City of Augusta Site Plan Review – Major Development Application for 2016 Infrastructure Improvements at the Augusta East Campus

Prepared for:
State of Maine
Bureau of General Services
77 State House Station
Augusta, ME 04333-0077

Prepared by:
Stantec Consulting Services Inc.
482 Payne Road
Scarborough Court
Scarborough, ME 04074

July 2016

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City of Augusta
Development Review Application

Bureau of Planning, Department of Development Services

Address of Proposed development: The East Campus (formerly AMHI)

Zone(s): BP- Institutional/Business/Professional

Project Name: East Campus Infrastructure Improvements

Existing Building (sq. ft.): 345,300 SF	**Proposed Building (sq. ft.):** 0 SF
Existing Impervious (sq. ft.): 1,052,700 SF (Includes Building)	**Proposed Impervious (sq. ft.):** 74,418 SF
Structure Demolition: No	**Blasting Proposed (cu. ft.): No**

Proposed Total Disturbed Area of the Site: Approximately 2.5 Acres
Proposed disturbance of greater than one acre requires a Chapter 500, Stormwater Management Permit from the Maine Department of Environmental Protection (DEP).

Owner's Name/Address:	**Applicant's Name/Address:**	**Consultant's Name/Address:**
State of Maine, DAFS, 111 Sewall Street, 77 SHS, 4th Floor, Augusta, ME 04333-0077	**Jill Instasi, State of Maine, DAFS, 111 Sewall Street, 77 SHS, 4th Floor, Augusta, ME 04333-0077**	**Dave Nadeau, Stantec Consulting Services, Inc., 482 Payne Road, Scarborough, ME 04074**
Phone #: 207-624-7341	**Phone #:** 207-624-7341	**Phone #:** 207-887-3842
Cell #:	**Cell #:**	**Cell #:**
e-mail: Jill.Instasi@maine.gov	**e-mail:** Jill.Instasi@maine.gov	**e-mail:** dave.nadeau@stantec.com
Tax Map #: 10	**Lot Size (acres):** 147.60	**Form for Evidence of Standing** (deed, purchase and sale agreement, other): Book number, 2380, Page number 189
Lot #: 8	**Frontage (Feet):** ±3,500	

Signatures:

Applicant: Jill M. Instasi **Date:** 7/8/2016

Owner: Jill M. Instasi **Date:** 7/8/2016

Agent: **Date:** 7/8/16

<u>For Staff Use</u>

Fee Calculation: Major Development max fee is $4,000; Minor Development max fee is $1,000

Major Development: $2,000 + (number of sq ft over 25,000 x $0.15) =

Minor Development: $250 + (number of sq ft over 5,000 x $0.15) =

All Development: Number of Abutters x (1oz First Class postage fee + $0.15) =

Total Fee:

Checklist. The checklist below must be completed by the applicant. The required material or a written waiver request must be provided.

Information Required on Plan(s) See Augusta Land Use Ordinance for greater detail including Section 300-405B(1) Preliminary Plan Requirements and Section 300-305B Final Plan Requirements	**Included**	**Waiver Requested**
a. Name of Site Plan or Subdivision. 300-405B(1)(a)	Yes	
b. Owner(s) name and address. 300-405B(1)(b)	Yes	
c. Deed reference to subject parcel and immediate abutter identification. 300-405B(1)(c)	Yes	
d. Engineer's name, address, signature and seal. 300-405B(1)(d)	Yes	
e. Surveyor's name, address, signature and seal. 300-405B(1)(e)	N/A	
f. Scale, both in graphic and written form. 300-405B(1)(f)	Yes	
g. Date and revision box. 300-405B(1)(g)	Yes	
h. Zoning designation(s). 300-405B(1)(h)	Yes	
i. North Arrow (true, magnetic, dated or grid). 300-405B(1)(i)	Yes	
j. Preliminary site plan. 300-405B(1)(j)	Yes	
k. Ownership, location & present or proposed use of abutting properties. 300-405B(1)(k)	Yes	
l. Location map. 300-405B(1)(l)	Yes	
m. Streets, existing & proposed, with curve data. 300-405B(1)(m) & 300-406B(5)	Yes	
n. Drainage and erosion control. 300-405B(1)(n)	Yes	
o. Utilities, existing and proposed. 300-405B(1)(o)	Yes	
p. Topography, 2 foot contours. 300-405B(1)(p)	Yes	
q. Lot lines and dimensions. 300-405B(1)(q)	Yes	
r. Proposed use of the property. 300-405B(1)(r)	Yes	
s. Proposed public or common areas, if any. 300-405B(1)(s)	Yes	
t. Boundary survey and associated information. 300-405B(1)(t)	N/A	
u. Traffic controls, off-street parking and facilities. 300-405B(1)(u)	Yes	
v. Proposed fire protection plans or needs. 300-405B(1)(v)	N/A	
w. Landscaping and buffering. 300-405B(1)(w)	Yes	
x. Outdoor lighting plan. 300-405B(1)(x)	Yes	
y. Freshwater wetlands. 300-404B(15)	Yes	
z. River, stream or brook. 300-404B(16)	Yes	

Information Required in Written Project Narrative See Augusta Land Use Ordinance for greater detail Section 300-404B(1) Criteria for Reviewing the Preapplication and Section 300-603E Conditional Uses Site Plan Review Criteria	**Included**	**Waiver Requested**
1. Pollution – undue water or air pollution. 300-404B(1)	Yes	
2. Water – sufficient potable water. 300-404B(2)	Yes	
3. Municipal Water – adequate supply, if applicable. 300-404B(3)	Yes	
4. Soil Erosion – unreasonable soil erosion. 300-404B(4)	Yes	
5. Road congestion and safety. 300-404B(5) & 300-405B(1)(v)	Yes	
6. Major Developments, additional traffic movement. 300-404B(6)	Yes	
7. Sewage waste disposal – adequate provisions. 300-404B(7)	Yes	
8. Solid waste – adequate provisions. 300-404B(8)	Yes	
9. Aesthetic, cultural, and natural values. 300-404B(9)	Yes	
10. Conformity with City ordinances and plans. 300-404B(10)	Yes	

Additional Information Required in Written Narrative (continued) **Where the items below duplicate the items above, identical responses are permitted and encouraged.**	**Included**	**Waiver Requested**
11. Financial and technical capacity. 300-404B(11)	Yes	
12. Surface water, shorelands and outstanding rivers. 300-404B(12)	Yes	
13. Groundwater – negative impact. 300-404B(13)	Yes	
14. Flood areas. 300-404B(14)	Yes	
15. Freshwater wetlands – description of impact. 300-404B(15)	Yes	
16. River, stream or brook – description of impact. 300-404B(16)	Yes	
17. Stormwater – management plans. 300-404B(17)	Yes	
18. Access to direct sunlight. 300-404B(18)	Yes	
19. State permits – description of requirements. 300-404B(19)	Yes	
20. Spaghetti lots prohibited – 300-404B(20)	Yes	
21. Outdoor lighting – description of lighting plans. 300-404B(21)	Yes	
22. Neighborhood compatibility – description per ordinance. 300-603E(1)	Yes	
23. Compliance with plans and policies. 300-603E(2)	Yes	
24. Traffic pattern, flow and volume analysis. 300-603E(3)	Yes	
25. Public facilities – utilities including stormwater. 300-603E(4)	Yes	
26. Resource protection and the environment. 300-603E(5)	Yes	
27. Performance standards. 300-603E(6)	Yes	
28. Financial and technical ability. 300-603E(7)	Yes	

Application Materials

The application materials that are required for a complete application are listed below:

Paper Copies	**Included**	**Waiver Requested**
10 copies of the Application Packet	Yes	
- Application Form(s)	Yes	
- Project narratives	Yes	
- Purchase & sale agreement, or other document to show standing	Yes	
- Letter authorizing the agent to represent the applicant	Yes	
3 copies of any stormwater report	In Application	
2 copies of any traffic report	N/A	
10 reduced-sized complete plan sets on 11” x 17” paper	Yes	
4 full-sized complete plan sets on ARCH D or E size paper	Yes	
Payment in full of application fee (Note: an abutter notification fee will be assessed after the application is determined to be complete. The fee is $0.15 plus the cost of first class postage for each abutter that will be notified as required by the ordinance.)	Invoice Owner	
Electronic Copy		
1 CD that includes each of the application documents in Adobe PDF format	Yes	

For Official Use:

$_____ **Application** Fee Paid. Received By (Initials):_____Date:_____

$_____ **Abutter** Notification Fee Paid. Received By (Initials):_____Date:_____

STATE OF MAINE
DEPARTMENT OF ADMINISTRATIVE & FINANCIAL SERVICES
BUREAU OF GENERAL SERVICES
BURTON M. CROSS BUILDING
4TH FLOOR, 77 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0077

PAUL R. LEPAGE
GOVERNOR

RICHARD W. ROSEN
COMMISSIONER

EDWARD A. DAHL
DIRECTOR

May 25, 2016

Dave Nadeau, PE
Stantec Consulting Services Inc.
482 Payne Road, Scarborough Court
Scarborough, ME 04074

Dear Mr. Nadeau,

The State of Maine, Bureau of General Services, hereby gives Stantec Consulting Services Inc. authorization to act as the Bureau's agent in submitting all required permits for the following project(s):

- Parking and Roadway Infrastructure Improvements at the East Campus in Augusta, Maine

Please contact me with any questions.

Sincerely,

Edward A Dahl

Edward A. Dahl
Director
Bureau of General Services

PHONE: (207) 624-7314 www.Maine.gov FAX: (207) 287-4039

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1.0 DEVELOPMENT DESCRIPTION

The State of Maine, being represented by the Department of Administrative and Financial Services, Bureau of General Services (applicant) is filing a Major Development application pursuant to the City of Augusta Land Use Requirements (Chapter 300, Part 4, 300-403) for proposed infrastructure improvements at the Augusta East Campus (former AMHI).

1.1 PROJECT LOCATION / FACILITY DESCRIPTION

The East Campus is located on the east shore of the Kennebec River between Hospital Street (Route 9) to the east and Arsenal Street to the west. The Kennebec River runs along the edge of the campus, approximately 725 feet to the west. The campus is owned by the State of Maine (Book 2380, Page 189 in the Kennebec Registry of Deeds; refer to Appendix A) and the deeded property covers approximately 148 acres. Refer to the attached *Location Map*, Figure No. 1, based on the USGS Quadrangle for Augusta, Maine. The East Campus consists of approximately two dozen buildings connected by a series of sidewalks and roadways, as well as multiple parking lots. The buildings are utilized as State of Maine departmental offices. The East Campus property is zoned as BP- Institutional/Business/Professional by the City of Augusta.

1.2 PROJECT DESCRIPTION

The Maine Bureau of General Services (BGS), which oversees management of the East Campus, recently completed a campus-wide parking study (Study) to determine existing and future anticipated parking needs. The study was also used to classify the conditions of all existing roadways, parking lots, and sidewalks as good, fair, or poor as part of an effort to develop a maintenance schedule for the campus infrastructure.

The results of the Study indicated that overall, there is presently sufficient parking capacity to accommodate the current usage of the campus. The study also indicated however that the layout of the parking is inefficient; i.e. there is extra parking capacity in some areas of the campus, while insufficient in other areas. This results in relatively long distances for employees and visitors to walk from their parked vehicles to their intended destination.

The Study results also indicate that anticipated future development within the next five years will exceed available parking capacity. The anticipated future development estimates were based on preliminary discussions with each of the various state agencies that are housed on the campus, and an analysis of the available floor space in each of the various campus buildings.

As a first stage in remedying the parking inefficiencies and shortage, three additional parking areas are proposed on the campus, identified as lots 3D, 7E and 7F on attached Figure 2, *Proposed Pavement Figure*. The lots have been located in areas where additional parking (both

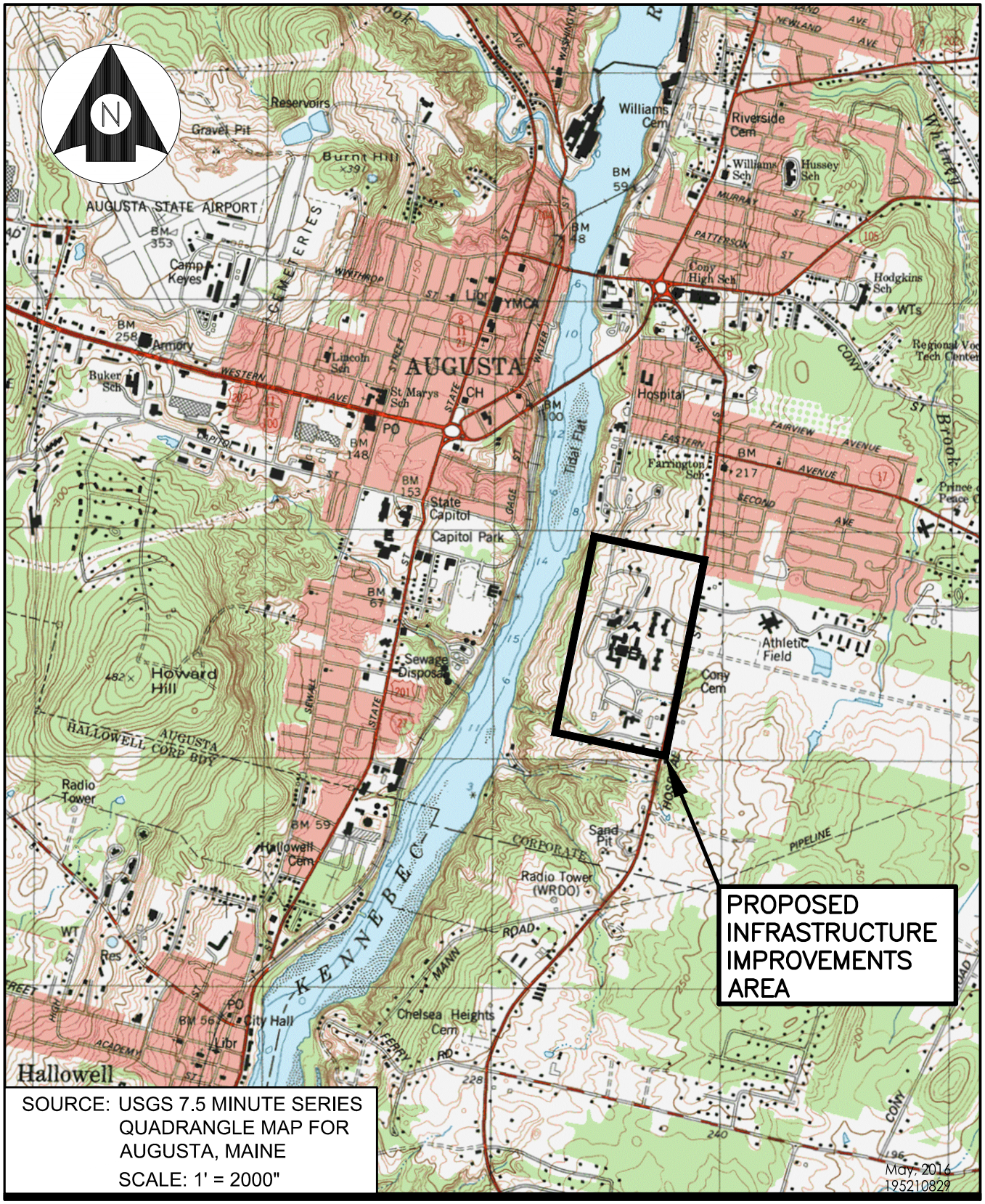
currently and in the future) is needed. An existing gravel parking lot identified as Lot 1A will be paved to provide additional parking as well.

Additional components of the project that are intended to improve pedestrian circulation and safety include constructing two new sections of paved sidewalk between the northeast corner of the Ray Building and Hospital Street, and removal of several sections of existing sidewalks that are no longer frequently used, but are in poor condition and prone to safety hazards.

The project includes several infrastructure improvements at the Campbell Barn site, which is located at the southern end of the campus along Hospital Street. The barn is used by BGS for storage of equipment and state agency vehicles such as boats and ATVs. In this location, a new paved driveway is proposed on the west side of the barn to provide access to an overhead door into the lower level of the barn. On the east side, the existing gravel driveway will be paved, and slightly expanded to accommodate a new boat / vehicle rinse down station (water only; no soaps or cleaners).

Maintenance projects that will be constructed concurrently with the improvements listed above, but are not included in this permit application, include rehabilitation of a majority of the parking lots, roadways and sidewalks on the campus based on the conditions analysis prepared during the Study.

Please refer to the project Drawing Set accompanying this application for identification of the different infrastructure improvement areas.



SOURCE: USGS 7.5 MINUTE SERIES QUADRANGLE MAP FOR AUGUSTA, MAINE

SCALE: 1' = 2000"

May, 2016
195210829

Stantec

Client/Project

State of Maine

EAST CAMPUS

Augusta, Maine

Figure No.

1.0

Title

LOCATION MAP

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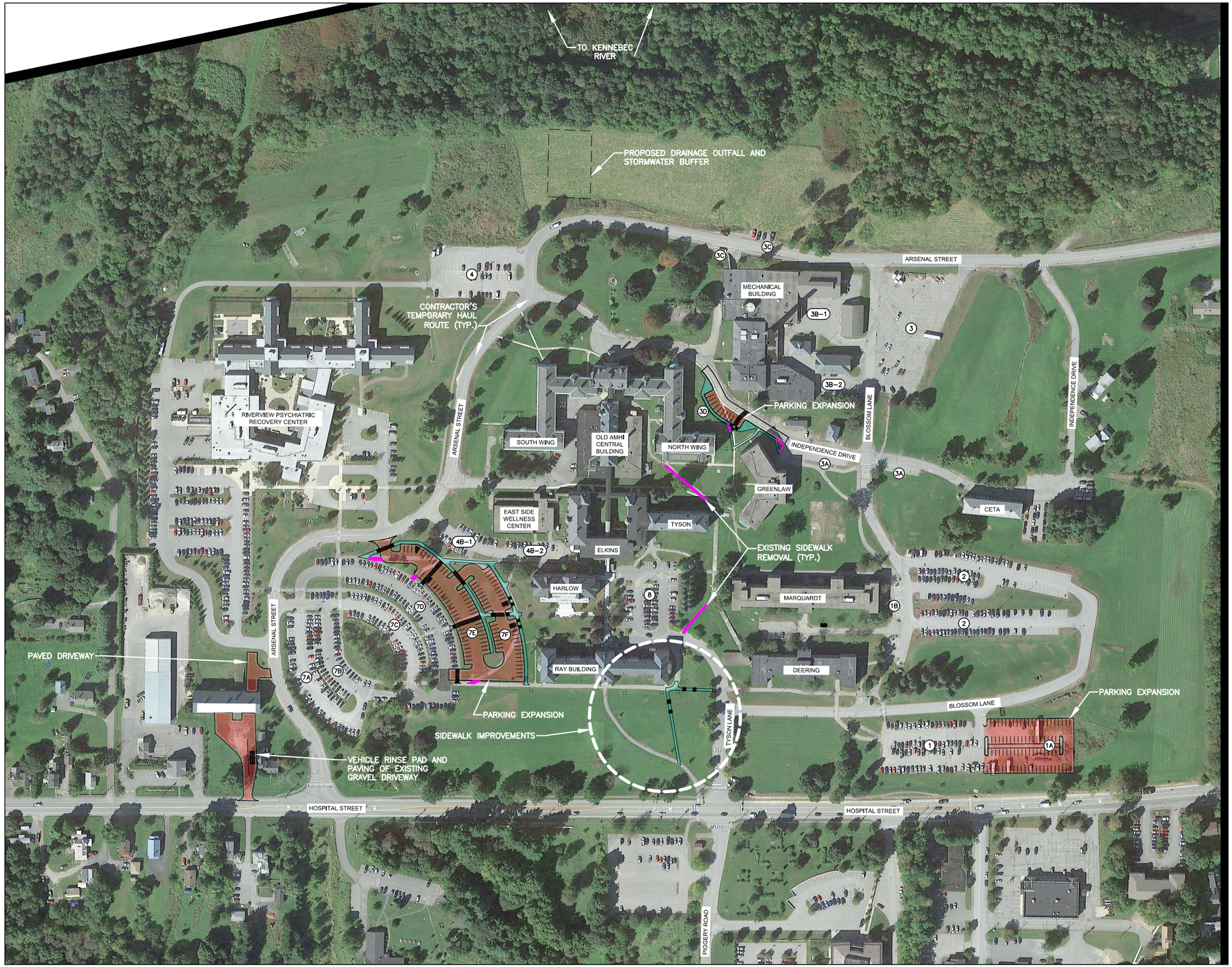

Stantec

Stantec Consulting Services Inc.
482 Payne Road
Scarborough ME 04074 U.S.A.
Tel. 207.883.3355
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www.stantec.com

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Notes

3C PARKING LOT ID
PROPOSED BITUMINOUS SIDEWALKS
PROPOSED BITUMINOUS PARKING / ROADS
EXISTING SIDEWALK REMOVAL

N

0 100' 200'

Revision	By	Appd.	YY.MM.DD
A CITY OF AUGUSTA SITE PLAN REVIEW			16.07.07

Issued	By	Appd.	YY.MM.DD
File Name: Fig_02_site_pln.dwg	DPN Dwn.	DPN Chkd.	DPN Dsgn.	16.04.26 YY.MM.DD

Permit-Seal

ISSUED FOR SITE PLAN REVIEW
JULY 7, 2016

Client/Project
STATE OF MAINE
BUREAU OF GENERAL SERVICES

EAST CAMPUS
INFRASTRUCTURE IMPROVEMENTS

Augusta, Maine

Title

GENERAL SITE PLAN

Project No.	Scale	
195210829	AS NOTED	
Drawing No.	Sheet	Revision
Fig 2	1 of 1	0

ORIGINAL SHEET - ARCH D

1.3 PROJECT SCHEDULE

The infrastructure improvements included in this Site Plan application are scheduled for construction during the summer/fall of 2016. Final stabilization is anticipated to occur in the spring of 2017.

1.4 PROJECT DRAWINGS

Refer to the Project Drawing set accompanying this application for additional facility and project information. The drawing set, prepared by Stantec Consulting Services Inc. and dated July 2016 includes:

- G001 Title Sheet
- G002 General Notes and Legend
- C001 General Site Plan
- C101 Layout Plan, Lot No. 7E and 7F
- C102 Layout Plan, Lot No. 3D
- C103 Layout Plan, Sidewalk Additions and Campbell Barn Improvements
- C104 Layout Plan, Lot No. 1 and 1A
- C201 Grading Plan, Lot No. 7E and 7F
- C202 Stormdrain Outfall Plan
- C203 Grading Plan, Lot No. 3D
- C204 Grading Plan, Sidewalk Additions and Campbell Barn Improvements
- C205 Miscellaneous Profiles, Ray Building Sidewalks
- C206 Grading Plan, Lot No. 1 and 1A
- C501 Civil Details
- C502 Civil Details
- C503 Civil Details
- C504 Civil Details
- C601 Erosion Control Notes
- C602 Erosion Control Details

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2.0 DEVELOPMENT REVIEW APPLICATION CRITERIA

2.1 POLLUTION

The project will not generate or increase the likelihood of pollution of groundwater or air.

During construction, liquid petroleum products and other materials with the potential to contaminate groundwater shall not be stored or handled in areas of the site draining to an infiltration area. Such storing and handling shall be located in designated staging / stockpile areas that are located away from drainage and infiltration areas, and surrounded by perimeter Best Management Practices (BMPs). An "infiltration area" is any area of the site that 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. The appropriate pollutant removal Best Management Practices (BMPs) shall be consulted prior to on-site storage of these materials in order to prevent impacts to groundwater quality.

Construction debris and trash shall be maintained in a secure location and shall be properly removed and disposed of according to applicable state laws. Construction debris for this project should be minimal and will typically consist of reclaimed or removed pavement, aggregates, topsoil, temporary erosion control products and small trash and debris to be kept in temporary on-site waste receptacles provided by the contractor. All accumulated waste shall be removed by the contractor at regular intervals to avoid significant accumulation on-site. No permanent increases in solid waste generation are anticipated as a result of the proposed projects.

2.2 WATER

No increase in potable water usage is anticipated as a result of the project.

2.3 MUNICIPAL WATER

A single yard hydrant will be constructed at the Campbell Barn to provide rinse down capabilities for state vehicles and equipment prior to storage in the barn. Usage is anticipated to be minimal, primarily during the fall months prior to winter storage. Maximum usage is estimate at between 20-50 gallons per vehicle, at two vehicles per day for a total of approximately 100 gallons per day.

2.4 SOIL EROSION

The development occurs within areas of on-site soils mapped according to the Kennebec County Medium Intensity Soil Survey and National Resources Conservation Service (NRCS) Web

Soil Survey as Hartland and Scio, both classified as Hydrologic Soils Group (HSG) type B soils according to TR-55. The proposed development occurs predominantly on Scio soils. Refer to Appendix B for a copy of the Soil Survey Map.

The terrain of the site is generally sloping in the range of 3 to 10 percent from Hospital Street to the Kennebec River. There are no wetlands within the project site and no history of flooding.

The erosion control measures proposed for project will prevent erosion and sedimentation and protect any adjacent resources. These standards include various erosion and sedimentation controls and housekeeping requirements. Please refer to the attached drawing set, which provides locations, details, and notes for the individual proposed measures.

2.4.1 Erosion and Sedimentation Control Plan

A plan for Erosion and Sedimentation Control (ESC) has been developed to provide a strategy for controlling soil erosion and sedimentation during and after construction of the proposed project. This plan is based on Standards and Specifications for Erosion Prevention in Developing Areas as contained in the most recent version of the *Maine Erosion and Sediment Control BMP Manual* for the Maine Department of Environmental Protection and on Appendix A, *Erosion and Sedimentation Control*, of the Maine Department of Environmental Protection Rules, 06-96, Chapter 500 Stormwater Management, amended December 27, 2006.

Drawings C601 *Erosion Control Notes* and C602 *Erosion Control Details* accompanying this application include the ESC plan during construction activities. Additional requirements for post construction erosion control are included below to create an overall erosion control plan, which addresses the stabilization of the site and the protections of off-site water resources.

2.4.2 Inspection Procedures and Maintenance after Construction

All measures will be maintained in effective operating condition. Maine BGS will designate a person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, to conduct the inspections. The following areas, facilities, and measures will be inspected and identified deficiencies will be corrected.

At a minimum, the following items will be inspected, as described below.

1. Vegetated areas: Vegetated areas will be inspected in the following spring and prior to final acceptance after heavy rains to identify and correct areas in need of replanting, erosive flow diversion, or armoring.

2. Open stormwater channels: Open stormwater channels, including ditches and swales, will be inspected in the spring, late fall, and after heavy rains to identify any obstructions to flow, including overgrown vegetation, and to repair any eroded areas, slumping side slopes, torn or visible riprap filter fabric, or dislodged riprap. The channel will receive

adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

3. Culverts: Culverts will be inspected and repaired if necessary, in the spring, late fall, and after heavy rains to remove any obstructions to flow and to repair any eroded areas. Culvert inlet and outlets, including riprap aprons and level lip spreaders will be inspected and repaired along with the culverts. Sediment will be removed, and erosion repaired.

4. Catch basins: Catch basins will be inspected once a year, preferably in spring, to identify any clean-out needed and to remove and properly dispose of accumulated sediments and debris. Catch basins which include water quality inlets, such as Snout shall be inspected quarterly and cleaned as necessary. Areas inspected will include the bottom of the basin, inlet grates, inflow channels to the basin, and pipes between basins. Any floating oils found in the basin outlet will be removed using oil absorptive pads.

5. Inspect vegetated treatment buffers once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or other measures must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or pools.

Regular maintenance shall include at a minimum.

1. Clear accumulations of winter sand in parking lots and along roadways draining to the stormwater BMPs 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.

2. Manage each buffer's vegetation consistently with the requirements in any deed restrictions for the buffer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches.

3. A qualified person, on behalf of the owner shall keep a log (report) summarizing annual and routine inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Department staff and a copy provided to the Department upon request. The permittee shall retain a copy of the

log for a period of at least five years from the completion of permanent stabilization and shall be provided as a condition of re-certification in accordance with Chapter 500, Appendix B.3.

2.4.3 Record Keeping

Within 24 hours of inspections, both during and after construction, a report (log) will be prepared summarizing the scope of the inspection and any corrective actions taken, the names and qualifications of the person(s) making the inspections, and the date(s) and time of inspection. Additional information listed in the following two paragraphs will also be included:

If the inspection occurs during construction, the report will include a description of major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas if exposed to precipitation, and vehicular access points to the parcel. Major observations will include, if necessary, BMPs that need maintenance, BMPs that are not performing as intended or are inadequate for a particular location, and location(s) where additional BMPs are needed.

If the inspection occurs after the construction is complete, the report will include a description of the inspection finding or maintenance task that was performed. In addition, if a clean-out of any sediments or debris was required, the location of disposal after removal will be noted.

The inspection reports will be signed by the responsible person designated by the registrant. These reports will be filed with the plan and kept on-site for a minimum of three years after the date of the Notice of Termination (NOT). The permittee will submit a NOT to the Maine Department of Environmental Protection within 20 days of achieving permanent stabilization at the site **or** after coverage under an alternative permit has been obtained.

2.5 ROAD CONGESTION AND SAFETY

The project will be occurring on private property adjacent to private roadways and is not anticipated to impact traffic on public roads. No congestion or compromised safety of public roads is anticipated.

2.6 MAJOR DEVELOPMENTS, ADDITIONAL TRAFFIC MOVEMENT

The proposed project will not cause an increase in traffic movement. The project is intended to address existing and future deficiencies in parking capacity on the campus.

2.7 SEWAGE WASTE DISPOSAL

No increase in sewage waste disposal is anticipated as a result of the project. No changes to the existing sanitary sewer system are proposed.

2.8 SOILD WASTE

The proposed project will not cause a permanent increase in solid waste generated on the site.

A temporary increase in solid waste will occur during construction in the form of construction debris and trash. All solid waste generated during construction shall be maintained in a secure location and shall be properly removed and disposed of according to applicable state laws by the construction contractor. Construction debris for this project should be minimal and will typically consist of reclaimed or removed pavement and aggregates, topsoil, temporary erosion control products and small trash and debris to be kept in temporary on-site waste receptacles provided by the contractor. All accumulated waste shall be removed by the contractor at regular intervals to avoid significant accumulation on-site. No permanent increases in solid waste generation are anticipated as a result of the proposed projects.

2.9 AESTHETIC, CULTURAL, AND NATURAL VALUES

The project site is located on a 147 acre campus that is bounded by commercial and residential development to the north, east, and south. To the west of the campus is a forested strip of land, beyond which lies the Kennebec River. The addition of new parking lots and sidewalks within the previously developed areas of the campus will blend in with the current land use type. The character of the area will remain essentially the same, and no impact to the overall visual quality and scenic character of the area is anticipated from the proposed infrastructure improvements.

Planting plans have been prepared that provide vegetative buffering between the proposed development and Hospital Street to the east. Existing buildings and vegetation will provide visual buffers between the new development and properties to the north and south.

New light fixtures within the development will be similar in type, size and photometrics to the existing light fixtures around the campus. The lights will be LED Luminaires designed to minimize light trespass to abutting properties, and include cutoffs. Parking lot fixtures will be D series size 1 Luminaires (Lithonia DSXOLED40C 700 50K T5M MVOLT SPUMBA DDBXD) and will be mounted on 30 foot high poles. Light fixtures along roadways and sidewalks will be Topaz LPT54/850/INT/E39 luminaires mounted on 14 foot high poles. Refer to cutsheets of the individual fixtures included in Appendix C.

The Maine Historic Preservation Commission (MHPC) was contacted regarding a determination of the presence of historic sites within the project limits. A letter received from the MHPC dated May 17, 2016 and included in Appendix D states that the proposed undertaking will have no adverse effect upon historic properties.

The Maine Department of Inland Fisheries and Wildlife (IF&W) maintains records of significant wildlife habitat for the state of Maine. A search of the IF&W online database concluded that

there is no significant wildlife habitat located on or in the vicinity of the East Campus in Augusta. The proposed development will occur entirely within a previously developed area that does not include rare or irreplaceable natural areas, and will not adversely affect access to the shoreline, or quality of, the Kennebec River. Additionally, there are no wetlands identified in the proposed development area.

2.10 CONFORMITY WITH CITY ORDINANCES AND PLANS

The proposed development as designed conforms to City Ordinances and plans, as well as State of Maine Capitol Planning Commission requirements.

2.11 FINANCIAL AND TECHNICAL CAPACITY

The estimated project cost for the campus wide infrastructure improvements, including the parking expansions included in this permit, as well as the other infrastructure maintenance projects is approximately $4,000,000, which includes engineering and construction costs. These costs are based on preliminary opinions of probable construction costs prepared by Stantec Consulting Services, Inc. The actual construction costs will be based on the result of a competitive bid process for construction. Should the bid results require a significant change in the proposed project, a revised project description will be forwarded to the City of Augusta and, if required, an application for a project modification will be filed.

The proposed improvements at the East Campus will be funded by the State of Maine Bureau of General Services (BGS). BGS has issued a commitment letter providing confirmation that they have the financial capacity to undertake the project via bond funds from MGFA 2015B. Refer to Appendix E.

BGS has contracted with Stantec Consulting Services, Inc. to provide technical expertise for the design, permitting, and construction oversight of the infrastructure improvements included in this permit application. Stantec's staff is technically proficient in the services for which they have been contracted and have experience on past projects of similar size and scope. Copies of individual resumes of Stantec staff involved in the project are available upon request.

2.12 SURFACE WATER, SHORELANDS, AND OUTSTANDING RIVERS

The location of the project is approximately 725 from the Kennebec River, and will not impact the water quality or the shoreline of the river.

2.13 GROUNDWATER

During construction, liquid petroleum products and other materials with the potential to contaminate groundwater shall 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 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. The appropriate pollutant removal Best Management Practices (BMPs) shall be consulted prior to on-site storage of these materials in order to prevent impacts to groundwater quality.

The proposed project includes construction of approximately 1.2 acres of new impervious surface in 5 locations spread around the campus. The new development will be surrounded by pervious grassed areas that allow for infiltration of runoff to the maximum extent practicable. Additionally, the stormwater treatment measures for the project consist of a level lip spreader that distributes the collected runoff from proposed lots 7E and 7F to a vegetated buffer located along the west side of Arsenal Street, where the runoff will be filtered and allowed to infiltrate.

2.14 FLOOD AREAS

The proposed infrastructure improvements at the East Campus will not cause or increase flooding, or cause an unreasonable flood hazard to any structure. The proposed infrastructure improvements are located at approximately elevation 180' above mean sea level, while the adjacent Kennebec River is at approximately elevation 0.5' AMSL. Additionally, the area is not located within any floodplains as shown on the attached Flood Insurance Rate Map.

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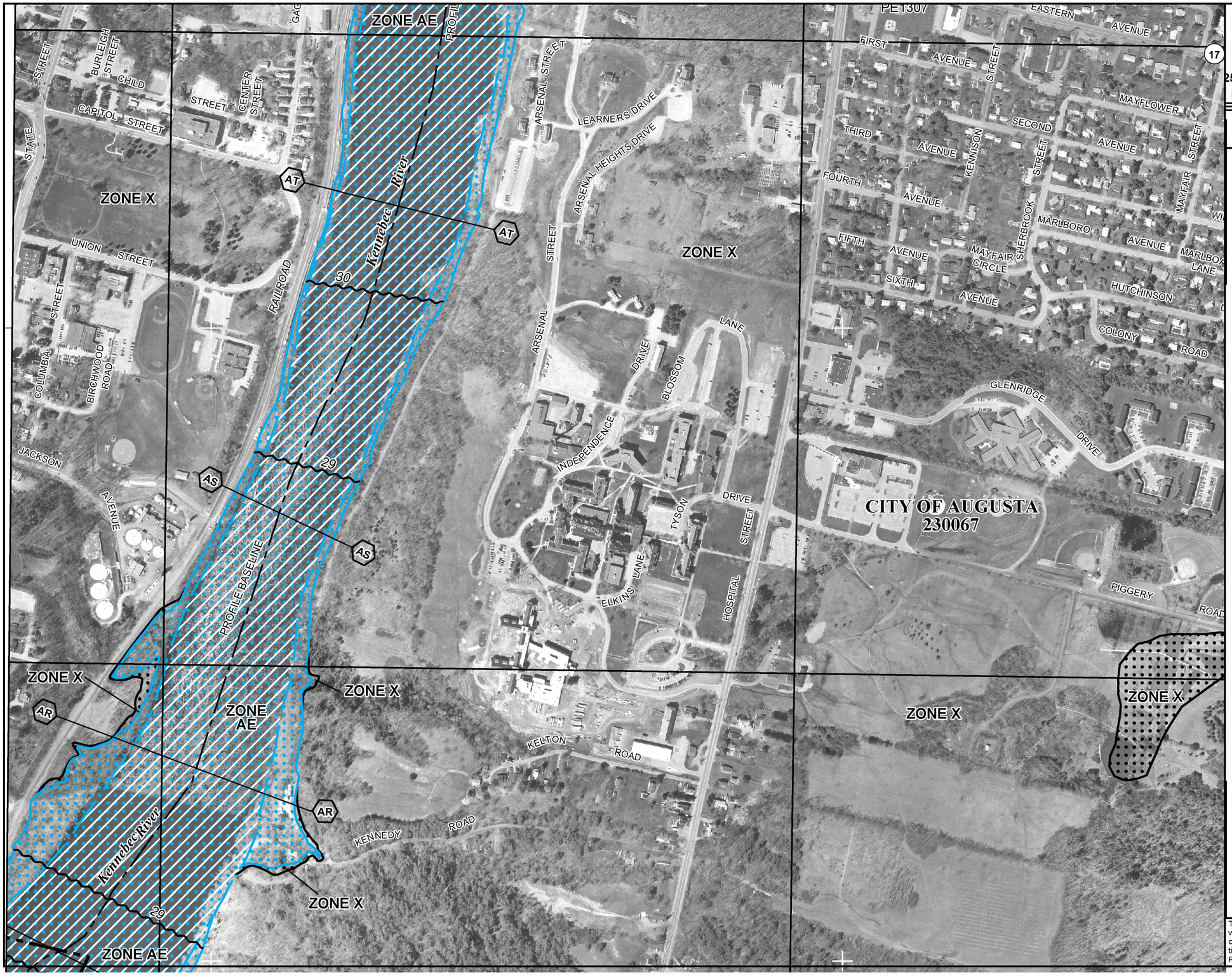

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0517D

FIRM

FLOOD INSURANCE RATE MAP

KENNEBEC COUNTY, MAINE

(ALL JURISDICTIONS)

PANEL 517 OF 775

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AUGUSTA, CITY OF	230067	0517	D
CHELSEA, TOWN OF	230234	0517	D
HALLOWELL, CITY OF	230069	0517	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
23011C0517D

EFFECTIVE DATE
JUNE 16, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

2.15 FRESHWATER WETLANDS

There are no freshwater wetlands within the project area, so no impacts to wetlands are anticipated.

2.16 RIVER, STREAM, OR BROOK

The Kennebec River has been identified on plans submitted with this application and is approximately 750 feet west of the nearest point of the project (stormwater buffer).

2.17 STORMWATER

The following section has been included in the Site Location of Development Act permit application submitted to the Maine Department of Environmental Protection. The permit application is currently under review and any comments or revisions required by the DEP will be forwarded to the City for evaluation. Refer to Appendix F for a copy of the associated Stormwater Model, calculations and drawings referenced in this narrative.

The East campus is located within the municipal boundaries of the City of Augusta, Maine, in Kennebec County. The campus is located between Hospital Street (Route 9) to the east and Arsenal Street to the west. The property continues to the Kennebec River west of Arsenal Street which includes a very large buffer strip of meadow and woods. The State of Maine (applicant) is filing a Major Development application pursuant to the City of Augusta Site Plan Review requirements for proposed infrastructure improvements at the Augusta East Campus.

The East campus consists of several buildings connected by a series of sidewalks, roadways, and multiple parking lots. The buildings are currently utilized by the State of Maine as departmental offices. The site is in the Kennebec River watershed, which is defined as a Major River Segment per Chapter 500, 3.S. Portions of the site were constructed in the nineteenth century and multiple changes have occurred to the campus since it was initially permitted under DEP Order L-017173-26-A-N in 1990.

The following stormwater management plan has been prepared for proposed parking and infrastructure improvements at the East Campus to evaluate potential stormwater impacts from the proposed new parking lot expansion of the existing site. The project will primarily consist of a new small parking lot located between the northern section of the East (Stone) building and the DEP Response Building; a larger parking lot located to the south of the Ray and Harlow buildings; and sidewalks for access to each new parking lot.

Recent improvements to Campbell Barn, located on south east corner of the East campus, included the addition of approximately 3,140 sf (0.072 ac) of new gravel pavement. The applicant also intends to construct a 450 sf ± wash down pad adjacent to the Campbell Barn which includes widening of the existing front driveway for a combined increase of 2,080 (.048

ac). This 5,220 sf of new impervious area is offset by the removal of an existing 2,300 sf farm building which will result in a net increase of 2,920 sf (0.067 ac) of impervious area added at this location.

Another small improvement is the proposed addition of 1,805 sf of new sidewalks and removal of 1,020 sf of existing sidewalks near the Ray Building. This will result in adding approximately 785 sf (0.018 ac) of impervious area.

New and expanded parking areas at Lot #7 (41,590 sf) and lot #3 (3,738 sf) will increase the impervious area of the campus by 1.041 acres and represents the majority of the improvements included in this project.

This project includes new developed or impervious areas and will be designed per Chapter 500 Rules pursuant to the Maine Stormwater Law M.R.S.A § 420-D. The entire East Campus drains to the Kennebec River. This project is subject to meeting the requirements of the General Standards and is requesting a waiver of the Flooding standard per Section 4.F.3).(a) for direct discharge to a Major River Segment.

A site specific stormwater management and erosion control plan has been prepared for the project. Proposed BMPs have been designed to meet the stormwater general standards. The project will not result in any increased flooding potential or significant impacts due to these proposed improvements.

2.17.1 Introduction

The State of Maine Bureau of General Services (BGS) has contracted with Stantec Consulting Services Inc. to provide design, permitting, and construction oversight services for the infrastructure improvements on the East Campus. On behalf of our client, The State of Maine, we are proposing a minor amendment for infrastructure improvements within the campus. The campus's deeded property covers approximately 148 acres.

This stormwater management plan has been prepared to mitigate the impacts associated with the development of an expansion of impervious area to the existing East campus in Augusta, Maine. The stormwater management controls and Best Management Practices (BMPS) outlined in this plan have been designed to suit the development objectives and to meet the applicable regulatory requirements of the Maine Stormwater Law and Chapter 500 Rules.

Stantec has evaluated the existing and developed conditions, to assess the potential stormwater impacts as a result of a total increase of 49,033 sf (1.13 ac) of impervious area for the new parking lots and infrastructure improvements. This site addition is an amendment to the existing Site Location of Development order D.E.P. #: L-17173-26-A-N and most recent subsequent orders.

Stantec recently (fall 2015 through spring 2016) completed a parking study at the East Campus to address existing condition and future/anticipated demand for roadways, parking lots, and sidewalks. Several areas identified as fair and poor condition were prioritized for maintenance. The activities and repairs required for these areas are considered as "Maintenance" per Chapter 500, Section 3).R. and are not included as impervious, developed or disturbed areas within this permit. The proposed new development expansion areas for this project include: a new parking lot (lot 7 expansion); a new parking lot (lot 4); sidewalk renovations and removals; and the recent renovations and proposed improvements to Campbell Barn. Please refer to the project Drawing Set accompanying this application for identification of the different infrastructure improvement areas.

Since the East campus is a single large property, and drains entirely to a single resource (Kennebec River), the campus is considered as a single watershed for this study. Although additional or new impervious area and development changes within this watershed occur at a few locations, the majority will be associated with the expansion of parking lot 7. Runoff from impervious area in the vicinity of this location will be captured and conveyed to a new treatment BMP sized for the treatment of the total additional impervious area proposed within the watershed. For the developed conditions the existing storm drain in this immediate vicinity will be reconfigured and upgraded. Runoff from the proposed expansion areas will, in some areas, be separated from existing drainage, allowed to drain independently, or will include portions of the existing site and impervious areas to be captured and treated in the proposed BMPs. The result will be a net reduction in impervious area, total drainage area, and runoff which currently discharges to the existing stormwater BMPs; improvements to existing drainage infrastructure; and the ultimate capture and treatment of 100% of the total increase in impervious area for the project within the proposed BMPs.

More specifically, the proposed new development expansion areas for this project include: a new parking lot (lot 7 expansion) which includes 41,590 sf of additional impervious area; a new parking lot (lot 3) which includes 3,738 sf of additional impervious area; sidewalk renovations and removals which include 785 sf of additional impervious area; and the recent renovations and proposed improvements to Campbell Barn resulting in 2,920 sf of additional impervious area. The total developed area for this project includes a 49,033 sf (1.13 ac.) increase in impervious area. There is no non-impervious disturbed area included within the developed area since the balance of the site is currently lawn and will be returned to the same condition after revegetation. Therefore the developed area will be the same as the additional impervious area or 1.13 acres.

A typical pre vs post development comparison is not performed for this project since a waiver is requested for the flooding standard in accordance with Section 4.F.3).(a) for direct discharge to a Major River Segment. Post development calculations will be performed as necessary to size the proposed drainage infrastructure and BMPs and assess any impacts to existing stormwater BMPs. As proposed, this project includes a new Stone Berm Level Lip Spreader (SBLLS) discharging to an existing meadow/grass buffer adjacent to Arsenal Street to provide for

treatment and mitigation of post construction runoff to the Kennebec River. This 150 foot long buffer is designed at 104 feet in width as a SBLLS which has available capacity to treat 100% of the project impervious and developed area or 1.13 acre increase in impervious area.

2.17.2 Methodology

We used the S.C. S. method for estimating runoff rates for the design storm intervals. This method accounts for soil types, existing land use, topography, vegetative cover and proposed land use for the developed portions of the property. For this study, a derivative of the S. C. S. TR-20 computer modeling method was used within HydroCAD 10.00 software. We evaluated the pre-development and post-development conditions, where necessary, for the proposed site in order to assess the magnitude of peak stormwater flows, drainage patterns, flow velocities, etc. for the site draining to existing and proposed BMPs.

The Pre-Development and post-Development drainage subcatchment areas are defined in our Stormwater Model for the purpose of evaluating drainage impacts, BMP sizing and capacity as shown on the HydroCAD diagrams and Pre-development and Post-Development drainage plans. Complete stormwater calculations (HydroCAD) are provided for compliance with DEP Stormwater General Standards, and as required for Site Location of Development projects in accordance with Maine Stormwater Law. This project is eligible for, and is requesting, a waiver of the Flooding Standards.

The predevelopment subcatchments and conditions are based on the previously approved stormwater management reports for the Harlow Building renovations and the Maine Psychiatric Treatment Center, as approved per DEP order L-17173-26-W-M and L-17173-26-T-A respectively. For our analysis of the existing conditions, Stantec input the data and information previously approved for the Harlow project as prepared by Pinkham & Greer, originally in HydroCAD version 6.0, as the developed condition (2003) into the current version of HydroCAD version 10.00 to model our existing conditions for the project. This was done for consistency to continue the analysis for the area and vicinity including Lot #7, as previously permitted, and draining to the existing stormwater pond. The post development conditions were evaluated then the HydroCAD model was modified slightly as needed for the current postdevelopment conditions and reconfiguration of existing drainage infrastructure.

2.17.3 Downstream Waterbodies and Resources

The Kennebec River runs along the edge of the campus, approximately 725 feet to the west. The Kennebec River is defined as a Major River Segment per Chapter 500, 3.S. The entire East campus drains to the Kennebec River. This project is requesting a waiver of the Flooding standard per Section 4.F.3).(a) for direct discharge to a Major River Segment.

This project has been designed to avoid impacts to existing on-site wetlands and will create zero disturbance or impacts to wetlands.

