-YR Rainfall=5.80"

Prepared by {enter your company name here}

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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

Attachment 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. Sediment Barriers:

- 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. Riprap Materials:

- 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 maintenance 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.

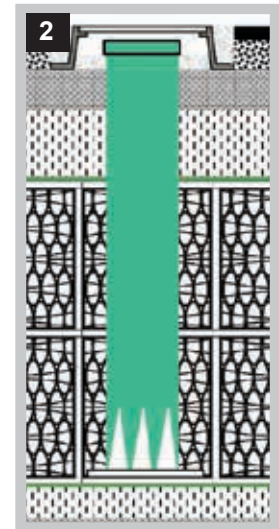
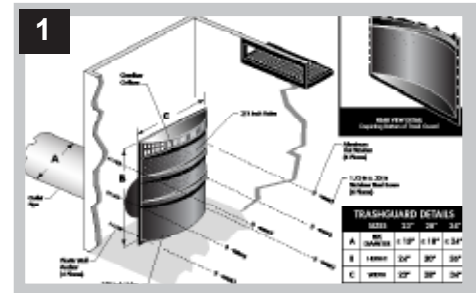
After pumping water into the tanks, flushing is completed by vacuuming sediment laden water out of the system either through the outlet structure or through the flush port.

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 Kits (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.



LET'S GET IT DONE

800.448.3636
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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).



2831 Cardwell Road
Richmond, Virginia, 23234
800.448.3636
FAX 804.743.7779
acfenvironmental.com

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

Company Responsible
for Maintenance:

Site Name: _____

Location: _____

Contact: _____

System Owner: _____

Phone Number: _____

Date	Location	Depth to Bottom	Depth to Sediment	Sediment Depth	Observations/Notes	Initials



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Operations and Maintenance Guidelines

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878 Federal Road
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www.cultec.com

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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.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

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May 2017

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 determine 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	<ul style="list-style-type: none"> Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	<ul style="list-style-type: none"> Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 1 st year	<ul style="list-style-type: none"> Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	<ul style="list-style-type: none"> Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	<ul style="list-style-type: none"> 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
<input type="checkbox"/> Month 1	Date:	
<input type="checkbox"/> Month 2	Date:	
<input type="checkbox"/> Month 3	Date:	
<input type="checkbox"/> Month 4	Date:	
<input type="checkbox"/> Month 5	Date:	
<input type="checkbox"/> Month 6	Date:	
<input type="checkbox"/> Month 7	Date:	
<input type="checkbox"/> Month 8	Date:	
<input type="checkbox"/> Month 9	Date:	
<input type="checkbox"/> Month 10	Date:	
<input type="checkbox"/> Month 11	Date:	
<input type="checkbox"/> Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
<input type="checkbox"/> Year 1	Date:	
<input type="checkbox"/> Year 4	Date:	
<input type="checkbox"/> Year 7	Date:	
<input type="checkbox"/> Year 10	Date:	
<input type="checkbox"/> Year 13	Date:	
<input type="checkbox"/> Year 16	Date:	
<input type="checkbox"/> Year 19	Date:	
<input type="checkbox"/> Year 22	Date:	

Major Maintenance

Frequency		Action
Inlets and Outlets	Every 3 years	
	Notes	
	<input type="checkbox"/> Year 1	Date:
	<input type="checkbox"/> Year 4	Date:
	<input type="checkbox"/> Year 7	Date:
	<input type="checkbox"/> Year 10	Date:
	<input type="checkbox"/> Year 13	Date:
	<input type="checkbox"/> Year 16	Date:
	<input type="checkbox"/> Year 19	Date:
	<input type="checkbox"/> Year 22	Date:
	Spring and Fall	
	Notes	
	<input type="checkbox"/> Spring	Date:
	<input type="checkbox"/> Fall	Date:
	<input type="checkbox"/> Spring	Date:
	<input type="checkbox"/> Fall	Date:
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
<input type="checkbox"/> Spring	Date:	
<input type="checkbox"/> Fall	Date:	
CULTEC Stormwater Chambers	2 years after commissioning	
Notes		
<input type="checkbox"/> Year 2	Date:	