2.17.4 Regulatory Requirements

Maine Department of Environmental Protection (DEP)

Site location of Development Act (SLODA)

This project is an amendment to a development of state or regional significance that may substantially affect the environment which has been previously permitted under SLODA. As an amendment this project must meet the standards for development pursuant to Site Law 38 M.R.S.A. § 484. This project must meet the stormwater management standards pursuant to the Stormwater Law 38 M.R.S.A. § 420-D and Erosion and Sedimentation Control Law 38 M.R.S.A. § 420-C.

Stormwater Law (DEP)

MDEP Chapter 500, Stormwater Management Rules describe the stormwater management requirements for new development and redevelopment projects. These rules describe performance standards in five major categories: Basic Standards; General Standards; Phosphorus Standards; Urban Impaired Stream Standards; and Flooding Standards. This project is not required to meet the Phosphorus Standards or Urban Impaired Stream Standards. The following sections describe how the project will address the applicable standards.

Basic Standards

A project disturbing one acre or more must meet the Basic Standards. Basic standards address erosion and sedimentation control, inspection and maintenance, and housekeeping measures. The proposed development will result in more than one acre of disturbance. The Basic Standards are applicable and include various erosion and sedimentation controls and housekeeping requirements as outlined in Section 2.4 of this permit. Please refer to the attached plans, details, notes and narratives for detailed information regarding compliance with the Basic Standards.

General Standards

The General Standards require that stormwater runoff from at least 95% of a project's impervious area receive some form of treatment through a Department approved BMP. Additionally, runoff from at least 80% of the project's developed area must receive treatment.

In accordance with Chapter 500, to meet the general standards, a project's stormwater management system must include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This must be achieved by using one or more of the approved methods to control runoff from no less

than 95% of the projects impervious area and no less than 80% of the developed area that is impervious or landscaped.

This project creates more than 1 acre (1.13 ac) of new or expanded impervious area and less than 5 acres (0.00 ac) of disturbed vegetated area. General Standards require the capture and treatment of a calculated percentage of the project impervious and developed area as stated above. For this project we are providing stormwater management BMPs for treating more than 100% of the increase in the projects impervious or developed areas. This project includes a proposed Stone Berm Level Lip Spreader BMP discharging to a 150 foot meadow/grass buffer prior to discharge to the river. Therefore the project meets the requirements of the stormwater General Standards.

Flooding Standards

If a project results in three acres or more of impervious area or 20 acres or more of developed area, requires review pursuant to the Site Law, or is a modification of any size, the flooding standard must be met. Stormwater management systems for these projects must detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2-year, 10-year, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project.

This project is a modification or amendment pursuant to Site Law, but is eligible for a waiver from the flooding standard as follows per Chapter 500 section 4.F.3).(a):

> *(a) Discharge to a coastal wetland, a great pond, or a major river segment. A waiver is available for a project in the watershed of a coastal wetland, a great pond, or a major river segment provided the applicant demonstrates that the project conveys stormwater exclusively in sheet flow, in a manmade open channel, or in a piped system directly into one of these resources.*

This project is proposing to convey runoff directly to the Kennebec River via sheet flow through the implementation of a SBLLS BMP. A waiver of this standard is requested.

2.17.5 Stormwater Quality Best Management Practices

This project requires a Site Location permit amendment for new development and is required to meet the stormwater quality General Standards. This project provides water quality treatment in accordance with section 4,C.(3).(d) – Buffers, and meets the design and sizing requirements described in Appendix F and Maine BMPs Technical Design Manual, Section 5.2.2 - Buffer with Stone Bermed Level Lip Spreader (SBLLS). The proposed SBLLS captures, and will provide treatment for, 1.13 acres of impervious area equivalent to the total increase in impervious area associated with this project. This exceeds the 95% requirement for meeting General Standards.

Stormwater runoff will be delivered to a 150 foot long vegetated meadow buffer with a 96 foot wide SBLLS utilizing a specialized system for converting concentrated flow uniformly into sheet flow prior to discharge to the Kennebec River to ensure that runoff remains well-distributed as it passes through the buffer. This meets the eligibility requirement for waiver of the Flooding Standard.

2.17.6 Stormwater Existing Conditions

The proposed site is bordered on the north/east by Hospital Street and south/west by Arsenal Street, beyond which substantial undeveloped meadow and woodland areas buffer the project from Kennebec River.

The present condition for the localized development sites is consistent with the East campus environment which is currently developed with many buildings, walkways, parking areas, internal drives and lawn. Much of the existing development predates DEP permitting. The first permit (L-17173-26-A-N) was obtained in 1990. Some of the more recent expansion areas are subsequently permitted. The proposed development is essentially characterized as minor expansions of existing parking and walkways and infill development in open lawn areas. The Kennebec River is located along the entire west boundary of the property and receives all of the runoff from the property.

For the existing condition, the area in the vicinity of the existing and new lot #7 and Riverview facilities is represented by several drainage subcatchments. These basic subcatchment areas build upon, and are based on, the information obtained from preceding projects which included stormwater evaluations and hydrology studies in this location. Specifically, the subcatchment areas are determined for the existing conditions by recreating the most recent study (2003) performed by Pinkham and Greer for the Harlow Building renovation project (L-17173-W-M). The stormwater management report, HydroCAD (version 6.00) calculations and drainage analysis map for that study can be referenced in the previously approved stormwater management report for the Harlow Building renovations, as approved per DEP order L-17173-26-W-M. This report, dated May 7, 2003, concluded that no adverse impacts would occur as a result of the Harlow projects drainage.

The Harlow Building analysis was performed just after the completion of the Maine Psychiatric Treatment Center (Riverview). As a part of the Harlow project a new parking lot and revision to the existing Lot 4B was included, as well as, minor sidewalk changes. Also included in the drainage design were upgrades to the storm drain system around the Harlow Building and Ray Building. The Harlow Building drainage analysis included the previous expansion of parking lot #7, as well as, the reconfiguration of the existing storm drains which redirected stormwater into the existing stormwater pond (5P) at the Riverview facility. This pond was originally constructed for the hospital around the same time as the Harlow project was approved, and was revised by adding another pipe outlet and level spreader to the pond as originally designed and permitted by Sebago Technics under DEP Order L-17173-26-T-A. The Harlow project did not increase peak

flows to the existing pond. The stormwater report and order for the hospital can be referenced in the previously approved stormwater management reports for the Maine Psychiatric Treatment Center, as approved per DEP L-17173-26-T-A.

The major element of the proposed parking expansion is lot #7 south of the Ray Building and includes most of the additional or total increase in impervious area, and this area is further broken down, locally, into the 5 small drainage subcatchments as described above. As previously stated, the existing conditions for this project are essentially the same as the developed conditions for the Harlow project. Slight, but insignificant differences in values resulted from upgrading the previous report from HydroCAD version 6.0 to the current version 10.00. The existing condition HydroCAD calculations for this proposal can be referenced in the reports for the Harlow Building renovations (DEP order L-17173-26-W-M).

2.17.7 Stormwater Proposed Development Conditions

Because of the campus environment, we considered implementing Low Impact Development design and treatment measures, where practical, which would inherently produce a unified systematic approach to stormwater management for water quality treatment for the entire project based on the total increased impervious/developed area. More construction intensive treatment options such as wetponds, vegetated soil filters or infiltration measures were considered but were resolved to present increased construction activities, soil disturbance, erosion potential and long term maintenance issues than utilizing buffers.

The objectives of LID site design is to temporarily retain and treat the post-development runoff volumes to minimize concentrated flow for smaller storms (water quality volume) in order to simulate predevelopment hydrological functions and existing drainage patterns. The use of LID practices with natural buffers will reduce thermal impacts and enhance recharge and infiltration of runoff. The buffer option will capture runoff, from impervious areas and discharge treated stormwater runoff as sheet flow to the river to meet the DEP requirements for the General Standards and Flooding Standard. The SBLLS is sized in accordance with the Maine Stormwater BMP Manual based on the amount of additional impervious area created for the project.

The post-development site drainage patterns and stormwater runoff Study Points are similar to the existing site. The most significant differences are the increases in impervious area and slight changes to the predevelopment subcatchment areas due to the proposed site development. The basic drainage areas, onsite reaches, and discharge patterns described by the original subcatchment areas identified for the predevelopment conditions are generally still in effect but a few of these original drainage subcatchment areas have been reduced in size or modified due to the additional developed impervious areas, and the reconfiguration of the existing storm drain infrastructure.

The existing storm drain system which intercepts most of the runoff from the existing development in the vicinity of lot #7, and the campus area from Hospital Street to the activities center,

including lot #4, and portions of the Ray, Harlow, Elkins and Gym buildings and lawns will be reconstructed and upgraded as follows:

1. The existing storm drain system receiving runoff from lot #4 near the Gym, including the new storm drains added for the Harlow renovations, and the easterly portion of lot seven will be maintained as existing. This storm drain was constructed in 2003 for the Harlow building and rerouted the runoff to the stormwater pond (5P) at Riverview. This will continue to drain to the existing pond and level spreaders. Because of the way that these drains are situated, a small portion of the new parking lot expansion will drain to this existing system. This will add approximately 12,820 sf (0.29 ac) of impervious area to the existing pond 5P. This smaller subcatchment 225 was formerly within the predevelopment subcatchment 200.

2. The existing storm drain from the Ray building will be upgraded and reconfigured. The previous study by Pinkham and Greer for the Harlow building stated that this system is undersized and functions as a temporary detention facility in larger storms and was modeled as a pond (1P). Upgrading this system from the southeast corner of the Ray building from 12" to 15" will allow the pipe to function as a pipe without surcharging and ponding for up to the 25 year storm. This new pipe is reconfigured to connect to the new storm drain discharging to the new SBLLS. This will effectively remove approximately 0.29 acres of impervious area from the existing subcatchment 100 which currently drains to the existing drainage pond 5P at Riverview and will offset the 0.29 acres added to this BMP in item #1 above. A small portion (SC 201) of the existing subcatchment 200 will also be removed from draining to the existing pond. This will amount to a zero net change in impervious area to the existing pond, in addition to reducing the total drainage area to this existing BMP from 14.6 ac. to 9.8 ac. (-4.8 ac). The result is a reduction in the drainage area and peak flows to this existing pond which still receives the same amount of impervious area draining to it.

The new sidewalk additions near the northeast corner of the Ray building will be added to subcatchment 100 and will add approximately 2000 sf (.05 ac) of impervious area. This subcatchment will include a total of 0.35 ac. of impervious area. When combined with the new impervious area from lot #7 in subcatchment 250 (formerly a portion of SC 200) a total of 1.18 acres of impervious area will be conveyed to the new SBLLS for treatment. This accounts for and accommodates the total increase of 1.13 acres (49,033 sf) of impervious area added to the campus as a result of this project. Since this exceeds 95% of the project impervious area the General Standard is met.

2.17.8 Erosion Control and Basic Standards

The erosion control measures proposed for project will prevent erosion and sedimentation and protect any adjacent resources. These standards include various erosion and sedimentation controls and housekeeping requirements as outlined in Section 2.4 of this permit. Please refer to the attached plans, details, notes and narratives for detailed information regarding compliance with the Basic Standards.

2.17.9 Summary of Stormwater Calculations and Results

Stormwater runoff calculations were performed in order to determine size and capacity for the stormwater BMPs and to assess the impacts to the existing stormwater facilities. The locations of the existing stormwater ponds and proposed BMPs are as indicated on the site plans. The sizing criteria are consistent with the Maine BMP Technical Design Manual and Chapter 500 Rules. The proposed SBLLS will meet the requirements of the General Standards and Flooding Standard section 4.F.3).(a). This BMP will capture and treat a minimum of 100% of the impervious and developed area generated for this project.

<u>Stone Berm Level Lip Spreader</u>

The SBLLS was designed as a treatment BMP and to provide management and controls for the runoff rates for 2, 10 and 25 year storm events as a buffer. The results of our analysis indicate that the discharge from the SBLLS will convey runoff as sheet flow (less than 0.10' depth) for storms up to the 25 year event. A bypass control structure is located just upstream from the SBLLS which will convey the WQV storm runoff (1.25") to the SBLLS and the larger storms will be bypassed to a stabile outlet which will convert the bypass outflow to sheet flow.

The results show the depths and velocity of the buffer to be within the range of sheet flow depth and velocities for buffers of less than 0.10 ft. in depth and less than 1 fps. The values for the buffer reach (100R) are D = 0.02'; V = 0.12 fps for the design water quality volume (WQV) storm of 1.25". The corresponding results for the 2 year, 10 year and 25 year events are D = 0.06'; V = 0.23 fps, D = 0.09'; V = 0.31 fps, and D = 0.10'; V = 0.32 fps, respectively.

The SBLLS was designed as a 150 foot buffer according to Table 5.-5, Chapter 5 of the BMP Technical Design Manual and requirements of Chapter 500, Appendix F for buffer slope of 9% to 15%.

(NOTE: The following tables were developed using a 1.25 inch, 24 hour storm of type III distribution, giving a maximum unit flow rate of less than 0.009 cfs per foot.)

Hydrologic Soil Group	Length of flow path through buffer (feet)	Berm length for a forested buffer (feet)		Berm length for a meadow buffer (feet)	
		Per acre of impervious area	Per acre of lawn	Per acre of impervious area	Per acre of lawn
Soil Group B	75	120	36	180	54
	100	96	30	120	36
	150	78	24	**90**	**30**

The total impervious area added to the project is 1.13 acres. No lawn areas were added.

1.13 * 90 + 0* 30 = 101.70' (required)

The SBLLS is designed for the required capacity with a length of 104 feet.

For design, the flow for the WQV (1.25") storm was routed through the stone berm with a constant rate of 0.009 cfs/foot to simulate the constructed condition per table 5-4 of the BMP manual.

A bypass structure (outlet control structure) is provided to divert flow from storms greater than the WQV to a level plunge pool apron to convert the bypass flows to sheet flow.

<u>Existing drainage pond (5P) and level spreaders</u>

HydroCad printouts and stormwater data for the typical subcatchment were done for the Pre and Post-Development conditions for the 2, 10 and 25 year rainfall amounts to assess and compare the existing and developed rates.

The total drainage area to Pond P5 for the existing conditions is 14.582 acres defined as 32.4% impervious (4.72 ac). This drainage area is reduced to 9.786 acres for the developed condition defined as 48.1% impervious (4.71 ac).

For the existing conditions and design storm 10 year event, the inflow to pond P5 is 15.19 cfs which distributes 4.85 cfs to each of three existing level spreaders. The developed conditions results in a slight reduction of peak flow to 15.11 cfs and 4.39 cfs to the three level spreaders.

Therefore, the existing drainage pond and level spreaders are not impacted by the proposed development and infrastructure changes.

2.17.10 Conclusion

The runoff water quality from the East Campus Infrastructure Improvements at the East Campus for the developed site will be controlled using LID design stormwater management techniques and the addition of a new Stone Bermed level Lip Spreader BMP for water quality treatment and discharge to the Kennebec river as sheet flow within a meadow buffer designed based on location, required water quality volume, impervious areas, length of buffers, length of level spreader, etc., in accordance with the BMP general standards.

The Infrastructure Improvements at the East Campus has been designed in a manner that compliments its surroundings and meets the requirements of the City of Augusta and the Department of Environmental Protection stormwater regulations. A sustainable stormwater system has been designed to control peak flows and minimize downstream impacts while controlling water quality.

It is our conclusion that the proposed stormwater BMPs and site improvements will provide adequate control of stormwater runoff from the site without producing significant flooding or adverse impacts to the site or downstream reaches. We feel that the proposed drainage, erosion control measures and stormwater quality Best Management Practices and LID measures, if properly constructed and maintained, will not create flooding or significant adverse impacts due to runoff to adjacent properties or result in degradation of existing water quality.

Prepared by:

Patrick L. Clark, PE

2.18 ACCESS TO DIRECT SUNLIGHT

The project will not impact access to direct sunlight on the East Campus or in the surrounding areas.

2.19 STATE PERMITS

A Site Location of Development Permit Minor Amendment application has been filed with the Maine Department of Environmental Protection for this project. The application is currently under review. All review comments, responses, and the final approval order will be forwarded to the City upon receipt.

2.20 SPAGHETTI LOTS PROHIBITED

The project does not include the development of any shore frontage lots.

2.21 OUTDOOR LIGHTING

New light fixtures within the development will be similar in type, size and photometrics to the existing light fixtures around the campus. The lights will be LED Luminaires designed to minimize light trespass to abutting properties, and include cutoffs. Parking lot fixtures will be D series size 1 Luminaires (Lithonia DSXOLED40C 700 50K T5M MVOLT SPUMBA DDBXD) and will be mounted on 30 foot high poles. Light fixtures along roadways and sidewalks will be Topaz LPT54/850/INT/E39 luminaires mounted on 14 foot high poles. Refer to cutsheets of the individual fixtures included in Appendix C.

2.22 NEIGHBORHOOD COMPATIBILITY

There will be no physical impacts on the immediate neighborhoods around the East Campus property as a result of this project. The proposed development will be shielded from abutting properties by existing buildings and vegetation, as well as proposed planted buffers of canopy trees, understory trees and shrubs. Plantings, light fixtures, and the parking lots themselves have been designed to imitate the existing site as much as practicable.

2.23 COMPLIANCE WITH PLANS AND POLICIES

The project will be in compliance with the 1988 Growth Management Plan and the State of Maine Capitol Area Rules and Regulations.

2.24 TRAFFIC PATTERN

The project will not generate additional traffic, or alter the flow or volume of traffic on public roadways. Access for emergency services to the campus will remain the same. The new parking

lots and alleys will provide for more convenient movement of vehicles on and off the campus and provide more direct access for pedestrians from parking areas to campus destinations.

2.25 PUBLIC FACILITIES

Refer to sections 2.2, 2.3, 2.7 and 2.17 for information on existing and proposed utilities.

2.26 RESOURCE PROTECTION AND THE ENVIRONMENT

The project area does not include any shallow soils, wetlands, aquifers, steep slopes, or floodplains. The project conforms to applicable local, State, and Federal air and water quality standards. All wastes from the project will be treated and disposed of in a manner as to conform to local, State, and Federal standards. The project location is not within the Shoreland or Wetland Districts.

2.27 PERFORMANCE STANDARDS

(a) The project complies with all applicable performance standards under Chapter 300 of the City ordinance.

(b) Temporary noise generated during construction of the project will not exceed performance levels specified in Chapter 300. The project itself will not result in an increase in permanent noise levels.

(c) The project will not involve the generation of intense glare or heat.

(d) The new lighting in the parking lots and sidewalks will not cause excessive glare into residential areas. Refer to section 2.21.

(e) Landscaping will provide vegetative buffers between the proposed development and Hospital Street to the East. The number of plantings required adjacent to Lot 1A per Buffer Yard 'A' requirements has been calculated as follows:

   a. +/- 350' perimeter along north and east side facing Hospital street

   b. 7 canopy/evergreen trees,

   c. 14 understory trees, and

   d. 21 deciduous shrubs

(f) No additional signs, other than traffic, parking and way-finding signage are proposed. Traffic and parking signs shall conform to the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

2.28 FINANCIAL AND TECHNICAL ABILITY

Refer to section 2.11 above.

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3.0 CONDITIONAL USE APPLICATION CRITERIA

3.1 NEIGHBORHOOD COMPATIBILITY

Please see Section 2.22 *Neighborhood Compatibility*.

3.2 PLANS AND POLICIES

Please see Section 2.23 *Compliance with Plans and Policies*.

3.3 TRAFFIC PATTERN, FLOW, AND VOLUME

Please see Section 2.24 *Traffic Pattern*.

3.4 PUBLIC FACILITIES

Please see Section 2.25 *Public Facilities*.

3.5 RESOURCE PROTECTION AND THE ENVIRONMENT

Please see Section 2.26 *Resource Protection and the Environment*.

3.6 PERFORMANCE STANDARDS

Please see Section 2.27 *Performance Standards*.

3.7 FINANCIAL AND TECHNICAL ABILITY

Please see Section 2.28 *Financial and Technical Ability*.

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Appendix A EAST CAMPUS DEED

AMENDATORY DEED

05664

Know all Men by these Presents:

WHEREAS, the Act of Congress, approved March 3, 1905, Public Law No. 235, entitled "An Act authorizing the Secretary of War to convey the Kennebec Arsenal property, situated in Augusta, Maine, to the State of Maine for public purposes", provided:

"That the Secretary of War be, and he is hereby, authorized and directed to convey, by deed duly and properly executed, to the State of Maine, for the use of a State institution, organized under the laws of the State of Maine and maintained by said State, known as the Maine Insane Hospital, at Augusta, Maine, the property situated in the corporate limits of said Augusta, belonging to the Government of the United States, formerly used as an arsenal and known as the Kennebec Arsenal property, the same comprising about forty acres, and bounded on the north by private property, on the east by the road to Pittston, on the south by the Insane Hospital grounds, and on the west by the Kennebec River: said conveyance to provide, however, that the estate thereby created shall continue so long only as the said property shall be used by said State as a part of and in connection with the Maine Insane Hospital for the appropriate uses of an Insane Hospital in conformity with the terms of this Act; and that at any time the said property may be taken possession of by the United States whenever the President in his discretion, shall decide that the said property is needed for the uses of the United States, or that the requirements of this Act are not strictly observed by the said State of Maine; and that there shall be no liability on the part of the United States at any time for the use or destruction of any building that may be placed on the said property by the State of Maine"; and

WHEREAS, Section 771(a) of the Act of Congress, approved December 15, 1980, Public Law 96-527, entitled "Department of Defense Appropriation Act 1981", provided "The Act entitled 'An Act authorizing the Secretary of War to convey the Kennebec Arsenal property, situated in Augusta, Maine, to the State of Maine for public purposes', approved March 3, 1905 (33 Stat. 1270), is amended by inserting 'or for other public purposes' after 'in conformity with the terms of this Act'."; and

WHEREAS, Section 771(b) of the Act of Congress, approved December 15, 1980, Public Law 96-527, entitled "Department of Defense Appropriation Act 1981" provided "The Secretary of the Army shall issue such written instructions, deeds, or other instruments as may be necessary to bring the conveyance made to the State of Maine under the authority of the Act referred to in subsection (a) into conformity with the amendment made by such subsection."

Now, Therefore, In compliance with the foregoing Acts of Congress, I, John O. Marsh, Jr. Secretary of the Army of the United States of America, do hereby give, grant, and convey unto the State of Maine, for the use of the said Maine Insane Hospital or for other public purposes, all that tract of land belonging to the United States, formerly used as an arsenal, and known as the Kennebec Arsenal property, containing about forty (40) acres, situated within the corporate limits of the city of Augusta, Maine, and bounded on the north by private property, on the east by the road to Pittston, on the south by the Insane Hospital grounds, and on the west by the Kennebec River;

To Have and to Hold the said premises unto and to the use of the State of Maine upon the following provisions, vis:

1. That the estate hereby created in the State of Maine shall continue so long only as the said property shall be used by said State as a part of and in connection with the Maine Insane Hospital for the appropriate uses of an Insane Hospital or for other public purposes in conformity with the terms of said Act, as amended by PL 96-527.

2. That at any time the said property may be taken possession of by the United States whenever the President in his discretion shall decide that the said property is needed for the uses of the United States, or that the requirements of said Act of Congress are not strictly observed by the said State of Maine.

3. That there shall be no liability on the part of the United States at any time for the use or destruction of any building that may be placed on said property by the State of Maine.

This deed is now given by The United States of America to the State of Maine pursuant to authority granted in and by Public Law 96-527, Sections 771, 94 Stat 3093 approved December 15, 1980 for the sole purpose of amending the conveyance made between the parties dated April 12, 1905, and recorded in the Kennebec County (Maine) Registry of Deeds, Book 462, Pages 361 and 362.

IN WITNESS WHEREOF, the UNITED STATES OF AMERICA has caused these presents to be signed, in its name and its behalf by the Secretary of the Army and the seal of the Department of the Army to be affixed.

UNITED STATES OF AMERICA

BY: John O. Marsh, Jr.

TITLE: THE SECRETARY OF THE ARMY

(SEAL)

ATTEST:

Walter H. Daly

Sandra V. Anderson

A C K N O W L E D G M E N T

COMMONWEALTH OF VIRGINIA)
) SS
COUNTY OF ARLINGTON)

On this 21ST day of APRIL, 1981, before me, W. R. Cabell, a Notary Public in and for the County of Arlington, Commonwealth of Virginia, residing therein, duly commissioned and sworn, personally appeared John O. Marsh, Jr., known to me to be THE SECRETARY OF THE ARMY, and the person who executed the foregoing instrument on behalf of the United States of America therein named and acknowledged to me that he executed the same as THE SECRETARY OF THE ARMY, and as the free act and deed of the United States of America under the authority of the act of Congress therein cited.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal the day and year in this certificate first above written.

(SEAL) SEAL

W. R. Cabell
Notary Public
W. R. Cabell, Notary Public
County of Arlington
State of Virginia
My Commission Expires February 28, 1983

KENNEBEC SS: MAY 11 1981
RECEIVED 9 H. _ M. A M.
AND RECORDED FROM ORIGINAL

Appendix B NRCS SOIL MAP

Soil Map—Kennebec County, Maine
(AMHI CAMPUS)

Map Scale: 1:2,430 if printed on B landscape (17" x 11") sheet.

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

Legend

This report presents general information about the map units in the selected area. It shows map unit symbols and names for each map unit.

Report—Legend

Legend–Kennebec County, Maine	
Map unit symbol and name	**Map unit acres**
Ha—Hadley silt loam	306
HfC—Hartland very fine sandy loam, 8 to 15 percent slopes	6,956
HfD—Hartland very fine sandy loam, 15 to 25 percent slopes	3,707
SkB—Scio very fine sandy loam, 3 to 8 percent slopes	14,051
W—Water bodies	55,597

Data Source Information

Soil Survey Area: Kennebec County, Maine
Survey Area Data: Version 14, Sep 14, 2015

Exhibit A-1, continued: Hydrologic soil groups for United States soils

SAPINERO	B	SAWTOWN	C	SCOTCH	D	SEITZ	C	SHAKER	C
SAPKIN	C	SAWYER	C	SCOTCO	A	SEJITA	D	SHAKESPEARE	C
SAPPHIRE	C	SAXBY	D	SCOTIA	B	SEKIL	B	SHAKOPEE	C
SAPPINGTON	B	SAXON	C	SCOTT	D	SEKIU	D	SHALAKE	C
SARA	D	SAY	B	SCOTT LAKE	B	SELAH	C	SHALAKO	D
SARAGOSA	B	SAYBROOK	B	SCOTTCAS	E	SELBIT	B	SHALBA	D
SARAHSVILLE	D	SAYDAB	C	SCOTTIES	F	SELDEN	C	SHALCAR	D
SARALEGUI	B	SAYERS	A	SCOTTSVILLE	C	SELEVIN	D	SHALCAR, DRAINED	C
SARANAC	C/D	SAYLES	D	SCOUT	F	SELFRIDGE	B	SHALCLEAV	D
SARANAC, GRAVELLY	C	SAYLESVILLE	C	SCRABBLERS	F	SELIA	C	SHALET	D
SUBSTRATUM		SAYNER	A	SCRANTON	A/D	SELIGMAN	D	SHALONA	B
SARAPH	D	SAYPO	C	SCRAVO	B	SELKIRK	C	SHALPER	D
SARATON	C	SAZI	C	SCRIBA	C	SELLE	B	SHAM	D
SARAZAN	B	SCALA	B	SCRIBNER	C	SELLERS	B/D	SHAMBO	B
SARBEN	B	SCALADE	D	SCRIVER	B	SELMA	B/D	SHAMEL	B
SARCILLO	D	SCALFAR	B	SCROGGIN	C	SELMAC	D	SHAMOCK	C
SARDINIA	C	SCALLEY	B	SCULLIN	C	SELON	B	SHANAMAN	B
SARDIS	C	SCAMMAN	D	SCUPPERNONG	D	SELTI	B	SHANDEP	B/D
SARGEANT	D	SCANDARD	C	SEABROOK	C	SELWAY	B	SHANE	D
SARILDA	C	SCANTIC	D	SEAFIELD	B	SEMIAHMOO	D	SHANGHAI	C
SARITA	A	SCAPONIA	B	SEAFORTH	B	SEMIAHMOO, DRAINED	C	SHANGHAI, DRAINED	B
SARKAR	D	SCAR	B	SEAGATE	A/D	SEMINOLE	D	SHANKLER	A
SARNOSA	B	SCARBORO	D	SEAGOVILLE	D	SEMPER	C	SHAND	B
SARONA	B	SCARIBOU	B	SEALY	B	SEN	B	SHANTA	B
SARPY	A	SCARPER	C	SEAMAN	B	SENCHERT	C	SHARATIN	B
SARTELL	A	SCATLAKE	D	SEAMAN, STRONGLY	C	SENECAVILLE	B	SHARESNOUT	C
SARUCHE	D	SCAVE	C	SALINE		SENSABAUGH	B	SHARKEY	D
SASABE	C	SCHAFFENAKER	A	SEAMAN, MODERATELY	C	SEQUATCHIE	B	SHARLAND	B
SASALAGUAN	C	SCHALLER	A	WET		SEQUIM	A	SHARON	B
SASCO	B	SCHAMBER	A	SEAQUEST	C	SEQUOIA	C	SHARONDALE	B
SASKA	B	SCHAMP	C	SEAP	B	SERDEN	A	SHARPS	C
SASPAMCO	B	SCHAPVILLE	C	SEARING	B	SERENE	C	SHARPSBURG	B
SASSAFRAS	B	SCHATTEL	C	SEARLA	B	SEROCO	A	SHARROTT	D
SASSER	B	SCHAUSON	B	SEARLES	C	SERPEN	C	SHARVANA	C
SATAGO	D	SCHAWANA	D	SEARSPORT	D	SERPENTANO	B	SHASER	B
SATANKA	C	SCHENCO	D	SEARSVILLE	D	SERPOD	C	SHASKIT	C
SATANTA	B	SCHERRARD	D	SEASTRAND	D	SERRANO	D	SHASTA	B
SATATTON	D	SCHLEY	B	SEATON	B	SERVILLETA	D	SHASTINA	B
SATELLITE	C	SCHMUTZ	B	SEATTLE	D	SESAME	C	SHATRUCE	C
SATILLA	D	SCHNEBLY	D	SEATTLE, DRAINED	C	SESPE	C	SHATTA	C
SATIN	C	SCHNEIDER	B	SEAVERSON	D	SESSIONS	C	SHATTUCK	B
SATSOP	B	SCHNIPPER	C	SEAWILLOW	B	SESSUM	D	SHAUSON	B
SATT	C	SCHNOORSON	C	SEBAGO	D	SET	C	SHAVAND	B
SATTLEY	B	SCHNORBUSH	B	SEBASTIAN	D	SETH	C	SHAVASH	C
SATTRE	B	SCHODSON	C	SEBASTOPOL	C	SETTERS	D	SHAVER	B
SATURN	B	SCHOENS	A	SEBEWA	B/D	SETTLEMENT	D	SHAWA	B
SATUS	B	SCHOFIELD	C	SEBREE	D	SETTLEMEYER	C	SHAWANO	A
SAUCEL	D	SCHOHARIE	C	SEBRING	B/D	SETTLEMEYER,	D	SHAWMUT	B
SAUCIER	C	SCHOLLE	B	SEBUD	B	SALINE-ALKALI		SHAY	D
SAUDE	B	SCHOODIC	D	SECCA	C	SETTLEMEYER,	D	SHAYLA	D
SAUGATUCK	C	SCHOOLCRAFT	B	SECESH	B	FLOODED		SHEAR	C
SAUGUS	B	SCHOOLEY	D	SECONDSET	C	SETTLEMEYER, COOL	D	SHEAVILLE	D
SAUK	B	SCHOOLEY, DRAINED	C	SECRET CREEK	B	SETTLEMEYER,	B	SHEBANG	D
SAULICH	D	SCHOOLEY,	C	SECURITY	C	CHANNELED		SHEBEON	C
SAUM	B	PROTECTED		SED	C	SEVAL	C	SHEDADD	C
SAUNDERS	D	SCHOOLHOUSE	D	SEDALE	D	SEVENMILE	B	SHEDD	C
SAURIN	C	SCHOONER	D	SEDGEFIELD	C	SEVERN	B	SHEDHORN	D
SAUTER	B	SCHRADER	D	SEDGWAY	E	SEVIER	D	SHEECAL	B
SAUVIE	D	SCHRAP	D	SEDILLO	B	SEVILLE	D	SHEEGE	D
SAUVIE, MODERATELY	C	SCHRIER	B	SEDMAR	D	SEVY	B	SHEEK	B
WET		SCHROCK	B	SEDROWOOLLEY	C	SEWANEE	B	SHEEP CREEK	C
SAUVIE, PROTECTED	B	SCHROON	B	SEDWELL	C	SEWARD	B	SHEEPCAN	B
SAUVOLA	C	SCHUELKE	C	SEEDSKADEE	D	SEWELL	C	SHEEPHEAD	C
SAUZ	B	SCHULINE	B	SEELEZ	A	SEXTON	C/D	SHEEPROCK	A
SAVAGE	C	SCHUMACHER	B	SEELOVERS	C	SEYMOUR	D	SHEEPSCOT	B
SAVAGETON	D	SCHUSTER	B	SEELYEVILLE	A/D	SEZNA	D	SHEETIRON	C
SAVANNAH	C	SCHUYLER	B	SEELYEVILLE,	D	SHAAK	C	SHEFFIELD	D
SAVENAC	C	SCIO	B	SLOPING		SHABLISS	D	SHEFFIT	D
SAVO	C	SCIOTOVILLE	C	SEEPRID	B	SHACK	B	SHEFFLEIN	B
SAVOIA	B	SCISM	C	SEES	C	SHADELAND	C	SHELBIANA	B
SAVONA	C	SCITICO	C	SEEWEE	B	SHADELEAF	C	SHELBURNE	C
SAWABE	D	SCITUATE	C	SEFFNER	C	SHADOW	B	SHELBY	B
SAWATCH	B/D	SCLOME	B	SEGIDAL	D	SHADYGROVE	C	SHELBYVILLE	B
SAWBUCK	B	SCOAP	B	SEGNO	C	SHAFFTON	B	SHELD	B
SAWCREEK	C	SCOBEY	C	SEGUIN	B	SHAFTER	D	SHELL	B
SAWDUST	B	SCOGGIN	D	SEGURA	D	SHAGEL	D	SHELLABARGER	B
SAWMILL	B/D	SCOON	D	SEHOME	C	SHAGNASTY	C	SHELLBLUFF	B
SAWTELL	C	SCOOTENEY	B	SEHORN	D	SHAKAMAK	C	SHELLCREEK	C
SAWTELPEAK	D	SCORUP	C	SEIS	C	SHAKAN	C	SHELLDRAKE	A

NOTES: TWO HYDROLOGIC SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION.
MODIFIERS SHOWN, E.G., BEDROCK SUBSTRATUM, REFER TO A SPECIFIC SOIL SERIES PHASE FOUND IN SOIL MAP LEGEND.

Exhibit A-1, continued: Hydrologic soil groups for United States soils

HAGGA, SALINE-ALKALI	C
HAGGERTY	B
HAGSTADT	C
HAGUE	A
HAIG	C/D
HAIGHTS	B
HAIKU	B
HAILMAN	B
HAIRE	C
HAIRE, BEDROCK SUBSTRATUM	D
HAKKER	C
HALACAN	D
HALAWA	B
HALBERT	D
HALCOTT	C/D
HALDER	C
HALE	D
HALE, DRAINED	C
HALEDON	C
HALEIWA	B
HALEY	B
HALF MOON	B
HALFADAY	A
HALFWAY	D
HALII	B
HALIIMAILE	B
HALL	B
HALL RANCH	C
HALLANDALE	B/D
HALLANDALE, TIDAL	D
HALLCREEK	A
HALLECK	C
HALLECK, GRAVELLY SUBSTRATUM	B
HALLETTSVILLE	D
HALLISON	C
HALLORAN	C
HALSEY	C/D
HALSO	D
HAMACER	A
HAMAKUAPOKO	B
HAMAR	A/D
HAMBLEN	C
HAMBONE	B
HAMBRIGHT	D
HAMBURG	B
HAMBY	C
HAMDEN	B
HAMEL	C
HAMERLY	C
HAMILTON	B
HAMLET	B
HAMLIN	B
HAMMACK	B
HAMMONTON	B
HAMPSHIRE	C
HAMPSON	C
HAMRE	C/D
HAMRUB	B
HAMTAH	C
HANA	A
HANAGITA	D
HANAKER	C
HANALEI	C
HANAMAULU	B
HANCEVILLE	B
HAND	B
HANDPAH	D
HANDRAN	A
HANDSBORO	D
HANDY	C
HANEY	B
HANFORD	B
HANGAARD	D
HANGDO	B
HANGTOWN	B
HANIPOE	B

HANIPOE, BEDROCK SUBSTRATUM	C
HANIS	C
HANKINS	C
HANKS	B
HANKSVILLE	D
HANKSVILLE, NONFLOODED	C
HANLON	B
HANLY	A
HANNA	B
HANNAHATCHEE	B
HANNING	B
HANO	C
HANOVER	C
HANS	C
HANSEL	C
HANSKA	B/D
HANSON	B
HANTHO	B
HANTZ	D
HANTZ, DRY	C
HAP	B
HAPGOOD	B
HAPJACK	D
HAPNEY	C
HAPPLE	B
HAPUR	D
HARAHAN	D
HARAHILL	C
HARANA	B
HARBORD	B
HARCANY	B
HARCO	B
HARCOT	B/D
HARDEMAN	B
HARDESTY	B
HARDHAT	B
HARDING	D
HARDISTER	B
HARDOL	B
HARDSCRABBLE	D
HARDTRIGGER	B
HARDY	C
HARGILL	B
HARGREAVE	C
HARJO	D
HARKERS	C
HARKEY	B
HARKNESS	C
HARLAN	B
HARLEM	C
HARLEM, CHANNELED	D
HARLESTON	C
HARLINGEN	D
HARLOW	D
HARMEHL	C
HARMONY	C
HARNEY	B
HAROL	B
HARPER	D
HARPERSVILLE	D
HARPETH	B
HARPOLE	B
HARPS	B/D
HARPSTER	B/D
HARPT	B
HARQUA	C
HARRAH	B
HARRIET	D
HARRIMAN	B
HARRIMAN, WET	C
HARRINGTON	C
HARRIS	D
HARRISBURG	C
HARRISON	B
HARRISVILLE	C
HARROUN	D
HARSAN	B

HARSHA	B
HARSLOW	C
HARSTINE	C
HARSTON	B
HART	D
HART CAMP	D
HARTER	C
HARTFORD	A
HARTIG	B
HARTILL	C
HARTLAND	B
HARTLESS	B
HARTLETON	B
HARTNIT	C
HARTSBURG	B/D
HARTSELLS	B
HARTSHORN	B
HARTVILLE	C
HARTWELL	D
HARVARD	B
HARVESTER	B
HARVEY	B
HARVEY, BEDROCK SUBSTRATUM, DRY	C
HARWOOD	C
HASKILL	B
HASKINS	C
HASSEE	D
HASSELL	C
HASTINGS	B
HAT	C
HATBORO	D
HATCH	C
HATCH, GRAVELLY	D
HATCHERY	C
HATCHET, OVERBLOWN, THICK SOLUM	B
HATCHET, GRAVELLY	C
HATCHET, OVERBLOWN	C
HATCHET, COBBLY	C
HATCHIE	C
HATEPMUS	D
HATERTON	D
HATHAWAY	B
HATLEY	C
HATLIFF	C
HATMAKER	C
HATPEAK	C
HATTIE	C
HATTON	C
HATUR	C
HATWAI	D
HAUBSTADT	C
HAUG	D
HAUGAN	D
HAULINGS	D
HAUNCHEE	D
HAUZ	C
HAVALA	B
HAVANA	B
HAVELOCK	B/D
HAVEN	B
HAVERDAD	B
HAVERDAD, MODERATELY SALINE	C
HAVERHILL	D
HAVERLY	C
HAVERMOM	B
HAVERSON	B
HAVILAND	B
HAVILLAH	B
HAVINGDON	C
HAVRE	B
HAVRE, SALINE	C
HAVRE, MODERATELY WET	C
HAVRELON	B
HAW	B

HAWI	B
HAWICK	A
HAWKEYE	A
HAWKINS	C
HAWKSBILL	B
HAWKSNEST	C/D
HAWKSPRINGS	B
HAWKSTONE	B
HAWLEY	B
HAWSLEY	A
HAXTUN	B
HAYBOURNE	B
HAYCRIK	C
HAYDEN	B
HAYESTON	B
HAYESVILLE	B
HAYESVILLE, STONY	C
HAYFIELD	B
HAYFORD	C
HAYHOOK	B
HAYMARKET	D
HAYMOND	B
HAYMONT	B
HAYNESS	B
HAYNIE	B
HAYPRESS	A
HAYRACK	C
HAYSPUR	D
HAYSUM	B
HAYTER	B
HAYTI	D
HAYWIRE	C
HAYWOOD	B
HAZEL	C
HAZELAIR	D
HAZEN	B
HAZLEHURST	C
HAZLETON	B
HAZTON	D
HEADLEY	B
HEADQUARTERS	B
HEAKE	D
HEALDTON	D
HEALING	B
HEARNE	C
HEARNE, GRADED	D
HEATH	C
HEATHCOAT	C
HEATLY	A
HEATON	A
HEBBRONVILLE	B
HEBER	A
HEBERT	C
HEBO	D
HEBRON	B
HECETA	D
HECHTMAN	D
HECKER	D
HECKISON	B
HECLA	D
HECTOR	D
HEDGE	D
HEDGES	C
HEDOX	C
HEDRICK	B
HEDSTROM	B
HEDVILLE	D
HEECHEE	B
HEELY	B
HEESER	B
HEFED	B
HEFLIN	B
HEGLAR	B
HEGNE	D
HEIDEL	B
HEIDEN	D
HEIDTMAN	C
HEIGHTS	B/D
HEIL	D

HEIMDAL	B
HEINSAW	C
HEISETON	B
HEISETON, STONY	C
HEISETON, SALINE-ALKALI	C
HEISLER	B
HEIST	B
HEITT	C
HEIZER	D
HELDT	C
HELEMANO	B
HELENA	C
HELENDALE	B
HELLGATE	B
HELLMAN	C
HELM	D
HELMER	C
HELMER, GRAVELLY SUBSOIL	D
HELMER, THIN SURFACE	D
HELMER, SEVERELY ERODED	D
HELMICK	D
HELTER	B
HELVETIA	C
HELY	C
HEMBRE	B
HEMCROSS	B
HEMINGFORD	B
HEMPSTEAD	B
HENCO	B/D
HENDERSON	B
HENDON	C
HENDRICKS	B
HENDY	C
HENEFER	C
HENHOIT	B
HENKIN	B
HENLEY	C
HENLINE	C
HENMEL	C
HENNEKE	D
HENNEPIN	B
HENNESSY	B
HENNEWAY	B
HENNEY	B
HENNINGS	B
HENNINGSEN	C
HENRIETTA	B/D
HENRIEVILLE	B
HENRY	D
HENSHAW	C
HENSLEY	D
HENSON	B
HEPLER	C
HEPPSIE	D
HERAKLE	D
HERBERT	B
HERBMAN	D
HERD	C
HEREFORD	B
HERITO	C
HERKIMER	B
HERLONG	D
HERM	C
HERMANTOWN	C
HERMERING	B
HERMISTON	B
HERMON	A
HERNANDEZ	B
HERNDON	B
HERO	B
HEROD	D
HERRICK	B
HERSH	B
HERSHAL	D
HERTY	D

NOTES: TWO HYDROLOGIC SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION. MODIFIERS SHOWN, E.G., BEDROCK SUBSTRATUM, REFER TO A SPECIFIC SOIL SERIES PHASE FOUND IN SOIL MAP LEGEND.

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Report—Physical Soil Properties

Physical Soil Properties–Kennebec County, Maine														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
BuB2—Buxton silt loam, 3 to 8 percent slopes, eroded														
Buxton	0-7	0-25- 50	50-53- 80	15-23- 30	0.90-1.05 -1.20	1.41-7.76-14.11	0.25-0.28-0. 30	0.0- 1.5- 2.9	3.0- 5.5- 8.0	.32	.32	5	6	48
	7-15	0-20- 20	40-48- 73	20-33- 45	1.10-1.33 -1.55	0.42-2.33-4.23	0.14-0.21-0. 28	3.0- 4.5- 5.9	0.5- 1.8- 3.0	.32	.32			
	15-36	0-20- 20	40-48- 73	20-33- 45	1.40-1.55 -1.70	0.00-0.71-1.41	0.07-0.17-0. 27	3.0- 4.5- 5.9	0.0- 0.5- 1.0	.43	.43			
	36-65	0- 7- 20	40-48- 60	35-45- 55	1.40-1.60 -1.80	0.00-0.10-1.41	0.04-0.10-0. 16	3.0- 4.5- 5.9	0.0- 0.3- 0.5	.37	.37			
Ha—Hadley silt loam														
Hadley	0-10	0-22- 50	50-71- 80	2- 8- 13	1.10-1.23 -1.35	4.23-9.17-14.11	0.20-0.30-0. 40	0.0- 1.5- 2.9	2.0- 4.0- 6.0	.43	.43	5	5	56
	10-34	45-63- 85	0-29- 50	2- 8- 13	0.90-1.13 -1.35	4.23-9.17-14.11	0.20-0.33-0. 45	0.0- 1.5- 2.9	1.0- 2.5- 4.0	.49	.49			
	34-65	0-22- 50	50-71- 80	2- 8- 13	1.00-1.20 -1.40	4.23-9.17-14.11	0.18-0.29-0. 40	0.0- 1.5- 2.9	0.5- 1.8- 3.0	.55	.55			

Physical Soil Properties–Kennebec County, Maine														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
HfC—Hartland very fine sandy loam, 8 to 15 percent slopes														
Hartland	0-7	45-62- 85	0-28- 50	2-10- 18	0.90-1.20 -1.50	4.23-9.17-14.11	0.22-0.27-0. 30	0.0- 1.5- 2.9	2.0- 4.0- 6.0	.32	.32	5	3	86
	7-15	45-62- 85	0-28- 50	2-10- 18	1.10-1.30 -1.50	4.23-9.17-14.11	0.17-0.22-0. 26	0.0- 1.5- 2.9	0.5- 1.0- 1.0	.43	.43			
	15-28	0-21- 50	50-69- 80	2-10- 18	1.45-1.55 -1.65	4.23-9.17-14.11	0.10-0.16-0. 22	0.0- 1.5- 2.9	0.5- 1.0- 2.0	.55	.55			
	28-65	45-62- 85	0-29- 50	3- 9- 16	1.45-1.55 -1.65	4.23-9.17-14.11	0.09-0.18-0. 26	0.0- 1.5- 2.9	0.5- 1.0- 2.0	.55	.55			
HfD—Hartland very fine sandy loam, 15 to 25 percent slopes														
Hartland	0-7	45-62- 85	0-28- 50	2-10- 18	0.90-1.20 -1.50	4.23-9.17-14.11	0.22-0.27-0. 30	0.0- 1.5- 2.9	2.0- 4.0- 6.0	.32	.32	5	3	86
	7-15	45-62- 85	0-28- 50	2-10- 18	1.10-1.30 -1.50	4.23-9.17-14.11	0.17-0.22-0. 26	0.0- 1.5- 2.9	0.5- 1.0- 1.0	.43	.43			
	15-28	0-21- 50	50-69- 80	2-10- 18	1.45-1.55 -1.65	4.23-9.17-14.11	0.10-0.16-0. 22	0.0- 1.5- 2.9	0.5- 1.0- 2.0	.55	.55			
	28-65	45-62- 85	0-29- 50	3- 9- 16	1.45-1.55 -1.65	4.23-9.17-14.11	0.09-0.18-0. 26	0.0- 1.5- 2.9	0.5- 1.0- 2.0	.55	.55			

Physical Soil Properties–Kennebec County, Maine														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
SkB—Scio very fine sandy loam, 3 to 8 percent slopes														
Scio	0-10	45-62- 85	0-28- 50	2-10- 18	1.20-1.35 -1.50	4.23-9.17-14.11	0.16-0.19-0. 22	0.0- 1.5- 2.9	2.0- 4.0- 6.0	.37	.37	5	3	86
	10-22	0-21- 50	50-69- 80	2-10- 18	1.20-1.35 -1.50	4.23-9.17-14.11	0.15-0.18-0. 20	0.0- 1.5- 2.9	2.0- 4.0- 6.0	.43	.43			
	22-65	45-62- 85	0-28- 50	2-10- 18	1.45-1.55 -1.65	4.23-9.17-14.11	0.10-0.15-0. 20	0.0- 1.5- 2.9	0.1- 0.3- 0.6	.55	.55			
W—Water bodies														
Water	—	—	—	—	—	—	—	—	—					

Data Source Information

Soil Survey Area: Kennebec County, Maine
Survey Area Data: Version 14, Sep 14, 2015

LOCATION SCIO NY+MA ME NH PA RI

Established Series
Rev. JDV-WEH-DAS
03/2013

SCIO SERIES

The Scio series consists of very deep, moderately well drained soils formed in eolian, lacustrine, or alluvial sediments dominated by silt and very fine sand. They are on terraces, old alluvial fans, lake plains, outwash plains and lakebeds. Saturated hydraulic conductivity is moderately high or high to a depth of 100 centimeters and ranges from moderately low through very high below 100 centimeters. Slope ranges from 0 through 25 percent. Mean annual temperature is 9 degrees C., and mean annual precipitation is 940 millimeters.

TAXONOMIC CLASS: Coarse-silty, mixed, active, mesic Aquic Dystrudepts

TYPICAL PEDON: Scio silt loam, on a 2 percent slope in a pasture. (Colors are for moist soil.)

Ap -- 0 to 23 centimeters; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; many fine roots; moderately acid; limed; abrupt smooth boundary. (10 to 33 centimeters thick.)

Bw1 -- 23 to 48 centimeters; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; common fine roots; common medium and fine pores; strongly acid; clear wavy boundary.

Bw2 -- 48 to 79 centimeters; yellowish brown (10YR 5/4) silt loam; weak fine subangular blocky structure; friable; few fine roots; common medium and fine pores; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation and light brownish gray (10YR 6/2) areas of iron depletion in the matrix; strongly acid; clear smooth boundary. (Combined thickness of the Bw horizon is 38 to 135 centimeters.)

C -- 79 to 102 centimeters; brown (10YR 5/3) silt loam; very weak thick plate like divisions; friable; common medium and fine pores; many medium prominent yellowish brown (10YR 5/8) masses of iron accumulation and distinct gray (10YR 6/1) areas of iron depletion in the matrix; 3 percent rock fragments; strongly acid; abrupt smooth boundary. (20 to 102 centimeters thick.)

2Cg -- 102 to 183 centimeters; grayish brown (2.5Y 5/2) very gravelly loamy sand; single grain; loose; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 35 percent gravel; moderately acid.

TYPE LOCATION: Wyoming County, New York; town of Pike, 2 miles north of village of Pike on west side of Campbell Road, 0.7 mile north of junction of Campbell Road and Safford Road. USGS Pike, NY topographic quadrangle; Latitude 42 degrees, 35 minutes, 17 seconds N. and Longitude 78 degrees, 09 minutes, 26 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 50 through 168 centimeters. Depth

to material contrasting with solum texture is 100 centimeters or more. Depth to bedrock is greater than 1.5 meters. Depth to free carbonates is greater than 2 meters. Rock fragments, mainly gravel and cobbles, range from 0 through 5 percent above 100 centimeters and from 0 through 60 percent below 100 centimeters. Stones cover 0 through 10 percent of the surface in some areas.

Some pedons have an O horizon.

The Ap horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 or 3. It is silt loam, very fine sandy loam, or fine sandy loam. Undisturbed pedons have an A horizon with colors similar to the Ap, but also include value of 2. They are 2 through 5 inches thick. Reaction ranges from extremely acid through strongly acid, unless limed.

The B horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 3 through 6. Redox depletions and accumulations are within a depth of 24 inches (61 centimeters). It is silt loam or very fine sandy loam. Reaction ranges from extremely acid through strongly acid to a depth of 76 centimeters and very strongly through moderately acid below 76 centimeters. Some pedons have a BC horizon.

The C horizon has hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 1 through 6. Texture is silt loam to fine sandy loam. It may contain strata of gravel and sand. It is massive or single grain, and may have plate-like divisions. Reaction ranges from very strongly acid through slightly alkaline.

The 2C horizon, if present, has hue of 7.5YR through 5Y, value of 3 through 6, and chroma of 1 through 4. It is silt loam, very fine sandy loam, or loamy very fine sand in the fine earth fraction. In addition, below a depth of 40 inches (100 centimeters) it can range from fine sandy loam through very gravelly sand. Reaction ranges from very strongly acid through slightly alkaline.

COMPETING SERIES: The Dartmouth series is the only other series in the same family. Dartmouth soils have a gravel content of 0 through 5 percent throughout, and have below a depth of 40 inches (100 centimeters) textures limited to silt, silt loam, very fine sandy loam, or loamy very fine sand and saturated hydraulic conductivity ranges from moderately low through moderately high.

GEOGRAPHIC SETTING: Scio soils are most commonly on terraces or old alluvial fans, but are also on lake plains, outwash plains, lakebeds, and lacustrine mantled uplands. The solum is formed entirely in eolian, lacustrine, or alluvial sediments which may extend to a depth of many centimeters or may be underlain by loamy, sandy, or gravelly material at depths greater than 40 inches (100 centimeters). Slope ranges from 0 through 25 percent. Mean annual temperature ranges from 8 through 10 degrees C., mean annual precipitation ranges from 710 through 1270 millimeters, and mean annual frost-free days ranges from 120 through 180 days. Elevation ranges from 31 through 457 meters above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: The Scio series is in a drainage sequence with the well drained Unadilla soils, the well drained and moderately well drained Bridgehampton soils, the poorly drained Raynham soils, and the very poorly drained Birdsall soils. Pope, Tioga, and Hadley soils, and their wetter associated soils are on adjacent floodplains. Alton, Chenango, Copake, and Howard soils, and their wetter associated soils are on adjacent gravelly outwash terraces, kames, and outwash plains.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Moderately well drained. The potential for surface runoff is very low to high. Saturated hydraulic conductivity is moderately high or high to a depth of 100 centimeters and ranges from moderately low through very high below 40 inches

100 centimeters.

USE AND VEGETATION: Most of the soil has been cleared and is used for growing hay, corn, vegetables, fruit, and small grain. Native vegetation is northern red oak, white ash, sugar maple, black cherry, eastern hemlock, and eastern white pine.

DISTRIBUTION AND EXTENT: Massachusetts, Maine, New Hampshire, New York, Pennsylvania, and Rhode Island. MLRAs 101, 139, 140, 143, 144A, 144B, 145, and 149B. The series is moderately extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Allegany County, New York, 1946.

REMARKS: This revision reflects changes to the range in characteristics as well as general updating to metric units. Scio soils have been mapped in frigid areas in the past, but have a Mesic temperature regime. The series will not be used in MLRAs 143 and 144B, or the state of Maine, when older soil surveys in these MLRAs are updated.

Diagnostic horizons and features recognized in this pedon are:
1) Ochric epipedon - the zone from 0 to 23 centimeters (Ap horizon).
2) Cambic horizon - the zone from 23 to 79 centimeters (Bw horizons).
3) Aquic subgroup - Redox depletions with chroma of 2 or less are within 60 centimeters of the mineral soil surface (Bw2 horizon).
4) Particle-size control section - the zone from 23 through 100 centimeters (Bw1, Bw2, C horizons).
5) Lithologic discontinuity - at a depth of 102 centimeters.

ADDITIONAL DATA: Full characterization data for sample no.91MA023009. Pedon analyzed by the NSSL, Lincoln, NE.

National Cooperative Soil Survey
U.S.A.

Appendix C LIGHTING FIXTURE CUT SHEETS

D-Series Size 1
LED Area Luminaire

Catalog Number

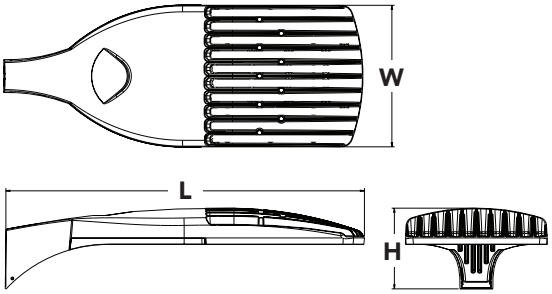
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

EPA:	1.01 ft² (0.09 m²)
Length:	33″ (83.8 cm)
Width:	13″ (33.0 cm)
Height:	7-1/2″ (19.0 cm)
Weight (max):	27 lbs (12.2 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX1 LED 60C 1000 40K T3M MVOLT SPA DDBXD

DSX1LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting
DSX1 LED	**Forward optics** 30C 30 LEDs (one engine) 40C 40 LEDs (two engines) 60C 60 LEDs (two engines) **Rotated optics** [1] 60C 60 LEDs (two engines)	530 530 mA 700 700 mA 1000 1000 mA (1 A)[2]	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted [3]	T1S Type I Short T2S Type II Short T2M Type II Medium T3S Type III Short T3M Type III Medium T4M Type IV Medium TFTM Forward Throw Medium T5VS Type V Very Short T5S Type V Short T5M Type V Medium T5W Type V Wide BLC Backlight control [4] LCCO Left corner cutoff [4] RCCO Right corner cutoff [4]	MVOLT [5] 120 [5] 208 [5] 240 [5] 277 [5] 347 [6] 480 [6]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor [7] RPUMBA Round pole universal mounting adaptor [7] **Shipped separately** KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) [8]

Control options		Other options	Finish *(required)*
Shipped installed PER NEMA twist-lock receptacle only (no controls) [9] PER5 Five-wire receptacle only (no controls) [9,10] PER7 Seven-wire receptacle only (no controls) [9,10] DMG 0-10V dimming driver (no controls) [11] DCR Dimmable and controllable via ROAM® (no controls) [12] DS Dual switching [13,14] PIR Motion/ambient sensor, 8-15′ mounting height, ambient sensor enabled at 5fc [15] PIRH Motion/ambient sensor, 15-30′ mounting height, ambient sensor enabled at 5fc [15] PIR1FC3V Motion/ambient sensor, 8-15′ mounting height, ambient sensor enabled at 1fc [15] PIRH1FC3V Motion/ambient sensor, 15-30′ mounting height, ambient sensor enabled at 1fc [15] BL30 Bi-level switched dimming, 30% [14,16] BL50 Bi-level switched dimming, 50% [14,16] PNMTDD3 Part night, dim till dawn [17] PNMT5D3 Part night, dim 5 hrs [17] PNMT6D3 Part night, dim 6 hrs [17] PNMT7D3 Part night, dim 7 hrs [17]	**Shipped installed** HS House-side shield [18] WTB Utility terminal block [19] SF Single fuse (120, 277, 347V) [20] DF Double fuse (208, 240, 480V) [20] L90 Left rotated optics [21] R90 Right rotated optics [21]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Accessories

Ordered and shipped separately.

Controls & Shields

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) [22]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) [22]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) [22]
DSHORT SBK U	Shorting cap [22]
DSX1HS 30C U	House-side shield for 30 LED unit
DSX1HS 40C U	House-side shield for 40 LED unit
DSX1HS 60C U	House-side shield for 60 LED unit
PUMBA DDBXD U*	Square and round pole universal mounting bracket (specify finish)
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) [8]

For more control options, visit DTL and ROAM online.

NOTES

1 Rotated optics available with 60C only.
2 Not available AMBPC.
3 Only available with 530mA or 700mA.
4 Not available with AMBPC in 530mA or 700mA in BLC, LCCO or RCCO distribution.
5 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120V, 208V, 240V or 277V options only when ordering with fusing (SF, DF options).
6 Not available with single board, 530mA product (30C 530 or 60C 530 DS). Not available with BL30, BL50 or PNMT options.
7 Available as a separate combination accessory: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
8 Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8″ mast arm (not included).
9 Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Not available with DS option.
10 If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR.
11 DMG option for 347V or 480V requires 1000mA.
12 Specifies a ROAM® enabled luminaire with 0-10V dimming capability; PER option required. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with PIR options DS, PER5, PER7, BL30, BL50 or PNMT options.
13 Requires 40C or 60C. Provides 50/50 luminaire operation via two independent drivers on two separate circuits. N/A with PER, DCR, WTB, PIR or PIRH.
14 Requires an additional switched circuit.
15 PIR and PIR1FC3V specify the SensorSwitch SBGR-10-ODP control; PIRH and PIRH1FC3V specify the SensorSwitch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with PER5 or PER7. Ambient sensor disabled when ordered with DCR. Separate on/off required.
16 Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, DS, PER5, PER7 or PNMT options.
17 Dimming driver standard. MVOLT only. Not available with 347V, 480V, DCR, DS, PER5, PER7, BL30 or BL50.
18 Also available as a separate accessory; see Accessories information.
19 WTB not available with DS.
20 Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
21 Available with 60 LEDs (60C option) only.
22 Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Controls.

LITHONIA LIGHTING
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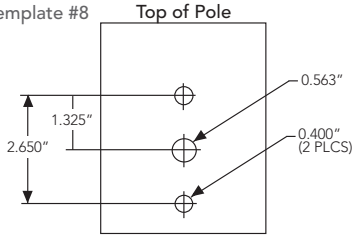
Drilling

Template #8 Top of Pole



DSX1 shares a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	**DM29AS**	2 at 90° *
DM28AS	2 at 180°	**DM39AS**	3 at 90° *
DM49AS	4 at 90° *	**DM32AS**	3 at 120° **

Example: SSA 20 4C **DM19AS** DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.
**Round pole top must be 3.25" O.D. minimum.*
***For round pole mounting (RPA) only.*

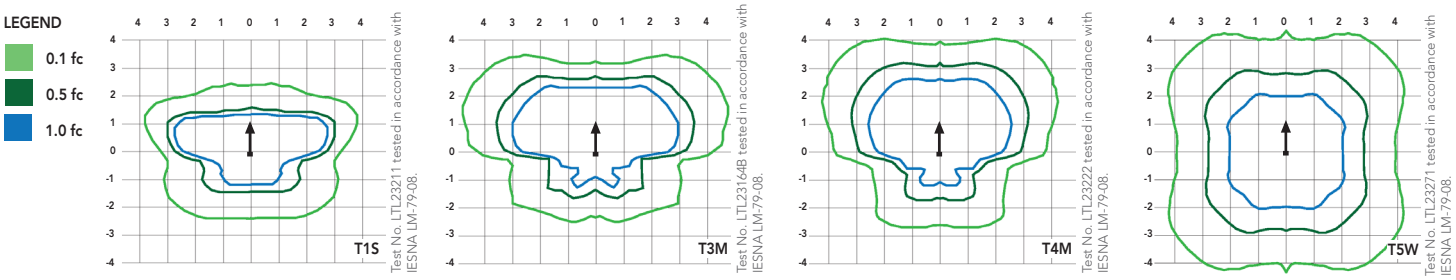
Tenon Mounting Slipfitter **

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's D-Series Area Size 1 homepage.

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (20').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	DSX1 LED 60C 1000			
	1.0	0.98	0.96	0.91
	DSX1 LED 60C 700			
	1.0	0.99	0.99	0.99

Electrical Load

Number of LEDs	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
30	530	52	0.52	0.30	0.26	0.23	--	--
	700	68	0.68	0.39	0.34	0.30	0.24	0.17
	1000	105	1.03	0.59	0.51	0.45	0.36	0.26
40	530	68	0.67	0.39	0.34	0.29	0.23	0.17
	700	89	0.89	0.51	0.44	0.38	0.31	0.22
	1000	138	1.35	0.78	0.67	0.58	0.47	0.34
60	530	99	0.97	0.56	0.48	0.42	0.34	0.24
	700	131	1.29	0.74	0.65	0.56	0.45	0.32
	1000	209	1.98	1.14	0.99	0.86	0.69	0.50

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Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
30C (30 LEDs)	530 mA	52 W	T1S	5,948	1	0	1	114	6,387	1	0	1	123	6,427	1	0	1	124	3,640	1	0	1	70
			T2S	6,132	1	0	1	118	6,585	2	0	2	127	6,626	2	0	2	127	3,813	1	0	1	73
			T2M	5,992	1	0	2	115	6,434	1	0	2	124	6,475	1	0	2	125	3,689	1	0	1	71
			T3S	5,985	1	0	1	115	6,427	1	0	2	124	6,467	1	0	2	124	3,770	1	0	1	73
			T3M	6,039	1	0	2	116	6,485	1	0	2	125	6,525	1	0	2	125	3,752	1	0	1	72
			T4M	6,121	1	0	2	118	6,573	1	0	2	126	6,614	1	0	2	127	3,758	1	0	1	72
			TFTM	6,030	1	0	2	116	6,475	1	0	2	125	6,515	1	0	2	125	3,701	1	0	1	71
			T5VS	6,370	2	0	0	123	6,840	2	0	0	132	6,883	2	0	0	132	3,928	2	0	0	76
			T5S	6,417	2	0	0	123	6,890	2	0	0	133	6,933	2	0	0	133	3,881	2	0	0	75
			T5M	6,428	3	0	1	124	6,902	3	0	1	133	6,945	3	0	1	134	3,930	2	0	1	76
			T5W	6,334	3	0	1	122	6,801	3	0	1	131	6,844	3	0	1	132	3,820	3	0	1	73
			BLC	4,735	1	0	1	91	5,085	1	0	2	98	5,116	1	0	1	98					
			LCCO	4,600	1	0	2	88	4,940	1	0	2	95	4,971	1	0	2	96					
			RCCO	4,600	1	0	2	88	4,940	1	0	2	95	4,971	1	0	2	96					
	700 mA	68 W	T1S	7,554	1	0	1	111	8,112	2	0	2	119	8,163	2	0	2	120	4,561	1	0	1	67
			T2S	7,789	2	0	2	115	8,364	2	0	2	123	8,416	2	0	2	124	4,777	1	0	1	70
			T2M	7,610	1	0	2	112	8,172	2	0	2	120	8,223	2	0	2	121	4,622	1	0	2	68
			T3S	7,601	1	0	2	112	8,162	2	0	2	120	8,213	2	0	2	121	4,724	1	0	1	69
			T3M	7,670	1	0	2	113	8,236	2	0	2	121	8,288	2	0	2	122	4,701	1	0	2	69
			T4M	7,774	1	0	2	114	8,348	2	0	2	123	8,400	2	0	2	124	4,709	1	0	2	69
			TFTM	7,658	1	0	2	113	8,223	1	0	2	121	8,275	1	0	2	122	4,638	1	0	2	68
			T5VS	8,090	2	0	0	119	8,687	3	0	1	128	8,742	3	0	1	129	4,922	2	0	0	72
			T5S	8,150	2	0	0	120	8,751	3	0	0	129	8,806	3	0	0	130	4,863	2	0	0	72
			T5M	8,164	3	0	1	120	8,767	3	0	2	129	8,821	3	0	2	130	4,924	3	0	1	72
			T5W	8,044	3	0	1	118	8,638	3	0	2	127	8,692	3	0	2	128	4,787	3	0	1	70
			BLC	6,028	1	0	2	89	6,473	1	0	2	95	6,514	1	0	2	96					
			LCCO	5,856	1	0	2	86	6,289	1	0	2	92	6,328	1	0	2	93					
			RCCO	5,856	1	0	2	86	6,289	1	0	2	92	6,328	1	0	2	93					
	1000 mA	105 W	T1S	10,331	2	0	2	98	11,094	2	0	2	106	11,163	2	0	2	106					
			T2S	10,652	2	0	2	101	11,438	2	0	2	109	11,510	2	0	2	110					
			T2M	10,408	2	0	2	99	11,176	2	0	3	106	11,246	2	0	3	107					
			T3S	10,395	2	0	2	99	11,163	2	0	2	106	11,233	2	0	2	107					
			T3M	10,490	2	0	2	100	11,264	2	0	2	107	11,335	2	0	2	108					
			T4M	10,632	2	0	2	101	11,417	2	0	2	109	11,488	2	0	2	109					
			TFTM	10,473	2	0	2	100	11,247	2	0	3	107	11,317	2	0	3	108					
			T5VS	11,064	3	0	1	105	11,881	3	0	1	113	11,955	3	0	1	114					
			T5S	11,145	3	0	1	106	11,968	3	0	1	114	12,043	3	0	1	115					
			T5M	11,165	3	0	2	106	11,989	4	0	2	114	12,064	4	0	2	115					
			T5W	11,001	3	0	2	105	11,813	4	0	2	113	11,887	4	0	2	113					
			BLC	7,960	1	0	2	76	8,548	1	0	2	81	8,601	1	0	2	82					
			LCCO	7,734	1	0	2	74	8,305	1	0	2	79	8,357	1	0	2	80					
			RCCO	7,734	1	0	2	74	8,305	1	0	2	79	8,357	1	0	2	80					

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Lumen Output

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Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
40C (40 LEDs)	530 mA	68 W	T1S	7,861	1	0	1	116	8,441	2	0	2	124	8,494	2	0	2	125	4,794	1	0	1	71
			T2S	8,105	2	0	2	119	8,704	2	0	2	128	8,758	2	0	2	129	5,021	1	0	1	74
			T2M	7,920	2	0	2	116	8,504	2	0	2	125	8,557	2	0	2	126	4,858	1	0	2	71
			T3S	7,910	1	0	2	116	8,494	2	0	2	125	8,547	2	0	2	126	4,966	1	0	1	73
			T3M	7,982	2	0	2	117	8,571	2	0	2	126	8,625	2	0	2	127	4,941	1	0	2	73
			T4M	8,090	1	0	2	119	8,687	2	0	2	128	8,741	2	0	2	129	4,950	1	0	2	73
			TFTM	7,969	1	0	2	117	8,558	2	0	2	126	8,611	2	0	2	127	4,875	1	0	2	72
			T5VS	8,419	2	0	0	124	9,040	3	0	1	133	9,097	3	0	1	134	5,174	2	0	0	76
			T5S	8,481	2	0	0	125	9,107	3	0	1	134	9,164	3	0	1	135	5,111	2	0	0	75
			T5M	8,496	3	0	1	125	9,123	3	0	2	134	9,180	3	0	2	135	5,175	3	0	1	76
			T5W	8,371	3	0	2	123	8,989	3	0	2	132	9,045	3	0	2	133	5,031	3	0	1	74
			BLC	6,255	1	0	2	92	6,717	1	0	2	99	6,759	1	0	2	99					
			LCCO	6,077	1	0	2	89	6,526	1	0	2	96	6,566	1	0	2	97					
			RCCO	6,077	1	0	2	89	6,526	1	0	2	96	6,566	1	0	2	97					
	700 mA	91 W	T1S	9,984	2	0	2	112	10,721	2	0	2	120	10,788	2	0	2	121	6,014	1	0	1	68
			T2S	10,294	2	0	2	116	11,054	2	0	2	124	11,123	2	0	2	125	6,299	2	0	2	71
			T2M	10,059	2	0	2	113	10,801	2	0	3	121	10,869	2	0	3	122	6,094	2	0	2	68
			T3S	10,046	2	0	2	113	10,788	2	0	2	121	10,855	2	0	2	122	6,229	1	0	2	70
			T3M	10,137	2	0	2	114	10,886	2	0	2	122	10,954	2	0	2	123	6,198	2	0	2	70
			T4M	10,275	2	0	2	115	11,033	2	0	2	124	11,102	2	0	2	125	6,209	1	0	2	70
			TFTM	10,122	2	0	2	114	10,869	2	0	2	122	10,937	2	0	2	123	6,115	1	0	2	69
			T5VS	10,693	3	0	1	120	11,482	3	0	1	129	11,554	3	0	1	130	6,490	2	0	0	73
			T5S	10,771	3	0	1	121	11,566	3	0	1	130	11,639	3	0	1	131	6,411	2	0	0	72
			T5M	10,790	3	0	2	121	11,587	4	0	2	130	11,659	4	0	2	131	6,492	3	0	1	73
			T5W	10,632	3	0	2	119	11,417	4	0	2	128	11,488	4	0	2	129	6,311	3	0	2	71
			BLC	7,963	1	0	2	89	8,551	1	0	2	96	8,605	1	0	2	97					
			LCCO	7,736	1	0	2	87	8,308	1	0	2	93	8,359	1	0	2	94					
			RCCO	7,736	1	0	2	87	8,308	1	0	2	93	8,359	1	0	2	94					
	1000 mA	138 W	T1S	13,655	2	0	2	99	14,663	3	0	3	106	14,754	3	0	3	107					
			T2S	14,079	2	0	2	102	15,118	3	0	3	110	15,212	3	0	3	110					
			T2M	13,756	2	0	3	100	14,772	3	0	3	107	14,864	3	0	3	108					
			T3S	13,739	2	0	2	100	14,754	2	0	2	107	14,846	3	0	3	108					
			T3M	13,864	2	0	2	100	14,888	3	0	3	108	14,981	3	0	3	109					
			T4M	14,052	2	0	2	102	15,090	3	0	3	109	15,184	3	0	3	110					
			TFTM	13,842	2	0	3	100	14,864	2	0	3	108	14,957	2	0	3	108					
			T5VS	14,623	3	0	1	106	15,703	4	0	1	114	15,801	4	0	1	115					
			T5S	14,731	3	0	1	107	15,818	3	0	1	115	15,917	3	0	1	115					
			T5M	14,757	4	0	2	107	15,846	4	0	2	115	15,945	4	0	2	116					
			T5W	14,540	4	0	2	105	15,614	4	0	2	113	15,711	4	0	2	114					
			BLC	10,516	1	0	2	76	11,292	1	0	2	82	11,363	1	0	2	82					
			LCCO	10,216	2	0	3	74	10,971	2	0	3	80	11,039	2	0	3	80					
			RCCO	10,216	2	0	3	74	10,971	2	0	3	80	11,039	2	0	3	80					

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Performance Data

Lumen Output

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Forward Optics

LEDs	Drive Current (mA)	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)				
				Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
60C (60 LEDs)	530 mA	99 W	T1S	11,569	2	0	2	117	12,423	2	0	2	125	12,501	2	0	2	126	7,167	2	0	2	72
			T2S	11,928	2	0	2	120	12,809	3	0	3	129	12,889	3	0	3	130	7,507	2	0	2	76
			T2M	11,655	2	0	2	118	12,516	2	0	3	126	12,594	2	0	3	127	7,263	2	0	2	73
			T3S	11,641	2	0	2	118	12,500	2	0	2	126	12,579	2	0	2	127	7,424	2	0	2	75
			T3M	11,747	2	0	2	119	12,614	2	0	2	127	12,693	2	0	2	128	7,387	2	0	2	75
			T4M	11,906	2	0	2	120	12,785	2	0	2	129	12,865	2	0	2	130	7,400	2	0	2	75
			TFTM	11,728	2	0	2	118	12,594	2	0	3	127	12,673	2	0	3	128	7,288	1	0	2	74
			T5VS	12,390	3	0	1	125	13,305	3	0	1	134	13,388	3	0	1	135	7,734	3	0	1	78
			T5S	12,481	3	0	1	126	13,402	3	0	1	135	13,486	3	0	1	136	7,641	3	0	0	77
			T5M	12,503	3	0	2	126	13,426	4	0	2	136	13,510	4	0	2	136	7,737	3	0	2	78
			T5W	12,320	4	0	2	124	13,229	4	0	2	134	13,312	4	0	2	134	7,522	3	0	2	76
			BLC	9,212	1	0	2	93	9,892	1	0	2	100	9,954	1	0	2	101					
			LCCO	8,950	1	0	2	90	9,611	2	0	2	97	9,671	2	0	2	98					
			RCCO	8,950	1	0	2	90	9,611	2	0	2	97	9,671	2	0	2	98					
	700 mA	131 W	T1S	14,694	2	0	2	112	15,779	3	0	3	120	15,877	3	0	3	121	8,952	2	0	2	68
			T2S	15,150	3	0	3	116	16,269	3	0	3	124	16,370	3	0	3	125	9,377	2	0	2	72
			T2M	14,803	2	0	3	113	15,896	3	0	3	121	15,995	3	0	3	122	9,072	2	0	2	69
			T3S	14,785	2	0	2	113	15,877	3	0	3	121	15,976	3	0	3	122	9,273	2	0	2	71
			T3M	14,919	2	0	2	114	16,021	3	0	3	122	16,121	3	0	3	123	9,227	2	0	2	70
			T4M	15,122	2	0	2	115	16,238	3	0	3	124	16,340	3	0	3	125	9,243	2	0	2	71
			TFTM	14,896	2	0	3	114	15,996	2	0	3	122	16,096	2	0	3	123	9,103	2	0	2	69
			T5VS	15,736	3	0	1	120	16,898	4	0	1	129	17,004	4	0	1	130	9,661	3	0	1	74
			T5S	15,852	3	0	1	121	17,022	4	0	1	130	17,129	4	0	1	131	9,544	3	0	1	73
			T5M	15,880	4	0	2	121	17,052	4	0	2	130	17,159	4	0	2	131	9,665	3	0	2	74
			T5W	15,647	4	0	2	119	16,802	4	0	2	128	16,907	4	0	2	129	9,395	4	0	2	72
			BLC	11,728	1	0	2	90	12,594	1	0	2	96	12,672	3	0	3	97					
			LCCO	11,394	2	0	3	87	12,235	2	0	3	93	12,311	2	0	3	94					
			RCCO	11,394	2	0	3	87	12,235	2	0	3	93	12,311	2	0	3	94					
	1000 mA	209 W	T1S	20,095	3	0	3	96	21,579	3	0	3	103	21,714	3	0	3	104					
			T2S	20,720	3	0	3	99	22,249	3	0	3	106	22,388	3	0	3	107					
			T2M	20,245	3	0	3	97	21,740	3	0	3	104	21,876	3	0	3	105					
			T3S	20,220	3	0	3	97	21,713	3	0	3	104	21,849	3	0	3	105					
			T3M	20,404	3	0	3	98	21,910	3	0	4	105	22,047	3	0	4	105					
			T4M	20,681	3	0	3	99	22,207	3	0	4	106	22,346	3	0	4	107					
			TFTM	20,372	3	0	3	97	21,876	3	0	4	105	22,013	3	0	4	105					
			T5VS	21,521	4	0	1	103	23,110	4	0	1	111	23,254	4	0	1	111					
			T5S	21,679	4	0	1	104	23,280	4	0	1	111	23,425	4	0	1	112					
			T5M	21,717	4	0	2	104	23,321	5	0	3	112	23,466	5	0	3	112					
			T5W	21,399	4	0	3	102	22,979	5	0	3	110	23,122	5	0	3	111					
			BLC	15,487	2	0	2	74	16,630	2	0	2	80	16,734	2	0	3	80					
			LCCO	15,046	2	0	3	72	16,157	2	0	3	77	16,258	2	0	3	78					
			RCCO	15,046	2	0	3	72	16,157	2	0	3	77	16,258	2	0	3	78					

FEATURES & SPECIFICATIONS

INTENDED USE

The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED driver is mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.01 ft^2) for optimized pole wind loading.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 4000 K (70 minimum CRI) or optional 3000 K (70 minimum CRI) or 5000 K (70 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine configurations consist of 30, 40 or 60 high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L96/100,000 hours at 25°C). Class 1 electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV or 6kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 1 utilizes the AERIS™ series pole drilling pattern. Optional terminal block, tool-less entry, and NEMA photocontrol receptacle are also available.

LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY

5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

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TOPAZ

Friendly Service... Powerful Solutions™

LED Post Top Light

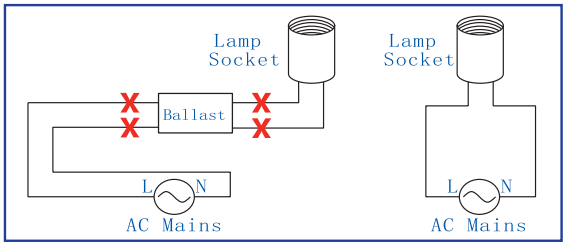
LPT54/850/INT/E26

LED Retrofit Light

- *Lead-free, UV-free, and a long-lasting cold lighting source*
- *Ballast bypass model**
- *Transient/surge protection*
- *Suitable for enclosed fixture***
- *Lamps designed to produce at least 70% of initial light output after 40,000 hours*
- *Power Factor ≥ 0.9*

Item #	LPT54/850/INT/E26-74
Product Code	78687
UPC Code	751338066489
Watts	54W
Volts	100-300VAC
Base	E26 Medium
Beam Spread	360°
CRI	80
Color Temp	5000K
Initial Lumens	5,670
Average Rated Life	40,000
Ambient Temp Range	-20°C to 50°C
Dimensions (DxL)	3.55" x 10.75"
Equivalent Wattage	250W MH
Warranty	5 Years

Specifications are subject to change without prior notice.



INT - Internal power supply

**Operation of the lamp at ambient temperature in excess of 105 degrees F may impact the lumen maintenance and or life of the product.

***Installation Note: Requires bypass of existing ballast. See installation instructions.**

c UL us LISTED

IP65

CE

RoHS COMPLIANT

SUITABLE FOR WET LOCATIONS

TOPAZ Friendly Service... Powerful Solutions™

www.topaz-usa.com

NY Office: *925 Waverly Ave • Holtsville, NY 11742 • 800-666-2852 • Fax: 631-758-8026*

CA Office: *225 Parkside Drive, San Fernando, CA 91340 • 888-551-2852 or 818-838-3123 • Fax: 888-690-2852 or 818-838-3102*

FL Office: *2020 West 26th Street, Jacksonville, FL 32209 • 800-338-2852 • Fax: 772-778-5386*

Appendix D MHPC CORRESPONDENCE

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

PAUL R. LEPAGE
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

May 17, 2016

Jill Instasi
BGS Director of Special Projects
State of Maine, DAFS
77 SHS
Augusta, ME 04333

Project: MHPC# 0693-16- East Campus pavement improvements
Town: Augusta, ME

Dear Ms. Instasi:

In response to your request, I have reviewed the information received May 9, 2016 to initiate consultation on the above referenced project in accordance with the requirements of the Maine Department of Environmental Protection.

Based on the information submitted, I have concluded that the proposed undertaking will have no adverse effect upon historic properties [archaeological or architectural], as defined by Section 106 of the National Historic Preservation Act of 1966, as amended.

Please contact Robin Reed of our office if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132 FAX: (207) 287-2335

Appendix E FUNDING LETTER

STATE OF MAINE
DEPARTMENT OF ADMINISTRATIVE & FINANCIAL SERVICES
BUREAU OF GENERAL SERVICES
BURTON M. CROSS BUILDING
4TH FLOOR, 77 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0077

PAUL R. LEPAGE
GOVERNOR

RICHARD W. ROSEN
COMMISSIONER

EDWARD A. DAHL
DIRECTOR

May 24, 2016

Dear Maine Department of Environmental Protection,

Please accept this letter as confirmation that the Bureau of General Services has the financial capacity to undertake the East Campus Paving Project. We have secured $4,000,000 from MGFA 2015B Bond Funds specifically for this project and have hired Stantec for all design/permitting work associated with it.

To date, project work is on schedule with our assigned funds.

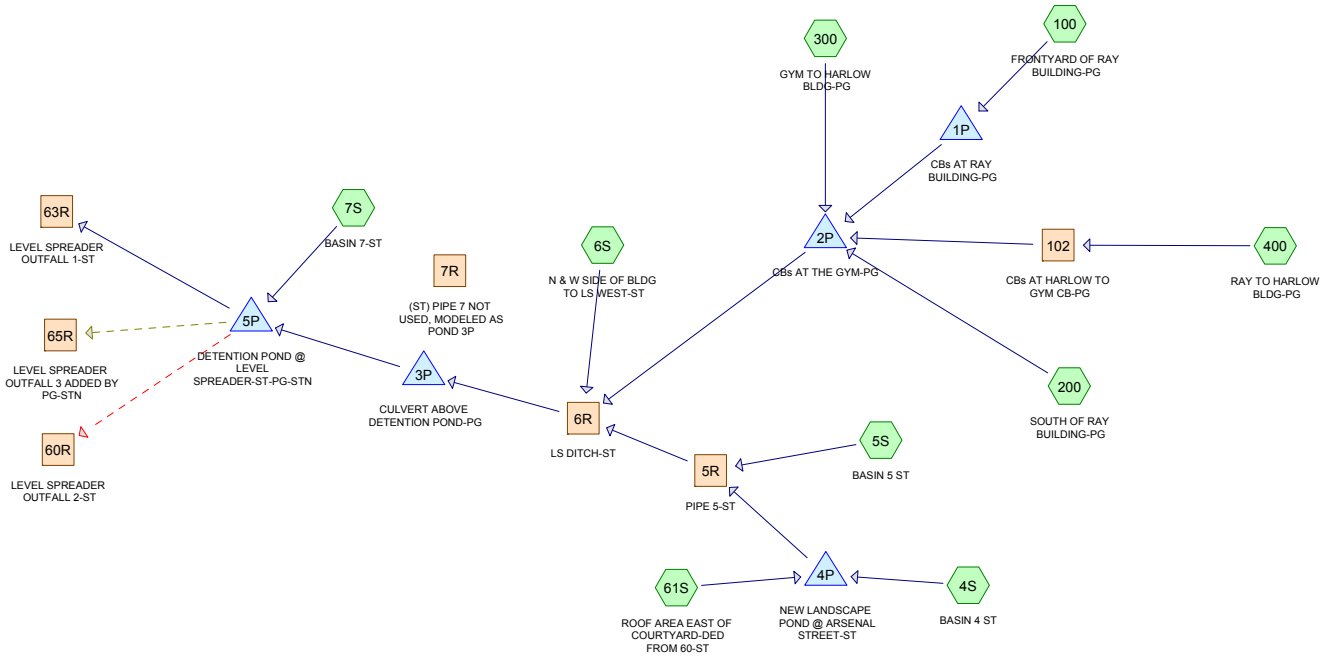
Sincerely,

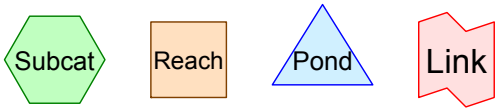
Edward A Dahl

Edward A. Dahl
Director
Bureau of General Services

PHONE: (207) 624-7314 www.Maine.gov FAX: (207) 287-4039

Appendix F STORMWATER MANAGEMENT DATA





Routing Diagram for AMHI_existing
Prepared by Stantec Consulting Ltd., Printed 6/8/2016
HydroCAD® 10.00-13 s/n 01672 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.857	61	>75% Grass cover, Good, HSG B (4S, 5S, 6S, 7S, 100, 200, 300, 400)
1.890	98	Paved parking, HSG B (5S, 6S, 7S, 100, 200)
0.330	98	Paved parking, HSG B (BLDGS AND WALKS) (400)
0.715	98	Paved parking, HSG B (NEW PRKG LOT) (4S)
0.740	98	Paved parking, HSG B (includes new pavement) (300)
1.050	98	Roofs, HSG B (61S)
14.582	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
14.582	HSG B	4S, 5S, 6S, 7S, 61S, 100, 200, 300, 400
0.000	HSG C	
0.000	HSG D	
0.000	Other	
14.582		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	9.857	0.000	0.000	0.000	9.857	>75% Grass cover, Good	4S, 5S, 6S, 7S, 100, 200, 300, 400
0.000	3.675	0.000	0.000	0.000	3.675	Paved parking	4S, 5S, 6S, 7S, 100, 200, 300, 400
0.000	1.050	0.000	0.000	0.000	1.050	Roofs	61S
0.000	**14.582**	**0.000**	**0.000**	**0.000**	**14.582**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	5R	0.00	-4.70	470.0	0.0100	0.012	14.0	0.0	0.0
2	102	177.20	176.91	140.0	0.0021	0.023	12.0	0.0	0.0
3	1P	182.00	176.89	370.0	0.0138	0.023	12.0	0.0	0.0
4	2P	173.10	170.81	450.0	0.0051	0.010	18.0	0.0	0.0
5	3P	161.00	160.50	66.0	0.0076	0.010	21.0	0.0	0.0
6	4P	174.00	173.80	40.0	0.0050	0.013	15.0	0.0	0.0
7	5P	160.00	156.00	90.0	0.0444	0.012	12.0	0.0	0.0
8	5P	160.00	156.00	68.0	0.0588	0.012	12.0	0.0	0.0
9	5P	160.00	158.13	72.0	0.0260	0.012	12.0	0.0	0.0

Time span=10.00-20.00 hrs, dt=0.01 hrs, 1001 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 4S: BASIN 4 ST Runoff Area=1.955 ac 36.57% Impervious Runoff Depth>1.81"
Flow Length=300' Tc=13.4 min CN=75 Runoff=3.53 cfs 0.295 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth>1.96"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=3.93 cfs 0.297 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth>1.21"
Flow Length=320' Tc=14.4 min CN=66 Runoff=1.69 cfs 0.153 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth>1.40"
Flow Length=240' Tc=7.3 min CN=69 Runoff=1.07 cfs 0.076 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth>3.36"
Tc=5.0 min CN=98 Runoff=4.67 cfs 0.294 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.200 ac 9.06% Impervious Runoff Depth>1.08"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=64 Runoff=2.79 cfs 0.289 af

Subcatchment 200: SOUTH OF RAY Runoff Area=2.280 ac 19.74% Impervious Runoff Depth>1.33"
Flow Length=500' Tc=23.3 min CN=68 Runoff=2.35 cfs 0.252 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth>2.47"
Tc=5.0 min CN=84 Runoff=3.86 cfs 0.241 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.940 ac 35.11% Impervious Runoff Depth>1.75"
Tc=5.0 min CN=74 Runoff=2.14 cfs 0.137 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=1.17' Max Vel=6.21 fps Inflow=7.61 cfs 0.868 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=6.22 cfs 0.867 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.51' Max Vel=6.34 fps Inflow=14.73 cfs 1.937 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=14.69 cfs 1.935 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.13' Max Vel=1.50 fps Inflow=4.85 cfs 0.670 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=4.84 cfs 0.669 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=2.11 fps Inflow=4.85 cfs 0.670 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=4.85 cfs 0.670 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.40' Max Vel=0.46 fps Inflow=4.85 cfs 0.670 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=4.84 cfs 0.669 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=1.00' Max Vel=1.33 fps Inflow=2.14 cfs 0.137 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.98 cfs 0.136 af

Pond 1P: CBs AT RAY BUILDING-PG Peak Elev=184.82' Storage=201 cf Inflow=2.79 cfs 0.289 af
Outflow=2.70 cfs 0.288 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=174.59' Storage=40 cf Inflow=7.35 cfs 0.917 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=7.35 cfs 0.917 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=163.47' Storage=682 cf Inflow=14.69 cfs 1.935 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=14.62 cfs 1.934 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=175.46' Storage=5,923 cf Inflow=7.05 cfs 0.589 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=4.24 cfs 0.571 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=162.14' Storage=3,362 cf Inflow=15.19 cfs 2.010 af
fs 0.000 af Primary=4.85 cfs 0.670 af Secondary=4.85 cfs 0.670 af Tertiary=4.85 cfs 0.670 af Outflow=14.54 cfs 2.009 af

Total Runoff Area = 14.582 ac Runoff Volume = 2.033 af Average Runoff Depth = 1.67"
67.60% Pervious = 9.857 ac 32.40% Impervious = 4.725 ac

Summary for Subcatchment 4S: BASIN 4 ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

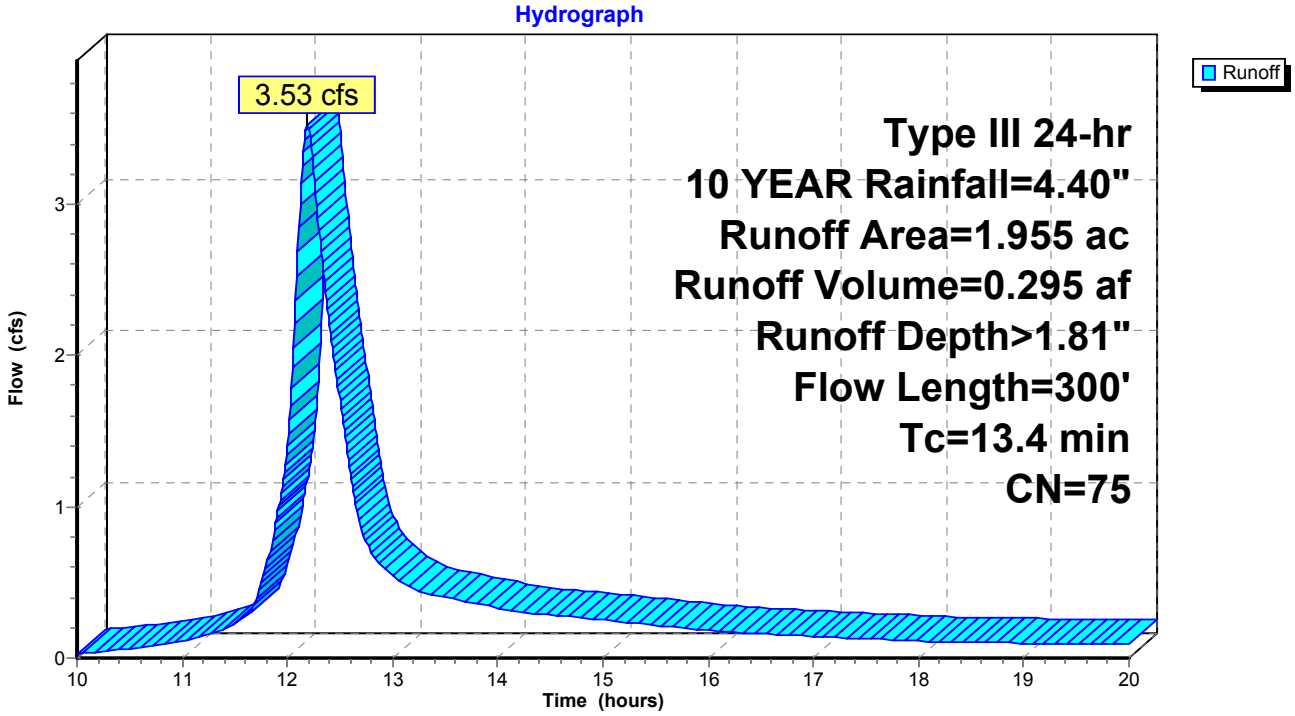
Runoff = 3.53 cfs @ 12.19 hrs, Volume= 0.295 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.715	98	Paved parking, HSG B (NEW PRKG LOT)
	1.240	61	>75% Grass cover, Good, HSG B
	1.955	75	Weighted Average
	1.240		63.43% Pervious Area
	0.715		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
4.8	200	0.0100	0.70		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
13.4	300	Total			

Subcatchment 4S: BASIN 4 ST



Summary for Subcatchment 5S: BASIN 5 ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