Major Maintenance

Frequency		Action
CULTEC Stormwater Chambers	9 years after commissioning every 9 years following	
	<ul style="list-style-type: none"> <input type="checkbox"/> Clean stormwater management chambers and feed connectors of any debris. <input type="checkbox"/> Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. <input type="checkbox"/> Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended. 	
	Notes	
	<input type="checkbox"/> Year 9	Date:
	<input type="checkbox"/> Year 18	Date:
	<input type="checkbox"/> Year 27	Date:
	<input type="checkbox"/> Year 36	Date:
45 years after commissioning		
<ul style="list-style-type: none"> <input type="checkbox"/> Clean stormwater management chambers and feed connectors of any debris. <input type="checkbox"/> Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. <input type="checkbox"/> Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. <input type="checkbox"/> Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. <input type="checkbox"/> Attain the appropriate approvals as required. <input type="checkbox"/> Establish a new operation and maintenance schedule. 		
Notes		
<input type="checkbox"/> Year 45	Date:	



Major Maintenance

Frequency		Action	
Surrounding Site	Monthly in 1st year		
	<input type="checkbox"/> Check for depressions in areas over and surrounding the stormwater management system.		
	Notes		
	<input type="checkbox"/> Month 1	Date:	
	<input type="checkbox"/> Month 2	Date:	
	<input type="checkbox"/> Month 3	Date:	
	<input type="checkbox"/> Month 4	Date:	
	<input type="checkbox"/> Month 5	Date:	
	<input type="checkbox"/> Month 6	Date:	
	<input type="checkbox"/> Month 7	Date:	
	<input type="checkbox"/> Month 8	Date:	
	<input type="checkbox"/> Month 9	Date:	
	<input type="checkbox"/> Month 10	Date:	
	<input type="checkbox"/> Month 11	Date:	
	<input type="checkbox"/> Month 12	Date:	
	Spring and Fall		
	<input type="checkbox"/> Check for depressions in areas over and surrounding the stormwater management system.		
	Notes		
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	<input type="checkbox"/> Spring	Date:	
	<input type="checkbox"/> Fall	Date:	
	Yearly		
	<input type="checkbox"/> Confirm that no unauthorized modifications have been performed to the site.		
Notes			
<input type="checkbox"/> Year 1	Date:		
<input type="checkbox"/> Year 2	Date:		
<input type="checkbox"/> Year 3	Date:		
<input type="checkbox"/> Year 4	Date:		
<input type="checkbox"/> Year 5	Date:		
<input type="checkbox"/> Year 6	Date:		
<input type="checkbox"/> Year 7	Date:		



The Founder of Plastic Chamber Technology

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878 Federal Road | P.O. Box 280 | Brookfield, CT 06804 USA

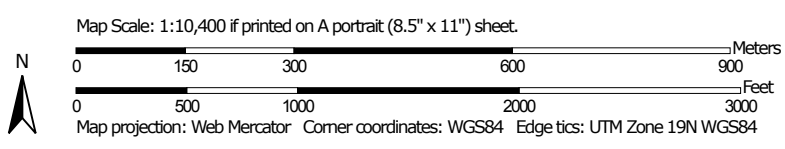
Attachment D

SOILS MAP

Soil Map—Cumberland County and Part of Oxford County, Maine
(Maine Medical Center area)



Soil Map may not be valid at this scale.



MAP LEGEND

- Area of Interest (AOI)
- Area of Interest (AOI)
- Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Water Features**
- Streams and Canals
- Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads
- Background**
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine

Survey Area Data: Version 15, Sep 6, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Au	Au Gres loamy sand	6.9	1.5%
BgB	Belgrade very fine sandy loam, 0 to 8 percent slopes	8.1	1.8%
Cu	Cut and fill land	39.7	8.6%
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	60.4	13.1%
Gp	Gravel pits	5.5	1.2%
HfD2	Hartland very fine sandy loam, 15 to 25 percent slopes, eroded	3.1	0.7%
HIB	Hinckley loamy sand, 3 to 8 percent slopes	261.8	57.0%
HIC	Hinckley loamy sand, 8 to 15 percent slopes	13.4	2.9%
HID	Hinckley loamy sand, 15 to 25 percent slopes	33.9	7.4%
Sz	Swanton fine sandy loam	0.4	0.1%
W	Water	4.7	1.0%
Wa	Walpole fine sandy loam	4.1	0.9%
WmB	Windsor loamy sand, 0 to 8 percent slopes	17.2	3.7%
Totals for Area of Interest		459.3	100.0%