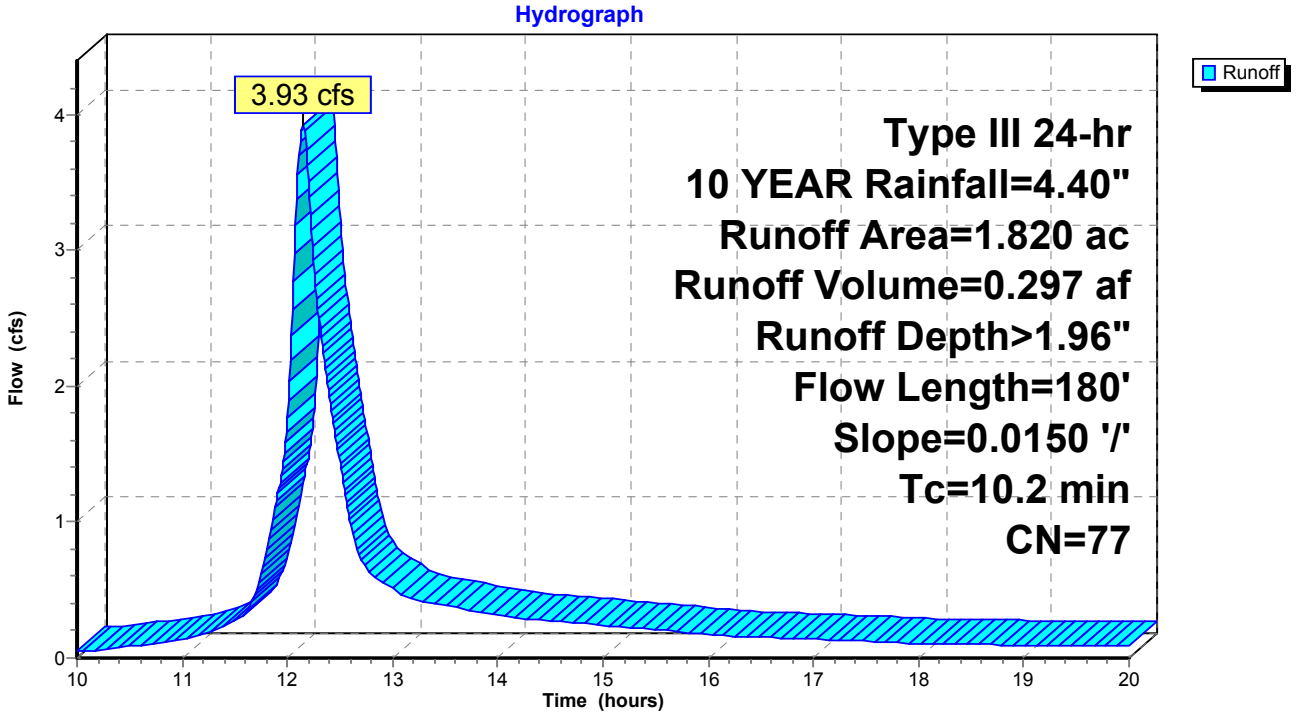
Runoff = 3.93 cfs @ 12.14 hrs, Volume= 0.297 af, Depth> 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG B
1.020	61	>75% Grass cover, Good, HSG B
1.820	77	Weighted Average
1.020		56.04% Pervious Area
0.800		43.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	80	0.0150	0.14		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow, SHALLOW BC** Paved Kv= 20.3 fps
10.2	180	Total			

Subcatchment 5S: BASIN 5 ST



Summary for Subcatchment 6S: N & W SIDE OF BLDG TO LS WEST-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

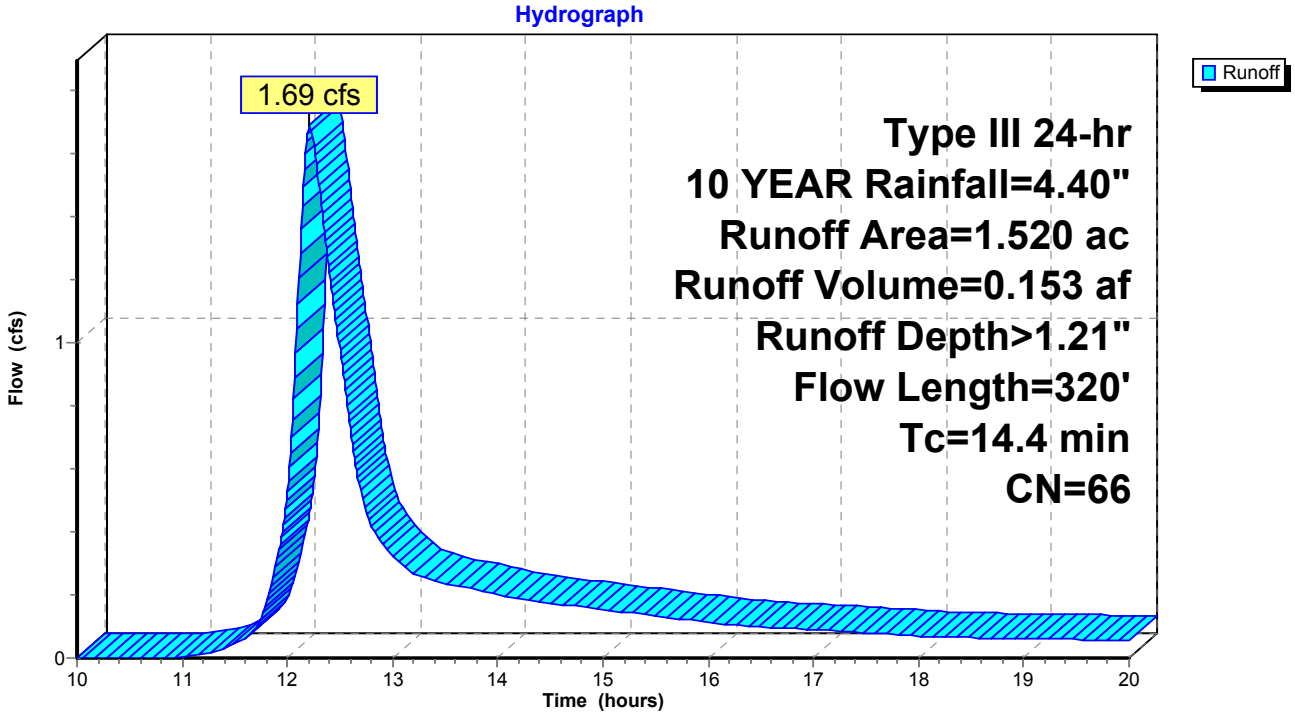
Runoff = 1.69 cfs @ 12.21 hrs, Volume= 0.153 af, Depth> 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG B
1.310	61	>75% Grass cover, Good, HSG B
1.520	66	Weighted Average
1.310		86.18% Pervious Area
0.210		13.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0100	0.12		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
1.0	220	0.0640	3.79		**Shallow Concentrated Flow, SHALLOW BC** Grassed Waterway Kv= 15.0 fps
14.4	320	Total			

Subcatchment 6S: N & W SIDE OF BLDG TO LS WEST-ST



Summary for Subcatchment 7S: BASIN 7-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

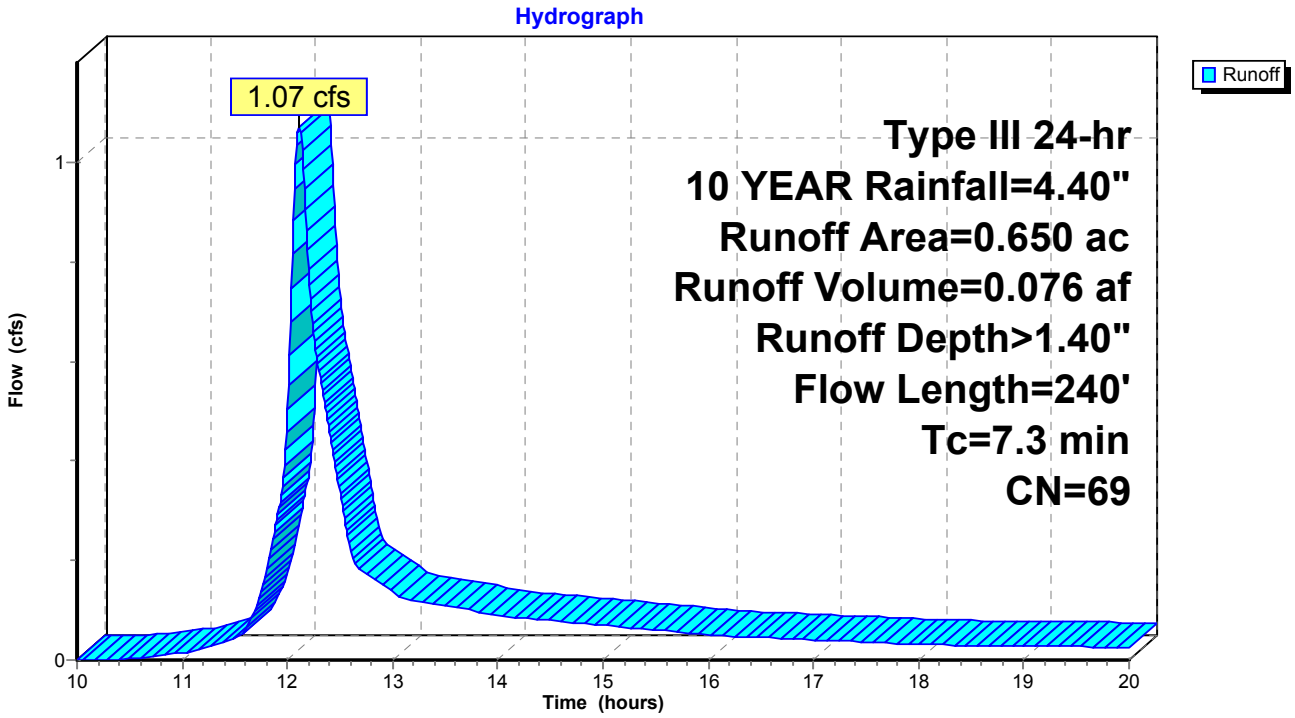
Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.076 af, Depth> 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.510	61	>75% Grass cover, Good, HSG B
0.650	69	Weighted Average
0.510		78.46% Pervious Area
0.140		21.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	60	0.0200	0.15		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
0.6	180	0.1000	4.74		**Shallow Concentrated Flow, SHALLOW BC** Grassed Waterway Kv= 15.0 fps
7.3	240	Total			

Subcatchment 7S: BASIN 7-ST



Summary for Subcatchment 61S: ROOF AREA EAST OF COURTYARD-DED FROM 60-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

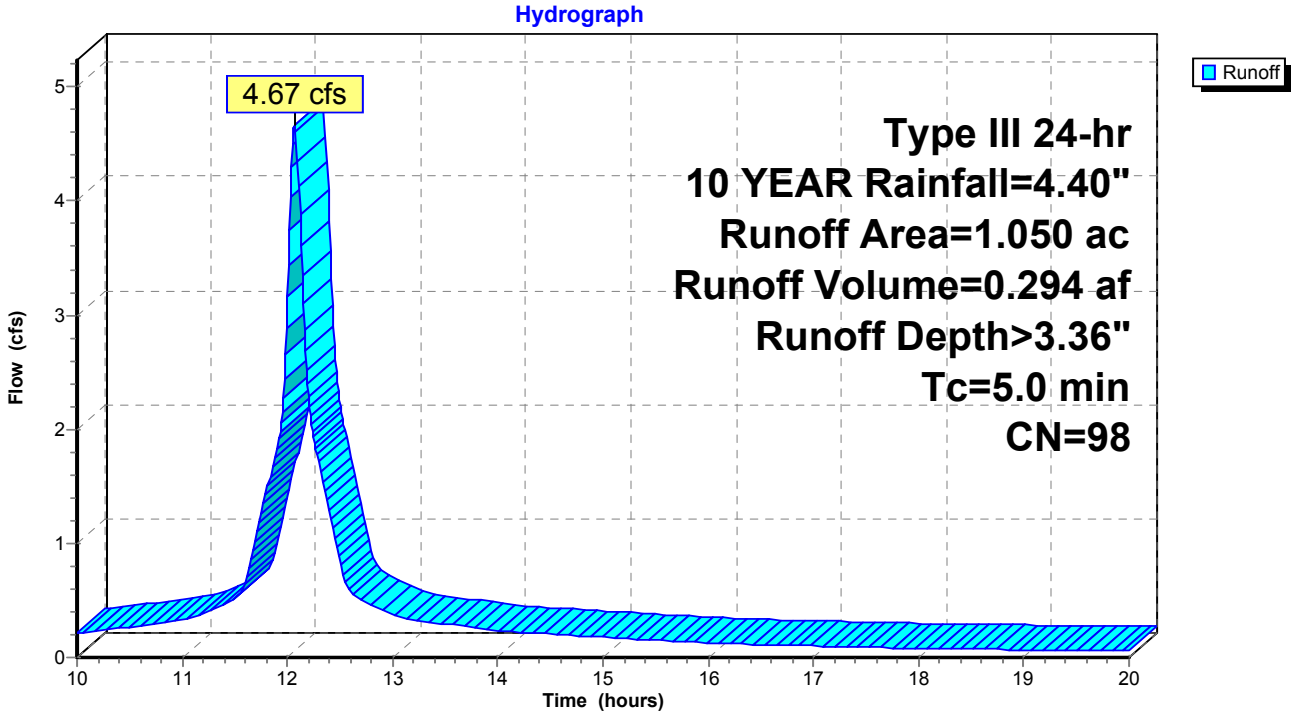
Runoff = 4.67 cfs @ 12.07 hrs, Volume= 0.294 af, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
1.050	98	Roofs, HSG B
1.050		100.00% Impervious Area

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

Subcatchment 61S: ROOF AREA EAST OF COURTYARD-DED FROM 60-ST



Summary for Subcatchment 100: FRONTYARD OF RAY BUILDING-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

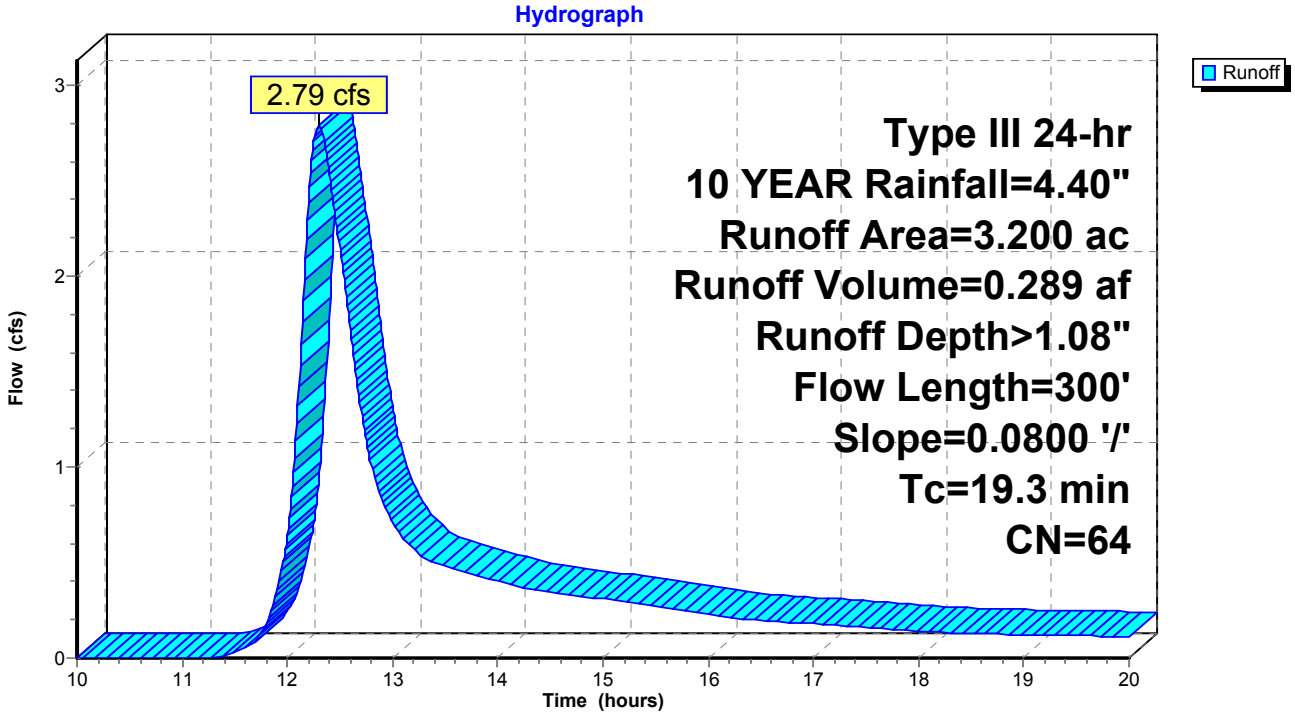
Runoff = 2.79 cfs @ 12.29 hrs, Volume= 0.289 af, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.290	98	Paved parking, HSG B
2.910	61	>75% Grass cover, Good, HSG B
3.200	64	Weighted Average
2.910		90.94% Pervious Area
0.290		9.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	150	0.0800	0.14		**Sheet Flow, SHEET AB** Grass: Bermuda n= 0.410 P2= 3.00"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
19.3	300	Total			

Subcatchment 100: FRONTYARD OF RAY BUILDING-PG



Summary for Subcatchment 200: SOUTH OF RAY BUILDING-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

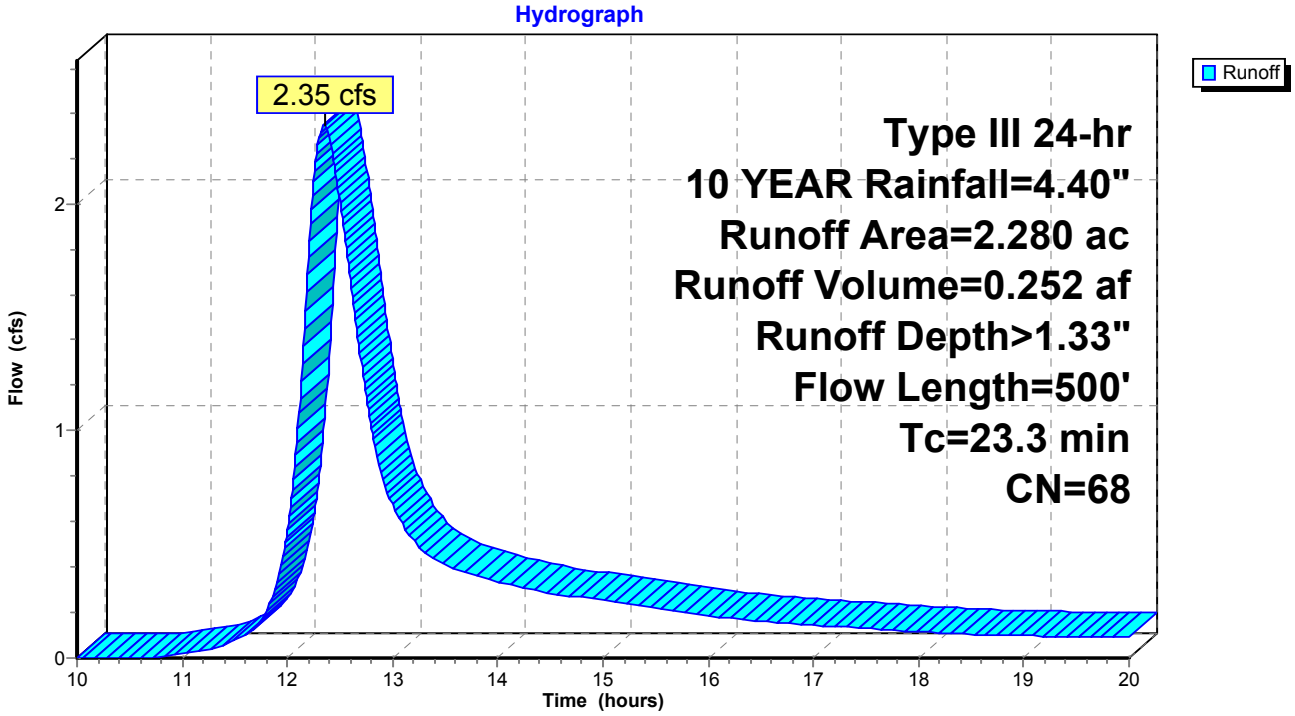
Runoff = 2.35 cfs @ 12.35 hrs, Volume= 0.252 af, Depth> 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
1.830	61	>75% Grass cover, Good, HSG B
0.450	98	Paved parking, HSG B
2.280	68	Weighted Average
1.830		80.26% Pervious Area
0.450		19.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	150	0.0800	0.14		**Sheet Flow, SHEET AB** Grass: Bermuda n= 0.410 P2= 3.00"
5.3	350	0.0250	1.11		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
23.3	500	Total			

Subcatchment 200: SOUTH OF RAY BUILDING-PG



Summary for Subcatchment 300: GYM TO HARLOW BLDG-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

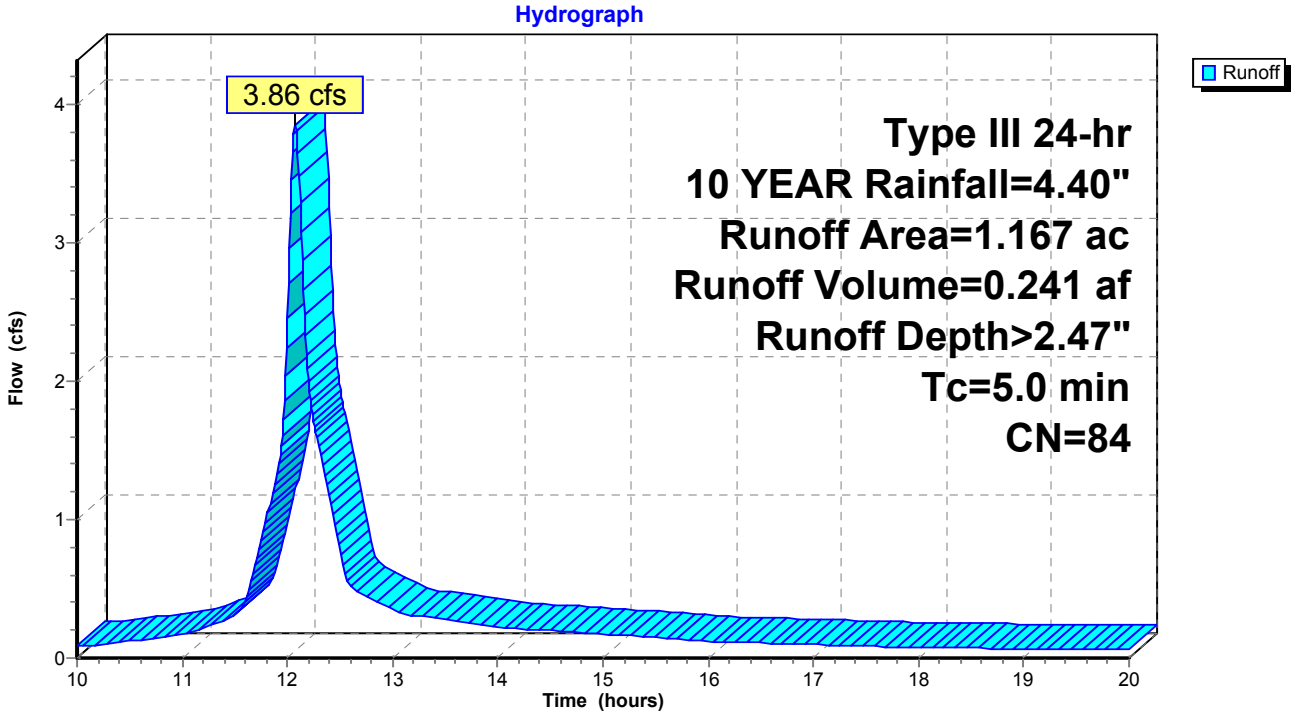
Runoff = 3.86 cfs @ 12.07 hrs, Volume= 0.241 af, Depth> 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.740	98	Paved parking, HSG B (includes new pavement)
	0.427	61	>75% Grass cover, Good, HSG B
	1.167	84	Weighted Average
	0.427		36.59% Pervious Area
	0.740		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT TO CATCH BASINS**

Subcatchment 300: GYM TO HARLOW BLDG-PG



Summary for Subcatchment 400: RAY TO HARLOW BLDG-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

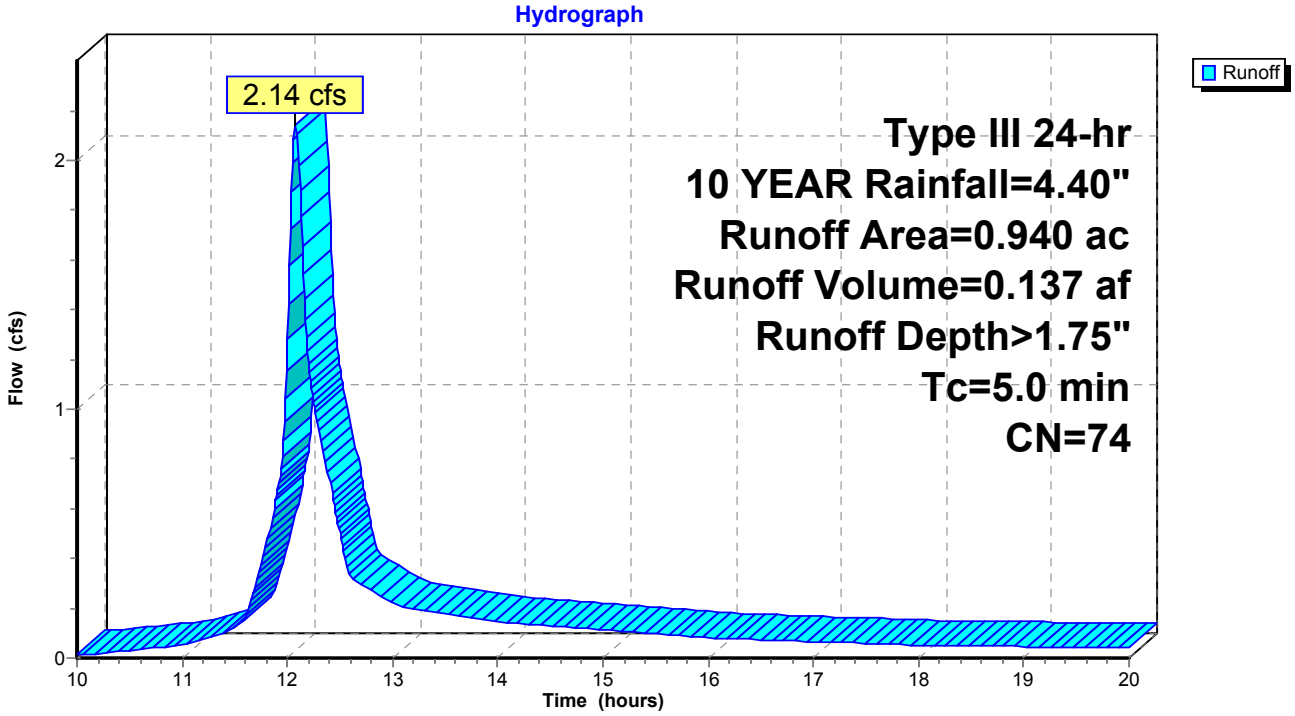
Runoff = 2.14 cfs @ 12.08 hrs, Volume= 0.137 af, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.330	98	Paved parking, HSG B (BLDGS AND WALKS)
	0.610	61	>75% Grass cover, Good, HSG B
	0.940	74	Weighted Average
	0.610		64.89% Pervious Area
	0.330		35.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT TO CATCH BASINS**

Subcatchment 400: RAY TO HARLOW BLDG-PG



Summary for Reach 5R: PIPE 5-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

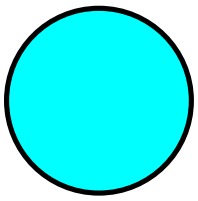
(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

Inflow Area = 4.825 ac, 53.16% Impervious, Inflow Depth > 2.16" for 10 YEAR event
Inflow = 7.61 cfs @ 12.17 hrs, Volume= 0.868 af
Outflow = 6.22 cfs @ 12.13 hrs, Volume= 0.867 af, Atten= 18%, Lag= 0.0 min

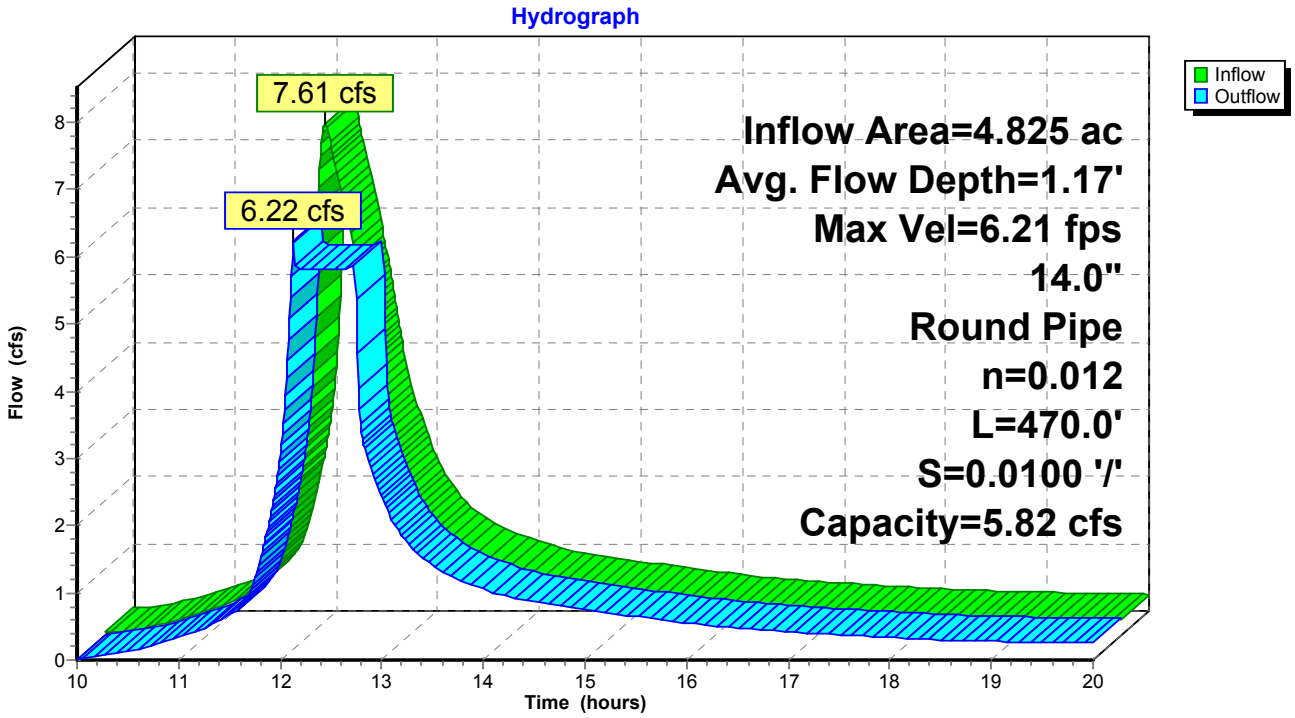
Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.21 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 3.56 fps, Avg. Travel Time= 2.2 min

Peak Storage= 502 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.17'
Bank-Full Depth= 1.17' Flow Area= 1.1 sf, Capacity= 5.82 cfs

14.0" Round Pipe
n= 0.012
Length= 470.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -4.70'



Reach 5R: PIPE 5-ST



Summary for Reach 6R: LS DITCH-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

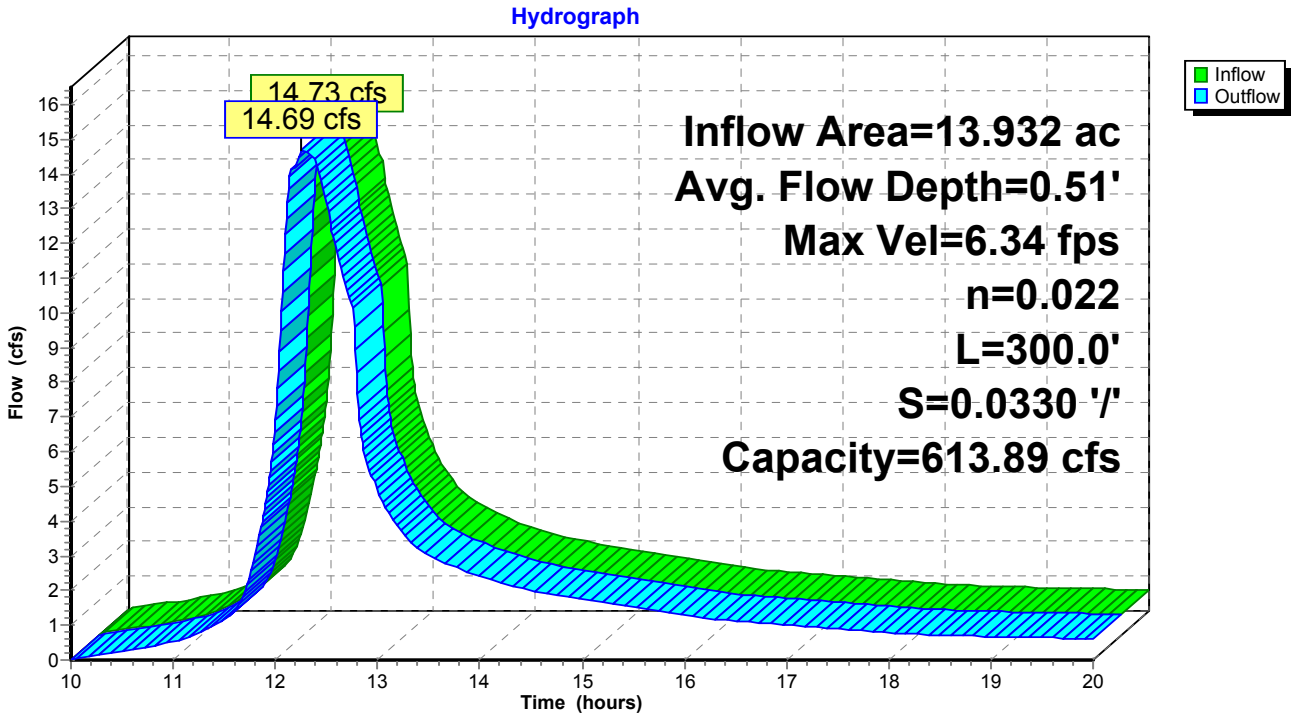
Inflow Area = 13.932 ac, 32.91% Impervious, Inflow Depth > 1.67" for 10 YEAR event
Inflow = 14.73 cfs @ 12.24 hrs, Volume= 1.937 af
Outflow = 14.69 cfs @ 12.26 hrs, Volume= 1.935 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.34 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 3.10 fps, Avg. Travel Time= 1.6 min

Peak Storage= 695 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 3.00' Flow Area= 36.0 sf, Capacity= 613.89 cfs

3.00' x 3.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 '/' Top Width= 21.00'
Length= 300.0' Slope= 0.0330 '/'
Inlet Invert= 0.00', Outlet Invert= -9.90'

Reach 6R: LS DITCH-ST



Summary for Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Summary for Reach 60R: LEVEL SPREADER OUTFALL 2-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

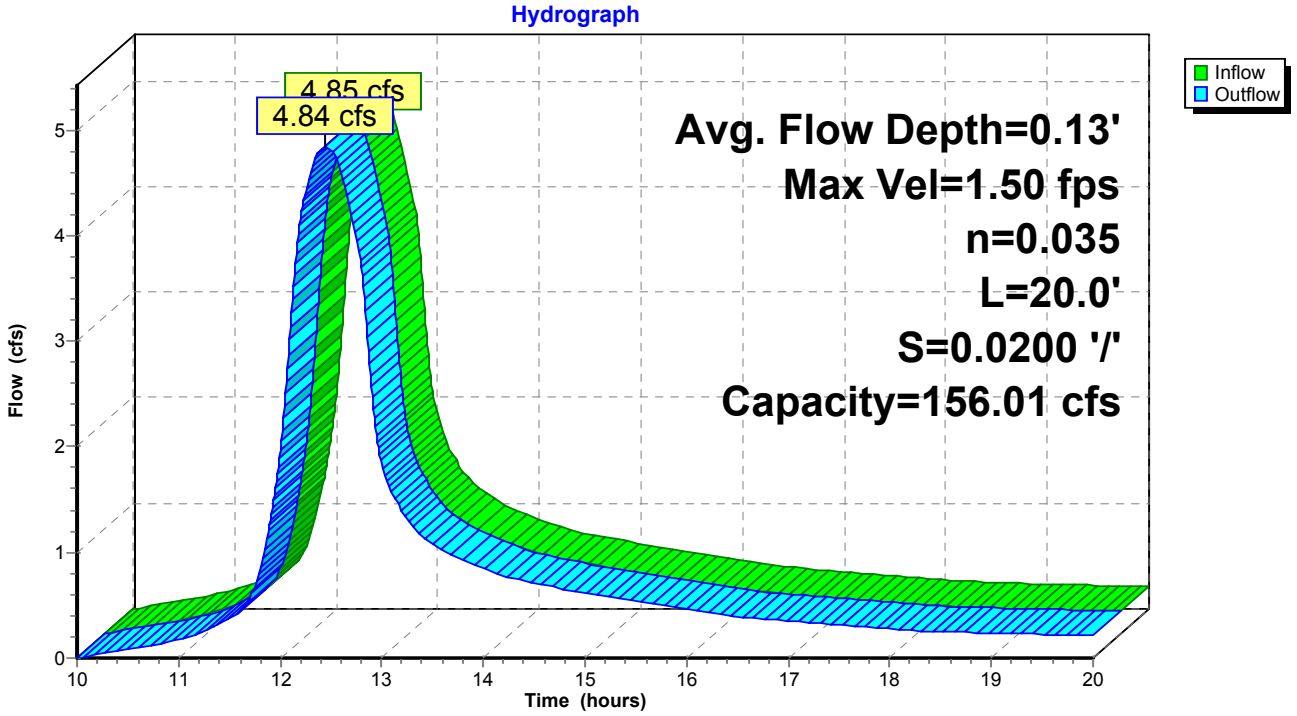
Inflow	=	4.85 cfs @	12.44 hrs, Volume=	0.670 af
Outflow	=	4.84 cfs @	12.45 hrs, Volume=	0.669 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.50 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 0.5 min

Peak Storage= 65 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 156.01 cfs

25.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

Reach 60R: LEVEL SPREADER OUTFALL 2-ST



Summary for Reach 63R: LEVEL SPREADER OUTFALL 1-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

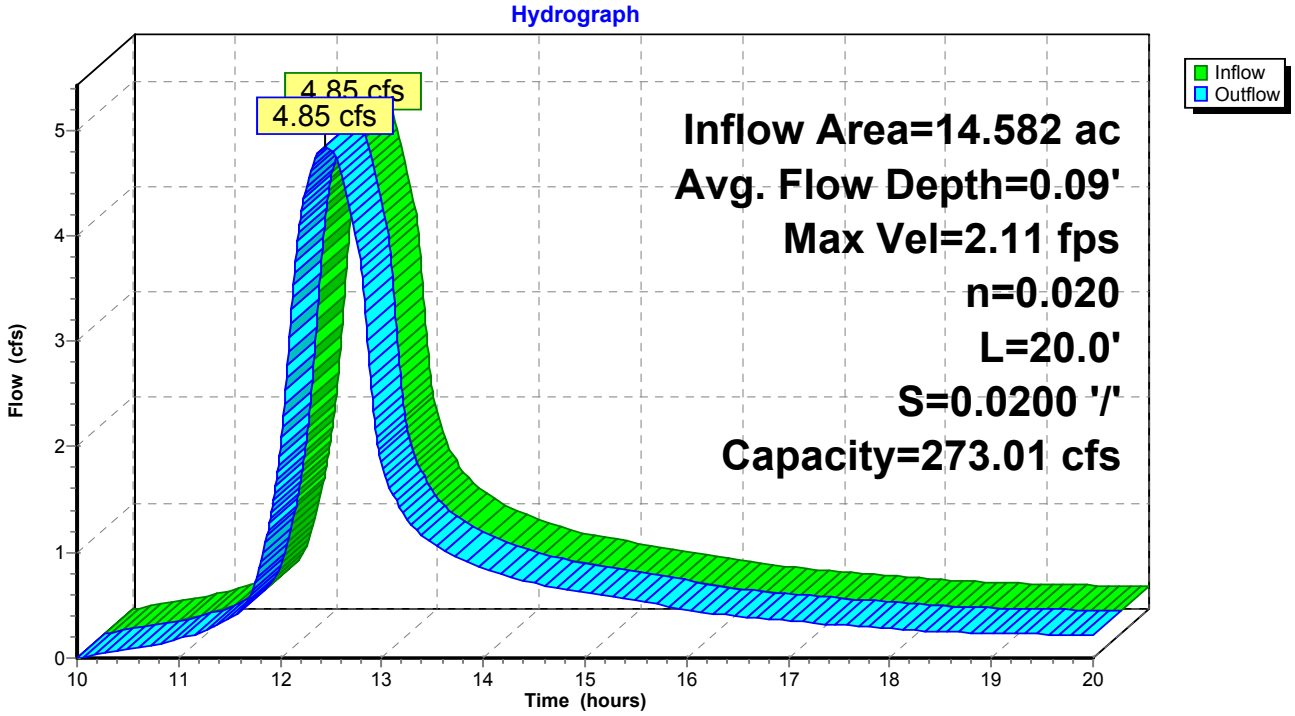
Inflow Area = 14.582 ac, 32.40% Impervious, Inflow Depth > 0.55" for 10 YEAR event
Inflow = 4.85 cfs @ 12.44 hrs, Volume= 0.670 af
Outflow = 4.85 cfs @ 12.44 hrs, Volume= 0.670 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.11 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 0.4 min

Peak Storage= 46 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 273.01 cfs

25.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

Reach 63R: LEVEL SPREADER OUTFALL 1-ST



Summary for Reach 65R: LEVEL SPREADER OUTFALL 3 ADDED BY PG-STN

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

STN = REVISIONS PER STANTEC (2016)

PREVIOUSLY NO REACH WAS ADDED BY PG TO ST REPORT FOR THE OUTFALL. STANTEC ADDED THIS THIRD REACH FOR CONSISTENCY. EARLIER VERSIONS OF HYDROCAD DID NOT ALLOW TERTIARY OUTLETS FROM PONDS, SO PG MODELED POND 5 TO REVISE ST REPORT DUE TO ADDITION OF THIRD PIPE OUTFALL. THE POND 5 OUTLETS WERE MODELD SO THAT THE PRIMARY OUTFALL(S) INCLUDED THE OVERFLOW SPILLWAY WHICH WAS REPORTED AS DISCHARGING (COMBINED) TO THE PRIMARY-1 OUTFALL. ONE OF THE PIPE OUTFALLS WAS LISTED AS "DISCARDED" DUE TO THE LIMITATIONS OF HYDROCAD VERSION 6 (2003) WHICH ONLY ALLOWED TWO SEPARATE OUTLETS AT THE TIME. THIS MODEL BY STN INCLUDES THREE SEPARATE PIPE OUTFALLS AND INCLUDES THE OVERFLOW AS "DISCARDED" FOR MORE ACCURATE ROUTING. EACH PIPE HAS A SEPARATE REACH FOR THE PIPE OUTFALL AND THE OVERFLOW IS CALCULATED SEPERATELY (DISCARDED). ALSO THE FLOW REGIME FOR THIS LEVEL SPREADER OUTFALL IS MODELED AS "SHEET FLOW" WHICH WAS NOT PREVIOUSLY AN OPTION.

Inflow	=	4.85 cfs @	12.44 hrs, Volume=	0.670 af
Outflow	=	4.84 cfs @	12.46 hrs, Volume=	0.669 af, Atten= 0%, Lag= 1.2 min

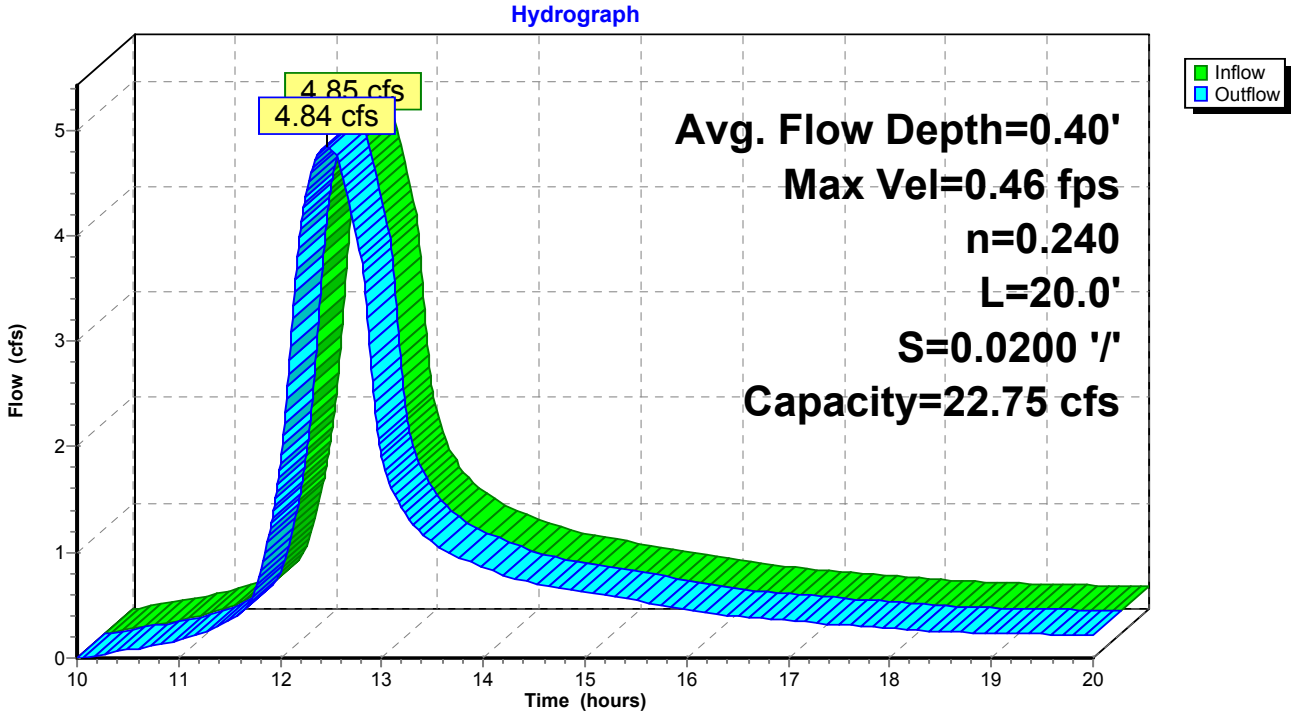
Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.46 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.20 fps, Avg. Travel Time= 1.7 min

Peak Storage= 210 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 22.75 cfs

25.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

‡

Reach 65R: LEVEL SPREADER OUTFALL 3 ADDED BY PG-STN



Summary for Reach 102: CBs AT HARLOW TO GYM CB-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

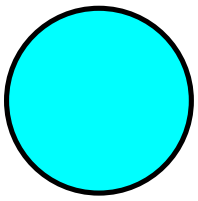
(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

Inflow Area = 0.940 ac, 35.11% Impervious, Inflow Depth > 1.75" for 10 YEAR event
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 0.137 af
Outflow = 0.98 cfs @ 12.03 hrs, Volume= 0.136 af, Atten= 54%, Lag= 0.0 min

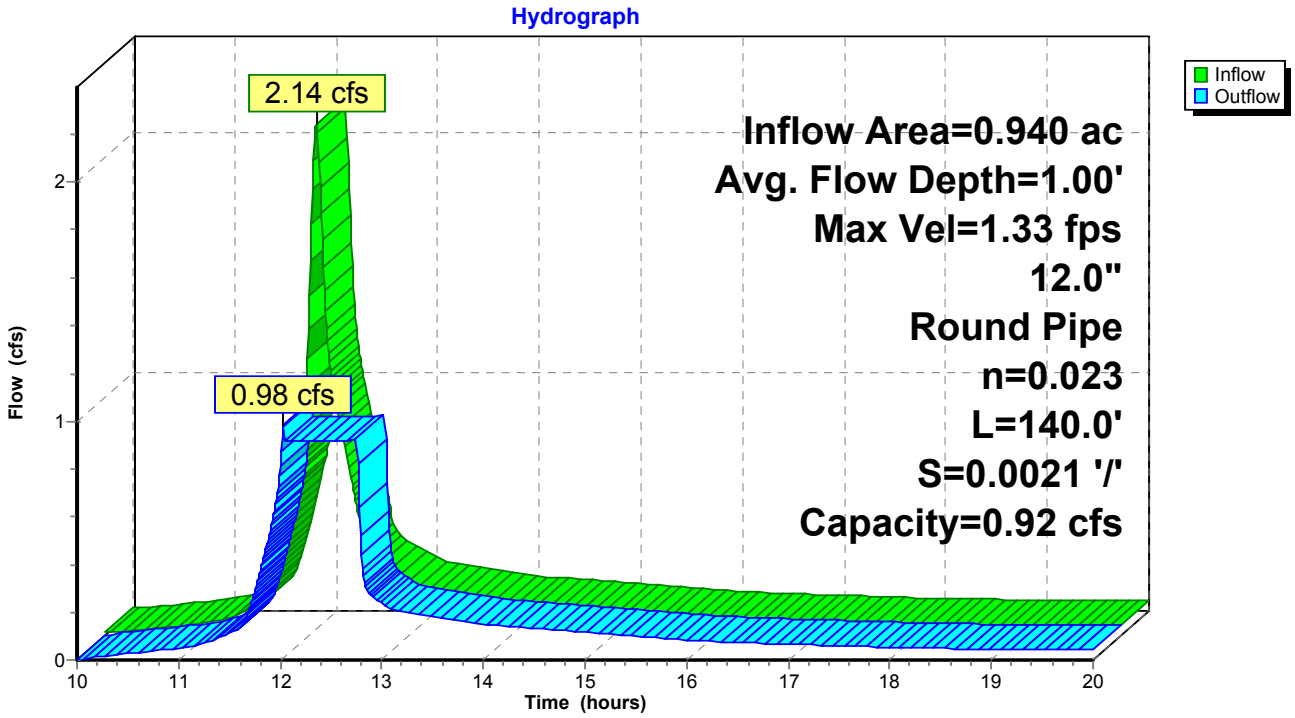
Routing by Stor-Ind+Trans method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.76 fps, Avg. Travel Time= 3.1 min

Peak Storage= 110 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 0.92 cfs

12.0" Round Pipe
n= 0.023
Length= 140.0' Slope= 0.0021 '/'
Inlet Invert= 177.20', Outlet Invert= 176.91'



Reach 102: CBs AT HARLOW TO GYM CB-PG



Summary for Pond 1P: CBs AT RAY BUILDING-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

Inflow Area = 3.200 ac, 9.06% Impervious, Inflow Depth > 1.08" for 10 YEAR event
Inflow = 2.79 cfs @ 12.29 hrs, Volume= 0.289 af
Outflow = 2.70 cfs @ 12.35 hrs, Volume= 0.288 af, Atten= 3%, Lag= 3.6 min
Primary = 2.70 cfs @ 12.35 hrs, Volume= 0.288 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 184.82' @ 12.35 hrs Surf.Area= 36 sf Storage= 201 cf

Plug-Flow detention time= 1.8 min calculated for 0.288 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (836.6 - 835.6)

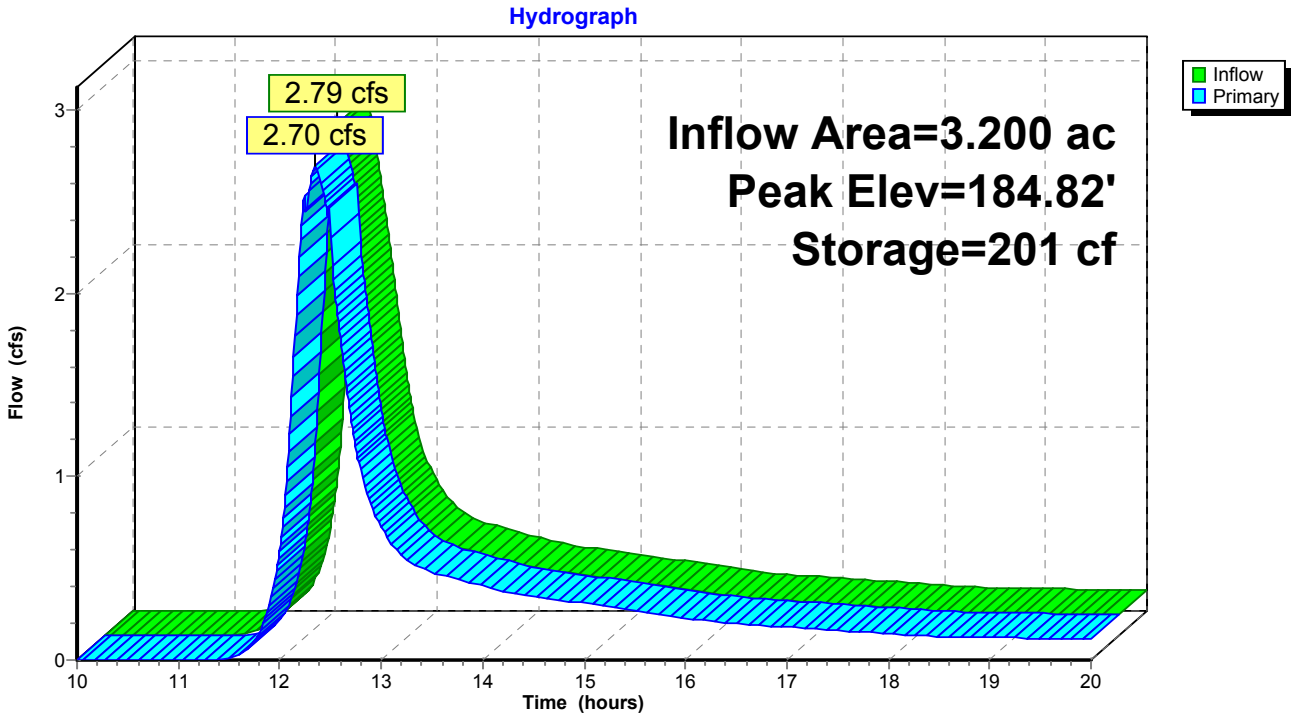
Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	4,584 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	136	0	0
184.00	36	172	172
188.00	36	144	316
189.00	2,500	1,268	1,584
190.00	3,500	3,000	4,584

Device	Routing	Invert	Outlet Devices
#1	Primary	182.00'	**12.0" Round Culvert** L= 370.0' Ke= 0.500 Inlet / Outlet Invert= 182.00' / 176.89' S= 0.0138 '/' Cc= 0.900 n= 0.023, Flow Area= 0.79 sf
#2	Primary	188.90'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.70 cfs @ 12.35 hrs HW=184.81' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.70 cfs @ 3.43 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: CBs AT RAY BUILDING-PG



Summary for Pond 2P: CBs AT THE GYM-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

Inflow Area = 7.587 ac, 23.86% Impervious, Inflow Depth > 1.45" for 10 YEAR event
Inflow = 7.35 cfs @ 12.32 hrs, Volume= 0.917 af
Outflow = 7.35 cfs @ 12.32 hrs, Volume= 0.917 af, Atten= 0%, Lag= 0.1 min
Primary = 7.35 cfs @ 12.32 hrs, Volume= 0.917 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 174.59' @ 12.32 hrs Surf.Area= 30 sf Storage= 40 cf

Plug-Flow detention time= 0.2 min calculated for 0.916 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (818.4 - 818.3)

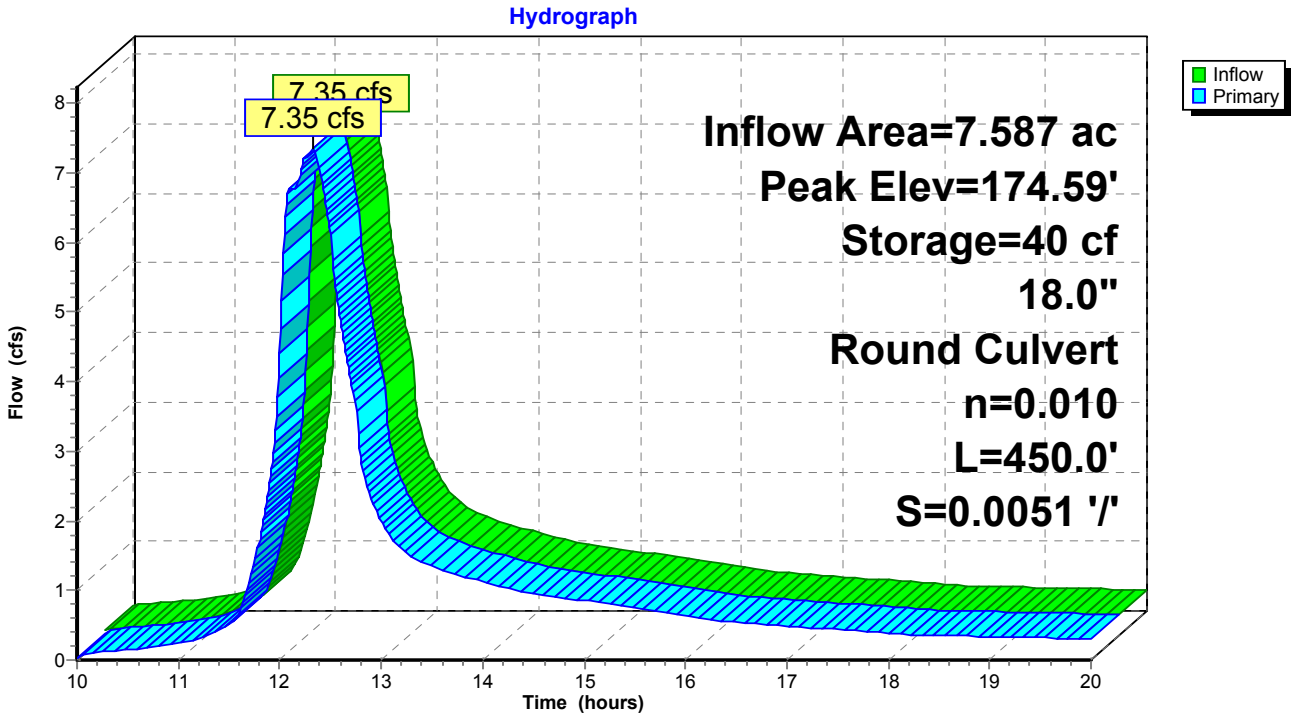
Volume	Invert	Avail.Storage	Storage Description
#1	173.10'	1,749 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.10	24	0	0
176.00	36	87	87
180.00	36	144	231
181.00	500	268	499
182.00	2,000	1,250	1,749

Device	Routing	Invert	Outlet Devices
#1	Primary	173.10'	**18.0" Round Culvert** L= 450.0' Ke= 0.500 Inlet / Outlet Invert= 173.10' / 170.81' S= 0.0051 '/' Cc= 0.900 n= 0.010, Flow Area= 1.77 sf

Primary OutFlow Max=7.35 cfs @ 12.32 hrs HW=174.59' (Free Discharge)
└**1=Culvert** (Inlet Controls 7.35 cfs @ 4.16 fps)

Pond 2P: CBs AT THE GYM-PG



Summary for Pond 3P: CULVERT ABOVE DETENTION POND-PG

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

PG MODIFIED THE ST MODEL FOR THIS CULVERT/POND WHICH WAS UPGRADED TO 21" PIPE TO PREVENT OVERTOPPING THE ROAD.

Inflow Area = 13.932 ac, 32.91% Impervious, Inflow Depth > 1.67" for 10 YEAR event
Inflow = 14.69 cfs @ 12.26 hrs, Volume= 1.935 af
Outflow = 14.62 cfs @ 12.33 hrs, Volume= 1.934 af, Atten= 0%, Lag= 4.5 min
Primary = 14.62 cfs @ 12.33 hrs, Volume= 1.934 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 163.47' @ 12.33 hrs Surf.Area= 503 sf Storage= 682 cf

Plug-Flow detention time= 0.6 min calculated for 1.934 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (819.3 - 818.8)

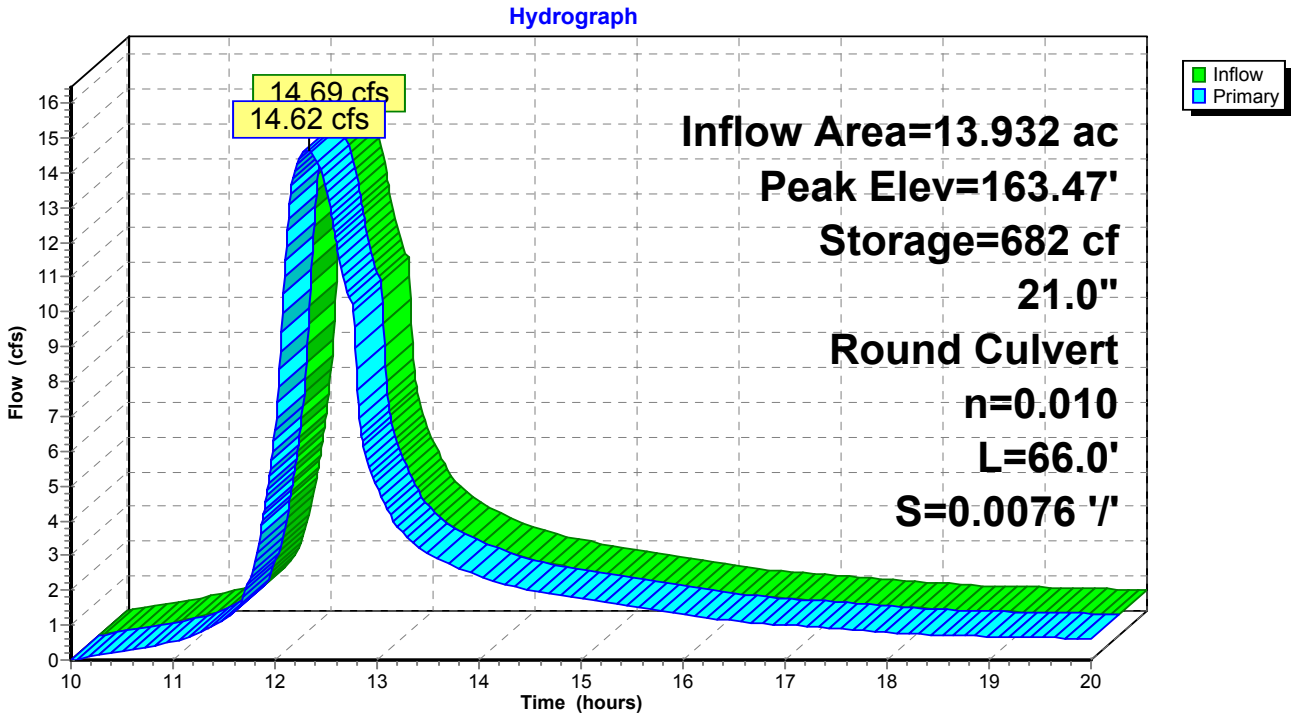
Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	3,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.00	50	0	0
164.00	600	975	975
166.00	2,100	2,700	3,675

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**21.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.50' S= 0.0076 '/' Cc= 0.900 n= 0.010, Flow Area= 2.41 sf

Primary OutFlow Max=14.62 cfs @ 12.33 hrs HW=163.47' (Free Discharge)
└**1=Culvert** (Inlet Controls 14.62 cfs @ 6.08 fps)

Pond 3P: CULVERT ABOVE DETENTION POND-PG



Summary for Pond 4P: NEW LANDSCAPE POND @ ARSENAL STREET-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

Inflow Area = 3.005 ac, 58.74% Impervious, Inflow Depth > 2.35" for 10 YEAR event
Inflow = 7.05 cfs @ 12.09 hrs, Volume= 0.589 af
Outflow = 4.24 cfs @ 12.32 hrs, Volume= 0.571 af, Atten= 40%, Lag= 13.9 min
Primary = 4.24 cfs @ 12.32 hrs, Volume= 0.571 af

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 175.46' @ 12.32 hrs Surf.Area= 4,697 sf Storage= 5,923 cf

Plug-Flow detention time= 36.2 min calculated for 0.571 af (97% of inflow)
Center-of-Mass det. time= 24.6 min (815.3 - 790.7)

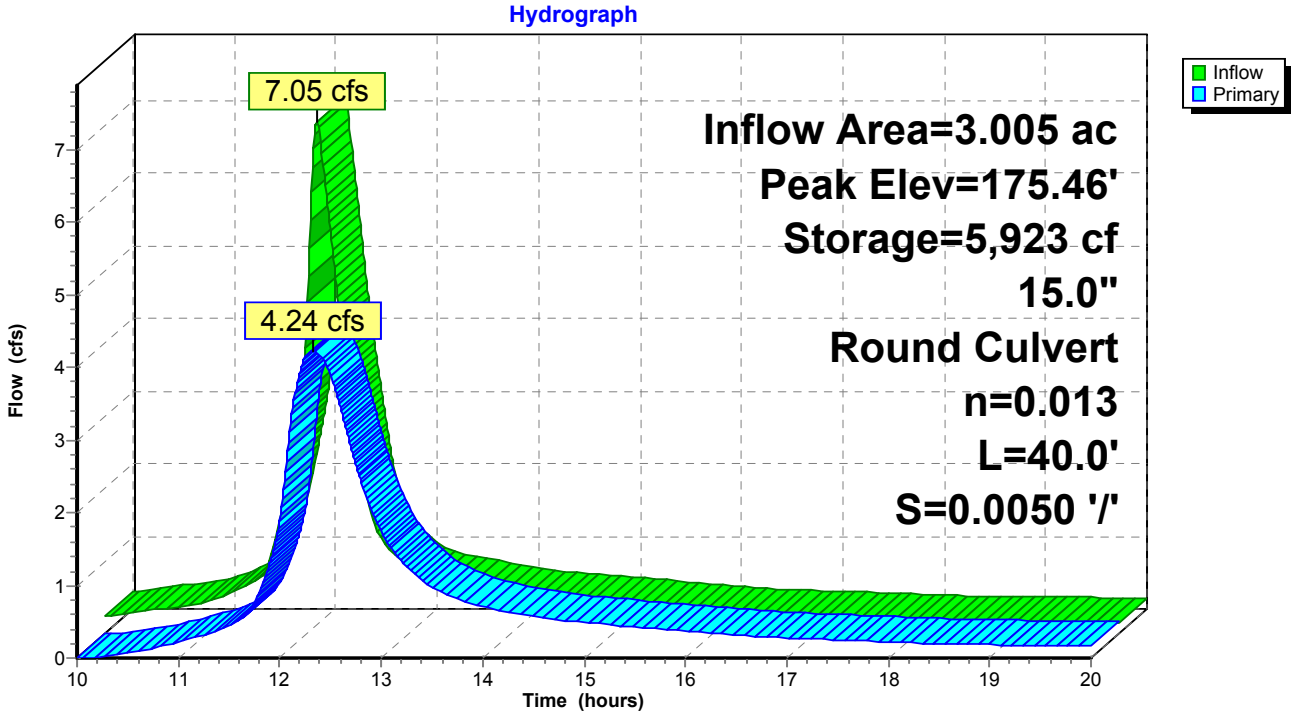
Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	20,678 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
174.00	3,423	0	0
178.00	6,916	20,678	20,678

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	**15.0" Round Culvert** L= 40.0' Ke= 0.900 Inlet / Outlet Invert= 174.00' / 173.80' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.24 cfs @ 12.32 hrs HW=175.46' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.24 cfs @ 3.72 fps)

Pond 4P: NEW LANDSCAPE POND @ ARSENAL STREET-ST



Summary for Pond 5P: DETENTION POND @ LEVEL SPREADER-ST-PG-STN

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

PREVIOUSLY NO REACH FOR THE THIRD PIPE WHICH WAS ADDED BY PG TO ST REPORT FOR THE ADDITIONAL OUTFALL. STANTEC ADDED THIS THIRD REACH (65R) FOR CONSISTENCY. EARLIER VERSIONS OF HYDROCAD DID NOT ALLOW TERTIARY OUTLETS FROM PONDS, SO PG MODELED POND 5 TO REVISE ST REPORT DUE TO THE ADDITION OF THIRD PIPE OUTFALL. THE POND 5 OUTLETS WERE MODELED SO THAT THE PRIMARY OUTFALL(S) INCLUDED THE OVERFLOW SPILLWAY WHICH WAS REPORTED AS DISCHARGING (COMBINED) TO THE PRIMARY-1 OUTFALL. ONE OF THE PIPE OUTFALLS WAS LISTED AS "DISCARDED" DUE TO THE LIMITATIONS OF HYDROCAD VERSION 6 (2003) WHICH ONLY ALLOWED TWO SEPARATE OUTLETS AT THE TIME. THIS MODEL BY STN INCLUDES THREE SEPARATE PIPE OUTFALLS AND INCLUDES THE OVERFLOW AS "DISCARDED" FOR MORE ACCURATE ROUTING. EACH PIPE HAS A SEPARATE REACH FOR THE PIPE OUTFALL AND THE OVERFLOW IS CALCULATED SEPARATELY (DISCARDED). ALSO THE FLOW REGIME FOR THIS LEVEL SPREADER OUTFALL (65R) IS MODELED AS "SHEET FLOW" WHICH WAS NOT PREVIOUSLY AN OPTION. THE END RESULT IS A BETTER BALANCING OF THE PIPE OUTFLOWS WHICH IS NOW CALCULATED FOR EQUAL FLOWS (5.40 CFS) FROM EACH SIMILAR PIPE OUTFALL.

Inflow Area =	14.582 ac,	32.40% Impervious,	Inflow Depth >	1.65"	for 10 YEAR event
Inflow =	15.19 cfs @	12.28 hrs,	Volume=	2.010 af	
Outflow =	14.54 cfs @	12.44 hrs,	Volume=	2.009 af,	Atten= 4%, Lag= 9.5 min
Discarded =	0.00 cfs @	10.00 hrs,	Volume=	0.000 af	
Primary =	4.85 cfs @	12.44 hrs,	Volume=	0.670 af	
Secondary =	4.85 cfs @	12.44 hrs,	Volume=	0.670 af	
Tertiary =	4.85 cfs @	12.44 hrs,	Volume=	0.670 af	

Routing by Stor-Ind method, Time Span= 10.00-20.00 hrs, dt= 0.01 hrs
Peak Elev= 162.14' @ 12.44 hrs Surf.Area= 2,528 sf Storage= 3,362 cf

Plug-Flow detention time= 2.2 min calculated for 2.009 af (100% of inflow)
Center-of-Mass det. time= 2.1 min (821.2 - 819.1)

Volume	Invert	Avail.Storage	Storage Description
#1	160.25'	9,613 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.25	1,100	0	0
161.00	1,600	1,013	1,013
162.00	2,400	2,000	3,013
164.00	4,200	6,600	9,613

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**12.0" Round Culvert** L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 156.00' S= 0.0444 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	162.40'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#3	Secondary	160.00'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 156.00' S= 0.0588 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#4	Tertiary	160.00'	**12.0" Round Culvert** L= 72.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 158.13' S= 0.0260 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

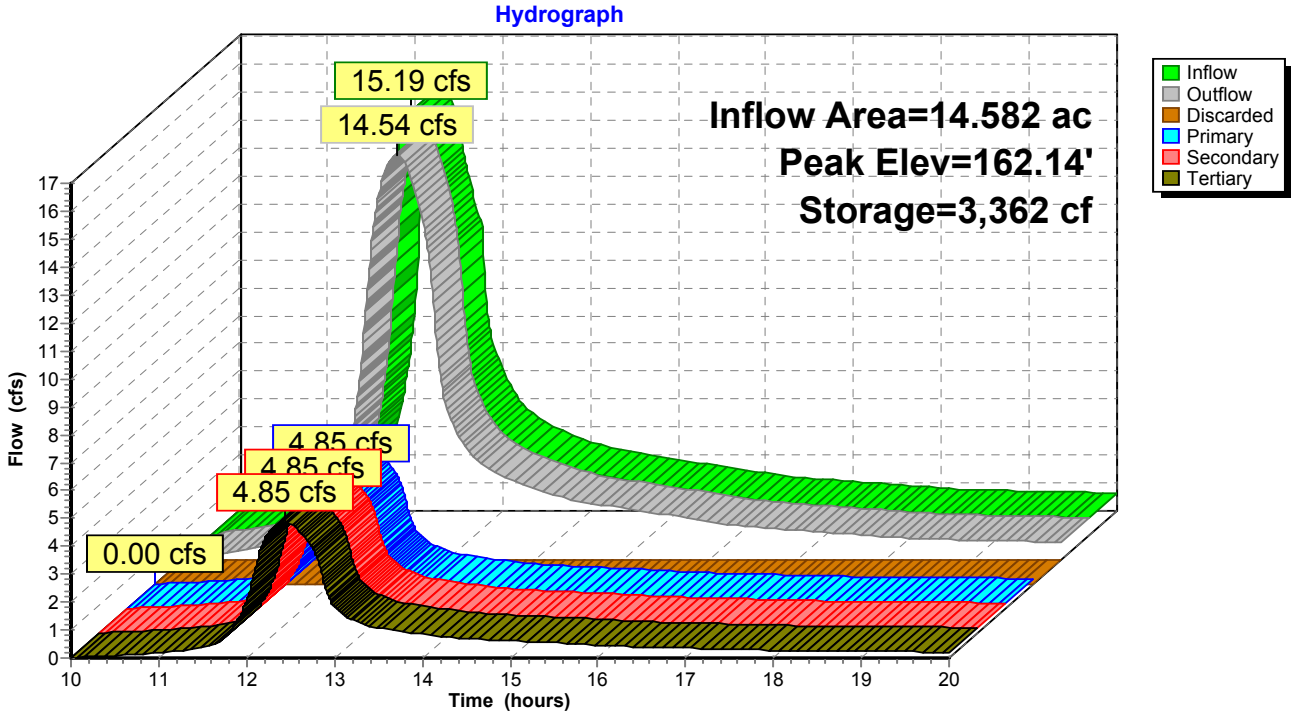
Discarded OutFlow Max=0.00 cfs @ 10.00 hrs HW=160.25' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Primary OutFlow Max=4.85 cfs @ 12.44 hrs HW=162.14' (Free Discharge)
└─**1=Culvert** (Inlet Controls 4.85 cfs @ 6.17 fps)

Secondary OutFlow Max=4.85 cfs @ 12.44 hrs HW=162.14' (Free Discharge)
└─**3=Culvert** (Inlet Controls 4.85 cfs @ 6.17 fps)

Tertiary OutFlow Max=4.85 cfs @ 12.44 hrs HW=162.14' (Free Discharge)
└─**4=Culvert** (Inlet Controls 4.85 cfs @ 6.17 fps)

Pond 5P: DETENTION POND @ LEVEL SPREADER-ST-PG-STN



Time span=10.00-20.00 hrs, dt=0.01 hrs, 1001 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 4S: BASIN 4 ST Runoff Area=1.955 ac 36.57% Impervious Runoff Depth>0.87"
Flow Length=300' Tc=13.4 min CN=75 Runoff=1.63 cfs 0.142 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth>0.98"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=1.90 cfs 0.148 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth>0.48"
Flow Length=320' Tc=14.4 min CN=66 Runoff=0.56 cfs 0.061 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth>0.60"
Flow Length=240' Tc=7.3 min CN=69 Runoff=0.41 cfs 0.032 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth>2.27"
Tc=5.0 min CN=98 Runoff=3.16 cfs 0.199 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.200 ac 9.06% Impervious Runoff Depth>0.41"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=64 Runoff=0.85 cfs 0.109 af

Subcatchment 200: SOUTH OF RAY Runoff Area=2.280 ac 19.74% Impervious Runoff Depth>0.55"
Flow Length=500' Tc=23.3 min CN=68 Runoff=0.87 cfs 0.105 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth>1.39"
Tc=5.0 min CN=84 Runoff=2.15 cfs 0.136 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.940 ac 35.11% Impervious Runoff Depth>0.83"
Tc=5.0 min CN=74 Runoff=0.97 cfs 0.065 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=0.70' Max Vel=5.85 fps Inflow=3.96 cfs 0.475 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=3.94 cfs 0.474 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.35' Max Vel=5.18 fps Inflow=7.46 cfs 0.949 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=7.45 cfs 0.947 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=1.16 fps Inflow=2.54 cfs 0.326 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=2.54 cfs 0.326 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.06' Max Vel=1.63 fps Inflow=2.54 cfs 0.326 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=2.54 cfs 0.326 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.27' Max Vel=0.36 fps Inflow=2.54 cfs 0.326 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=2.53 cfs 0.326 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=0.82' Max Vel=1.33 fps Inflow=0.97 cfs 0.065 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.92 cfs 0.064 af

Pond 1P: CBs AT RAY BUILDING-PG Peak Elev=182.55' Storage=67 cf Inflow=0.85 cfs 0.109 af
Outflow=0.85 cfs 0.109 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=173.95' Storage=22 cf Inflow=3.24 cfs 0.414 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=3.24 cfs 0.414 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=162.35' Storage=234 cf Inflow=7.45 cfs 0.947 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=7.45 cfs 0.947 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=174.97' Storage=3,712 cf Inflow=4.15 cfs 0.341 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=2.38 cfs 0.327 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=160.94' Storage=922 cf Inflow=7.72 cfs 0.979 af
cfs 0.000 af Primary=2.54 cfs 0.326 af Secondary=2.54 cfs 0.326 af Tertiary=2.54 cfs 0.326 af Outflow=7.61 cfs 0.979 af

Total Runoff Area = 14.582 ac Runoff Volume = 0.997 af Average Runoff Depth = 0.82"
67.60% Pervious = 9.857 ac 32.40% Impervious = 4.725 ac

Time span=10.00-20.00 hrs, dt=0.01 hrs, 1001 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 4S: BASIN 4 ST Runoff Area=1.955 ac 36.57% Impervious Runoff Depth>2.32"
Flow Length=300' Tc=13.4 min CN=75 Runoff=4.56 cfs 0.379 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth>2.48"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=5.01 cfs 0.377 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth>1.64"
Flow Length=320' Tc=14.4 min CN=66 Runoff=2.35 cfs 0.207 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth>1.87"
Flow Length=240' Tc=7.3 min CN=69 Runoff=1.45 cfs 0.101 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth>3.90"
Tc=5.0 min CN=98 Runoff=5.43 cfs 0.342 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.200 ac 9.06% Impervious Runoff Depth>1.49"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=64 Runoff=3.97 cfs 0.398 af

Subcatchment 200: SOUTH OF RAY Runoff Area=2.280 ac 19.74% Impervious Runoff Depth>1.78"
Flow Length=500' Tc=23.3 min CN=68 Runoff=3.20 cfs 0.338 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth>3.03"
Tc=5.0 min CN=84 Runoff=4.73 cfs 0.295 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.940 ac 35.11% Impervious Runoff Depth>2.25"
Tc=5.0 min CN=74 Runoff=2.78 cfs 0.176 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=1.17' Max Vel=6.21 fps Inflow=9.37 cfs 1.077 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=6.24 cfs 1.076 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.56' Max Vel=6.64 fps Inflow=17.27 cfs 2.488 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=17.25 cfs 2.485 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.14' Max Vel=1.57 fps Inflow=5.40 cfs 0.855 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=5.40 cfs 0.855 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.10' Max Vel=2.20 fps Inflow=5.40 cfs 0.855 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=5.40 cfs 0.855 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.43' Max Vel=0.48 fps Inflow=5.40 cfs 0.855 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=5.40 cfs 0.854 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=1.00' Max Vel=1.33 fps Inflow=2.78 cfs 0.176 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.98 cfs 0.176 af

Pond 1P: CBs AT RAY BUILDING-PG Peak Elev=188.49' Storage=630 cf Inflow=3.97 cfs 0.398 af
Outflow=3.33 cfs 0.397 af

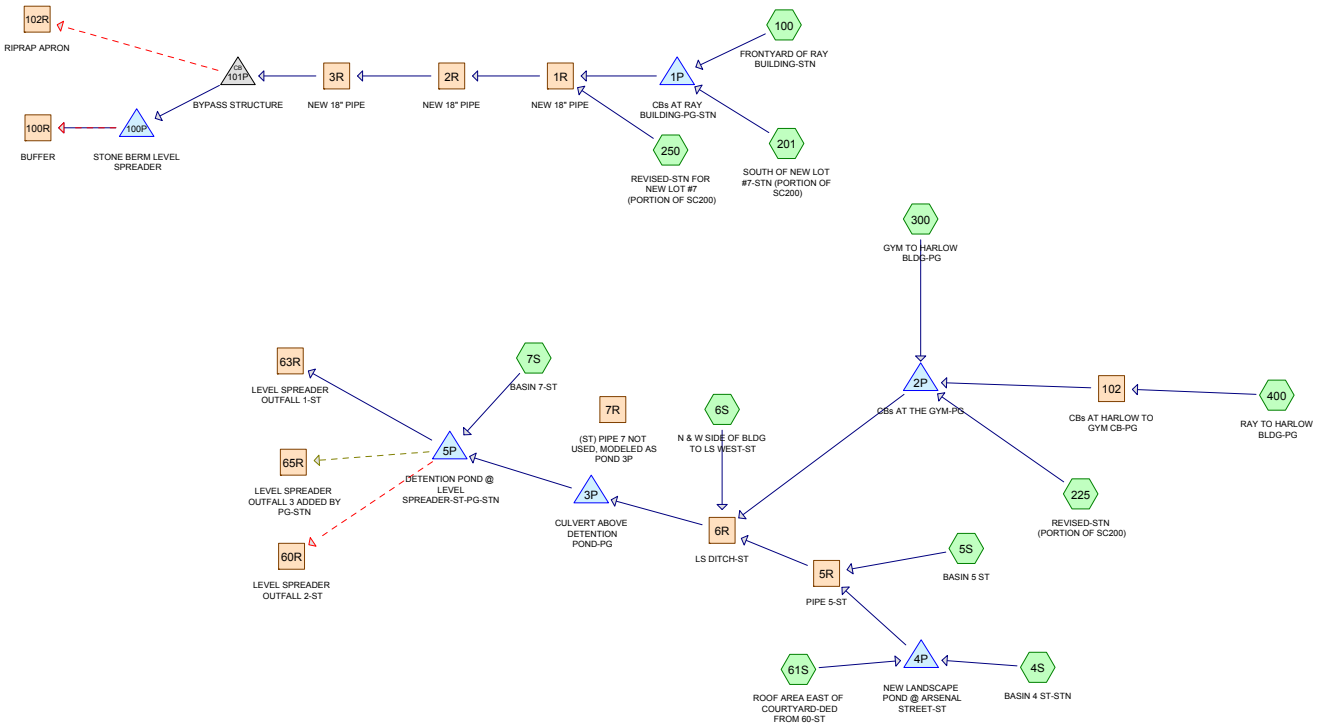
Pond 2P: CBs AT THE GYM-PG Peak Elev=175.02' Storage=54 cf Inflow=9.21 cfs 1.205 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=9.21 cfs 1.205 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=164.05' Storage=1,008 cf Inflow=17.25 cfs 2.485 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=17.09 cfs 2.484 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=175.75' Storage=7,312 cf Inflow=8.58 cfs 0.720 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=4.88 cfs 0.701 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=162.54' Storage=4,428 cf Inflow=17.84 cfs 2.585 af
fs 0.019 af Primary=5.40 cfs 0.855 af Secondary=5.40 cfs 0.855 af Tertiary=5.40 cfs 0.855 af Outflow=17.40 cfs 2.585 af

Total Runoff Area = 14.582 ac Runoff Volume = 2.611 af Average Runoff Depth = 2.15"
67.60% Pervious = 9.857 ac 32.40% Impervious = 4.725 ac



Subcat Reach Pond Link

Routing Diagram for AMHI_DEVELOPED
Prepared by Stantec Consulting Ltd., Printed 6/8/2016
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.682	61	>75% Grass cover, Good, HSG B (4S, 5S, 6S, 7S, 100, 201, 225, 250, 300, 400)
2.258	98	Paved parking, HSG B (5S, 6S, 7S, 100, 225)
0.330	98	Paved parking, HSG B (BLDGS AND WALKS) (400)
0.676	98	Paved parking, HSG B (NEW PRKG LOT) (4S)
0.740	98	Paved parking, HSG B (includes new pavement) (300)
1.050	98	Roofs, HSG B (61S)
0.834	98	Water Surface, HSG B (250)
14.570	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
14.570	HSG B	4S, 5S, 6S, 7S, 61S, 100, 201, 225, 250, 300, 400
0.000	HSG C	
0.000	HSG D	
0.000	Other	
14.570		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	8.682	0.000	0.000	0.000	8.682	>75% Grass cover, Good	4S, 5S, 6S, 7S, 100, 201, 225, 250, 300, 400
0.000	4.004	0.000	0.000	0.000	4.004	Paved parking	4S, 5S, 6S, 7S, 100, 225, 300, 400
0.000	1.050	0.000	0.000	0.000	1.050	Roofs	61S
0.000	0.834	0.000	0.000	0.000	0.834	Water Surface	250
0.000	**14.570**	**0.000**	**0.000**	**0.000**	**14.570**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1R	0.00	-2.30	460.0	0.0050	0.013	18.0	0.0	0.0
2	2R	0.00	-7.75	250.0	0.0310	0.013	18.0	0.0	0.0
3	3R	0.00	-25.50	300.0	0.0850	0.013	18.0	0.0	0.0
4	5R	0.00	-4.70	470.0	0.0100	0.012	14.0	0.0	0.0
5	102	177.20	176.91	140.0	0.0021	0.023	12.0	0.0	0.0
6	1P	182.00	176.89	370.0	0.0138	0.023	15.0	0.0	0.0
7	2P	173.10	170.81	450.0	0.0051	0.010	18.0	0.0	0.0
8	3P	161.00	160.50	66.0	0.0076	0.010	21.0	0.0	0.0
9	4P	174.00	173.80	40.0	0.0050	0.013	15.0	0.0	0.0
10	5P	160.00	156.00	90.0	0.0444	0.012	12.0	0.0	0.0
11	5P	160.00	156.00	68.0	0.0588	0.012	12.0	0.0	0.0
12	5P	160.00	158.13	72.0	0.0260	0.012	12.0	0.0	0.0
13	101P	138.70	138.50	20.0	0.0100	0.013	12.0	0.0	0.0
14	101P	138.20	136.50	75.0	0.0227	0.013	18.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=1.97"
Flow Length=300' Tc=13.4 min CN=75 Runoff=3.29 cfs 0.300 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=2.13"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=3.93 cfs 0.323 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=1.33"
Flow Length=320' Tc=14.4 min CN=66 Runoff=1.69 cfs 0.169 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=1.53"
Flow Length=240' Tc=7.3 min CN=69 Runoff=1.07 cfs 0.083 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=4.16"
Tc=5.0 min CN=98 Runoff=4.67 cfs 0.364 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=1.27"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=2.93 cfs 0.332 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=1.02"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.43 cfs 0.053 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=3.72"
Tc=5.0 min CN=94 Runoff=3.57 cfs 0.261 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=3.40"
Tc=5.0 min CN=91 Runoff=4.06 cfs 0.288 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=2.73"
Tc=5.0 min CN=84 Runoff=3.86 cfs 0.265 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=1.90"
Tc=5.0 min CN=74 Runoff=2.07 cfs 0.144 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=0.93' Max Vel=4.55 fps Inflow=5.34 cfs 0.674 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=5.22 cfs 0.674 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.54' Max Vel=8.99 fps Inflow=5.22 cfs 0.674 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=5.21 cfs 0.674 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.42' Max Vel=12.92 fps Inflow=5.21 cfs 0.674 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=5.20 cfs 0.674 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=1.17' Max Vel=6.21 fps Inflow=7.53 cfs 0.987 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=6.19 cfs 0.987 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.51' Max Vel=6.32 fps Inflow=14.51 cfs 1.826 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=14.48 cfs 1.826 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.12' Max Vel=1.44 fps Inflow=4.39 cfs 0.637 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=4.39 cfs 0.637 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=2.03 fps Inflow=4.39 cfs 0.637 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=4.39 cfs 0.637 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.38' Max Vel=0.44 fps Inflow=4.39 cfs 0.637 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=4.39 cfs 0.637 af

Reach 100R: BUFFER Avg. Flow Depth=0.09' Max Vel=0.31 fps Inflow=2.85 cfs 0.569 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=2.70 cfs 0.569 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=1.00' Max Vel=1.33 fps Inflow=2.07 cfs 0.144 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.97 cfs 0.144 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.18' Max Vel=0.79 fps Inflow=2.28 cfs 0.081 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=2.28 cfs 0.081 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=183.11' Storage=121 cf Inflow=3.35 cfs 0.385 af
Outflow=3.35 cfs 0.385 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=174.81' Storage=47 cf Inflow=8.34 cfs 0.671 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=8.34 cfs 0.671 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=163.37' Storage=632 cf Inflow=14.48 cfs 1.826 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=14.13 cfs 1.826 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=175.42' Storage=5,760 cf Inflow=6.88 cfs 0.664 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=4.13 cfs 0.664 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=161.85' Storage=2,659 cf Inflow=15.11 cfs 1.910 af
fs 0.000 af Primary=4.39 cfs 0.637 af Secondary=4.39 cfs 0.637 af Tertiary=4.39 cfs 0.637 af Outflow=13.18 cfs 1.910 af

Pond 100P: STONE BERM LEVEL Peak Elev=141.04' Storage=2,208 cf Inflow=2.92 cfs 0.593 af
Discarded=0.02 cfs 0.023 af Primary=0.86 cfs 0.464 af Secondary=1.99 cfs 0.105 af Outflow=2.87 cfs 0.593 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.87' Inflow=5.20 cfs 0.674 af
Primary=2.92 cfs 0.593 af Secondary=2.28 cfs 0.081 af Outflow=5.20 cfs 0.674 af

Total Runoff Area = 14.570 ac Runoff Volume = 2.583 af Average Runoff Depth = 2.13"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Summary for Subcatchment 4S: BASIN 4 ST-STN

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT IS MODIFIED SLIGHTLY AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

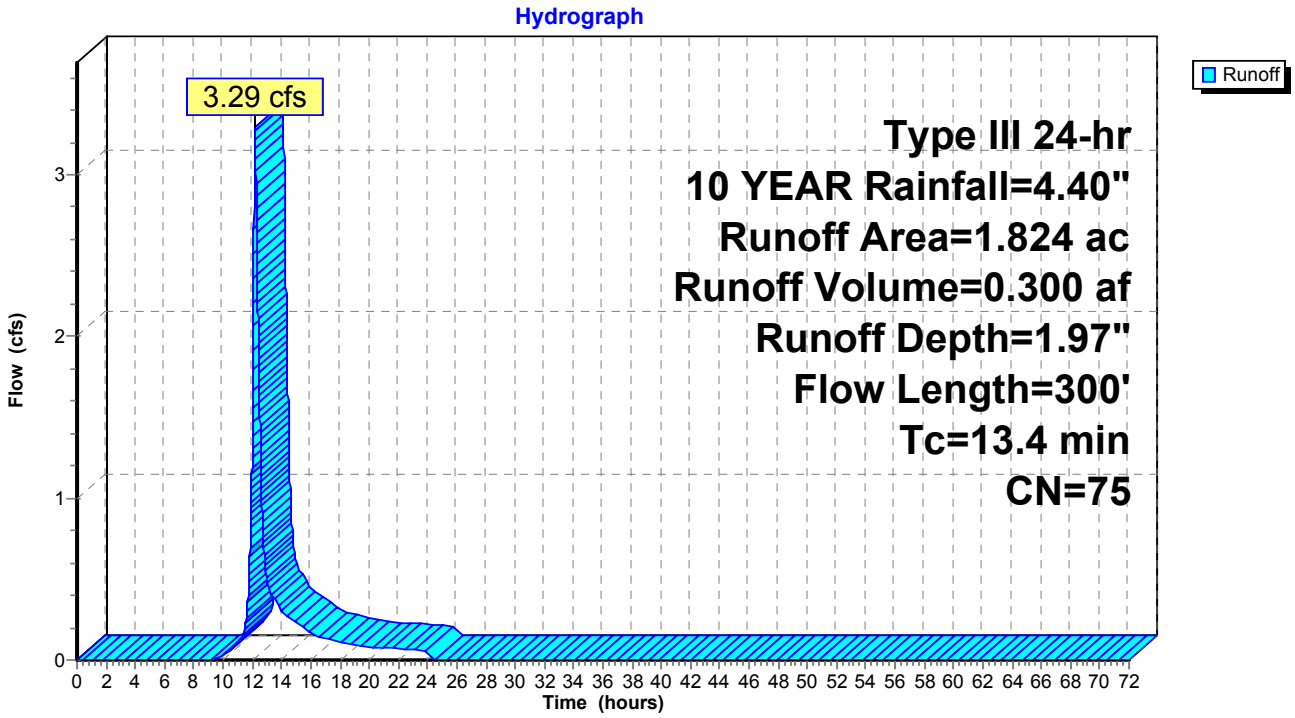
Runoff = 3.29 cfs @ 12.19 hrs, Volume= 0.300 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.676	98	Paved parking, HSG B (NEW PRKG LOT)
	1.148	61	>75% Grass cover, Good, HSG B
	1.824	75	Weighted Average
	1.148		62.94% Pervious Area
	0.676		37.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6	100	0.0300	0.19		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
4.8	200	0.0100	0.70		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
13.4	300	Total			

Subcatchment 4S: BASIN 4 ST-STN



Summary for Subcatchment 5S: BASIN 5 ST

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

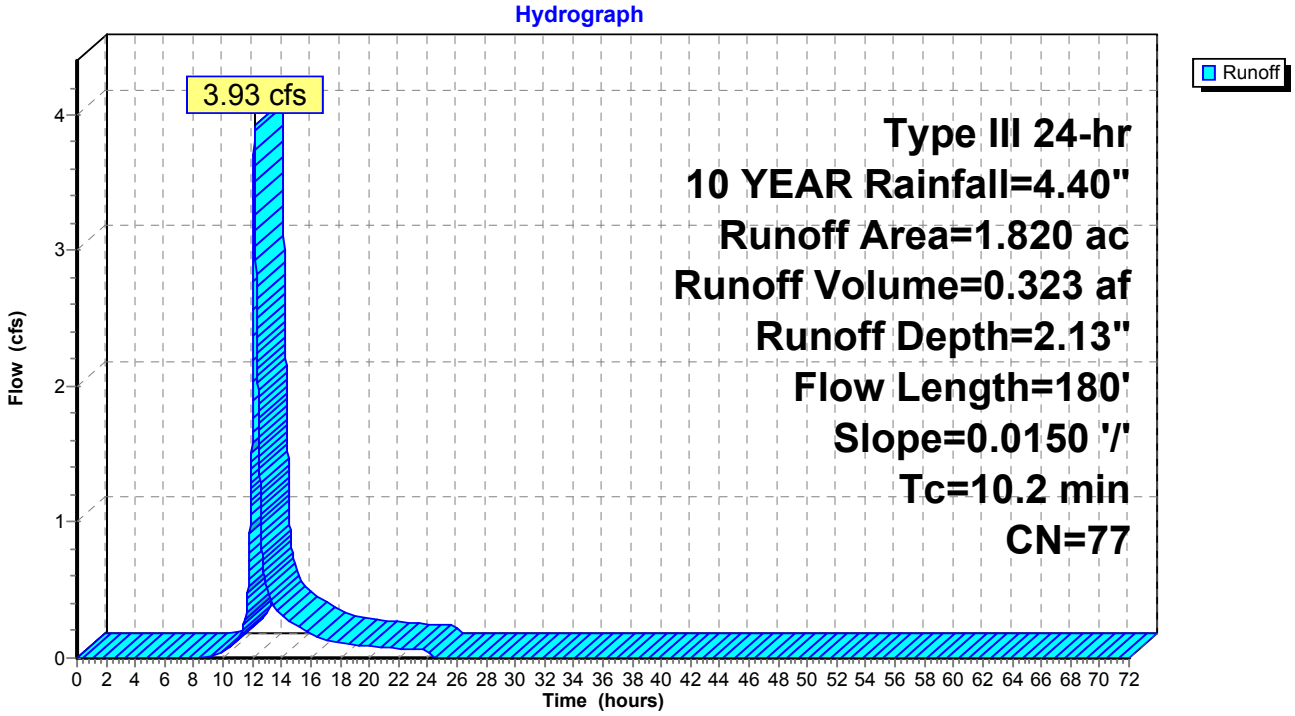
Runoff = 3.93 cfs @ 12.14 hrs, Volume= 0.323 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.800	98	Paved parking, HSG B
1.020	61	>75% Grass cover, Good, HSG B
1.820	77	Weighted Average
1.020		56.04% Pervious Area
0.800		43.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	80	0.0150	0.14		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
0.7	100	0.0150	2.49		**Shallow Concentrated Flow, SHALLOW BC** Paved Kv= 20.3 fps
10.2	180	Total			

Subcatchment 5S: BASIN 5 ST



Summary for Subcatchment 6S: N & W SIDE OF BLDG TO LS WEST-ST

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

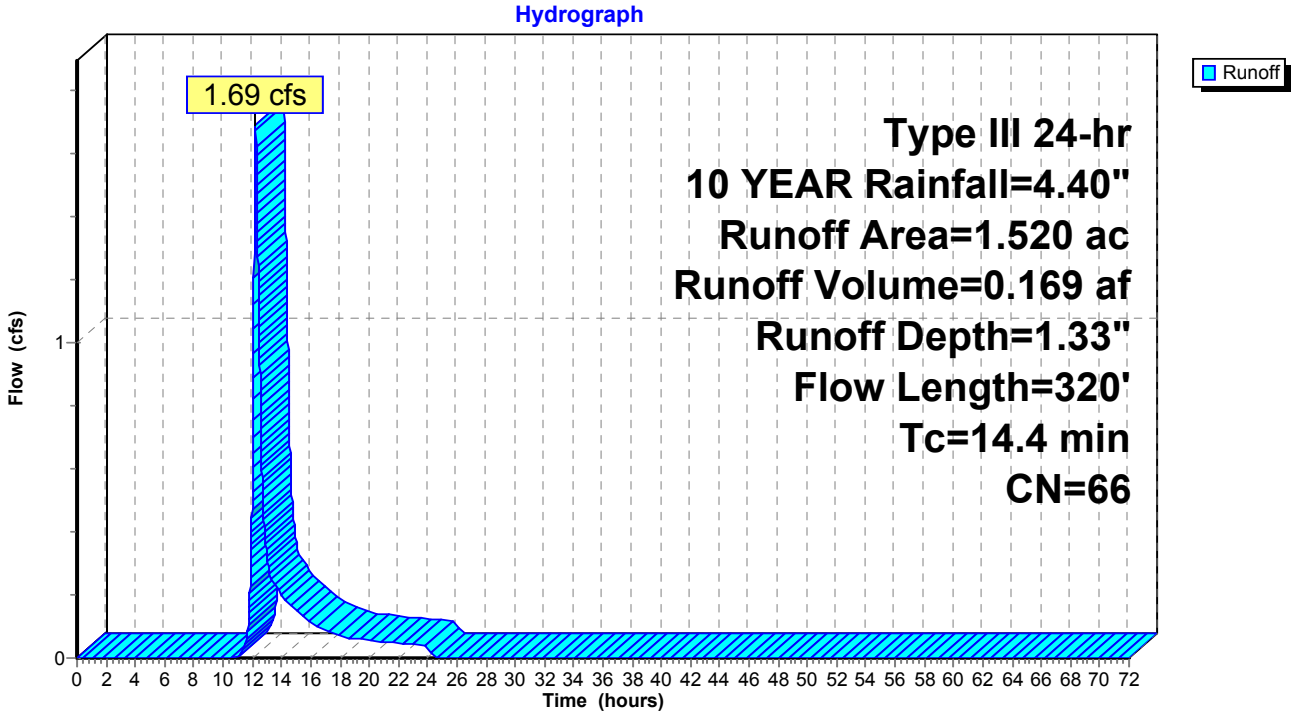
Runoff = 1.69 cfs @ 12.21 hrs, Volume= 0.169 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.210	98	Paved parking, HSG B
1.310	61	>75% Grass cover, Good, HSG B
1.520	66	Weighted Average
1.310		86.18% Pervious Area
0.210		13.82% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4	100	0.0100	0.12		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
1.0	220	0.0640	3.79		**Shallow Concentrated Flow, SHALLOW BC** Grassed Waterway Kv= 15.0 fps
14.4	320	Total			

Subcatchment 6S: N & W SIDE OF BLDG TO LS WEST-ST



Summary for Subcatchment 7S: BASIN 7-ST

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

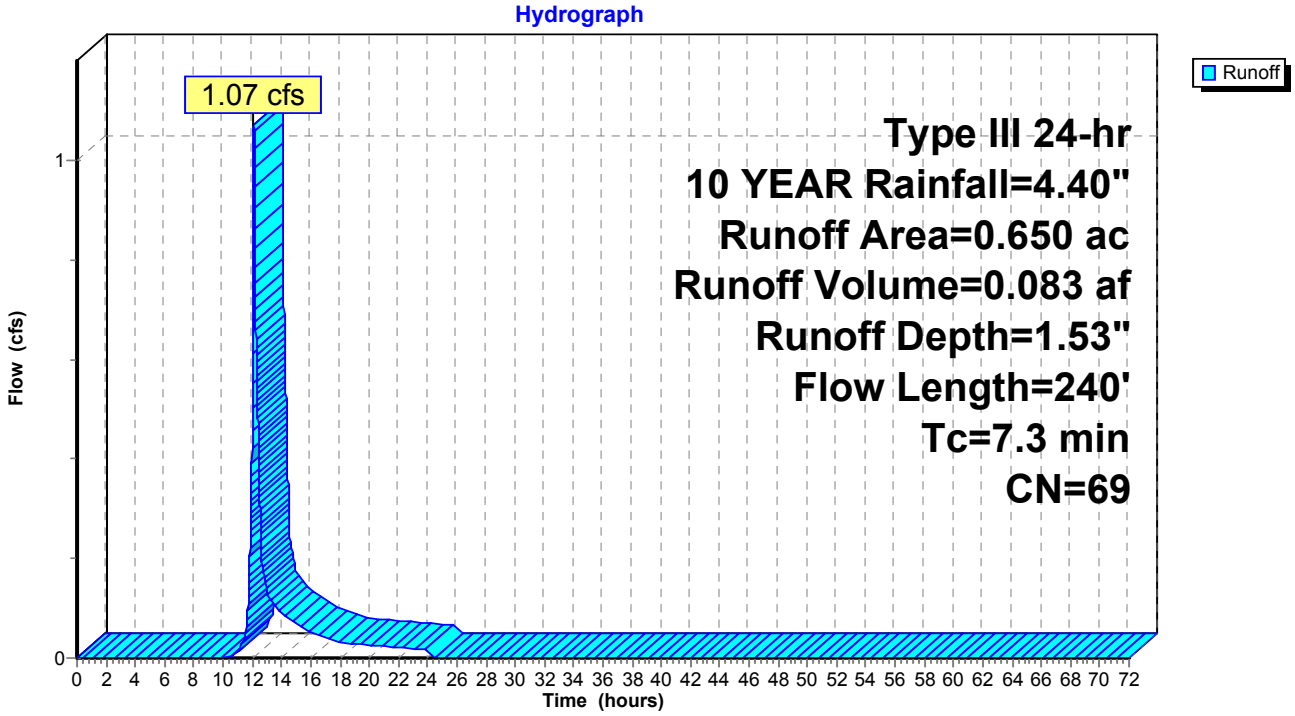
Runoff = 1.07 cfs @ 12.11 hrs, Volume= 0.083 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.140	98	Paved parking, HSG B
0.510	61	>75% Grass cover, Good, HSG B
0.650	69	Weighted Average
0.510		78.46% Pervious Area
0.140		21.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.7	60	0.0200	0.15		**Sheet Flow, SHEET AB** Grass: Short n= 0.150 P2= 3.00"
0.6	180	0.1000	4.74		**Shallow Concentrated Flow, SHALLOW BC** Grassed Waterway Kv= 15.0 fps
7.3	240	Total			

Subcatchment 7S: BASIN 7-ST



Summary for Subcatchment 61S: ROOF AREA EAST OF COURTYARD-DED FROM 60-ST

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

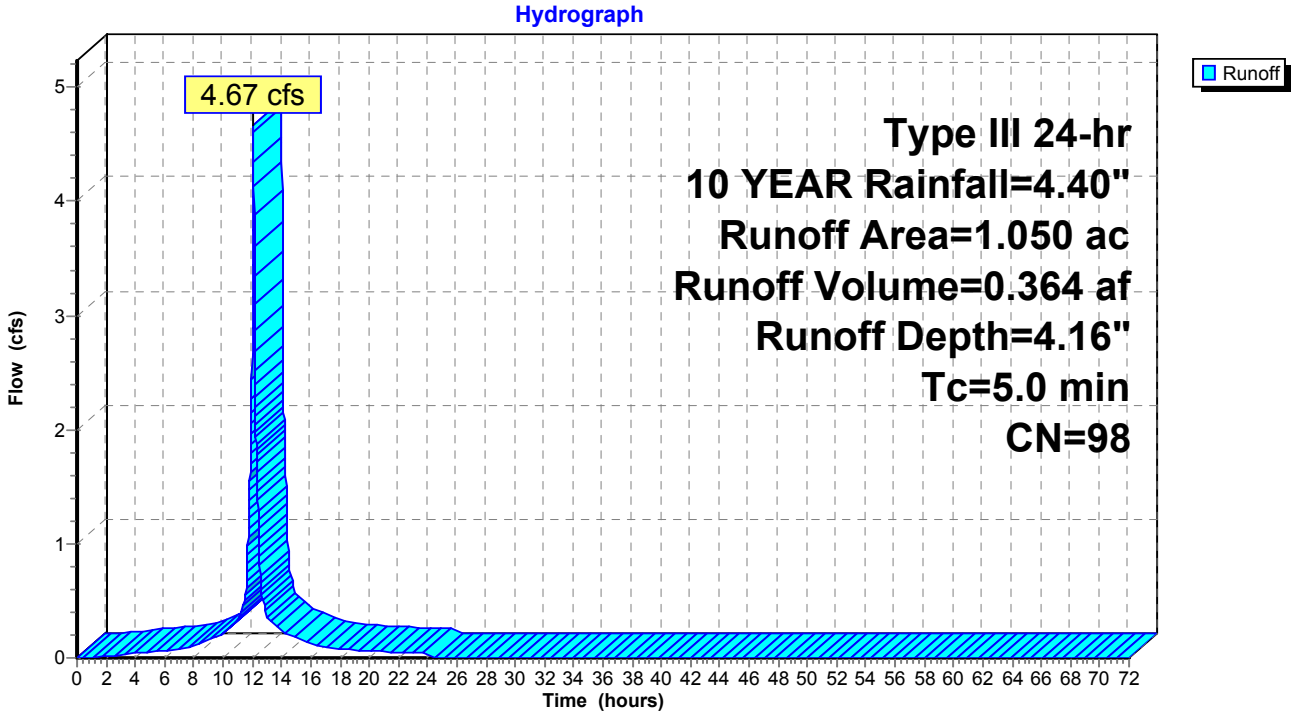
Runoff = 4.67 cfs @ 12.07 hrs, Volume= 0.364 af, Depth= 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
1.050	98	Roofs, HSG B
1.050		100.00% Impervious Area

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

Subcatchment 61S: ROOF AREA EAST OF COURTYARD-DED FROM 60-ST



Summary for Subcatchment 100: FRONTYARD OF RAY BUILDING-STN

SUBCATCHMENT 100 PREVIOUSLY DRAINED TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

FOR THE DEVELOPED CONDITION THE STORM DRAIN SYSTEMS WERE RECONFIGURED. THIS AREA NOW DRAINS TO THE PROPOSED STONE BERM LEVEL SPREADER.

THIS AREA INCLUDES TWO NEW SIDEWALKS ADDED NEAR THE NORTH END OF THE RAY BUILDING.

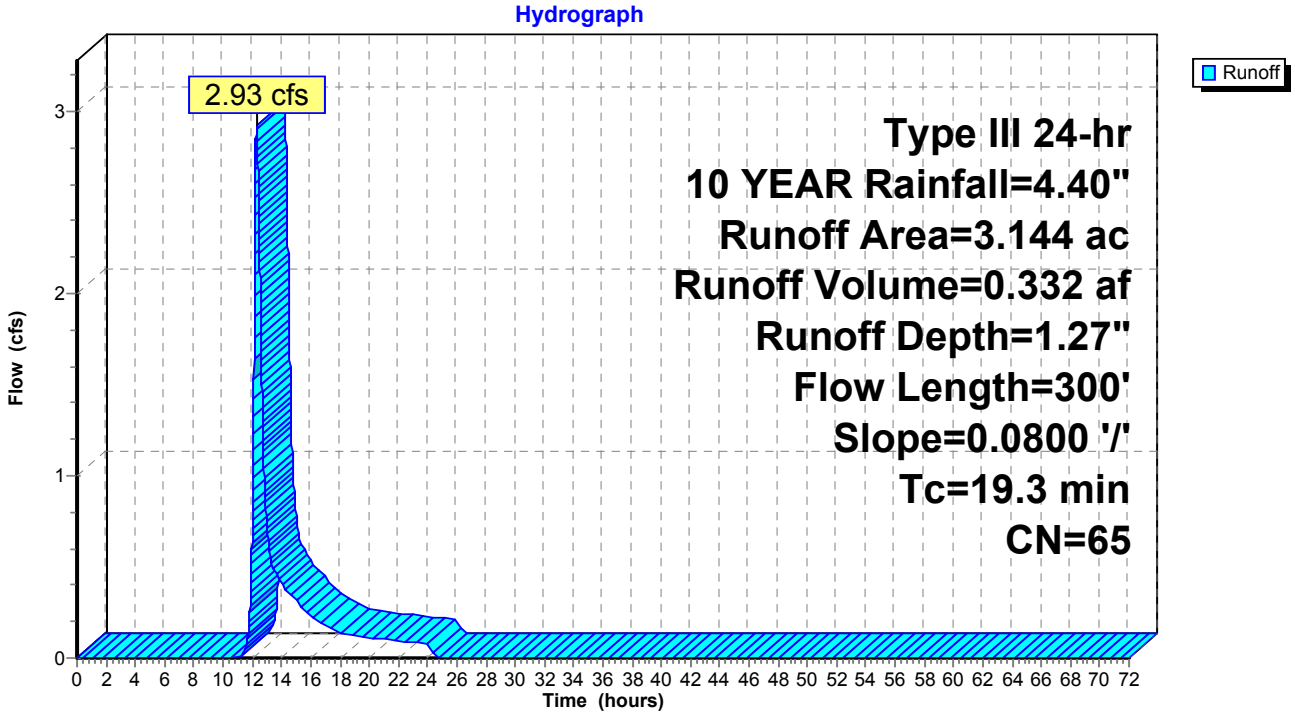
Runoff = 2.93 cfs @ 12.29 hrs, Volume= 0.332 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.347	98	Paved parking, HSG B
2.797	61	>75% Grass cover, Good, HSG B
3.144	65	Weighted Average
2.797		88.96% Pervious Area
0.347		11.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	150	0.0800	0.14		**Sheet Flow, SHEET AB** Grass: Bermuda n= 0.410 P2= 3.00"
1.3	150	0.0800	1.98		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
19.3	300	Total			

Subcatchment 100: FRONTYARD OF RAY BUILDING-STN



Summary for Subcatchment 201: SOUTH OF NEW LOT #7-STN (PORTION OF SC200)

SUBCATCHMENT 200 PREVIOUSLY DRAINED TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

FOR THE DEVELOPED CONDITION THE STORM DRAIN SYSTEMS WERE RECONFIGURED AND NEW PARKING LOT #7 ADDED. THIS SUBCATCHMENT AREA NOW DRAINS TO THE PROPOSED STONE BERM LEVEL SPREADER.

THIS AREA INCLUDES A PORTION OF THE EXISTING CONDITION SUBCATCHMENT #200 AND IS DIVERTED TO THE CATCH BASIN AT THE SOUTHEAST CORNER OF THE RAY BUILDING VIA A SHALLOW GRASS SWALE.

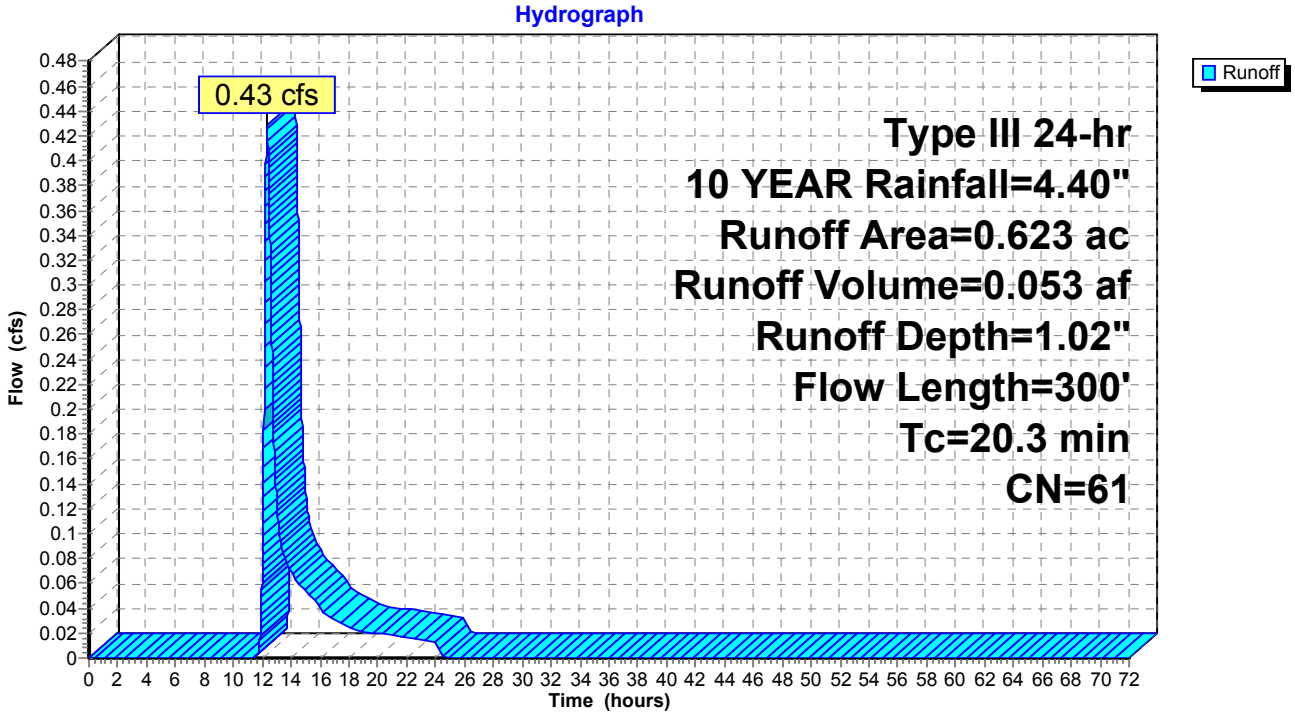
Runoff = 0.43 cfs @ 12.33 hrs, Volume= 0.053 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.623	61	>75% Grass cover, Good, HSG B
0.623		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.0	150	0.0800	0.14		**Sheet Flow, SHEET AB** Grass: Bermuda n= 0.410 P2= 3.00"
2.3	150	0.0250	1.11		**Shallow Concentrated Flow, SHALLOW BC** Short Grass Pasture Kv= 7.0 fps
20.3	300	Total			

Subcatchment 201: SOUTH OF NEW LOT #7-STN (PORTION OF SC200)



Summary for Subcatchment 225: REVISED-STN (PORTION OF SC200)

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT IS MODIFIED AS DEVELOPED PREVIOUSLY BY PINKHAM AND GREER AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

THE STORM DRAIN SYSTEMS WERE RECONFIGURED AND NEW PARKING LOT #7 ADDED. THIS AREA INCLUDES A PORTION OF THE EXISTING CONDITION SUBCATCHMENT #200.

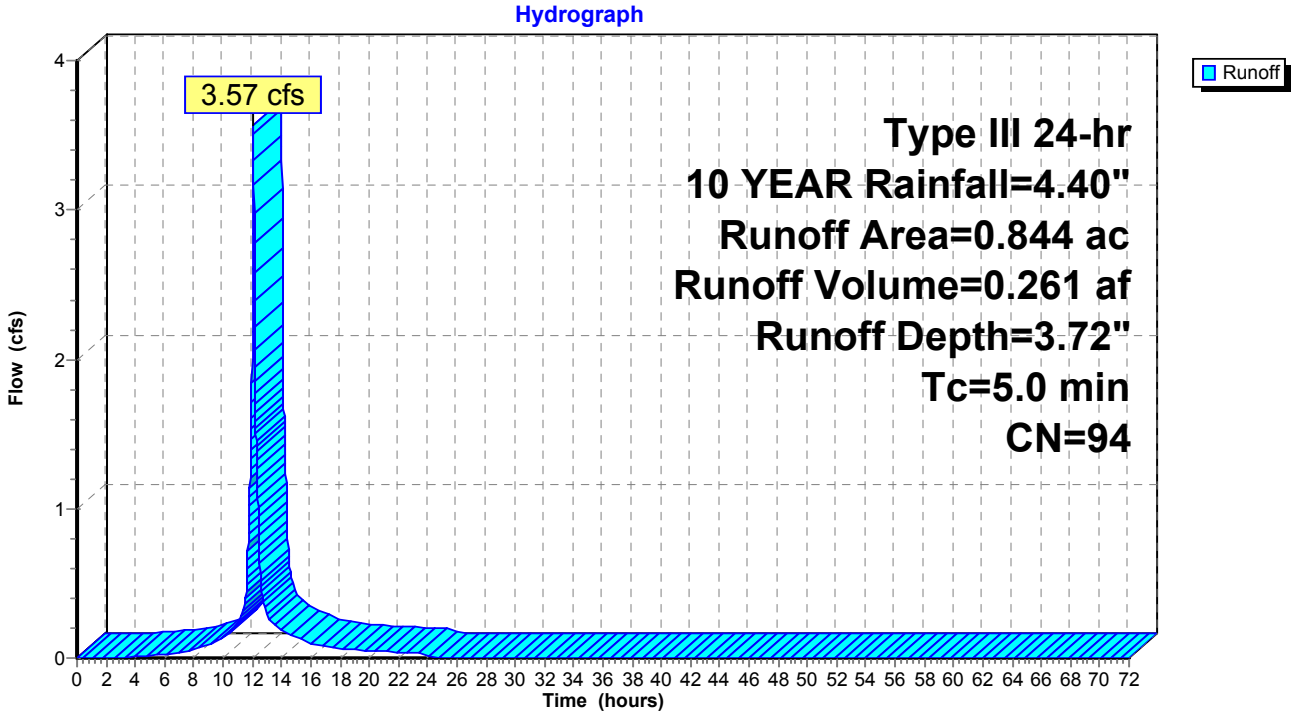
Runoff = 3.57 cfs @ 12.07 hrs, Volume= 0.261 af, Depth= 3.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.083	61	>75% Grass cover, Good, HSG B
0.761	98	Paved parking, HSG B
0.844	94	Weighted Average
0.083		9.83% Pervious Area
0.761		90.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT ENTRY TO CATCH BASINS**

Subcatchment 225: REVISED-STN (PORTION OF SC200)



Summary for Subcatchment 250: REVISED-STN FOR NEW LOT #7 (PORTION OF SC200)

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT IS MODIFIED AS DEVELOPED PREVIOUSLY BY PINKHAM AND GREER. THE STORM DRAIN SYSTEMS WERE RECONFIGURED AND NEW PARKING LOT #7 ADDED. THIS AREA INCLUDES A PORTION OF THE EXISTING CONDITION SUBCATCHMENT #200.

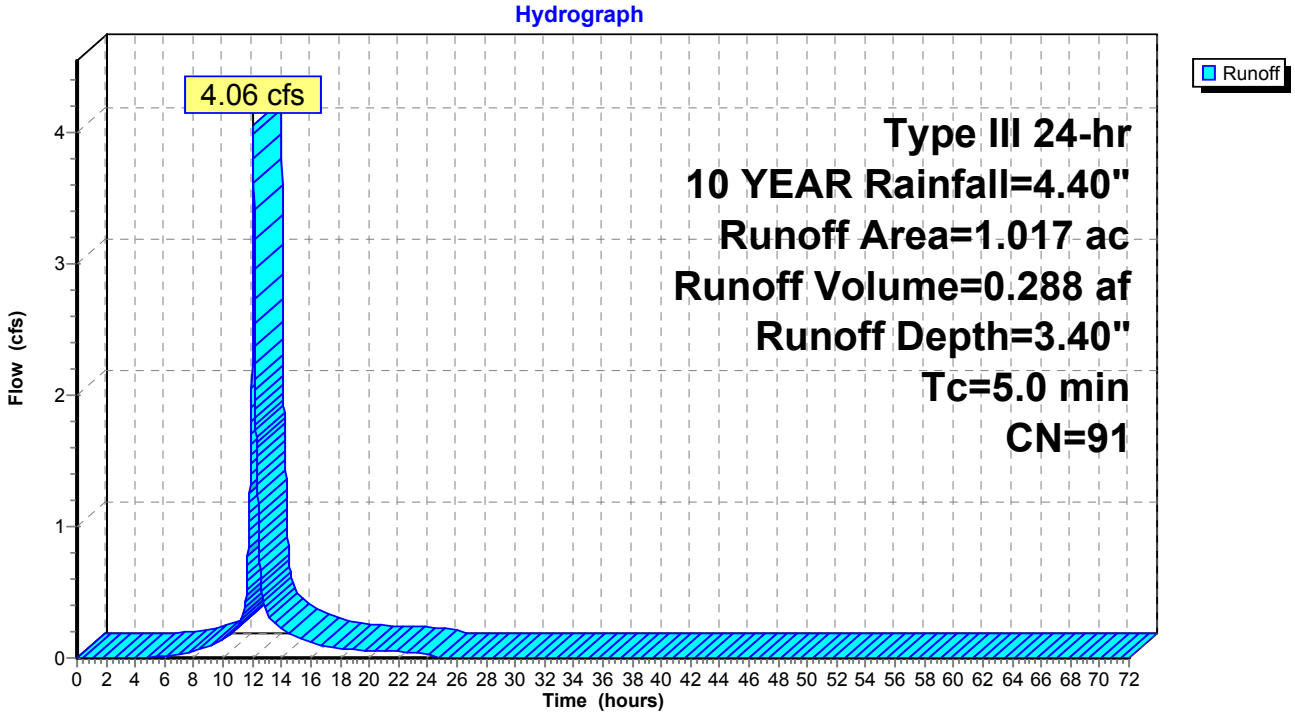
Runoff = 4.06 cfs @ 12.07 hrs, Volume= 0.288 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

Area (ac)	CN	Description
0.183	61	>75% Grass cover, Good, HSG B
0.834	98	Water Surface, HSG B
1.017	91	Weighted Average
0.183		17.99% Pervious Area
0.834		82.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT ENTRY TO NEW CARCH BASINS**

Subcatchment 250: REVISED-STN FOR NEW LOT #7 (PORTION OF SC200)



Summary for Subcatchment 300: GYM TO HARLOW BLDG-PG

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS UNCHANGED AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

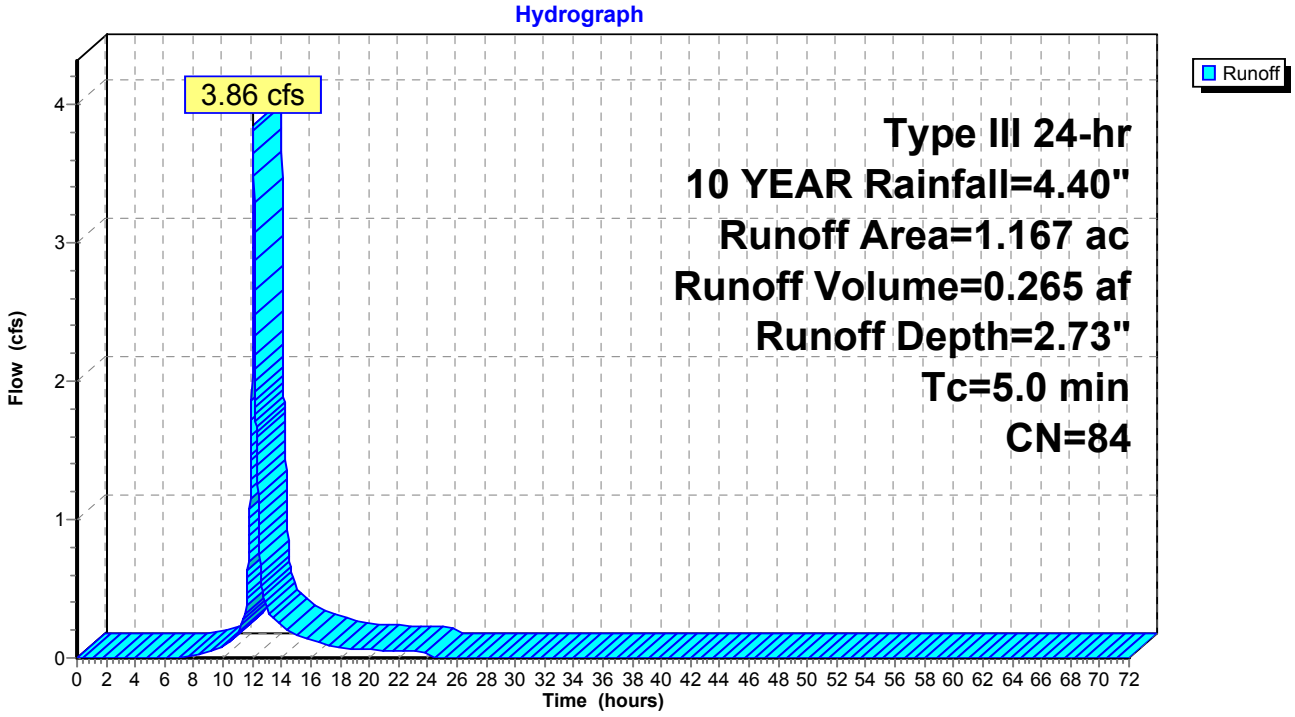
Runoff = 3.86 cfs @ 12.07 hrs, Volume= 0.265 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.740	98	Paved parking, HSG B (includes new pavement)
	0.427	61	>75% Grass cover, Good, HSG B
	1.167	84	Weighted Average
	0.427		36.59% Pervious Area
	0.740		63.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT TO CATCH BASINS**

Subcatchment 300: GYM TO HARLOW BLDG-PG



Summary for Subcatchment 400: RAY TO HARLOW BLDG-PG

FOR THE DEVELOPED CONDITION THIS SUBCATCHMENT REMAINS NEARLY UNCHANGED AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

FOR THE DEVELOPED CONDITION THE STORM DRAIN SYSTEMS WERE RECONFIGURE AND NEW PARKING LOT#7 WAS ADDED. THIS SUBCATCHMENT AREA WAS SLIGHTLY REDUCED DUE TO THE PROPOSED CHANGES.

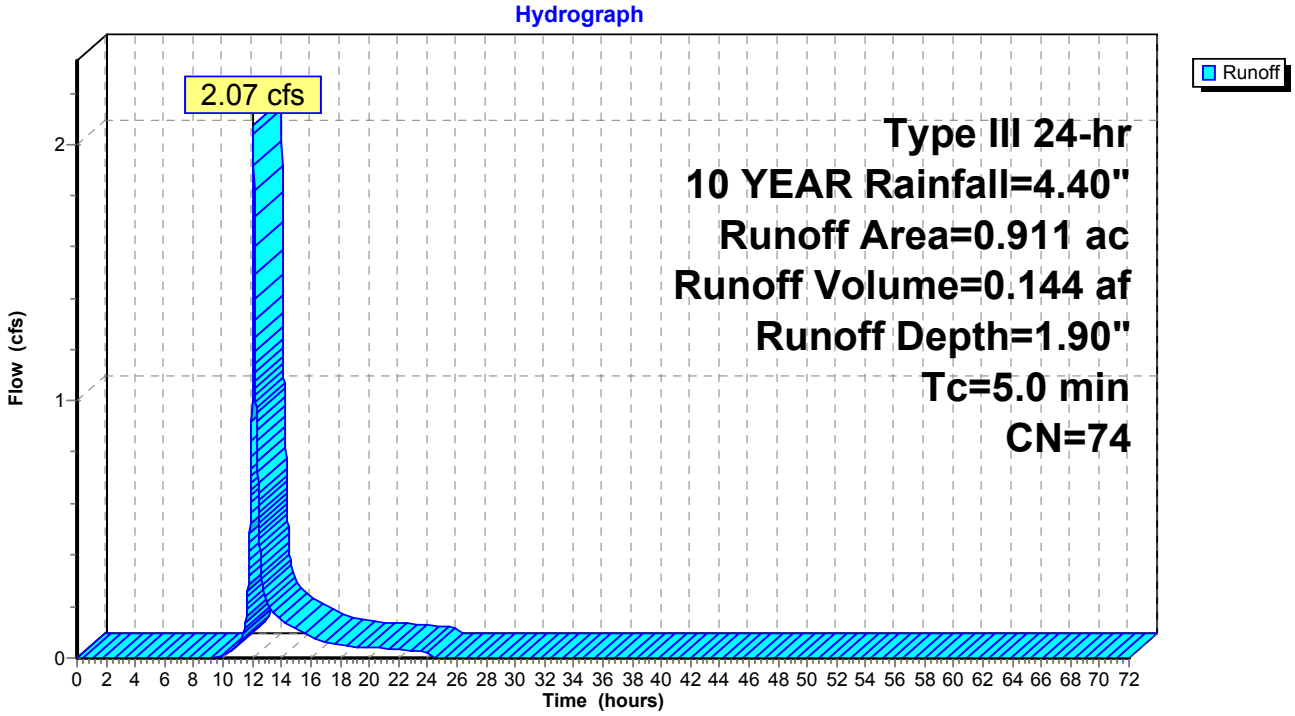
Runoff = 2.07 cfs @ 12.08 hrs, Volume= 0.144 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10 YEAR Rainfall=4.40"

	Area (ac)	CN	Description
*	0.330	98	Paved parking, HSG B (BLDGS AND WALKS)
	0.581	61	>75% Grass cover, Good, HSG B
	0.911	74	Weighted Average
	0.581		63.78% Pervious Area
	0.330		36.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, DIRECT TO CATCH BASINS**

Subcatchment 400: RAY TO HARLOW BLDG-PG



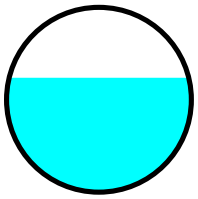
Summary for Reach 1R: NEW 18" PIPE

Inflow Area = 4.784 ac, 24.69% Impervious, Inflow Depth = 1.69" for 10 YEAR event
Inflow = 5.34 cfs @ 12.09 hrs, Volume= 0.674 af
Outflow = 5.22 cfs @ 12.14 hrs, Volume= 0.674 af, Atten= 2%, Lag= 3.2 min

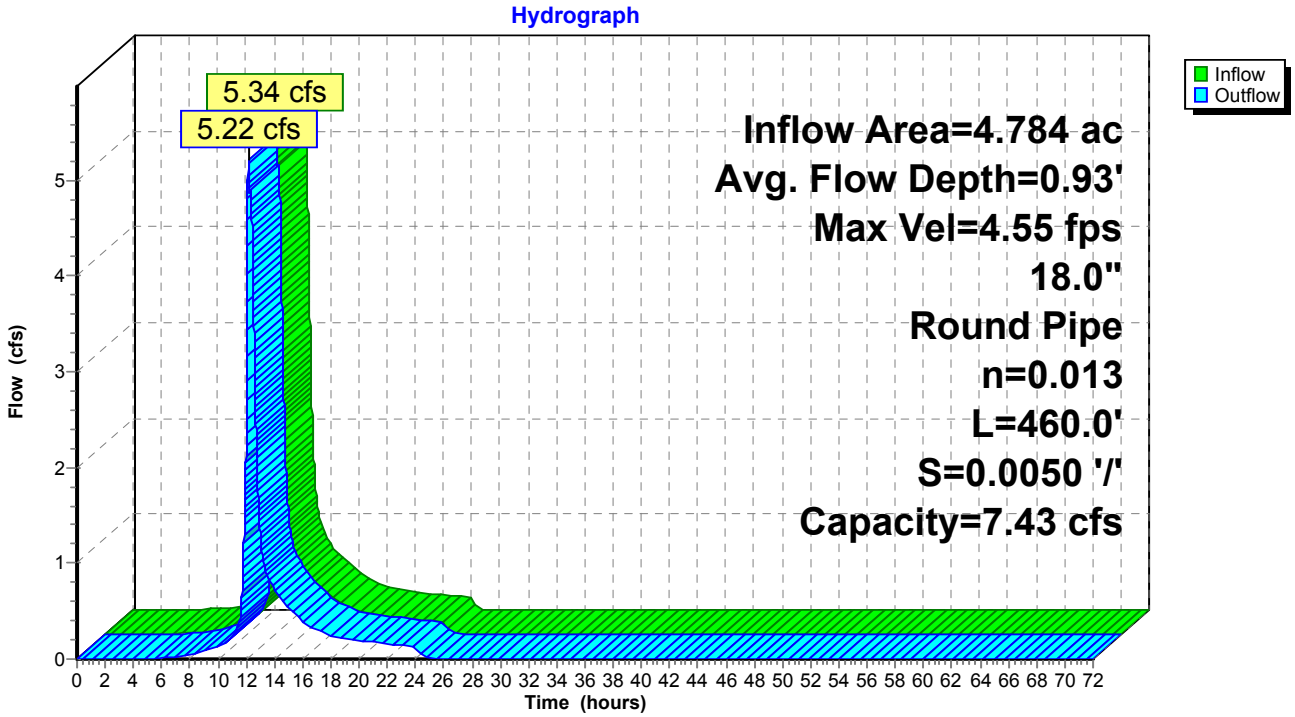
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.55 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.71 fps, Avg. Travel Time= 4.5 min

Peak Storage= 528 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.93'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 7.43 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 460.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -2.30'



Reach 1R: NEW 18" PIPE



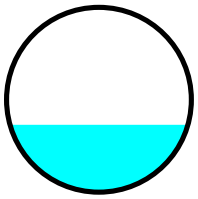
Summary for Reach 2R: NEW 18" PIPE

Inflow Area = 4.784 ac, 24.69% Impervious, Inflow Depth = 1.69" for 10 YEAR event
Inflow = 5.22 cfs @ 12.14 hrs, Volume= 0.674 af
Outflow = 5.21 cfs @ 12.16 hrs, Volume= 0.674 af, Atten= 0%, Lag= 0.8 min

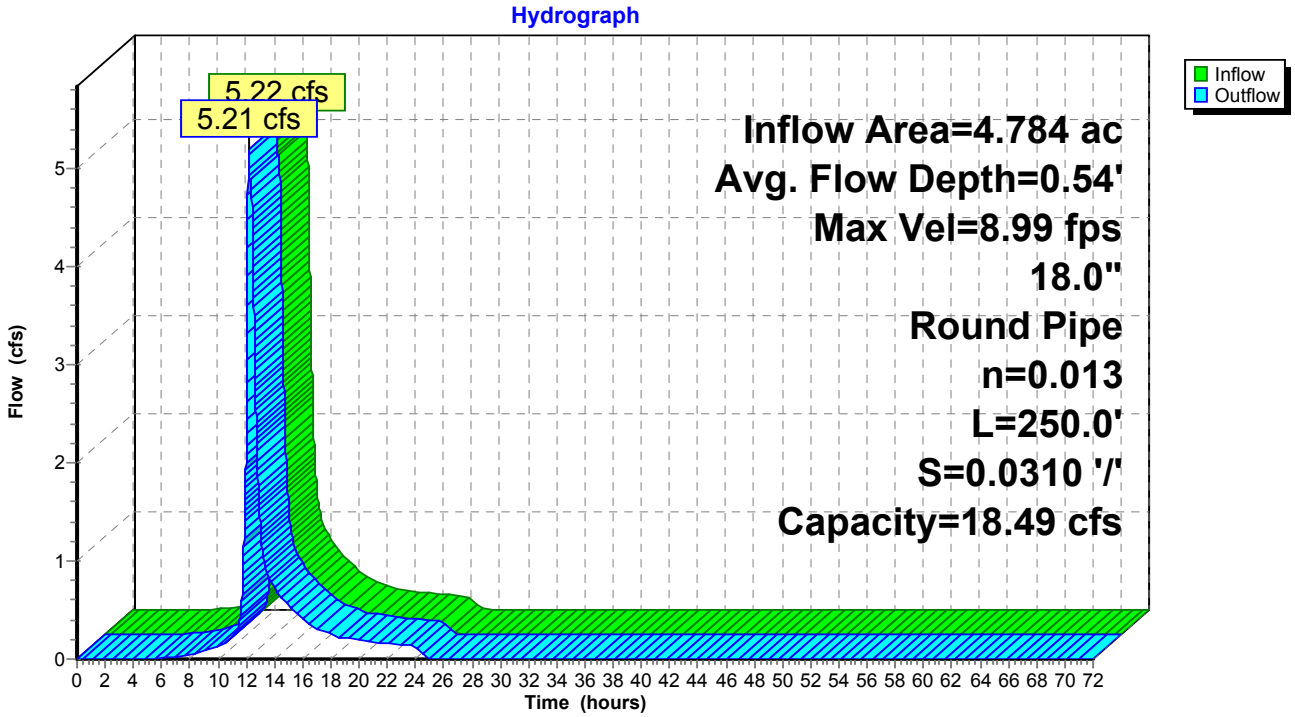
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.99 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 3.30 fps, Avg. Travel Time= 1.3 min

Peak Storage= 145 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 18.49 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 250.0' Slope= 0.0310 '/'
Inlet Invert= 0.00', Outlet Invert= -7.75'



Reach 2R: NEW 18" PIPE



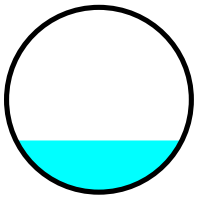
Summary for Reach 3R: NEW 18" PIPE

Inflow Area = 4.784 ac, 24.69% Impervious, Inflow Depth = 1.69" for 10 YEAR event
Inflow = 5.21 cfs @ 12.16 hrs, Volume= 0.674 af
Outflow = 5.20 cfs @ 12.17 hrs, Volume= 0.674 af, Atten= 0%, Lag= 0.7 min

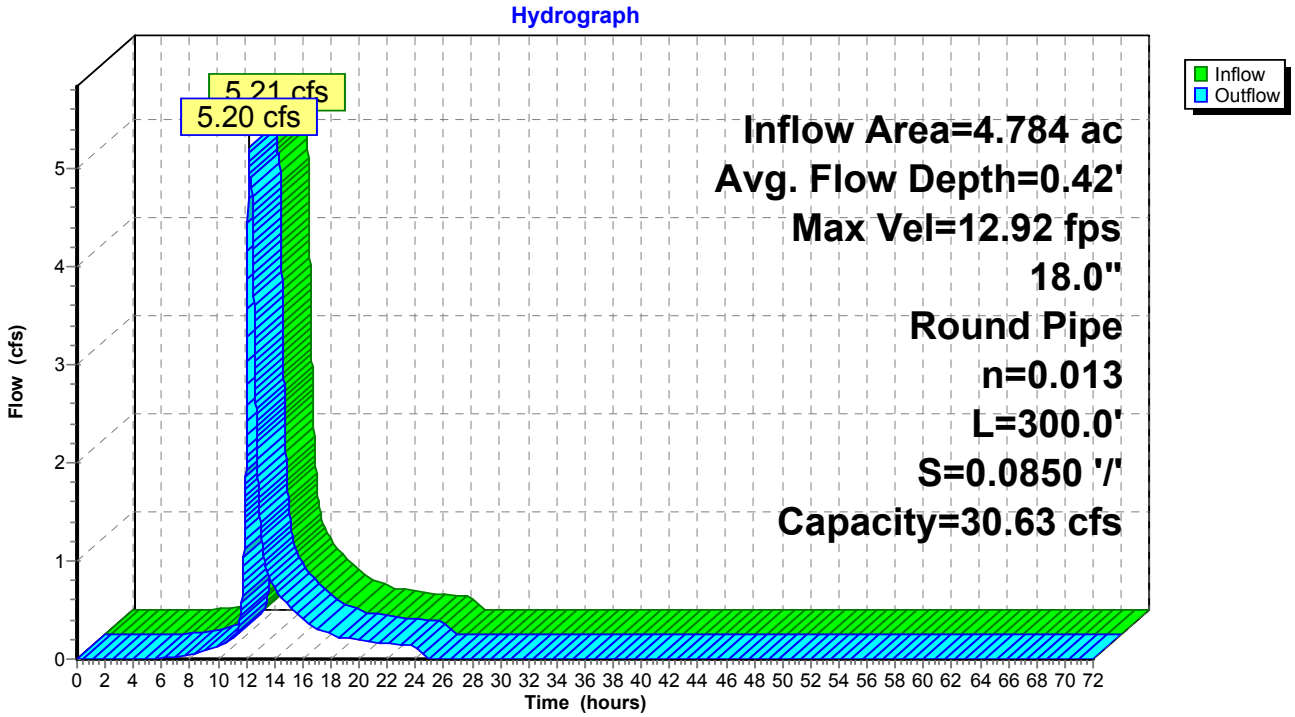
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.92 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 4.74 fps, Avg. Travel Time= 1.1 min

Peak Storage= 121 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 30.63 cfs

18.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 300.0' Slope= 0.0850 '/'
Inlet Invert= 0.00', Outlet Invert= -25.50'



Reach 3R: NEW 18" PIPE



Summary for Reach 5R: PIPE 5-ST

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

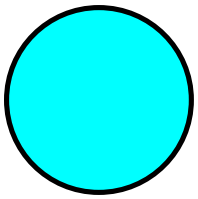
INFLOW TO THIS STRUTURE IS MODIFIED DUE TO THE MINOR CHANGES TO SUBCATCHMENT 4S.

Inflow Area = 4.694 ac, 53.81% Impervious, Inflow Depth = 2.52" for 10 YEAR event
Inflow = 7.53 cfs @ 12.17 hrs, Volume= 0.987 af
Outflow = 6.19 cfs @ 12.13 hrs, Volume= 0.987 af, Atten= 18%, Lag= 0.0 min

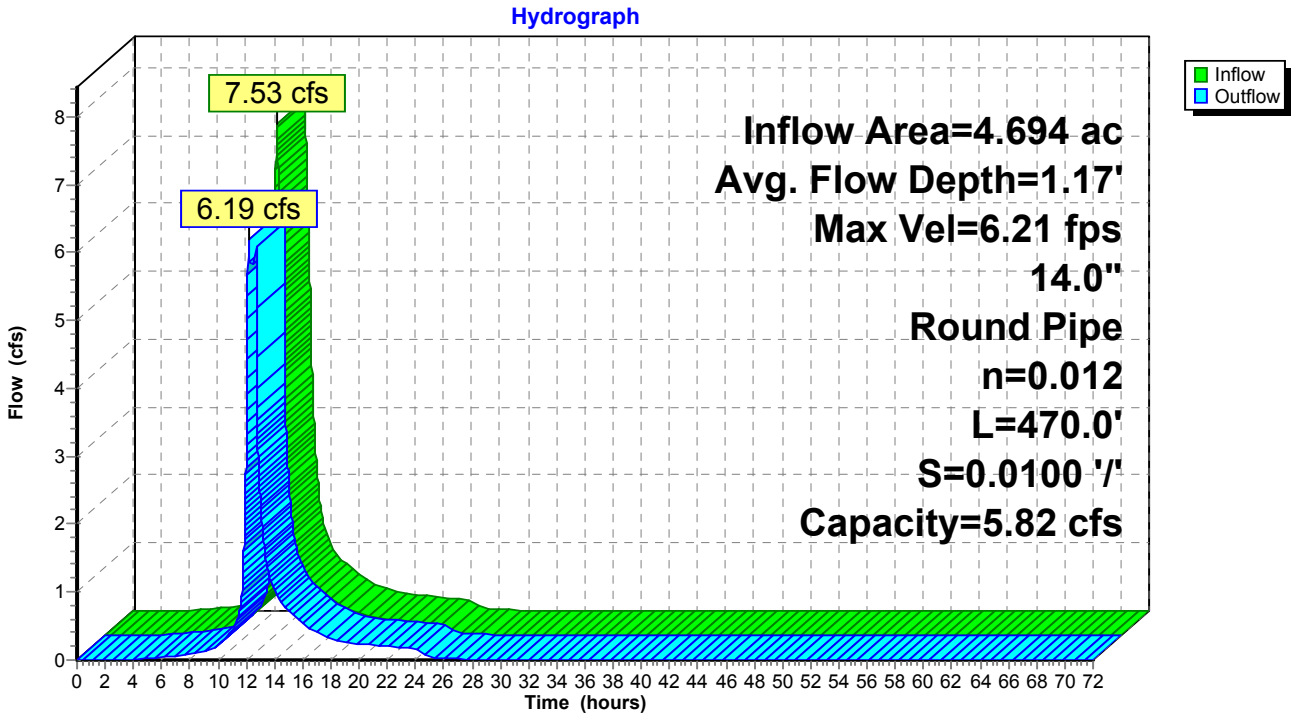
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.21 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 6.0 min

Peak Storage= 502 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.17'
Bank-Full Depth= 1.17' Flow Area= 1.1 sf, Capacity= 5.82 cfs

14.0" Round Pipe
n= 0.012
Length= 470.0' Slope= 0.0100 '/'
Inlet Invert= 0.00', Outlet Invert= -4.70'



Reach 5R: PIPE 5-ST



Summary for Reach 6R: LS DITCH-ST

ST = PER REPORT BY PG FROM SEBAGO TECHNICS (RIVERVIEW)

PG = PER REPORT BY PINKHAM AND GREER

SUBCATCHMENT DESCRIPTION PER REPORT BY PG

(PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT)

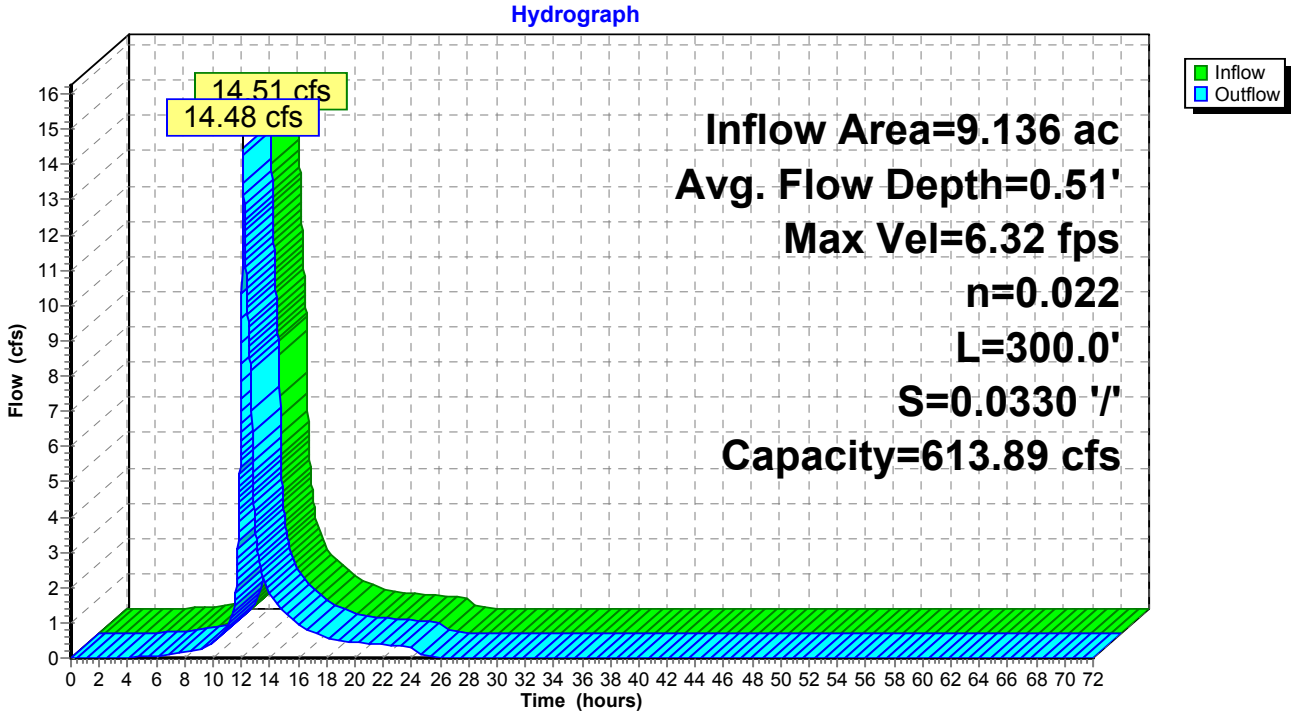
Inflow Area = 9.136 ac, 49.99% Impervious, Inflow Depth = 2.40" for 10 YEAR event
Inflow = 14.51 cfs @ 12.11 hrs, Volume= 1.826 af
Outflow = 14.48 cfs @ 12.14 hrs, Volume= 1.826 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.32 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.53 fps, Avg. Travel Time= 3.3 min

Peak Storage= 687 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.51'
Bank-Full Depth= 3.00' Flow Area= 36.0 sf, Capacity= 613.89 cfs

3.00' x 3.00' deep channel, n= 0.022
Side Slope Z-value= 3.0 '/' Top Width= 21.00'
Length= 300.0' Slope= 0.0330 '/'
Inlet Invert= 0.00', Outlet Invert= -9.90'

Reach 6R: LS DITCH-ST



Summary for Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Summary for Reach 60R: LEVEL SPREADER OUTFALL 2-ST

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND MODELED AS THE EXISTING LEVEL SPREADER POND CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS. STANTEC REPLICATED THIS POND FOR THE EXISTING CONDITIONS FOR MORE RECENT HYDROCAD VERSION 10 (PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT).

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

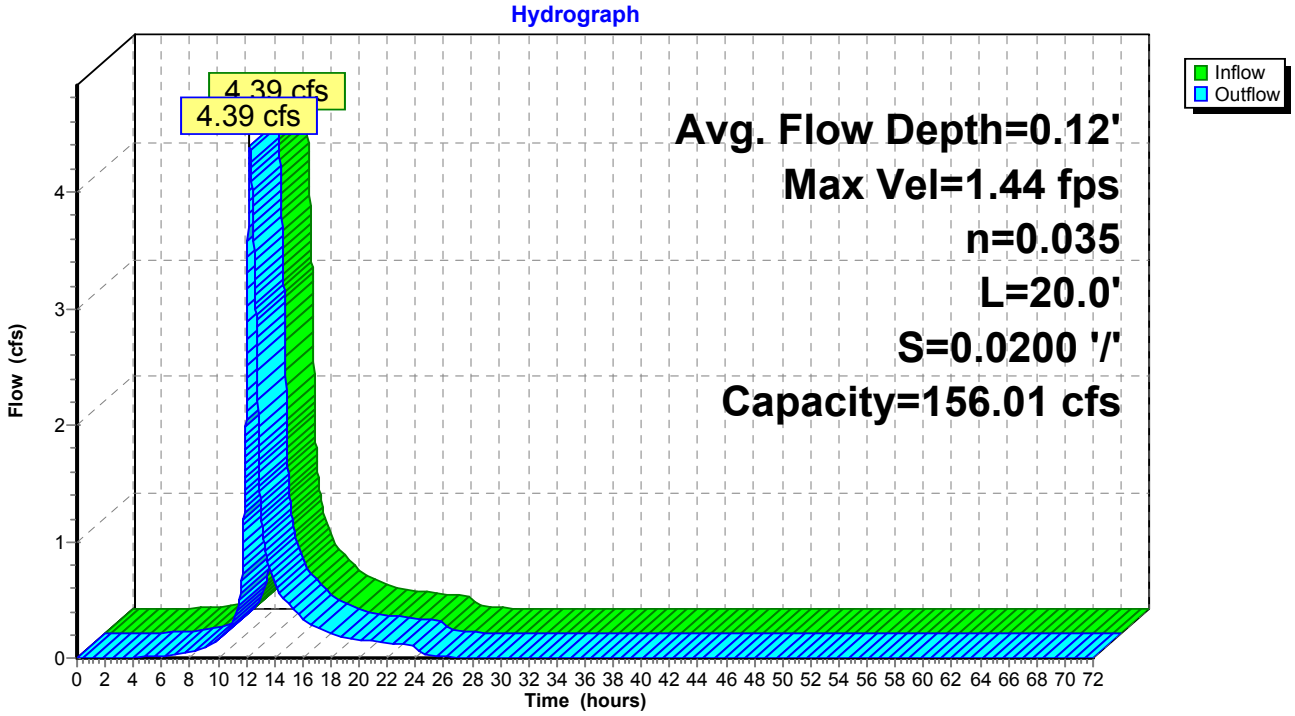
Inflow	=	4.39 cfs @	12.23 hrs, Volume=	0.637 af
Outflow	=	4.39 cfs @	12.24 hrs, Volume=	0.637 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.44 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 1.0 min

Peak Storage= 61 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 156.01 cfs

25.00' x 1.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

Reach 60R: LEVEL SPREADER OUTFALL 2-ST



Summary for Reach 63R: LEVEL SPREADER OUTFALL 1-ST

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND MODELED AS THE EXISTING LEVEL SPREADER POND CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS. STANTEC REPLICATED THIS POND FOR THE EXISTING CONDITIONS FOR MORE RECENT HYDROCAD VERSION 10 (PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT).

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow Area = 9.786 ac, 48.10% Impervious, Inflow Depth = 0.78" for 10 YEAR event
Inflow = 4.39 cfs @ 12.23 hrs, Volume= 0.637 af
Outflow = 4.39 cfs @ 12.24 hrs, Volume= 0.637 af, Atten= 0%, Lag= 0.3 min

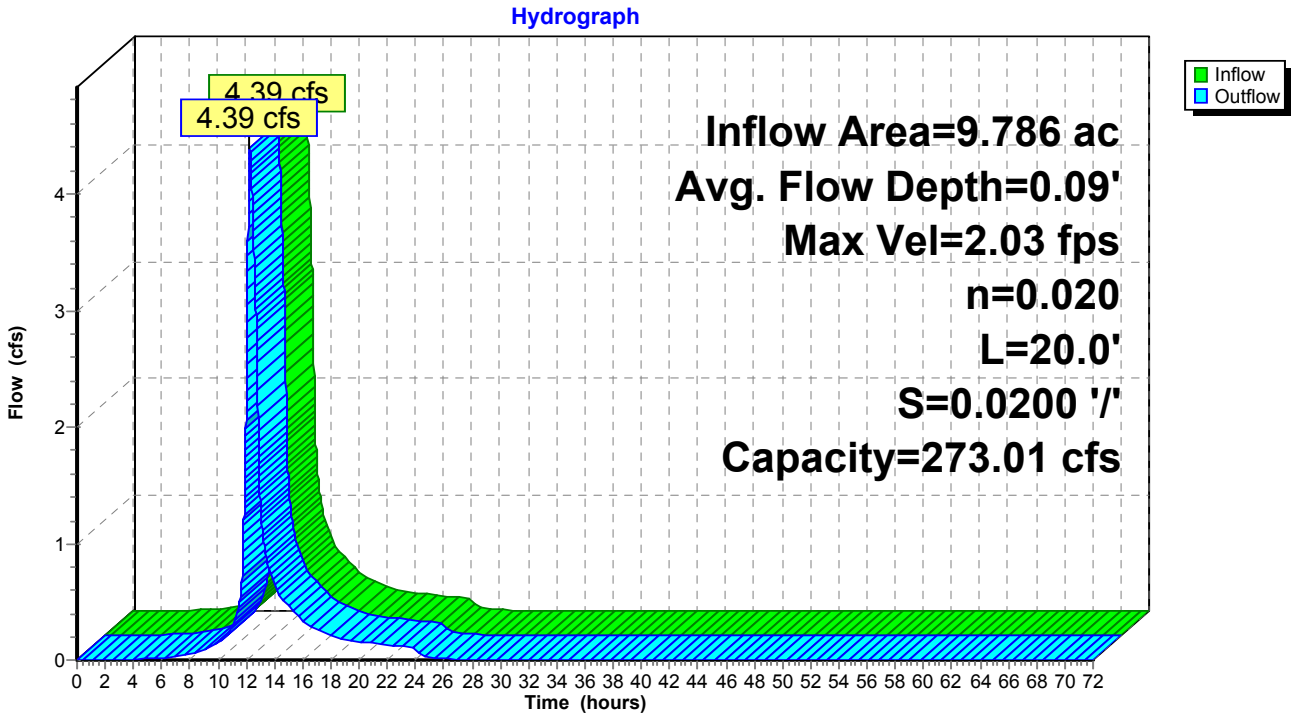
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.03 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 0.6 min

Peak Storage= 43 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 273.01 cfs

25.00' x 1.00' deep channel, n= 0.020
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

‡

Reach 63R: LEVEL SPREADER OUTFALL 1-ST



Summary for Reach 65R: LEVEL SPREADER OUTFALL 3 ADDED BY PG-STN

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND MODELED AS THE EXISTING LEVEL SPREADER POND CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS. STANTEC REPLICATED THIS POND FOR THE EXISTING CONDITIONS FOR MORE RECENT HYDROCAD VERSION 10 (PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT).

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow	=	4.39 cfs @	12.23 hrs,	Volume=	0.637 af
Outflow	=	4.39 cfs @	12.26 hrs,	Volume=	0.637 af, Atten= 0%, Lag= 1.3 min

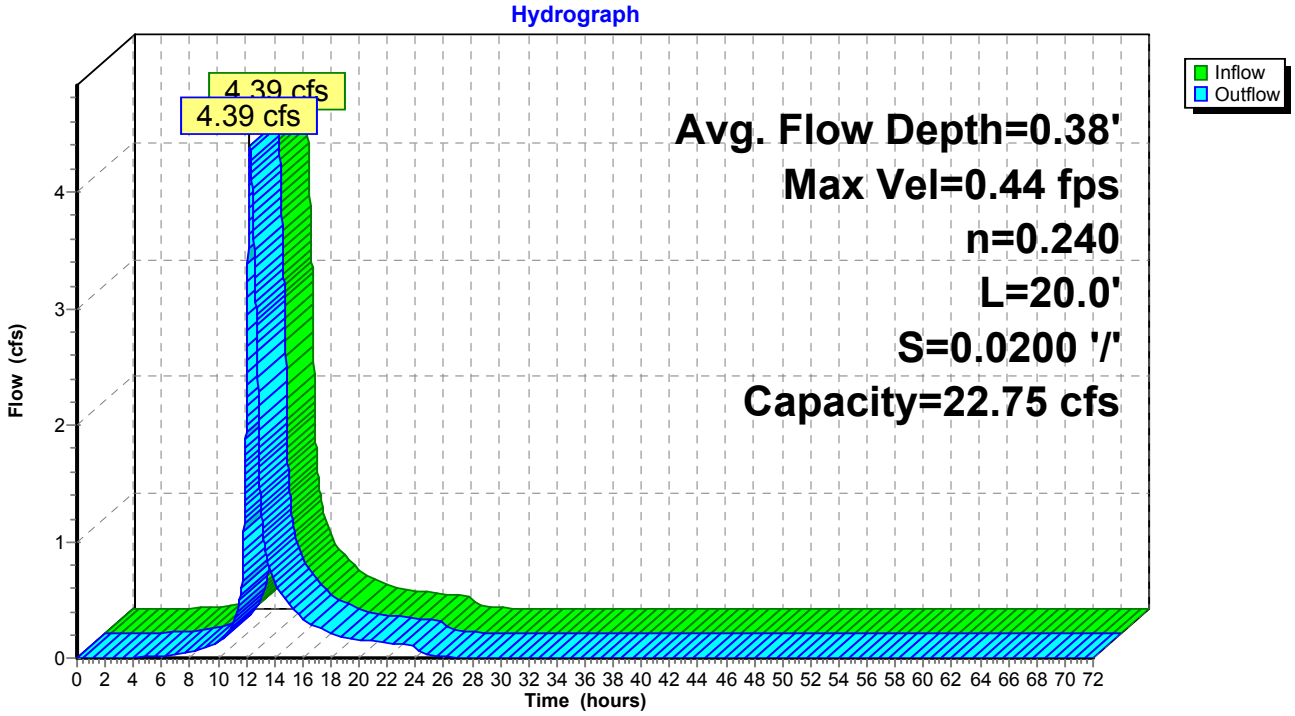
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.44 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 4.9 min

Peak Storage= 198 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 28.0 sf, Capacity= 22.75 cfs

25.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 3.0 '/' Top Width= 31.00'
Length= 20.0' Slope= 0.0200 '/'
Inlet Invert= 0.00', Outlet Invert= -0.40'

‡

Reach 65R: LEVEL SPREADER OUTFALL 3 ADDED BY PG-STN



Summary for Reach 100R: BUFFER

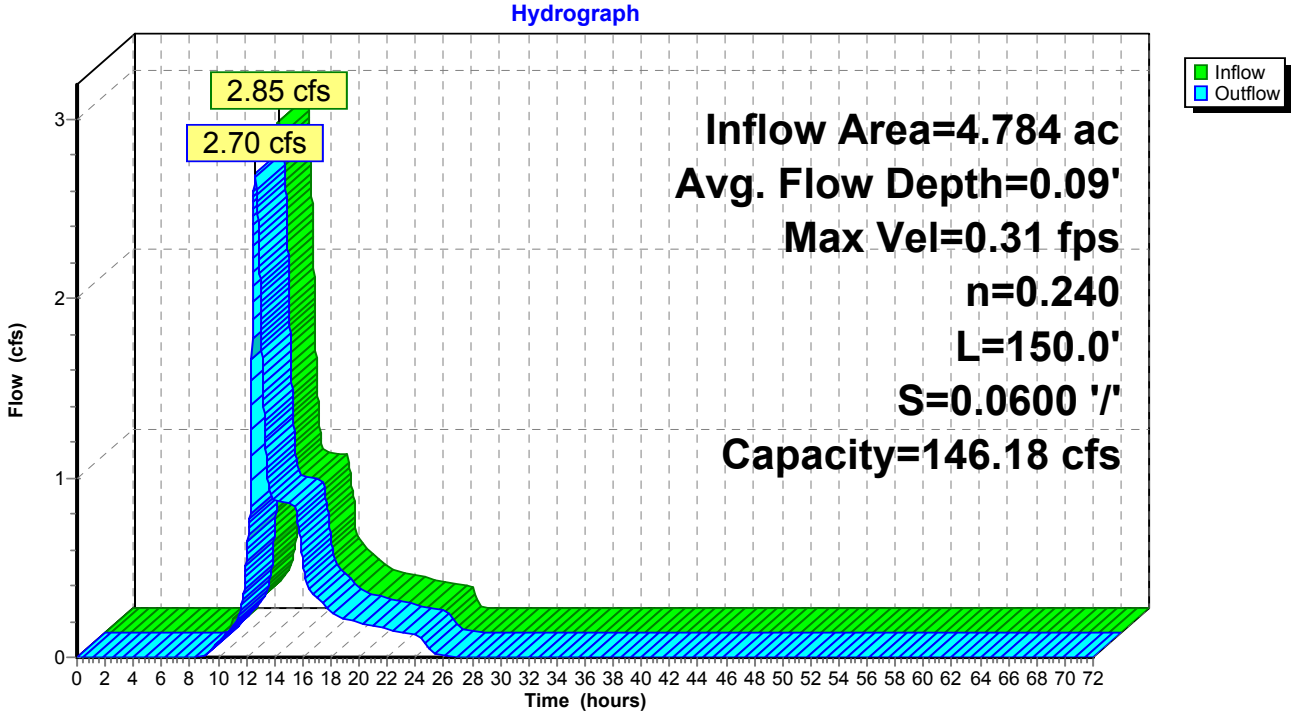
Inflow Area = 4.784 ac, 24.69% Impervious, Inflow Depth = 1.43" for 10 YEAR event
Inflow = 2.85 cfs @ 12.33 hrs, Volume= 0.569 af
Outflow = 2.70 cfs @ 12.62 hrs, Volume= 0.569 af, Atten= 5%, Lag= 17.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.31 fps, Min. Travel Time= 8.1 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 21.3 min

Peak Storage= 1,317 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 1.00' Flow Area= 98.0 sf, Capacity= 146.18 cfs

96.00' x 1.00' deep channel, n= 0.240 Sheet flow over Dense Grass
Side Slope Z-value= 2.0 '/' Top Width= 100.00'
Length= 150.0' Slope= 0.0600 '/'
Inlet Invert= 0.00', Outlet Invert= -9.00'

Reach 100R: BUFFER



Summary for Reach 102: CBs AT HARLOW TO GYM CB-PG

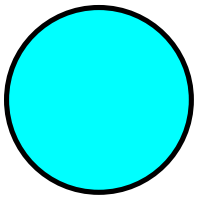
INFLOW TO THIS STRUTURE IS UNCHANGED FOR THIS PROJECT.

Inflow Area = 0.911 ac, 36.22% Impervious, Inflow Depth = 1.90" for 10 YEAR event
Inflow = 2.07 cfs @ 12.08 hrs, Volume= 0.144 af
Outflow = 0.97 cfs @ 12.03 hrs, Volume= 0.144 af, Atten= 53%, Lag= 0.0 min

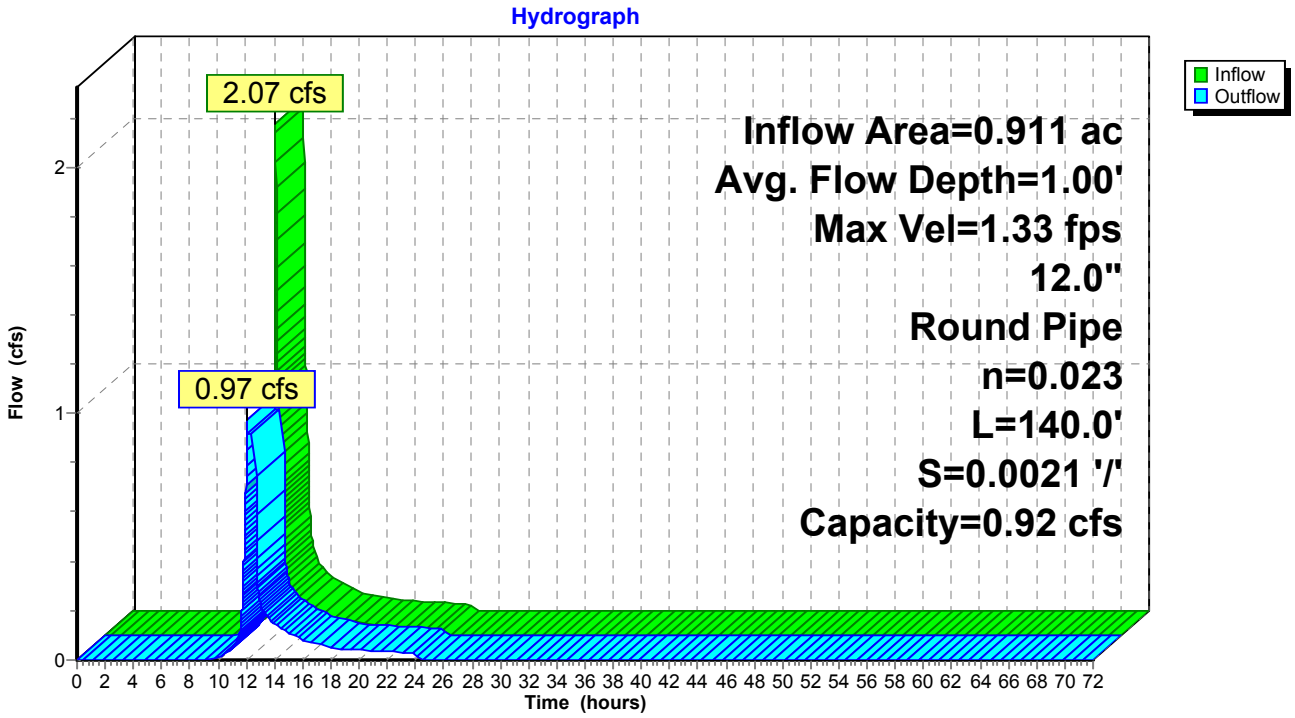
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.62 fps, Avg. Travel Time= 3.7 min

Peak Storage= 110 cf @ 12.01 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 0.92 cfs

12.0" Round Pipe
n= 0.023
Length= 140.0' Slope= 0.0021 '/'
Inlet Invert= 177.20', Outlet Invert= 176.91'



Reach 102: CBs AT HARLOW TO GYM CB-PG



Summary for Reach 102R: RIPRAP APRON

Inflow	=	2.28 cfs @	12.17 hrs,	Volume=	0.081 af
Outflow	=	2.28 cfs @	12.17 hrs,	Volume=	0.081 af, Atten= 0%, Lag= 0.4 min

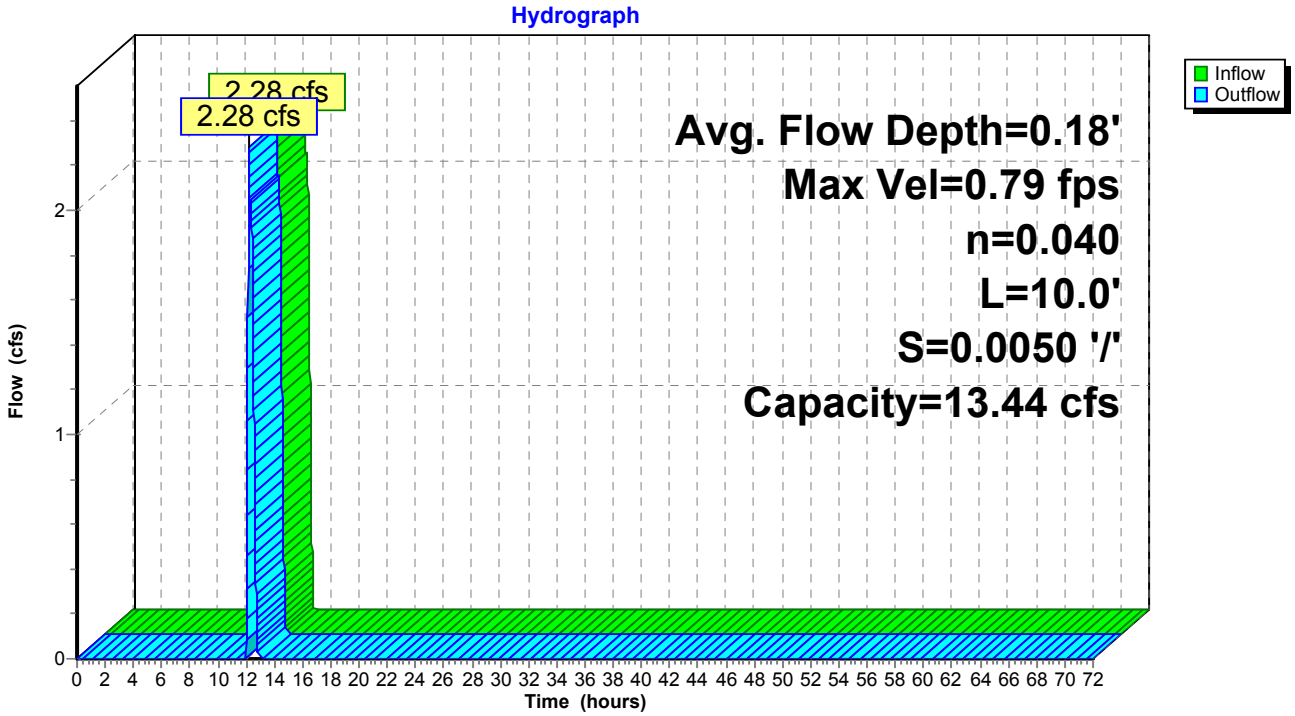
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.79 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.46 fps, Avg. Travel Time= 0.4 min

Peak Storage= 29 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.18'
Bank-Full Depth= 0.50' Flow Area= 9.5 sf, Capacity= 13.44 cfs

14.00' x 0.50' deep channel, n= 0.040 Earth, cobble bottom, clean sides
Side Slope Z-value= 10.0 '/' Top Width= 24.00'
Length= 10.0' Slope= 0.0050 '/'
Inlet Invert= 137.00', Outlet Invert= 136.95'

‡

Reach 102R: RIPRAP APRON



Summary for Pond 1P: CBs AT RAY BUILDING-PG-STN

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE IS REVISED (UPGRADED TO 15" PIPE OUTLET) AS DEVELOPED PREVIOUSLY BY PINKHAM AND GREER.

INFLOW TO THIS STRUTURE IS REVISED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT. THE STORM DRAIN SYSTEMS WERE RECONFIGURED. THIS STRUCTURE NOW DRAINS TO THE PROPOSED STONE BERM LEVEL SPREADER.

RUNOFF FROM SUBCATCHMENT 100 (REVISED TO INCLUDE NEW SIDEWALKS) PREVIOUSLY DRAINING TO THIS STRUCTURE, AND A PORTION OF SC200 WAS ADDED. THESE FLOWS ARE DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow Area = 3.767 ac, 9.21% Impervious, Inflow Depth = 1.23" for 10 YEAR event
Inflow = 3.35 cfs @ 12.29 hrs, Volume= 0.385 af
Outflow = 3.35 cfs @ 12.30 hrs, Volume= 0.385 af, Atten= 0%, Lag= 0.5 min
Primary = 3.35 cfs @ 12.30 hrs, Volume= 0.385 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 183.11' @ 12.30 hrs Surf.Area= 80 sf Storage= 121 cf

Plug-Flow detention time= 1.7 min calculated for 0.385 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (885.2 - 883.5)

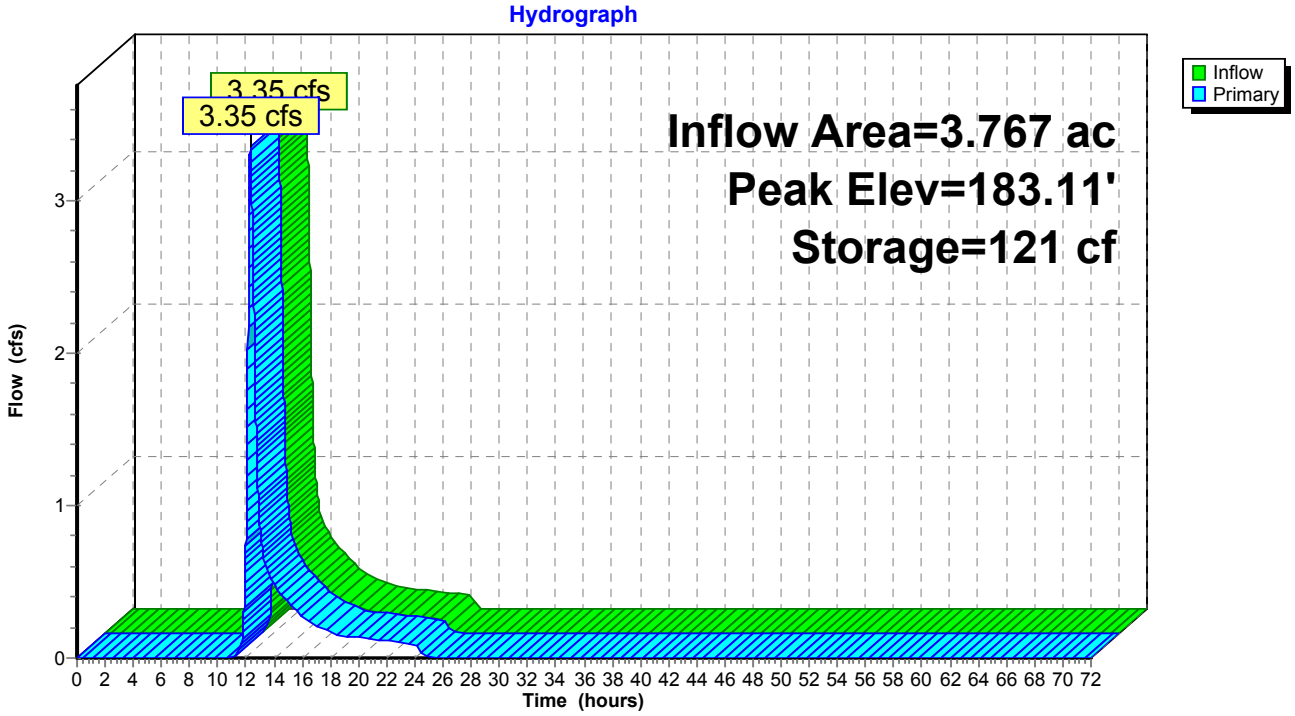
Volume	Invert	Avail.Storage	Storage Description
#1	182.00'	4,584 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
182.00	136	0	0
184.00	36	172	172
188.00	36	144	316
189.00	2,500	1,268	1,584
190.00	3,500	3,000	4,584

Device	Routing	Invert	Outlet Devices
#1	Primary	182.00'	**15.0" Round Culvert** L= 370.0' Ke= 0.500 Inlet / Outlet Invert= 182.00' / 176.89' S= 0.0138 '/' Cc= 0.900 n= 0.023, Flow Area= 1.23 sf
#2	Primary	188.90'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.35 cfs @ 12.30 hrs HW=183.11' (Free Discharge)
└─**1=Culvert** (Barrel Controls 3.35 cfs @ 3.84 fps)
└─**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: CBs AT RAY BUILDING-PG-STN



Summary for Pond 2P: CBs AT THE GYM-PG

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY PINKHAM AND GREER AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow Area = 2.922 ac, 62.66% Impervious, Inflow Depth = 2.75" for 10 YEAR event
Inflow = 8.34 cfs @ 12.07 hrs, Volume= 0.671 af
Outflow = 8.34 cfs @ 12.07 hrs, Volume= 0.671 af, Atten= 0%, Lag= 0.1 min
Primary = 8.34 cfs @ 12.07 hrs, Volume= 0.671 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 174.81' @ 12.07 hrs Surf.Area= 31 sf Storage= 47 cf

Plug-Flow detention time= 0.2 min calculated for 0.671 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (807.5 - 807.3)

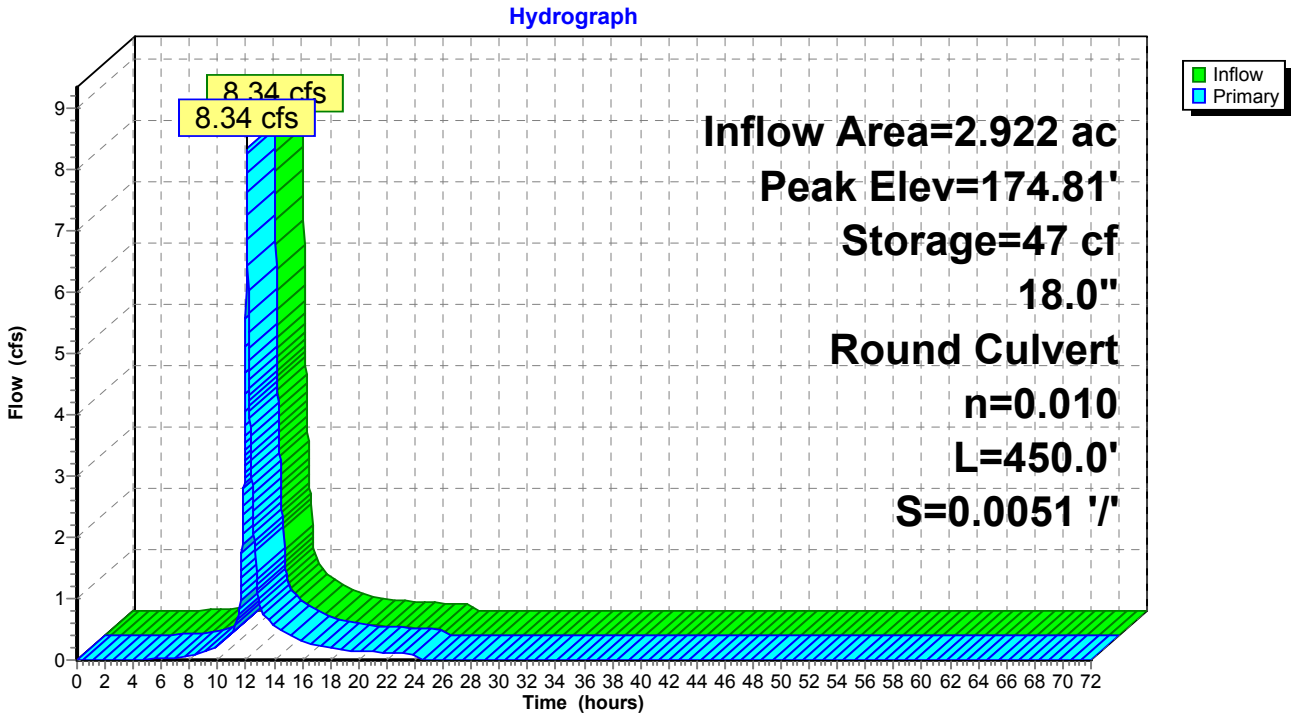
Volume	Invert	Avail.Storage	Storage Description
#1	173.10'	1,749 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
173.10	24	0	0
176.00	36	87	87
180.00	36	144	231
181.00	500	268	499
182.00	2,000	1,250	1,749

Device	Routing	Invert	Outlet Devices
#1	Primary	173.10'	**18.0" Round Culvert** L= 450.0' Ke= 0.500 Inlet / Outlet Invert= 173.10' / 170.81' S= 0.0051 '/' Cc= 0.900 n= 0.010, Flow Area= 1.77 sf

Primary OutFlow Max=8.33 cfs @ 12.07 hrs HW=174.81' (Free Discharge)
└**1=Culvert** (Inlet Controls 8.33 cfs @ 4.71 fps)

Pond 2P: CBs AT THE GYM-PG



Summary for Pond 3P: CULVERT ABOVE DETENTION POND-PG

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY PINKHAM AND GREER (PREVIOUSLY MODELED BY SEBAGO TECHNICS AS PIPE REACH 7R) AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow Area = 9.136 ac, 49.99% Impervious, Inflow Depth = 2.40" for 10 YEAR event
Inflow = 14.48 cfs @ 12.14 hrs, Volume= 1.826 af
Outflow = 14.13 cfs @ 12.15 hrs, Volume= 1.826 af, Atten= 2%, Lag= 1.1 min
Primary = 14.13 cfs @ 12.15 hrs, Volume= 1.826 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 163.37' @ 12.15 hrs Surf.Area= 484 sf Storage= 632 cf

Plug-Flow detention time= 0.6 min calculated for 1.826 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (837.8 - 837.2)

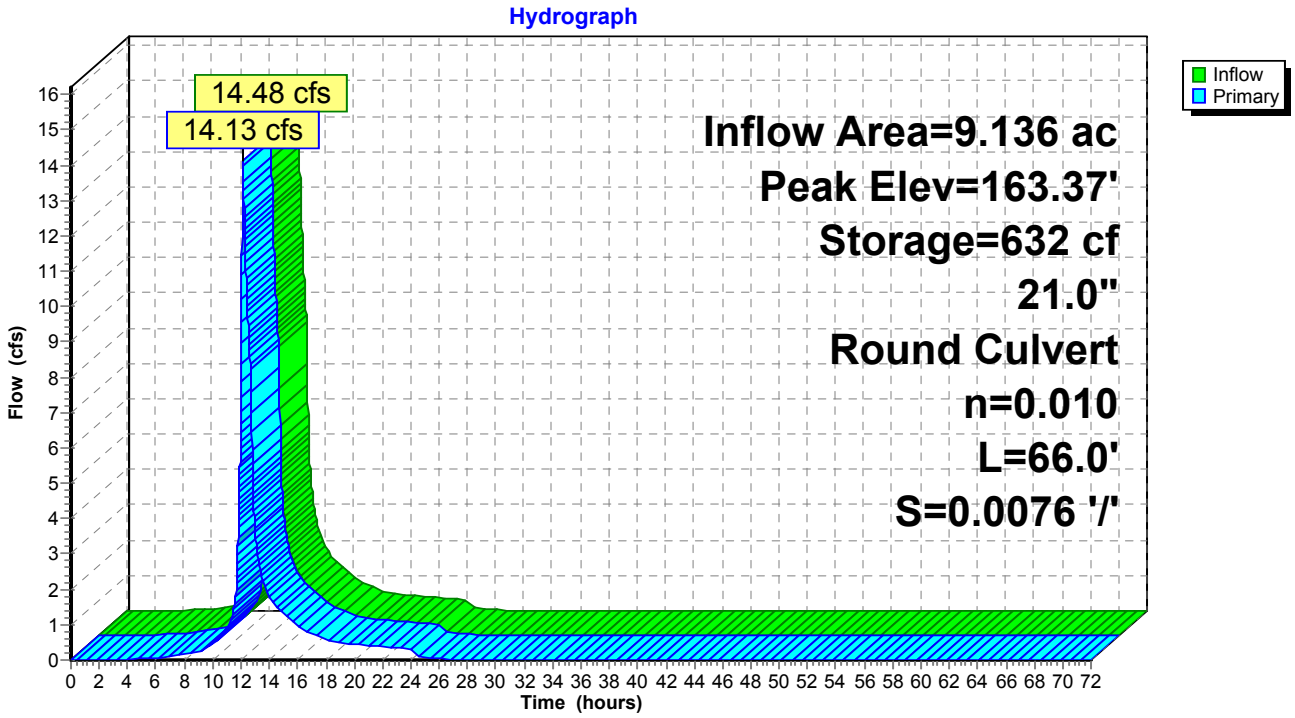
Volume	Invert	Avail.Storage	Storage Description
#1	161.00'	3,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.00	50	0	0
164.00	600	975	975
166.00	2,100	2,700	3,675

Device	Routing	Invert	Outlet Devices
#1	Primary	161.00'	**21.0" Round Culvert** L= 66.0' Ke= 0.500 Inlet / Outlet Invert= 161.00' / 160.50' S= 0.0076 '/' Cc= 0.900 n= 0.010, Flow Area= 2.41 sf

Primary OutFlow Max=14.13 cfs @ 12.15 hrs HW=163.37' (Free Discharge)
└**1=Culvert** (Barrel Controls 14.13 cfs @ 5.87 fps)

Pond 3P: CULVERT ABOVE DETENTION POND-PG



Summary for Pond 4P: NEW LANDSCAPE POND @ ARSENAL STREET-ST

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND CONTINUES TO DRAIN TO THE EXISTING LEVEL SPREADER POND (5P) CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS.

INFLOW TO THIS STRUTURE IS MODIFIED SLIGHTLY DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

Inflow Area = 2.874 ac, 60.06% Impervious, Inflow Depth = 2.77" for 10 YEAR event
Inflow = 6.88 cfs @ 12.09 hrs, Volume= 0.664 af
Outflow = 4.13 cfs @ 12.32 hrs, Volume= 0.664 af, Atten= 40%, Lag= 13.6 min
Primary = 4.13 cfs @ 12.32 hrs, Volume= 0.664 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 175.42' @ 12.32 hrs Surf.Area= 4,667 sf Storage= 5,760 cf

Plug-Flow detention time= 50.6 min calculated for 0.664 af (100% of inflow)
Center-of-Mass det. time= 50.6 min (844.4 - 793.9)

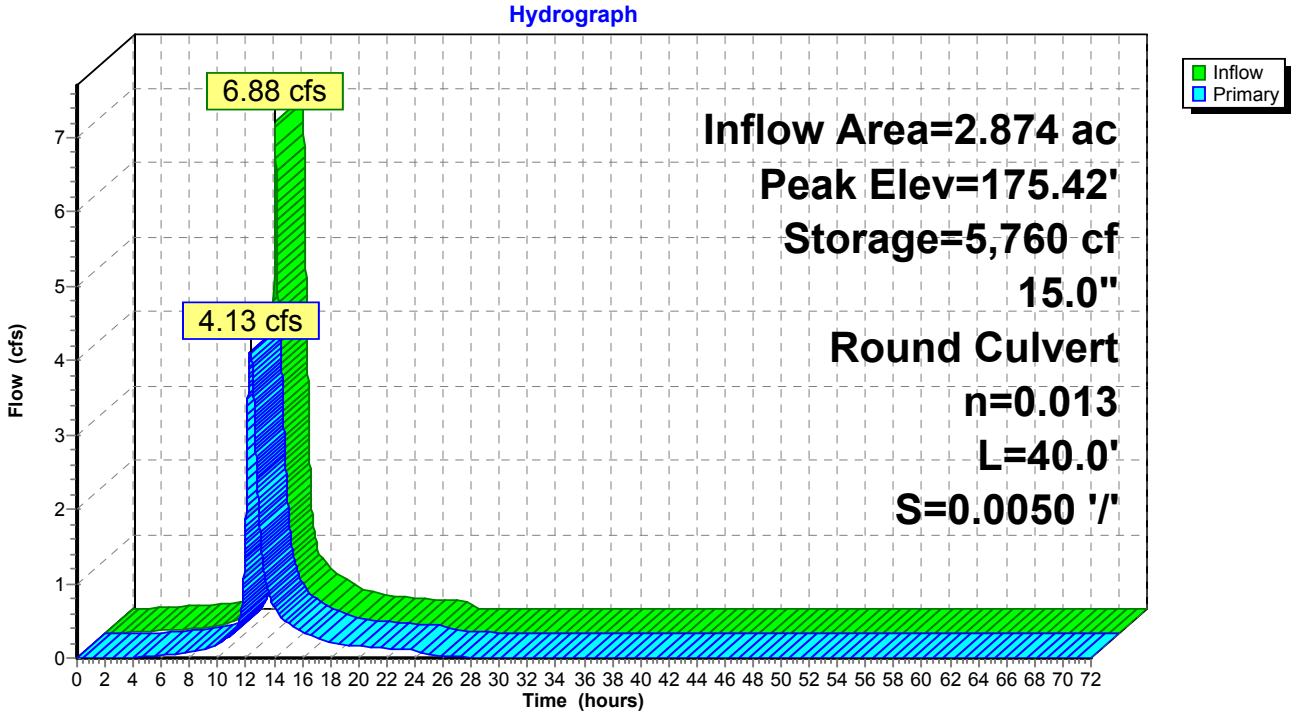
Volume	Invert	Avail.Storage	Storage Description
#1	174.00'	20,678 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
174.00	3,423	0	0
178.00	6,916	20,678	20,678

Device	Routing	Invert	Outlet Devices
#1	Primary	174.00'	**15.0" Round Culvert** L= 40.0' Ke= 0.900 Inlet / Outlet Invert= 174.00' / 173.80' S= 0.0050 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf

Primary OutFlow Max=4.13 cfs @ 12.32 hrs HW=175.42' (Free Discharge)
└**1=Culvert** (Barrel Controls 4.13 cfs @ 3.70 fps)

Pond 4P: NEW LANDSCAPE POND @ ARSENAL STREET-ST



Summary for Pond 5P: DETENTION POND @ LEVEL SPREADER-ST-PG-STN

FOR THE DEVELOPED CONDITION THE CONFIGURATION OF THIS STRUCTURE REMAINS UNCHANGED AS DEVELOPED PREVIOUSLY BY SEBAGO TECHNICS AND MODELED AS THE EXISTING LEVEL SPREADER POND CONSTRUCTED FOR THE RIVERVIEW PROJECT (SEBAGO TECHNICS) AND SUBSEQUENTLY REVISED BY PINKHAM AND GREER FOR THE HARLOW BUILDING RENOVATIONS. STANTEC REPLICATED THIS POND FOR THE EXISTING CONDITIONS FOR MORE RECENT HYDROCAD VERSION 10 (PREVIOUSLY PERFORMED WITH HYDROCAD VERSION 6.0-VALUES FOR Q MAY BE SLIGHTLY DIFFERENT).

INFLOW TO THIS STRUTURE IS REDUCED DUE TO THE RECONFIGURATION OF THE STORM DRAIN SYSTEM FOR THIS PROJECT AND MINOR CHANGES TO SUBCATCHMENT 4S.

RUNOFF FROM SUBCATCHMENTS 100 AND 200 PREVIOUSLY DRAINING TO THIS STRUCTURE IS DIVERTED TO A NEW STONE BERM LEVEL SPREADER (100P) FOR THIS PROJECT.

Inflow Area =	9.786 ac,	48.10% Impervious,	Inflow Depth =	2.34"	for 10 YEAR event
Inflow =	15.11 cfs @	12.15 hrs,	Volume=	1.910 af	
Outflow =	13.18 cfs @	12.23 hrs,	Volume=	1.910 af,	Atten= 13%, Lag= 5.0 min
Discarded =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Primary =	4.39 cfs @	12.23 hrs,	Volume=	0.637 af	
Secondary =	4.39 cfs @	12.23 hrs,	Volume=	0.637 af	
Tertiary =	4.39 cfs @	12.23 hrs,	Volume=	0.637 af	

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.85' @ 12.23 hrs Surf.Area= 2,279 sf Storage= 2,659 cf

Plug-Flow detention time= 1.8 min calculated for 1.909 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (840.5 - 838.7)

Volume	Invert	Avail.Storage	Storage Description
#1	160.25'	9,613 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
160.25	1,100	0	0
161.00	1,600	1,013	1,013
162.00	2,400	2,000	3,013
164.00	4,200	6,600	9,613

Device	Routing	Invert	Outlet Devices
#1	Primary	160.00'	**12.0" Round Culvert** L= 90.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 156.00' S= 0.0444 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf
#2	Discarded	162.40'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#3	Secondary	160.00'	**12.0" Round Culvert** L= 68.0' Ke= 0.500 Inlet / Outlet Invert= 160.00' / 156.00' S= 0.0588 '/' Cc= 0.900

n= 0.012, Flow Area= 0.79 sf
#4 Tertiary 160.00' **12.0" Round Culvert** L= 72.0' Ke= 0.500
Inlet / Outlet Invert= 160.00' / 158.13' S= 0.0260 '/' Cc= 0.900
n= 0.012, Flow Area= 0.79 sf

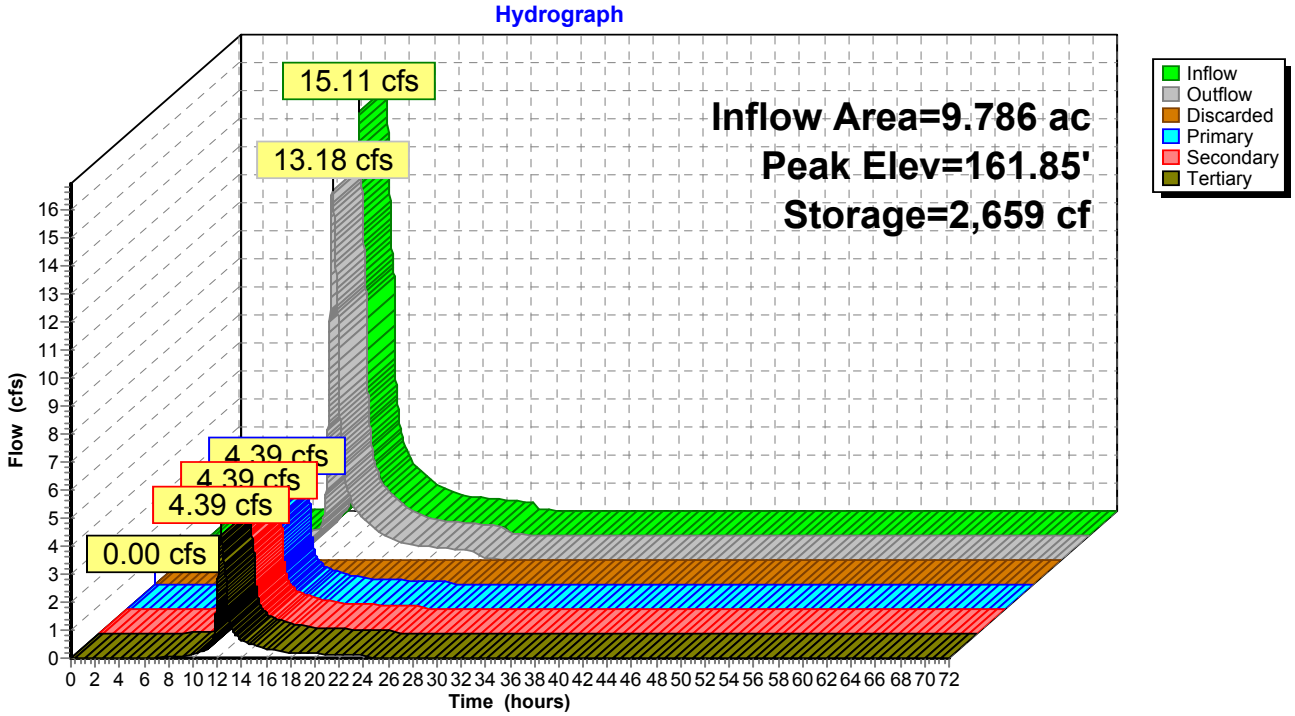
Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=160.25' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Primary OutFlow Max=4.39 cfs @ 12.23 hrs HW=161.85' (Free Discharge)
└**1=Culvert** (Inlet Controls 4.39 cfs @ 5.59 fps)

Secondary OutFlow Max=4.39 cfs @ 12.23 hrs HW=161.85' (Free Discharge)
└**3=Culvert** (Inlet Controls 4.39 cfs @ 5.59 fps)

Tertiary OutFlow Max=4.39 cfs @ 12.23 hrs HW=161.85' (Free Discharge)
└**4=Culvert** (Inlet Controls 4.39 cfs @ 5.59 fps)

Pond 5P: DETENTION POND @ LEVEL SPREADER-ST-PG-STN



Summary for Pond 100P: STONE BERM LEVEL SPREADER

Inflow Area = 4.784 ac, 24.69% Impervious, Inflow Depth = 1.49" for 10 YEAR event
Inflow = 2.92 cfs @ 12.17 hrs, Volume= 0.593 af
Outflow = 2.87 cfs @ 12.33 hrs, Volume= 0.593 af, Atten= 2%, Lag= 10.0 min
Discarded = 0.02 cfs @ 12.33 hrs, Volume= 0.023 af
Primary = 0.86 cfs @ 11.97 hrs, Volume= 0.464 af
Secondary = 1.99 cfs @ 12.33 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 141.04' @ 12.33 hrs Surf.Area= 1,608 sf Storage= 2,208 cf

Plug-Flow detention time= 30.6 min calculated for 0.593 af (100% of inflow)
Center-of-Mass det. time= 30.6 min (897.3 - 866.7)

Volume	Invert	Avail.Storage	Storage Description
#1	138.50'	4,116 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
138.50	315	0.0	0	0
139.00	315	40.0	63	63
139.50	750	100.0	266	329
140.00	1,125	100.0	469	798
141.00	1,580	100.0	1,353	2,151
142.00	2,350	100.0	1,965	4,116

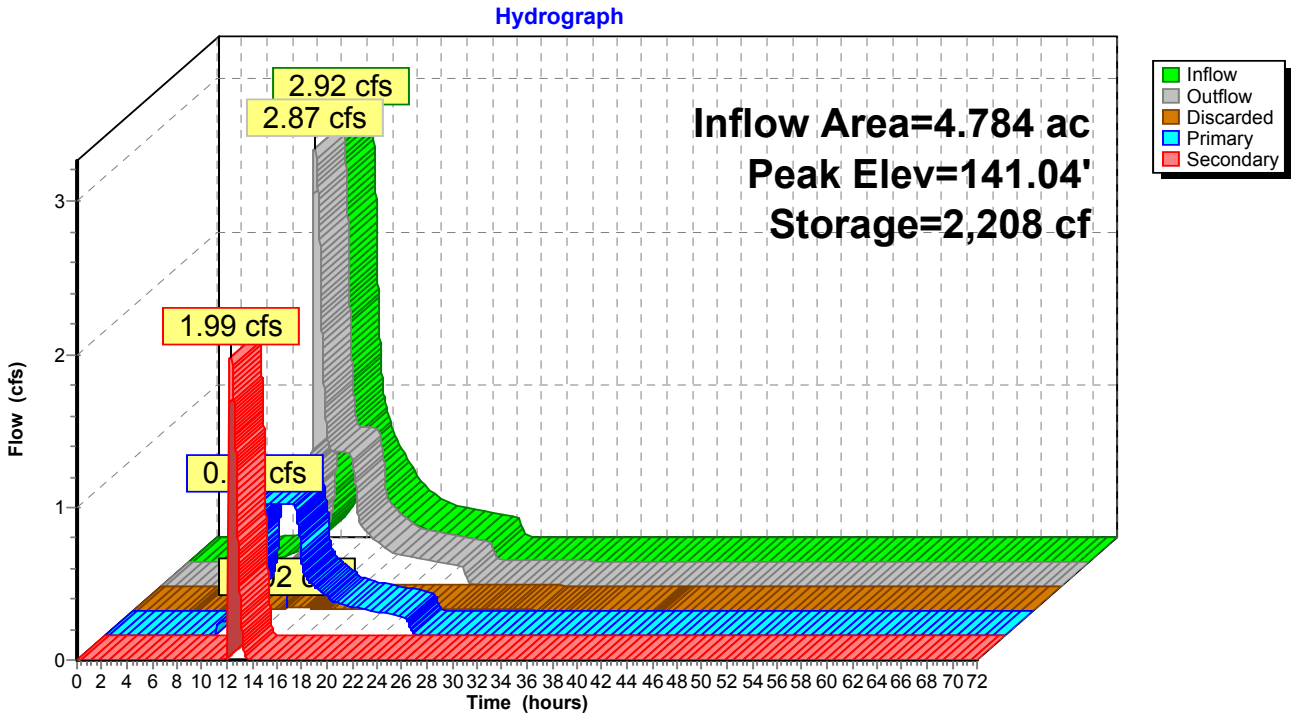
Device	Routing	Invert	Outlet Devices
#1	Device 2	139.50'	**100.0' long x 8.0' breadth Broad-Crested Weir-LEVEL LIP** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	138.50'	**0.864 cfs Constant Flow THROUGH BERM (0.009 FCS/FT)** Phase-In= 1.50'
#3	Secondary	141.00'	**105.0' long x 2.0' breadth Broad-Crested Weir-STONE BERM** 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
#4	Discarded	138.50'	**0.500 in/hr Exfiltration-(STONE TRENCH) over Surface area**

Discarded OutFlow Max=0.02 cfs @ 12.33 hrs HW=141.04' (Free Discharge)
└─**4=Exfiltration-(STONE TRENCH)** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.86 cfs @ 11.97 hrs HW=140.00' (Free Discharge)
└─**2=Constant Flow THROUGH BERM (0.009 FCS/FT)** (Constant Controls 0.86 cfs)
  └─**1=Broad-Crested Weir-LEVEL LIP** (Passes 0.86 cfs of 92.83 cfs potential flow)

Secondary OutFlow Max=1.83 cfs @ 12.33 hrs HW=141.04' (Free Discharge)
└─**3=Broad-Crested Weir-STONE BERM** (Weir Controls 1.83 cfs @ 0.48 fps)

Pond 100P: STONE BERM LEVEL SPREADER



Summary for Pond 101P: BYPASS STRUCTURE

Inflow Area =	4.784 ac, 24.69% Impervious, Inflow Depth = 1.69" for 10 YEAR event				
Inflow =	5.20 cfs @	12.17 hrs, Volume=	0.674 af		
Outflow =	5.20 cfs @	12.17 hrs, Volume=	0.674 af, Atten= 0%, Lag= 0.0 min		
Primary =	2.92 cfs @	12.17 hrs, Volume=	0.593 af		
Secondary =	2.28 cfs @	12.17 hrs, Volume=	0.081 af		

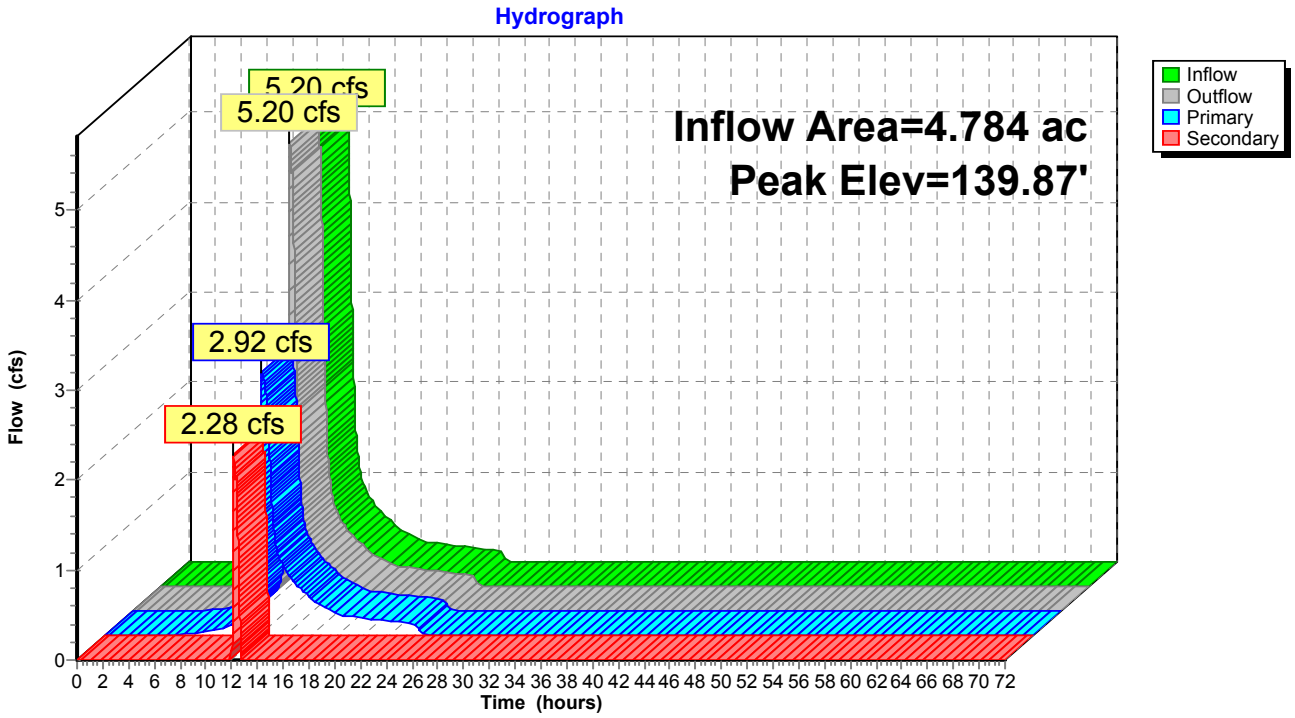
Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 139.87' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	138.70'	**12.0" Round Culvert** L= 20.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.70' / 138.50' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.20'	**18.0" Round CULVERT TO APRON** L= 75.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.20' / 136.50' S= 0.0227 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	139.60'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.92 cfs @ 12.17 hrs HW=139.87' (Free Discharge)
└─**1=Culvert** (Barrel Controls 2.92 cfs @ 3.99 fps)

Secondary OutFlow Max=2.28 cfs @ 12.17 hrs HW=139.87' (Free Discharge)
└─**2=CULVERT TO APRON** (Passes 2.28 cfs of 8.17 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.28 cfs @ 1.70 fps)

Pond 101P: BYPASS STRUCTURE



Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.682	61	>75% Grass cover, Good, HSG B (4S, 5S, 6S, 7S, 100, 201, 225, 250, 300, 400)
2.258	98	Paved parking, HSG B (5S, 6S, 7S, 100, 225)
0.330	98	Paved parking, HSG B (BLDGS AND WALKS) (400)
0.676	98	Paved parking, HSG B (NEW PRKG LOT) (4S)
0.740	98	Paved parking, HSG B (includes new pavement) (300)
1.050	98	Roofs, HSG B (61S)
0.834	98	Water Surface, HSG B (250)
14.570	**76**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
14.570	HSG B	4S, 5S, 6S, 7S, 61S, 100, 201, 225, 250, 300, 400
0.000	HSG C	
0.000	HSG D	
0.000	Other	
14.570		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	8.682	0.000	0.000	0.000	8.682	>75% Grass cover, Good	4S, 5S, 6S, 7S, 100, 201, 225, 250, 300, 400
0.000	4.004	0.000	0.000	0.000	4.004	Paved parking	4S, 5S, 6S, 7S, 100, 225, 300, 400
0.000	1.050	0.000	0.000	0.000	1.050	Roofs	61S
0.000	0.834	0.000	0.000	0.000	0.834	Water Surface	250
0.000	**14.570**	**0.000**	**0.000**	**0.000**	**14.570**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1R	0.00	-2.30	460.0	0.0050	0.013	18.0	0.0	0.0
2	2R	0.00	-7.75	250.0	0.0310	0.013	18.0	0.0	0.0
3	3R	0.00	-25.50	300.0	0.0850	0.013	18.0	0.0	0.0
4	5R	0.00	-4.70	470.0	0.0100	0.012	14.0	0.0	0.0
5	102	177.20	176.91	140.0	0.0021	0.023	12.0	0.0	0.0
6	1P	182.00	176.89	370.0	0.0138	0.023	15.0	0.0	0.0
7	2P	173.10	170.81	450.0	0.0051	0.010	18.0	0.0	0.0
8	3P	161.00	160.50	66.0	0.0076	0.010	21.0	0.0	0.0
9	4P	174.00	173.80	40.0	0.0050	0.013	15.0	0.0	0.0
10	5P	160.00	156.00	90.0	0.0444	0.012	12.0	0.0	0.0
11	5P	160.00	156.00	68.0	0.0588	0.012	12.0	0.0	0.0
12	5P	160.00	158.13	72.0	0.0260	0.012	12.0	0.0	0.0
13	101P	138.70	138.50	20.0	0.0100	0.013	12.0	0.0	0.0
14	101P	138.20	136.50	75.0	0.0227	0.013	18.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=0.96"
Flow Length=300' Tc=13.4 min CN=75 Runoff=1.52 cfs 0.146 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=1.07"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=1.90 cfs 0.162 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=0.54"
Flow Length=320' Tc=14.4 min CN=66 Runoff=0.56 cfs 0.069 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=0.67"
Flow Length=240' Tc=7.3 min CN=69 Runoff=0.41 cfs 0.036 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=2.77"
Tc=5.0 min CN=98 Runoff=3.16 cfs 0.242 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=0.51"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=0.94 cfs 0.133 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=0.37"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.11 cfs 0.019 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=2.35"
Tc=5.0 min CN=94 Runoff=2.32 cfs 0.165 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=2.07"
Tc=5.0 min CN=91 Runoff=2.53 cfs 0.176 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=1.52"
Tc=5.0 min CN=84 Runoff=2.15 cfs 0.147 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=0.91"
Tc=5.0 min CN=74 Runoff=0.94 cfs 0.069 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=0.60' Max Vel=3.80 fps Inflow=2.63 cfs 0.327 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=2.52 cfs 0.327 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.37' Max Vel=7.32 fps Inflow=2.52 cfs 0.327 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=2.52 cfs 0.327 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.29' Max Vel=10.46 fps Inflow=2.52 cfs 0.327 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=2.51 cfs 0.327 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=0.70' Max Vel=5.84 fps Inflow=3.94 cfs 0.551 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=3.91 cfs 0.551 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.37' Max Vel=5.30 fps Inflow=8.03 cfs 1.001 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=8.00 cfs 1.001 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=1.19 fps Inflow=2.66 cfs 0.346 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=2.65 cfs 0.346 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.06' Max Vel=1.66 fps Inflow=2.66 cfs 0.346 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=2.65 cfs 0.346 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.28' Max Vel=0.37 fps Inflow=2.66 cfs 0.346 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=2.65 cfs 0.346 af

Reach 100R: BUFFER Avg. Flow Depth=0.06' Max Vel=0.23 fps Inflow=1.76 cfs 0.305 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=1.36 cfs 0.305 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=0.80' Max Vel=1.33 fps Inflow=0.94 cfs 0.069 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.89 cfs 0.069 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.05' Max Vel=0.34 fps Inflow=0.23 cfs 0.001 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=0.23 cfs 0.001 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=182.56' Storage=68 cf Inflow=1.04 cfs 0.152 af
Outflow=1.04 cfs 0.152 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=174.23' Storage=30 cf Inflow=5.15 cfs 0.382 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=5.15 cfs 0.382 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=162.41' Storage=253 cf Inflow=8.00 cfs 1.001 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=7.98 cfs 1.001 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=174.95' Storage=3,657 cf Inflow=4.08 cfs 0.388 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=2.33 cfs 0.388 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=160.99' Storage=999 cf Inflow=8.36 cfs 1.038 af
cfs 0.000 af Primary=2.66 cfs 0.346 af Secondary=2.66 cfs 0.346 af Tertiary=2.66 cfs 0.346 af Outflow=7.97 cfs 1.038 af

Pond 100P: STONE BERM LEVEL Peak Elev=141.02' Storage=2,185 cf Inflow=2.28 cfs 0.326 af
Discarded=0.02 cfs 0.021 af Primary=0.86 cfs 0.291 af Secondary=0.90 cfs 0.013 af Outflow=1.78 cfs 0.326 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.66' Inflow=2.51 cfs 0.327 af
Primary=2.28 cfs 0.326 af Secondary=0.23 cfs 0.001 af Outflow=2.51 cfs 0.327 af

Total Runoff Area = 14.570 ac Runoff Volume = 1.365 af Average Runoff Depth = 1.12"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=2.53"
Flow Length=300' Tc=13.4 min CN=75 Runoff=4.26 cfs 0.385 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=2.71"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=5.01 cfs 0.411 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=1.80"
Flow Length=320' Tc=14.4 min CN=66 Runoff=2.35 cfs 0.228 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=2.03"
Flow Length=240' Tc=7.3 min CN=69 Runoff=1.45 cfs 0.110 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=4.86"
Tc=5.0 min CN=98 Runoff=5.43 cfs 0.426 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=1.72"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=4.12 cfs 0.451 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=1.43"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.64 cfs 0.074 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=4.41"
Tc=5.0 min CN=94 Runoff=4.19 cfs 0.310 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=4.08"
Tc=5.0 min CN=91 Runoff=4.82 cfs 0.346 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=3.36"
Tc=5.0 min CN=84 Runoff=4.73 cfs 0.327 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=2.44"
Tc=5.0 min CN=74 Runoff=2.70 cfs 0.186 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=1.12' Max Vel=4.76 fps Inflow=6.87 cfs 0.871 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=6.73 cfs 0.871 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.63' Max Vel=9.64 fps Inflow=6.73 cfs 0.871 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=6.72 cfs 0.871 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.48' Max Vel=13.89 fps Inflow=6.72 cfs 0.871 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=6.71 cfs 0.871 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=1.17' Max Vel=6.21 fps Inflow=9.29 cfs 1.221 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=6.22 cfs 1.221 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.56' Max Vel=6.64 fps Inflow=17.44 cfs 2.271 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=17.16 cfs 2.271 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.13' Max Vel=1.52 fps Inflow=4.96 cfs 0.794 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=4.96 cfs 0.794 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=2.13 fps Inflow=4.96 cfs 0.794 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=4.96 cfs 0.794 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.41' Max Vel=0.47 fps Inflow=4.96 cfs 0.794 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=4.96 cfs 0.794 af

Reach 100R: BUFFER Avg. Flow Depth=0.10' Max Vel=0.32 fps Inflow=3.11 cfs 0.698 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=3.01 cfs 0.698 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=1.00' Max Vel=1.33 fps Inflow=2.70 cfs 0.186 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.98 cfs 0.186 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.24' Max Vel=0.92 fps Inflow=3.59 cfs 0.148 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=3.58 cfs 0.148 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=184.53' Storage=191 cf Inflow=4.75 cfs 0.525 af
Outflow=4.66 cfs 0.525 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=175.36' Storage=65 cf Inflow=9.84 cfs 0.822 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=9.81 cfs 0.822 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=163.85' Storage=889 cf Inflow=17.16 cfs 2.271 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=16.29 cfs 2.271 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=175.70' Storage=7,065 cf Inflow=8.35 cfs 0.810 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=4.71 cfs 0.810 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=162.22' Storage=3,571 cf Inflow=17.67 cfs 2.381 af
fs 0.000 af Primary=4.96 cfs 0.794 af Secondary=4.96 cfs 0.794 af Tertiary=4.96 cfs 0.794 af Outflow=14.89 cfs 2.381 af

Pond 100P: STONE BERM LEVEL Peak Elev=141.04' Storage=2,213 cf Inflow=3.13 cfs 0.722 af
Discarded=0.02 cfs 0.024 af Primary=0.86 cfs 0.544 af Secondary=2.24 cfs 0.154 af Outflow=3.13 cfs 0.722 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.97' Inflow=6.71 cfs 0.871 af
Primary=3.13 cfs 0.722 af Secondary=3.59 cfs 0.148 af Outflow=6.71 cfs 0.871 af

Total Runoff Area = 14.570 ac Runoff Volume = 3.251 af Average Runoff Depth = 2.68"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=0.09"
Flow Length=300' Tc=13.4 min CN=75 Runoff=0.05 cfs 0.013 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=0.12"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=0.10 cfs 0.018 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=0.01"
Flow Length=320' Tc=14.4 min CN=66 Runoff=0.00 cfs 0.001 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=0.03"
Flow Length=240' Tc=7.3 min CN=69 Runoff=0.00 cfs 0.001 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=1.03"
Tc=5.0 min CN=98 Runoff=1.25 cfs 0.091 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=0.01"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=0.00 cfs 0.001 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.00 cfs 0.000 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=0.72"
Tc=5.0 min CN=94 Runoff=0.73 cfs 0.050 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=0.54"
Tc=5.0 min CN=91 Runoff=0.66 cfs 0.046 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=84 Runoff=0.32 cfs 0.026 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=0.07"
Tc=5.0 min CN=74 Runoff=0.02 cfs 0.006 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=0.29' Max Vel=2.54 fps Inflow=0.66 cfs 0.047 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=0.61 cfs 0.047 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.19' Max Vel=4.81 fps Inflow=0.61 cfs 0.047 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=0.60 cfs 0.047 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.15' Max Vel=6.82 fps Inflow=0.60 cfs 0.047 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=0.60 cfs 0.047 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=0.25' Max Vel=3.46 fps Inflow=0.57 cfs 0.121 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=0.57 cfs 0.121 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.13' Max Vel=2.89 fps Inflow=1.28 cfs 0.205 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=1.25 cfs 0.205 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.03' Max Vel=0.56 fps Inflow=0.40 cfs 0.069 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=0.40 cfs 0.069 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.02' Max Vel=0.78 fps Inflow=0.40 cfs 0.069 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=0.40 cfs 0.069 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=0.17 fps Inflow=0.40 cfs 0.069 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=0.39 cfs 0.069 af

Reach 100R: BUFFER Avg. Flow Depth=0.02' Max Vel=0.12 fps Inflow=0.54 cfs 0.030 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=0.24 cfs 0.030 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=0.10' Max Vel=0.48 fps Inflow=0.02 cfs 0.006 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.02 cfs 0.006 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=182.01' Storage=1 cf Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=173.56' Storage=11 cf Inflow=1.05 cfs 0.082 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=1.05 cfs 0.082 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=161.48' Storage=45 cf Inflow=1.25 cfs 0.205 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=1.25 cfs 0.205 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=174.39' Storage=1,386 cf Inflow=1.25 cfs 0.104 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.47 cfs 0.104 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=160.31' Storage=68 cf Inflow=1.25 cfs 0.206 af
cfs 0.000 af Primary=0.40 cfs 0.069 af Secondary=0.40 cfs 0.069 af Tertiary=0.40 cfs 0.069 af Outflow=1.19 cfs 0.206 af

Pond 100P: STONE BERM LEVEL SPREADER Peak Elev=139.54' Storage=357 cf Inflow=0.60 cfs 0.047 af
Discarded=0.01 cfs 0.017 af Primary=0.54 cfs 0.030 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.047 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.12' Inflow=0.60 cfs 0.047 af
Primary=0.60 cfs 0.047 af Secondary=0.00 cfs 0.000 af Outflow=0.60 cfs 0.047 af

Total Runoff Area = 14.570 ac Runoff Volume = 0.254 af Average Runoff Depth = 0.21"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=0.96"
Flow Length=300' Tc=13.4 min CN=75 Runoff=1.52 cfs 0.146 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=1.07"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=1.90 cfs 0.162 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=0.54"
Flow Length=320' Tc=14.4 min CN=66 Runoff=0.56 cfs 0.069 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=0.67"
Flow Length=240' Tc=7.3 min CN=69 Runoff=0.41 cfs 0.036 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=2.77"
Tc=5.0 min CN=98 Runoff=3.16 cfs 0.242 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=0.51"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=0.94 cfs 0.133 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=0.37"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.11 cfs 0.019 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=2.35"
Tc=5.0 min CN=94 Runoff=2.32 cfs 0.165 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=2.07"
Tc=5.0 min CN=91 Runoff=2.53 cfs 0.176 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=1.52"
Tc=5.0 min CN=84 Runoff=2.15 cfs 0.147 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=0.91"
Tc=5.0 min CN=74 Runoff=0.94 cfs 0.069 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=0.60' Max Vel=3.80 fps Inflow=2.63 cfs 0.327 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=2.52 cfs 0.327 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.37' Max Vel=7.32 fps Inflow=2.52 cfs 0.327 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=2.52 cfs 0.327 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.29' Max Vel=10.46 fps Inflow=2.52 cfs 0.327 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=2.51 cfs 0.327 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=0.70' Max Vel=5.84 fps Inflow=3.94 cfs 0.551 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=3.91 cfs 0.551 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.37' Max Vel=5.30 fps Inflow=8.03 cfs 1.001 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=8.00 cfs 1.001 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=1.19 fps Inflow=2.66 cfs 0.346 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=2.65 cfs 0.346 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.06' Max Vel=1.66 fps Inflow=2.66 cfs 0.346 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=2.65 cfs 0.346 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.28' Max Vel=0.37 fps Inflow=2.66 cfs 0.346 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=2.65 cfs 0.346 af

Reach 100R: BUFFER Avg. Flow Depth=0.06' Max Vel=0.23 fps Inflow=1.76 cfs 0.305 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=1.36 cfs 0.305 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=0.80' Max Vel=1.33 fps Inflow=0.94 cfs 0.069 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.89 cfs 0.069 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.05' Max Vel=0.34 fps Inflow=0.23 cfs 0.001 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=0.23 cfs 0.001 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=182.56' Storage=68 cf Inflow=1.04 cfs 0.152 af
Outflow=1.04 cfs 0.152 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=174.23' Storage=30 cf Inflow=5.15 cfs 0.382 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=5.15 cfs 0.382 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=162.41' Storage=253 cf Inflow=8.00 cfs 1.001 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=7.98 cfs 1.001 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=174.95' Storage=3,657 cf Inflow=4.08 cfs 0.388 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=2.33 cfs 0.388 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=160.99' Storage=999 cf Inflow=8.36 cfs 1.038 af
cfs 0.000 af Primary=2.66 cfs 0.346 af Secondary=2.66 cfs 0.346 af Tertiary=2.66 cfs 0.346 af Outflow=7.97 cfs 1.038 af

Pond 100P: STONE BERM LEVEL Peak Elev=141.02' Storage=2,185 cf Inflow=2.28 cfs 0.326 af
Discarded=0.02 cfs 0.021 af Primary=0.86 cfs 0.291 af Secondary=0.90 cfs 0.013 af Outflow=1.78 cfs 0.326 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.66' Inflow=2.51 cfs 0.327 af
Primary=2.28 cfs 0.326 af Secondary=0.23 cfs 0.001 af Outflow=2.51 cfs 0.327 af

Total Runoff Area = 14.570 ac Runoff Volume = 1.365 af Average Runoff Depth = 1.12"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=2.53"
Flow Length=300' Tc=13.4 min CN=75 Runoff=4.26 cfs 0.385 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=2.71"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=5.01 cfs 0.411 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=1.80"
Flow Length=320' Tc=14.4 min CN=66 Runoff=2.35 cfs 0.228 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=2.03"
Flow Length=240' Tc=7.3 min CN=69 Runoff=1.45 cfs 0.110 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=4.86"
Tc=5.0 min CN=98 Runoff=5.43 cfs 0.426 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=1.72"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=4.12 cfs 0.451 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=1.43"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.64 cfs 0.074 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=4.41"
Tc=5.0 min CN=94 Runoff=4.19 cfs 0.310 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=4.08"
Tc=5.0 min CN=91 Runoff=4.82 cfs 0.346 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=3.36"
Tc=5.0 min CN=84 Runoff=4.73 cfs 0.327 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=2.44"
Tc=5.0 min CN=74 Runoff=2.70 cfs 0.186 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=1.12' Max Vel=4.76 fps Inflow=6.87 cfs 0.871 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=6.73 cfs 0.871 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.63' Max Vel=9.64 fps Inflow=6.73 cfs 0.871 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=6.72 cfs 0.871 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.48' Max Vel=13.89 fps Inflow=6.72 cfs 0.871 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=6.71 cfs 0.871 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=1.17' Max Vel=6.21 fps Inflow=9.29 cfs 1.221 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=6.22 cfs 1.221 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.56' Max Vel=6.64 fps Inflow=17.44 cfs 2.271 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=17.16 cfs 2.271 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.13' Max Vel=1.52 fps Inflow=4.96 cfs 0.794 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=4.96 cfs 0.794 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=2.13 fps Inflow=4.96 cfs 0.794 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=4.96 cfs 0.794 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.41' Max Vel=0.47 fps Inflow=4.96 cfs 0.794 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=4.96 cfs 0.794 af

Reach 100R: BUFFER Avg. Flow Depth=0.10' Max Vel=0.32 fps Inflow=3.11 cfs 0.698 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=3.01 cfs 0.698 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=1.00' Max Vel=1.33 fps Inflow=2.70 cfs 0.186 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.98 cfs 0.186 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.24' Max Vel=0.92 fps Inflow=3.59 cfs 0.148 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=3.58 cfs 0.148 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=184.53' Storage=191 cf Inflow=4.75 cfs 0.525 af
Outflow=4.66 cfs 0.525 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=175.36' Storage=65 cf Inflow=9.84 cfs 0.822 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=9.81 cfs 0.822 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=163.85' Storage=889 cf Inflow=17.16 cfs 2.271 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=16.29 cfs 2.271 af

Pond 4P: NEW LANDSCAPE POND @ Peak Elev=175.70' Storage=7,065 cf Inflow=8.35 cfs 0.810 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=4.71 cfs 0.810 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=162.22' Storage=3,571 cf Inflow=17.67 cfs 2.381 af
fs 0.000 af Primary=4.96 cfs 0.794 af Secondary=4.96 cfs 0.794 af Tertiary=4.96 cfs 0.794 af Outflow=14.89 cfs 2.381 af

Pond 100P: STONE BERM LEVEL Peak Elev=141.04' Storage=2,213 cf Inflow=3.13 cfs 0.722 af
Discarded=0.02 cfs 0.024 af Primary=0.86 cfs 0.544 af Secondary=2.24 cfs 0.154 af Outflow=3.13 cfs 0.722 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.97' Inflow=6.71 cfs 0.871 af
Primary=3.13 cfs 0.722 af Secondary=3.59 cfs 0.148 af Outflow=6.71 cfs 0.871 af

Total Runoff Area = 14.570 ac Runoff Volume = 3.251 af Average Runoff Depth = 2.68"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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 4S: BASIN 4 ST-STN Runoff Area=1.824 ac 37.06% Impervious Runoff Depth=0.09"
Flow Length=300' Tc=13.4 min CN=75 Runoff=0.05 cfs 0.013 af

Subcatchment 5S: BASIN 5 ST Runoff Area=1.820 ac 43.96% Impervious Runoff Depth=0.12"
Flow Length=180' Slope=0.0150 '/' Tc=10.2 min CN=77 Runoff=0.10 cfs 0.018 af

Subcatchment 6S: N & W SIDE OF BLDG Runoff Area=1.520 ac 13.82% Impervious Runoff Depth=0.01"
Flow Length=320' Tc=14.4 min CN=66 Runoff=0.00 cfs 0.001 af

Subcatchment 7S: BASIN 7-ST Runoff Area=0.650 ac 21.54% Impervious Runoff Depth=0.03"
Flow Length=240' Tc=7.3 min CN=69 Runoff=0.00 cfs 0.001 af

Subcatchment 61S: ROOF AREA EAST OF Runoff Area=1.050 ac 100.00% Impervious Runoff Depth=1.03"
Tc=5.0 min CN=98 Runoff=1.25 cfs 0.091 af

Subcatchment 100: FRONTYARD OF RAY Runoff Area=3.144 ac 11.04% Impervious Runoff Depth=0.01"
Flow Length=300' Slope=0.0800 '/' Tc=19.3 min CN=65 Runoff=0.00 cfs 0.001 af

Subcatchment 201: SOUTH OF NEW LOT Runoff Area=0.623 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=300' Tc=20.3 min CN=61 Runoff=0.00 cfs 0.000 af

Subcatchment 225: REVISED-STN Runoff Area=0.844 ac 90.17% Impervious Runoff Depth=0.72"
Tc=5.0 min CN=94 Runoff=0.73 cfs 0.050 af

Subcatchment 250: REVISED-STN FOR Runoff Area=1.017 ac 82.01% Impervious Runoff Depth=0.54"
Tc=5.0 min CN=91 Runoff=0.66 cfs 0.046 af

Subcatchment 300: GYM TO HARLOW Runoff Area=1.167 ac 63.41% Impervious Runoff Depth=0.27"
Tc=5.0 min CN=84 Runoff=0.32 cfs 0.026 af

Subcatchment 400: RAY TO HARLOW Runoff Area=0.911 ac 36.22% Impervious Runoff Depth=0.07"
Tc=5.0 min CN=74 Runoff=0.02 cfs 0.006 af

Reach 1R: NEW 18" PIPE Avg. Flow Depth=0.29' Max Vel=2.54 fps Inflow=0.66 cfs 0.047 af
18.0" Round Pipe n=0.013 L=460.0' S=0.0050 '/' Capacity=7.43 cfs Outflow=0.61 cfs 0.047 af

Reach 2R: NEW 18" PIPE Avg. Flow Depth=0.19' Max Vel=4.81 fps Inflow=0.61 cfs 0.047 af
18.0" Round Pipe n=0.013 L=250.0' S=0.0310 '/' Capacity=18.49 cfs Outflow=0.60 cfs 0.047 af

Reach 3R: NEW 18" PIPE Avg. Flow Depth=0.15' Max Vel=6.82 fps Inflow=0.60 cfs 0.047 af
18.0" Round Pipe n=0.013 L=300.0' S=0.0850 '/' Capacity=30.63 cfs Outflow=0.60 cfs 0.047 af

Reach 5R: PIPE 5-ST Avg. Flow Depth=0.25' Max Vel=3.46 fps Inflow=0.57 cfs 0.121 af
14.0" Round Pipe n=0.012 L=470.0' S=0.0100 '/' Capacity=5.82 cfs Outflow=0.57 cfs 0.121 af

Reach 6R: LS DITCH-ST Avg. Flow Depth=0.13' Max Vel=2.89 fps Inflow=1.28 cfs 0.205 af
n=0.022 L=300.0' S=0.0330 '/' Capacity=613.89 cfs Outflow=1.25 cfs 0.205 af

Reach 7R: (ST) PIPE 7 NOT USED, MODELED AS POND 3P

Reach 60R: LEVEL SPREADER Avg. Flow Depth=0.03' Max Vel=0.56 fps Inflow=0.40 cfs 0.069 af
n=0.035 L=20.0' S=0.0200 '/' Capacity=156.01 cfs Outflow=0.40 cfs 0.069 af

Reach 63R: LEVEL SPREADER Avg. Flow Depth=0.02' Max Vel=0.78 fps Inflow=0.40 cfs 0.069 af
n=0.020 L=20.0' S=0.0200 '/' Capacity=273.01 cfs Outflow=0.40 cfs 0.069 af

Reach 65R: LEVEL SPREADER Avg. Flow Depth=0.09' Max Vel=0.17 fps Inflow=0.40 cfs 0.069 af
n=0.240 L=20.0' S=0.0200 '/' Capacity=22.75 cfs Outflow=0.39 cfs 0.069 af

Reach 100R: BUFFER Avg. Flow Depth=0.02' Max Vel=0.12 fps Inflow=0.54 cfs 0.030 af
n=0.240 L=150.0' S=0.0600 '/' Capacity=146.18 cfs Outflow=0.24 cfs 0.030 af

Reach 102: CBs AT HARLOW TO GYM Avg. Flow Depth=0.10' Max Vel=0.48 fps Inflow=0.02 cfs 0.006 af
12.0" Round Pipe n=0.023 L=140.0' S=0.0021 '/' Capacity=0.92 cfs Outflow=0.02 cfs 0.006 af

Reach 102R: RIPRAP APRON Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=10.0' S=0.0050 '/' Capacity=13.44 cfs Outflow=0.00 cfs 0.000 af

Pond 1P: CBs AT RAY BUILDING-PG-STN Peak Elev=182.01' Storage=1 cf Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Pond 2P: CBs AT THE GYM-PG Peak Elev=173.56' Storage=11 cf Inflow=1.05 cfs 0.082 af
18.0" Round Culvert n=0.010 L=450.0' S=0.0051 '/' Outflow=1.05 cfs 0.082 af

Pond 3P: CULVERT ABOVE DETENTION Peak Elev=161.48' Storage=45 cf Inflow=1.25 cfs 0.205 af
21.0" Round Culvert n=0.010 L=66.0' S=0.0076 '/' Outflow=1.25 cfs 0.205 af

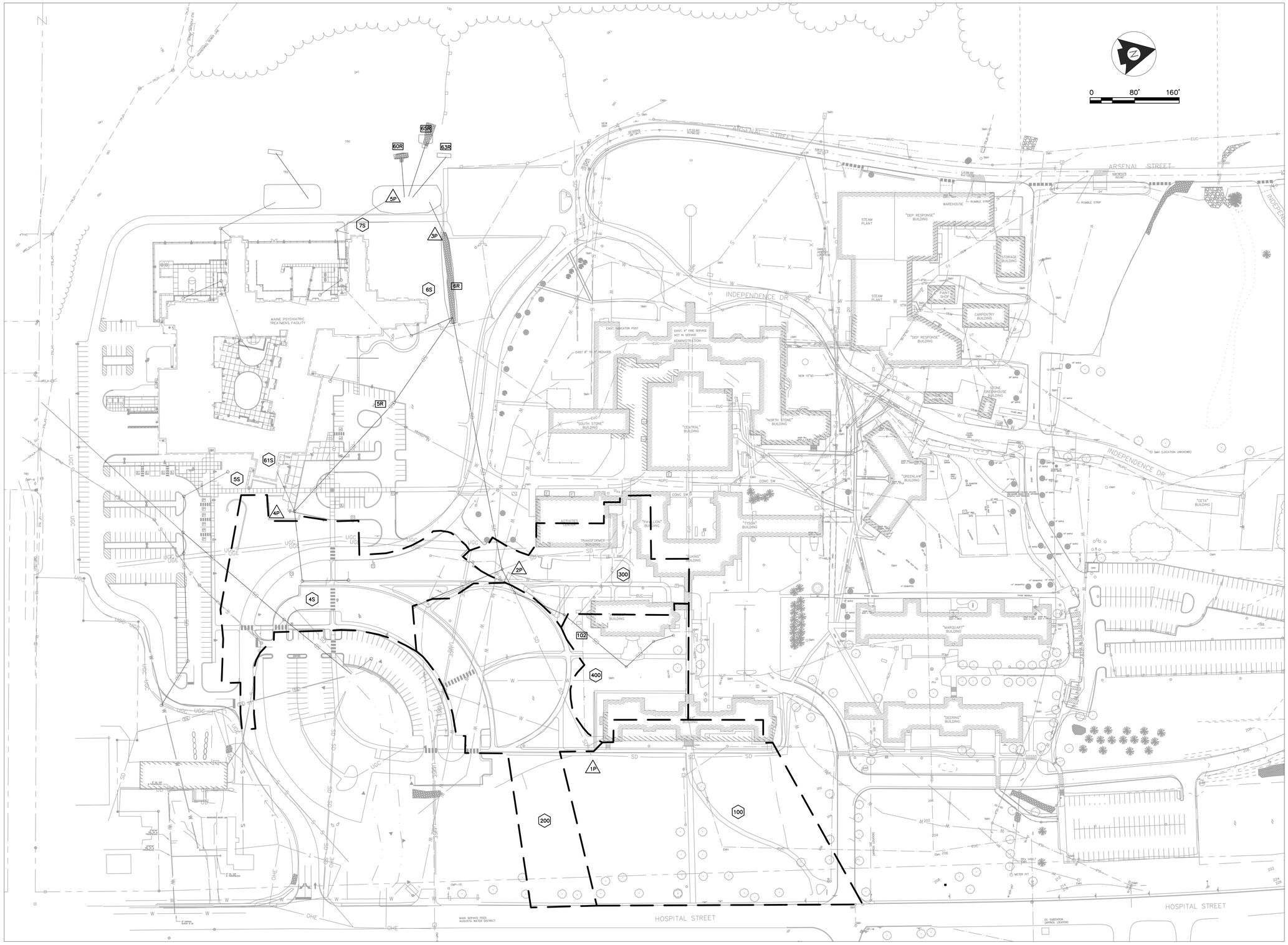
Pond 4P: NEW LANDSCAPE POND @ Peak Elev=174.39' Storage=1,386 cf Inflow=1.25 cfs 0.104 af
15.0" Round Culvert n=0.013 L=40.0' S=0.0050 '/' Outflow=0.47 cfs 0.104 af

Pond 5P: DETENTION POND @ LEVEL Peak Elev=160.31' Storage=68 cf Inflow=1.25 cfs 0.206 af
cfs 0.000 af Primary=0.40 cfs 0.069 af Secondary=0.40 cfs 0.069 af Tertiary=0.40 cfs 0.069 af Outflow=1.19 cfs 0.206 af

Pond 100P: STONE BERM LEVEL SPREADER Peak Elev=139.54' Storage=357 cf Inflow=0.60 cfs 0.047 af
Discarded=0.01 cfs 0.017 af Primary=0.54 cfs 0.030 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.047 af

Pond 101P: BYPASS STRUCTURE Peak Elev=139.12' Inflow=0.60 cfs 0.047 af
Primary=0.60 cfs 0.047 af Secondary=0.00 cfs 0.000 af Outflow=0.60 cfs 0.047 af

Total Runoff Area = 14.570 ac Runoff Volume = 0.254 af Average Runoff Depth = 0.21"
59.59% Pervious = 8.682 ac 40.41% Impervious = 5.888 ac



Stantec

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Notes

LEGEND

123	SUBCATCHMENT
123	DRAINAGE REACH
— — —	SUBCATCHMENT BOUNDARY
2	POND

Revision	By	Appd.	YY.MM.DD
A ISSUED FOR MDEP PERMIT	DMG	DPN	16.06.09

Issued	By	Appd.	YY.MM.DD

File Name:	Dwn.	Chkd.	Dsgn.	YY.MM.DD

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PROFESSIONAL ENGINEER

Client/Project
STATE OF MAINE
BUREAU OF GENERAL SERVICES

EAST CAMPUS
INFRASTRUCTURE IMPROVEMENTS
PHASE A

Augusta, Maine

Title
PRE-DEVELOPMENT DRAINAGE PLAN

Project No.	Scale
195210829	AS NOTED

Drawing No.	Sheet	Revision
SW-1	1 of 2	A

ORIGINAL SHEET - ARCH D

DRAINAGE AREA TO EXISTING DRAINAGE BMP

DRAINAGE AREA TO PROPOSED DRAINAGE BMP

Stantec

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Notes

LEGEND

123	SUBCATCHMENT
123	DRAINAGE REACH
— — —	SUBCATCHMENT BOUNDARY
2	POND

Revision	By	Appd.	YY.MM.DD
A ISSUED FOR MDEP PERMIT	DMG	DPN	16.06.09

Issued	By	Appd.	YY.MM.DD

File Name:

Dwn.	Chkd.	Dsgn.	YY.MM.DD

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PATRICK L. CLARK
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LICENSED
PROFESSIONAL ENGINEER

Client/Project
STATE OF MAINE
BUREAU OF GENERAL SERVICES

EAST CAMPUS
INFRASTRUCTURE IMPROVEMENTS
PHASE A

Augusta, Maine

Title
POST-DEVELOPMENT DRAINAGE PLAN

Project No.	Scale	
195210829	AS NOTED	
Drawing No.	**Sheet**	**Revision**
SW-2	2 of 2	A

ORIGINAL SHEET - ARCH D